PBS | Engineering + Environmental

Phase II Environmental Site Assessment

Former Service Station
9321 SE Stark Street
Portland, Oregon 97216

Prepared for:
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Project No. 22338.001

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EXECUTIVE SUMMARY

PBS Engineering and Environmental has completed a geophysical survey and soil and soil gas investigation at the subject property ("site") located at 9321 SE Stark Street in Portland, Oregon. The site is currently vacant and was historically used as a fueling service station.

The subject property was undeveloped until 1954, when a Signal Oil Service Station was built. Three tanks were installed at that time; the sizes of the tanks are unknown. The use of the property changed in 1966, and since that time, it has been used for motor home sales, several used car lots, a transmission business, and various auto repair businesses. The site was most recently vacated in March, 2015, by Affordable Car Care. A permit found through the City of Portland indicates that the three fuel tanks were removed in 1982.

The former fuel pump island remains on the south side of the commercial structure; the pumps have been removed. The southeast portion of the structure also contains in-floor hydraulic hoists.

A geophysical survey did not identify any existing underground storage tanks (USTs) but did identify a previously documented drywell location and evidence of a former UST excavation to the southwest of the site structure.

Soil and soil gas investigations were conducted in November 2015, which included the installation of nine soil boring and two soil gas borings. Significant soil and/or soil gas contamination was not identified. Detections of petroleum hydrocarbons above laboratory detection limits were limited to a soil sample collected adjacent to the interior hoist location and one of three soil samples collected from the estimated bottom of the former UST excavation. Analysis of soil samples for contaminants of interest did not indicate that presence of detected compounds above applicable Oregon Department of Environmental Quality (DEQ) risk-based criteria (RBC) or DEQ clean fill values.

Although gasoline-range petroleum hydrocarbons and volatile organic compounds were detected in the two soil gas samples collected from the site, concentrations of these compounds were well below RBCs protective of vapor intrusion to indoor air for occupational receptors.

No further assessment is warranted at this time.

1.0 INTRODUCTION

PBS Engineering and Environmental Inc. (PBS) has completed a Phase II Environmental Site Assessment (Phase II ESA) at 9321 SE Stark Street in Portland, Oregon. This report summarizes the previous work performed at the site, and presents the results of the current investigation and PBS' conclusions.

1.1 Site Description and Topography

The property (site) is listed as Tax Lot 4800 in the southwest one-quarter of the southeast one-quarter of Section 33, Township 1 North, Range 2 East, of the Willamette Base and Meridian (Figure 1). The property is bound to the north by residences, to the east by SE 94th Avenue, to the south by SE Stark Street, and to the west by Fix Auto Collision. The site was not in use during the site assessment.

The US Geological Survey 7.5-minute topographic map (Mt. Tabor Quadrangle, 1990, see Figure 1) for the site indicates that the site is located in the neighborhood known as Montavilla, located west of Interstate 205. The area has a regional slope to the west-southwest. The subject property elevation is approximately 280 feet above mean sea level.

1.2 Site Ownership and History

The property is currently owned by the Joyce M. Bitar Living Trust. The subject property was undeveloped until 1954, when a Signal Oil Service Station was built. The use of the property changed in 1966, and since that time, the site has been used for motor home sales, several used car lots, a transmission business, and various auto repair businesses. The site was most recently vacated in March 2015, by Affordable Car Care. The former fuel pump island remains on the south side of the commercial structure; the pumps have been removed. The southeast portion of the structure also contains in-floor hydraulic hoists.

2.0 PREVIOUS ENVIRONMENTAL ASSESSMENTS

In July 2015, PBS completed a Phase I Environmental Site Assessment (Phase I ESA) of the property and had the following recognized environmental conditions (RECs):

- The subject property was in use as a gas station from 1954 through 1966. The underground fuel tanks were reportedly removed in 1982. No testing was completed at that time. This poses a high concern.
- The property has been in automobile repair use since at least the 1990s through March 2015, and related features of concern on the site include in-ground hoists, a drywell, and a historical septic tank. This poses a high concern.

PBS also identified the following other Issues of Concern:

- The west adjacent property has been in car repair use since at least the 1950s. This poses a concern for vapor migration.
- Historical use of the adjacent property to the south was for several self-service laundry businesses and dry cleaners (9250 SE Stark Street, 9316 SE Stark Street). This poses a concern for vapor migration.

PBS recommended the following:

- A geophysical survey should be completed on the subject property to identify historical USTs or UST pits, drywells, and the historical septic system.
- Soil testing should be completed in the vicinity of features of concern identified during the geophysical survey and adjacent to in-ground hoists to evaluate potential impact from historical gas station and auto repair activities.
- Soil vapor testing is warranted to evaluate risks to site occupants from historical subject property uses and from off-site sources, including the automobile repair facility to the west and former dry-cleaning businesses to the south.
- A Hazardous Building Materials Survey should be performed prior to demolition.

3.0 PURPOSE AND SCOPE

The proposed scope of work for the current investigation consisted of the following:

- Complete a geophysical survey of the accessible areas of the site to outline existing underground storage tanks (USTs), identify historical USTs and/or UST pits and other features of concern such as fuel piping and drywells.
- Complete soil sampling in the vicinity of features of concern identified by the Phase I ESA and geophysical survey.
- Conduct soil vapor testing to evaluate risks to site occupants from historical subject property uses and from off-site sources.

4.0 GEOPHYSICAL SURVEY

On October 28, 2015, a geophysical survey of the accessible exterior areas of the site was completed by Pacific Geophysics of Portland, Oregon.

The survey did not identify any evidence of existing USTs at the site; however, the survey did identify a likely former UST excavation area west of the service station building. Asphalt patching indicative of an excavation was noted. The survey identified the location of a known drywell at the site southeast of the building corner.

The survey did not identify any evidence of an existing septic tank at the site.

All of the above-listed features were marked on the pavement by the contractor. A report was prepared by the geophysical surveyor and includes maps of the features identified. The contractor also cleared proposed boring locations for buried utility lines. A copy of the report is included in Appendix A.

5.0 SOIL AND SOIL GAS SAMPLING

Prior to beginning the drilling investigation, PBS filed a public utility notification request. A site-specific health and safety plan (HASP) was prepared and reviewed with all field personnel and subcontractors prior to beginning work.

PBS was on site on November 3, 2015, to conduct the drilling investigation with Pacific Soil and Water of Tigard, Oregon providing the drilling services. A track-mounted, direct-push drill rig was used to advance all borings.

5.1 Soil Sampling

PBS oversaw the installation of nine soil borings at the site. Boring depths and target areas were as follows:

- SB-1: Advanced to a depth of 30 feet below ground surface (bgs) to address the drywell.
- SB-2: Advanced to a depth of 10 feet bgs to address an interior floor hoist.
- SB-3 through SB-5: Advanced to a depth of 1 foot bgs to address former pump island locations
- SB-6 through SB-9: Advanced to a depth of 15 feet bgs within the footprint of the former UST excavation and associated piping to dispensers.

Figure 2 shows the location of the temporary boreholes advanced at the site. Soil samples were collected from each boring based on depth of the feature being addressed.

Groundwater was not encountered to the maximum depth explored of 30 feet bgs. In all borings, soils were logged continuously noting grain size, color, odor, and moisture. Photoionization detector (PID) measurements were taken to assess for the presence of volatile contaminants. For the PID screening, soil was collected at approximately 2-foot intervals and placed into a disposable zipper-type plastic bag that was sealed, gently shaken, and allowed to rest for 5 to 15 minutes. The PID tip was then inserted into the bag to measure total volatile compounds.

Sampling equipment and drill rods were decontaminated between borings using a detergent wash and tap water rinse. PBS personnel wore new disposable nitrile gloves when collecting samples. Upon completion of sampling, temporary boreholes were backfilled and sealed with bentonite to 6 inches below grade, and the surface restored to match the surrounding area.

5.2 Soil Gas Sampling

PBS oversaw the installation of two soil gas borings, SB-10 and SB-11, located along the southern and western property boundaries, respectively. Soil gas samples were collected from each boring using a screened interval of 5 to 5.5 feet bgs.

The samples were collected using methods that generally follow Sections 3.2.1 and 3.2.2 of the Oregon Department of Environmental Quality (DEQ) *Guidance for Assessing and Remediating Vapor Intrusion in Buildings* (VI Guidance) dated March 10, 2010, with adjustments made for field conditions and the leak detection process. The sample collection process is described in Appendix B.

The equipment used for sampling, including flow regulators, gauges, fittings, and tubing, was dedicated to the sample point. After sample collection was completed, the canister was closed and a tag was attached indicating the sample ID, canister ID, tracer gas ingredient (helium), sample date, and the time sample collection occurred. The sample was then shipped to Air Toxics LTD in Folsom, California, under chain-of-custody documentation. All borings were backfilled with hydrated bentonite chips, and the surface restored to match the surrounding area.

5.3 Laboratory Analysis

All samples were collected in laboratory-supplied containers, placed on ice in a cooler (soil samples only) and transported to ESC Lab Sciences of Mt. Juliet, Tennessee with chain-of-custody documentation. Analyses were conducted under normal turnaround time.

Soil gas samples were analyzed for volatile organic compounds (VOCs), as well as gasoline-range organic hydrocarbons by Modified EPA Method TO-15. The samples were also analyzed for helium by the Modified Natural Gas Analysis Method ASTM D-1946.

One soil sample from each boring was analyzed for total petroleum hydrocarbons (TPH) by Northwest (NW) Methods TPH-Gx and TPH-Dx. Based on low concentrations of gasoline, diesel, and heavy oil-range petroleum hydrocarbons in soil sample SB2-8, additional analysis for VOCs by EPA Method 8260B and/or polycyclic aromatic hydrocarbons (PAH) by EPA Method 8270SIM was performed. As well, soil sample SB1-26 was analyzed for RCRA 8 metals, as this analysis would be helpful for future decommissioning of the drywell, if needed.

6.0 INVESTIGATION-DERIVED WASTES

Gloves, tubing, and other disposable field supplies were disposed of as solid waste. Soil cuttings and decontamination water were placed in a 55-gallon drum that was sealed, labeled, and temporarily stored at the site and is pending disposal.

7.0 FINDINGS

7.1 Soil Field Observations

The surface of most of the site was covered by pavement over silty gravel or sand fill. Generally, the subsurface across the site consisted of silt or sandy silt to an approximate depth of 11 feet, underlain by sands to the maximum depth explored of 30 feet bgs. Groundwater was not encountered in any of the boreholes. Graphic boring logs are provided in Appendix C.

The soils encountered did not exhibit evidence of staining, odor, or PID detections.

7.2 Soil Analytical Results

Laboratory testing revealed no detectable petroleum hydrocarbons except in Samples SB2-8, in which low levels of gasoline, diesel, and heavy oil-range petroleum organics were detected, and Sample SB9-12, in which heavy oil-range organics were detected. Both of these results are well below the most stringent Risk-Based Concentrations (RBC) established by DEQ. Sample SB2-8 was analyzed for VOCs and PAHs to determine the presence (if any) of individual petroleum constituents. As well, given the presence of heavy oil in soil sample SB9-12, this sample was analyzed for PAHs. PAHs were not present in either sample at concentrations above laboratory detection limits (DLs). VOCs were not present above DLs in soil sample SB2-8, with the exception of trans-1,2-dichloroethene (0.00493 milligrams per kilogram or mg/kg). This concentration is well below applicable RBC presented on Table 1. As well, this concentration is below DEQ's clean fill criteria for soil[1] of 2.5 mg/kg for this compound.

Table 1 summarizes the analytical results; the laboratory report is provided in Appendix D.

7.3 Soil Gas Results

Gasoline-range TPH and numerous individual VOCs were detected in the two soil gas samples collected at the site. The reported detections were all well below residential RBCs.

Table 2 summarizes the analytical results; the laboratory report is provided in Appendix D.

Table 3 provides the results of the helium leak detection protocol conducted on the samples (Appendix B provides a description of the protocol). As can be seen, the two samples had

[1] DEQ (2014) *Internal Management Directive – Clean Fill Determinations. Last Updated July 23, 2014.*

helium detections less than one percent (1%), which indicates that the sampling protocols provided a high quality sample for analysis.

8.0 CONCLUSIONS AND RECOMMENDATIONS

8.1 Conclusions

The geophysical survey did not identify the presence of existing USTs, but did identify a probable former UST excavation and existing drywell.

Detection of petroleum hydrocarbons were limited to a soil sample collected adjacent to the interior hoist location and one of three soil samples collected from the estimated bottom of the former UST excavation. Analysis of TPH, VOCs, and PAHs did not indicate that presence of detected compounds above applicable RBCs or DEQ clean fill criteria. As such, additional assessment is not recommended.

Although gasoline-range TPH and VOCs were detected in the two soil gas samples collected from the site, concentrations of these compounds were well below RBCs protective of vapor intrusion to indoor air for occupational receptors.

8.2 Recommendations

No further assessment is recommended at this time.

9.0 LIMITATIONS

PBS has prepared this report for use by Joyce Bitar. This report is for the exclusive use of the client and is not to be relied upon by other parties. It is not to be photographed, photocopied, or similarly reproduced in total or in part without the expressed written consent of the client and PBS.

This study was limited to the tests, locations, and depths as indicated to determine the absence or presence of certain contaminants. The site as a whole may have other contamination that was not characterized by this study. The findings and conclusions of this report are not scientific certainties but, rather, probabilities based on professional judgment concerning the significance of the data gathered during the course of this investigation. PBS is not able to represent that the site or adjoining land contain no hazardous waste, oil, or other latent conditions beyond that detected or observed by PBS. Groundwater data collected from temporary borings is considered preliminary; detections may need confirmation by installation of permanent wells.

PBS Engineering and Environmental Inc.

12/16/2015

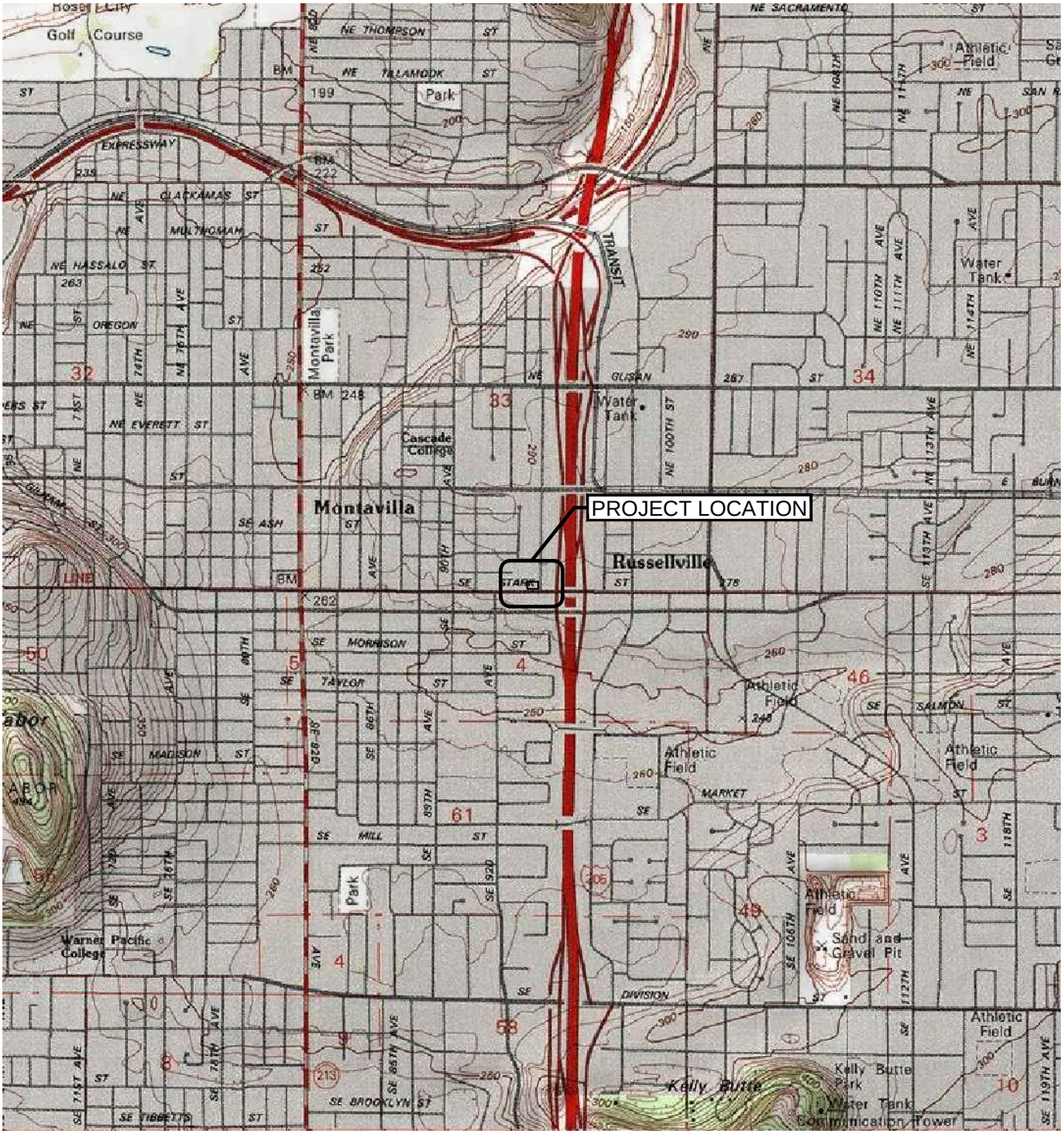
Dennis M. Terzian RG Date
Senior Geologist

12/16/2015

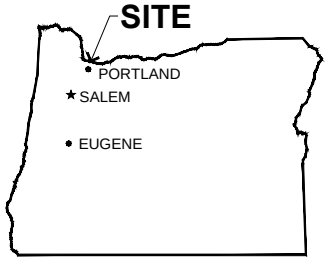
Reviewed by Heidi Yantz RG Date
Principal Geologist

Expires 12/04/2016

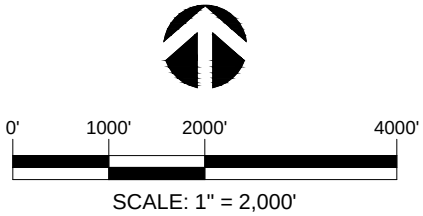
FIGURES



SOURCE: USGS MOUNT TABOR, OR WA QUADRANGLE 1990



OREGON

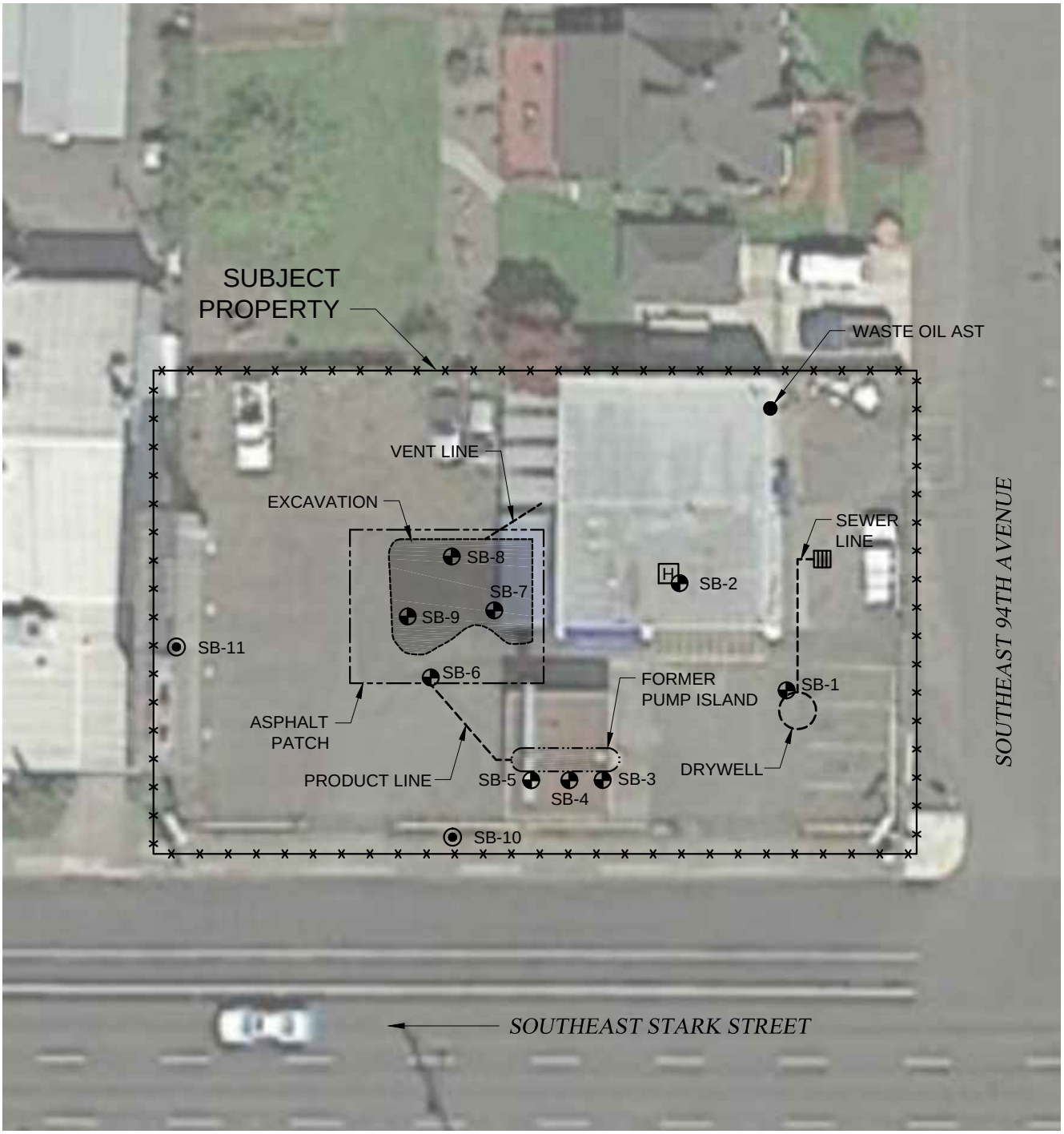


SCALE: 1" = 2,000'

