

FINAL REPORT
U.S. AIR FORCE RADIO RELAY STATION LANDFILL (LF007)
SUPPLEMENTAL REMEDIAL INVESTIGATION
PORT HEIDEN, ALASKA

CONTRACT NO. W911KB-17-D-0019
DELIVERY ORDER NO. W911KB17F0078

SEPTEMBER 2020



Prepared for:
United States Air Force

Under contract with:
Department of the Army
U.S. Army Corps of Engineers, Alaska District
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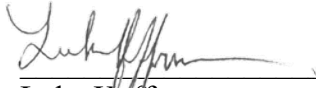
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APPROVAL PAGE

Ahtna Environmental, Inc. has prepared this Supplemental Remedial Investigation report for the U.S. Air Force in accordance with the terms and conditions of U.S. Army Corps of Engineers Contract No. W911KB-17-D-0019, Delivery Order No. W911KB17F0078.

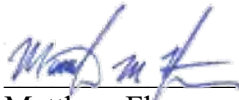
ADEC File No. 185 / 2637.38.002.05



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ACRONYMS AND ABBREVIATIONS

%	percent
AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
Ahtna	Ahtna Environmental, Inc.
AK	Alaska test method
Aniakchak	Aniakchak Contractors, LLC
AOC	area of concern
bgs	below ground surface
BHC	hexachlorocyclohexane
btoc	below top of casing
CCV	continuing calibration verification
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	contaminant of concern
COPC	chemical of potential concern
COR	contracting officer's representative
CRSL	cumulative risk screening level
CSM	conceptual site model
cy	cubic yard
DERP	Defense Environmental Restoration Program
Discovery	Discovery Drilling, Inc.
DoD	U.S. Department of Defense
DRO	diesel range organics
DTW	depth to water
EB	equipment blank
EDB	ethylene dibromide
ELM	ELM Solutions Corp.
EPA	U.S. Environmental Protection Agency
Everts	Everts Air Cargo
FD	field duplicate
FS	Feasibility Study
ft	feet
FUDS	Formerly Used Defense Site
GIS	geographic information system
GNSS	Global Navigation Satellite System
GRO	gasoline range organics
HTRW	hazardous, toxic, and radioactive waste
ID	identification
IDW	investigation-derived waste
JBER	Joint Base Elmendorf-Richardson
KO	contracting officer
Lake Clark	Lake Clark Air, Inc.
LOD	limit of detection
m	meter
<i>MED</i>	<i>Manual for Electronic Deliverables</i>

mg/kg	.....	milligrams per kilogram
mg/L	.....	milligrams per liter
MS/MSD	.....	matrix spike/matrix spike duplicate
NLF	.....	North Landfill (an alternate name for the Port Heiden RRS Landfill, LF007)
PA	.....	preliminary assessment
PAH	.....	polycyclic aromatic hydrocarbon
PAL	.....	project action limit
PCB	.....	polychlorinated biphenyl
PCE	.....	tetrachloroethene
pH	.....	potential of hydrogen
PP	.....	proposed plan
PPE	.....	personal protective equipment
QC	.....	quality control
RCRA	.....	Resource Conservation and Recovery Act
RI	.....	remedial investigation
RMS	.....	root mean square
ROD	.....	Record of Decision
RPD	.....	relative percent difference
RRO	.....	residual range organics
RRS	.....	Radio Relay Station
RTK	.....	real-time kinematic
SARA	.....	Superfund Amendments and Reauthorization Act
SI	.....	site investigation
SVOC	.....	semivolatile organic compound
TB	.....	trip blank
TCE	.....	trichloroethene
TOC	.....	top of casing
TP	.....	test pit
TSCA	.....	Toxic Substances Control Act
USACE	.....	U.S. Army Corps of Engineers
USAF	.....	U.S. Air Force
USGS	.....	U.S. Geological Survey
VOC	.....	volatile organic compound
WP	.....	work plan

EXECUTIVE SUMMARY

Ahtna Environmental, Inc. (Ahtna) prepared this report for the U.S. Air Force (USAF) under a U.S. Army Corps of Engineers (USACE) contract to detail the results of a 2018 Supplemental Remedial Investigation (RI) performed at the former USAF White Alice Radio Relay Station (RRS) Landfill (LF007), also referred to as the North Landfill (NLF), located in Port Heiden, Alaska.

The objectives of the Supplemental RI were to identify data gaps and gather additional evidence regarding impact to soil and groundwater that may remain at LF007 from activities conducted during USAF operations and that may pose a threat to human health and/or the environment. Supplemental RI field work was conducted during July and November 2018. Waste load-out occurred in June 2019. Project wastes were disposed at facilities in Arlington, Oregon during September and October 2019.

Potentially-impacted LF007 groundwater was investigated by installing five new monitoring wells with a Geoprobe® 6712DT direct-push drill rig. One well was installed upgradient of LF007, one well was installed within the LF007 footprint, and three wells were installed downgradient. Groundwater was successfully collected from four of the five wells for analysis (one well went dry prior to sampling). Four groundwater samples and associated quality control samples were analyzed for fuels, volatile organic compounds (VOCs), ethylene dibromide (EDB), semivolatile organic compounds (SVOCs), pesticides, herbicides, Resource Conservation and Recovery Act (RCRA) metals, nickel, vanadium, polychlorinated biphenyls (PCBs), and hexavalent chromium. One groundwater sample from the well nearest the highest historical groundwater TCE detection was also analyzed for 1,4-dioxane. Supplemental RI groundwater results were all below project action limits (PALs).

LF007 impacted soils and buried landfill contents were investigated by test pitting and soil sampling during monitoring well installation. Eleven test pits were installed with an excavator through the landfill cap soils, buried landfill contents, and native soils to maximum depths of 5–12 feet below ground surface (bgs). Cap soil thickness and buried landfill contents were documented for all eleven test pits, and soil samples were collected from 10 of the 11 test pits. The Geoprobe® retrieved soil samples from the monitoring well borings in acetate sleeves up to a depth of 50 feet bgs using Macro-Core® tooling. In total, 31 soil samples and associated quality control samples were collected and analyzed for fuels, VOCs, EDB, SVOCs, pesticides, herbicides, RCRA metals, nickel, vanadium, and PCBs. Some test pits contained drum carcasses. No transformers, fluid wastes, identifiable asbestos-contaminated materials, unexploded ordnance or discarded military munitions were encountered. LF007 soils were found to have concentrations of both previously documented contaminants of concern (COCs) and other Supplemental RI chemicals of potential concern (COPCs) above their respective PALs.

This report summarizes the project background, details Supplemental RI activities and results, and provides an assessment of remaining LF007 contamination. Comprehensive analytical result tables, figures presenting sample locations and exceedances, and field documentation are included.

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1.0 INTRODUCTION

This report was prepared to detail the results of a 2018 Supplemental Remedial Investigation (RI) performed at the former U.S. Air Force (USAF) White Alice Radio Relay Station (RRS) Landfill (LF007), also referred to as the North Landfill (NLF), located in Port Heiden, Alaska (Figure 1). Ahtna Environmental, Inc. (Ahtna), located in Anchorage, Alaska, was the prime contractor for performing the 2018 Supplemental RI under U.S. Army Corps of Engineers (USACE) Alaska District Contract No. W911KB-17-D-0019, Delivery Order No. W911KB17F0078.

1.1 Project Objectives

An RI was conducted at the Port Heiden RRS, including the RRS Landfill (LF007), in 2004 (USAF, 2006a); and a Record of Decision (ROD) for the RRS was signed in 2009 (USAF, 2009). Various response actions implementing ROD remedies across the RRS have taken place since 2012. During implementation of 2009 RRS ROD remedies, unanticipated materials were encountered within the LF007 cap. In addition, regulatory cleanup levels have changed subsequent to ROD approval. Consequently, it was determined that there was insufficient information about the nature and extent of LF007 contamination to verify whether current remedies remain protective of human health and the environment.

The objectives of the Supplemental RI were to identify data gaps and gather additional evidence regarding impact to soil and groundwater that may remain at LF007 from activities conducted during USAF operations and that may pose a threat to human health and/or the environment. The following were the Supplemental RI project objectives:

1. Review available analytical results and evaluate against current 18 AAC 75 cleanup levels and regulated analytes.
2. Review site documents to identify any previously identified data gaps.
3. Address identified data gaps by:
 - a. Further delineating impact to groundwater.
 - b. Further delineating impact to soil.
 - c. Further delineating nature of buried landfill contents.
4. Obtain all data needed to complete a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Feasibility Study (FS).

1.2 Investigation Summary

The following is a summary of the major Supplemental RI tasks completed:

- Identified data gaps and prepared a Work Plan (WP) (USAF, 2018)
 - Reviewed existing LF007 documents for previously identified data gaps
 - Located and reviewed applicable data sets and evaluated against Title 18 Alaska Administrative Code, Chapter 75 (18 AAC 75) cleanup levels (Alaska Department of Environmental Conservation [ADEC], 2017a) that were in effect during WP approval
- Participated in a Project Meeting with stakeholders and conducted site reconnaissance
 - Confirmed that no LF007 groundwater monitoring wells remain in place

- Mobilized to and demobilized from the field
 - Installed and developed groundwater wells
 - Collected and analyzed groundwater laboratory samples from newly installed groundwater monitoring wells
 - Investigated and documented landfill contents, using test pits
 - Collected and analyzed soil laboratory samples from well borings and test pits
 - Containerized contaminated materials encountered during the investigation, and transported them offsite for disposal
- Assembled and evaluated Supplemental RI data in reference to 18 AAC 75 cleanup levels in effect at the time of reporting (ADEC, 2018c)

All Supplemental RI tasks were performed in accordance with:

- Resource Conservation and Recovery Act (RCRA), October 21, 1976
- CERCLA, December 11, 1980
- Superfund Amendments and Reauthorization Act (SARA), October 17, 1986
- 18 AAC 75 Oil and Other Hazardous Substances Pollution Control, as amended through November 7, 2017 (ADEC, 2017a) or October 27, 2018 (ADEC, 2018c)
- 18 AAC 78 Underground Storage Tanks procedures, as amended through November 7, 2017 (ADEC, 2017b)

1.3 Project Location

The Port Heiden RRS Landfill (LF007) is located on a flat coastal plain of Bristol Bay, on the lower Alaska Peninsula, approximately 430 miles southwest of Anchorage (Figure 1). The area surrounding the LF007 site is referred to as the Port Heiden area. It includes Port Heiden Bay, the city of Port Heiden, and the delta of the Meshik River. The city of Port Heiden (population 102 as of 2010 [U.S. Census, 2010]) is the only local population center. The nearest large settlement is King Salmon (population 374 as of 2010 [U.S. Census, 2010]), approximately 140 miles to the northeast.

Access to the area is only by air and water. A state-owned runway and limited road system connect the city of Port Heiden and the greater Port Heiden area. The former Port Heiden White Alice RRS site is approximately 3,000 feet from the airstrip, which is serviced by small, commercial carriers. The gravel airstrip is approximately 5,000 feet long. Gravel roads connect the airstrip, the city of Port Heiden, the barge landing area, the RRS landfill, and the Former Port Heiden RRS. The roads are in moderately good condition. The barge landing is located approximately 3 miles southwest of the RRS site (Figure 1). The Port Heiden RRS Landfill (LF007) is located north of the former RRS facility area (Figure 2).

1.4 Site Background

1.4.1 Site History

There are two former facilities in the Port Heiden area, the White Alice RRS and the Fort Morrow Military Base. Fort Morrow was authorized for construction in December 1941 as an airfield and protective garrison for the air defense of Alaska and the naval base at Dutch Harbor. The War

Department acquired 1,023,927.22 acres for the establishment of Fort Morrow. Construction began in July 1942. The buildings of Fort Morrow were constructed in an area of approximately 8,000 acres centered on the two airfield runways, 2 miles northeast of the former Native village of Meshik. Following World War II, the site was abandoned.

The Port Heiden White Alice RRS was constructed from 1955 to 1960 during the expansion of the Distant Early Warning Line. The White Alice RRS was established on 172.04 acres within the existing Fort Morrow site. The site served as a communication link between King Salmon and Cold Bay, Alaska, and was active until 1981.

The Defense Environmental Restoration Program (DERP) originally combined these two sites under the title of Port Heiden. The Port Heiden White Alice RRS/Fort Morrow site was authorized for DERP cleanup design on July 7, 1986, by the USACE North Pacific Division. Following 1990 cleanup work at Fort Morrow, the USACE Alaska District determined that the White Alice RRS property was still owned by the USAF and clarified that the USAF is responsible for any further environmental remediation. The Fort Morrow site was designated as a new project under the Formerly Used Defense Sites (FUDS) Program. The Fort Morrow FUDS was divided into 13 areas of concern (AOCs) and is currently undergoing a phased RI. The Port Heiden RRS Landfill (LF007) is surrounded by Fort Morrow AOCs L and M (primarily M).

Note for clarity that there are other military landfills in the Port Heiden area that are not co-located with the Port Heiden RRS Landfill (LF007). During Fort Morrow cleanup activities, two permitted landfills were created at Port Heiden. Site A is located at T37S, R59W, SE & SW 1/4, NW 1/4 of Section 15, Seward Meridian, and was issued ADEC permit number 8721-BA012. Site B is located at T37S, R59W, SW 1/4 NW 1/4 of Section 26, Seward Meridian, and was issued ADEC permit number 8721-BA013. During RRS ROD remedy implementation, additional permitted Class III landfills were created and used for disposal of certain contaminated soils.

Contamination-causing compounds that may have been used at the Port Heiden RRS include fuels, antifreeze, solvents (e.g., trichloroethene [TCE]), batteries, PCBs, paints and paint thinners, herbicides, pesticides, and asbestos (USAF, 2008).

1.4.2 Climate

Port Heiden has a maritime climate (Hartman and Johnson, 1984). Climatic conditions are affected by the Bering Sea and the North Pacific Ocean and are characterized by small temperature variations, high humidity, heavy precipitation, and frequent cloudy periods. Cyclonic storms with high winds, fog, and poor visibility occur frequently (Hartman and Johnson, 1984). Mountainous terrain of the Aleutian Range is approximately 10 kilometers east of Port Heiden and provides protection from approaching southeasterly winds and precipitation. The mean annual temperature for the period 1952 to 1987 for Port Heiden was 36.14 degrees Fahrenheit (°F). Mean monthly temperatures range from an August mean maximum of 57.92 °F to a February mean minimum of 15.98 °F (Leslie, 1989; Table 1). Mean annual precipitation is approximately 15.55 inches, and mean annual snowfall is approximately 51.57 inches.

1.4.3 Vegetation

The project area environment consists of open low shrub/ericaceous tundra on moderately well-drained lowlands.

1.4.4 Geology, Soils, and Topography

Detterman et al. (1981a, b) mapped the geology of the Port Heiden area. Major geologic units observed near the site of former Fort Morrow include till and volcanic, estuarine, alluvial, outwash, swamp, and marine terrace deposits. The volcanic deposits in the Port Heiden area consist of pumice, ash, debris-flow deposits, and ash-flow tuff of Holocene and Pleistocene age (Detterman et al., 1981a).

The ash-flow tuff deposits were emplaced during the most recent caldera-forming eruption of Aniakchak Crater approximately 3,400 years ago. The volcanic tuff is unsorted, poorly stratified, and composed primarily of pumice in a matrix of fine to coarse ash and lithic fragments (Detterman et al., 1981b). The ash-fall tuff is moderately well sorted, well stratified, and consists of fine- to medium-grained dacitic ash. Near the Port Heiden airfield, volcanic deposits are exposed on either side of the runway, around the radio beacon, on slopes adjacent to Reindeer Creek and Aniakchak Crater, and along the eastern shoreline of Hendrickson Lake. The depth to volcanic tuff deposits in other areas of former Fort Morrow is not known specifically but is likely between 75 and 150 feet bgs.

Debris-flow, pumice, and ash deposits were found near the ground surface in much of the investigation area. Typically, these units non-conformably overlay a paleosol developed on earlier geologic deposits. The thickness of this most recent deposit stratigraphic sequence was found to vary from 2 to 20 feet (where present).

The soils in the Port Heiden area are generally poorly developed because of the geologically frequent deposition of volcanic ash (Rieger et al., 1979; Howard Grey and Associates, Inc., 1982). Where soils are well developed, they are dark brown to reddish brown and typically have buried surface horizons because of repeated deposition of volcanic ash. The soil particles are mostly sand or gravel size (Howard Grey and Associates, Inc., 1982). The Port Heiden area is generally free of permafrost (USGS, 1995).

1.4.5 Hydrology and Groundwater Use

The principal groundwater aquifers near Port Heiden consist of 1) unconsolidated sand and gravel, 2) volcanic tuff (mostly pumice), and 3) bedrock. Silt- and clay-rich till layers act locally as confining beds (USGS, 1995). Groundwater is present at LF007 at approximately 50 feet bgs, with flow to the northwest, away from populated areas (USAF, 2006a). There is no current known use of groundwater in the proximity of the former Port Heiden RRS, nor are there any known plans for future use. The residents of Port Heiden obtain drinking water from wells near their residences. Surface water is not used for drinking. The closest drinking water well is located approximately 2.5 miles south of the former RRS (USAF, 2009).

A separate USACE project (Fort Morrow Phase III RI) was scheduled to conduct a Port Heiden area drinking water well inventory in 2018; however, that project was delayed until 2019. Results from that inventory will be reviewed during development of the Proposed Plan (PP), to evaluate whether the potential for contaminated LF007 groundwater to impact local drinking water sources has changed since the 2009 ROD.

1.4.6 Previous Investigations

Some previous investigations and remedial actions have been completed at LF007 and adjacent RRS sites. A Preliminary Assessment (PA) (USAF, 1994) and Preliminary Assessment and Site Investigation (PA/SI) (USAF, 1996) were conducted at the RRS. The RRS landfill (LF007) was not sampled.

An RRS-wide RI/FS was conducted by Weston Solutions, Inc. in 2004. It delineated the nature and extent of contamination in LF007 groundwater, perimeter soils and cap soils; and estimated buried debris extents. The landfill had not been studied previously. The 2004 RI/FS included reconnaissance, a geophysical investigation, field tests, seven test pits, 10 soil borings, five well installations, 29 soil samples, nine groundwater samples, and a risk assessment. The report concluded that cover soil thickness averages 3.5 feet; cover soil contains PCBs, polycyclic aromatic hydrocarbons (PAHs), and pesticides; no contaminants were detected above screening criteria in perimeter soil samples; residual range organics (RRO) were detected above screening criteria in one groundwater sample (likely naturally occurring); and that the aerial extent of buried debris is approximately 300 feet by 400 feet (USAF, 2006a).

An RRS-wide PP (USAF, 2008) was circulated, and an RRS-wide ROD was signed (USAF, 2009). The USAF entered into a cooperative agreement with the Native Village of Port Heiden from 2009 and 2010 to perform a removal action at the former RRS. Various contractors have been implementing ROD remedies across the RRS since 2012 by excavating, stockpiling, treating, transporting, and disposing of contaminated soils. Much of the analytical information contained in interim removal action reports pertains to areas outside the landfill and/or has been superseded by subsequent excavation activities, so is not listed in detail herein. Two Explanations of Significant Differences have been written to document changes to remedies and contaminated soil volumes (USAF, 2010; USAF, 2017a). A First Five-Year Review for the RRS, including a 2013 site inspection of LF007, was performed (USAF, 2014).

Jacobs Engineering Group, Inc. (Jacobs), performed PCB-contaminated soil removal actions in 2016 and 2017 under the supervision of Ahtna Engineering Services, LLC. When two drums with unknown contents were encountered within the RRS landfill cap, contaminated soil removal efforts were shifted to other areas of the RRS. The two drums were containerized, sampled for waste characterization, and transported off-site for disposal. Soil samples were taken from below the drums and sampled for PCBs. Remaining PCB-contaminated soils at LF007 were partially delineated as part of the removal action process (USAF, 2019). In 2016, four soil samples were collected at LF007 for volatile organic compounds (VOCs), PAHs and pesticides. One sample had an exceedance of benzo(a)pyrene (USAF, 2017b).

In 2016, Jacobs conducted 1,4-dioxane sampling in a TCE groundwater plume at the Drum Storage Area. The results were non-detect (Jacobs, 2016).

In 2017, Jacobs Technology, Inc., conducted a geophysical investigation at the RRS Landfill (LF007) to evaluate the extent of buried debris associated with the landfill. (Jacobs Technology Inc., 2017).

Table 1-1 provides a list of previous investigation documents that contain analytical information pertinent to the Supplemental RI.

TABLE 1-1. PREVIOUS LF007 INVESTIGATIONS WITH ANALYTICAL DATA

Document	Year Published
USAF, 2006a. <i>Final Remedial Investigation/Feasibility Study Volumes I–IV, Port Heiden Radio Relay Station</i> . April. Prepared by Weston Environmental Solutions.	2006
Jacobs Technology, Inc., 2017. <i>North Landfill Geophysical Investigation</i> . Technical Memorandum. June 21.	2017
USAF, 2017b. <i>PCB-Contaminated Soil Removal Action, Final 2016 Interim Data Report</i> , Port Heiden, Alaska. July. Prepared by Ahtna Engineering Services, LLC.	2017
USAF, 2019. <i>Final 2016–2018 PCB-Contaminated Soil Removal Action Report</i> , Port Heiden, Alaska. January. Prepared by Ahtna Engineering Services, LLC.	2019

1.5 Project Personnel

Table 1-2 presents key personnel involved in project activities.

TABLE 1-2. KEY PROJECT PERSONNEL

Person	Entity	Role	Contact	Responsibilities
Timothy Clapp	USACE	Contracting Officer (KO)	907-753-2836 Office Timothy.L.Clapp@usace.army.mil	Issues contract documents and voucher payments, monitor contract compliance
Scott Kendall	USACE	Contracting Officer's Representative (COR)	907-753-5661 Office Scott.Kendall@usace.army.mil	Provides scope clarification, reviews vouchers and makes recommendations to the KO for payment, reports problems or discrepancies to the KO, and oversees Contractor performance
Julie Sharp-Dahl	USACE	Project Manager	907-753-2720 Office Julie.L.Sharp-Dahl@usace.army.mil	Provides scope clarification, reviews Contractor submittals, provides periodic inspections of Contractor performance, and monitors execution of work
Craig Scola	USACE	Technical Lead	907-753-5769 Office Craig.P.Scola@usace.army.mil	Reviews Contractor submittals for compliance with contract requirements
Sean Benjamin	USACE	Project Chemist	907-753-5514 Office Sean.P.Benjamin@usace.army.mil	Reviews Contractor submittals for compliance with analytical data requirements.

Person	Entity	Role	Contact	Responsibilities
Robert Johnston	USAF	Remedial Project Manager (after Dec 2018)	907-552-7193 Office Robert.Johnston17@us.af.mil	Reviews Contractor submittals for compliance with USAF requirements.
Louis Howard	ADEC	Project Manager	907-269-7552 Office Louis.Howard@alaska.gov	Reviews Contractor submittals for compliance with ADEC requirements.
Matthew Flynn	Ahtna	Project Manager	907-433-0727 Office 907-440-0408 Cell mflynn@ahtna.net	Oversees project personnel and activities; ensures that project objectives are achieved, point of contact for USACE/USAF
Luke Hoffmann	Ahtna	Field Team Lead (rotational)	907-868-8215 Office lhoffmann@ahtna.net	Organizes and performs field work in accordance with WP, authors reports
Kim Holmes	Ahtna	Field Team Lead (rotational)	907-433-0765 Office kholmes@ahtna.net	Organizes and performs field work in accordance with WP, authors reports
Julia Klens Caprio	Geosyntec	Project Chemist	865-291-4696 Office jklenscaprio@geosyntec.com	Contributes to WP and reports, assists with resolution of laboratory quality control (QC) issues, performs data validation
Pete Rice, CSP, CIH	Ahtna	QC / Safety & Health	415-518-8665 Office price@ahtna.net	Reviews Contractor WP safety documents, monitors field work for safety and conformance to WP

Table 1-3 lists the environmental professionals involved in the field investigation. The responsibilities of the field team included test pit installation, surface and subsurface soil sampling, monitoring well installation, groundwater sampling, and surveying.

TABLE 1-3. PROJECT FIELD PERSONNEL

Person	Entity	Position
Luke Hoffmann	Ahtna	Field Team Lead (rotational)
Kimberly Holmes	Ahtna	Field Team Lead (rotational)
Lexie Lucassen	Ahtna	Environmental Scientist / Sample Manager
Nick Simmons	Ahtna	Environmental Scientist / Cultural Resource Specialist

Equipment, craft labor, office space, lodging, local transportation, and overwintered waste condition documentation were provided by Aniakchak Contractors, LLC (Aniakchak). Drilling services were provided by Discovery Drilling, Inc. (Discovery). Surveying was performed by Mammoth Consulting, LLC (Mammoth). Waste transportation and disposal were arranged by ELM Solutions Corp (ELM). Analytical laboratory services were provided by Eurofins TestAmerica and SGS.

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2.0 INVESTIGATION ACTIVITIES

This section describes the Supplemental RI investigation activities performed to accomplish the project objectives.

2.1 Data Gap Analysis and Work Planning

A data gap analysis was performed. A WP was developed to document the data gaps and detail the Supplemental RI efforts designed to close them (USAF, 2018).

2.2 Project Meeting and Site Reconnaissance

The project team participated in a public meeting in Port Heiden on 1 May 2018 to discuss the Supplemental RI with the community. Meeting minutes are provided in Appendix A.

While in Port Heiden, Ahtna also performed site reconnaissance to inform the upcoming field work and confirm local support arrangements (Appendix B, Photographs 1-3). No existing LF007 monitoring wells were located, closing one of the data gaps identified in the WP.

2.3 Permits

USACE and USAF provided a Right of Entry permit for the project work prior to the start of field work. A copy of the permit is provided in Appendix C. No other permits were required. USACE and USAF coordinated with the State Historic Preservation Office and/or Alaska Peninsula Corporation (landowner), as required.

2.4 Health and Safety

Health and safety concerns were paramount during the Supplemental RI field investigation. Due to the remote location and the inherent delays in evacuating injured personnel, prevention and avoidance of any accidents were high priorities. The project team ensured that all procedures were conducted in a safe manner and in accordance with the Accident Prevention Plan (USAF, 2018). Particular care was taken to protect workers and the environment during test pit installations through unknown landfill contents. Small lifts were utilized in order to allow careful handling and observation of any source materials or other hazardous contents. Personnel were not allowed to enter the test pits at any time. The field crew conducted air monitoring for contaminant exposure with a MultiRAE Plus 5-gas meter (combustibles, oxygen, carbon monoxide, hydrogen sulfide, and carbon dioxide) instead of the WP-specified photoionization detector for enhanced safety. Level B personal protective equipment, including respiratory protection, was on site throughout the field effort for handling any drums with unknown contents. No incidents resulting in worker injury, damage to property, or environmental releases occurred as part of the investigation.

