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November 21, 2014

1462-04

Alaska Department of Environmental Conservation
Contaminated Sites Division
410 Willoughby
Suite 103
P.O. Box 111800
Juneau, AK 99811-1800

Attn: Danielle Duncan, Environmental Program Specialist III

Re: Glacier Highway Battery Dump Site
File Number: 1531.38.006
Hazard ID: 4636
Ledger Code: 14260760

Dear Ms. Duncan:

Travis/Peterson Environmental Consulting, Inc. (TPECI) is submitting the enclosed Site Cleanup Report for the Glacier Highway Battery Recycling Site at 11385 Glacier Highway in Juneau, Alaska.

We look forward to your prompt review of the report so that the site may be stabilized, backfilled and we may work towards site closure.

If you have any questions or comments, please feel free to contact me at EMundahl@tpeci.com or by phone at (907) 522-4337.

Sincerely,

Erik D. Mundahl, P.E.
Environmental Engineer

Enclosures: 1) Glacier Highway Battery Recycling Site Characterization and Cleanup Report

Cc: Mr. John Hagmeier

GLACIER HIGHWAY BATTERY RECYCLING
11385 GLACIER HIGHWAY, JUNEAU, AK
SITE CLEANUP REPORT

Prepared for:

MR. JOHN HAGMEIER
2204 Cleveland Avenue
Anchorage, AK 99517

Prepared by:

Travis/Peterson
Environmental Consulting, Inc.

TRAVIS/PETERSON ENVIRONMENTAL CONSULTING, INC.

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1462-04
November, 2014

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APPENDIX

Acronyms and Abbreviations

ADEC	Alaska Department of Environmental Conservation
AST	Above-ground Storage Tank
COPC	Contaminants of Potential Concern
DOT&PF	Alaska Department of Transportation and Public Facilities
Mg/L	Milligrams per Liter
NOAA	National Oceanic and Atmospheric Administration
PAH	Polycyclic Aromatic Hydrocarbons
PID	Photo-Ionization Detector
ppm	Parts per Million
QA/QC	Quality Assurance/Quality Control
SOP	Standard Operating Procedure
TPECI	Travis/Peterson Environmental Consulting, Inc.
TCLP	Toxicity Characteristic Leaching Procedure
µg/L	Micrograms per Liter
µg/mL	Micrograms per Milliliter
VOC	Volatile Organic Compound
XRF	X-Ray Fluorescence

1.0 INTRODUCTION

During the 1950s, for an unknown period of time, a small battery recycling business operated at 11385 Glacier Highway near Auke Bay in Juneau, Alaska. This battery disposal operation was positioned at the southeast corner of the property immediately adjacent to a small garage and near the Glacier Highway (Figure 1). Operations included discarding battery casings adjacent to a small driveway near the garage on the property.

Following the cessation of battery recycling activities, the Hagmeier family sold an adjacent property parcel to a third party. This third party in turn sold the parcel to the National Oceanic and Atmospheric Administration (NOAA) in 1964 for the construction of the National Marine Fisheries Service (NMFS) lab. Both the Hagmeier parcel and the NOAA parcel have Parcel Code Prefix 6D090 and Block Number 102. The NOAA parcel is Lot Number 0050 and the Hagmeier parcel is Lot Number 0060. At the time of the property sale, the battery recycling operation had been discontinued, but battery casings were present on both parcels.

The Alaska Department of Transportation and Public Facilities (DOT&PF) acquired a road right-of-way for the expansion and reconstruction of the Glacier Highway from the Hagmeier property at an unknown date following the cessation of battery recycling operations. Based on the known location of the historical battery recycling, the Glacier Highway right-of-way, and the present location of the highway and its shoulder, the DOT&PF constructed the highway on top of battery casing debris.

In 2003, NOAA contracted CCI, Inc. (CCI) to conduct an interim removal action and remove surface debris on their property that they suspected were causing lead contamination of the soil on the NOAA/NMFS property. This work included a preliminary characterization of the horizontal extent of lead contamination (on the NOAA/NMFS property) as well as the removal of battery casing solid waste and lead contaminated soils. The total volume of solid waste and contaminated soils removed from the property during this work is unknown. A total of nine soil samples were collected for laboratory analysis for Total Lead. Of the nine samples collected, five were found to have lead concentrations above the Alaska Department of Environmental Conservation (ADEC) Method Two cleanup level of 400mg/kg.

In 2007, NOAA contracted BNC International, Inc., (BNCI) to conduct a site investigation and interim removal action of the remaining battery debris and lead contaminated soils on the NOAA/NMFS property. BNCI collected 11 soil samples for laboratory analysis for Total Lead. Of these 11 samples, four were found to have lead concentrations above the ADEC Method Two cleanup level of 400 mg/kg. The May 2009 BNCI report documents the locations of both the 2007 BNCI samples and the 2003 CCI samples. In both the 2003 CCI work and the 2007 BNCI work, it is unclear if NOAA attempted to work with the Hagmeiers or DOT&PF in the characterization of the adjacent properties or if the NOAA sampling actions were limited exclusively to the NOAA/NMFS property.

In 2009, NOAA again contracted BNCI to conduct a site remediation and removal action of all remaining battery solid wastes and lead contaminated soils on the NOAA property. The May 2009 BNCI report stated that the original objective of the work was to remove all soils exceeding the ADEC Method Two Cleanup levels. NOAA assumed that the 2003 CCI cleanup activities had removed the extent of the battery debris from the site. The 2009 investigation still found some debris on site. NOAA abandoned the objective to remove soils contaminated above cleanup levels and decided to attempt to remove the remaining battery debris. BMCI excavated visible battery debris and contaminated soils up slope from the NOAA property to the Hagmeier property.

According to the May 2009 report, BNCI actions removed contaminated soils and visible battery debris to the extent possible into the hillside to the east and north without potentially destabilizing the road shoulder or removal several large trees. Based on the figures in the 2009 report, it appears that much of the work occurred on the DOT&PF right-of-way and the Hagmeier property rather than on the NOAA property.

BNCI utilized large rip-rap material, 20-mil HDPE liner, as well as geotextile fabrics during the backfill and stabilization process of their excavation. These methods were done in an attempt to stabilize the slope and segregate the clean fill material from potentially contaminated soil and battery debris remaining on site. The site was re-graded and seeded during final stabilization.

BNCI stated in their 2009 report that further remediation of the site would not be possible without significant removal of surrounding trees, interruption of the adjacent highway, and excavation into the highway right-of-way and the highway prism. The only remaining battery debris on site is located beneath the existing highway bed.

In October, 2013 and February, 2014, a NOAA maintenance representative met with ADEC personnel and toured the site regarding concerns of highway destabilization and potential exposure of lead contaminated soils. This information is documented within the ADEC Contaminated Site Database, but it is unclear what action initiated these meetings. During these meetings, the NOAA maintenance representative notified ADEC personnel that DOT&PF would be completing construction activities on the Glacier Highway during the summer of 2014 and that contamination within the right-of-way may pose a concern.

Based on these meetings, the ADEC contaminated sites database indicated that solid waste and potentially contaminated soils may still exist on site. The ADEC then identified a new Potentially Responsible Party (PRP). In February, 2014, Mr. John Hagmeier received a PRP letter from the State of Alaska regarding the former battery dump site on his property (11385 Glacier Highway), the adjacent DOT&PF right-of-way, and on the adjacent NOAA/NMFS property near Auke Bay in Juneau, Alaska.

After a thorough review of previous site investigations and cleanup actions, TPECI determined that it was necessary to complete a site characterization of the potentially contaminated soils and solid waste issues on the Hagmeier property. TPECI prepared a work plan for ADEC review and approval. ADEC subsequently approved the work plan and TPECI conducted the site characterization and remediation work in July, 2014.

The majority of the lead contaminated soils were excavated and removed from the Hagmeier property in the July, 2014 work. However, lead contaminated soils did remain on the property beneath the southern portion of the Hagmeier garage. Based on soil sampling results, Total Lead concentrations in the range of 1,000 mg/kg were present beneath the garage foundation. TPECI estimated the total volume of contaminated soils remaining a maximum of five to ten cubic yards.

In October, 2014, Mr. Hagmeier determined that it would be possible to remove the remaining lead contaminated soils without demolishing the garage and wished to pursue this work immediately. TPECI contacted the ADEC for approval to continue the use of the previous site work plan. ADEC granted approval of the work plan and TPECI and Mr. Hagmeier conducted the site remediation work in October, 2014.

2.0 OBJECTIVE

TPECI conducted this site cleanup action for the battery dump site at 11385 Glacier Highway in Juneau, Alaska. The work conducted remediated the property of Mr. John Hagmeier. No work was conducted within the DOT&PF right-of-way (ROW) or on the NOAA property. The results of this work are described in detail within the report. The findings of this report describe the extent of the contamination on the property, address contaminant concentrations, and discuss excavation and remediation action conducted on the property. This report also addresses the fate and transport of contaminated materials as well as discusses the final site status.

3.0 SITE DESCRIPTION AND BACKGROUND

The project site was located near the City of Juneau, Alaska adjacent to Auke Bay on the Glacier Highway. The site was located on a steep road embankment along the southwest edge of the Glacier Highway. A guardrail was located adjacent to the site. A small pad had been constructed as a foundation for a wood garage structure. The integrity of this garage was no longer sound and required additional reinforcement prior to site work occurring. A short driveway to the garage off the Glacier Highway existed immediately adjacent and up-gradient of the battery dump site.

The terrain surrounding the potentially impacted site was steeply banked. Some vegetation, including grass, forest undergrowth, and large trees existed on the property. Mr. Hagmeier removed several large trees immediately adjacent to the DOT&PF ROW to allow for a full characterization of the site. Large rip-rap was placed on the site following previous remediation work to stabilize the slope. Naturally-occurring boulders and shallow bedrock were also present on the property. The site drained to the adjacent Auke Bay. A small, seasonal drainage passed immediately adjacent to the site. The drainage originates from a culvert passing beneath the highway. This drainage was rerouted around the site during previous remediation work and no longer contacts the contaminated area.

Access during previous BNCI remediation work was made from below the site. The 2009 BNCI report indicated that access from above was blocked by several trees and the highway guardrail. Additionally, access from below the site was limited by the presence of a large boulder and saturated soils. They stated that the boulder could not be moved as it provided stability for the slope. It is unclear if the boulder was removed, that it would compromise the integrity of the Glacier Highway. Access in July, 2014 was made from above the site in the driveway area.

During the October, 2014 work, the Hagmeier garage structure was supported with additional timbers and joists. The structural support additions allowed for the excavation beneath the garage structure without negatively impacting the building's integrity. As a result, only bedrock limited the excavation.

4.0 CONTAMINANTS OF POTENTIAL CONCERN

The primary contaminant of concern was lead. Analytical laboratory samples were collected for total lead. The ADEC Method 2 cleanup level for total lead is 400 mg/Kg. Several samples were also analyzed for toxicity characteristic leaching procedure (TCLP) for lead. The EPA characteristic hazardous waste TCLP limit for lead is 5.0 mg/l.

Samples were submitted to SGS Environmental Laboratories, Inc. in Anchorage, Alaska for analysis. The qualified sampler also performed field screening using a hand-held x-ray fluorescence (XRF) analyzer to screen for lead. Screening and sampling activities are further described in Sections 5.0, 6.0, and 7.0 of this report.

4.1 Conceptual Site Model

A Preliminary Conceptual Site Model was developed for this project in conjunction with the Site Characterization Work Plan. Additionally, a Final Conceptual Site Model was prepared following the July, 2014 work. A Revised Final Conceptual Site Model has been prepared based on the findings of the work conducted and this report. The Revised Final Conceptual Site Model is enclosed in Appendix C and the findings are referenced in Section 10.0.

5.0 SAMPLING PLAN IMPLIMENTATION

The site characterization and cleanup response was conducted in accordance with the ADEC *18 AAC 75 Oil and Other Hazardous Substances Pollution Control (revised Oct. 2008).* The cleanup was modeled after procedures described in the ADEC *Site Characterization Work Plan and Reporting Guidance for Investigation of Contaminated Sites (September 2009).*

TPECI conducted the site cleanup work at the Glacier Highway Property on October 15-16th, 2014. A detailed photo log of the site work is attached in Appendix D. While on site, TPECI personnel were aided by Mr. John Hagmeier. No ADEC personnel were available to visit the site during the time when work was conducted. Mr. Hagmeier assisted TPECI personnel by providing equipment and laborers to support the excavation within, and around the garage structure.