PREPARED FOR: JOYCE BITAR

PBS	PROJECT # 22338.001 DATE NOV 2015	VICINITY MAP 9321 SOUTHEAST STARK STREET PORTLAND, OREGON	FIGURE 1

L:\Projects\22000\22300-22399\22338 SEStark\DWG\22338.001_FIG_1-2.dwg Nov 17, 2015 10:30am jjustind



SOURCE: © 2015 GOOGLE EARTH PRO

LEGEND

- CATCH BASIN
- H — HYDRAULIC LIFTS
- FENCE
- SB-1 — SOIL BORING NUMBER AND LOCATION
- SB-10 — SOIL GAS SAMPLE NUMBER AND LOCATION

0' 15' 30' 60'

SCALE: 1" = 30'

PREPARED FOR: JOYCE BITAR

PBS

PROJECT # 22338.001

DATE NOV 2015

SITE PLAN

9321 SOUTHEAST STARK STREET
PORTLAND, OREGON

FIGURE 2

TABLES

Table 1: Summary of Soil Sample Analytical Results
9321 SE Stark Street
Portland, Oregon

				Total Petroleum Hydrocarbons			VOCs		PAHs	Metals							
Sample ID	Location	Sample Date	Sampling Depth	Gasoline	Diesel	Heavy Oil	trans-1,2-Dichloroethene	Remaining VOCs	All PAHs	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
			feet bgs	mg/kg													
SB1-26	Next to drywell	11/3/2015	26	<0.113	<4.53	<11.3	--	--	--	<2.26	38.5	<0.566	3.82	4.23	<0.0226	<2.26	<1.13
SB2-8	Next to interior hoist	11/3/2015	8	1.74	7.95	19.0	0.00493	ND	ND	--	--	--	--	--	--	--	--
SB3-1	Next to east dispenser	11/3/2015	1	<0.122	<4.90	<12.2	--	--	--	--	--	--	--	--	--	--	--
SB4-1	Next to center dispenser	11/3/2015	1	<0.123	<4.94	<12.3	--	--	--	--	--	--	--	--	--	--	--
SB5-1	Next to west dispenser	11/3/2015	1	<0.113	<4.52	<11.3	--	--	--	--	--	--	--	--	--	--	--
SB6-3	Product line between dispensers and UST pit	11/3/2015	3	<0.122	<4.89	<12.2	--	--	--	--	--	--	--	--	--	--	--
SB7-11	Within UST pit	11/3/2015	11	<0.122	<4.89	<12.2	--	--	--	--	--	--	--	--	--	--	--
SB8-12	Within UST pit	11/3/2015	12	<0.119	<4.78	<11.9	--	--	--	--	--	--	--	--	--	--	--
SB9-12	Within UST pit	11/3/2015	12	<0.120	<4.33	14.4	--	--	ND	--	--	--	--	--	--	--	--
Oregon RBC - Soil Ingestion, Dermal Contact, and Inhalation[1]			Residential	1,200	1,100		1,600	Varies	Varies	0.43	15,000	78	120,000	400	23	NS	390
			Occupational	20,000	14,000		23,000	Varies	Varies	1.9	220,000	1,100	>MAX	800	350	NS	5,800
			Construction Worker	9,700	4,600		7,100	Varies	Varies	15	69,000	350	530,000	800	110	NS	1,800
			Excavation Worker	>MAX	>MAX		200,000	Varies	Varies	420	>MAX	9,700	>MAX	800	2,900	NS	49,000
Oregon RBC - Volatilization to Outdoor Air[1]			Residential	5,900	>MAX		>MAX	Varies	Varies	NV	NV	NV	NV	NV	NV	NS	NV
Oregon RBC - Volatilization to Outdoor Air[1]			Occupational	69,000	>MAX		>MAX	Varies	Varies	NV	NV	NV	NV	NV	NV	NS	NV
Oregon RBC - Vapor Intrusion into Buildings[1]			Residential	94	>MAX		>MAX	Varies	Varies	NV	NV	NV	NV	NV	NV	NS	NV
Oregon RBC - Vapor Intrusion into Buildings[1]			Occupational	>MAX	>MAX		>MAX	Varies	Varies	NV	NV	NV	NV	NV	NV	NS	NV
Oregon RBC - Soil Leaching to Groundwater[1]			Residential	31	9,500		13	Varies	Varies	*	*	*	*	30	*	NS	*
Oregon RBC - Soil Leaching to Groundwater[1]			Occupational	130	>MAX		51	Varies	Varies	*	*	*	*	30	*	NS	*
Regional Background Concentrations (metals)[2]										8.8	790	0.63	76	79	0.23	0.71	0.82

See laboratory report for full list of analytes
bgs: below ground surface
mg/kg: milligrams per kilogram
NS: Not set for this compound
--: analyte not tested
NV: Compound not volatile so pathway is not valid
<: not detected above laboratory method reporting limit
ND: not detected above laboratory method reporting limit

BTEX: benzene, toluene, ethylbenzene, total xylenes
Bold text indicates an exceedance of one or more of the cleanup levels
*: Leaching to Groundwater RBCs are not provided for inorganic chemicals
[1]Oregon Risk-Based Decision-Making for the Remediation of Petroleum-Contaminated Sites, Oregon DEQ Sept. 2003, Revised RBCs November 1, 2015
[2]According to the Oregon Department of Environmental Quality (DEQ) Oregon Background Metals Concentrations in Soil for the Portland Basin, March 2013
>MAX: The RBC for this pathway is greater than 1,000,000 mg/kg. This substance is not deemed to pose a risk in this scenario

Table 2: Summary of Soil Gas Analytical Results
9321 SE Stark Street
Portland, Oregon

			Volatile Organic Compounds (detections only)																											
Sample ID	**Depth (Feet bgs)**	**Sample Date**	**TPH (as Gasoline)**	**ACETONE**	**BENZENE**	**1,3-BUTADIENE**	**CARBON DISULFIDE**	**CHLOROMETHANE**	**CYCLOHEXANE**	**ETHANOL**	**ETHYLBENZENE**	**4-ETHYLTOLUENE**	**DICHLORODIFLUOROMETHANE**	**HEPTANE**	**N-HEXANE**	**METHYL BUTYL KETONE**	**2-BUTANONE (MEK)**	**4-METHYL-2-PENTANONE (MIBK)**	**METHYL METHACRYLATE**	**NAPHTHALENE**	**2-PROPANOL**	**PROPENE**	**STYRENE**	**TETRACHLOROETHENE (PCE)**	**TOLUENE**	**1,2,4-TRIMETHYLBENZENE**	**1,3,5-TRIMETHYLBENZENE**	**2,2,4-TRIMETHYLPENTANE**	**VINYL CHLORIDE**	**M&P-XYLENE**	**O-XYLENE**
			µg/m^3																											
SB10-SG	5	10/8/2015	2,440	214	42.5	57.9	27.2	1.5	3.57	61.2	14.5	6.93	2.21	23.8	38.9	27.6	72.3	32.5	<1.64	7.56[2]	9.26	552	10.4	8.56	51.1	26.8	6.42	2	<1.02	50.1	18.9
SB11-SG	5	10/8/2015	873	75.4	5.43	<8.85	5.76	<0.826	<1.38	48.9	2.01	<1.96	<1.98	5.54	9.2	<10.2	26.4	<10.2	99.8	<6.6	<6.15	101	<1.7	<2.72	20.7	2.57	<1.96	8.04	<1.02	6.03	2.51
Oregon RBC - Vapor Intrusion into Buildings[1]		Residential	79,000	NS	72	NS	NS	19,000	NS	NS	220	NS	NS	NS	NS	NS	NS	NS	NS	17	NS	NS	210,000	2,200	1,000,000	1,500	>Pv	NS	33	21,000	21,000
		Occupational	1,700,000	NS	1,600	NS	NS	390,000	NS	NS	4,900	NS	NS	NS	NS	NS	NS	NS	NS	360	NS	NS	4,400,000	47,000	22,000,000	31,000	>Pv	NS	2,800	440,000	440,000

bgs: below ground surface

µg/m^3: micrograms per cubic meter

<: not detected above laboratory method reporting limit

NS: Not set for this compound

TPH: Total petroleum hydrocarbons

[1]Oregon Risk-Based Decision-Making for the Remediation of Petroleum-Contaminated Sites, Oregon DEQ Sept. 2003, Revised RBCs November 1, 2015

>Pv: The air concentration reported for the RBC exceeds the vapor pressure of the pure chemical

2: The same analyte is found in the associated blank. Quality control samples are reported down to half of the RDL. The trace detection in the method blank is not considered significant and does not affect sample results.

Table 3: Helium Leak Detection Results
9321 SE Stark Street
Portland, Oregon

Sample ID	Depth (Feet bgs)	Sample Date	Helium Concentration (shroud)[1]	Helium Concentration (sample)	Percentage of Helium in Sample	Leak Test Results
			ppmv	ppmv	%	pass/not pass
SB10-SG	5	11/3/2015	566,667	4,230	0.75	pass
SB11-SG	5	11/3/2015	660,333	3,980	0.60	pass

[1]Readings taken using a Dielectric MGD-20002 Helium Meter. Reported value is the average of three readings.

ppmv: parts per million volume

pass: percent of helium in sample is less than 5 percent (%)

bgs: below ground surface

APPENDIX A

Geophysical Survey Report

PACIFIC GEOPHYSICS
Applied Geophysics

GEOPHYSICAL SURVEY LETTER REPORT

Scott Braunsten
PBS Environmental

Project: 151015
Survey Date: October 28, 2015

Former Service Station

9321 SE Stark Street
Portland, Oregon

A Geometrics G858 cesium magnetometer, two hand-held metal detectors and a GSSI SIR2000 Ground Penetrating Radar (GPR) system coupled to a 400 MHz antenna were used to scan the property located at 9321 SE Stark Street. The south sidewalk was included. The goal of the survey was to detect possible underground storage tanks (USTs) related to a former service station that occupied the property. The building and pump island structure are still present. Additional goals included investigating two asphalt patches, one suspected to be the former station's UST nest, and scanning parts of the site for a septic tank. No fill ports or vent pipes were seen. The concrete floor in the vicinity of a hoist was scanned for a hydraulic-fluid tank.

Figure 1 shows the results of the magnetometer survey. Red contours indicate ferrous objects on, or below the ground surface (including USTs). Blue contours represent magnetic values lower than the earth's local background level. They are caused by ferrous objects situated higher than the magnetometer sensor, carried at a height of about 3 feet. At this site the building, the base of a large billboard, yard lights, a steel canopy, the former pump island, two cars in the lot and several parked along the adjacent south curb, chain-link fences and the concrete pad around the pump island created magnetic interference. Buried objects of interest located near these surface features could be missed.

Anomalies marked A are interpreted to be caused by the reinforced-concrete pad. Anomalies B are caused by the parked cars while anomaly C is caused by a 55-gallon drum and other metallic surface objects.

No USTs were detected at this site. The large patch west of the building does not contain tanks. Reflectors typical of a tank excavation were seen in GPR profiles across the patch. The shape and location of the tank pit are shown in figure 2.

Reflectors typical of a drywell were seen in profiles across the smaller patch southeast of the building. This drywell drains the catch basin several feet to the north.

The bathroom is located in the west side of the building. A cleanout under the steel canopy appears to be related to the change from septic to city sewer, based on surface evidence of new trenching and radar profiles showing the possible sewer pipe. GPR was used to scan the subsurface across the gravel area west of the building, and the area under the steel canopy for a possible septic tank, based on the

location of the bathroom and the cleanout. A septic tank was not detected. A pipe extending from the tank pit toward the building was detected north of the cleanout.

Jeff Mann and Nikos Tzetos of Pacific Geophysics conducted the survey for Mr. Scott Braunsten of PBS on October 28, 2015. Mr. Braunsten was on site during the field work. This letter report was written by Nikos Tzetos, reviewed by Jeff Mann and sent to Mr. Braunsten on November 1, 2015.

Limitations

The conclusions presented in this report were based upon widely accepted geophysical principles, methods and equipment. This survey was conducted with limited knowledge of the site, the site history and the subsurface conditions.
The goal of near-surface geophysics is to provide a rapid means of characterizing the subsurface using non-intrusive methods. Conclusions based upon these methods are generally reliable; however, due to the inherent ambiguity of the methods, no single interpretation of the data can be made. As an example, rocks and roots produce radar reflections that may appear the same as pipes and tanks.

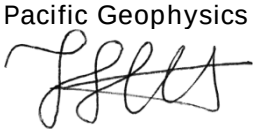
Under reasonable conditions, geophysical surveys are good at detecting changes in the subsurface caused by man-made objects or changes in subsurface conditions, but they are poor at actually identifying those objects or subsurface conditions.

Objects of interest are not always detectable due to surface and subsurface conditions. The deeper an object is buried, the more difficult it is to detect, and the less accurately it can be located.

The only way to see an object is to physically expose it.

Jeff Mann November 1, 2015
Pacific Geophysics

Nikos Tzetos November 1, 2015
Pacific Geophysics



Appendix A. Geophysical Survey Methods

Magnetometer Surveys

Small disturbances in the Earth's local magnetic field are called "magnetic anomalies". These may be caused by naturally occurring features such as metallic mineral ore bodies, or from manmade features such as metal buildings, vehicles, fences, and underground storage tanks. The magnetometer only detects changes produced by ***ferrous*** objects. Aluminum and brass are non-ferrous metals and cannot be detected using a magnetometer.

A magnetometer is an electronic instrument designed to detect small changes in the Earth's local magnetic field. Over the years different technologies have been used in magnetometers. The Geometrics G-858 Portable Cesium Magnetometer used to collect magnetic data for Pacific Geophysics uses one of the most recent methods to detect magnetic anomalies. A detailed discussion describing the method this unit uses is available at Geometrics.com.

This magnetometer enables the operator to collect data rapidly and continuously rather than the older instruments that collected data at discreet points only. The G-858 is carried by hand across the site. The sensor is carried at waist level. Typically individual data points collected at normal walking speed are about 6" apart along survey lines usually 5 feet apart, depending on the dimensions of the target objects.

It is critical to know the exact location of each data point so that if an anomaly is detected it can be accurately plotted on a magnetic contour map. At most small sites, data are collected along straight, parallel survey lines set up on the site before the data collection stage begins. For very large, complex sites, the G-858 can be connected to a Global Positioning System (GPS) antenna which allows the operator to collect accurately-located data without establishing a survey grid. With GPS, data are collected and positioned wherever the operator walks. A limitation using GPS is that the GPS antenna must have line of sight with the GPS satellites. Data can be mislocated if the GPS antenna is under trees or near tall buildings.

Data are stored in the unit's memory for later downloading and processing. A magnetic contour map of the data is plotted in the field. Geographical features are plotted on the map. Magnetic anomalies appearing to be caused by objects of interest are then investigated on the site using several small hand-held metal detectors. If an object appears to be a possible object of interest, it may be investigated with GPR.

Magnetic contour maps may be printed in color in order to highlight anomalies caused by ferrous objects located under the magnetic sensor. Usually, ferrous objects situated below the sensor produce magnetic "highs" and anomalies located above the sensor produce magnetic "lows". Magnetic highs are of interest to the operator since most objects of interest are located underground.

Depending on the orientation, shape and mass of a metallic object, a high/low pair of magnetic anomalies may be present. In the northern hemisphere the magnetic low is located north of the object and the magnetic high toward the south. The object producing the anomaly is located part way between the high and the low anomalies.

Magnetometer surveys have limitations. Magnetometers only detect objects made of ferrous (iron-containing) metal. Large ferrous objects (buildings, cars, fences, etc.) within several feet of the magnetometer create interference that may hide the anomaly produced by a nearby object of interest.

Ground Penetrating Radar

A Geophysical Survey Systems, Inc. (GSSI) SIR-2000 GPR system coupled to a 270-, 400-, or 900-MHz GSSI antenna is used to obtain the radar data for our surveys.

GPR antennas both transmit and receive electromagnetic energy. EM energy is transmitted into the material the antenna passes over. A portion of that energy is reflected back to the antenna and amplified. Reflections are displayed in real-time in a continuous cross section. Reflections are produced where there is a sufficient electrical contrast between two materials. Changes in the electrical properties (namely the dielectric constant) that produce radar reflections include the moisture content, porosity, mineralogy, and texture of the material. Metallic objects of interest exhibit a strong electrical contrast with the surrounding material and thus produce relatively strong reflections. Non-metallic objects of interest (septic tanks, cesspools, dry wells, PVC and clay tile pipes) are not always good reflectors.

Radar data are ambiguous. It can be difficult to distinguish the reflection produced by an object of interest from the reflection caused by some natural feature. Rocks or tree roots have reflections that appear similar to reflections from pipes. In concrete investigations reflections produced by metal rebar look exactly like those from electrical conduit or post-tension cables. Objects with too small an electrical contrast may produce no reflections at all and may be missed.

In addition to interpreting ambiguous data, radar has several limitations that cannot be controlled by the operator. The radar signal is severely attenuated by electrically conductive material, including wet, clay-rich soil and reinforced concrete. The quality of the data is affected by the surface conditions over which the antenna is pulled. Ideally the antenna should rest firmly on a smooth surface. Rough terrain and tall grass reduce the quality of radar data.

It is the job of an experienced interpreter to examine the GPR profiles and deduce if reflections are from objects of interest. A GPR interpreter cannot see underground, but can only interpret reflections based on experience.

The only way to truly identify an object is to excavate.

Hand-held Metal detectors

Two small, non-recording metal detectors are used to locate suspect magnetic anomalies detected using the G-858 Magnetometer in order to determine the likely cause of the anomaly. First, the magnetic contour map and a Schonstedt Magnetic Gradiometer are used to locate the center of the magnetic anomalies.

Once the anomaly is located an Aqua-Tronics Tracer is used to determine if the object producing the anomaly is a possible object of interest. Most anomalies are at least in part produced by features observed on the ground surface.

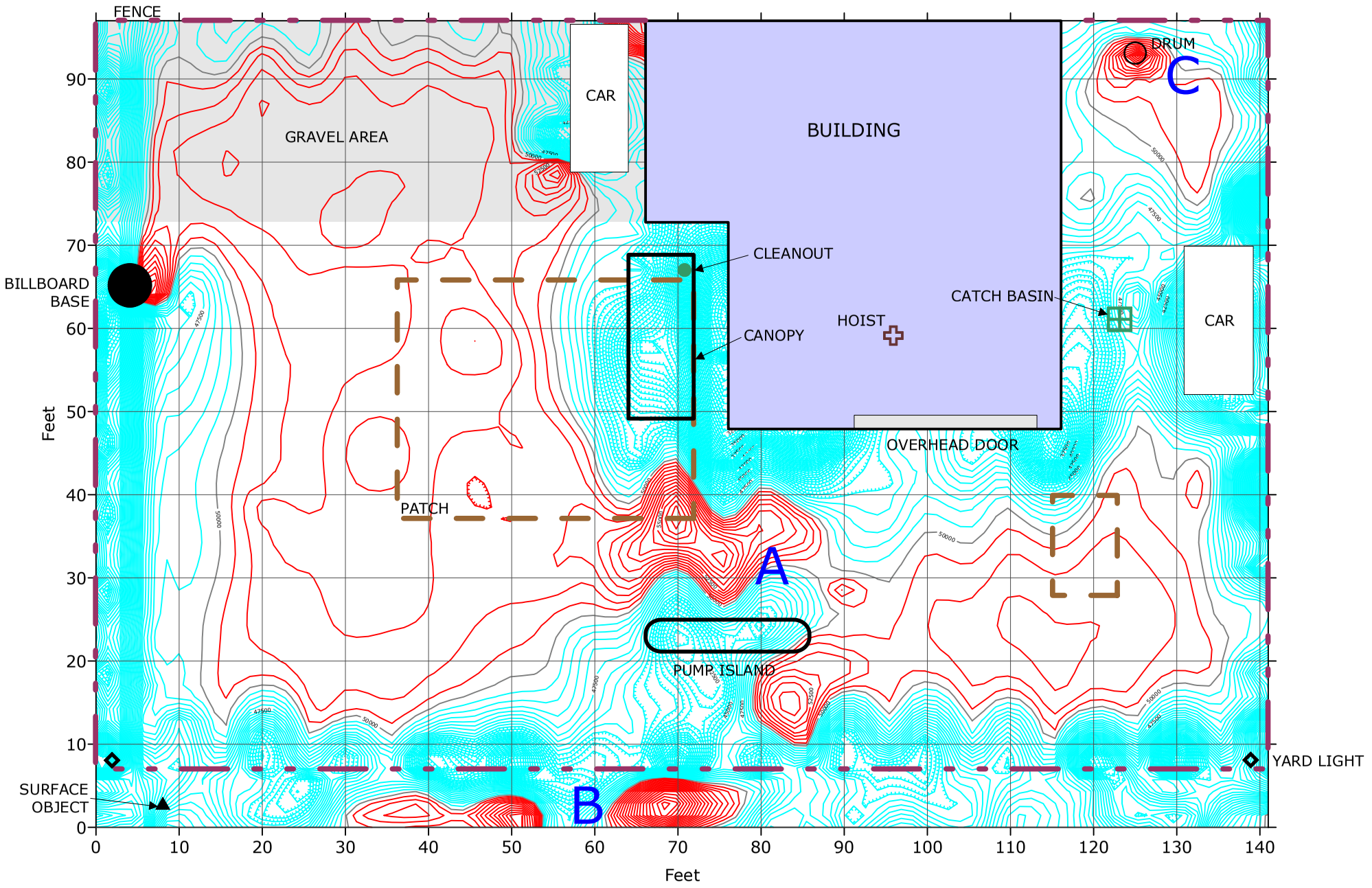
Schonstedt Magnetic Gradiometer: This magnetometer has two magnetic sensors separated vertically by 10”. The magnetic field surrounding a ferrous object is strongest near the object and decreases rapidly as the distance increases. If the magnitude measured by the sensor located in the tip of the Schonstedt is very high, and the magnetic field measured by the sensor located farther up the shaft of the Schonstedt is low, there is a large vertical magnetic gradient and the instrument responds with a loud whistle indicating the object is near the surface. If there is a small difference in the magnitudes measured by the two sensors, the object is

deeper. The instrument responds with a softer tone. A discussion of this instrument is available at Schonstedt.com.