2.5 Mobilization/Demobilization

Heavy equipment and pickup trucks for local transportation were sourced locally from Aniakchak. Certain supplies were available on site from previous USAF projects. The remainder of the equipment and supplies required for 2018 Supplemental RI activities were mobilized from

Anchorage to Port Heiden by air. Ahtna and Discovery coordinated a shared Everts Air Cargo (Everts) charter flight on 4 June 2018. The drill rig, drilling supplies, waste containers, and sampling supplies were mobilized on a second Everts charter on 12 July 2018. Rented sampling equipment and Ahtna field personnel mobilized to Port Heiden on a Lake Clark Air, Inc. (Lake Clark) 17 July 2018 scheduled service flight. Ahtna's surveyor mobilized to the site on 26 July 2018.

Sample coolers were shipped to Anchorage by air throughout the field effort on various carriers. The drill rig, waste containers, sample coolers, and other large items were freighted back to Anchorage 26 July 2018 on an Everts Air cargo charter. Demobilization of Ahtna personnel occurred on Lake Clark Air scheduled service flights 27 and 30 July 2018.

Two Ahtna personnel mobilized to Port Heiden on 2 November 2018 to manage containerized wastes based on waste characterization results, assist with waste load-out, and perform some additional surveying. They also planned to sample a groundwater well, if it had recharged, but the well was found to still contain insufficient water to obtain a sample. The landing craft contracted to transport waste from Port Heiden to Seattle, Washington experienced mechanical issues that prevented it from landing. Because no other landing craft were found to be available, Ahtna personnel staged the waste for overwintering at the barge landing area and departed 4 November 2018.

An Ahtna staff member mobilized to Port Heiden 11 June 2019 to assist with waste load-out, perform walrus observations, and measure groundwater levels in project wells. The person returned to Anchorage on 13 June 2019.

2.6 Utility Locates

Prior to commencing ground-disturbing activities, project personnel—including local equipment operators—confirmed that utilities are not present at LF007.

2.7 Investigation Methods

The following sections summarize the field methods used during the Supplemental RI to investigate the nature and extent of contamination remaining at LF007.

2.7.1 Field Screening

Field screening was not planned or conducted during the Supplemental RI, because field screening methods are not available for many chemicals of potential concern (COPCs).

2.7.2 Groundwater

2.7.2.1 Monitoring Well Installation

Monitoring wells were installed and developed in accordance with *ADEC Monitoring Well Guidance* (ADEC, 2013) and the WP (USAF, 2018). The wells were developed a minimum of 24 hours after installation. Monitoring wells were developed in general accordance with ADEC's *Monitoring Well Guidance* and the WP (USAF, 2018). A brief description follows:

- The groundwater level was measured.
- The well was surged across the entire well screen for approximately 3 minutes by use of a bailer or surge block.
- Water was removed by means of a Stainless Steel Hurricane® submersible pump until it became less turbid. Water level and turbidity were measured. Odor and appearance were also noted.
- The process of surging and removing water was continued until turbidity decreased, ideally to clear. In the event that turbidity did not decrease, a minimum of five well volumes was removed from the well.

2.7.2.2 Analytical Sampling

No existing wells were located. Newly installed wells were sampled by either a qualified environmental professional or a qualified sampler as defined by 18 AAC 75.333, after groundwater levels rebounded from development. Purging and sampling were conducted using a pneumatic bladder pump and low-flow sampling techniques in accordance with ADEC *Field Sampling Guidance* (ADEC, 2017c), EPA low-flow sampling procedures (EPA, 2017), and the WP (USAF, 2018). Dedicated ¼-inch internal diameter Teflon™-lined polyethylene sample tubing was used for each monitoring well.

An equipment blank (EB) sample was also collected by pumping deionized water through an unused bladder and sample tubing, following decontamination of the bladder pump.

Samples were placed in pre-labeled certified sample jars obtained from the laboratory for analysis according to the WP. All sample containers were maintained under chain-of-custody procedures from the time of collection to the time of sample analysis.

2.7.3 Soil

2.7.3.1 Analytical Sampling

Samples were collected, by either a qualified environmental professional or a qualified sampler in accordance with 18 AAC 75.333, from subsurface soil (greater than 2 feet bgs). Soil samples were collected in accordance with the *Underground Storage Tanks Procedures Manual* (ADEC, 2017d); *Field Sampling Guidance* (ADEC, 2017c); the DoD Environmental Field Sampling Handbook (U.S. Department of Defense [DoD], 2013), and the WP (USAF, 2018).

Subsurface soil from well borings was sampled using a Geoprobe® 6712DT direct-push drill rig and clear plastic Macro-Core® sleeves. Disposable sampling tools and clean sampling gloves were used to collect samples from the sleeves. The sampled soil was collected across an intended interval, no longer than 2 feet. Generally, soil cores were collected continuously during advancement of soil borings, in 4-foot or 5-foot lengths. Test pit soil samples were collected from the center of the excavator bucket, in accordance with the WP for personnel safety reasons, using disposable sampling gloves. Test pit soil sample depths ranged from 1–12 feet bgs.

Samples were placed in pre-labeled certified sample jars obtained from the laboratories for analyses in accordance with the WP. All sample containers were maintained under chain-of-custody procedures from the time of collection to the time of sample analyses.

2.7.4 Sample Handling

All samples were shipped in coolers under standard chain-of-custody protocol via one of the following routings from Port Heiden to Anchorage, Alaska:

- Lake Clark Air
- Everts Air Cargo
- Grant Aviation from Port Heiden to King Salmon, and then PenAir from King Salmon to Anchorage

Upon arrival in Anchorage, sample coolers were routed via one of the following methods:

- Alaska Airlines' Goldstreak service to Eurofins TestAmerica Sacramento
- Alaska Airlines' Goldstreak service to Eurofins TestAmerica Tacoma (which shipped water samples for herbicides to SGS Orlando by FedEx)
- Hand-delivered to SGS Anchorage for shipment to SGS Dayton

2.7.5 Buried Landfill Contents

During test pit excavations, landfill contents were segregated and documented with detailed field notes and photographs.

2.7.6 Survey Plan

A location survey was completed during the Supplemental RI to document the physical locations at which activities were conducted in accordance with the WP (USAF, 2018). In accordance with the 2017 MED, location data was collected at the RI level, which is 3.3 feet (1 meter) horizontal accuracy for all locations other than monitoring wells. For soil borings and sample locations, the required vertical accuracy is 0.5 foot (0.15 meter). For monitoring wells, the horizontal accuracy requirement is 1.0 foot (0.3 meter) and vertical accuracy is expected to be 0.01 foot on a closed level loop tied to an existing monument.

Project geospatial data deliverables are compliant with 2017 *Manual for Electronic Deliverables* (MED) Air Force project requirements. Vector data developed for the project were created in the following spatial reference:

- Horizontal – WGS 1984 (UTM Zone 4N), in meters
- Vertical – NAVD88 in meters

Each sampling location was given a unique location identification (ID) and was surveyed according to the methodology below. Locations surveyed included:

- Monitoring wells

- Sampling locations (any media)
- Test pit dimensions

2.7.6.1 Survey Monuments and Basis of Control

The basis of control used for the Supplemental RI was set in the field by a professional surveyor in a suitable location out of the way of the flow of work. It was constructed of a 30-inch section of rebar pounded into stable ground, with a red plastic cap.

2.7.6.2 Horizontal Locations

The Ahtna field team marked horizontal locations with laths or pin flags for later survey. As planned, only the excavation limit corners of test pits were surveyed, because test pits were too narrow and deep to enter safely. Test pit center/sample locations were calculated based on the surveyed excavation boundaries.

Horizontal locations were collected by a professional land surveyor, using real-time kinematic (RTK) Global Navigation Satellite System (GNSS) survey methods, at the conclusion of the field work.

2.7.6.3 Vertical Locations

Vertical locations of monitoring wells, sample locations, and soil borings were collected by a professional land surveyor using RTK GNSS survey methods.

2.8 Waste Management

Ahtna generated three types of waste during Supplemental RI activities:

1. **Investigation-derived waste (IDW)** including spent, disposable sampling materials; personal protective equipment (PPE); and incidental garbage generated on-site (paper towels, waste plastic, etc.).
2. **Municipal waste** consisting of trash generated from administrative activities performed on-site in support of project execution.
3. **Hazardous, toxic, and radioactive waste (HTRW) Source Materials and/or Contaminated Media** including decontamination water from sampling equipment, development and purge water from groundwater wells, excess soil from sample tooling that was not used in analytical sampling, and contaminated landfill cap soils.

Waste handling, temporary waste storage, waste transport, and waste disposal responsibilities were managed jointly by Ahtna and ELM. Ahtna managed test pitting, waste segregation, waste containerization and tracking, initial labeling, and waste characterization sampling. ELM arranged waste profiling, final labeling and placarding, manifesting, transport, and disposal. All waste handling was performed in accordance with the USAF *Waste Handling Handbook* (USAF, 2006b). To the extent practicable, Ahtna made every effort to minimize the overall generation of waste and IDW while achieving project objectives.

2.9 Work Plan Deviations

Field and analytical laboratory conditions encountered during the Supplemental RI necessitated some deviations to the WP. Deviations are presented in the following subsections.

2.9.1 Additional Test Pits

Nine test pits with associated analytical soil samples were planned. Since the landfill contents were shallower than anticipated, and waste quantities encountered in the field had not reached contract maximums, Ahtna added a 10th test pit with associated analytical soil samples to the Supplemental RI. Ahtna also relocated one of the test pits, because the original location did not encounter significant buried landfill contents. This resulted in an 11th observation-only test pit. Observations were documented at both TP-13A and TP-13B; however, analytical soil samples were only taken from TP-13B. The USACE and USAF concurred with the changes during the field effort.

2.9.2 TP-10 Backfill

The WP outlined the need to backfill the entire co-located test pit/monitoring well TP-10 with imported clean fill in order to prevent drilling through potential source materials; however, onsite personnel determined that drilling through the excavated landfill contents (once observed) did not present risk of additional environmental release or damage to drilling equipment and could be used as backfill in lieu of imported clean fill prior to drilling. The USACE project manager concurred with this change while on site. This change is documented in the 20 July 2018 daily report.

2.9.3 MW-06 Well Screen Depth

Due to miscommunication in the field, the MW-06 well screen was installed slightly below the zone of water table fluctuation. This is not expected to have significant impact to the well's functionality, because floating non-aqueous phase liquids are not expected to be present.

2.9.4 MW-10 Groundwater Sample

MW-10 – located within the landfill boundary – was dry when the field team returned on 28 July 2018 to develop the well after installation on 23 July 2018. The depth of water in the well was 0.20 feet when the field crew checked again in November 2018 and 0.75 feet when observed again the following June. No groundwater sample was obtained from MW-10 in July or November 2018 since there was insufficient water present to develop and sample with a pump. Water level measurements in June 2019 indicate that it may be possible to sample small volumes from MW-10 with a bailer when water is at seasonal high levels.

2.9.5 Equipment Blank Samples

The WP indicated collection of two EB samples; however, only one was collected because soil boring samples were collected with disposable Macro-Core® sleeves, and test pit samples were collected with disposable gloves.

Ahtna Standard Operating Procedure 10 requires EBs to be reagent-grade water rinsate samples. A deionized water rinsate sample was collected instead. This did not impact the validity of the EB results.

2.9.6 Additional Laboratory

Due to inoperable laboratory extraction equipment, water samples were transferred from Eurofins TestAmerica Tacoma to SGS Orlando for herbicide analyses. The USACE chemist was consulted and approved use of this additional certified laboratory prior to sample transfer. All herbicide water samples were run within hold times, despite SGS Orlando's initial concerns that they would not receive the samples in time.

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3.0 INVESTIGATION RESULTS

This section details the results of the Supplemental RI, including project action limits (PALs) used for reporting, analytical sampling and results, buried landfill contents findings, survey results, groundwater flow analysis, conceptual site model updates, and project-generated waste handling.

The following field activities were performed to support the project objectives:

- Dug test pits within the landfill boundary, documenting and segregating landfill debris encountered, in order to further characterize nature and extent of landfill contents
- Installed and developed groundwater wells to further characterize and delineate impact to groundwater
- Collected and analyzed groundwater samples from newly installed groundwater monitoring wells to characterize impact to groundwater and to determine if further delineation is needed
- Collected and analyzed soil laboratory samples from test pits and well borings to determine if contaminants are present and if further delineation is needed

Field activities were documented as outlined in the WP and in the 2017 MED. All field documents, including field notebooks, daily reports, safety forms, and sampling forms, are provided in Appendix D.

3.1 Project Action Limits

PALs and cumulative risk screening levels (CRSLs) were listed by analyte in Worksheet #15 of the WP (USAF, 2018). After acceptance of the WP and completion of the 2018 field season, ADEC approved revised cleanup levels within the regulations for *Oil and Other Hazardous Substances Pollution Control*, 18 AAC 75 (ADEC, 2018c), subsequently requiring the modification of PALs and CRSLs for some analytes for reporting purposes.

Groundwater analytical results were compared to PALs that are based on the current 18 AAC 75 Groundwater Cleanup Levels for Human Health (ADEC, 2018c). Results for analytes that are not currently regulated by ADEC were not evaluated.

Soil analytical results were compared to PALs that are based on the current soil cleanup levels in ADEC Method Two, Tables B1 and B2 Migration to Groundwater or Under 40 Inch Zone, Human Health (whichever is more stringent) (ADEC, 2018c). Results for analytes that are not currently regulated by ADEC were not evaluated.

3.2 Analytical Sampling Results

Groundwater and soil samples were collected from monitoring wells, well borings, and test pits as planned. Associated quality control (QC) samples (field duplicates [FD], matrix spike/matrix spike duplicate [MS/MSD] samples, trip blanks [TB], EB) were also collected and submitted. These nature and extent delineation sample results are presented in the following subsections. Waste characterization samples were also collected, and are discussed in Section 3.7.3.

3.2.1 Chemical Data Quality Review

Data verification and validation were performed. In general, the overall quality of the data set is acceptable. The completeness goal of 95% for all parameters was met; the final completeness was 99.99%. The reported data, that were not rejected, are considered usable for the 2018 LF007 Supplemental Remedial Investigation, within the limitations of the qualifications. The qualifications applied during data validation did not adversely affect data usability with the exception of a single methoxychlor data point that was rejected. Several non-detect LOD values exceeded the PALs provided in QAPP Worksheet #15 and may lead to the reporting of false negative results (in relation to an analyte's respective PAL). However, in many cases where this occurred, samples were analyzed at dilutions due to the high concentrations of target analytes in the sample or the percent solids results were low, resulting in elevated LODs.

The data, as qualified, are usable for supporting project DQOs. Data verification and data validation findings support that the dataset is representative of site conditions and comparable to other similar datasets. Detailed discussions of data quality and usability can be found in the Chemical Data Quality Review (CDQR, Appendix E) and Section 3.2.3.

3.2.2 Groundwater Results

In order to determine the presence/absence/extent of COPCs that may have impacted groundwater beneath the landfill, five monitoring wells were installed. As planned, one was placed upgradient of the landfill, three were placed downgradient of the landfill, and one was installed through a backfilled test pit within the landfill footprint.

Four primary groundwater samples and one FD sample were collected from Supplemental RI wells MW-06, MW-07, MW-08 (FD), and MW-09. MW-10 was not sampled because there was insufficient water present following installation. The groundwater samples were all analyzed for the following analytical suites:

- Gasoline range organics (GRO) by Alaska test method (AK) 101
- DRO/RRO by AK102/103
- VOCs by 8260/8260SIM
- EDB by 8011
- 8270/8270SIM for SVOCs
- Pesticides by 8081
- Herbicides by 8151
- RCRA metals, nickel, and vanadium by 6020/7470
- Hexavalent chromium by 218.7
- PCBs by 8082

Additionally, the primary and FD groundwater samples from MW-08 were analyzed for 1,4-dioxane by 8270SIM. MW-08 was selected for 1,4-dioxane analysis because it is the well nearest the historical well with the highest TCE result (NLF-MW-03).

Arsenic exceeded the PAL in all groundwater samples collected; however, this can be attributed to elevated background levels. Background metals are discussed further in Section 3.2.4.

No other detected exceedances were reported in groundwater; however, four additional analytes had limits of detection (LODs) that exceeded applicable PALs in all samples, including 1,2,3-trichloropropane, chlordane, and n-nitrosodimethylamine.

Groundwater sample locations and status are presented on Figure 3. Field forms are provided in Appendices D-4 and D-5. Groundwater sample results are provided in Appendix E, Table E-3. Water equipment blank and trip blank results are provided in Appendix E, Table E-5 and discussed in the CDQR. Arsenic and LOD exceedances are indicated in the tables, but are not depicted on Figure 3.

3.2.3 Soil Results

In order to obtain data regarding the nature and extent of contaminated soil within and below the buried landfill contents, 11 test pits were excavated within the landfill boundary. Analytical samples were collected from 10 of them. Soil samples were also collected from monitoring well borings during installation to obtain additional data about subsurface soils below and surrounding the landfill.

Thirty-one primary soil samples and five duplicate samples were collected during this Supplemental RI. Two primary samples were collected from each test pit and soil boring, with the exception of test pit TP-12, from which three primary samples were collected. The soil samples were analyzed for the following requested analytical suites:

- GRO by AK101
- DRO/RRO by AK102/103
- VOCs by 8260/8260SIM
- EDB by 8011
- SVOCs by 8270/8270SIM
- Pesticides by 8081
- Herbicides by 8151
- RCRA metals, nickel, and vanadium by 6020/7471
- PCBs by 8082

DRO, VOCs (1,2,3-trichloropropane, 1,2-dichloroethane, TCE, tetrachloroethene [PCE]), SVOCs (1,2,4-trichlorobenzene, hexachlorobenzene, n-Nitrosodi-n-propylamine, pentachlorophenol), PAHs (1-methylnaphthalene, 2-methylnaphthalene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, naphthalene), a pesticide (beta-hexachlorocyclohexane[BHC]), and PCBs (Aroclor 1254, Aroclor 1260) were detected in at least one soil sample at concentrations above applicable PALs.

The 1,2,3-trichloropropane exceedances by method 8011 were deemed biased low due to holding time exceedances, surrogate recovery issues, and laboratory continuing calibration verification (CCV) recovery errors. The pentachlorophenol exceedances (18-NLF-SB-06-S01, 18-NLF-TP-09-S01, 18-NLF-TP-09-S02, 18-NLF-TP-10-S01) were flagged due to blank contamination. The beta-BHC exceedance in sample 18-NLF-TP-07-S01 was qualified due to matrix spike, matrix spike duplicate relative percent difference (RPD) errors while exceedances in samples 18-NLF-TP-12-S02 and 18-NLF-TP-14-S01 were qualified due to field duplicate RPD errors.. Due to

preservation issues, the 1,2,4-trichlobenzene exceedance in sample 18-NLF-TP-10-S01 was qualified while the exceedance in sample 18-NLF-TP-09-S01 was qualified due to field duplicated RPD exceedances. The exceedance in sample 18-NLF-TP-08-S02 was qualified due to preservation issues.

Arsenic also exceeded the PAL in all soil samples collected; however, this can be attributed to elevated background levels. Background metals are discussed further in Section 3.2.4.

Multiple analytes that were not detected in soil had reported LODs that exceeded applicable PALs. However, in many cases where this occurred, samples were analyzed at dilutions due to the high concentrations of target analytes in the sample or the percent solids results were low, resulting in elevated LODs. These analytes include two by method 8011 (1,2,3-trichloropropane and 1,2-dibromoethane), 13 pesticides by method 8081, six PCB Aroclors by method 8082, one herbicide (pentachlorophenol) by method 8151, 19 VOCs by method 8260/8260SIM, and 20 SVOCs by method 8270/8270SIM.

Soil sample locations and status are shown on Figure 4 and soil sample exceedance details are presented on Figure 5. Field forms are provided in Appendices D-4 and D-6. Soil results are provided in Appendix E, Table E-2, and soil trip blank results are provided in Appendix E, Table E-4 and discussed in the CDQR. Arsenic and LOD exceedances are indicated in the tables, but are not depicted on Figures 4 and 5. All other exceedances, including results impacted by blank contamination and laboratory quality control errors, are indicated in the tables and depicted on Figures 4 and 5.

3.2.4 Background Metals Evaluation

Background studies were conducted for the Port Heiden area in 2004 (USAF, 2006a) and 2015 (USACE, 2016). The 2009 ROD determined that arsenic and other metals are naturally occurring throughout the Port Heiden RRS (USAF, 2009). Excerpts of these documents are provided for reference in Appendix F. No additional background studies were planned or conducted during the Supplemental RI.

Arsenic was detected at concentrations above groundwater and soil PALs—0.00052 milligrams per liter (mg/L) and 0.2 milligrams per kilogram (mg/kg), respectively—at many Supplemental RI sample locations. Soil exceedances ranged from 1.6 to 8.5 mg/kg (Appendix E, Table E-2). Groundwater exceedances ranged from 0.0014 to 0.0050 mg/L (Appendix E, Table E-3). The detected ranges and widespread presence are consistent with 2004 RI results and previous site-specific background determinations. There is no apparent evidence of anthropogenic arsenic contamination at LF007 (ADEC, 2018b).

3.3 Buried Landfill Contents Results

LF007 buried landfill contents required additional investigation during the Supplemental RI in order to further delineate the nature and extent of potentially hazardous source materials and impacted soil. Impacted soil findings are described previously in Sections 3.2.3. This section documents the hazardous source material investigation.

Excavated materials were segregated and documented during installation of 11 test pits. Test pit extents and select content photos are shown on Figure 6. Test pit logs are provided in Appendix D-6. Additional photographs are available in Appendix B and in the Supplemental data.

Landfill cap soils were identified based on their superposition over landfill debris and were composed of homogeneous sandy fill material. Landfill cap soils removed during test pit installation were containerized, characterized, and disposed as planned and discussed in Section 3.7. Some test pits contained drum carcasses. No transformers, fluid wastes, identifiable asbestos-contaminated materials, or discarded military munitions were encountered. Test pit content details are provided in the following subsections.

After soil samples were taken, test pits were lined with GEOTEX® 315ST woven polypropylene geotextile fabric, and contents were returned to each excavation in reverse order as planned. Native soils excavated from beneath the landfill contents were backfilled first, followed by landfill debris and soil to within 2 feet of the surrounding ground surface, followed by 2 feet of clean, imported fill. Soils observed to be intermixed with landfill debris were similar in composition to the cap soils and were often stained by the landfill debris that came into contact with it (e.g. rusting drums and scrap metal tended to contribute reddish orange oxidization staining to the soil). Excavated landfill debris and soil fit back in the test pits, so no excess materials required characterization, transportation, or offsite disposal.

All test pits were advanced a minimum of two feet below the last suspected observation of buried landfill contents to confirm that native soils had been reached. Native soils observed within 10 of the 11 test pits consisted of well-developed gray-brown sandy soil with intermittent cobbles and visible depositional surfaces. These soils appeared consistent with the brown soils described in the geology section of this report (Section 1.4.4). Native soils in the test pit nearest to the LF007 entrance consisted of dry, black sandy silt with crushed pumice. Volcanic tuff was not observed in any of the test pits.

3.3.1 Test Pit TP-08

TP-08 was 4.2 feet wide by 12 feet long and 8 feet deep. Soil from 0–1.5 feet bgs was removed, containerized, and composite sampled for PCB analysis. One partially exposed drum carcass was observed at the ground surface, and a length of 1-inch-diameter steel pipe and a cable segment were observed from 1–1.5 feet bgs. TP-08 was advanced through previously undisturbed native soil deposition layers without observed landfill contents from 1.5–8 feet bgs.

3.3.2 Test Pit TP-09

TP-09 was 4.5 feet wide by 14 feet long and 7 feet deep. All of the soil from 0–1.5 feet bgs was removed, containerized, and composite sampled for PCB analysis. Ten empty drum carcasses in various states of decay were encountered in TP-09 from 0–2.5 feet bgs. Several aluminum beer cans and other miscellaneous trash were found between 2.5–4 feet bgs. TP-09 was advanced through previously undisturbed native soil deposition layers without observed landfill contents from 4.5–7 feet bgs. A crushed battery was observed on the ground surface, approximately 5 feet south of TP-09.

3.3.3 Test Pit TP-10

TP-10 was 5 feet wide by 16 feet long and 8.5 feet deep. Soil from 0–2 feet bgs was removed, containerized, and composite sampled for PCB analysis. Thirty-two empty, rusted, and partially crushed and crushed drums were observed in TP-10 from approximately 0–4.5 feet bgs. One drum had illegible writing on the exterior, and two other drums had small amounts of water that had collected inside of them due to their compromised integrity. Three beer cans, a piece of structural steel, and a vehicle oil pan were also observed. No staining or odors were observed, and the air monitoring meter did not indicate a hazardous atmosphere (combustibles, oxygen, carbon monoxide, hydrogen sulfide, carbon dioxide). TP-10 was advanced through previously undisturbed native soil deposition layers without observed landfill contents from 4.5–8.5 feet bgs.

3.3.4 Test Pit TP-11

TP-11 was 16 feet wide by 17 feet long and 12 feet deep. Soil from 0–2 feet bgs was removed, containerized, and composite sampled for PCB analysis. Twisted metal, steel building materials and framing, and vehicle parts (including a vehicle frame, radiator, and other miscellaneous parts) were observed from 0–7 feet bgs. Fifteen empty drum carcasses were also observed from 2–9 feet bgs, and a grader blade was encountered at 7.5 feet bgs. TP-11 was advanced through previously undisturbed native soil deposition layers without observed landfill contents from 9–12 feet bgs.

3.3.5 Test Pit TP-12

TP-12 was 10 feet wide by 15 feet long and 8 feet deep. Soil from 0–2 feet bgs was removed, containerized, and composite sampled for PCB analysis. Three empty drum carcasses were uncovered between 2–2.5 feet bgs. At 3 feet bgs, large chunks of dried tar were observed. An unknown white powdery substance was found intermixed with soil at 5 feet bgs. A discretionary soil sample (18-NLF-TP-12-S04) was collected near the white powder. TP-12 was advanced through previously undisturbed native soil deposition layers without observed landfill contents from 5–8 feet bgs.

3.3.6 Test Pit TP-13A/B

TP-13A was 3.5 feet wide by 14 feet long and 5 feet deep. One drum carcass was encountered at the ground surface. Soil from 0–2 feet bgs was removed, containerized, and composite sampled for PCB analysis. TP-13A was advanced through previously undisturbed native soil deposition layers without observed landfill contents from 2–5 feet bgs. The field team decided not to sample TP-13A and identified an alternate test pit location (TP-13B) approximately 20 feet north of TP-13A, where large quantities of debris were noted at the surface.

TP-13B was 5 feet wide by 13 feet long and 8 feet deep. All soil from 0–2 feet bgs was removed, containerized, and composite sampled for PCB analysis. Framing materials, welding rods, broken glass, and broken light bulbs were present from 0–4.5 feet bgs. A white powdery substance was found intermixed with the metal debris and soil at 2 feet bgs. TP-13B was advanced through previously undisturbed native soil deposition layers without observed landfill contents from 4.5–8 feet bgs.

3.3.7 Test Pit TP-14

TP-14 was 11 feet wide by 16 feet long by 7 feet deep. Soil from 0–1.5 feet was removed, containerized and composite sampled for PCB analysis. No debris was observed. TP-14 was advanced through previously undisturbed native soil deposition layers without observed landfill contents from 1.5–7 feet bgs.