TPECI utilized a hand-held XRF analyzer, in addition to visual clues to determine the extent of the contamination. SGS Laboratory provided a sampling kit with the appropriate containers for the collection of analytical soil samples. SGS Laboratory also provided coolers and gel ice for transport and preservation of the soil samples.

A small excavator removed soil from the property. The small, rubber-tracked excavator allowed for easy access inside the garage where mobility was restricted by the structure. Mr. Hagmeier had previously prepared the site by placing additional joists and other structural support beams on the garage to allow for excavation beneath the buildings footings.

TPECI personnel directed the excavator operator to dig within the limits of the proposed excavation while taking care to avoid damaging the garage structure or enter the DOT&PF ROW. Minor excavation occurred on the south side of the garage to allow access beneath the garage footing. TPECI personnel guided the excavation utilizing visual indicators of battery debris and field screening of soils within the excavation base and sidewalls. As soils exhibiting screening results above 400 mg/Kg were excavated, the contractor placed the soil into SuperSacks® to be stockpiled on site. SuperSacks® were loaded immediately adjacent to, or within the excavation footprint at all times. No contaminated soils were stockpiled on the ground surface at any time. Detailed figures showing the location and extents of the excavation are shown in Appendix A.

The excavation was continued until the soil field screening indicated lead concentrations were below 400 mg/Kg or the excavation reached bedrock. The excavation also was stopped at the entrance of the garage, at the former Test Pit Three. This location exhibited lead concentrations below 400 mg/Kg at this time as well as in July, 2014. The excavation was limited by bedrock throughout most of the site. A thin layer (less than 1-inch thick) of soil remained on the bedrock in some locations. The removal of all soil from the bedrock was not practicable due to the morphology of the rock. At the completion of the excavation, soil samples were collected for field screening and laboratory analysis as described in Sections 6.0 and 7.0.

In addition to the stockpiled soils, approximately three cubic yards of rock and boulders 1'-3' in diameter was removed from the excavation, brushed of soil, and piled near the excavation site. This rock will likely be used to re-stabilize the site in the future.

During screening and excavation, solid wastes such as battery casings that were encountered were removed from the soils if easily extracted and placed into SuperSacks® for future disposal. The majority of solid waste and battery debris was mixed in SuperSacks® with excavated soils. No additional SuperSacks® of waste material were created. Any inert, non-hazardous, non-battery related solid waste encountered (pipe materials, automotive parts, and other household debris) were placed into contractor trash bags for disposal in the Juneau municipal landfill.

5.1 Excavated Soil Sampling

Soil excavated from the test pits that exhibited screening results above 400 mg/Kg was stockpiled in accordance with ADEC stockpile regulations. Stockpiled soils were placed into 1.0 or 1.5 cubic yard SuperSacks® for future transport and disposal. A maximum of 0.75 to 1.0 cubic yards of soil was placed into any SuperSack®. A total of 16 SuperSacks® containing approximately 16 cubic yards of soil were stockpiled on the property.

Soil samples collected from stockpiled soil were collected from SuperSacks® as composite samples. Each sample was collected from multiple separate SuperSacks® until all SuperSacks® were sampled. Soils were collected from varying depths within each of the SuperSacks®. The resulting sampling frequency for field screening was six field screening samples per approximately 15 cubic yards of soil. This is a greater sampling frequency than prescribed within the May, 2010 ADEC *Draft Field Sampling Guidance* document "Table 2A – Excavated Soil Sample Collection Guide" for an excavated soil volume of 11-50 cubic yards. Of the six field screening samples, three of these samples were selected for laboratory analysis. The laboratory analysis sampling frequency was also greater than that prescribed within the May 2010 ADEC *Draft Field Sampling Guidance* document for an excavated soil volume of 11-50 cubic yards.

Due to the known final fate and disposal of the stockpiled soils, TPECI personnel elected to collect a third, individual characterization sample for laboratory analysis rather than collect a field duplicate sample. This action was a deviation from the approved work plan.

5.2 Project Staff

TPECI staff include:

- Michael D. Travis, P.E. – Project oversight and supervision
- Erik Mundahl, P.E. – Project Management and onsite field sampling

6.0 FIELD SCREENING

The following describes the sampling protocols that TPECI field personnel followed to screen and collect soil samples. Field screening occurred first to delineate lead contamination within test pits. A hand-held XRF analyzer was utilized for field screening.

TPECI personnel conducted the field screening of soils with the XRF analyzer, in accordance with the ADEC *May 2010 Draft Field Sampling Guidance*, Section III Soil Sampling and EPA Method 6200 *Field Portable X-Ray Fluorescence spectrometry for determination of elemental concentrations in soil and sediment.* TPECI rented a calibrated XRF analyzer with a threshold of 400 ppm as an indicator of lead contamination in soils. The unit had a limit of detection of 40 mg/Kg. The unit did not have maximum detection limit. TPECI personnel collected confirmation samples from the highest XRF analyzer readings within the excavations. The confirmation samples were collected in accordance with page 19 of the ADEC *May 2010 Draft Field Sampling Guidance*, Section III, Subsection C. Soil Laboratory Analytical Sample Collection, paragraph 5 In-Situ (sub-surface) Soils (see excerpt below).

> ***5. In-Situ (sub-surface) Soils***
> *The frequency and location of field screening and laboratory analytical samples must be proposed in the work plan submitted to ADEC for approval.*
>
> *Typically, two laboratory samples should be collected from each boring. Collect one sample from the interval that is most impacted based on field screening and observations. If applicable, collect a second laboratory sample from the saturated soils just above the water table where contaminants are most likely to migrate, unless sampling objectives dictate otherwise.*

In the excavation of the garage site, field screening was conducted in accordance with the ADEC " Table 2B - Surface/Excavation Base and Excavation Sidewall Soil Sample Collection Guide" on page 10 of the ADEC *May 2010 Draft Field Sampling Guidance*. Due to the extent of the excavation and variability in soil types, screening frequencies were significantly greater than the minimums required within the guidance document.

The XRF analyzer was calibrated for lead according to the manufacturer's specifications. The area selected for field screening analysis was cleared of any surface debris or vegetation. The surface face was leveled to allow the sample window to contact the area evenly. Where ever possible, finer and homogeneous soils were screened to allow for more accurate results to be obtained. Additionally, where practical, the soil was loosened and dried in the sun prior to testing for greater accuracy. The XRF analyzer screening window was held to the ground surface. The trigger on the device was pulled and held for the duration of the analysis until results were displayed.

Soils were also screened within a zip-lock bag. The soils within the bag were homogenized, and an XRF reading was taken directly through the bag. Both methods of soil screening were found to yield quality results.

7.0 CONFIRMATION AND CHARACTERIZATION SAMPLING

Confirmation samples were collected as described below from the locations flagged for field screening. Following site excavation, the field screening samples which exhibited the highest readings on the XRF analyzer were chosen for additional laboratory analysis. Soils samples collected for laboratory analysis were collected separately from those collected for field screening. Additionally, field duplicate samples were collected as described in 7.3.1.1

In the excavation field screening and laboratory sample collection was conducted in accordance with the ADEC " Table 2B - Surface/Excavation Base and Excavation Sidewall Soil Sample Collection Guide" on page 10 of the ADEC *May 2010 Draft Field Sampling Guidance*. Due to the extent of the excavation and variability in soil types, sample collection frequencies were greater than the minimums required within the guidance document. Additional samples were collected in each test pit based on visual indicators of lead contamination or the presence of solid wastes.

All confirmation soil samples were analyzed for total lead by EPA Method 6020A. No samples were analyzed for TCLP lead by Method SW 1311 as no groundwater was encountered within the excavation.

Sample Field Preparation
Sampling was performed in accordance with the applicable regulations:

- All samples were collected using disposable or cleaned and decontaminated sampling equipment;
- TPECI Environmental Field Staff wore disposable gloves, safety goggles, steel toed boots, hard hat, reflective vest, and other appropriate Class D personal protective equipment. Gloves and sampling devices were changed between samples;

- Samples were collected as quickly as possible and placed in laboratory supplied containers;
- All samples were labeled; and
- All samples were preserved in accordance with laboratory specifications. Samples were not chilled as no temperature preservation is required for the analysis of Total Lead or TCLP Lead.

The following sections describe field preparation, and sampling protocols.

7.1 Standard Operating Procedures

The standard operating procedures (SOP) for this project fall into two categories, field SOP and laboratory SOP. Throughout the sampling effort, laboratory hold-times and sample temperatures shall be maintained. The laboratory SGS Quality Assurance Project Plan is filed at the laboratory and at TPECI. Thus, the SOP contained herein refers to generic field sampling and sample preparation.

7.1.1 Field Sampling SOPs

Field personnel kept detailed notes that included:

- Weather conditions;
- Sample collection date and time;
- Sample identification number; and
- Sampling methodology.

Sampling location plan view:

- Sampling location cross-sectional view (if applicable);
- Unusual characteristics of the sampling location; and
- Any problems encountered during sampling.

7.1.2 Field Sample Preparation SOP

All samples were prepared in accordance with laboratory instructions. At a minimum, the following information was included on the sample label or Chain of Custody:

- Client name;
- Date and time of sample collection;
- Sampler;
- Sample location;
- Preservative, and
- Analytical test(s) to be run.

In addition, the above information was recorded in the field notes. Chain of custody records were maintained for each sample. Samples were not chilled as no temperature preservation was required for Total Lead and TCLP Lead analysis.

7.1.3 Field Decontamination Procedures

TPECI used clean disposable sampling gloves when acquiring samples. A stainless steel trowel and disposable plastic spoons were used for the collection of samples. Prior to use and between each sampling location, reusable sampling implements were cleaned and scrubbed using alcohol based wipes and an Alconox® detergent. Used wipes were disposed in the stockpiled soil SuperSacks®. No decontamination water was created during the cleaning process.

7.2 Field and laboratory Calibration Methods

All field and laboratory procedures requiring instrument calibration were conducted according to the applicable Environmental Protection Agency (EPA) methods, the ADEC methods, and standard operating procedures. TPECI rented the analyzer from a local rental company in Anchorage. The manufacturer calibrated the XRF analyzer on an as-needed basis. The XRF analyzer was also calibrated daily using the on board system prior to use.

The EPA checks the calibrations traceable quality control standards for the laboratory.

7.3 Routine and Periodic Quality Control Activities

SGS Laboratory, an ADEC approved laboratory, was used for all project analyses. This section describes the methods used for determining the quality of laboratory results.

7.3.1 Field Quality Control Samples

TPECI utilized two types of field quality control samples. These are sample duplicates and trip blanks. The objective and frequency of these samples are discussed below.

7.3.1.1 Field Duplicates

Field duplicates are samples collected simultaneously from the same sampling locations. TPECI used identical sampling methods to retrieve one duplicate for every 10 samples. TPECI split one sample for duplicate analysis from the excavation and followed the same QA/QC methods for collecting, packaging, recording, and shipping the duplicate samples as all other samples. See Section 10.0 Deviations from the Work Plan for a deviation regarding field duplicates.

7.3.1.2 Trip Blank

Trip blanks are samples prepared from sterile media at the laboratory and shipped with the sample containers. Trip blanks remain with the samples after collection and are analyzed for volatile compounds. This analysis determines if any cross-contamination occurred during shipping. TPECI did not open the trip blank containers during the entire sampling process.

TPECI used one trip blank per cooler. If the laboratory found any contamination within the trip blank, TPECI uses the results to evaluate any possible impacts to associated samples and would be described within the Results Section.

7.3.2 Laboratory Quality Control Samples

The project laboratory used matrix-spiked samples, spiked duplicates, surrogates, method blanks, duplicates, and laboratory control samples to measure data quality. Matrix spiked samples and laboratory control samples assess sample matrix interference and analytical errors and accuracy. Surrogates evaluate accuracy of an analytical measurement. Method blanks check for laboratory contamination and instrument bias. Duplicates measure the precision of the analysis.

The laboratory used one method blank per sample period and used one laboratory control sample. The laboratory used a surrogate spike for every sample, standard, and blank. The laboratory will use one matrix spike per sample period.

7.4 Data Reduction, Validation and Reporting

Data reduction is conducted by the laboratory analyst. All calculations were made as specified by the particular analytical method. Units were reported as mg/L, µg/L, µg/mL or as otherwise called for in the method. Analytical data reports will include:

- Client name;
- Date and time of sample collection;
- Sample location;
- Date and time samples received at the laboratory;
- Date analysis completed;
- Laboratory sample ID number;
- A list of parameters analyzed;
- The analytical method number for each parameter; and
- Concentration of each parameter.