Aqua-Tronics A-6 Tracer: The Aqua-Tronics A-6 Tracer uses a different method of detecting metallic objects. This instrument measures the electrical conductivity of a metal object. It is capable of detecting any electrically conductive metal, including non-ferrous aluminum and brass. The Tracer is capable of detecting three-dimensional objects as well as pipes.

The Tracer consists of a transmitter coil and a receiver coil. In the absence of any electrically conductive material in the vicinity of the Tracer, the electromagnetic field around each coil is balanced.

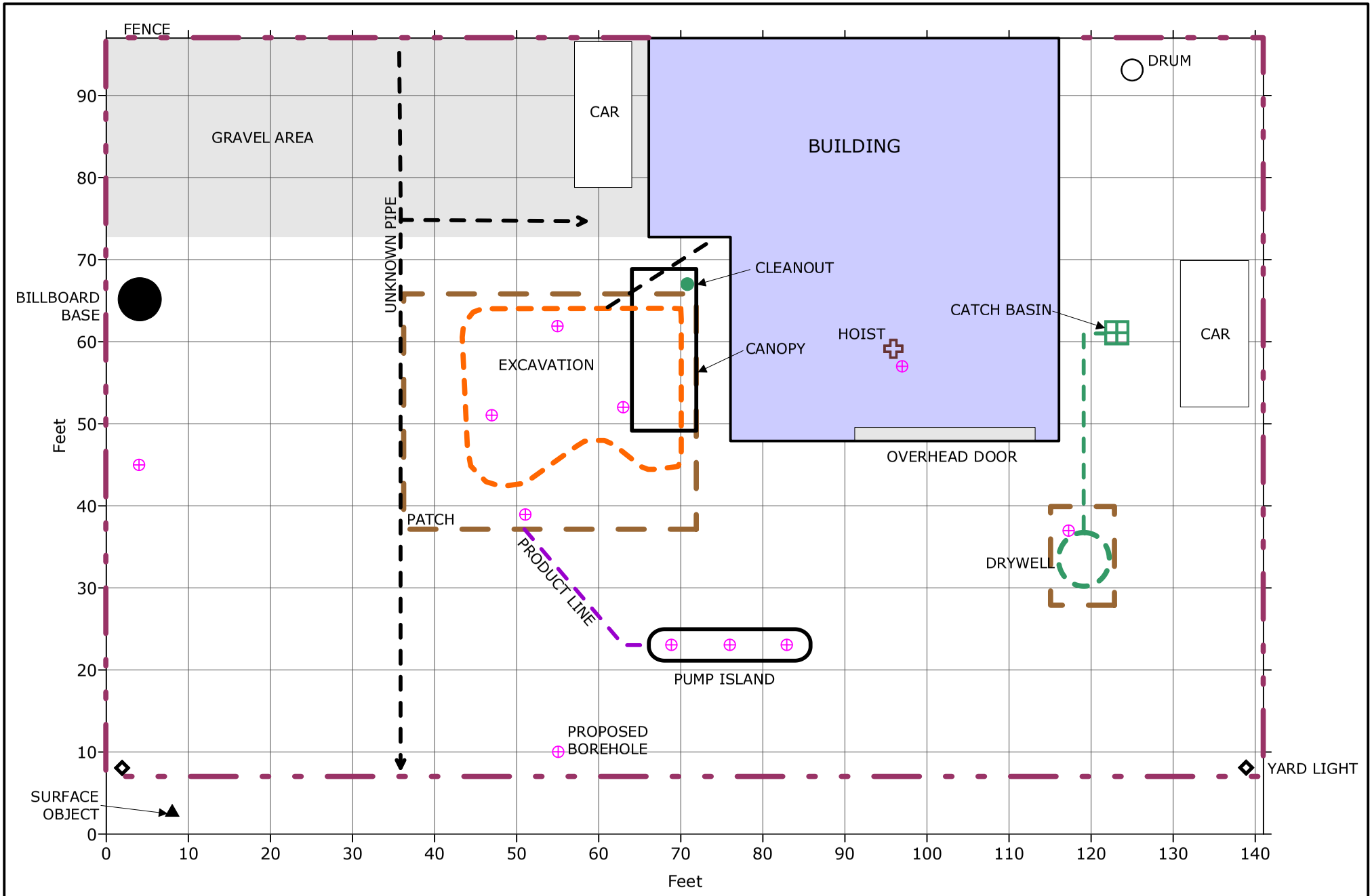
Basically the electromagnetic field produced by the transmitter induces an electric current into the area surrounding the instrument. Nearby conductive objects distort the EM field. The balance between the two coils is disturbed and the instrument produces an audible tone and meter indication.



PACIFIC GEOPHYSICS
Applied Geophysics

N

FIGURE	Magnetic Contour Map-C.I.=250 nT	
1	Project: 151015	Former Service Station 9321 SE Stark Street Portland, Oregon
	Drawn by : NT	Prepared for: PBS Environmental
		Survey Date: October 28, 2012



PACIFIC GEOPHYSICS
Applied Geophysics

FIGURE 2	Interpretation Map	
	Project: 151015	Former Service Station 9321 SE Stark Street Portland, Oregon
	Drawn by : NT	Prepared for: PBS Environmental
		Survey Date: October 28, 2012

APPENDIX B

Standard Operating Procedure for Soil Gas Sampling

PBS | Engineering + Environmental

STANDARD OPERATING PROCEDURE
SUB-SLAB VAPOR AND SOIL GAS SAMPLING

1.0 PURPOSE

Vapor intrusion of volatile organic compounds (VOCs) into occupied structures is considered a critical migration pathway requiring assessment at contaminated sites. Specifically, regulators may require property owners to sample soil gas, sub-slab vapor, or indoor air to assess risk to building occupants.

This standard operating procedure (SOP) is intended to guide soil gas or sub-slab vapor sampling efforts when creating temporary sampling points when Method TO-15 or other analytical methods utilizing a Summa canister as the sampling media are required. The sampling points can be modified to produce a permanent sampling location. The sampling protocols for analysis of soil gas or sub-slab vapor by Method TO-17, which utilizes a sorbent tube as the sampling media (instead of a Summa canister), as well as the sampling of indoor air are presented as a separate SOPs.

Soil gas or sub-slab vapor sampling is typically conducted based on prior results from other environmental studies, such as soil or groundwater sampling, or if historical uses indicate a human health risk could be present. There are a variety of issues that can significantly affect the results of soil gas or sub-slab vapor sampling. Adherence to this SOP will help to ensure that sampling results will be valid and reliable. This SOP assumes that samples will be collected in Summa canisters. If other sampling media is used (such as tedlar bags), some of the steps in this SOP may not apply or may need to be modified.

2.0 EQUIPMENT LIST

The table that begins below indicates the standard equipment and tools needed for soil gas or sub-slab vapor sampling projects. When renting a helium meter, ask the vendor for one that is intended for use in leak detection testing (e.g., MGD-2002 multi-gas leak locator). It should have the ability to purge the line quickly (the equipment company may provide a special filter for this) and a meter with an active pump (as opposed to passive venting) is preferable. It does not need to be intrinsically safe UNLESS site conditions require this feature.

Equipment to get from lab	• 1 or 6 Liter Summa canister • One extra Summa canister in the event that a canister fails in the field • Flow Regulator (also known as critical orifice) preset by lab for pre-determined sampling time, not to exceed a flow rate of 200 mL/min • Vacuum gauge (for verifying vacuum prior to sampling, flow regulator may act in this role) • Tubing (new for each sample location). *Must be* Teflon, Nylaflow, Peek, or stainless tubing. Do NOT use polyethylene tubing. • Chain of custody and identification tags • T-fitting (need one for each sampling location, including ferrels and hex nuts for each leg of T)

Other equipment	• Purging syringe (calibrated, typically for 50 to 60 milliliters [mL]) • Granular bentonite • Disposable or washable containers (~16 ounces) for mixing bentonite and/or cement • Water for mixing bentonite and cement • Sand • Silicone tubing • Helium gas tank with regulator • Helium meter (make sure that it measures in ppm by volume) • On-off valve (2 per sampling location) • Vapor Pin with a silicon sleeve (or similar equipment) • Vapor Pin tool and hammer for installation and removal (or similar equipment) • Vapor Pin drill guide (for permanent installations) • Field notebook and/or field forms • Helium shroud • Weight for shroud, if needed • Nuts and ferrels (if you did not receive from lab) • Cap for “shroud air tubing” • Water dam (e.g., 1.5” PVC coupler)
Tools	• Scissors • Rotohammer/drill for drilling through concrete • Drill bits (0.625-inch, 1.5-inch) • Crescent wrench (1/2 and 9/16 inch) • Whisk broom/dust pan • Wet-dry vacuum • Extra-thin knife/screwdriver • Extension cord for rotohammer • Wrench for helium regulator
Supplemental supplies	• Teflon tape (if seal leaks are sustained) • Purging pump with tubing (if purging syringe not used) and charging cord • Fast setting concrete to patch floor • Adhesive to repair carpet or tile

3.0 LABORATORY

The lab will supply the Summa canisters, flow regulators, gauges, and tubing. They can also provide the purging syringe if you do not already have one. Have the equipment shipped to arrive **TWO** business days prior to sampling if possible. This will allow you time to have the lab express-mail any additional or forgotten equipment. Verify the vacuum of all canisters as soon as the shipment is received (you can order an extra gauge to do this); this will allow you to check the summa canisters for pressure prior to leaving the office. Knowing that the canister has sufficient initial vacuum allows for better trouble shooting in the field.

The following information must be provided to the lab for them to ship the correct equipment.

- Size of canister (400 mL, 1 liter [L], 6 L) (sample size is largely dependent on method reporting limits). You MUST know your reporting limits to determine the canister size.

- Type of canister certification (batch vs individual). Batch certification is usually sufficient for sub-slab vapor or soil gas sampling projects.
- Method reporting limits
- Tracer gas to be used (the lab must certify container for this prior to shipping)
- Sample time/flow rate

Samples should be collected at a rate between 100 and 175 milliliters (mL) per minute (most guidance documents recommend that samples are not collected faster than 200 mL per minute). A flow rate greater than 200 mL/min runs the risk of introducing ambient air dilution to the sample. The sample time for grab samples is calculated by determining an acceptable sample flow rate (perhaps 150 mL per minute) and multiplying that by the sample container size. For a 150 mL per minute rate, a 1 L summa canister would require approximately 7 minutes. A 6 L Summa canister would require 40 minutes.

4.0 SUB-SLAB VAPOR INITIAL PROCEDURES

Order equipment as identified previously. Prior to field activities, the following should occur:

- Determine the proposed locations for each sample.
- Confirm with the property owner/occupant that subsurface utilities will not be impacted when drilling through the slab in these locations.
- Conduct a private utility locate for your locations to check for subslab or subgrade obstructions.
- If possible, determine the slab thickness to confirm that a hand-operated drill will be able to drill through it.
- Determine if carpeting or other flooring will need to be removed prior to drilling, or will requiring patching.
- Get the lab equipment delivered two days prior to sampling and ensure that all equipment was provided.
- Have the helium meter arrive the day before sampling.

Once at the site, sampling should occur as described below.

Drill Hole and Seal Tubing

These instructions assume that all samples will be collected using a Vapor Pin or similar equipment.

- Confirm concrete thickness, if possible, so you'll know when to expect the drill bit to break through bottom of slab.
- If the Vapor Pin will be installed for on-going monitoring (i.e., permanent installation), begin by drilling a hole 2 inches into the concrete using the 1.5" drill bit. This larger hole will be used to install a flush-mount cover. Then insert the Vapor Pin drill guide into this hole so that the smaller diameter drill hole will be centered. Continue with directions below.
- Drill a hole through the slab using the 0.625" drill bit. Drill one to three inches into backfill or native material beneath the concrete slab.
- Use a 0.625" tube brush to clean concrete dust from the hole.
- Use the whisk broom or vacuum to remove concrete dust or loose material from around the drill hole.

- Install a Vapor Pin with a silicon sleeve (the silicon sleeve provides the seal) into the 0.625" drilled hole utilizing a dead weight hammer and the Vapor Pin installation/extraction tool (or similar equipment).
- If not drilling the 1.5: hole, place a small amount of hydrated bentonite on the concrete surface around the Vapor Pin and insert a water dam into the bentonite.
- Place a silicon mat with a circular cut-out for the Vapor Pin on the concrete surface around the sample point and water dam.
- Add a small piece of silicone tubing to the top of the Vapor Pin for attaching tubing later.
- Add a small amount of water to the inside of the water dam to ensure a good seal is in place.

For temporary holes, wait 20 to 30 minutes to allow the hole to equilibrate. If you will be collecting sub-slab gas samples at multiple locations, you could perform these initial activities at each location prior to continuing with the sampling.

5.0 SOIL GAS INITIAL PROCEDURES

Order equipment as previously identified. Prior to field activities, the following should occur:

- Determine the locations and depths for each sample
- Determine if equipment, vehicles or other stored items will need to be moved prior to the field event
- Call in a public utility notification
- Conduct a private utility locate for your locations to check for subgrade utilities/obstructions
- Get the lab equipment delivered two days prior to sampling and ensure that all equipment was provided
- Arrange for a driller to deploy a Post Run Tubing (PRT) sample system, or equivalent, or arrange with the driller to install a sample point using a hand auger

Once at the site, sampling should occur as described below.

Drill Hole and Seal Tubing

- Drill a borehole hole using a PRT system, or equivalent. The bottom of the hole should be at least 5.5 feet below ground surface (bgs).
- Lift up on the drilling rod approximately 6 inches to create a void in the subsurface.
- Insert the PRT fitting to the 0.25-inch tubing and place down the hole. Once it reaches the bottom, screw the fitting onto the PRT sample point (note: the fitting uses left-hand threads).
- Determine the length of 0.25-inch tubing needed to conduct sampling at this location and cut it to that length. Do not forget that there must be enough tubing to go through the helium shroud, connect to the purging T-valve and connect to the Summa canister. Be sure to cut the ends straight with no burrs or jagged edges.
- Mix bentonite for sealing.
- Place bentonite around the rod protruding from the ground.
- Insert bentonite evenly around tubing exiting the drill rod, making sure it penetrates fully into the rod. Thread the other tubing end through the helium shroud/stopper. Cover the loose tubing end with a plastic bag or cap to ensure it remains clean until it is connected to the Summa canister.

- Place the shroud over the drill rod and place more bentonite around the base to seal the shroud to the ground.

Sample Train Assembly

- Place the shroud over the sample point, and thread tubing through the shroud and shroud stopper.
- Attach an on-off valve to the end of the tubing, then place additional tubing on the other side of the valve. Turn the valve off.
- Install a T-fitting and a second on/off valve in-line with the sample tubing to allow for purging. Add tubing from the third leg of the T-fitting to the Summa canister.
- Connect the gauge and flow regulator to the Summa canister and tubing. Do not overtighten the fittings.
- Record the canister and flow regulator serial numbers on the field form.
- Ensure that all connections are tight and all valves are closed.

For temporary holes, wait 20 to 30 minutes to allow the hole to equilibrate. If a hand auger was used to install the sample point you must wait 48 hours.

6.0 LEAK DETECTION TESTING

Two methods of leak detection testing are performed. They are a “shut-in” test and field/laboratory test for helium.

Shut-in Test: Evaluate the integrity of the sample train by performing a vacuum shut-in test. Remove a sufficient volume of air from the sample train using the purging syringe to provide a vacuum of at least -15 inches of mercury (Hg). Observe the gauge for at least two minutes to detect any decrease in measured vacuum. The vacuum must be maintained for at least two minutes. If the vacuum is not maintained, check the fittings and retest.

Helium Test: At this point, you should have the shroud in place with the tubing from the Vapor Pin or soil gas sample point extending from the shroud, and the inlet hose from the helium tank extending into the shroud. Perform these actions:

- Place a weight on the shroud to prevent it from being moved and compromising the seal integrity, if needed.
- Fill the shroud with helium for several seconds and turn off the tank.
- Using the helium meter (meter), measure and record the helium concentration in the shroud in percent (%) or parts-per-million-volume (ppmv) (1% is equivalent to 10,000 ppmv). The target helium concentration is 70 to 90%. Remove the meter from the shroud air tubing and cap the tubing. *Allow meter to clear back to zero.*

Sample Train Purging

- Open the on-off valve to the Vapor Pin or PRT sampling point tubing. The Summa canister remains closed.
- Determine the amount of air that requires purging within the sampling tubing.
  - Determine how much tubing you need to purge (round up to whole feet).
  - Multiple the number of feet by the volume of air within one unit foot of tubing (see multipliers below for various tubing sizes).
  - Determine how much you need to purge from the hole drilled through the concrete slab or PRT sampler (usually 6 inch length).
  - Add the tubing and hole purge volumes together.

- You want to remove a minimum of two purge volumes, so multiply volume calculated by two.

Size of tubing (inches)	Air volume in mL per one unit foot
1/4	9.7
3/8	21.7
1/2	38.6
5/8	60.3
3/4	86.9
1	154.4

- Connect the purging syringe and turn the on/off valve to ON.
- Purge the calculated volume of air. Draw the air slowly through the syringe, approximating the sample collection flow rate, to minimize the effect of creating a vacuum that could compromise the connections or seals. If your sample collection rate is 150 mL/min, and you need to purge 50 mL, then take approximately 20 seconds to purge the 50 mL or as slow as possible.
- If you need to purge more than one syringe volume, complete the first purge, turn the valve on the syringe to OFF, depress the syringe to purge the air out of the syringe, turn syringe valve to ON and repeat the purging process.
- When done purging, turn the on-off valve to OFF.

- Connect the meter to the sample point tubing (Vapor Pin or PRT) and allow the meter to run for approximately one minute. Measure the helium concentration.
- If indicated by elevated readings on the helium meter (greater than 5,000 ppmv [0.5%]), make adjustments to seals.
- Once all necessary adjustments have been made, record the helium measurement in the shroud on field sheet following adjustment to seals

Once the leak detection testing has confirmed the Vapor Pin or PRT seal is sufficient, proceed to sample collection.

7.0 SAMPLE COLLECTION

Sample Collection

- Confirm that all connections remain tight and all valves are closed.
- Close the on-off valve connected to the purging syringe.
- Open the Summa canister by turning its valve approximately one-half turn.
- Immediately record the vacuum on the gauge (it should stabilize very quickly) and the time. The gauge should measure approximately -30 inches Hg (please note that some gauges may read greater than -30 inches Hg). If the vacuum is less than -27 inches Hg, the canister may not have sufficient vacuum for sampling. In this case, select another canister. If another canister is not available, call the project manager and ask how they would like you to proceed.
- Allow the Summa canister to fill, keeping in mind the amount of time determined for sample collection (i.e., what you told the lab to set for a flow regulator time)
- At the mid-point of the sample collection, record the helium concentration in the shroud.
- The vacuum gauge should never drop below -5 inches Hg. If the vacuum readings are not matching up with the expected sampling time (the gauge is dropping faster or slower

than expected), you will need to use your best judgment as to when to stop the sample collection (or call the lab or project manager to discuss).
- Once the sample has been collected, record the vacuum reading and time.
- Close the canister valve. Be sure it is tightly closed, but do not overtighten.
- Record the helium concentration in the shroud.
- Remove the gauge and flow regulator and replace the canister fitting.
- Fill out the chain of custody and return the containers to the lab with the original chain of custody. Retain a copy of the chain of custody for the project files.