3.3.8 Test Pit TP-15

TP-15 measured 4 feet wide by 11 feet long and 7 feet deep. Soil from 0–2 feet was removed, containerized and composite sampled for PCB analysis. Two empty drum carcasses were encountered at approximately 0.5 feet bgs. Approximately 10 additional empty drum carcasses in various states of decay were found from 2–4 feet bgs. One drum carcass had “Gasoline Aviation” written on the exterior. TP-15 was advanced through previously undisturbed native soil deposition layers without observed landfill contents from 4–7 feet bgs.

3.3.9 Test Pit TP-16

TP-16 was 11 feet wide by 31 feet long by 7 feet deep. Soil from 0–2 feet was removed, containerized and composite sampled for PCB analysis. No landfill contents were observed. Native soil consisted of dry, black sandy silt with crushed pumice. TP-16 was advanced through previously undisturbed native soil without observed landfill contents from 2–7 feet bgs.

3.3.10 Test Pit TP-17

TP-17 measured 16 feet long by 7 feet wide and 8 feet deep. Metal fragments and a drum lid were present on the ground surface. Soil from 0–1.5 feet bgs was removed, containerized and composite sampled for PCB analysis. From 0–4.5 feet bgs, large metal building materials, possible tower components, Styrofoam, and other miscellaneous debris items were observed. Four empty 55-gallon drum carcasses were found between 1.5–4 feet bgs. TP-17 was advanced through previously undisturbed native soil deposition layers without observed landfill contents from 4.5–8 feet bgs.

3.4 Survey Results

Mammoth collected coordinates for all monitoring wells and test pit boundaries at the conclusion of the July field effort. Based on the survey methods used and the results obtained, the Mammoth survey met the 2017 MED RI-level quality requirements, including minimum horizontal quality for new monuments (OPUS solution), RI test pit locations (0.020 meter versus 1 meter), RI monitoring well coordinates (0.020 meter versus 0.3 meter), and found features of interest (0.20 meter versus 1 meter). The Mammoth survey also met the minimum vertical quality for test pit elevations (0.030 meter versus 0.15 meter) and monitoring well elevations (3rd Order Level).

Upon reviewing Mammoth’s July survey data, Ahtna determined that a portion of the TP-10 excavation was not surveyed, due to miscommunication in the field. During the November waste staging mobilization, Ahtna collected additional TP-10 boundary coordinates and mapped the area where soils were disposed onsite following receipt of analytical results. All Ahtna survey points

met RI survey quality requirements, with the maximum horizontal root mean square (RMS) error in the horizontal (95% sigma) of 0.035 meter and vertical RMS error (95% sigma) of 0.039 meter.

Mammoth and Ahtna survey reports are provided in Appendix G. Additional survey data is provided as Supplemental data.

As planned for safety reasons, only the test pit excavation limit boundaries were surveyed. Ahtna calculated test pit center/sample locations based on the surveyed excavation boundaries. These calculated sample locations are depicted on Figures and provided in the geographic information system (GIS) deliverables.

3.5 Groundwater Flow Analysis

Groundwater levels were measured during July 2018 monitoring well development and sampling, November 2018 waste management mobilization, and June 2019 waste load-out. Table 3-1 presents water level measurements, surveyed well elevations, and calculated groundwater elevations.

TABLE 3-1. GROUNDWATER ELEVATION DATA

Well ID	Date	DTW (ft btoc)	TOC Elevation ^a (ft amsl)	Groundwater Elevation ^a (ft amsl)
MW-06	7/26/18	34.02	85.23	51.21
	7/28/18	34.3	85.23	50.93
	11/2/18	36.5	85.23	48.73
	6/12/19	33.99	85.23	51.24
MW-07	7/23/18	33.1	66.97	33.87
	7/24/18	30.5	66.97	36.47
	11/2/18	33.51	66.97	33.46
	6/12/19	33.02	66.97	33.95
MW-08	7/27/18	42.5	75.43	32.93
	7/28/18	42.58	75.43	32.85
	11/2/18	43.04	75.43	32.39
	6/12/19	42.43	75.43	33.00
MW-09	7/27/18	28.2	61.44	33.24
	7/28/18	28.22	61.44	33.22
	11/2/18	28.55	61.44	32.89
	6/12/19	28.03	61.44	33.41
MW-10	7/23/18	51.23	90.69	39.46
	11/2/18	57.44 ^b	90.69	33.25 ^b
	6/12/19	56.89 ^b	90.69	33.80 ^b

^a vertical datum NAVD88, GEOID 12B

^b small volume detected at bottom of well, insufficient to develop or sample with pump
amsl = above mean sea level

Well ID	Date	DTW (ft btoc)	TOC Elevation ^a (ft amsl)	Groundwater Elevation ^a (ft amsl)
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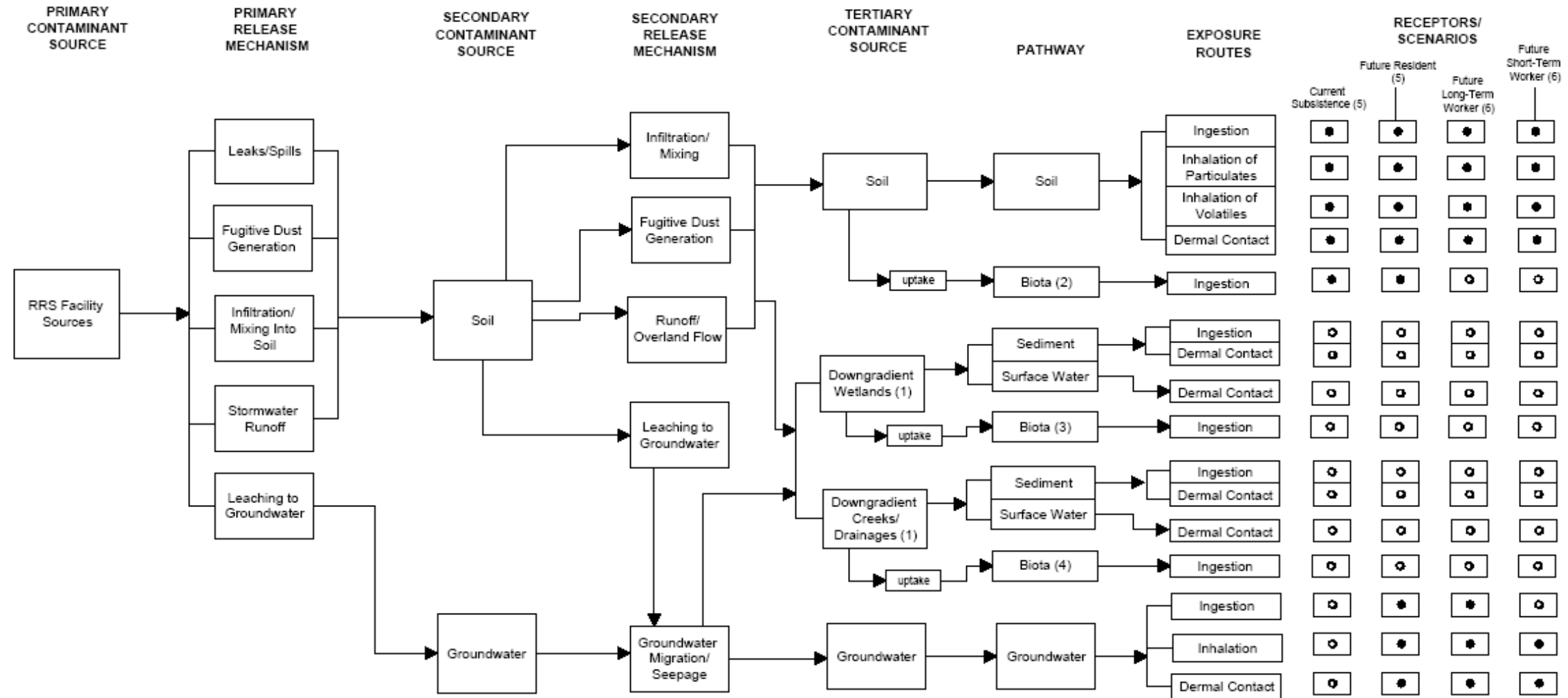
btoc = below top of casing
 DTW = depth to water
 ft = feet
 TOC = top of casing

Groundwater contours and flow directions generated from November 2018 MW-06/-07/-08/-09 water level measurements (Figure 3) are generally consistent with 2004 RI/FS results. 2018 groundwater elevations are generally higher than 2004 measurements, assuming that the 2004 vertical datum was also NAVD88.

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3.6 Conceptual Site Model

The Conceptual Site Model (CSM) documented in the Port Heiden RRS ROD (USAF, 2009) and shown below was used as the basis for the Supplemental RI sampling design. The CSM has been refined to reflect current ADEC guidance (ADEC, 2014; ADEC, 2017e) and the LF007 Supplemental RI analytical data. The resulting scoping forms and graphic are provided in Appendix H.



● - Medium to High Potential For Exposure
 ○ - Identified as a Low Potential For Exposure. Was not quantified in the human health risk assessment.

(1) Wetlands begin approximately 3/4 mile southwest of the RRS source areas. The wetlands drain into creeks that eventually flow to Bristol Bay. Wetlands and/or creeks were not sampled during the RI. The potential for impact to these areas was determined to be minimal during the RI.

(2) Biota evaluated included the collection of berry tissue residue. In addition, small mammal uptake modeling was performed.

(3) It's assumed that human foraging in wetlands is minimal. Ingestion of biota was not evaluated based on uptake in wetland sediment/soil.

(4) Biota were not evaluated for any downgradient creeks. Significant downgradient creeks were not identified during the RI.

(5) Subsistence users hunt for moose and caribou, but the home range size of these animals makes it unlikely that a significant portion of their diet over their lifespan will be obtained at Port Heiden RRS sources. This pathway is considered minor and was not evaluated.

(6) Long-term workers are identified as those that will work at the site in the future for a period of 25 years. Short-term workers (e.g., construction or utility workers) are identified as those that will work at the site in the future for less than a year.

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3.7 Project-Generated Waste

All wastes generated during project activities were handled in accordance with the WP (USAF, 2018).

3.7.1 Waste Inventory

Spent, disposable sampling materials, PPE, and incidental garbage (paper towels, waste plastic, etc.) generated outside the landfill boundary and municipal waste generated at the field office were disposed of at the Port Heiden landfill.

Excess soil generated during installation of monitoring wells outside the landfill boundary was put back into the boring of origin or spread on nearby ground, at least 100 feet away from any surface water body.

Potentially contaminated landfill cap soils were containerized in eight 9-cubic-yard bulk bags. Soil cuttings from within the landfill boundary and liquid wastes from all wells were placed into a total of six 55-gallon drums. Waste characterization samples were collected, and containers were labeled as Pending Analysis (Appendix B, Photographs 17 and 74).

Potentially contaminated spent, disposable sampling materials; PPE; and incidental garbage were containerized in a single 55-gallon drum to await offsite transportation and disposal.

Ahtna did not encounter any containerized fluids during advancement of the landfill test pits, so overpacking and sampling for unknown HTRW contents were not required. The project team also did not encounter any transformers, suspected asbestos-containing materials, unexploded ordnance, or discarded military munitions.

Ahtna maintained a waste inventory log throughout the duration of the project. A copy of the waste inventory log is provided in Appendix I.

3.7.2 Waste Storage

A temporary 12-millimeter-thick coated-plastic-lined waste storage area was established at the RRS for bulk bags awaiting analysis results (Figure 2; Appendix B, Photograph 73). Following waste characterization, bulk bags requiring offsite disposal were placed on a temporary plastic-lined area near the barge landing area (Appendix B, Photograph 79). The areas selected were relatively flat, well drained, and easily accessible to personnel and equipment. Bulk bags were kept closed and sealed once full.

Drums of waste soils and liquids were staged on pallets in an intermodal container at the barge landing area while pending analysis and while awaiting offsite transport.

Inspections of the waste storage areas were performed daily during field work and documented on Waste Storage Inspection Forms (Appendix D-7). The barge landing storage area was also inspected periodically by Aniakchak to ensure that the containers were being properly maintained during overwintering (Appendix B, Photographs 83 through 88).

3.7.3 Waste Characterization

3.7.3.1 Soil Waste Characterization Sample Results

Eleven waste soil characterization samples were collected during the Supplemental RI. One composite sample was taken from each of the eight bulk bags and three drums of waste soil. The bulk bag soil samples were analyzed for PCBs only, and the drummed waste soil samples were analyzed for full suite analysis.

Three of the eight bulk bags had PCB detections at concentrations above the PAL. All three of the drum characterization samples contained arsenic at concentrations above the PAL. TCE exceeded in one drum characterization sample (18-NLF-WS-09-S01), but no other waste characterization sample exceedances were detected.

Sixteen analytes were not detected in the characterization samples, but had LODs higher than the applicable PALs in at least one sample. This is consistent with all other soil samples collected during this Supplemental RI.

Soil waste characterization sample results are presented in Appendix E, Table E-6.

3.7.3.2 Liquid Waste Characterization Sample Results

Three liquid waste characterization samples were collected during this Supplemental RI, one from each of the three waste water drums.

Lead and vanadium were detected in all liquid waste characterization samples at concentrations exceeding PALs, and heptachlor was detected in one sample above the PAL. Arsenic was also detected in each of the three samples at concentrations above the PAL.

Twenty-one analytes that were not detected in the waste characterization samples had LODs that exceeded their respective PALs, which is consistent with all other analytical results.

Liquid waste characterization sample results are provided in Appendix E, Table E-7.

3.7.4 Onsite Disposal

Upon receipt and screening of the bulk bag waste characterization analytical results against the PCB PAL (Section 3.7.3.1), it was determined that five of the eight bulk bags did not exceed criteria and could be disposed onsite at a suitable location per the WP. On 3 November 2018, Ahtna emptied bulk bags NLF-S-002, NLF-S-004, NLF-S-006, NLF-S-007, and NLF-S-008 and spread soils at the location depicted on Figure 2 and Appendix B, Photograph 81. Care was taken not to place disposed soils over areas of the landfill cap or other RRS excavations that have not yet been remediated and backfilled. The five used 9-cubic-yard bulk bags were each placed into a 1-cubic-yard bulk bag and put inside the intermodal container with drummed wastes at the barge landing for offsite disposal (Appendix B, Photograph 80).

3.7.5 Offsite Transportation and Disposal

Three bulk bags (NLF-S-001, NLF-S-003, and NLF-S-005) exceeded the PCB PAL (Section 3.7.3.1), so they were relabeled in accordance with waste composition and transported from the temporary RRS waste storage area to the barge landing waste storage area for offsite transportation and disposal. The six drums in the intermodal container were also relabeled in accordance with waste composition. One 9-cubic-yard bulk bag of Toxic Substances Control Act (TSCA) waste (PCB concentrations greater than or equal to 50 mg/kg), two 9-cubic-yard bulk bags of non-TSCA waste (PCB concentrations less than 50 mg/kg, but greater than or equal to 1 mg/kg) and no hazardous wastes were generated during the project.

ELM prepared waste profiles, manifests, and transportation notices based on the waste characterization results for the waste containers requiring offsite transportation and disposal. ELM arranged for the waste to be picked up in November 2018; however, due to mechanical problems, the landing craft opted not to land in Port Heiden. It was determined that no other transporters were available, so wastes were secured near the barge landing area for overwintering.

Waste load-out occurred in June 2019 (Appendix B, Photographs 89 and 90). In accordance with the WP, the Pacific walrus avoidance plan was implemented during waste load-out since it involved marine operations. The walrus observation log is provided in Appendix D-8.

Project wastes were disposed in Arlington, Oregon during September and October 2019. Waste documents, including fully signed manifests and certificates of disposal, are provided in Appendix I.

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4.0 CONTAMINATION ASSESSMENT

Data collected during the Supplemental RI field activities further delineated the nature and extent of impacted LF007 groundwater and soil, and the nature of buried landfill contents.

4.1 Groundwater

Analytical testing results of the one upgradient and three downgradient Supplemental RI monitoring wells show groundwater travelling beneath LF007 is not currently impacted. A sample of groundwater could not be obtained from MW-10 within the landfill footprint; however analytical results of soil sampled during installation of MW-10 indicate TCE concentrations are present in the soils above the PAL near the water table suggesting that groundwater immediately below the landfill could be contaminated.

4.2 Soil

Based on 2004 RI/FS results, ROD remedy implementation action sampling data, and Supplemental RI results, LF007 soils are impacted with DRO, VOCs, SVOCs, PAHs, pesticides, and PCBs. As discussed in Section 3.2.3, some of the Supplemental RI exceedances are likely attributed to blank contamination and laboratory quality control failures. Supplemental RI LF007 perimeter soil boring sample results are consistent with 2004 RI/FS and 2009 ROD findings of no impacted subsurface LF007 perimeter soils.

Supplemental RI soil samples within the LF007 footprint exceeded PALs for four site-wide and LF007 source area ROD contaminants of concern (COCs); namely, total PCBs, benzo(a)anthracene, benzo(a)pyrene, and dibenzo(a,h)pyrene (USAF, 2009; USAF, 2017b). Dieldrin (site-wide and LF007 source area COC) and heptachlor epoxide (site-wide COC) were not detected in Supplemental RI soil samples.

Supplemental RI soil samples within the LF007 footprint also exceeded PALs for the following analytes that are not site-wide or LF007 source area ROD COCs: DRO, VOCs (1,2-dichloroethane, TCE, PCE), SVOCs (1,2,4-trichlorobenzene, hexachlorobenzene), PAHs (1-methylnaphthalene, 2-methylnaphthalene, benzo(b)fluoranthene, naphthalene), and beta-BHC. TCE is a site-wide ROD COC in groundwater, but not at the LF007 source area. Petroleum/petroleum-related contamination was previously documented at the RRS; however, remedies were not selected in the ROD.

Soil sample results were consistent with test pit observations, including the following:

- TP-12: fuel exceedances, tar observed at 3 feet bgs
- TP-12: multiple COPC exceedances, white powder observed at 5 feet bgs
- TP-13B: multiple COPC exceedances, white powder observed at 2 feet bgs
- TP-15: fuel exceedances, “Gasoline Aviation” drum carcass observed at 2–4 feet bgs

Additional data would be needed to fully delineate horizontal and vertical extents of COPC-impacted soils. Based on available information, the LF007 contaminated soil volume (petroleum and CERCLA constituents combined) is estimated to be on the order of 23,000 cubic yards,

assuming an expansion factor of 1.15 from in-situ volumes with no reduction for entrained debris volume. This estimate assumes an areal impacted surface soil extent of 50,800 square feet (digitized Supplemental RI soil exceedance extent) with 50% of the impacted soils extending to 3 feet bgs, 40% extending to 10 feet bgs, and 10% extending to 50 feet bgs.

4.3 Buried Landfill Contents

Supplemental RI test pit observations indicate that buried landfill contents including drum carcasses, construction debris, vehicle parts, and miscellaneous trash are present from approximately 0–9 feet bgs, with an average maximum depth of 3.9 feet bgs. The observed vertical extent of metallic debris was consistent with the ground penetrating radar estimated maximum depths of approximately 10–15 feet bgs (Jacobs Technology, Inc., 2017). No containerized hazardous source materials were encountered during the Supplemental RI; however, drum carcasses were found in eight of the test pits, impacted soils are present in seven of the test pits, and an unknown white powder was found in two test pits, so it is conceivable that hazardous source materials might be present at locations not selected for test pitting.

LF007 debris and trash volume is estimated to be on the order of 8,000 cubic yards, with no reductions for ex-situ debris compaction or separation of entrained soil volumes. This estimate assumes an areal debris extent of 53,600 square feet (digitized from 2017 geophysical survey results) and the Supplemental RI average observed maximum debris depth of 3.9 feet bgs.

4.4 Remaining Data Gap Analysis

The Supplemental RI further delineated the nature and extent of contamination at LF007. The following sections provide status of the data gaps identified in the WP and newly identified data gaps.

4.4.1 Closed Data Gaps

The following data gaps are closed:

- No existing wells were observed at LF007. This is consistent with 2011 groundwater monitoring report information regarding 2010 well abandonments (USAF, 2011). It conflicts with a 2013 inspection observation (USAF, 2014).
- Supplemental RI groundwater data indicate that the ROD remedy for groundwater remains protective for the LF007 source area. No COPCs were detected above PALs in upgradient or downgradient wells.
- The 2014 First Five-Year Review identified 1,4-dioxane as a potential COPC in TCE groundwater plumes at USAF installations. The Supplemental RI well closest to the former well location with the highest 2004 TCE groundwater detection was sampled for 1,4-dioxane and results were non-detect.
- LF007 test pit observations are consistent with 2017 geophysical investigation buried debris depth estimates and provide sufficient data regarding the nature of buried landfill materials to support preparation of an FS.
- Perfluorooctane sulfonate, perfluorooctanoic acid, magnesium, strontium, and perchlorate have recently promulgated cleanup levels and were not sampled; however,

they are not considered COPC data gaps at the site, due to lack of relevant site use history.

4.4.2 Open Data Gaps

The following data gaps require additional data to close:

- The 2011 groundwater monitoring report, monitoring well abandonment section, states: “During work plan development, the monitoring wells [selected for abandonment] were chosen with considerable input from the ADEC and 611 CES. In all cases, the monitoring wells had either tested clean or been viewed as redundant. In the case of the five abandoned NLF wells, the wells had all tested clean for several monitoring events.” Only 2004 RI groundwater data for the LF007 wells (typically labeled “NLF”) have been located to date. If LF007 groundwater monitoring analytical or elevation data exist, they would be useful for site evaluation purposes. This data gap will remain open unless LF007 groundwater monitoring data are located, or it can be confirmed that no additional groundwater sampling was performed between the 2004 RI/FS and well abandonment in 2010.
- The nature and extent of COPCs in groundwater directly beneath LF007 remain unknown. MW-10 was installed for this purpose but was not sampled because there was insufficient water present both initially after installation and again in the Fall of 2018 to develop and sample with a pump. Water level measurements in June 2019 indicate that it may be possible to sample small volumes from MW-10 with a bailer when water is at seasonal high levels. Supplemental RI data indicates that TCE and other soil COPCs are present above PALs in soils above LF007 groundwater; therefore, the Supplemental RI wells should be monitored to ensure that the ROD groundwater remedy (monitored natural attenuation and long-term monitoring) remains protective at the LF007 source area.
- Horizontal and vertical delineations of LF007 surface and subsurface soil contamination are incomplete. Known site COCs and other Supplemental RI COPCs exceeded PALs at multiple soil sample locations and depths. Additional surface and subsurface soil data would be required to determine extents for each COPC; however, sufficient data was collected to develop FS alternatives.
- Hazardous source materials such as containerized liquids, transformers, asbestos-containing materials, unexploded ordnance or military munitions may still be present in LF007 at locations not observed during the test pitting performed during this investigation.

4.5 Risk Assessment

4.5.1 Baseline Risk Assessment

An RRS-wide baseline human health and ecological risk assessment was performed as part of the 2004 RI/FS (USAF, 2006a), and the findings were incorporated in the Port Heiden RRS ROD (USAF, 2009).

4.5.2 Cumulative Risk Screening

The cumulative risk of analyte detections that exceeded CRSLs (1/10th of Human Health cleanup levels as presented in Table B1 of 18 AAC 75.341), other than arsenic considered background, were evaluated in accordance with 18 AAC 75, including ADEC's cumulative risk calculation procedures (ADEC, 2018a). The maximum concentration detected for each LF007 COPC represents a conservative exposure point concentration. Maximum detected concentrations for soil and groundwater were entered into ADEC's Cumulative Risk Calculator (https://csites.ornl.gov/cgi-bin/risk_search), with Residential Scenario and Under 40" Precipitation Zone selections for soil.

Soil and groundwater risks were then added together to assess cumulative risks for the site. The calculated LF007 cumulative carcinogenic risk of 0.005 is above the acceptable carcinogenic risk threshold of 0.00001. The calculated LF007 cumulative noncarcinogenic hazard index of 2 is above the acceptable noncarcinogenic hazard index threshold of 1.

Cumulative risk calculator inputs, outputs, and summations are provided in Appendix J.

5.0 REFERENCES

- Alaska Department of Environmental Conservation (ADEC), 2013. *Monitoring Well Guidance*. Division of Spill Prevention and Response Contaminated Sites Program. September.
- ADEC, 2014. *Ecoscoping Guidance, A Tool for Developing an Ecological Conceptual Site Model*. Division of Spill Prevention and Response Contaminated Sites Program. March.
- ADEC, 2017a. *Oil and Other Hazardous Substances Pollution Control*. Title 18 Alaska Administrative Code, Chapter 75 (18 AAC 75), as amended through November 7.
- ADEC, 2017b. *Underground Storage Tanks*. 18 AAC 78. November 7.
- ADEC, 2017c. *Field Sampling Guidance*. Division of Spill Prevention and Response Contaminated Sites Program. August.
- ADEC, 2017d. *Underground Storage Tanks Procedures Manual*. Guidance for Treatment of Petroleum-Contaminated Soil and Water and Standard Sampling Procedures. Division of Spill Prevention and Response Contaminated Sites Program. March 22.
- ADEC, 2017e. *Guidance on Developing Conceptual Site Models*. Division of Spill Prevention and Response Contaminated Sites Program. January.
- ADEC, 2018a. *Procedures for Calculating Cumulative Risk*. Division of Spill Prevention and Response Contaminated Sites Program. February 1.
- ADEC, 2018b. *Guidance for Evaluating Metals at Contaminated Sites*. Technical Memorandum. Division of Spill Prevention and Response Contaminated Sites Program. August.
- ADEC, 2018c. *Oil and Other Hazardous Substances Pollution Control*. Title 18 Alaska Administrative Code, Chapter 75 (18 AAC 75), as amended through October 27.
- Detterman, R. L.; T. P. Miller; M. E. Yount; and F. H. Wilson, 1981a. *Geologic Map*. Alaska Rare Plant Data Portal, 2016. Alaska Center for Conservation Science, University of Alaska Anchorage. <http://aknhp.uaa.alaska.edu/maps-js/rare-vascular-plant-portal>.
- Detterman, R. L.; T. P. Miller; M. E. Yount; and F. H. Wilson, 1981b. *Quaternary Geologic Map of the Chignik and Sutwik Island Quadrangles, Alaska*. U.S. Geological Survey Miscellaneous Investigations Series Map 1-1292, scale 1: 250,000.
- Hartman, C. W., and P. R. Johnson, 1984. *Environmental Atlas of Alaska*. University of Alaska Fairbanks, Institute of Water Resources/Engineering Experiment Station. 95 p.
- Howard Grey and Associates, Inc., 1982. Preliminary soils-foundation exploration, Port Heiden community housing project. Anchorage, Alaska. Variously paged.
- Jacobs Engineering Group, Inc. (Jacobs), 2016. *Port Heiden 2016 Groundwater Monitoring After-Action Report (Final)*. Technical Memorandum. December 14.