The laboratory forwarded a copy of the completed analytical results to TPECI.

8.0 RESULTS

8.1 Excavation Results

TPECI personnel collected a total of 41 field screening soil samples from the excavations on the property. The screening samples were spread throughout the excavation to fully characterize the dig site and later as confirmation samples for the excavation of contaminated soils in the primary excavation. A total of 26 field screening soil samples were conducted to identify contaminant concentrations and guide excavation. An additional 15 field screening soil samples were conducted as confirmation samples.

The soil samples associated with the excavation were identified as G2 through G42. Soil samples G2 through G27 were only field screened and used to guide excavation activities. Figure 3 is Appendix A shows the location of these samples. Soil samples G28 through G42 were used as confirmation samples. Figure 4 in Appendix A shows the locations of these confirmation samples.

One field duplicate sample was collected from the soil excavations (confirmation sampling) for laboratory analysis. The number of duplicate samples collected is in accordance with 10% duplicate sampling as detailed in Section 7.3.1.1. Sample ID T100 is a field duplicate of soil sample G33.

Table 1.0, Excavation Soil Screening Results, identifies the Sample IDs, the sampling depth of each individual sample, and the field screening XRF result for lead in ppm.

Table 2.0, Confirmation Soil Sampling Screening and Laboratory Results, identifies the Sample IDs, the sampling depth of each individual sample, the field screening XRF result for lead in ppm, and the laboratory analysis result for lead in mg/Kg.

Detailed sample results for the laboratory analysis are attached in the SGS Laboratory Report in Appendix B.

Table 1.0. Excavation Soil Screening Results

Sample ID	Depth (ft bgs)	XRF (Pb) ppm	Laboratory (Pb) mg/Kg
G2	2.0	5,943	-
G3	2.0	2,334	-
G4	2.0	5,120	-
G5	2.0	7,690	-
G6	0.25	161	-
G7	1.0	130	-
G8	1.00	<LOD	-
G9	1.0	<LOD	-
G10	1.0	3,210	-
G11	1.0	3,799	-
G12	1.00	4,703	-
G13	1.0	6,427	-
G14	1.0	7,231	-
G15	1.0	6,712	-
G16	1.0	5,442	-
G17	1.0	3,111	-
G18	1.0	12,000	-
G19	2.0	9,000	-
G20	2.0	5710.0	-
G21	2.0	3,118	-
G22	2.0	2108.0	-
G23	2.0	716	-
G24	2.0	606	-
G25	2.0	822	-
G26	2.0	933	-
G27	2.0	754	-

Table 2.0. Confirmation Soil Sampling Screening and Laboratory Results

Sample ID	Depth (ft bgs)	XRF (Pb) ppm	Laboratory (Pb) mg/Kg
G28	2.0	<LOD	-
G29	2.5	237.1	13.5
G30	2.5	<LOD	-
G31	2.0	<LOD	-
G32	1.0	<LOD	-
G33	1.5	264.7	1,900
G34	2.5	152.2	-
G35	3.0	164	-
G36	3.0	148.2	-
G37	3.0	213.7	-
G38	3.0	311.4	244
G39	3.0	177.6	-
G40	3.0	332.1	228
G41	3.0	<LOD	-
G42	3.0	197.8	-
T100	1.5	264.7	570

Within the garage excavation, a number of soils samples were collected as an effort to characterize the site and not as cleanup confirmation samples. None of these samples were submitted for laboratory analysis. These initial soil samples collected were identified as G2 through G27. The screening results show soil lead concentrations notably greater than ADEC cleanup levels. It is important to note that these soils were excavated and stockpiled as contaminated soils. Soil sample depth, as shown in Table 1.0, further details the location of these initial soil samples near the ground surface as opposed to the greater depth of samples collected later during the excavation.

Soil samples identified as G28 through G42 were samples collected as final excavation confirmation screening and laboratory samples. These samples were often collected at final excavation depth. In some areas, additional soil was excavated following the initial screening result to ensure all contaminated soils were removed.

Confirmation soil screening and laboratory results found that the majority of soils located within the garage excavation were excavated to areas below the ADEC cleanup level of 400 mg/kg. In many areas, soils were excavated to bedrock.

One sampling location, G33, located at the southwest corner of the excavation (near the garage wall) exhibited lead concentrations of 1,900 mg/kg. The field duplicate T100 was collected as part of G33. T100 exhibited lead concentrations of 570 mg/kg. This significant difference within a single sample represents the extreme variability of lead concentrations within the soil. The soil for G33 and T100 was scraped from bedrock within the excavation. It was neither practical nor feasible to continue excavation at this location. As such, all lead contaminated soils exceeding ADEC cleanup levels were removed from the spot.

No other laboratory soil confirmation samples exhibited lead concentrations above the ADEC cleanup level of 400 mg/kg. Based on these findings, TPECI determined that all lead contaminated soils above ADEC cleanup levels had been successful excavated from within the garage structure. In conjunction with previous site test pits and excavations, this verifies that no lead contaminated soils remained on the Hagmeier property.

8.2 TCLP Sampling Results

No soil samples were analyzed for TCLP. TPECI personnel were prepared to collect samples for TCLP analysis should groundwater have been encountered. As no groundwater was noted within the excavation, no samples were collected for this analysis.

Previous TCLP sampling results indicated that the lead contamination at the property was not actively leaching and does not pose any threat to the downstream environment or Auke Bay.

8.3 Excavated Soil Sampling Results

The stockpiled excavated soils were stored temporarily on site in SuperSacks®. The excavated and stockpiled soils were sampled for field screening and laboratory analysis to adequately characterize them for disposal.

To fully characterize the stockpiled soil, composite samples were collected from each of the 16 SuperSacks®. The samples were identified as E1 through E6. All samples were field screened and samples E1, E2, and E6 were submitted for laboratory analysis as they exhibited the highest field screening concentrations. Due to the known final fate and disposal of the stockpiled soils, TPECI personnel elected to collect a third, individual characterization sample for laboratory analysis rather than collect a field duplicate sample. This action was a deviation from the approved work plan.

The sample IDs, the breakdown of the composite sampling, and the screening and laboratory results are shown in Table 3.0. Detailed laboratory results for the stockpiled soils are shown in the SGS Laboratory report in Appendix B.

Table 3.0. Excavated Soil Screening and Sampling Results

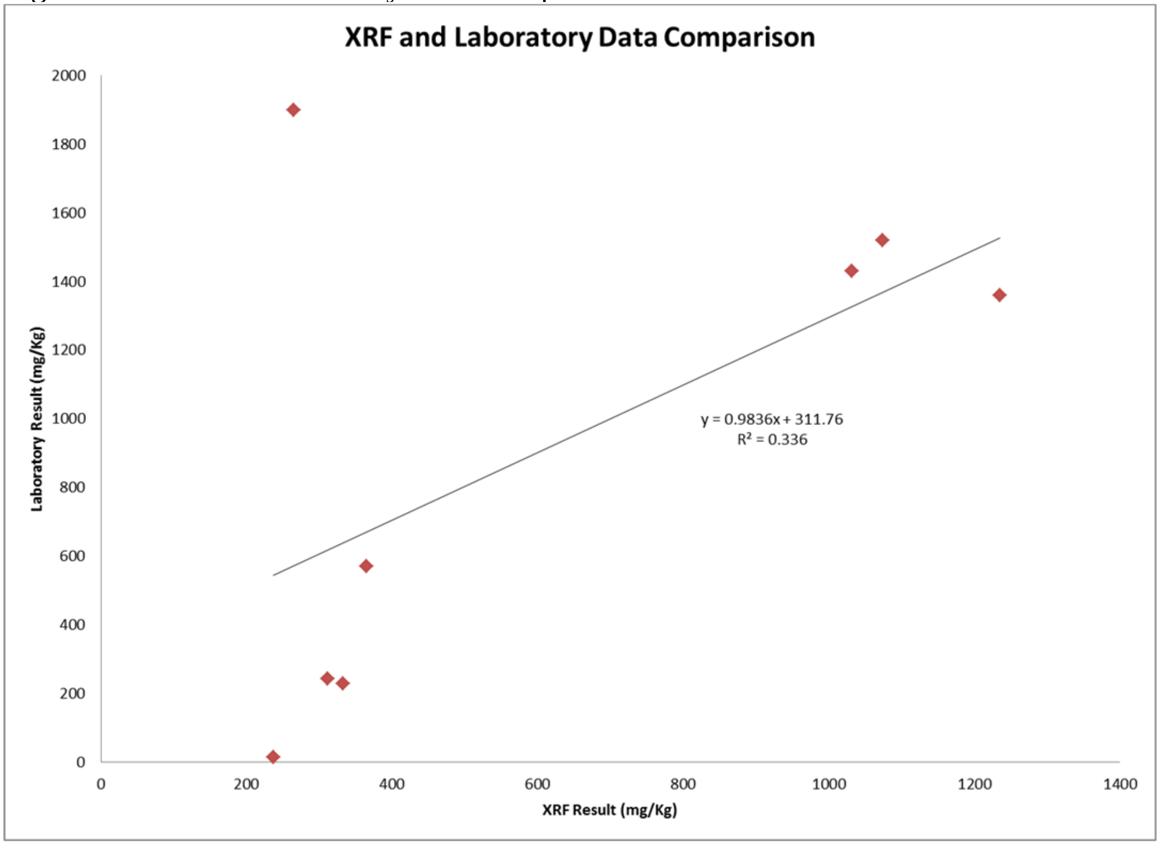
Sample ID	SuperSacks®	XRF (Pb) ppm	Laboratory (Pb) mg/Kg
E1	1 to2	1,032	1,430
E2	3 to 5	1,074	1,520
E3	6 to 8	811.5	-
E4	9 to 11	721.3	-
E5	12 to 14	740.0	-
E6	15 to 16	1,235	1,360

Soil screening and laboratory analysis for total lead found contaminant concentrations well in excess of the ADEC cleanup level of 400 mg/kg. Based on the Total Lead concentrations observed in the stockpiled soil, if analyzed for TCLP Lead, concentrations would likely exceed the 5.0 mg/L limit classifying the soils as a regulated hazardous waste. As a result, all 16 stockpiled SuperSacks® are to be handled, transported and disposed as a regulated hazardous waste. ADEC has concurred with the handling of the stockpiled soils as a hazardous waste.

8.4 XRF and Laboratory Data Comparison

TPECI conducted a comparison of the XRF field screening results to the laboratory analytical results. The soil screening using the XRF devise is described in Section 6.0. The results for both the XRF field screening data and the laboratory analytical data for Total Lead are shown in Table 1.0. Figure 5 shows a comparison of the XRF field screening data and the laboratory analytical data.

Figure 5. XRF and Laboratory Data Comparison



The figure depicts a linear trend line and linear regression was calculated with an R^2 value of 0.336. The analysis of this data shows a fair to poor correlation between the XRF results and the laboratory data. The XRF unit tended to be fairly accurate at concentrations above 800 mg/kg. The XRF unit also tended to be biased low near its lower level of detection. Factors leading to screening error may have included highly variable soil types and non-homogenous samples or a dirt residue present on the XRF optical face.

TPECI does not believe that the poor correlation between XRF screening values and the laboratory data negatively impacted the overall result of the investigation. Laboratory confirmation samples still were generally found to be below ADEC cleanup levels despite any XRF screening bias.

8.5 Laboratory Data QA/QC

The ADEC Laboratory Data Review Checklist was completed for the laboratory analytical results within the SGS Laboratories report "1462-04 Juneau Glacier Hwy" (Report Number 1145201).

No preservation is required for the analyses for Total Lead (Method 6020) and TCLP Lead (Method 1311/6020). As such, samples were stored and transported at ambient temperatures. Laboratory data quality and usability was not affected.

The percent recoveries for Sample T100 and the associated method blank were outside of laboratory limits. The data quality and usability of the sample was not affected as post digestion spike was successful.

Field duplicate T100 and original sample G33 had a relative percent difference greater than the standard 50%. The data quality and usability of these samples is not affected as both the original sample and the duplicate exceed ADEC cleanup levels for lead. Extreme variability in the soil, along with potential lead particles within the soil could lead to duplicates with such a significant RPD.

