

OFFSITE CAP SOIL SOURCE SURFACE SOIL ASSESSMENT

Troh Legacy Landfill Property

10010 SE Vradenburg Road
Happy Valley, Oregon 97086




Prepared for:

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June 14, 2017

Project No. THG-2016.1/351-14002-07

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and



EXP. 1/31/2018

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Project No. THG-2016.1/351-14002-07

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ACRONYMS AND ABBREVIATIONS

bgs	below ground surface
CFSLs	clean fill screening levels
Client	The Holt Group / Holt Homes
Creekside	Creekside Environmental Consulting, LLC
DU	decision unit
ENW	EVREN Northwest, Inc.
EPA	US Environmental Protection Agency
EPC	exposure point concentration
ESCI	Environmental Site Cleanup Information
ISM	incremental sampling methodology
mg/Kg	milligrams per Kilogram
MRL	method reporting limit
ODEQ	Oregon Department of Environmental Quality
RCRA	Resource Conservation and Recovery Act
SOW	scope of work
UCL	upper confidence limit

1.0 INTRODUCTION

Creekside Environmental Consulting LLC (Creekside) has prepared this Offsite Cap Soil Source Surface Soil Assessment report for the Troh Legacy Landfill property (10010 SE Vradenburg Road, Happy Valley, Oregon; see Figure 1). The assessment evaluated shallow soils at the nearby Scouters Mountain Phase I development area (11300 SE 147th Avenue; subject area), which will be the source of clean capping soil for the Troh Legacy Landfill property. Creekside requested EVREN Northwest, Inc. (ENW) to collaborate on the project.

The work was completed in accordance with Creekside's *Surface Soil Assessment / Sampling and Analysis Plan* prepared for The Hold Group / Holt Homes, dated May 15, 2017.¹ Oregon Department of Environmental Quality (ODEQ) approved the work plan with revisions on May 16, 2017.

1.1 Authorization

The Holt Group / Holt Homes (Client) authorized the scope of work (SOW) for this project in May of 2016. This report is for the exclusive use of the Client and its legal counsel.

1.2 Background

Holt Group / Holt Homes owns both the Troh Legacy Landfill property (ODEQ Environmental Cleanup Site Information [ECSI] Site No. 5257) and the nearby Scouters Mountain Phase I development land. The ODEQ has approved a work plan to close the Troh Legacy Landfill, in part by capping the landfill with clean overburden soil.

The Scouters Mountain Phase I is a planned single-family residential development. It's our understanding that an estimated 56,000 cubic yards of surplus soil will be generated through removal of the upper 8 inches of soil during site preparation. Holt Group wishes to utilize some of this soil from the Phase I Development site as cap material for the Troh Legacy Landfill.

1.3 Purpose

The purpose of this work was to assess surface soils in the planned Scouters Mountain Phase I development area for use as cap materials for the Troh Legacy Landfill (North Cell) located at 10010 SE Vradenburg Road in Happy Valley, Oregon.

1.4 Scope

The Creekside team performed the following SOW for this project:

- Prepare a Sampling and Analysis Plan for ODEQ approval using the guidance provided in:

¹ Creekside, 2017, *Surface Soil Assessment/Sampling and Analysis Plan*, Troh Legacy Landfill, 10010 SE Vradenburg Road, Happy Valley, Clackamas County, Oregon, ECSI Site ID: 5257, dated May 15, 2017.

- The Interstate Technology & Regulatory Council (ITRC; 2012), Incremental Sampling Methodology².
- Oregon Department of Environmental Quality (ODEQ; 2015), electronic mail communication dated November 5, 2015.
- Order utility clearance (One Call) to provide clearance for this project, prior to implementation of the surface soil sampling program;
- Collect surface soil samples using Incremental Sampling Methodology (ISM) for laboratory analyses;
- Laboratory will conduct the Representative Sampling Method such that a representative sample is produced for further analysis;
- Analyze representative samples for Resource Conservation and Recovery Act (RCRA) total metals (arsenic, barium, cadmium, chromium, mercury, lead, silver and selenium);
- Evaluated analytical data with respect to Oregon regulatory standards and ODEQ guidance documents, specifically related to clean fill screening; and
- Prepare this report documenting findings and analytical data.

The field activities described in this report were performed in May and June 2017.

² ITRC, 2012, Incremental Sampling Methodology, Technical and Regulatory Guidance: Prepared by The Interstate Technology & Regulatory Council Incremental Sampling Methodology Team, dated February 2012.

2.0 SITE SETTING

2.1 Location and Description

The subject site (Troh Legacy Landfill) is located at 10010 SE Vradenburg Road, in the City of Happy Valley (see Figures 1 and 2), more formally described as the “*Eastern part of Tax Lot 401 of the East Scouters Mountain Development.*” The former Troh Legacy Landfill is centered near 45.4488°N, 122.4957°, within Township 1 South, Range 2 East (Willamette Meridian), Section 25D. The subject site is irregular in outline, and located on the upper east side of Scouters Mountain. It is accessed from SE Vradenburg Road along the west side of the property. The site is currently developed with three residences, an abandoned aircraft hangar, an old air strip, and several outbuildings.

Soil for importation to the subject site is to originate from the surface soil of the nearby Scouters Mountain Phase I development located at 11300 SE 147th Avenue near the crest of Scouters Mountain within Township 1 South, Range 2 East Section 25D of the Willamette Meridian. This offsite source is approximately 1.4 miles west of the subject site and is the location of the former Scouters Mountain Boy Scout Camp. While there are some areas developed for outdoor activities (ranger’s residence, picnic, archery and BB gun shooting range (no leaded BBs were used), tree climbing and zipline), a large portion of the property is forested and undeveloped.

2.2 Historical Land Use (Off-Site Scouters Mountain Phase I)

The Phase I development site had been a Boy Scout Camp for a number of years before being sold to Holt Group in 2015.

2.3 Topography

The subject site and source subject area are located within the US Geological Survey Damascus, Oregon 7.5-minute quadrangle, between approximate 550 and 775 feet elevation above mean sea level (Figure 1). The subject site occupies an elevated topographic "bench" and both area occupied the south and east slope of Scouters Mountain, in the highland area between the Portland Basin and the Clackamas River. The area slopes variably to the south and east.

2.4 Geologic Setting

The site is located in the volcanic highlands between the Portland Basin and the Clackamas River, generally known as the Pleistocene Boring Lava Field³. The area is characterized by young (Pleistocene) volcanic cones and basalt flows composed of basalt or basaltic andesite, mapped collectively as Boring Lavas. The valleys and lowlands between and bounding the volcanic highlands are occupied by small creeks, and are underlain by the Springwater Formation (Pliocene to Pleistocene) and older Troutdale Formation (Miocene-Pliocene). The Springwater Formation is composed of fluvial sediments originating from the Cascades Mountain highlands to

³ Madin, I.P., 1994, Geologic Map of the Damascus Quadrangle, Clackamas and Multnomah Counties, Oregon: State of Oregon Department of Geology and Mineral Industries, Geological Map Series GMS-60, Map 1:24,000.

the east. The Troutdale Formation is considered to be the ancestral deposits of the Columbia River and its coeval Cascadian sediments.

Boring Lavas are generally resistant to erosion and protect underlying rocks from erosion, thus accounting for their occurrence as highlands and cones greatly dissected and modified by fluvial processes.

2.5 Site Geology

Madin² mapped the Boring Lava below the site as belonging to the Basalt of Mt. Scott flow unit. The source of the flow is not known but is suspected to be vented to the north or northeast of the site. The flow is believed to be up to 260 feet thick.

Locally, soil consisted for fine-grained silt soil with some organics to the maximum depth of 0.5 feet.

2.6 Hydrogeologic Setting

2.6.1 Surface Water

No perennial streams were observed on the subject area; however, ephemeral (intermittent) drainage may be present in the southern portion of the subject area.

2.6.2 Ground Water

Localized perched water bodies can occur within or above the Boring Lavas (e.g., within scoriaceous flow-top breccia), the saturated thickness of which depends on the structure and lithology of the rocks, topographic position, and extent of surficial weathering⁴. Ground water movement will follow topography and is expected to migrate to the east and south towards Rock Creek.

Water wells in the upper elevations of Scouter Mountain are typically completed in the sedimentary formations (Springwater and Troutdale Formations) underlying the Boring Lavas. Ground water in the Springwater and Troutdale Formation probably discharges to the Clackamas River and its tributaries (including Rock Creek).

