FINAL

REPORT

LF003 - LANDFILL NO. 2,
SS016 - UPPER TRAM TERMINAL, AND
SS017 - LOWER TRAM TERMINAL
REMEDIAL ACTION - CONSTRUCTION

Cape Romanzof Long Range Radar Station

Cape Romanzof, Alaska

W911KB-15-C-0018

June 2017

FINAL REPORT

LF003 - LANDFILL NO. 2, SS016 - UPPER TRAM TERMINAL, SS017 - LOWER TRAM TERMINAL Remedial Action-Construction

Cape Romanzof Long Range Radar Station, Alaska

June 2017

Prepared for:

United States Army Corps of Engineers

By:

Olgoonik Diversified Services, LLC.

With

BEM Systems, Inc.

Qualified environmental professional responsible for data r [illegible] 75.335(c)(1):

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

APPENDICES

LIST OF ACRONYMS

amsl	above mean sea level
AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, xylenes
COC	contaminant of concern
cy	cubic yards
DRO	diesel range organics
ft	feet
GAC	granulated activated carbon
GPS	global positioning system
IDW	investigation derived waste
LRRS	Long Range Radar Station
mg/Kg	milligrams per kilogram
PCB	polychlorinated biphenyl
QA	quality assurance
RA	Remedial Action
RA-C	Removal Action-Construction
RI	Remedial Investigation
RI/FS	Remedial Investigation / Feasibility Study
ROD	Record of Decision
RRO	residual range organics
sq ft	square feet
TCLP	toxicity characteristic leachate procedure
TPH	total petroleum hydrocarbons
UFP-QAPP	Uniform Federal Policy - Quality Assurance Project Plan
USACE	United States Army Corps of Engineers
USAF	United States Air Force
USFWS	United States Fish and Wildlife Service
VOC	volatile organic compound
XRF	X-ray fluorescence

1.0 INTRODUCTION

This Remedial Action – Construction (RA-C) report describes the 2016 Remedial Action (RA) activities at the Cape Romanzof Long Range Radar Station (LRRS), **Figure 1-1**. The remediation activities were conducted in accordance with the project Uniform Federal Policy – Quality Assurance Project Plan (UFP-QAPP), approved by the Alaska Department of Environmental Conservation (ADEC), dated April 2016 (United States Air Force [USAF], 2016).

1.1 Project Objectives

The goal of the RA was to remove and dispose of polychlorinated biphenyls (PCBs) and lead contaminated soils at Site LF003 (former Landfill No. 2), Site SS016 located at the Upper Tram Terminal, and Site SS017 located at the Lower Tram Terminal. Soils at these sites were known to be contaminated with PCBs and lead in concentrations greater than their respective ADEC Method Two Soil Cleanup Levels per 18 Alaska Administrative Code (AAC) 75.340 (ADEC, 2016). Confirmation of contaminated soil removal was to be achieved by post excavation sampling and laboratory analysis.

1.1.1 LF003

The objective of the RA for LF003 was to excavate surface and subsurface soil and sediment with PCB concentrations greater than or equal to 1 milligram per kilogram (mg/Kg) or lead concentrations greater than or equal to 400 mg/Kg, and transport the contaminated materials offsite for disposal. The estimated quantity of surface soil requiring removal from the site was 375 tons with a maximum PCB concentration of 110 mg/Kg. The estimated quantity of sediment requiring removal from the site was 38 tons with a maximum PCB concentration of 230 mg/Kg.

At LF003, four distinct areas requiring excavation (**Figure 1-2**) were delineated based on results from the 2008 Remedial Investigation (RI) (USAF, 2009). The largest excavation, included overlapping Areas 1 (soil) and 2 (sediment), was located along a boulder-covered drainage leading to the north fork of Fowler Creek located 250 feet to the south of LF003. The source of the sediment contamination was suspected to be deposition of sediments from stormwater runoff emanating from the landfill.

1.1.2 SS016

The objective of the RA for Site SS016 was removal of an estimated 525 tons of surface and subsurface soil containing PCB concentrations greater than or equal to 1 mg/Kg and lead concentrations greater than or equal to 400 mg/Kg for offsite transport and disposal. SS016 is located near the Upper Tram Terminal and active radar. The proposed excavation was west of the radar dome and to the north and south of the upper tram dock (**Figure 1-3**). These areas were delineated based upon results of the 2008 RI (USAF, 2009). The sources of the soil contamination were historic oil spills and the removal of lead containing paint from the exterior of the tram building.

1.1.3 SS017

The objective of the RA-C for Site SS017 was to excavate and remove surface and subsurface soil with PCB concentrations greater than or equal to 1 mg/Kg and lead concentrations greater than or equal to 400 mg/Kg for offsite transport and disposal. SS017 is located near the Lower

Tram Terminal, which is no longer in use. The approximate excavation boundaries as presented in the 2013 Record of Decision (ROD) (USAF, 2016) were marked using a handheld global positioning (GPS) device. Based upon the results from the 2008 RI (USAF, 2009), approximately 300 tons of lead and PCB contaminated soil were to be excavated from two main areas to the north and south of the Lower Tram Terminal and four isolated areas to the northwest and east of the Lower Tram Terminal (**Figure 1-4**).

2.0 SITE DESCRIPTION, BACKGROUND, AND ENVIRONMENTAL SETTING

The background and environmental status of Cape Romanzof LRRS and the project sites LF003, SS016, and SS017 prior to the 2016 RA activities are described below.

2.1 Site Background

The USAF Cape Romanzof LRRS is located within the Yukon Delta National Wildlife Refuge in western Alaska, approximately 540 air miles west of Anchorage, 165 miles northwest of Bethel, and 170 miles southeast of Nome. It sits on a small peninsula extending into the Bering Sea (**Figure 1-1**). The nearest towns are Scammon Bay (population 498) and Hooper Bay (population 1,137), which are approximately 15 miles east and south, respectively. The communities are not connected to Cape Romanzof LRRS by road. The Cape Romanzof LRRS reserve includes 4,900 acres of land.

The LRRS facilities have been divided into two areas, the Lower Camp and the Upper Camp. The Lower Camp lies at the head of an alpine tundra valley next to intermittent streams, which drain into a perennial stream, Fowler Creek (as depicted on USAF drawings and maps) or Nilumat Creek (official name as on United States Geological Survey topographic maps). Current operations, the airfield, LF003 and SS017 are in the Lower Camp area.

The Upper Camp is situated atop Towak Mountain, a high ridge located directly above the head of the valley. The Upper Camp is linked to the Lower Camp by a gravel road. The active radar and SS016 are in the Upper Camp area.

<u>LF003</u>

The LF003 site for this remedial action is adjacent and down the slope from former Landfill No. 2 which carries the designation LF003. Landfill No. 2 is located along the access road leading to the airfield from the current operations center (**Figure 1-2)** and covers approximately 43,800 square feet (sq ft). Landfill No. 2 contains various wastes including garbage, wood, metal, plastic, construction/ demolition debris, shop waste, and incinerator ash, and was operational until the mid-1970s. The landfill was capped with material obtained from a local borrow source in 1993 and 1994. The PCB and lead contaminated areas addressed in this RA are outside the south and west boundaries of Landfill No. 2 (LF003).

<u>SS016</u>

SS016, the Upper Tram Terminal Area, is situated near the top of a steep slope at approximately 2,250 feet above mean sea level (amsl), adjacent to the Upper Tram building and the active radar (**Figure 1-3**). Although much of the tram equipment remains, the tram cables between the upper terminal building and lower terminal building have been removed. A 1.9 mile gravel road now provides access to the radar. The PCB and lead contaminated areas are down the slope from the radar facility and around the foundation of the terminal building.

SS017

SS017, the Lower Tram Terminal Area, is located approximately 0.46 miles southeast of the Lower Camp operations base and 0.28 miles west of the Upper Tram, at approximately 600 feet lower in elevation than the Upper Tram. SS017 consisted of PCB and lead contaminated soil surrounding and adjacent to the foundation of the lower tram terminal building, at the toe of the slope down from the Upper Tram (**Figure 1-4**).

2.2 Environmental Setting

The climate, topography, hydrology, geology and hydrogeology, and soil and vegetation characteristics for the Cape Romanzof LRRS are discussed below.

2.2.1 Climate

Cape Romanzof LRRS is located in the Yukon-Kuskokwim Coastal Lowland region at the western end of the Askinuk Mountains. Cape Romanzof lies within the Alaskan Transitional Climate Zone, with an approximate average annual precipitation of 26 inches, average wind speed of 12 miles per hour, summer average high temperatures in the 40s and 50s degrees Fahrenheit and winter average high temperatures in the teens. Temperatures recorded at Hooper Bay range from -25 to 79 degrees Fahrenheit. Total precipitation at Hooper Bay is 16 inches, with a mean annual snowfall of 75 inches. Annual precipitation for Scammon Bay is 14 inches, with a mean annual snowfall of 65 inches. Winter snowpack and winds often promote severe conditions in this region of Alaska. The Bering Sea is generally ice-free from June to October which allows for shipping and travel by watercraft and barge.

2.2.2 Topography

Cape Romanzof LRRS is located in the Yukon-Kuskokwim Coastal Lowland section of the Bering Shelf, an Alaskan physiographic province. The Cape Romanzof LRRS is constructed in an upland area near the Bering Sea on an isolated linear mountain mass that rises abruptly out of the Yukon-Kuskokwim Delta to a maximum elevation of 2,342 feet amsl. Surrounding deltaic lowlands consist of a lake-dotted marshy plain that rises from sea level eastward to a maximum elevation of 300 feet amsl. Meandering streams of extremely low gradient cross the lowlands and flow west into the Bering Sea. A discontinuous layer of permafrost underlies the lowland; however, permafrost is not known to exist at the Cape Romanzof LRRS. Upper Camp is situated at the top of the ridgeline, which overlooks a steep-sided valley. The longitudinal profile of this valley, containing Fowler Creek, is irregular and stepped, with steep segments followed by flat segments (as at Lower Camp).

2.2.3 Hydrology

Cape Romanzof LRRS is located between the Yukon and Kuskokwim river deltas. Surface water drainage at the site is primarily via overland flow to Fowler Creek. Some drainage from the Upper Camp flows north and eastward to Kawiakpak Creek and Ekashluak Creek, and some drainage may flow south and southwestward to Ekasluktuli River and the unnamed creek sometimes referred to as “South Creek”. Surface waters of the Cape Romanzof area generally occur as ephemeral streams that drain to Kokechik Bay, several miles south of the sites. A small, unnamed lake was formed by a small dam at the head of the valley upstream of Fowler Creek, in the watershed about 0.3 miles south of Lower Camp.

2.2.4 Hydrogeology and Geology

The hydrogeology and geology details pertinent to Cape Romanzof LRRS are included in the following sections.

2.2.4.1 Hydrogeology

The most significant groundwater resources are present in unconsolidated alluvial and glacial deposits and in weathered bedrock, which underlies the flanks and the valley floor of the upper part of Fowler Creek Valley. Minimal groundwater is available on high valley slopes and consists of localized perched water. Water-bearing geologic units at Cape Romanzof LRRS include: 1) granitoid-rich colluvium on steep valley sides and adjacent parts of the valley floor; 2) alluvium/glacial deposits underlying the central part of the valley floor; and, 3) weathered granitoid bedrock that underlies surficial deposits of colluvium and alluvial/glacial deposits.

Depth to groundwater at Cape Romanzof LRRS ranges from approximately one foot to 60 feet (ft) below ground surface (bgs). The drinking water source for Cape Romanzof LRRS is groundwater, which is supplied by Well #1 at the Lower Camp. The Cape Romanzof LRRS water supply well is reportedly 154 ft deep and penetrates a sequence of gravelly clay with boulders (0 to 43 ft bgs), overlying sand and boulders (43 to 57 feet bgs), and overlying weathered granitoid bedrock (93 to 150 ft bgs).

2.2.4.2 Geology

Cape Romanzof LRRS is located within the valley of Fowler Creek. The upper part of this valley has very steep sides and a relatively shallow-sloped valley floor. The U-shaped valley cross-section and the stepped longitudinal profile of Fowler Creek are typical of glaciated valleys.

The Upper Camp facilities (located on the narrow ridge above the valley) were constructed on a thin accumulation of angular sand deposits and block residues overlying the granitoid bedrock of Towak Mountain. The granitoid rocks appear to have a composition of quartz-monzonite to granodiorite, although the USAF has conducted no sampling or analysis for detailed chemical composition.

Lower Camp and adjacent facilities at the valley margin are underlain by deposits of talus and other colluvial materials that have moved down the steep valley side slopes toward Fowler Creek, largely under the influence of gravity. This colluvium consists of granitoid material of a wide range of material sizes, from large granite blocks (1-2 ft diameter) to fine-to-coarse grained sand, silt, and minor clay. At the base of the steep slope, colluvium forms an apron that extends across part of the low-angle slope on the valley floor adjacent to Fowler Creek. The Lower Camp and the main access road are located at the uphill margin of this apron, near the beginning of the northern steep slope.

Alluvial and glacial deposits intermittently underlie the central low-slope-angle area of the valley, with a colluvial apron present along a downward sloping zone towards Fowler Creek from Lower Camp.

2.2.5 Soil and Vegetation Types

The soil and vegetation details pertinent to Cape Romanzof LRRS are included in the following sections.

2.2.5.1 Soil

Cape Romanzof LRRS is located in a geographic region where thin to moderately thick (to 600 ft) permafrost zones may occur in predominately fine-grained sediment. However, permafrost may be generally absent in glacial cirques and protected hollows at locations such as the Cape Romanzof LRRS. Permafrost is not known to exist at Cape Romanzof LRRS.

Soils of the region formed in essentially unglaciated residuum. They are very gravelly and stony but occasionally have inclusions of a thin silty mantle on flatter slopes. They are normally well drained. Soils are classified as complex, Pergelic Cryumbrepts-Histic Pergelic Cryaquepts. On steep upper slopes, the mantle of weathered material is usually shallow, and bedrock outcrops are quite common.

2.2.5.2 Vegetation

Vegetation at Upper Camp is characteristic of alpine tundra/barren ground communities. Dwarf shrub meadows with abundant sedges are widespread and dominate the vegetation at Lower Camp. Pockets of mountain avens, lichens, and low-growing herbs, shrubs, and grasses are also found at Lower Camp. Trees are absent in this environment, and willow-dominated riparian zones support lush growths of herbs (i.e. forbs and graminoids).

2.3 Site Investigation and Remedial Activity History

Brief summaries of historical environmental investigations and the current environmental status of the three project sites are presented below.

2.3.1 LF003

A Remedial Investigation and Feasibility Study (RI/FS) of LF003 was conducted by the USAF from 1989 to 1991. Soil, sediment, surface water and groundwater samples were collected for laboratory analysis to assess for the presence of exceeding contaminants of concern (COC). Analytical results reported the presence of total petroleum hydrocarbons (TPH) contamination in soil and sediment, as well as PCBs and TPH contamination in surface water, generally located in the vicinity of the landfill and associated drainage channels. Groundwater samples collected from a four well monitoring network located in and around the landfill showed contamination by benzene, toluene, ethylbenzene, and xylenes (BTEX) and volatile organic compounds (VOCs).

The 611th Air Support Group, Civil Engineer Squadron/Asset Management Flight Restoration Element conducted site cleanup and capping activities at LF003 from 1993 to 1994. Debris identified during the RI/FS was collected from an approximately 200 ft wide zone around the periphery of the landfill, added to the landfill, then covered with 500 cubic yards (cy) of soil and compacted. An additional layer of fill was placed over the landfill and also compacted. Then impermeable 20-mil liner and geotextile material were laid over the surface of the landfill, an additional 18 inches of clean fill was placed over the liners, and a seed mixture was applied to the new landfill surface. Active surface drainage was diverted away from the area to prevent erosion and possible contact with potentially contaminated materials contained in the landfill. In 1994, two of the four monitoring wells that were previously located within the extent of the landfill were abandoned and sealed.

Long-term monitoring of LF003 was conducted from 1996 through 2004, during which time groundwater, surface water, and sediment samples were collected in support of landfill closure. Up until 1999, DRO, chloromethane, benzene, and lead were detected exceeding regulatory limits in groundwater, surface water, and sediment during several of these monitoring events. PCBs also exceeded cleanup levels in surface water and sediment samples during these monitoring events. Since 1999, groundwater is no longer of concern at LF003. DRO has not been detected above regulatory limits and no exceedances of any contaminants of concern were detected in groundwater during monitoring events conducted later in 2003 and 2004.

A limited site inspection was conducted in 2000. Two sets of surface water and associated sediment samples were collected along Fowler Creek, both upstream and downstream of the drainages running adjacent to LF003. Surface water samples from Fowler Creek were analyzed for DRO, residual range organics (RRO), VOCs, semi volatile organic compounds and metals, and the results reported all analyzed parameters below their respective method detection limits. Sediment samples from Fowler Creek detected DRO and RRO at both locations above their respective method detection limit. The upstream sediment sample location reported DRO at 23.8 mg/Kg and RRO at 91.4 mg/Kg, and the downstream location reported DRO at a concentration of 24.8 mg/Kg and RRO at 98 mg/Kg.

In 2002, the finalized Interim ROD established an interim remedy for LF003 which included landfill closure, additional capping of the disposal cell, long term monitoring of groundwater, and removal of soils with elevated concentrations of PCBs.

The 2003 Clean Sweep activities at Cape Romanzof LRRS included groundwater, surface water, and sediment sampling events. Analytical results for groundwater and surface water found no COCs present above applicable regulatory limits. The two sediment samples, SD-1 (Southeast corner of LF003) and SD-2 (along the western boundary of LF003) were collected during the 2003 Clean Sweep effort. The analytical results reported PCBs at SD-1 and DRO at SD-2 below their respective ADEC Method Two Cleanup Levels and PCBs at SD-2 above the ADEC Method Two Cleanup Levels of 1 mg/Kg. These sample locations were presented on *Figure 2-1 of the Final Remedial Investigation Report, July 2009.*

As a result of the sediment contamination detected in 2003, a focused investigation of the sediment and surface water was conducted around SD-2 in 2004. This included collection of 18 analytical samples (SS01 to SS18) of sediment and soils along the seep near SD-2 (5 samples), surrounding SD-2 (9 samples), and from Fowler Creek sediments (4 samples). Nine of the 18 samples detected total PCBs exceeding the regulatory limit of 1 mg/Kg with the highest concentration of 195 mg/Kg reported for SS18 located near the northern end of the drainage channel in close proximity to Landfill LF003. Eight of the nine exceedances were detected in the sediments in the seep and the other exceedance was detected in a soil sample collected from around SD-2 but adjacent to the seep. The sample locations and exceedances were presented on *Figure 2-1 of the Final Remedial Investigation Report, July 2009*.

In 2008 a RI was conducted by the USAF at LF003 to further investigate PCB contamination present in soils/sediment surrounding the landfill based upon the results of the 2003/2004 investigations. Three arcs of surface soil sample locations were established around the outside of the landfill. Arcs were established at approximately 25-foot intervals from the edge of the landfill, which originated from the access road in the northeast, and terminated at the seep associated with sediment sample location SD-2 to the west. Each arc had a minimum of ten analytical sample locations. Based upon screening and analytical sample results to delineate the extent of contamination, two additional partial arcs were established starting near the origin of the drainage channel and continued to the midway point of the landfill along the western and southwestern edges. Additionally, established long term monitoring sediment and surface water locations were sampled for comparison to historic data. In all, 43 discrete surface soil samples and three surface water and sediment samples were collected and analyzed to determine the extent of PCB contamination around the outside of the landfill. These locations were presented on *Figure 6-1 of the Final Remedial Investigation Report, July 2009*. The results indicated that 14 soil samples contained PCBs in excess of 1 mg/Kg. No sediment or surface water sample detections were above regulatory standards.

In order to delineate the extent of the hotspot SS18 detected during the 2004 investigation, an approximately 10-ft by 10-ft sampling grid was initially established around the location. Nine discrete analytical soil samples were initially collected around SS18 on this grid. These sample results indicated the presence of PCB contamination across much of the grid. Step-out samples were then collected to the northwest, the east, and to the south of the initial sample grid. Additional step-out samples were collected until analytical results below 1 mg/Kg indicated the extent of PCB contamination. In all, 19 discrete analytical surface soil samples were collected and analyzed to determine the extent of PCB contamination around former sample location SS18. In addition, five sediment samples (two upstream, two downstream, and one near to historical sample location SS18) were collected from the seep flowing through historical sample location SS18. These locations were presented on *Figure 6-1 of the Final Remedial Investigation Report, July 2009*.

The boundary of PCB contaminated surface soil around LF003 was defined through laboratory analytical testing and field screening. The sample grid, depicted on *Figures 6-3 and 6-4 of the Final Remedial Investigation Report, July 2009*, clearly indicated that adequate sampling was performed to estimate the extent of PCB surface soil contamination at LF003. Based on field testing and analytical results, the sampling grid contained two localized areas exceeding screening criteria at sample location SS14 (775 sq ft) and SS10 (1,000 sq ft), one sample with elevated PCBs associated with contaminated sediments, discussed further below, at sample location SS24 (53/110 mg/Kg), and one area conservatively estimated at 2,970 sq ft, encompassing historical sample locations SS07 to the south and SS18 to the north. The depth of contamination was generally located at an interval that extended from the ground surface to 1-ft bgs at the two localized areas, and in the vicinity of historical location SS18. The depth of contamination in the vicinity of SS07 was approximately 2-3 ft bgs.

Analytical results for sediment samples collected from the seep area indicated that seep sediments were contaminated along the length of the seep from the northwest corner of the landfill, from the toe of the landfill, adjacent to historical sampling location SD-2 to the approximate location of SS07, with PCB concentrations in sediment ranging from 60 mg/Kg to 240 mg/Kg. The area of sediment contamination was approximately 1,755 sq ft.

2.3.2 SS016 and SS017

SS016 and SS017 were initially investigated under a Preliminary Assessment/Site Inspection conducted by the USAF in 1999. Surface soil sampling was conducted at the Upper and Lower Tram Terminal Areas to determine whether petroleum based lubricants caused soil contamination at these sites. PCB contamination appears to be coincident with petroleum contamination at both the Upper (SS016) and Lower (SS017) Trams. Three areas were identified with PCB, DRO, and RRO concentrations in soil that exceeded cleanup levels.

An effort was made in 2002 by the USAF to conduct a removal of contaminated soils at SS016 and SS017. Contaminated soil was excavated from the SS016, SS017, and the Lower Tram Terminal Waste Disposal Pit during the 2002 RA. The contaminated soil generated during the 2002 removal action was removed to an off-site disposal facility. Discrete, post-excavation soil samples were collected from the footprint of each excavated area. Analytical results of the post excavation soil samples showed DRO and PCB concentrations exceeding cleanup levels in each of the three locations.

In 2008 an RI was conducted at SS016 to further assess the areas of contamination, estimate the volume of impacted soil, and investigate potential remediation strategies. The RI identified three separate areas at SS016 where PCB concentrations exceeded clean up level (1 mg/Kg) in soil:

- 240 sq ft area along the south edge of the facility;
- 1,787 sq ft area west of the upper tram terminal near the tram docking area;
- 2,540 sq ft area north of the substation near the elevated walkway.

Lead was also detected above its cleanup level of 400 mg/Kg at four locations along the northern wall of the facility.

In 2008 the USAF also implemented an RI at SS017 to determine the extent of PCB and lead contamination remaining in surface and subsurface soils at the site. For the purposes of the RI, surface soil was considered to be the soil horizon encountered at depths of 2 ft or less bgs and subsurface soil was considered to be soil horizon located between 2 ft bgs and the surface of the underlying bedrock. Discrete surface and subsurface samples were collected and analyzed for PCBs and lead to further define the extent of contamination. Based on the 2008 RI analytical results, it was estimated that 190.7 cy of soil (179 cy surface soil and 11.7 cy subsurface soil) was contaminated with PCBs at concentrations above the cleanup level (1 mg/Kg).

3.0 REGULATORY CRITERIA

Applicable ADEC regulations are contained in 18 AAC 75, *Oil and Other Hazardous Substances Pollution Control*. The Method Two Human Health Soil Cleanup Levels for the Under 40-inch Precipitation Zone Soils (Table B1 of 18 AAC 75) (ADEC, 2016) applicable for this site are:

- Lead at 400 mg/Kg
- Total PCBs at 1 mg/Kg

4.0 2016 REMEDIAL ACTIVITIES

A pre-mobilization site reconnaissance to Cape Romanzof LRRS was conducted on 25 and 26 May 2016. Full mobilization for the 2016 RA activities commenced on 15 June 2016 and activities continued until final departure of the field team on 14 October 2016.

Table 4-1 presents a timeline of the activities completed during this 2016 RA. A photographic log of the site activities is included in **Appendix A** and copies of the field logbooks are presented in **Appendix B**. **Appendix C** presents a summary of the progress reports submitted internally from the field team for project manager review.

Utility locate/clearance permits were obtained prior to conducting the RA work at each site. Base Civil Engineering Work Clearance Requests were authorized for the proposed RA activities at each site on 15 June 2016. Copies of the approved Base Civil Engineering Work Clearance Requests are included as **Appendix D**.

Table 4-1 2016 Remedial Action Activities Timeline

Date	Activity
May 25:	Initial site inspection. Extensive snow cover remained at SS016 and SS017. Dense fog and high winds.
June 04:	Alaska Marine Lines barge delivered equipment and supplies to Romanzof barge landing.
June 09:	Mobilization crew arrived on site, began moving equipment and supplies from barge landing.
June 15:	Job site set up complete, excavation crew arrived on site.
June 16:	First day of excavation, beginning at SS017.
June 17:	Notified USAF that live power lines are laid on the ground across some of the contaminated areas at SS017.
June 18:	AML delivered shipping platforms to the barge landing, 60 tons of PCB soil excavated at SS017 by this date.
June 20:	Notified USAF that live power lines are also laid on the ground across some of SS016.
June 22:	Continued excavation at SS017. Begin transportation of filled bags containing contaminated soils to the barge landing staging area, coordinating work around the annual fuel delivery activities.
June 23:	Continued excavation at SS017 with a total of 255 tons of contaminated soil supersacked by this date. Began setting up equipment at LF003.
June 24:	Stopped excavation at SS017 pending receipt of lab results, began excavation at LF003.
June 28:	Stopped excavation at LF003 pending receipt of lab results, with a total of 155 tons of contaminated soil excavated from LF003 by this date. Began moving equipment and setting up at SS016.
June 30:	Began excavation at SS016. Conduct dye test at LF003.
July 06:	Continue excavation at SS016 with approximately 52 tons of contaminated soil supersacked by this date. Constructed a water diversion trench around the LF003 excavation area.
July 09:	Stopped excavation at SS016 due to weather conditions. Resumed excavation at LF003.

Date	Activity
July 11:	Stopped excavation at LF003 pending receipt of lab results, with a total of 417 tons of contaminated soil supersacked from LF003 by this date.
July 13:	Resumed excavation at SS016.
July 16:	Resumed excavation at SS017, continued excavation at SS016.
July 17:	Stopped work at SS016 due to weather conditions, continued excavation at SS017.
July 22:	Weather improved enough to resume excavation at SS016 for part of the day. Also resumed excavation at LF003.
July 29:	Weather conditions again prevented work at SS016.
July 30:	Resumed excavation at SS016.
July 31:	Weather stoppage again at SS016. Began backfilling cleared areas of LF003.
Aug 01:	Resumed excavation at SS016.
Aug 03:	Began bringing equipment down the mountain from SS016. For the 3 excavation sites, a total of 1241 tons of contaminated soil supersacked by this date.
Aug 04:	Began backfilling clear areas at SS017. Weather conditions hindered progress.
Aug 06:	Completed backfilling at SS017. Continued excavation at LF003.
Aug 09:	Final excavation at SS016 completed. Final excavation at LF003 completed. Continued backfilling and leveling cleared areas of SS017 and LF003. Continued backfilling and leveling at cleared areas of SS017 and LF003. Site cleanup for demobilization continues. Some of the crew departs the site.
Aug 13:	Backfilling complete at LF003. LUC signs installed. All supersacked soil staged on platforms at the barge landing.
Aug 15:	Barge arrived to demobilize equipment and supplies. The field office, one loader, and a pickup remain on site. Remaining crew departs for Anchorage.
Sept 26:	Barge loading crew returns to Romanzof to finish loading up the supersacks containing the contaminated soils.
Sept 27:	Approximately 25% of supersacked soil picked up by the landing craft and transferred to an ocean-going barge.
Sept 28:	After weather delays, another 25% of the supersacks were picked up early in the day by the landing craft. Winds increased and the vessels departed for protected waters.
Oct 02:	All but 1 of the crew departs for Anchorage. Strong winds and high seas set in, the weather forecast is unfavorable for the next 5 days.
Oct 12:	Improved weather, landing craft picks up remaining equipment and supersacks.
Oct 14:	Final crew departure from Romanzof.

4.1 LF003

Activities performed at LF003 included the excavation of soil and sediment contaminated with PCB concentrations greater than or equal to 1 mg/Kg and lead concentrations greater than or equal to 400 mg/Kg per 18 AAC 75. A summary of the RA's completed at LF003 in 2016 is presented below.

4.1.1 Ground-Nesting Bird Survey

During the completion of the 611th Air Support Group questionnaire, as presented in the UFP-QAPP, it was identified that ground-nesting birds may be impacted by activities at LF003. The United States Fish and Wildlife Service (USFWS) recommended avoiding land disturbances on shrubless or treeless ground habitat on the Yukon/Kuskokwim Delta from 5 May to 25 July (USFWS, 1999). An initial ground-nesting bird survey was conducted on 25 May 2016 during the pre-mobilization site reconnaissance to evaluate whether any ground-nesting bird nesting areas might be impacted by the RA. No evidence of ground-nesting bird activity was observed during this survey. The methodology and results of the ground nesting bird survey can be found in the field logbook, **Appendix B**.

4.1.2 Excavation Area Markout and Tracer Test

Upon mobilizing to the site, the known extent of contamination at LF003 were established and marked using a handheld GPS device containing boundary coordinates from the prior investigations. As an initial step toward identifying the flow path of the natural drainage running through the excavation area, some large boulders and rocks were removed to expose visible surface water flow at certain locations. In order to confirm the preferred path of seepage flow originating from the vicinity of the landfill, a dye tracer test was performed.

Permission was obtained from the USAF to use a non-toxic dye to visibly identify the seepage drainage path. A non-toxic green powder dye was utilized to make a solution of approximately 10 ounces of dye powder mixed into 5 gallons of clean water. The dye was released upgradient from the planned excavation area where surface water emanated from the toe of the capped landfill. The dye was eventually observed in the observation points located throughout the proposed excavation area. This seepage water exited the excavation area to the south (**Figure 1-2**). Dye was also observed in the drainage down-gradient of the proposed excavation area where a seepage discharges into the north fork of Fowler Creek. Identifying the discharge point was useful in establishing turbidity monitoring points during the implementation of the contaminated soil excavation activities.

4.1.3 Excavation and Sampling Activities

From 24 June to 8 August 2016, approximately 727 tons of PCB and lead contaminated soil were excavated from Areas 1, 2, 3, and 4 of LF003. Areas 1 and 2 are co-located and include the main drainage channel. Area 3 is an isolated area located along the southwestern edge of the landfill. Area 4 is another isolated area located approximately 70 feet from the southeastern boundary of the landfill. The locations of the excavation areas are presented on **Figure 1-2**.