When collecting 6L Summa canister samples, it is recommended that you keep watch on the vacuum gauge during the entire sample duration, which can take up to 50 minutes. If the gauge should drop below -5 inches Hg, the sample may be considered void; this can be prevented by keeping watch of the gauge during sampling. If the gauge drops to 0 inches Hg the sample will need to be re-taken using a new canister.

Drill Hole Abandonment
Once soil gas sampling is completed the boring will be abandoned by the licensed drilling subcontractor who completed the borehole following applicable state requirements.

Once sub-slab vapor sampling is completed, the following should occur:

- Remove the water from the water dam.
- Clean out the remaining bentonite, cleaning as much as possible from the floor.
- If the sampling location is for one-time use, deploy the Vapor Pin extraction tool to remove the pin.
- Add a small amount of sand to fill the drill hole to approximately two inches below the concrete surface (approximately two inches below the bottom of the “seat”). Do NOT overfill with sand as this may compromise your patch.
- Use the whisk broom to remove any loose material at the surface.
- Fill the upper three inches with a quick setting cement grout. Smooth or feather the surface to help create a bond between the slab and the grout.

If the Vapor Pin or similar equipment is for a permanent installation, the following should occur:

- Place a white cap over the tip of the Vapor Pin
- Install a permanent cover over the capped Vapor Pin (plastic or metal)

8.0 POST FIELD ACTIVITIES

- Be sure to retain all paperwork provided by the lab, including the packing list and certifications. This information must be retained in the permanent project file.
- Decontaminate reusable fittings owned by PBS following the *Standard Operating Procedure for Vapor Pin Decontamination for Vapor Intrusion Assessments*. This includes the Vapor Pin drill guide and any brushes or other tools used for cleaning.

Confirming Helium Detections Meet Regulatory Requirements

- Calculate average helium concentration in shroud by taking 2 or more readings before, during, and after sampling (*be sure that meter is reading in ppm by volume*)

- When we receive lab results, if helium is detected, use this formula to confirm level of leakage.

  Level of leakage = lab-detected concentration / shroud concentration

- Be sure you are using the same units (ppm may not always equal ppmv – check your units)

- Some regulatory guidance documentss allow up to 5 to 10% helium within a sample. Be sure to check your state's guidance for allowable levels.

APPENDIX C

Soil Boring Logs

PBS Engineering + Environmental
4412 SW Corbett Avenue
Portland, Oregon 97239
Phone: 503.248.1939
Fax: 866.727.0140

9321 SE STARK STREET
PORTLAND, OREGON

PBS PROJECT NUMBER:
22338.001

BORING SB-1

BORING SB-1 LOCATION:
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		ASPHALT AND FILL						
		Medium stiff brown SILT (ML); low plasticity; no odor; damp						
2.0		**FILL**					60	
4.0								
		Stiff brown sandy SILT (ML) with gravel; non-plastic; medium sand; fine, subangular gravel; no odor; damp						
6.0								
							60	
8.0								
10.0								
		Medium dense brown SAND (SP-SM) with silt; low plasticity; coarse sand; no odor; moist						
12.0							50	
14.0								
16.0							40	
18.0								
20.0								

BORING METHOD: Push Probe
DRILLED BY: Pacific Soil & Water, LLC
BORING BIT DIAMETER: 2¼-inch OD

LOGGED BY: S. Braunsten
COMPLETED: 11/03/15

PBS Engineering + Environmental
4412 SW Corbett Avenue
Portland, Oregon 97239
Phone: 503.248.1939
Fax: 866.727.0140

9321 SE STARK STREET
PORTLAND, OREGON

PBS PROJECT NUMBER:
22338.001

BORING SB-1
(continued)

BORING SB-1 LOCATION:
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
20.0		Medium dense brown SAND (SP-SM) with silt; low plasticity; coarse sand; no odor; moist						
22.0							20	
24.0								
26.0		Loose dark brown gravelly SAND (SP) with silt; low plasticity; coarse sand; fine, subrounded gravel; no odor; moist			SB1-26			
28.0							60	
30.0		Final boring depth 30.0 feet bgs; boring backfilled with bentonite. Groundwater not encountered at time of exploration.						
32.0								
34.0								
36.0								
38.0								
40.0								

BORING METHOD: Push Probe
DRILLED BY: Pacific Soil & Water, LLC
BORING BIT DIAMETER: 2¼-inch OD

LOGGED BY: S. Braunsten
COMPLETED: 11/03/15

PBS Engineering + Environmental
4412 SW Corbett Avenue
Portland, Oregon 97239
Phone: 503.248.1939
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9321 SE STARK STREET
PORTLAND, OREGON

PBS PROJECT NUMBER:
22338.001

BORING SB-2

BORING SB-2 LOCATION:
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		CONCRETE						
		Void (from 0.25 to 1 foot bgs)						
		Loose brown SAND (SP); coarse sand; no odor; dry						
		FILL						
2.0		Medium stiff brown sandy SILT (ML); low plasticity; fine sand; no odor; damp					60	
4.0				0	SB2-5			
		Medium dense brown silty SAND (SM); low plasticity; medium sand; no odor; dry						
6.0								
							90	
8.0		Very stiff dark brown SILT (ML) with gravel; low plasticity; coarse, subrounded gravel; no odor; damp			SB2-8			
				0				
10.0		Final boring depth 10.0 feet bgs; boring backfilled with bentonite. Groundwater not encoutered at time of exploration.						
12.0								
14.0								
16.0								
18.0								
20.0								

BORING METHOD: Push Probe
DRILLED BY: Pacific Soil & Water, LLC
BORING BIT DIAMETER: 2¼-inch OD

LOGGED BY: S. Braunsten
COMPLETED: 11/03/15

PBS Engineering + Environmental
4412 SW Corbett Avenue
Portland, Oregon 97239
Phone: 503.248.1939
Fax: 866.727.0140

9321 SE STARK STREET
PORTLAND, OREGON

PBS PROJECT NUMBER:
22338.001

BORING SB-3

BORING SB-3 LOCATION:
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		CONCRETE						
		Stiff brown SILT (ML); low plasticity; no odor; dry			SB3-1			
		Final boring depth 1.0 feet bgs; boring backfilled with bentonite. Groundwater not encountered at time of exploration.						
2.0								
4.0								
6.0								
8.0								
10.0								
12.0								
14.0								
16.0								
18.0								
20.0								

BORING METHOD: Push Probe
DRILLED BY: Pacific Soil & Water, LLC
BORING BIT DIAMETER: 2¼-inch OD

LOGGED BY: S. Braunsten
COMPLETED: 11/03/15

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4412 SW Corbett Avenue
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9321 SE STARK STREET
PORTLAND, OREGON

PBS PROJECT NUMBER:
22338.001

BORING SB-4

BORING SB-4 LOCATION:
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		CONCRETE						
		Stiff brown SILT (ML); low plasticity; no odor; dry			SB4-1			
		Final boring depth 1.0 feet bgs; boring backfilled with bentonite. Groundwater not encountered at time of exploration.						
2.0								
4.0								
6.0								
8.0								
10.0								
12.0								
14.0								
16.0								
18.0								
20.0								

BORING METHOD: Push Probe
DRILLED BY: Pacific Soil & Water, LLC
BORING BIT DIAMETER: 2¼-inch OD

LOGGED BY: S. Braunsten
COMPLETED: 11/03/15

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9321 SE STARK STREET
PORTLAND, OREGON

PBS PROJECT NUMBER:
22338.001

BORING SB-5

BORING SB-5 LOCATION:
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		CONCRETE						
		Stiff brown SILT (ML); low plasticity; no odor; dry			SB5-1			
		Final boring depth 1.0 feet bgs; boring backfilled with bentonite. Groundwater not encountered at time of exploration.						
2.0								
4.0								
6.0								
8.0								
10.0								
12.0								
14.0								
16.0								
18.0								
20.0								

BORING METHOD: Push Probe
DRILLED BY: Pacific Soil & Water, LLC
BORING BIT DIAMETER: 2¼-inch OD

LOGGED BY: S. Braunsten
COMPLETED: 11/03/15

PBS Engineering + Environmental
4412 SW Corbett Avenue
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9321 SE STARK STREET
PORTLAND, OREGON

PBS PROJECT NUMBER:
22338.001

BORING SB-6

BORING SB-6 LOCATION:
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		ASPHALT AND FILL						
		Medium stiff brown SILT (ML); medium plasticity; no odor; damp			SB6-3		60	
2.0								
4.0				0				
6.0							80	
8.0		Stiff brown sandy SILT (ML); low plasticity; fine sand; no odor; damp						
10.0				0				
12.0		Loose brown poorly graded SAND (SP); medium sand; no odor; damp					90	
14.0					SB6-15			
		Final boring depth 15.0 feet bgs; boring backfilled with bentonite. Groundwater not encountered at time of exploration.						
16.0								
18.0								
20.0								

BORING METHOD: Push Probe
DRILLED BY: Pacific Soil & Water, LLC
BORING BIT DIAMETER: 2¼-inch OD

LOGGED BY: S. Braunsten
COMPLETED: 11/03/15

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9321 SE STARK STREET
PORTLAND, OREGON

PBS PROJECT NUMBER:
22338.001

BORING SB-7

BORING SB-7 LOCATION:
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		ASPHALT AND FILL						
		BRICK AND CONCRETE FRAGMENTS						
2.0		Brown SILT (ML); non-plastic; no odor; damp **FILL**					45	
4.0				0				
6.0								
8.0		Very stiff brown sandy SILT (ML); low plasticity; coarse sand; no odor; damp					50	
10.0				0				
12.0		Loose brown silty SAND (SM); non-plastic; coarse sand; no odor; damp			SB7-11		60	
14.0					SB7-05			
				0				
16.0		Final boring depth 15.0 feet bgs; boring backfilled with bentonite. Groundwater not encountered at time of exploration.						
18.0								
20.0								

BORING METHOD: Push Probe
DRILLED BY: Pacific Soil & Water, LLC
BORING BIT DIAMETER: 2¼-inch OD

LOGGED BY: S. Braunsten
COMPLETED: 11/03/15

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9321 SE STARK STREET
PORTLAND, OREGON

PBS PROJECT NUMBER:
22338.001

BORING SB-8

BORING SB-8 LOCATION:
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		ASPHALT AND FILL						
		Medium stiff brown SILT; medium plasticity; no odor; moist						
2.0							40	
		Red, white, and brown brick, concrete, and debris; no odor; damp						
4.0				0				
		FILL						
6.0								
		Loose brown SAND (SP); coarse sand; no odor; damp					40	
8.0								
				0				
10.0								
12.0		Loose brown silty SAND (SM); non-plastic; coarse sand; no odor; damp			SB8-12		80	
14.0				0	SB8-15			
		Final boring depth 15.0 feet bgs; boring backfilled with bentonite. Groundwater not encountered at time of exploration.						
16.0								
18.0								
20.0								

BORING METHOD: Push Probe
DRILLED BY: Pacific Soil & Water, LLC
BORING BIT DIAMETER: 2¼-inch OD

LOGGED BY: S. Braunsten
COMPLETED: 11/03/15

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9321 SE STARK STREET
PORTLAND, OREGON

PBS PROJECT NUMBER:
22338.001

BORING SB-9

BORING SB-9 LOCATION:
(See Site Plan)

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		ASPHALT AND FILL						
		BRICK AND CONCRETE FRAGMENTS						
2.0		Loose brown silty SAND (SM); non-plastic; coarse sand; no odor; damp					60	
4.0		**FILL**		0				
6.0								
8.0		Stiff brown sandy SILT (ML); low plasticity; fine sand; no odor; damp					70	
10.0				0				
12.0		Loose brown silty SAND (SM); non-plastic; medium sand; no odor; damp			SB9-12		100	
14.0				0	SB9-15			
		Final boring depth 15.0 feet bgs; boring backfilled with bentonite. Groundwater not encountered at time of exploration.						
16.0								
18.0								
20.0								

BORING METHOD: Push Probe
DRILLED BY: Pacific Soil & Water, LLC
BORING BIT DIAMETER: 2¼-inch OD

LOGGED BY: S. Braunsten
COMPLETED: 11/03/15

APPENDIX D

Laboratory Reports
Chain-of-Custody Documentation

ANALYTICAL REPORT

November 13, 2015

PBS Engineering & Environmental

Sample Delivery Group:	L799016
Samples Received:	11/05/2015
Project Number:	22338.001
Description:	9321 SE Stark

Report To:

Scott Braunsten
4412 SW Corbett Ave
Portland, OR 97239

Entire Report Reviewed By:

Jarred Willis
Technical Service Representative

SB10-SG L799016-01 Air

Collected by: Scott Braunsten
Collected date/time: 11/03/15 13:05
Received date/time: 11/05/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Volatile Organic Compounds (MS) by Method TO-15	WG827304	2	11/06/15 21:43	11/06/15 21:43	SNH

SB11-SG L799016-02 Air

Collected by: Scott Braunsten
Collected date/time: 11/03/15 14:02
Received date/time: 11/05/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Volatile Organic Compounds (MS) by Method TO-15	WG827304	2	11/06/15 22:36	11/06/15 22:36	SNH

SB10-SG L799016-03 Air

Collected by: Scott Braunsten
Collected date/time: 11/03/15 13:05
Received date/time: 11/05/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Volatile Organic Compounds (GC) by Method ASTM 1946	WG828667	5	11/12/15 15:46	11/12/15 15:46	SNH

SB11-SG L799016-04 Air

Collected by: Scott Braunsten
Collected date/time: 11/03/15 14:02
Received date/time: 11/05/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Volatile Organic Compounds (GC) by Method ASTM 1946	WG828667	5	11/12/15 16:00	11/12/15 16:00	SNH

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jarred Willis
Technical Service Representative

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppb	RDL2 ug/m3	ppbv	ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	2.50	5.94	20.5	48.6		2	WG827304
Allyl chloride	107-05-1	76.53	0.400	1.25	ND	ND		2	WG827304
Benzene	71-43-2	78.10	0.400	1.28	1.01	3.21		2	WG827304
Benzyl Chloride	100-44-7	127	0.400	2.08	ND	ND		2	WG827304
Bromodichloromethane	75-27-4	164	0.400	2.68	ND	ND		2	WG827304
Bromoform	75-25-2	253	1.20	12.4	ND	ND		2	WG827304
Bromomethane	74-83-9	94.90	0.400	1.55	ND	ND		2	WG827304
1,3-Butadiene	106-99-0	54.10	4.00	8.85	ND	ND		2	WG827304
Carbon disulfide	75-15-0	76.10	0.400	1.24	0.554	1.72		2	WG827304
Carbon tetrachloride	56-23-5	154	0.400	2.52	ND	ND		2	WG827304
Chlorobenzene	108-90-7	113	0.400	1.85	ND	ND		2	WG827304
Chloroethane	75-00-3	64.50	0.400	1.06	ND	ND		2	WG827304
Chloroform	67-66-3	119	0.400	1.95	ND	ND		2	WG827304
Chloromethane	74-87-3	50.50	0.400	0.826	ND	ND		2	WG827304
2-Chlorotoluene	95-49-8	126	0.400	2.06	ND	ND		2	WG827304
Cyclohexane	110-82-7	84.20	0.400	1.38	ND	ND		2	WG827304
Dibromochloromethane	124-48-1	208	0.400	3.40	ND	ND		2	WG827304
1,2-Dibromoethane	106-93-4	188	0.400	3.08	ND	ND		2	WG827304
1,2-Dichlorobenzene	95-50-1	147	0.400	2.40	ND	ND		2	WG827304
1,3-Dichlorobenzene	541-73-1	147	0.400	2.40	ND	ND		2	WG827304
1,4-Dichlorobenzene	106-46-7	147	0.400	2.40	ND	ND		2	WG827304
1,2-Dichloroethane	107-06-2	99	0.400	1.62	ND	ND		2	WG827304
1,1-Dichloroethane	75-34-3	98	0.400	1.60	ND	ND		2	WG827304
1,1-Dichloroethene	75-35-4	96.90	0.400	1.59	ND	ND		2	WG827304
cis-1,2-Dichloroethene	156-59-2	96.90	0.400	1.59	ND	ND		2	WG827304
trans-1,2-Dichloroethene	156-60-5	96.90	0.400	1.59	ND	ND		2	WG827304
1,2-Dichloropropane	78-87-5	113	0.400	1.85	ND	ND		2	WG827304
cis-1,3-Dichloropropene	10061-01-5	111	0.400	1.82	ND	ND		2	WG827304
trans-1,3-Dichloropropene	10061-02-6	111	0.400	1.82	ND	ND		2	WG827304
1,4-Dioxane	123-91-1	88.10	0.400	1.44	ND	ND		2	WG827304
Ethanol	64-17-5	46.10	1.26	2.38	14.8	27.8		2	WG827304
Ethylbenzene	100-41-4	106	0.400	1.73	0.625	2.71		2	WG827304
4-Ethyltoluene	622-96-8	120	0.400	1.96	ND	ND		2	WG827304
Trichlorofluoromethane	75-69-4	137.40	0.400	2.25	ND	ND		2	WG827304
Dichlorodifluoromethane	75-71-8	120.92	0.400	1.98	ND	ND		2	WG827304
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.400	3.07	ND	ND		2	WG827304
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.400	2.80	ND	ND		2	WG827304
Heptane	142-82-5	100	0.400	1.64	1.21	4.95		2	WG827304
Hexachloro-1,3-butadiene	87-68-3	261	1.26	13.5	ND	ND		2	WG827304
n-Hexane	110-54-3	86.20	0.400	1.41	1.03	3.62		2	WG827304
Isopropylbenzene	98-82-8	120.20	0.400	1.97	ND	ND		2	WG827304
Methylene Chloride	75-09-2	84.90	0.400	1.39	ND	ND		2	WG827304
Methyl Butyl Ketone	591-78-6	100	2.50	10.2	ND	ND		2	WG827304
2-Butanone (MEK)	78-93-3	72.10	2.50	7.37	4.67	13.8		2	WG827304
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	2.50	10.2	5.40	22.1		2	WG827304
Methyl methacrylate	80-62-6	100.12	0.400	1.64	0.725	2.97		2	WG827304
MTBE	1634-04-4	88.10	0.400	1.44	ND	ND		2	WG827304
Naphthalene	91-20-3	128	1.26	6.60	ND	ND		2	WG827304
2-Propanol	67-63-0	60.10	2.50	6.15	ND	ND		2	WG827304
Propene	115-07-1	42.10	0.800	1.38	23.9	41.2		2	WG827304
Styrene	100-42-5	104	0.400	1.70	ND	ND		2	WG827304
1,1,2,2-Tetrachloroethane	79-34-5	168	0.400	2.75	ND	ND		2	WG827304
Tetrachloroethylene	127-18-4	166	0.400	2.72	ND	ND		2	WG827304
Tetrahydrofuran	109-99-9	72.10	0.400	1.18	ND	ND		2	WG827304
Toluene	108-88-3	92.10	0.400	1.51	2.24	8.46		2	WG827304
1,2,4-Trichlorobenzene	120-82-1	181	1.26	9.33	ND	ND		2	WG827304

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1	RDL2	ppbv	ug/m3	Qualifier	Dilution	Batch
			ppb	ug/m3	ppb				
1,1,1-Trichloroethane	71-55-6	133	0.400	2.18	ND	ND		2	WG827304
1,1,2-Trichloroethane	79-00-5	133	0.400	2.18	ND	ND		2	WG827304
Trichloroethylene	79-01-6	131	0.400	2.14	ND	ND		2	WG827304
1,2,4-Trimethylbenzene	95-63-6	120	0.400	1.96	1.27	6.21		2	WG827304
1,3,5-Trimethylbenzene	108-67-8	120	0.400	1.96	ND	ND		2	WG827304
2,2,4-Trimethylpentane	540-84-1	114.22	0.400	1.87	ND	ND		2	WG827304
Vinyl chloride	75-01-4	62.50	0.400	1.02	ND	ND		2	WG827304
Vinyl Bromide	593-60-2	106.95	0.400	1.75	ND	ND		2	WG827304
Vinyl acetate	108-05-4	86.10	0.400	1.41	ND	ND		2	WG827304
m&p-Xylene	1330-20-7	106	0.800	3.47	1.94	8.43		2	WG827304
o-Xylene	95-47-6	106	0.400	1.73	0.764	3.31		2	WG827304
TPH (GC/MS) Low Fraction	8006-61-9	101	100	413	211	872		2	WG827304
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*103*				WG827304

