

APPENDIX A

LIMITED SHALLOW SUBSURFACE INVESTIGATION AND CONTAMINATED SOIL SPOT CLEANUP

SUBMITTED TO:
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LIMITED SHALLOW SUBSURFACE INVESTIGATION AND
SOIL SPOT CLEANUP

Seattle Center Skate Plaza

SEATTLE, WASHINGTON

Submitted To: Environmental Science Associates
5309 Shilshole Avenue NW, Suite 200
Seattle, WA 98107
Attn: Ms. Molly Adolfson

Subject: LIMITED SHALLOW SUBSURFACE INVESTIGATION AND SOIL SPOT
CLEANUP, SEATTLE CENTER SKATE PLAZA, SEATTLE, WASHINGTON

Shannon & Wilson participated in this project as a subconsultant to Environmental Science Associates. Our scope of services was specified in our proposal provided via email to you on March 18, 2019. Acceptance of the scope of services and notice to proceed was provided by you via email on March 18, 2019.

Sincerely,

SHANNON & WILSON, INC.



David J. Randall
Senior Environmental Scientist



SCOTT W. GAULKE

Scott W. Gaulke, PE, LHG
Vice President - Environmental Professional

DJR:SWG/djr

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1 INTRODUCTION

Shannon & Wilson has prepared this report, which summarizes the limited shallow subsurface soil investigation and contaminated soil spot cleanup conducted for the proposed Seattle Center Skate Plaza located on the Broad Street Right-of Way between Thomas Street and Taylor Avenue North in Seattle, Washington (project site). The location of the site is shown in Figure 1. A concrete sidewalk bisects the project site into a northeastern area (Area 1) and southwestern area (Area 2). The limited soil sampling was conducted as a screening level effort to identify potential contamination that may be encountered during construction at the subject property and to support the preparation of the State Environmental Policy Act checklist currently being prepared for the project.

1.1 Scope of Services – Subsurface Soil Investigation

The proposed scope of services was initially developed to evaluate the shallow subsurface soil at the subject property that may have been impacted by adjacent sites including former historic gas stations and an auto repair shop. Shannon & Wilson field staff advanced a total of five shallow hand borings across the site, collecting a single grab soil sample from each boring for analytical laboratory testing.

As shown in Figure 2, three of the five hand borings, HB-1, HB-2, and HB-3, were advanced in the northeast corner of the subject property, identified as Area 1, and hand borings HB-4 and HB-5 were advanced in the southwest corner, identified as Area 2. We understand that the proposed site work may likely require up to 2 feet of excavation/soil disturbance across the site. Prior to the start of field activities, a private utility locating company was subcontracted to clear each location for the presence of underground utilities.

Based on the initial analytical results following the Subsurface Soil Investigation, Shannon & Wilson recommended conducting the removal of a small area of polycyclic aromatic hydrocarbons (PAHs) impacted soils and conducting additional confirmation sampling and analytical testing. This additional scope of services was conducted during the Infiltration Pilot Testing conducted on May 18, 2019.

1.2 Field Activities

On March 20, 2019, a Shannon & Wilson field representative advanced a total of five hand borings at the subject property. The hand borings were advanced to total depths of 3.5 to 4.5 feet below ground surface (bgs). Field screening for indications of contamination was conducted during the investigation with the use of visual and olfactory methods and a

photoionization detector (PID). Based on field screening, no indications of contamination were identified/encountered in any of the borings. A single grab soil sample was collected from each boring.

Exhibit 1-1 below presents soil sample information for each boring including boring and sample identification, approximate sample depth, total boring depth, and PID reading.

Exhibit 1-1: Soil Sample Information

North Area				
Exploration ID	Sample ID	Sample Depth (feet)	Total Boring Depth (feet)	PID (ppm)
HB-1	HB-1:3	2.5 to 3 feet	4.0	0
HB-2	HB-2:3	2.5 to 3 feet	4.5	0
HB-3	HB-3:3.5	3 to 3.5 Feet	3.5*	0
South Area				
Exploration ID	Sample ID	Sample Depths (Feet)	Total Boring Depth (Feet)	PID (ppm)
HB-4	HB-4:3.5	3 to 3.5 Feet	3.5*	0
HB-5	HB-5:3.5	3 to 3.5 Feet	3.5*	0

NOTE:

* = refusal; ID = identification, PID = photoionization detector; ppm = parts per million

Prior to the start of hand boring activities, on March 18, 2019, APS of North Bend, Washington, under subcontract to Shannon & Wilson, conducted a private utility locate to clear each boring location of public utilities.

1.3 Site Geology

In general, the Area 1 hand borings, HB-1, HB-2, and HB-3, identified 6 to 12 inches of topsoil in each of the three borings, underlain by 1.5 to 2 feet of brown to tan fill material with rocks and cobbles. With the exception of boring HB-3, a gray to blue, clayey sand was present beneath the fill to a depth of approximately 4 to 5 feet. Refusal was met in boring HB-3 at 3.5 feet bgs.

The Area 2 hand borings, HB-4 and HB-5, identified 6 to 12 inches of topsoil in each boring, underlain by 2.5 to 3 feet of brown to tan fill material with rocks and cobbles. Refusal was met in each boring at 3.5 feet bgs.

1.4 Analytical Methods

Upon completion of the hand borings, soil samples were submitted to Fremont Analytical in Seattle, Washington, under subcontract to Shannon & Wilson for analytical testing.

Each soil sample was analyzed using the following methods:

- Total Petroleum Hydrocarbons – Gasoline Range Organics using Northwest Total Petroleum Hydrocarbons (NWTPH) Gasoline Extended;
- Total Petroleum Hydrocarbons – Diesel and Heavy Oil Range Organics using NWTPH Diesel Extended;
- Volatile Organic Compounds (VOCs) – U.S. Environmental Protection Agency (USEPA) Method 8260;
- PAHs – USEPA Method 8270/625; and
- Resource Conservation Recovery Act (RCRA) 8 Metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) – USEPA Method 6020/7471.

1.5 Analytical Results

The analytical results of the sampling indicated that the majority of soil samples did not contain any contaminants of interest at concentrations greater than the Department of Ecology Model Toxic Control Act (MTCA) Method A residential cleanup levels for organic compounds or background levels for metals.

Testing found the following:

- No VOCs were detected in any of the soil samples collected;
- No diesel-range petroleum hydrocarbons were detected in any of the soil samples collected;
- No gasoline-range petroleum hydrocarbons were detected in any of the soil samples collected;
- Heavy oil-range hydrocarbons were only detected in sample HB-5:3.5 at a concentration of 117 milligrams per kilograms (mg/kg). The detected concentration is well below the MTCA Method A cleanup level of 2,000 mg/kg (Table 1).
- Of the eight RCRA 8 metals, low levels of arsenic, barium, chromium, lead, and selenium were detected in each of the five samples collected. None of the detected concentrations exceeded available MTCA Method A cleanup levels, with the exception of total chromium. Detected total chromium concentrations exceeded the MTCA unrestricted land use cleanup criteria of 19 mg/kg for hexavalent chromium (chrome VI). Based on the location of the site, we have no reason to suspect that chrome VI is present. As a follow-up though, we analyzed the HB-5:3.5 sample, which contained the largest detection of total chromium at 25.9 mg/kg for chrome VI. No chrome VI was detected in the sample, so it is likely the chromium that is present is chrome III and the cleanup level for chrome III is 2,000 mg/kg. Mercury was only detected in sample HB-4:3.5. The detected concentration did not exceed its MTCA Method A cleanup level of 2 mg/kg.

- None of the detected metals concentrations exceeded naturally occurring metals background concentrations for the Puget Sound (Table 1).
- PAHs, including carcinogenic polycyclic aromatic hydrocarbons (cPAHs), were only detected in sample HB-2:3. Where available, none of the detected analytes exceeded existing MTCA Method A cleanup levels (Table 2). However, based on the toxicity equivalency factor (TEF) analysis of the individual cPAH constituents, sample HB-2:3 does modestly exceed the cleanup level with a TEF adjusted value of 0.1 mg/kg.
 - Table 3 provides the TEF analysis of the individual cPAH constituents. The TEF method is used to adjust the concentrations of individual cPAHs such that they are relative in toxicity to benzo(a)pyrene, which is the most carcinogenic of the PAHs. The individual cPAH concentrations are then added together to evaluate the total toxicity of the soil for comparison with the MTCA cleanup level for benzo(a)pyrene of 0.1 mg/kg.

The analytical test results and regulatory criteria are presented in the Tables 1, 2, and 3. A copy of the laboratory analytical results are presented in Appendix A.

1.6 Spot Removal and Soil Disposal

Based on the analytical results of the HB-2:3 sample, a spot removal was conducted to remove and dispose of the cPAH impacted soil. Under subcontract to Shannon & Wilson on May 18, 2019, the soil at boring location HB-2 was excavated by Clearcreek Contractors to a total depth of 4 feet bgs and placed in to one 55-gallon drum. No indication of further contamination were observed following the removal of the area of contamination.

Two confirmation samples, HB-2:C1 and HB-2:C2, were collected and analyzed for PAHs by Fremont Analytical. No PAHs including cPAHs were detected in either sample indicating that the removal of the contamination was completed. A copy of the laboratory analytical results are presented in Appendix A.

On June 11, 2019, under subcontract to Shannon & Wilson, Waste Management picked up and disposed of the one drum containing the impacted soil. The drum was taken to the Chemical Waste Management Facility in Arlington, Oregon. A copy of the waste manifest is presented in Appendix B.

1.7 Conclusions

Based on the above data we offer the following conclusions and recommendations for the proposed Seattle Center Skate Plaza:

- No VOCs diesel-, or gasoline-range hydrocarbons were detected in any of the samples collected.

- Heavy oil-range hydrocarbons were detected in the sample collected at boring HB-5 at 3.5 feet bgs. The detected concentration was well below the MTCA Method A cleanup level.
- Metals concentrations present in the soil samples appear to be within natural regional metals background concentrations for the Puget Sound.
- PAHs including cPAHs were detected in the sample collected from boring HB-2 at 3 feet bgs. Based on the toxicity equivalency factor (TEF) analysis, the detected cPAH concentration modestly exceeds the MTCA Method A cleanup level for benzo(a)pyrene of 0.1 mg/kg. A spot removal was conducted at the HB-2 boring location. The impacted PAH and cPAH soils were excavated and disposed of at an off-site facility permitted to accept the material. Confirmation sampling was performed following the removal of the documented contaminated soil. The analytical results of the confirmation sampling indicate that all of the PAH and cPAH soils were removed. Based on the sampling there is no PAH or cPAH contamination on site.

2 LIMITATIONS

Shannon & Wilson has prepared this report in a professional manner, using that level of skill and care normally exercised for similar projects under similar conditions by reputable and competent environmental consultants currently practicing in the area. Shannon & Wilson is not responsible for conditions or consequences arising from relevant facts that were concealed, withheld, or not fully disclosed at the time the report was prepared. We also note that the facts and conditions referenced in this report may change over time, and that the conclusions and recommendations set forth here are applicable to the facts and conditions as described only at the time of this report. We believe that the conclusions stated here are factual, but no guarantee is made or implied.

This report was prepared for the exclusive use of Environmental Science Associates and your respective representatives and in no way guarantees that any agency or its staff will reach the same conclusions as Shannon & Wilson. Shannon & Wilson has prepared the enclosed, "Important Information About Your Environmental Site Assessment/Evaluation Report," to help you and others in understanding our reports.