4.1.3.1 Areas 1 and 2

The excavation of Areas 1 and 2 took place during three separate excavation lifts as summarized below. All confirmation sampling was conducted by a qualified environmental professional in accordance with 18 AAC 75.335(c)(1).

4.1.3.1.1 Areas 1 and 2 Excavation Lift #1

Prior to the start of Excavation Lift #1, a vehicle access ramp was constructed leading down from the main access road at the top of the landfill to a staging area (**Figure 1-2**). This staging area was primarily used for loading excavated material into supersacks and to allow for heavy equipment to access and remove the filled supersacks. Supersack loading areas were lined with an impermeable 20-mil liner and geotextile combination to prevent cross contamination and containment of any potentially spilled soils.

Before the commencement of the excavation of contaminated soil at LF003, the overlying rocks and boulders were removed to expose the contaminated surface area. The boulders and rocks that were removed were placed adjacent to the excavation areas and staged for later use as backfill.

The initial Excavation Lift #1 was advanced to a depth of approximately 2 to 3 feet bgs. Excavated soils were placed directly into supersacks before being weighed and labeled and transported to the staging area located at the barge landing as presented on **Figure 1-1**.

4.1.3.1.2 Areas 1 and 2 Post Excavation Lift #1 Confirmation Sample Results

Following completion of Excavation Lift #1, the excavation floor was gridded into twenty-nine 15 ft by 15 ft sampling cells as described in the UFP-QAPP (**Figure 1-2**). One 9-part composite floor sample was collected for PCB analysis and one discrete floor sample was collected for lead analysis from each cell. Compositing for PCB analysis was accomplished by collecting 9 parts across an evenly distributed grid on the cell floor. If sidewalls were present adjacent to the cell being sampled, parts were collected from the center of each sidewall present and contributed to the 9-part composite. Twenty-nine composite floor samples were collected for PCB analysis. Twenty-nine discrete floor samples were collected for lead analysis. Discrete sidewall samples were also collected for lead analysis at a minimum frequency of one sample per sidewall, plus an additional sample for every sidewall area over 250 sq ft. Thirty-six discrete sidewall samples were collected for lead analysis.

Confirmation samples were collected using a decontaminated stainless steel trowel from a sample interval of 0-0.5 ft bgs for the excavation floor and for the same sample interval advanced into the excavation sidewall. Discrete samples were transferred directly into labeled laboratory provided sample containers while the composite samples were collected and mixed thoroughly in new Ziploc baggies prior to transfer. The labeled sample containers were placed immediately into a cooler containing gel ice pending charter air shipment to the laboratory under proper chain of custody procedures.

Field duplicates were collected at a minimum frequency of 10% and matrix spike/matrix spike duplicates (MS/MSD's) were collected at a minimum frequency of 5%. The soil samples were submitted to offsite ADEC-approved laboratories including: TestAmerica-Denver, TestAmerica-Seattle, or Accutest Orlando Laboratories for analysis of PCBs and lead. Multiple analytical laboratories were utilized for this effort in order to provide the rapid turnaround time needed for results that was necessary for this project. ADEC approval was obtained for utilization of the primary (Test America - Denver) and alternate laboratories (Test America – Seattle and Accutest-Orlando) prior to submittal and analysis of any confirmation soil samples.

Along the northern edge of the excavation boundary in sampling cells #9 and #15, a small surface water stream was observed. With the upgradient source of this water presumed to be clean, a soil berm was left in place between the stream and the edge of excavation to prevent this surface water from mixing with potentially contaminated soils. The northern extent of the excavation in this area of the site was advanced far enough toward the north to remove the contaminated soil that was previously identified by sample CR-LF03-SS-048-0-090108, as reported in the 2013 ROD (USAF, 2013).

The analytical confirmation soil sample results following Excavation Lift #1 indicated that all floor and sidewall samples analyzed for lead were below the ADEC Method Two Cleanup Level of 400 mg/Kg. Composite sample results indicated that PCBs in nine cells (**Figure 4-1**) were in exceedance of the ADEC Method Two Cleanup Standard of 1 mg/Kg. Contaminated cells remaining after the completion of Excavation Lift #1 included cells 7, 18, 19, 21, 22, 23, 24, 25, and 27. **Table 4-2** presents the exceeding post excavation sample results from Excavation Lift #1. A complete table of the post excavation laboratory confirmation samples is presented in **Appendix E**. **Appendix F** presents the ADEC Laboratory Review Checklist, **Appendix G** presents the Quality Assurance (QA) Summary, and **Appendix H** presents the laboratory reports for all LF003 sampling results.

Table 4-2 LF003 Areas 1 and 2 – Post-Excavation Lift #1 Exceeding PCBs Soil Sample Results

ADEC Cleanup Level – Total PCBs	16LF03-E2-FL07A-SO	16LF03-E2-FL18A-SO	16LF03-E2-FL19A-SO	16LF03-E2-FL21A-SO	16LF03-E2-FL21A-SO-Dup	16LF03-E2-FL22A-SO	16LF03-E2-FL23A-SO	16LF03-E2-FL24A-SO	16LF03-E2-FL25A-SO	16LF03-E2-FL27A-SO
Location	Cell #7 Floor	Cell #18 Floor	Cell #19 Floor	Cell #21 Floor	Cell #21 Floor	Cell #22 Floor	Cell # 23 Floor	Cell #24 Floor	Cell #25 Floor	Cell #27 Floor
mg/Kg	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite
1	2.1 J	7.9 J	1.4 J	4.5 J	6.1 J	11.4 J	14.9 J	8.7 J	1.8 J	1.1

Notes:
J = detection below the reporting limit and/or an estimated concentration based on data assessment

4.1.3.1.3 Areas 1 & 2 Excavation Lift #2

The nine cells identified as contaminated following the Excavation Lift #1 confirmation sampling were further excavated down an additional 1 ft on the floor and extended an additional 1 ft out on any exceeding sidewall. Since the 9-part composite sampling which included sidewalls was not effective in identifying the source of contamination within each cell, a proposal was made to modify the approach by collection of discrete sidewall samples separately while keeping the 9-part composite sample of the floor to indicate whether the sidewall or the excavation floor (or both) contained the exceeding soils. ADEC reviewed and approved the approach on 19 July 2016.

4.1.3.1.4 Areas 1 & 2 Post Excavation Lift #2 Confirmation Sample Results

Upon completion of Excavation Lift #2, nine floor composite samples were collected from each of the previously identified contaminated cells for PCBs analysis only. Sidewall samples were collected as per the revised sampling approach with a discrete sample from the center of each previously reported exceeding sidewall. Twenty-two discrete sidewall samples were collected from the contaminated cells for PCBs analysis. The analytical results indicated that four of the nine excavation floor samples and six discrete sidewall samples contained PCBs concentrations exceeding the ADEC Method Two Cleanup Level of 1 mg/Kg (**Figure 4-2**). **Table 4-3** presents the exceeding post excavation sample results from Excavation Lift #2.

Table 4-3 LF003 Areas 1 and 2 – Post-Excavation Lift #2 Exceeding PCBs Soil Sample Results

ADEC Cleanup Level – Total PCBs	16LF03-E3-FL07A-SO	16LF03-E3-FL19A-SO	16LF03-E3-FL21A-SO	16LF03-E3-FL23A-SO	16LF03-E3-SW02A-SO	16LF03-E3-SW05A-SO	16LF03-E3-SW08A-SO	16LF03-E3-SW09A-SO	16LF03-E3-SW16A-SO	16LF03-E3-SW19A-SO
Location	Cell #7 Floor	Cell #19 Floor	Cell #21 Floor	Cell #23 Floor	Cell #7 Sidewall	Cell #21 Sidewall	Cell #25 Sidewall	Cell #27 Sidewall	Cell #23 Sidewall	Cell #19 Sidewall
mg/Kg	Composite	Composite	Composite	Composite	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete
1	1.8 J	5.9 J	1.7	1.9 J	23.5 J	1.4	1.0	3.0 J	1.3	34.0 J

Notes:
J = detection below the reporting limit and/or an estimated concentration based on data assessment

4.1.3.1.5 Areas 1 & 2 Excavation Lift #3 and Confirmation Sample Results

During the third and final round of excavation, the four cells with contaminated floors and the six sidewalls were further excavated down and outwards approximately an additional 1 to 1.5 ft. Following the completion of Excavation Lift #3, four floor composite samples and five discrete sidewall samples were collected from the previously reported contaminated cells and associated sidewalls.

One variation to the revised sampling approach was implemented at Cell 19. Precipitation during the completion of Excavation Lift #3 potentially smeared and mixed floor and sidewall soils. It was concluded that collection of a discrete sample from the sidewall for laboratory analysis would not be representative of the soil quality at Cell 19. As a result of this mixing, the method originally approved by ADEC of collecting a 9-part composite sample from the floor and sidewall was implemented only for Cell 19.

Analytical results for these confirmation samples indicated that none of the floor or sidewall samples contained PCBs at concentrations exceeding the ADEC Method Two Cleanup Level of 1 mg/Kg (**Figure 4-3**) and excavation for this area was deemed complete.

4.1.3.2 Area 3

The excavation of Area 3 took place during two separate excavation lifts as summarized below. All confirmation sampling was conducted by a qualified environmental professional in accordance with 18 AAC 75.335(c)(1).

4.1.3.2.1 Area 3 Excavation Lift #1

The RA activities conducted at Area 3 consisted of the excavation of PCBs and lead contaminated soil and confirmation sampling of the excavation floor and sidewalls. The proposed pre-excavation area at Area 3 was estimated to be approximately 1,000 sq ft and was situated near the toe of the southwest corner of LF003 (**Figure 4-1**). The approximate excavation boundary was marked out using flagging and paint. Large boulders and rocks that did not have soils attached to the surface were placed on an impermeable 20-mil liner and geotextile combination adjacent to the excavation area for future use as backfill. Rocks and boulders that had potentially contaminated soil attached to their surface were brushed off within the excavation area prior to staging on the liner. Following this activity, contaminated soils were excavated to depths of approximately18 inches bgs and placed directly into super sacks for transport to the staging area at the barge landing. Supersack loading areas were lined with an impermeable 20-mil liner and geotextile to prevent cross contamination of any spilled material. Approximately 41 tons of contaminated soil were removed from Area 3 during Lift #1.

4.1.3.2.2 Area 3 Post Excavation Lift #1 Confirmation Sample Results

Upon completion of Excavation Lift #1 at Area 3, the excavated floor was gridded into eight 15 ft by 15 ft sampling cells as described in the UFP-QAPP (**Figure 1-2**). Confirmation samples for PCB and lead laboratory analysis were initially collected using the sampling methods described in the approved work plan, using the same methodology as for Areas 1 and 2. Discrete sidewall samples for lead analysis were collected at a minimum frequency of one per sidewall in each cell. Eight post excavation floor samples and 11 sidewall samples for lead analysis were collected from Area 3 following the completion of Excavation Lift #1 using the methodology described in Section 3.1.2.1.1.

The laboratory analyses indicated that two discrete floor samples (Cells #35 and #36) and four discrete sidewall samples (Cells #31, #35, #36, and #37) reported lead concentrations exceeding the 400 mg/Kg ADEC Method Two Cleanup Level. No composite floor or discrete sidewall samples reported total PCBs above the 1 mg/Kg cleanup standard. **Table 4-4** presents the exceeding post excavation soil sample results from Area 3 Excavation Lift #1.

Table 4-4 LF003 Area 3 – Post-Excavation Lift #1 Exceeding Soil Sample Results

ADEC Cleanup Level - Lead	16LF03-E2-FL35A-SO	16LF03-E2-FL36A-SO	16LF03-E2-SW45A-SO	16LF03-E2-SW46A-SO	16LF03-E2-SW47A-SO	16LF03-E2-SW50A-SO
Location	Cell #35 Floor	Cell #36 Floor	Cell #35 Sidewall	Cell #36 Sidewall	Cell #37 Sidewall	Cell #31 Sidewall
mg/Kg	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete
400	820	440	2,400	610	570	460

Notes:
No laboratory qualifiers were applied to these results

4.1.3.2.3 Area 3 Excavation Lift #2

Following review of the results from the Excavation Lift #1 confirmation samples, additional excavation of the contaminated floors at Cells #35 and #36 and the sidewalls of Cells #31, #35, #36, and #37 was done. Since lead was the only contaminant of concern, field screening was conducted using an X-ray Florescence (XRF) Analyzer to help guide the excavation. Based upon the XRF analyzer field screening results, the excavation was advanced an additional 1 ft in depth at Cells #35 and #36 and an additional 1 to 3 ft outwards on the sidewalls of Cells # 31, #34, #35, #36, and #37. Approximately 30 tons of soil was removed during the completion of Excavation Lift #2.

4.1.3.2.4 Post Excavation Lift #2 Confirmation Sample Results

Upon completion of excavation as guided by the XRF field screening activities, two post excavation discrete floor and eight discrete sidewall samples were collected and analyzed for lead. The results indicated that three sidewall samples (including field duplicate) associated with Cell #36 reported concentrations of lead in exceedance of the ADEC Method Two Cleanup Level of 400 mg/Kg (**Figure 4-2)**. No other floor or sidewall samples were reported above the 400 mg/Kg cleanup standard. **Table 4-5** presents the exceeding post excavation sample results from Area 3 Excavation Lift #2.

Table 4-5 LF003 Area 3 – Post-Excavation Lift #2 Exceeding Soil Sample Results

ADEC Cleanup Level - Lead	16LF03-E3-SW26A-SO	16LF03-E3-SW26A-SO Dup	16LF03-E3-SW27A-SO
Location	Cell #36 Sidewall	Cell #36 Sidewall	Cell #36 Sidewall
mg/Kg	Discrete	Discrete	Discrete
400	507 J	455	543

Notes:
No laboratory qualifiers were applied to these results

Cell #36 and #37 are located along the eastern boundary of Area 3 and the exceeding sidewalls were located immediately adjacent to the toe of the LF003 disposal cell. Buried debris was encountered in these areas during the excavation activities, indicating that the actual extent of buried debris for LF003 extends further toward the southwest than indicated by historic records. Upon discovery of the debris, further excavation ceased in these cells and the area was immediately backfilled to avoid further disturbance of buried debris. The USAF and ADEC were notified of the presence of the observed debris and confirmed that further excavation in this area should cease. A partially buried fiber optic cable was also identified directly to the east of these cells, limiting further excavation of the remaining contaminated soils in this area of the site. All other Area 3 cells were sufficiently excavated until the laboratory confirmation results reported PCB and lead concentrations below their respective ADEC Method Two Cleanup Levels.

4.1.3.3 Area 4

The excavation of Area 4 took place during one excavation lift as summarized below. All confirmation sampling was conducted by a qualified environmental professional in accordance with 18 AAC 75.335(c)(1).

4.1.3.3.1 Area 4 Excavation Lift #1

The RA activities at Area 4 consisted of the excavation of PCB and lead contaminated soil and confirmation sampling of the excavation floor and sidewalls. The proposed excavation area of Area 4 was approximately 800 sq ft and was situated across a small creek located approximately 70 ft from the southeastern boundary of LF003 (**Figure 1-2**). The approximate excavation boundary was marked out with flagging. Large boulders and rocks without soil attached to the surface were placed on an impermeable 20-mil liner and geotextile combination adjacent to the excavation area for later use as backfill. Rocks and boulders that had soil attached to the surface were brushed off within the excavation area prior to staging on the liner. Contaminated soil was then excavated down to an approximate depth of 18 inches bgs and placed directly into super sacks and transported to the staging area located at the barge landing for offsite disposal. Supersack loading areas were lined with an impermeable 20-mil liner and geotextile combination to prevent cross contamination and to contain any spilled materials. Approximately 17 tons of contaminated soil were removed with Excavation Lift #1.

4.1.3.3.2 Area 4 Post Excavation Lift #1 Confirmation Sample Results

Upon completion of Excavation Lift #1 at Area 4, the excavation floor was gridded into six 15 ft by 15 ft sampling cells as described in the UFP-QAPP (**Figure 1-2**) and as described for the other areas of the site. Discrete sidewall samples were collected at a minimum frequency of one per sidewall in each cell. Six post excavation floor samples and 10 discrete sidewall samples for lead analysis were collected from Area 4 following the completion of Excavation Lift #1 using the methodology as described in Section 3.1.2.1.1.

The laboratory results of the confirmation soil samples indicated that none of the post excavation floor or sidewall samples reported concentrations of PCBs or lead exceeding their respective ADEC Method Two Cleanup Levels (**Figure 4-1**).

4.1.4 Site Restoration

Upon completion of excavation and sampling activities, the area was backfilled with clean material from the installation borrow pit along with the previously staged clean boulders, bringing the area back to original grade and matching the pre-existing rocky nature of the area.

4.2 SS016

Activities performed at SS016 included the excavation of soil contaminated with PCB concentrations greater than or equal to 1 mg/Kg and lead concentrations greater than or equal to 400 mg/Kg per 18 AAC 75. A summary of the RAs completed at SS016 in 2016 is presented below.

4.2.1 Site Clearance, Equipment Staging, and Excavation Area Mark Out

Located along a steep slope with narrow access routes to some locations of SS016, mobilization to the site and equipment setup required special precautions (**Figure 1-3**). The contaminated soils documented in the 2013 ROD were present along the gravel pad surrounding the radar dome and along the cliff slope located below and adjacent to the historic tram dock. Equipment mobilized to this site included a trailer-mounted vacuum excavator, a mini excavator, a large excavator, an extended-reach forklift for supersack handling, a loader, and a dump truck for transportation of filled supersacks to the staging area located at the barge landing. Personnel working along the slope were equipped with fall protection, slip resistant footwear, head and foot protection, and disposable Tyvek® suits for working in steep areas with high concentrations of PCBs (greater than 50 mg/Kg).

Several locations at the site required the use of hand tools and the vacuum trailer to conduct the soil excavation due to the steep terrain as well as the presence of live power cables and electrical transformers. An approximate 1.5 cy catch pan was fabricated to collect soil material from the vacuum excavator and for easy transfer of the contaminated soils into supersacks using the forklift. This method reduced the potential for spillage during the transfer of soil into supersacks. Supersack loading areas were lined with an impermeable 20-mil liner and geotextile combination to prevent cross contamination and to contain any spilled materials. Personnel working in close proximity to the vacuum excavator operation were also equipped with respiratory protection to protect from exposure to airborne contaminated dust.

4.2.2 Excavation and Sampling Activities

From 29 June to 13 August 2016, approximately 126 tons of PCB and lead contaminated soil was excavated from SS016. The excavation of SS016 took place during three separate excavation lifts as summarized below. All confirmation sampling was conducted by a qualified environmental professional in accordance with 18 AAC 75.335(c)(1).

4.2.2.1 SS016 Excavation Lift #1

The initial excavation was advanced to a depth of approximately 6 to 18 inches bgs. Excavated soils were placed directly into supersacks before being weighed and labeled and transported to the staging area at the barge landing. The excavation area for contaminated soils at SS016 was gridded into 30 sampling cells of 15 ft by 15 ft using the methodology described in the UFP-QAPP (**Figure 1-3**).

<u>Cells #29 and #30</u>

Excavation activities commenced at Cells #29 and #30, located on the south side of the radar dome. Cells #29 and #30 contained a shallow layer of soil (approximately 6 inches) on top of bedrock. The vacuum trailer was used to remove the soil down to bedrock at these cells. Following the soil removal, confirmation samples were collected from soil that remained within the cracks of the bedrock and along the sidewalls of the excavation area, using the previously described sampling approach. Discrete sidewall samples were collected at a minimum frequency of one per sidewall, and composite (for PCBs) and discrete (for lead) floor samples were collected at a frequency of one sample per each 15ft x 15ft sampling cell located within the excavation area.

<u>Cells #12 Through #28</u>

Excavation efforts then focused on the gravel pad located to the west of the radar dome. After consulting with the USAF and onsite ArcTec personnel, it was determined that the use of heavy machinery should be limited in this area due to the presence of live high voltage power cables and electrical transformers. It was also decided that neither the mini excavator nor metal hand tools should be used within six feet of the high voltage cables to prevent potential damage or electrocution. A combination of methods included the vacuum, hand tools, and the mini excavator were utilized to remove gravel and soil in these cells to an approximate depth of 18 inches bgs. Material removed by the excavator and hand tools was transported through an enclosed chute that extended from the gravel pad down slope to the soil collection pan for loading into supersacks. Following soil removal, confirmation samples were collected from the designated cells for PCB and lead analysis.

Cells #1 Through #11

Excavation efforts were then conducted along the slope below and adjacent to the historic tram dock that included Cells #1 through #11. Due to the steepness of the known contaminated area and the proximity to live high voltage power cables, the excavation approach in this area was limited to the vacuum attachment and hand tools. Cells #6, #7, #8, #9, #10, and #11 were excavated to approximately depths of 12 to 18 inches bgs or to bedrock. During the excavation at Cell #8, several large rocks present underneath the tram dock became unstable and dislodged, creating an unsafe working condition. Further excavation in this area ceased at that point, thus Cells #2, #3, and #4 were not excavated. Additionally, due to the high voltage power cable passing through Cells #1 and #5, these cells were also not excavated. These site details are presented on **Figure 4-4**.

During Excavation Lift #1, Cells #7 and #11 were excavated to bedrock and all soil within these cells was removed to the extent possible (see photo documentation in **Appendix A**). This effort resulted in the removal of all potential contaminated soils thus no post-excavation confirmation sampling was conducted. Following the soil removal, confirmation samples were collected from Cells #6, #8, #9, and #10 for PCB and lead laboratory analysis.

4.2.2.2 SS016 Post Excavation Lift #1 Sample Results

Confirmation soil samples were collected using a decontaminated stainless steel trowel and obtained from a sample interval of 0-0.5 ft bgs below the excavation floor and from the same sample interval advanced into the excavation sidewalls.

Twenty-three post excavation floor and 22 sidewall samples were collected after the completion of Excavation Lift #1. The analytical results of these confirmation samples indicated that one floor sample (Cell #10) and no sidewall samples were above the ADEC Method Two Cleanup Level of 400 mg/Kg for lead. Composite sample results for PCBs indicated that twelve cells (**Figure 4-4**) were in exceedance of the ADEC Method Two Cleanup Standard of 1 mg/Kg. Post-excavation contamination was found in cells #6, #9, #10, #12, #14, #17, #20, #21, #24, #25, #28, and #29. **Table 4-6** presents the exceeding post excavation sample results from SS016 Excavation Lift #1. A complete table of the post excavation laboratory confirmation samples is presented in **Appendix E**. **Appendix F** presents the ADEC Laboratory Review Checklist, **Appendix G** presents the QA Summary, and **Appendix H** presents the laboratory reports for all SS016 sampling results.

Table 4-6 SS016 – Post-Excavation Lift #1 Exceeding Soil Sample Results

ADEC Cleanup Level	16SS16-E2-FL06A-SO	16SS16-E2-FL09A-SO	16SS16-E2-FL10A-SO	16SS16-E2-FL10A-SO-Dup	16SS16-E2-FL12A-SO	16SS16-E2-FL14A-SO	16SS16-E2-FL17A-SO
Location	Cell #6 Floor	Cell #9 Floor	Cell #10 Floor	Cell #10 Floor	Cell #12 Floor	Cell #14 Floor	Cell #17 Floor
mg/Kg	Composite	Composite	Composite	Composite	Composite	Composite	Composite
Total PCBs - 1	20 D	1.74	86 DJ	29 DJ	3.3 D	1.12	1.27
	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete
Lead - 400	-	-	120 J	540 J	-	-	-
ADEC Cleanup Level	16SS16-E2-FL20A-SO	16SS16-E2-FL20A-SO-Dup	16SS16-E2-FL21A-SO	16SS16-E2-FL24A-SO	16SS16-E2-FL25A-SO	16SS16-E2-FL28A-SO	16SS16-E2-FL29A-SO
Location	Cell #20 Floor	Cell #20 Floor	Cell #21 Floor	Cell #24 Floor	Cell #25 Floor	Cell #28 Floor	Cell #29 Floor
mg/Kg	Composite	Composite	Composite	Composite	Composite	Composite	Composite
Total PCBs - 1	1.14 J	0.42 J	4.5 D	1.55	12.1 D	6.0 DQJ	2.2 D
	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete
Lead - 400	-	-	-	-	-	-	-

Notes:
D = Analyte identified at a primary, secondary, or tertiary dilution
Q = One or more quality control criteria failed.
J = Result is detected below the reporting limit and/or is an estimated concentration based on data assessment
- = No exceedance

4.2.2.3 SS016 Excavation Lift #2

Three of the 12 cells that were detected with PCBs and lead above the ADEC Method Two Soil Cleanup Levels (Cells #6, #9, and #10) were located underneath the tram station and were not re-excavated due to the safety concerns discussed in Section 4.2.2.1. Excavation at the remaining nine cells located on the gravel pad west of the radar dome was further advanced another 1 foot in depth below the existing grade or to bedrock if encountered at shallower depths.

During Excavation Lift #2 at SS016, previously contaminated Cells #14, #20, and #29 were excavated down to shallow bedrock at depths of 6 to 12 inches bgs. These cells were further cleared completely of soil using a combination of vacuum and hand tools. This effort resulted in the removal of all potentially contaminated soils, thus no confirmation sampling was conducted for these cells.

4.2.2.4 Post Excavation Lift #2 Confirmation Sample Results

Post excavation sampling of these cells was completed in accordance with the revised sampling approach as previously described. Six floor samples and 14 sidewall samples were collected and submitted to the laboratory for PCBs analysis. The analytical sample results indicated that four floor samples and ten sidewall samples (**Figure 4-5**) were still exceeding the ADEC Method Two Soil Cleanup Level for PCBs of 1 mg/Kg. **Table 4-7** presents the exceeding post excavation sample results from Excavation Lift #2.

Table 4-7 SS016 – Post-Excavation Lift #2 Confirmation Soil Sample Results

ADEC Cleanup Level – Total PCBs	16SS16-E3-FL17A-SO	16SS16-E3-FL24A-SO	16SS16-E3-FL25A-SO	16SS16-E3-FL28A-SO	16SS16-E3-SW01A-SO	16SS16-E3-SW02A-SO	16SS16-E3-SW03A-SO	16SS16-E3-SW05A-SO	16SS16-E3-SW05A-SO Dup
Location	Cell #17 Floor	Cell #24 Floor	Cell #25 Floor	Cell #28 Floor	Cell #28 Sidewall	Cell #28 Sidewall	Cell #28 Sidewall	Cell #25 Sidewall	Cell #25 Sidewall
mg/Kg	Composite	Composite	Composite	Composite	Discrete	Discrete	Discrete	Discrete	Discrete
1	1.04	2.3 D	5.6 D	11.4 D	3.8 D	7.5 D	2.65 D	2.11 DJ	5.26 DJ

ADEC Cleanup Level – Total PCBs	16SS16-E3-SW08A-SO	16SS16-E3-SW10A-SO	16SS16-E3-SW10A-SO Dup	16SS16-E3-SW11A-SO	16SS16-E3-SW12A-SO	16SS16-E3-SW13A-SO	16SS16-E3-SW14A-SO
Location	Cell #21 Sidewall	Cell #17 Sidewall	Cell #17 Sidewall	Cell #17 Sidewall	Cell #17 Sidewall	Cell #12 Sidewall	Cell #12/#17 Sidewall
mg/Kg	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete
1	1.57	0.43 J	1.29 J	1.08	1.61	2.72	1.64

Notes:

D = Analyte identified at a primary, secondary, or tertiary dilution

J = Result is detected below the reporting limit and/or is an estimated concentration based on data assessment

4.2.2.5 SS016 Excavation Lift #3

Due to inclement weather conditions at the site (strong winds and precipitation), Excavation Lift #3 was limited to the gravel pad located to the west of the radar dome, specifically Cells #21, #24, #25, and #28, **Figure 4-6**.

Cell #21 contained contaminated soil on the western sidewall as reported for previously collected sample 16SS16-E3-SW08A-SO. This sidewall of Cell #21 was part of an uncontaminated area of the gravel pad separating Cells #16 and #21. Cell #16 was confirmed clean after the completion of SS016 Excavation Lift #1, and the excavation floor of Cell #21 was confirmed clean after the completion of SS016 Excavation Lift #2. Thus, this sidewall and all associated soil was removed to be flush to the surrounding excavated grade and no further confirmation sampling was required for Cell #21.

Cell #25 is located directly adjacent to the western side of the radar dome and analytical results reported the excavation floor and northern sidewall contained PCB concentrations above the ADEC Method Two Soil Cleanup Level. Bedrock was observed on both the floor as well as the northern sidewall at this location. This cell was completely cleared of soil using a combination of the vacuum trailer and hand tools. This effort resulted in the removal of all potentially contaminated soils remaining on the surface and cracks of the bedrock, thus no additional confirmation sampling was conducted.

Excavations at Cells #24 and #28 were advanced an additional 6 to 12 inches below the existing grade and an also consisted of the removal of an additional 6 to 12 inches into the sidewalls that were detected with PCB exceedances.

4.2.2.6 SS016 Post Excavation Lift #3 Sample Results

Two composite floor samples and four discrete sidewall samples (including one field duplicate) were collected following the completion of SS016 Excavation Lift #3 and submitted for PCB analysis. The analytical results indicated that all samples exceeded the ADEC Method Two Soil Cleanup Level for PCBs (**Figure 4-6**). **Table 4-8** presents the exceeding post excavation sample results associated with Excavation Lift #3.

Table 4-8 SS016 – Post-Excavation #3 Soil Sample Results

ADEC Cleanup Level – Total PCBs	16SS16-E4-FL24A-SO	16SS16-E4-FL28A-SO	16SS16-E4-SW01A-SO	16SS16-E4-SW01A-SO Dup	16SS16-E4-SW02A-SO	16SS16-E4-SW03A-SO
Location	Cell #24 Floor	Cell #28 Floor	Cell #24/#28 Sidewall	Cell #24/#28 Sidewall	Cell #28 Sidewall	Cell #24Sidewall
mg/Kg	Composite	Composite	Discrete	Discrete	Discrete	Discrete
1	1.22	22.0 D	26.0 DJ	34 D	25.2 D	1.26

Notes:
D = Analyte identified at a primary, secondary, or tertiary dilution
J = Result is detected below the reporting limit and/or is an estimated concentration based on data assessment

4.2.3 Site Restoration

Upon completion of excavation and sampling activities, the floor and sidewalls of those cells containing PCBs exceeding the 1 mg/Kg cleanup standard were covered with a geotextile to delineate the contaminated area for future removal actions. Clean fill was then placed on top of the liner and the excavated areas were backfilled to match the surrounding grade.

4.3 SS017

Activities performed at SS017 included the excavation of soil contaminated with PCB concentrations greater than or equal to 1 mg/Kg and lead concentrations greater than or equal to 400 mg/Kg per 18 AAC 75. A summary of the RA completed at SS017 in 2016 is presented below.