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppb	RDL2 ug/m3	ppbv ppb	ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	2.50	5.94	20.5	48.8		2	WG827304
Allyl chloride	107-05-1	76.53	0.400	1.25	ND	ND		2	WG827304
Benzene	71-43-2	78.10	0.400	1.28	1.32	4.22		2	WG827304
Benzyl Chloride	100-44-7	127	0.400	2.08	ND	ND		2	WG827304
Bromodichloromethane	75-27-4	164	0.400	2.68	ND	ND		2	WG827304
Bromoform	75-25-2	253	1.20	12.4	ND	ND		2	WG827304
Bromomethane	74-83-9	94.90	0.400	1.55	ND	ND		2	WG827304
1,3-Butadiene	106-99-0	54.10	4.00	8.85	ND	ND		2	WG827304
Carbon disulfide	75-15-0	76.10	0.400	1.24	0.418	1.30		2	WG827304
Carbon tetrachloride	56-23-5	154	0.400	2.52	ND	ND		2	WG827304
Chlorobenzene	108-90-7	113	0.400	1.85	ND	ND		2	WG827304
Chloroethane	75-00-3	64.50	0.400	1.06	ND	ND		2	WG827304
Chloroform	67-66-3	119	0.400	1.95	ND	ND		2	WG827304
Chloromethane	74-87-3	50.50	0.400	0.826	ND	ND		2	WG827304
2-Chlorotoluene	95-49-8	126	0.400	2.06	ND	ND		2	WG827304
Cyclohexane	110-82-7	84.20	0.400	1.38	ND	ND		2	WG827304
Dibromochloromethane	124-48-1	208	0.400	3.40	ND	ND		2	WG827304
1,2-Dibromoethane	106-93-4	188	0.400	3.08	ND	ND		2	WG827304
1,2-Dichlorobenzene	95-50-1	147	0.400	2.40	ND	ND		2	WG827304
1,3-Dichlorobenzene	541-73-1	147	0.400	2.40	ND	ND		2	WG827304
1,4-Dichlorobenzene	106-46-7	147	0.400	2.40	ND	ND		2	WG827304
1,2-Dichloroethane	107-06-2	99	0.400	1.62	ND	ND		2	WG827304
1,1-Dichloroethane	75-34-3	98	0.400	1.60	ND	ND		2	WG827304
1,1-Dichloroethene	75-35-4	96.90	0.400	1.59	ND	ND		2	WG827304
cis-1,2-Dichloroethene	156-59-2	96.90	0.400	1.59	ND	ND		2	WG827304
trans-1,2-Dichloroethene	156-60-5	96.90	0.400	1.59	ND	ND		2	WG827304
1,2-Dichloropropane	78-87-5	113	0.400	1.85	ND	ND		2	WG827304
cis-1,3-Dichloropropene	10061-01-5	111	0.400	1.82	ND	ND		2	WG827304
trans-1,3-Dichloropropene	10061-02-6	111	0.400	1.82	ND	ND		2	WG827304
1,4-Dioxane	123-91-1	88.10	0.400	1.44	ND	ND		2	WG827304
Ethanol	64-17-5	46.10	1.26	2.38	38.8	73.2		2	WG827304
Ethylbenzene	100-41-4	106	0.400	1.73	ND	ND		2	WG827304
4-Ethyltoluene	622-96-8	120	0.400	1.96	ND	ND		2	WG827304
Trichlorofluoromethane	75-69-4	137.40	0.400	2.25	ND	ND		2	WG827304
Dichlorodifluoromethane	75-71-8	120.92	0.400	1.98	ND	ND		2	WG827304
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.400	3.07	ND	ND		2	WG827304
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.400	2.80	ND	ND		2	WG827304
Heptane	142-82-5	100	0.400	1.64	0.592	2.42		2	WG827304
Hexachloro-1,3-butadiene	87-68-3	261	1.26	13.5	ND	ND		2	WG827304
n-Hexane	110-54-3	86.20	0.400	1.41	0.700	2.47		2	WG827304
Isopropylbenzene	98-82-8	120.20	0.400	1.97	ND	ND		2	WG827304
Methylene Chloride	75-09-2	84.90	0.400	1.39	ND	ND		2	WG827304
Methyl Butyl Ketone	591-78-6	100	2.50	10.2	ND	ND		2	WG827304
2-Butanone (MEK)	78-93-3	72.10	2.50	7.37	4.05	11.9		2	WG827304
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	2.50	10.2	ND	ND		2	WG827304
Methyl methacrylate	80-62-6	100.12	0.400	1.64	ND	ND		2	WG827304
MTBE	1634-04-4	88.10	0.400	1.44	ND	ND		2	WG827304
Naphthalene	91-20-3	128	1.26	6.60	ND	ND		2	WG827304
2-Propanol	67-63-0	60.10	2.50	6.15	4.61	11.3		2	WG827304
Propene	115-07-1	42.10	0.800	1.38	20.9	36.0		2	WG827304
Styrene	100-42-5	104	0.400	1.70	ND	ND		2	WG827304
1,1,2,2-Tetrachloroethane	79-34-5	168	0.400	2.75	ND	ND		2	WG827304
Tetrachloroethylene	127-18-4	166	0.400	2.72	0.464	3.15		2	WG827304
Tetrahydrofuran	109-99-9	72.10	0.400	1.18	ND	ND		2	WG827304
Toluene	108-88-3	92.10	0.400	1.51	2.03	7.64		2	WG827304
1,2,4-Trichlorobenzene	120-82-1	181	1.26	9.33	ND	ND		2	WG827304

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1	RDL2	ppbv	ug/m3	Qualifier	Dilution	Batch
			ppb	ug/m3	ppb				
1,1,1-Trichloroethane	71-55-6	133	0.400	2.18	ND	ND		2	WG827304
1,1,2-Trichloroethane	79-00-5	133	0.400	2.18	ND	ND		2	WG827304
Trichloroethylene	79-01-6	131	0.400	2.14	ND	ND		2	WG827304
1,2,4-Trimethylbenzene	95-63-6	120	0.400	1.96	ND	ND		2	WG827304
1,3,5-Trimethylbenzene	108-67-8	120	0.400	1.96	ND	ND		2	WG827304
2,2,4-Trimethylpentane	540-84-1	114.22	0.400	1.87	ND	ND		2	WG827304
Vinyl chloride	75-01-4	62.50	0.400	1.02	ND	ND		2	WG827304
Vinyl Bromide	593-60-2	106.95	0.400	1.75	ND	ND		2	WG827304
Vinyl acetate	108-05-4	86.10	0.400	1.41	ND	ND		2	WG827304
m&p-Xylene	1330-20-7	106	0.800	3.47	0.908	3.94		2	WG827304
o-Xylene	95-47-6	106	0.400	1.73	ND	ND		2	WG827304
TPH (GC/MS) Low Fraction	8006-61-9	101	100	413	180	745		2	WG827304
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*100*				WG827304

Volatile Organic Compounds (GC) by Method ASTM 1946

Analyte	CAS #	Mol. Wt.	RDL	Result	Qualifier	Dilution	Batch
			ppb	ppb			
Helium	7440-59-7		500000	4230000		5	WG828667

Volatile Organic Compounds (GC) by Method ASTM 1946

Analyte	CAS #	Mol. Wt.	RDL	Result	Qualifier	Dilution	Batch
			ppb	ppb			
Helium	7440-59-7		500000	3980000		5	WG828667

Method Blank (MB)

(MB) 11/12/15 15:20

Analyte	MB Result	MB Qualifier	MB RDL
	ppm		ppm
Helium	ND		100

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 11/12/15 14:34 • (LCSD) 11/12/15 15:01

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ppm	ppm	ppm	%	%	%			%	%
Helium	500	481	474	96.3	94.9	70.0-130			1.45	25

Method Blank (MB)

(MB) 11/06/15 13:57

Analyte	MB Result ppb	MB Qualifier	MB RDL ppb
Acetone	ND		1.25
Allyl Chloride	ND		0.200
Benzene	ND		0.200
Benzyl Chloride	ND		0.200
Bromodichloromethane	ND		0.200
Bromoform	ND		0.600
Bromomethane	ND		0.200
1,3-Butadiene	ND		2.00
Carbon disulfide	ND		0.200
Carbon tetrachloride	ND		0.200
Chlorobenzene	ND		0.200
Chloroethane	ND		0.200
Chloroform	ND		0.200
Chloromethane	ND		0.200
2-Chlorotoluene	ND		0.200
Cyclohexane	ND		0.200
Dibromochloromethane	ND		0.200
1,2-Dibromoethane	ND		0.200
1,2-Dichlorobenzene	ND		0.200
1,3-Dichlorobenzene	ND		0.200
1,4-Dichlorobenzene	ND		0.200
1,2-Dichloroethane	ND		0.200
1,1-Dichloroethane	ND		0.200
1,1-Dichloroethene	ND		0.200
cis-1,2-Dichloroethene	ND		0.200
trans-1,2-Dichloroethene	ND		0.200
1,2-Dichloropropane	ND		0.200
cis-1,3-Dichloropropene	ND		0.200
trans-1,3-Dichloropropene	ND		0.200
1,4-Dioxane	ND		0.200
Ethylbenzene	ND		0.200
4-Ethyltoluene	ND		0.200
Trichlorofluoromethane	ND		0.200
Dichlorodifluoromethane	ND		0.200
1,1,2-Trichlorotrifluoroethane	ND		0.200
1,2-Dichlorotetrafluoroethane	ND		0.200

Method Blank (MB)

(MB) 11/06/15 13:57

Analyte	MB Result ppb	MB Qualifier	MB RDL ppb
Heptane	ND		0.200
Hexachloro-1,3-butadiene	ND		0.630
n-Hexane	ND		0.200
Isopropylbenzene	ND		0.200
Methylene Chloride	ND		0.200
Methyl Butyl Ketone	ND		1.25
2-Butanone (MEK)	ND		1.25
4-Methyl-2-pentanone (MIBK)	ND		1.25
Methyl Methacrylate	ND		0.200
MTBE	ND		0.200
Naphthalene	ND		0.630
2-Propanol	ND		1.25
Propene	ND		0.400
Styrene	ND		0.200
1,1,2,2-Tetrachloroethane	ND		0.200
Tetrachloroethylene	ND		0.200
Tetrahydrofuran	ND		0.200
Toluene	ND		0.200
1,2,4-Trichlorobenzene	ND		0.630
1,1,1-Trichloroethane	ND		0.200
1,1,2-Trichloroethane	ND		0.200
Trichloroethylene	ND		0.200
1,2,4-Trimethylbenzene	ND		0.200
1,3,5-Trimethylbenzene	ND		0.200
2,2,4-Trimethylpentane	ND		0.200
Vinyl chloride	ND		0.200
Vinyl Bromide	ND		0.200
Vinyl acetate	ND		0.200
m&p-Xylene	ND		0.400
o-Xylene	ND		0.200
Ethanol	ND		0.630
TPH (GC/MS) Low Fraction	ND		50.0
(S) 1,4-Bromofluorobenzene	*95.6*		*60.0-140*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 11/06/15 12:09 • (LCSD) 11/06/15 13:03

Analyte	Spike Amount ppb	LCS Result ppb	LCSD Result ppb	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Ethanol	3.75	4.57	4.85	122	129	34.3-167			6.05	25
Propene	3.75	3.47	3.53	92.6	94.1	53.9-143			1.64	25
Dichlorodifluoromethane	3.75	3.54	3.14	94.5	83.8	56.7-140			12.0	25
1,2-Dichlorotetrafluoroethane	3.75	3.69	3.78	98.4	101	70.0-130			2.41	25
Chloromethane	3.75	3.85	3.84	103	102	70.0-130			0.360	25
Vinyl chloride	3.75	3.84	3.98	102	106	70.0-130			3.48	25
1,3-Butadiene	3.75	4.04	4.18	108	111	70.0-130			3.41	25
Bromomethane	3.75	3.60	3.85	96.0	103	70.0-130			6.81	25
Chloroethane	3.75	3.74	4.11	99.6	110	70.0-130			9.61	25
Trichlorofluoromethane	3.75	3.65	3.93	97.4	105	70.0-130			7.49	25
1,1,2-Trichlorotrifluoroethane	3.75	3.59	3.80	95.7	101	70.0-130			5.70	25
1,1-Dichloroethene	3.75	3.82	4.04	102	108	70.0-130			5.63	25
1,1-Dichloroethane	3.75	3.93	4.02	105	107	70.0-130			2.21	25
Acetone	3.75	3.99	4.15	106	111	70.0-130			3.80	25
2-Propanol	3.75	4.33	4.42	115	118	50.4-152			1.92	25
Carbon disulfide	3.75	3.69	3.93	98.4	105	70.0-130			6.22	25
Methylene Chloride	3.75	3.38	3.57	90.1	95.2	70.0-130			5.44	25
MTBE	3.75	4.09	4.20	109	112	70.0-130			2.72	25
trans-1,2-Dichloroethene	3.75	3.84	4.03	102	108	70.0-130			4.94	25
n-Hexane	3.75	3.81	3.93	102	105	70.0-130			3.21	25
Vinyl acetate	3.75	4.57	4.46	122	119	70.0-130			2.25	25
Methyl Ethyl Ketone	3.75	4.26	4.29	113	114	70.0-130			0.830	25
cis-1,2-Dichloroethene	3.75	4.04	4.11	108	110	70.0-130			1.85	25
Chloroform	3.75	3.81	3.89	102	104	70.0-130			2.21	25
Cyclohexane	3.75	4.02	4.14	107	110	70.0-130			2.89	25
1,1,1-Trichloroethane	3.75	3.84	3.95	102	105	70.0-130			2.84	25
Carbon tetrachloride	3.75	3.84	3.95	102	105	70.0-130			2.89	25
Benzene	3.75	4.20	4.25	112	113	70.0-130			1.23	25
1,2-Dichloroethane	3.75	4.26	4.33	113	116	70.0-130			1.78	25
Heptane	3.75	4.58	4.63	122	123	70.0-130			1.10	25
Trichloroethylene	3.75	4.22	4.28	113	114	70.0-130			1.43	25
1,2-Dichloropropane	3.75	4.30	4.33	115	116	70.0-130			0.690	25
1,4-Dioxane	3.75	4.88	5.00	130	133	48.0-156			2.53	25
Bromodichloromethane	3.75	4.25	4.26	113	113	70.0-130			0.0900	25
cis-1,3-Dichloropropene	3.75	4.55	4.54	121	121	70.0-130			0.0900	25
4-Methyl-2-pentanone (MIBK)	3.75	4.95	5.14	132	137	55.3-154			3.60	25

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 11/06/15 12:09 • (LCSD) 11/06/15 13:03

Analyte	Spike Amount ppb	LCS Result ppb	LCSD Result ppb	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Toluene	3.75	4.36	4.35	116	116	70.0-130			0.260	25
trans-1,3-Dichloropropene	3.75	4.69	4.66	125	124	70.0-130			0.670	25
1,1,2-Trichloroethane	3.75	4.20	4.20	112	112	70.0-130			0.0300	25
Tetrachloroethylene	3.75	4.06	4.09	108	109	70.0-130			0.660	25
Methyl Butyl Ketone	3.75	5.15	5.34	137	143	47.9-165			3.76	25
Dibromochloromethane	3.75	4.28	4.22	114	113	70.0-130			1.24	25
1,2-Dibromoethane	3.75	4.36	4.32	116	115	70.0-130			0.810	25
Chlorobenzene	3.75	4.16	4.13	111	110	70.0-130			0.910	25
Ethylbenzene	3.75	4.31	4.37	115	116	70.0-130			1.21	25
m&p-Xylene	7.50	8.52	8.70	114	116	70.0-130			2.04	25
o-Xylene	3.75	4.51	4.62	120	123	70.0-130			2.40	25
Styrene	3.75	4.47	4.52	119	120	70.0-130			1.11	25
Bromoform	3.75	4.20	4.23	112	113	70.0-130			0.690	25
1,1,2,2-Tetrachloroethane	3.75	4.27	4.35	114	116	70.0-130			1.82	25
4-Ethyltoluene	3.75	4.51	4.60	120	123	70.0-130			1.97	25
1,3,5-Trimethylbenzene	3.75	4.46	4.49	119	120	70.0-130			0.640	25
1,2,4-Trimethylbenzene	3.75	4.58	4.67	122	125	70.0-130			1.94	25
1,3-Dichlorobenzene	3.75	4.43	4.46	118	119	70.0-130			0.760	25
1,4-Dichlorobenzene	3.75	4.53	4.52	121	121	70.0-130			0.140	25
Benzyl Chloride	3.75	4.83	4.92	129	131	55.6-160			1.83	25
1,2-Dichlorobenzene	3.75	4.31	4.39	115	117	70.0-130			1.92	25
1,2,4-Trichlorobenzene	3.75	4.72	4.64	126	124	53.6-154			1.71	25
Hexachloro-1,3-butadiene	3.75	4.19	4.25	112	113	62.1-143			1.59	25
Naphthalene	3.75	4.80	4.83	128	129	52.0-158			0.510	25
TPH (GC/MS) Low Fraction	150	164	169	109	113	70.0-130			3.17	25
Allyl Chloride	3.75	4.02	4.20	107	112	70.0-130			4.46	25
2-Chlorotoluene	3.75	4.38	4.44	117	118	70.0-130			1.31	25
Methyl Methacrylate	3.75	4.70	4.64	125	124	70.0-130			1.24	25
Tetrahydrofuran	3.75	4.47	4.51	119	120	65.0-140			1.00	25
2,2,4-Trimethylpentane	3.75	4.19	4.24	112	113	70.0-130			1.15	25
Vinyl Bromide	3.75	3.58	3.96	95.5	106	70.0-130			10.1	25
Isopropylbenzene	3.75	4.50	4.59	120	122	70.0-130			2.04	25
(S) 1,4-Bromofluorobenzene				*103*	*104*	*60.0-140*				

Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND,U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.
SDL	Sample Detection Limit.
MQL	Method Quantitation Limit.
Unadj. MQL	Unadjusted Method Quantitation Limit.

Qualifier	Description
	The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE.**

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Alaska	UST-080	New Hampshire	2975
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California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Conneticut	PH-0197	North Carolina [1]	DW21704
Florida	E87487	North Carolina [2]	41
Georgia	NELAP	North Dakota	R-140
Georgia [1]	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky [1]	90010	South Dakota	n/a
Kentucky [2]	16	Tennessee [1 4]	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

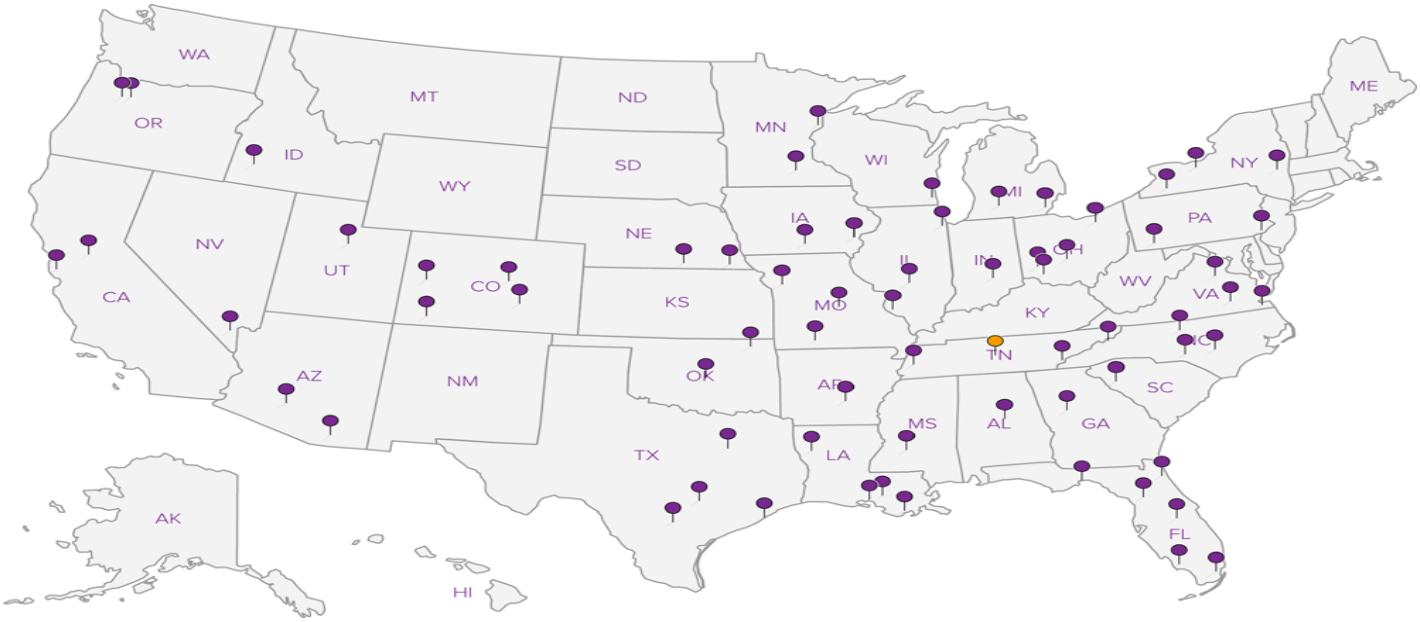
Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [n/a] Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



Company Name/Address:
PBS Engineering
4412 SW Corbett Ave
Portland, OR 97239

Billing Information:
Accounts Payable
4412 SW Corbett Ave
Portland, OR 97239

Analysis: TO-15/Helium Summa

Chain of Custody Page 1 of 1

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L799016
F095

Report to: **Scott Braunsten**

Email To: **scott.braunsten@pbsenv.com**

Project Description: **9321 SE Stark**

City/State Collected: **Portland, OR**

Phone: **503-248-1939**
Fax:

Client Project # **22338.001**

Lab Project # **PBSENGPOR-22338**

Collected by (print): Scott Braunsten

Site/Facility ID #

P.O. #

Collected by (signature):

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No ✓Yes
FAX? ✓No ___Yes

Canister Pressure/Vacuum

Acctnum: **PBSENGPOR**
Template: **T106796**
Prelogin: **P528765**
TSR: **358-Jarred Willis**
PB:
Shipped Via:

Sample ID	Sample Description	Can #	Date	Time	Initial	Final	Rem./Contaminant	Sample # (lab only)
SB10-SG	Soil gas from SB-10	2069	11/3/15	1300-1305	-29.5	-6	X	-01
SB11-SG	Soil gas from SB-11	1639	11/3/15	1357-1402	-29.5	-5	X	02