Table 1 - Soil Analytical Results

Boring ID	Sample Number	Depth (feet)	Total Petroluem Hydrocarbons			RCRA 8 - Metals								
			Gasoline	Diesel	Heavy Oil	Arsenic	Barium	Cadmium	Chromium	Hexavalent Chromium	Lead	Mercury	Selenium	Silver
Soil Results (mg/kg)														
HB-1	HB-1:3	2.5-3	<7.21	<22.1	<55.2	1.67	41.5	<0.176	9.28	--	2.56	<0.268	0.827	<0.0882
HB-2	HB-2:3	2.5-3	<3.79	<21.8	<54.5	3.09	91.6	<0.175	23.3	--	6.56	<0.261	1.17	<0.0873
HB-3	HB-3:3.5	3-3.5	<1.0	<3.63	<55.9	2.02	54.4	<0.187	22	--	2.72	<0.268	0.912	<0.0933
HB-4	HB-4:3.5	3-3.5	<7.46	<21.6	<54.1	4.11	70.2	<0.178	25.5	--	10.9	1.19	1.22	<0.0890
HB-5	HB-5:3.5	3-3.5	<6.27	<23.4	117	4.95	88.7	<0.189	25.9	<0.623	14.5	<0.287	1.41	<0.0945
MTCA Method A (unrestricted use)			30/100	2,000	2,000	20	NA	2	19/2,000	19	250	2	NA	NA
Puget Sound Background			NA	NA	NA	7	300-1,000	48	48	48	24	0.07	0.78	0.61

NOTES:

Bold indicates detected concentration.

J = analyte was detected. However, the analytical concentration is an estimated value, which is between the method detection level and the practical quantitation limit.

-- = not analyzed; < = not detected above indicated laboratory reporting limit; ID = identification; mg/kg = milligrams per kilogram; MTCA = Model Toxics Control Act; NA = not applicable; RCRA = Resource Conservation and Recovery Act

Table 2 - Polyaromatic Hydrocarbon Analytical Results

Boring/Well Number:	HB-1	HB-2	HB-2	HB-2	HB-3	HB-4	HB-5	MTCA Method
Sample Number:	HB-1:3	HB-2:3	HB-2:C1	HB-2:C2	HB-3:3.5	HB-4:3.5	HB-5:3.5	A CUL for
Sample Depth:	2.5-3	2.5-3	4	4	3-3.5	3-3.5	3-3.5	Unrestricted
Sample Date:	3/20/2019	3/20/2019	5/16/2019	5/16/2019	3/20/2019	3/20/2019	3/20/2019	Land Use
Polycyclic Aromatic Hydrocarbons (mg/kg)								
Naphthalene	<0.0391	<0.042	<0.045	<0.047	<0.0459	<0.0465	<0.0472	5
2-Methylnaphthalene	<0.0391	<0.042	<0.045	<0.047	<0.0459	<0.0465	<0.0472	5
1-Methylnaphthalene	<0.0391	<0.042	<0.045	<0.047	<0.0459	<0.0465	<0.0472	5
Acenaphthylene	<0.0391	<0.042	<0.045	<0.047	<0.0459	<0.0465	<0.0472	NE
Acenaphthene	<0.0391	<0.042	<0.045	<0.047	<0.0459	<0.0465	<0.0472	NE
Fluorene	<0.0391	<0.042	<0.045	<0.047	<0.0459	<0.0465	<0.0472	NE
Phenanthrene	<0.0391	0.176	<0.045	<0.047	<0.0459	<0.0465	<0.0472	NE
Anthracene	<0.0391	0.0594	<0.045	<0.047	<0.0459	<0.0465	<0.0472	NE
Fluoranthene	<0.0391	0.316	<0.045	<0.047	<0.0459	<0.0465	<0.0472	NE
Pyrene	<0.0391	0.217	<0.045	<0.047	<0.0459	<0.0465	<0.0472	NE
Benzo[g,h,i]perylene	<0.0391	<0.042	<0.045	<0.047	<0.0459	<0.0465	<0.0472	NE
Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs) (mg/kg)								
benzo(a)pyrene	<0.0391	0.0903	<0.045	<0.047	<0.0459	<0.0465	<0.0472	NE
benzo(a)anthracene	<0.0391	0.0929	<0.045	<0.047	<0.0459	<0.0465	<0.0472	NE
benzo(b)fluoranthene	<0.0391	0.0532	<0.045	<0.047	<0.0459	<0.0465	<0.0472	NE
benzo(k)fluoranthene	<0.0391	<0.042	<0.045	<0.047	<0.0459	<0.0465	<0.0472	NE
chrysene	<0.0391	<0.042	<0.045	<0.047	<0.0459	<0.0465	<0.0472	0.1
dibenzo[a,h]anthracene	<0.0391	<0.042	<0.045	<0.047	<0.0459	<0.0465	<0.0472	NE
indeno[1,2,3-cd]pyrene	<0.0391	<0.042	<0.045	<0.047	<0.0459	<0.0465	<0.0472	NE
Total cPAH TEQ (See Table 3)	0.04	0.1	0.03	0.04	0.03	0.04	0.04	0.1

NOTES:

Bold text indicates detected analyte.

Shaded text indicates concentrations exceeds cleanup criterion.

< = not detected above indicated laboratory testing; CUL = cleanup level; mg/kg = milligrams per kilogram; MTCA = Model Toxics Control Act; NE = not established; TEQ = toxic equivalent concentration

Table 3 - Toxicity Equivalency Factor Adjusted Polycyclic Aromatic Hydrocarbon Concentrations

Analyte	Total cPAH TEQ Calculation for Sample HB-1			Adjusted Concentration ¹ (mg/kg)
	Result (mg/kg)	Method Detection Limit (mg/kg)	Toxicity Equivalency Factor	
benzo(a)pyrene	ND	0.0465	1	0.02325
benzo(a)anthracene	ND	0.0465	0.1	0.002325
benzo(b)fluoranthene	ND	0.0465	0.1	0.002325
benzo(k)fluoranthene	ND	0.0465	0.1	0.002325
chrysene	ND	0.0465	0.01	0.0002325
dibenzo[a,h]anthracene	ND	0.0465	0.1	0.002325
indeno[1,2,3-cd]pyrene	ND	0.0465	0.1	0.002325
Total cPAH TEQ ²			<	0.0351
MTCA Method A Cleanup Level for Unrestricted Land Use				0.10

Analyte	Total cPAH TEQ Calculation for Sample HB-2			Adjusted Concentration ¹ (mg/kg)
	Result (mg/kg)	Method Detection Limit (mg/kg)	Toxicity Equivalency Factor	
benzo(a)pyrene	0.0903	0.042	1	0.0903
benzo(a)anthracene	0.0929	0.042	0.1	0.00929
benzo(b)fluoranthene	0.0532	0.042	0.1	0.00532
benzo(k)fluoranthene	ND	0.042	0.1	0.0021
chrysene	ND	0.042	0.01	0.00021
dibenzo[a,h]anthracene	ND	0.042	0.1	0.0021
indeno[1,2,3-cd]pyrene	ND	0.042	0.1	0.0021
Total cPAH TEQ ²				0.1
MTCA Method A Cleanup Level for Unrestricted Land Use				0.10

Analyte	Total cPAH TEQ Calculation for Sample HB-3			Adjusted Concentration ¹ (mg/kg)
	Result (mg/kg)	Method Detection Limit (mg/kg)	Toxicity Equivalency Factor	
benzo(a)pyrene	ND	0.0459	1	0.02295
benzo(a)anthracene	ND	0.0459	0.1	0.002295
benzo(b)fluoranthene	ND	0.0459	0.1	0.002295
benzo(k)fluoranthene	ND	0.0459	0.1	0.002295
chrysene	ND	0.0459	0.01	0.0002295
dibenzo[a,h]anthracene	ND	0.0459	0.1	0.002295
indeno[1,2,3-cd]pyrene	ND	0.0459	0.1	0.002295
Total cPAH TEQ ²			<	0.0347
MTCA Method A Cleanup Level for Unrestricted Land Use				0.10

Total cPAH TEQ Calculation for Sample HB-4				
Analyte	Result (mg/kg)	Method Detection Limit (mg/kg)	Toxicity Equivalency Factor	Adjusted Concentration ¹ (mg/kg)
benzo(a)pyrene	ND	0.0465	1	0.02325
benzo(a)anthracene	ND	0.0465	0.1	0.002325
benzo(b)fluoranthene	ND	0.0465	0.1	0.002325
benzo(k)fluoranthene	ND	0.0465	0.1	0.002325
chrysene	ND	0.0465	0.01	0.0002325
dibenzo[a,h]anthracene	ND	0.0465	0.1	0.002325
indeno[1,2,3-cd]pyrene	ND	0.0465	0.1	0.002325
Total cPAH TEQ ²			<	0.0351
MTCA Method A Cleanup Level for Unrestricted Land Use				0.10

Total cPAH TEQ Calculation for Sample HB-5				
Analyte	Result (mg/kg)	Method Detection Limit (mg/kg)	Toxicity Equivalency Factor	Adjusted Concentration ¹ (mg/kg)
benzo(a)pyrene	ND	0.0472	1	0.0236
benzo(a)anthracene	ND	0.0472	0.1	0.00236
benzo(b)fluoranthene	ND	0.0472	0.1	0.00236
benzo(k)fluoranthene	ND	0.0472	0.1	0.00236
chrysene	ND	0.0472	0.01	0.000236
dibenzo[a,h]anthracene	ND	0.0472	0.1	0.00236
indeno[1,2,3-cd]pyrene	ND	0.0472	0.1	0.00236
Total cPAH TEQ ²			<	0.0356
MTCA Method A Cleanup Level for Unrestricted Land Use				0.10

Total cPAH TEQ Calculation for Sample HB-2:C1				
Analyte	Result (mg/kg)	Method Detection Limit (mg/kg)	Toxicity Equivalency Factor	Adjusted Concentration ¹ (mg/kg)
benzo(a)pyrene	ND	0.0453	1	0.02265
benzo(a)anthracene	ND	0.0453	0.1	0.002265
benzo(b)fluoranthene	ND	0.0453	0.1	0.002265
benzo(k)fluoranthene	ND	0.0453	0.1	0.002265
chrysene	ND	0.0453	0.01	0.0002265
dibenzo[a,h]anthracene	ND	0.0453	0.1	0.002265
indeno[1,2,3-cd]pyrene	ND	0.0453	0.1	0.002265
Total cPAH TEQ ²			<	0.0342
MTCA Method A Cleanup Level for Unrestricted Land Use				0.10