- Jacobs Technology, Inc., 2017. *North Landfill Geophysical Investigation*. Technical Memorandum. June 21.
- Leslie, L. D., 1989. *Alaska Climate Summaries* (2d ed.). University of Alaska Anchorage, Arctic Environmental Information and Data Center, Alaska Climate Center Technical Note 5, variously paged.
- Rieger, Samuel; Dale B. Schoephorster; Clarence E. Furbush, 1979. Exploratory soil survey of Alaska: Soil Conservation Service report. 213 p.
- U.S. Air Force (USAF), 1994. *Preliminary Assessment Port Heiden*. January. Prepared by CH2M HILL.
- USAF, 1996. *Final Preliminary Assessment/Site Inspection*, Port Heiden Radio Relay Station, Port Heiden, Alaska. March. Prepared by EMCON Alaska, Inc.
- USAF, 2006a. *Final Remedial Investigation/Feasibility Study Volumes I–IV, Port Heiden Radio Relay Station*. April. Prepared by Weston Environmental Solutions.
- USAF, 2006b. *Waste Handling Handbook*. March 1.
- USAF, 2008. *Proposed Plan for Cleanup Action at the Former Facility Area*, Port Heiden Radio RRS. October.
- USAF, 2009. *Record of Decision for Port Heiden Radio Relay Station*, Port Heiden, Alaska. February.
- USAF, 2010. *Explanation of Significant Differences for Port Heiden Radio Relay Station*, Port Heiden, Alaska. May.
- USAF, 2011. *Final Groundwater Monitoring Report*, Former Port Heiden Radio Relay Station. May. Prepared by Native Village of Port Heiden.
- USAF, 2014. *First Five-Year Review of Environmental Restoration Program Sites OT001, WP002, SS004, LF007, and Four Unnumbered Sites (Antenna Pads, Contaminated Soil Removal Areas, Drum Storage Area, and Focus Area)*. Final Report. August. Prepared by CH2M HILL.
- USAF, 2017a. *Explanation of Significant Differences for Port Heiden Radio Relay Station*. Final Report (unsigned). May.
- USAF, 2017b. *PCB-Contaminated Soil Removal Action, Final 2016 Interim Data Report*, Port Heiden, Alaska. July. Prepared by Ahtna Engineering Services, LLC.
- USAF, 2018. *Final Work Plan, U.S. Air Force Radio Relay Station Landfill (LF007) Supplemental Remedial Investigation*, Port Heiden, Alaska. May. Prepared by Ahtna Environmental, Inc.

USAF, 2019. *Final 2016–2018 PCB-Contaminated Soil Removal Action Report*, Port Heiden, Alaska. January. Prepared by Ahtna Engineering Services, LLC.

U.S. Army Corps of Engineers (USACE), 2016. *Final Fort Morrow Phase II Remedial Investigation Report, Port Heiden, Alaska, F10AK002704_03.10_0501_a*. November. Prepared by North Wind, Inc.

USACE, 2017. *Manual for Electronic Deliverables*. Requirements for Submittal of Documents, Chemistry Data, Geospatial Data, and Other Items. April.

U.S. Department of Defense (DoD), 2013. *DoD Environmental Field Sampling Handbook, Revision 1.0*. April.

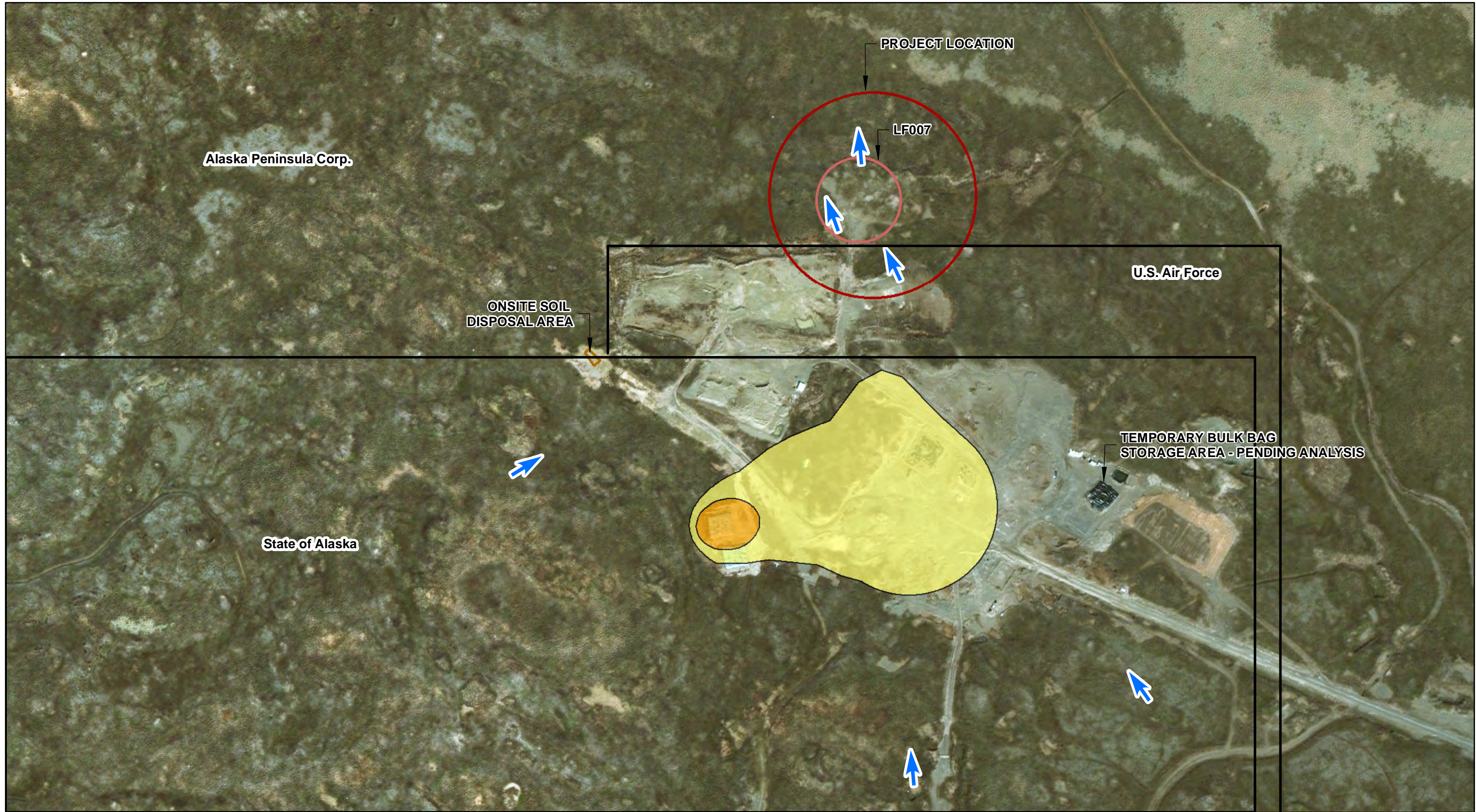
U.S. Environmental Protection Agency (EPA), 2017. *Low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells*. EPASOP-GW4. September 19.

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FIGURES

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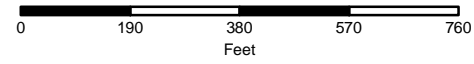
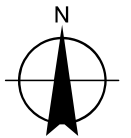


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Legend

- Project Location
- Land Ownership (approximate)
- LF007
- Onsite Soil Disposal Area
- Former Facility Area Plumes
- Black Lagoon Outfall POL Plume (approximate)
- Drum Storage Area TCE Plume (approximate)
- ↑ Groundwater Flow Direction

Notes:
 1. Acronyms:
 POL = petroleum, oil, and lubricants
 TCE = trichloroethene
 2. Aerial Imagery - ESRI Basemaps, accessed December 2017



1 inch = 333 feet
 WGS 1984 UTM Zone 4N



SITE MAP
 PORT HEIDEN RRS LANDFILL (LF007)
 SUPPLEMENTAL REMEDIAL INVESTIGATION
 REPORT
 PORT HEIDEN, ALASKA

DATE: 05 NOV 2019	PROJECT MANAGER: H. Williams	FIGURE NO.: 2
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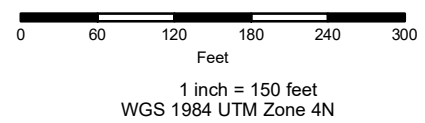
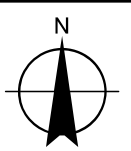
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Legend

- 2004 Boring/Monitoring Well
- 2018 Monitoring Well Status
- No Exceedance
- No Water
- Estimated Groundwater Elevation (ft amsl, NAVD88), based on November 2018 MW-06/-07/-08/-09 measurements
- Groundwater Flow Direction

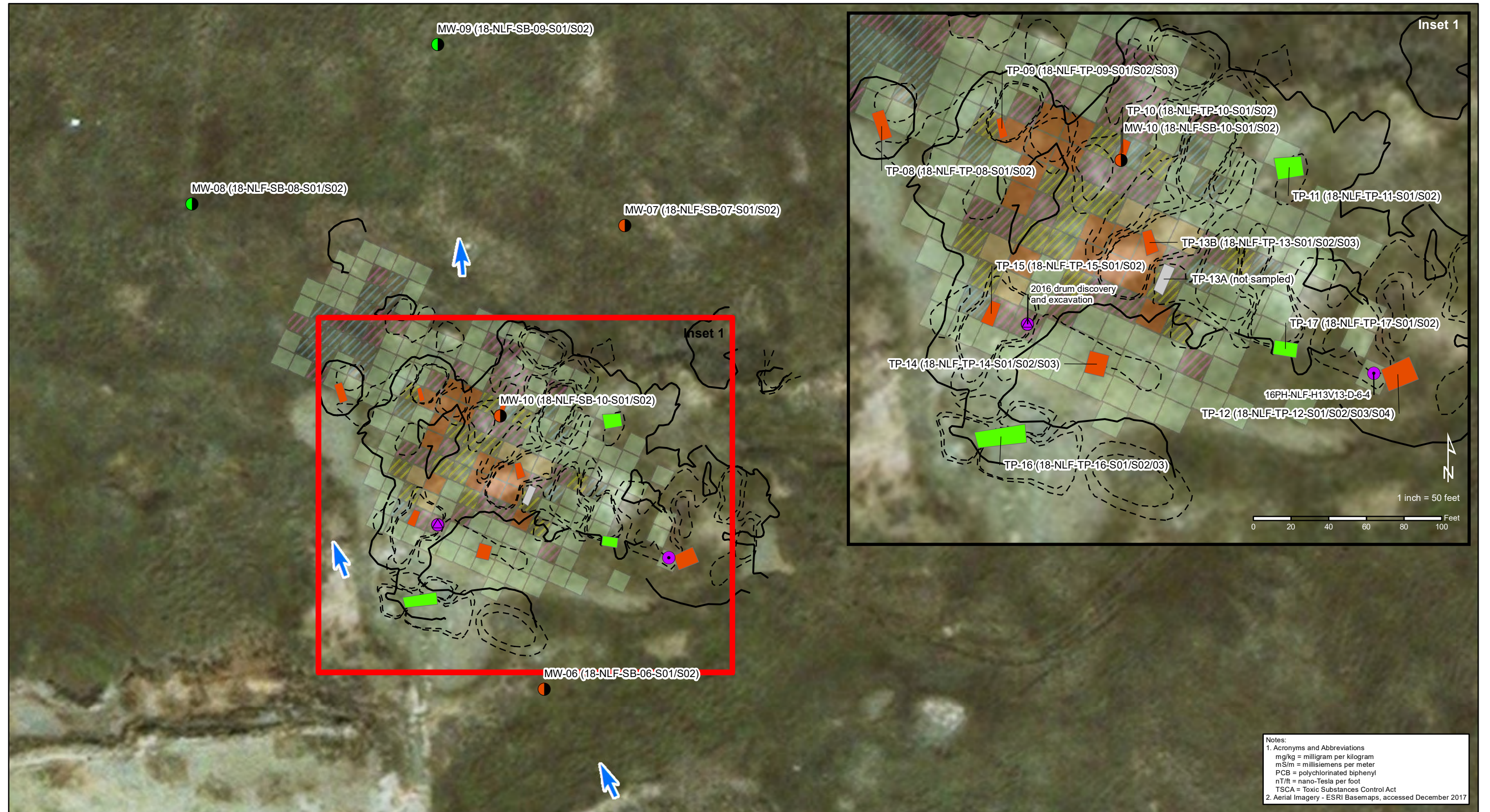
Notes:
 1. No groundwater sample was collected from MW-10, since it went dry after installation.
 2. July 2018 groundwater results did not exceed 18 AAC 75, Table C, Groundwater Human Health Cleanup Levels (27 October 2018), with the exception of arsenic, considered background. LOD exceedances not shown.
 3. Acronyms and Abbreviations
 ft amsl = feet above mean sea level
 4. Aerial Imagery – ESRI Basemaps, accessed December 2017



GROUNDWATER CONTOURS AND SAMPLE LOCATIONS PORT HEIDEN RRS LANDFILL (LF007) SUPPLEMENTAL REMEDIAL INVESTIGATION REPORT PORT HEIDEN, ALASKA		
DATE: 05 NOV 2019	PROJECT MANAGER: H. Williams	FIGURE NO.: 3

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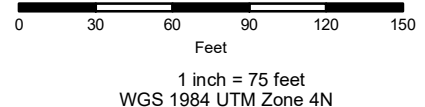
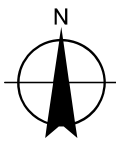
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Notes:
 1. Acronyms and Abbreviations
 mg/kg = milligram per kilogram
 mS/m = millisiemens per meter
 PCB = polychlorinated biphenyl
 nT/ft = nano-Tesla per foot
 TSCA = Toxic Substances Control Act
 2. Aerial Imagery - ESRI Basemaps, accessed December 2017

Legend

- 2016 drum location
- 2016 surface soil benzo(a)pyrene exceedance
- 2018 Boring Status - No Exceedance
- 2018 Boring Status - Exceedance
- 2018 Test Pit Status - No Exceedance
- 2018 Test Pit Status - Exceedance
- 2018 Test Pit Status - Not Sampled
- 2016-17 PCB Removal Action - Below Cleanup Level
- 2016-17 PCB Removal Action - TSCA estimated to 24 inches
- 2016-17 PCB Removal Action - TSCA estimated to 12 inches
- 2016-17 PCB Removal Action - Non-TSCA estimated 1-50 mg/kg at 18 inches
- 2016-17 PCB Removal Action - Non-TSCA estimated 1-50 mg/kg at 12 inches
- 2016-17 PCB Removal Action - Non-TSCA estimated 1-50 mg/kg at 6 inches
- 2017 Conductivity estimated extent of metallic debris (-2.5, 2.5, 5 mS/m)
- 2017 Magnetic estimated extent of metallic debris (120 nT/ft Contour)
- Groundwater Flow Direction



TEST PIT EXTENTS AND SOIL SAMPLE LOCATIONS PORT HEIDEN RRS LANDFILL (LF007) SUPPLEMENTAL REMEDIAL INVESTIGATION REPORT PORT HEIDEN, ALASKA		
DATE: 05 NOV 2019	PROJECT MANAGER: H. Williams	FIGURE NO.: 4

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TP-09 excavated debris
Facing northeast. July 21, 2018



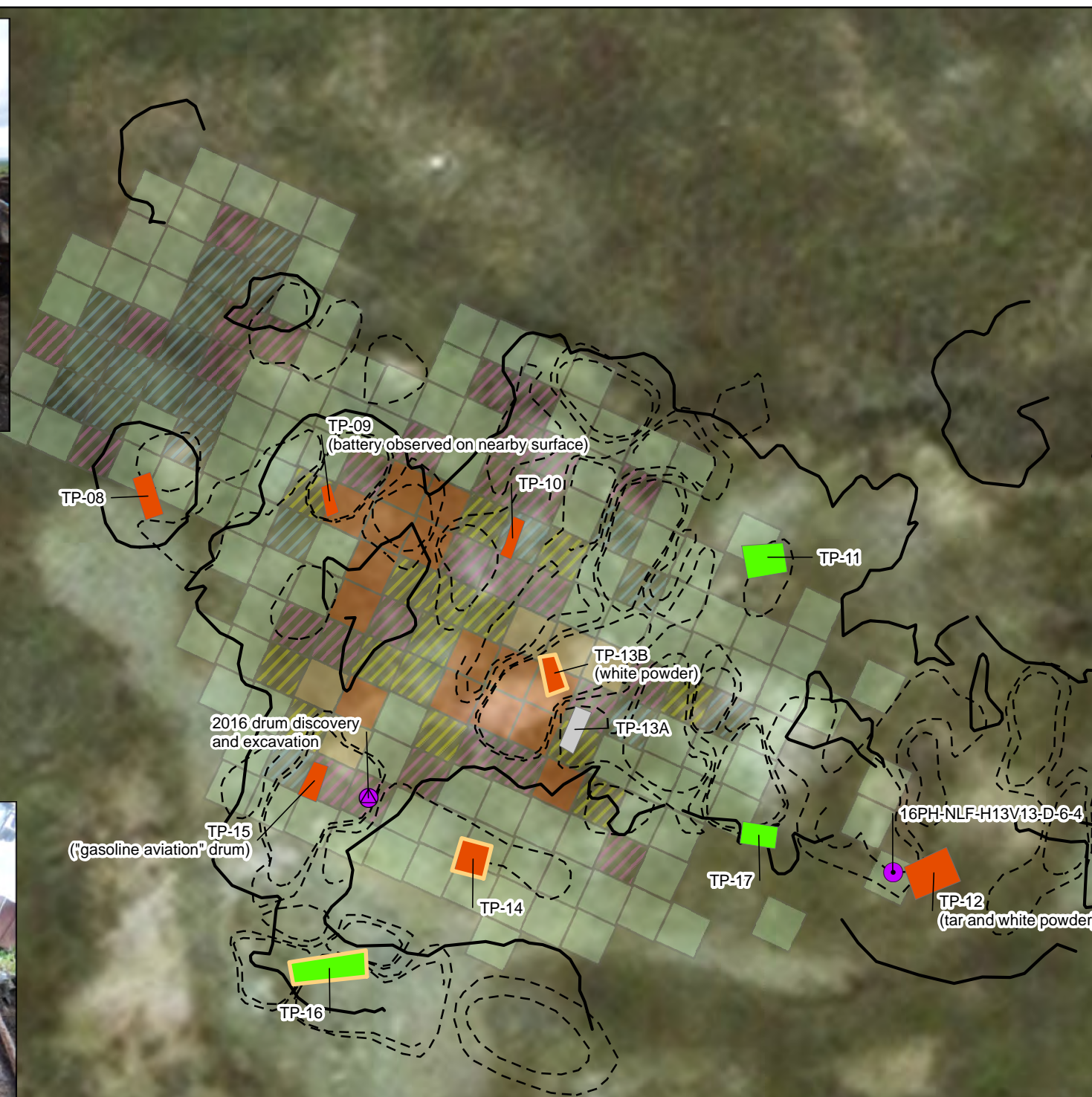
TP-10 excavation and debris
Facing northeast. July 19, 2018



TP-15: Drum carcass. July 23, 2018



TP-12: Close-up of excavated soil and white powder
July 25, 2018

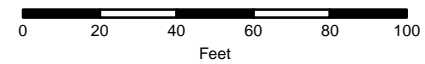
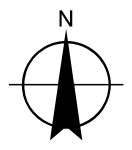


Notes:
1. Acronyms and Abbreviations
mg/kg = milligram per kilogram
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PCB = polychlorinated biphenyl
nT/ft = nano-Tesla per foot
TSCA = Toxic Substances Control Act
2. Aerial Imagery - ESRI Basemaps, accessed December 2017

Legend

- 2016 drum location
- 2016 surface soil benzo(a)pyrene exceedance
- 2018 Test Pit Status: No Exceedance
- 2018 Test Pit Status: Exceedance
- 2018 Test Pit Status: Not Sampled
- 2016-17 PCB Removal Action: Below Cleanup Level
- 2016-17 PCB Removal Action: TSCA estimated to 24 inches
- 2016-17 PCB Removal Action: TSCA estimated to 12 inches
- 2016-17 PCB Removal Action: Non-TSCA estimated 1-50 mg/kg at 18 inches
- 2016-17 PCB Removal Action: Non-TSCA estimated 1-50 mg/kg at 12 inches
- 2016-17 PCB Removal Action: Non-TSCA estimated 1-50 mg/kg at 6 inches

-- 2017 Conductivity estimated extent of metallic debris (-2.5, 2.5, 5 mS/m)
— 2017 Magnetic estimated extent of metallic debris (120 nT/ft Contour)



1 inch = 50 feet
WGS 1984 UTM Zone 4N



**TEST PIT SELECT CONTENTS
PORT HEIDEN RRS LANDFILL (LF007)
SUPPLEMENTAL REMEDIAL INVESTIGATION
REPORT
PORT HEIDEN, ALASKA**

DATE: 05 NOV 2019 PROJECT MANAGER: H. Williams FIGURE NO: 6

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APPENDIX A

PROJECT MEETING MINUTES

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Environmental, Inc.

Ahtna Environmental, Inc.

110 W. 38th Ave., Suite 200B

Anchorage, AK 99503

Phone: 907.644.0760 Fax: 907.272.6356

Meeting Minutes

Design-Build • Construction • Environmental • Staff Augmentation

Meeting Title: Port Heiden RRS Landfill Supplemental RI Project Meeting
Meeting Date: 1 May 2018
Meeting Time: 6-6:45pm
Location: Ray's Place, Port Heiden, Alaska
Project: Port Heiden Supplemental RI, RRS Landfill (LF007), Port Heiden, Alaska
Objectives: Provide information and obtain stakeholder feedback regarding Supplemental RI

TRIP NOTES

- Presentation (Heather Williams, Ahtna Project Manager)
 - See attached slides
 - Local residents typically refer to the site as “North Landfill”
- Stakeholder Comments and Questions
 - **Question:** Testing only this year?
Answer: Yes, this year's project at the North Landfill is an investigation, not a removal action. Waste generated during the investigation will be containerized, characterized and disposed appropriately based on test results. No USAF removal actions are planned this year, due to funding limitations.
 - **Question:** Why is the North Landfill being investigated, but not the USAF's in-town landfill that was used previously? Attendees indicated that it is located near the store, west of the bunkhouse. There are reportedly drums, cables and oil coming out of it. It is believed to be on the brownfield site list, but has not yet been remediated. There were reportedly three wells installed in 2003. The landfill in question and other community concern sites are shown on the Area Use Map, available for download at the Lake and Peninsula Borough website (http://www.lakeandpen.com/departments/community_development_coordinator/lake_and_peninsula_borough_maps/village_maps/).
Answer: That landfill is not part of this project. Rich Mauser (USAF) will look into it and follow up directly with stakeholders.

- LF007 Site Reconnaissance (USACE, Ahtna)
 - Condition as expected. No existing wells were located, so no need to determine suitability for sampling.



- Main road to the landfill is blocked at the former facility area by fencing marked “Danger: Keep Out”. Meeting attendees were not aware of the reason, speculated that it was due to remaining PCB contamination. Heather Williams followed up with Greg Rutkowski (Jacobs) following the meeting. Greg indicated that the fencing is to limit public access to the landfill, since excavations there were not backfilled.



ATTACHMENTS

- Sign-in Sheet
- Presentation Slides

USACE FORT MORROW PHASE III RI AND USAF RRS LANDFILL SUPPLEMENTAL RI - PROJECT MEETING

1 MAY 2018 - SIGN IN SHEET

Name	Organization	Phone	Email
Louis Howard	ADEC-Anchorage	907-269-7552	Louis.Howard@alaska.gov
Rebecca Jordan	USACE	907-854-5101	rebecca.s.jordan@usace.army.mil
Lori Verbruggen	USACE	907-753-2626	lori.a.verbruggen@usace.army.mil
Luke Hoffmann	Ahtna Environmental	907-947-6011	lhoffmann@ahtna.net
DENNIS SHELTON	JACOBS FOR AHTNA	541 766 3524	DSHELTON@CH2M.COM
Richard Mauser	AFCEC	907-552-0788	richard.Mauser@us.af.mil
Diana Kalnykoff	'	3128341	
Scott W. Anderson	NVPTH	240 6932	scott@portheidenalaska.com
Ami Christensen	NVPTH	837 2796	
Celeste Christensen	Aniakchak/NVPTH	717 8869	
Kristian Carlson	NVPTH	907-837-4841	meshikwolt@yahoo.com
James Christensen	PORTHEIDEN	907-837-4013	jameschris_pth@hotmail.com
John Christensen	NVPH	907 444 5976	johnivan2@gmail.com
Jaclyn Christensen	NVPH Local	907 444 4247	jaclync@portheidenalaska.com
Heather Williams	Ahtna	907-433-0761	hwilliams@ahtna.net
Larissa Orloff (by phone)			

↑
info →
FB

johnivan2@gmail.com



US Air Force Port Heiden RRS Landfill (LF007) Supplemental Remedial Investigation Project Meeting

Ray's Place, Port Heiden, Alaska

May 1, 2018



Agenda

- Introduction
- Project Background
- Project Overview
- Comments and Questions

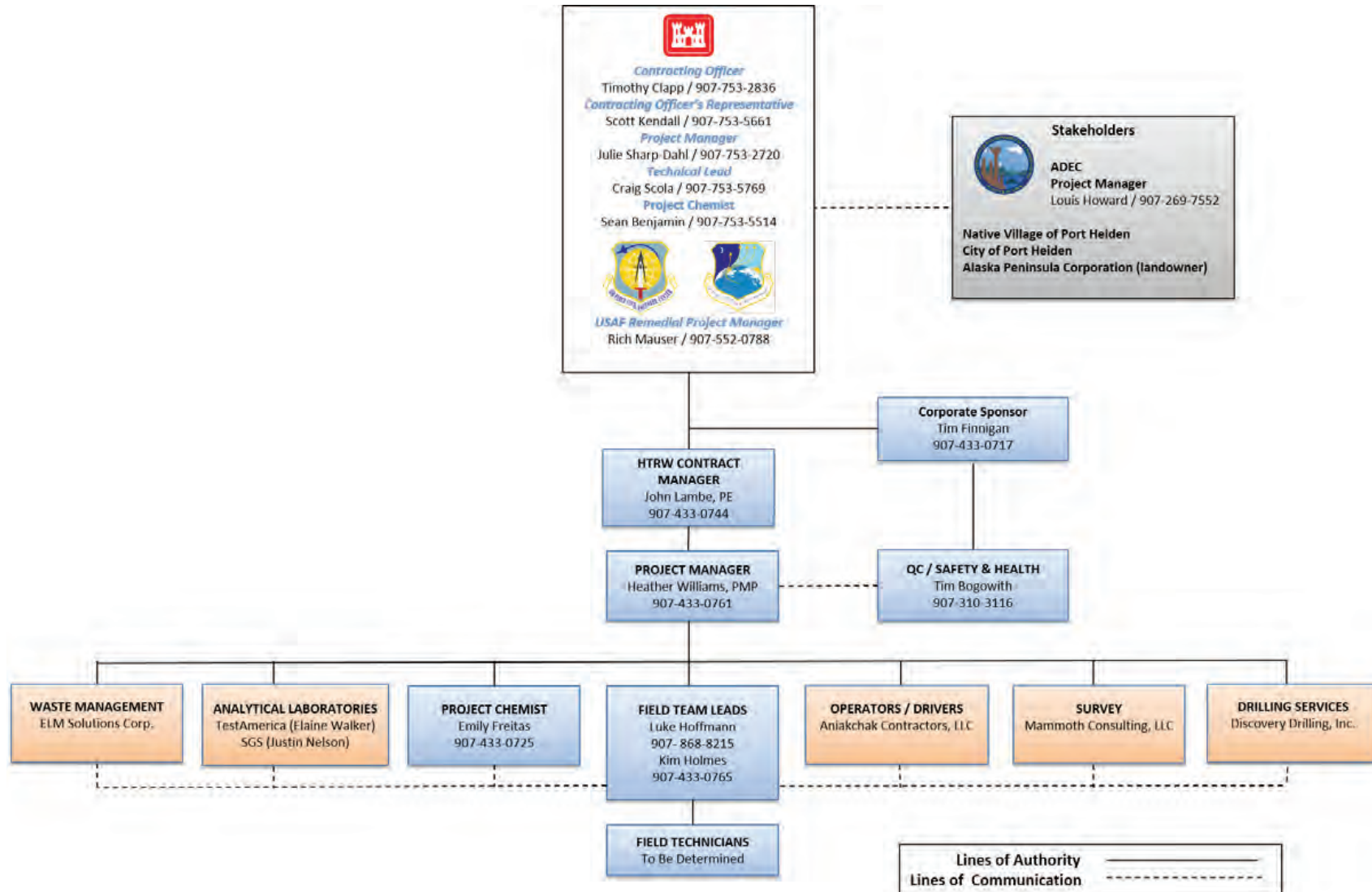


Introduction

- USACE contracted Ahtna Environmental, Inc. to conduct a Supplemental RI at the former Port Heiden Radio Relay Station (RRS) Landfill.
- USAF Civil Engineer Center based at Joint Base Elmendorf-Richardson is the lead agency.
- Meeting Attendees
 - Rich Mauser: USAF Remedial Project Manager
 - Louis Howard: ADEC Project Manager
 - Rebecca Jordan: USACE Representative
 - Heather Williams: Ahtna Project Manager
 - Luke Hoffmann: Ahtna Field Team Lead
- Unable to Attend
 - Julie Sharp-Dahl: USACE Project Manager
 - Craig Scola: USACE Technical Lead
 - Sean Benjamin: USACE Chemist
 - Kim Holmes: Ahtna Field Team Lead