Remarks:

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Samples returned via: ☐ UPS ☒ FedEx ☐ Courier ☐ ____	Condition: (lab use only)
	11/3/15	1700			FCB3 TD
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: Amb °C Bottles Received: 2 + lemoby	COC Seal Intact: ___Y ___N ✓NA
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 11-5-15 Time: 0900	pH Checked: NCF:

ANALYTICAL REPORT

November 17, 2015

PBS Engineering & Environmental

Sample Delivery Group:	L799111
Samples Received:	11/05/2015
Project Number:	22338.000
Description:	9321 SE Stark

Report To:

Scott Braunsten
4412 SW Corbett Ave
Portland, OR 97239

Entire Report Reviewed By:

Jarred Willis
Technical Service Representative

SB1-26 L799111-01 Solid

Collected by: Scott Braunsten | Collected date/time: 11/03/15 09:37 | Received date/time: 11/05/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Mercury by Method 7471A	WG827123	1	11/06/15 16:35	11/09/15 11:02	BRJ
Metals (ICP) by Method 6010B	WG827638	1	11/09/15 20:24	11/09/15 23:34	ST
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX	WG828055	1	11/10/15 23:37	11/11/15 12:51	KLM
Total Solids by Method 2540 G-2011	WG827432	1	11/09/15 11:03	11/10/15 06:38	MEL
Volatile Organic Compounds (GC) by Method NWTPHGX	WG827210	1	11/06/15 06:00	11/06/15 19:28	BMB

SB2-8 L799111-02 Solid

Collected by: Scott Braunsten | Collected date/time: 11/03/15 10:30 | Received date/time: 11/05/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM	WG829138	1	11/15/15 09:24	11/16/15 01:54	KMP
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX	WG828055	1	11/10/15 23:37	11/11/15 13:04	KLM
Total Solids by Method 2540 G-2011	WG827432	1	11/09/15 11:03	11/10/15 06:39	MEL
Volatile Organic Compounds (GC) by Method NWTPHGX	WG827210	1	11/06/15 06:00	11/06/15 21:45	BMB
Volatile Organic Compounds (GC/MS) by Method 8260B	WG828752	1	11/12/15 23:54	11/14/15 02:45	BMB

SB3-1 L799111-03 Solid

Collected by: Scott Braunsten | Collected date/time: 11/03/15 14:50 | Received date/time: 11/05/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX	WG828055	1	11/10/15 23:37	11/11/15 13:16	KLM
Total Solids by Method 2540 G-2011	WG827432	1	11/09/15 11:03	11/10/15 06:39	MEL
Volatile Organic Compounds (GC) by Method NWTPHGX	WG827210	1	11/06/15 06:00	11/06/15 22:05	BMB

SB4-1 L799111-04 Solid

Collected by: Scott Braunsten | Collected date/time: 11/03/15 14:40 | Received date/time: 11/05/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX	WG828055	1	11/10/15 23:37	11/11/15 13:54	KLM
Total Solids by Method 2540 G-2011	WG827433	1	11/09/15 10:53	11/10/15 06:32	MEL
Volatile Organic Compounds (GC) by Method NWTPHGX	WG827210	1	11/06/15 06:00	11/06/15 22:26	BMB

SB5-1 L799111-05 Solid

Collected by: Scott Braunsten | Collected date/time: 11/03/15 14:30 | Received date/time: 11/05/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX	WG828055	1	11/10/15 23:37	11/11/15 16:40	KLM
Total Solids by Method 2540 G-2011	WG827433	1	11/09/15 10:53	11/10/15 06:33	MEL
Volatile Organic Compounds (GC) by Method NWTPHGX	WG827541	1	11/07/15 16:34	11/07/15 20:48	BMB

SB6-3 L799111-06 Solid

Collected by: Scott Braunsten | Collected date/time: 11/03/15 10:40 | Received date/time: 11/05/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX	WG828055	1	11/10/15 23:37	11/11/15 14:07	KLM
Total Solids by Method 2540 G-2011	WG827433	1	11/09/15 10:53	11/10/15 06:33	MEL
Volatile Organic Compounds (GC) by Method NWTPHGX	WG827541	1	11/07/15 16:34	11/07/15 21:09	BMB

SB7-11 L799111-07 Solid

Collected by: Scott Braunsten
Collected date/time: 11/03/15 11:18
Received date/time: 11/05/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX	WG828055	1	11/10/15 23:37	11/11/15 14:20	KLM
Total Solids by Method 2540 G-2011	WG827433	1	11/09/15 10:53	11/10/15 06:33	MEL
Volatile Organic Compounds (GC) by Method NWTPHGX	WG827541	1	11/07/15 16:34	11/07/15 21:30	BMB

SB8-12 L799111-08 Solid

Collected by: Scott Braunsten
Collected date/time: 11/03/15 11:45
Received date/time: 11/05/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX	WG828055	1	11/10/15 23:37	11/11/15 14:33	KLM
Total Solids by Method 2540 G-2011	WG827433	1	11/09/15 10:53	11/10/15 06:34	MEL
Volatile Organic Compounds (GC) by Method NWTPHGX	WG827541	1	11/07/15 16:34	11/07/15 21:51	BMB

SB9-12 L799111-09 Solid

Collected by: Scott Braunsten
Collected date/time: 11/03/15 12:10
Received date/time: 11/05/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM	WG829138	10	11/15/15 09:24	11/16/15 09:04	KMP
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX	WG828055	1	11/10/15 23:37	11/11/15 16:27	KLM
Total Solids by Method 2540 G-2011	WG827433	1	11/09/15 10:53	11/10/15 06:34	MEL
Volatile Organic Compounds (GC) by Method NWTPHGX	WG827541	1.11	11/07/15 16:34	11/07/15 22:12	BMB

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jarred Willis
Technical Service Representative

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	88.3		1	11/10/2015 06:38	WG827432

Mercury by Method 7471A

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Mercury	ND		0.0226	1	11/09/2015 11:02	WG827123

Metals (ICP) by Method 6010B

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Arsenic	ND		2.26	1	11/09/2015 23:34	WG827638
Barium	38.5		0.566	1	11/09/2015 23:34	WG827638
Cadmium	ND		0.566	1	11/09/2015 23:34	WG827638
Chromium	3.82		1.13	1	11/09/2015 23:34	WG827638
Lead	4.23		0.566	1	11/09/2015 23:34	WG827638
Selenium	ND		2.26	1	11/09/2015 23:34	WG827638
Silver	ND		1.13	1	11/09/2015 23:34	WG827638

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Gasoline Range Organics-NWTPH	ND		0.113	1	11/06/2015 19:28	WG827210
(S) a,a,a-Trifluorotoluene(FID)	*98.1*		*59.0-128*		*11/06/2015 19:28*	WG827210

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Diesel Range Organics (DRO)	ND		4.53	1	11/11/2015 12:51	WG828055
Residual Range Organics (RRO)	ND		11.3	1	11/11/2015 12:51	WG828055
(S) o-Terphenyl	*79.9*		*50.0-150*		*11/11/2015 12:51*	WG828055

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	74.6		1	11/10/2015 06:39	WG827432

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Gasoline Range Organics-NWTPH	1.74		0.134	1	11/06/2015 21:45	WG827210
(S) a,a,a-Trifluorotoluene(FID)	*97.8*		*59.0-128*		*11/06/2015 21:45*	WG827210

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Acetone	ND		0.0670	1	11/14/2015 02:45	WG828752
Acrylonitrile	ND		0.0134	1	11/14/2015 02:45	WG828752
Benzene	ND		0.00134	1	11/14/2015 02:45	WG828752
Bromobenzene	ND		0.00134	1	11/14/2015 02:45	WG828752
Bromodichloromethane	ND		0.00134	1	11/14/2015 02:45	WG828752
Bromoform	ND		0.00134	1	11/14/2015 02:45	WG828752
Bromomethane	ND		0.00670	1	11/14/2015 02:45	WG828752
n-Butylbenzene	ND		0.00134	1	11/14/2015 02:45	WG828752
sec-Butylbenzene	ND		0.00134	1	11/14/2015 02:45	WG828752
tert-Butylbenzene	ND		0.00134	1	11/14/2015 02:45	WG828752
Carbon tetrachloride	ND		0.00134	1	11/14/2015 02:45	WG828752
Chlorobenzene	ND		0.00134	1	11/14/2015 02:45	WG828752
Chlorodibromomethane	ND		0.00134	1	11/14/2015 02:45	WG828752
Chloroethane	ND		0.00670	1	11/14/2015 02:45	WG828752
2-Chloroethyl vinyl ether	ND		0.0670	1	11/14/2015 02:45	WG828752
Chloroform	ND		0.00670	1	11/14/2015 02:45	WG828752
Chloromethane	ND		0.00335	1	11/14/2015 02:45	WG828752
2-Chlorotoluene	ND		0.00134	1	11/14/2015 02:45	WG828752
4-Chlorotoluene	ND		0.00134	1	11/14/2015 02:45	WG828752
1,2-Dibromo-3-Chloropropane	ND		0.00670	1	11/14/2015 02:45	WG828752
1,2-Dibromoethane	ND		0.00134	1	11/14/2015 02:45	WG828752
Dibromomethane	ND		0.00134	1	11/14/2015 02:45	WG828752
1,2-Dichlorobenzene	ND		0.00134	1	11/14/2015 02:45	WG828752
1,3-Dichlorobenzene	ND		0.00134	1	11/14/2015 02:45	WG828752
1,4-Dichlorobenzene	ND		0.00134	1	11/14/2015 02:45	WG828752
Dichlorodifluoromethane	ND		0.00670	1	11/14/2015 02:45	WG828752
1,1-Dichloroethane	ND		0.00134	1	11/14/2015 02:45	WG828752
1,2-Dichloroethane	ND		0.00134	1	11/14/2015 02:45	WG828752
1,1-Dichloroethene	ND		0.00134	1	11/14/2015 02:45	WG828752
cis-1,2-Dichloroethene	ND		0.00134	1	11/14/2015 02:45	WG828752
trans-1,2-Dichloroethene	0.00493		0.00134	1	11/14/2015 02:45	WG828752
1,2-Dichloropropane	ND		0.00134	1	11/14/2015 02:45	WG828752
1,1-Dichloropropene	ND		0.00134	1	11/14/2015 02:45	WG828752
1,3-Dichloropropane	ND		0.00134	1	11/14/2015 02:45	WG828752
cis-1,3-Dichloropropene	ND		0.00134	1	11/14/2015 02:45	WG828752
trans-1,3-Dichloropropene	ND		0.00134	1	11/14/2015 02:45	WG828752
2,2-Dichloropropane	ND		0.00134	1	11/14/2015 02:45	WG828752
Di-isopropyl ether	ND		0.00134	1	11/14/2015 02:45	WG828752
Ethylbenzene	ND		0.00134	1	11/14/2015 02:45	WG828752
Hexachloro-1,3-butadiene	ND		0.00134	1	11/14/2015 02:45	WG828752
Isopropylbenzene	ND		0.00134	1	11/14/2015 02:45	WG828752
p-Isopropyltoluene	ND		0.00134	1	11/14/2015 02:45	WG828752
2-Butanone (MEK)	ND		0.0134	1	11/14/2015 02:45	WG828752
Methylene Chloride	ND		0.00670	1	11/14/2015 02:45	WG828752

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
4-Methyl-2-pentanone (MIBK)	ND		0.0134	1	11/14/2015 02:45	WG828752
Methyl tert-butyl ether	ND		0.00134	1	11/14/2015 02:45	WG828752
Naphthalene	ND		0.00670	1	11/14/2015 02:45	WG828752
n-Propylbenzene	ND		0.00134	1	11/14/2015 02:45	WG828752
Styrene	ND		0.00134	1	11/14/2015 02:45	WG828752
1,1,1,2-Tetrachloroethane	ND		0.00134	1	11/14/2015 02:45	WG828752
1,1,2,2-Tetrachloroethane	ND		0.00134	1	11/14/2015 02:45	WG828752
1,1,2-Trichlorotrifluoroethane	ND		0.00134	1	11/14/2015 02:45	WG828752
Tetrachloroethene	ND		0.00134	1	11/14/2015 02:45	WG828752
Toluene	ND		0.00670	1	11/14/2015 02:45	WG828752
1,2,3-Trichlorobenzene	ND		0.00134	1	11/14/2015 02:45	WG828752
1,2,4-Trichlorobenzene	ND		0.00134	1	11/14/2015 02:45	WG828752
1,1,1-Trichloroethane	ND		0.00134	1	11/14/2015 02:45	WG828752
1,1,2-Trichloroethane	ND		0.00134	1	11/14/2015 02:45	WG828752
Trichloroethene	ND		0.00134	1	11/14/2015 02:45	WG828752
Trichlorofluoromethane	ND		0.00670	1	11/14/2015 02:45	WG828752
1,2,3-Trichloropropane	ND		0.00335	1	11/14/2015 02:45	WG828752
1,2,4-Trimethylbenzene	ND		0.00134	1	11/14/2015 02:45	WG828752
1,2,3-Trimethylbenzene	ND		0.00134	1	11/14/2015 02:45	WG828752
1,3,5-Trimethylbenzene	ND		0.00134	1	11/14/2015 02:45	WG828752
Vinyl chloride	ND		0.00134	1	11/14/2015 02:45	WG828752
Xylenes, Total	ND		0.00402	1	11/14/2015 02:45	WG828752
(S) Toluene-d8	*106*		*88.7-115*		*11/14/2015 02:45*	WG828752
(S) Dibromofluoromethane	*107*		*76.3-123*		*11/14/2015 02:45*	WG828752
(S) 4-Bromofluorobenzene	*101*		*69.7-129*		*11/14/2015 02:45*	WG828752

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Diesel Range Organics (DRO)	7.95		5.36	1	11/11/2015 13:04	WG828055
Residual Range Organics (RRO)	19.0		13.4	1	11/11/2015 13:04	WG828055
(S) o-Terphenyl	*56.9*		*50.0-150*		*11/11/2015 13:04*	WG828055

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.00804	1	11/16/2015 01:54	WG829138
Acenaphthene	ND		0.00804	1	11/16/2015 01:54	WG829138
Acenaphthylene	ND		0.00804	1	11/16/2015 01:54	WG829138
Benzo(a)anthracene	ND		0.00804	1	11/16/2015 01:54	WG829138
Benzo(a)pyrene	ND		0.00804	1	11/16/2015 01:54	WG829138
Benzo(b)fluoranthene	ND		0.00804	1	11/16/2015 01:54	WG829138
Benzo(g,h,i)perylene	ND		0.00804	1	11/16/2015 01:54	WG829138
Benzo(k)fluoranthene	ND		0.00804	1	11/16/2015 01:54	WG829138
Chrysene	ND		0.00804	1	11/16/2015 01:54	WG829138
Dibenz(a,h)anthracene	ND		0.00804	1	11/16/2015 01:54	WG829138
Fluoranthene	ND		0.00804	1	11/16/2015 01:54	WG829138
Fluorene	ND		0.00804	1	11/16/2015 01:54	WG829138
Indeno(1,2,3-cd)pyrene	ND		0.00804	1	11/16/2015 01:54	WG829138
Naphthalene	ND		0.0268	1	11/16/2015 01:54	WG829138
Phenanthrene	ND		0.00804	1	11/16/2015 01:54	WG829138
Pyrene	ND		0.00804	1	11/16/2015 01:54	WG829138
1-Methylnaphthalene	ND		0.0268	1	11/16/2015 01:54	WG829138
2-Methylnaphthalene	ND		0.0268	1	11/16/2015 01:54	WG829138
2-Chloronaphthalene	ND		0.0268	1	11/16/2015 01:54	WG829138

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
(S) Nitrobenzene-d5	*85.1*		*22.1-146*		*11/16/2015 01:54*	WG829138
(S) 2-Fluorobiphenyl	*66.6*		*40.6-122*		*11/16/2015 01:54*	WG829138
(S) p-Terphenyl-d14	*65.0*		*32.2-131*		*11/16/2015 01:54*	WG829138

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	81.7		1	11/10/2015 06:39	WG827432

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Gasoline Range Organics-NWTPH	ND		0.122	1	11/06/2015 22:05	WG827210
(S) a,a,a-Trifluorotoluene(FID)	*98.3*		*59.0-128*		*11/06/2015 22:05*	WG827210

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Diesel Range Organics (DRO)	ND		4.90	1	11/11/2015 13:16	WG828055
Residual Range Organics (RRO)	ND	J3	12.2	1	11/11/2015 13:16	WG828055
(S) o-Terphenyl	*90.1*		*50.0-150*		*11/11/2015 13:16*	WG828055

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	81.0		1	11/10/2015 06:32	WG827433

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Gasoline Range Organics-NWTPH	ND		0.123	1	11/06/2015 22:26	WG827210
(S) a,a,a-Trifluorotoluene(FID)	*98.1*		*59.0-128*		*11/06/2015 22:26*	WG827210

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Diesel Range Organics (DRO)	ND		4.94	1	11/11/2015 13:54	WG828055
Residual Range Organics (RRO)	ND		12.3	1	11/11/2015 13:54	WG828055
(S) o-Terphenyl	*80.6*		*50.0-150*		*11/11/2015 13:54*	WG828055

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	88.4		1	11/10/2015 06:33	WG827433

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Gasoline Range Organics-NWTPH	ND		0.113	1	11/07/2015 20:48	WG827541
(S) a,a,a-Trifluorotoluene(FID)	*97.7*		*59.0-128*		*11/07/2015 20:48*	WG827541

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Diesel Range Organics (DRO)	ND		4.52	1	11/11/2015 16:40	WG828055
Residual Range Organics (RRO)	ND		11.3	1	11/11/2015 16:40	WG828055
(S) o-Terphenyl	*83.7*		*50.0-150*		*11/11/2015 16:40*	WG828055

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	81.8		1	11/10/2015 06:33	WG827433

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Gasoline Range Organics-NWTPH	ND		0.122	1	11/07/2015 21:09	WG827541
(S) a,a,a-Trifluorotoluene(FID)	*98.5*		*59.0-128*		*11/07/2015 21:09*	WG827541

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Diesel Range Organics (DRO)	ND		4.89	1	11/11/2015 14:07	WG828055
Residual Range Organics (RRO)	ND		12.2	1	11/11/2015 14:07	WG828055
(S) o-Terphenyl	*87.2*		*50.0-150*		*11/11/2015 14:07*	WG828055

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	81.8		1	11/10/2015 06:33	WG827433

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Gasoline Range Organics-NWTPH	ND		0.122	1	11/07/2015 21:30	WG827541
(S) a,a,a-Trifluorotoluene(FID)	*97.9*		*59.0-128*		*11/07/2015 21:30*	WG827541

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Diesel Range Organics (DRO)	ND		4.89	1	11/11/2015 14:20	WG828055
Residual Range Organics (RRO)	ND		12.2	1	11/11/2015 14:20	WG828055
(S) o-Terphenyl	*94.2*		*50.0-150*		*11/11/2015 14:20*	WG828055

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	83.7		1	11/10/2015 06:34	WG827433

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Gasoline Range Organics-NWTPH	ND		0.119	1	11/07/2015 21:51	WG827541
(S) a,a,a-Trifluorotoluene(FID)	*97.9*		*59.0-128*		*11/07/2015 21:51*	WG827541

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Diesel Range Organics (DRO)	ND		4.78	1	11/11/2015 14:33	WG828055
Residual Range Organics (RRO)	ND		11.9	1	11/11/2015 14:33	WG828055
(S) o-Terphenyl	*83.9*		*50.0-150*		*11/11/2015 14:33*	WG828055

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	92.4		1	11/10/2015 06:34	WG827433

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Gasoline Range Organics-NWTPH	ND		0.120	1.11	11/07/2015 22:12	WG827541
(S) a,a,a-Trifluorotoluene(FID)	*98.1*		*59.0-128*		*11/07/2015 22:12*	WG827541

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Diesel Range Organics (DRO)	ND		4.33	1	11/11/2015 16:27	WG828055
Residual Range Organics (RRO)	14.4		10.8	1	11/11/2015 16:27	WG828055
(S) o-Terphenyl	*87.6*		*50.0-150*		*11/11/2015 16:27*	WG828055

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Anthracene	ND		0.0649	10	11/16/2015 09:04	WG829138
Acenaphthene	ND		0.0649	10	11/16/2015 09:04	WG829138
Acenaphthylene	ND		0.0649	10	11/16/2015 09:04	WG829138
Benzo(a)anthracene	ND		0.0649	10	11/16/2015 09:04	WG829138
Benzo(a)pyrene	ND		0.0649	10	11/16/2015 09:04	WG829138
Benzo(b)fluoranthene	ND		0.0649	10	11/16/2015 09:04	WG829138
Benzo(g,h,i)perylene	ND		0.0649	10	11/16/2015 09:04	WG829138
Benzo(k)fluoranthene	ND		0.0649	10	11/16/2015 09:04	WG829138
Chrysene	ND		0.0649	10	11/16/2015 09:04	WG829138
Dibenz(a,h)anthracene	ND		0.0649	10	11/16/2015 09:04	WG829138
Fluoranthene	ND		0.0649	10	11/16/2015 09:04	WG829138
Fluorene	ND		0.0649	10	11/16/2015 09:04	WG829138
Indeno(1,2,3-cd)pyrene	ND		0.0649	10	11/16/2015 09:04	WG829138
Naphthalene	ND		0.216	10	11/16/2015 09:04	WG829138
Phenanthrene	ND		0.0649	10	11/16/2015 09:04	WG829138
Pyrene	ND		0.0649	10	11/16/2015 09:04	WG829138
1-Methylnaphthalene	ND		0.216	10	11/16/2015 09:04	WG829138
2-Methylnaphthalene	ND		0.216	10	11/16/2015 09:04	WG829138
2-Chloronaphthalene	ND		0.216	10	11/16/2015 09:04	WG829138
(S) Nitrobenzene-d5	*76.9*		*22.1-146*		*11/16/2015 09:04*	WG829138
(S) 2-Fluorobiphenyl	*69.1*		*40.6-122*		*11/16/2015 09:04*	WG829138
(S) p-Terphenyl-d14	*60.5*		*32.2-131*		*11/16/2015 09:04*	WG829138