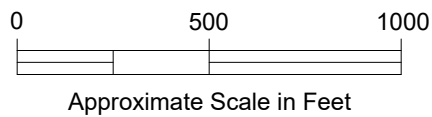
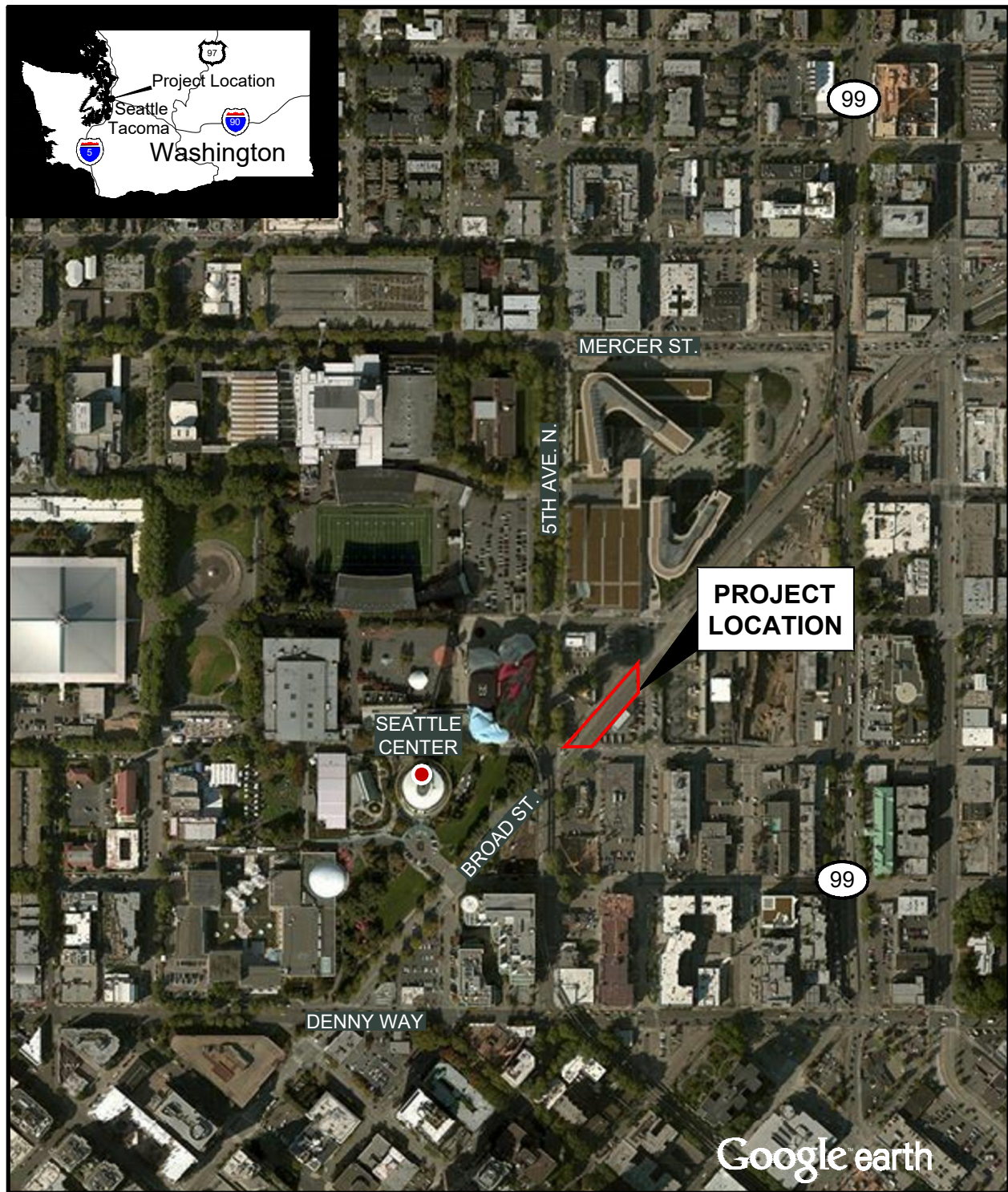
Analyte	Total cPAH TEQ Calculation for Sample HB-2:C2			Adjusted Concentration ¹ (mg/kg)
	Result (mg/kg)	Method Detection Limit (mg/kg)	Toxicity Equivalency Factor	
benzo(a)pyrene	ND	0.0472	1	0.0236
benzo(a)anthracene	ND	0.0472	0.1	0.00236
benzo(b)fluoranthene	ND	0.0472	0.1	0.00236
benzo(k)fluoranthene	ND	0.0472	0.1	0.00236
chrysene	ND	0.0472	0.01	0.000236
dibenzo[a,h]anthracene	ND	0.0472	0.1	0.00236
indeno[1,2,3-cd]pyrene	ND	0.0472	0.1	0.00236
Total cPAH TEQ ²			<	0.0356
MTCA Method A Cleanup Level for Unrestricted Land Use				0.10

NOTES:

1 For detected compounds, calculated as the detected concentration multiplied by the compound's TEF. For compounds that are ND, calculated as 1/2 of the MDL multiplied by the compound's TEF.

2 Sum of the TEF adjusted concentration for each cPAH.

< = ND = not detected above the MDL; cPAH = carcinogenic polycyclic aromatic hydrocarbon; MDL = Method Detection Limit; mg/kg = milligrams per kilogram; MTCA = Model Toxics Control Act; TEF = toxicity equivalency factor; TEQ = toxic equivalent concentration



NOTE

Map adapted from aerial imagery provided by Google Earth Pro.

Seattle Center Skate Plaza
Broad Street Right-of-Way
Seattle, Washington

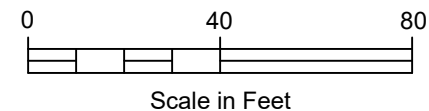
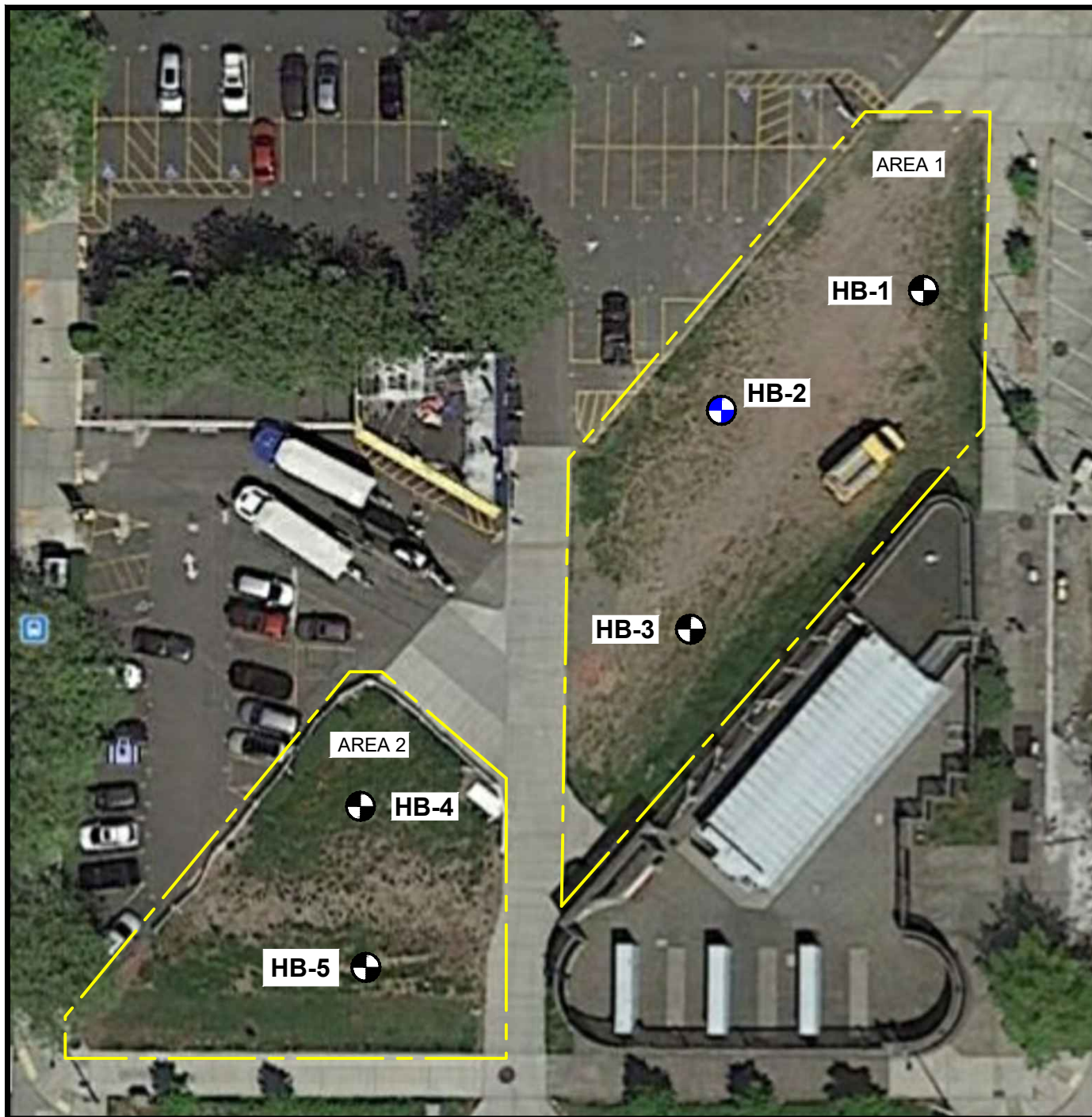
VICINITY MAP

June 2019




102998-001

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 1



LEGEND

- HB-1  Boring Designation and Approximate Location
- HB-2  Spot Removal
-  Area Outline

Seattle Center Skate Plaze
Broad Street Right-of-Way
Seattle, Washington

SITE AND EXPLORATION PLAN

June 2019

102998-001

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 2

Appendix A

Laboratory Analytical Results Report

CONTENTS

- Fremont Analytical – Laboratory Report 1903300
- Fremont Analytical – Laboratory Report 1905255



Fremont
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Shannon & Wilson

Dave Randall
400 N. 34th Street, Suite 100
Seattle, WA 98103

RE: Seattle Center Skate Plaza
Work Order Number: 1903300

May 08, 2019

Attention Dave Randall:

Fremont Analytical, Inc. received 5 sample(s) on 3/20/2019 for the analyses presented in the following report.

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.
Gasoline by NWTPH-Gx
Hexavalent Chromium by EPA Method 7196
Mercury by EPA Method 7471
Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)
Sample Moisture (Percent Moisture)
Total Metals by EPA Method 6020
Volatile Organic Compounds by EPA Method 8260C

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Mike Ridgeway
Laboratory Director

DoD/ELAP Certification #L 17-135, ISO/IEC 17025:2005
ORELAP Certification: WA 100009-007 (NELAP Recognized)

CLIENT: Shannon & Wilson
Project: Seattle Center Skate Plaza
Work Order: 1903300

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1903300-001	HB-1:3	03/20/2019 8:30 AM	03/20/2019 1:08 PM
1903300-002	HB-4:3.5	03/20/2019 9:00 AM	03/20/2019 1:08 PM
1903300-003	HB-5:3.5	03/20/2019 10:00 AM	03/20/2019 1:08 PM
1903300-004	HB-3:3.5	03/20/2019 11:00 AM	03/20/2019 1:08 PM
1903300-005	HB-2:3	03/20/2019 12:00 PM	03/20/2019 1:08 PM

CLIENT: Shannon & Wilson
Project: Seattle Center Skate Plaza

I. SAMPLE RECEIPT:

Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:

Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:

Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Rev1 - Additional analysis for hexavalent chromium for 003. 5/8/2019

Qualifiers:

- * - Flagged value is not within established control limits
- B - Analyte detected in the associated Method Blank
- D - Dilution was required
- E - Value above quantitation range
- H - Holding times for preparation or analysis exceeded
- I - Analyte with an internal standard that does not meet established acceptance criteria
- J - Analyte detected below Reporting Limit
- N - Tentatively Identified Compound (TIC)
- Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
- S - Spike recovery outside accepted recovery limits
- ND - Not detected at the Reporting Limit
- R - High relative percent difference observed

Acronyms:

- %Rec - Percent Recovery
- CCB - Continued Calibration Blank
- CCV - Continued Calibration Verification
- DF - Dilution Factor
- HEM - Hexane Extractable Material
- ICV - Initial Calibration Verification
- LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
- MB or MBLANK - Method Blank
- MDL - Method Detection Limit
- MS/MSD - Matrix Spike / Matrix Spike Duplicate
- PDS - Post Digestion Spike
- Ref Val - Reference Value
- RL - Reporting Limit
- RPD - Relative Percent Difference
- SD - Serial Dilution
- SGT - Silica Gel Treatment
- SPK - Spike
- Surr - Surrogate



Analytical Report

Work Order: 1903300
Date Reported: 5/8/2019

Client: Shannon & Wilson

Collection Date: 3/20/2019 8:30:00 AM

Project: Seattle Center Skate Plaza

Lab ID: 1903300-001

Matrix: Soil

Client Sample ID: HB-1:3

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Batch ID: 23918

Analyst: DW

Diesel (Fuel Oil)	ND	22.1		mg/Kg-dry	1	3/22/2019 5:53:14 AM
Heavy Oil	ND	55.2		mg/Kg-dry	1	3/22/2019 8:43:38 PM
Surr: 2-Fluorobiphenyl	102	50 - 150		%Rec	1	3/22/2019 5:53:14 AM
Surr: o-Terphenyl	103	50 - 150		%Rec	1	3/22/2019 5:53:14 AM

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Batch ID: 23919

Analyst: IH

Naphthalene	ND	39.1		µg/Kg-dry	1	3/22/2019 3:59:33 AM
2-Methylnaphthalene	ND	39.1		µg/Kg-dry	1	3/22/2019 3:59:33 AM
1-Methylnaphthalene	ND	39.1		µg/Kg-dry	1	3/22/2019 3:59:33 AM
Acenaphthylene	ND	39.1		µg/Kg-dry	1	3/22/2019 3:59:33 AM
Acenaphthene	ND	39.1		µg/Kg-dry	1	3/22/2019 3:59:33 AM
Fluorene	ND	39.1		µg/Kg-dry	1	3/22/2019 3:59:33 AM
Phenanthrene	ND	39.1		µg/Kg-dry	1	3/22/2019 3:59:33 AM
Anthracene	ND	39.1		µg/Kg-dry	1	3/22/2019 3:59:33 AM
Fluoranthene	ND	39.1		µg/Kg-dry	1	3/22/2019 3:59:33 AM
Pyrene	ND	39.1		µg/Kg-dry	1	3/22/2019 3:59:33 AM
Benz(a)anthracene	ND	39.1		µg/Kg-dry	1	3/22/2019 3:59:33 AM
Chrysene	ND	39.1		µg/Kg-dry	1	3/22/2019 3:59:33 AM
Benzo(b)fluoranthene	ND	39.1		µg/Kg-dry	1	3/22/2019 3:59:33 AM
Benzo(k)fluoranthene	ND	39.1		µg/Kg-dry	1	3/22/2019 3:59:33 AM
Benzo(a)pyrene	ND	39.1		µg/Kg-dry	1	3/22/2019 3:59:33 AM
Indeno(1,2,3-cd)pyrene	ND	39.1		µg/Kg-dry	1	3/22/2019 3:59:33 AM
Dibenz(a,h)anthracene	ND	39.1		µg/Kg-dry	1	3/22/2019 3:59:33 AM
Benzo(g,h,i)perylene	ND	39.1	Q	µg/Kg-dry	1	3/22/2019 3:59:33 AM
Surr: 2-Fluorobiphenyl	40.1	19.4 - 157		%Rec	1	3/22/2019 3:59:33 AM
Surr: Terphenyl-d14 (surr)	46.5	31.5 - 173		%Rec	1	3/22/2019 3:59:33 AM

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria

Gasoline by NWTPH-Gx

Batch ID: 23915

Analyst: CR

Gasoline	ND	7.21		mg/Kg-dry	1	3/21/2019 9:59:42 PM
Surr: Toluene-d8	98.5	65 - 135		%Rec	1	3/21/2019 9:59:42 PM
Surr: 4-Bromofluorobenzene	90.8	65 - 135		%Rec	1	3/21/2019 9:59:42 PM

Volatile Organic Compounds by EPA Method 8260C

Batch ID: 23915

Analyst: CR

Dichlorodifluoromethane (CFC-12)	ND	0.0288	Q	mg/Kg-dry	1	3/21/2019 9:59:42 PM
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Analytical Report

Work Order: 1903300
Date Reported: 5/8/2019

Client: Shannon & Wilson

Collection Date: 3/20/2019 8:30:00 AM

Project: Seattle Center Skate Plaza

Lab ID: 1903300-001

Matrix: Soil

Client Sample ID: HB-1:3

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Volatile Organic Compounds by EPA Method 8260C

Batch ID: 23915

Analyst: CR

Chloromethane	ND	0.0721	Q	mg/Kg-dry	1	3/21/2019 9:59:42 PM
Vinyl chloride	ND	0.0360		mg/Kg-dry	1	3/21/2019 9:59:42 PM
Bromomethane	ND	0.0721		mg/Kg-dry	1	3/21/2019 9:59:42 PM
Trichlorofluoromethane (CFC-11)	ND	0.0288		mg/Kg-dry	1	3/21/2019 9:59:42 PM
Chloroethane	ND	0.0721		mg/Kg-dry	1	3/21/2019 9:59:42 PM
1,1-Dichloroethene	ND	0.0288		mg/Kg-dry	1	3/21/2019 9:59:42 PM
Methylene chloride	ND	0.0288		mg/Kg-dry	1	3/21/2019 9:59:42 PM
trans-1,2-Dichloroethene	ND	0.0288		mg/Kg-dry	1	3/21/2019 9:59:42 PM
Methyl tert-butyl ether (MTBE)	ND	0.0721		mg/Kg-dry	1	3/21/2019 9:59:42 PM
1,1-Dichloroethane	ND	0.0288		mg/Kg-dry	1	3/21/2019 9:59:42 PM
2,2-Dichloropropane	ND	0.144	Q	mg/Kg-dry	1	3/21/2019 9:59:42 PM
cis-1,2-Dichloroethene	ND	0.0288		mg/Kg-dry	1	3/21/2019 9:59:42 PM
Chloroform	ND	0.0288		mg/Kg-dry	1	3/21/2019 9:59:42 PM
1,1,1-Trichloroethane (TCA)	ND	0.0360		mg/Kg-dry	1	3/21/2019 9:59:42 PM
1,1-Dichloropropene	ND	0.0288		mg/Kg-dry	1	3/21/2019 9:59:42 PM
Carbon tetrachloride	ND	0.0360		mg/Kg-dry	1	3/21/2019 9:59:42 PM
1,2-Dichloroethane (EDC)	ND	0.0288		mg/Kg-dry	1	3/21/2019 9:59:42 PM
Benzene	ND	0.0288		mg/Kg-dry	1	3/21/2019 9:59:42 PM
Trichloroethene (TCE)	ND	0.0288		mg/Kg-dry	1	3/21/2019 9:59:42 PM
1,2-Dichloropropane	ND	0.0288		mg/Kg-dry	1	3/21/2019 9:59:42 PM
Bromodichloromethane	ND	0.0288		mg/Kg-dry	1	3/21/2019 9:59:42 PM
Dibromomethane	ND	0.0288		mg/Kg-dry	1	3/21/2019 9:59:42 PM
cis-1,3-Dichloropropene	ND	0.0288	Q	mg/Kg-dry	1	3/21/2019 9:59:42 PM
Toluene	ND	0.0288		mg/Kg-dry	1	3/21/2019 9:59:42 PM
trans-1,3-Dichloropropylene	ND	0.0288		mg/Kg-dry	1	3/21/2019 9:59:42 PM
1,1,2-Trichloroethane	ND	0.0288		mg/Kg-dry	1	3/21/2019 9:59:42 PM
1,3-Dichloropropane	ND	0.0360		mg/Kg-dry	1	3/21/2019 9:59:42 PM
Tetrachloroethene (PCE)	ND	0.0360		mg/Kg-dry	1	3/21/2019 9:59:42 PM
Dibromochloromethane	ND	0.0360		mg/Kg-dry	1	3/21/2019 9:59:42 PM
1,2-Dibromoethane (EDB)	ND	0.00721		mg/Kg-dry	1	3/21/2019 9:59:42 PM
Chlorobenzene	ND	0.0360		mg/Kg-dry	1	3/21/2019 9:59:42 PM
1,1,1,2-Tetrachloroethane	ND	0.0360		mg/Kg-dry	1	3/21/2019 9:59:42 PM
Ethylbenzene	ND	0.0360		mg/Kg-dry	1	3/21/2019 9:59:42 PM
m,p-Xylene	ND	0.0721		mg/Kg-dry	1	3/21/2019 9:59:42 PM
o-Xylene	ND	0.0360		mg/Kg-dry	1	3/21/2019 9:59:42 PM
Styrene	ND	0.0360		mg/Kg-dry	1	3/21/2019 9:59:42 PM
Isopropylbenzene	ND	0.0360		mg/Kg-dry	1	3/21/2019 9:59:42 PM
Bromoform	ND	0.0721		mg/Kg-dry	1	3/21/2019 9:59:42 PM
1,1,2,2-Tetrachloroethane	ND	0.0288		mg/Kg-dry	1	3/21/2019 9:59:42 PM



Analytical Report

Work Order: 1903300
Date Reported: 5/8/2019

Client: Shannon & Wilson

Collection Date: 3/20/2019 8:30:00 AM

Project: Seattle Center Skate Plaza

Lab ID: 1903300-001

Matrix: Soil

Client Sample ID: HB-1:3

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Volatile Organic Compounds by EPA Method 8260C

Batch ID: 23915

Analyst: CR

n-Propylbenzene	ND	0.0360		mg/Kg-dry	1	3/21/2019 9:59:42 PM
Bromobenzene	ND	0.0288		mg/Kg-dry	1	3/21/2019 9:59:42 PM
1,3,5-Trimethylbenzene	ND	0.0360		mg/Kg-dry	1	3/21/2019 9:59:42 PM
2-Chlorotoluene	ND	0.0360		mg/Kg-dry	1	3/21/2019 9:59:42 PM
4-Chlorotoluene	ND	0.0360		mg/Kg-dry	1	3/21/2019 9:59:42 PM
tert-Butylbenzene	ND	0.0360		mg/Kg-dry	1	3/21/2019 9:59:42 PM
1,2,3-Trichloropropane	ND	0.0360		mg/Kg-dry	1	3/21/2019 9:59:42 PM
1,2,4-Trichlorobenzene	ND	0.0360		mg/Kg-dry	1	3/21/2019 9:59:42 PM
sec-Butylbenzene	ND	0.0721		mg/Kg-dry	1	3/21/2019 9:59:42 PM
4-Isopropyltoluene	ND	0.0721		mg/Kg-dry	1	3/21/2019 9:59:42 PM
1,3-Dichlorobenzene	ND	0.0288		mg/Kg-dry	1	3/21/2019 9:59:42 PM
1,4-Dichlorobenzene	ND	0.0288		mg/Kg-dry	1	3/21/2019 9:59:42 PM
n-Butylbenzene	ND	0.0360		mg/Kg-dry	1	3/21/2019 9:59:42 PM
1,2-Dichlorobenzene	ND	0.0288		mg/Kg-dry	1	3/21/2019 9:59:42 PM
1,2-Dibromo-3-chloropropane	ND	0.721		mg/Kg-dry	1	3/21/2019 9:59:42 PM
1,2,4-Trimethylbenzene	ND	0.0288		mg/Kg-dry	1	3/21/2019 9:59:42 PM
Hexachlorobutadiene	ND	0.0721		mg/Kg-dry	1	3/21/2019 9:59:42 PM
Naphthalene	ND	0.0721		mg/Kg-dry	1	3/21/2019 9:59:42 PM
1,2,3-Trichlorobenzene	ND	0.0288		mg/Kg-dry	1	3/21/2019 9:59:42 PM
Surr: Dibromofluoromethane	95.5	56.5 - 129		%Rec	1	3/21/2019 9:59:42 PM
Surr: Toluene-d8	104	64.5 - 151		%Rec	1	3/21/2019 9:59:42 PM
Surr: 1-Bromo-4-fluorobenzene	94.6	54.8 - 168		%Rec	1	3/21/2019 9:59:42 PM

