Corrective Action Report and Conditional Closure Request

Municipal Garage Demolition and Contaminated Soil Removal
NOAA Site 20/TPA Site 9e
St. Paul Island, Alaska

April 8, 2008

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ACRONYMS AND ABBREVIATIONS

AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
bgs	below ground surface
BSE	Bering Sea Eccotech, Inc.
BTEX	benzene, toluene, ethylbenzene, and total xylenes
CAP	corrective action plan
CAR	corrective action report
CESI	Columbia Environmental Sciences, Inc.
cm	centimeter
COC	chain-of-custody
CSM	conceptual site model
CY	cubic yard
DRO	diesel-range organics
EPA	U.S. Environmental Protection Agency
F&BI	Friedman and Bruya Inc.
FPXRF	field portable x-ray fluorescence instrument
ft	feet
GIS	geographic information system
GPS	global positioning system
GRO	gasoline-range organics
ICP/MS	inductively coupled plasma/ mass spectrometry
IDW	investigation-derived waste
LCS	laboratory control samples
mg/kg	milligrams per kilogram
MS/MSD	matrix spike/matrix spike duplicate
LCG	Larson Consulting Group
NOAA	National Oceanic and Atmospheric Administration
PAH	polynuclear aromatic hydrocarbon
PCS	petroleum contaminated soil
PID	photo ionization detector
PQL	practical quantitation limit
QA/QC	quality assurance and quality control
QAP	quality assurance plan
RPD	relative percent difference
RRO	residual-range organics
SGS	SGS Environmental Services, Inc. of Anchorage, Alaska
TLC	thin-layer chromatography
TPA	Two-Party Agreement
VOCs	volatile organic compounds

EXECUTIVE SUMMARY

The U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), through its Office of Response and Restoration, Pribilof Project Office (PPO) is responsible for site characterization and restoration activities on St. Paul Island, Alaska (Figure 1). The PPO conducts these activities at several sites on the Pribilof Islands according to the Two Party Agreement (TPA) between NOAA and the State of Alaska. This corrective action report details corrective actions conducted at the Municipal Garage Site (NOAA Site 20/TPA Site 9e), including the adjacent former Connector Building footprint, on St. Paul Island. This report was prepared by NOAA.

The Municipal Garage was located at the base of Village Hill, just north of the Machine Shop (Figure 2). The building has been the location of various storage and equipment maintenance operations dating back to the 1930s. The Municipal Garage (also referred to as the Equipment Shed and Elephant Hut) was most recently used by NOAA for storage of heavy equipment, construction supplies, and miscellaneous items. The concrete foundation of the former Connector Building abutted the Municipal Garage on the south end, connecting it to the Machine Shop building.

Gasoline above ground storage tanks (ASTs) were once located on the southwest side of the Municipal Garage, while diesel underground storage tanks (USTs) were previously located on the northwest side of the building. Pipelines transferred diesel fuel from a Diesel Tank Farm (NOAA Site 30/TPA Site 11) atop Village Hill to the diesel USTs. Gasoline was gravity fed to the ASTs from a former Gasoline Tank Farm (NOAA Site 29/TPA Site 10) located on the north slope of Village Hill. There were two floor drains inside the Municipal Garage and a small sump was located along the exterior of the south wall of the Municipal Garage, inside the former Connector Building. A former gasoline service station was located to the east of the Municipal Garage.

Accidental releases of diesel fuel and gasoline previously stored and/or transferred by pipelines to, or near to, the site led to environmental contamination. Also, wastes may have been spilled or dumped into the floor drains and sump. Investigations at the site indicated the presence of diesel-range and gasoline range organic compounds in soil at concentrations above site specific cleanup levels. Since the Municipal Garage had become structurally compromised due to partially rotted structural members, NOAA agreed to demolish the structure. With the structure demolished, it was then necessary for NOAA to remove the petroleum contaminated soil (PCS) known to exist underneath.

NOAA also discovered a six foot wide strip of soil along the north wall of the building where lead contamination in soil exceeded the State of Alaska industrial area cleanup level for soil of 1,000 mg/kg total lead. This contamination was thought to have resulted from lead paint peeling off the building's exterior siding.

NOAA selected Bering Sea Eccotech Inc. (BSE) to implement the corrective action for the demolition of the building and removal of PCS and lead contaminated soil at the site. NOAA's site cleanup levels for soil were based on ADEC Method Two, or alternative cleanup levels established under application of ADEC's 10x Rule where approved by ADEC. The Municipal Garage was demolished and the building demolition debris placed in the City of St. Paul municipal landfill. During the corrective action, BSE removed approximately 2,014 cubic yards (CY) of PCS from the site and transported it to NOAA's ADEC-approved landspreading area at the National Weather Service property on the island. BSE also removed approximately 18 CY of lead contaminated soil and transported it to a disposal trench in NOAA's Tract 42 Landfill Cell C, covering it with at least two feet of landfill cap soil. BSE backfilled the PCS and lead contaminated soil excavations to the original grade using clean fill material.

After completing removal of PCS at the Municipal Garage Site, confirmation samples collected from the excavation bottom indicated concentrations of GRO and DRO and some BTEX constituents that exceeded the site specific cleanup levels along the sides of the excavation. However, more PCS could not be removed because this remaining contaminated soil was at the depth of groundwater (14 feet below ground surface) or extended into areas with buried utilities that NOAA is not required to disturb. After completing removal of lead contaminated soil, a confirmation sample collected from the excavation bottom indicated no soil remained with lead contamination greater than the site cleanup level.

As a result of this cleanup action, all required contamination has been removed and no exposure routes remain for human receptors or the environment. NOAA is therefore requesting in this Corrective Action Report/Conditional Closure Request that ADEC agree further remedial action from NOAA is no longer required at the Municipal Garage Site since the primary sources of contamination have been removed and analytical data indicate that PCS and lead contaminated soil has been excavated to the maximum extent practicable.

1.0 INTRODUCTION

The U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), through its Office of Response and Restoration, Pribilof Project Office is responsible for site characterization and restoration on St. Paul Island, Alaska. St. Paul Island is located north of the Aleutian Islands chain in the Bering Sea, approximately 800 miles west-southwest of Anchorage, Alaska (Figure 1).

Public Law 104-91 of 1996 and Public Law 106-562 of 2000 provide the mandate for these activities. A Two-Party Agreement (TPA), signed in 1996 by NOAA and the State of Alaska, provides the framework for corrective action on St. Paul Island (NOAA 1996). The State of Alaska provides TPA oversight through the Alaska Department of Environmental Conservation (ADEC). Under the TPA, NOAA is required to comply with State of Alaska regulations in effect in 1991 (ADEC 1991); however, with ADEC agreement, NOAA has chosen to follow more current regulations whenever possible.

This corrective action report/condition closure request (CAR/CCR) documents the 2007 corrective action work performed at the St. Paul Island Municipal Garage site ("site"), designated by NOAA as NOAA Site 20, and also known as TPA Site 9e. The Municipal Garage was located at the base of Village Hill, just north of the Machine Shop (Figure 2). During this corrective action, the Municipal Garage was demolished and petroleum or lead contaminated soil was removed from the site, followed by backfilling with clean soil. Except as noted in this CAR, field activities for this work were carried out in accordance with the following documents:

- Corrective Action Plan (CAP) Addendum for the Removal of Lead and Petroleum Contaminated Soil at the Municipal Garage (NOAA Site 20, TPA Site 9e) St. Paul Island, Alaska. (NOAA 2006b)
- Master quality assurance plan (QAP) (NOAA 2006a)
- NOAA's Master Investigation Derived Waste Plan (NOAA 2003b)
- Master health and safety plan (NOAA 2004a)

NOAA performed this corrective action to address environmental impacts resulting from past operations conducted in and around the Municipal Garage. The ADEC does not require that existing buildings be demolished to remediate environmental contamination underneath them. While the Municipal Garage building was still usable, some of its wooden roof trusses were structurally compromised by rot and NOAA determined that it should be demolished prior to a planned property transfer because it could be a potential safety hazard in the future. Demolition of the structure was complicated by the fact that the entire structure was painted with lead based paint, preventing reuse or burning of wood parts. NOAA collected representative samples of various parts of the building prior to demolition and analyzed them using the Toxicity Characteristic Leaching Procedure (TCLP), EPA Method 1311 (40 CFR 261.23). The results showed that the exterior siding exceeded allowable limits for lead leachability and would have to be considered a Resource Conservation and Recovery Act (RCRA) hazardous waste if removed without treatment. NOAA also found that a small area of soil along the north wall of the building exceeded the ADEC industrial cleanup standard for lead of 1,000 milligrams per kilogram (mg/kg), although this soil did not fail the TCLP and therefore did not require handling as a hazardous waste upon removal. Cleanup of the known petroleum contaminated soil (PCS) underneath the building was required by State of Alaska Regulations if the building were to be removed. Therefore, the objectives of the corrective action were as follows:

- Treat the exterior siding of the building prior to demolition with a commercial phosphate coating that would prevent leaching of the lead paint and render it non-RCRA hazardous and therefore able to be disposed by placing it in the City of St. Paul’s municipal solid waste landfill.
- Demolish the Municipal Garage building and dispose of the wood and concrete debris in the City of St. Paul Landfill.
- Remove PCS from under the building and dispose it by land spreading it on the island at the National Weather Service land spread area.
- Remove the lead contaminated soil along the north side of the building and dispose it by burial in the NOAA Tract 42 Cell C landfill.
- Conduct all soil excavation under the oversight of an archaeologist to ensure documentation and preservation of any archaeologically significant artifacts that may be uncovered.
- Collect lead soil characterization and waste characterization and designation samples for analysis using a field-portable x-ray fluorescence meter (FPXRF), and verify FPXRF results by fixed laboratory analysis.
- Collect field petroleum hydrocarbon screening samples for analysis by thin-layer chromatography (TLC) and photoionization detector (PID).
- Collect confirmation samples from the excavation boundary for fixed laboratory analyses.
- Collect samples to characterize PCS removed from the excavation.
- Restore the site to grade with clean fill.
- Incorporate site features and sampling locations into a geographic information system (GIS) database and map project.
- Report CAP activities and results to ADEC for acknowledgement of clean closure.

2.0 SITE DESCRIPTION

The following subsections provide a description of the site background, site geology, site hydrogeology, and previous investigations for the Municipal Garage Site.

2.1 SITE BACKGROUND

The Municipal Garage was located at the base of Village Hill, just north of the Machine Shop (Figure 2). The building has been the location of various storage and maintenance operations dating back to the 1930s. The Municipal Garage (also referred to as the Equipment Shed and Elephant Hut) was most recently used by NOAA for storage of heavy equipment, construction supplies, and miscellaneous items. The concrete foundation of the former Connector Building lay between the Municipal Garage site and Machine Shop building (Figure 2).

Gasoline above ground storage tanks (ASTs) were once located on the southwest side of the Municipal Garage, while diesel underground storage tanks (USTs) were previously located on the northwest side of the building (Hart Crowser 1997). Pipelines transferred diesel fuel from a Diesel Tank Farm (NOAA Site 30/TPA Site 11) atop Village Hill to the diesel USTs. Gasoline was gravity fed to the ASTs from a former Gasoline Tank Farm (NOAA Site 29/TPA Site 10) located on the north slope of Village Hill. Petroleum contaminated soil (PCS) had been discovered and subsequently removed from the west, north, and east sides of the building (Figure 3) during earlier NOAA corrective actions as discussed below. NOAA sampling had revealed that some of the soil underneath the Municipal Garage building was also contaminated with petroleum, but since the building was still in use and had not been slated for demolition, this contamination was not removed at that time.

2.2 SITE GEOLOGY

St. Paul Island was formed as a result of volcanic eruptions of basaltic lavas onto the southern edge of the Bering Sea Shelf. The island has never been glaciated, and many cinder cones with steep slopes and sharp crater rims are present on the island. The island soil is characterized primarily as volcanic deposits consisting of scoria of varying sizes (pebbles to cobbles) and colors (lenses of gray, red, and black) with fractured basalt occurring at depth (Barth 1956).

Soils in the vicinity of the Municipal Garage generally consist of fill material including sand, scoria, and gravel from the surface to a depth of 2 to 12 feet below ground surface (bgs). This fill material is underlain by approximately 3 to 14 feet of sand. Bedrock in this area consists of basalt (NOAA 2003c).

2.3 SITE HYDROGEOLOGY

Groundwater in the vicinity of the Municipal Garage is present at approximately 4 feet above mean sea level, which is about 14 feet bgs. Groundwater likely flows to the north toward Village Cove (NOAA 2003c). Currently, groundwater in this area is not used for drinking water, and it is not expected that it will ever be used for drinking water. NOAA has elected to proceed with corrective actions at the Municipal Garage and other sites within Tract 46 under the guidelines afforded by 18 AAC 75.345(b)(2) and 18 AAC 75.350 (ADEC 2000a), commonly referred to as the *Ten Times Rule* (10x rule) as described below.

NOAA performed a Groundwater Use and Classification study of St. Paul Village in 2002 Based upon analyses of existing data, groundwater beneath the City of St. Paul is considered brackish and is therefore not potable (Mitretek 2002, ADEC 2002). NOAA demonstrated the water is not drinkable regardless of past petroleum releases that had resulted in groundwater exceeding ADEC Table C cleanup levels for GRO, DRO, benzene, and toluene found in the immediate vicinity of the Municipal Garage. NOAA requested of ADEC to utilize alternative groundwater and soil cleanup criteria allowed under (18 Alaska Administrative Code [AAC] 75.345). If ADEC concurred the alternative would allow groundwater and soil cleanup criteria to increase to ten times the Table C and Method Two (18 AAC 75.341) cleanup levels for those compounds listed above. ADEC conditionally approved NOAA's Groundwater Use and Classification Study's request to utilize alternative cleanup standards based on groundwater cleanup levels and soil (protection of groundwater) cleanup levels set at 10x the Method Two and Table C cleanup levels for those compounds listed above (ADEC 2002).ADEC's condition required NOAA to satisfy appropriate institutional controls as required under 18 AAC 75.350. NOAA applied to Alaska Department of Natural Resources (ADRN) for a Critical Water Management Area (CWMA) determination under 11 AAC 93.500 - 11 AAC 93.530 (ADNR 2006), which would satisfy ADEC's institutional control requirement. Following numerous regulatory procedures, ADNR determined a CWMA was appropriate for the areas with groundwater contamination in the old village. The CWMA determination allowed NOAA to apply the alternative cleanup levels under the Ten Times Rule (ADEC 2002).

ADEC conditionally approved NOAA's Groundwater Use and Classification Study's request to utilize alternative cleanup standards based on groundwater cleanup levels and soil (protection of groundwater) cleanup levels set at 10x the Method Two and Table C cleanup levels for those compounds listed above (ADEC 2002). Additionally, the 1996 TPA provided NOAA to clean up contaminated media on the Pribilof Islands consistent with ADEC regulations at that time. The benzene cleanup level for soil in 1996 was based on the 0.5 mg/kg level established in ADEC 1991 promulgated regulations. As a result, NOAA can use 0.5 mg/kg as its benzene cleanup level. As a result, NOAA applied the 0.5 mg/kg as its benzene cleanup level instead of 0.2 mg/kg under the Ten Times Rule or 0.02 mg/kg under ADEC Method Two.

NOAA also received approval from the State of Alaska to designate most of Tract 46 and some adjacent areas (including the Municipal Garage site) as a Critical Water Management Area (CWMA) under 11 AAC 93.500- 11 AAC 93.530 (ADNR 2006). This designation is required in order to implement the 10x rule.

2.4 PREVIOUS INVESTIGATIONS AND CORRECTIVE ACTIONS

During 1995, Hart Crowser, Inc. conducted an expanded site inspection that included the collection of soil samples from the area of the Municipal Garage. Analytical data for soil samples collected during this investigation indicated the presence of arctic diesel at concentrations up to 5,900 mg/kg at a depth of 10 feet bgs. Arctic diesel consists of diesel fuel mixed with gasoline-range hydrocarbons to prevent the mixture from freezing (NOAA 2003c, 2003d).

During 1997, the ASTs and most of the USTs along the west side of the Municipal Garage were removed by Aleutian Enterprises. In 2000, a UST at the southeast corner of the Municipal Garage was removed by Columbia Environmental Sciences, Inc. (CESI) during site characterization activities (NOAA 2003b, 2003d).

During 2000, CESI also conducted additional sampling at the Municipal Garage (CESI 2001). Analytical data for soil samples collected during this investigation indicated the presence of diesel-range organic compounds (DRO) up to 13,000 mg/kg, gasoline-range organic compounds (GRO) up to 470 mg/kg, toluene up to 20 mg/kg, and ethylbenzene up to 12 mg/kg (NOAA 2003b, 2003d).

Groundwater samples were collected from monitoring wells at and near the Municipal Garage in 2000 by CESI and in 2001 by IT Alaska Corporation. Analytical data for these samples indicated the presence of DRO, GRO, residual-range organic compounds (RRO), benzene, and toluene at concentrations exceeding regulatory limits established by ADEC (NOAA 2003b, 2003d).

A corrective action was conducted from August 4, 2003, through September 4, 2003 to remove PCS along the west and north sides of the Municipal Garage (Tetra Tech 2004). PCS site cleanup levels used were those developed by NOAA for soil under the 10x rule as described in Section 2.3 above, and as provided in section 3.0 below. A total of 2,805 cubic yards of PCS was excavated. PCS was excavated all along the length of the western wall, all the way to the bedrock, and as close to the building as possible (Figure 3). Confirmation samples at 10 to 15 feet bgs showed that DRO contaminated soil above the site cleanup level of 2,500 mg/kg continued underneath the building along the western wall. GRO contamination exceeded the 300 mg/kg ADEC Method Two cleanup level, but GRO did not exceed the site cleanup level of 1,400 mg/kg under the 10x rule. PCS was also excavated at the north end of the Municipal Garage, though the extent of the excavation was restricted by the presence of a monitoring well, electrical transformers, and the building itself. Confirmation samples inside the excavation at the north end of the building at a depth of 10 feet bgs indicated no contamination above the site cleanup levels or the ADEC Method Two cleanup levels, except at the north east and north west corners of the building where DRO contamination still exceeded the site cleanup level of 2,500 mg/kg, but could not be removed without damaging the building or adjacent utilities (NOAA 2004c).

NOAA also conducted a removal action at the Cascade Building (TPA Site 9f) in 2003, (NOAA 2005a), adjacent to the Municipal Garage on the south east side. A total of 3,510 cubic yards of PCS were excavated from the main part of the Cascade building site, which extended along the east foundation wall of the Municipal Garage (Figure 3). The soil removed exceeded site cleanup levels for both DRO and GRO. Except for two confirmation sample location near the northeast corner and center of the Municipal Garage (Figure 4), it did not appear that the petroleum contamination continued underneath the building, though it was not possible to excavate soil all the way to the water table along the foundation because of risk to compromising the structure and a buried electrical line and a water main (Figure 3). Confirmation samples at 8 to 11 feet bgs showed that the soil along the eastern wall of the Municipal garage did not exceed either the Method Two cleanup levels or the site cleanup levels under the 10x rule, except for GRO or DRO at two samples near the northeast corner and center of the Municipal Garage (NOAA 2005a).