9.0 SOIL DISPOSAL

A total of 16, 1.0 to 1.5 cubic yard SuperSacks® were temporarily stockpiled on the property until they can be shipped for hazardous waste disposal. Stockpiled soils contained Total Lead concentrations as high as 1,520 mg/Kg, well above the 400 mg/Kg threshold in which the soils must be handled as an EPA RCRA listed hazardous waste.

TPECI and Mr. Hagmeier coordinated with WasteManagement, Inc., as a shipper, handler, and for ultimate disposal in their RCRA TSD facility in Arlington, Oregon. TPECI has obtained an EPA generator ID number for Mr. Hagmeier, as well as ADEC approval to transport the contaminated soils. All stockpiled soils were transported off-site by WasteManagement and are currently in transit to the WasteManagement RCRA TSD facility. TPECI will provide ADEC the final Certificate of Disposal once it becomes available.

10.0 DEVIATIONS FROM THE WORK PLAN

Due to the known final fate and disposal of the stockpiled soils, TPECI personnel elected to collect a third, individual characterization sample for laboratory analysis rather than collect a field duplicate sample. This decision provided additional characterization information for WasteManagement in the ultimate soil disposal at their RCRA TSD facility. This action was a deviation from the approved work plan.

No other deviations from the approved work plan were made.

11.0 CONCLUSIONS AND RECOMMENDATIONS

11.1 Garage Excavation

The excavation of soils within the Hagmeier garage was conducted utilizing field screening to guide soil removal efforts. The predicted small soil volumes remaining within the garage were correct with a total of approximately 16 cubic yards removed. All contaminated soils were removed from the site and stockpiled temporarily in SuperSacks®. TPECI personnel collected soil samples for field screening and laboratory analysis as excavation confirmation samples.

The confirmation samples found that all soils on the Hagmeier property, with a minor note of the single sample G33 collected from bedrock, were below the ADEC cleanup level of 400 mg/kg.

Based on these findings, TPECI has determined that all lead contaminated soils currently practicably removable on the property have been excavated and transported for disposal.

11.2 Contamination Remaining on the Property

No lead contaminated soils remain on the Hagmeier property. The soil sampling results indicated one area of elevated lead concentrations above ADEC cleanup levels. However, the soils in this area were excavated to bedrock. The soils collected for this sample were scraped from bedrock. It was not practical, nor feasible to excavate additional soil at this site.

11.3 Contamination within the DOT&PF ROW

Lead contaminated soils do remain on the DOT&PF ROW. TPECI excavated soils immediately up to and slightly into the DOT&PF ROW. A near vertical excavation sidewall was created on the east face of the excavation in July 2014. This sidewall has since been lined with geotextile fabric, and a poly liner, and backfilled. Soil samples collected along this sidewall (S47-2, S62, and S64) exhibited Total Lead concentrations of nearly 1,000 mg/Kg, with even higher screening results. Contaminated soil on the DOT&PF property was outside of the scope of work for this investigation and cleanup. No action to remove the contaminated soils in the ROW was made. Lead contaminated soils remain on the DOT&PF property and are the responsibility of the property owner.

11.4 Contamination on NOAA Property

Soil samples collected for field screening and laboratory analysis found that those areas adjacent to the NOAA property were free of lead contaminated soils at the completion of the excavation. Based on the topography of the drainage, it is possible that some lead contaminated soils do remain on the NOAA property. Investigation of the NOAA property was outside of the scope of work for this investigation and cleanup. TPECI did not investigation any soils on the NOAA property. However, the previous site work conducted by NOAA likely excavated the majority of contaminated soils on their property. Any remaining soils on the site are likely minimal.

11.5 Site Stabilization

Following the completion of the excavation in July, 2014, TPECI, DOT&PF personnel, and ADEC personnel determined that initial stabilization of the site would be required to prevent the sloughing and collapse of the excavation side walls, specifically the eastern sidewall along the DOT&PF ROW.

With ADEC approval, Mr. Hagmeier placed a liner and geotextile fabric throughout the excavation interface of the July site work. The liner not only covers the DOT&PF ROW and NOAA interfaces, but also was placed along the bottom of the excavation on the Hagmeier property. The site was then backfilled with clean fill material. Photos of the liner materials and backfill are shown in the attached Photo Log in Appendix D.

Following the October, 2014 work, the excavation inside of the garage structure was not backfilled. It was determined that the garage was structurally sound with the excavation in place. The site was secured and access restricted.

TPECI requests ADEC approval to backfill the excavation in the spring of 2015. Mr. Hagmeier would like to backfill the garage excavation using clean pit run material. Due to the lack of any additional contamination in the immediate vicinity of the excavation, no liner should be necessary prior to backfill being placed.

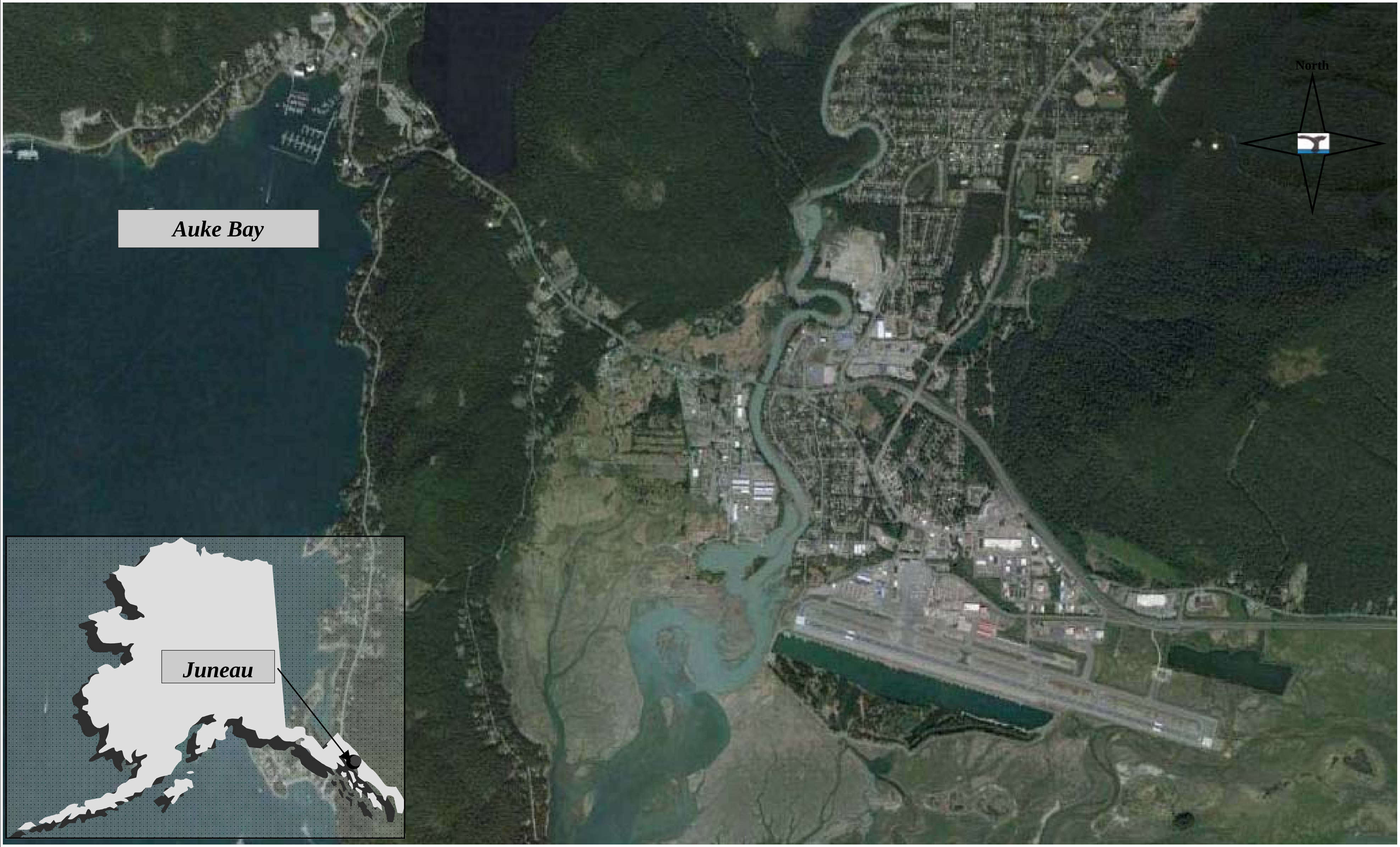
11.6 Conceptual Site Model

The 2014 Perliminary Conceptual Site Model for the Glacier Highway property was updated following the completion of the site investigation and cleanup and the review of site data. A reduction in contaminant pathways occurred in conjunction with the site remediation activities that occurred on the Hagmeier property. The complete Revised Final Conceptual Site Model is attached in Appendix C.

11.7 Site Closure

Pending the final stabilization of the site, TPECI and Mr. John Hagmeier request that the ADEC issue a site closure letter. While contamination does exist on the NOAA and DOT&PF properties, no contaminated soils remain on the Hagmeier property. Should it not be possible to fully close the site due to contamination remaining on the nearby properties, TPECI and Mr. Hagmeier request that the ADEC Contaminated Sites Database record be revised to indicate that no contamination remains on the Hagmeier property and the ADEC is no longer pursuing Mr. Hagmeier as a Potentially-Responsible Party.

APPENDIX A:
Figures

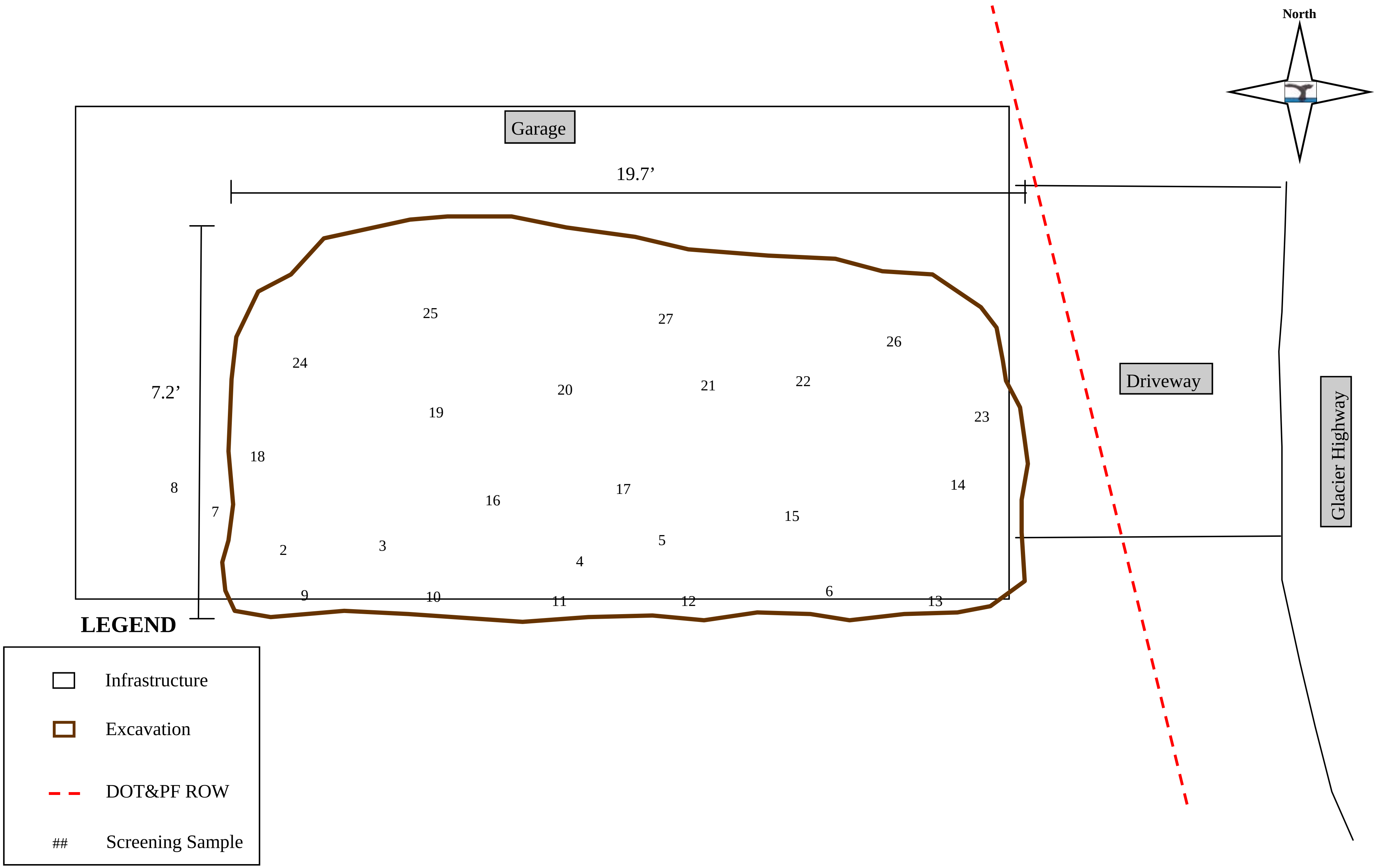


Travis/Peterson Environmental Consulting, Inc. 3305 Arctic Boulevard, Suite 102 Anchorage, AK 99503 907-522-4337	**Glacier Highway Battery Recycling Site Characterization Plan** **Juneau, Alaska**	**General Location Map** **Figure #1**