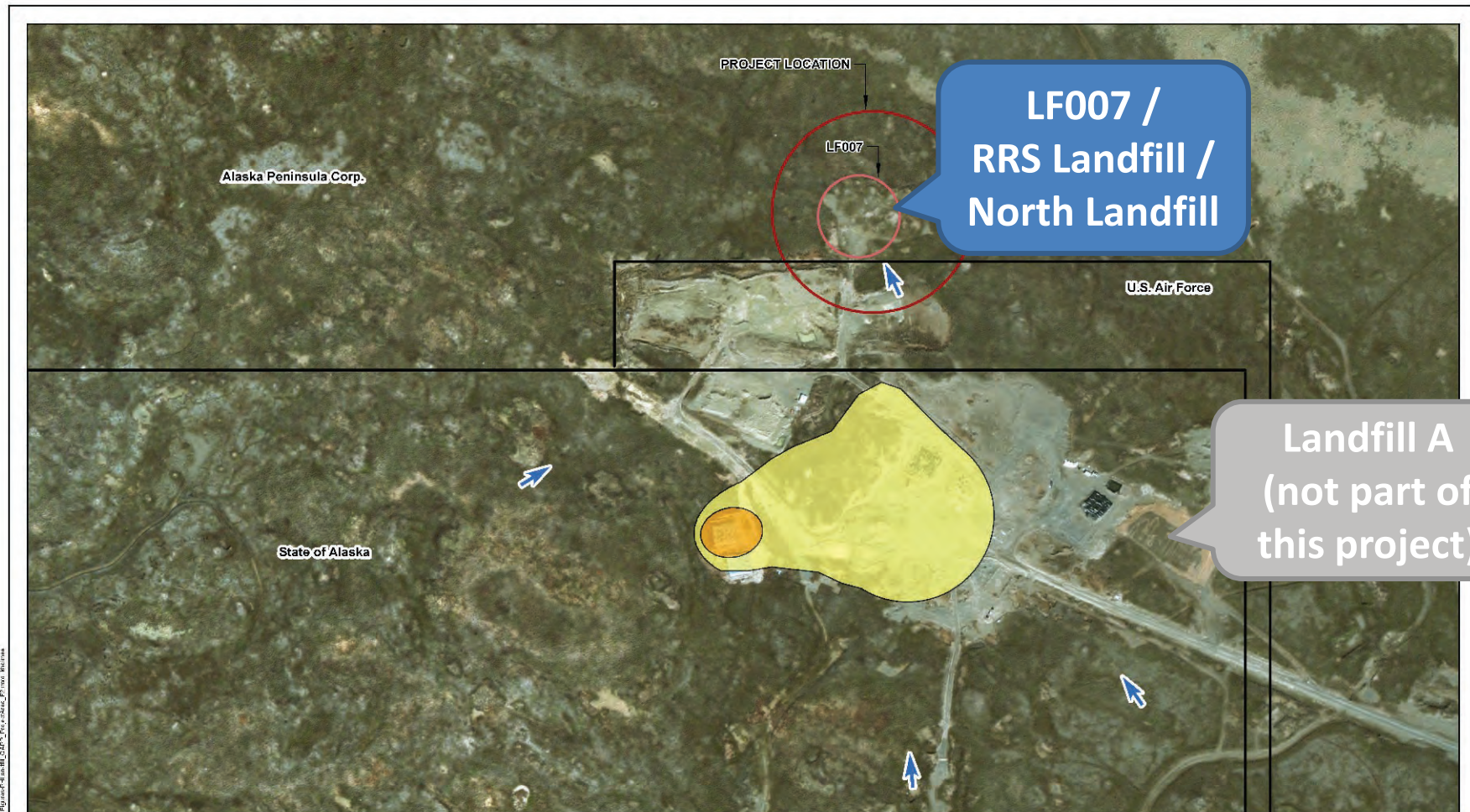


Introduction: Organization Chart





Project Background: Location



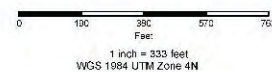
**LF007 /
RRS Landfill /
North Landfill**

**Landfill A
(not part of
this project)**

Legend

- Project Location
- LF007
- Stream/Channel Flow Direction
- Land Ownership (approximate)
- Former Facility Area Plumes**
- Back Lagoon Outfall POC Plume (approximate)
- Drum Storage Area TCE Plume (approximate)

Notes:
POI = petroleum, oil, and lubricants
TCE = trichloroethene
Air at Imagery - ESRI Basemaps, accessed December 2017



SITE MAP PORT HEIDEN RRS LANDFILL (LF007) SUPPLEMENTAL REMEDIAL INVESTIGATION WORK PLAN PORT HEIDEN, ALASKA		
DATE 16 FEB 2018	PROJECT NUMBER H. Williams	PAGE NO 2



Project Background: Previous CERCLA Activities

- 2004 Remedial Investigation (RI) / Feasibility Study (FS) / Baseline Risk Assessment
 - LF007 cover soil was found to contain polychlorinated biphenyl (PCBs), polycyclic aromatic hydrocarbons (PAHs), and pesticides
 - Trichloroethylene (TCE) was detected below screening criteria in groundwater downgradient of LF007
- 2008 Proposed Plan (PP)
- 2009 Record of Decision (ROD)
 - Contaminated cap soil removal at LF007
 - Groundwater monitoring at LF007, wells removed 2010
- 2012-Present ROD Remedy Implementation
 - 2016 drum discovery at LF007
 - Transformer, fire extinguisher, misc. cylinder, asbestos discoveries at other RRS locations
- 2014 First Five-Year Review



Project Background: Drum Discovery



Exposed drums at LF007 / RRS Landfill / North Landfill, July 2016



Project Overview: Drivers and Objectives

- Drivers
 - Drums were encountered during 2016 LF007 contaminated cap soil remedial action
 - ADEC cleanup regulations have changed since the 2009 ROD
- Objectives
 - Identify and close LF007 data gaps
 - Develop remedial alternatives
 - Obtain public comment
 - Document decisions made



Project Overview: Scope and Schedule

- Supplemental Remedial Investigation
 - ✓ May 2018: Project Meeting in Port Heiden
 - May 2018: Final Supplemental RI Work Plan
 - July-August 2018: Supplemental RI Field Work
 - September 2018: Transport Waste Off-Site
 - Spring 2019: Final Supplemental RI Report
- Feasibility Study: 2019
- Proposed Plan: 2020
 - Public Comment Period
 - Public Meeting in Port Heiden
- Record of Decision Amendment (if reqd): 2021



Project Overview: Data Gap Analysis Highlights

- Contaminated media presence/nature/extent
 - Multiple 2004 LF007 groundwater TCE detections exceed 2017 ADEC cleanup level
 - 1,4-dioxane identified as contaminant of potential concern at USAF TCE sites, not yet sampled at LF007
 - Subsurface soils within and below landfill not yet investigated. 2004 RI dug shallow test pits through the cap, no samples were taken
 - Hexavalent chromium not yet sampled
- Potential source materials
 - Landfill contents not well known

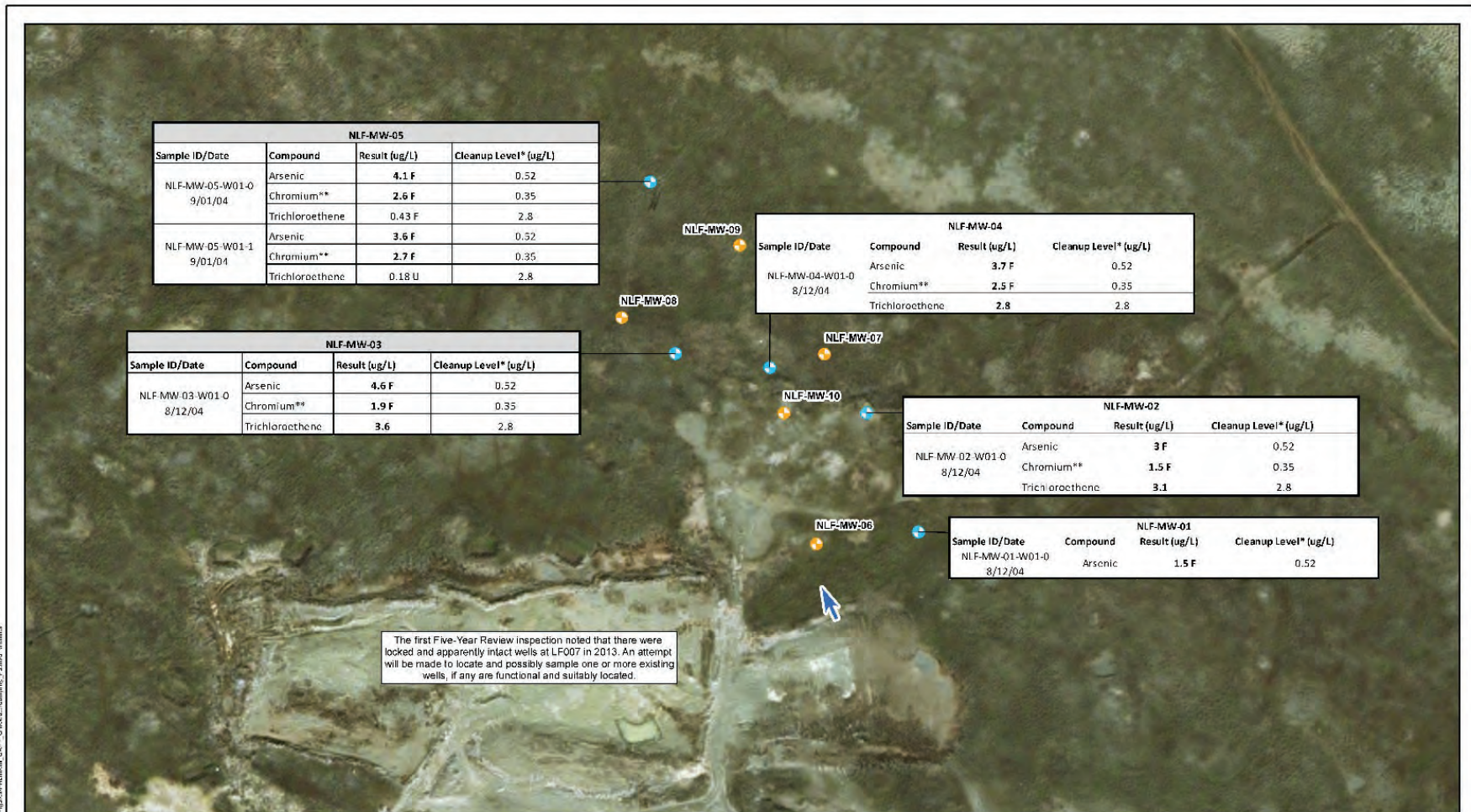


Project Overview: Planned 2018 Field Work

- Investigate landfill contents, with 9 test pits (maximum 15 ft bgs)
- Investigate potential landfill groundwater contamination with laboratory samples from 5 new groundwater wells
 - GRO, DRO, RRO, VOC, EDB, SVOC, Pesticides, Herbicides, RCRA metals, Ni, V, PCB, Chromium VI, 1,4-dioxane (one well)
- Investigate potential landfill subsurface soil contamination with laboratory samples from well borings and test pits
 - GRO, DRO, RRO, VOC, EDB, SVOC, Pesticides, Herbicides, RCRA metals, Ni, V, PCB
- Containerize, transport, and dispose of hazardous and/or RCRA/TSCA contaminated materials encountered during the investigation



Project Overview: Groundwater Sampling



NLF-MW-05			
Sample ID/Date	Compound	Result (ug/L)	Cleanup Level* (ug/L)
NLF-MW-05-W01-0 9/01/04	Arsenic	4.1 F	0.52
	Chromium**	2.6 F	0.35
	Trichloroethene	0.43 F	2.8
NLF-MW-05-W01-1 9/01/04	Arsenic	3.6 F	0.52
	Chromium**	2.7 F	0.35
	Trichloroethene	0.18 U	2.8

NLF-MW-04			
Sample ID/Date	Compound	Result (ug/L)	Cleanup Level* (ug/L)
NLF-MW-04-W01-0 8/12/04	Arsenic	3.7 F	0.52
	Chromium**	2.5 F	0.35
	Trichloroethene	2.8	2.8

NLF-MW-03			
Sample ID/Date	Compound	Result (ug/L)	Cleanup Level* (ug/L)
NLF-MW-03-W01-0 8/12/04	Arsenic	4.6 F	0.52
	Chromium**	1.9 F	0.35
	Trichloroethene	3.6	2.8

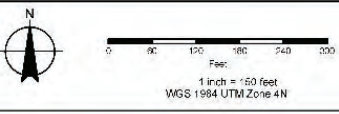
NLF-MW-02			
Sample ID/Date	Compound	Result (ug/L)	Cleanup Level* (ug/L)
NLF-MW-02-W01-0 8/12/04	Arsenic	3 F	0.52
	Chromium**	1.5 F	0.35
	Trichloroethene	3.1	2.8

NLF-MW-01			
Sample ID/Date	Compound	Result (ug/L)	Cleanup Level* (ug/L)
NLF-MW-01-W01-0 8/12/04	Arsenic	1.5 F	0.52

Legend

- 2004 Monitoring Wells
- Proposed 2018 Boring / Monitoring Wells
- Groundwater Flow Direction

Notes:
 *18 AAC 75, Table C, Standard for Human Health Cleanup Level (November 7, 2017)
 **Total Chromium result compared with hexavalent chromium cleanup level
 F = The analyte was positively identified but the associated numerical value is below the RL
 RL = Reporting Limit (the lowest calibration level employed during analysis to detect the presence of a particular analyte)
 ug/L = micrograms per liter
 Aerial Imagery: TARR Images captured December 20 7
 Field information result exceeds cleanup level





Project Overview: Landfill Investigation Safety

- Safety Awareness
 - Heavy equipment operations (excavator, drill rig, trucks)
 - Open trenches during test pitting
 - Possible hazardous material encounters (drums, transformers, energized cylinders, UXO, discarded military munitions, asbestos)
- Safety Measures
 - Limited public access during field work
 - Test pit excavation in small lifts
 - Workers will use appropriate protective clothing and equipment
 - Stop work and notification procedures in the event that unexpected items are encountered



Contact Information

- Rich Mauser, USAF Remedial Project Manager
 - richard.mauser@us.af.mil
 - (907)552-0788



Comments and Questions?



APPENDIX B

PHOTOGRAPHIC LOG

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Photograph 1: Site reconnaissance, facing north. 01 May 2018.



Photograph 2: Site reconnaissance, facing northeast. 01 May 2018.



Photograph 3: Site reconnaissance – a locally available excavator. 2 May 2018.



Photograph 4: Field mobilization – drill rig. 12 Jul 2018.



Photograph 5: Test Pit 10 reconnaissance and preparation, facing south. 18 Jul 2018.



Photograph 6: TP-10 reconnaissance and preparation, facing south. 18 Jul 2018.



Photograph 7: TP-10 excavation and debris, facing northeast. 19 Jul 2018.



Photograph 8: TP-10 excavation finalization, facing northeast. 19 Jul 2018.



Photograph 9: Drum carcass excavated from TP-10. 19 Jul 2018.



Photograph 10: Overview of drum carcasses excavated from TP-10. 19 Jul 2018.



Photograph 11: Backfilling TP-10 with all debris segregated for co-location of MW-10, facing north. 19 Jul 2018.



Photograph 12: Backfilling TP-10, facing west. 19 Jul 2018.



Photograph 13: Installation of MW-06, with boring cores in the foreground, facing south. 19 Jul 2018.



Photograph 14: Finalization of MW-06. 20 Jul 2018.



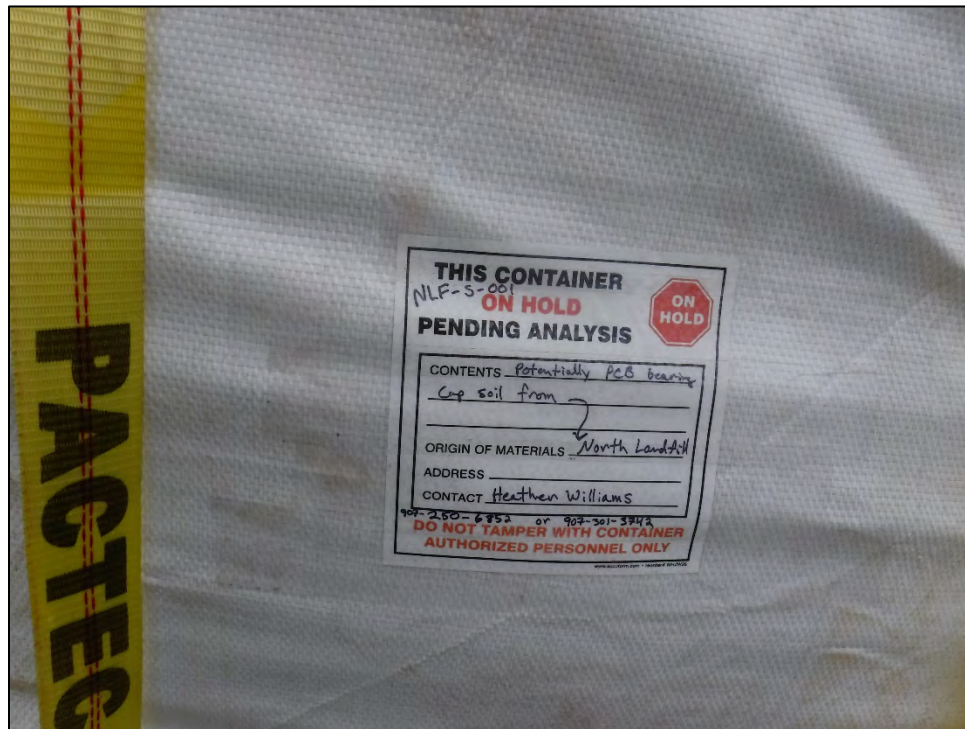
Photograph 15: Site overview, facing northeast. 20 Jul 2018.



Photograph 16: Filling sandbags, facing south. 20 Jul 2018.



Photograph 17: Labeling waste bulk bag. 20 Jul 2018.



Photograph 18: Pending Analysis Label on NLF-S-001. 20 Jul 2018.



Photograph 19: TP-08 excavation and debris, facing north. 21 Jul 2018.



Photograph 20: TP-08 excavated debris, facing west. 21 Jul 2018.



Photograph 21: TP-08 excavation finalization, facing east. 21 Jul 2018.



Photograph 22: TP-08 backfilled and marked for survey, facing north. 21 Jul 2018.



Photograph 23: Close-up of TP-09 debris. 21 Jul 2018.



Photograph 24: TP-09 excavated debris, facing northeast. 21 Jul 2018.



Photograph 25: Close-up of finalized excavation at TP-09. 21 Jul 2018.



Photograph 26: TP-09 backfilled and marked for survey, facing southeast.
21 Jul 2018.



Photograph 27: MW-07 overview, after well installation, facing north. 21 Jul 2018.



Photograph 28: MW-07 monument, facing northeast. 21 Jul 2018.



Photograph 29: TP-11 excavation and debris, facing west. 22 Jul 2018.



Photograph 30: TP-11 excavated debris, facing northwest. 22 Jul 2018.



Photograph 31: TP-11 excavated debris, facing west. 22 Jul 2018.



Photograph 32: Drum carcass excavated from TP-11. 22 Jul 2018.



Photograph 33: Close-up of finalized excavation at TP-11. 22 Jul 2018.



Photograph 34: TP-11 backfill preparation, facing northwest. 22 Jul 2018.



Photograph 35: TP-13A excavation location overview, facing north. 22 Jul 2018.



Photograph 36: TP-35A excavated drum carcass, facing north. 22 Jul 2018.



Photograph 37: TP-13A excavation finalization, facing northwest. 22 Jul 2018.



Photograph 38: TP-13B excavation location overview, facing northeast. 22 Jul 2018.



Photograph 39: Close-up of observed white power in TP-13B. 22 Jul 2018.



Photograph 40: TP-13B excavated debris, facing west. 22 Jul 2018.



Photograph 41: Close-up of finalized excavation at TP-13B. 22 Jul 2018.



Photograph 42: TP-13B backfill preparation, facing north. 22 Jul 2018.



Photograph 43: MW-09 overview during installation, facing northwest. 22 Jul 2018.



Photograph 44: MW-08 overview during installation, facing east. 22 Jul 2018.



Photograph 45: TP-15 excavation location overview, with MW-10 installation in the background, facing north. 23 Jul 2018.



Photograph 46: TP-15 excavation and debris, facing east. 23 Jul 2018.



Photograph 47: Drum carcass at TP-15. 23 Jul 2018.



Photograph 48: Close-up of finalized excavation at TP-15. 23 Jul 2018.



Photograph 49: TP-14 excavation location overview, facing northeast. 23 Jul 2018.



Photograph 50: TP-14 excavation, facing southwest. 23 Jul 2018.



Photograph 51: Close-up of excavation finalization at TP-14. 23 Jul 2018.



Photograph 52: Backfilling TP-14, facing south. 23 Jul 2018.



Photograph 53: TP-16 excavation location overview, facing north. 24 Jul 2018.



Photograph 54: TP-16 soil sampling. 24 Jul 2018.



Photograph 55: TP-16 excavation finalization. 24 Jul 2018.



Photograph 56: TP-16 excavated soil overview, facing north. 24 Jul 2018.



Photograph 57: TP-17 excavation location overview, facing northwest. 24 Jul 2018.



Photograph 58: TP-17 excavated debris, facing north. 24 Jul 2018.



Photograph 59: TP-17 excavation finalization, facing east. 24 Jul 2018.



Photograph 60: Backfilling TP-17, facing east. 24 Jul 2018.



Photograph 61: Weighing and marking waste bulk bag. 24 Jul 2018.



Photograph 62: Re-loading bulk bag in hopper. 24 Jul 2018.



Photograph 63: TP-12 excavation location overview, facing northwest. 25 Jul 2018.



Photograph 64: Close-up of obsidian excavated from TP-12. 25 Jul 2018.



Photograph 65: TP-12 excavation debris. 25 Jul 2018.



Photograph 66: Close-up of white powder excavated from TP-12. 25 Jul 2018.



Photograph 67: TP-12 excavation finalization. 25 Jul 2018.



Photograph 68: Site survey, facing northeast. 26 Jul 2018.



Photograph 69: Site survey in the foreground, equipment decontamination (right) and MW-06 well development (left) in the background. 26 Jul 2018.



Photograph 70: Equipment decontamination after all Test Pit excavations finished, with site survey in the background. 26 Jul 2018.



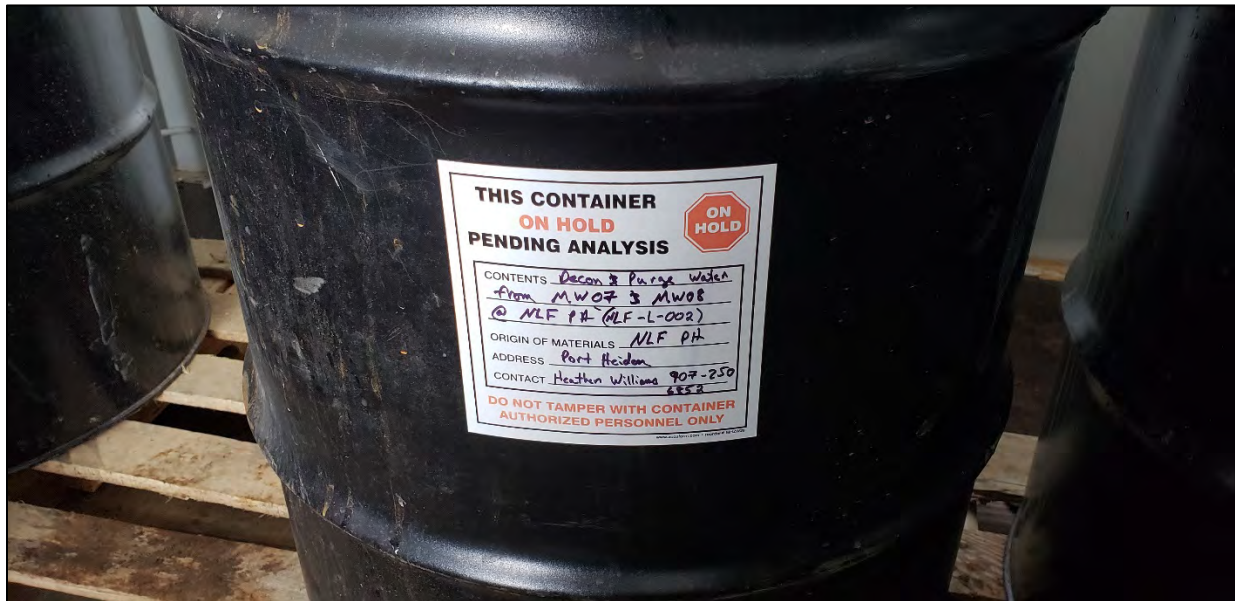
Photograph 71: Coolers packed for shipment on Everts demob charter. 26 Jul 2018.