4.3.1 Site Clearance and Excavation Area Mark out

Upon mobilizing to the site, the known contamination boundaries of SS017 were established using a handheld GPS device containing the boundary coordinates as proposed in the UFP-QAPP. The grid for the confirmation sampling cells was also marked out at this time. The original estimated excavation boundary and sampling cells for SS017 are presented on **Figure 1-4**. A large metal structure related to historic tram operations was found that would obstruct excavation on the north side of the lower tram building in Cells 14, 17, and 20. This metal structure was removed and set aside upon obtaining USAF approval. At this time it was also observed that the high voltage power cable connecting the lower and upper tram buildings to the lower camp extended through the northern portion of the proposed excavation area. After conversations with USAF site personnel it was decided that a 6-foot buffer would be maintained to ensure personnel safety as well as to minimize potential damage to the power cable. Leaving this buffer zone around the power cable resulted in that Cells #18 and 21 could not be accessed for excavation, and that only portions of Cells 12, 15, 16, 19, and 22 could be excavated.

4.3.2 Excavation and Sampling Activities

From 16 June to 6 August 2016, approximately 453 tons of PCB and lead contaminated soil was excavated from SS017. The initial excavation was advanced to depths between 1 and 3.5 feet bgs depending upon the depths of contamination reported in previous investigations. Excavated soils contaminated with PCBs and lead were placed directly in supersacks and then transported to the staging area at the barge landing. All confirmation sampling was conducted by a qualified environmental professional in accordance with 18 AAC 75.335(c)(1). The excavation of SS017 took place during two excavation lifts as summarized below.

SS017 Excavation Lift #1

Excavation activities began on the southern portion of SS017 on 16 June 2016 using the vacuum trailer. It was quickly determined that due to the high moisture content of the soils in this part of the site that an excavator would be a more efficient piece of equipment for conducting the soil excavation.

Excavation Lift #1 commenced at the PCB hot spot (PCB concentrations greater than 50 mg/Kg) located at southwest corner of the lower tram building (Cell #1). Based upon historic investigation results, the first excavation lift was advanced to a depth of 18 inches bgs. Large rocks encountered during the excavation were staged on a nearby concrete pad (**Figure 1-4**).

The remainder of the site was subsequently excavated to approximately 18 inches bgs except for Cell #8 (3.5 ft bgs), Cell #9 (3 ft bgs), and portions of Cells #17 and #20 (3 ft bgs). Cells #16, #19, and #23 were excavated to 1 ft bgs to complete Excavation Lift #1. Approximately 255 tons of soil was removed and supersacked during the completion of Excavation Lift #1.

When the initial excavation was complete, field screening was performed at Cell #1 to confirm that lead contaminated soil was adequately removed. Four excavation floor samples and three excavation sidewall samples were collected and analyzed *in-situ* using the XRF analyzer. XRF field screening results ranged from 6.8 mg/Kg to 168.5 mg/Kg suggesting that the lead contaminated soil had been removed from this location.

4.3.2.1 SS017 Post Excavation Lift #1 Sample Results

Following the completion of Excavation Lift #1, 20 floor samples and 32 discrete sidewall samples were collected from the 20 cells present within the excavation area (**Figure 1-4**). The soil samples were collected using the collection methodology previously described in Section 4.1.3.1.2.

Confirmation samples were not collected from Cells #11 and #12 during this round of sampling since the actual portion of those cells warranting sampling were too small to distinguish and thus they were included with the confirmation sampling event for Cells #10 and #16, respectively.

The analytical results of the confirmation samples obtained following the completion of Excavation Lift #1 indicated that two sidewall samples and one excavation floor sample reported lead concentrations above the ADEC Method Two Soil Cleanup Level of 400 mg/Kg. Eleven of the composite floor samples reported exceedances of the ADEC Method Two Soil Cleanup Level of 1 mg/Kg for PCBs. Contaminated cells remaining after the completion of Excavation Lift #1 at SS017 included Cells #1, #2, #6, #9, #10, #13, #16, #17, #19, #20, and #23 (**Figure 4-7**). **Table 4-9** presents the exceeding post excavation sample results associated with SS017 Excavation Lift #1. A complete table of the post excavation laboratory confirmation sample results is presented in **Appendix E**. **Appendix F** presents the ADEC Laboratory Review Checklist, **Appendix G** presents the QA Summary, and **Appendix H** presents the laboratory reports for all SS017 sampling results.

Table 4-9 SS017 - Post-Excavation Lift #1 Exceeding Soil Sample Results

ADEC Cleanup Level	16SS17-E2-FL01A-SO	16SS17-E2-FL02A-SO	16SS17-E2-FL06A-SO	16SS17-E2-FL09A-SO	16SS17-E2-FL10A-SO	16SS17-E2-FL10A-SO-Dup	16SS17-E2-FL13A-SO	16SS17-E2-FL16A-SO
Location	Cell #1 Floor	Cell #2 Floor	Cell #6 Floor	Cell #9 Floor	Cell #10 Floor	Cell #10 Floor	Cell #13 Floor	Cell #16 Floor
mg/Kg	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite
PCBs - 1	3.2 D	1.2 D	13 DQJ	1 D	0.93 D	1.5 D	2.3 D	7.8 DQJ
Lead - 400	-	-	-	1,400	-	-	-	

ADEC Cleanup Level	16SS17-E2-FL17A-SO	16SS17-E2-FL19A-SO	16SS17-E2-FL20A-SO	16SS17-E2-FL20A-SO-Dup	16SS17-E2-FL23A-SO	16SS17-E2-SW17A-SO	16SS17-E2-SW20A-SO
Location	Cell #17 Floor	Cell #19 Floor	Cell #20 Floor	Cell #20 Floor	Cell #23 Floor	Cell #10 Sidewall	Cell #11 Sidewall
mg/Kg	Composite	Composite	Composite	Composite	Composite	Discrete	Discrete
PCBs - 1	4.9 D	1.4 D	6.3 DQJ	4.2 D	4.7 DQJ	-	-
Lead - 400	-	-	-	-	-	620 QJ	490

Notes:
D = Analyte identified at a primary, secondary, or tertiary dilution
J = Result is detected below the reporting limit and/or is an estimated concentration based on data assessment
Q = One or more quality control criteria failed.
- = No exceedance

4.3.2.2 SS017 Excavation Lift #2

Excavation Lift #2 removed another one-foot interval from the floor of the eleven contaminated cells and removed an additional one-foot interval of material outwards from the contaminated sidewalls. The excavation of Cell #10 was advanced south to the edge of the building overlapping with Cell #11. Dark staining with a petroleum odor was observed along the building edge, which appeared to be originating from underneath the building.

4.3.2.3 Post Excavation Lift #2 Sample Results

Post Excavation Lift #2 confirmation sampling was completed in accordance with the revised sampling approach that was adopted for LF003 described in Section 4.1.3.1.3. Eleven composite floor samples were collected for PCB analysis and one discrete floor sample was collected for lead analysis (Cell #9). Twenty-eight sidewall samples were collected for PCB analysis and discrete soil samples were collected from the western and southern sidewalls of Cell #10 for lead analysis. The southern sidewall sample from Cell #10 was collected from the stained soil location. Additionally, while excavating along the eastern edge of the excavation area at Cell #20, strong odors were noted by the field team and the post-excavation confirmation sample collection was biased towards areas where visual and olfactory observations indicated potential contamination.

The results from the post Excavation Lift #2 confirmation sampling event reported five floor samples and nine sidewall samples with PCB or lead concentrations exceeding the ADEC Method Two Soil Cleanup Levels. Five floor samples (Cells #6, #13, #16, #17, and #19) reported PCB concentrations exceeding the 1 mg/Kg cleanup standard. The eastern sidewall sample collected from Cell #9 reported lead concentrations exceeding the 400 mg/Kg cleanup standard. The southern sidewall confirmation sample (16SS17-E3-SW22A-SO) collected from Cell #11 (collected from the stained soil) reported both PCB and lead concentrations exceeding the ADEC Method Two Soil Cleanup Levels. The remaining seven sidewall samples showing PCB concentrations greater than or equal to 1 mg/Kg were concentrated along the eastern portion of the excavation at Cells #2, #17, #20, and #23 (**Figure 4-8**). **Table 4-10** presents the exceeding post excavation sample results from SS017 Excavation Lift #2.

Table 4-10 SS017 - Post-Excavation Lift #2 Exceeding Soil Sample Results

ADEC Cleanup Level	16SS17-E3-FL06A-SO	16SS17-E3-FL13A-SO	16SS17-E3-FL16A-SO	16SS17-E3-FL17A-SO	16SS17-E3-FL19A-SO	16SS17-E3-SW04A-SO	16SS17-E3-SW10A-SO
Location	Cell #6 Floor	Cell #13 Floor	Cell #16 Floor	Cell #17 Floor	Cell #19 Floor	Cell #2 Sidewall	Cell #20 Sidewall
mg/Kg	Composite	Composite	Composite	Composite	Composite	Discrete	Discrete
PCBs - 1	1.6 D	1.4 J	3.3 J	5.9 J	1.6 J	1 D	0.86 J
Lead - 1	NS	NS	NS	NS	NS	NS	NS

ADEC Cleanup Level	16SS17-E3-SW10A-SO Dup	16SS17-E3-SW11A-SO	16SS17-E3-SW12A-SO	16SS17-E3-SW14A-SO	16SS17-E3-SW15A-SO	16SS17-E3-SW17A-SO	16SS17-E3-SW17A-SO Dup
Location	Cell #20 Sidewall	Cell #17/#20 Sidewall	Cell #17 Sidewall	Cell #23 Sidewall	Cell #23 Sidewall	Cell #23 Sidewall	Cell #23 Sidewall
mg/Kg	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete
PCBs - 1	1.2 J	8.3 J	1.6	3.5 J	1.5	2.2 J	1.9 J
Lead - 1	NS	NS	NS	NS	NS	NS	NS

ADEC Cleanup Level	16SS17-E3-SW18A-SO	16SS17-E3-SW22A-SO
Location	Cell #9 Sidewall	Cell #11 Sidewall
mg/Kg	Discrete	Discrete
PCBs - 1	-	18.4 J
Lead - 1	660	2,160

Notes:
D = Analyte identified at a primary, secondary, or tertiary dilution
J = Result is detected below the reporting limit and/or is an estimated concentration based on data assessment
NS = Not Sampled
- = No exceedance

4.3.3 Site Restoration

Upon completion of excavation and sampling activities, the floor and sidewalls of those cells containing PCBs or lead exceeding their applicable ADEC Method Two Soil Cleanup Levels were covered with a geotextile to delineate the contaminated area for future removal actions. Clean fill from the installation borrow source and the large rocks previously set aside were then placed on top of the liner as backfill to match the surrounding grade.

4.4 Surveying

The excavation boundaries and coordinates of the sampling locations were surveyed using a handheld GPS and base station with minimum1-meter horizontal and 0.15-meter vertical accuracy in accordance with United States Army Corps of Engineers (USACE) Manual for Electronic Deliverable requirements (USACE, 2011).

4.5 Waste Transportation and Disposal

Summaries of the contaminated soil disposal and site demobilization activities are described below.

4.5.1 Contaminated Soil and Waste Disposal

The RA-C activities at LF003, SS016, and SS017 required the disposal of lead and PCB contaminated soil. Excavated soil was loaded into 3.5 cy supersacks that were weighed and labeled, manifested, and then transported to the staging area near the barge landing. The demobilization barge transported the supersacks containing the contaminated soil to the Port of Seattle where they were transported by truck and rail to the Waste Management, Inc (WM) facilities in Arlington, Oregon. The last set of supersacks were picked up from the Cape Romanzof barge landing on 12 October 2016. Waste manifests accompanied the supersacks from Cape Romanzof LRRS to the WM facility. The disposal documentation is presented in **Appendix I**.

Waste characterization samples were collected from LF003, SS016 and SS017 to determine if leachate produced from the excavated soils would require hazardous disposal. The waste characterization samples were collected from the contaminated soils excavated from each of the sites, with one sample collected from LF003, one sample collected from SS016, and two samples collected from SS017 from locations where lead concentrations were potentially exceeding the ADEC Method Two Cleanup Level of 400 mg/Kg. The samples were submitted to the laboratory for analysis using the toxicity characteristic leachate procedure (TCLP). The analytical results for the PCB soil analysis and TCLP lead soil analysis are summarized in **Table 4-11**.

A total of 1,309.2 tons (as weighed on site) of contaminated soil was excavated from LF003, SS016, and SS017 (scale total at WM was 1302.6 tons). Lead contaminated soil from LF003 (30.3 tons), SS016 (18.8 tons) and SS017 (50.01 tons) was conservatively disposed of as hazardous waste, irrespective of the TCLP result, with all other soils disposed of as non-hazardous. **Table 4-11** presents the amount of contaminated soil that was removed from each site and disposed of, as well as the concentration range of contaminants.

Table 4-11 Site Contaminated Soil Disposal Summary

Contaminant	Tons of Soil Disposed Of		
	LF003	SS016	SS017
PCBs > 50 mg/Kg	173.09	4.06	11.86
PCBs < 50 mg/Kg	523.55	105.61	391.93
PCBs<50 PPM; Lead > 400 mg/Kg	30.3	-	50.01
PCBs>50 PPM; Lead > 400 mg/Kg	-	18.8	-
Lead TCLP Result	76 J mg/L Lead	0.15 J mg/L	0.6 mg/L

Notes:
J = Result is detected below the reporting limit and/or is an estimated concentration based on data assessment

Other wastes included both general refuse and investigation-derived waste (IDW). General refuse and IDW accumulated during sampling and contaminated soil removal activities included the following:

- General Refuse - paper towels, plastic bags, plastic water containers, etc.;
- IDW - expended personal protective equipment; and
- IDW - wastewater from decontamination activities.

Small quantities of general refuse were collected and disposed of onsite. Contaminated IDW was placed into supersacks with the excavated soil and staged for offsite disposal. Decontamination wastewater was filtered through a granulated activated carbon (GAC) system and discharged no closer than 100 ft to the nearest surface water body or drinking water well. The GAC filter was placed into a supersack with excavated soil for offsite disposal.

4.6 Demobilization

Supersacks of soil containers were periodically staged at the Cape Romanzof barge landing on standard 20-foot shipping platforms. After all the wastes were staged, an Alaska Marine Lines (AML) landing craft was scheduled. The landing craft (LC) could transport 300 to 400 tons per trip depending on wind and tide conditions.

The first LC arrived on August 15 and picked up heavy equipment and supply containers.

Weather conditions deteriorated and the barge operations moved to other locations waiting for a safe opportunity to return.

On September 27, during a break in the weather, the LC was able to pick up 25 of the shipping platforms (75 supersacks).

On September 28, the LC was able to pick up another 24 shipping platforms (72 supersacks).

These 49 platforms were transported offshore and loaded onto an ocean-going barge for the trip to Seattle.

Weather conditions deteriorated again, and the barge operations again left the area.

On October 12, the LC returned as was able to pick up the remaining supersacks. These were transferred to an ocean-going barge bound for Seattle. Final demobilization activities at the site were completed on 12 October 2016.

The barge arrived in Seattle on 31 October and off-loading at AML docks was completed by 04 November. WM trucks periodically delivered containers to AML and began periodically loading supersacks into the containers. The containers were trucked to a rail station and loaded onto rail cars for the final leg to Arlington, Oregon. The first of the waste containers arrived at the disposal facility on 28 November and the last container was received on 13 December 2016.

5.0 WORK PLAN DEVIATIONS

During the implementation of the 2016 RA, work plan deviations were necessary to complete the work in a safe, timely, and efficient manner, while still meeting the objectives of the ROD. A summary of these deviations is presented below in **Table 5-1**.

Table 5-1 Work Plan Deviation Summary

WORKPLAN ITEM – SECTION	DEVIATION FROM WORKPLAN/REASON
The work plan (QAPP 21 (field SOPs) and QAPP 22) stated the use of a Trimble GeoExplorer 6000 handheld sub-meter GPS device for the collection of sample points and excavation extents, and a laser level for elevation.	A Leica Viva CS15 GNSS smart antenna, field controller and software was utilized at the site instead. Calibration and maintenance was performed in accordance with manufacturer recommended practices.
The work plan did not specify the potential use of tracer dye to track LF003 subsurface and surface seepage flows across the site.	The use of a non-toxic traces dye was essential in identifying the drainage channel and discharge point. Approval was obtained from AFCEC/USACE prior to use of the dye.
Section 4.4.1-1. LF003: After evaluation of actual site conditions, (i.e. water is not surficial and is flowing under large boulders)	The suggested BMPs listed would not be effective in this scenario since water is flowing underneath rocks and no surficial water was present. The actual of flow through the planned excavation area (measured at approximately 2 GPM) and measured turbidity readings (<15 ntu) will not significantly impact the down gradient wetland or water discharging into Fowler Creek.
"Section 4.4.1-2. Water seeping from LF003 has been confirmed by laboratory analysis to be clean.	Testing confirmed that the water seeping at the source location was not contaminated hence suitable for diversion without treatment into adjacent creeks. Field team monitored the turbidity on a regular basis at the discharge point during excavation.
Section 4.4.1-6. Following pumping the sump hole dry, if there is still water observed within the excavation, that water will be pumped into “pop-up" berms, allowed to settle and the filtrate will be pumped through GAC system, sampled and discharged. If water is only observed along the boundary of the excavation limits a berm will be left in place to separate the water drainage and excavation areas. The sidewall sample will be collected from the side of the berm and additional excavation will be implemented if the samples prove to be contaminated.	If water was only observed along the boundary of the excavation limits a berm was left in place to separate the water drainage and excavation areas. The sidewall sample was collected from the side of the berm and additional excavation would have been implemented if the samples proved to be contaminated.
Section 4.4.1-7 & 8 Excavation Quantities	Based on initial observations at the site and the cells that have been excavated to date, it has been

WORKPLAN ITEM – SECTION	DEVIATION FROM WORKPLAN/REASON
	determined that actual soil/sediment quantities within the limits of the excavation area are less than anticipated at some locations. The ratio of large rocks to soil/sediment was biased toward the large rocks, resulting in an actual lesser volume of soil to be disposed than estimated. Hence, the screening procedure that was designed to delineate hot spots to prioritize soils with higher levels of contamination area was not necessary because the entire initial area of excavation could be excavated with a resulting tonnage that was well under the contract quantities at several locations.
Section 4.4.1-9. The work plan calls for excavation to be performed in 1-foot lifts.	Based upon site observations, it was decided to excavate an18" bgs lift throughout the entire area. Since the actual excavation quantities removed was lower than originally anticipated, increasing the lift to 18 inches was more efficient in removing a larger volume contaminated soil during a shorter period of time.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Activities performed at LF003, SS016, and SS017 included the excavation of soil and sediment with PCB concentrations greater than or equal to 1 mg/Kg and lead concentrations greater than or equal to 400 mg/Kg per 18 AAC 75. Field activities were performed in accordance with the ADEC-approved UFP-QAPP unless prior approval was obtained to deviate from the plan. From 24 June to 8 August 2016, approximately 1,309 tons of PCB and lead contaminated soil was excavated from LF003, SS016, and SS017.

6.1 LF003

Remedial activities conducted at LF003 resulted in the removal of approximately 727 tons of PCB and lead contaminated soil and sediment. The analytical results from the post excavation confirmation samples collected after each round of excavation show that cleanup goals for PCB and lead impacted soils have been achieved (Method Two Soil Cleanup Levels of 1 mg/Kg for PCBs and 400 mg/Kg for lead) for Areas 1, 2, and 4.

While lead contamination remains in Area 3, further excavation along the eastern boundary was not continued due to the presence of buried debris along the edge of LF003. It is anticipated that a recommendation to extend the land use control boundary along the southwest edge of LF003 (the eastern edge of Area 3) will be sought to include the area where subsurface debris was encountered in Cells #36 and #37 and lead contaminated soil remains. ADEC recommends a memo be prepared and added to the site file with a revised land use control map explaining why buried debris could not be removed in Cells #36 and #37 as well as the location of the partially buried fiber optic cable, located east of the cells, which limits further excavation of the remaining contaminated soils in this area.

6.2 SS016

Remedial activities conducted at SS016 resulted in the removal of approximately 129 tons of PCB and lead contaminated soil. Post excavation confirmation sampling was conducted after three excavation lifts. Analytical results from the post Excavation Lift #3 sampling event reported that 18 of the 30 sampling cells that comprised the excavation footprint were confirmed clean. While soil contamination remains present at the site, safety concerns must be resolved before additional remedial actions can be performed. These safety concerns include the relocation of live high voltage power cables (to access the contaminated soils that lie underneath Cells #1 and #5), and stabilization of the tram dock footing before additional remedial activities can be safely resumed.

6.3 SS017

Remedial activities conducted at SS017 resulted in the removal of approximately 454 tons of PCB and lead contaminated soil. The observed extent of soil contamination extended further laterally and vertically at SS017 than estimated in the 2013 ROD. Post excavation confirmation sampling was conducted after two excavation lifts. Analytical results from the post Excavation Lift #2 sampling show that cleanup goals were met for 11 of the 23 sampling cells. While contamination remains at the site, safety concerns must be resolved before additional remedial actions can be performed. Relocation of the live high voltage power cable is required to access the contaminated soils at Cells #15, #18, #21, and #22). Contaminated soil appears to extend beneath the building which must be supported or removed prior to further excavation (soil sample 16SS17-E3-SW22A-SO reported the highest concentration of PCBs and lead at SS017).

In order to achieve site closure, the area underneath the building will need to be evaluated and the extent of contamination determined before remedial activity can resume. The extent of contamination at the eastern portion of the site (Cells #19, #20, and #23) needs further characterization before remedial activity can resume.

7.0 REFERENCES

Alaska Department of Environmental Conservation (ADEC). 2016. *Oil and Other Hazardous Substances Pollution Control*, 18 ACC 75. November 2016.

United States Army Corps of Engineers (USACE). 2011. *Manual for Electronic Deliverables*, October.

United States Air Force (USAF). 2009. Final Remediation Investigation Report, Cape Romanzof Long Range Radar Station, Alaska, Weston Solutions, July.

USAF. 2013. Final Record of Decision for sites LF003, SS010, SS016, and SS017, Cape Romanzof Long Range Radar Station, Alaska, February

USAF. 2016. *Cape Romanzof LRRS Uniform Federal Policy – Quality Assurance Project Plan*, Cape Romanzof LRRS, Alaska, April.

United States Fish and Wildlife Service (USFWS). 1999. *Land Clearing Timing Guidance for Alaska*, Recommended Time Periods to Avoid Vegetation Clearing.

FIGURES

Due to document size limitations, figures are included as separate files

APPENDIX A

Photograph Log - due to document size limitations, digital photo logs are included as separate files

APPENDIX B

Field Logbooks - due to document size limitations, field logs are included as separate files

APPENDIX C

Internal Progress Report Summaries

Date LF003 SS016 . SS017 .

Date	LF003	SS016	SS017
25-May	Pre Mobe Site Inspection - 15 soil, 2 FD, 1 EB samples, and an upgradient SW sample collected for PCBs. First Bird Avoidance Walk; stake out site boundary, install owl decoy in center of site with flagging/deturrence along perimeter. No nests or eggs seen. Mark site boundary for utility clearance.		Pre Mobe Site Inspection - 4 soil, 1 FD samples collected for PCBs
26-May		Pre Mobe Site Inspection - limited marking of site boundary for utility clearance due to high winds, heavy fog, and extensive snow cover.	Mark site boundary for utility clearance. Collect 5 soil, 1 FD sample for PCBs. Collect PCB screening sample from ramp.
15-Jun	Colin arrived at Romanzof. Inspected coolers, bottles against bottle order. Placed order for extras. the surface water channel on the north side of the road from LF03 is now completely dry, meaning it was entirely snow melt on the surface. Whether or not there is some subsurface flow that follows that path and then seeps thru the landfill is not clear. We haven't taken too close a look as to whether there is still flow at the LF03 dig site, but I will look tomorrow.		Began excavating at SS17 on the south side (where the ramp is). There is still melting snow that would cause problems if we started on the north. Colin started marking out the southern area. The building is not orientated correctly on WP Figure 2 of SS017; the cells don't line up to the building as depicted due to elevation on aerials. Can excavate in relation to the building. Will treat the earthen ramp just like it was a natural feature, taking 18" of material of the top and sloping sides as appropriate.
16-Jun	Collected GPS coords for the Pre Mobe SW location. Colin marked out areas 1 and 2 for excavation.		Started excavating at the hot spot just west of the ramp at the SW corner of the building. The vac truck turns out to be extremely slow compared to excavators and since excavators can easily be utilized here, they switched to excavators. Filled one super sack (9,080 lbs) and started another before calling it a day. Estimate 15,000 lbs per cell to 1.5' bgs, so 7.5 tons x 23 cells give us plenty of room. Collected pre-ex GPS elevations at 20 locations along the ramp and it's sloping sides to get accurate estimate of removal.
17-Jun			Continued excavations, finished the hot PCB cell but the weather turned, so we will plan on taking a couple clor n soil samples tomorrow to confirm we got everything above 50 ppm. Then moved on to the top of the ramp and are about 80% complete there and then will remove the boulders and scrape the sides. Are still using the excavator, but did get the vac truck working at full capacity, which is good news for the other sites. So far, 28.9 of 300 tons and we have gone through 3 of 23 cells. GPS data collected for pre/post ex elevations. Title II oversight suggested collecting screening samples under the concrete pad and other side of concrete pad at SS17.

Date	LF003	SS016 .	SS017 .
18-Jun			Kept on at SS017, finished up the top of the ramp and the west side. Olgoonik sprung a leak on a hydraulic hose on the 135 excavator and don't have a replacement part, so they had to switch to the 85, which is smaller but not noticeably slower. Colin took a clor n soil from the floor of the hot spot cell and the result was dark purple, indicating <50 ppm but on the color scale it's closest to probably zero. Saw two moose today, I guess that's normal and they get a half dozen or so every year. There are powerline issues - see Greg's email regarding the power line on the north side of SS017. We are now at 60 tons and in good shape.
19-Jun			Kept on at SS017, nearly finished with the southern half of the building. At 120 tons right now, still in good shape.
20-Jun		Miles and Colin went up and marked out the cell perimeters at SS016 and think they have a pretty good plan in place for at least most of it, we will discuss with Venkat. The coordinates in the GPS seem about 15 ft off (east/west) due to vertical offset as Adam predicted, so once he confirms that this is correct, the perimeter will need to be moved east 15 ft.	Continued excavation at SS017, finished the southern portion and moved on to the north. Removed 168 tons so far, over half way there. GPS coords. include the ramp post-ex elevs, and some other pre/post-ex cell elevations.
21-Jun			The crew continued excavation and we are nearing as far as we can get without encroaching on the power line. We are now at 232 tons. ODS also began hauling super sacks down to the barge landing. Tomorrow we will probably begin sampling at SS017. GPS coordinates collected from pre-ex elevations from the north side of the building. Diesel odors noted around concrete vault structure. Map of location of diesel sent to USACE by J. Ford. WP Deviation requested/approved to use higher tech GPS eqiupment than planned in WP.
22-Jun	ODS is planning to begin mobilizing to LF003 tomorrow.		We excavated to the extent practicable at this time. We are still waiting for word on the portion that runs underneath the power line. We decided to run the last most eastern and northern portions of the northern plume down to 12" to conserve tonnage, and we are now at 252 tons. We performed XRF screening at cell #01 (one of the two lead hot spots) and readings ranged from non-detect to 168.5 mg/Kg from 7 samples (3 sidewalls and 4 floor). Pre and Post elevation data collected on the GPS.

Date	LF003	SS016 .	SS017 .
23-Jun	Olgoonik mobed to site. BEM identified where the seep daylights on the west end of the landfill but are unable to determine its source. Olgoonik began building an access road with clean boulders and clean fill material to access the LF003 excavation area and they began moving the large boulders from within the excavation boundary and they exposed the surface water in the 3 or 4 eastern most sampling cells, they are already making good progress.		Olgoonik demobed equipment from here to move to LF003, and continued hauling super sacks from SS017 to the barge landing. BEM marked out the sampling cells on the south side of the building at SS017 and plan on sampling tomorrow.
24-Jun			
25-Jun	• Completed excavating Area 3 at LF003 with 6 more bags filled for a total of 41 tons removed so far. • Completed preparations for excavating Area 4 including building a bridge across a small creek and setting up rock and super sack staging areas. Erosion control measures were installed at the bridge crossing where a super sack flat and clean fill was used to construct the bridge crossing. • Started excavating Area 4, about ¼ done. • GPS data was collected for LF003 Area 3 pre and post ex elevations.		• GPS data was collected for SS017 sidewall sampling coordinates • Began collecting samples at SS017 (see log)
26-Jun	• Continued and completed excavation of Area 4 of LF003 – 19.5 Tons removed • Started excavation in Areas 1 and 2 of LF003. Excavation area within Cells 9, 15, 10, 16, 20, 11, 17, 1, and 2. 23 Tons removed till now		• Completed SS017 Confirmation sampling of Cells 13, 14, 15, 16, 17, 19, 20, and 23 • 8 Floor samples and 11 Sidewall samples, 2 Dups, 1MS/MSD and 1 EB collected • Collected post-ex sample location of sidewalls at SS017

Date	LF003	SS016 .	SS017 .
27-Jun	• ODS continued excavation at LF003 in cells 3, 4, 5, 6, 7, and 8 • Observed water seeping through the sidewalls at Cell#8. Stopped digging in that area and focused on the northern portion of the excavation area in cells 3,4,6, and 12 which are free of seep water. • Approximately 55 tons of contaminated cells removed and placed in 12 super sacks today • BEM collected post excavation elevations from Area 4 of LF003 • BEM collected surface water sample 16LF03-E2-01A-WS for PCB and lead analysis from the location known as Observation Point #1 or the source of the water flowing through the drainage across LF003 excavation area. Also collected duplicate sample 16LF03-E2-06A-WS from the same location. • BEM performed activities related to preparation of sample labels and packing coolers for samples collected over the week from SS017 and LF003. These samples are being prepared to be sent out to laboratory on the plane on Tuesday June 28.		• ODS continued removing super sacks from SS017 down to the barge landing area by the beach • BEM performed activities related to preparation of sample labels and packing coolers for samples collected over the week from SS017 and LF003. These samples are being prepared to be sent out to laboratory on the plane on Tuesday June 28.
28-Jun	• ODS continued excavation at LF003 and finished cell#s 6 and 12. Soils removed today = 13.5 TONS • No more excavation could be advanced at the site due to water seeping through side walls. Excavation will resume at LF003 upon receipt of surface water results and once a water management plan is in place. • BEM prepared and shipped out 3 coolers with samples from SS017 and LF003 o LF003 = 2 Surface water samples (Raw and through GAC), 1 Duplicate	• John Ford (ODS), Olgoonik H&S Manager, and Ditch Witch mechanic arrived on plane along with other supplies. Ditch Witch repairs have been performed and we have been told it is ready for use at SS016 • ODS started mobilization to upper tram terminal – SS016. Two excavators (335, 85) and weight scale have been staged near the site.	• BEM prepared and shipped out 3 coolers with samples from SS017 and LF003 o SS017 = 18 floor samples for PCBs and lead, 32 sidewall samples for lead, 5 duplicates, 2 MS/MSDs, 2 EBs
29-Jun	• BEM performed activities with Title II to identify potential downgradient discharge locations for water draining through LF003 dig area. This will help in monitoring turbidity at this location during excavations, to help provide supporting data that excavations are not contributing to TSS/TDS in the nearby creek. • ODS completed the day with approximately half a supersack of material removed from Cells 29 and 30. Areas where excavator use is limited will be slow going.	• Mobilized ditch witch, loader, and squirt boom to SS016 • BEM marked out excavation areas based on revised GPS data. Currently focusing on 10-50, and >50 ppm areas • ODS started digging using ditch witch, vacuum digging at cells 29 and 30 (see attached photo) • BEM performed a PCB screening sample at a suspect location just outside of the dig areas, result was negative for PCBs greater than 50 ppm.	