NOAA collected additional characterization samples underneath the Municipal Garage by drilling through the concrete floor in the fall of 2003. These samples showed that there were areas under the building where the soil exceeded the site cleanup level for DRO, and the Method Two cleanup level for GRO (NOAA 2004c).

3.0 REMOVAL OBJECTIVES AND APPROACH

The corrective action's lead soil removal objective at this site involved the removal of all soil located between the building's perimeter and six (6) feet horizontally away from the perimeter, herein referred to as the "Potential Lead-Contaminated Soil Area" (Figure 3), that exceeded the commercial and industrial land use cleanup level of 1,000 mg/kg total lead listed in note 11 to Tables B1 and B2 of 18 AAC 75.341 (ADEC 2005). (NOTE: The CAP Addendum [NOAA 2006b] erroneously stated in Section 4.0 that the lead contaminated zone was that "between the building's perimeter and 10 feet horizontally away from the perimeter". This was a typographic error and should have said "6 feet horizontally away from the perimeter". Later in Section 5.1 the CAP Addendum made it clear that soil will only be characterized "6 feet horizontally from the building". Also, in past lead contaminated soil corrective actions at the St. Paul Teacher Houses and Duplex, NOAA only removed lead contaminated soil within 6 feet of those structures [NOAA 2007]). The objective for the vertical extent of lead contaminated soil removal was from ground surface to a depth of 2 feet bgs. Lead-contaminated soil exceeding the commercial and industrial cleanup level is assumed to lack a complete risk pathway if covered by a minimum of two feet of clean soil, which would occur if lead soil at and deeper than two feet bgs is backfilled to grade with clean soil.

The PCS removal objective for this site involved the removal of all PCS beneath the footprint of the demolished building (including its concrete footings and floor), that exceeded the site-specific cleanup levels for GRO, DRO, benzene, toluene, ethylbenzene, and total xylenes (BTEX), and select polynuclear aromatic hydrocarbons (PAHs). PCS cleanup levels for the site are detailed in the corrective action report detailing the 2003 PCS removal activities (Tetra Tech 2004), and are based on applying the 10x (Ten Times) rule as described in section 2.3 above. These levels are listed in Table 3-1. One should note that contaminated soil represented by 2003 confirmation samples along the eastern edge of the building footprint, and one near the northeast corner of the building footprint, exceed the site specific cleanup levels (Figure 4). This soil was not excavated in 2003 due to its proximity to the building. NOAA's objective was to remove and temporarily stockpile the clean backfill that had been placed over these 2003 confirmation sample locations, then resume excavation of this PCS even though a portion of it may extend outside the building footprint.

NOAA expected that the extent of PCS contamination planned to be removed at this site would be limited by sidewall sloping requirements to prevent damaging adjacent utilities or structures including the electrical transformer and monitoring well to the north, the former Connector Building's concrete foundation to the south, and the electrical supply line along the east wall (Figure 3). Also, NOAA did not plan the excavation to extend deeper than 15 feet bgs or to groundwater due to impracticability associated with deep excavating and saturated soil excavation. Groundwater at this site was anticipated at approximately 14 feet bgs.

Under the 10x rule NOAA may elect to remove PCS to a cleanup level ten times higher than the Method Two cleanup levels for any chemical constituent found in the groundwater at levels that exceed the groundwater cleanup level for that constituent. However, NOAA attempted to clean up soils to the Method Two cleanup level where possible. For example, under the 10x rule the site-specific cleanup level for DRO is 2,500 mg/kg, while the Method Two cleanup level is only 250 mg/kg.

Site-specific cleanup levels are summarized in Table 3-1. A detailed discussion on the development of the site-specific cleanup levels for petroleum compounds can be found in the Final CAP for the 2003 corrective action along the west side of the building (NOAA 2003c).

4.0 FIELD ACTIVITIES

The following subsections summarize the equipment used and the activities performed during this corrective action. Appendix A provides photographic documentation of the corrective action. Appendix B provides copies of the daily reports as well as logbook notes generated during the corrective action.

4.1 CONTRACTORS AND EQUIPMENT

Bering Sea Eccotech (BSE) provided overall site management via its subcontractor Larsen Consulting Group (LCG), including the direction of excavation and hauling activities, engineering services, and preparation of weekly reports. The collection of screening, characterization, and confirmation samples during implementation of the corrective action was performed by Tutka Services LLC (Tutka). BSE provided most of the equipment used during the corrective action, but NOAA furnished some government-owned equipment. BSE/LCG conducted health and safety meetings before the commencement of each day’s activities. Tutka performed PID analyses of screening samples. NOAA representatives performed TLC and FPXRF analyses of screening samples and provided survey support using real-time kinematic GPS techniques and equipment. BSE subcontracted laboratory analytical services to SGS Environmental Services Inc. of Anchorage, AK (SGS).

Heavy equipment used on site during field activities included the following:

- Hitachi EX150 excavator (BSE)
- Hitachi ZX200LC Excavator (BSE)
- 5-10 CY dump trucks (BSE and NOAA)
- Volvo L-70 Front End Loader (BSE)
- CAT 966 Front End Loader (BSE)
- Flat Bed Truck (BSE)
- Telescoping Rough Terrain Fork Lift (BSE)
- Trimble Total Station R8 GPS (NOAA)
- FPXRF instrument

4.2 LEAD CONTAMINATED SOIL INVESTIGATION

During the summer of 2007 NOAA conducted additional soil sampling for lead contamination around the perimeter of the building in a zone starting at the outer wall to 6 feet away from the wall. Samples were collected on June 24 and June 26 from ground surface to a depth of either 1 or 2 feet as shown in Figure 3. NOAA sampled this area because of the knowledge that the exterior of the building was painted with peeling LBP, and the peeling paint may have contaminated surface soil near the exterior wall of the building. NOAA collected soil samples at either two or four different depth intervals at each of the fourteen (1) locations shown on Figure 3 using a hand driven core sampler as follows:

- West side of building – 2 samples per boring at 0.0 to 0.5 foot, and at 0.5 foot to 1.0 foot. This soil was known to be clean fill placed along the wall after the 2003 Municipal Garage corrective action (NOAA 2004c). Lead contamination from recent peeling paint was expected to only have the potential to affect the surface soil.

- North and east sides of building – 4 samples per boring, at 0.0 to 0.5 foot, 0.5 foot to 1 foot, 1.0 foot to 1.5 feet, and 1.5 feet to 2.0 feet. All the soil along the north wall was believed undisturbed since construction of the building, noting that the building's approach apron was concrete and thus soil beneath it was assumed uncontaminated by peeling LBP since the apron was poured prior to the first application of LBP to the building during its construction. Only some of the surface soil along the east wall may have been removed and replaced with clean fill during the 2003 remedial action at the Cascade Building corrective action (NOAA 2005a). Lead contamination from historic paint peeling along these sides could potentially have contaminated soil to the two foot removal action depth.

NOAA collected FPXRF screening and fixed-laboratory definitive data samples in accordance with the CAP addendum (NOAA 2006b) and NOAA's Master Quality Assurance Plan (NOAA 2006a). NOAA collected the soil samples from a combination of hand excavated test pits and direct-push explorations, then screened them at its Seattle, Washington office using its FPXRF (Table 1). Consistent with the CAP addendum (NOAA 2006b), at least ten percent of the samples were then selected for off site laboratory analysis to confirm the results of the FPXRF readings (Table 1). NOAA selected 1 or 2 samples from each side of the building for laboratory analysis, based on which sample had the highest FPXRF reading for lead from that side of the building.

The following subsections describe the instrumentation used and procedures followed during the collection of FPXRF screening and fixed-laboratory site characterization samples. The FPXRF results are discussed in Section 5. Laboratory analytical results are discussed in Section 6.0. Data quality is discussed in Section 7.

4.2.1 FIELD-PORTABLE X-RAY FLUORESCENCE SCREENING SAMPLES

FPXRF involves the use of x-rays from a depleted radioactive source to cause a fluorescence response from metallic elements during the change of energy bands by electrons in the metal molecules as they react with the x-rays. The response is measured by a sensor, then compared against standard responses for materials with known levels of lead contamination using an on-board computer. ADEC approved the use of the FPXRF for site characterization and excavation screening as part of NOAA's CAP addendum for the site (NOAA 2006b).

During site characterization, NOAA or PSI collected 50 samples into resealable plastic bags, with approximately 250 grams of soil collected per sample. These samples were then shipped to NOAA's Seattle facility. NOAA homogenized the soil in each bag, and analyzed each sample with the FPXRF. Table 1 provides a list of FPXRF ex-situ samples collected for the site investigation with lab analytical results for those samples sent to an off site lab.

4.2.2 FIXED-LABORATORY SAMPLES

Fixed-laboratory analytical samples for lead were selected from the 50 FPXRF samples collected as described above. Two samples were selected from the east and west sides of the building and one along the north side, based on which had the highest lead content on that side according to the FPXRF results. The homogenized bag was delivered to F&BI under chain-of-custody.

Fixed-laboratory total lead analyses were performed using inductively coupled plasma/ mass spectrometry (ICP/MS), while leachable lead analyses were performed by first extracting the samples using EPA Method SW-846 1311 (TCLP) then analyzing the leachates using an ICP/MS.

Site Characterization

NOAA sent six (6) site characterization samples collected in June 2006 for fixed-laboratory total lead analysis to verify the accuracy of the 50 FPXRF site characterization analyses.

Confirmation Sampling

NOAA sent one confirmation sample for fixed-laboratory total lead analysis to confirm site excavation removed all soil exceeding the ADEC industrial cleanup level at the point of compliance.

4.3 BUILDING DEMOLITION

NOAA's contractor BSE began work at the site on August 2, 2007. Photograph 2 shows a view of the Municipal Garage (in center) taken in 2006 from the top of Village Hill. A portion of the Machine Shop is visible in the lower right corner, and the space between the two buildings is occupied by the concrete pad from the former Connector Building. BSE removed several remaining items owned by NOAA from the building's interior and stored or disposed of them. Next, BSE coated the lead painted exterior siding and a small area inside the south east corner of the building with a commercial phosphate based paint (Ecobond LBP) that was designed to bind with lead in the paint and render it less soluble (Photograph 3). Previous samples of the paint in these two areas had failed the TCLP limit of 5.0 mg/L for lead. The siding and the material from the interior painted walls would have required handling as a RCRA hazardous waste if they had been removed from the building in that condition. After coating the surfaces with Ecobond LBP, BSE then coated the same surfaces with a latex based primer, in order to better bind any peeling paint chips to the substrate. The Ecobond did not adhere well to the exterior siding on the south end of the building, so this was manually removed, brought inside the adjacent Machine Shop building, then after drying the siding was recoated with Ecobond LBP and primer. BSE collected samples from the exterior siding and the interior wall materials after coating them with the Ecobond LBP. These were analyzed by the TCLP and found to no longer exceed 5.0 mg/L (Table 3-1), and thus would be a non-hazardous solid waste if removed and disposed. At this point, demolition of the building proceeded (Photograph 4), with the wooden portions being buried in the City of St. Paul landfill. The City of St. Paul used the concrete portions (Photographs 5 and 6) being used at the landfill to extend their containment berm, enlarging the capacity of the landfill to accept more solid waste. The only portion of the building remaining was the concrete stem wall and footings along the north end of the building (Photographs 7, and 8). This was left in place because of the presence of lead contaminated soil as shown in Figure 3. NOAA was concerned that if the footings (installed 3 to 4 feet below the surface) were removed, some of the lead contaminated surface soil could fall into the remaining void and be mixed into the deeper soil.

4.4 EXCAVATION ACTIVITIES

In 2006, NOAA contracted an archaeologist to evaluate the Municipal Garage site and its historical background in preparation for the PCS excavation work (Mobley 2006). The archaeologist identified a potential for significant archaeological deposits underneath or near the Municipal Garage and Connector Building pad, and along the north wall where soil was not already disturbed by prior remedial actions. The archaeologist's report provided a monitoring plan that NOAA's excavation contractor used to plan and conduct archaeological monitoring during the PCS excavation.

All soil excavation activities at the Municipal Garage Site proceeded under the supervision of an archaeologist to ensure proper conservation and management of any significant archaeological deposits unearthed during excavation. The archaeologist monitored all excavation at the site with the authority to halt excavation and consult with the Alaska State Historical Preservation Office upon the discovery of significant archaeological deposits. Although the archaeologist observed many discarded artifacts from the early 1900s beneath the site, he did not deem any to be "significant archaeological deposits", and the excavation proceeded without interruption. The archaeologist's monitoring report (Pipken 2007) is included as Appendix D.

Approximately 18 CY of lead contaminated soil was removed from a 6 foot wide, 2 foot deep strip along the exterior of the north wall of the building (Photograph 9). Excavation of approximately 1,632 CY of PCS (Photograph 11) from under the building footprint and along the exterior of the north wall (Photograph 10) began on August 29 and terminated on September 7, 2007. BSE completed excavation of all petroleum contaminated soil under the original footprint of the building, extending into the clean backfill along the west side of the building from the 2003 excavation, and as far as could be excavated before threatening adjacent buried utilities along the north and east sides of the building (Figure 4). Approximately 1/3 of the area under the original footprint of the building in the southeast corner was not contaminated and left in place. Figure 4 and Photograph 11 show the final extent of the PCS excavation under the Municipal Garage. However, an area of heavily contaminated soil was discovered underneath an old sump located inside the former Connector Building, just outside the former south door of the Municipal Garage (Photograph 11). The petroleum contamination emanating from the sump extended from the sump down to the groundwater at 14 feet bgs. It occupied an area approximately15 feet in diameter along the exposed face (Photograph 12). NOAA proceeded with further excavation at the sump after backfilling the Municipal Garage Site (Photograph 13). NOAA's contractor excavated an additional 385 CY of PCS under the Connector Building Pad on October 21 and 22, 2007 (Figure 4, Photograph 14). This brought the total volume of PCS excavated to 2,017 CY. The excavation was backfilled following collection of confirmation samples on October 23, 2007 (Photograph 15).

4.5 SOIL DISPOSAL

During the Municipal Garage corrective action, NOAA's contractors transported PCS directly to NOAA's National Weather Service landspreading area (Figure 5). The PCS was spread no more than 0.5 ft ± 3 inches deep (Figure 5). NOAA spread soils with high levels of gasoline separately at the landspreading area. NOAA's contractor will till the contaminated soil to promote evaporation of volatile organic compounds (VOCs) during the spring of 2008. The landspreading area with the Municipal Garage and

Connector Building Pad PCS will be fertilized and seeded with native grasses to promote revegetation after the tilling is complete.

BSE transported the lead contaminated soil to the NOAA Tract 42 landfill where it was placed in a disposal cell excavated into the capping material, atop approximately 2,000 pounds of a phosphate soil amendment (Ecobond) design to reduce the leachability of lead (Figure 6). NOAA was not required to use Ecobond with the lead contaminated soil, however it chose to place Ecobond in the bottom of the lead soil disposal trench as a precaution as well as a means to dispose of its otherwise unneeded supply of Ecobond. A small area of the Tract 42 landfill was reopened by NOAA in 2006 in order to dispose of demolition debris from lead and asbestos abatement projects at the Municipal Garage and other NOAA buildings on the island. These cells were recapped after materials from the Municipal Garage were disposed in them, using the same capping material spread at a thickness of 2 feet or greater. The areas at Tract 42 that were disturbed by the 2006 landfilling activity were revegetated in 2007, and the area disturbed in 2007 will be revegetated in 2008.

4.6 BACKFILLING AND SITE RESTORATION

Backfilling the excavation began after a point was reached where no more soil could be excavated, or when soil testing with FPXRF, PID and TLC screening sample analyses indicated contaminant concentrations were below ADEC Method Two cleanup levels, and fixed laboratory confirmation samples had been collected. Backfill operations involved transporting clean fill from an on-island scoria pit to the site, dumping the material into the excavation, and compacting the fill material. Samples of the backfill material were collected and sent to a fixed laboratory for analysis, which showed no petroleum, PAHs, or lead present above State of Alaska Method Two cleanup standards for soil. Approximately 1,627.5 CY of scoria were used to backfill the Municipal Garage excavation, and another 363 CY for the area under the former Connector Building Pad, bringing the total to 1,990.5 CY. Also, approximately 15 cubic yards of concrete from demolition of the former connector building pad was used as clean backfill. The backfilled area was leveled to the surrounding grade.

4.7 INVESTIGATION-DERIVED WASTE MANAGEMENT

Investigation-derived waste generated during this corrective action included:

- Used nitrile sampling gloves, which were placed in trash bags and disposed as municipal solid waste.
- Plastic bags and glassware, which were emptied of soil and disposed as municipal solid waste.
- Soil not extracted during TLC screening sample analyses, which was disposed at the landspreading site.

- Spent methylene chloride and small vials of soil extracted with methylene chloride from TLC analyses, which were containerized in glass jars, placed in lab pack containers and stored to be shipped off-island for disposal as hazardous waste in 2008.
- Silica gel plates spotted with methylene chloride during TLC analyses, which were containerized in glass jars and placed in lab pack containers, then prepared to be shipped off-island for disposal as hazardous waste in 2008.

All such wastes were disposed according to NOAA's Master Investigation Derived Waste Plan (NOAA 2003b)

4.8 SITE SURVEYING

NOAA representatives surveyed sampling locations, benchmarks, excavation extents, and buildings using a survey-grade Trimble Total Station® R8 differential GPS. The Trimble Total Station® R8 is a GPS and GIS data collection and mapping system that combines a high-performance, dual-channel GPS receiver and antenna with a local base station and real-time differential correction system to provide survey-grade accuracy in real time. NOAA's survey-grade GPS determines horizontal positions of soil sampling locations and excavation boundaries to within approximately plus or minus 1 centimeter (cm), and elevations to within approximately plus or minus 2 cm. NOAA collected survey data in latitude and longitude referenced to the World Geodetic System 84 Datum, Universal Transverse Mercator Zone 2 coordinate system in meters. However, most confirmation samples were collected at the toe of potentially unstable excavation sidewalls inside the excavation and it was unsafe to enter the excavation to survey the exact location. Consequently, NOAA surveyed these samples at a point on the upper rim of the excavation, as close to the actual sample location as deemed safe to approach. Therefore, each survey point for these samples is displaced approximately 2 to 3 feet laterally, and up to 14 feet vertically higher than the actual sample location.