⁴ Leonard, A.R. and Collins, C.A., 1983, Ground Water in the Northern Part of Clackamas County, Oregon: US Geological Survey Open-File Report 80-1049, prepared in cooperation with Oregon Water Resources Department in Ground Water Report No. 29, 36 pages, 2 plates, 9 figures, 4 tables.

4.0 METHODS AND PROCEDURES

The field activities described in this report were performed in May and June 2017, in general accordance with Creekside/ENW's work plan entitled *Surface Soil Assessment/Sampling and Analysis Plan, dated May 15, 2017*. A description of preparatory and field tasks completed are presented below.

4.1 Pre-Field Activities

Oregon's One Call Utility Locate Service was requested to locate all utilities below the site before the investigation field activities were begun.

4.2 ISM Soil Sampling Method

Surface soils on the Scouters Mountain Phase I development area were assessed using Incremental Sampling Methodology (ISM)⁵. ISM is a structured composite sampling and processing protocol, approved by most state regulatory agencies, that provides a reasonably unbiased estimate of the mean contaminant concentration in a volume of soil targeted for sampling. ISM provides representative samples of specific soil volumes defined as decision units (DUs) by collecting numerous increments of soil (typically 30 to 100 increments) that are combined, processed, and subsampled according to specific protocols. ISM sampling has the advantage of reducing heterogeneity in soil (both micro and macro scale) to provide an average concentration within the target sample area.

For the purposes of this investigation, the subject property was divided into 13 decision units (DUs), effectively segmenting the area into 5-acre units. The 13 decision units are arbitrarily identified as DU01 through DU13 as illustrated on Figure 3.

Given the heavy vegetation existing throughout the area and surrounding areas, it was not possible to divide each DU into a grid pattern. Rather, a hand-held Trimble Nomad GPS unit was used to map the 64 sampling points within each of the 13 DUs, with the goal of good representation, distributed as evenly as possible, across each DU within the accessible portions of the area. A map showing the individual subsample points within each DU is included in Appendix A.

At each sampling point, increment samples were collected at a depth of approximately 0.5 feet below ground surface (bgs) using a one-inch inside diameter stainless-steel push probe, resulting in 64 equal-volume increment samples from each decision unit. The increments were placed into a dedicated one-gallon laboratory-prepared glass sample jar, labelled with a distinctive designation, including the date, time, and project number, and then immediately placed in cooled storage until delivered to the laboratory under chain-of-custody protocols. IS samples were labeled using the naming convention "DUX-160628-IS-0.5", where "X" represents the decision unit number and 0.5 represents the sample depth in feet. Sampling personnel wore fresh Nitrile

⁵ TRC, 2012, Incremental Sampling Methodology, Technical and Regulatory Guidance: Prepared by The Interstate Technology & Regulatory Council Incremental Sampling Methodology Team, dated February 2012.

gloves and all sampling equipment was decontaminated between decision units to prevent cross-contamination between decision units.

In addition to the IS samples collected from DU01 through DU13, two replicate samples were collected from DU03 for quality control purposes (explained further in Section 5.0). Replicate samples were collected within 18 inches away, each in a different direction from the original location. The replicates were labeled with “REP1 and “REP2” appended to the sample identification.

All sampling equipment was decontaminated before and after each sample by undergoing a wash sequence of Alconox solution, tap water, and then deionized water final rinse. Clean Nitrile gloves were used for each DU and when handling any sampling equipment.

4.3 Analytical Methods

Table 4-1 describes the analytical plan. Laboratory analyses were performed by Friedman & Bruya, Inc., of Seattle, Washington. Soil samples were analyzed for RCRA 8 metals by US Environmental Protection Agency (EPA) Method 6020.

Table 4-1. Analytical Plan

Analytical Method	Constituents	Soil
EPA 6020/200.8	RCRA 8 Metals plus nickel (soil only) [total (soil) / dissolved (water)]	All DU incremental samples

Analytical results for this SOW, are presented in Table 1 (soil). Laboratory analytical reports for the current investigation are presented in Appendix B.

4.4 Cleanup Standards

The assessment and remediation of hazardous substances in Oregon are conducted according to Oregon Administrative Rule (OAR) 340, Division 122, *Hazardous Substance Remedial Action Rules*. The following standards were considered when evaluating sampling results at the subject site.

4.4.1 Background Concentrations (Metals)

Metals were compared to ODEQ's regional default background concentrations in soil.⁶

4.4.2 Clean Fill Screening (Unrestricted Upland Disposal)

Analytical data for organics were compared with clean fill screening levels (CFCLs) for upland sites established by the ODEQ⁷. ODEQ does not require materials in which contaminant concentrations are less than or equal to CFSLs to be regulated as a solid waste. Rather, these materials may be placed at upland locations which are greater than 1,000 feet from a surface water body. CFLSs do not constitute rulemaking by the Environmental Quality Commission and may not be relied upon to create an enforceable right or benefit, substantive or procedural, enforceable

⁶ ODEQ, March 20, 2013, Background Levels of Metals in Soils for Cleanups: ODEQ Fact Sheet.

⁷ ODEQ. July 2014. Clean Fill Determinations: Internal Management Directive, last updated July 23, 2014, by Bill Mason. Clean Fill Table for Uplands last updated by Bill Mason, ODEQ-Eugene, June 10, 2014.

at law or in equity, by any person. Therefore, CFSLs should be considered as guidance for best practices during future development of the subject site.

5.0 FINDINGS

This section describes the results of laboratory analysis of surface soil samples collected at the site on May and June 2017, as documented in photographs presented in Appendix C. Specifically, ISM soil sampling results in decision units DU01 through DU13 in the Scouters Mountain Phase I development area.

5.1 ISM Sampling

Surface soil samples were collected from a depth of approximately 0.5 feet bgs from the area planned for development (13 DUs) to provide a statistical “average” concentration of metals in surface soils. Each DU is represented by 64 “increments” of soil, weighing approximately 40 grams each. The location of the DUs relative to planned development is presented on Figure 3. For reference, the GIS coordinates of each sample location within each DU is presented on the IS Sample Location Map in Appendix A.

Some areas within the 13 DUs were not accessible due to dense vegetation or buildings and roads at the time of sampling and therefore, could not be sampled. Un-sampled areas included:

- DU01 – building and road on west side; dense vegetation in north and central-southeast
- DU02 – paved area in NW corner of DU
- DU03 – blackberries
- DU04 – blackberries
- DU05 – blackberries in east area of DU
- DU07 – blackberries; forested area
- DU08 – road; area west of road marked by METRO “Native Restoration”
- Excluded DU09 – blackberries (small area)

Un-sampled areas are considered insignificant and do not alter the findings of this investigation.

Increments from each DU were composited together in the field, then processed at the laboratory to produce a statistically valid sample prior to analysis for total metals.

5.2 Laboratory Results

Thirteen ISM samples and two replicate samples were analyzed for RCRA 8 metals by EPA Method 6020A. The results of the laboratory analysis of soil sampled collected from 13 DUs are summarized in Table 1 (after the text). A copy of the laboratory report is included in Appendix B. A review of the laboratory report indicates samples were analyzed within appropriate quality assurance/quality control (QA/QC) procedures and specified holding times.

A summary of the laboratory results is presented below. Please refer to the laboratory report for a complete presentation of the results.

- Arsenic was detected in four (4) of the samples up to a maximum concentration of 1.19 milligrams per Kilogram (mg/Kg). All remaining samples did not contain arsenic concentrations above the laboratory method reporting limit of 1 to 5 mg/Kg. All detected

concentrations are below the ODEQ's CFSL of 8.8 mg/Kg, which is equivalent to its background concentration in this area.

- Barium was reported in all samples at a maximum concentration of 220 mg/Kg. The maximum barium concentration did not exceed the ODEQ's CFSL for barium of 790 mg/Kg, which is equivalent to its background concentration in this area.
- Chromium (III) was detected in all samples at a maximum concentration of 21.2 mg/Kg. None of the detected chromium levels exceeded its CFSL of 76 mg/Kg, which is equivalent to its background concentration in this area.
- Lead was detected in all samples at a maximum concentration of 12.4 mg/Kg, below its ODEQ CFSL of 79 mg/Kg and below is background concentration of 28 mg/Kg for this area.
- Mercury, cadmium, selenium and silver were not detected above the laboratory method reporting limit (MRL).

Calculation of 90% UCL for Metals in DU03. Replicate data from DU03 was used to calculate the 90 percent upper confidence limit (90% UCL) of the average concentration of metals detected above the laboratory MRL (barium, chromium and lead). The 90% UCL is commonly used by regulators as the exposure point concentration (EPC) to be compared with appropriate cleanup levels (in this case CFSLs). In applying to the evaluation of human health risk, the EPC represents the concentration of hazardous substance at the point of exposure for potentially exposed populations. Since multiple sample increments are represented in each ISM sample, the 90% UCL can be higher than the arithmetic mean concentration, since sample variation is added to this value.