Photograph 72: Equipment loading onto Everts demob charter. 26 Jul 2018.



Photograph 73: Covered bulk bags at the Radio Relay Station (RRS) for temporary waste staging until analytical results received, facing south. 27 Jul 2018.



Photograph 74: Labeled drums stored in connexes at the barge landing area for temporary waste staging until analytical results received. 28 Jul 2018.



Photograph 75: Cavity observed at MW-10 during attempted well development. Cavity observed to extend approximately 24 feet below ground surface (ft bgs). 29 Jul 2018.



Photograph 76: MW-10 monument re-establishment. No water observed in well and no further well-development or sampling possible, facing north. 29 Jul 2018.



Photograph 77: Site overview after 2018 field work conclusion, facing northwest.
02 Nov 2018.



Photograph 78: Site overview after 2018 field work conclusion, facing northeast.
02 Nov 2018.



Photograph 79: Covered waste bulk bags staged at barge landing area awaiting off-site transportation, facing southwest. 03 Nov 2018.



Photograph 80: Labeled drums of waste and 1-CY bulk bags of project debris planned for removal and staged in connex at barge landing area. 04 Nov 2018.



Photograph 81: Survey of location where soils were disposed from bulk bags after analytical results received, facing west. 04 Nov 2018.



Photograph 82: Field Office overview after 2018 field work conclusion. 04 Nov 2018.



Photograph 83: Covered waste bulk bags staged at barge landing area awaiting off-site transportation, facing northeast. 12 Feb 2019.



Photograph 84: Staged waste in blue intermodal shipping container, facing north. 12 Feb 2019.



Photograph 85: Covered waste bulk bags staged at barge landing area awaiting off-site transportation, facing northwest. 28 Mar 2019.



Photograph 86: Staged waste in blue intermodal shipping container, facing north. 28 Mar 2019.



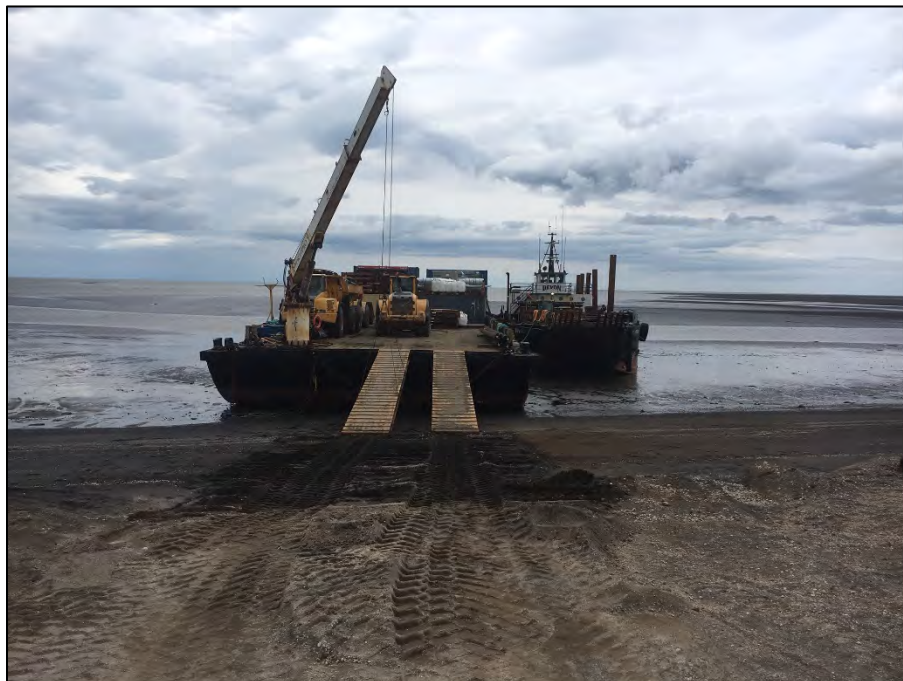
Photograph 87: Covered waste bulk bags staged at barge landing area awaiting off-site transportation, facing southwest. 1 May 2019.



Photograph 88: Staged waste in blue intermodal shipping container, facing north. 1 May 2019.



Photograph 89: Waste loaded on barge. 12 Jun 2019.



Photograph 90: Tug and waste loaded on barge, facing west. 12 Jun 2019.

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APPENDIX C

PERMIT

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**ALASKA PENINSULA CORPORATION
LICENSE TO ENTER**

AGREEMENT made this 3rd day of April, 2018, between Alaska Peninsula Corporation, a corporation organized and existing under the laws of the State of Alaska and U.S.C, 1601 et. Seq., amended under the Alaska Native Claims Settlement Act (“ANCSA”), whose address is 301 Calista Court, Suite 101, Anchorage, Alaska 99518 (hereinafter referred to as “licensor”) and

UNITED STATES OF AMERICA
611 Air Support Group
9480 Pease Avenue Ste 123
JBER, AK 99506-2101
COM: (907) 552-8757
FAX: (907) 522-2161

(hereinafter referred to as “Licensee”).

RECITALS:

1. WHEREAS, Licensor is the owner of the surface estate of the following described land: *The surface estate of Portions of Sections 3 and 4, T38S, R59W; and Portions of Sections 15, 16, 20, 21, and 34, T37S, R59W, Seward Meridian, located in the State of Alaska, Lake and Peninsula Borough, Port Heiden, Alaska as shown on Exhibits A & B (“Premises”).*
2. WHEREAS, Licensee desires permission of Licensor for the right of Licensee, its agents, employees, contractors (including, but not limited to, United States contractor Weston Solutions, Inc), and consultants (collectively, “Licensee”) to enter upon subject lands for the purposes of an environmental assessment and response pertaining to the Port Heiden Radio Relay Station.
3. WHEREAS, Licensor is prepared to grant the permission Licensee desires, subject to Licensee’s full and faithful performance of all the terms and conditions stated in this agreement.

NOW, THEREFORE, in consideration of the mutual promises and covenants contained herein, the parties agree as follows:

1. GRANT OF PERMISSION:

Licensor hereby grants permission, revocable and terminals (as hereinafter provided) to Licensee to enter the Premises, subject to the terms and conditions of this license.

(a) Purpose:

Permission is hereby granted to Licensee for the express purpose of conducting such environmental assessment and response pertaining to the Port Heiden Radio Relay Station, as follows:

For use by the United States, its representatives, agents, contractors for use by the United States, its representatives, agents, contractors and assigns, as a work area for environmental investigation and response in connection with the former Port Heiden Radio Relay Station; including the right to store, move and remove equipment and supplies; erect and remove temporary structures on the land; investigate and collect samples; excavate and remove pollutants, hazardous substances, contaminated soils, containerize waste, and replace with uncontaminated soil; excavate and remove all storage tanks (above, at and below ground level), contents and appurtenant piping; demolish and dispose of former military structures and debris; construct, operate, maintain, alter, repair and remove groundwater monitoring wells, groundwater purification and injection systems, appurtenances thereto and other devices for the monitoring and treatment of contamination in soil, air, and water; and perform any other such work which may be necessary and incident to the Government's use for the environmental investigation and response on said lands; subject to existing easements for public roads and highways, public utilities, railroads and pipelines; reserving, however to the landowner(s), their-heirs, executors, administrators, successors and assigns, all such right, title, interest and privilege as may be used and enjoyed without interfering with or abridging the rights and right-of-entry hereby acquired.

(b) Limitations:

This License shall be subject to all valid, existing rights, including, but not limited to any rights created by Licensor in third persons. And rights under 14© of ANCSA, the terms and conditions of this agreement and the non-disturbance of other persons who, with Licensor's permission, are on the subject lands.

(c) Exercise of Rights:

Licensee shall endeavor to provide notice to Licensor not less than 24 hours prior to entering on to the property, which notice shall specify the work, location of work, the number in the party and the expected time of departure.

2. **LICENSOR HOLDS TITLE:**

Licensor has received conveyance to these lands under the Alaska Native Claims Settlement Act ("ANCSA") within the Licensor's land selections established under 11 of ANCSA, 43 U.S.C. 1610.

3. **PAYMENTS:**

Licensee shall pay to Licensor a single lump sum payment of \$2,050. 00/100 DOLLARS within 45 days of the date of invoice for this License.

4. **NO BUILDINGS OR STRUCTURES:**

(a) Prior Approval Required:

Except as otherwise expressly permitted in this instrument, Licensee shall not erect any improvements of any type on the Premises whatsoever.

(b) Unauthorized Structures/Removal:

Licensee shall immediately remove any unauthorized improvements placed by the Licensee upon the Premises at Licensee's sole cost.

5. **LIMITATIONS ON USE:**

(a) Purpose Limited:

The permission herein granted is limited to those reasonable contemplated by the purpose stated in Paragraph 1(a) above. Neither Licensee nor Licensee's employee, agents, contractors, guests, invitees, and/or clients shall permit or be permitted, to shoot, kill, catch, trap or otherwise destroy or injure any animal.

(b) Cultural and Historical Sites:

All cultural items, artifacts, sites, and/or evidence of such are the sole and exclusive property of Licensor and any disturbances thereof is strictly prohibited. Any disturbances of any such items or sites shall result in immediate revocation of this license, and, in addition, Licensor shall be entitled to any and all other remedies at law, whether at law, whether civil and/or criminal and in equity. Licensee shall immediately report to Licensor any such discovery, and shall take all action as may be required to keep and maintain such discovery in strictest confidence, and in compliance with applicable Federal law, including but not limited to the Archeological Resources Protection Act, the Native American Graves and Repatriation Act, and the Antiquities Act.

(c) Access to Information:

Licensee shall furnish copies of all reports generated arising out of, or as a result of the studies and undertakings anticipated under this License without demand and prior to release to the public. Upon Licensor's request, Licensee shall provide Licensor with all data, analysis, studies and any other information obtained, generated or otherwise in Licensee's possession as a result of Licensee's exercise of rights pursuant to this license.

6. **FIRE PROTECTION; SANITATION; ACCESS:**

(a) Fire Protection:

Licensee shall comply with all federal, state, borough or municipal rules and regulations relating to the occupancy and use of the premises. Licensee shall take all reasonable precautions to prevent or suppress fires thereon;

(b) Sanitation:

Licensee shall, to the extent required by law, install and maintain, at Licensee's sole expense, suitable and adequate sanitary facilities acceptable to Licensor.

(c) No Waste:

Licensee shall not commit, nor permit to be committed, any waste upon the land and shall restore all lands used to their original state upon expiration of this License.

(d) No Hazardous Materials:

Licensee shall not bring upon, nor store or otherwise permit the carriage of hazardous materials upon the subject lands, except for the purpose of removal of the same as may be buried upon or within the premises. As used in this license, the term "hazardous materials" shall comprehend all materials so defined in any Federal or State of Alaska statutes, regulations, ordinances or orders.

7. **FEDERAL TORTS CLAIMS ACT:**

The Licensee hereby agrees to assume full control and sole responsibility for its activities, structures, and personnel on the Premises. Further, the Licensee agrees to promptly consider and adjudicate any and all claims which arise out of its operations on the Premises and to pay for any damage don't to the land or other property of the Licensor if the adjudication indicates payment is appropriate. Such adjudication may be made under the Federal Torts Claims Act, 28 U.S.C. 2671, et. seq., or under such authority as may be available to the Licensee. Such consideration shall be given to all claims, demands, or suits arising directly or indirectly from the operations of the Licensee incident to the Licensee's use of the Premises.

8. **INSURANCE:**

(a) Policies/Limits:

Licensee's primary contractors (including Weston Solutions, Inc.) shall add Alaska Peninsula Corporation as a named insured to each such contractor's insurance policies shall insure Licensor and such prime contractors against liability for personal injury, death or property damage occurring upon, in or about the lands for which permission to enter is granted. Said insurance shall offer protection in limits of not less than \$2,000,000 in respect to injury or death to a single person, \$5,000,000 per occurrence. The primary contractors shall provide Licensor with proof of insurance prior to entering and the primary contractors shall keep such insurance in full force and effect during all times material to this license.

9. **LIABILITY:**

In accordance with and subject to the conditions, limitations and exceptions set forth in the Federal tort Claims Act of 1948, as amended (28 USC 2671 et. seq.), ("Act), the Licensee will be liable to persons damaged by any personal injury, death or injury to or loss of property that is caused by a negligent or wrongful act or omission of an employee of the Licensee while acting within the scope of his office employment under circumstances where a private person would be liable in accordance with the law of the place where the act or mission occurred. The foregoing shall not be deemed to extend the Licensee's liability

beyond that existing under the Act at the time of such act or omission or to preclude the Licensee from using any defense available in law or equity.

10. **INITIAL TERM; RENEWAL; TERMINATION:**

(a) **Term:**

The term of this License shall be for 12 months and shall commence on 01st Jun, 2018 and terminate on 31st May 2019.

(b) **Termination:**

Licensor may, at its election, terminate this License if Licensee fails to comply with or abide by each or any of the provisions of this License and if Licensee fails to cure or to begin a reasonable effort to cure that failure to comply or to abide with such provision within in 30 days of its receipt of written notice of such failure to comply.

11. **WAIVER:**

Waiver by Licensor of any breach of any term of provision shall not be deemed a waiver of any subsequent breach of the same or any other term or provision hereof.

12. **NOTICE:**

Any notice to Licensor or Licensee's point of contact shall be sufficient if served on the party to whom notice is given personally or by registered mail with adequate and sufficient postage affixed thereon as follows:

If to Licensee: **UNITED STATES OF AMERICA**
611 CES/CEAIP
REAL PROPERTY OFFICE
10471 20th STREET, SUITE 316
ELMENDORF AFB, AK 99506-2201
COM: (907) 552-4080
FAX: (907) 552-2161
Email: sajid.khan.4@us.af.mil

If to Licensor: **ALASKA PENINSULA CORPORATION**
301 CALISTA COURT, SUITE 101
ANCHORAGE, ALASKA 99518
TEL: (907) 274-2433
FAX: (907) 274-8694
Email: dmcalister@alaskapeninsulacorp.com

13. **TIME IS OF THE ESSENCE:**

Time is of the essence in each and every provision contained herein.

14. **NO INTEREST OR ESTATE:**

Licensee understands and agrees that this License does not convey any estate or interest in the described property and that Licensee shall not claim at any time interest or estate of any kind of extent whatsoever in the Premises by virtue of this License, Licensee's occupancy, the use granted by this License or any renewal hereof, any previous occupancy or use by virtue of any prior license.

15. **NO WARRANTY:**

Licensor does not warrant or represent that the Premises are safe, healthful, or suitable for the purposes for which they are permitted to be used under the terms of this License.

16. **ENTIRE AGREEMENT:**

The making, execution, and delivery of the Agreement by Licensee have been induced by no representations, statements, warranties, or agreements other than those herein expressed. This Agreement embodies the entire understanding of the parties and there are no further or other agreements or understand, written or oral, in effect between the parties, relating to the subject matter hereof. This instrument may be amended or modified only by an instrument in writing signed by all parties hereto.

17. **APPLICABLE LAW; VENUE:**

(a) Applicable Law:

This Agreement shall be governed and interpreted in accordance with the laws of the federal Government and the State of Alaska and shall be for all purposes deemed to have been made in the State of Alaska.

18. **CONSTRUCTION:**

Both parties to this Agreement have had the opportunity to consult with counsel of their choice and agree that the usual rule of judicial construction (which construes the terms of the instrument against the draftsman) shall not apply.

LICENSOR:

ALASKA PENINSULA CORPORATION

By: 

Its: VP CORPORATE AFFAIRS



LICENSEE:

DANIEL W. LEMON, Colonel, USAF
Commander

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APPENDIX D

FIELD DOCUMENTATION

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APPENDIX D-1

FIELD NOTEBOOKS

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PORT HEIDEN
LANDFILL RI

05172.002



Rite in the Rain

ALL-WEATHER

LEVEL

No 313

Test Bit log Book

B.H. Lardt



Name Ahtna Environmental, Inc.

Address 110 W 38th Ave
Anchorage, AK 99503

Phone _____

Email _____

Projects Port Heiden Landfill 007

- Test Pit Logbook -



RiteintheRain.com

②

CONTENTS

PAGE	REFERENCE	DATE
	Port Heiden Landfill 007 2018	
	<u>Ahtna Crew</u> Luke Hoffmann Kimberly Holmes Nick Simmons Lexie Lucassen	
	<u>Aniakchak Crew</u> Celestee Renae Jeffrey Orloff Holly Matson	
	<u>Discovery Drilling Crew</u> Gary Erickson Tommy Brunsvold	

③

7/19

8:00 Safety Meeting @ "Red Building"
with Drillers⁽²⁾, Operators⁽³⁾, Client⁽¹⁾, Ahtna
staff⁽⁴⁾

9:00 Mob to site to go over
TP and MW areas with crew

9:45 - 10:30 Return to Red
Building to gather drilling supplies,
sampling supplies, and begin trucking
down excavating equipment, loader

~~10:00 Walked over site to determine what areas are US~~

10:45 Drillers begin soil boring
@ MW-06; First core is logged
@ 11:00 (0-60); 2nd core @ 11:20;
3rd core 11:35; 4th core 11:50

Kim and I walked over site to find
contaminated figures to areas covered
in geotextile to determine which
areas were still considered contaminated
and if excavator could approach
test pits without walking over
contaminated soils.

→ need to state were not doing this in the Rain. ←

7/19 cont.

(4)

5th core sleeve logged @ 1410

6th core sleeve logged @ 1435

* 1st sample from SB-06 is collected from 6th sleeve (300-360 inches)

@ 1445. Sample ID: ~~18-NLF-SB-06-501~~
18-NLF-SB-06-501

Full suite sample collected.

7th CORE SLEEVE LOGGED @ 1511. SLEEVE ONLY RECEIVED 19" Simmons leaves for manual

1555 8th sleeve logged, 49 recovery

1621 9th sleeve received, 15.5' recovery

1650 receive 10th sleeve, recovery = 52.5"

1730 11th sleeve received, still no groundwater, recovery = 57.5"

1900 Leave site. Drillers hitting refusal at 160 ft with the sampling sleeve and groundwater is ~58 ft. Will drill 5 more ft tomorrow with the auger & will be unable to log litho of last 5 ft.

(5)

7/20

7:00 Tailgate meeting at Red Building with the following:

Jeff Orloff Anickchak

Celestee Christensen Anickchak

Holly Matson Anickchak

Lexie Luessen Ahlma

Luke Hoffmann Ahlma

Kim Holmes Ahlma

Nick Simon Ahlma

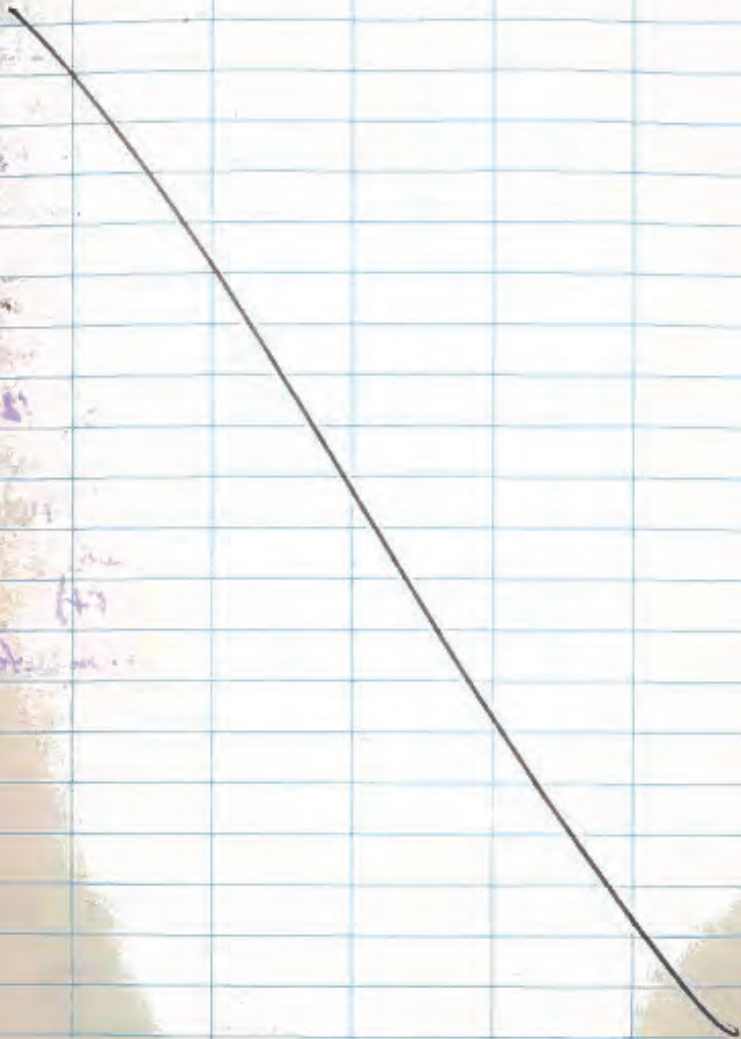
Tommy Brunsvold Discovery Drilling

Gary Erickson Discovery Drilling

Julie Sharp-Dalle Discovery Drilling

Jeff
COP
the Rain

⑥



17.5'

7.5'

17.5'



⑦

7/21

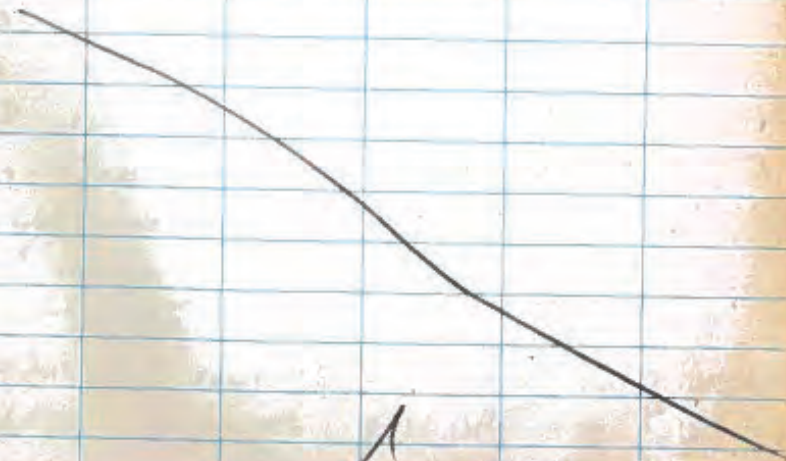
TP-08

1 Drum partially exposed @ ground surface. No other drums exposed or recovered during test pit TP-08 excavation. 1" steel pipe and cable are recovered from approx. 1-1.5 Ft bgs. Test pit is excavated to approx. 8 ft. bgs.

TP-8 measures 4.2 Ft wide by 12 Ft long.

* Samples are collected @ 1.5 Ft directly beneath steel pipe and @ Bottom of excavation (8 Ft)

Over pack is ~~determined~~ terminates @ ~ 1.5 Ft.



Rite in the Rain

⑧

2024.05172.02.03

7/21 cont.

TP-09 Begins @ 11:30

Break for lunch from 12:30-1:30

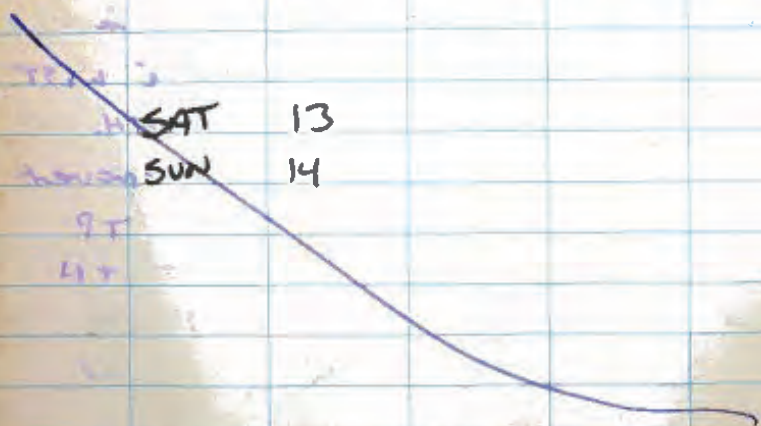
Resume TP-9

10 Drums removed from
ground surface to 2.5 ft. bgs.
3 Drums are still intact but
have holes and are empty

A CRUSHED BATTERY IS LOCATED
ON SURFACE ~ 5' south of
test pit 9. TP9 has several
aluminum beer cans (Budweiser and Schlitz)

SAT 13

SUN 14



⑨

7/22

TP-11 Begins @ ~ 8:00 am

SUPER SACK #3 is filled by 0900

~~NO DRUMS ARE OBSERVED DURING~~~~REMOVAL OF TOP CAP. THIRSD~~

VEHICLE FRAMES AND OTHER

MISC VEHICLE PARTS/PANE, RADIATOR

ARE OBSERVED IN 0-1.5 FT. DCS.

1 55 GALLON DRUM IS REMOVED

BUT NOT INTACT. RINGS ARE PRESENT

BUT BODY IS MISSING AND TOP

AND BOTTOM ARE ONLY TWO PIECES

IDENTIFIABLE. STEEL FRAMING

RUNS ACROSS THE TP E-W AND

CANNOT BE REMOVED BY EXCAVATOR

WITHOUT WIDENING TP TO THE WEST

BY 1 MORE BUCKET WIDTH.

A 2nd Steel Drum is removed

@ ~ 4' Bgs on western wall. TP

IS SLOPED TO THE EAST WITH

WEST WALL BEING THE HIGHEST.

3rd DRUM IS PULLED FROM 4' IN

NW CORNER OF TP

DRUMS (NOT COMPLETELY INTACT AND OTHER

METAL OBJECTS APPEAR TO CONTINUE

TO THE WEST

7/22 cont.

⑩

TP-11 STEEL FRAMING AND

TWISTED METAL FRAGMENTS ARE STILL BEING PULLED FROM 7'

BGS. MOST METAL LOOKS TO BE ASSOCIATED WITH BUILDING MATERIALS AND FRAMING. A GRADER BLADE

IS PULLED FROM APPROX. 7.5 FT.

A DRUM IS EXPOSED AND REMOVED FROM 8' BGS IN NORTHERN CORNER OF TEST PIT.

TEST PIT 11 TERMINATED @ 12' BGS. NO MATERIALS OBSERVED IN TEST PIT PAST ~~9'~~ 9'.

WEST WALL SHOWS SIGNS OF MATERIAL CONTINUING.

SAMPLES TAKEN @ 2' BGS @ 1100

AND 12' BGS @ 1115

'S.

APPROX 15 DRUMS WERE REMOVED

FROM TP 11 FROM DEPTHS

RANGING BETWEEN 2-9' BGS.

17' N-S x 16' EW TOTAL

17' N-S x 10' EW PRIMARY

7/22 cont.

⑪

TP 13 IS STARTED AFTER LUNCH

@ ~ 1:45. AA DRUM WAS REMOVED FROM SURFACE BUT VERY LITTLE (ALMOST NO OTHER TRASH OR WASTE IS OBSERVED).

THIS PIT MEASURES 14' N-S x 3.5'

EW. DECISION MADE TO ABANDON

TP, LAY GEOTEXTILE IN CURRENT EXCAVATION, BACKFILL AND MOVE TEST PIT FORWARD (NORTH)

~ 20'. THIS WILL STILL BE

TP-13 BUT REPOSITIONED TO NW-SE ORIENTATION.