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5.0 FIELD SCREENING AND ANALYTICAL SAMPLING

During this corrective action, BSE collected screening and analytical confirmation samples in accordance with the CAP addendum (NOAA 2006b) and 18 AAC 78 (ADEC 2003). For petroleum contamination, NOAA performed TLC screening sample analyses, and provided the results to BSE to direct excavation activities and identify locations for analytical confirmation samples; BSE performed PID screening sample analyses for petroleum contamination. Based on evaluation of the TLC and PID screening sample results, BSE selected analytical sampling locations where the greatest potential for residual contamination existed. BSE also collected screening and laboratory confirmation samples for lead contamination in soil; NOAA analyzed lead soil field screening samples using its FPXRF, and provided the results to BSE to direct excavation activities and identify locations for analytical confirmation samples.

The following subsections describe the instrumentation used and procedures followed during the collection of screening and analytical confirmation samples.

5.1 SCREENING SAMPLES

NOAA used three different technologies to screen soil samples in the field in order to facilitate rapid decision making, as described below.

5.1.1 PID SCREENING SAMPLES FOR PETROLEUM CONTAMINATION

As excavation of contaminated soil progressed and the remaining soil was no longer obviously contaminated with petroleum hydrocarbons as determined by visual and olfactory inspection, BSE collected field screening samples of soil from the bottom (or sidewalls) of the excavation, as directed by the on-site NOAA representative. BSE used a PID as a first screening method to determine whether remaining soil was still contaminated as specified by the CAP (NOAA 2003c). The soil sample was first warmed to approximately room temperature while sealed inside a plastic bag, and then the PID was inserted into the bag to sample any VOC vapors that may have been released. The PID was used because it can detect low levels of VOCs, which were expected because high levels of GRO and BTEX had been detected in the soil underneath the Municipal Garage by previous NOAA laboratory analyzed samples. A PID cannot distinguish between the main VOC constituents that had previously been found to exceed ADEC cleanup standards (such as benzene) and other VOCs such as toluene, ethylbenzene, and xylenes. Nevertheless, if VOCs were detected above background levels, the soil represented by the sample was assumed to be contaminated above site cleanup levels and was removed. If the soil sample did not show elevated VOC levels according to the PID reading, then a second aliquot of the sample was given to NOAA to perform TLC analysis as described below.

5.1.2 THIN-LAYER CHROMATOGRAPHY SCREENING SAMPLES FOR PETROLEUM CONTAMINATION

TLC is the use of solid-liquid chromatography for the semi-quantitative analysis of DRO in soil. A specific analytical method designed by NOAA, TLC, was originally used in support of field efforts during a crude oil spill in the State of Washington (NOAA 2006a).

The procedure involves the solvent extraction of soil screening samples in a field laboratory and subsequent comparison of the extracts to a range of standard diesel concentrations. By using standards that include diesel concentrations equal to, above, and below site-specific cleanup levels, the analyst determines whether the sample contains concentrations above or below the site cleanup level; in addition, the analyst is able to determine an approximate concentration of DRO in each sample.

TLC screening samples were collected throughout the corrective action by placing a small amount of soil (at least 20 grams) into a clean, re-sealable plastic bag. Each sample was homogenized and kept cool until it could be processed at the NOAA field laboratory.

5.1.3 X-RAY FLUORESCENCE SCREENING SAMPLES FOR LEAD CONTAMINATION

While none of the FPXRF readings exceeded the industrial lead cleanup level of 1,000 mg/kg total lead, the sample with the highest FPXRF reading, SP20-CH-108-015, was the only sample to exceed 1,000 mg/kg total lead in the laboratory analysis. These samples indicated that only the soil along the north end of the building exceeded the state of Alaska industrial cleanup level (18 AAC 75.340 Table B1) of 1,000 mg/kg lead. NOAA analyzed samples SP20-CH-108-005 and SP20-CH-108-015 (the sample with the highest FPXRF reading for lead) by the TCLP, finding that neither exceeded the TCLP limit of 5.0 mg/L (Table 1). Therefore, the soil along the north wall represented by these samples would not need to be handled as a hazardous waste during excavation and disposal. Based on the characterization data, NOAA estimated 20 CY of lead contaminated soil would require removal and disposal.

NOAA had determined that the soil 6 feet out from the concrete foundation along the north side of the building would be excavated to a predetermined depth of 2 feet to remove lead contamination from peeling exterior siding paint, based both on the ADEC-approved points of compliance (NOAA 2006b) and lead soil characterization results. NOAA’s characterization results indicated lead soil contamination exceeded the State of Alaska industrial site lead cleanup level of 1,000 mg/kg total lead extends no greater than 1.5 ft bgs. Nonetheless, NOAA chose to remove lead soil to 2.0 ft bgs in this area to simplify the excavation work. Once two feet of soil was excavated, NOAA used an FPXRF instrument to determine whether soil remaining at that depth still exceeded the lead cleanup level in soil. The soil sample was then sent for laboratory confirmation analysis.

5.2 CONFIRMATION SAMPLES

Once petroleum screening samples indicated that the remaining soil did not contain elevated lead, VOCs or DRO from the FPXRF, PID, and TLC testing, Tutka collected a confirmation sample by placing a split of the screening sample into appropriate containers for fixed laboratory analyses by SGS to verify concentrations of contaminants remaining in soil in the excavation. Section 7.1.2 describes the confirmation sampling procedures. Confirmation samples were packaged and shipped to SGS via Air Cargo Express, to Anchorage Airport, picked up by either a courier or a BSE employee for transport to SGS. SGS conducted the following analyses:

- Total lead by U.S. Environmental Protection Agency (EPA) SW-846 (EPA 1996) Method 6020
- BTEX by EPA Method 8021B
- GRO by ADEC Method AK101
- DRO by ADEC Method AK102
- RRO by ADEC Method AK103
- PAHs by EPA SW-846 (EPA 1996) Method 8270C, Selected Ion Monitoring

One confirmation sample and one duplicate sample were collected to verify the lead concentration of soil that remained along the north end of the building where a strip of soil 2 feet deep by 6 feet wide was excavated. BSE initially collected fifteen (15) petroleum contamination confirmation samples, plus two duplicate samples during corrective action activities at the Municipal Garage Site. BSE then collected eleven (11) additional confirmation samples after the excavation was extended under the former connector building pad. Figure 4 illustrates the approximate sampling locations. Since most of the samples were collected from the toe of the nearly vertical excavation side wall, at a depth of approximately 14 feet, the surveyor could not enter the excavation to place the survey instrument directly on the sample location due to safety considerations. Instead, a point was surveyed just adjacent the actual sample location at the top edge of the side wall. This point was usually displaced only 2 to 3 feet horizontally from the actual sample point.

5.3 WASTE CHARACTERIZATION SAMPLES

BSE collected 18 characterization samples from the 2,017 CY of PCS excavated from the site. SGS analyzed all the samples for BTEX, GRO, DRO, RRO, and some of the samples for PAHs per the methods listed in Section 5.2. The total and TCLP sample analyses conducted during the June 2007 characterization sampling discussed in Section 4.2 above also served as waste characterization samples for the lead contaminated soil removed from the site for disposal at the Tract 42 landfill.

5.4 BACKFILL CHARACTERIZATION SAMPLES

BSE collected three characterization samples from 1,990.5 CY of scoria obtained from the Lake Hill scoria pit and used as backfill for the excavation at the Municipal Garage Site. Backfill characterization samples were analyzed by SGS for BTEX, GRO, DRO, RRO, and PAHs.

6.0 ANALYTICAL RESULTS

The following subsections summarize the analytical results for samples collected during corrective action activities at the Municipal Garage. Tables 6-1 through 6-3 provide an analytical data summary. Appendix C includes the analytical data for soil samples collected during the corrective action.

Laboratory reporting limits for non-detected compounds were mostly below ADEC Method Two cleanup levels except for several halogenated organic compounds in some samples (e.g., samples SP20-CS-021-140 and SP20-CS-029-130). In several samples the practical quantitation limit (PQL) for benzene was above the ADEC Method Two and the TPA-approved cleanup levels, coinciding with high detections of ethylbenzene in the same sample that could indicate contaminant interference. Section 7.0 of the report will address data usability issues associated with these issues.

6.1 CONFIRMATION SAMPLES

As shown in Table 4 and Figure 4, confirmation samples collected from the bottom of the excavation at the Municipal Garage Site indicated concentrations of DRO and GRO and some BTEX constituents exceeded the site cleanup levels along the four sides of the excavation. Soil with several constituents exceeding the site cleanup level was found at the depth of the water table (about 14 feet) along the west side.,. Petroleum constituents above the site cleanup levels remain in soils at the water table along the north and northeast sides of the site. Further excavation was precluded because of the risk to buried utilities. NOAA’s initial extent of excavation along the southeast wall of the Municipal garage was extended to include soils below the concrete pad of the adjacent former Connector Building. The additional excavation effort became necessary when high levels of petroleum contamination were found in soils beneath a former used oil sump located along the south wall of the former Connector Building. After removing the concrete pad another 385 CY of soil was excavated from the site. Additional confirmation samples (Figure 4) showed that contamination had been removed down to the water table, which was still contaminated above the site cleanup level. For example, sample SP20-CS-306-140 at 14 feet bgs still exceeded the cleanup level, while sample SP20-CS-306-100 at the same location but at only 10 feet bgs did not exceed the cleanup level. This finding suggests that the source of contamination within the vadose zone had been removed, but petroleum products within the groundwater smear zone migrate along the water table.

Petroleum contaminant concentrations remaining at the site varied among the analytes. Several analytes exceeded the site cleanup levels allowed under the 10x rule determination: GRO reached a concentration as high as 3,430 mg/kg. DRO concentrations varied from not detected to 10,900 mg/kg. Total xylenes was detected above its Method Two cleanup level (78 mg/kg) as high as 735 mg/kg. Since total xylenes have never been detected above the cleanup level in groundwater at Tract 46, it is not subject to the 10X rule alternative cleanup level of 780 mg/kg. However, the detection of total xlyene above Method Two occurred only within the water table's smear zone, and is not subject to removal activity. Toluene exceeded the Method Two and the 10x rule alternative cleanup level with a reading of 123 mg/kg at a single location. As with total xylenes this level of toluene occurred within the water table's smear zone. All soil contaminant concentrations as measured in post excavation confirmation samples are presented in Table 4. Figure 4 depicts the sample locations.

In one confirmation sample (SP20-CS-401-130) benzene was detected at an estimated concentration of .639 mg/kg, which is above the site cleanup level of 0.5 mg/kg. The PQL for this sample was 1.38 mg/kg. However, this sample is a duplicate of sample SP20-CS-308-130, which did not detect benzene at a PQL of 1.04 mg/kg. Since the estimated benzene value was less than the PQL in both these cases, it cannot be determined whether the samples actually did contain benzene above the cleanup level. Since the confirmation sample and its duplicate were not homogenized prior to placing them in their sample jars, it is reasonable that their results would vary significantly. NOAA used the higher estimated result from the duplicate sample in mapping and discussion of contaminant levels at the site. As noted in the discussion of data quality, the PQL for benzene was above the site cleanup level in several of the samples coinciding with high detections of ethylbenzene. It is possible the benzene also exceeded its cleanup level in these samples but the data can neither prove nor disprove this.

All other contaminants were either not detected (with PQLs below ADEC Method Two cleanup levels), or were detected at concentrations below ADEC Method Two cleanup levels.

6.2 CHARACTERIZATION SAMPLES

Characterization samples collected from PCS removed from the Municipal Garage site contained several constituents that exceeded the site cleanup levels, including DRO with concentrations that varied from not detected to 6,860 mg/kg, GRO (as high as 1,600 mg/kg), ethylbenzene (as high as 20.6 mg/kg), and total xylenes (as high as 231.9 mg/kg). Toluene did not exceed the alternate cleanup level, but was detected as high as 11.4 mg/kg. Table 5 provides an analytical data summary of characterization sample results. The characterization samples collected during the June 2007 investigation detected lead as high as 1,160 mg/kg in the area where soil was eventually removed during this corrective action. Since only 18 CY of lead contaminated soil was removed during this corrective action, no additional characterization samples were collected from the soil removed.

6.3 BACKFILL CHARACTERIZATION SAMPLES

Backfill characterization samples collected from the Lake Hill scoria pit indicated concentrations of all clean backfill-specific analytes below the ADEC Method Two cleanup levels (Table 6).

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7.0 QUALITY ASSURANCE AND QUALITY CONTROL

To ensure that information obtained from field and laboratory procedures is an accurate and defensible representation of site conditions, quality assurance and quality control (QA/QC) procedures were implemented. NOAA followed the operational guidelines set forth in the ADEC Environmental Laboratory Data and Quality Assurance Requirements memorandum (ADEC 2006) as well as those stipulated in the Pribilof Islands site restoration QAP (NOAA 2006a). These documents provide detailed QA/QC information pertaining to each quality control item discussed in this section. Appendix C contains a Chemical Data Quality Assessment Summary and 6 copies (one for each sample delivery group) of the ADEC-required (ADEC 2006) Laboratory Data Review Checklist completed by NOAA's contractor, BSE/Tutka, LLC.

Although the Chemical Data Quality Assessment Summary in Appendix C points out various instances with the data set in which data quality objectives defined by the QAP were not met, the data are satisfactory for decision making purposes.

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8.0 CONCEPTUAL SITE MODEL

A conceptual site model (CSM) is used to evaluate exposure pathways for human health and ecological receptors (ADEC 2000b). The following subsections provide an evaluation for each of the elements of the CSM for the Municipal Garage, including historical contamination sources, release mechanisms, impacted media, migration pathways, exposure routes, potential receptors, and a cumulative risk assessment.

8.1 HISTORICAL SOURCES OF CONTAMINATION

Historical sources of contamination (*e.g.,* peeling LBP, a sump, two floor drains inside or adjacent to the building, ASTs, USTs, and fuel pipelines around the outside of the building) were removed from this site. The resulting contamination (*i.e.,* lead contaminated soil and PCS) was mostly removed from the site during the 2007 field season, except for petroleum contaminated soil at the depth of groundwater (14 feet bgs) and contaminated soil near underground utilities.

8.2 RELEASE MECHANISMS

Potential release mechanisms include LBP peeling from the Municipal Garage building, wastes dumped into the sump and the floor drains, and leaks and spills from the ASTs, USTs, and pipelines.

8.3 IMPACTED MEDIA

As a result of past releases, NOAA identified lead contaminated soil and PCS during site investigations. During the 2003 field seasons, NOAA removed PCS from areas on 3 sides of the site to depths up to 15 feet bgs. Groundwater was consistently encountered at approximately 14 to 15 ft bgs. Contaminated soil was left behind in these excavations because the water table was reached, or because the contamination continued beneath the Municipal Garage, the connector building next door, or close to buried utilities. In 2007, NOAA removed the Municipal Garage and part of the pad under the former connector building, then removed lead contaminated soil adjacent the northwest end of the building as well as PCS that had been underneath the buildings, again reaching PCS excavation depths of 14 feet deep. Analytical data for confirmation samples indicates that contamination remains in some areas at the interface of the groundwater table.

8.4 MIGRATION PATHWAYS

NOAA removed all lead contaminated soil that exceeds the site cleanup level, thus no migration pathway remains for this contaminant. NOAA removed PCS to the groundwater table (14 to 15 feet bgs). PCS that was not removed from the groundwater table continues to be a source of contamination to groundwater. The majority of PCS, however, has been removed from this site, and the source volume has been significantly reduced.

NOAA removed petroleum-contaminated surface soil, and no overland transport pathway is available to PCS remaining at 14 to 15 feet bgs.

8.5 EXPOSURE ROUTES

Because NOAA has removed all lead contaminated soil that exceeds site cleanup levels, all exposure routes have been eliminated for this contaminant. Because NOAA has removed nearly all PCS down to the groundwater table, direct exposure pathways such as dermal contact with or incidental ingestion of PCS no longer exist at this site. The depth of remaining contamination likely precludes inhalation of source material vapors or contaminated soil particles or direct contact with this soil. However, some contamination remains above cleanup criteria in soil at or near the water table at 13 to 14 feet bgs. The contaminant analytes are discussed below in section 8.7. Inhalation and ingestion of contaminated groundwater are not considered viable exposure routes because no water production wells are located in the vicinity; therefore, exposure to contaminated groundwater is unlikely. Given the proximity of the site to the harbor and the direction of groundwater flow, it is possible that the contaminated groundwater could migrate to the surface water of the harbor; however, there is no indication of this occurring. NOAA is conducting long term groundwater monitoring of wells located between the site and the harbor and will be able to detect in any such migration if it should occur (NOAA 2005b).

8.6 POTENTIAL RECEPTORS

Potential exposure pathways have been mitigated, and indirect exposure routes are not considered viable given existing site conditions, thus no potential receptors have been identified.

8.7 CUMULATIVE RISK ASSESSMENT

Cumulative risk is defined as the sum of risks resulting from multiple sources and pathways to which humans are exposed. When more than one hazardous substance is present at a site or multiple exposure pathways exist, the cleanup levels in Table B1 of 18 AAC 75.341 and Table C of 18 AAC 75.345 may need to be adjusted downward. In accordance with the requirements outlined in 18 AAC 78.600, NOAA must ensure that the cumulative cancer risk remaining after the completion of the corrective action does not exceed 1 in 100,000 (1×10^{-5}) and that the cumulative non-carcinogenic hazard index does not exceed 1.0. Each contaminant detected above one-tenth of the Table B1 inhalation or ingestion cleanup levels (excluding DRO, GRO, and RRO) must be included in cumulative risk calculations (ADEC 2007) if those contaminants are found in soil or groundwater to which there is a complete pathway. However, the only remaining soil with levels of contamination above one-tenth of the Table B1 inhalation or ingestion cleanup levels at the site are found within the groundwater smear zone at 13 to 14 feet bgs. Since there is no complete exposure pathway to this soil or groundwater, there is no risk to human health, and no cumulative risk calculation is required with respect to this soil. No soil samples collected within soil shallower than the smear zone at the site exceeded one-tenth of the Table B1 inhalation or ingestion cleanup levels, so no cumulative risk calculation is required for the site.

8.8 MONITORING WELL NETWORK

Monitoring wells located in the vicinity of the site include MW46-6, MW46-28, MW46-5, MW46-9, MW46-14, MW46-10, and MW46-15 (Figure 7).

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9.0 CONCLUSIONS AND RECOMMENDATIONS

The following subsections present conclusions and recommendations for the Municipal Garage on field activities performed and analytical findings obtained from corrective action activities conducted during the 2004 field season.

9.1 CONCLUSIONS

NOAA and its contractors removed approximately 2,017 CY of PCS and 18 CY of lead contaminated soil from the Municipal Garage and Connector Building sites. No lead contaminated soil remains above the site cleanup level of 1,000 mg/kg. Although confirmation sample data indicated that GRO, DRO, toluene, ethylbenzene, and total xylenes concentrations remain above the site cleanup level in some portions of the bottom of the excavation, further excavation was not practicable due to the presence of groundwater (18 AAC 75.325(f), 18 AAC 75.990). Because of the great depth of the remaining contamination (13 to 15 feet bgs), there is no complete exposure pathway to humans or the environment, and therefore no unacceptable risks are present. Groundwater in the vicinity of the site is being monitored to evaluate contaminant attenuation and to ensure that if contaminant levels increase they do not pose an unacceptable risk to the environment.