The 90% UCL provides additional basis to support a "clean fill" determination for soil to be imported for the Troh Legacy Landfill capping project. As indicated in Table 5-1, the 90% UCL for barium, chromium and lead are below their respective CFSL.

Table 5-1. Summary of Calculation of 90% UCL of Barium, Chromium and Lead in DU03

Analyte	Barium	Chromium (III)	Lead
Units	mg/Kg	mg/Kg	mg/Kg
DU03-170522-IS-0.5	152	20.3	1.50
DU03-170522-IS-0.5-REP01	132	17	1.17
DU03-170522-IS-0.5-REP02	117	15.3	1.14
Mean	133.67	17.53	8.560
Standard Deviation	17.56	2.54	7.140
90% Students-t UCL	163.27	21.82	20.60
CFSL	790	76	28
CFSL = clean fill Screening level.			

6.0 CONCLUSIONS AND RECOMMENDATIONS

This Offsite Cap Soil Source Surface Soil Assessment was performed at the Scouters Mountain Planned Residential subdivision subject area to assess surface soils marked for excavation and potential placement as cap materials on the nearby Troh Legacy Landfill. The area of planned development (Scouters Mountain Phase I) was divided into thirteen “decision units” and representative surface soil samples were collected from each DU using the Incremental Sampling Methodology. Thirteen surface soil samples and two replicate samples were analyzed for RCRA 8 total metals in accordance with Creekside’s ODEQ-approved *Surface Soil Assessment / Sampling and Analysis Plan*¹.

Laboratory results were evaluated against ODEQ’s clean fill screening levels (CFSLs), with the following results:

- All metals analyzed in 13 ISM samples and 2 replicate samples were either not detected or were below ODEQ’s CFSLs.

Based on the findings of this investigation, surface soils at the Scouter Mountain Phase I development site meet or exceed the clean fill criteria for disposal at upland sites. As such, surface soils are suitable as cap materials at the former Troh Legacy Landfill Site.

7.0 LIMITATIONS

The scope of this report is limited to observations made during on-site work; interviews with knowledgeable sources; and review of readily available published and unpublished reports and literature. As a result, these conclusions are based on information supplied by others as well as interpretations by qualified parties.

The focus of the investigative site work and subsequent report does not extend to the presence of the following conditions unless they were the express concerns of contacted personnel, report and literature authors or the work scope:

1. Naturally occurring toxic or hazardous substances in the subsurface soils, geology and water,
2. Toxicity of substances common in current habitable environments, such as stored chemicals, products, building materials and consumables,
3. Contaminants or contaminant concentrations that are not a concern now but may be under future regulatory standards,
4. Unpredictable events that may occur after Creekside/ENW's site work, such as illegal dumping or accidental spillage.

There is no practice that is thorough enough to absolutely identify the presence of all hazardous substances that may be present at a given site. Creekside/ENW's investigation has been focused only on the potential for contamination that was specifically identified in the SOW. Therefore, if contamination other than that specifically mentioned is present and not identified as part of a limited SOW, Creekside/ENW's environmental investigation shall not be construed as a guaranteed absence of such materials. Creekside/ENW has endeavored to collect representative analytical samples for the locations and depths indicated in this report. However, no sampling program can thoroughly identify all variations in contaminant distribution.

We have performed our services for this project in accordance with our agreement and understanding with the client. This document and the information contained herein have been prepared solely for the use of the client.

Creekside/ENW performed this study under a limited scope of services per our agreement. It is possible, despite the use of reasonable care and interpretation, that Creekside/ENW may have failed to identify regulation violations related to the presence of hazardous substances other than those specifically mentioned at the closure site. Creekside/ENW assumes no responsibility for conditions that we did not specifically evaluate or conditions that were not generally recognized as environmentally unacceptable at the time this report was prepared.

TABLES

Table 1 - Summary of Analytical Data, Soil

Location ID	DU01	DU02	DU03	DU03	DU03	DU04	DU05	DU06	DU07	DU08	DU09	DU10	
Sample ID	DU01	DU02-170523-IS-0.5	DU03-170522-IS-0.5	DU03-170522-IS-0.5-REP01	DU03-170522-IS-0.5-REP02	DU04-170522-IS-0.5	DU05	DU06-170522-IS-0.5	DU07-170523-IS-0.5	DU08	DU09	DU10-170523-IS-0.5	
Date Sampled	6/2/17	5/23/17	5/22/17	5/22/17	5/22/17	5/22/17	5/25/17	5/22/17	5/23/17	5/25/17	5/25/17	5/23/17	
Depth Sampled (feet)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
Sampled By	ENW	ENW	ENW	ENW	ENW	ENW	ENW	ENW	ENW	ENW	ENW	ENW	
Constituent of Interest	Note	mg/Kg (ppm)	mg/Kg (ppm)	mg/Kg (ppm)	mg/Kg (ppm)	mg/Kg (ppm)	mg/Kg (ppm)	mg/Kg (ppm)	mg/Kg (ppm)	mg/Kg (ppm)	mg/Kg (ppm)	mg/Kg (ppm)	
Metals													
Arsenic	c, nv	<1 (ND)	<5 (ND)	<5 (ND)	<5 (ND)	<5 (ND)	<5 (ND)	<1 (ND)	<5 (ND)	<5 (ND)	1.19	1.09	<5 (ND)
Barium	nc, nv	70.1	111	152	132	117	92	96	160	220	110	143	112
Cadmium	c, nv	<0.5 (ND)	<0.5 (ND)	<0.5 (ND)	<0.5 (ND)	<0.5 (ND)	<0.5 (ND)	<0.5 (ND)	<0.5 (ND)	<0.5 (ND)	<0.5 (ND)	<0.5 (ND)	<0.5 (ND)
Chromium (III)	nc, nv	11.7	15.7	20.3	17	15.3	8.56	16.8	21.2	20.7	12.8	14.7	12.6
Lead	NA, nv	7.15	11.1	8.56	7.14	7.07	5.69	7.04	11.2	12.4	6.4	7.84	7.2
Mercury	nc, nv	<0.2 (ND)	<0.2 (ND)	<0.2 (ND)	<0.2 (ND)	<0.2 (ND)	<0.2 (ND)	<0.2 (ND)	<0.2 (ND)	<0.2 (ND)	<0.2 (ND)	<0.2 (ND)	<0.2 (ND)
Silver	nc, nv	<1 (ND)	<1 (ND)	<1 (ND)	<1 (ND)	<1 (ND)	<1 (ND)	<1 (ND)	<1 (ND)	<1 (ND)	<1 (ND)	<1 (ND)	<1 (ND)

Notes:

mg/Kg = milligram per kilogram or parts per million (ppm).

<# (ND) = not detected at or above the laboratory method reporting limit shown.

NE = not established.

— = not analyzed or not applicable.

c = carcinogenic

v = volatile

nc = nonvolatile

¹ Lowest Risk-Based Concentration for soil (screening level).

(Y) indicates analyte not detected, but detection limit is above screening concentration.

BKG = constituent was not detected above default background concentrations in soil

Table 1 - Summary of Analytical Data, Soil

Location ID		DU11	DU12	DU13	Maximum Soil Concentration (detected)	ODEQs Screening-Level SLRBCs ¹ (Soil)	Background Concentrations (Regional Default)	Clean Fill Screening Levels or Background Concentrations (as applicable)	Exceeds ODEQs Screening-Level SLRBCs (Soil) and/or Soil Matrix Cleanup Level	Exceeds Background Concentrations (metals) or Clean Fill Screening
Sample ID		DU11	DU12	DU13						
Date Sampled		6/2/17	6/2/17	5/26/17						
Depth Sampled (feet)		0.5	0.5	0.5						
Sampled By		ENW	ENW	ENW	Portland Basin					
Constituent of Interest	Note	mg/Kg (ppm)	mg/Kg (ppm)	mg/Kg (ppm)	mg/Kg (ppm)			TRUE OR Y FALSE OR N	TRUE OR Y FALSE OR N	
Metals										
Arsenic	c, nv	<1 (ND)	1.19	1.38	1.19	0.43	8.8	8.8	BKG	FALSE
Barium	nc, nv	83.5	113	182	220	15000	790	790	N	FALSE
Cadmium	c, nv	<0.5 (ND)	<0.5 (ND)	<0.5 (ND)	<0.5 (ND)	78	0.63	0.63	N	FALSE
Chromium (III)	nc, nv	10.1	11.8	20.3	21.2	120000	76	76	N	FALSE
Lead	NA, nv	8.96	7.89	10.2	12.4	30	79	28	N	FALSE
Mercury	nc, nv	<0.2 (ND)	<0.2 (ND)	<0.2 (ND)	<0.2 (ND)	23	0.23	0.23	N	FALSE
Silver	nc, nv	<1 (ND)	<1 (ND)	<1 (ND)	<1 (ND)	390	0.82	0.82	N	(TRUE)

Notes:

mg/Kg = milligram per kilogram or parts per million (ppm).