Sample Narrative:

8270D-SIM L799111-09 WG829138: Dilution due to matrix

Method Blank (MB)

(MB) 11/10/15 06:36

Analyte	MB Result	MB Qualifier	MB RDL
	%		%
Total Solids	0.000800		

L799109-01 Original Sample (OS) • Duplicate (DUP)

(OS) 11/10/15 06:37 • (DUP) 11/10/15 06:37

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	%	%		%		%
Total Solids	84.7	84.8	1	0.0722		5

Laboratory Control Sample (LCS)

(LCS) 11/10/15 06:36

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	%	%	%	%	
Total Solids	50.0	50.0	99.9	85.0-115	

Method Blank (MB)

(MB) 11/10/15 06:32

Analyte	MB Result	MB Qualifier	MB RDL
	%		%
Total Solids	0.000400		

L799111-06 Original Sample (OS) • Duplicate (DUP)

(OS) 11/10/15 06:33 • (DUP) 11/10/15 06:33

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	%	%		%		%
Total Solids	81.8	81.6	1	0.237		5

Laboratory Control Sample (LCS)

(LCS) 11/10/15 06:32

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	%	%	%	%	
Total Solids	50.0	50.0	100	85.0-115	

Method Blank (MB)

(MB) 11/09/15 10:39

Analyte	MB Result mg/kg	MB Qualifier	MB RDL mg/kg
Mercury	ND		0.0200

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 11/09/15 10:41 • (LCSD) 11/09/15 10:44

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Mercury	0.300	0.264	0.272	88	91	80-120			3	20

L799074-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 11/09/15 10:46 • (MS) 11/09/15 10:49 • (MSD) 11/09/15 10:52

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.300	0.0177	0.278	0.291	87	91	1	75-125			5	20

Method Blank (MB)

(MB) 11/09/15 22:59

Analyte	MB Result mg/kg	MB Qualifier	MB RDL mg/kg
Arsenic	ND		2.00
Barium	ND		0.500
Cadmium	ND		0.500
Chromium	ND		1.00
Lead	ND		0.500
Selenium	ND		2.00
Silver	ND		1.00

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 11/09/15 23:02 • (LCSD) 11/09/15 23:05

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Arsenic	100	95.9	96.1	96	96	80-120			0	20
Barium	100	98.0	98.2	98	98	80-120			0	20
Cadmium	100	96.7	96.8	97	97	80-120			0	20
Chromium	100	96.0	96.1	96	96	80-120			0	20
Lead	100	98.2	98.5	98	99	80-120			0	20
Selenium	100	98.0	99.6	98	100	80-120			2	20
Silver	100	94.1	94.2	94	94	80-120			0	20

L799104-25 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 11/09/15 23:08 • (MS) 11/09/15 23:17 • (MSD) 11/09/15 23:20

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	100	10.8	97.3	107	86	96	1	75-125			9	20
Barium	100	73.7	160	155	86	81	1	75-125			3	20
Cadmium	100	0.890	91.9	100	91	99	1	75-125			9	20
Chromium	100	7.05	90.5	97.2	83	90	1	75-125			7	20
Lead	100	9.92	103	110	93	100	1	75-125			6	20
Selenium	100	0.818	81.1	93.5	80	93	1	75-125			14	20
Silver	100	ND	89.5	98.8	89	99	1	75-125			10	20

Method Blank (MB)

(MB) 11/06/15 04:44

Analyte	MB Result	MB Qualifier	MB RDL
	mg/kg		mg/kg
TPHG C6 - C12	ND		0.100
(S) a,a,a-Trifluorotoluene(FID)	*98.5*		*59.0-128*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 11/06/15 03:42 • (LCSD) 11/06/15 04:02

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	%	%	%			%	%
TPHG C6 - C12	5.50	5.92	5.82	108	106	62.2-127			1.69	20
(S) a,a,a-Trifluorotoluene(FID)				*98.4*	*99.5*	*59.0-128*				

Method Blank (MB)

(MB) 11/07/15 19:45

Analyte	MB Result	MB Qualifier	MB RDL
	mg/kg		mg/kg
TPHG C6 - C12	ND		0.100
(S) a,a,a-Trifluorotoluene(FID)	*98.6*		*59.0-128*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 11/07/15 18:43 • (LCSD) 11/07/15 19:04

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	%	%	%			%	%
TPHG C6 - C12	5.50	5.55	5.33	101	96.9	62.2-127			3.99	20
(S) a,a,a-Trifluorotoluene(FID)				*98.8*	*99.1*	*59.0-128*				

L799113-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 11/07/15 22:32 • (MS) 11/08/15 00:17 • (MSD) 11/08/15 00:38

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
TPHG C6 - C12	5.50	4.24	26.9	20.8	82.2	60.4	5	20.5-134		J3	25.2	23.8
(S) a,a,a-Trifluorotoluene(FID)					*96.5*	*96.2*		*59.0-128*				

Method Blank (MB)

(MB) 11/14/15 01:03

Analyte	MB Result mg/kg	MB Qualifier	MB RDL mg/kg
Acetone	ND		0.0500
Acrylonitrile	ND		0.0100
Benzene	ND		0.00100
Bromobenzene	ND		0.00100
Bromodichloromethane	ND		0.00100
Bromoform	ND		0.00100
Bromomethane	ND		0.00500
n-Butylbenzene	ND		0.00100
sec-Butylbenzene	ND		0.00100
tert-Butylbenzene	ND		0.00100
Carbon tetrachloride	ND		0.00100
Chlorobenzene	ND		0.00100
Chlorodibromomethane	ND		0.00100
Chloroethane	ND		0.00500
2-Chloroethyl vinyl ether	ND		0.0500
Chloroform	ND		0.00500
Chloromethane	ND		0.00250
2-Chlorotoluene	ND		0.00100
4-Chlorotoluene	ND		0.00100
1,2-Dibromo-3-Chloropropane	ND		0.00500
1,2-Dibromoethane	ND		0.00100
Dibromomethane	ND		0.00100
1,2-Dichlorobenzene	ND		0.00100
1,3-Dichlorobenzene	ND		0.00100
1,4-Dichlorobenzene	ND		0.00100
Dichlorodifluoromethane	ND		0.00500
1,1-Dichloroethane	ND		0.00100
1,2-Dichloroethane	ND		0.00100
1,1-Dichloroethene	ND		0.00100
cis-1,2-Dichloroethene	ND		0.00100
trans-1,2-Dichloroethene	ND		0.00100
1,2-Dichloropropane	ND		0.00100
1,1-Dichloropropene	ND		0.00100
1,3-Dichloropropane	ND		0.00100
cis-1,3-Dichloropropene	ND		0.00100
trans-1,3-Dichloropropene	ND		0.00100

Method Blank (MB)

(MB) 11/14/15 01:03

Analyte	MB Result mg/kg	MB Qualifier	MB RDL mg/kg
2,2-Dichloropropane	ND		0.00100
Di-isopropyl ether	ND		0.00100
Ethylbenzene	ND		0.00100
Hexachloro-1,3-butadiene	ND		0.00100
Isopropylbenzene	ND		0.00100
p-Isopropyltoluene	ND		0.00100
2-Butanone (MEK)	ND		0.0100
Methylene Chloride	ND		0.00500
4-Methyl-2-pentanone (MIBK)	ND		0.0100
Methyl tert-butyl ether	ND		0.00100
Naphthalene	ND		0.00500
n-Propylbenzene	ND		0.00100
Styrene	ND		0.00100
1,1,1,2-Tetrachloroethane	ND		0.00100
1,1,2,2-Tetrachloroethane	ND		0.00100
Tetrachloroethene	ND		0.00100
Toluene	ND		0.00500
1,1,2-Trichlorotrifluoroethane	ND		0.00100
1,2,3-Trichlorobenzene	ND		0.00100
1,2,4-Trichlorobenzene	ND		0.00100
1,1,1-Trichloroethane	ND		0.00100
1,1,2-Trichloroethane	ND		0.00100
Trichloroethene	ND		0.00100
Trichlorofluoromethane	ND		0.00500
1,2,3-Trichloropropane	ND		0.00250
1,2,3-Trimethylbenzene	ND		0.00100
1,2,4-Trimethylbenzene	ND		0.00100
1,3,5-Trimethylbenzene	ND		0.00100
Vinyl chloride	ND		0.00100
Xylenes, Total	ND		0.00300
(S) Toluene-d8	*98.7*		*88.7-115*
(S) Dibromofluoromethane	*101*		*76.3-123*
(S) 4-Bromofluorobenzene	*101*		*69.7-129*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 11/13/15 23:31 • (LCSD) 11/13/15 23:49

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acetone	0.125	0.115	0.116	92.2	92.7	25.3-178			0.540	22.9
Acrylonitrile	0.125	0.0918	0.0887	73.4	70.9	57.8-143			3.44	20
Benzene	0.0250	0.0216	0.0210	86.4	84.1	72.6-120			2.66	20
Bromobenzene	0.0250	0.0242	0.0236	96.8	94.4	80.3-115			2.45	20
Bromodichloromethane	0.0250	0.0277	0.0272	111	109	75.3-119			1.98	20
Bromoform	0.0250	0.0243	0.0230	97.3	92.0	69.1-135			5.55	20
Bromomethane	0.0250	0.0214	0.0206	85.6	82.5	23.0-191			3.71	20
n-Butylbenzene	0.0250	0.0275	0.0269	110	108	74.2-134			2.24	20
sec-Butylbenzene	0.0250	0.0250	0.0246	99.9	98.2	77.8-129			1.73	20
tert-Butylbenzene	0.0250	0.0246	0.0255	98.6	102	77.2-129			3.42	20
Carbon tetrachloride	0.0250	0.0266	0.0255	106	102	69.4-129			4.04	20
Chlorobenzene	0.0250	0.0233	0.0239	93.3	95.6	78.9-122			2.39	20
Chlorodibromomethane	0.0250	0.0255	0.0252	102	101	76.4-126			1.37	20
Chloroethane	0.0250	0.0243	0.0235	97.4	94.1	47.2-147			3.39	20
2-Chloroethyl vinyl ether	0.125	0.114	0.116	91.1	93.1	16.7-162			2.19	23.7
Chloroform	0.0250	0.0262	0.0245	105	98.1	73.3-122			6.60	20
Chloromethane	0.0250	0.0202	0.0193	80.8	77.4	53.1-135			4.31	20
2-Chlorotoluene	0.0250	0.0234	0.0228	93.6	91.4	74.6-127			2.35	20
4-Chlorotoluene	0.0250	0.0240	0.0246	96.1	98.4	79.5-123			2.33	20
1,2-Dibromo-3-Chloropropane	0.0250	0.0241	0.0224	96.4	89.8	64.9-131			7.14	20
1,2-Dibromoethane	0.0250	0.0226	0.0219	90.4	87.8	78.7-123			2.93	20
Dibromomethane	0.0250	0.0252	0.0242	101	96.8	78.5-117			3.99	20
1,2-Dichlorobenzene	0.0250	0.0257	0.0243	103	97.4	83.6-119			5.57	20
1,3-Dichlorobenzene	0.0250	0.0238	0.0247	95.2	98.7	75.9-129			3.56	20
1,4-Dichlorobenzene	0.0250	0.0241	0.0231	96.2	92.4	81.0-115			4.08	20
Dichlorodifluoromethane	0.0250	0.0253	0.0227	101	90.8	50.9-139			11.0	20
1,1-Dichloroethane	0.0250	0.0243	0.0231	97.1	92.3	71.7-125			5.02	20
1,2-Dichloroethane	0.0250	0.0271	0.0259	108	104	67.2-121			4.42	20
1,1-Dichloroethene	0.0250	0.0284	0.0270	114	108	60.6-133			5.24	20
cis-1,2-Dichloroethene	0.0250	0.0225	0.0222	90.0	88.7	76.1-121			1.45	20
trans-1,2-Dichloroethene	0.0250	0.0220	0.0221	87.8	88.3	70.7-124			0.590	20
1,2-Dichloropropane	0.0250	0.0232	0.0237	93.0	94.9	76.9-123			2.03	20
1,1-Dichloropropene	0.0250	0.0240	0.0239	95.9	95.5	71.2-126			0.390	20
1,3-Dichloropropane	0.0250	0.0223	0.0220	89.0	88.1	80.3-114			1.07	20
cis-1,3-Dichloropropene	0.0250	0.0246	0.0249	98.4	99.7	77.3-123			1.36	20
trans-1,3-Dichloropropene	0.0250	0.0264	0.0244	105	97.7	73.0-127			7.62	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 11/13/15 23:31 • (LCSD) 11/13/15 23:49

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
2,2-Dichloropropane	0.0250	0.0264	0.0248	106	99.2	61.9-132			6.30	20
Di-isopropyl ether	0.0250	0.0222	0.0217	89.0	86.9	67.2-131			2.35	20
Ethylbenzene	0.0250	0.0236	0.0239	94.3	95.5	78.6-124			1.32	20
Hexachloro-1,3-butadiene	0.0250	0.0283	0.0278	113	111	69.2-136			1.87	20
Isopropylbenzene	0.0250	0.0239	0.0242	95.6	96.7	79.4-126			1.15	20
p-Isopropyltoluene	0.0250	0.0253	0.0250	101	99.9	75.4-132			1.16	20
2-Butanone (MEK)	0.125	0.0970	0.0947	77.6	75.8	44.5-154			2.44	21.3
Methylene Chloride	0.0250	0.0215	0.0212	85.9	85.0	68.2-119			1.02	20
4-Methyl-2-pentanone (MIBK)	0.125	0.0990	0.0986	79.2	78.9	61.1-138			0.440	20
Methyl tert-butyl ether	0.0250	0.0214	0.0206	85.8	82.3	70.2-122			4.08	20
Naphthalene	0.0250	0.0251	0.0254	101	101	69.9-132			0.890	20
n-Propylbenzene	0.0250	0.0248	0.0238	99.1	95.2	80.2-124			4.08	20
Styrene	0.0250	0.0238	0.0238	95.1	95.2	79.4-124			0.0200	20
1,1,1,2-Tetrachloroethane	0.0250	0.0258	0.0256	103	102	76.7-127			0.620	20
1,1,2,2-Tetrachloroethane	0.0250	0.0209	0.0210	83.7	84.1	78.8-124			0.430	20
Tetrachloroethene	0.0250	0.0250	0.0235	100	93.9	71.1-133			6.38	20
Toluene	0.0250	0.0231	0.0225	92.6	90.1	76.7-116			2.65	20
1,1,2-Trichlorotrifluoroethane	0.0250	0.0255	0.0248	102	99.1	62.6-138			2.92	20
1,2,3-Trichlorobenzene	0.0250	0.0270	0.0267	108	107	72.5-137			1.01	20
1,2,4-Trichlorobenzene	0.0250	0.0278	0.0265	111	106	74.0-137			4.86	20
1,1,1-Trichloroethane	0.0250	0.0276	0.0256	110	102	69.9-127			7.61	20
1,1,2-Trichloroethane	0.0250	0.0236	0.0233	94.4	93.0	81.9-119			1.46	20
Trichloroethene	0.0250	0.0242	0.0240	96.8	95.9	77.2-122			0.890	20
Trichlorofluoromethane	0.0250	0.0288	0.0264	115	106	51.5-151			8.53	20
1,2,3-Trichloropropane	0.0250	0.0230	0.0230	91.8	91.8	74.0-124			0.0300	20
1,2,3-Trimethylbenzene	0.0250	0.0251	0.0248	100	99.3	79.4-118			0.850	20
1,2,4-Trimethylbenzene	0.0250	0.0233	0.0235	93.4	94.0	77.1-124			0.710	20
1,3,5-Trimethylbenzene	0.0250	0.0247	0.0249	98.9	99.7	79.0-125			0.860	20
Vinyl chloride	0.0250	0.0243	0.0231	97.3	92.5	58.4-134			5.10	20
Xylenes, Total	0.0750	0.0705	0.0696	94.0	92.8	78.1-123			1.24	20
(S) Toluene-d8				*107*	*104*	*88.7-115*				
(S) Dibromofluoromethane				*101*	*101*	*76.3-123*				
(S) 4-Bromofluorobenzene				*97.6*	*98.9*	*69.7-129*				

L800538-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 11/14/15 06:42 • (MS) 11/14/15 01:51 • (MSD) 11/14/15 02:09

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acetone	0.125	0.00704	0.589	0.650	93.1	103	5	10.0-130			9.96	31.5
Acrylonitrile	0.125	ND	0.403	0.476	64.5	76.2	5	39.3-152			16.7	27.2
Benzene	0.0250	ND	0.109	0.118	86.9	94.2	5	47.8-131			8.12	22.8
Bromobenzene	0.0250	ND	0.112	0.122	89.5	97.5	5	40.0-130			8.63	27.4
Bromodichloromethane	0.0250	ND	0.139	0.144	111	115	5	50.6-128			3.71	22.8
Bromoform	0.0250	ND	0.116	0.130	93.0	104	5	43.3-139			10.8	25.9
Bromomethane	0.0250	ND	0.114	0.134	91.1	107	5	5.00-189			16.3	26.7
n-Butylbenzene	0.0250	ND	0.119	0.130	95.1	104	5	23.6-146			8.91	39.2
sec-Butylbenzene	0.0250	ND	0.114	0.131	91.0	104	5	31.0-142			13.8	34.7
tert-Butylbenzene	0.0250	ND	0.112	0.129	90.0	103	5	36.9-142			13.8	31.7
Carbon tetrachloride	0.0250	ND	0.135	0.151	108	121	5	46.0-140			11.3	27.2
Chlorobenzene	0.0250	ND	0.114	0.130	91.4	104	5	44.1-134			12.9	25.7
Chlorodibromomethane	0.0250	ND	0.123	0.137	98.2	109	5	49.7-134			10.9	24
Chloroethane	0.0250	ND	0.126	0.146	100	117	5	5.00-164			14.9	28.4
2-Chloroethyl vinyl ether	0.125	ND	0.539	0.590	86.2	94.3	5	5.00-159			8.98	40
Chloroform	0.0250	ND	0.128	0.141	102	113	5	51.2-133			9.67	22.8
Chloromethane	0.0250	ND	0.107	0.127	85.7	101	5	31.4-141			16.9	24.6
2-Chlorotoluene	0.0250	ND	0.108	0.119	86.3	95.0	5	36.1-137			9.62	28.9
4-Chlorotoluene	0.0250	ND	0.115	0.126	91.9	101	5	35.4-137			9.50	29.8
1,2-Dibromo-3-Chloropropane	0.0250	ND	0.105	0.130	83.9	104	5	40.4-138			21.3	30.8
1,2-Dibromoethane	0.0250	ND	0.109	0.121	87.2	96.7	5	50.2-133			10.4	23.6
Dibromomethane	0.0250	ND	0.122	0.131	97.3	105	5	52.4-128			7.23	23
1,2-Dichlorobenzene	0.0250	ND	0.112	0.120	89.9	96.1	5	34.6-139			6.65	29.9
1,3-Dichlorobenzene	0.0250	ND	0.107	0.127	85.5	101	5	28.4-142			16.9	31.2
1,4-Dichlorobenzene	0.0250	ND	0.112	0.118	89.7	94.1	5	35.0-133			4.82	31.1
Dichlorodifluoromethane	0.0250	ND	0.142	0.154	114	123	5	31.2-144			7.94	30.2
1,1-Dichloroethane	0.0250	ND	0.122	0.136	97.5	109	5	49.1-136			10.9	22.9
1,2-Dichloroethane	0.0250	ND	0.132	0.149	106	119	5	47.1-129			11.8	22.7
1,1-Dichloroethene	0.0250	ND	0.147	0.161	118	128	5	36.1-142			8.73	25.6
cis-1,2-Dichloroethene	0.0250	ND	0.113	0.121	90.5	96.7	5	50.6-133			6.70	23
trans-1,2-Dichloroethene	0.0250	ND	0.116	0.124	93.1	99.3	5	43.8-135			6.46	24.8
1,2-Dichloropropane	0.0250	ND	0.118	0.125	94.4	100	5	50.3-134			5.76	22.7
1,1-Dichloropropene	0.0250	ND	0.117	0.134	93.9	107	5	43.0-137			13.0	26.4
1,3-Dichloropropane	0.0250	ND	0.107	0.115	85.3	91.9	5	51.4-127			7.42	23.1
cis-1,3-Dichloropropene	0.0250	ND	0.119	0.129	95.5	103	5	48.4-134			8.05	23.6
trans-1,3-Dichloropropene	0.0250	ND	0.124	0.137	99.5	110	5	46.6-135			9.80	25.3