Date	LF003	SS016 .	SS017 .
30-Jun	• Obtained authorization from AF and COE for the use of dye to trace the path of drainage along LF003 excavation area. • Excavated three test pits along the drainage ditch on the north side of the access road across for potential upgradient sump locations. Only western most excavation was observed with water flowing into the excavation. • Performed a dye test to check if water from this location was percolating across the gravel road and to the drainage running through the LF003 excavation area. Findings indicated that the source of drainage across the excavation area was not from across the access road at this location. • Performed a second dye test at the potential source location located at the northwest corner of LF003 Landfill, at which location there is observable seepage of water into the drainage area. It was confirmed that water from this location travels through the known drainage path across the LF003 excavation area. • Performed a third dye test from a seep location near the southern extent of LF003 excavation limit to assess path of drainage and discharge point to Fowler Creek. Discharge point at Fowler Creek was identified through this test.	• Continued excavation up at SS016 cells 29 and 30.	
1-Jul	• Post dye test inspection of creek – no issues were observed.	• Continue excavation at SS016 Cells 29 and 30. Complete filling Supersack#1, yet to be weighed. • Mark out additional areas of excavation on the western side of SS016. • Collect pre-excavation elevations at SS016.	
2-Jul	• Collected post excavation confirmation soil samples form Area 4 of LF003. A total of 6 floor samples for PCBs and lead, 10 sidewall samples for lead, 3 duplicates (1 floor for lead and PCB, and 2 sidewall samples for lead), 1 MS/MSD (Quality Control sample), and 1 equipment blank was collected. • Collected excavation boundary GPS coordinates of Area 4. • Collected GPS coordinates of sidewall sample locations.	• Continue and completed vacuum excavation of cells 29 and 30. Total 1.5 supersacks of contaminated soil removed. Yet to be weighed. • Mobilized the vacuum truck down to the upper access road below the excavation area located to the west of the radome. • Constructed staging area for presumed clean rocks coming out of the excavation areas. Staging area consisted of geofabric liner and impermeable PVC liner.	

Date	LF003	SS016 .	SS017 .
3-Jul	Collected confirmation samples at LF003 Area 3: o 8 floor samples for PCBs and lead (including 1 field duplicate) o 11 sidewall samples for lead (including 1 field duplicate and MS/MSD) o 1 equipment blank Collected GPS coordinates for LF003 Area 3 sidewall sample locations. Marked out sampling cells for those that have been excavated at LF003 Areas 1 and 2.	Continue excavating at SS016, completed filling one supersack. Total 2.5 supersacks to date from SS016.	
4-Jul	Collected post excavation confirmation samples from LF003 Area 1, Cells 1, 2, 3, 4, 5, 6, 10, 11, and 16. o 9 floor samples for PCBs and lead o 2 duplicates from the floor for PCB and lead o 13 sidewall samples for lead o 2 duplicate sidewall samples for lead o 1 MS/MSD o 1 Equipment blank Collected GPS coordinates of sidewall sampling locations.	Continued excavating at cells 22, 24, 26, 27, and 28. Approximately 2.5 supersacks filled today. Devised and installed a chute system from the dig area down to the supersacking area to increase excavated material movement. Material was shoveled into 5 gallons buckets and directly dropped down the chute into the collection pan. Vacuum extraction was also implemented alongside, especially in areas near live power cables and transformers. Collected post excavation confirmation samples from SS016 Cells 28, 29, and 30. o 3 floor samples for PCBs and lead o 3 sidewall samples for lead o 1 Equipment blank Collected GPS coordinates of sidewall sampling locations.	
5-Jul	• Received results for water samples collected from potential sump location at LF003. Results indicated ND or below standards for PCBs and lead. A flow test was performed to determine velocity of flow to design the size of the sump required. Additional tests to be performed tomorrow prior to any sump excavation. • Shipped out soil confirmation samples from LF003 on Iliamna flight to Anchorage.	• Continued excavation/vacuum extraction/hand digging at SS016 Cells 16, 17, 18, 21, 22, 23, and 25. Completed filling 4 supersacks today. Most of the material around top camp on the flat part has been removed with the exception of the areas occupied by power cables. What is left up there that can be removed is minimal near the transformers that will removed by vacuum extraction tomorrow. • Shipped out soil confirmation samples from SS016 on Iliamna flight to Anchorage.	

Date	LF003	SS016 .	SS017 .
6-Jul	• Performed flow rate tests to determine sump capacity design. • Collected baseline turbidity readings from source point, point of entry at drainage channel along the excavation, exit point from area of excavation (Cell 8), creek near discharge location upgradient of Fowler Creek, and at discharge point to Fowler Creek. • Dug a sump at source point measuring approximately 3ft wide X 6ft long X 3ft deep. Installed a pump and connected hose down to the selected discharge location downgradient, which is near a tributary discharging into Fowler Creek. The creek first discharges into a marsh area which also acts as a filter prior to discharging into Fowler Creek. Additionally the hose dumps the water pumped out from the sump into a filter bag (Pactec-Geopac) which will filter out any fines in the water and diffuse the discharge rate. • Collected elevations across LF003 to aid in completing a elevation profile for the site.	• SS016 excavation continued up near the dome. Due to bad weather only excavator digging was possible. Worked on cells 12, 13, 16, and 17 along the top slope. Filled 2 supersacks, #10 and #11. • Weighed supersacks #1 through #9 and transported down to the staging area by the barge landing.	
7-Jul	• Installed the pump and diverted water from the sump. There was still water flowing through the drainage area, potentially from several other side seeps from under the rocks. Have submitted a variation from workplan to install a sump immediately upgradient of the excavation area to capture water flowing into the drainage – *awaiting ADEC response.* • Submitted several other small deviation requests from the workplan to ADEC in order to adjust work activities based on field observations. Deviations were approved by ADEC and USCOE/AF.	•work up at top camp limited due to bad weather conditions – heavy fog and rain.	
8-Jul	• Awaiting response from ADEC with regards to new sump location at LF003. Other options were evaluated but nothing implemented yet.	• Excavated down cells 12 and 13 • Collected confirmation soil samples from Cells 12, 13, 16, 17, 21, 22, 23, 24, 25, 26, and 27 o 11 floor samples for PCBs and lead; o 11 sidewall samples for lead; o 1 duplicate each from floor and sidewall; o 1 MS/MSD and 1 Equipment Blank • Informed by station chief that power cables will not be relocated at both upper and lower camp.	• Informed by station chief that power cables will not be relocated at both upper and lower camp.

Date	LF003	SS016 .	SS017 .
9-Jul	Excavations continued at cells 7, 8, 12, 13, and 14 with a 1-foot berm left in place at cells along the southern border to separate the excavation area and the water running adjacent to the southern boundary in accordance with the approved work plan deviation submitted on 7 July. o Cells 7, 8, 12, 13, and 14 were excavated down to 18" bgs o 12 super sacks were filled at a total weight of 60 tons · Silt fence blocks were installed in the channel adjacent to the excavation with silt noticeably being filtered. Turbidity readings collected below the silt fences verified this. · Turbidity was continuously monitored along the channel as well as at the seep discharge point to Fowler Creek. · Supersacks were transported from the staging area at LF003 to the barge landing area.		
10-Jul	• Source point water flowing in to the drainage along the excavation area was diverted in such a way that it continued flowing just south of the excavation limits. This source point water was previously tested for PCBs and lead, and results indicated no contamination. Also the area that the water flows through has been previously tested clean. *We will not need variation to dig a new sump at this point.* • Continued and completed excavation at LF003 of cells, 17, 18, 19, 21, 22, 27, 28, and 29. o Total of 22 supersacks filled o Total of 106 tons of soil/sediment removed • Collected post excavation confirmation floor and sidewalls samples at cells, 7, 8, 12, 13, 14, 17, 18, and 19. o 11 floor samples for PCBs and Lead including 1 Duplicate sample and 1 MS/MSD o 7 sidewall samples for lead		

Date	LF003	SS016 .	SS017 .
11-Jul	• Continued and completed excavation at LF003 cells 20, 23, 24, 25, and 26. The entire excavation area has been removed down to 1-1.5 ft bgs as part of the first round of excavation o Total 18 supersacks filled today o Total of 90 tons • As of the completion of the first round of excavation, the tonnage amount as per contract has been reached ~ 418 Tons • Confirmation floor and sidewall samples collected from excavated cells; o • Collected GPS coordinates of sidewall sample locations • Collected post excavation elevations of the excavated area • Preparation of samples for shipment – COCs and labels		
12-Jul	• Packed and shipped out three coolers with samples from LF003 and SS016 on Iliamna flight to Anchorage. • Two ODS personnel out, one BEM personnel out and two ODS personnel flew in on the same plane. • Trouble shooting issues with internet in the field office	• Collected two post excavation PCB screening samples, at previous hot spots. Both samples negative for PCBs > 50ppm. Packed and shipped out three coolers with samples from LF003 and SS016 on Iliamna flight to Anchorage. • Conducted a recon of next area for excavation at SS016, marked out dig zones underneath the tram dock.	
13-Jul	• Collected post-excavation turbidity monitoring samples from the drainage running along LF003 excavation area, and down by the discharge point to Fowler Creek. Both turbidity readings were below 15 NTU.		• Setup for continuing excavation at SS016 using the vacuum truck. Vacuum hose will have a non-metallic end to work in close proximity to the power cables. • Excavated the areas previously not completed within cells 22 and 23 due to proximity to power cables. • Approximately 2 supersacks filled up today. They will be weighed later on, during transportation to staging at the barge landing area. • Field documentation and backup.

Date	LF003	SS016 .	SS017 .
14-Jul		o Mark out additional excavation areas on the slope at SS016. o Continued and completed excavation at flat area around the dome in cells 23 and 24 where the power cables are laid. Excavation was performed with non-metallic edge attached to the vacuum hose. Areas directly under the power cables were left intact and not disturbed in order to minimize any potential damage to the cables. These areas will be surveyed and GPS coordinates will be collected. o Moved on to cell 20 located between the substation and tram dock. Completed excavation cells 20 and portions of 19 that were not impacted by power lines. o Started excavation at cell 11 down on the slope outside the tram dock station to the north. Currently able to vacuum down to bedrock at that cell. o Total of 1.5 supersacks filled today.	
15-Jul	Performed an inspection of the drainage running south of the excavation area at LF003. Water appeared to be clear with very low turbidity.	Continued vacuum excavation at SS016, at cells 11, and partially 9 & 10. Approximately 1 supersack filled today. Also moving rocks along other areas of excavation to facilitate easier vacuum extraction. • Prepared sample jars and cooler for resampling of SS016 samples.	Reviewed analytical results received for the first round of confirmation samples for SS017. Eleven cell were detected with PCBs/lead greater than ADEC standards that will require re-excavation. With the remaining 45 tons as per contract for the site and an additional 30 tons in options to utilized, the focus will be initially on cells 1, 2, 6, 9 and 23. Performed decontamination activities of the excavated bucket at LF003 and mobilized it to SS017. Also mobilized the loader to be used for holding supersacks.
16-Jul		o Continued excavation at SS016, cell 9. ODS personnel also removing rocks at other cells to facilitate vacuum excavation beneath the rocks. o Excavation had to be stopped before noon due to bad weather. Heavy wind gusts, thick fog, and low visibility causing unsafe conditions on the slope. o Resampled cells 12-27 for PCBs and lead;	o Started second round of excavation on the contaminated cells at SS017, cells 6, 2, and 1 in the same order. Contaminated cells are being excavated down approximately 1 foot and out one foot from the original boundary. Also field observations (visual, odor) are being utilized to bias the excavation within each cell. Total of 6 supersacks were filled today, approximately 25-30 tons removed.

Date	LF003	SS016 .	SS017 .
17-Jul		o Unsafe conditions at SS016 due to heavy fog, and strong winds. No work performed today.	o Continued excavation at SS017. Total 50 tons removed to date from excavation#2. Contract total of 300 tons was reached. Option of 30 tons is being used. Approximately 25 tons remaining. o Completed excavating Cell# 6 down 1 foot and 1 foot out on sidewalls. Unable to extend excavation to the north and west due to presence of building. Approximately 19 tons removed from this cell. o Completed excavating Cell#1 down 1 foot on the floor. Unable to proceed sidewall excavations in any direction due to the presence of building to the north and east, concrete pad to the west and cell#2 to the south. Approximately 11.5 tons removed from this cell. o Completed excavating Cell#2 floor down 1 foot and sidewalls out 1 foot to the west and east. Clean sidewall #3 present to the south and north is cell#1. Approximately 13 tons removed from this cell. o On-going excavation at Cell#10. Side walls removed 1 foot to the south and west. Approximately 6.5 tons removed from this cell so far. o Collected 8 sidewall XRF lead screening samples along the south and west sidewalls of Cell#10. These sidewalls were detected with lead samples above ADEC criteria during the first round of sampling. o Out of the 8 screening samples, 2 samples located in the south east corner of the cell were detected with concentrations in the 400 ppm range. Additional excavations will be performed within this corner and further screened. All other screening samples were well below the ADEC criteria for lead.
18-Jul		o Due to unsafe work conditions (very low visibility and strong winds), no work was conducted at SS016	o Completed excavating to contract quantities including options. One supersack filled today. Total 68 to date. o The sidewall at Cell#10 to the south was detected with lead concentrations above 400 ppm through screening. The 8 foot section to the south east corner was excavated out about 5-6 ft after consecutive XRF screening samples indicating concentrations in exceedance of 400 ppm. It was observed that concentrations increased closer to the building. Eventually the cell was excavated until the building wall. o A stained soil streak was observed and what appeared to continue down under the building slab. A quick inspection of the interior of the building revealed several locations of spills of oil/grease on the floor, which is part concrete with cracks and part dirt. These appear to be straight in line with the dark stained soil seen outside the building. Field observations indicate that the contamination could continue down under the building. Further screening of the sidewall against the building will be conducted. o Confirmation floor and sidewall samples for PCBs were collected from cells 1, 2, and 6

Date	LF003	SS016 .	SS017 .
19-Jul		Due to unsafe work conditions (very low visibility and strong winds), no work was conducted at SS016	o Completed excavating to contract quantities including options. One supersack filled today. Total 68 to date. o The sidewall at Cell#10 to the south was detected with lead concentrations above 400 ppm through screening. The 8 foot section to the south east corner was excavated out about 5-6 ft after consecutive XRF screening samples indicating concentrations in exceedance of 400 ppm. It was observed that concentrations increased closer to the building. Eventually the cell was excavated until the building wall. o A stained soil streak was observed and what appeared to continue down under the building slab. A quick inspection of the interior of the building revealed several locations of spills of oil/grease on the floor, which is part concrete with cracks and part dirt. These appear to be straight in line with the dark stained soil seen outside the building. Field observations indicate that the contamination could continue down under the building. Further screening of the sidewall against the building will be conducted. o Confirmation floor and sidewall samples for PCBs were collected from cells 1, 2, and 6.
20-Jul			
21-Jul			• Performed post excavation #2 elevation survey at SS017. • Also collected GPS coordinates of post excavation#2 confirmation floor (all 9 sub parts) and sidewall sample locations. • Collected excavation boundary GPS locations of the southern portion of SS017.
22-Jul	• ODS excavated the second lifts from cells 7, 19, 23, and 27. Cells were excavated another 1 ft below the existing grade. • Conducted turbidity monitoring at the down gradient seep discharge into Fowler Creek before and every two hours during the excavation. Turbidity readings were below 5.0 ntu. • Conducted PCB and lead screening from cell 23 sidewall that contained suspected contaminated soils. Screening results reported lead concentrations below 40 ppm and PCB concentrations <50 ppm. • 96 tons of soil was removed and placed into super sacks. • 18 super sacks were filled.	• ODS attempted to resume excavating at SS16 but was unable due to dense fog, rain, and wind.	• Collected lead and PCB screening samples from the stained soil against the building in cell 10 at SS017. Screening results reported lead concentrations ranging from 1,400 to 4,700 ppm and PCB screen results reported PCB concentrations possibly >50 PCB. The Air Force was informed of these results and they decided against pursuing the contamination below the building.

Date	LF003	SS016 .	SS017 .
23-Jul	• Resumed excavating 2nd lifts at LF003 for PCB contaminated soils. Cells 18, 21, 22, 23, 24, and 25 were excavated from Areas 1 and 2. • Excavated 2nd lifts at lead contaminated cells 35 and 36 and excavated the sidewalls out approximately 1 foot from Sidewalls 47 and 50. • 29 super sacks were filled. • 147 tons of soil removed and supersacked. • Collected lead screening samples from Area 3 floor and sidewalls. Areas with lead >400 mg/Kg were excavated an additional foot until screening results were <400 mg/Kg. • Used the GPS to mark out excavation cells at LF003. • Conducted turbidity monitoring at the down gradient seep discharge into Fowler Creek every two to three hours during the excavation. Turbidity readings were below 25 ntu. Elevated turbidity likely due to heavy rains during the first part of the day. Turbidity readings were also collected from flowing surface water just below the excavation area. Readings were all below 5 ntu, suggesting the source of the turbidity was down gradient of this point. • Collected Event 3 (post-ex 2) confirmation samples from cells 7, 18, and 19 at LF003. One 9-part composite was collected for PCB analysis in each cell, and jars were also collected for individual sub-parts in each cell. 30 samples total.		
24-Jul	o Collected confirmation Post Excavation#2 confirmation floor and sidewall samples from LF003 cells 21, 22, 23, 24, 25, 27, 35, 36, and 37;		o Continued excavation of contaminated cells on the northern side of the lower tram building o Completed excavating cells 9, 16, 17, 19, and 20 o Total of 17 supersacks filled today amounting to 78 tons o Collected GPS coordinates of the location of the power cables running along the northern edge of the excavation area o Collected GPS coordinates of the area that will not be excavated due to the presence of power cables
25-Jul		• Continued excavation at SS016 cells 9, 11, and 29. Documented cell 29 excavation down to bedrock to request for closure.	• Finished excavation of contaminated cells at SS017 - #12, 13, 20, and 23 • Total of 10 supersacks amounting to 47 tons • Collected confirmation floor and sidewall samples as below;
26-Jul			Oversight and documentation of excavation activities at SS016.

Date	LF003	SS016 .	SS017 .
27-Jul	Collected Post-Excavation#2 elevations of the excavation floor. Also collected GPS coordinates of sidewall sample locations at Areas 1, 2, and 3. o Performed decon of excavator and equipment prior to moving to another site.	Continued excavation activities at SS016. Finished excavation of Cell#9. Most of the area at Cell#9 was removed down to bedrock except for the flat area near the foundations where removal was down to 1.5 to 2 ft. o Filled 2 supersacks today for a total weight of approximately 9.5 tons. o Continued to clear cells 2, 6, 3, and 7 for removal activities.	
28-Jul	Completed GPS elevation surveys of Post-Ex#2 cells and obtained coordinates of sidewall sample locations.	Continued excavation by hand at cells 6 and 7 along the slope at SS016. o Total of 1 supersack filled for a weight of approximately 5 tons. o Work was stopped around noon due to very low visibility and strong wind gusts causing unsafe work conditions on the slope.	
29-Jul	Completed GPS survey of sample locations and boundary.		
30-Jul	Conducted turbidity monitoring after the heavy rain event that occurred during the morning. Turbidity was measured from the seep discharge into Fowler creek (23.56 ntu) and from a surface water discharge point just below the excavation boundary (0.74 ntu). Results indicate that elevated turbidity is likely being generated down gradient from the excavation area.	SS016 oversight and 2nd excavation of cells 14, 20, 21, 24, 25, and 28. · The 2nd excavation of cells 20, 21, 24, 25, and 28 was completed. · Cells 21, 24, 25, and 28 were excavated an additional 8-12 inches below the existing grade with bedrock exposed in most places at that depth. · Cell 20 which is present on top of bedrock was cleaned of soils within the cracks and photo logged.	
31-Jul		• Continued excavation at SS016 at contaminated cells #6, 7, 10, 12, 14, and 17. • Completed excavation at SS016 of contaminated cells #6, 10, 12, 14, and 17. • Completed post excavation #1 confirmation sampling at SS016 cells 6, 9, and 10: • Completed post excavation #2 confirmation sampling at SS016 of cells 12, 17, 21, 24, 25, and 28 :	

Date	LF003	SS016 .	SS017 .
1-Aug		• Continued excavation at SS016 at contaminated cells #6, 7, 10, 12, 14, and 17. • Completed excavation at SS016 of contaminated cells #6, 10, 12, 14, and 17. • Completed post excavation #1 confirmation sampling at SS016 cells 6, 9, and 10: • Completed post excavation #2 confirmation sampling at SS016 of cells 12, 17, 21, 24, 25, and 28 :	
2-Aug		Continued hand dig excavation at SS016 cells 2, 3, 4, 7, and 8. During excavation, some loose rocks underneath the tram dock foundation destabilized and rolled down toward workers causing an unsafe work condition. Work was stopped, the conditions photo logged and sent over to the attention of COE/AF for further instructions.	
3-Aug	• Received sampling results for post-excavation#2 (PE#2) samples from LF003. Cells 7, 19, 21, and 23 were detected with PCBs>1ppm. Additionally 5 sidewall samples, one each at cells 7, 21, 23, 25, and 27 were detected with PCBs>1ppm	• Demobilized Ditch-Witch vacuum trailer from SS016 and performed decontamination activities.	• Mobilized equipment to SS017 in preparations for backfill.
4-Aug	• Collected PE#2 excavation floor elevations and sidewall sample GPS locations. • At LF003, collected GPS coordinates of the current drainage flow path.	• At SS016 collected GPS coordinates of the area that could not be excavated due to presence of power cables.	• Started and completed backfill of cells 1, 2, 3, 4, 5, and 7 with clean fill brought in from borrow source. • Additional digging is pending AF/COE decision on additional quantities for excavation.
5-Aug	• Started excavation#3 at LF003 of contaminated cell 7. Due to rain and water flowing through the excavation area, the activities have been stopped until dry. 1 supersack filled today. • Moved on to Area#3 of LF003. John F provided direction after consultation with COE/AF that no additional digging will be done at Area 3 due to proximity to the landfill. The contaminated sidewalls were lined and the entire area was backfilled.		• Started and continued through the day, backfill activities at SS017. Liner was placed on all floors and sidewalls prior to backfilling.

Date	LF003	SS016 .	SS017 .
6-Aug	• Continued and completed excavation at LF003 contaminated cells 7, 19, 21, and 23 and sidewalls at cells 25 and 27. o Total of 14 supersacks filled for an approximate total of 67.5 tons. o Of this total, approximately 33 tons were removed in excess of the contract total of 1283 tons. o Removed supersacks down to barge landing staging area with the exception of 7 supersacks that were filled after reaching contract total. o Conducted turbidity monitoring of surface water at discharge point to Fowler Creek and at point of discharge from the excavation area.		• Continued and completed backfill of remaining cells at SS017. o Cells 9-17 were backfilled today. o Conducted a post backfill elevation survey of all cells.
7-Aug			
8-Aug	• Completed Post-Excavation#3 confirmation floor samples from 7, 19, 21, and 23 and sidewall samples from 7, 21, 23, 25, and 27; • Performed GPS survey of excavation boundary, elevations of excavation floors, and sample locations.	• Continued hand excavation/cleanup of cells 21, 24, and 25 that were found in exceedance of PCBs after the second round of sampling. These 3 cells have been excavated down to visible bedrock and could potentially be cleaned out further to present a case for no additional sampling.	
9-Aug		• Continued hand excavation at cells 25, 24, and 28. o Completed hand dig/cleaning cell 25 down to bedrock on the floor and sidewall. Photo documented the removal and cleanup to bedrock for request for closure. o Cells 24 and 28 were cleared by hand digging on the floor and one foot out on the sidewalls. • Collected confirmation floor and sidewall samples from cells 24 and 28; • Started backfill at cells located on the flat area around the dome. Liner was placed on the floor of cells 24 and 28. Backfill monitoring and photo documentation.	
10-Aug			
11-Aug			

Date	LF003	SS016 .	SS017 .
12-Aug	• Obtained confirmation sample results for PE#3 at LF003. All floor and sidewall samples were below ADEC Method 2 criteria • Started and completed backfill of all excavated areas at LF003. Backfill was brought in from local borrow source as well as large rocks and boulders segregated during excavation were used mostly in backfill. Photo documentation.	• Backfilled cells 6, 9, and 10 at SS016. A liner was placed on the floor and contaminated sidewalls prior to backfilling at each of these cells.	
13-Aug			
14-Aug	• Collected final backfilled GPS elevations at LF003	• Collected final backfilled GPS elevations at SS016.	

APPENDIX D

Base Civil Engineering Work Clearance Requests

BASE CIVIL ENGINEERING WORK CLEARANCE REQUEST
(See Instructions on Reverse)

DATE PREPARED: 01 June 2016

1. Clearance is requested to proceed with work at Cape Romanzof - LF03 on Work Order No. n / a, Contract No. W911KB-15-C-0018, involving excavation or utility disturbance per attached sketch. This area [X] has [ ] has not been staked or clearly marked.

2. TYPE OF FACILITY/WORK INVOLVED

[ ] A. PAVEMENTS	[ ] D. FIRE DETECTION & PROTECTION SYSTEMS	[ ] G. AIRCRAFT OR VEHICULAR TRAFFIC FLOW
[ ] B. DRAINAGE SYSTEMS	[ ] E. UTILITY [ ] OVERHEAD [ ] UNDERGROUND	[ ] H. SECURITY
[ ] C. RAILROAD TRACKS	[ ] F. COMM [ ] OVERHEAD [ ] UNDERGROUND	[X] I. OTHER underground

3. DATE CLEARANCE REQUIRED: 15 June 2016	4. DATE OF CLEARANCE:

5. SIGNATURE OF REQUESTING OFFICIAL: John Ford - PM Click to sign [signature]	6. TELEPHONE NO.: 907-562-8728	7. ORGANIZATION: Olgoonik

ORGANIZATION	REMARKS *(Use Reverse for additional comments)*	REVIEWER'S NAME AND INITIALS
8. BASE CIVIL ENGINEERING A. ELECTRICAL DISTRIBUTION	N/A Locates if suspect	[initials]
B. STEAM DISTRIBUTION		
C. WATER DISTRIBUTION	N/A	
D. POL DISTRIBUTION		[initials]
E. SEWER DISTRIBUTION		
F. ENVIRONMENTAL		
G. PAVEMENTS/ GROUNDS		
H. FIRE PROTECTION		
I. ZONE AFCEC CZOP ERA Program Review DSN: 552-0788. 3 Jun 16	Richard Mauser RPM, Cape Romanzof OK	MAUSER.RICHARD.JAMES.1073657438 [digital signature]
J. OTHER *(Specify)*		
9. SECURITY POLICE	n/a	
10. SAFETY	Follow Olgoonik OSHA Plan	[initials]
11. COMMUNICATIONS		
12. BASE OPERATIONS	n/a	[initials]
13. CABLE TV		
14. COMMERCIAL UTILITY COMPANY [ ] TELEPHONE [ ] GAS [ ] ELECTRIC	N/A	[initials]
15. OTHER *(Specify)*		

16. REQUESTED CLEARANCE [X] APPROVED [ ] DISAPPROVED

17. TYPED NAME AND SIGNATURE OF APPROVING OFFICER *(Chief of Operations Flight or Chief of Engineering Flight)*: David Malzac CIV Aretec [signature]

17a. DATE SIGNED: 15-June-2016

AF IMT 103, 19940801, V3 PREVIOUS EDITIONS ARE OBSOLETE.

INSTRUCTIONS

The BCE work clearance request is used for any work (contract or in-house) that may disrupt aircraft or vehicular traffic flow, base utility services, protection provided by fire and intrusion alarm system, or routine activities of the installation. This form is used to coordinate the required work with key base activities and keep customer inconvenience to a minimum. It is also used to identify potentially hazardous work conditions in an attempt to prevent accidents. The work clearance request is processed just prior to the start of work. If delays are encountered and the conditions at the job site change (or may have changed) this work clearance request must be reprocessed.

18. REMARKS. *(This section must describe specific precautionary measure to be taken before and during work accomplishment. Specific comments concerning the approved method of excavation, hand or powered equipment, should be included.)*

At the old landfill (Site LF03) we will excavate PCB contaminated soil as shown on the attached Figure 3-1 by circled areas near the closed landfill. Soil will be removed with tracked excavators or a vacuum excavator. The site will be backfilled and graded upon completion of the soil removal activities.

BASE CIVIL ENGINEERING WORK CLEARANCE REQUEST
(See Instructions on Reverse)

DATE PREPARED: 01 June 2016

1. Clearance is requested to proceed with work at Cape Romanzof - SS016

on Work Order No. n / a, Contract No. W911KB-15-C-0018, involving excavation or utility disturbance per attached sketch. This area [ ] has [X] has not been staked or clearly marked.

2. TYPE OF FACILITY/WORK INVOLVED

[ ] A. PAVEMENTS	[ ] D. FIRE DETECTION & PROTECTION SYSTEMS	[ ] G. AIRCRAFT OR VEHICULAR TRAFFIC FLOW
[ ] B. DRAINAGE SYSTEMS	[ ] E. UTILITY [ ] OVERHEAD [ ] UNDERGROUND	[ ] H. SECURITY
[ ] C. RAILROAD TRACKS	[ ] F. COMM [ ] OVERHEAD [ ] UNDERGROUND	[X] I. OTHER underground

3. DATE CLEARANCE REQUIRED: 30 June 2016	4. DATE OF CLEARANCE:

5. SIGNATURE OF REQUESTING OFFICIAL: John Ford - PM Click to sign [signature]	6. TELEPHONE NO.: 907-562-8728	7. ORGANIZATION: Olgoonik

ORGANIZATION	REMARKS *(Use Reverse for additional comments)*	REVIEWER'S NAME AND INITIALS
8. BASE CIVIL ENGINEERING A. ELECTRICAL DISTRIBUTION	DeACTIVATED - BUT LOCATES ONLY	[initials]
B. STEAM DISTRIBUTION	N/A	[initials]
C. WATER DISTRIBUTION	N/A	[initials]
D. POL DISTRIBUTION		
E. SEWER DISTRIBUTION		
F. ENVIRONMENTAL		
G. PAVEMENTS/ GROUNDS		
H. FIRE PROTECTION		
I. ZONE AFCEC CZOP ERA Program Review DSN: 552-0788. 3 Jun 16	Richard Mauser RPM, Cape Romanzof OK	MAUSER.RICHARD.JAMES.1073657438 [digital signature]
J. OTHER *(Specify)*	Tram Dock - See Notes	[initials]
9. SECURITY POLICE	N/A	[initials]
10. SAFETY	Follow Olgoonik Plan	[initials]
11. COMMUNICATIONS	N/A	
12. BASE OPERATIONS		[initials]
13. CABLE TV		
14. COMMERCIAL UTILITY COMPANY [ ] TELEPHONE [ ] GAS [ ] ELECTRIC	N/A	[initials]

15. OTHER *(Specify)*

16. REQUESTED CLEARANCE [X] APPROVED [ ] DISAPPROVED

17. TYPED NAME AND SIGNATURE OF APPROVING OFFICER *(Chief of Operations Flight or Chief of Engineering Flight)*: David Malzac CIV Arctec [signature]

17a DATE SIGNED: 15-JUNE-2016

INSTRUCTIONS

The BCE work clearance request is used for any work (contract or in-house) that may disrupt aircraft or vehicular traffic flow, base utility services, protection provided by fire and intrusion alarm system, or routine activities of the installation. This form is used to coordinate the required work with key base activities and keep customer inconvenience to a minimum. It is also used to identify potentially hazardous work conditions in an attempt to prevent accidents. The work clearance request is processed just prior to the start of work. If delays are encountered and the conditions at the job site change (or may have changed) this work clearance request must be reprocessed.