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria

Mercury by EPA Method 7471

Batch ID: 23965

Analyst: WF

Mercury	ND	0.268		mg/Kg-dry	1	3/27/2019 11:35:29 AM
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Total Metals by EPA Method 6020

Batch ID: 23912

Analyst: WC

Arsenic	1.67	0.221		mg/Kg-dry	1	3/21/2019 2:53:48 PM
Barium	41.5	0.441		mg/Kg-dry	1	3/21/2019 2:53:48 PM
Cadmium	ND	0.176		mg/Kg-dry	1	3/21/2019 2:53:48 PM
Chromium	9.28	0.0882		mg/Kg-dry	1	3/21/2019 2:53:48 PM
Lead	2.56	0.176		mg/Kg-dry	1	3/21/2019 2:53:48 PM
Selenium	0.827	0.441		mg/Kg-dry	1	3/21/2019 2:53:48 PM
Silver	ND	0.0882		mg/Kg-dry	1	3/21/2019 2:53:48 PM



Analytical Report

Work Order: 1903300
Date Reported: 5/8/2019

Client: Shannon & Wilson

Collection Date: 3/20/2019 8:30:00 AM

Project: Seattle Center Skate Plaza

Lab ID: 1903300-001

Matrix: Soil

Client Sample ID: HB-1:3

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Sample Moisture (Percent Moisture)

Batch ID: R50191 Analyst: CJ

Percent Moisture	12.1			wt%	1	3/21/2019 8:14:12 AM
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Analytical Report

Work Order: 1903300
Date Reported: 5/8/2019

Client: Shannon & Wilson

Collection Date: 3/20/2019 9:00:00 AM

Project: Seattle Center Skate Plaza

Lab ID: 1903300-002

Matrix: Soil

Client Sample ID: HB-4:3.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Batch ID: 23918

Analyst: DW

Diesel (Fuel Oil)	ND	21.6		mg/Kg-dry	1	3/22/2019 6:23:00 AM
Heavy Oil	ND	54.1		mg/Kg-dry	1	3/22/2019 9:13:34 PM
Surr: 2-Fluorobiphenyl	126	50 - 150		%Rec	1	3/22/2019 6:23:00 AM
Surr: o-Terphenyl	126	50 - 150		%Rec	1	3/22/2019 6:23:00 AM

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Batch ID: 23919

Analyst: IH

Naphthalene	ND	46.5		µg/Kg-dry	1	3/22/2019 4:20:13 AM
2-Methylnaphthalene	ND	46.5		µg/Kg-dry	1	3/22/2019 4:20:13 AM
1-Methylnaphthalene	ND	46.5		µg/Kg-dry	1	3/22/2019 4:20:13 AM
Acenaphthylene	ND	46.5		µg/Kg-dry	1	3/22/2019 4:20:13 AM
Acenaphthene	ND	46.5		µg/Kg-dry	1	3/22/2019 4:20:13 AM
Fluorene	ND	46.5		µg/Kg-dry	1	3/22/2019 4:20:13 AM
Phenanthrene	ND	46.5		µg/Kg-dry	1	3/22/2019 4:20:13 AM
Anthracene	ND	46.5		µg/Kg-dry	1	3/22/2019 4:20:13 AM
Fluoranthene	ND	46.5		µg/Kg-dry	1	3/22/2019 4:20:13 AM
Pyrene	ND	46.5		µg/Kg-dry	1	3/22/2019 4:20:13 AM
Benz(a)anthracene	ND	46.5		µg/Kg-dry	1	3/22/2019 4:20:13 AM
Chrysene	ND	46.5		µg/Kg-dry	1	3/22/2019 4:20:13 AM
Benzo(b)fluoranthene	ND	46.5		µg/Kg-dry	1	3/22/2019 4:20:13 AM
Benzo(k)fluoranthene	ND	46.5		µg/Kg-dry	1	3/22/2019 4:20:13 AM
Benzo(a)pyrene	ND	46.5		µg/Kg-dry	1	3/22/2019 4:20:13 AM
Indeno(1,2,3-cd)pyrene	ND	46.5		µg/Kg-dry	1	3/22/2019 4:20:13 AM
Dibenz(a,h)anthracene	ND	46.5		µg/Kg-dry	1	3/22/2019 4:20:13 AM
Benzo(g,h,i)perylene	ND	46.5	Q	µg/Kg-dry	1	3/22/2019 4:20:13 AM
Surr: 2-Fluorobiphenyl	54.1	19.4 - 157		%Rec	1	3/22/2019 4:20:13 AM
Surr: Terphenyl-d14 (surr)	53.7	31.5 - 173		%Rec	1	3/22/2019 4:20:13 AM

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria

Gasoline by NWTPH-Gx

Batch ID: 23915

Analyst: CR

Gasoline	ND	7.46		mg/Kg-dry	1	3/21/2019 10:59:56 PM
Surr: Toluene-d8	97.5	65 - 135		%Rec	1	3/21/2019 10:59:56 PM
Surr: 4-Bromofluorobenzene	88.5	65 - 135		%Rec	1	3/21/2019 10:59:56 PM

Volatile Organic Compounds by EPA Method 8260C

Batch ID: 23915

Analyst: CR

Dichlorodifluoromethane (CFC-12)	ND	0.0299	Q	mg/Kg-dry	1	3/21/2019 10:59:56 PM
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Analytical Report

Work Order: 1903300
Date Reported: 5/8/2019

Client: Shannon & Wilson

Collection Date: 3/20/2019 9:00:00 AM

Project: Seattle Center Skate Plaza

Lab ID: 1903300-002

Matrix: Soil

Client Sample ID: HB-4:3.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Volatile Organic Compounds by EPA Method 8260C

Batch ID: 23915

Analyst: CR

Chloromethane	ND	0.0746	Q	mg/Kg-dry	1	3/21/2019 10:59:56 PM
Vinyl chloride	ND	0.0373		mg/Kg-dry	1	3/21/2019 10:59:56 PM
Bromomethane	ND	0.0746		mg/Kg-dry	1	3/21/2019 10:59:56 PM
Trichlorofluoromethane (CFC-11)	ND	0.0299		mg/Kg-dry	1	3/21/2019 10:59:56 PM
Chloroethane	ND	0.0746		mg/Kg-dry	1	3/21/2019 10:59:56 PM
1,1-Dichloroethene	ND	0.0299		mg/Kg-dry	1	3/21/2019 10:59:56 PM
Methylene chloride	ND	0.0299		mg/Kg-dry	1	3/21/2019 10:59:56 PM
trans-1,2-Dichloroethene	ND	0.0299		mg/Kg-dry	1	3/21/2019 10:59:56 PM
Methyl tert-butyl ether (MTBE)	ND	0.0746		mg/Kg-dry	1	3/21/2019 10:59:56 PM
1,1-Dichloroethane	ND	0.0299		mg/Kg-dry	1	3/21/2019 10:59:56 PM
2,2-Dichloropropane	ND	0.149	Q	mg/Kg-dry	1	3/21/2019 10:59:56 PM
cis-1,2-Dichloroethene	ND	0.0299		mg/Kg-dry	1	3/21/2019 10:59:56 PM
Chloroform	ND	0.0299		mg/Kg-dry	1	3/21/2019 10:59:56 PM
1,1,1-Trichloroethane (TCA)	ND	0.0373		mg/Kg-dry	1	3/21/2019 10:59:56 PM
1,1-Dichloropropene	ND	0.0299		mg/Kg-dry	1	3/21/2019 10:59:56 PM
Carbon tetrachloride	ND	0.0373		mg/Kg-dry	1	3/21/2019 10:59:56 PM
1,2-Dichloroethane (EDC)	ND	0.0299		mg/Kg-dry	1	3/21/2019 10:59:56 PM
Benzene	ND	0.0299		mg/Kg-dry	1	3/21/2019 10:59:56 PM
Trichloroethene (TCE)	ND	0.0299		mg/Kg-dry	1	3/21/2019 10:59:56 PM
1,2-Dichloropropane	ND	0.0299		mg/Kg-dry	1	3/21/2019 10:59:56 PM
Bromodichloromethane	ND	0.0299		mg/Kg-dry	1	3/21/2019 10:59:56 PM
Dibromomethane	ND	0.0299		mg/Kg-dry	1	3/21/2019 10:59:56 PM
cis-1,3-Dichloropropene	ND	0.0299	Q	mg/Kg-dry	1	3/21/2019 10:59:56 PM
Toluene	ND	0.0299		mg/Kg-dry	1	3/21/2019 10:59:56 PM
trans-1,3-Dichloropropylene	ND	0.0299		mg/Kg-dry	1	3/21/2019 10:59:56 PM
1,1,2-Trichloroethane	ND	0.0299		mg/Kg-dry	1	3/21/2019 10:59:56 PM
1,3-Dichloropropane	ND	0.0373		mg/Kg-dry	1	3/21/2019 10:59:56 PM
Tetrachloroethene (PCE)	ND	0.0373		mg/Kg-dry	1	3/21/2019 10:59:56 PM
Dibromochloromethane	ND	0.0373		mg/Kg-dry	1	3/21/2019 10:59:56 PM
1,2-Dibromoethane (EDB)	ND	0.00746		mg/Kg-dry	1	3/21/2019 10:59:56 PM
Chlorobenzene	ND	0.0373		mg/Kg-dry	1	3/21/2019 10:59:56 PM
1,1,1,2-Tetrachloroethane	ND	0.0373		mg/Kg-dry	1	3/21/2019 10:59:56 PM
Ethylbenzene	ND	0.0373		mg/Kg-dry	1	3/21/2019 10:59:56 PM
m,p-Xylene	ND	0.0746		mg/Kg-dry	1	3/21/2019 10:59:56 PM
o-Xylene	ND	0.0373		mg/Kg-dry	1	3/21/2019 10:59:56 PM
Styrene	ND	0.0373		mg/Kg-dry	1	3/21/2019 10:59:56 PM
Isopropylbenzene	ND	0.0373		mg/Kg-dry	1	3/21/2019 10:59:56 PM
Bromoform	ND	0.0746		mg/Kg-dry	1	3/21/2019 10:59:56 PM
1,1,2,2-Tetrachloroethane	ND	0.0299		mg/Kg-dry	1	3/21/2019 10:59:56 PM