Project No: 1462-04	**File: Jupiter\backup\Erik\1462-04\Figures**	**Date: 9/16/2014**	**Scale: None**

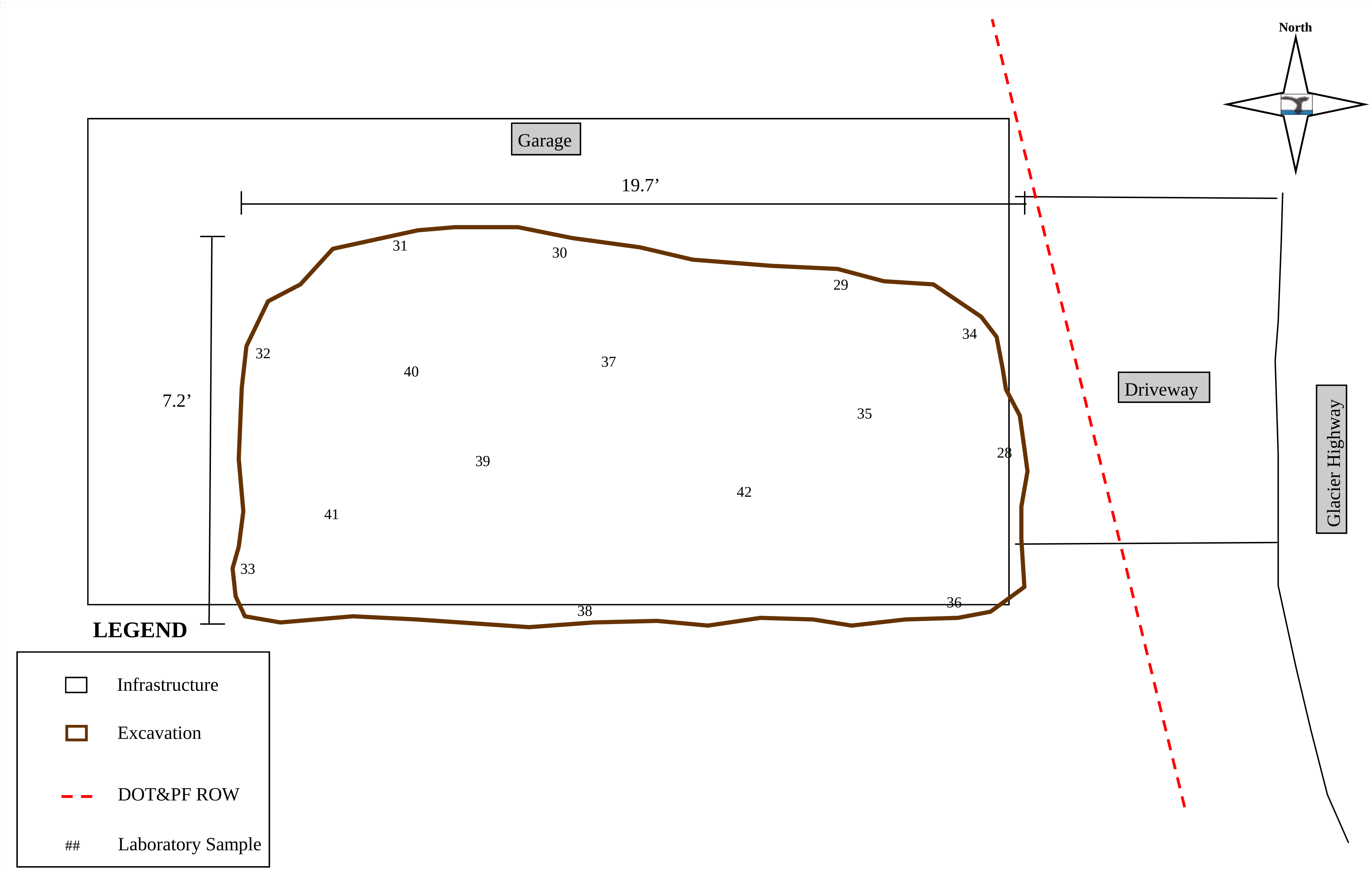
Travis/Peterson Environmental Consulting, Inc. 3305 Arctic Boulevard, Suite 102 Anchorage, AK 99503 907-522-4337	**Glacier Highway Battery Recycling Site Characterization Plan** **Juneau, Alaska**	**Site Map** **Figure #2**

Project No: 1462-04	**File: Jupiter\backup\Erik\1462-04\Figures**	**Date: 9/16/2014**	**Scale: None**



Travis/Peterson Environmental Consulting, Inc. 3305 Arctic Boulevard, Suite 102 Anchorage, AK 99503 907-522-4337	**Glacier Highway Battery Recycling Site Characterization Plan** **Juneau, Alaska**	**Excavation Map** **Figure # 3**

Project No: 1462-04	**File: Jupiter\backup\Erik\projects/1462-04\Figures**	**Date: 11/20/14**	**Scale: None**



Travis/Peterson Environmental Consulting, Inc. 3305 Arctic Boulevard, Suite 102 Anchorage, AK 99503 907-522-4337	**Glacier Highway Battery Recycling Site Characterization Plan** **Juneau, Alaska**	**Confirmation Sampling Map** **Figure # 3**

Project No: 1462-04	**File: Jupiter\backup\Erik\projects/1462-04\Figures**	**Date: 11/20/14**	**Scale: None**

APPENDIX B:
SGS Laboratory Report and
ADEC Data Checklist

SGS

Laboratory Report of Analysis

To: Travis/Peterson (TPECI)
3305 Arctic Blvd Suite 102
Anchorage, AK 99503
(907)522-4337

Report Number: **1145201**

Client Project: **Juneau Glacier Hwy**

Dear Erik Mundahl,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Victoria at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

Victoria Pennick Date
Project Manager
Victoria.Pennick@sgs.com

Case Narrative

SGS Client: **Travis/Peterson (TPECI)**
SGS Project: **1145201**
Project Name/Site: **Juneau Glacier Hwy**
Project Contact: **Erik Mundahl**

Refer to sample receipt form for information on sample condition.

T100(1145201008MS) (1241160) MS

6020A - Metals - MS recovery for lead is outside of acceptance criteria (biased low). Post digestion spike was successful. Sample concentration of lead is greater than 4 times the spike amount.

T100(1145201008MSD) (1241161) MSD

6020A - Metals - MSD recovery for lead is outside of acceptance criteria (biased low). Post digestion spike was successful. Sample concentration of lead is greater than 4 times the spike amount.

Note: Sample T100 was created, per client request, by splitting sample G-33 into two samples after receipt at the lab. G-33 was dumped out in its entirety and homogenized as best as possible, and then split between two jars. Prep initial weight for metals analysis is ~ 1 gram of soil. Variability and homogeneity at this small amount is increased and can cause duplicate RPD criteria to be exceeded. Post digestion spikes were successful, and the MS/MSD RPD was within limits. This suggests that the sample is not homogeneous for lead, and the higher result should be used for decision-making purposes. VLP

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

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Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. If you have any questions regarding this report, or if we can be of any other assistance, please contact your SGS Project Manager at 907-562-2343. All work is provided under SGS general terms and conditions (<http://www.sgs.com/terms_and_conditions.htm>), unless other written agreements have been accepted by both parties.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & UST-005 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020A, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035B, 6020, 7470A, 7471B, 8021B, 8082A, 8260B, 8270D, 8270D-SIM, 9040B, 9045C, 9056A, 9060A, AK101 and AK102/103). Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

The following descriptors or qualifiers may be found in your report:

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV	Continuing Calibration Verification
CL	Control Limit
D	The analyte concentration is the result of a dilution.
DF	Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
F	Indicates value that is greater than or equal to the DL
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
JL	The analyte was positively identified, but the quantitation is a low estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
M	A matrix effect was present.
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
Q	QC parameter out of acceptance range.
R	Rejected
RPD	Relative Percent Difference
U	Indicates the analyte was analyzed for but not detected.

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content. All DRO/RRO analyses are integrated per SOP.

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Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
G29	1145201001	10/16/2014	10/17/2014	Soil/Solid (dry weight)
G33	1145201002	10/16/2014	10/17/2014	Soil/Solid (dry weight)
G38	1145201003	10/16/2014	10/17/2014	Soil/Solid (dry weight)
G40	1145201004	10/16/2014	10/17/2014	Soil/Solid (dry weight)
E1	1145201005	10/16/2014	10/17/2014	Soil/Solid (dry weight)
E2	1145201006	10/16/2014	10/17/2014	Soil/Solid (dry weight)
E6	1145201007	10/16/2014	10/17/2014	Soil/Solid (dry weight)
T100	1145201008	10/16/2014	10/17/2014	Soil/Solid (dry weight)

Method	Method Description
SW6020A	Metals by ICP-MS (S)
SM21 2540G	Percent Solids SM2540G

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Detectable Results Summary

Client Sample ID	Lab Sample ID	Method	Parameter	Result	Units
G29	1145201001	**Metals by ICP/MS**	Lead	13.5	mg/Kg
G33	1145201002	**Metals by ICP/MS**	Lead	1900	mg/Kg
G38	1145201003	**Metals by ICP/MS**	Lead	244	mg/Kg
G40	1145201004	**Metals by ICP/MS**	Lead	228	mg/Kg
E1	1145201005	**Metals by ICP/MS**	Lead	1430	mg/Kg
E2	1145201006	**Metals by ICP/MS**	Lead	1520	mg/Kg
E6	1145201007	**Metals by ICP/MS**	Lead	1360	mg/Kg
T100	1145201008	**Metals by ICP/MS**	Lead	570	mg/Kg

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Results of **G29**

Client Sample ID: **G29**
Client Project ID: **Juneau Glacier Hwy**
Lab Sample ID: 1145201001
Lab Project ID: 1145201

Collection Date: 10/16/14 08:13
Received Date: 10/17/14 11:07
Matrix: Soil/Solid (dry weight)
Solids (%): 93.5
Location:

Results by **Metals by ICP/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	13.5	1.03	0.319	mg/Kg	50		10/22/14 14:47

Batch Information

Analytical Batch: MMS8718
Analytical Method: SW6020A
Analyst: ACF
Analytical Date/Time: 10/22/14 14:47
Container ID: 1145201001-A

Prep Batch: MXX28209
Prep Method: SW3050B
Prep Date/Time: 10/20/14 09:50
Prep Initial Wt./Vol.: 1.04 g
Prep Extract Vol: 50 mL

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Results of **G33**

Client Sample ID: **G33**
Client Project ID: **Juneau Glacier Hwy**
Lab Sample ID: 1145201002
Lab Project ID: 1145201

Collection Date: 10/16/14 08:29
Received Date: 10/17/14 11:07
Matrix: Soil/Solid (dry weight)
Solids (%): 97.5
Location:

Results by **Metals by ICP/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	1900	1.02	0.316	mg/Kg	50		10/22/14 14:56

Batch Information

Analytical Batch: MMS8718
Analytical Method: SW6020A
Analyst: ACF
Analytical Date/Time: 10/22/14 14:56
Container ID: 1145201002-A

Prep Batch: MXX28209
Prep Method: SW3050B
Prep Date/Time: 10/20/14 09:50
Prep Initial Wt./Vol.: 1.006 g
Prep Extract Vol: 50 mL

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Results of **G38**

Client Sample ID: **G38**
Client Project ID: **Juneau Glacier Hwy**
Lab Sample ID: 1145201003
Lab Project ID: 1145201

Collection Date: 10/16/14 08:52
Received Date: 10/17/14 11:07
Matrix: Soil/Solid (dry weight)
Solids (%): 91.4
Location:

Results by **Metals by ICP/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	244	1.08	0.334	mg/Kg	50		10/22/14 14:59