18. REMARKS. *(This section must describe specific precautionary measure to be taken before and during work accomplishment. Specific comments concerning the approved method of excavation, hand or powered equipment, should be included.)*

At the Upper Tram Terminal (Site SS016) we will excavate PCB and Lead contaminated soil as shown on the attached Figure 6-10 by the shaded areas around the buildings. Soil will be removed with tracked excavators or a vacuum excavator. The site will be backfilled and graded upon completion of the soil removal activities.

Tram car dock may BE REMOVED + NOT replaced
Tram building LOADING Dock needs to be replaced

BASE CIVIL ENGINEERING WORK CLEARANCE REQUEST

(See Instructions on Reverse)

DATE PREPARED: 01 June 2016

1. Clearance is requested to proceed with work at Cape Romanzof - SS017

on Work Order No. n / a, Contract No. W911KB-15-C-0018, involving excavation or utility disturbance per attached sketch. This area ☐ has ☒ has not been staked or clearly marked.

2. TYPE OF FACILITY/WORK INVOLVED

☐ A. PAVEMENTS	☐ D. FIRE DETECTION & PROTECTION SYSTEMS			☐ G. AIRCRAFT OR VEHICULAR TRAFFIC FLOW
☐ B. DRAINAGE SYSTEMS	☐ E. UTILITY	☐ OVERHEAD	☐ UNDERGROUND	☐ H. SECURITY
☐ C. RAILROAD TRACKS	☐ F. COMM	☐ OVERHEAD	☐ UNDERGROUND	☒ I. OTHER underground

3. DATE CLEARANCE REQUIRED: 15 June 2016	4. DATE OF CLEARANCE

5. SIGNATURE OF REQUESTING OFFICIAL: John Ford - PM Click to sign [signature]	6. TELEPHONE NO. 907-562-8728	7. ORGANIZATION: Olgoonik

	ORGANIZATION	REMARKS (Use Reverse for additional comments)	REVIEWER'S NAME AND INITIALS
8. BASE CIVIL ENGINEERING	A. ELECTRICAL DISTRIBUTION	ID by Locates only	[initials]
	B. STEAM DISTRIBUTION	N/A	[initials]
	C. WATER DISTRIBUTION	ID if suspect / Locates	[initials]
	D. POL DISTRIBUTION	ID if suspect / Locates	[initials]
	E. SEWER DISTRIBUTION	ID if suspect / Locates	[initials]
	F. ENVIRONMENTAL	N/A	[initials]
	G. PAVEMENTS/ GROUNDS		
	H. FIRE PROTECTION		
	I. ZONE AFCEC CZOP ERA Program Review DSN: 552-0788, 3 Jun 16	Richard Mauser RPM, Cape Romanzof OK	MAUSER.RICHARD.JAMES.1073657438 [digital signature]
	J. OTHER (Specify)		
9. SECURITY POLICE		N/A	
10. SAFETY		Follow Olgoonik Plan	[initials]
11. COMMUNICATIONS			
12. BASE OPERATIONS		N/A	
13. CABLE TV			[initials]
14. COMMERCIAL UTILITY COMPANY ☐ TELEPHONE ☐ GAS ☐ ELECTRIC		N/A	[initials]

15. OTHER (Specify)

16. REQUESTED CLEARANCE ☒ APPROVED ☐ DISAPPROVED

17. TYPED NAME AND SIGNATURE OF APPROVING OFFICER (Chief of Operations Flight or Chief of Engineering Flight): David Malzac CIV Arctec [signature]

17a. DATE SIGNED: 15-JUNE-2016

INSTRUCTIONS

The BCE work clearance request is used for any work (contract or in-house) that may disrupt aircraft or vehicular traffic flow, base utility services, protection provided by fire and intrusion alarm system, or routine activities of the installation. This form is used to coordinate the required work with key base activities and keep customer inconvenience to a minimum. It is also used to identify potentially hazardous work conditions in an attempt to prevent accidents. The work clearance request is processed just prior to the start of work. If delays are encountered and the conditions at the job site change (or may have changed) this work clearance request must be reprocessed.

18. REMARKS. *(This section must describe specific precautionary measure to be taken before and during work accomplishment. Specific comments concerning the approved method of excavation, hand or powered equipment, should be included.)*

At the Lower Tram Terminal (Site SS017) we will excavate PCB and Lead contaminated soil as shown on the attached Figure 6-13 by the shaded and cross-hatched areas around the building. Soil will be removed with a tracked excavator or vacuum excavator. The site will be backfilled and leveled upon completion of the soil removal activities.

APPENDIX E

2016 Laboratory Confirmation Sample Results

Sample ID	LAB Sample ID	Lab Report #	Checklist #
16SS17-01B-SO	280-83809-20	280-83809-1	F.16
16SS17-02B-SO	280-83809-21		
16SS17-RAMP-B-SO	280-83809-22		
16SS17-03B-SO	280-83809-23		
16SS17-07B-SO	280-83809-24		
16SS17-08B-SO	280-83809-25		
16LF03-01A-SW	280-83809-26		
16LF03-02A-SW	280-83809-27		
16SS17-E2-FL02A-SO	280-85047-1	280-85047-1	F.17
16SS17-E2-FL03A-SO	280-85047-2		
16SS17-E2-FL04A-SO	280-85047-3		
16SS17-E2-FL05A-SO	280-85047-4		
16SS17-E2-FL06A-SO	280-85047-5		
16SS17-E2-FL07A-SO	280-85047-6		
16SS17-E2-FL09A-SO	280-85047-7		
16SS17-E2-FL10A-SO	280-85047-8		
16SS17-E2-FL40A-SO	280-85047-9		
16SS17-E2-FL13A-SO	280-85047-10		
16SS17-E2-FL14A-SO	280-85047-11		
16SS17-E2-FL15A-SO	280-85047-12		
16SS17-E2-FL16A-SO	280-85047-13		
16SS17-E2-FL17A-SO	280-85047-14		
16SS17-E2-FL19A-SO	280-85047-15		
16SS17-E2-FL20A-SO	280-85047-16		
16SS17-E2-FL41A-SO	280-85047-17		
16SS17-E2-FL23A-SO	280-85047-18		
16SS17-E2-EB01-WQ	280-85047-19		
16SS17-E2-TCLP01-SO	280-85047-20		
16SS17-E2-FL01A-SO	280-85047-21		
16SS17-E2-FL08A-SO	280-85047-22		
16SS17-E2-SW01A-SO	280-85047-23		
16SS17-E2-SW02A-SO	280-85047-24		
16SS17-E2-SW03A-SO	280-85047-25		
16SS17-E2-SW04A-SO	280-85047-26		
16SS17-E2-SW05A-SO	280-85047-27		
16SS17-E2-SW06A-SO	280-85047-28		
16SS17-E2-SW07A-SO	280-85047-29		
16SS17-E2-SW08A-SO	280-85047-30		
16SS17-E2-SW09A-SO	280-85047-31		
16SS17-E2-SW10A-SO	280-85047-32		
16SS17-E2-SW11A-SO	280-85047-33		
16SS17-E2-SW50A-SO	280-85047-34		
16SS17-E2-SW12A-SO	280-85047-35		
16SS17-E2-SW-13A-SO	280-85047-36		
16SS17-E2-SW14A-SO	280-85047-37		
16SS17-E2-SW15A-SO	280-85047-38		

16SS17-E2-SW16A-SO	280-85047-39		
16SS17-E2-SW17A-SO	280-85047-40		
16SS17-E2-SW51A-SO	280-85047-41		
16SS17-E2-SW18A-SO	280-85047-42		
16SS17-E2-SW19A-SO	280-85047-43		
16SS17-E2-SW20A-SO	280-85047-44		
16SS17-E2-SW21A-SO	280-85047-45		
16SS17-E2-SW22A-SO	280-85047-46		
16SS17-E2-SW23A-SO	280-85047-47		
16SS17-E2-SW24A-SO	280-85047-48		
16SS17-E2-SW25A-SO	280-85047-49		
16SS17-E2-SW26A-SO	280-85047-50		
16SS17-E2-SW27A-SO	280-85047-51		
16SS17-E2-SW52A-SO	280-85047-52		
16SS17-E2-SW28A-SO	280-85047-53		
16SS17-E2-SW29A-SO	280-85047-54		
16SS17-E2-SW30A-SO	280-85047-55		
16SS17-E2-SW31A-SO	280-85047-56		
16SS17-E2-SW32A-SO	280-85047-57		
16SS17-E2-EB02-WQ	280-85047-58		
16SS17-E3-FL01A-SO	280-85951-1		
16SS17-E3-SW01A-SO	280-85951-2		
16SS17-E3-SW02A-SO	280-85951-3		
16SS17-E3-SW03A-SO	280-85951-4		
16SS17-E3-SW04A-SO	280-85951-5		
16SS17-E3-FL02A-SO	280-85951-6		
16SS17-E3-SW05A-SO	280-85951-7	280-85951-1	F.18
16SS17-E3-SW06A-SO	280-85951-8		
16SS17-E3-FL06A-SO	280-85951-9		
16SS17-E3-SW07A-SO	280-85951-10		
16SS17-E3-SW08A-SO	280-85951-11		
16SS17-E3-SW54A-SO	280-85951-12		
16SS17-E3-EB01-WQ	280-85951-40		
16SS17-E3-FL10A-SO	FA35715-10		
16SS17-E3-FL13A-SO	FA35715-20	FA35715	F.19
16SS17-E3-FL11A-SO	FA35715-30		
16SS17-E3-FL09A-SO	FA35738-10		
16SS17-E3-FL16A-SO	FA35738-20		
16SS17-E3-SW18A-SO	FA35738-21		
16SS17-E3-SW19A-SO	FA35738-22		
16SS17-E3-SW20A-SO	FA35738-23		
16SS17-E3-SW21A-SO	FA35738-24		
16SS17-E3-SW22A-SO	FA35738-25		
16SS17-E3-SW23A-SO	FA35738-26		
16SS17-E3-SW24A-SO	FA35738-27	FA35738	F.20
16SS17-E3-SW25A-SO	FA35738-28		
16SS17-E3-SW09A-SO	FA35738-29		

16SS17-E3-SW10A-SO	FA35738-30		
16SS17-E3-SW30A-SO	FA35738-31		
16SS17-E3-SW11A-SO	FA35738-32		
16SS17-E3-SW12A-SO	FA35738-33		
16SS17-E3-SW13A-SO	FA35738-34		
16SS17-E3-FL12A-SO	FA35738-35		
16SS17-E3-FL17A-SO	FA35740-10	FA35740	F.21
16SS17-E3-FL19A-SO	FA35740-20		
16SS17-E3-FL23A-SO	FA35740-30		
16SS17-E3-FL30A-SO	FA35740-31		
16SS17-E3-FL20A-SO	FA35740-41		
16SS17-E3-SW14A-SO	FA35740-42		
16SS17-E3-SW15A-SO	FA35740-43		
16SS17-E3-SW16A-SO	FA35740-44		
16SS17-E3-SW17A-SO	FA35740-45		
16SS17-E3-SW31A-SO	FA35740-46		
16SS17-E3-EB01-SO	FA35740-47		
16SS17-E2-TCLP02-SO	FA35740-48		
16SS17-E3-SW26A-SO	FA35740-49		
16SS17-E3-SW27A-SO	FA35740-50		
16SS17-E3-SW28A-SO	FA35740-51		

Analyte	Cleanup Level	16LF03-E2-FL01A-SO-C	16LF03-E2-FL01A-SO-G	16LF03-E2-FL02A-SO-C	16LF03-E2-FL02A-SO-G	16LF03-E2-FL03A-SO-C	16LF03-E2-FL04A-SO-C	16LF03-E2-FL04A-SO-G	16LF03-E2-FL05A-SO-C	16LF03-E2-FL05A-SO-G
Aroclor 1016	NSC	0.016 U	NA	0.016 U	NA	0.016 U	0.016 U	NA	0.015 U	NA
Aroclor 1221	NSC	0.018 U	NA	0.018 U	NA	0.018 U	0.018 U	NA	0.017 U	NA
Aroclor 1232	NSC	0.016 U	NA	0.016 U	NA	0.016 U	0.016 U	NA	0.015 U	NA
Aroclor 1242	NSC	0.034 U	NA	0.035 U	NA	0.034 U	0.035 U	NA	0.034 U	NA
Aroclor 1248	NSC	0.021 U	NA	0.021 U	NA	0.021 U	0.021 U	NA	0.021 U	NA
Aroclor 1254	NSC	0.018 U	NA	0.018 U	NA	0.018 U	0.018 U	NA	0.017 U	NA
Aroclor 1260	NSC	0.0080 U	NA	0.0069 J	NA	0.0087 J	0.0083 U	NA	0.0079 U	NA
Aroclor 1262	NSC	0.034 U	NA	0.035 U	NA	0.034 U	0.035 U	NA	0.034 U	NA
Aroclor 1268	NSC	0.013 U	NA	0.013 U	NA	0.013 U	0.013 U	NA	0.012 U	NA
Total PCBs	1	NA	NA	0.0069 J	NA	0.0087 J	NA	NA	NA	NA
Lead	400	NA	5.4	NA	4.8	NA	NA	4.7	NA	5.0

Analyte	Cleanup Level	16LF03-E2-FL06A-SO-C	16LF03-E2-FL06A-SO-G	16LF03-E2-FL07A-SO-C	16LF03-E2-FL07A-SO-G	16LF03-E2-FL08A-SO-C	16LF03-E2-FL08A-SO-G	16LF03-E2-FL10A-SO-C	16LF03-E2-FL10A-SO-C Dup	16LF03-E2-FL10A-SO-G
Aroclor 1016	NSC	0.017 UQJ	NA	0.15 UJ	NA	0.070 U	NA	0.016 U	0.016 U	NA
Aroclor 1221	NSC	0.019 UQJ	NA	0.19 UJ	NA	0.089 U	NA	0.018 U	0.018 U	NA
Aroclor 1232	NSC	0.017 UQJ	NA	0.19 UJ	NA	0.087 U	NA	0.016 U	0.016 U	NA
Aroclor 1242	NSC	0.037 UQJ	NA	0.15 UJ	NA	0.070 U	NA	0.035 U	0.035 U	NA
Aroclor 1248	NSC	0.023 UQJ	NA	0.15 UJ	NA	0.070 U	NA	0.021 U	0.021 U	NA
Aroclor 1254	NSC	0.019 UQJ	NA	0.18 UJ	NA	0.084 U	NA	0.018 U	0.018 U	NA
Aroclor 1260	NSC	0.0087 UQJ	NA	2.1 J	NA	0.82	NA	0.0082 U	0.0082 U	NA
Aroclor 1262	NSC	0.037 UQ	NA	NA	NA	NA	NA	0.035 U	0.035 U	NA
Aroclor 1268	NSC	0.014 UQ	NA	NA	NA	NA	NA	0.013 U	0.013 U	NA
Total PCBs	1	NA	NA	2.1 J	NA	0.82	NA	NA	NA	NA
Lead	400	NA	5.1	NA	5.8	NA	4.1	NA	NA	5.5

Analyte	Cleanup Level	16LF03-E2-FL10A-SO-G Dup	16LF03-E2-FL11A-SO-C	16LF03-E2-FL11A-SO-G	16LF03-E2-FL12A-SO-C	16LF03-E2-FL12A-SO-G	16LF03-E2-FL13A-SO-C	16LF03-E2-FL13A-SO-G	16LF03-E2-FL14A-SO-C	16LF03-E2-FL14A-SO-G
Aroclor 1016	NSC	NA	0.017 U	NA	0.0080 U	NA	0.035 U	NA	0.039 U	NA
Aroclor 1221	NSC	NA	0.020 U	NA	0.010 U	NA	0.044 U	NA	0.050 U	NA
Aroclor 1232	NSC	NA	0.017 U	NA	0.010 U	NA	0.043 U	NA	0.049 U	NA
Aroclor 1242	NSC	NA	0.038 U	NA	0.0080 U	NA	0.035 U	NA	0.039 U	NA
Aroclor 1248	NSC	NA	0.023 U	NA	0.0080 U	NA	0.035 U	NA	0.039 U	NA
Aroclor 1254	NSC	NA	0.020 U	NA	0.0095 U	NA	0.042 U	NA	0.047 U	NA
Aroclor 1260	NSC	NA	0.016 J	NA	0.054	NA	0.78	NA	0.33	NA
Aroclor 1262	NSC	NA	0.038 U	NA	NA	NA	NA	NA	NA	NA
Aroclor 1268	NSC	NA	0.014 U	NA	NA	NA	NA	NA	NA	NA
Total PCBs	1	NA	0.016 J	NA	0.054	NA	0.78	NA	0.33	NA
Lead	400	6.6	NA	6.6	NA	11.5	NA	3.8	NA	4.2

Analyte	Cleanup Level	16LF03-E2-FL16A-SO-C	16LF03-E2-FL16A-SO-G	16LF03-E2-FL17A-SO-C	16LF03-E2-FL17A-SO-G	16LF03-E2-FL18A-SO-C	16LF03-E2-FL18A-SO-G	16LF03-E2-FL19A-SO-C	16LF03-E2-FL19A-SO-G	16LF03-E2-FL20A-SO-C
Aroclor 1016	NSC	0.015 U	NA	0.0070 U	NA	0.36 UJ	NA	0.15 UJ	NA	0.033 U
Aroclor 1221	NSC	0.017 U	NA	0.0089 U	NA	0.46 UJ	NA	0.19 UJ	NA	0.043 U
Aroclor 1232	NSC	0.015 U	NA	0.0088 U	NA	0.45 UJ	NA	0.19 UJ	NA	0.042 U
Aroclor 1242	NSC	0.034 U	NA	0.0070 U	NA	0.36 UJ	NA	0.15 UJ	NA	0.033 U
Aroclor 1248	NSC	0.020 U	NA	0.0070 U	NA	0.36 UJ	NA	0.15 UJ	NA	0.033 U
Aroclor 1254	NSC	0.017 U	NA	0.0084 U	NA	0.43 UJ	NA	0.18 UJ	NA	0.040 U
Aroclor 1260	NSC	0.037	NA	0.017 J	NA	7.9 J	NA	1.4 J	NA	0.30
Aroclor 1262	NSC	0.034 U	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1268	NSC	0.012 U	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs	1	0.037	NA	0.017 J	NA	7.9 J	NA	1.4 J	NA	0.30
Lead	400	NA	4.5	NA	5.2	NA	4.7	NA	3.9	NA

2016 Laboratory Confirmation Sample Results
LF003

Analyte	Cleanup Level	16LF03-E2-FL20A-SO-G	16LF03-E2-FL21A-SO-C	16LF03-E2-FL21A-SO-C Dup	16LF03-E2-FL21A-SO-G	16LF03-E2-FL21A-SO-G Dup	16LF03-E2-FL22A-SO-C	16LF03-E2-FL22A-SO-G	16LF03-E2-FL23A-SO-C	16LF03-E2-FL23A-SO-G
Aroclor 1016	NSC	NA	0.32 UJ	0.37 UJ	NA	NA	0.74 UJ	NA	0.77 UJ	NA
Aroclor 1221	NSC	NA	0.41 UJ	0.47 UJ	NA	NA	0.95 UJ	NA	0.99 UJ	NA
Aroclor 1232	NSC	NA	0.40 UJ	0.46 UJ	NA	NA	0.93 UJ	NA	0.97 UJ	NA
Aroclor 1242	NSC	NA	0.32 UJ	0.37 UJ	NA	NA	0.74 UJ	NA	0.77 UJ	NA
Aroclor 1248	NSC	NA	0.32 UJ	0.37 UJ	NA	NA	0.74 UJ	NA	0.77 UJ	NA
Aroclor 1254	NSC	NA	0.39 UJ	0.44 UJ	NA	NA	0.89 UJ	NA	0.92 UJ	NA
Aroclor 1260	NSC	NA	4.5 J	6.1 J	NA	NA	11.4 J	NA	14.9 J	NA
Aroclor 1262	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1268	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs	1	NA	4.5 J	6.1 J	NA	NA	11.4 J	NA	14.9 J	NA
Lead	400	7.1	NA	NA	6.5	5.4	NA	5.4	NA	5.2

Analyte	Cleanup Level	16LF03-E2-FL24A-SO-C	16LF03-E2-FL24A-SO-G	16LF03-E2-FL25A-SO-C	16LF03-E2-FL25A-SO-G	16LF03-E2-FL26A-SO-C	16LF03-E2-FL26A-SO-G	16LF03-E2-FL27A-SO-C	16LF03-E2-FL27A-SO-G	16LF03-E2-FL28A-SO-C
Aroclor 1016	NSC	0.74 UJ	NA	0.15 UJ	NA	0.078 U	NA	0.072 U	NA	0.036 U
Aroclor 1221	NSC	0.94 UJ	NA	0.19 UJ	NA	0.099 U	NA	0.092 U	NA	0.046 U
Aroclor 1232	NSC	0.92 UJ	NA	0.19 UJ	NA	0.097 U	NA	0.090 U	NA	0.045 U
Aroclor 1242	NSC	0.74 UJ	NA	0.15 UJ	NA	0.078 U	NA	0.072 U	NA	0.036 U
Aroclor 1248	NSC	0.74 UJ	NA	0.15 UJ	NA	0.078 U	NA	0.072 U	NA	0.036 U
Aroclor 1254	NSC	0.88 UJ	NA	0.18 UJ	NA	0.093 U	NA	0.086 U	NA	0.043 U
Aroclor 1260	NSC	8.7 J	NA	1.8 J	NA	0.68	NA	1.1	NA	0.61
Aroclor 1262	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1268	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs	1	8.7 J	NA	1.8 J	NA	0.68	NA	1.1	NA	0.61
Lead	400	NA	4.0	NA	4.2	NA	4.9	NA	4.7	NA

Analyte	Cleanup Level	16LF03-E2-FL28A-SO-G	16LF03-E2-FL29A-SO-C	16LF03-E2-FL29A-SO-G	16LF03-E2-FL30A-SO-C	16LF03-E2-FL30A-SO-C Dup	16LF03-E2-FL30A-SO-G	16LF03-E2-FL30A-SO-G Dup	16LF03-E2-FL31A-SO-C	16LF03-E2-FL31A-SO-G
Aroclor 1016	NSC	NA	0.0074 U	NA	0.16 U	0.16 U	NA	NA	0.18 UQJ	NA
Aroclor 1221	NSC	NA	0.0094 U	NA	0.18 U	0.18 U	NA	NA	0.20 UQJ	NA
Aroclor 1232	NSC	NA	0.0093 U	NA	0.16 U	0.16 U	NA	NA	0.18 UQJ	NA
Aroclor 1242	NSC	NA	0.0074 U	NA	0.35 U	0.35 U	NA	NA	0.39 UQJ	NA
Aroclor 1248	NSC	NA	0.0074 U	NA	0.21 U	0.21 U	NA	NA	0.24 UQJ	NA
Aroclor 1254	NSC	NA	0.0089 U	NA	0.18 U	0.18 U	NA	NA	0.17 DQJ	NA
Aroclor 1260	NSC	NA	0.056	NA	0.081 U	0.082 U	NA	NA	0.091 UQJ	NA
Aroclor 1262	NSC	NA	NA	NA	0.35 U	0.35 U	NA	NA	0.39 UQ	NA
Aroclor 1268	NSC	NA	NA	NA	0.13 U	0.13 U	NA	NA	0.14 UQ	NA
Total PCBs	1	NA	0.056	NA	NA	NA	NA	NA	0.17 DQJ	NA
Lead	400	4.6	NA	3.9	NA	NA	130	150	NA	120 J

Analyte	Cleanup Level	16LF03-E2-FL32A-S0-C	16LF03-E2-FL32A-SO-G	16LF03-E2-FL33A-SO-C	16LF03-E2-FL33A-SO-G	16LF03-E2-FL34A-SO-C	16LF03-E2-FL34A-SO-G	16LF03-E2-FL35A-SO-C	16LF03-E2-FL35A-SO-G	16LF03-E2-FL36A-SO-C
Aroclor 1016	NSC	0.15 U	NA	0.17 UQJ	NA	0.17 UQJ	NA	0.16 UQJ	NA	0.16 UQJ
Aroclor 1221	NSC	0.17 U	NA	0.20 UQJ	NA	0.19 UQJ	NA	0.18 UQJ	NA	0.18 UQJ
Aroclor 1232	NSC	0.15 U	NA	0.17 UQJ	NA	0.17 UQJ	NA	0.16 UQJ	NA	0.16 UQJ
Aroclor 1242	NSC	0.33 U	NA	0.38 UQJ	NA	0.36 UQJ	NA	0.34 UQJ	NA	0.35 UQJ
Aroclor 1248	NSC	0.20 U	NA	0.23 UQJ	NA	0.22 UQJ	NA	0.21 UQJ	NA	0.21 UQJ
Aroclor 1254	NSC	0.17 U	NA	0.39 DQJ	NA	0.19 UQJ	NA	0.18 DQJ	NA	0.51 DQJ
Aroclor 1260	NSC	0.076 U	NA	0.089 UQJ	NA	0.085 UQJ	NA	0.080 UQJ	NA	0.082 UQJ
Aroclor 1262	NSC	0.33 U	NA	0.38 UQ	NA	0.36 UQ	NA	0.34 UQ	NA	0.35 UQ
Aroclor 1268	NSC	0.12 U	NA	0.14 UQ	NA	0.13 UQ	NA	0.13 UQ	NA	0.13 UQ
Total PCBs	1	NA	NA	0.39 DQJ	NA	NA	NA	0.18 DQJ	NA	0.51 DQJ
Lead	400	NA	170	NA	290	NA	110	NA	820	NA

2016 Laboratory Confirmation Sample Results
LF003

Analyte	Cleanup Level	16LF03-E2-FL36A-SO-G	16LF03-E2-FL37A-SO-C	16LF03-E2-FL37A-SO-G	16LF03-E2-FL38A-SO-C	16LF03-E2-FL38A-SO-G	16LF03-E2-FL39A-SO-C	16LF03-E2-FL39A-SO-C Dup	16LF03-E2-FL39A-SO-G	16LF03-E2-FL39A-SO-G Dup
Aroclor 1016	NSC	NA	0.16 UQJ	NA	0.016 U	NA	0.018 U	0.018 U	NA	NA
Aroclor 1221	NSC	NA	0.19 UQJ	NA	0.018 U	NA	0.020 U	0.020 U	NA	NA
Aroclor 1232	NSC	NA	0.16 UQJ	NA	0.016 U	NA	0.018 U	0.018 U	NA	NA
Aroclor 1242	NSC	NA	0.36 UQJ	NA	0.035 U	NA	0.039 U	0.040 U	NA	NA
Aroclor 1248	NSC	NA	0.22 UQJ	NA	0.021 U	NA	0.024 U	0.024 U	NA	NA
Aroclor 1254	NSC	NA	0.29 DQJ	NA	0.018 U	NA	0.020 U	0.020 U	NA	NA
Aroclor 1260	NSC	NA	0.084 UQJ	NA	0.0083 U	NA	0.0092 U	0.0092 U	NA	NA
Aroclor 1262	NSC	NA	0.36 UQ	NA	0.035 U	NA	0.039 U	0.040 U	NA	NA
Aroclor 1268	NSC	NA	0.13 UQ	NA	0.013 U	NA	0.014 U	0.014 U	NA	NA
Total PCBs	1	NA	0.29 DQJ	NA	NA	NA	NA	NA	NA	NA
Lead	400	440	NA	350	NA	12	NA	NA	7.4	8.1

Analyte	Cleanup Level	16LF03-E2-FL40A-SO-C	16LF03-E2-FL40A-SO-G	16LF03-E2-FL41A-SO-C	16LF03-E2-FL41A-SO-G	16LF03-E2-FL42A-SO-C	16LF03-E2-FL42A-SO-G	16LF03-E2-FL43A-SO-C	16LF03-E2-FL43A-SO-G	16LF03-E2-SW01A-SO
Aroclor 1016	NSC	0.016 U	NA	0.020 UQ	NA	0.019 UQJ	NA	0.017 U	NA	NA
Aroclor 1221	NSC	0.018 U	NA	0.023 UQ	NA	0.022 UQJ	NA	0.020 U	NA	NA
Aroclor 1232	NSC	0.016 U	NA	0.020 UQ	NA	0.019 UQJ	NA	0.017 U	NA	NA
Aroclor 1242	NSC	0.035 U	NA	0.045 UQ	NA	0.042 UQJ	NA	0.038 U	NA	NA
Aroclor 1248	NSC	0.021 U	NA	0.027 UQ	NA	0.025 UQJ	NA	0.023 U	NA	NA
Aroclor 1254	NSC	0.018 U	NA	0.023 UQ	NA	0.022 UQJ	NA	0.020 U	NA	NA
Aroclor 1260	NSC	0.0082 U	NA	0.010 UQ	NA	0.0098 UQJ	NA	0.0089 U	NA	NA
Aroclor 1262	NSC	0.035 U	NA	0.045 UQ	NA	0.042 UQ	NA	0.038 U	NA	NA
Aroclor 1268	NSC	0.013 U	NA	0.016 UQ	NA	0.015 UQ	NA	0.014 U	NA	NA
Total PCBs	1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400	NA	5.0	NA	9.8	NA	7.9	NA	6.5	10

Analyte	Cleanup Level	16LF03-E2-SW01A-SO Dup	16LF03-E2-SW02A-SO	16LF03-E2-SW03A-SO	16LF03-E2-SW04A-SO	16LF03-E2-SW05A-SO	16LF03-E2-SW06A-SO	16LF03-E2-SW07A-SO	16LF03-E2-SW08A-SO	16LF03-E2-SW09A-SO
Aroclor 1016	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1262	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1268	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs	1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400	10	4.5	4.5	6.0	6.7	10	5.9	7.1	12

Analyte	Cleanup Level	16LF03-E2-SW10A-SO	16LF03-E2-SW11A-SO	16LF03-E2-SW11A-SO Dup	16LF03-E2-SW12A-SO	16LF03-E2-SW13A-SO	16LF03-E2-SW14A-SO	16LF03-E2-SW15A-SO	16LF03-E2-SW16A-SO	16LF03-E2-SW17A-SO
Aroclor 1016	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1262	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1268	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs	1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400	4.9	7.0	8.4	4.9	4.5	9.0	5.0	5.1	5.3