<# (ND) = not detected at or above the laboratory method reporting limit shown.

NE = not established.

— = not analyzed or not applicable.

c = carcinogenic

v = volatile

nc = noncarcinogenic

nv = nonvolatile

¹ Lowest Risk-Based Concentration for soil (screening

level).

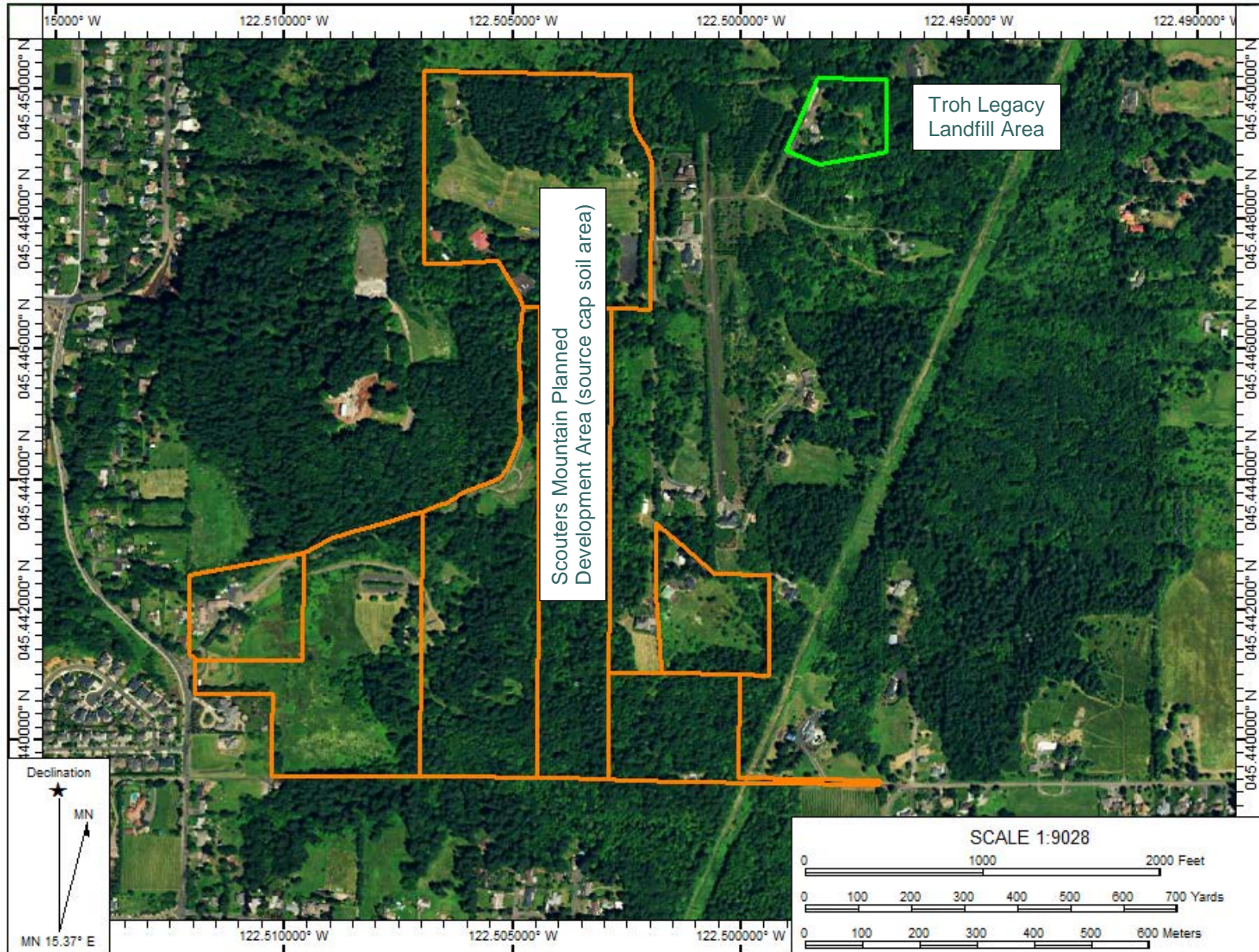
(Y) indicates analyte not detected, but detection limit is above

screening concentration.

BKG = constituent was not detected above default background

concentrations in soil

FIGURES



Map Name: GLADSTONE NE, OR Quadrangle
 Date: Jun 30, 2014

Location: 045.468750° N, 122.531250° W



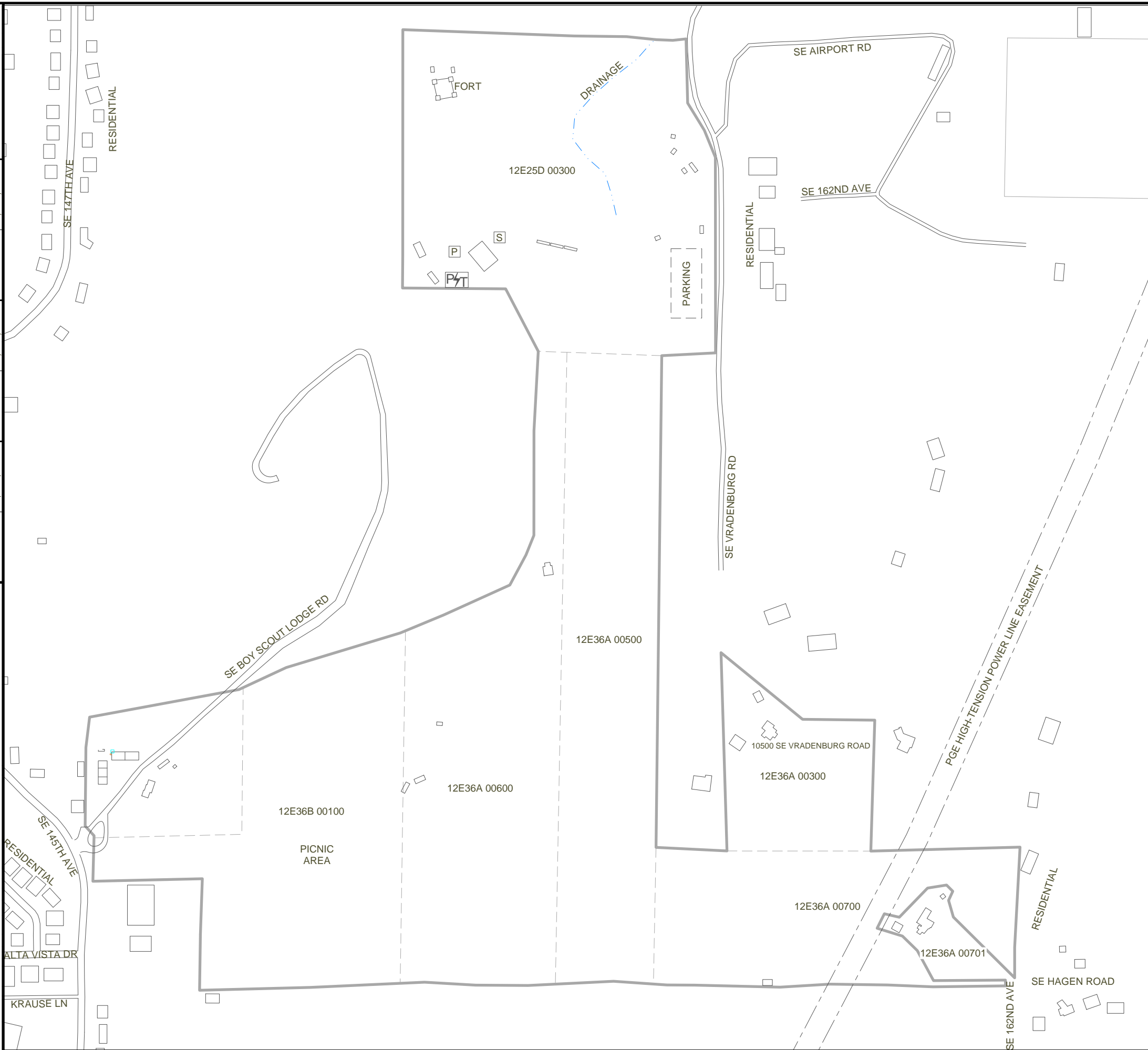
Date Drawn: 6/14/2017
 CAD File Name: 351-14002fig1sv_map(Scouters=Troh)(v01)
 Drawn By: LDG
 Approved By: BJ