Batch Information

Analytical Batch: MMS8718
Analytical Method: SW6020A
Analyst: ACF
Analytical Date/Time: 10/22/14 14:59
Container ID: 1145201003-A

Prep Batch: MXX28209
Prep Method: SW3050B
Prep Date/Time: 10/20/14 09:50
Prep Initial Wt./Vol.: 1.016 g
Prep Extract Vol: 50 mL

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Results of **G40**

Client Sample ID: **G40**
Client Project ID: **Juneau Glacier Hwy**
Lab Sample ID: 1145201004
Lab Project ID: 1145201

Collection Date: 10/16/14 09:04
Received Date: 10/17/14 11:07
Matrix: Soil/Solid (dry weight)
Solids (%): 97.7
Location:

Results by **Metals by ICP/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	228	0.978	0.303	mg/Kg	50		10/22/14 15:01

Batch Information

Analytical Batch: MMS8718
Analytical Method: SW6020A
Analyst: ACF
Analytical Date/Time: 10/22/14 15:01
Container ID: 1145201004-A

Prep Batch: MXX28209
Prep Method: SW3050B
Prep Date/Time: 10/20/14 09:50
Prep Initial Wt./Vol.: 1.047 g
Prep Extract Vol: 50 mL

Results of **E1**

Client Sample ID: **E1**
Client Project ID: **Juneau Glacier Hwy**
Lab Sample ID: 1145201005
Lab Project ID: 1145201

Collection Date: 10/16/14 09:11
Received Date: 10/17/14 11:07
Matrix: Soil/Solid (dry weight)
Solids (%): 94.2
Location:

Results by **Metals by ICP/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	1430	1.04	0.322	mg/Kg	50		10/22/14 15:03

Batch Information

Analytical Batch: MMS8718
Analytical Method: SW6020A
Analyst: ACF
Analytical Date/Time: 10/22/14 15:03
Container ID: 1145201005-A

Prep Batch: MXX28209
Prep Method: SW3050B
Prep Date/Time: 10/20/14 09:50
Prep Initial Wt./Vol.: 1.023 g
Prep Extract Vol: 50 mL

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Results of **E2**

Client Sample ID: **E2**
Client Project ID: **Juneau Glacier Hwy**
Lab Sample ID: 1145201006
Lab Project ID: 1145201

Collection Date: 10/16/14 09:14
Received Date: 10/17/14 11:07
Matrix: Soil/Solid (dry weight)
Solids (%): 95.0
Location:

Results by **Metals by ICP/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	1520	0.974	0.302	mg/Kg	50		10/22/14 15:06

Batch Information

Analytical Batch: MMS8718
Analytical Method: SW6020A
Analyst: ACF
Analytical Date/Time: 10/22/14 15:06
Container ID: 1145201006-A

Prep Batch: MXX28209
Prep Method: SW3050B
Prep Date/Time: 10/20/14 09:50
Prep Initial Wt./Vol.: 1.081 g
Prep Extract Vol: 50 mL

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Results of **E6**

Client Sample ID: **E6**
Client Project ID: **Juneau Glacier Hwy**
Lab Sample ID: 1145201007
Lab Project ID: 1145201

Collection Date: 10/16/14 09:29
Received Date: 10/17/14 11:07
Matrix: Soil/Solid (dry weight)
Solids (%): 95.2
Location:

Results by **Metals by ICP/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	1360	1.00	0.310	mg/Kg	50		10/22/14 15:08

Batch Information

Analytical Batch: MMS8718
Analytical Method: SW6020A
Analyst: ACF
Analytical Date/Time: 10/22/14 15:08
Container ID: 1145201007-A

Prep Batch: MXX28209
Prep Method: SW3050B
Prep Date/Time: 10/20/14 09:50
Prep Initial Wt./Vol.: 1.049 g
Prep Extract Vol: 50 mL

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Results of **T100**

Client Sample ID: **T100**
Client Project ID: **Juneau Glacier Hwy**
Lab Sample ID: 1145201008
Lab Project ID: 1145201

Collection Date: 10/16/14 08:29
Received Date: 10/17/14 11:01
Matrix: Soil/Solid (dry weight)
Solids (%): 97.8
Location:

Results by **Metals by ICP/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Lead	570	1.96	0.609	mg/Kg	100		10/22/14 15:51

Batch Information

Analytical Batch: MMS8718
Analytical Method: SW6020A
Analyst: ACF
Analytical Date/Time: 10/22/14 15:51
Container ID: 1145201008-A

Prep Batch: MXX28216
Prep Method: SW3050B
Prep Date/Time: 10/21/14 08:55
Prep Initial Wt./Vol.: 1.042 g
Prep Extract Vol: 50 mL

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Method Blank

Blank ID: MB for HBN 1660618 [MXX/28209]
Blank Lab ID: 1240876

Matrix: Soil/Solid (dry weight)

QC for Samples:
1145201001, 1145201002, 1145201003, 1145201004, 1145201005, 1145201006, 1145201007

Results by **SW6020A**

Parameter	Results	LOQ/CL	DL	Units
Lead	0.100U	0.200	0.0620	mg/Kg

Batch Information

Analytical Batch: MMS8718
Analytical Method: SW6020A
Instrument: Perkin Elmer Sciex ICP-MS P3
Analyst: ACF
Analytical Date/Time: 10/22/2014 2:25:48PM

Prep Batch: MXX28209
Prep Method: SW3050B
Prep Date/Time: 10/20/2014 9:50:44AM
Prep Initial Wt./Vol.: 1 g
Prep Extract Vol: 50 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1145201 [MXX28209]
Blank Spike Lab ID: 1240877
Date Analyzed: 10/22/2014 14:28

Matrix: Soil/Solid (dry weight)

QC for Samples: 1145201001, 1145201002, 1145201003, 1145201004, 1145201005, 1145201006, 1145201007

Results by **SW6020A**

	Blank Spike (mg/Kg)			
Parameter	Spike	Result	Rec (%)	CL
Lead	50	54.5	109	(80-120)

Batch Information

Analytical Batch: **MMS8718**
Analytical Method: **SW6020A**
Instrument: **Perkin Elmer Sciex ICP-MS P3**
Analyst: **ACF**

Prep Batch: **MXX28209**
Prep Method: **SW3050B**
Prep Date/Time: **10/20/2014 09:50**
Spike Init Wt./Vol.: 50 mg/Kg Extract Vol: 50 mL
Dup Init Wt./Vol.: Extract Vol:

Print Date: 10/23/2014 3:42:39PM

Matrix Spike Summary

Original Sample ID: 1240882
MS Sample ID: 1240880 MS
MSD Sample ID: 1240881 MSD

Analysis Date: 10/22/2014 13:34
Analysis Date: 10/22/2014 13:39
Analysis Date: 10/22/2014 13:41
Matrix: Soil/Solid (dry weight)

QC for Samples: 1145201001, 1145201002, 1145201003, 1145201004, 1145201005, 1145201006, 1145201007

Results by **SW6020A**

		Matrix Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Lead	9.33	49.6	55.7	94	49.6	49.3	81	80-120	12.30	(< 20)

Batch Information

Analytical Batch: MMS8718
Analytical Method: SW6020A
Instrument: Perkin Elmer Sciex ICP-MS P3
Analyst: ACF
Analytical Date/Time: 10/22/2014 1:39:33PM

Prep Batch: MXX28209
Prep Method: Soils/Solids Digest for Metals by ICP-MS
Prep Date/Time: 10/20/2014 9:50:44AM
Prep Initial Wt./Vol.: 1.01g
Prep Extract Vol: 50.00mL

Method Blank

Blank ID: MB for HBN 1660686 [MXX/28216]
Blank Lab ID: 1241156

Matrix: Soil/Solid (dry weight)

QC for Samples:
1145201008

Results by **SW6020A**

Parameter	Results	LOQ/CL	DL	Units
Lead	0.100U	0.200	0.0620	mg/Kg

Batch Information

Analytical Batch: MMS8718
Analytical Method: SW6020A
Instrument: Perkin Elmer Sciex ICP-MS P3
Analyst: ACF
Analytical Date/Time: 10/22/2014 3:40:32PM

Prep Batch: MXX28216
Prep Method: SW3050B
Prep Date/Time: 10/21/2014 8:55:44AM
Prep Initial Wt./Vol.: 1 g
Prep Extract Vol: 50 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1145201 [MXX28216]
Blank Spike Lab ID: 1241157
Date Analyzed: 10/22/2014 15:42

Matrix: Soil/Solid (dry weight)

QC for Samples: 1145201008

Results by **SW6020A**

	Blank Spike (mg/Kg)			
Parameter	Spike	Result	Rec (%)	CL
Lead	50	56.5	113	(80-120)

Batch Information

Analytical Batch: **MMS8718**
Analytical Method: **SW6020A**
Instrument: **Perkin Elmer Sciex ICP-MS P3**
Analyst: **ACF**

Prep Batch: **MXX28216**
Prep Method: **SW3050B**
Prep Date/Time: **10/21/2014 08:55**
Spike Init Wt./Vol.: 50 mg/Kg Extract Vol: 50 mL
Dup Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1241162
MS Sample ID: 1241160 MS
MSD Sample ID: 1241161 MSD

Analysis Date: 10/22/2014 15:51
Analysis Date: 10/22/2014 15:55
Analysis Date: 10/22/2014 15:58
Matrix: Soil/Solid (dry weight)

QC for Samples: 1145201008

Results by **SW6020A**

		Matrix Spike (mg/Kg)				Spike Duplicate (mg/Kg)						
Parameter	Sample	Spike	Result	Rec (%)		Spike	Result	Rec (%)		CL	RPD (%)	RPD CL
Lead	557	49.4	437	-244	*	49.3	454	-210	*	80-120	3.79	(< 20)

Batch Information

Analytical Batch: MMS8718
Analytical Method: SW6020A
Instrument: Perkin Elmer Sciex ICP-MS P3
Analyst: ACF
Analytical Date/Time: 10/22/2014 3:55:58PM

Prep Batch: MXX28216
Prep Method: Soils/Solids Digest for Metals by ICP-MS
Prep Date/Time: 10/21/2014 8:55:44AM
Prep Initial Wt./Vol.: 1.01g
Prep Extract Vol: 50.00mL

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Bench Spike Summary

Original Sample ID: 1241162
MS Sample ID: 1241158 BND
MSD Sample ID:

QC for Samples: 1145201008

Analysis Date: 10/22/2014 15:51
Analysis Date: 10/22/2014 16:00
Analysis Date:
Matrix: Soil/Solid (dry weight)

Results by **SW6020A**

		Matrix Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Lead	557	1200	1820	105				75-125		

Batch Information

Analytical Batch: MMS8718
Analytical Method: SW6020A
Instrument: Perkin Elmer Sciex ICP-MS P3
Analyst: ACF
Analytical Date/Time: 10/22/2014 4:00:43PM

Prep Batch: MXX28216
Prep Method: Soils/Solids Digest for Metals by ICP-MS
Prep Date/Time: 10/21/2014 8:55:44AM
Prep Initial Wt./Vol.: 1.04g
Prep Extract Vol: 50.00mL

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Method Blank

Blank ID: MB for HBN 1660589 [SPT/9474]
Blank Lab ID: 1240732

Matrix: Soil/Solid (dry weight)

QC for Samples:
1145201001, 1145201002, 1145201003, 1145201004, 1145201005, 1145201006, 1145201007

Results by **SM21 2540G**

Parameter	Results	LOQ/CL	DL	Units
Total Solids	100			%

Batch Information

Analytical Batch: SPT9474
Analytical Method: SM21 2540G
Instrument:
Analyst: MJN
Analytical Date/Time: 10/17/2014 7:05:00PM

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Duplicate Sample Summary

Original Sample ID: 1145185005
Duplicate Sample ID: 1240733

Analysis Date: 10/17/2014 19:05
Matrix: Soil/Solid (dry weight)

QC for Samples:

1145201001, 1145201002, 1145201003, 1145201004, 1145201005, 1145201006, 1145201007

Results by **SM21 2540G**

NAME	Original ()	Duplicate ()	RPD (%)	RPD CL
Total Solids	90.8	90.0	0.90	15.00

Batch Information

Analytical Batch: SPT9474
Analytical Method: SM21 2540G
Instrument:
Analyst: MJN

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Method Blank

Blank ID: MB for HBN 1660675 [SPT/9475]
Blank Lab ID: 1241096

Matrix: Soil/Solid (dry weight)