2016 Laboratory Confirmation Sample Results
LF003

Analyte	Cleanup Level	16LF03-E2-SW18A-SO	16LF03-E2-SW19A-SO	16LF03-E2-SW20A-SO	16LF03-E2-SW21A-SO	16LF03-E2-SW21A-SO Dup	16LF03-E2-SW22A-SO	16LF03-E2-SW23A-SO	16LF03-E2-SW24A-SO	16LF03-E2-SW25A-SO
Aroclor 1016	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1262	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1268	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs	1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400	5.1	17.9	7.6	3.3	2.7	3.1	3.3	3.4	5.5

Analyte	Cleanup Level	16LF03-E2-SW26A-SO	16LF03-E2-SW27A-SO	16LF03-E2-SW28A-SO	16LF03-E2-SW29A-SO	16LF03-E2-SW30A-SO	16LF03-E2-SW31A-SO	16LF03-E2-SW31A-SO Dup	16LF03-E2-SW32A-SO	16LF03-E2-SW33A-SO
Aroclor 1016	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1262	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1268	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs	1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400	3.6	4.1	4.6	3.4	5.4	3.6	3.3	3.6	6.4

Analyte	Cleanup Level	16LF03-E2-SW34A-SO	16LF03-E2-SW35A-SO	16LF03-E2-SW36A-SO	16LF03-E2-SW41A-SO	16LF03-E2-SW42A-SO	16LF03-E2-SW43A-SO	16LF03-E2-SW43A-SO Dup	16LF03-E2-SW44A-SO	16LF03-E2-SW45A-SO
Aroclor 1016	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1262	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1268	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs	1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400	4.5	7.0	9.2	140	8.0	22 J	16	56	2400

Analyte	Cleanup Level	16LF03-E2-SW46A-SO	16LF03-E2-SW47A-SO	16LF03-E2-SW48A-SO	16LF03-E2-SW49A-SO	16LF03-E2-SW50A-SO	16LF03-E2-SW51A-SO	16LF03-E2-SW52A-SO	16LF03-E2-SW53A-SO	16LF03-E2-SW54A-SO
Aroclor 1016	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1262	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1268	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs	1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400	610	570	310	160	460	270 J	7.5	7.1	8.3

2016 Laboratory Confirmation Sample Results
LF003

Analyte	Cleanup Level	16LF03-E2-SW55A-SO	16LF03-E2-SW56A-SO	16LF03-E2-SW57A-SO	16LF03-E2-SW57A-SO Dup	16LF03-E2-SW58A-SO	16LF03-E2-SW59A-SO	16LF03-E2-SW60A-SO	16LF03-E2-SW61A-SO	16LF03-E2-SW61A-SO Dup
Aroclor 1016	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1262	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1268	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs	1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400	7.3	7.3	5.6	5.3	6.1	7.0	5.5	9.6	11

Analyte	Cleanup Level	16LF03-E3-FL07A-SO	16LF03-E3-FL18A-SO	16LF03-E3-FL19A-SO	16LF03-E3-FL21A-SO	16LF03-E3-FL22A-SO	16LF03-E3-FL23A-SO	16LF03-E3-FL24A-SO	16LF03-E3-FL25A-SO	16LF03-E3-FL27A-SO
Aroclor 1016	NSC	0.18 UJ	0.030 U	0.38 UJ	0.074 U	0.037 U	0.37 UJ	0.076 U	0.015 U	0.0072 U
Aroclor 1221	NSC	0.23 UJ	0.038 U	0.49 UJ	0.094 U	0.047 U	0.47 UJ	0.096 U	0.019 U	0.0091 U
Aroclor 1232	NSC	0.23 UJ	0.037 U	0.48 UJ	0.092 U	0.046 U	0.47 UJ	0.095 U	0.019 U	0.0090 U
Aroclor 1242	NSC	0.18 UJ	0.030 U	0.38 UJ	0.074 U	0.037 U	0.37 UJ	0.076 U	0.015 U	0.0072 U
Aroclor 1248	NSC	0.18 UJ	0.030 U	0.38 UJ	0.074 U	0.037 U	0.37 UJ	0.076 U	0.015 U	0.0072 U
Aroclor 1254	NSC	0.22 UJ	0.036 U	0.46 UJ	0.088 U	0.044 U	0.44 UJ	0.090 U	0.018 U	0.0086 U
Aroclor 1260	NSC	1.8 J	0.19	5.9 J	1.7	0.60	1.9 J	0.63	0.19	0.13 J
Aroclor 1262	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1268	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs	1	1.8 J	0.19	5.9 J	1.7	0.60	1.9 J	0.63	0.19	0.13
Lead	400	NA	NA	NA	NA	NA	NA	NA	NA	NA

Analyte	Cleanup Level	16LF03-E3-FL35A-SO	16LF03-E3-FL36A-SO	16LF03-E3-SW01A-SO	16LF03-E3-SW02A-SO	16LF03-E3-SW03A-SO	16LF03-E3-SW04A-SO	16LF03-E3-SW05A-SO	16LF03-E3-SW06A-SO	16LF03-E3-SW07A-SO
Aroclor 1016	NSC	NA	NA	0.014 U	0.74 UJ	0.0071 U	0.028 U	0.074 U	0.029 U	0.0075 U
Aroclor 1221	NSC	NA	NA	0.018 U	0.95 UJ	0.0090 U	0.036 U	0.095 U	0.037 U	0.0096 U
Aroclor 1232	NSC	NA	NA	0.018 U	0.93 UJ	0.0088 U	0.035 U	0.093 U	0.036 U	0.0094 U
Aroclor 1242	NSC	NA	NA	0.014 U	0.74 UJ	0.0071 U	0.028 U	0.074 U	0.029 U	0.0075 U
Aroclor 1248	NSC	NA	NA	0.014 U	0.74 UJ	0.0071 U	0.028 U	0.074 U	0.029 U	0.0075 U
Aroclor 1254	NSC	NA	NA	0.017 U	0.89 UJ	0.0085 U	0.033 U	0.089 U	0.035 U	0.0090 U
Aroclor 1260	NSC	NA	NA	0.18	23.5 J	0.033	0.35	1.4	0.29	0.025
Aroclor 1262	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1268	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs	1	NA	NA	0.18	23.5 J	0.033	0.35	1.4	0.29	0.025
Lead	400	4.4	9.0	NA	NA	NA	NA	NA	NA	NA

Analyte	Cleanup Level	16LF03-E3-SW08A-SO	16LF03-E3-SW09A-SO	16LF03-E3-SW10A-SO	16LF03-E3-SW10A-SO Dup	16LF03-E3-SW11A-SO	16LF03-E3-SW12A-SO	16LF03-E3-SW13A-SO	16LF03-E3-SW14A-SO	16LF03-E3-SW15A-SO
Aroclor 1016	NSC	0.077 U	0.19 UJ	0.0081 U	0.0073 U	0.0080 U	0.0074 U	0.0074 U	0.074 U	0.015 U
Aroclor 1221	NSC	0.098 U	0.24 UJ	0.010 U	0.0093 U	0.010 U	0.0095 U	0.0094 U	0.094 U	0.019 U
Aroclor 1232	NSC	0.096 U	0.24 UJ	0.010 U	0.0091 U	0.010 U	0.0093 U	0.0092 U	0.092 U	0.019 U
Aroclor 1242	NSC	0.077 U	0.19 UJ	0.0081 U	0.0073 U	0.0080 U	0.0074 U	0.0074 U	0.074 U	0.015 U
Aroclor 1248	NSC	0.077 U	0.19 UJ	0.0081 U	0.0073 U	0.0080 U	0.0074 U	0.0074 U	0.074 U	0.015 U
Aroclor 1254	NSC	0.091 U	0.23 UJ	0.0097 U	0.0087 U	0.0095 U	0.0089 U	0.0088 U	0.088 U	0.018 U
Aroclor 1260	NSC	1.0	3.0 J	0.0081 UJ	0.047 J	0.0080 U	0.095	0.014 J	0.91	0.17
Aroclor 1262	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1268	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs	1	1.0	3.0 J	0.010 U	0.047	0.010 U	0.095	0.014 J	0.91	0.17
Lead	400	NA	NA	NA	NA	NA	NA	NA	NA	NA

2016 Laboratory Confirmation Sample Results
LF003

Analyte	Cleanup Level	16LF03-E3-SW16A-SO	16LF03-E3-SW17A-SO	16LF03-E3-SW18A-SO	16LF03-E3-SW19A-SO	16LF03-E3-SW20A-SO	16LF03-E3-SW20A-SO Dup	16LF03-E3-SW21A-SO	16LF03-E3-SW22A-SO	16LF03-E3-SW23A-SO
Aroclor 1016	NSC	0.075 U	0.0073 U	0.0071 U	1.0 UJ	0.029 U	0.035 U	0.0072 U	0.0088 U	NA
Aroclor 1221	NSC	0.096 U	0.0093 U	0.0090 U	1.3 UJ	0.038 U	0.044 U	0.0091 U	0.011 U	NA
Aroclor 1232	NSC	0.094 U	0.0091 U	0.0088 U	1.3 UJ	0.037 U	0.043 U	0.0090 U	0.011 U	NA
Aroclor 1242	NSC	0.075 U	0.0073 U	0.0071 U	1.0 UJ	0.029 U	0.035 U	0.0072 U	0.0088 U	NA
Aroclor 1248	NSC	0.075 U	0.0073 U	0.0071 U	1.0 UJ	0.029 U	0.035 U	0.0072 U	0.0088 U	NA
Aroclor 1254	NSC	0.090 U	0.0087 U	0.0084 U	1.2 UJ	0.035 U	0.041 U	0.0086 U	0.010 U	NA
Aroclor 1260	NSC	1.3	0.013 J	0.018	34 J	0.33	0.47	0.028	0.046	NA
Aroclor 1262	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1268	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs	1	1.3	0.013 J	0.018	34 J	0.33	0.47	0.028	0.046	NA
Lead	400	NA	NA	NA	NA	NA	NA	NA	NA	5.9 J

Analyte	Cleanup Level	16LF03-E3-SW23A-SO Dup	16LF03-E3-SW24A-SO	16LF03-E3-SW25A-SO	16LF03-E3-SW26A-SO	16LF03-E3-SW26A-SO Dup	16LF03-E3-SW27A-SO	16LF03-E3-SW28A-SO	16LF03-E3-SW29A-SO	16LF03-E3-SW30A-SO
Aroclor 1016	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1262	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1268	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs	1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400	3.3 J	21.8	89.4	507 J	455	543	8.2	15.4	338

Analyte	Cleanup Level	16LF03-E3-SW30A-SO Dup	16LF03-E4-FL07A-SO	16LF03-E4-FL19A-SO	16LF03-E4-FL21A-SO	16LF03-E4-FL23A-SO	16LF03-E4-SW01A-SO	16LF03-E4-SW01A-SO Dup	16LF03-E4-SW02A-SO	16LF03-E4-SW03A-SO
Aroclor 1016	NSC	NA	0.0075 U	0.0073 U	0.0076 U	0.0073 U	0.0076 U	0.0075 U	0.0073 U	0.0073 U
Aroclor 1221	NSC	NA	0.0095 U	0.0093 U	0.0097 U	0.0093 U	0.0097 U	0.0095 U	0.0093 U	0.0092 U
Aroclor 1232	NSC	NA	0.0094 U	0.0091 U	0.0095 U	0.0091 U	0.0095 U	0.0093 U	0.0092 U	0.0091 U
Aroclor 1242	NSC	NA	0.0075 U	0.0073 U	0.0076 U	0.0073 U	0.0076 U	0.0075 U	0.0073 U	0.0073 U
Aroclor 1248	NSC	NA	0.0075 U	0.0073 U	0.0076 U	0.0073 U	0.0076 U	0.0075 U	0.0073 U	0.0073 U
Aroclor 1254	NSC	NA	0.015 J	0.0087 U	0.0091 U	0.0087 U	0.0091 U	0.0089 U	0.018 U	0.0087 U
Aroclor 1260	NSC	NA	0.0075 U	0.0073 U	0.0076 U	0.0073 U	0.012 J	0.012 J	0.038	0.0073 U
Aroclor 1262	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1268	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs	1	NA	0.015 J	0.0091 U	0.0095 U	0.0091 U	0.012 J	0.012 J	0.038	0.0091 U
Lead	400	350	NA	NA	NA	NA	NA	NA	NA	NA

Analyte	Cleanup Level	16LF03-E4-SW04A-SO	16LF03-E4-SW05A-SO
Aroclor 1016	NSC	0.0077 U	0.0071 U
Aroclor 1221	NSC	0.0098 U	0.0091 U
Aroclor 1232	NSC	0.0096 U	0.0089 U
Aroclor 1242	NSC	0.0077 U	0.0071 U
Aroclor 1248	NSC	0.0077 U	0.0071 U
Aroclor 1254	NSC	0.0092 U	0.0085 U
Aroclor 1260	NSC	0.0077 U	0.0071 U
Aroclor 1262	NSC	NA	NA
Aroclor 1268	NSC	NA	NA
Total PCBs	1	0.0096 U	0.0089 U
Lead	400	NA	NA

Notes:
Analyte concentrations in mg/kg (ppm)
Analyses were performed by TestAmerica Seattle, using standard analytical methodology
Qualifiers:
U - Analyte analyzed for but undetected at the corresponding method detection or quantitation limit
D - Analyte identified at a primary, secondary, or tertiary dilution
J - Result is detected below the reporting limit and/or is an estimated concentration based on data assessment
Q - One or more quality control criteria failed.nt
NA - Not analyzed
NSC - No Screening Criteria
Exceeds ADEC 2016 Method Two Human Health Soil Cleanup Levels for Under 40-inch Zone

2016 Laboratory Confirmation Sample Results
SS016

Analyte	Cleanup Level	16SS16-E2-FL06A-SO-C	16SS16-E2-FL06A-SO-G	16SS16-E2-FL08A-SO-C	16SS16-E2-FL08A-SO-G	16SS16-E2-FL09A-SO-C	16SS16-E2-FL09A-SO-G	16SS16-E2-FL10A-SO-C	16SS16-E2-FL10A-SO-C Dup	16SS16-E2-FL10A-SO-G
Aroclor 1016	NSC	0.022 U	NA	0.022 U	NA	0.021 U	NA	0.022 UJ	0.023 U	NA
Aroclor 1221	NSC	0.011 U	NA	0.011 U	NA	0.010 U	NA	0.011 U	0.011 U	NA
Aroclor 1232	NSC	0.011 U	NA	0.011 U	NA	0.010 U	NA	0.011 U	0.011 U	NA
Aroclor 1242	NSC	0.0038 U	NA	0.0038 U	NA	0.0037 U	NA	0.0039 U	0.0039 U	NA
Aroclor 1248	NSC	0.011 U	NA	0.011 U	NA	0.010 U	NA	0.011 U	0.011 U	NA
Aroclor 1254	NSC	20 D	NA	0.31	NA	1.5	NA	86 DJ	29 DJ	NA
Aroclor 1260	NSC	0.0076 U	NA	0.092	NA	0.24	NA	0.0077 UJ	0.0079 U	NA
Aroclor 1262	NSC	0.0022 U	NA	0.0022 U	NA	0.0021 U	NA	0.0022 U	0.0023 U	NA
Aroclor 1268	NSC	0.0038 U	NA	0.0038 U	NA	0.0037 U	NA	0.0039 U	0.0039 U	NA
Total PCBs	1	20 D	NA	0.402	NA	1.74	NA	86 DJ	29 DJ	NA
Lead	400	NA	120	NA	110	NA	43	NA	NA	120 J

Analyte	Cleanup Level	16SS16-E2-FL10A-SO-G Dup	16SS16-E2-FL12A-SO-C	16SS16-E2-FL12A-SO-G	16SS16-E2-FL13A-SO-C	16SS16-E2-FL13A-SO-G	16SS16-E2-FL14A-SO-C	16SS16-E2-FL14A-SO-G	16SS16-E2-FL15A-SO-C	16SS16-E2-FL15A-SO-G
Aroclor 1016	NSC	NA	0.019 U	NA	0.021 U	NA	0.020 U	NA	0.020 U	NA
Aroclor 1221	NSC	NA	0.0097 U	NA	0.010 U	NA	0.010 U	NA	0.010 U	NA
Aroclor 1232	NSC	NA	0.0097 U	NA	0.010 U	NA	0.010 U	NA	0.010 U	NA
Aroclor 1242	NSC	NA	0.0034 U	NA	0.0036 U	NA	0.0035 U	NA	0.0036 U	NA
Aroclor 1248	NSC	NA	0.0097 U	NA	0.010 U	NA	0.010 U	NA	0.010 U	NA
Aroclor 1254	NSC	NA	1.0	NA	0.075	NA	0.24	NA	0.022	NA
Aroclor 1260	NSC	NA	2.3 D	NA	0.17	NA	0.88	NA	0.054	NA
Aroclor 1262	NSC	NA	0.0019 U	NA	0.0021 U	NA	0.0020 U	NA	0.0020 U	NA
Aroclor 1268	NSC	NA	0.0034 U	NA	0.0036 U	NA	0.0035 U	NA	0.0036 U	NA
Total PCBs	1	NA	3.3 D	NA	0.245	NA	1.12	NA	0.076	NA
Lead	400	540 J	NA	12	NA	28	NA	34	NA	28

Analyte	Cleanup Level	16SS16-E2-FL16A-SO-C	16SS16-E2-FL16A-SO-G	16SS16-E2-FL17A-SO-C	16SS16-E2-FL17A-SO-G	16SS16-E2-FL18A-S0-C	16SS16-E2-FL18A-SO-G	16SS16-E2-FL19A-SO-C	16SS16-E2-FL19A-SO-G	16SS16-E2-FL20A-SO-C
Aroclor 1016	NSC	0.020 U	NA	0.019 U	NA	0.019 U	NA	0.019 U	NA	0.020 U
Aroclor 1221	NSC	0.0098 U	NA	0.0094 U	NA	0.0097 U	NA	0.0094 U	NA	0.010 U
Aroclor 1232	NSC	0.0098 U	NA	0.0094 U	NA	0.0097 U	NA	0.0094 U	NA	0.010 U
Aroclor 1242	NSC	0.0034 U	NA	0.0033 U	NA	0.0034 U	NA	0.0033 U	NA	0.0035 U
Aroclor 1248	NSC	0.0098 U	NA	0.0094 U	NA	0.0097 U	NA	0.0094 U	NA	0.010 U
Aroclor 1254	NSC	0.20	NA	0.37	NA	0.0049 U	NA	0.0047 U	NA	0.37 J
Aroclor 1260	NSC	0.45	NA	0.90	NA	0.0048 J	NA	0.0066 U	NA	0.77 J
Aroclor 1262	NSC	0.0020 U	NA	0.0019 U	NA	0.0019 U	NA	0.0019 U	NA	0.0020 U
Aroclor 1268	NSC	0.0034 U	NA	0.0033 U	NA	0.0034 U	NA	0.0033 U	NA	0.0035 U
Total PCBs	1	0.65	NA	1.27	NA	0.0048 J	NA	0.0019 U	NA	1.14 J
Lead	400	NA	50	NA	19	NA	7.0	NA	7.2	NA

Analyte	Cleanup Level	16SS16-E2-FL20A-SO-C Dup	16SS16-E2-FL20A-SO-G	16SS16-E2-FL20A-SO-G Dup	16SS16-E2-FL21A-SO-C	16SS16-E2-FL21A-SO-G	16SS16-E2-FL22A-SO-C	16SS16-E2-FL22A-SO-G	16SS16-E2-FL23A-SO-C	16SS16-E2-FL23A-SO-G
Aroclor 1016	NSC	0.021 U	NA	NA	0.019 U	NA	0.019 U	NA	0.020 U	NA
Aroclor 1221	NSC	0.011 U	NA	NA	0.0097 U	NA	0.0094 U	NA	0.010 U	NA
Aroclor 1232	NSC	0.011 U	NA	NA	0.0097 U	NA	0.0094 U	NA	0.010 U	NA
Aroclor 1242	NSC	0.0037 U	NA	NA	0.0034 U	NA	0.0033 U	NA	0.0036 U	NA
Aroclor 1248	NSC	0.011 U	NA	NA	1.8 D	NA	0.16	NA	0.010 U	NA
Aroclor 1254	NSC	0.10 J	NA	NA	0.0049 U	NA	0.0047 U	NA	0.0051 U	NA
Aroclor 1260	NSC	0.32 J	NA	NA	2.7 D	NA	0.72	NA	0.030	NA
Aroclor 1262	NSC	0.0021 U	NA	NA	0.0019 U	NA	0.0019 U	NA	0.0020 U	NA
Aroclor 1268	NSC	0.0037 U	NA	NA	0.0034 U	NA	0.0033 U	NA	0.0036 U	NA
Total PCBs	1	0.42 J	NA	NA	4.5 D	NA	0.88	NA	0.03	NA
Lead	400	NA	220 J	170	NA	33	NA	6.2	NA	6.0

2016 Laboratory Confirmation Sample Results
SS016

Analyte	Cleanup Level	16SS16-E2-FL24A-SO-C	16SS16-E2-FL24A-SO-G	16SS16-E2-FL25A-SO-C	16SS16-E2-FL25A-SO-G	16SS16-E2-FL26A-SO-C	16SS16-E2-FL26A-SO-G	16SS16-E2-FL27A-SO-C	16SS16-E2-FL27A-SO-C Dup	16SS16-E2-FL27A-SO-G
Aroclor 1016	NSC	0.019 U	NA	0.020 U	NA	0.019 U	NA	0.020 U	0.019 U	NA
Aroclor 1221	NSC	0.0097 U	NA	0.0099 U	NA	0.0094 U	NA	0.010 U	0.0095 U	NA
Aroclor 1232	NSC	0.0097 U	NA	0.0099 U	NA	0.0094 U	NA	0.010 U	0.0095 U	NA
Aroclor 1242	NSC	0.0034 U	NA	0.0035 U	NA	0.0033 U	NA	0.0036 U	0.0033 U	NA
Aroclor 1248	NSC	0.35	NA	3.9 D	NA	0.093	NA	0.026 J	0.044 J	NA
Aroclor 1254	NSC	0.0048 U	NA	0.0049 U	NA	0.0047 U	NA	0.0051 U	0.0047 U	NA
Aroclor 1260	NSC	1.2	NA	8.2 D	NA	0.28	NA	0.047	0.070	NA
Aroclor 1262	NSC	0.0019 U	NA	0.0020 U	NA	0.0019 U	NA	0.0020 U	0.0019 U	NA
Aroclor 1268	NSC	0.0034 U	NA	0.0035 U	NA	0.0033 U	NA	0.0036 U	0.0033 U	NA
Total PCBs	1	1.55	NA	12.1 D	NA	0.373	NA	0.073 J	0.114 J	NA
Lead	400	NA	22	NA	92	NA	11	NA	NA	8.9

Analyte	Cleanup Level	16SS16-E2-FL27A-SO-G Dup	16SS16-E2-FL28A-SO-C	16SS16-E2-FL28A-SO-G	16SS16-E2-FL29A-SO-C	16SS16-E2-FL29A-SO-G	16SS16-E2-FL30A-SO-C	16SS16-E2-FL30A-SO-G	16SS16-E2-SW-21A-SO	16SS16-E2-SW01A-SO
Aroclor 1016	NSC	NA	0.63 UQJ	NA	0.15 U	NA	0.015 U	NA	NA	NA
Aroclor 1221	NSC	NA	0.71 UQJ	NA	0.17 U	NA	0.017 U	NA	NA	NA
Aroclor 1232	NSC	NA	0.63 UQJ	NA	0.15 U	NA	0.015 U	NA	NA	NA
Aroclor 1242	NSC	NA	1.4 UQJ	NA	0.32 U	NA	0.032 U	NA	NA	NA
Aroclor 1248	NSC	NA	0.83 UQJ	NA	0.20 U	NA	0.019 U	NA	NA	NA
Aroclor 1254	NSC	NA	0.71 UQJ	NA	0.17 U	NA	0.017 U	NA	NA	NA
Aroclor 1260	NSC	NA	6.0 DQJ	NA	2.2 D	NA	0.064	NA	NA	NA
Aroclor 1262	NSC	NA	1.4 UQ	NA	0.32 U	NA	0.032 U	NA	NA	NA
Aroclor 1268	NSC	NA	0.50 UQ	NA	0.12 U	NA	0.012 U	NA	NA	NA
Total PCBs	1	NA	6.0 DQJ	NA	2.2 D	NA	0.064	NA	NA	NA
Lead	400	7.3	NA	20	NA	94	NA	17	6.4	23

Analyte	Cleanup Level	16SS16-E2-SW02A-SO	16SS16-E2-SW03A-SO	16SS16-E2-SW04A-SO	16SS16-E2-SW05A-SO	16SS16-E2-SW06A-SO	16SS16-E2-SW07A-SO	16SS16-E2-SW08A-SO	16SS16-E2-SW09A-SO	16SS16-E2-SW10A-SO
Aroclor 1016	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1262	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1268	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs	1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400	34	38	6.9	8.4	18	21	6.6	7.2	57 J

Analyte	Cleanup Level	16SS16-E2-SW02A-SO	16SS16-E2-SW03A-SO	16SS16-E2-SW04A-SO	16SS16-E2-SW05A-SO	16SS16-E2-SW06A-SO	16SS16-E2-SW07A-SO	16SS16-E2-SW08A-SO	16SS16-E2-SW09A-SO	16SS16-E2-SW10A-SO
Aroclor 1016	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1262	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1268	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs	1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400	34	38	6.9	8.4	18	21	6.6	7.2	57 J

2016 Laboratory Confirmation Sample Results
SS016

Analyte	Cleanup Level	16SS16-E2-SW10A-SO Dup	16SS16-E2-SW11A-SO	16SS16-E2-SW12A-SO	16SS16-E2-SW13A-SO	16SS16-E2-SW14A-SO	16SS16-E2-SW15A-SO	16SS16-E2-SW16A-SO	16SS16-E2-SW17A-SO	16SS16-E2-SW18A-SO
Aroclor 1016	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1262	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1268	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs	1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400	83	36 J	7.0	7.3	9.1	30	31	32	20

Analyte	Cleanup Level	16SS16-E2-SW19A-SO	16SS16-E2-SW20A-SO	16SS16-E2-SW20A-SO Dup	16SS16-E2-TCLP01-SO	16SS16-E3-FL12A-SO	16SS16-E3-FL17A-SO	16SS16-E3-FL21A-SO	16SS16-E3-FL24A-SO	16SS16-E3-FL25A-SO
Aroclor 1016	NSC	NA	NA	NA	NA	0.021 U	0.018 U	0.021 U	0.020 U	0.021 U
Aroclor 1221	NSC	NA	NA	NA	NA	0.010 U	0.0088 U	0.010 U	0.010 U	0.011 U
Aroclor 1232	NSC	NA	NA	NA	NA	0.010 U	0.0088 U	0.010 U	0.010 U	0.011 U
Aroclor 1242	NSC	NA	NA	NA	NA	0.0036 U	0.0031 U	0.0036 U	0.0035 U	0.0037 U
Aroclor 1248	NSC	NA	NA	NA	NA	0.29	0.27	0.086	1.1	1.5
Aroclor 1254	NSC	NA	NA	NA	NA	0.0052 U	0.0044 U	0.0051 U	0.0050 U	0.0053 U
Aroclor 1260	NSC	NA	NA	NA	NA	0.67	0.77	0.13	1.2 D	4.1 D
Aroclor 1262	NSC	NA	NA	NA	NA	0.0021 U	0.0018 U	0.0021 U	0.0020 U	0.0021 U
Aroclor 1268	NSC	NA	NA	NA	NA	0.0036 U	0.0031 U	0.0036 U	0.0035 U	0.0037 U
Total PCBs	1	NA	NA	NA	NA	0.96	1.04	0.216	2.3 D	5.6 D
Lead	400	100	190 J	350 J	150 J	NA	NA	NA	NA	NA

Analyte	Cleanup Level	16SS16-E3-FL28A-SO	16SS16-E3-SW01A-SO	16SS16-E3-SW02A-SO	16SS16-E3-SW03A-SO	16SS16-E3-SW04A-SO	16SS16-E3-SW05A-SO	16SS16-E3-SW05A-SO Dup	16SS16-E3-SW06A-SO	16SS16-E3-SW07A-SO
Aroclor 1016	NSC	0.020 U	0.020 U	0.023 U	0.020 U	0.019 U	0.018 UJ	0.021 U	0.020 U	0.022 U
Aroclor 1221	NSC	0.010 U	0.0099 U	0.011 U	0.010 U	0.0097 U	0.0090 U	0.010 U	0.010 U	0.011 U
Aroclor 1232	NSC	0.010 U	0.0099 U	0.011 U	0.010 U	0.0097 U	0.0090 U	0.010 U	0.010 U	0.011 U
Aroclor 1242	NSC	0.0036 U	0.0035 U	0.0040 U	0.0035 U	0.0034 U	0.0031 U	0.0037 U	0.0035 U	0.0038 U
Aroclor 1248	NSC	3.5 D	1.3	1.9	0.95	0.097	0.51 J	0.86 J	0.22	0.011 U
Aroclor 1254	NSC	0.0051 U	0.0049 U	0.0056 U	0.0050 U	0.0048 U	0.0045 U	0.0052 U	0.0051 U	0.0054 U
Aroclor 1260	NSC	7.9 D	2.5 D	5.6 D	1.7 D	0.15	1.6 DJ	4.4 DJ	0.34	0.013
Aroclor 1262	NSC	0.0020 U	0.0020 U	0.0023 U	0.0020 U	0.0019 U	0.0018 U	0.0021 U	0.0020 U	0.0022 U
Aroclor 1268	NSC	0.0036 U	0.0035 U	0.0040 U	0.0035 U	0.0034 U	0.0031 U	0.0037 U	0.0035 U	0.0038 U
Total PCBs	1	11.4 D	3.8 D	7.5 D	2.65 D	0.247	2.11 DJ	5.26 DJ	0.56	0.013
Lead	400	NA	NA	NA	NA	NA	NA	NA	NA	NA

Analyte	Cleanup Level	16SS16-E3-SW08A-SO	16SS16-E3-SW09A-SO	16SS16-E3-SW10A-SO	16SS16-E3-SW10A-SO Dup	16SS16-E3-SW11A-SO	16SS16-E3-SW12A-SO	16SS16-E3-SW13A-SO	16SS16-E3-SW14A-SO	16SS16-E4-FL24A-SO
Aroclor 1016	NSC	0.020 U	0.019 U	0.019 UJ	0.021 U	0.019 U	0.019 U	0.020 U	0.020 U	0.018 U
Aroclor 1221	NSC	0.0098 U	0.0096 U	0.0095 U	0.011 U	0.0097 U	0.0097 U	0.010 U	0.010 U	0.0089 U
Aroclor 1232	NSC	0.0098 U	0.0096 U	0.0095 U	0.011 U	0.0097 U	0.0097 U	0.010 U	0.010 U	0.0089 U
Aroclor 1242	NSC	0.0034 U	0.0034 U	0.0033 U	0.0038 U	0.0034 U	0.0034 U	0.0035 U	0.0035 U	0.0031 U
Aroclor 1248	NSC	0.66	0.31	0.16 J	0.57 J	0.41	0.51	0.92	0.34	0.39
Aroclor 1254	NSC	0.0049 U	0.0048 U	0.0048 U	0.0054 U	0.0048 U	0.0049 U	0.0050 U	0.0050 U	0.0044 U
Aroclor 1260	NSC	0.91	0.26	0.27 J	0.72	0.67	1.1	1.8	1.3	0.83
Aroclor 1262	NSC	0.0020 U	0.0019 U	0.0019 UJ	0.0021 UJ	0.0019 U	0.0019 U	0.0020 U	0.0020 U	0.0018 U
Aroclor 1268	NSC	0.0034 U	0.0034 U	0.0033 U	0.0038 U	0.0034 U	0.0034 U	0.0035 U	0.0035 U	0.0031 U
Total PCBs	1	1.57	0.57	0.43 J	1.29 J	1.08	1.61	2.72	1.64	1.22
Lead	400	NA	NA	NA	NA	NA	NA	NA	NA	NA