Former Troh Legacy Landfill Property
 Scouts Mountain Residential Development
 Happy Valley, Clackamas County, Oregon

**Site Vicinity
 Map**

Project No.
 351-14002-07
 Figure No.
1

DRAWN BY: J. BIGELOW 01/29/2016 P. TRONE 05/15/2017 B. JORGENSEN 05/15/2017
 CHECKED BY: J. BIGELOW 01/29/2016 P. TRONE 05/15/2017 B. JORGENSEN 05/15/2017
 APPROVED BY: J. BIGELOW 01/29/2016 P. TRONE 05/15/2017 B. JORGENSEN 05/15/2017
 DRAWING NUMBER: 351-15042(v01)

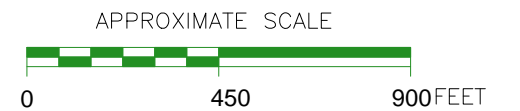


LEGEND:

- SUBJECT PROPERTY BOUNDARIES
- HOLDING TANK FOR SEWAGE
- PUMP FOR TRANSFER OF SEWAGE FROM TANK TO SEWER LINES
- PAD TRANSFORMER

NOTES:

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH MAP DATED 2012 AND ENW FIELD NOTES.
2. ALL BUILDING, STREET, AND FEATURE LOCATIONS ARE APPROXIMATE.

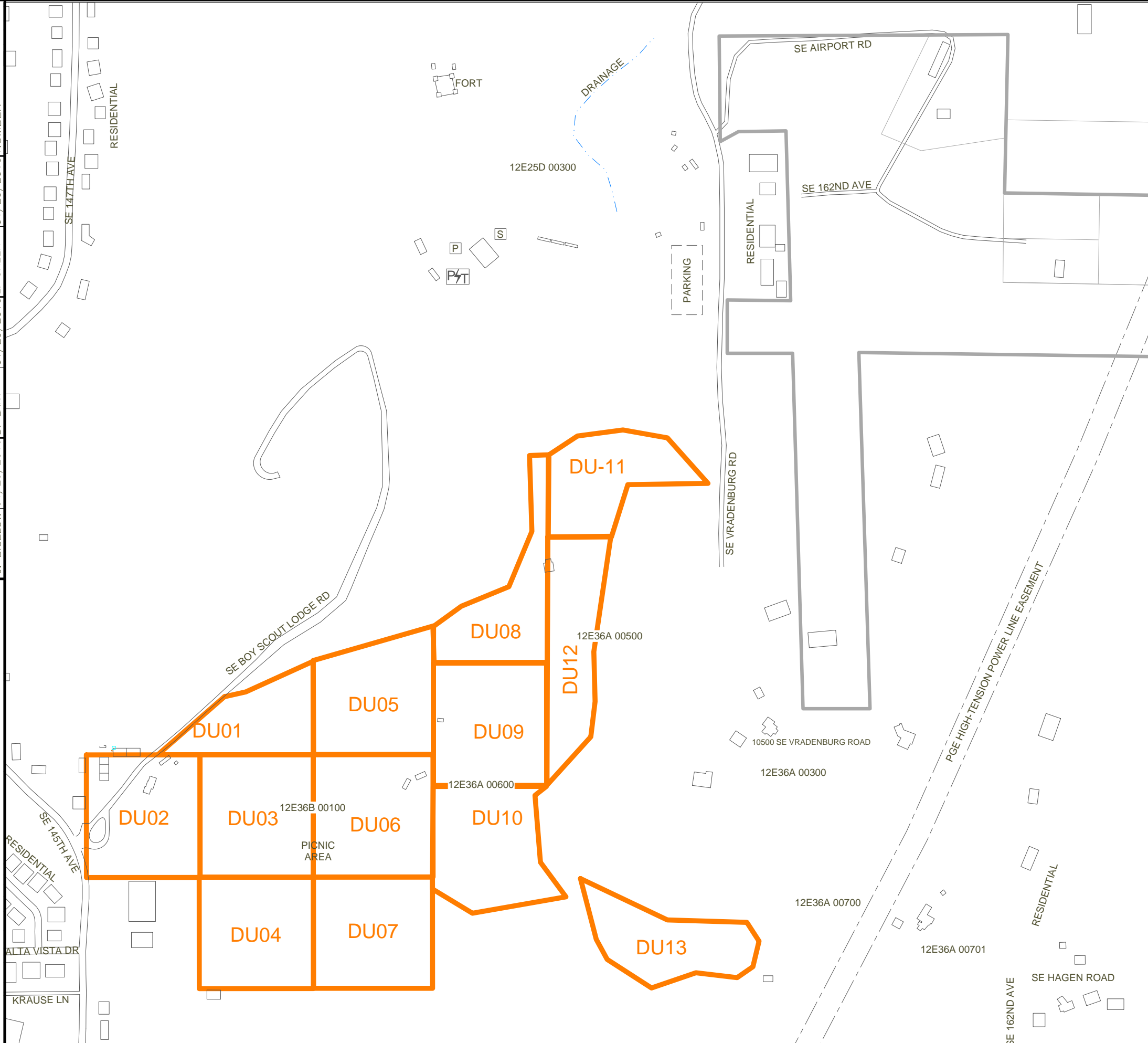


CREEKSIDE ENVIRONMENTAL CONSULTING, LLC
 21790 SW CHEHALIS COURT
 TUALATIN, OREGON 97062
 (503)692-8118






FIGURE 2
 SITE PLAN
 (OFFSITE CAP SOIL SOURCE PROPERTY)

SCOUTERS MOUNTAIN PLANNED DEVELOPMENT
 APPROXIMATE ADDRESS 11300 SE 147TH AVENUE
 HAPPY VALLEY, OREGON

DRAWN BY: J. BIGELOW [01/29/2016] B. LARY [01/29/2016] L. GREEN [01/29/2016] DRAWING NUMBER: 351-14002(v01)

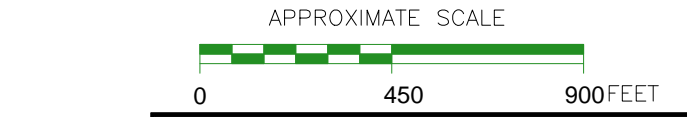


LEGEND:

-  SUBJECT PROPERTY BOUNDARIES
-  HOLDING TANK FOR SEWAGE
-  PUMP FOR TRANSFER OF SEWAGE FROM TANK TO SEWER LINES
-  PAD TRANSFORMER
-  MIS SAMPLING GRID

NOTES:

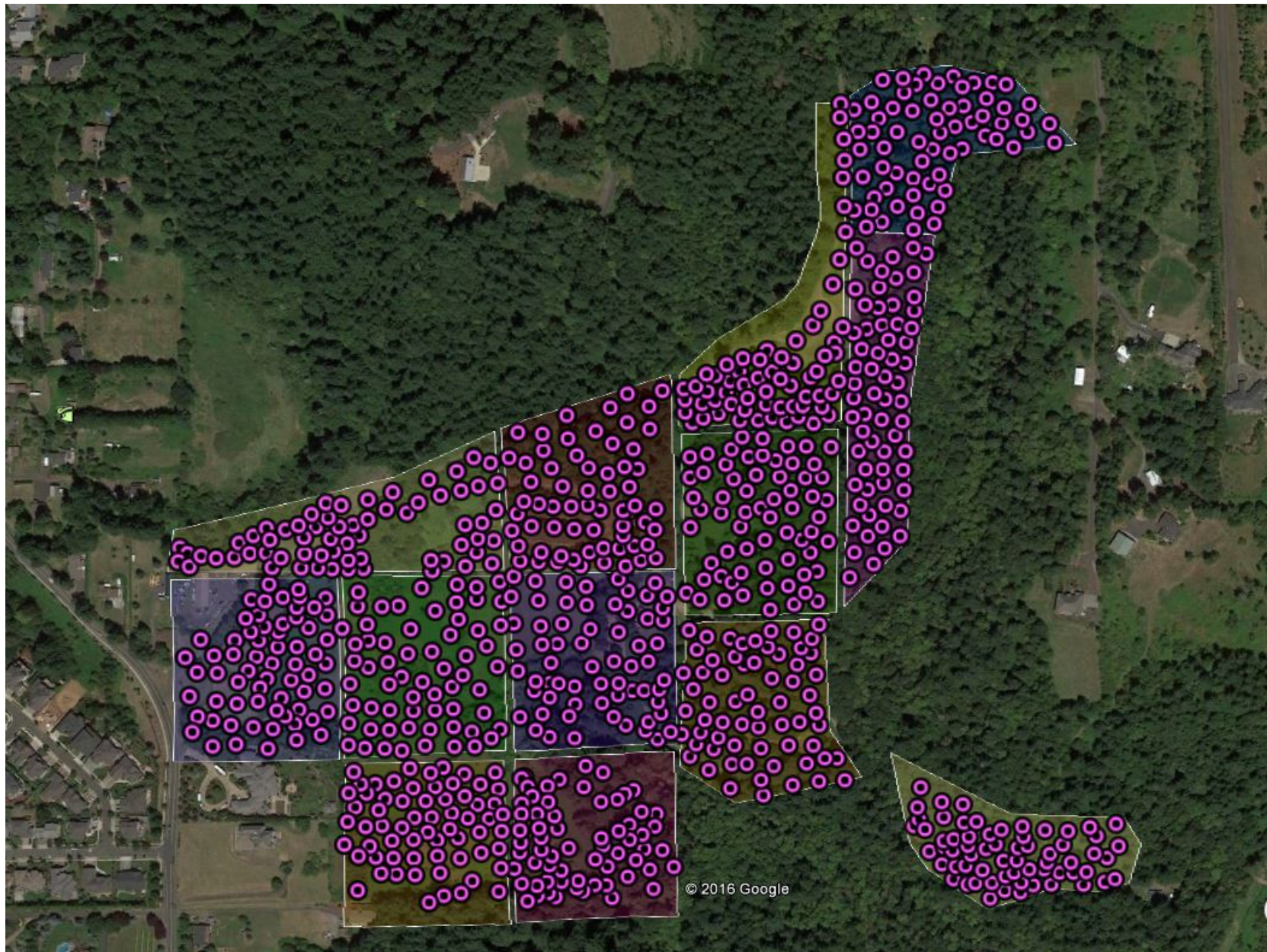
1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH MAP DATED 2012 AND ENW FIELD NOTES.
2. ALL BUILDING, STREET, AND FEATURE LOCATIONS ARE APPROXIMATE.



 CREEKSIDE ENVIRONMENTAL CONSULTING, LLC
 21790 SW CHEHALIS COURT
 TUALATIN, OREGON 97062
 (503)692-8118

FIGURE 3
 TROH LEGACY LANDFILL
 OFFSITE CAP SOIL SOURCE
 MIS SURFACE SOIL GRID
 SCOUTERS MOUNTAIN PLANNED DEVELOPMENT
 APPROXIMATE ADDRESS 11300 SE 147TH AVENUE
 HAPPY VALLEY, OREGON

APPENDIX A INCREMENTAL SAMPLE LOCATION MAP



View of the individual sub samples collected in each of the 13 DUs. Areas not covered included those heavily vegetated (blackberries and dense forest) or covered in buildings and pavement (DU01 and DU02) or DU boundaries that did not line up with a property boundary. In particular, the northern boundary of DU 08 was a road and on the far side of the road was a natural area owned by Metro that was not to be disturbed.

APPENDIX B LABORATORY ANALYTICAL REPORTS

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

June 5, 2017

Lynn Green, Project Manager
Evren Northwest, Inc.
PO Box 14488
Portland, OR 97293

Dear Mr Green:

Included are the results from the testing of material submitted on May 24, 2017 from the 351-14002-07, F&BI 705422 project. There are 12 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures

c: Neil Woller, Paul Trone
ENW0605R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on May 24, 2017 by Friedman & Bruya, Inc. from the Evren Northwest 351-14002-07, F&BI 705422 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Evren Northwest</u>
705422 -01	DU03-170522-IS-0.5
705422 -02	DU03-170522-IS-0.5-REP01
705422 -03	DU03-170522-IS-0.5-REP02
705422 -04	DU04-170522-IS-0.5
705422 -05	DU06-170522-IS-0.5
705422 -06	DU07-170523-IS-0.5
705422 -07	DU02-170523-IS-0.5
705422 -08	DU10-170523-IS-0.5

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020A

Client ID:	DU03-170522-IS-0.5	Client:	Evren Northwest
Date Received:	05/24/17	Project:	351-14002-07, F&BI 705422
Date Extracted:	05/31/17	Lab ID:	705422-01
Date Analyzed:	05/31/17	Data File:	705422-01.088
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	<5
Barium	152
Cadmium	<0.5
Chromium	20.3
Lead	8.56
Mercury	<0.2
Selenium	<1
Silver	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020A

Client ID:	DU03-170522-IS-0.5-REP01	Client:	Evren Northwest
Date Received:	05/24/17	Project:	351-14002-07, F&BI 705422
Date Extracted:	05/31/17	Lab ID:	705422-02
Date Analyzed:	05/31/17	Data File:	705422-02.089
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	<5
Barium	132
Cadmium	<0.5
Chromium	17.0
Lead	7.14
Mercury	<0.2
Selenium	<1
Silver	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020A

Client ID:	DU03-170522-IS-0.5-REP02	Client:	Evren Northwest
Date Received:	05/24/17	Project:	351-14002-07, F&BI 705422
Date Extracted:	05/31/17	Lab ID:	705422-03
Date Analyzed:	05/31/17	Data File:	705422-03.097
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	<5
Barium	117
Cadmium	<0.5
Chromium	15.3
Lead	7.07
Mercury	<0.2
Selenium	<1
Silver	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020A

Client ID:	DU04-170522-IS-0.5	Client:	Evren Northwest
Date Received:	05/24/17	Project:	351-14002-07, F&BI 705422
Date Extracted:	05/31/17	Lab ID:	705422-04
Date Analyzed:	05/31/17	Data File:	705422-04.098
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	<5
Barium	92.0
Cadmium	<0.5
Chromium	8.56
Lead	5.69
Mercury	<0.2
Selenium	<1
Silver	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020A

Client ID:	DU06-170522-IS-0.5	Client:	Evren Northwest
Date Received:	05/24/17	Project:	351-14002-07, F&BI 705422
Date Extracted:	05/31/17	Lab ID:	705422-05
Date Analyzed:	05/31/17	Data File:	705422-05.099
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	<5
Barium	160
Cadmium	<0.5
Chromium	21.2
Lead	11.2
Mercury	<0.2
Selenium	<1
Silver	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020A

Client ID:	DU07-170523-IS-0.5	Client:	Evren Northwest
Date Received:	05/24/17	Project:	351-14002-07, F&BI 705422
Date Extracted:	05/31/17	Lab ID:	705422-06
Date Analyzed:	05/31/17	Data File:	705422-06.100
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	<5
Barium	220
Cadmium	<0.5
Chromium	20.7
Lead	12.4
Mercury	<0.2
Selenium	<1
Silver	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020A

Client ID:	DU02-170523-IS-0.5	Client:	Evren Northwest
Date Received:	05/24/17	Project:	351-14002-07, F&BI 705422
Date Extracted:	05/31/17	Lab ID:	705422-07
Date Analyzed:	05/31/17	Data File:	705422-07.101
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	<5
Barium	111
Cadmium	<0.5
Chromium	15.7
Lead	11.1
Mercury	<0.2
Selenium	<1
Silver	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020A

Client ID:	DU10-170523-IS-0.5	Client:	Evren Northwest
Date Received:	05/24/17	Project:	351-14002-07, F&BI 705422
Date Extracted:	05/31/17	Lab ID:	705422-08
Date Analyzed:	05/31/17	Data File:	705422-08.102
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	<5
Barium	112
Cadmium	<0.5
Chromium	12.6
Lead	7.20
Mercury	<0.2
Selenium	<1
Silver	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020A

Client ID:	Method Blank	Client:	Evren Northwest
Date Received:	Not Applicable	Project:	351-14002-07, F&BI 705422
Date Extracted:	05/31/17	Lab ID:	I7-296 mb
Date Analyzed:	05/31/17	Data File:	I7-296 mb.063
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	<5
Barium	<1
Cadmium	<0.5
Chromium	<1
Lead	<1
Mercury	<0.2
Selenium	<1
Silver	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 06/05/17