NEW TP13 LOCATION HAS A LARGE AMOUNT OF RANDOM SCRAP METAL DEBRIS. METAL FRAMING, LIGHT TUBES WELDING RODS, ETC. A WHITE POWDERY

SUBSTANCE IS OBSERVED COMINGLED IN

THE METAL DEBRIS @ APPROX. 2'

BGS. DEBRIS APPEARS TO

TERMINATE @ ~ 4.5' BGS. TP13

IS EXCAVATED TO A TOTAL DEPTH

OF 8' BGS. TP13 MEASURES 13' x 5'

TP13 IS GEOTEXTILED AND BACKFILLED AFTER SAMPLES ARE TAKEN.

Return to the Rain.

⑫
TP-13 WAS ABANDONED DUE
TO LACK OF DEBRIS AND MUGO
~~~~~ ~ 20' NORTH.

FIRST TP WAS GIVEN DESIGNATION  
TP-13 A AND SECOND TP  
WAS LABELLED TP13-B

⑬  
TP-15 excavation placed directly west  
of 2016 DRUM LOC.

7/23  
NO GARBAGE OR WASTE MATERIAL ON  
GROUND SURFACE, DIRECTLY BELOW  
GROUND SURFACE, DRUMS ARE UNCOVERED  
2 FT DGS DRUMS ARE PRESENT  
~ 10 DRUMS ARE REMOVED  
BETWEEN 2 - 4 FT DGS. ALL DRUMS  
ARE EMPTY AND FILLED WITH  
HILES, MARKING ON ONE  
DRUM APPEAR TO READ

"GASOLINE AVIATION" SEE  
PHOTO). NO ADDITIONAL  
DRUMS OR MATERIALS ~~ARE~~  
ARE OBSERVED. TP15 IS  
EXCAVATED TO 7 FT DGS BEFORE  
BEING ~~ABANDONED~~ <sup>COMPLETED</sup>. TP15  
MEASURES 11' x 4' AND 7' DEEP.  
~~THIS EXCAVATION WILL BE~~  
~~TP 15 A, TP 15 A WILL~~  
~~BE BACKFILLED AFTER GEOTECH~~  
~~1) LAY DOWN. TP 15 B WILL~~  
~~BE EXCAVATED DIRECTLY~~  
~~NORTH APPROX 15 FT.~~

14, 500

Reto

7/23 cont.

(14)

TP 14 IS STARTED @ 1345. NO MATERIAL IS ON GROUND SURFACE. OVERPACK IS REMOVED FROM 0-1.5 FT BGS AND PLACED IN SUPERSACK #6. SOIL BELOW 1.5 FT IS STOCKPILED ON POLY AND WILL BE USED FOR BACKFILL. TP 14 HAS NO METAL CONTENTS OR TRASH. TH FROM 0-5 FT.

IN AN EFFORT TO IDENTIFY MORE CONTAMINANTS TP 14 IS WIDENED BY ONE BUCKET WIDTH TO

THE WEST. WIDENING TP 14 DOES NOT INCREASE AMOUNT OF DEBRIS AND DRUMS, METAL DEBRIS, OR TRASH IS IDENTIFIED. BROWN SILT WITH ROUNDED GRAVELS AND SMALL COBBLES.

TP 14 MEASURES 16' N-S. X 11' E-W AND 7' DEEP. SAMPLES ARE COLLECTED FROM BOTH TOP OF EXCAVATION @ APPROX. 1 FT BGS AND @ BASE OF EXCAVATION (7').

DUP SAMPLE IS TAKEN.

13,500

7/24

(15)

TP 16 EXCAVATION BEGINS @ APPROX 8:15. THE LOADER WAS NEEDED TO ASSIST DRILLING DEMOBILIZATION.

0-2 FT BGS OF SOIL IS REMOVED AND PLACED IN SUPERSACK. SOIL IN EXCAVATION APPEARS TO BE A MIX OF BLANK SANDY SILT WITH CRUSHED PUMICE. NO MATERIALS/DEBRIS OBSERVED IN EXCAVATION. NO

TRASH, DEBRIS, METAL, DRUMS, ETC. UNCOVERED. TP 16 MEASURES 17' E-W AND IS 7' DEEP. TP 16 IS EXTENDED TO THE EAST TO MAKE A LONGER TEST PIT (E-W) TEST PIT TOTAL LENGTH IS 31' WIDE, AND 7' DEEP.

DUP IS TAKEN @ 1105 FROM 3' BGS

TP 17 IS STARTED @ ~ 1330. METAL FRAGMENTS AND DRUM LID ARE OBSERVED ON GROUND SURFACE. THIS PIT IS POSITIONED EAST-WEST,

Site in the Rain

7/24 CONT.

TP17 PRODUCES A SIGNIFICANT INCREASE IN LANDFILL MATERIALS. SEVERAL LARGE METAL BUILDING MATERIALS, A FEW 55 GALLON DRUMS, POSSIBLE TOWER COMPONENTS, MILLED LUMBER, STYROFOAM (SP), and other MISC. DEBRIS. TP17 MEASURES 16' E-W x 7' N-S and 8' DEEP. APPROX 4 DRUMS ARE REMOVED FROM TP17. SAMPLE 1.5 WAS TAKEN FROM SOIL DIRECTLY BELOW 55 GALLON DRUM. DRUMS WERE RECOVERED BETWEEN 1.5 AND 4 FT BGS. NO MATERIALS WERE RECOVERED BELOW ~4.5'. TP17 WAS EXCAVATED AN ADDITIONAL 3.5' TO ENSURE NO OTHER DEBRIS WAS PRESENT. SAMPLE B WAS TAKEN @ DATE OF EXCAVATION.

TRAP  
ASTAR

7/24

(16)

(17)

7/25

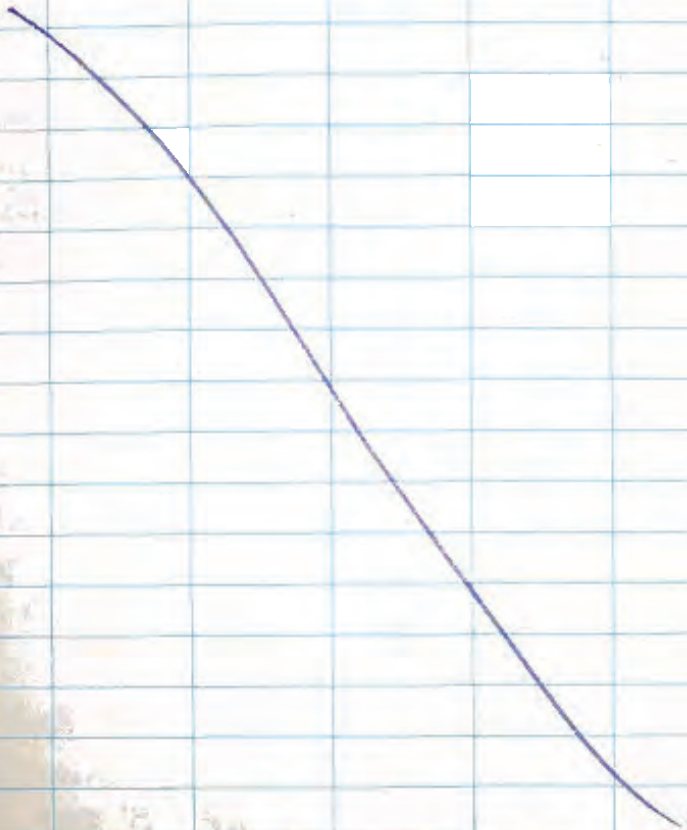
TP12 IS ORIENTED N-S. THE FIRST 2' ARE REMOVED AND PLACED IN SURFACE, DIRECTION UNDER TOP CAP, 2 DRUMS ARE UNLOADED. A DUPLICATE SAMPLE WILL BE TAKEN UNDER DRUM @ 2.1' BGS. A 3rd DRUM IS REMOVED @ 2.5'. @ 3' BGS LARGE CHUNKS OF DRIED TAR ARE REMOVED AND SET ASIDE. LARGE AMOUNT OF WHITE SUBSTANCE (THOUGHT TO BE DETERGENT) IS OBSERVED @ ~5' BGS. A ZIPLOC BAG IS FILLED AND MAY BE USED FOR SAMPLE MATERIAL. EAST AND WEST WALLS HAVE LENS OF WHITE POWDERY SUBSTANCE AND BLACK BURNED MATERIAL @ 5' BGS. NO OTHER MATERIALS ARE OBSERVED PAST 5' BGS. TP12 IS EXCAVATED TO A TOTAL DEPTH OF 8' BGS. TEST PIT MEASURES 15' N-S x 5' E-W and 8' DEEP.

7/25

7/26

(18)

LOADED PLANE FIRST 1/2  
OF DAY. RETURNED TO  
TEST PIT 12 TO COLLECT  
SAMPLE WITH WHITE POWDERY  
SUBSTANCE WITHIN SOIL.



Al

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No 311FX

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Name Ahtna Environmental, Inc

Address 110 W 38th Ave  
Anchorage, AK 99503

Phone \_\_\_\_\_

Project Port Heiden Landfill 007



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←  
 Luke Hoffmann  
 Kimberly Holmes  
 Lexie Lucassen  
 Nick Simmons

DISCOVERY CREW  
 Gary Erickson  
 Tommy Brunsvold

ANIACHAK CREW  
 Celestee Renae  
 Jeffrey Orloff  
 Holly Matson

Monitoring Well Installation →  
 Groundwater Sampling  
 Logbook

L. Lucassen, K. Holmes, L. Hoffmann, N. Simmons 60°F, partly cloudy  
7/17/18 Port Heiden Landfill RI (of 2)

- 0700 All personnel (Ahtna + Discovery drilling) have arrived at Lake Clark Air + are checking bags in Anchorage.
- 0800 Crew departs on plane for port Heiden. 2 Drillers (Gary + Tommy) + 4 Ahtna personnel.
- 1000 Flight arrives in Port Heiden. Cargo is unloaded from flight, as well as cargo staged @ the "Red Building" (office) from the Events Charter flight that arrived several days ago.
- 1225 WiFi / internet will not be able to be accessed at the Red Building. The signal on the Ahtna GCI phones is not strong enough to create a hotspot, so WiFi at lodging only.
- 1400 Ahtna departs Red Building for lodging (Carol's Legacy Lodge) to unpack food + personal items. Then break for lunch.

7/17/18 Port Heiden Landfill RI 2 of 2 ~60°F, partly cloudy

- 1430 L. Hoffmann + L. Lucassen continue to setup Red Bldg. While K. Holmes + N. Simmons create GPS GPX files for legacy + proposed locations. Proposed points are manually entered as a backup.
- 1900 Ahtna returns to Carol's Lodge, do paperwork + plan for tomorrow. EOD.

*L. Lucassen*

L. Lucassen, K. Holmes, L. Hoffmann, N. Simmons 55°F, 10mph wind, partly cloudy

7/18/18 Port Heiden Landfill RI DofD

- 0800 Daily tailgate safety meeting is conducted at the Red Building with Ahtra + Discovery personnel.
- 0830 Drill rig + materials are mDbed to site.
- 0900 K. Holmes returns to the lodge to troubleshoot GPS connection for file upload. GPS files have been wiped + handheld GPS is no longer capable of creating waypoints.
- 0940 Julie Sharp-Dahl arrives in Port Heiden (USACE) via Lake Clark Air. She heads to Ray's Place to meet with Larissa (Aniakchak) + get settled at lodging.
- 1240 L. Hoffmann + L. Lucassen visit the barge loading area to meet with ELM. They have staged 2 Connexes there for Landfill waste. The walrus observation logs are delivered to ELM to complete as they are loading

55°F, 5-10mph breeze

7/18/18 Port Heiden Landfill RI DofD

- the barge for another Ahtra project (PCB Soil Removal, 20279.006).
- 1315 Lunch at Card's Lodge.
- 1500 L. Lucassen + L. Hoffmann depart Lodge to meet Julie (USACE) + conduct a site visit. K. Holmes + N. Simmons continue to troubleshoot GPS.
- 1530 The primary GPS is encrypted + cannot be accessed. The backup GPS will be used, + proposed locations are manually entered. Swingties are also calculated.
- 1700 All Ahtra personnel go to the site to stake out proposed monitoring wells + test pits
- 1900 All points have been staked + marked. Discovery has also finished moving all drilling materials to site, EOD

7/19/2018  
Partially cloudy

0800 Tailgate @  
Red Bldg  
w/ Discovery - Gary & Tommy  
Aniakchak - Celeste, Holly, & Jeff  
USACE - Julie onsite  
Ahtna - Luke, Kim, Lexie, Nick

0900 Mob to NLF to recon

0945 Gather sampling & profiling  
sample kit

1045 Begin SB-06 @ MW-06

1445 18-NLF-SB-06-S01 collected  
@ 25-27' bgs  
Full Suite

1805 18-NLF-SB-S06-S02 taken 55-57' bgs  
Final macrocore came back  
w/water in the tube  
Need to drill 5 additional  
feet to set well. Will wait  
until tomorrow due to  
hard return drilling

*Handwritten signature*

Partially cloudy  
Winds pick up ~1400

7/20/2018

0700 Tailgate w/  
Discovery - Gary & Tommy  
Aniakchak - Celeste, Holly, & Jeff  
USACE - Julie  
Ahtna - Nick, Lexie, Luke, Kim

0800 Continue @ SB-06

0950 Sidewalls of boring collapsed  
in to 39' bgs  
Boring unrecoverable  
Start new SB-06 boring  
adjacent to original  
Will disregard previous  
sample at GW interface  
& take a new one  
~~from 40-42' bgs due  
to observed water level  
today.~~

1310 Collected core from 40-45'  
@ SB-06  
No water observed but soil  
is wet.

1430 Return from Break  
Water observed @ 38.4' bgs

1510 Collect sample  
18-NLF-SB-06-S02 From <sup>Return core from</sup>  
40-42' bgs

7/20/2018 (cont)

1700 Finish installing  
MW-06 in this boring.  
Screen set  
from 35-45' bgs

\* Had troubles w/ the  
water interface probe  
in this well.  
Alternate water measurement  
practices were applied  
w/ confirmation from  
L. Hoffmann  
A new water interface probe  
has been ordered



overcast & Rainy

7/21

6700 Tailgate w/  
Discovery - Gary & Timmy  
Anrakchak - Celeste, Jeff & Holly  
Aitna - Kim, Luke, Nick, Lexie

0930 Drillers setting up @ MW-07  
KIT f LL to fill Poly  
w/ water for drillers

1050 Begin drilling @ MW-07

1130 GW encountered @ MW-07  
Collect samples at GW  
interface & in transition  
zone above <sup>20-30'</sup>  
~~25-27'~~ KH  
18-NLF-SB-07-501 (~~23-25'~~)  
18-NLF-SB-07-502  
From ~~25-27'~~ 30-32' KH

1250 Break for lunch

1440 GW measured @ 30.5' bgs  
Realize that boring depths have  
been off due to misunderstanding  
re macrocores.  
Macrocore 0-5' bgs was not received  
Soil sample depths were corrected.

7/21/2018  
(cont.)

1605 Installation of MW-07  
is complete  
Screen is set 27-37' bgs

1740 Move to setup drilling  
@ MW-09  
p decon

~~6/1/18~~

Partially cloudy

7/22/2018<sup>11</sup>

0700 Tailgate w/  
Discovery - Gary & Jimmy  
Aniakchak - Celeste, Holly & Jeff  
Ahtna - Luke, Lexie, Nick, Kim

0845 Start drilling @ MW-09

1010 Collect samples @ MW-09  
GW observed at 25.5'  
Collect samples at GW interface  
& vadose zone above

18-NLF-~~SB-09~~-501 from 23-25' bgs  
18-NLF-SB-09-502 from 25-27' bgs

Screen will be set 23-33 bgs

1100 Well MW-09 installation complete  
Move rig to SB-08  
p decon

1245 Break for lunch

1400 Start drilling @ SB-08

1700 Measure water level @  
MW-07 - 30'  
MW-09 - 24.9' bgs

1745 GW observed @ MW-08  
@ 38.7' bgs

*Rite in the Rain*

Partially Cloudy

7/22/2018  
(cont.)

1755 19-NLF-SB-08-501  
collected from 35.5-37.5'

18-NLF-SB-08-502  
collected from 37.5-39.5'

Screen will be set 37-47' bgs

1920 MW-08 installation complete  
will move rig & decon

~~Wade~~

Light Rain

7/23/2018

13

0700 Tarlgate w/  
Discovery - Gary & Tommy  
Anrakchak - Celeste, Jeff, Holly  
Ahtna - Luke, Nick, Lexie, Kim

0800 Setup @ MW-10  
Will containerize all  
cuttings

0815 L Lucassen to start  
developing MW-07

0930 Finish TP-15

1040 Finish development @ MW-07  
Lexie & Luke leave to  
finish prepping coolers  
for Lake Clark

1200 Drilling going slower than  
hoped. Drill rig keeps  
encountering hard returns  
Break for lunch

1440 GW encountered in boring SB-10  
*later in the rain*

7/23/2018  
(cont.)

Water meter probe (new one)  
isn't working. Test meter in  
bucket of water but no  
alarm signal.

Water visually observed from  
SB-10 on probe but can't  
confirm depth.

L. Hoffmann to do blind test.

We observe same depth

I have 48.7' bgs  
He measures 48.8' bgs

Screen to be set 45-55' bgs

1555 Sample 18-NLF-SB-10-S01  
collected from 46-48' bgs

1600 18-NLF-SB-10-S02  
collected from 48-50' bgs

1700 MW-10 installation complete

2 bags of chips

8 bags of sand

2' of sand above screen

1' of chips

No sand @ bottom

overcast

7/24/2018 15

0700 Tailgate w/  
Discovery - Gary & Tommy  
Aniakchak - Celeste, Jeff, Holly  
Ahtna - Luke, Kim, Lexie, Nick

0730 L. Hoffmann & Lucassen  
Pack samples

K Holmes & N Simmons  
start test pit activities  
w/Aniakchak crew

Discovery will finish packing  
gear for departure today

1305 K Holmes & Lucassen  
to sample MW-07

1510 Groundwater sample  
collected @ MW-07

1645 Sampling of MW-07  
is finished

~~W. H. H.~~

7/25/2018  
7/24/2018  
(cont.)

Discovery crew left  
on afternoon Lake Clark  
flight.

They were a good crew to  
work with

Safety observations include:

7/19 Tommy noted that macrocore  
ends can be sharp.  
He was careful w/ placement  
of tubing & relying  
pertinent information

Daily Gary & Tommy have good  
communication w/ each other  
& others working around drill rig.  
Consistently wearing PPE,  
watching for overhead hazards,  
using right tool for job &  
looking out for others.

*lath*

Rainy

7/25/2018 17

0700 Tailgate w/  
Aniakchak - Celeste, Holly, Jeff  
USACE - Craig Sola  
Ahtna - Luke, Nick, Lexie, Kim

0800 K. Holmes & L. Lucassen  
to develop MW-09

1000 Confirmation that MS/MSD  
& duplicate will be collected  
from MW-08. Development  
of MW-09 abandoned.

Decon & reset up @ MW-08  
to include samples in Everts  
flight arriving tomorrow.

L. Lucassen departs for more sample jars

1100 L. Lucassen & L. Hoffmann  
return to MW-08 to  
assist w/ development

1200 Hurricane pump is not  
consistently pumping water  
from MW-08.

L. Hoffmann & K. Holmes to  
troubleshoot.

N. Simmons & L. Lucassen  
to stage drums

*Rite in the Rain*

18 Partially cloudy

7/25/2018  
(Cont.)

- 1315 KH & L Lucassen continue development of MW-08
- 1530 Turbidity meter doesn't seem to be working  
Water is still turbid but readings don't seem reliable
- 1620 Water seems to be clearing up. Turbidity meter still unreliable  
Water parameters for stabilization collected
- 1700 Groundwater sampling @ MW-08 begins  
18-NLF-MW-08-W01 (Primary) & MS/MSD  
18-NLF-MW-08-W02 (duplicate)
- 2100 Water sampling finished  
N Simmons & KHolmes pack up MW-08 site & return to label samples
- KH*

7/26/2018 19

- 0800 ~~there~~ Everts charter flight eta delayed to 0930
- 0900 Arrive @ Red Bldg to prepare for Everts arrival
- 1250 Everts flight departs
- 1330 Mammoth Survey, Shelley Williams arrives in Port Heiden
- 1400 KHolmes & L Lucassen to develop MW-06
- 1515 KHolmes continue development @ MW-06  
L Lucassen returns to prep final sample kits before her departure tomorrow.
- 1900 MW-06 development continues  
It is recharging slowly & running dry. 1 gal DI added to well for development
- 2200 MW-06 surged & purged for final time tonight. Will continue tomorrow
- KH*

0800

Tailgate w/ Amrakchak

Celeste  
Holly  
Jeff

Athena

Luke, Nick, Lexie, Kim

Mammoth Survey also onsite

0845

Well development @ MW-06

seems to be going better

After full recharge overnight  
water is less turbid

0930

Stop purging to dispose  
of water.

All buckets full

1040

Continue development  
@ MW-06

1130

Water Well pumped dry

Recharge rate seems  
faster than yesterday

1245

L Lucassen &amp; S. Williams (Mammoth)

depart on afternoon

Lake Clark flight

~~1500~~ 1415

MW-06 Pumped dry again

Will return to decon &  
setup on MW-09 to  
start development.

(cont)

1630

Total Depth

@ MW-09 measured

@ 36.05 bgs

1800

Well development @ MW-09

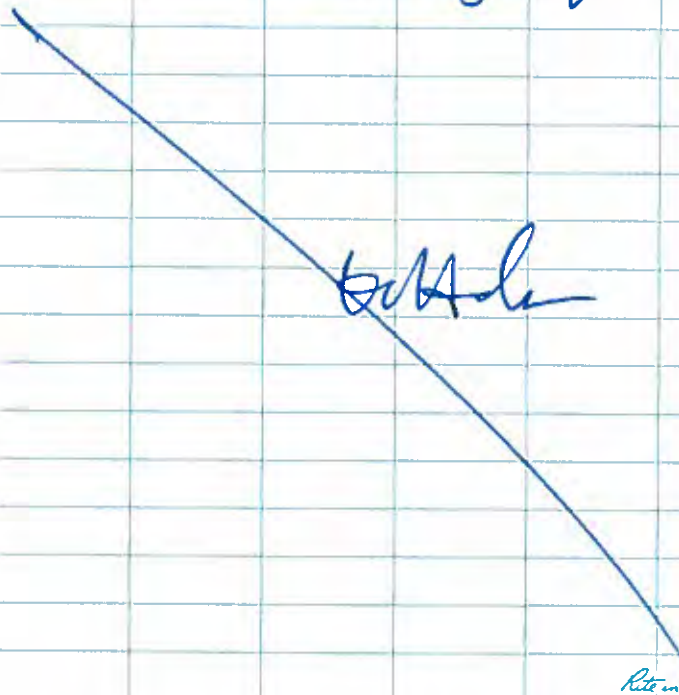
continues w/ N Simmons

1900

Well development finished.

Water turbidity cleared up

&amp; well recharges quickly



7/28/2018

Plan today to collect  
 Sample from MW-06.  
 Will set pump slow enough  
 that well doesn't run dry.  
 Will stop & let well  
 recharge if pump  
 more than 20% of column

1435 K. Holmes & N. Simmons  
 collect sample @ MW-06  
 18-NLF-MW-06-W01

20% drawdown @ 36.87' TOC

1700 Setup to start development  
 @ MW-10  
 Initial water level measurement  
 indicates well is dry.  
 Water meter is checked  
 - seems to be in working  
 order.  
 Water meter also visually  
 observed to be dry.  
 Call L. Hoffmann to confirm.  
 Will add D1 to try  
 and develop.

7/28/2018

(Cont.)

1745 L. Hoffmann  
 will continue to develop/  
 troubleshoot MW-10  
 K. Holmes & N. Simmons  
 Set up to sample  
 MW-09

1900 18-NLF-MW-09-W01  
 Sample collected.

1910 A large cavity was observed  
 at the surface of MW-10  
 while water was added  
 to well to try and develop,  
 the well monument  
 fell into the ground.  
 The monument was recovered  
 but a large cavity  
 (18" in diameter & 20' deep)  
 MW-10 is abandoned for  
 the time being

2100 Water sampling @ MW-09 is  
 complete \* see page 25

*[Signature]*

24 Overcast & Windy 7/29/2018

0700 Tailgate w/ Antua  
Luke, Kim, Nick

0830 Confirm status of  
MW-10.  
Well is still observed  
to be dry  
w/ large cavity @ surface.

No additional water samples  
will be collected.

The warehouse (Red Bldg)  
will be packed up  
for demob &  
final waste samples  
collected

~~Antua~~

7/29/2018 25  
(cont.)

\*

Additional note to water  
sampling @ MW-09.

While breaking down the  
pump after water sampling  
was complete

A little bit of water (a small amount  
from end of  
sample tubing)  
was splashed  
into the face of

N. Simmons while pulling  
the sample tubing from the  
pump connection.

A short while later (~5 mins)

N. Simmons asked if any  
red blotches were observed  
on his face, as a burning sensation  
was possibly felt.

He said it was hard to tell but  
it was also slightly windy & end  
before of day. No blotches observed.  
K.H. After decon of equipment @  
Red Bldg K. Holmes also observed  
slight burning sensation in hands.  
Abonox was applied & tubing separated!  
Team members left to wash off <sup>skin in the rain.</sup>

26 Partially cloudy, windy 7/30/2018

0700 Tailgate w/Luke, Nick & Kim

Red Bldg all packed  
L. Hoffmann will pack up  
final Cooler → QA  
COCs

N Simmons & K. Holmes  
return to site to  
try & fill cavity & reset  
MW-10 monument.

1030 MW-10 monument back in  
place

Approx. 10 sand bags  
were poured into cavity  
w/ ~1' of fill per bag.  
Original depth of cavity  
not obtained but  
depth observed ~17' bgs  
after adding ~10 bags of  
sand.

Monument locks in place on  
all wells & all wells labelled

~~to H. Hoffmann~~

L. Hoffmann P.# 1-601-1111 9/27/18

27

1400

Note on Sample # 18-NLF-MW-011-W01  
(Renamed EBW - 072918-01) taken  
on 7/29/18 @ 1325. Sample  
was taken from subsurface  
bladder pump following the  
decon of the unit per Airline  
Equipment Recor Sep. using clean  
& DI water. A new bladder  
was placed in the unit & new  
tubing was used to pump DI  
water from its original  
storage vessel into the  
sample bottles.

Decon & sampling occurred  
after all field samples were  
collected. & was performed  
in the red building that  
served as the field office &  
Sample Management area.

  
Rite in the Rain

Lube Hoffman  
Kim Holmes

P.H. Landfill

11/2/18  
55° cloudy  
Wind 10 mph

0830 Meet w/ Kim Holmes & Lube Hoffman @ Lake Clark Dr

1230 Arrive in P.H. & go to Kris's house.

1330 go to potluck @ RAY's place & talk to Lurissa B plan to meet @ the Red building @ 1000 AM tomorrow to start moving bags.

1500 go to North landfill to begin survey of TP10 & top MW's @ NLF

Set up box station on point "RRS\_LF", height 1.380 m, Rover by 2.43 m & begin survey of TP10. finish setting point "TP10\_SE\_R" & "TP10\_SW\_R"

1635 go to TP10 to measure draw & TP. No appreciable draw detected

BTOC 57.44 Top of draw?

BTOC 57.61 Bottom of MW (TO)

0.17' of water measured, may be condensate @ base of well, cannot sample.

Lube Hoffman  
K Holmes

P.H. Landfill

11/2/18  
55° cloudy

1645 go to MW-07 & Measure

DT&W & TD

DT&W 33.57 ft BT&C

TD 39.55 ft BT&C

draw depth 6.04 ft

1650 go to MW-09 & Measure

DT&W & TD

DT&W 28.55 ft BT&C

TD 36.17 ft BT&C

draw depth 7.62 ft

1655 go to MW-08 & Measure

DT&W & TD

DT&W 43.04 ft BT&C

TD 48.90 ft BT&C

draw depth 5.86 ft

1705 go to MW-06 to measure

DT&W & TD

DT&W 36.50 ft BT&C

TD 47.35 ft BT&C

draw depth 10.85' ft

1830 Mob back to house, EOD

*Rite in the Rain*

Luke Hoffman P.H. Landfill 11/13/18  
 Kim Holmes 55 Sunny

- 0830 Began getting coolers from both  
 Conways & putting in Red building
- 1030 Meet w/ Annie Clark & troubleshoot  
 issue w/ low boy brakes.
- 1200 Begin transporting bags NLF-S-001,  
 NLF-S-002, & NLF-S-003 to  
 barge landing area.
- 1530 finish transport to barge landing  
 & wrap bags up w/ liner &  
 weighdown w/ tires in case they  
 need to spend the winter @  
 the landing.
- 1600 Begin land spreading Supersacks  
 NLF-S-002, NLF-S-004,  
 NLF-S-006, NLF-S-007, &  
 NLF-S-008 @ the old  
 septic outfall off the old  
 facility. No other areas  
 were "clean" nor were  
 curbs, a roadway or have  
 wells present.
- 1900 finish land spreading bags &  
 getting old Supersacks into 1 yd.  
 Supersacks in corner @ landing  
 EOP

Luke Hoffman P.H. Landfill 11/13/18  
 Kim Holmes 65 Sunny

- 0830 Begin packing gear & coolers for  
 flight home & shipping
- 1100 Digging in land spread area @  
 former septic outfall area.  
 w/ 4 corner points.

~~1300~~

- 1300 curbing this area:
- 1M coolers of TA bottles  
 w/ No Excepted gts.  
 sent on Grant to King  
 Solomon → ANC.
  - 3 coolers of Excepted  
 gts single bottles remain  
 in Red building 1-mesh,  
 1-Nitric acid, 1-Hcl,
  - 3 coolers (empty) in Red building

1330 leave PH on Lake Clark Air

1900 Arrive in ANC, EOP

*[Signature]*  
 11/13/18

32 Nick Simmons P.H. Landfill 06/11/19  
55 sunny

0700 Check in @ Lake Clark  
Air in Anchorage for flight  
to Port Heiden

- Flight delayed due to  
weather (low fog in PH) and  
then a mechanical issue

1340 Leave Anchorage for PH

1745 Arrived in PH

1800 Drop gear and food @ lodging

1830 Go to Axtna connex  
behind red building to  
retrieve tools and labels  
for waste.

1900 Drive to landing and  
check connex for drums  
of soil and liquid (Ocean water/  
Purge water) and 170 super  
sacks filled with empty 9yd bags

2000 Complete ratcheting waste drums  
together with new ratchet straps

2100 Review Manifest and Walrus  
Observation Log requirements

Ali

Nick Simmons P.H. Landfill 06/12/19 33  
45° Fog/Lt Rain

0600 Review manifests; Add weights,  
signatures, quantities, etc.

0630 Reach out to Mike Gurtner  
to confirm details of International  
Manifest

0700 Arrive @ landing area to  
begin walrus observation  
and check status of barge

1100 Barge arrives @ landing  
and begins to set up for  
unloading of gear and equipment  
and then load waste

1700 Barge loaded with waste but  
waiting on high tide before  
departure.

1800 Drive to landfill to check  
monitoring wells installed in 2018

MW-06 DTW = 33.99' TD = 47.33'

MW-07 DTW = 33.02' TD = 39.59'

(Missing well cap)

MW-08 DTW = 42.43' TD = 48.94'

(casing heaved ~2" above datum<sup>MS</sup> monument)

MW-09 DTW = 28.03' TD = 36.21'

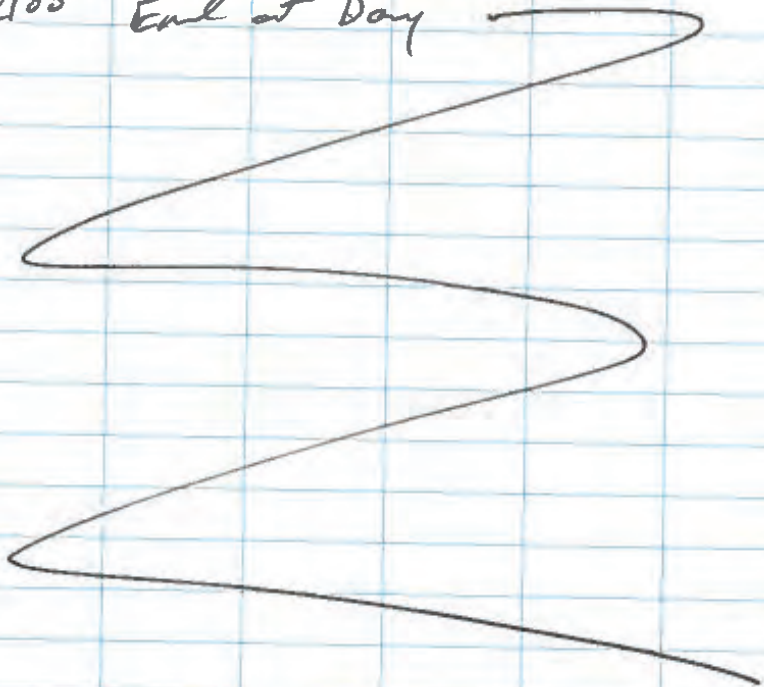
MW-10 DTW = 56.89' TD = 57.64"

Return to the Rain

Nick Simmons P.H. Landfill 06/12/19

2000 MW-10 had no water  
@ time of last measurement  
Upon further investigation  
of MW-08 it is determined  
the well did not heave, but  
the monument settled and is  
lower than when originally  
installed. Monument was pulled  
up approx. 4" so well cover  
could be closed.

2100 End of Day



N. Simmons

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**APPENDIX D-2**

**DAILY QUALITY CONTROL REPORTS**

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# Environmental Quality Control/Quality Assurance Report

(ER 415-1-302)

|                                                                              |                                         |                                                                              |                           |
|------------------------------------------------------------------------------|-----------------------------------------|------------------------------------------------------------------------------|---------------------------|
| <b>Contract Number / Task Order Number</b><br>W911KB-17-D-0019/W911KB17F0078 |                                         | <b>UPC/Project Title</b><br>Port Heiden RRS Landfill (LF007) Supplemental RI |                           |
| <b>CQC Report Number</b>                                                     | <b>Date or Time Period</b><br>7/17/2018 | <b>Location and Team</b><br>PH NLF Team                                      |                           |
| <b>Weather Conditions</b>                                                    |                                         |                                                                              | <b>Contractor</b>         |
| Temp Low (F°)                                                                | 50                                      | Temp High (F°)                                                               | 56                        |
| Max Wind Speed (mph)                                                         | 15                                      | Conditions                                                                   | Partially cloudy          |
|                                                                              |                                         |                                                                              | Ahtna Environmental, Inc. |

**Quality Control Inspections Performed This Date** (Include inspections, results, deficiencies observed, and corrective action.)

Preparatory

Initial

Follow-Up

N/A

Was the construction deficiency tracking list updated this date?

Yes  No

**Field Screening and Testing**

Has field screening been performed this date?

Yes  No

| Type of test / QTY: | Notes: | Results: |
|---------------------|--------|----------|
| N/A                 |        |          |

Have Data Quality Objectives been achieved?

N/A  Yes  No

**Have Samples Been Collected for Laboratory Analysis?**

Yes  No

Type of Test EPA U.S. Environmental Protection Agency Test Method/Matrix Quantity of Samples

| Type of test / QTY: | Method/Matrix: | Results: |
|---------------------|----------------|----------|