9.2 RECOMMENDATION

Because NOAA removed the primary sources of contamination and met the objectives of the CAP addendum, NOAA seeks a conditional closure for soil contamination at the Municipal Garage site. ADEC can concur with this request by providing NOAA with a signed copy of the conditional closure approval letter attached at the end of this report as Appendix E.

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TABLES

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TABLE 1
RESULTS OF 2007 NOAA BUILDING PERIMETER INVESTIGATIN FOR LEAD IN SOIL
Municipal Garage Demolition St. Paul Island, Alaska

SAMPLE ID	Municipal Garage Building Side (soil condition)	XRF Lead Measurement Reading	XRF Lead Measurement Error	LAB ANALYTICAL RESULTS	TCLP RESULTS
		mg/kg	+/- mg/kg	mg/kg	mg/L
SP20-CH-101-005	West (2003 clean fill)	8.22	19.07	823.00	
SP20-CH-101-010	West (2003 clean fill)	-8.92	21.73		
SP20-CH-102-005	West (2003 clean fill)	1.48	18.59		
SP20-CH-102-010	West (2003 clean fill)	-5.93	19.29		
SP20-CH-103-005	West (2003 clean fill)	13.1	25.7		
SP20-CH-103-010	West (2003 clean fill)	-3.89	21.89		
SP20-CH-104-005	West (2003 clean fill)	-3.31	20.3		
SP20-CH-104-010	West (2003 clean fill)	-8.82	18.72		
SP20-CH-105-005	West (2003 clean fill)	11.43	19.88	7.48	
SP20-CH-105-010	West (2003 clean fill)	4.06	19.24		
SP20-CH-106-005	West (2003 clean fill)	6.28	19.47		
SP20-CH-106-010	West (2003 clean fill)	8.91	20.86		
SP20-CH-107-005D	West (2003 clean fill)	3.27	24.01		
SP20-CH-108-005	North (undisturbed)	524.31	59.86	278.00	4.38
SP20-CH-108-005D	North (undisturbed)	197.68	40.49		
SP20-CH-108-010	North (undisturbed)	202.43	34.62		
SP20-CH-108-015	North (undisturbed)	673.27	66.19	1,160.00	2.99
SP20-CH-108-015D	North (undisturbed)	585.79	54.9		
SP20-CH-108-020	North (undisturbed)	168.93	38.37		
SP20-CH-109-005	North (undisturbed)	155.46	37.94		
SP20-CH-109-010	North (undisturbed)	271.41	50.15		
SP20-CH-109-015	North (undisturbed)	197.99	41.37		
SP20-CH-109-015D	North (undisturbed)	250.48	44.21		
SP20-CH-109-020	North (undisturbed)	147.89	36.35		
SP20-CH-110-010	East (road & 2003 fill)	108.8	34.76		
SP20-CH-110-015	East (road & 2003 fill)	116.57	33.77		
SP20-CH-110-015D	East (road & 2003 fill)	107.99	29.4		
SP20-CH-110-020	East (road & 2003 fill)	146.36	35.46		
SP20-CH-110-050	East (road & 2003 fill)	56.19	36.01		
SP20-CH-111-010	East (road & 2003 fill)	24.22	24.13		
SP20-CH-111-015	East (road & 2003 fill)	-13.04	21.7		
SP20-CH-111-020	East (road & 2003 fill)	25.99	27.02		
SP20-CH-111-050	East (road & 2003 fill)	61.01	30.27		
SP20-CH-112-005	East (road & 2003 fill)	9.69	25.79		
SP20-CH-112-010	East (road & 2003 fill)	314.04	69.5		
SP20-CH-112-015	East (road & 2003 fill)	333.48	54.87	398.00	
SP20-CH-112-015D	East (road & 2003 fill)	255.04	61.33		
SP20-CH-112-020	East (road & 2003 fill)	142.35	36.11		
SP20-CH-113-005	East (road & 2003 fill)	24.59	28.45		
SP20-CH-113-010	East (road & 2003 fill)	163.72	39.19		
SP20-CH-113-015	East (road & 2003 fill)	36.71	24.69		

TABLE 1
RESULTS OF 2007 NOAA BUILDING PERIMETER INVESTIGATIN FOR LEAD IN SOIL
Municipal Garage Demolition St. Paul Island, Alaska

SAMPLE ID	Municipal Garage Building Side (soil condition)	XRF Lead Measurement		LAB ANALYTICAL RESULTS	TCLP RESULTS
		Reading	Error		
		mg/kg	+/- mg/kg	mg/kg	mg/L
SP20-CH-113-020	East (road & 2003 fill)	-5.94	19.37		
SP20-CH-114-005	East (road & 2003 fill)	171.44	40.95	514.00	
SP20-CH-114-010	East (road & 2003 fill)	231.91	39.67		
SP20-CH-114-015	East (road & 2003 fill)	116.96	35.07		
SP20-CH-114-020	East (road & 2003 fill)	3.25	19.42		
SP20-CH-115-005	East (road & 2003 fill)	87.33	29.97		
SP20-CH-115-010	East (road & 2003 fill)	139.65	36.38		
SP20-CH-115-015	East (road & 2003 fill)	17.4	22.39		
SP20-CH-115-020	East (road & 2003 fill)	-1.58	19.79		

TABLE 2
SITE-SPECIFIC CLEANUP LEVELS FOR SOIL UNDER THE 10X RULE Municipal Garage Demolition St. Paul Island, Alaska

Analysis Type	Laboratory Method	Cleanup Level, mg/kg
Total Lead	EPA 6020	1,000
GRO [b]	AK-101	1,400
DRO [b]	AK-102	2,500
Acenaphthene[a]	EPA 8270C	210
Anthracene[a]	EPA 8270C	4,300
Benzo(a)anthracene[a]	EPA 8270C	6
Benzo(b)fluoranthene[a]	EPA 8270C	11
Benzo(k)fluoranthene[a]	EPA 8270C	110
Benzo(a)pyrene[a]	EPA 8270C	1
Chrysene[a]	EPA 8270C	620
Dibenzo(a,h)anthracene[a]	EPA 8270C	1
Fluorene[a]	EPA 8270C	270
Indeno(1,2,3-c,d)pyrene[a]	EPA 8270C	11
Naphthalene[a]	EPA 8270C	43
Pyrene[a]	EPA 8270C	1,500
Benzene[b]	AK-101	0.5
Toluene[b]	AK-101	54
Ethylbenzene[b]	AK-101	55
Total Xylenes[a]	AK-101	78

[a] These contaminants are still subject to the cleanup levels under Method Two, the chemical-specific cleanup levels for the PAHs indicated must be met unless ADEC determines that those cleanup levels need not be met to protect human health, safety, and welfare, and the environment (Note 15 to Method Two Tables B1 and B2).

[b] ADEC has approved the use of the 10X rule for these contaminants. NOAA will elect to cleanup benzene in soils at 0.5 mg/kg in accordance with the TPA (see Section 1.0), and NOAA may elect to cleanup GRO, DRO, and other contaminants as appropriate under the Ten Times Rule (see Section 5.1.1 of NOAA's Final CAP for this site (NOAA 2006b)).

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TABLE 3
TCLP RESULTS FOR SIDING AND INTERIOR PLYWOOD TREATED WITH ECOBOND
Municipal Garage Demolition St. Paul Island, Alaska

Sample No./sampling location	Parameter	Results	Units	PQL	Units	Analytical Method	Cleanup level	Units
Exterior 001	TCLP Lead	0.749	mg/L	0.500	mg/L	SW6010B TCLP	5	mg/L
Exterior 002	TCLP Lead	1.38	mg/L	0.500	mg/L	SW6010B TCLP	5	mg/L
Exterior 003	TCLP Lead	<0.500	mg/L	0.500	mg/L	SW6010B TCLP	5	mg/L
Exterior 004	TCLP Lead	3.74	mg/L	0.500	mg/L	SW6010B TCLP	5	mg/L
Exterior 005	TCLP Lead	0.968	mg/L	0.500	mg/L	SW6010B TCLP	5	mg/L
Exterior 006	TCLP Lead	1.13	mg/L	0.500	mg/L	SW6010B TCLP	5	mg/L
Exterior 007	TCLP Lead	0.986	mg/L	0.500	mg/L	SW6010B TCLP	5	mg/L
Interior 008	TCLP Lead	<0.500	mg/L	0.500	mg/L	SW6010B TCLP	5	mg/L
Interior 009	TCLP Lead	<0.500	mg/L	0.500	mg/L	SW6010B TCLP	5	mg/L
Interior 010	TCLP Lead	<0.500	mg/L	0.500	mg/L	SW6010B TCLP	5	mg/L
Interior 011	TCLP Lead	<0.500	mg/L	0.500	mg/L	SW6010B TCLP	5	mg/L

< = Less than the value listed
mg/L= Milligrams per Liter
PQL = Practical Quantitation Limit

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TABLE 4
ANALYTICAL DATA SUMMARY -CONFIRMATION SAMPLE RESULTS
Municipal Garage Demolition St. Paul Island, Alaska

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
SP20-CS-100-020	Lead	23	0.238	1,000	mg/kg
SP20-CS-001-020	Lead	18.7	0.215	1,000	mg/kg
Duplicate of SP20-CS-001-020					
SP20-CS-010-140	1-Methylnaphthalene	33.3	2.7	n/a	mg/kg
	2-Methylnaphthalene	43.9	2.7	n/a	mg/kg
	Acenaphthene	0.697	0.054	210	mg/kg
	Acenaphthylene	0	0.054	n/a	mg/kg
	Anthracene	0.0356J	0.054	4,300	mg/kg
	Benzene	0	0.155	0.5	mg/kg
	Benzo(a)anthracene	0.082	0.054	6	mg/kg
	Benzo(a)pyrene	0.07	0.054	3	mg/kg
	Benzo(b)fluoranthene	0.0516J	0.054	20	mg/kg
	Benzo(g,h,i)perylene	0.0301J	0.054	n/a	mg/kg
	Benzo(k)fluoranthene	0.0313J	0.054	200	mg/kg
	Chrysene	0.0794	0.054	620	mg/kg
	Dibenzo(a,h)anthracene	0	0.054	6	mg/kg
	Diesel Range Organics	**10,900**	1080	2,500	mg/kg
	Ethylbenzene	**8.87**	0.297	5.5	mg/kg
	Fluoranthene	0.143	0.054	2,100	mg/kg
	Fluorene	0.882	0.054	270	mg/kg
	Gasoline Range Organics	1,300	59.4	1,400	mg/kg
	Indeno(1,2,3-cd)pyrene	0.0262J	0.054	54	mg/kg
	Naphthalene	24.6	2.7	43	mg/kg
	o-Xylene	9.77	0.297	n/a	mg/kg
	Phenanthrene	0.492	0.054	n/a	mg/kg
	Pyrene	0.255	0.054	1,500	mg/kg
	Residual Range Organics	217	21.6	10,000	mg/kg
	Toluene	0.363J	0.594	54	mg/kg
	Total Xylene	42.87	0.891	78	mg/kg
	Xylene, Isomers m & p	33.1	0.594	n/a	mg/kg
SP20-CS-011-060	Benzene	0	0.0141	0.5	mg/kg
	Diesel Range Organics	3.58J	21.9	2,500	mg/kg
	Ethylbenzene	0.0349	0.0271	5.5	mg/kg
	Gasoline Range Organics	2.95	2.71	1,400	mg/kg
	o-Xylene	0.122	0.0271	n/a	mg/kg
	Residual Range Organics	9.31J	21.9	10,000	mg/kg
	Toluene	0.0414J	0.0541	54	mg/kg
	Total Xylene	0.34	0.0812	78	mg/kg
	Xylene, Isomers m & p	0.218	0.0541	n/a	mg/kg

TABLE 4
ANALYTICAL DATA SUMMARY -CONFIRMATION SAMPLE RESULTS
Municipal Garage Demolition St. Paul Island, Alaska

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
SP20-CS-023-130	Benzene	0	0.147	0.5	mg/kg
	Diesel Range Organics	**9,160**	436	2,500	mg/kg
	Ethylbenzene	5.26	0.283	5.5	mg/kg
	Gasoline Range Organics	654	28.3	1,400	mg/kg
	o-Xylene	1.25	0.283	n/a	mg/kg
	Residual Range Organics	1,180	218	10,000	mg/kg
	Toluene	0.441J	0.566	54	mg/kg
	Total Xylene	23.25	0.849	78	mg/kg
	Xylene, Isomers m & p	22	0.566	n/a	mg/kg
SP20-CS-024-130	Benzene	0	0.0124	0.5	mg/kg
	Diesel Range Organics	2,000	87.4	2,500	mg/kg
	Ethylbenzene	1.98	0.0239	5.5	mg/kg
	Gasoline Range Organics	206	11.9	1,400	mg/kg
	o-Xylene	2.32	0.239	n/a	mg/kg
	Residual Range Organics	71.6J	87.4	10,000	mg/kg
	Toluene	0.299	0.0477	54	mg/kg
	Total Xylene	13.02	0.716	78	mg/kg
	Xylene, Isomers m & p	10.7	0.477	n/a	mg/kg
SP20-CS-025-130	Benzene	0.0867J	0.105	0.5	mg/kg
	Diesel Range Organics	**2,710**	117	2,500	mg/kg
	Ethylbenzene	**13.2**	0.202	5.5	mg/kg
	Gasoline Range Organics	487	20.2	1,400	mg/kg
	o-Xylene	21.1	2.02	n/a	mg/kg
	Residual Range Organics	287	23.4	10,000	mg/kg
	Toluene	13.3	0.403	54	mg/kg
	Total Xylene	**79.4**	6.05	78	mg/kg
	Xylene, Isomers m & p	58.3	4.03	n/a	mg/kg
SP20-CS-027-130	Benzene	0	12.3	0.5	mg/kg
	Diesel Range Organics	**10,200**	445	2,500	mg/kg
	Ethylbenzene	**86.1**	23.6	5.5	mg/kg
	Gasoline Range Organics	**3,160**	236	1,400	mg/kg
	o-Xylene	134	23.6	n/a	mg/kg
	Residual Range Organics	288	88.9	10,000	mg/kg
	Toluene	35.4J	47.2	54	mg/kg
	Total Xylene	**552**	70.8	78	mg/kg
	Xylene, Isomers m & p	418	47.2	n/a	mg/kg
SP20-CS-028-130	Benzene	0	0.0732	0.5	mg/kg
GPS Point labeled as SP20-CH-028-130	Diesel Range Organics	**8,690**	434	2,500	mg/kg
	Ethylbenzene	**17.8**	1.41	5.5	mg/kg
	Gasoline Range Organics	529	14.1	1,400	mg/kg
	o-Xylene	19.1	1.41	n/a	mg/kg
	Residual Range Organics	209	86.8	10,000	mg/kg
	Toluene	3.52	0.281	54	mg/kg
	Total Xylene	**97.9**	4.22	78	mg/kg
	Xylene, Isomers m & p	78.8	2.81	n/a	mg/kg

TABLE 4
ANALYTICAL DATA SUMMARY -CONFIRMATION SAMPLE RESULTS
Municipal Garage Demolition St. Paul Island, Alaska

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
SP20-CS-029-130	1,1,1-Trichloroethane	0	2.43	1.0	mg/kg
	1,1,2,2-Tetrachloroethane	0	4.85	0.017	mg/kg
	1,1-Dichloroethane	0	2.43	12	mg/kg
	1,1-Dichloroethene	0	2.43	12	mg/kg
	1,2-Dichlorobenzene	0	2.43	7.0	mg/kg
	1,2-Dichloroethane	0	2.43	0.015	mg/kg
	1,2-Dichloropropane	0	2.43	0.017	mg/kg
	1,3-Dichlorobenzene	0	2.43	0.02	mg/kg
	1,4-Dichlorobenzene	0	2.43	0.8	mg/kg
	1-Methylnaphthalene	18	5.37	n/a	mg/kg
	2-Methylnaphthalene	34	5.37	n/a	mg/kg
	Acenaphthene	0.162	0.0537	210	mg/kg
	Acenaphthylene	0	0.0537	n/a	mg/kg
	Anthracene	0.0286J	0.0537	4,300	mg/kg
	Benzene	0	1.26	0.5	mg/kg
	Benzo(a)anthracene	0.0261J	0.0537	6	mg/kg
	Benzo(a)pyrene	0	0.0537	3	mg/kg
	Benzo(b)fluoranthene	0	0.0537	20	mg/kg
	Benzo(g,h,i)perylene	0	0.0537	n/a	mg/kg
	Benzo(k)fluoranthene	0.0274J	0.0537	200	mg/kg
	Bromodichloromethane	0	2.43	0.35	mg/kg
	Bromoform	0	2.43	0.38	mg/kg
	Carbon tetrachloride	0	2.43	0.03	mg/kg
	Chlorobenzene	0	2.43	0.6	mg/kg
	Chloroform	0	2.43	0.34	mg/kg
	Chrysene	0.0279J	0.0537	620	mg/kg
	cis-1,2-Dichloroethene	0	2.43	0.2	mg/kg
	Dibenzo(a,h)anthracene	0	0.0537	6	mg/kg
	Dibromochloromethane	0	2.43	n/a	mg/kg
	Diesel Range Organics	**3,060**	215	2,500	mg/kg
	Ethylbenzene	**86.1**	2.43	5.5	mg/kg
	Fluoranthene	0.0486J	0.0537	2,100	mg/kg
	Fluorene	0.19	0.0537	270	mg/kg
	Gasoline Range Organics	**3,290**	243	1,400	mg/kg
	Indeno(1,2,3-cd)pyrene	0	0.0537	54	mg/kg
	Methylene chloride	0	9.7	0.015	mg/kg
	Naphthalene	33.1	5.37	43	mg/kg
	o-Xylene	160	2.43	n/a	mg/kg
	Phenanthrene	0.253	0.0537	n/a	mg/kg
	Pyrene	0.0941	0.0537	1,500	mg/kg
	Residual Range Organics	3,220	215	10,000	mg/kg
	Tetrachloroethene	0	2.43	0.03	mg/kg
	Toluene	53.7	4.85	54	mg/kg
	Total Xylene	**645**	7.28	78	mg/kg
	trans-1,2-Dichloroethene	0	2.43	0.4	mg/kg
	Trichloroethene	0	2.43	0.027	mg/kg
	Xylene, Isomers m & p	485	4.85	n/a	mg/kg

TABLE 4
ANALYTICAL DATA SUMMARY -CONFIRMATION SAMPLE RESULTS
Municipal Garage Demolition St. Paul Island, Alaska