Date Received: 05/24/17

Project: 351-14002-07, F&BI 705422

**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF SOIL SAMPLES
FOR TOTAL METALS USING EPA METHOD 6020A**

Laboratory Code: 705520-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/kg (ppm)	10	<5	95	104	75-125	9
Barium	mg/kg (ppm)	50	51.6	97	104	75-125	7
Cadmium	mg/kg (ppm)	10	1.25	99	103	75-125	4
Chromium	mg/kg (ppm)	50	14.7	82	76	75-125	8
Lead	mg/kg (ppm)	50	173	59 b	43 b	75-125	31 b
Mercury	mg/kg (ppm)	5	<0.2	88	93	75-125	6
Selenium	mg/kg (ppm)	5	<1	104	107	75-125	3
Silver	mg/kg (ppm)	10	<1	90	93	75-125	3

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	105	80-120
Barium	mg/kg (ppm)	50	105	80-120
Cadmium	mg/kg (ppm)	10	102	80-120
Chromium	mg/kg (ppm)	50	96	80-120
Lead	mg/kg (ppm)	50	97	80-120
Mercury	mg/kg (ppm)	5	95	80-120
Selenium	mg/kg (ppm)	5	110	80-120
Silver	mg/kg (ppm)	10	100	80-120

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Data Qualifiers & Definitions

- a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.
- b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.
- ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.
- c - The presence of the analyte may be due to carryover from previous sample injections.
- cf - The sample was centrifuged prior to analysis.
- d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.
- dv - Insufficient sample volume was available to achieve normal reporting limits.
- f - The sample was laboratory filtered prior to analysis.
- fb - The analyte was detected in the method blank.
- fc - The compound is a common laboratory and field contaminant.
- hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.
- hs - Headspace was present in the container used for analysis.
- ht - The analysis was performed outside the method or client-specified holding time requirement.
- ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.
- j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.
- J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.
- jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.
- js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.
- lc - The presence of the analyte is likely due to laboratory contamination.
- L - The reported concentration was generated from a library search.
- nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.
- pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.
- ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.
- vo - The value reported fell outside the control limits established for this analyte.
- x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

June 7, 2017

Lynn Green, Project Manager
Evren Northwest, Inc.
PO Box 14488
Portland, OR 97293

Dear Mr Green:

Included are the results from the testing of material submitted on May 26, 2017 from the 351-14002-07, F&BI 705477 project. There are 7 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures

c: Neil Woller, Paul Trone
ENW0607R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on May 26, 2017 by Friedman & Bruya, Inc. from the Evren Northwest 351-14002-07, F&BI 705477 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Evren Northwest</u>
705477 -01	DU05-170525-IS-0.5
705477 -02	DU09-170525-IS-0.5
705477 -03	DU08-170525-IS-0.5

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020A

Client ID:	DU05-170525-IS-0.5	Client:	Evren Northwest
Date Received:	05/26/17	Project:	351-14002-07, F&BI 705477
Date Extracted:	06/01/17	Lab ID:	705477-01
Date Analyzed:	06/01/17	Data File:	705477-01.050
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1
Barium	96.0
Cadmium	<0.5
Chromium	16.8
Lead	7.04
Mercury	<0.2
Selenium	<1
Silver	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020A

Client ID:	DU09-170525-IS-0.5	Client:	Evren Northwest
Date Received:	05/26/17	Project:	351-14002-07, F&BI 705477
Date Extracted:	06/01/17	Lab ID:	705477-02
Date Analyzed:	06/01/17	Data File:	705477-02.051
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	1.09
Barium	143
Cadmium	<0.5
Chromium	14.7
Lead	7.84
Mercury	<0.2
Selenium	<1
Silver	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020A

Client ID:	DU08-170525-IS-0.5	Client:	Evren Northwest
Date Received:	05/26/17	Project:	351-14002-07, F&BI 705477
Date Extracted:	06/01/17	Lab ID:	705477-03
Date Analyzed:	06/01/17	Data File:	705477-03.052
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	1.19
Barium	110
Cadmium	<0.5
Chromium	12.8
Lead	6.40
Mercury	<0.2
Selenium	<1
Silver	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020A

Client ID:	Method Blank	Client:	Evren Northwest
Date Received:	Not Applicable	Project:	351-14002-07, F&BI 705477
Date Extracted:	06/01/17	Lab ID:	I7-299 mb
Date Analyzed:	06/01/17	Data File:	I7-299 mb.046
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1
Barium	<1
Cadmium	<0.5
Chromium	<1
Lead	<1
Mercury	<0.2
Selenium	<1
Silver	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 06/07/17

Date Received: 05/26/17

Project: 351-14002-07, F&BI 705477

**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF SOIL SAMPLES
FOR TOTAL METALS USING EPA METHOD 6020A**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/kg (ppm)	10	108	110	80-120	2
Barium	mg/kg (ppm)	50	109	111	80-120	2
Cadmium	mg/kg (ppm)	10	106	108	80-120	2
Chromium	mg/kg (ppm)	50	96	96	80-120	0
Lead	mg/kg (ppm)	50	105	106	80-120	1
Mercury	mg/kg (ppm)	5	87	102	80-120	16
Selenium	mg/kg (ppm)	5	108	106	80-120	2
Silver	mg/kg (ppm)	10	102	104	80-120	2

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Data Qualifiers & Definitions

- a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.
- b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.
- ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.
- c - The presence of the analyte may be due to carryover from previous sample injections.
- cf - The sample was centrifuged prior to analysis.
- d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.
- dv - Insufficient sample volume was available to achieve normal reporting limits.
- f - The sample was laboratory filtered prior to analysis.
- fb - The analyte was detected in the method blank.
- fc - The compound is a common laboratory and field contaminant.
- hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.
- hs - Headspace was present in the container used for analysis.
- ht - The analysis was performed outside the method or client-specified holding time requirement.
- ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.
- j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.
- J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.
- jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.
- js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.
- lc - The presence of the analyte is likely due to laboratory contamination.
- L - The reported concentration was generated from a library search.
- nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.
- pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.
- ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.
- vo - The value reported fell outside the control limits established for this analyte.
- x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
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3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

June 7, 2017

Lynn Green, Project Manager
Evren Northwest, Inc.
PO Box 14488
Portland, OR 97293

Dear Mr Green:

Included are the results from the testing of material submitted on May 27, 2017 from the 351-14002-07, F&BI 705500 project. There are 5 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures

c: Neil Woller, Paul Trone
ENW0607R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on May 27, 2017 by Friedman & Bruya, Inc. from the Evren Northwest 351-14002-07, F&BI 705500 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID
705500 -01

Evren Northwest
DU13-170526-IS-0.5

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020A

Client ID:	DU13-170526-IS-0.5	Client:	Evren Northwest
Date Received:	05/27/17	Project:	351-14002-07, F&BI 705500
Date Extracted:	06/01/17	Lab ID:	705500-01
Date Analyzed:	06/01/17	Data File:	705500-01.040
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	1.38
Barium	182
Cadmium	<0.5
Chromium	20.3
Lead	10.2
Mercury	<0.2
Selenium	<1
Silver	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020A

Client ID:	Method Blank	Client:	Evren Northwest
Date Received:	Not Applicable	Project:	351-14002-07, F&BI 705500
Date Extracted:	06/01/17	Lab ID:	I7-296 mb2
Date Analyzed:	06/01/17	Data File:	I7-296 mb2.039
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1
Barium	<1
Cadmium	<0.5
Chromium	<1
Lead	<1
Mercury	<0.2
Selenium	<1
Silver	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 06/07/17

Date Received: 05/27/17

Project: 351-14002-07, F&BI 705500

**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF SOIL SAMPLES
FOR TOTAL METALS USING EPA METHOD 6020A**

Laboratory Code: 705520-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/kg (ppm)	10	4.90	95	104	75-125	9
Barium	mg/kg (ppm)	50	51.6	97	104	75-125	7
Cadmium	mg/kg (ppm)	10	1.25	99	103	75-125	4
Chromium	mg/kg (ppm)	50	14.7	82	76	75-125	8
Lead	mg/kg (ppm)	50	173	59 b	43 b	75-125	31 b
Mercury	mg/kg (ppm)	5	<0.2	88	93	75-125	6
Selenium	mg/kg (ppm)	5	<1	104	107	75-125	3
Silver	mg/kg (ppm)	10	<1	90	93	75-125	3

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	105	80-120
Barium	mg/kg (ppm)	50	105	80-120
Cadmium	mg/kg (ppm)	10	102	80-120
Chromium	mg/kg (ppm)	50	96	80-120
Lead	mg/kg (ppm)	50	97	80-120
Mercury	mg/kg (ppm)	5	95	80-120
Selenium	mg/kg (ppm)	5	110	80-120
Silver	mg/kg (ppm)	10	100	80-120

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Data Qualifiers & Definitions