QC for Samples:
1145201008

Results by **SM21 2540G**

Parameter	Results	LOQ/CL	DL	Units
Total Solids	100			%

Batch Information

Analytical Batch: SPT9475
Analytical Method: SM21 2540G
Instrument:
Analyst: MJN
Analytical Date/Time: 10/20/2014 6:30:00PM

Duplicate Sample Summary

Original Sample ID: 1145233003
Duplicate Sample ID: 1241097

Analysis Date: 10/20/2014 18:30
Matrix: Soil/Solid (dry weight)

QC for Samples:

1145201008

Results by **SM21 2540G**

NAME	Original ()	Duplicate ()	RPD (%)	RPD CL
Total Solids	86.8	85.4	1.60	15.00

Batch Information

Analytical Batch: SPT9475
Analytical Method: SM21 2540G
Instrument:
Analyst: MJN

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- New York
- Indiana
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1145201

CLIENT: Travis/Peterson Environmental	SGS Reference #:
CONTACT: Erik Mundahl	PHONE NO: 907-522-4337
PROJECT NAME: Sunrise Glacier Hwy	PROJECT/ PWSID/ PERMIT#:
REPORTS TO: Erik Mundahl	EMAIL: EMundahl@tpeci.com
INVOICE TO: TPECI	QUOTE #:
	P.O. #: 1462-04

page 1 of 1

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX/ MATRIX CODE	# CONTAINERS	SAMPLE TYPE C= COMP G= GRAB MI= Multi Incremental Samples	Preservatives Used: None / Analysis Required: Total Lead								REMARKS/ LOC ID
1 A	G 29	10/16/14	8:13	Soil	1	G	X								
2 A	G 33	|	8:29	|	|	|	X								
3 A	G 38	|	8:52	|	|	|	X								
4 A	G 40	|	9:04	|	|	|	X								
5 A	E1	|	9:11	|	|	|	X								
6 A	E2	|	9:14	|	|	|	X								
7 A	E6	|	9:29	|	|	|	X								
8 A	T100	10/16/14	0829	"	"	"	✓	added per E. Mundahl					10/20/14		

Collected/Relinquished By:(1)	Date	Time	Received By:
[signature]	10/17/14	11:01	
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date 10/17/14	Time 11:01	Received For Laboratory By: Heather Hale

DOD Project? YES NO

Cooler ID

Data Deliverable Requirements:

Requested Turnaround Time and-or Special Instructions:

Temperature Blank °C: 9.8°C #240 or Ambient [ ]

(See attached Sample Receipt Form)

Chain of Custody Seal: (Circle)

INTACT BROKEN ABSENT

(See attached Sample Receipt Form)

❑ 200 W. Potter Drive **Anchorage, AK 99518** Tel: (907) 562-2343 Fax: (907) 561-5301
❑ 5500 Business Drive **Wilmington, NC 28405** Tel: (910) 350-1903 Fax: (910) 350-1557

http://www.sgs.com/terms and conditions.htm

White - Retained by Lab
Pink - Retained by Client

SGS

1145201

SAMPLE RECEIPT FORM

Review Criteria:	Condition:	Comments/Action Taken:
Were **custody seals** intact? Note # & location, if applicable. COC accompanied samples?	Yes No N/A Yes No	☑ *Exemption permitted if sampler hand carries/delivers.*
Temperature blank compliant* (i.e., 0-6°C after CF)? *If >6°C, were samples collected <8 hours ago?* *If <0°C, were all sample containers ice free?* Cooler ID: 1 @ 9.8 w/ Therm.ID: 240 Cooler ID: ____ @ ____ w/ Therm.ID: ____ Cooler ID: ____ @ ____ w/ Therm.ID: ____ Cooler ID: ____ @ ____ w/ Therm.ID: ____ Cooler ID: ____ @ ____ w/ Therm.ID: ____ If samples are received without a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "**COOLER TEMP**" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled."	Yes No Yes No N/A Yes No N/A	☐ *Exemption permitted if chilled & collected <8 hrs ago.* OK to proceed per client. AHH *Note: Identify containers received at non-compliant temperature. Use form FS-0029 if more space is needed.*
Delivery method (specify all that apply): Client (hand carried) USPS Lynden AK Air Alert Courier UPS FedEx RAVN C&D Delivery Carlile Pen Air Warp Speed Other: ____ → *For WO# with airbills, was the WO# & airbill info recorded in the Front Counter eLog?*	Tracking/AB # or see attached or N/A Yes No N/A	
→ For samples received with payment, note amount ($) and whether cash / check / CC (**circle one**) was received. → For samples **received in FBKS**, ANCH staff will verify all criteria are reviewed. SRF initiated in FBKS by:		
Were samples received within hold time? Do samples **match COC*** (i.e., sample IDs, dates/times collected)? Were analyses requested unambiguous?	Yes No N/A Yes No N/A Yes No N/A	*Note: Refer to form F-083 "Sample Guide" for hold times.* *Note: If times differ <1hr, record details and login per COC.*
Were samples in **good condition** (no leaks/cracks/breakage)? Packing material used (specify all that apply): Bubble Wrap Separate plastic bags Vermiculite Other:	Yes No	
Were **proper containers** (type/mass/volume/preservative*) used? Were **Trip Blanks** (i.e., VOAs, LL-Hg) in cooler with samples? Were all VOA vials **free of headspace** (i.e., bubbles ≤6 mm)? Were all soil VOAs **field extracted** with MeOH+BFB?	Yes No N/A Yes No N/A Yes No N/A Yes No N/A	☐ *Exemption permitted for metals (e.g., 200.8/6020A).*
For preserved waters (other than VOA vials, LL-Mercury or microbiological analyses), was **pH verified and compliant**? If pH was adjusted, were bottles flagged (i.e., stickers)?	Yes No N/A Yes No N/A	
For **special handling** (e.g., "MI" soils, foreign soils, lab filter for dissolved…, lab extract for volatiles, Ref Lab, limited volume), were bottles/paperwork flagged (e.g., sticker)?	Yes No N/A	
For **RUSH/SHORT Hold Time**, were COC/Bottles flagged accordingly? Was Rush/Short HT email sent, if applicable?	Yes No N/A	
For **SITE-SPECIFIC QC, e.g. BMS/BMSD/BDUP**, were containers / paperwork flagged accordingly?	Yes No N/A	
For any question answered "No," has the PM been notified and the problem resolved (or paperwork put in their bin)?	Yes No N/A	SRF Completed by: NEB PM notified: HCH N/A
Was **PEER REVIEW** of *sample numbering/labeling completed?*	Yes No N/A	Peer Reviewed by: N/A

Additional notes (if applicable):

10/20/14 VUP per E. Mundahl; split G33 + run as duplicate. ID = T100.

Note to Client: *Any "no" circled above indicates non-compliance with standard procedures and may impact data quality.*

Sample Containers and Preservatives

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition
1145201001-A	No Preservative Required	OK			
1145201002-A	No Preservative Required	OK			
1145201003-A	No Preservative Required	OK			
1145201004-A	No Preservative Required	OK			
1145201005-A	No Preservative Required	OK			
1145201006-A	No Preservative Required	OK			
1145201007-A	No Preservative Required	OK			
1145201008-A	No Preservative Required	OK			

Container Condition Glossary

OK - The container was received at an acceptable pH for the analysis requested.

PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

BU - The container was received with headspace greater than 6mm.

Laboratory Data Review Checklist

Completed by:	Erik D. Mundahl, P.E.
Title:	Environmental Engineer
Date:	Nov 19, 2014
CS Report Name:	1462-04 Juneau Glacier Hwy
Report Date:	October 23, 2014
Consultant Firm:	Travis/Peterson Environmental Consulting, Inc.
Laboratory Name:	SGS Laboratories
Laboratory Report Number:	1145201
ADEC File Number:	1531.38.006
ADEC RecKey Number:	

1. Laboratory

a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

(●) Yes ( ) No ( ) NA (Please explain.) Comments:

b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

( ) Yes ( ) No (●) NA (Please explain) Comments:

Samples were not transferred.

2. Chain of Custody (COC)

a. COC information completed, signed, and dated (including released/received by)?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

b. Correct analyses requested?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?

( ) Yes ( ) No (●) NA (Please explain) Comments:

Analyses for Total Lead (Method 6020) and TCLP Lead (Method 1311/6020) do not require a temperature preservation. As such, samples were stored and transported at ambient temperature. Laboratory data quality and usability is not affected.

b. Sample preservation acceptable - acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

◉ Yes ○ No ○ NA (Please explain) Comments:

c. Sample condition documented - broken, leaking (Methanol), zero headspace (VOC vials)?

◉ Yes ○ No ○ NA (Please explain) Comments:

d. If there were any discrepancies, were they documented? - For example, incorrect sample containers/ preservation, sample temperature outside of acceptance range, insufficient or missing samples, etc.?

◉ Yes ○ No ○ NA (Please explain) Comments:

No discrepancies were present. As such, none were document. Had any discrepancies occurred, they would have been documented by the lab.

e. Data quality or usability affected? (Please explain)

Comments:

Data usability was not affected.

4. <u>Case Narrative</u>

a. Present and understandable?

◉ Yes ○ No ○ NA (Please explain) Comments:

b. Discrepancies, errors or QC failures identified by the lab?

◉ Yes ○ No ○ NA (Please explain) Comments:

c. Were all corrective actions documented?

◉ Yes ○ No ○ NA (Please explain) Comments:

d. What is the effect on data quality/usability according to the case narrative?

Comments:

Data quality and usability was not affected.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

◉ Yes ○ No ○ NA (Please explain) Comments:

b. All applicable holding times met?

◉ Yes ○ No ○ NA (Please explain) Comments:

c. All soils reported on a dry weight basis?

◉ Yes ○ No ○ NA (Please explain) Comments:

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?

◉ Yes ○ No ○ NA (Please explain) Comments:

e. Data quality or usability affected? (Please explain)

Comments:

Data quality and usability was not affected.

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

◉ Yes ○ No ○ NA (Please explain) Comments:

ii. All method blank results less than PQL?

◉ Yes ○ No ○ NA (Please explain) Comments:

iii. If above PQL, what samples are affected? Comments:

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain) Comments:

No affected samples.

v. Data quality or usability affected? (Please explain) Comments:

Data usability of these samples is not affected. While the concentration of the lead in the sample may be biased due to laboratory contamination, the level of contamination is significantly less than the regulatory limit.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics - One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

○ Yes ○ No ◉ NA (Please explain) Comments:

No organic analysis conducted.

ii. Metals/Inorganics - One LCS and one sample duplicate reported per matrix, analysis and 20 samples?

◉ Yes ○ No ○ NA (Please explain) Comments:

iii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

○ Yes ◉ No ○ NA (Please explain) Comments:

MS/MSD recoveries for lead were outside of acceptance criteria on sample T100 .

iv. Precision - All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/DMSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

◉ Yes ○ No ○ NA (Please explain) Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

Sample T100 was affected.

vi. Do the affected samples(s) have data flags? If so, are the data flags clearly defined?

- (x) Yes
- ( ) No
- ( ) NA (Please explain)

Comments:

Affected samples are flagged.

vii. Data quality or usability affected? (Please explain)

Comments:

Data quality and usability was not affected. The post digestion spike was successful.

c. Surrogates - Organics Only

i. Are surrogate recoveries reported for organic analyses - field, QC and laboratory samples?

- ( ) Yes
- ( ) No
- (x) NA (Please explain)

Comments:

No organics analysis was conducted.

ii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

- ( ) Yes
- ( ) No
- (x) NA (Please explain)

Comments:

No organics analysis was conducted.

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

- ( ) Yes
- ( ) No
- (x) NA (Please explain)

Comments:

No organics analysis was conducted.

iv. Data quality or usability affected? (Use the comment box to explain.).

Comments:

No organics analysis was conducted.

d. Trip Blank - Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): <u>Water and Soil</u>

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

- ( ) Yes
- ( ) No
- (x) NA (Please explain.)

Comments:

No organics analysis was conducted.

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

- ( ) Yes
- ( ) No
- (x) NA (Please explain.)

Comments:

No organics analysis was conducted. No trip blanks or VOA samples present.

iii. All results less than PQL?

○ Yes ○ No ◉ NA (Please explain.) Comments:

No organics analysis was conducted.

iv. If above PQL, what samples are affected?

Comments:

No organics analysis was conducted.

v. Data quality or usability affected? (Please explain.)

Comments:

No organics analysis was conducted.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

◉ Yes ○ No ○ NA (Please explain) Comments:

Field duplicates were collected. See report for identification of duplicate samples.

ii. Submitted blind to lab?