Analytical Report

Work Order: 1903300
Date Reported: 5/8/2019

Client: Shannon & Wilson

Collection Date: 3/20/2019 9:00:00 AM

Project: Seattle Center Skate Plaza

Lab ID: 1903300-002

Matrix: Soil

Client Sample ID: HB-4:3.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Volatile Organic Compounds by EPA Method 8260C

Batch ID: 23915

Analyst: CR

n-Propylbenzene	ND	0.0373		mg/Kg-dry	1	3/21/2019 10:59:56 PM
Bromobenzene	ND	0.0299		mg/Kg-dry	1	3/21/2019 10:59:56 PM
1,3,5-Trimethylbenzene	ND	0.0373		mg/Kg-dry	1	3/21/2019 10:59:56 PM
2-Chlorotoluene	ND	0.0373		mg/Kg-dry	1	3/21/2019 10:59:56 PM
4-Chlorotoluene	ND	0.0373		mg/Kg-dry	1	3/21/2019 10:59:56 PM
tert-Butylbenzene	ND	0.0373		mg/Kg-dry	1	3/21/2019 10:59:56 PM
1,2,3-Trichloropropane	ND	0.0373		mg/Kg-dry	1	3/21/2019 10:59:56 PM
1,2,4-Trichlorobenzene	ND	0.0373		mg/Kg-dry	1	3/21/2019 10:59:56 PM
sec-Butylbenzene	ND	0.0746		mg/Kg-dry	1	3/21/2019 10:59:56 PM
4-Isopropyltoluene	ND	0.0746		mg/Kg-dry	1	3/21/2019 10:59:56 PM
1,3-Dichlorobenzene	ND	0.0299		mg/Kg-dry	1	3/21/2019 10:59:56 PM
1,4-Dichlorobenzene	ND	0.0299		mg/Kg-dry	1	3/21/2019 10:59:56 PM
n-Butylbenzene	ND	0.0373		mg/Kg-dry	1	3/21/2019 10:59:56 PM
1,2-Dichlorobenzene	ND	0.0299		mg/Kg-dry	1	3/21/2019 10:59:56 PM
1,2-Dibromo-3-chloropropane	ND	0.746		mg/Kg-dry	1	3/21/2019 10:59:56 PM
1,2,4-Trimethylbenzene	ND	0.0299		mg/Kg-dry	1	3/21/2019 10:59:56 PM
Hexachlorobutadiene	ND	0.0746		mg/Kg-dry	1	3/21/2019 10:59:56 PM
Naphthalene	ND	0.0746		mg/Kg-dry	1	3/21/2019 10:59:56 PM
1,2,3-Trichlorobenzene	ND	0.0299		mg/Kg-dry	1	3/21/2019 10:59:56 PM
Surr: Dibromofluoromethane	93.0	56.5 - 129		%Rec	1	3/21/2019 10:59:56 PM
Surr: Toluene-d8	101	64.5 - 151		%Rec	1	3/21/2019 10:59:56 PM
Surr: 1-Bromo-4-fluorobenzene	92.1	54.8 - 168		%Rec	1	3/21/2019 10:59:56 PM

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria

Mercury by EPA Method 7471

Batch ID: 23965

Analyst: WF

Mercury	1.19	1.43	JD	mg/Kg-dry	5	3/27/2019 11:42:59 AM
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Total Metals by EPA Method 6020

Batch ID: 23912

Analyst: WC

Arsenic	4.11	0.222		mg/Kg-dry	1	3/21/2019 2:58:22 PM
Barium	70.2	0.445		mg/Kg-dry	1	3/21/2019 2:58:22 PM
Cadmium	ND	0.178		mg/Kg-dry	1	3/21/2019 2:58:22 PM
Chromium	25.5	0.0890		mg/Kg-dry	1	3/21/2019 2:58:22 PM
Lead	10.9	0.178		mg/Kg-dry	1	3/21/2019 2:58:22 PM
Selenium	1.22	0.445		mg/Kg-dry	1	3/21/2019 2:58:22 PM
Silver	ND	0.0890		mg/Kg-dry	1	3/21/2019 2:58:22 PM



Analytical Report

Work Order: 1903300
Date Reported: 5/8/2019

Client: Shannon & Wilson

Collection Date: 3/20/2019 9:00:00 AM

Project: Seattle Center Skate Plaza

Lab ID: 1903300-002

Matrix: Soil

Client Sample ID: HB-4:3.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Sample Moisture (Percent Moisture)

Batch ID: R50191 Analyst: CJ

Percent Moisture	17.4			wt%	1	3/21/2019 8:14:12 AM
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Analytical Report

Work Order: 1903300
Date Reported: 5/8/2019

Client: Shannon & Wilson

Collection Date: 3/20/2019 10:00:00 AM

Project: Seattle Center Skate Plaza

Lab ID: 1903300-003

Matrix: Soil

Client Sample ID: HB-5:3.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Batch ID: 23918

Analyst: DW

Diesel (Fuel Oil)	ND	23.4		mg/Kg-dry	1	3/22/2019 6:52:52 AM
Heavy Oil	117	58.6		mg/Kg-dry	1	3/22/2019 9:43:30 PM
Surr: 2-Fluorobiphenyl	101	50 - 150		%Rec	1	3/22/2019 6:52:52 AM
Surr: o-Terphenyl	102	50 - 150		%Rec	1	3/22/2019 6:52:52 AM

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Batch ID: 23919

Analyst: IH

Naphthalene	ND	47.2		µg/Kg-dry	1	3/22/2019 4:40:52 AM
2-Methylnaphthalene	ND	47.2		µg/Kg-dry	1	3/22/2019 4:40:52 AM
1-Methylnaphthalene	ND	47.2		µg/Kg-dry	1	3/22/2019 4:40:52 AM
Acenaphthylene	ND	47.2		µg/Kg-dry	1	3/22/2019 4:40:52 AM
Acenaphthene	ND	47.2		µg/Kg-dry	1	3/22/2019 4:40:52 AM
Fluorene	ND	47.2		µg/Kg-dry	1	3/22/2019 4:40:52 AM
Phenanthrene	ND	47.2		µg/Kg-dry	1	3/22/2019 4:40:52 AM
Anthracene	ND	47.2		µg/Kg-dry	1	3/22/2019 4:40:52 AM
Fluoranthene	ND	47.2		µg/Kg-dry	1	3/22/2019 4:40:52 AM
Pyrene	ND	47.2		µg/Kg-dry	1	3/22/2019 4:40:52 AM
Benz(a)anthracene	ND	47.2		µg/Kg-dry	1	3/22/2019 4:40:52 AM
Chrysene	ND	47.2		µg/Kg-dry	1	3/22/2019 4:40:52 AM
Benzo(b)fluoranthene	ND	47.2		µg/Kg-dry	1	3/22/2019 4:40:52 AM
Benzo(k)fluoranthene	ND	47.2		µg/Kg-dry	1	3/22/2019 4:40:52 AM
Benzo(a)pyrene	ND	47.2		µg/Kg-dry	1	3/22/2019 4:40:52 AM
Indeno(1,2,3-cd)pyrene	ND	47.2		µg/Kg-dry	1	3/22/2019 4:40:52 AM
Dibenz(a,h)anthracene	ND	47.2		µg/Kg-dry	1	3/22/2019 4:40:52 AM
Benzo(g,h,i)perylene	ND	47.2	Q	µg/Kg-dry	1	3/22/2019 4:40:52 AM
Surr: 2-Fluorobiphenyl	52.8	19.4 - 157		%Rec	1	3/22/2019 4:40:52 AM
Surr: Terphenyl-d14 (surr)	55.0	31.5 - 173		%Rec	1	3/22/2019 4:40:52 AM

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria

Gasoline by NWTPH-Gx

Batch ID: 23915

Analyst: CR

Gasoline	ND	6.27		mg/Kg-dry	1	3/21/2019 11:30:02 PM
Surr: Toluene-d8	97.0	65 - 135		%Rec	1	3/21/2019 11:30:02 PM
Surr: 4-Bromofluorobenzene	92.4	65 - 135		%Rec	1	3/21/2019 11:30:02 PM

Volatile Organic Compounds by EPA Method 8260C

Batch ID: 23915

Analyst: CR

Dichlorodifluoromethane (CFC-12)	ND	0.0251	Q	mg/Kg-dry	1	3/21/2019 11:30:02 PM
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Analytical Report

Work Order: 1903300
Date Reported: 5/8/2019

Client: Shannon & Wilson

Collection Date: 3/20/2019 10:00:00 AM

Project: Seattle Center Skate Plaza

Lab ID: 1903300-003

Matrix: Soil

Client Sample ID: HB-5:3.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Volatile Organic Compounds by EPA Method 8260C

Batch ID: 23915

Analyst: CR

Chloromethane	ND	0.0627	Q	mg/Kg-dry	1	3/21/2019 11:30:02 PM
Vinyl chloride	ND	0.0313		mg/Kg-dry	1	3/21/2019 11:30:02 PM
Bromomethane	ND	0.0627		mg/Kg-dry	1	3/21/2019 11:30:02 PM
Trichlorofluoromethane (CFC-11)	ND	0.0251		mg/Kg-dry	1	3/21/2019 11:30:02 PM
Chloroethane	ND	0.0627		mg/Kg-dry	1	3/21/2019 11:30:02 PM
1,1-Dichloroethene	ND	0.0251		mg/Kg-dry	1	3/21/2019 11:30:02 PM
Methylene chloride	ND	0.0251		mg/Kg-dry	1	3/21/2019 11:30:02 PM
trans-1,2-Dichloroethene	ND	0.0251		mg/Kg-dry	1	3/21/2019 11:30:02 PM
Methyl tert-butyl ether (MTBE)	ND	0.0627		mg/Kg-dry	1	3/21/2019 11:30:02 PM
1,1-Dichloroethane	ND	0.0251		mg/Kg-dry	1	3/21/2019 11:30:02 PM
2,2-Dichloropropane	ND	0.125	Q	mg/Kg-dry	1	3/21/2019 11:30:02 PM
cis-1,2-Dichloroethene	ND	0.0251		mg/Kg-dry	1	3/21/2019 11:30:02 PM
Chloroform	ND	0.0251		mg/Kg-dry	1	3/21/2019 11:30:02 PM
1,1,1-Trichloroethane (TCA)	ND	0.0313		mg/Kg-dry	1	3/21/2019 11:30:02 PM
1,1-Dichloropropene	ND	0.0251		mg/Kg-dry	1	3/21/2019 11:30:02 PM
Carbon tetrachloride	ND	0.0313		mg/Kg-dry	1	3/21/2019 11:30:02 PM
1,2-Dichloroethane (EDC)	ND	0.0251		mg/Kg-dry	1	3/21/2019 11:30:02 PM
Benzene	ND	0.0251		mg/Kg-dry	1	3/21/2019 11:30:02 PM
Trichloroethene (TCE)	ND	0.0251		mg/Kg-dry	1	3/21/2019 11:30:02 PM
1,2-Dichloropropane	ND	0.0251		mg/Kg-dry	1	3/21/2019 11:30:02 PM
Bromodichloromethane	ND	0.0251		mg/Kg-dry	1	3/21/2019 11:30:02 PM
Dibromomethane	ND	0.0251		mg/Kg-dry	1	3/21/2019 11:30:02 PM
cis-1,3-Dichloropropene	ND	0.0251	Q	mg/Kg-dry	1	3/21/2019 11:30:02 PM
Toluene	ND	0.0251		mg/Kg-dry	1	3/21/2019 11:30:02 PM
trans-1,3-Dichloropropylene	ND	0.0251		mg/Kg-dry	1	3/21/2019 11:30:02 PM
1,1,2-Trichloroethane	ND	0.0251		mg/Kg-dry	1	3/21/2019 11:30:02 PM
1,3-Dichloropropane	ND	0.0313		mg/Kg-dry	1	3/21/2019 11:30:02 PM
Tetrachloroethene (PCE)	ND	0.0313		mg/Kg-dry	1	3/21/2019 11:30:02 PM
Dibromochloromethane	ND	0.0313		mg/Kg-dry	1	3/21/2019 11:30:02 PM
1,2-Dibromoethane (EDB)	ND	0.00627		mg/Kg-dry	1	3/21/2019 11:30:02 PM
Chlorobenzene	ND	0.0313		mg/Kg-dry	1	3/21/2019 11:30:02 PM
1,1,1,2-Tetrachloroethane	ND	0.0313		mg/Kg-dry	1	3/21/2019 11:30:02 PM
Ethylbenzene	ND	0.0313		mg/Kg-dry	1	3/21/2019 11:30:02 PM
m,p-Xylene	ND	0.0627		mg/Kg-dry	1	3/21/2019 11:30:02 PM
o-Xylene	ND	0.0313		mg/Kg-dry	1	3/21/2019 11:30:02 PM
Styrene	ND	0.0313		mg/Kg-dry	1	3/21/2019 11:30:02 PM
Isopropylbenzene	ND	0.0313		mg/Kg-dry	1	3/21/2019 11:30:02 PM
Bromoform	ND	0.0627		mg/Kg-dry	1	3/21/2019 11:30:02 PM
1,1,2,2-Tetrachloroethane	ND	0.0251		mg/Kg-dry	1	3/21/2019 11:30:02 PM