L800538-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 11/14/15 06:42 • (MS) 11/14/15 01:51 • (MSD) 11/14/15 02:09

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
2,2-Dichloropropane	0.0250	ND	0.135	0.149	108	119	5	45.2-141			9.24	26.6
Di-isopropyl ether	0.0250	ND	0.106	0.121	85.1	97.1	5	46.7-140			13.2	23.5
Ethylbenzene	0.0250	ND	0.114	0.132	91.2	105	5	44.8-135			14.6	26.9
Hexachloro-1,3-butadiene	0.0250	ND	0.120	0.124	95.9	99.1	5	10.0-149			3.35	40
Isopropylbenzene	0.0250	ND	0.115	0.128	91.7	102	5	41.9-139			10.7	29.3
p-Isopropyltoluene	0.0250	ND	0.115	0.132	92.1	105	5	27.3-146			13.4	35.1
2-Butanone (MEK)	0.125	ND	0.464	0.531	74.3	85.0	5	23.9-170			13.4	28.3
Methylene Chloride	0.0250	0.00230	0.106	0.117	83.0	91.8	5	46.7-125			9.80	22.2
4-Methyl-2-pentanone (MIBK)	0.125	ND	0.458	0.515	73.3	82.3	5	42.4-146			11.7	26.7
Methyl tert-butyl ether	0.0250	ND	0.106	0.116	84.9	92.6	5	50.4-131			8.77	24.8
Naphthalene	0.0250	ND	0.106	0.120	84.4	96.2	5	18.4-145			13.0	34
n-Propylbenzene	0.0250	ND	0.113	0.126	90.5	101	5	35.2-139			11.1	31.9
Styrene	0.0250	ND	0.115	0.124	91.9	99.4	5	39.7-137			7.82	28.2
1,1,1,2-Tetrachloroethane	0.0250	ND	0.123	0.141	98.3	113	5	48.8-136			13.9	25.5
1,1,2,2-Tetrachloroethane	0.0250	ND	0.0970	0.111	77.6	88.8	5	45.7-140			13.5	26.4
Tetrachloroethene	0.0250	ND	0.120	0.133	96.2	106	5	37.7-140			10.1	29.2
Toluene	0.0250	ND	0.113	0.122	90.5	97.4	5	47.8-127			7.42	24.3
1,1,2-Trichlorotrifluoroethane	0.0250	ND	0.129	0.136	103	109	5	35.7-146			5.03	28.8
1,2,3-Trichlorobenzene	0.0250	ND	0.113	0.126	90.5	101	5	10.0-150			10.5	38.5
1,2,4-Trichlorobenzene	0.0250	ND	0.114	0.122	90.8	97.5	5	10.0-153			7.11	39.3
1,1,1-Trichloroethane	0.0250	ND	0.139	0.148	111	118	5	49.0-138			6.05	25.3
1,1,2-Trichloroethane	0.0250	ND	0.107	0.123	85.7	98.1	5	52.3-132			13.5	23.4
Trichloroethene	0.0250	ND	0.123	0.130	98.7	104	5	48.0-132			5.55	24.8
Trichlorofluoromethane	0.0250	ND	0.140	0.157	112	125	5	12.8-169			11.0	29.7
1,2,3-Trichloropropane	0.0250	ND	0.109	0.123	87.4	98.5	5	44.4-138			11.9	26.3
1,2,3-Trimethylbenzene	0.0250	ND	0.121	0.130	97.0	104	5	41.0-133			6.58	27.6
1,2,4-Trimethylbenzene	0.0250	ND	0.111	0.129	88.7	103	5	32.9-139			14.8	30.6
1,3,5-Trimethylbenzene	0.0250	ND	0.116	0.132	92.6	106	5	37.1-138			13.3	30.6
Vinyl chloride	0.0250	ND	0.131	0.149	105	119	5	32.0-146			13.0	26.3
Xylenes, Total	0.0750	ND	0.335	0.375	89.3	99.9	5	42.7-135			11.2	26.6
(S) Toluene-d8					*105*	*106*		*88.7-115*				
(S) Dibromofluoromethane					*99.0*	*105*		*76.3-123*				
(S) 4-Bromofluorobenzene					*98.3*	*105*		*69.7-129*				

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) 11/11/15 12:14

Analyte	MB Result	MB Qualifier	MB RDL
	mg/kg		mg/kg
Diesel Range Organics (DRO)	ND		4.00
Residual Range Organics (RRO)	ND		10.0
(S) o-Terphenyl	*95.8*		*50.0-150*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 11/11/15 12:26 • (LCSD) 11/11/15 12:39

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	%	%	%			%	%
Diesel Range Organics (DRO)	30.0	30.2	29.9	101	99.6	50.0-150			0.880	20
Residual Range Organics (RRO)	30.0	22.7	23.3	75.5	77.8	50.0-150			2.95	20
(S) o-Terphenyl				*77.8*	*79.2*	*50.0-150*				

L799111-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 11/11/15 13:16 • (MS) 11/11/15 13:30 • (MSD) 11/11/15 13:42

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Diesel Range Organics (DRO)	30.0	0.498	27.2	30.1	89.1	98.5	1	50.0-150			9.89	20
Residual Range Organics (RRO)	30.0	0.326	22.0	30.6	72.2	101	1	50.0-150		J3	32.8	20
(S) o-Terphenyl					*68.4*	*61.6*		*50.0-150*				

Method Blank (MB)

(MB) 11/16/15 01:32

Analyte	MB Result mg/kg	MB Qualifier	MB RDL mg/kg
Anthracene	ND		0.00600
Acenaphthene	ND		0.00600
Acenaphthylene	ND		0.00600
Benzo(a)anthracene	ND		0.00600
Benzo(a)pyrene	ND		0.00600
Benzo(b)fluoranthene	ND		0.00600
Benzo(g,h,i)perylene	ND		0.00600
Benzo(k)fluoranthene	ND		0.00600
Chrysene	ND		0.00600
Dibenz(a,h)anthracene	ND		0.00600
Fluoranthene	ND		0.00600
Fluorene	ND		0.00600
Indeno(1,2,3-cd)pyrene	ND		0.00600
Naphthalene	ND		0.0200
Phenanthrene	ND		0.00600
Pyrene	ND		0.00600
1-Methylnaphthalene	ND		0.0200
2-Methylnaphthalene	ND		0.0200
2-Chloronaphthalene	ND		0.0200
(S) p-Terphenyl-d14	*71.4*		*32.2-131*
(S) Nitrobenzene-d5	*80.3*		*22.1-146*
(S) 2-Fluorobiphenyl	*76.7*		*40.6-122*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 11/16/15 00:49 • (LCSD) 11/16/15 01:11

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Anthracene	0.0800	0.0588	0.0565	73.5	70.7	50.3-130			3.97	20
Acenaphthene	0.0800	0.0553	0.0544	69.1	68.0	52.4-120			1.60	20
Acenaphthylene	0.0800	0.0561	0.0551	70.2	68.8	49.6-120			1.88	20
Benzo(a)anthracene	0.0800	0.0577	0.0559	72.1	69.9	46.7-125			3.19	20
Benzo(a)pyrene	0.0800	0.0579	0.0566	72.4	70.8	42.3-119			2.22	20
Benzo(b)fluoranthene	0.0800	0.0575	0.0556	71.9	69.5	43.6-124			3.37	20
Benzo(g,h,i)perylene	0.0800	0.0624	0.0604	78.0	75.5	45.1-132			3.30	20
Benzo(k)fluoranthene	0.0800	0.0619	0.0603	77.4	75.4	46.1-131			2.58	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 11/16/15 00:49 • (LCSD) 11/16/15 01:11

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Chrysene	0.0800	0.0580	0.0566	72.5	70.8	49.5-131			2.30	20
Dibenz(a,h)anthracene	0.0800	0.0667	0.0643	83.4	80.4	44.8-133			3.69	20
Fluoranthene	0.0800	0.0673	0.0663	84.1	82.9	49.3-128			1.41	20
Fluorene	0.0800	0.0602	0.0587	75.2	73.4	50.6-121			2.46	20
Indeno(1,2,3-cd)pyrene	0.0800	0.0658	0.0636	82.3	79.5	46.1-135			3.41	20
Naphthalene	0.0800	0.0617	0.0616	77.1	77.0	49.6-115			0.220	20
Phenanthrene	0.0800	0.0532	0.0519	66.6	64.9	48.8-121			2.48	20
Pyrene	0.0800	0.0513	0.0503	64.1	62.8	44.7-130			2.06	20
1-Methylnaphthalene	0.0800	0.0672	0.0669	84.0	83.7	50.6-122			0.410	20
2-Methylnaphthalene	0.0800	0.0673	0.0671	84.1	83.8	50.4-120			0.340	20
2-Chloronaphthalene	0.0800	0.0539	0.0533	67.4	66.6	53.9-121			1.22	20
(S) p-Terphenyl-d14				*70.4*	*70.5*	*32.2-131*				
(S) Nitrobenzene-d5				*83.0*	*83.8*	*22.1-146*				
(S) 2-Fluorobiphenyl				*77.4*	*76.9*	*40.6-122*				

L799111-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 11/16/15 01:54 • (MS) 11/16/15 02:15 • (MSD) 11/16/15 02:37

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Anthracene	0.0800	ND	0.0443	0.0508	55.4	63.5	1	26.5-141			13.6	21.2
Acenaphthene	0.0800	ND	0.0483	0.0526	60.3	65.8	1	31.9-130			8.64	20
Acenaphthylene	0.0800	ND	0.0506	0.0543	63.2	67.9	1	33.7-129			7.08	20
Benzo(a)anthracene	0.0800	ND	0.0425	0.0452	53.1	56.5	1	18.3-136			6.27	24.6
Benzo(a)pyrene	0.0800	ND	0.0426	0.0466	53.3	58.3	1	16.9-135			8.96	25.2
Benzo(b)fluoranthene	0.0800	ND	0.0397	0.0439	49.6	54.8	1	10.0-134			10.1	30.9
Benzo(g,h,i)perylene	0.0800	ND	0.0363	0.0437	45.4	54.6	1	14.1-140			18.4	25.5
Benzo(k)fluoranthene	0.0800	ND	0.0414	0.0454	51.7	56.7	1	18.2-138			9.15	25.6
Chrysene	0.0800	ND	0.0431	0.0460	53.8	57.5	1	17.1-145			6.65	24.2
Dibenz(a,h)anthracene	0.0800	ND	0.0413	0.0486	51.7	60.8	1	18.5-138			16.2	24.3
Fluoranthene	0.0800	ND	0.0521	0.0579	65.1	72.4	1	15.4-144			10.5	27.1
Fluorene	0.0800	ND	0.0500	0.0548	62.5	68.5	1	23.5-136			9.18	20
Indeno(1,2,3-cd)pyrene	0.0800	ND	0.0395	0.0467	49.3	58.4	1	14.5-142			16.7	25.8
Naphthalene	0.0800	ND	0.0603	0.0641	75.3	80.2	1	29.2-128			6.23	20
Phenanthrene	0.0800	ND	0.0425	0.0469	53.1	58.6	1	20.1-134			9.89	23.6
Pyrene	0.0800	ND	0.0409	0.0439	51.1	54.8	1	11.0-148			7.00	26.1

L799111-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 11/16/15 01:54 • (MS) 11/16/15 02:15 • (MSD) 11/16/15 02:37

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
1-Methylnaphthalene	0.0800	ND	0.0632	0.0682	79.0	85.2	1	28.4-137			7.54	20
2-Methylnaphthalene	0.0800	ND	0.0622	0.0676	77.7	84.5	1	26.6-137			8.33	20
2-Chloronaphthalene	0.0800	ND	0.0476	0.0518	59.5	64.8	1	38.6-126			8.39	20
(S) p-Terphenyl-d14					*70.2*	*72.3*		*32.2-131*				
(S) Nitrobenzene-d5					*87.2*	*87.4*		*22.1-146*				
(S) 2-Fluorobiphenyl					*75.3*	*79.2*		*40.6-122*				

Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND,U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.
SDL	Sample Detection Limit.
MQL	Method Quantitation Limit.
Unadj. MQL	Unadjusted Method Quantitation Limit.

Qualifier	Description
J3	The associated batch QC was outside the established quality control range for precision.

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE.**

State Accreditations

Alabama	40660
Alaska	UST-080
Arizona	AZ0612
Arkansas	88-0469
California	01157CA
Colorado	TN00003
Conneticut	PH-0197
Florida	E87487
Georgia	NELAP
Georgia [1]	923
Idaho	TN00003
Illinois	200008
Indiana	C-TN-01
Iowa	364
Kansas	E-10277
Kentucky [1]	90010
Kentucky [2]	16
Louisiana	AI30792
Maine	TN0002
Maryland	324
Massachusetts	M-TN003
Michigan	9958
Minnesota	047-999-395
Mississippi	TN00003
Missouri	340
Montana	CERT0086
Nebraska	NE-OS-15-05
Nevada	TN-03-2002-34
New Hampshire	2975
New Jersey–NELAP	TN002
New Mexico	TN00003
New York	11742
North Carolina	Env375
North Carolina [1]	DW21704
North Carolina [2]	41
North Dakota	R-140
Ohio–VAP	CL0069
Oklahoma	9915
Oregon	TN200002
Pennsylvania	68-02979
Rhode Island	221
South Carolina	84004
South Dakota	n/a
Tennessee [1 4]	2006
Texas	T 104704245-07-TX
Texas [5]	LAB0152
Utah	6157585858
Vermont	VT2006
Virginia	109
Washington	C1915
West Virginia	233
Wisconsin	9980939910
Wyoming	A2LA

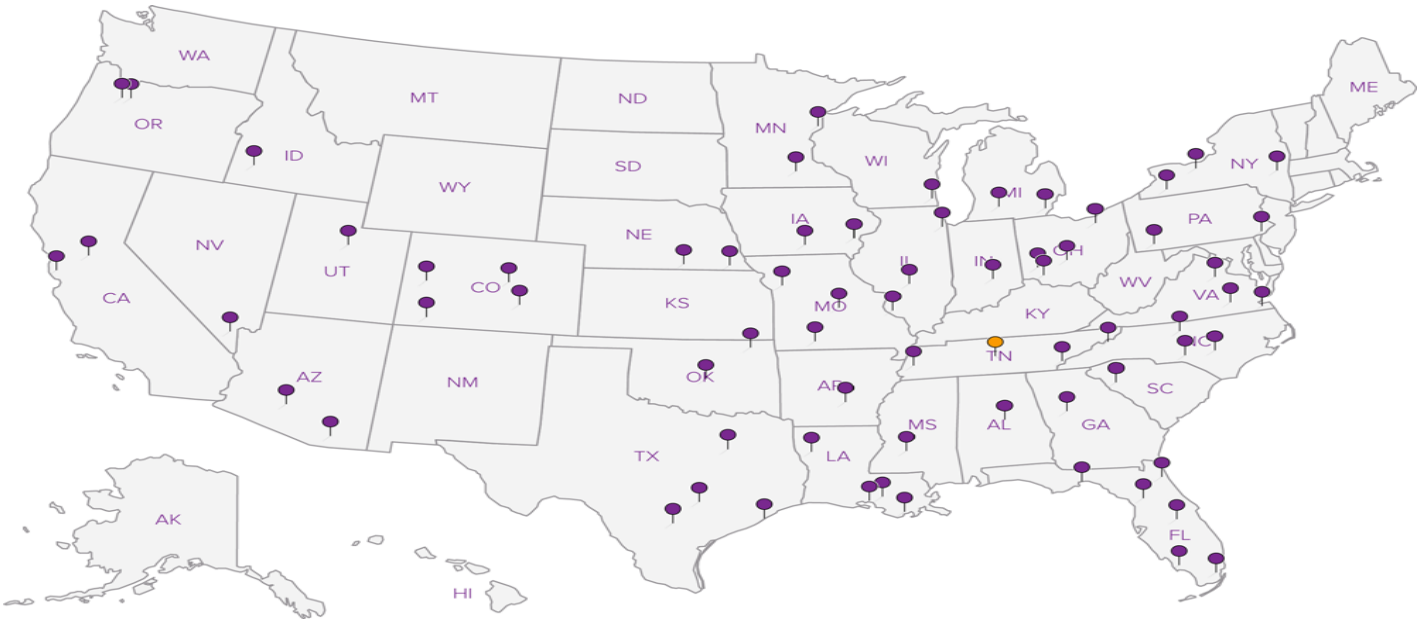
Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01
A2LA – ISO 17025 [5]	1461.02
Canada	1461.01
EPA–Crypto	TN00003
AIHA	100789
DOD	1461.01
USDA	S-67674

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [n/a] Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



Company Name/Address:
PBS Engineering
4412 SW Corbett Ave
Portland, OR 97239

Billing Information:
Accounts Payable
4412 SW Corbett Ave
Portland, OR 97239

Report to: Scott Braunsten

Email To: scott.braunsten@pbsenv.com

Project Description: 9321 SE Stark

City/State Collected: Portland, OR

Phone: 503-248-1939
Fax:

Client Project # 22338.001

Lab Project # PBSENGPOR-22338

Collected by (print): Scott Braunsten

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No ✓Yes
FAX? ✓No ___Yes

Analysis / Container / Preservative

Chain of Custody Page 1 of 2

ESC LABSCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L799111

T F093

Acctnum: PBSENGPOR
Template: T106796
Prelogin: P528765
TSR: 358-Jarred Willis
Cooler:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	NWTPH-Gx	NWTPH-Dx	VOCs 8260	PAHs 8270-SIM	RCRA-8 Metals					HOLD	Rem./Contaminant	Sample # (lab only)
SB1-26	G	SS	26'	11/3/15	0937	5	X	X			X							-01
SB2-5			5'		1018											X		
SB2-8			8'		1030		X	X										02
SB3-1			1'		1450		X	X										03
SB4-1			1'		1440		X	X										04
SB5-1			1'		1430		X	X										05
SB6-3			3'		1040		X	X										06
SB6-15			15'		1050											X		
SB7-11			11'		1118		X	X										07
SB7-15			15'		1125											X		

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

pH _____ Temp _____

Remarks: 6053 7156 1361

Flow _____ Other _____

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	11/3/15	1700	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ _____

Temp: 3.4 °C Bottles Received: 70+TB

Date: 11-5-15 Time: 908

Condition: (lab use only) JW7

COC Seal Intact: ___Y ___N ___NA

pH Checked: NCF:

Company Name/Address:
PBS Engineering
4412 SW Corbett Ave
Portland, OR 97239

Billing Information:
Accounts Payable
4412 SW Corbett Ave
Portland, OR 97239

Report to: **Scott Braunsten**

Email To: **scott.braunsten@pbsenv.com**

Project Description: **9321 SE Stark**

City/State Collected: **Portland, OR**

Phone: **503-248-1939**
Fax:

Client Project # **22338.001**

Lab Project # **PBSENGPOR-22338**

Collected by (print): Scott Braunsten

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No ✓Yes
FAX? ✓No ___Yes

Analysis / Container / Preservative

Chain of Custody Page 2 of 2

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L799111

Table #

Acctnum: PBSENGPOR
Template: T106796
Prelogin: P528765
TSR: 358-Jarred Willis
Cooler:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	NWTPH-Gx	NWTPH-Dx	VOCs 8260	PAHs 8270-SIM	RCRA-8 Metals					HOLD	Rem./Contaminant	Sample # (lab only)
SB8-12	G	SS	12'	11/3/15	1145	5	X	X										08
SB8-15	↓	↓	15'	↓	1150	↓										X		
SB9-12	↓	↓	12'	↓	1210	↓	X	X										09
SB9-15	↓	↓	15'	↓	1215	↓										X		

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

pH _____ Temp _____

Remarks:

Flow _____ Other _____

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	11/3/15	1700	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ _____

Temp: 3.4 °C Bottles Received:

Date: Time:

Condition: (lab use only) JW1

COC Seal Intact: ___Y ___N ___NA

pH Checked: NCF:

Jeremy W. Watkins

From: Jarred Willis
Sent: Thursday, November 12, 2015 10:35 AM
To: Login
Subject: L799111-02, -09 - PBSENGPOR - add follow-ups

Please add the following analysis to L799111 from *PBSENGPOR* per client request. Add to existing L# and dash #s. Due date has been updated.

L799111-02 (SB2-8) - add SV8270PAHSIMD and V8260
L799111-09 (SB9-12) - add SV8270PAHSIMD

Thanks,
Jarred

-----Original Message-----
From: Scott Braunsten [mailto:Scott.Braunsten@pbsenv.com]
Sent: Thursday, November 12, 2015 10:29 AM
To: Jarred Willis
Subject: RE: ESC Lab Sciences Login for 22338.000 9321 SE Stark L799111

Jarred,

Please run PAH analysis on samples SB2-8 and SB9-12, and run VOCs on sample SB2-8.

Thank you,

Scott Braunsten, RG, LG, CES
Project Geologist
Scott.Braunsten@pbsenv.com
503.417.7737
503.939.7910 mobile
PBS Engineering + Environmental
Engineering | Natural Resources | Environmental | Health and Safety www.pbsenv.com
4412 SW Corbett Avenue, Portland, OR 97239
ph: 503.248.1939 : fax: 866.727.0140