2016 Laboratory Confirmation Sample Results
SS016

Analyte	Cleanup Level	16SS16-E4-FL28A-SO	16SS16-E4-SW01A-SO	16SS16-E4-SW01A-SO Dup	16SS16-E4-SW02A-SO	16SS16-E4-SW03A-SO	16SS16E2-SW22A-SO
Aroclor 1016	NSC	0.20 U	0.22 UJ	0.20 U	0.22 U	0.021 U	NA
Aroclor 1221	NSC	0.10 U	0.11 UJ	0.10 U	0.11 U	0.011 U	NA
Aroclor 1232	NSC	0.10 U	0.11 UJ	0.10 U	0.11 U	0.011 U	NA
Aroclor 1242	NSC	0.035 U	0.039 UJ	0.036 U	0.039 U	0.0037 U	NA
Aroclor 1248	NSC	8.0 D	13 DJ	16 D	4.2 D	0.34	NA
Aroclor 1254	NSC	0.050 U	0.055 UJ	0.051 U	0.055 U	0.0053 U	NA
Aroclor 1260	NSC	14 D	13 DJ	18 D	21 D	0.92	NA
Aroclor 1262	NSC	0.020 U	0.022 U	0.020 U	0.022 U	0.0021 U	NA
Aroclor 1268	NSC	0.035 U	0.039 U	0.036 U	0.039 U	0.0037 U	NA
Total PCBs	1	22 D	26 DJ	34 D	25.2 D	1.26	NA
Lead	400	NA	NA	NA	NA	NA	47

Notes:
Analyte concentrations in mg/kg (ppm)
Analyses were performed by TestAmerica Seattle, using standard analytical methodology
Qualifiers:
U - Analyte analyzed for but undetected at the corresponding method detection or quantitation limit
D - Analyte identified at a primary, secondary, or tertiary dilution
J - Result is detected below the reporting limit and/or is an estimated concentration based on data assessment
Q - One or more quality control criteria failed.nt
NA - Not analyzed
NSC - No Screening Criteria
Exceeds ADEC 2016 Method Two Human Health Soil Cleanup Levels for Under 40-inch Zone

2016 Laboratory Confirmation Sample Results
SS017

Analyte	Cleanup Level	16SS17-E2-FL01A-SO-C	16SS17-E2-FL01A-SO-G	16SS17-E2-FL02A-SO-C	16SS17-E2-FL03A-SO-C	16SS17-E2-FL03A-SO-G	16SS17-E2-FL04A-SO-C	16SS17-E2-FL04A-SO-G	16SS17-E2-FL05A-SO-C	16SS17-E2-FL05A-SO-G
Aroclor 1016	NSC	0.17 U	NA	0.083 U	0.017 U	NA	0.034 U	NA	0.034 U	NA
Aroclor 1221	NSC	0.19 U	NA	0.094 U	0.019 U	NA	0.038 U	NA	0.039 U	NA
Aroclor 1232	NSC	0.17 U	NA	0.083 U	0.017 U	NA	0.034 U	NA	0.034 U	NA
Aroclor 1242	NSC	0.37 U	NA	0.18 U	0.038 U	NA	0.074 U	NA	0.076 U	NA
Aroclor 1248	NSC	0.22 U	NA	0.11 U	0.023 U	NA	0.045 U	NA	0.046 U	NA
Aroclor 1254	NSC	3.2 D	NA	1.2 D	0.27	NA	0.34 D	NA	0.30 D	NA
Aroclor 1260	NSC	0.086 U	NA	0.042 U	0.0088 U	NA	0.017 U	NA	0.018 U	NA
Aroclor 1262	NSC	0.37 U	NA	0.18 U	0.038 U	NA	0.074 U	NA	0.076 U	NA
Aroclor 1268	NSC	0.13 U	NA	0.066 U	0.014 U	NA	0.027 U	NA	0.028 U	NA
Total PCBs	1	3.2 D	NA	1.2 D	0.27	NA	0.34 D	NA	0.3 D	NA
Lead	400	NA	110	NA	NA	25	NA	20	NA	21

Analyte	Cleanup Level	16SS17-E2-FL06A-SO-C	16SS17-E2-FL06A-SO-G	16SS17-E2-FL07A-SO-C	16SS17-E2-FL07A-SO-G	16SS17-E2-FL08A-SO-C	16SS17-E2-FL08A-SO-G	16SS17-E2-FL09A-SO-C	16SS17-E2-FL09A-SO-G	16SS17-E2-FL10A-SO-C
Aroclor 1016	NSC	1.6 UQJ	NA	0.017 U	NA	0.18 U	NA	0.080 U	NA	0.077 U
Aroclor 1221	NSC	1.9 UQJ	NA	0.019 U	NA	0.20 U	NA	0.091 U	NA	0.087 U
Aroclor 1232	NSC	1.6 UQJ	NA	0.017 U	NA	0.18 U	NA	0.080 U	NA	0.077 U
Aroclor 1242	NSC	3.6 UQJ	NA	0.036 U	NA	0.40 U	NA	0.18 U	NA	0.17 U
Aroclor 1248	NSC	2.2 UQJ	NA	0.022 U	NA	0.24 U	NA	0.11 U	NA	0.10 U
Aroclor 1254	NSC	13 DQJ	NA	0.25	NA	0.20 U	NA	1.0 D	NA	0.93 D
Aroclor 1260	NSC	0.84 UQJ	NA	0.0085 U	NA	0.092 U	NA	0.041 U	NA	0.040 U
Aroclor 1262	NSC	3.6 UQ	NA	0.036 U	NA	0.40 U	NA	0.18 U	NA	0.17 U
Aroclor 1268	NSC	1.3 UQ	NA	0.013 U	NA	0.14 U	NA	0.064 U	NA	0.062 U
Total PCBs	1	13 DQJ	NA	0.25	NA	0.092 U	NA	1 D	NA	0.93 D
Lead	400	NA	140	NA	26	NA	15	NA	1400	NA

Analyte	Cleanup Level	16SS17-E2-FL10A-SO-C Dup	16SS17-E2-FL10A-SO-G	16SS17-E2-FL10A-SO-G Dup	16SS17-E2-FL13A-SO-C	16SS17-E2-FL13A-SO-G	16SS17-E2-FL14A-SO-C	16SS17-E2-FL14A-SO-G	16SS17-E2-FL15A-SO-C	16SS17-E2-FL15A-SO-G
Aroclor 1016	NSC	0.082 U	NA	NA	0.16 U	NA	0.033 U	NA	0.069 U	NA
Aroclor 1221	NSC	0.093 U	NA	NA	0.18 U	NA	0.037 U	NA	0.078 U	NA
Aroclor 1232	NSC	0.082 U	NA	NA	0.16 U	NA	0.033 U	NA	0.069 U	NA
Aroclor 1242	NSC	0.18 U	NA	NA	0.35 U	NA	0.072 U	NA	0.15 U	NA
Aroclor 1248	NSC	0.11 U	NA	NA	0.21 U	NA	0.044 U	NA	0.092 U	NA
Aroclor 1254	NSC	1.5 D	NA	NA	2.3 D	NA	0.30 D	NA	0.81 D	NA
Aroclor 1260	NSC	0.042 U	NA	NA	0.082 U	NA	0.017 U	NA	0.035 U	NA
Aroclor 1262	NSC	0.18 U	NA	NA	0.35 U	NA	0.072 U	NA	0.15 U	NA
Aroclor 1268	NSC	0.066 U	NA	NA	0.13 U	NA	0.026 U	NA	0.055 U	NA
Total PCBs	1	1.5 D	NA	NA	2.3 D	NA	0.3 D	NA	0.81 D	NA
Lead	400	NA	79 J	34 J	NA	110	NA	30	NA	11

Analyte	Cleanup Level	16SS17-E2-FL16A-SO-C	16SS17-E2-FL16A-SO-G	16SS17-E2-FL17A-SO-C	16SS17-E2-FL17A-SO-G	16SS17-E2-FL19A-SO-C	16SS17-E2-FL19A-SO-G	16SS17-E2-FL20A-SO-C	16SS17-E2-FL20A-SO-C Dup	16SS17-E2-FL20A-SO-G
Aroclor 1016	NSC	0.65 UQJ	NA	0.34 U	NA	0.079 U	NA	0.68 UQJ	0.32 U	NA
Aroclor 1221	NSC	0.74 UQJ	NA	0.38 U	NA	0.089 U	NA	0.77 UQJ	0.36 U	NA
Aroclor 1232	NSC	0.65 UQJ	NA	0.34 U	NA	0.079 U	NA	0.68 UQJ	0.32 U	NA
Aroclor 1242	NSC	1.4 UQJ	NA	0.74 U	NA	0.17 U	NA	1.5 UQJ	0.71 U	NA
Aroclor 1248	NSC	0.87 UQJ	NA	0.45 U	NA	0.11 U	NA	0.91 UQJ	0.43 U	NA
Aroclor 1254	NSC	7.8 DQJ	NA	4.9 D	NA	1.4 D	NA	6.3 DQJ	4.2 D	NA
Aroclor 1260	NSC	0.34 UQJ	NA	0.17 U	NA	0.040 U	NA	0.35 UQJ	0.16 U	NA
Aroclor 1262	NSC	1.4 UQ	NA	0.74 U	NA	0.17 U	NA	1.5 UQ	0.71 U	NA
Aroclor 1268	NSC	0.52 UQ	NA	0.27 U	NA	0.063 U	NA	0.55 UQ	0.26 U	NA
Total PCBs	1	7.8 DQJ	NA	4.9 D	NA	1.4 D	NA	6.3 DQJ	4.2 D	NA
Lead	400	NA	270	NA	130	NA	75	NA	NA	89 J

2016 Laboratory Confirmation Sample Results
SS017

Analyte	Cleanup Level	16SS17-E2-FL20A-SO-G Dup	16SS17-E2-FL23A-SO-C	16SS17-E2-FL23A-SO-G	16SS17-E2-SW01A-SO	16SS17-E2-SW02A-SO	16SS17-E2-SW03A-SO	16SS17-E2-SW04A SO	16SS17-E2-SW05A-SO	16SS17-E2-SW06A-SO
Aroclor 1016	NSC	NA	0.33 UQ	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	NSC	NA	0.38 UQ	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	NSC	NA	0.33 UQ	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	NSC	NA	0.73 UQ	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NSC	NA	0.45 UQ	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254	NSC	NA	4.7 DQ	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NSC	NA	0.17 UQ	NA	NA	NA	NA	NA	NA	NA
Aroclor 1262	NSC	NA	0.73 UQ	NA	NA	NA	NA	NA	NA	NA
Aroclor 1268	NSC	NA	0.27 UQ	NA	NA	NA	NA	NA	NA	NA
Total PCBs	1	NA	4.7 DQ	NA	NA	NA	NA	NA	NA	NA
Lead	400	120	NA	48	8.7	85	9.9	9.4	28	22

Analyte	Cleanup Level	16SS17-E2-SW07A-SO	16SS17-E2-SW08A-SO	16SS17-E2-SW09A-SO	16SS17-E2-SW10A-SO	16SS17-E2-SW11A-SO	16SS17-E2-SW12A-SO	16SS17-E2-SW13A SO	16SS17-E2-SW14A-SO	16SS17-E2-SW15A-SO
Aroclor 1016	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1262	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1268	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs	1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400	16	77 Q	90 Q	34 Q	12 Q	9.4 Q	8.5 Q	6.7	8.0

Analyte	Cleanup Level	16SS17-E2-SW16A-SO	16SS17-E2-SW17A-SO	16SS17-E2-SW18A-SO	16SS17-E2-SW19A-SO	16SS17-E2-SW20A-SO	16SS17-E2-SW21A-SO	16SS17-E2-SW22A SO	16SS17-E2-SW23A-SO	16SS17-E2-SW24A-SO
Aroclor 1016	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1262	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1268	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs	1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400	28 Q	620 QJ	32 Q	150 J	490	10	66	73	8.2

Analyte	Cleanup Level	16SS17-E2-SW25A-SO	16SS17-E2-SW26A-SO	16SS17-E2-SW27A-SO	16SS17-E2-SW27A-SO-Dup	16SS17-E2-SW28A-SO	16SS17-E2-SW29A-SO	16SS17-E2-SW30A SO	16SS17-E2-SW31A-SO	16SS17-E2-SW32A-SO
Aroclor 1016	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1262	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1268	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs	1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400	38 Q	19 Q	18 Q	17 Q	90 Q	11 Q	13 Q	6.7	19 Q

2016 Laboratory Confirmation Sample Results
SS017

Analyte	Cleanup Level	16SS17-E2-SW07A-SO-Dup	16SS17-E2-SW17A-SO-Dup	16SS17-E3-FL02A-SO	16SS17-E3-FL06A-SO	16SS17-E3-FL09A-SO	16SS17-E3-FL10A-SO	16SS17-E3-FL11A-SO	16SS17-E3-FL12A-SO	16SS17-E3-FL13A-SO
Aroclor 1016	NSC	NA	NA	0.016 U	0.16 U	0.014 U	0.037 U	0.036 U	0.079 U	0.20 UJ
Aroclor 1221	NSC	NA	NA	0.018 U	0.19 U	0.018 U	0.047 U	0.046 U	0.10 U	0.25 UJ
Aroclor 1232	NSC	NA	NA	0.016 U	0.16 U	0.017 U	0.046 U	0.045 U	0.099 U	0.25 UJ
Aroclor 1242	NSC	NA	NA	0.035 U	0.36 U	0.014 U	0.037 U	0.036 U	0.079 U	0.20 UJ
Aroclor 1248	NSC	NA	NA	0.021 U	0.22 U	0.014 U	0.037 U	0.036 U	0.079 U	0.20 UJ
Aroclor 1254	NSC	NA	NA	0.28	1.6 D	0.19	0.67	0.79	0.64	1.4 J
Aroclor 1260	NSC	NA	NA	0.0083 U	0.084 U	0.014 U	0.037 U	0.036 U	0.079 U	0.20 UJ
Aroclor 1262	NSC	NA	NA	0.035 U	0.36 U	NA	NA	NA	NA	NA
Aroclor 1268	NSC	NA	NA	0.013 U	0.13 U	NA	NA	NA	NA	NA
Total PCBs	1	NA	NA	0.28	1.6 D	0.19	0.67	0.79	0.64	1.4 J
Lead	400	18 Q	32 QJ	NA	NA	41.5 J	NA	NA	NA	NA

Analyte	Cleanup Level	16SS17-E3-FL16A-SO	16SS17-E3-FL17A-SO	16SS17-E3-FL19A-SO	16SS17-E3-FL20A-SO	16SS17-E3-FL23A-SO	16SS17-E3-FL23A-SO Dup	16SS17-E3-SW01A SO	16SS17-E3-SW02A-SO	16SS17-E3-SW03A-SO
Aroclor 1016	NSC	0.16 UJ	0.35 UJ	0.15 UJ	0.077 U	0.0073 U	0.015 U	0.070 UQJ	0.016 U	0.063 U
Aroclor 1221	NSC	0.20 UJ	0.45 UJ	0.19 UJ	0.098 U	0.0093 U	0.019 U	0.079 UQJ	0.019 U	0.071 U
Aroclor 1232	NSC	0.20 UJ	0.44 UJ	0.19 UJ	0.096 U	0.0091 U	0.018 U	0.070 UQJ	0.016 U	0.063 U
Aroclor 1242	NSC	0.16 UJ	0.35 UJ	0.15 UJ	0.077 U	0.0073 U	0.015 U	0.15 UQJ	0.036 U	0.14 U
Aroclor 1248	NSC	0.16 UJ	0.35 UJ	0.15 UJ	0.077 U	0.0073 U	0.015 U	0.093 UQJ	0.022 U	0.084 U
Aroclor 1254	NSC	3.3 J	5.9 J	1.6 J	0.98	0.13	0.21	0.58 DQJ	0.032 J	0.70 D
Aroclor 1260	NSC	0.16 UJ	0.35 UJ	0.15 UJ	0.077 U	0.0073 U	0.015 U	0.036 UQJ	0.0084 U	0.032 U
Aroclor 1262	NSC	NA	NA	NA	NA	NA	NA	0.15 UQ	0.036 U	0.14 U
Aroclor 1268	NSC	NA	NA	NA	NA	NA	NA	0.056 UQ	0.013 U	0.050 U
Total PCBs	1	3.3 J	5.9 J	1.6 J	0.98	0.13	0.21	0.58 DQJ	0.032 J	0.7 D
Lead	400	NA	NA	NA	NA	NA	NA	NA	NA	NA

Analyte	Cleanup Level	16SS17-E3-SW04A-SO	16SS17-E3-SW05A-SO	16SS17-E3-SW06A-SO	16SS17-E3-SW07A-SO	16SS17-E3-SW08A-SO	16SS17-E3-SW08A-SO Dup	16SS17-E3-SW09A SO	16SS17-E3-SW10A-SO	16SS17-E3-SW10A-SO Dup
Aroclor 1016	NSC	0.076 U	0.017 U	0.017 U	0.015 U	0.015 U	0.063 U	0.028 U	0.073 U	0.14 UJ
Aroclor 1221	NSC	0.086 U	0.019 U	0.020 U	0.017 U	0.017 U	0.071 U	0.036 U	0.093 U	0.18 UJ
Aroclor 1232	NSC	0.076 U	0.017 U	0.017 U	0.015 U	0.015 U	0.063 U	0.036 U	0.092 U	0.18 UJ
Aroclor 1242	NSC	0.17 U	0.037 U	0.038 U	0.033 U	0.034 U	0.14 U	0.028 U	0.073 U	0.14 UJ
Aroclor 1248	NSC	0.10 U	0.022 U	0.023 U	0.020 U	0.020 U	0.084 U	0.028 U	0.073 U	0.14 UJ
Aroclor 1254	NSC	1.0 D	0.086	0.022 J	0.22	0.19 J	0.73 DJ	0.30	0.86 J	1.2 J
Aroclor 1260	NSC	0.039 U	0.0085 U	0.0089 U	0.0076 U	0.0079 U	0.032 U	0.028 U	0.073 U	0.14 UJ
Aroclor 1262	NSC	0.17 U	0.037 U	0.038 U	0.033 U	0.034 U	0.14 U	NA	NA	NA
Aroclor 1268	NSC	0.061 U	0.013 U	0.014 U	0.012 U	0.012 U	0.050 U	NA	NA	NA
Total PCBs	1	1 D	0.086	0.022 J	0.22	0.19 J	0.73 DJ	0.3	0.86 J	1.2 J
Lead	400	NA	NA	NA	NA	NA	NA	NA	NA	NA

Analyte	Cleanup Level	16SS17-E3-SW11A-SO	16SS17-E3-SW12A-SO	16SS17-E3-SW13A-SO	16SS17-E3-SW14A-SO	16SS17-E3-SW15A-SO	16SS17-E3-SW16A-SO	16SS17-E3-SW17A SO	16SS17-E3-SW17A-SO Dup	16SS17-E3-SW18A-SO
Aroclor 1016	NSC	0.40 UJ	0.078 U	0.076 U	0.18 UJ	0.072 U	0.071 U	0.14 UJ	0.14 UJ	0.0068 U
Aroclor 1221	NSC	0.51 UJ	0.10 U	0.096 U	0.23 UJ	0.092 U	0.091 U	0.18 UJ	0.18 UJ	0.0086 U
Aroclor 1232	NSC	0.50 UJ	0.098 U	0.094 U	0.23 UJ	0.090 U	0.089 U	0.18 UJ	0.18 UJ	0.0085 U
Aroclor 1242	NSC	0.40 UJ	0.078 U	0.076 U	0.18 UJ	0.072 U	0.071 U	0.14 UJ	0.14 UJ	0.0068 U
Aroclor 1248	NSC	0.40 UJ	0.078 U	0.076 U	0.18 UJ	0.072 U	0.071 U	0.14 UJ	0.14 UJ	0.0068 U
Aroclor 1254	NSC	8.3 J	1.6	0.99	3.5 J	1.5	0.99	2.2 J	1.9 J	0.014 J
Aroclor 1260	NSC	0.40 UJ	0.078 U	0.076 U	0.18 UJ	0.072 U	0.071 U	0.14 UJ	0.14 UJ	0.0068 U
Aroclor 1262	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1268	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs	1	8.3 J	1.6	0.99	3.5 J	1.5	0.99	2.2 J	1.9 J	0.014 J
Lead	400	NA	NA	NA	NA	NA	NA	NA	NA	660

2016 Laboratory Confirmation Sample Results
SS017

Analyte	Cleanup Level	16SS17-E3-SW19A-SO	16SS17-E3-SW20A-SO	16SS17-E3-SW21A-SO	16SS17-E3-SW22A-SO	16SS17-E3-SW23A-SO	16SS17-E3-SW24A-SO	16SS17-E3-SW25A SO	16SS17-E3-SW26A-SO	16SS17-E3-SW27A-SO
Aroclor 1016	NSC	0.028 U	0.0070 U	0.071 U	0.73 UJ	0.029 U	0.0079 U	0.028 U	0.0073 U	0.077 U
Aroclor 1221	NSC	0.035 U	0.0089 U	0.091 U	0.93 UJ	0.037 U	0.010 U	0.036 U	0.0093 U	0.098 U
Aroclor 1232	NSC	0.035 U	0.0087 U	0.089 U	0.92 UJ	0.036 U	0.0099 U	0.035 U	0.0091 U	0.096 U
Aroclor 1242	NSC	0.028 U	0.0070 U	0.071 U	0.73 UJ	0.029 U	0.0079 U	0.028 U	0.0073 U	0.077 U
Aroclor 1248	NSC	0.028 U	0.0070 U	0.071 U	0.73 UJ	0.029 U	0.0079 U	0.028 U	0.0073 U	0.077 U
Aroclor 1254	NSC	0.20	0.015 J	0.76	18.4 J	0.38	0.023	0.26	0.0093 J	0.94
Aroclor 1260	NSC	0.028 U	0.0070 U	0.071 U	0.73 UJ	0.029 U	0.0079 U	0.028 U	0.0073 U	0.077 U
Aroclor 1262	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1268	NSC	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs	1	0.2	0.015 J	0.76	18.4 J	0.38	0.023	0.26	0.0093 J	0.94
Lead	400	29.8	8.3	43.3	2160	NA	NA	NA	NA	NA

Analyte	Cleanup Level	16SS17-E3-SW28A-SO
Aroclor 1016	NSC	0.029 U
Aroclor 1221	NSC	0.037 U
Aroclor 1232	NSC	0.036 U
Aroclor 1242	NSC	0.029 U
Aroclor 1248	NSC	0.029 U
Aroclor 1254	NSC	0.23
Aroclor 1260	NSC	0.029 U
Aroclor 1262	NSC	NA
Aroclor 1268	NSC	NA
Total PCBs	1	0.23
Lead	400	NA

Notes:
Analyte concentrations in mg/kg (ppm)
Analyses were performed by Accutest Laboratories or TestAmerica Denver, using standard analytical methodology
Qualifiers:
U - Analyte analyzed for but undetected at the corresponding method detection or quantitation limit
J - Result is detected below the reporting limit and/or is an estimated concentration based on data assessment
D - Analyte identified at a primary, secondary, or tertiary dilution
Q - One or more quality control criteria failed.
NA - Not Analyzed
NSC - No Screening Criteria
Exceeds ADEC 2016 Method Two Human Health Soil Cleanup Levels for Under 40-inch Zone

APPENDIX F

ADEC Checklists - due to document size limitations, digital checklists are included as separate files

APPENDIX G

Quality Assurance Summaries

Appendix G - Quality Assurance Summary
Environmental Restoration Report, Cape Romanzof Long Range Radar Station, Alaska, Site LF003 – Landfill No. 2

1. Precision

a. Field Duplicate

2 duplicate samples were collected for 16 pre-mobilization soil samples for PCB analysis:

- Sample 16LF03-17B-SO is the field duplicate of 16LF03-11B-SO
- Sample 16LF03-18A-SO is the field duplicate of 16LF03-01A-SO

17 duplicate samples were collected for 149 sidewall and floor soil samples for PCB and Lead analyses:

- Sample 16LF03-E2-FL60A-SO is the field duplicate of 16LF03-E2-FL10A-SO
- Sample 16LF03-E2-FL61A-SO is the field duplicate of 16LF03-E2-FL21A-SO
- Sample 16LF03-E2-FL63A-SO is the field duplicate of 16LF03-E2-FL39A-SO
- Sample 16LF03-E2-FL62A-SO is the field duplicate of 16LF03-E2-FL30A-SO
- Sample 16LF03-E2-SW80A-SO is the field duplicate of 16LF03-E2-SW01A-SO
- Sample 16LF03-E2-SW81A-SO is the field duplicate of 16LF03-E2-SW11A-SO
- Sample 16LF03-E2-SW82A-SO is the field duplicate of 16LF03-E2-SW21A-SO
- Sample 16LF03-E2-SW83A-SO is the field duplicate of 16LF03-E2-SW31A-SO
- Sample 16LF03-E2-SW84A-SO is the field duplicate of 16LF03-E2-SW43A-SO
- Sample 16LF03-E2-SW85A-SO is the field duplicate of 16LF03-E2-SW57A-SO
- Sample 16LF03-E2-SW86A-SO is the field duplicate of 16LF03-E2-SW61A-SO
- Sample 16LF03-E3-SW50A-SO is the field duplicate of 16LF03-E3-SW10A-SO
- Sample 16LF03-E3-SW51A-SO is the field duplicate of 16LF03-E3-SW20A-SO
- Sample 16LF03-E3-SW52A-SO is the field duplicate of 16LF03-E3-SW23A-SO
- Sample 16LF03-E3-SW53A-SO is the field duplicate of 16LF03-E3-SW26A-SO
- Sample 16LF03-E3-SW54A-SO is the field duplicate of 16LF03-E3-SW30A-SO
- Sample 16LF03-E4-SW20A-SO is the field duplicate of 16LF03-E4-SW01A-SO

2 duplicate samples were collected for 5 surface water samples for PCB and Lead analyses:

- Sample 16LF03-02A-SW is the field duplicate of 16LF03-01A-SW
- Sample 16LF03-E2-06A-WS is the field duplicate of 16LF03-E2-01A-WS

The following analytes were positively identified or detected in sample and/or duplicate and had an RPD higher than 50%. For results higher than LOQs, the Relative Percent Differences (RPDs) between sample and duplicate are used to evaluate field duplicate precision. For results lower than LOQs, the relative differences (Δ) are used to evaluate field duplicate precision. For soil samples, RPD should be less than 50% or the Δ should be less than LOQ. The results where RPD>50% or Δ >LOQ were highlighted in the tables below. Associated results were qualified as "J". The higher concentration was used to compare with the project action limits.

Analytes	16LF03-01A-SO	16LF03-18A-SO	RPD	Δ	RL
Total PCB	13 DQJ	1.2 DQJ	166	11.8	2.2
Analytes	16LF03-E3-SW10A-SO	16LF03-E3-SW50A-SO	RPD	Δ	RL
Total PCB	0.01 U	0.047	130	0.037	0.02
Analytes	16LF03-E3-SW23A-SO	16LF03-E3-SW52A-SO	RPD	Δ	RL
Lead	5.9	3.3	57	2.6	1.2

Analyte concentrations in mg/kg (ppm).

b. LCS /LCSD-RPD met DoD QSM 5.0 criteria

c. MS/MSD-RPD

PCB:

MS/MSD-RPD met DoD QSM 5.0 criteria.

Lead:

The RPD between MS/MSD for Lead performed on sample 16LF03-E2-FL31A-SO (280-85281-23) was 26%, which is also out of control limit of 20%.

The RPD between MS and MSD for Lead performed on sample 16LF03-E3-SW23A-SO (FA35791-30) was 23.6%, which is out of the control limit of 20%.

The high RPD is due to possible sample non-homogeneity.

d. Lab Duplicate

The RPDP associated with sample 16LF03-E2-EB05-WQ (FA35396-27) and MP30597-D1 (Lab Duplicate) for Lead are 200%, which is outside control limit 20%.

The RPD associated with sample 16LF03-E2-EB04-WQ (FA35397-19) and MP30597-D1 (Lab Duplicate) for Lead are 200%, which is outside control limit 20%.

The RPD between sample 16LF03-E3-SW23A-SO (FA35731-30) and its lab duplicate MP30659-D1 was 33.7%, which is out of the control limit of 20%.

The high RPD is due to possible sample non-homogeneity.

e. Serial Dilution

The RPD for Serial Dilution for Lead associated with sample 16LF03-E2-EB05-WQ (FA35396-27) was 100%, which is out of the control limit 10%. However, the percent difference is acceptable due to low initial sample concentration (< 50 times IDL).

The RPD for Serial Dilution for Lead associated with sample 16LF03-E2-EB04-WQ (FA35397-19) was 100%, which is out of the control limit 10%. However, the percent difference is acceptable due to low initial sample concentration (< 50 times IDL).

2. Accuracy

a. LCS/LCSD Recoveries met DoD QSM 5.0 criteria.

b. MS/MSD Recoveries

PCB:

The recoveries of MS and MSD for PCB-1260 performed on sample 16LF03-01A-SO were -9617% and -9423% respectively, which are out of the control limit range of 53-140%.

The recoveries of MS and MSD for PCB-1260 performed on sample 16LF03-12B-SO were 451% and 514% respectively, which are out of control limit range of 53-140%

The recoveries of MS and MSD for Lead performed on sample 16LF03-E2-SW45A-SO were 74% and 23%, which are out of the control limit of 80-120%.

The recoveries of MS and MSD performed on sample 16LF03-E2-FL21A-SO (FA35397-9) for PCB-1016 were both 0%, which are outside control limits 58-126%.

The recoveries of MS and MSD performed on sample 16LF03-E2-FL21A-SO (FA35397-9) for PCB-1260 were -665% and -432%, which are outside control limits 59-133%. Outside control limits due to high level in sample relative to spike amount.

The recoveries of MS and MSD for PCB-1260 performed on sample 16LF03-E3-FL27A-SO (FA35731-2) were 37% and 19% respectively, which are out of the control limit of 53-140%.

The exceeded recoveries of MS/MSD are probable due to matrix interference. The effect on data quality is minor; however, affected samples are flagged by lab or BEM reviewer. Data usability is acceptable.