Analytical Report

Work Order: 1903300
Date Reported: 5/8/2019

Client: Shannon & Wilson

Collection Date: 3/20/2019 10:00:00 AM

Project: Seattle Center Skate Plaza

Lab ID: 1903300-003

Matrix: Soil

Client Sample ID: HB-5:3.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Volatile Organic Compounds by EPA Method 8260C

Batch ID: 23915

Analyst: CR

n-Propylbenzene	ND	0.0313		mg/Kg-dry	1	3/21/2019 11:30:02 PM
Bromobenzene	ND	0.0251		mg/Kg-dry	1	3/21/2019 11:30:02 PM
1,3,5-Trimethylbenzene	ND	0.0313		mg/Kg-dry	1	3/21/2019 11:30:02 PM
2-Chlorotoluene	ND	0.0313		mg/Kg-dry	1	3/21/2019 11:30:02 PM
4-Chlorotoluene	ND	0.0313		mg/Kg-dry	1	3/21/2019 11:30:02 PM
tert-Butylbenzene	ND	0.0313		mg/Kg-dry	1	3/21/2019 11:30:02 PM
1,2,3-Trichloropropane	ND	0.0313		mg/Kg-dry	1	3/21/2019 11:30:02 PM
1,2,4-Trichlorobenzene	ND	0.0313		mg/Kg-dry	1	3/21/2019 11:30:02 PM
sec-Butylbenzene	ND	0.0627		mg/Kg-dry	1	3/21/2019 11:30:02 PM
4-Isopropyltoluene	ND	0.0627		mg/Kg-dry	1	3/21/2019 11:30:02 PM
1,3-Dichlorobenzene	ND	0.0251		mg/Kg-dry	1	3/21/2019 11:30:02 PM
1,4-Dichlorobenzene	ND	0.0251		mg/Kg-dry	1	3/21/2019 11:30:02 PM
n-Butylbenzene	ND	0.0313		mg/Kg-dry	1	3/21/2019 11:30:02 PM
1,2-Dichlorobenzene	ND	0.0251		mg/Kg-dry	1	3/21/2019 11:30:02 PM
1,2-Dibromo-3-chloropropane	ND	0.627		mg/Kg-dry	1	3/21/2019 11:30:02 PM
1,2,4-Trimethylbenzene	ND	0.0251		mg/Kg-dry	1	3/21/2019 11:30:02 PM
Hexachlorobutadiene	ND	0.0627		mg/Kg-dry	1	3/21/2019 11:30:02 PM
Naphthalene	ND	0.0627		mg/Kg-dry	1	3/21/2019 11:30:02 PM
1,2,3-Trichlorobenzene	ND	0.0251		mg/Kg-dry	1	3/21/2019 11:30:02 PM
Surr: Dibromofluoromethane	96.2	56.5 - 129		%Rec	1	3/21/2019 11:30:02 PM
Surr: Toluene-d8	103	64.5 - 151		%Rec	1	3/21/2019 11:30:02 PM
Surr: 1-Bromo-4-fluorobenzene	95.4	54.8 - 168		%Rec	1	3/21/2019 11:30:02 PM

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria

Mercury by EPA Method 7471

Batch ID: 23965

Analyst: WF

Mercury	ND	0.287		mg/Kg-dry	1	3/27/2019 11:44:34 AM
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Total Metals by EPA Method 6020

Batch ID: 23912

Analyst: WC

Arsenic	4.95	0.236		mg/Kg-dry	1	3/21/2019 3:02:56 PM
Barium	88.7	0.473		mg/Kg-dry	1	3/21/2019 3:02:56 PM
Cadmium	ND	0.189		mg/Kg-dry	1	3/21/2019 3:02:56 PM
Chromium	25.9	0.0945		mg/Kg-dry	1	3/21/2019 3:02:56 PM
Lead	14.2	0.189		mg/Kg-dry	1	3/21/2019 3:02:56 PM
Selenium	1.41	0.473		mg/Kg-dry	1	3/21/2019 3:02:56 PM
Silver	ND	0.0945		mg/Kg-dry	1	3/21/2019 3:02:56 PM



Analytical Report

Work Order: 1903300
Date Reported: 5/8/2019

Client: Shannon & Wilson

Collection Date: 3/20/2019 10:00:00 AM

Project: Seattle Center Skate Plaza

Lab ID: 1903300-003

Matrix: Soil

Client Sample ID: HB-5:3.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Sample Moisture (Percent Moisture)

Batch ID: R50191 Analyst: CJ

Percent Moisture	19.2			wt%	1	3/21/2019 8:14:12 AM
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Hexavalent Chromium by EPA Method 7196

Batch ID: 24434 Analyst: WF

Chromium, Hexavalent	ND	0.623	H	mg/Kg-dry	1	5/7/2019 4:55:00 PM
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Analytical Report

Work Order: 1903300
Date Reported: 5/8/2019

Client: Shannon & Wilson

Collection Date: 3/20/2019 11:00:00 AM

Project: Seattle Center Skate Plaza

Lab ID: 1903300-004

Matrix: Soil

Client Sample ID: HB-3:3.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Batch ID: 23918

Analyst: DW

Diesel (Fuel Oil)	ND	22.3		mg/Kg-dry	1	3/22/2019 7:22:42 AM
Heavy Oil	ND	55.9		mg/Kg-dry	1	3/22/2019 7:22:42 AM
Surr: 2-Fluorobiphenyl	112	50 - 150		%Rec	1	3/22/2019 7:22:42 AM
Surr: o-Terphenyl	112	50 - 150		%Rec	1	3/22/2019 7:22:42 AM

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Batch ID: 23919

Analyst: IH

Naphthalene	ND	45.9		µg/Kg-dry	1	3/22/2019 5:01:35 AM
2-Methylnaphthalene	ND	45.9		µg/Kg-dry	1	3/22/2019 5:01:35 AM
1-Methylnaphthalene	ND	45.9		µg/Kg-dry	1	3/22/2019 5:01:35 AM
Acenaphthylene	ND	45.9		µg/Kg-dry	1	3/22/2019 5:01:35 AM
Acenaphthene	ND	45.9		µg/Kg-dry	1	3/22/2019 5:01:35 AM
Fluorene	ND	45.9		µg/Kg-dry	1	3/22/2019 5:01:35 AM
Phenanthrene	ND	45.9		µg/Kg-dry	1	3/22/2019 5:01:35 AM
Anthracene	ND	45.9		µg/Kg-dry	1	3/22/2019 5:01:35 AM
Fluoranthene	ND	45.9		µg/Kg-dry	1	3/22/2019 5:01:35 AM
Pyrene	ND	45.9		µg/Kg-dry	1	3/22/2019 5:01:35 AM
Benz(a)anthracene	ND	45.9		µg/Kg-dry	1	3/22/2019 5:01:35 AM
Chrysene	ND	45.9		µg/Kg-dry	1	3/22/2019 5:01:35 AM
Benzo(b)fluoranthene	ND	45.9		µg/Kg-dry	1	3/22/2019 5:01:35 AM
Benzo(k)fluoranthene	ND	45.9		µg/Kg-dry	1	3/22/2019 5:01:35 AM
Benzo(a)pyrene	ND	45.9		µg/Kg-dry	1	3/22/2019 5:01:35 AM
Indeno(1,2,3-cd)pyrene	ND	45.9		µg/Kg-dry	1	3/22/2019 5:01:35 AM
Dibenz(a,h)anthracene	ND	45.9		µg/Kg-dry	1	3/22/2019 5:01:35 AM
Benzo(g,h,i)perylene	ND	45.9	Q	µg/Kg-dry	1	3/22/2019 5:01:35 AM
Surr: 2-Fluorobiphenyl	50.0	19.4 - 157		%Rec	1	3/22/2019 5:01:35 AM
Surr: Terphenyl-d14 (surr)	53.1	31.5 - 173		%Rec	1	3/22/2019 5:01:35 AM

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria

Gasoline by NWTPH-Gx

Batch ID: 23915

Analyst: CR

Gasoline	ND	3.63		mg/Kg-dry	1	3/22/2019 12:00:10 AM
Surr: Toluene-d8	97.8	65 - 135		%Rec	1	3/22/2019 12:00:10 AM
Surr: 4-Bromofluorobenzene	88.9	65 - 135		%Rec	1	3/22/2019 12:00:10 AM

Volatile Organic Compounds by EPA Method 8260C

Batch ID: 23915

Analyst: CR

Dichlorodifluoromethane (CFC-12)	ND	0.0145	Q	mg/Kg-dry	1	3/22/2019 12:00:10 AM
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Analytical Report

Work Order: 1903300
Date Reported: 5/8/2019

Client: Shannon & Wilson

Collection Date: 3/20/2019 11:00:00 AM

Project: Seattle Center Skate Plaza

Lab ID: 1903300-004

Matrix: Soil

Client Sample ID: HB-3:3.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Volatile Organic Compounds by EPA Method 8260C