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
SP20-CS-110-130	1-Methylnaphthalene	20.5	5.38	n/a	mg/kg
Duplicate of SP20-CS-029-130	2-Methylnaphthalene	38	5.38	n/a	mg/kg
	Acenaphthene	0.172	0.0538	210	mg/kg
	Acenaphthylene	0	0.0538	n/a	mg/kg
	Anthracene	0.0298J	0.0538	4,300	mg/kg
	Benzene	0	11.1	0.5	mg/kg
	Benzo(a)anthracene	0.023J	0.0538	6	mg/kg
	Benzo(a)pyrene	0	0.0538	3	mg/kg
	Benzo(b)fluoranthene	0	0.0538	20	mg/kg
	Benzo(g,h,i)perylene	0	0.0538	n/a	mg/kg
	Benzo(k)fluoranthene	0.0305J	0.0538	200	mg/kg
	Chrysene	0.0258J	0.0538	620	mg/kg
	Dibenzo(a,h)anthracene	0	0.0538	6	mg/kg
	Diesel Range Organics	**3,770**	214	2,500	mg/kg
	Ethylbenzene	**97.5**	21.3	5.5	mg/kg
	Fluoranthene	0.0498J	0.0538	2,100	mg/kg
	Fluorene	0.204	0.0538	270	mg/kg
	Gasoline Range Organics	**3,430**	213	1,400	mg/kg
	Indeno(1,2,3-cd)pyrene	0	0.0538	54	mg/kg
	Naphthalene	37.1	5.38	43	mg/kg
	o-Xylene	167	21.3	n/a	mg/kg
	Phenanthrene	0.269	0.0538	n/a	mg/kg
	Pyrene	0	0.0538	1,500	mg/kg
	Residual Range Organics	4,000	214	10,000	mg/kg
	Toluene	**70.9**	42.6	54	mg/kg
	Total Xylene	**735**	63.9	78	mg/kg
	Xylene, Isomers m & p	568	42.6	n/a	mg/kg
SP20-CS-030-140	1-Methylnaphthalene	0.0152	0.0066	n/a	mg/kg
	2-Methylnaphthalene	0.009	0.0066	n/a	mg/kg
	Acenaphthene	0.0032J	0.0066	210	mg/kg
	Acenaphthylene	0	0.0066	n/a	mg/kg
	Anthracene	0	0.0066	4,300	mg/kg
	Benzene	0	0.0127	0.5	mg/kg
	Benzo(a)anthracene	0	0.0066	6	mg/kg
	Benzo(a)pyrene	0	0.0066	3	mg/kg
	Benzo(b)fluoranthene	0	0.0066	20	mg/kg
	Benzo(g,h,i)perylene	0.0021J	0.0066	n/a	mg/kg
	Benzo(k)fluoranthene	0	0.0066	200	mg/kg
	Chrysene	0	0.0066	620	mg/kg
	Dibenzo(a,h)anthracene	0	0.0066	6	mg/kg
	Diesel Range Organics	62.3	26	2,500	mg/kg
	Ethylbenzene	0.0102J	0.0244	5.5	mg/kg
	Fluoranthene	0.0023J	0.0066	2,100	mg/kg
	Fluorene	0.0041J	0.0066	270	mg/kg
	Gasoline Range Organics	2.01J	2.44	1,400	mg/kg
	Indeno(1,2,3-cd)pyrene	0	0.0066	54	mg/kg
	Naphthalene	0.0132	0.0066	43	mg/kg
	o-Xylene	0.0202J	0.0244	n/a	mg/kg
	Phenanthrene	0.0028J	0.0066	n/a	mg/kg
	Pyrene	0.0049J	0.0066	1,500	mg/kg
	Residual Range Organics	38.4	26	10,000	mg/kg
	Toluene	0	0.0487	54	mg/kg
	Total Xylene	0.0928J	0.0731	78	mg/kg
	Xylene, Isomers m & p	0.0726	0.0487	n/a	mg/kg

TABLE 4
ANALYTICAL DATA SUMMARY -CONFIRMATION SAMPLE RESULTS
Municipal Garage Demolition St. Paul Island, Alaska

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
SP20-CS-031-140	Benzene	0	0.0132	0.5	mg/kg
	Diesel Range Organics	**3,280**	220	2,500	mg/kg
	Ethylbenzene	0.0132J	0.0254	5.5	mg/kg
	Gasoline Range Organics	31	2.54	1,400	mg/kg
	o-Xylene	0	0.0254	n/a	mg/kg
	Residual Range Organics	710	88.2	10,000	mg/kg
	Toluene	0	0.0508	54	mg/kg
	Total Xylene	0.0432J	0.0762	78	mg/kg
	Xylene, Isomers m & p	0.0432J	0.0508	n/a	mg/kg
SP20-CS-032-140	Benzene	0.0273	0.0165	0.5	mg/kg
	Diesel Range Organics	310	22.6	2,500	mg/kg
	Ethylbenzene	0.0876	0.0317	5.5	mg/kg
	Gasoline Range Organics	14.7	3.17	1,400	mg/kg
	o-Xylene	0.41	0.0317	n/a	mg/kg
	Residual Range Organics	1,570	90.4	10,000	mg/kg
	Toluene	0.145	0.0635	54	mg/kg
	Total Xylene	1.45	0.0952	78	mg/kg
	Xylene, Isomers m & p	1.04	0.0635	n/a	mg/kg
SP20-CS-033-140	Benzene	0	0.0131	0.5	mg/kg
	Diesel Range Organics	**3,310**	217	2,500	mg/kg
	Ethylbenzene	0	0.0251	5.5	mg/kg
	Gasoline Range Organics	58.5	2.51	1,400	mg/kg
	o-Xylene	0	0.0251	n/a	mg/kg
	Residual Range Organics	74.3J	86.7	10,000	mg/kg
	Toluene	0	0.0503	54	mg/kg
	Total Xylene	0	0.0754	78	mg/kg
	Xylene, Isomers m & p	0	0.0503	n/a	mg/kg
SP20-CS-034-140	Benzene	0	0.0106	0.5	mg/kg
	Diesel Range Organics	22.3	21.7	2,500	mg/kg
	Ethylbenzene	0	0.0204	5.5	mg/kg
	Gasoline Range Organics	1.84J	2.04	1,400	mg/kg
	o-Xylene	0.0072J	0.0204	n/a	mg/kg
	Residual Range Organics	50.4	21.7	10,000	mg/kg
	Toluene	0.0127J	0.0409	54	mg/kg
	Total Xylene	0.0276J	0.0613	78	mg/kg
	Xylene, Isomers m & p	0.0204J	0.0409	n/a	mg/kg
SP20-CS-035-140	Benzene	0	0.0111	0.5	mg/kg
	Diesel Range Organics	21.1J	21.2	2,500	mg/kg
	Ethylbenzene	0.0486	0.0213	5.5	mg/kg
	Gasoline Range Organics	9.06	2.13	1,400	mg/kg
	o-Xylene	0.27	0.0213	n/a	mg/kg
	Residual Range Organics	34.8	21.2	10,000	mg/kg
	Toluene	0.0203J	0.0427	54	mg/kg
	Total Xylene	0.914	0.064	78	mg/kg
	Xylene, Isomers m & p	0.644	0.0427	n/a	mg/kg
SP20-CS-115-140	Benzene	0	0.0119	0.5	mg/kg
Duplicate of SP20-CS-035-140	Diesel Range Organics	54J	85.2	2,500	mg/kg
	Ethylbenzene	0.187	0.0228	5.5	mg/kg
	Gasoline Range Organics	37.9	4.56	1,400	mg/kg
	o-Xylene	1.07	0.0228	n/a	mg/kg
	Residual Range Organics	85.6	85.2	10,000	mg/kg
	Toluene	0.0285J	0.0456	54	mg/kg
	Total Xylene	3.63	0.0684	78	mg/kg
	Xylene, Isomers m & p	2.56	0.0456	n/a	mg/kg

TABLE 4
ANALYTICAL DATA SUMMARY -CONFIRMATION SAMPLE RESULTS
Municipal Garage Demolition St. Paul Island, Alaska

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
SP20-CS-303-140	1-Methylnaphthalene	16.2	2.87	n/a	mg/kg
	2-Methylnaphthalene	21.3	2.87	n/a	mg/kg
	Acenaphthene	0.0276J	0.0575	210	mg/kg
	Acenaphthylene	0	0.0575	n/a	mg/kg
	Anthracene	0	0.0575	4,300	mg/kg
	Benzene	0	0.142	0.5	mg/kg
	Benzo(a)anthracene	0	0.0575	6	mg/kg
	Benzo(a)pyrene	0	0.0575	3	mg/kg
	Benzo(b)fluoranthene	0	0.0575	20	mg/kg
	Benzo(g,h,i)perylene	0	0.0575	n/a	mg/kg
	Benzo(k)fluoranthene	0	0.0575	200	mg/kg
	Chrysene	0	0.0575	620	mg/kg
	Dibenzo(a,h)anthracene	0	0.0575	6	mg/kg
	Diesel Range Organics	309	23.1	2,500	mg/kg
	Ethylbenzene	2.46	0.273	5.5	mg/kg
	Fluoranthene	0	0.0575	2,100	mg/kg
	Fluorene	0.0375J	0.0575	270	mg/kg
	Gasoline Range Organics	330	136	1,400	mg/kg
	Indeno(1,2,3-cd)pyrene	0	0.0575	54	mg/kg
	Naphthalene	10.7	2.87	43	mg/kg
	o-Xylene	6.09	0.273	n/a	mg/kg
	Phenanthrene	0.0568J	0.0575	n/a	mg/kg
	Pyrene	0.0218J	0.0575	1,500	mg/kg
	Residual Range Organics	436	23.1	10,000	mg/kg
	Toluene	2.29	0.546	54	mg/kg
	Total Xylenes	23.6	0.819	78	mg/kg
	Xylene, Isomers m & p	17.5	0.546	n/a	mg/kg
SP20-CS-304-120	Benzene	0	0.015	0.5	mg/kg
	Diesel Range Organics	569	23	2,500	mg/kg
	Ethylbenzene	0.0793	0.0289	5.5	mg/kg
	Gasoline Range Organics	38.1	2.89	1,400	mg/kg
	o-Xylene	0.245	0.0289	n/a	mg/kg
	Residual Range Organics	580	23	10,000	mg/kg
	Toluene	0.0915	0.0579	54	mg/kg
	Total Xylenes	0.727	0.0868	78	mg/kg
	Xylene, Isomers m & p	0.482	0.0579	n/a	mg/kg
SP20-CS-305-100	Benzene	0	0.0112	0.5	mg/kg
	Diesel Range Organics	2.75J	21.8	2,500	mg/kg
	Ethylbenzene	0	0.0215	5.5	mg/kg
	Gasoline Range Organics	0.854J	2.15	1,400	mg/kg
	o-Xylene	0.0071J	0.0215	n/a	mg/kg
	Residual Range Organics	13.4J	21.8	10,000	mg/kg
	Toluene	0	0.043	54	mg/kg
	Total Xylenes	0.0254J	0.0645	78	mg/kg
	Xylene, Isomers m & p	0.0183J	0.043	n/a	mg/kg
SP20-CS-306-140	Benzene	0	1.24	0.5	mg/kg
	Diesel Range Organics	565	24.1	2,500	mg/kg
	Ethylbenzene	**9.92**	2.39	5.5	mg/kg
	Gasoline Range Organics	739	239	1,400	mg/kg
	o-Xylene	18.6	2.39	n/a	mg/kg
	Residual Range Organics	130	24.1	10,000	mg/kg
	Toluene	11.1	4.78	54	mg/kg
	Total Xylenes	74.6	7.17	78	mg/kg
	Xylene, Isomers m & p	56	4.78	n/a	mg/kg

TABLE 4
ANALYTICAL DATA SUMMARY -CONFIRMATION SAMPLE RESULTS
Municipal Garage Demolition St. Paul Island, Alaska

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
SP20-CS-308-130	Benzene	0	1.04	0.5	mg/kg
	Diesel Range Organics	30.9	23.2	2,500	mg/kg
	Ethylbenzene	**12.7**	1.99	5.5	mg/kg
	Gasoline Range Organics	686	99.7	1,400	mg/kg
	o-Xylene	19.3	1.99	n/a	mg/kg
	Residual Range Organics	28.2B	23.2	10,000	mg/kg
	Toluene	40.4	3.99	54	mg/kg
	Total Xylenes	76.3	5.98	78	mg/kg
	Xylene, Isomers m & p	57	3.99	n/a	mg/kg
SP20-CS-401-130	Benzene	0.639J	1.38	0.5	mg/kg
Duplicate of CS-308-130	Diesel Range Organics	55.6	23.5	2,500	mg/kg
	Ethylbenzene	**41.5**	2.66	5.5	mg/kg
	Gasoline Range Organics	**2,040**	133	1,400	mg/kg
	o-Xylene	57	2.66	n/a	mg/kg
	Residual Range Organics	36.7B	23.5	10,000	mg/kg
	Toluene	**123**	5.32	54	mg/kg
	Total Xylenes	**237**	7.98	78	mg/kg
	Xylene, Isomers m & p	180	5.32	n/a	mg/kg
SP20-CS-309-140	Benzene	0	0.153	0.5	mg/kg
	Diesel Range Organics	4.81J	25.9	2,500	mg/kg
	Ethylbenzene	2.78	0.294	5.5	mg/kg
	Gasoline Range Organics	96.3	14.7	1,400	mg/kg
	o-Xylene	3.7	0.294	n/a	mg/kg
	Residual Range Organics	18.9J	25.9	10,000	mg/kg
	Toluene	3.63	0.588	54	mg/kg
	Total Xylenes	16	0.882	78	mg/kg
	Xylene, Isomers m & p	12.3	0.588	n/a	mg/kg
SP20-CS-311-100	Benzene	0	0.0193	0.5	mg/kg
	Diesel Range Organics	4.3J	22.5	2,500	mg/kg
	Ethylbenzene	0.0887	0.0371	5.5	mg/kg
	Gasoline Range Organics	0	3.71	1,400	mg/kg
	o-Xylene	0.13	0.0371	n/a	mg/kg
	Residual Range Organics	28.6B	22.5	10,000	mg/kg
	Toluene	0.135	0.0742	54	mg/kg
	Total Xylenes	0.567	0.1113	78	mg/kg
	Xylene, Isomers m & p	0.437	0.0742	n/a	mg/kg
SP20-CS-312-100	Benzene	0	0.0163	0.5	mg/kg
	Diesel Range Organics	3.53J	21.8	2,500	mg/kg
	Ethylbenzene	0	0.0314	5.5	mg/kg
	Gasoline Range Organics	0	3.14	1,400	mg/kg
	o-Xylene	0	0.0314	n/a	mg/kg
	Residual Range Organics	15.9J	21.8	10,000	mg/kg
	Toluene	0	0.0627	54	mg/kg
	Total Xylenes	0.0301J	0.0941	78	mg/kg
	Xylene, Isomers m & p	0.0301J	0.0627	n/a	mg/kg

TABLE 4
ANALYTICAL DATA SUMMARY -CONFIRMATION SAMPLE RESULTS
Municipal Garage Demolition St. Paul Island, Alaska

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
SP20-CS-303-140	1-Methylnaphthalene	16.2	2.87	n/a	mg/kg
	2-Methylnaphthalene	21.3	2.87	n/a	mg/kg
	Acenaphthene	0.0276J	0.0575	210	mg/kg
	Acenaphthylene	0	0.0575	n/a	mg/kg
	Anthracene	0	0.0575	4,300	mg/kg
	Benzene	0	0.142	0.5	mg/kg
	Benzo(a)anthracene	0	0.0575	6	mg/kg
	Benzo(a)pyrene	0	0.0575	3	mg/kg
	Benzo(b)fluoranthene	0	0.0575	20	mg/kg
	Benzo(g,h,i)perylene	0	0.0575	n/a	mg/kg
	Benzo(k)fluoranthene	0	0.0575	200	mg/kg
	Chrysene	0	0.0575	620	mg/kg
	Dibenzo(a,h)anthracene	0	0.0575	6	mg/kg
	Diesel Range Organics	309	23.1	2,500	mg/kg
	Ethylbenzene	2.46	0.273	5.5	mg/kg
	Fluoranthene	0	0.0575	2,100	mg/kg
	Fluorene	0.0375J	0.0575	270	mg/kg
	Gasoline Range Organics	330	136	1,400	mg/kg
	Indeno(1,2,3-cd)pyrene	0	0.0575	54	mg/kg
	Naphthalene	10.7	2.87	43	mg/kg
	o-Xylene	6.09	0.273	n/a	mg/kg
	Phenanthrene	0.0568J	0.0575	n/a	mg/kg
	Pyrene	0.0218J	0.0575	1,500	mg/kg
	Residual Range Organics	436	23.1	10,000	mg/kg
	Toluene	2.29	0.546	54	mg/kg
	Total Xylenes	23.6	0.819	78	mg/kg
	Xylene, Isomers m & p	17.5	0.546	n/a	mg/kg
SP20-CS-304-120	Benzene	0	0.015	0.5	mg/kg
	Diesel Range Organics	569	23	2,500	mg/kg
	Ethylbenzene	0.0793	0.0289	5.5	mg/kg
	Gasoline Range Organics	38.1	2.89	1,400	mg/kg
	o-Xylene	0.245	0.0289	n/a	mg/kg
	Residual Range Organics	580	23	10,000	mg/kg
	Toluene	0.0915	0.0579	54	mg/kg
	Total Xylenes	0.727	0.0868	78	mg/kg
	Xylene, Isomers m & p	0.482	0.0579	n/a	mg/kg
SP20-CS-305-100	Benzene	0	0.0112	0.5	mg/kg
	Diesel Range Organics	2.75J	21.8	2,500	mg/kg
	Ethylbenzene	0	0.0215	5.5	mg/kg
	Gasoline Range Organics	0.854J	2.15	1,400	mg/kg
	o-Xylene	0.0071J	0.0215	n/a	mg/kg
	Residual Range Organics	13.4J	21.8	10,000	mg/kg
	Toluene	0	0.043	54	mg/kg
	Total Xylenes	0.0254J	0.0645	78	mg/kg
	Xylene, Isomers m & p	0.0183J	0.043	n/a	mg/kg
SP20-CS-306-140	Benzene	0	1.24	0.5	mg/kg
	Diesel Range Organics	565	24.1	2,500	mg/kg
	Ethylbenzene	**9.92**	2.39	5.5	mg/kg
	Gasoline Range Organics	739	239	1,400	mg/kg
	o-Xylene	18.6	2.39	n/a	mg/kg
	Residual Range Organics	130	24.1	10,000	mg/kg
	Toluene	11.1	4.78	54	mg/kg
	Total Xylenes	74.6	7.17	78	mg/kg
	Xylene, Isomers m & p	56	4.78	n/a	mg/kg