- a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.
- b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.
- ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.
- c - The presence of the analyte may be due to carryover from previous sample injections.
- cf - The sample was centrifuged prior to analysis.
- d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.
- dv - Insufficient sample volume was available to achieve normal reporting limits.
- f - The sample was laboratory filtered prior to analysis.
- fb - The analyte was detected in the method blank.
- fc - The compound is a common laboratory and field contaminant.
- hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.
- hs - Headspace was present in the container used for analysis.
- ht - The analysis was performed outside the method or client-specified holding time requirement.
- ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.
- j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.
- J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.
- jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.
- js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.
- lc - The presence of the analyte is likely due to laboratory contamination.
- L - The reported concentration was generated from a library search.
- nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.
- pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.
- ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.
- vo - The value reported fell outside the control limits established for this analyte.
- x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

June 13, 2017

Lynn Green, Project Manager
Evren Northwest, Inc.
PO Box 14488
Portland, OR 97293

Dear Mr Green:

Included are the results from the testing of material submitted on June 3, 2017 from the 351-14002-07, F&BI 706059 project. There are 7 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: Neil Woller, Paul Trone
ENW0613R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on June 3, 2017 by Friedman & Bruya, Inc. from the Evren Northwest 351-14002-07, F&BI 706059 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Evren Northwest</u>
706059 -01	DU01-170602-IS-0.5
706059 -02	DU11-170602-IS-0.5
706059 -03	DU12-170602-IS-0.5

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020A

Client ID:	DU01-170602-IS-0.5	Client:	Evren Northwest
Date Received:	06/03/17	Project:	351-14002-07, F&BI 706059
Date Extracted:	06/08/17	Lab ID:	706059-01 and 706059-01 x2
Date Analyzed:	06/09/17	Data File:	706059-01.060 and 706059-01 x2.075
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1
Barium	70.1
Cadmium	<0.5
Chromium	11.7
Lead	7.15
Mercury	<0.2
Selenium	<1
Silver	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020A

Client ID:	DU11-170602-IS-0.5	Client:	Evren Northwest
Date Received:	06/03/17	Project:	351-14002-07, F&BI 706059
Date Extracted:	06/08/17	Lab ID:	706059-02 and 706059-02 x2
Date Analyzed:	06/09/17	Data File:	706059-02.061 and 706059-02 x2.079
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1
Barium	83.5
Cadmium	<0.5
Chromium	10.1
Lead	8.96
Mercury	<0.2
Selenium	<1
Silver	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020A

Client ID:	DU12-170602-IS-0.5	Client:	Evren Northwest
Date Received:	06/03/17	Project:	351-14002-07, F&BI 706059
Date Extracted:	06/08/17	Lab ID:	706059-03
Date Analyzed:	06/09/17	Data File:	706059-03.062
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	1.19
Barium	113
Cadmium	<0.5
Chromium	11.8
Lead	7.89
Mercury	<0.2
Selenium	<1
Silver	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020A

Client ID:	Method Blank	Client:	Evren Northwest
Date Received:	Not Applicable	Project:	351-14002-07, F&BI 706059
Date Extracted:	06/08/17	Lab ID:	I7-315 mb
Date Analyzed:	06/09/17	Data File:	I7-315 mb.068
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1
Barium	<1
Cadmium	<0.5
Chromium	<1
Lead	<1
Mercury	<0.2
Selenium	<1
Silver	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 06/13/17

Date Received: 06/03/17

Project: 351-14002-07, F&BI 706059

**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF SOIL SAMPLES
FOR TOTAL METALS USING EPA METHOD 6020A**

Laboratory Code: 706124-05 x5 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/kg (ppm)	10	<5	87	96	75-125	10
Barium	mg/kg (ppm)	50	42.6	89	99	75-125	11
Cadmium	mg/kg (ppm)	10	<2.5	92	96	75-125	4
Chromium	mg/kg (ppm)	50	18.0	80	87	75-125	8
Lead	mg/kg (ppm)	50	5.11	87	91	75-125	4
Mercury	mg/kg (ppm)	5	<1	95	95	75-125	0
Selenium	mg/kg (ppm)	5	<5	84	86	75-125	2
Silver	mg/kg (ppm)	10	<5	82	88	75-125	7

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	110	80-120
Barium	mg/kg (ppm)	50	106	80-120
Cadmium	mg/kg (ppm)	10	105	80-120
Chromium	mg/kg (ppm)	50	109	80-120
Lead	mg/kg (ppm)	50	104	80-120
Mercury	mg/kg (ppm)	5	106	80-120
Selenium	mg/kg (ppm)	5	109	80-120
Silver	mg/kg (ppm)	10	100	80-120

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Data Qualifiers & Definitions

- a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.
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- ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.
- vo - The value reported fell outside the control limits established for this analyte.
- x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

706059

SAMPLE CHAIN OF CUSTODY

ME 06/23/17

1 of 1

Send Report To LYNN GREEN

Company EVERETT NORTHWEST

Address 40 SE 24th WIRTH

City, State, ZIP PORTLAND, OR 97214

Phone 503-452-5526 Fax # _____

SAMPLERS (signature) Lynn Green
PROJECT NAME/NO. 351-14002-07 PO# _____

REMARKS

TURNAROUND TIME
 Standard (2 Weeks)
 RUSH
 Rush charges authorized by _____

SAMPLE DISPOSAL
 Dispose after 30 days
 Return samples
 Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	ANALYSES REQUESTED					Notes	
						TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270		HFS
Du01-170602-15-0501		6/02/17	1025	501C	1							
Du11-170602-15-0502			1505									
Du12-170602-15-0503			1235									

Friedman & Bruya, Inc.
 3012 16th Avenue West
 Seattle, WA 98119-2029
 Ph. (206) 285-8282
 Fax (206) 283-5044
 FORMS\COC\COC.DOC

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
<u>[Signature]</u>	<u>BRAD LARBY</u>	<u>ENW</u>	<u>6/23/17</u>	<u>1905</u>
<u>[Signature]</u>	<u>JAMES BLOYD</u>	<u>ENW</u>	<u>6/13</u>	<u>0630</u>
Received by:				

Samples received at 6 OC

APPENDIX C PHOTO LOG



An approximate 40-gram core is obtained from each subsample location. These are collected in a dedicated 1-gallon jar and submitted to the lab for processing.



Soil samples were obtained using a stainless-steel probe, advanced approximately 6-inches BGS, with the lower 3 to 4 inches sampled.



Each subsample location was recorded using a handheld GPS unit. This assured obtaining 64 subsamples across the site with appropriate coverage.



View of DU04, which was a combination of grassy open land and forested land.



Offsite Cap Source Soil Sampling
 Scouters Mountain ~ 11300 SE 147th Avenue
 Happy Valley, Oregon

Site Photographs

Project No.
 351-14002-07

Appendix
C



View looking north from DU04 at the back side of the former ranger's house, located in the northeast corner of the DU02. There are thick blackberries that border the back side of the residence.



View of the forested area within DU06. Thickly forested areas of the property were accessed through trails, both animal and human.



View looking northeast along an access road within DU06. Note the thick blackberries on the left side of the road that hampered access.



View of one of the picnic shelters within DU06.



Offsite Cap Source Soil Sampling
 Scouters Mountain ~ 11300 SE 147th Avenue
 Happy Valley, Oregon

Site Photographs

Project No.
 351-14002-07

Appendix
C



View looking southwest at the former stables located on the northwest corner of DU02.



View looking west along the south end of DU02. Note the stand of blackberries on the right that limited access in the west central area of this DU.



View of a disturbed area within DU09. Primitive shelters were observed throughout this area, created out of tree limbs.



A basic stage was found within thick blackberries and tall grass in DU09. It was built out of wood with a steel roof. Basic bench seats were noted in the field in front of the stage, most removed and stacked off to the side.



Offsite Cap Source Soil Sampling
 Scouters Mountain ~ 11300 SE 147th Avenue
 Happy Valley, Oregon

Site Photographs

Project No.
 351-14002-07

Appendix
C



View looking south along the access road that bordered DU08 along the western side. Further west (right side of the photo) was Metro property under protection due to reforestation. Sampling included the area on the left side of the photo.



View looking south and east across DU03 and DU06 on June 2, 2017. Work to set up erosion control was beginning and areas had been mown and silt fencing was being erected.



View looking north during sampling of DU01, following some clearing in preparation for erosion control installation.



View of the forested area within DU12, near the south end of this area.



Offsite Cap Source Soil Sampling
 Scouters Mountain ~ 11300 SE 147th Avenue
 Happy Valley, Oregon

Site Photographs

Project No.
 351-14002-07

Appendix
C