| N/A                 |                |          |

Have required amount of QC trip blanks and rinsates been achieved?

N/A  Yes  No

Have appropriate QC laboratory tests been ordered?

N/A  Yes  No

Have QA and QC samples been collected in the specified quantity?

N/A  Yes  No

Have samples been properly labeled and packaged?

N/A  Yes  No

**Health and Safety**

Worker protection levels this date:

Level A  Level B  Level C  Level D

Was any work activity conducted within a confined space?

Yes  No

Was any work activity conducted within an area determined to be immediately dangerous to life and health?

Yes  No

Were approved decontamination procedures used on workers and equipment as required?

Yes  No

Was a Job Safety Meeting held this date?

Yes  No

Were there any lost time accidents this date? (If YES, attach copy of completed accident report)

Yes  No

Was hazardous waste/material released into the environment?

Yes  No

Reconnaissance of field office and site for any safety concerns - none noted. Local building administrator turned on the water at the field office and later a large leak developed in the field office. The water was turned-back off. There is a portable bathroom by the airport that can be used.

**Work Activities Performed This Date:**

Reference (NAS ID #/Tech Spec #) Activity & Location Quantity Subcontractor

Arrived in Port Heiden. Started unpacking field equipment and organizing the field office. Met with local contacts and arranged plans for local field crew schedule for the next couple of days.  
Drill team also unpacking equipment and prepping drill rig.

**Manpower and Equipment**

Classification Number Hours Type Hours Used Hours Idle Hours Repair

| <b>Labor</b>           |                       |              |
|------------------------|-----------------------|--------------|
| Name                   | Description           | Hours Worked |
| Luke Hoffmann          | FTL                   | 12           |
| Kim Holmes             | Assistant FTL         | 12           |
| Lexie Lucassen         | Sample Manager        | 12           |
| Nick Simmons           | Environmental Sampler | 12           |
| Gary Erickson          | Drilling Lead         | 12           |
| Thomas Brunsvold       | Drill Helper          | 12           |
|                        |                       |              |
|                        |                       |              |
|                        |                       |              |
|                        |                       |              |
|                        |                       |              |
| <b>TOTAL MAN HOURS</b> |                       |              |

| <b>Equipment</b>             |                |      |
|------------------------------|----------------|------|
| Make                         | Model          | Rate |
| Ford                         | F350           | Day  |
| Chevy                        | Silverado 1500 | Day  |
| GMC                          | Flatbed        | Day  |
| Drill Rig                    | 6712DT         | Day  |
|                              |                |      |
|                              |                |      |
|                              |                |      |
|                              |                |      |
| <b>TOTAL EQUIPMENT HOURS</b> |                |      |

**Material Received to be incorporated into Job**

None

Gasoline and Diesel

**Instructions Given by the Government to the Contractor** (Include names, reactions, and remarks.)

Verbal  Written  None

|                      |                                                        |                                                                     |
|----------------------|--------------------------------------------------------|---------------------------------------------------------------------|
| <b>Work Progress</b> | Are there any Contractor caused delays?                | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
|                      | Are there any Contractor-potential findings of fact?   | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
|                      | Are there any Government caused delays?                | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
|                      | Are there any Government-potential findings of fact?   | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
|                      | Are there any unforeseeable or weather related delays? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |

**Rework Items Identified Today (Not corrected by COB)**

None

**Rework Items Corrected Today (From Rework Items List)**

None

**Remarks** (Include any visitors to project and miscellaneous remarks pertinent to work.)

The above report is complete and correct, and all work reported is believed, to the best of my knowledge, to be in compliance with state and federal requirements, and the contract specifications.

CQC System Manager Signature \_\_\_\_\_ Date \_\_\_\_\_

Site Manager Signature  \_\_\_\_\_ Date 7-17-18

**Contracting Entity Authorized Representative Quality Assurance Comments**

Concurs with the QC report? Yes  No

Additional comments or exceptions:

QAR Signature \_\_\_\_\_ Date \_\_\_\_\_

# Environmental Quality Control/Quality Assurance Report

(ER 415-1-302)

|                                                                              |                                         |                                                                              |                                                |                  |
|------------------------------------------------------------------------------|-----------------------------------------|------------------------------------------------------------------------------|------------------------------------------------|------------------|
| <b>Contract Number / Task Order Number</b><br>W911KB-17-D-0019/W911KB17F0078 |                                         | <b>UPC/Project Title</b><br>Port Heiden RRS Landfill (LF007) Supplemental RI |                                                |                  |
| <b>CQC Report Number</b>                                                     | <b>Date or Time Period</b><br>7/18/2018 | <b>Location and Team</b><br>PH NLF Team                                      |                                                |                  |
| <b>Weather Conditions</b>                                                    |                                         |                                                                              | <b>Contractor</b><br>Ahtna Environmental, Inc. |                  |
| <b>Temp Low (F°)</b>                                                         | 49                                      | <b>Temp High (F°)</b>                                                        |                                                | 55               |
| <b>Max Wind Speed (mph)</b>                                                  | 28                                      | <b>Conditions</b>                                                            |                                                | Partially cloudy |

**Quality Control Inspections Performed This Date** (Include inspections, results, deficiencies observed, and corrective action.)

Preparatory

Initial

Follow-Up

N/A

Was the construction deficiency tracking list updated this date?

Yes  No

**Field Screening and Testing**

Has field screening been performed this date?

Yes  No

| Type of test / QTY: | Notes: | Results: |
|---------------------|--------|----------|
| N/A                 |        |          |

Have Data Quality Objectives been achieved?

N/A  Yes  No

**Have Samples Been Collected for Laboratory Analysis?**

Yes  No

Type of Test EPA U.S. Environmental Protection Agency Test Method/Matrix Quantity of Samples

| Type of test / QTY: | Method/Matrix: | Results: |
|---------------------|----------------|----------|
| N/A                 |                |          |

Have required amount of QC trip blanks and rinsates been achieved?

N/A  Yes  No

Have appropriate QC laboratory tests been ordered?

N/A  Yes  No

Have QA and QC samples been collected in the specified quantity?

N/A  Yes  No

Have samples been properly labeled and packaged?

N/A  Yes  No

**Health and Safety**

Worker protection levels this date:

Level A  Level B  Level C  Level D

Was any work activity conducted within a confined space?

Yes  No

Was any work activity conducted within an area determined to be immediately dangerous to life and health?

Yes  No

Were approved decontamination procedures used on workers and equipment as required?

Yes  No

Was a Job Safety Meeting held this date?

Yes  No

Were there any lost time accidents this date? (If YES, attach copy of completed accident report)

Yes  No

Was hazardous waste/material released into the environment?

Yes  No

Safety Comments: Morning Safety Tailgate was performed. All daily tasks discussed during meeting were properly executed throughout the day including properly securing loads transported to the site from the red building laydown.

**Work Activities Performed This Date:**

Reference (NAS ID #/Tech Spec #) Activity & Location Quantity Subcontractor

Finished staging equipment at the field office and onsite. Prepared sampling kits and coolers. Staked out proposed monitoring wells and test pit locations. Established PPE kits for various sampling scenarios. Preliminary site reconnaissance with client visitor (Julie Sharp-Dahl) who arrived onsite today. Met with ELM at barge loading area to check-in and provide Walrus Observation Logs for a separate Ahtna project.

Drill team staged equipment onsite and mobilized drill rig to site.

**Manpower and Equipment**

Classification Number Hours Type Hours Used Hours Idle Hours Repair

| <b>Labor</b>           |                       |              |
|------------------------|-----------------------|--------------|
| Name                   | Description           | Hours Worked |
| Luke Hoffmann          | FTL                   | 12           |
| Kim Holmes             | Assistant FTL         | 12           |
| Lexie Lucassen         | Sample Manager        | 12           |
| Nick Simmons           | Environmental Sampler | 12           |
| Gary Erickson          | Drilling Lead         | 12           |
| Thomas Brunsvold       | Drill Helper          | 12           |
|                        |                       |              |
|                        |                       |              |
|                        |                       |              |
|                        |                       |              |
|                        |                       |              |
|                        |                       |              |
| <b>TOTAL MAN HOURS</b> |                       |              |

| <b>Equipment</b>             |                |      |
|------------------------------|----------------|------|
| Make                         | Model          | Rate |
| Ford                         | F350           | Day  |
| Chevy                        | Silverado 1500 | Day  |
| GMC                          | Flatbed        | Day  |
| Drill Rig                    | 6712DT         | Day  |
|                              |                |      |
|                              |                |      |
|                              |                |      |
|                              |                |      |
|                              |                |      |
| <b>TOTAL EQUIPMENT HOURS</b> |                |      |

**Material Received to be incorporated into Job**

None

Gasoline

**Instructions Given by the Government to the Contractor** (Include names, reactions, and remarks.)

Verbal  Written  None

|                      |                                                        |                                                                     |
|----------------------|--------------------------------------------------------|---------------------------------------------------------------------|
| <b>Work Progress</b> | Are there any Contractor caused delays?                | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
|                      | Are there any Contractor-potential findings of fact?   | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
|                      | Are there any Government caused delays?                | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
|                      | Are there any Government-potential findings of fact?   | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
|                      | Are there any unforeseeable or weather related delays? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |

**Rework Items Identified Today (Not corrected by COB)**

None

**Rework Items Corrected Today (From Rework Items List)**

None

**Remarks** (Include any visitors to project and miscellaneous remarks pertinent to work.)

USACE Project Manager, Julie Sharp-Dahl arrived onsite to inspect the work area.

The above report is complete and correct, and all work reported is believed, to the best of my knowledge, to be in compliance with state and federal requirements, and the contract specifications.

CQC System Manager Signature \_\_\_\_\_ Date \_\_\_\_\_

Site Manager Signature  \_\_\_\_\_ Date 7-18-18

**Contracting Entity Authorized Representative Quality Assurance Comments**

Concurs with the QC report? Yes  No

Additional comments or exceptions:

QAR Signature \_\_\_\_\_ Date \_\_\_\_\_

# Environmental Quality Control/Quality Assurance Report

(ER 415-1-302)

|                                                                              |                                                 |                                                                              |                           |
|------------------------------------------------------------------------------|-------------------------------------------------|------------------------------------------------------------------------------|---------------------------|
| <b>Contract Number / Task Order Number</b><br>W911KB-17-D-0019/W911KB17F0078 |                                                 | <b>UPC/Project Title</b><br>Port Heiden RRS Landfill (LF007) Supplemental RI |                           |
| <b>CQC Report Number</b>                                                     | <b>Date or Time Period</b><br>7/19/2018 (Rev 1) | <b>Location and Team</b><br>PH NLF Team                                      |                           |
| <b>Weather Conditions</b>                                                    |                                                 |                                                                              | <b>Contractor</b>         |
| Temp Low (F°)                                                                | 45                                              | Temp High (F°)                                                               | 63                        |
| Max Wind Speed (mph)                                                         | 25                                              | Conditions                                                                   | Partially cloudy          |
|                                                                              |                                                 |                                                                              | Ahtna Environmental, Inc. |

**Quality Control Inspections Performed This Date** (Include inspections, results, deficiencies observed, and corrective action.)

Preparatory

Initial

Follow-Up

N/A

Was the construction deficiency tracking list updated this date? Yes  No

**Field Screening and Testing**

Has field screening been performed this date? Yes  No

| Type of test / QTY: | Notes: | Results: |
|---------------------|--------|----------|
| N/A                 |        |          |

Have Data Quality Objectives been achieved? N/A  Yes  No

**Have Samples Been Collected for Laboratory Analysis?**

Yes  No

Type of Test EPA U.S. Environmental Protection Agency Test Method/Matrix Quantity of Samples

| Type of test / QTY:             | Method/Matrix:                         | Results: |
|---------------------------------|----------------------------------------|----------|
| 2 samples from NLF-MW-06 boring | COPC suite per WP Worksheet #18 / Soil |          |

Have required amount of QC trip blanks and rinsates been achieved? N/A  Yes  No

Have appropriate QC laboratory tests been ordered? N/A  Yes  No

Have QA and QC samples been collected in the specified quantity? N/A  Yes  No

Have samples been properly labeled and packaged? N/A  Yes  No

**Health and Safety**

Worker protection levels this date: Level A  Level B  Level C  Level D

Was any work activity conducted within a confined space? Yes  No

Was any work activity conducted within an area determined to be immediately dangerous to life and health? Yes  No

Were approved decontamination procedures used on workers and equipment as required? Yes  No

Was a Job Safety Meeting held this date? Yes  No

Were there any lost time accidents this date? (If YES, attach copy of completed accident report) Yes  No

Was hazardous waste/material released into the environment? Yes  No

Safety Comments: Morning Safety Tailgate was performed. All daily tasks discussed during meeting were properly executed throughout the day.

**Work Activities Performed This Date:**

Reference (NAS ID #/Tech Spec #) Activity & Location Quantity Subcontractor

Recon of site with Aniakchak crew. Mobilized excavator and loader to site.  
 Filled sand bags and prepped NLF-TP-10 location.  
 Drilled NLF-MW-06 location, encountered some water around 40 feet, collected 2 soil samples for full COPC suite.

**Manpower and Equipment**

Classification Number Hours Type Hours Used Hours Idle Hours Repair

| Labor                  |                       |              |
|------------------------|-----------------------|--------------|
| Name                   | Description           | Hours Worked |
| Luke Hoffmann          | FTL                   | 14           |
| Kim Holmes             | Assistant FTL         | 14           |
| Lexie Lucassen         | Sample Manager        | 13           |
| Nick Simmons           | Environmental Sampler | 13           |
| Gary Erickson          | Drilling Lead         | 12           |
| Thomas Brunsvold       | Drill Helper          | 12           |
| Celestee Renae         | Excavator Operator    | 11           |
| Jeffry Orloff          | Loader Operator       | 11           |
| Holly                  | Laborour              | 11           |
|                        |                       |              |
|                        |                       |              |
|                        |                       |              |
| <b>TOTAL MAN HOURS</b> |                       |              |

| Equipment                    |                |      |
|------------------------------|----------------|------|
| Make                         | Model          | Rate |
| Ford                         | F350           | Day  |
| Chevy                        | Silverado 1500 | Day  |
| GMC                          | Flatbed        | Day  |
| Drill Rig                    | 6712DT         | Day  |
| Cat Excavator                | 320D L         | Day  |
| Cat Loader                   | 180FL          | Day  |
|                              |                |      |
|                              |                |      |
|                              |                |      |
| <b>TOTAL EQUIPMENT HOURS</b> |                |      |

**Material Received to be incorporated into Job**

None

Gasoline

**Instructions Given by the Government to the Contractor** (Include names, reactions, and remarks.)

Verbal  Written  None

|                      |                                                        |                                                                     |
|----------------------|--------------------------------------------------------|---------------------------------------------------------------------|
| <b>Work Progress</b> | Are there any Contractor caused delays?                | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
|                      | Are there any Contractor-potential findings of fact?   | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
|                      | Are there any Government caused delays?                | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
|                      | Are there any Government-potential findings of fact?   | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
|                      | Are there any unforeseeable or weather related delays? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |

**Rework Items Identified Today (Not corrected by COB)**

None

**Rework Items Corrected Today (From Rework Items List)**

None

**Remarks** (Include any visitors to project and miscellaneous remarks pertinent to work.)

USACE Project Manager, Julie Sharp-Dahl onsite

The above report is complete and correct, and all work reported is believed, to the best of my knowledge, to be in compliance with state and federal requirements, and the contract specifications.

CQC System Manager Signature \_\_\_\_\_ Date \_\_\_\_\_

Site Manager Signature  \_\_\_\_\_ Date 7-19-18

**Contracting Entity Authorized Representative Quality Assurance Comments**

Concurs with the QC report? Yes  No

Additional comments or exceptions:

QAR Signature \_\_\_\_\_ Date \_\_\_\_\_

# Environmental Quality Control/Quality Assurance Report

(ER 415-1-302)

|                                                                              |                                         |                                                                              |
|------------------------------------------------------------------------------|-----------------------------------------|------------------------------------------------------------------------------|
| <b>Contract Number / Task Order Number</b><br>W911KB-17-D-0019/W911KB17F0078 |                                         | <b>UPC/Project Title</b><br>Port Heiden RRS Landfill (LF007) Supplemental RI |
| <b>CQC Report Number</b>                                                     | <b>Date or Time Period</b><br>7/20/2018 | <b>Location and Team</b><br>PH NLF Team                                      |
| <b>Weather Conditions</b>                                                    |                                         | <b>Contractor</b>                                                            |
| Temp Low (F°)                                                                | 45                                      | Temp High (F°)                                                               |
| Max Wind Speed (mph)                                                         | 15                                      | Conditions                                                                   |
|                                                                              |                                         | Partially cloudy                                                             |
|                                                                              |                                         | Ahtna Environmental, Inc.                                                    |

**Quality Control Inspections Performed This Date** (Include inspections, results, deficiencies observed, and corrective action.)

Preparatory

Initial

Follow-Up

N/A

Was the construction deficiency tracking list updated this date?

Yes  No

**Field Screening and Testing**

Has field screening been performed this date?

Yes  No

| Type of test / QTY: | Notes: | Results: |
|---------------------|--------|----------|
| N/A                 |        |          |

Have Data Quality Objectives been achieved?

N/A  Yes  No

**Have Samples Been Collected for Laboratory Analysis?**

Yes  No

Type of Test EPA U.S. Environmental Protection Agency Test Method/Matrix Quantity of Samples

| Type of test / QTY:                | Method/Matrix:                         | Results: |
|------------------------------------|----------------------------------------|----------|
| 1 Sample from new NLF-SB-06 boring | COPC suite per WP Worksheet #18 / Soil |          |
| 2 Samples from NLF-TP-10 test pit  | COPC suite per WP Worksheet #18 / Soil |          |
| 1 composite sample from NLF-S-001  | PCBs / Soil                            |          |

Have required amount of QC trip blanks and rinsates been achieved?

N/A  Yes  No

Have appropriate QC laboratory tests been ordered?

N/A  Yes  No

Have QA and QC samples been collected in the specified quantity?

N/A  Yes  No

Have samples been properly labeled and packaged?

N/A  Yes  No

**Health and Safety**

Worker protection levels this date:

Level A  Level B  Level C  Level D

Was any work activity conducted within a confined space?

Yes  No

Was any work activity conducted within an area determined to be immediately dangerous to life and health?

Yes  No

Were approved decontamination procedures used on workers and equipment as required?

Yes  No

Was a Job Safety Meeting held this date?

Yes  No

Were there any lost time accidents this date? (If YES, attach copy of completed accident report)

Yes  No

Was hazardous waste/material released into the environment?

Yes  No

Safety Comments: Morning Safety Tailgate was performed. All daily tasks discussed during meeting were properly executed throughout the day.