TABLE 4
ANALYTICAL DATA SUMMARY -CONFIRMATION SAMPLE RESULTS
Municipal Garage Demolition St. Paul Island, Alaska

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
SP20-CS-308-130	Benzene	0	1.04	0.5	mg/kg
	Diesel Range Organics	30.9	23.2	2,500	mg/kg
	Ethylbenzene	**12.7**	1.99	5.5	mg/kg
	Gasoline Range Organics	686	99.7	1,400	mg/kg
	o-Xylene	19.3	1.99	n/a	mg/kg
	Residual Range Organics	28.2B	23.2	10,000	mg/kg
	Toluene	40.4	3.99	54	mg/kg
	Total Xylenes	76.3	5.98	78	mg/kg
	Xylene, Isomers m & p	57	3.99	n/a	mg/kg
SP20-CS-309-140	Benzene	0	0.153	0.5	mg/kg
	Diesel Range Organics	4.81J	25.9	2,500	mg/kg
	Ethylbenzene	2.78	0.294	5.5	mg/kg
	Gasoline Range Organics	96.3	14.7	1,400	mg/kg
	o-Xylene	3.7	0.294	n/a	mg/kg
	Residual Range Organics	18.9J	25.9	10,000	mg/kg
	Toluene	3.63	0.588	54	mg/kg
	Total Xylenes	16	0.882	78	mg/kg
	Xylene, Isomers m & p	12.3	0.588	n/a	mg/kg
SP20-CS-311-100	Benzene	0	0.0193	0.5	mg/kg
	Diesel Range Organics	4.3J	22.5	2,500	mg/kg
	Ethylbenzene	0.0887	0.0371	5.5	mg/kg
	Gasoline Range Organics	0	3.71	1,400	mg/kg
	o-Xylene	0.13	0.0371	n/a	mg/kg
	Residual Range Organics	28.6B	22.5	10,000	mg/kg
	Toluene	0.135	0.0742	54	mg/kg
	Total Xylenes	0.567	0.1113	78	mg/kg
	Xylene, Isomers m & p	0.437	0.0742	n/a	mg/kg
SP20-CS-312-100	Benzene	0	0.0163	0.5	mg/kg
	Diesel Range Organics	3.53J	21.8	2,500	mg/kg
	Ethylbenzene	0	0.0314	5.5	mg/kg
	Gasoline Range Organics	0	3.14	1,400	mg/kg
	o-Xylene	0	0.0314	n/a	mg/kg
	Residual Range Organics	15.9J	21.8	10,000	mg/kg
	Toluene	0	0.0627	54	mg/kg
	Total Xylenes	0.0301J	0.0941	78	mg/kg
	Xylene, Isomers m & p	0.0301J	0.0627	n/a	mg/kg
SP20-CS-401-130	Benzene	0.639J	1.38	0.5	mg/kg
	Diesel Range Organics	55.6	23.5	2,500	mg/kg
	Ethylbenzene	**41.5**	2.66	5.5	mg/kg
	Gasoline Range Organics	**2040**	133	1,400	mg/kg
	o-Xylene	57	2.66	n/a	mg/kg
	Residual Range Organics	36.7B	23.5	10,000	mg/kg
	Toluene	**123**	5.32	54	mg/kg
	Total Xylenes	**237**	7.98	78	mg/kg
	Xylene, Isomers m & p	180	5.32	n/a	mg/kg

Bold numbers indicate greater than ADEC cleanup levels.
J = Estimated value due to value less than PQL
B = EPA Flag - Analyte present in the blank and the sample
CL = Initial analysis within holding time but required dilution
GRO = Gasoline Range Organics
DRO = Diesel Range Organics
RRO = Residual Range Organics
mg/Kg = Milligrams per Kilogram
PQL = Practical Quantitation Limit

TABLE 5
ANALYTICAL DATA SUMMARY -CHARACTERIZATION SAMPLE RESULTS
Municipal Garage Demolition St. Paul Island, Alaska

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
SP20-CH-002	1-Methylnaphthalene	0.216	0.0591	n/a	mg/kg
	2-Methylnaphthalene	0.0791	0.0591	n/a	mg/kg
	Acenaphthene	0	0.0591	210	mg/kg
	Acenaphthylene	0	0.0591	n/a	mg/kg
	Anthracene	0	0.0591	4,300	mg/kg
	Benzene	0	0.0165	0.5	mg/kg
	Benzo(a)anthracene	0	0.0591	6	mg/kg
	Benzo(a)pyrene	0	0.0591	3	mg/kg
	Benzo(b)fluoranthene	0	0.0591	20	mg/kg
	Benzo(g,h,i)perylene	0	0.0591	n/a	mg/kg
	Benzo(k)fluoranthene	0	0.0591	200	mg/kg
	Chrysene	0	0.0591	620	mg/kg
	Dibenzo(a,h)anthracene	0	0.0591	6	mg/kg
	Diesel Range Organics	265	23.9	2,500	mg/kg
	Ethylbenzene	0.034	0.0318	5.5	mg/kg
	Fluoranthene	0.0219J	0.0591	2,100	mg/kg
	Fluorene	0.0251J	0.0591	270	mg/kg
	Gasoline Range Organics	55.6	3.18	1,400	mg/kg
	Indeno(1,2,3-cd)pyrene	0	0.0591	54	mg/kg
	Naphthalene	0.023J	0.0591	43	mg/kg
	o-Xylene	0.027J	0.0318	n/a	mg/kg
	Phenanthrene	0.0388J	0.0591	n/a	mg/kg
	Pyrene	0.046J	0.0591	1,500	mg/kg
	Residual Range Organics	52	23.9	10,000	mg/kg
	Toluene	0.0216J	0.0635	54	mg/kg
	Total Xylene	0.168J	0.0953	78	mg/kg
	Xylene, Isomers m & p	0.141	0.0635	n/a	mg/kg
SP20-CH-003	Benzene	0.0111J	0.0156	0.5	mg/kg
	Diesel Range Organics	261	21.6	2,500	mg/kg
	Ethylbenzene	0	0.0301	5.5	mg/kg
	Gasoline Range Organics	3.03	3.01	1,400	mg/kg
	o-Xylene	0.031	0.0301	n/a	mg/kg
	Residual Range Organics	157	21.6	10,000	mg/kg
	Toluene	0.0539J	0.0602	54	mg/kg
	Total Xylene	0.0849J	0.0903	78	mg/kg
	Xylene, Isomers m & p	0.0539J	0.0602	n/a	mg/kg

TABLE 5
ANALYTICAL DATA SUMMARY -CHARACTERIZATION SAMPLE RESULTS
Municipal Garage Demolition St. Paul Island, Alaska

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
SP20-CH-004	1-Methylnaphthalene	0.0455J	0.0557	n/a	mg/kg
	2-Methylnaphthalene	0.0395J	0.0557	n/a	mg/kg
	Acenaphthene	0	0.0557	210	mg/kg
	Acenaphthylene	0	0.0557	n/a	mg/kg
	Anthracene	0	0.0557	4,300	mg/kg
	Benzene	0.0475	0.0133	0.5	mg/kg
	Benzo(a)anthracene	0.0462J	0.0557	6	mg/kg
	Benzo(a)pyrene	0.0592	0.0557	3	mg/kg
	Benzo(b)fluoranthene	0.0483J	0.0557	20	mg/kg
	Benzo(g,h,i)perylene	0.0748	0.0557	n/a	mg/kg
	Benzo(k)fluoranthene	0.0265J	0.0557	200	mg/kg
	Chrysene	0.0375J	0.0557	620	mg/kg
	Dibenzo(a,h)anthracene	0	0.0557	6	mg/kg
	Diesel Range Organics	417	22.1	2,500	mg/kg
	Ethylbenzene	0.0107J	0.0255	5.5	mg/kg
	Fluoranthene	0.0435J	0.0557	2,100	mg/kg
	Fluorene	0	0.0557	270	mg/kg
	Gasoline Range Organics	4.51	2.55	1,400	mg/kg
	Indeno(1,2,3-cd)pyrene	0.0545J	0.0557	54	mg/kg
	Naphthalene	0.0345J	0.0557	43	mg/kg
	o-Xylene	0.0641	0.0255	n/a	mg/kg
	Phenanthrene	0.0514J	0.0557	n/a	mg/kg
	Pyrene	0.0791	0.0557	1,500	mg/kg
	Residual Range Organics	284	22.1	10,000	mg/kg
	Toluene	0.0996	0.0511	54	mg/kg
	Total Xylene	0.1961	0.0766	78	mg/kg
	Xylene, Isomers m & p	0.132	0.0511	n/a	mg/kg
SP20-CH-008-140	Benzene	0	0.133	0.5	mg/kg
Confirmation Sample	Diesel Range Organics	**5,960**	245	2,500	mg/kg
mislabeled	Ethylbenzene	3.74	0.257	5.5	mg/kg
	Gasoline Range Organics	205	12.8	1,400	mg/kg
	o-Xylene	6.22	0.257	n/a	mg/kg
	Residual Range Organics	44.5	24.5	10,000	mg/kg
	Toluene	0.19J	0.513	54	mg/kg
	Total Xylene	22.42	0.77	78	mg/kg
	Xylene, Isomers m & p	16.2	0.513	n/a	mg/kg

TABLE 5
ANALYTICAL DATA SUMMARY -CHARACTERIZATION SAMPLE RESULTS
Municipal Garage Demolition St. Paul Island, Alaska

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
SP20-CH-009	1-Methylnaphthalene	2.38	0.273	n/a	mg/kg
	2-Methylnaphthalene	3.12	0.273	n/a	mg/kg
	Acenaphthene	0.0625	0.0546	210	mg/kg
	Acenaphthylene	0	0.0546	n/a	mg/kg
	Anthracene	0	0.0546	4,300	mg/kg
	Benzene	0	0.124	0.5	mg/kg
	Benzo(a)anthracene	0	0.0546	6	mg/kg
	Benzo(a)pyrene	0	0.0546	3	mg/kg
	Benzo(b)fluoranthene	0	0.0546	20	mg/kg
	Benzo(g,h,i)perylene	0	0.0546	n/a	mg/kg
	Benzo(k)fluoranthene	0	0.0546	200	mg/kg
	Chrysene	0	0.0546	620	mg/kg
	Dibenzo(a,h)anthracene	0	0.0546	6	mg/kg
	Diesel Range Organics	1,950	86.9	2,500	mg/kg
	Ethylbenzene	1.68	0.238	5.5	mg/kg
	Fluoranthene	0.0197	0.0546	2,100	mg/kg
	Fluorene	0.0825J	0.0546	270	mg/kg
	Gasoline Range Organics	286	11.9	1,400	mg/kg
	Indeno(1,2,3-cd)pyrene	0	0.0546	54	mg/kg
	Naphthalene	1.43	0.273	43	mg/kg
	o-Xylene	0.845	0.238	n/a	mg/kg
	Phenanthrene	0.057	0.0546	n/a	mg/kg
	Pyrene	0.0399J	0.0546	1,500	mg/kg
	Residual Range Organics	149	21.7	10,000	mg/kg
	Toluene	0.466J	0.476	54	mg/kg
	Total Xylene	7.045	0.714	78	mg/kg
	Xylene, Isomers m & p	6.2	0.476	n/a	mg/kg
SP20-CH-012	Benzene	0	1.47	0.5	mg/kg
	Diesel Range Organics	**5,510**	219	2,500	mg/kg
	Ethylbenzene	**20.6**	2.83	5.5	mg/kg
	Gasoline Range Organics	938	28.3	1,400	mg/kg
	o-Xylene	37.8	2.83	n/a	mg/kg
	Residual Range Organics	523	21.9	10,000	mg/kg
	Toluene	11.4	5.66	54	mg/kg
	Total Xylene	**141.8**	8.49	78	mg/kg
	Xylene, Isomers m & p	104	5.66	n/a	mg/kg

TABLE 5
ANALYTICAL DATA SUMMARY -CHARACTERIZATION SAMPLE RESULTS
Municipal Garage Demolition St. Paul Island, Alaska

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
SP20-CH-013	1-Methylnaphthalene	15.3	1.21	n/a	mg/kg
	2-Methylnaphthalene	21.5	1.21	n/a	mg/kg
	Acenaphthene	0.206	0.0605	210	mg/kg
	Acenaphthylene	0	0.0605	n/a	mg/kg
	Anthracene	0	0.0605	4,300	mg/kg
	Benzene	0	0.139	0.5	mg/kg
	Benzo(a)anthracene	0.0208J	0.0605	6	mg/kg
	Benzo(a)pyrene	0	0.0605	3	mg/kg
	Benzo(b)fluoranthene	0	0.0605	20	mg/kg
	Benzo(g,h,i)perylene	0	0.0605	n/a	mg/kg
	Benzo(k)fluoranthene	0	0.0605	200	mg/kg
	Chrysene	0	0.0605	620	mg/kg
	Dibenzo(a,h)anthracene	0	0.0605	6	mg/kg
	Diesel Range Organics	2,120	95.9	2,500	mg/kg
	Ethylbenzene	4.55	0.268	5.5	mg/kg
	Fluoranthene	0.0385J	0.0605	2,100	mg/kg
	Fluorene	0.264	0.0605	270	mg/kg
	Gasoline Range Organics	185	5.36	1,400	mg/kg
	Indeno(1,2,3-cd)pyrene	0	0.0605	54	mg/kg
	Naphthalene	12.7	1.21	43	mg/kg
	o-Xylene	2.49	0.268	n/a	mg/kg
	Phenanthrene	0.161	0.0605	n/a	mg/kg
	Pyrene	0.0708	0.0605	1,500	mg/kg
	Residual Range Organics	45.7	24	10,000	mg/kg
	Toluene	0.172J	0.536	54	mg/kg
	Total Xylene	21.39	0.804	78	mg/kg
	Xylene, Isomers m & p	18.9	0.536	n/a	mg/kg
SP20-CH-099 Duplicate of SP20-CH-013	1-Methylnaphthalene	7.42	0.605	n/a	mg/kg
	2-Methylnaphthalene	10.4	0.605	n/a	mg/kg
	Acenaphthene	0.214	0.0605	210	mg/kg
	Acenaphthylene	0	0.0605	n/a	mg/kg
	Anthracene	0	0.0605	4,300	mg/kg
	Benzene	0	0.116	0.5	mg/kg
	Benzo(a)anthracene	0.0203J	0.0605	6	mg/kg
	Benzo(a)pyrene	0	0.0605	3	mg/kg
	Benzo(b)fluoranthene	0	0.0605	20	mg/kg
	Benzo(g,h,i)perylene	0	0.0605	n/a	mg/kg
	Benzo(k)fluoranthene	0	0.0605	200	mg/kg
	Chrysene	0.0183J	0.0605	620	mg/kg
	Dibenzo(a,h)anthracene	0	0.0605	6	mg/kg
	Diesel Range Organics	1,310	96.6	2,500	mg/kg
	Ethylbenzene	2.75	0.223	5.5	mg/kg
	Fluoranthene	0.0422	0.0605	2,100	mg/kg
	Fluorene	0.27J	0.0605	270	mg/kg
	Gasoline Range Organics	118	4.45	1,400	mg/kg
	Indeno(1,2,3-cd)pyrene	0	0.0605	54	mg/kg
	Naphthalene	5.92	0.605	43	mg/kg
	o-Xylene	1.59	0.223	n/a	mg/kg
	Phenanthrene	0.175	0.0605	n/a	mg/kg
	Pyrene	0.0753	0.0605	1,500	mg/kg
	Residual Range Organics	54.5	24.1	10,000	mg/kg
	Toluene	0	0.445	54	mg/kg
	Total Xylene	12.99	0.668	78	mg/kg
	Xylene, Isomers m & p	11.4	0.445	n/a	mg/kg

TABLE 5
ANALYTICAL DATA SUMMARY -CHARACTERIZATION SAMPLE RESULTS
Municipal Garage Demolition St. Paul Island, Alaska

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
SP20-CH-014-140 Confirmation Sample mislabeled	Benzene	0	0.123	0.5	mg/kg
	Diesel Range Organics	**10,600**	437	2,500	mg/kg
	Ethylbenzene	**17.9**	2.36	5.5	mg/kg
	Gasoline Range Organics	**1,600**	236	1,400	mg/kg
	o-Xylene	61.9	2.36	n/a	mg/kg
	Residual Range Organics	2,410	437	10,000	mg/kg
	Toluene	9.2	4.72	54	mg/kg
	Total Xylene	**231.9**	7.08	78	mg/kg
	Xylene, Isomers m & p	170	4.72	n/a	mg/kg
SP20-CH-015	Benzene	0	0.0959	0.5	mg/kg
	Diesel Range Organics	**6,050**	232	2,500	mg/kg
	Ethylbenzene	1.92	0.184	5.5	mg/kg
	Gasoline Range Organics	139	18.4	1,400	mg/kg
	o-Xylene	1.58	0.184	n/a	mg/kg
	Residual Range Organics	60.5	23.2	10,000	mg/kg
	Toluene	0	0.369	54	mg/kg
	Total Xylene	8.64	0.553	78	mg/kg
	Xylene, Isomers m & p	7.06	0.369	n/a	mg/kg
SP20-CH-016	Benzene	0	0.016	0.5	mg/kg
	Diesel Range Organics	3.04J	21.2	2,500	mg/kg
	Ethylbenzene	0	0.0308	5.5	mg/kg
	Gasoline Range Organics	2.01J	3.08	1,400	mg/kg
	o-Xylene	0	0.0308	n/a	mg/kg
	Residual Range Organics	11J	21.2	10,000	mg/kg
	Toluene	0	0.0616	54	mg/kg
	Total Xylene	0	0.0924	78	mg/kg
	Xylene, Isomers m & p	0	0.0616	n/a	mg/kg
SP20-CH-017	Benzene	0	0.0181	0.5	mg/kg
	Diesel Range Organics	55.4	23.8	2,500	mg/kg
	Ethylbenzene	0	0.0349	5.5	mg/kg
	Gasoline Range Organics	1.51J	3.49	1,400	mg/kg
	o-Xylene	0	0.0349	n/a	mg/kg
	Residual Range Organics	159	23.8	10,000	mg/kg
	Toluene	0	0.0698	54	mg/kg
	Total Xylene	0.000	0.1047	78	mg/kg
	Xylene, Isomers m & p	0	0.0698	n/a	mg/kg
SP20-CH-018	Benzene	0	0.0122	0.5	mg/kg
	Diesel Range Organics	**6,860**	214	2,500	mg/kg
	Ethylbenzene	1.32	0.234	5.5	mg/kg
	Gasoline Range Organics	0.831J	2.34	1,400	mg/kg
	o-Xylene	1.28	0.234	n/a	mg/kg
	Residual Range Organics	4,580	214	10,000	mg/kg
	Toluene	0	0.468	54	mg/kg
	Total Xylene	7.99	0.702	78	mg/kg
	Xylene, Isomers m & p	6.71	0.468	n/a	mg/kg