◉ Yes ○ No ○ NA (Please explain.) Comments:

Samples were submitted to the lab blind.

iii. Precision - All relative percent differences (RPD) less than specified DQOs?
(Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute Value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

○ Yes ◉ No ○ NA (Please explain) Comments:

Field duplicate sample T100 and sample G33 had an RPD greater than 50%.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

○ Yes ◉ No ○ NA (Please explain) Comments:

Field duplicate sample B103 is of stockpiled excavated soil for disposal. Both duplicate sample and original sample B6 far exceed ADEC cleanup levels. Fate of contaminated soils does not change based on the sample results or high RPD.

f. Decontamination or Equipment Blank (if applicable)

○ Yes ○ No ◉ NA (Please explain) Comments:

No decontamination or equipment blank was collected.

i. All results less than PQL?

○ Yes ○ No ◉ NA (Please explain) Comments:

No decontamination or equipment blank was collected.

ii. If above PQL, what samples are affected?

Comments:

No decontamination or equipment blank was collected.

iii. Data quality or usability affected? (Please explain.)

Comments:

No decontamination or equipment blank was collected.

7. <u>Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)</u>

a. Defined and appropriate?

◉ Yes ○ No ○ NA (Please explain) Comments:

Reset Form

APPENDIX C:
Conceptual Site Model

HUMAN HEALTH CONCEPTUAL SITE MODEL GRAPHIC FORM

Site: Glacier Highway Battery Recycling Site

Completed By: Erik D. Mundahl, P.E.

Date Completed: 11/18/2014

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

(1) *Check the media that could be directly affected by the release.*

(2) *For each medium identified in (1), follow the top arrow and check possible transport mechanisms. Check additional media under (1) if the media acts as a secondary source.*

Media / Transport Mechanisms

Media	Transport Mechanisms	
☐ Surface Soil (0-2 ft bgs)	Direct release to surface soil	check soil
	☐ Migration to subsurface	check soil
	☐ Migration to groundwater	check groundwater
	☐ Volatilization	check air
	☐ Runoff or erosion	check surface water
	☐ Uptake by plants or animals	check biota
	☐ Other (list):____	
☐ Subsurface Soil (2-15 ft bgs)	Direct release to subsurface soil	check soil
	☐ Migration to groundwater	check groundwater
	☐ Volatilization	check air
	☐ Uptake by plants or animals	check biota
	☐ Other (list):____	
☐ Ground-water	Direct release to groundwater	check groundwater
	☐ Volatilization	check air
	☐ Flow to surface water body	check surface water
	☐ Flow to sediment	check sediment
	☐ Uptake by plants or animals	check biota
	☐ Other (list):____	
☐ Surface Water	Direct release to surface water	check surface water
	☐ Volatilization	check air
	☐ Sedimentation	check sediment
	☐ Uptake by plants or animals	check biota
	☐ Other (list):____	
☐ Sediment	Direct release to sediment	check sediment
	☐ Resuspension, runoff, or erosion	check surface water
	☐ Uptake by plants or animals	check biota
	☐ Other (list):____	

(3) *Check all exposure media identified in (2).*

(4) *Check all pathways that could be complete. The pathways identified in this column **must** agree with Sections 2 and 3 of the Human Health CSM Scoping Form.*

(5) *Identify the receptors potentially affected by each exposure pathway: Enter "C" for current receptors, "F" for future receptors, "C/F" for both current and future receptors, or "I" for insignificant exposure.*

Exposure Media / Exposure Pathway/Route / Current & Future Receptors

Exposure Media	Exposure Pathway/Route	Residents (adults or children)	Commercial or industrial workers	Site visitors, trespassers, or recreational users	Construction workers	Farmers or subsistence harvesters	Subsistence consumers	Other
☐ soil	☐ Incidental Soil Ingestion							
	☐ Dermal Absorption of Contaminants from Soil							
	☐ Inhalation of Fugitive Dust							
☐ groundwater	☐ Ingestion of Groundwater							
	☐ Dermal Absorption of Contaminants in Groundwater							
	☐ Inhalation of Volatile Compounds in Tap Water							
☐ air	☐ Inhalation of Outdoor Air							
	☐ Inhalation of Indoor Air							
	☐ Inhalation of Fugitive Dust							
☐ surface water	☐ Ingestion of Surface Water							
	☐ Dermal Absorption of Contaminants in Surface Water							
	☐ Inhalation of Volatile Compounds in Tap Water							
☐ sediment	☐ Direct Contact with Sediment							
☐ biota	☐ Ingestion of Wild or Farmed Foods							

Print Form

Human Health Conceptual Site Model
Scoping Form

Site Name: Glacier Highway Battery Recycling Site

File Number: 1531.38.006

Completed by: Erik D. Mundahl, P.E.

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

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

1. General Information:

Sources *(check potential sources at the site)*

- ☐ USTs
- ☐ ASTs
- ☐ Dispensers/fuel loading racks
- ☐ Drums
- ☐ Vehicles
- ☐ Landfills
- ☐ Transformers
- ☒ Other: Former battery recycling site on the property.

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

- ☒ Spills
- ☐ Leaks
- ☒ Direct discharge
- ☐ Burning
- ☐ Other:

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

- ☐ Surface soil (0-2 feet bgs*)
- ☐ Subsurface soil (>2 feet bgs)
- ☐ Air
- ☐ Sediment
- ☐ Groundwater
- ☐ Surface water
- ☐ Biota
- ☐ Other:

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

- ☐ Residents (adult or child)
- ☐ Commercial or industrial worker
- ☐ Construction worker
- ☐ Subsistence harvester (i.e. gathers wild foods)
- ☐ Subsistence consumer (i.e. eats wild foods)
- ☐ Site visitor
- ☐ Trespasser
- ☐ Recreational user
- ☐ Farmer
- ☐ Other:

* bgs - below ground surface

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

a) Direct Contact -

1. Incidental Soil Ingestion

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

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

Comments:

2. Dermal Absorption of Contaminants from Soil

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

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

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

Comments:

Inorganic lead cannot be absorbed through the skin.

b) Ingestion -

1. Ingestion of Groundwater

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

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

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

Comments:

Lead contamination is not present in the groundwater. Inorganic lead is not water soluble.

2. Ingestion of Surface Water

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

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

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

Comments:

While surface water is present on the site, the lead contaminant was found to not be leaching and transported by surface waters. Inorganic lead is not water soluble.

3. Ingestion of Wild and Farmed Foods

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

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

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

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

Comments:

While ground water is present on the site. Inorganic lead is not water soluble. The lead was found to not leach from the soils and is non-transportable. As a result, lead contamination from the site does not reach Auke Bay and the fisheries resources in the bay.

c) Inhalation-

1. Inhalation of Outdoor Air

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

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

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

Comments:

Contaminants are not soil volatile.

2. Inhalation of Indoor Air

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

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

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

Comments:

Lead contamination is not volatile.

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

Dermal Exposure to Contaminants in Groundwater and Surface Water

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

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

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

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

Comments:

Not applicable. Lead is not water soluble.

Inhalation of Volatile Compounds in Tap Water

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

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

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

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

Comments:

Not applicable. Inorganic lead is not water soluble.

Inhalation of Fugitive Dust

Inhalation of fugitive dust may be a complete pathway if:

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

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

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

Comments:

Not applicable. All surface contamination is no longer present on site.

Direct Contact with Sediment

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

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

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

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

Comments:

Not applicable. Sediment concentrations were found to contain extremely low contaminant concentrations.

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

No other applicable contaminant pathways exist.

2014 FINAL CONCEPTUAL SITE MODEL
FOR
GLACIER HIGHWAY BATTERY RECYCLING

Travis/Peterson Environmental Consulting, Inc. developed this Final Conceptual Site Model (PCSM) was developed for the Glacier Highway Battery Recycling remediation project in accordance with the Alaska Department of Environmental Conservation (ADEC) *Policy Guidance on Developing Conceptual Site Models* dated November 30, 2005.

Human Health CSM

Sources

Duration the 1950s, for an unknown period of time, a small battery recycling business operated 11385 Glacier Highway near Auke Bay in Juneau, Alaska. The most likely contaminant is remnant lead particles in the soil. Potential sources include the lead battery casings that were discarded on the ground. Site characterization and remediation on the adjoining property was conducted in 2003, 2007, and 2009. Due to the proximity to Glacier Highway, complete remediation was not possible without excavating into the road prism. The cleanup status on the adjoining property is unknown. TPECI conducted a site investigation and cleanup effort in July 2014. The majority of the contaminated soils on the Hagmeier property were removed at this time. TPECI conducted a final cleanup effort in October, 2014 removing the remaining contaminated soils on the Hagmeier property.

Impacted Media

Impacted media to which the contaminant was directly released are subsurface soil, surface water, and groundwater on the property.

Exposure Media and Pathways

Exposure media is the substance that a receptor could be potentially be exposed. Exposure media at the property includes soil, groundwater, and surface water.

The exposure pathways (or routes) are the way that a receptor comes in to contact with a contaminant.

No complete exposure pathways remain on the Hagmeier property.

Soil Ingestion and Dermal Contact Pathways

Incidental soil ingestion and dermal contact with soil were pathways eliminated by the removal of contaminated soils beneath the garage. Contact with the soil is the only way that a receptor would have been exposed by possible soil ingestion or dermal contact.

Surface Water Ingestion and Dermal Contact Pathways

Incidental surface water ingestion and dermal contact with surface water were preliminary pathways. A small, seasonal drainage runs adjacent to the site. Contact with the surface water is the only way that a receptor would be exposed by possible surface water ingestion or dermal contact. The removal of contaminated soils from the Hagmeier property has eliminated that contaminant pathway. As contaminated soils are still present in the DOT&PF ROW, a CSM prepared for the ROW would recognize this as a complete pathway.

Ingestion of Groundwater

Ingestion of groundwater is not a pathway. TPECI employees conducted a well search and eight wells were found within the vicinity of the Hagmeier property. All the wells were located above or cross gradient. Three wells were located on the subject property and had an average depth of 118-feet. This information is available on the Alaska Department of Natural Resources Well Log Tracking System (WELTS). All the wells on the property have been abandoned and properly closed. It is unknown at this time where the wells were located.

Ecological CSM

Surrounding properties contain structures, but are dominated by mature coniferous trees. The temperate coniferous forest dominates the landscape and lies directly adjacent to Auke Bay. Due to the neurological impacts caused by lead, environmental impacts pose a threat to the environment. Burrowing animals and birds may be subjected to elevated lead concentrations from contact with the skin or ingestions of soil and bugs. 2014 field investigations determined that the leach of lead through ground and surface water was not occurring. Lead leachate was not being produced on site and impact to Auke Bay and the local fisheries was not possible.

Conclusion

TPECI developed this FCSM following the removal of all lead contaminated soils at the site. Contaminated soils are still present on the DOT&PF ROW. This CSM address only the soils on the Hagmeier property and does not account for any contaminant pathways as a result of contamination on other properties. No identified exposure pathways remain on the Hagmeier property.

APPENDIX D:
Photo Log

Travis/Peterson
Environmental Consulting, Inc.

Glacier Highway Battery Recycling Site Cleanup Work: Photo Log – October, 2014

Garage lifted and supported with additional joists.	Garage lifted and supported with additional joists.
	

Garage lifted and supported with additional joists.	Garage lifted and supported with additional joists.
	

Garage lifted and supported with additional joists.	Excavation begins beneath south garage wall.
	

Excavations begins beneath south garage wall.	Excavation beneath south garage wall continues toward center of garage.
	

Using the small tracked excavator inside the garage.	Excavation confirmation samples collected within the garage.
	
Excavation confirmation samples collected within the garage.	Excavation confirmation samples collected within the garage.
	

Excavation confirmation samples collected within the garage.

Excavation confirmation samples collected within the garage.

Excavation confirmation samples collected within the garage.

Stockpiled soil in SuperSacks® on the property. This soil was transported off-site the same day.

<table>
<tr><td>Stockpiled soil in SuperSacks® on the property. This soil was transported off-site the same day.</td><td>Excess rock removed during the dig was placed back into the excavation.</td></tr>
<tr><td></td><td></td></tr>
</table>

<table>
<tr><td>The July 2014 excavation areas were lined and geotextile placed before being backfill with clean material.</td><td>The July 2014 excavation areas were lined and geotextile placed before being backfill with clean material.</td></tr>
<tr><td></td><td></td></tr>
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