Note: in reports FA35711 and FA35716, the sample performed for MS/MSD was sample 16SS17-E3-FL10A-SO (FA35715-10) from another SDG FA35715. The recoveries of MS and MSD performed on sample 16SS17-E3-FL10A-SO (FA35715-10) for PCB-1260 were 144% and 145% respectively, which are outside control limits of 53-140%. Probable cause is due to matrix interference.

Lead:

The recoveries of MS and MSD for Lead performed on sample 16LF03-E2-FL31A-SO (280-85281-23) were 63% and 153% respectively, which are out of the control limit range of 81-112%.

The recoveries of MS and MSD for Lead performed on sample 16LF03-E2-SW51A-SO (280-85281-31) were 78% and 57% respectively, which are out of the control limit range of 81-112%.

The recoveries of MS and MSD for Lead performed on sample 16LF03-E2-SW45A-SO (280-85281-42) were 74% and 23%, which are out of the control limit of 80-120%.

The recoveries of MS and MSD for Lead performed on sample 16LF03-E3-SW26A-SO (FA35731-33) were -261.4% and 8.1% which is out of the control limit of 81-112%.

c. Surrogate Recoveries

The surrogate recoveries of Decachlorobiphenyl (DCB for following samples failed low: 16LF03-01A-SO (0%), 16LF03-02A-SO (44%), 16LF03-03B-SO (46%), 16LF03-04B-SO (50%), 16LF03-05A-SO (45%), 16LF03-06A-SO (44%), 16LF03-07B-SO (41%), 16LF03-08A-SO (0%), 16LF03-09B-SO (42%), 16LF03-10B-SO (33%), 16LF03-12B-SO (41%), 16LF03-13A-SO (46%), 16LF03-14C-SO (57%), 16LF03-17B-SO (56%) and 16LF03-18A-SO (36%), which are out of control limit range of 59-130%.

The recoveries of surrogate Decachlorobiphenyl (DCB) in samples 16LF03-E2-FL41A-SO (280-85281-5), 16LF03-E2-FL42A-SO (280-85281-6) and 16LF03-E2-FL06A-SO (280-85281-37) were 50%, 53% and 58% respectively, which are out of control limit of 59-130%.

The recoveries of surrogate Decachlorobiphenyl (DCB) in samples 16LF03-E2-FL31A-SO, 16LF03-E2-FL33A-SO, 16LF03-E2-FL34A-SO, 16LF03-E2-FL35A-SO, 16LF03-E2-FL36A-SO and 16LF03-E2-FL37A-SO were 48%, 41%, 24%, 43%, 45% and 40% respectively, which are out of the control limit range of 59-130%.

The recoveries of surrogate Tetrachloro-m-xylene for samples 16LF03-E2-FL25A-SO (FA35396-5), 16LF03-E2-FL24A-SO (FA35396-6) and 16LF03-E2-FL23A-SO (FA35396-7) were all 0%, which are out of the control limits 44-126%.

The recoveries of surrogate Decachlorobiphenyl for samples 16LF03-E2-FL25A-SO (FA35396-5), 16LF03-E2-FL24A-SO (FA35396-6) and 16LF03-E2-FL23A-SO (FA35396-7) were all 0%, which are out of the control limits 41-145%.

The recoveries of surrogate Tetrachloro-m-xylene for samples 16LF03-E2-FL07A-SO (FA35397-1), 16LF03-E2-FL18A-SO (FA35397-7), 16LF03-E2-FL19A-SO (FA35397-8), 16LF03-E2-FL21A-SO (FA35397-9), 16LF03-E2-FL61A-SO (FA35397-10), 16LF03-E2-FL22A-SO (FA35397-11) were all 0%, which are out of control limit of 44-126%.

The recoveries of surrogate Decachlorobiphenyl for samples 16LF03-E2-FL07A-SO (FA35397-1), 16LF03-E2-FL18A-SO (FA35397-7), 16LF03-E2-FL19A-SO (FA35397-8), 16LF03-E2-FL21A-SO (FA35397-9), 16LF03-E2-FL61A-SO (FA35397-10), 16LF03-E2-FL22A-SO (FA35397-11) were all 0%, which are out of the control limits 41-145%.

The recoveries of surrogate Tetrachloro-m-xylene for sample 16LF03-E3-FL07A-SO (FA35711-10) and 16LF03-E3-FL19A-SO (FA35711-44) were both 0%, which are outside control limits of 44-126%.

The recoveries of surrogate Decachlorobiphenyl for sample 16LF03-E3-FL07A-SO (FA35711-10) and 16LF03-E3-FL19A-SO (FA35711-44) were both 0%, which are outside control limits of 41-145%.

The recoveries of surrogates Tetrachloro-m-xylene and Decachlorobiphenyl for sample 16LF03-E3-FL23A-SO (FA35716-16) were both 0%, which are outside control limits of 44-126% and 41-145% respectively.

The recoveries of surrogates Tetrachloro-m-xylene and Decachlorobiphenylf for Samples 16LF03-E3-SW02A-SO (FA35731-7), 16LF03-E3-SW09A-SO (FA35731-14) and 16LF03-E3-SW19A-SO (FA35731-25) are all 0%, which are out of control limit 44-130% and 41-145% respectively.

Most of these samples were analyzed at dilutions due to abundance of target analytes. Because of the dilution, the surrogate spike concentrations in the samples were reduced to a level where the recovery calculation does not provide useful information. Data quality and usability are acceptable.

3. Representativeness

a. BEM considers the associated samples fully representative of the site.

b. The data collected is consistent with the approved work plan/sampling and analysis plan.

4. Comparability

These results are comparable to other results that are collected using standard sample collection and analysis methods.

5. Completeness

All data are acceptable to use. This meets the 90% completeness goal set for the project.

6. Sensitivity

a. The PQLs of the analyzed parameters are below the applicable ADEC Method Two Soil

Cleanup Levels in Under 40 inch Zone Soils except the following variances:

For sample 16LF03-01A-SO, 16LF03-08A-SO, and 16LF03-E3-SW19A-SO some Aroclor PQL values are above the Cleanup Level. However, in each of these samples there was one Aroclor detection above the Cleanup Level, so there is no data quality or usability effect due to the PQL values that are above the Cleanup Level.

PCB:

The following samples appear to contain a mixture of PCB-1254 & PCB-1260: 16LF03-E2-FL35A-SO (280-85281-27), 16LF03-E2-FL36A-SO (280-85281-28) and 16LF03-E2-FL37A-SO (280-85281-29). The samples have been quantified and reported as PCB-1254 as PCB-1254 appears to be the most prevalent of the Aroclors. Due to these Aroclors having shared peaks there is increased qualitative and quantitative uncertainty associated with this result.

Lead:

Multiple samples have elevated reporting limits for Lead due to matrix interference. However, this did not cause the reporting limits to exceed the Cleanup level.

c. Method Blank (MB)

All method blanks are non-detected.

d. Trip Blank (TB)

No trip blank samples were collected since there were no volatile analyses requested.

e. Equipment Blank (EB)

All equipment blank samples are non-detected.

Appendix G - Quality Assurance Summary
Environmental Restoration Report, Cape Romanzof Long Range Radar Station, Alaska, Site SS016 – Upper Tram Terminal

1. Precision

a. Field Duplicate

3 duplicate samples were collected for 31 floor soil samples requested PCB and Lead analyses:

- 16SS16-E2-FL50A-SO is a field duplicate of 16SS16-E2-FL10A-SO
- 16SS16-E2-FL51A-SO id a filed duplicate of 16SS16-E2-FL20A-SO
- 16SS16-E2-FL52A-SO is a field duplicate of 16SS16-E2-FL27A-SO

5 duplicate samples were collected for 44 sidewall soil samples requested Lead analysis:

- 16SS16-E2-SW50A-SO is a field duplicate of 16SS16-E2-SW10A-SO
- 16SS16-E2-SW51A-SO is a field duplicate of 16SS16-E2- SW20A-SO
- 16SS16-E3-SW40A-SO is a field duplicate of 16SS16-E3-SW05A-SO
- 16SS16-E3-SW41A-SO is a field duplicate of 16SS16-E3-SW10A-SO
- 16SS16-E4-SW20A-SO is a field duplicate of 16SS16-E4-SW01A-SO

The following analytes were positively identified or detected in sample and/or duplicate. For results higher than LOQs, the Relative Percent Differences (RPDs) between sample and duplicate are used to evaluate field duplicate precision. For results lower than LOQs, the relative differences (Δ) are used to evaluate field duplicate precision. For soil samples, RPD should be less than 50% or the Δ should be less than LOQ. The results where RPD>50% or Δ >LOQ were highlighted in the tables below. Associated results were qualified as "J". The higher concentration was used to compare with the project action limits.

Analytes	16SS16-E2-FL20A-SO	16SS16-E2-FL51A-SO	RPD %	Δ	RL
PCB-1254	0.37	0.10	114.9	0.27	0.011
PCB 1260	0.77 J	0.32	82.6	0.45	0.011
Analytes	16SS16-E2-FL27A-SO	16SS16-E2-FL52A-SO	RPD %	Δ	RL
PCB 1248	0.026	0.044	51.4	0.018	0.011
Analytes	16SS16-E3-SW05A-SO	16SS16-E3-SW40A-SO	RPD	Δ	RL
PCB 1248	0.51	0.86	51.1	0.35	0.011
PCB 1260	1.5	4.4	93.3	2.8	0.1
Analytes	16SS16-E2-SW20A-SO	16SS16-E2-SW51A-SO	RPD %	Δ	RL
Lead	190 J	350	59	160	1.5
Analytes	16SS16-E2-FL10A-SO	16SS16-E2-FL50A-SO	RPD %	Δ	RL
PCB 1254	86	29	99	57	0.011
Lead	120	540	127	420	1.5
Analytes	16SS16-E3-SW10A-SO	16SS16-E3-SW41A-SO	RPD %	Δ	RL
PCB 1248	0.16	0.57	112	0.41	0.011
PCB 1262	0.27 J	0.72	90.9	0.45	0.011

Analyte concentrations in mg/kg (ppm).

b. LCS /LCSD-RPD met DoD QSM 5.0 criteria

c. MS/MSD-RPD

PCB:

The MS/MSD RPD of PCB-1260 for sample 16SS16-E2-FL20A-SO was 36%, which is out of control limit 30%

The MS/MSD RPD of PCB-1260 for sample 16SS16-E4-SW01A-SO was 122%, which is out of the control criteria 30%.

The reason is that there are high concentrations of PCB-1248 and PCB-1260 in the parent sample that this MS/MSD was performed on. Therefore, the MS and MSD could not be evaluated for accuracy and precision. The associated laboratory control sample / laboratory control sample duplicate (LCS/LCSD) did meet acceptance criteria and provide evidence that operating procedures were in control.

Lead:

The MS/MSD RPD of Lead for sample 16SS16-E2-SW10A-SO was 36%, which is out of the control limit 20%.

The MS/MSD RPD of Lead for sample 16SS16-E2-SW11A-SO was 25%, which is out of control limit 20%.

The MS/MSD RPD of Lead for sample16SS16-E2-SW20A-SO was 104%, which is out of control limit 20%.

These variances are caused by non-homogeneity of the samples. Even though the data quality is reduced due to the issues noted above, the data remain usable, as qualified, for the intended purpose, except that BEM recommends consideration of further evaluation of associated sample locations (FL06A, FL08A, FL10A) with reported concentrations of 100 ppm or higher of lead. These results are qualified with "J" qualifiers and are associated with the 104% RPD referenced above.

2. Accuracy

a. LCS/LCSD Recoveries met DoD QSM 5.0 criteria.

b. MS/MSD Recoveries

PCB:

For sample 16SS16-E2-FL20A-SO, the MS/MSD recoveries of PCB-1260 were -328% and -106%, which are out of the control limit 53-140%.

For sample 16SS16-E3-SW05A-SO, the MS/MSD recoveries for PCB-1016 were 19% and 20%, which are out of the control limit 47-134%. The MS/MSD recoveries for PCB-1260, -839% and -831%, that are out of control limit 53-140%. The reason is that there are high concentrations of PCB-1248 and PCB-1260 in the parent sample that this MS/MSD was performed on. Therefore, the MS and MSD could not be evaluated for accuracy and precision.

For sample16SS16-E3-SW10A-SO, the MS/MSD recoveries for PCB-1016 were both 0%, which are out of control limit 47-134%. The recoveries of MS/MSD for PCB-1260 were 35% and -26% respectively, which are out of control limit 53-140%.

For sample 16SS16-E4-SW01A-SO, the MS/MSD recoveries for PCB-1016 were 0% and 0%, which are out of the control limit 47-134%. The MS/MSD recoveries for PCB-1260, 33343% and -1154%, that are out of control limit 53-140%. The reason is that there are high concentrations of PCB-1248 and PCB-

1260 in the parent sample that this MS/MSD was performed on. Therefore, the MS and MSD could not be evaluated for accuracy and precision

Lead:

For sample 16SS16-E2-FL20A-SO, the MS and MSD recoveries were -50% and -113%, which are out of control limit 81-112%.

For sample 16SS16-E2-SW10A-SO, the MS and MSD recoviers were 147% and 60% respectively, which are out of the control limit 81-112%.

For sample 16SS16-E2-SW11A-SO, the MSD recovery was 138%, which is out of control limit 81-112%.

For sample16SS16-E2-SW20A-SO, the MS and MSD recoveries were 297% and 1899% respectively, which are out of control limit 81-112%.

c. Surrogate Recoveries

The CCV 580-224136/54 for surrogate DCB Decachlorobiphenyl was -21.9%, which is outside control limit 20%. Associated samples have both surrogates Tetrachloro-m-xylene and DCB Decachlorobiphenyl within the % Recovery criteria; therefore only the surrogate data has been reported and flagged "Q" per DOD QSM.

Surrogate recoveries met the DoD QSM 5.0 control limits except the variances listed in table below:

Sample	Method	Surrogate	Recovery
16SS16-E2-FL28A-SO	8082A	Decachlorobiphenyl	0%
16SS16-E3-EB01-WQ	8082A	Tetrachloro-m-xylene	127%
16SS16-E4-SW01A-	8082a	DCB Decachlorobipheny	0%

These variances are attributed to matrix interferences. Associated LCS/LCSD recoveries are within control limit; data quality reduction is indicated by application of “J” qualifier.

3. Representativeness

a. BEM considers the associated samples fully representative of the site.P

b. The data collected is consistent with the approved workplan/sampling and analysis plan.

4. Comparability

The sample results can be compared to other results obtained using comparable standard sample collection and analysis methodologies.

5. Completeness

All data are acceptable to use. This meets the 90% completeness goal set for the project.

6. Sensitivity

a. The PQLs of the analyzed parameters are below the applicable ADEC Method Two Soil

Cleanup Levels in Under 40 inch Zone Soils

b. PCB quantification and elevated Reporting Limits (RLs) due to sample dilution

PCB:

The following samples contained more than one Aroclor with insufficient separation to quantify individually. The PCBs present are quantified as the predominant Aroclor: 16SS16-E3-FL12A-SO (580-

61450-17), 16SS16-E3-FL17A-SO (580-61450-18), 16SS16-E3-SW10A-SO (580-61450-19), 16SS16-E3-SW10A-SO (580-61450-19[MS]), 16SS16-E3-SW10A-SO (580-61450-19[MSD]), 16SS16-E3-SW41A-SO (580-61450-20), 16SS16-E3-SW11A-SO (580-61450-21), 16SS16-E3-SW12A-SO (580-61450-22), 16SS16-E3-SW13A-SO (580-61450-23), 16SS16-E3-SW14A-SO (580-61450-24) and 16SS16-E2-FL08A-SO (580-61450-26). Due to peak overlap the PCBs in the sample do not exactly match any of the laboratory's Aroclor standards used for instrument calibration. Due to the poor match with the Aroclor standards, there is increased qualitative and quantitative uncertainty associated with this result.

The following samples required a 100X dilution due to the nature of the sample matrix: 16SS16-E2-FL10A-SO (580-61450-12), 16SS16-E2-FL50A-SO (580-61450-13) and 16SS16-E2-FL06A-SO (580-61450-14). The reporting limits were raised accordingly.

c. Method Blank (MB)

TCLP:

For method blank LB 280-333177/1-B, Lead was detected as 0.0798 mg/L, which is above DL= 0.013 mg/L but below ½ LOQ =0.5 mg/L. The corrective action was deemed unnecessary. The value should be considered an estimate and has been flagged “J” on affected sample 16SS16-E2-TCLP01-SO.

Although Lead was detected and reported as estimated values in the method blanks, the concentration of the compounds are much lower than the LOQ. No data quality or usability are affected.

d. Trip Blank (TB)

No trip blank samples were collected since there is no volatile analytes requested.

e. Equipment Blank (EB)

Analytes in equipment blanks are non-detected or less than the highest value among 1/2 LOQ, 1/10 sample results, and 1/10 regulatory standard.

Appendix G - Quality Assurance Summary
Environmental Restoration Report, Cape Romanzof Long Range Radar Station, Alaska, Site SS017 – Lower Tram Terminal

Data quality and usability are acceptable for intended purposes as qualified.

1. Precision

a. Field Duplicate

1 duplicate sample was collected for 6 pre-mobilization soil samples requested PCBs analysis:

- Sample 16SS17-08B-SO is the field duplicate of 16SS17-02B-SO

3 duplicate samples were collected for 31 floor soil samples requested PCB and Lead analyses:

- Sample 16SS17-E2-FL40A-SO is the field duplicate of 16SS17-E2-FL10A-SO
- Sample 16SS17-E2-FL41A-SO is the field duplicate of 16SS17-E2-FL20A-SO
- Sample 16SS17-E3-FL30A-SO is the field duplicate for 16SS17-E3-FL23A-SO

6 duplicate samples were collected for 61 sidewall soil samples requested Lead analysis:

- Sample 16SS17-E2-SW50A-SO is the field duplicate of 16SS17-E2-SW07A-SO
- Sample 16SS17-E2-SW51A-SO is the field duplicate of 16SS17-E2-SW17A-SO
- Sample 16SS17-E2-SW52A-SO is the field duplicate of 16SS17-E2-SW27A-SO
- Sample 16SS17-E3-SW54A-SO is the field duplicate of 16SS17-E3-SW08A-SO
- Sample 16SS17-E3-SW30A-SO is the field duplicate of 16SS17-E3-SW10A-SO
- Sample 16SS17-E3-SW31A-SO is the field duplicate of 16SS17-E3-SW17A-SO

The following analytes were positively identified or detected in sample and/or duplicate. For results higher than LOQs, the Relative Percent Differences (RPDs) between sample and duplicate are used to evaluate field duplicate precision. For results lower than LOQs, the relative differences (Δ) are used to evaluate field duplicate precision. For soil samples, RPD should be less than 50% or the Δ should be less than LOQ. The results where RPD>50% or Δ >LOQ were highlighted in the tables below. Associated results were qualified as "J". The higher concentration was used to compare with the project action limits.

The lead RPD values, as well as recoveries and RPD values for MS/MSD for lead, indicated a high level of variability. While most of the variability in PCB duplicate results indicated deltas that were close to the reporting limit, the lead data deltas are significantly higher than the reporting limits. The design of future sampling and analysis programs should take this variability into account to attempt to attain improved precision.

Analytes	16SS17-02B-SO	16SS17-08B-SO	RPD %	Δ	RL
PCB 1254	0.19 Q	0.081 Q	80.4	0.109	0.034
Analytes	16SS17-E2-FL10A-SO	16SS17-E2-FL40A-SO	RPD %	Δ	RL
Lead	79	34	79	45	0.79
Analytes	16SS17-E2-SW17A-SO	16SS17-E2-SW51A-SO	RPD	Δ	RL
Lead	620 QJ	32 Q	180	588	0.89
Analytes	16SS17-E3-SW08A-SO	16SS17-E3-SW54A-SO	RPD %	Δ	RL
PCB 1254	0.19	0.73	117	0.54	0.034
Analytes	16SS17-E3-SW10A-SO	16SS17-E3-SW30A-SO	RPD %	Δ	RL
PCB 1254	0.86	1.2	56.7	0.34	0.034

Analyte concentrations in mg/kg (ppm).

Pb. LCS /LCSD-RPD met DoD QSM 5.0 criteria

c. MS/MSD-RPD

PCB:

The RPD between MS and MSD for PCB-1016 and PCB-1260 performed on sample 16SS17-01B-SO were 113% and 101% respectively, which are out of control limit range of 30%.

The RPD between MS/MSD for PCB-1016 and PCB-1260 performed on sample 16SS17-E2-FL20A-SO were 200% and 56% respectively, where are out of control limit range of 30%.

Lead:

The RPD between MS and MSD for Lead performed on sample 16SS17-E2-SW19A-SO was 54%, which is outside the recovery criteria ranges of 20%.

The RPD between MS and MSD for Lead performed on sample 16SS17-E3-FL09A-SO (FA35738-10) was 43.1%, which is out of control limit of 20%.

2. Accuracy

a. LCS/LCSD Recoveries met DoD QSM 5.0 criteria.

b. MS/MSD Recoveries

PCB:

The recoveries of MS and MSD for PCB-1016 performed on sample 16SS17-01B-SO were 1548% and 433% respectively, which are out of control limit range of 47-134%.

The recoveries of MS and MSD for PCB-1260 performed on sample 16SS17-01B-SO were 1854% and 613% respectively, which are out of control limit range of 53-140%.

The recoveries of MS and MSD for PCB-1016 and PCB-1260 on sample 16SS17-E2-FL20A-SO were outside the recovery criteria and no calculated in batch 280-333298.

The recoveries of MS and MSD performed on sample 16SS17-E3-FL10A-SO (FA35715-10) for PCB1260 were 144% and 145%, which are outside control limits 53-140%.

The recoveries of MS and MSD for PCB 1260performed on sample 16SS17-E3-SW10A-SO (FA35738-30) were 140% and 140%, which are out of control limit range of 59-133%.

The recoveries of MS and MSD performed on sample 16SS17-E3-FL23A-SO (FA35738-30) for PCB-1260 were both 140%, which are outside control limits 59-133%.

The recoveries of MS and MSD performed on sample 16SS17-E3-SW17A-SO (FA35738-45) for PCB-1260 were 322% and 252% respectively, which are outside control limits 53-140%.

The recovery exceedances for MS/MSD are probable due to matrix interference. The effect on data quality is minor; however, affected samples were flagged by lab or BEM reviewer.

Lead:

The recovery of MSD for Lead on sample 16SS17-E2-FL20A-SO was 136%, which exceeded the recovery criteria of 81-112%.

The recoveries of MS and MSD for lead performed on sample 16SS17-E2-SW17A-SO were -1145% and -1248%, which are outside the recovery criteria 81-112%.

The recoveries of MS and MSD for Lead performed on sample 16SS17-E2-SW19A-SO were -155% and 7%, which are outside the recovery criteria ranges of 81-112%.

The recoveries of MS and MSD for Lead performed on sample 16SS17-E3-FL09A-SO (FA35738-10) were 3047.0%, 5083.7%, which are outside control limits of 80-120%.

See note under field duplicates that also discusses MS/MSD data.

c. Surrogate Recoveries

The recoveries of surrogate Decachlorobiphenyl in sample 16SS17-02B-SO and 16SS17-08B-SO were 56% and 58% respectively, which are out of the control limit range of 59-130%.

The recovery of surrogate Tetrachloro-m-xylene for sample 16SS17-E2-FL06A-SO was 0%, which is out of control limit range of 44-130%.

The recoveries of surrogate Decachlorobiphenyl for samples 16SS17-E2-FL06A-SO, 16SS17-E2-FL16A-SO, 16SS17-E2-FL20A-SO, 16SS17-E2-FL20A-SO[MS], 16SS17-E2-FL20A-SO[MSD], and 16SS17-E2-FL23A-SO 0%, 47%, 41%, 0%, 29% and 31% respectively, which are out of the control limit range of 59-130%.

The recoveries of surrogate Decachlorobiphenyl for sample 16SS17-E3-FL01A-SO and 16SS17-E3-SW01A-SO were 57% and 53% respectively, which are out of control limit range of 59-130%.

The recoveries of surrogates Tetrachloro-m-xylene and Decachlorobiphenyl on sample 16SS17-E3-FL13A-SO (FA35715-20) were 0% and 0% respectively, which are outside control limits of 44-130%.

The recoveries of surrogate Tetrachloro-m-xylenehave on sample 16SS17-E3-FL16A-SO (FA35738-20), 16SS17-E3-SW22A-SO (FA35738-25), 16SS17-E3-SW30A-SO (FA35738-31) and 16SS17-E3-SW11A-SO (FA35738-32) were all 0% and outside control limits of 44-130%.

The recoveries of surrogate Decachlorobiphenyl on sample 16SS17-E3-FL16A-SO (FA35738-20), 16SS17-E3-SW22A-SO (FA35738-25), 16SS17-E3-SW30A-SO (FA35738-31) and 16SS17-E3-SW11A-SO (FA35738-32) were all 0% and outside control limits of 41-145%.

The recoveries of surrogate Tetrachloro-m-xylene for samples 16SS17-E3-FL17A-SO (FA35740-10), 16SS17-E3-FL19A-SO (FA35740-20), 16SS17-E3-SW14A-SO (FA35740-42), 16SS17-E3-SW17A-SO (FA35740-45), and 16SS17-E3-SW31A-SO (FA35740-46) were all 0%, which are out of control limit of 44-130%.

The recoveries of surrogate Decachlorobiphenyl for samples 16SS17-E3-FL17A-SO (FA35740-10), 16SS17-E3-FL19A-SO (FA35740-20), 16SS17-E3-SW14A-SO (FA35740-42), 16SS17-E3-SW17A-SO (FA35740-45), and 16SS17-E3-SW31A-SO (FA35740-46) were all 0%, which are out of control limit of 41-145%.

Due to dilution performed on most of these samples, the surrogate concentrations were reduced to a level where the recovery calculation does not provide useful information. Results were flagged per DOD QSM.

3. Representativeness

a. BEM considers the associated samples fully representative of the site.

b. The data collected is consistent with the approved work plan/sampling and analysis plan.

4. Comparability

5. Completeness

All data are acceptable to use. This meets the 90% completeness goal set for the project.

6. Sensitivity

The PQLs of the analyzed parameters are below the applicable ADEC Method Two Soil

Cleanup Levels in Under 40 inch Zone Soils except the following:

For samples 16SS17E2-FL06A-SO, 16SS17-E2-FL16A-SO, and 16SS17-E2-FL20A-SO, PQLs for several non-detected individual Aroclors exceed the cleanup level of 1 mg/kg. However, in each of these samples, there are also detections of at least 1 Aroclor that is above 1 mg/kg, so there is no data quality or usability issue associated with the PQLs that are above 1 mg/kg due to dilution. BEM's reviewers applied "D" flags to these results.

PCB:

Sample 16SS017-08B-SO (280-83809-25) appears to contain a mixture of PCB-1254 & PCB-1260. The sample has been quantified and reported as PCB-1254 as it appears to be the most prevalent of the PCB. Due to these Aroclors having shared peaks there is increased qualitative and quantitative uncertainty associated with this result.

c. Method Blank (MB)

Method blanks are non-detected.

d. Trip Blank (TB)

No trip blank samples were collected since there is no volatile analytes requested.

e. Equipment Blank (EB)

Equipment blank samples are non-detected.

APPENDIX H

Laboratory Reports - due to document size limitations, digital laboratory reports are included as separate files

APPENDIX I

Disposal Documentation - due to document size limitations, waste disposal documents are included as separate files

APPENDIX J

Agency Comment Matrix

THE STATE of ALASKA

GOVERNOR BILL WALKER

Department of Environmental Conservation

DIVISION OF SPILL PREVENTION AND RESPONSE
Contaminated Sites Program

555 Cordova Street
Anchorage, AK 99501
Main: 907-269-7552
Fax: 907-269-7687
www.dec.alaska.gov

File No: 2526.38.001

June 20, 2017

Richard Mauser
AFCEC/OLAR
10471 20th Street, Suite 341
JBER, AK 99506-2201

Re: Approval of Response to Comments on the Draft Remedial Action – Construction Report for LF003, SS016, SS017 at Cape Romanzof LRRS, Alaska dated April 2017

Dear Mr. Mauser:

The Alaska Department of Environmental Conservation (ADEC) has reviewed the responses to comments on the above document. The responses are acceptable to ADEC and the document may be finalized.

If you have any questions on this letter, please contact me at (907) 269-7552 or louis.howard@alaska.gov.

Sincerely,

Louis Howard
Environmental Program Specialist

Alaska Department of Environmental Conservation
Comments on the Draft RA – Construction Report for
LF003, SS016, SS017 at Cape Romanzof LRRS, Alaska, dated April 2017.
Commenter: Louis Howard (ADEC, Comments Developed: May 11, 2017

Comment No.	Page & Line	Section	Comment/Recommendation	Response
1.			General Comments Immediately after the cover page for the report, have a page for the "qualified environmental professional(s)[1]" that prepared and wrote the report in accordance with 18 AAC 75.335(c)(1)[a] to sign and date. A hard copy was received with electronic files on CD/DVD for review by ADEC. ADEC requests AFCEC submit only electronic files (on CD or DVD) with a signed cover letter for all submittals to ADEC for review and comment. Hard copies of all drafts, draft-final, final versions of documents/work plans with appendices are not required for ADEC's records. Electronic only versions will be the desired format of these type of documents.	A signature section has been included immediately behind the cover page, as requested. Acknowledged.
2.	13	4.1.3.1	LF003 Areas 1 and 2 State in this section that all confirmation sampling was conducted either by a "qualified environmental professional" or a "qualified sampler", whichever the case may be for each lift and post excavation sampling.	The section has been revised as requested.
3.	16	4.1.3.2	Area 3 See Comment #2 above regarding qualified environmental professional or qualified sampler.	The section has been revised as requested.
4.	18	4.1.3.3	Area 4 See Comment #2 above regarding qualified environmental professional or qualified sampler.	The section has been revised as requested.

[1] 18 AAC 75.333(a)

Comment No.	Page & Line	Section	Comment/Recommendation	Response
			Excavation and Sampling Activities See Comment #2 above regarding qualified environmental professional or qualified sampler.	revised as requested.
6.	25	4.3.2	SS017 Excavation and Sampling Activities See Comment #2 above regarding qualified environmental professional or qualified sampler.	The section has been revised as requested.
7.	34	6.1	LF003 ADEC concurs with the recommendation to extend the land use control boundary along the southwest edge of LF003 cap (the eastern edge of Area 3) where subsurface debris and lead contaminated soil remains. A memo to the site file with a revised land use control map should be developed explaining why buried debris couldn't be removed in cells #36 and #37 as well as the location of the partially buried fiber optic cable, located east of the cells, which limits further excavation of the remaining contaminated soils in this area.	Acknowledged; the recommended memo and updated LUC map have been added to section 6.1 conclusions for LF003.
8.	34	6.2	SS016 ADEC concurs with the recommendations to address safety concerns before additional remedial actions can be performed at this site.	Acknowledged
9.	34	6.3	SS017 ADEC concurs with the recommendations to address safety concerns before additional remedial actions can be performed at this site. ADEC also concurs with the recommendation that additional characterization near the building in this area and the eastern portion of the site (see Section 4.3.2.3).	Acknowledged

[a] 18 AAC 75.335(c) After completing site characterization work, the responsible person shall submit to the department for approval a site characterization report that

(1) is prepared by a qualified environmental professional