TABLE 5
ANALYTICAL DATA SUMMARY -CHARACTERIZATION SAMPLE RESULTS
Municipal Garage Demolition St. Paul Island, Alaska

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
SP20-CH-019	Benzene	0	0.0139	0.5	mg/kg
	Diesel Range Organics	**4,290**	214	2,500	mg/kg
	Ethylbenzene	0	0.0266	5.5	mg/kg
	Gasoline Range Organics	159	13.3	1,400	mg/kg
	o-Xylene	0	0.0266	n/a	mg/kg
	Residual Range Organics	668	21.4	10,000	mg/kg
	Toluene	0	0.0533	54	mg/kg
	Total Xylene	0	0.0799	78	mg/kg
	Xylene, Isomers m & p	0	0.0533	n/a	mg/kg
SP20-CH-020	Benzene	0	0.0153	0.5	mg/kg
	Diesel Range Organics	3.01J	21.6	2,500	mg/kg
	Ethylbenzene	0	0.0295	5.5	mg/kg
	Gasoline Range Organics	1.83J	2.95	1,400	mg/kg
	o-Xylene	0	0.0295	n/a	mg/kg
	Residual Range Organics	13.4J	21.6	10,000	mg/kg
	Toluene	0	0.0589	54	mg/kg
	Total Xylene	0	0.0884	78	mg/kg
	Xylene, Isomers m & p	0	0.0589	n/a	mg/kg
SP20-CH-022	Benzene	0	0.0106	0.5	mg/kg
	Diesel Range Organics	23.4	21.6	2,500	mg/kg
	Ethylbenzene	0	0.0205	5.5	mg/kg
	Gasoline Range Organics	0.697J	2.05	1,400	mg/kg
	o-Xylene	0.0076J	0.0205	n/a	mg/kg
	Residual Range Organics	24.2	21.6	10,000	mg/kg
	Toluene	0	0.041	54	mg/kg
	Total Xylene	0.0076J	0.0615	78	mg/kg
	Xylene, Isomers m & p	0	0.041	n/a	mg/kg
SP20-CH-301	1-Methylnaphthalene	0.15	0.0568	n/a	mg/kg
Connector Pad	2-Methylnaphthalene	0.172	0.0568	n/a	mg/kg
	Acenaphthene	0	0.0568	210	mg/kg
	Acenaphthylene	0	0.0568	n/a	mg/kg
	Anthracene	0	0.0568	4,300	mg/kg
	Benzene	0	0.0171	0.5	mg/kg
	Benzo(a)anthracene	0	0.0568	6	mg/kg
	Benzo(a)pyrene	0	0.0568	3	mg/kg
	Benzo(b)fluoranthene	0	0.0568	20	mg/kg
	Benzo(g,h,i)perylene	0	0.0568	n/a	mg/kg
	Benzo(k)fluoranthene	0	0.0568	200	mg/kg
	Chrysene	0	0.0568	620	mg/kg
	Dibenzo(a,h)anthracene	0	0.0568	6	mg/kg
	Diesel Range Organics	110	22.6	2,500	mg/kg
	Ethylbenzene	0	0.0329	5.5	mg/kg
	Fluoranthene	0	0.0568	2,100	mg/kg
	Fluorene	0	0.0568	270	mg/kg
	Gasoline Range Organics	0.76J	3.29	1,400	mg/kg
	Indeno(1,2,3-cd)pyrene	0	0.0568	54	mg/kg
	Naphthalene	0.0865	0.0568	43	mg/kg
	o-Xylene	0	0.0329	n/a	mg/kg
	Phenanthrene	0	0.0568	n/a	mg/kg
	Pyrene	0	0.0568	1,500	mg/kg
	Residual Range Organics	706	22.6	10,000	mg/kg
	Toluene	0.024J	0.0657	54	mg/kg
	Total Xylene	0.0207J	0.0986	78	mg/kg
	Xylene, Isomers m & p	0.0207J	0.0657	n/a	mg/kg

TABLE 5
ANALYTICAL DATA SUMMARY -CHARACTERIZATION SAMPLE RESULTS
Municipal Garage Demolition St. Paul Island, Alaska

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
SP20-CH-302	Benzene	0.0338	0.0148	0.5	mg/kg
Connector Pad	Diesel Range Organics	438	22.9	2,500	mg/kg
	Ethylbenzene	0.525	0.0284	5.5	mg/kg
	Gasoline Range Organics	97.3	2.84	1,400	mg/kg
	o-Xylene	2.96	0.284	n/a	mg/kg
	Residual Range Organics	1,190	91.4	10,000	mg/kg
	Toluene	0.572	0.0568	54	mg/kg
	Total Xylene	11.68	0.852	78	mg/kg
	Xylene, Isomers m & p	8.72	0.568	n/a	mg/kg
SP20-CH-307	Benzene	0	0.0121	0.5	mg/kg
Connector Pad	Diesel Range Organics	65.6	21.6	2,500	mg/kg
	Ethylbenzene	0	0.0233	5.5	mg/kg
	Gasoline Range Organics	9.36	2.33	1,400	mg/kg
	o-Xylene	0.275	0.0233	n/a	mg/kg
	Residual Range Organics	103B	21.6	10,000	mg/kg
	Toluene	0	0.0465	54	mg/kg
	Total Xylene	0.375	0.0698	78	mg/kg
	Xylene, Isomers m & p	0.0996	0.0465	n/a	mg/kg
SP20-CH-310	Benzene	0	0.0132	0.5	mg/kg
Connector Pad	Diesel Range Organics	4.77J	21.4	2,500	mg/kg
	Ethylbenzene	0	0.0253	5.5	mg/kg
	Gasoline Range Organics	1.08J	2.53	1,400	mg/kg
	o-Xylene	0.0403	0.0253	n/a	mg/kg
	Residual Range Organics	12.4J	21.4	10,000	mg/kg
	Toluene	0	0.0507	54	mg/kg
	Total Xylene	0.1011	0.076	78	mg/kg
	Xylene, Isomers m & p	0.0608	0.0507	n/a	mg/kg
SP20-CH-400	Benzene	0	0.0154	0.5	mg/kg
Connector Pad	Diesel Range Organics	85.7	21.9	2,500	mg/kg
	Ethylbenzene	0.011J	0.0296	5.5	mg/kg
	Gasoline Range Organics	2.6	2.01	1,400	mg/kg
	o-Xylene	0.111	0.0296	n/a	mg/kg
	Residual Range Organics	113	21.9	10,000	mg/kg
	Toluene	0.059J	0.0593	54	mg/kg
	Total Xylene	0.182	0.0889	78	mg/kg
	Xylene, Isomers m & p	0.0709	0.0593	n/a	mg/kg

Bold numbers indicate greater than ADEC cleanup levels.
J = Estimated value due to value less than PQL
B = EPA Flag - Analyte present in the blank and the sample
CL = Initial analysis within holding time but required dilution
GRO = Gasoline Range Organics
DRO = Diesel Range Organics
RRO = Residual Range Organics
mg/Kg = Milligrams per Kilogram
PQL = Practical Quantitation Limit

TABLE 6
BACKFILL CHARACTERIZATION SAMPLE RESULTS
Municipal Garage Demolition St. Paul Island, Alaska

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
SP20-CB-005	1-Methylnaphthalene	0	0.0056	n/a	mg/kg
	2-Methylnaphthalene	0	0.0056	n/a	mg/kg
	Acenaphthene	0	0.0056	210	mg/kg
	Acenaphthylene	0	0.0056	n/a	mg/kg
	Anthracene	0	0.0056	4,300	mg/kg
	Benzene	0	0.017	0.5	mg/kg
	Benzo(a)anthracene	0	0.0056	6	mg/kg
	Benzo(a)pyrene	0	0.0056	3	mg/kg
	Benzo(b)fluoranthene	0	0.0056	20	mg/kg
	Benzo(g,h,i)perylene	0	0.0056	n/a	mg/kg
	Benzo(k)fluoranthene	0	0.0056	200	mg/kg
	Chrysene	0	0.0056	620	mg/kg
	Dibenzo(a,h)anthracene	0	0.0056	6	mg/kg
	Diesel Range Organics	2.64J	22.2	2,500	mg/kg
	Ethylbenzene	0	0.0326	5.5	mg/kg
	Fluoranthene	0	0.0056	2,100	mg/kg
	Fluorene	0	0.0056	270	mg/kg
	Gasoline Range Organics	0.743J	3.26	1,400	mg/kg
	Indeno(1,2,3-cd)pyrene	0	0.0056	54	mg/kg
	Lead	1.25	0.216	1,000	mg/kg
	Naphthalene	0	0.0056	43	mg/kg
	o-Xylene	0	0.0326	n/a	mg/kg
	Phenanthrene	0	0.0056	n/a	mg/kg
	Pyrene	0	0.0056	1,500	mg/kg
	Residual Range Organics	17.3J	22.2	10,000	mg/kg
	Toluene	0	0.0653	54	mg/kg
	Total Xylene	0	0.0979	78	mg/kg
	Xylene, Isomers m & p	0	0.0653	n/a	mg/kg
SP20-CB-006	1-Methylnaphthalene	0	0.0055	n/a	mg/kg
	2-Methylnaphthalene	0	0.0055	n/a	mg/kg
	Acenaphthene	0	0.0055	210	mg/kg
	Acenaphthylene	0	0.0055	n/a	mg/kg
	Anthracene	0	0.0055	4,300	mg/kg
	Benzene	0	0.0113	0.5	mg/kg
	Benzo(a)anthracene	0	0.0055	6	mg/kg
	Benzo(a)pyrene	0	0.0055	3	mg/kg
	Benzo(b)fluoranthene	0	0.0055	20	mg/kg
	Benzo(g,h,i)perylene	0	0.0055	n/a	mg/kg
	Benzo(k)fluoranthene	0	0.0055	200	mg/kg
	Chrysene	0	0.0055	620	mg/kg
	Dibenzo(a,h)anthracene	0	0.0055	6	mg/kg
	Diesel Range Organics	0	22	2,500	mg/kg
	Ethylbenzene	0	0.0218	5.5	mg/kg
	Fluoranthene	0	0.0055	2,100	mg/kg
	Fluorene	0	0.0055	270	mg/kg
	Gasoline Range Organics	0	2.18	1,400	mg/kg
	Indeno(1,2,3-cd)pyrene	0	0.0055	54	mg/kg
	Lead	0.712	0.223	1,000	mg/kg
	Naphthalene	0	0.0055	43	mg/kg
	o-Xylene	0	0.0218	n/a	mg/kg
	Phenanthrene	0	0.0055	n/a	mg/kg
	Pyrene	0	0.0055	1,500	mg/kg
	Residual Range Organics	10.6J	22	10,000	mg/kg
	Toluene	0	0.0436	54	mg/kg
	Total Xylene	0	0.0654	78	mg/kg
	Xylene, Isomers m & p	0	0.0436	n/a	mg/kg

TABLE 6
BACKFILL CHARACTERIZATION SAMPLE RESULTS
Municipal Garage Demolition St. Paul Island, Alaska

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
SP20-CB-007	1-Methylnaphthalene	0.0029J	0.0057	n/a	mg/kg
	2-Methylnaphthalene	0.0041J	0.0057	n/a	mg/kg
	Acenaphthene	0	0.0057	210	mg/kg
	Acenaphthylene	0	0.0057	n/a	mg/kg
	Anthracene	0	0.0057	4,300	mg/kg
	Benzene	0	0.0153	0.5	mg/kg
	Benzo(a)anthracene	0	0.0057	6	mg/kg
	Benzo(a)pyrene	0	0.0057	3	mg/kg
	Benzo(b)fluoranthene	0	0.0057	20	mg/kg
	Benzo(g,h,i)perylene	0	0.0057	n/a	mg/kg
	Benzo(k)fluoranthene	0	0.0057	200	mg/kg
	Chrysene	0	0.0057	620	mg/kg
	Dibenzo(a,h)anthracene	0	0.0057	6	mg/kg
	Diesel Range Organics	2.68J	22.4	2,500	mg/kg
	Ethylbenzene	0	0.0293	5.5	mg/kg
	Fluoranthene	0	0.0057	2,100	mg/kg
	Fluorene	0	0.0057	270	mg/kg
	Gasoline Range Organics	0	2.93	1,400	mg/kg
	Indeno(1,2,3-cd)pyrene	0	0.0057	54	mg/kg
	Lead	1.06	0.222	1,000	mg/kg
	Naphthalene	0.0042J	0.0057	43	mg/kg
	o-Xylene	0	0.0293	n/a	mg/kg
	Phenanthrene	0	0.0057	n/a	mg/kg
	Pyrene	0	0.0057	1,500	mg/kg
	Residual Range Organics	13J	22.4	10,000	mg/kg
	Toluene	0	0.0587	54	mg/kg
	Total Xylene	0	0.088	78	mg/kg
	Xylene, Isomers m & p	0	0.0587	n/a	mg/kg

Bold numbers indicate greater than ADEC cleanup levels.
J = Estimated value due to value less than PQL
B = EPA Flag - Analyte present in the blank and the sample
CL = Initial analysis within holding time but required dilution
GRO = Gasoline Range Organics
DRO = Diesel Range Organics
RRO = Residual Range Organics
mg/Kg = Milligrams per Kilogram
PQL = Practical Quantitation Limit

FIGURES

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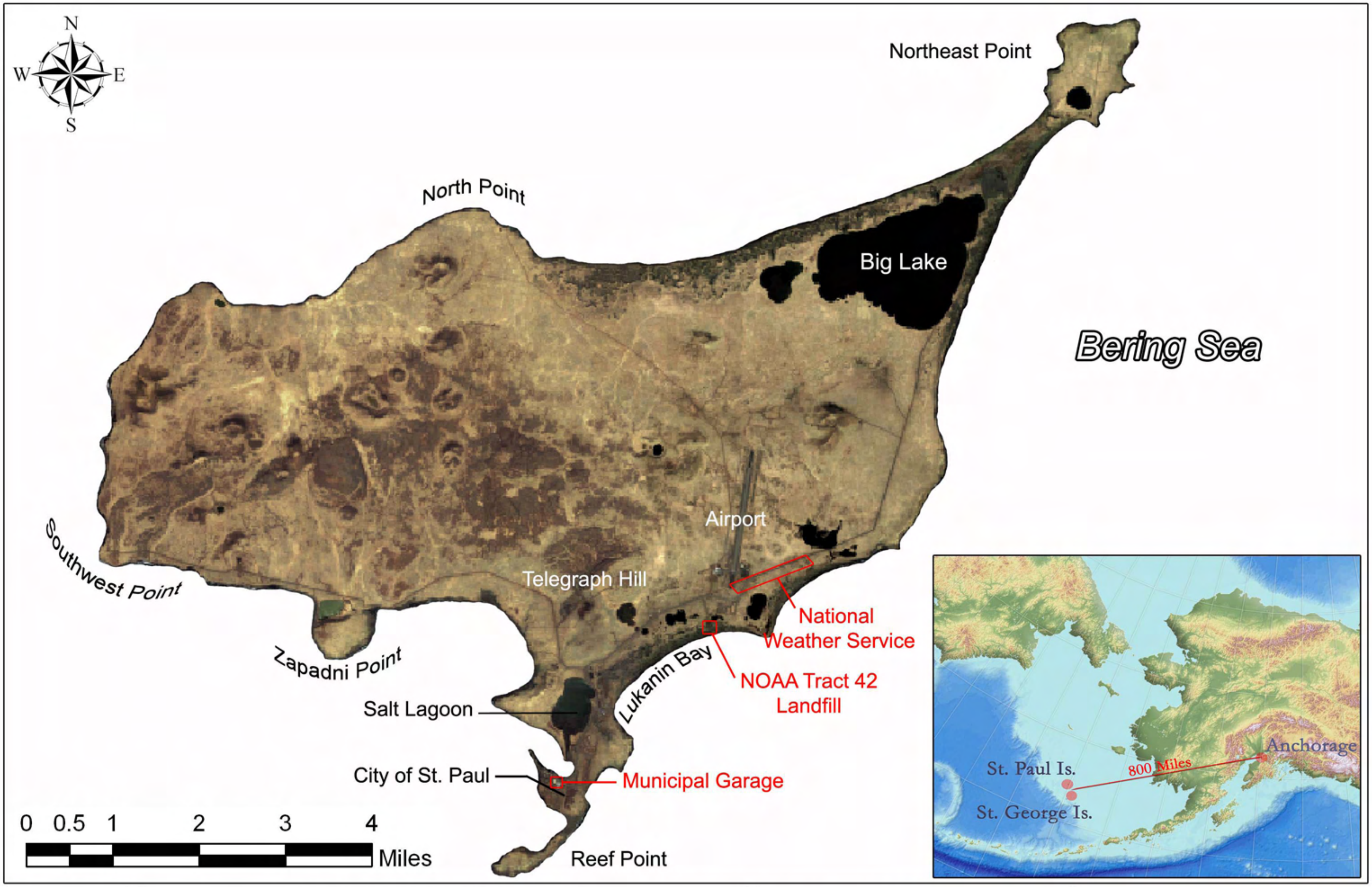

Figure **1**	**St. Paul Island Vicinity Map** **Municipal Garage Demolition** **Corrective Action Report/Conditional Closure Request** **NOAA Site 20/TPA Site 9e** **St. Paul Island, Alaska**	**Source:** Ikonos Satellite Imagery (Space Imaging 2001) **Path:** C:\KP_GIS Data\Maps & Figures\ SNP\Municipal Garage Demolition CAR\ SNP Standard Fig 1 - Muncipal Garge.psd **Date:** 3/27/2008

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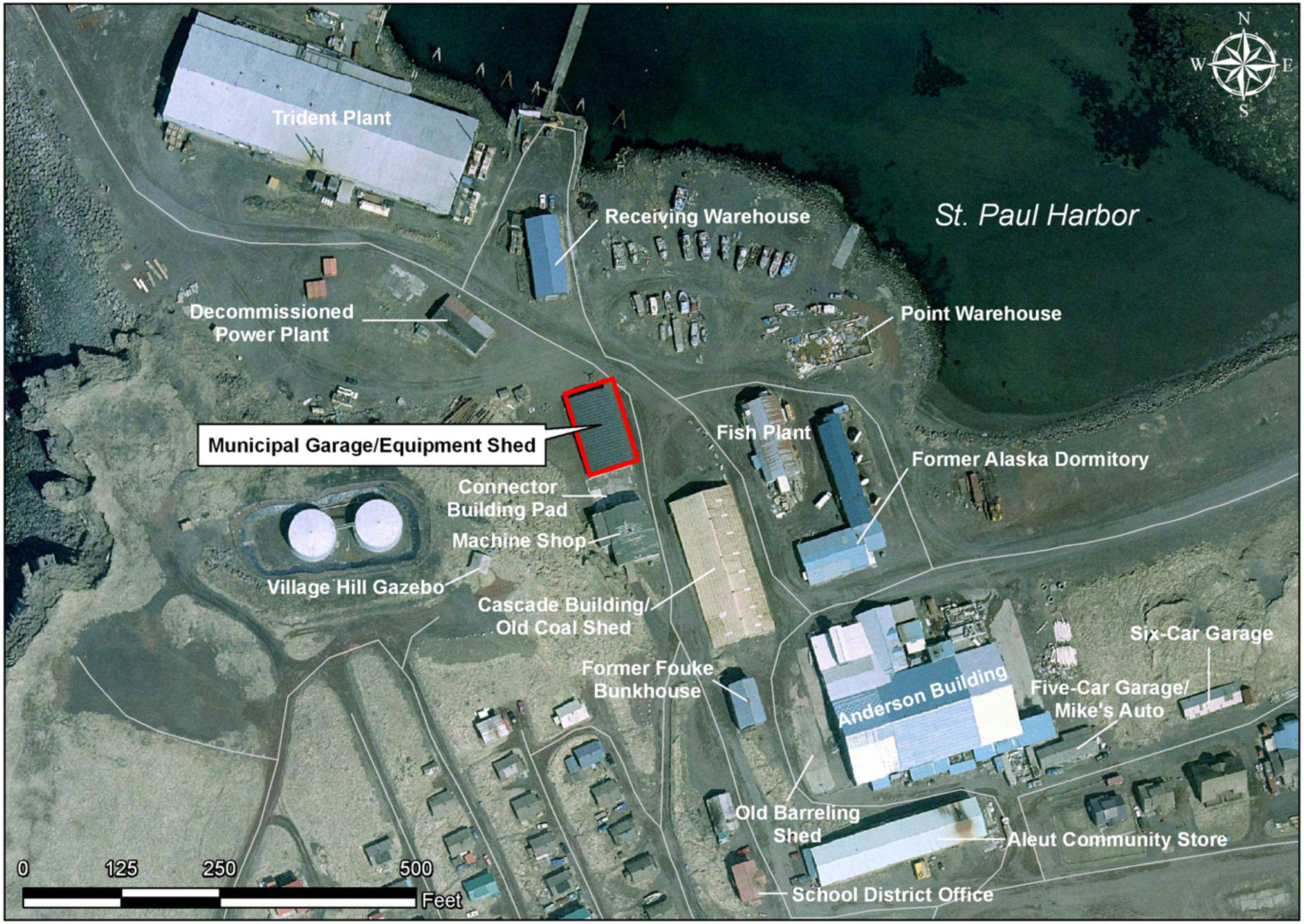

Figure 2	Municipal Garage and Vicinity Municipal Garage Demolition Corrective Action Report/Conditional Closure Request NOAA Site 20/TPA Site 9e St. Paul Island, Alaska	Source: Aero-Metric 2006 1 ft Aerial Photo Path: C:\KP_GIS Data\Maps & Figures\SNP\Municipal Garage Demolition CAR\Municipal_Garage_Demolition_Fig2.mxd Date: 3/27/2008 @ 1:37:14 PM	Pribilof Islands Restoration Project

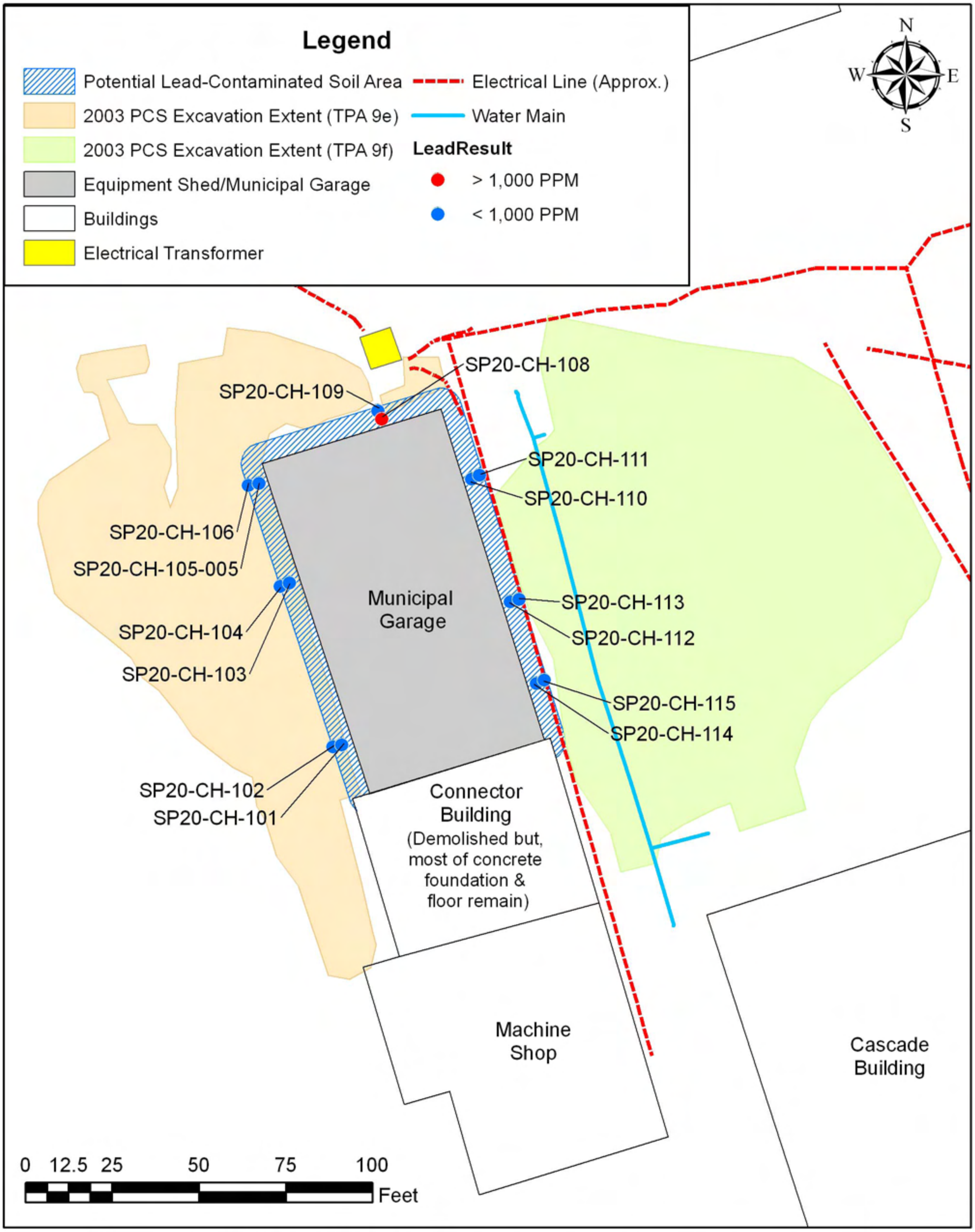

Figure 3	Areas of Previous Excavations and Potential Lead Contaminated Zone Municipal Garage Demolition Corrective Action Report/Conditional Closure Request NOAA Site 20/TPA Site 9e St. Paul Island, Alaska	Sources: NOAA GIS Layers (Pribilof Project GIS Database 2007) Path: C:\KP_GIS Data\ Maps & Figures\SNP\ Municipal Garage Demolition CAR\ Proposed_PCS_Removal_Fig3.mxd Date: 3/27/2008 @ 1:52:07 PM

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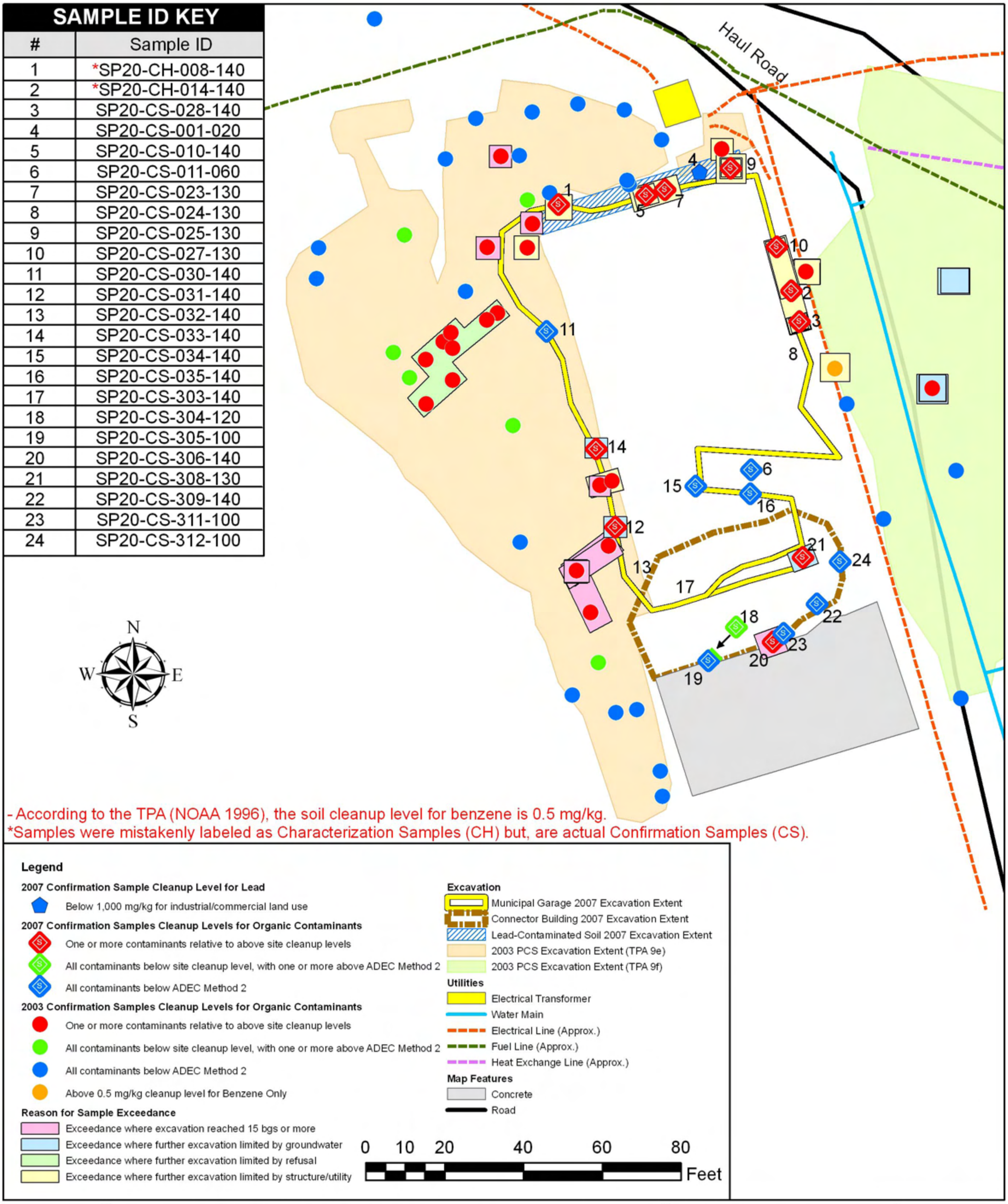
SAMPLE ID KEY	
#	Sample ID
1	*SP20-CH-008-140
2	*SP20-CH-014-140
3	SP20-CS-028-140
4	SP20-CS-001-020
5	SP20-CS-010-140
6	SP20-CS-011-060
7	SP20-CS-023-130
8	SP20-CS-024-130
9	SP20-CS-025-130
10	SP20-CS-027-130
11	SP20-CS-030-140
12	SP20-CS-031-140
13	SP20-CS-032-140
14	SP20-CS-033-140
15	SP20-CS-034-140
16	SP20-CS-035-140
17	SP20-CS-303-140
18	SP20-CS-304-120
19	SP20-CS-305-100
20	SP20-CS-306-140
21	SP20-CS-308-130
22	SP20-CS-309-140
23	SP20-CS-311-100
24	SP20-CS-312-100



- According to the TPA (NOAA 1996), the soil cleanup level for benzene is 0.5 mg/kg.
*Samples were mistakenly labeled as Characterization Samples (CH) but, are actual Confirmation Samples (CS).

Figure 4

2003 & 2007 Soil Confirmation Samples
Municipal Garage Demolition
Corrective Action Report/Conditional Closure Request
NOAA Site 20/TPA Site 9e
St. Paul Island, Alaska

Sources: NOAA GIS Layers
(Pribilof Project Database 2006/2007)
Path: C:\KP_GIS Data\Maps & Figures\SNP\Municipal Garage Demolition CAR\Soil_Lead_Samples_Fig4.mxd
Date: 3/27/2008 @ 4:18:33 PM

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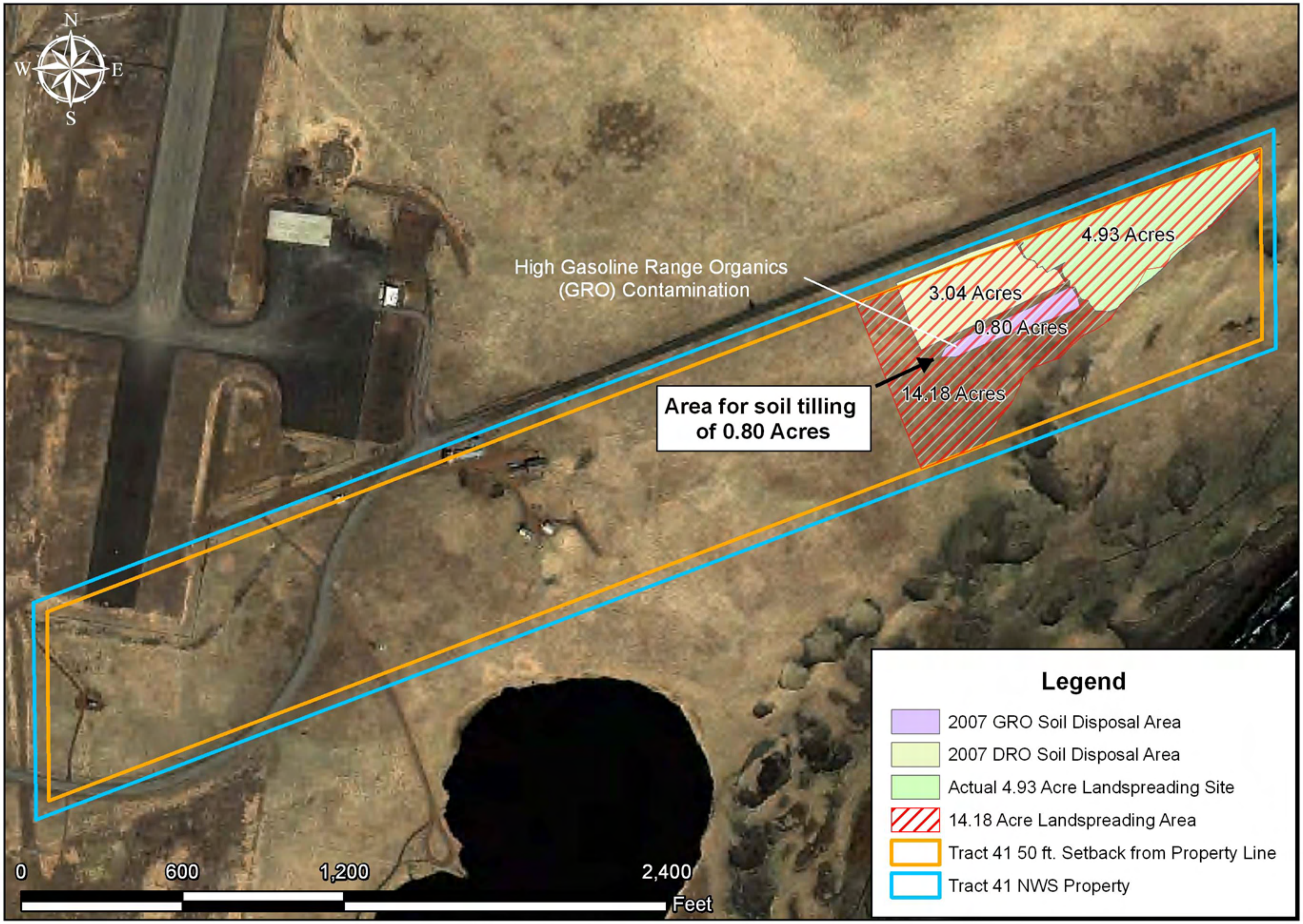

Figure 5	National Weather Service Property Boundary and Landspreading Area Municipal Garage Demolition Corrective Action Report/Conditional Closure Request NOAA Site 20/TPA Site 9e St Paul Island, Alaska	Source: Ikonos 2001 Satellite Imagery GIS Layers (NOAA Pribilof Project Database); Path Name: C:\KP_GIS Data\Maps & Figures\SNP\Municipal Garage Demolition CAR\ContaminatedSoilTask11_Fig5.mxd Date: 3/28/2008 @ 9:07:36 AM Note: Calculations for landspreading and disposal areas are of estimated values.

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Figure 6	Lead Contaminated Soil Disposal Cell in Tract 42 Municipal Garage Demolition Corrective Action Report/Conditional Closure Request NOAA Site 20/TPA Site 9e St. Paul Island, Alaska	Sources: Ikonos Satellite Imagery (Space Imaging 2001), GIS Layers (NOAA Pribilof Project Database 2007) Path: C:\KP_GIS Data\Maps & Figures\SNP\ Municipal Garage Demolition CAR\ DisposalCell_Fig6.mxd Date: 3/28/2008 @ 9:42:42 AM

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Figure 7

Current Monitoring Network
Municipal Garage Demolition
Corrective Action Report/Conditional Closure Request
NOAA Site 20/TPA Site 9e
St. Paul Island, Alaska

Sources: Well locations (NOAA GIS SNP_Wells), Aero-Metric 2006
2 ft Aerial Photo
Path: C:\KP_GIS Data\Maps & Figures\SNP\Municipal Garage Demolition CAR\MonitoringWells_Fig7.mxd
Date: 3/28/2008 @ 9:58:02 AM

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APPENDIX E

ADEC APPROVAL LETTER FOR CONDITIONAL CLOSURE

For the National Oceanic and Atmospheric Administration

John Lindsay
NOAA, Pribilof Project Office

28 March 2008
Date

Approvals: In accordance with Paragraph 59 of the Two Party Agreement, this is to confirm that all corrective action has been completed to the maximum extent practicable at the *Municipal Garage Demolition and Contaminated Soil Removal NOAA Site 20/TPA Site 9e, St. Paul Island, Alaska*, in accordance with the Agreement and that no further remedial action is required as a part of this conditional closure granted by ADEC.

For the Alaska Department of Environmental Conservation

Louis Howard
Alaska Department of Environmental Conservation
Remedial Project Manager

Apr. 16 2008
Date

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