Batch ID: 23915

Analyst: CR

Chloromethane	ND	0.0363	Q	mg/Kg-dry	1	3/22/2019 12:00:10 AM
Vinyl chloride	ND	0.0181		mg/Kg-dry	1	3/22/2019 12:00:10 AM
Bromomethane	ND	0.0363		mg/Kg-dry	1	3/22/2019 12:00:10 AM
Trichlorofluoromethane (CFC-11)	ND	0.0145		mg/Kg-dry	1	3/22/2019 12:00:10 AM
Chloroethane	ND	0.0363		mg/Kg-dry	1	3/22/2019 12:00:10 AM
1,1-Dichloroethene	ND	0.0145		mg/Kg-dry	1	3/22/2019 12:00:10 AM
Methylene chloride	ND	0.0145		mg/Kg-dry	1	3/22/2019 12:00:10 AM
trans-1,2-Dichloroethene	ND	0.0145		mg/Kg-dry	1	3/22/2019 12:00:10 AM
Methyl tert-butyl ether (MTBE)	ND	0.0363		mg/Kg-dry	1	3/22/2019 12:00:10 AM
1,1-Dichloroethane	ND	0.0145		mg/Kg-dry	1	3/22/2019 12:00:10 AM
2,2-Dichloropropane	ND	0.0725	Q	mg/Kg-dry	1	3/22/2019 12:00:10 AM
cis-1,2-Dichloroethene	ND	0.0145		mg/Kg-dry	1	3/22/2019 12:00:10 AM
Chloroform	ND	0.0145		mg/Kg-dry	1	3/22/2019 12:00:10 AM
1,1,1-Trichloroethane (TCA)	ND	0.0181		mg/Kg-dry	1	3/22/2019 12:00:10 AM
1,1-Dichloropropene	ND	0.0145		mg/Kg-dry	1	3/22/2019 12:00:10 AM
Carbon tetrachloride	ND	0.0181		mg/Kg-dry	1	3/22/2019 12:00:10 AM
1,2-Dichloroethane (EDC)	ND	0.0145		mg/Kg-dry	1	3/22/2019 12:00:10 AM
Benzene	ND	0.0145		mg/Kg-dry	1	3/22/2019 12:00:10 AM
Trichloroethene (TCE)	ND	0.0145		mg/Kg-dry	1	3/22/2019 12:00:10 AM
1,2-Dichloropropane	ND	0.0145		mg/Kg-dry	1	3/22/2019 12:00:10 AM
Bromodichloromethane	ND	0.0145		mg/Kg-dry	1	3/22/2019 12:00:10 AM
Dibromomethane	ND	0.0145		mg/Kg-dry	1	3/22/2019 12:00:10 AM
cis-1,3-Dichloropropene	ND	0.0145	Q	mg/Kg-dry	1	3/22/2019 12:00:10 AM
Toluene	ND	0.0145		mg/Kg-dry	1	3/22/2019 12:00:10 AM
trans-1,3-Dichloropropylene	ND	0.0145		mg/Kg-dry	1	3/22/2019 12:00:10 AM
1,1,2-Trichloroethane	ND	0.0145		mg/Kg-dry	1	3/22/2019 12:00:10 AM
1,3-Dichloropropane	ND	0.0181		mg/Kg-dry	1	3/22/2019 12:00:10 AM
Tetrachloroethene (PCE)	ND	0.0181		mg/Kg-dry	1	3/22/2019 12:00:10 AM
Dibromochloromethane	ND	0.0181		mg/Kg-dry	1	3/22/2019 12:00:10 AM
1,2-Dibromoethane (EDB)	ND	0.00363		mg/Kg-dry	1	3/22/2019 12:00:10 AM
Chlorobenzene	ND	0.0181		mg/Kg-dry	1	3/22/2019 12:00:10 AM
1,1,1,2-Tetrachloroethane	ND	0.0181		mg/Kg-dry	1	3/22/2019 12:00:10 AM
Ethylbenzene	ND	0.0181		mg/Kg-dry	1	3/22/2019 12:00:10 AM
m,p-Xylene	ND	0.0363		mg/Kg-dry	1	3/22/2019 12:00:10 AM
o-Xylene	ND	0.0181		mg/Kg-dry	1	3/22/2019 12:00:10 AM
Styrene	ND	0.0181		mg/Kg-dry	1	3/22/2019 12:00:10 AM
Isopropylbenzene	ND	0.0181		mg/Kg-dry	1	3/22/2019 12:00:10 AM
Bromoform	ND	0.0363		mg/Kg-dry	1	3/22/2019 12:00:10 AM
1,1,2,2-Tetrachloroethane	ND	0.0145		mg/Kg-dry	1	3/22/2019 12:00:10 AM



Analytical Report

Work Order: 1903300
Date Reported: 5/8/2019

Client: Shannon & Wilson

Collection Date: 3/20/2019 11:00:00 AM

Project: Seattle Center Skate Plaza

Lab ID: 1903300-004

Matrix: Soil

Client Sample ID: HB-3:3.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Volatile Organic Compounds by EPA Method 8260C

Batch ID: 23915

Analyst: CR

n-Propylbenzene	ND	0.0181		mg/Kg-dry	1	3/22/2019 12:00:10 AM
Bromobenzene	ND	0.0145		mg/Kg-dry	1	3/22/2019 12:00:10 AM
1,3,5-Trimethylbenzene	ND	0.0181		mg/Kg-dry	1	3/22/2019 12:00:10 AM
2-Chlorotoluene	ND	0.0181		mg/Kg-dry	1	3/22/2019 12:00:10 AM
4-Chlorotoluene	ND	0.0181		mg/Kg-dry	1	3/22/2019 12:00:10 AM
tert-Butylbenzene	ND	0.0181		mg/Kg-dry	1	3/22/2019 12:00:10 AM
1,2,3-Trichloropropane	ND	0.0181		mg/Kg-dry	1	3/22/2019 12:00:10 AM
1,2,4-Trichlorobenzene	ND	0.0181		mg/Kg-dry	1	3/22/2019 12:00:10 AM
sec-Butylbenzene	ND	0.0363		mg/Kg-dry	1	3/22/2019 12:00:10 AM
4-Isopropyltoluene	ND	0.0363		mg/Kg-dry	1	3/22/2019 12:00:10 AM
1,3-Dichlorobenzene	ND	0.0145		mg/Kg-dry	1	3/22/2019 12:00:10 AM
1,4-Dichlorobenzene	ND	0.0145		mg/Kg-dry	1	3/22/2019 12:00:10 AM
n-Butylbenzene	ND	0.0181		mg/Kg-dry	1	3/22/2019 12:00:10 AM
1,2-Dichlorobenzene	ND	0.0145		mg/Kg-dry	1	3/22/2019 12:00:10 AM
1,2-Dibromo-3-chloropropane	ND	0.363		mg/Kg-dry	1	3/22/2019 12:00:10 AM
1,2,4-Trimethylbenzene	ND	0.0145		mg/Kg-dry	1	3/22/2019 12:00:10 AM
Hexachlorobutadiene	ND	0.0363		mg/Kg-dry	1	3/22/2019 12:00:10 AM
Naphthalene	ND	0.0363		mg/Kg-dry	1	3/22/2019 12:00:10 AM
1,2,3-Trichlorobenzene	ND	0.0145		mg/Kg-dry	1	3/22/2019 12:00:10 AM
Surr: Dibromofluoromethane	96.9	56.5 - 129		%Rec	1	3/22/2019 12:00:10 AM
Surr: Toluene-d8	104	64.5 - 151		%Rec	1	3/22/2019 12:00:10 AM
Surr: 1-Bromo-4-fluorobenzene	92.7	54.8 - 168		%Rec	1	3/22/2019 12:00:10 AM

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria

Mercury by EPA Method 7471

Batch ID: 23965

Analyst: WF

Mercury	ND	0.268		mg/Kg-dry	1	3/27/2019 11:46:10 AM
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Total Metals by EPA Method 6020

Batch ID: 23912

Analyst: WC

Arsenic	2.02	0.233		mg/Kg-dry	1	3/21/2019 3:07:29 PM
Barium	54.4	0.467		mg/Kg-dry	1	3/21/2019 3:07:29 PM
Cadmium	ND	0.187		mg/Kg-dry	1	3/21/2019 3:07:29 PM
Chromium	22.0	0.0933		mg/Kg-dry	1	3/21/2019 3:07:29 PM
Lead	2.72	0.187		mg/Kg-dry	1	3/21/2019 3:07:29 PM
Selenium	0.912	0.467		mg/Kg-dry	1	3/21/2019 3:07:29 PM
Silver	ND	0.0933		mg/Kg-dry	1	3/21/2019 3:07:29 PM



Analytical Report

Work Order: 1903300
Date Reported: 5/8/2019

Client: Shannon & Wilson

Collection Date: 3/20/2019 11:00:00 AM

Project: Seattle Center Skate Plaza

Lab ID: 1903300-004

Matrix: Soil

Client Sample ID: HB-3:3.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Sample Moisture (Percent Moisture)

Batch ID: R50191 Analyst: CJ

Percent Moisture	13.6			wt%	1	3/21/2019 8:14:12 AM
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Analytical Report

Work Order: 1903300
Date Reported: 5/8/2019

Client: Shannon & Wilson

Collection Date: 3/20/2019 12:00:00 PM

Project: Seattle Center Skate Plaza

Lab ID: 1903300-005

Matrix: Soil

Client Sample ID: HB-2:3

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Batch ID: 23918

Analyst: DW

Diesel (Fuel Oil)	ND	21.8		mg/Kg-dry	1	3/22/2019 7:52:35 AM
Heavy Oil	ND	54.5		mg/Kg-dry	1	3/22/2019 7:52:35 AM
Surr: 2-Fluorobiphenyl	95.7	50 - 150		%Rec	1	3/22/2019 7:52:35 AM
Surr: o-Terphenyl	96.1	50 - 150		%Rec	1	3/22/2019 7:52:35 AM

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Batch ID: 23919

Analyst: IH

Naphthalene	ND	42.0		µg/Kg-dry	1	3/22/2019 5:22:16 AM
2-Methylnaphthalene	ND	42.0		µg/Kg-dry	1	3/22/2019 5:22:16 AM
1-Methylnaphthalene	ND	42.0		µg/Kg-dry	1	3/22/2019 5:22:16 AM
Acenaphthylene	ND	42.0		µg/Kg-dry	1	3/22/2019 5:22:16 AM
Acenaphthene	ND	42.0		µg/Kg-dry	1	3/22/2019 5:22:16 AM
Fluorene	ND	42.0		µg/Kg-dry	1	3/22/2019 5:22:16 AM
Phenanthrene	176	42.0		µg/Kg-dry	1	3/22/2019 5:22:16 AM
Anthracene	59.4	42.0		µg/Kg-dry	1	3/22/2019 5:22:16 AM
Fluoranthene	316	42.0		µg/Kg-dry	1	3/22/2019 5:22:16 AM
Pyrene	217	42.0		µg/Kg-dry	1	3/22/2019 5:22:16 AM
Benz(a)anthracene	90.3	42.0		µg/Kg-dry	1	3/22/2019 5:22:16 AM
Chrysene	92.9	42.0		µg/Kg-dry	1	3/22/2019 5:22:16 AM
Benzo(b)fluoranthene	53.2	42.0		µg/Kg-dry	1	3/22/2019 5:22:16 AM
Benzo(k)fluoranthene	ND	42.0		µg/Kg-dry	1	3/22/2019 5:22:16 AM
Benzo(a)pyrene	ND	42.0		µg/Kg-dry	1	3/22/2019 5:22:16 AM
Indeno(1,2,3-cd)pyrene	ND	42.0		µg/Kg-dry	1	3/22/2019 5:22:16 AM
Dibenz(a,h)anthracene	ND	42.0		µg/Kg-dry	1	3/22/2019 5:22:16 AM
Benzo(g,h,i)perylene	ND	42.0	Q	µg/Kg-dry	1	3/22/2019 5:22:16 AM
Surr: 2-Fluorobiphenyl	62.2	19.4 - 157		%Rec	1	3/22/2019 5:22:16 AM
Surr: Terphenyl-d14 (surr)	66.1	31.5 - 173		%Rec	1	3/22/2019 5:22:16 AM

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria

Gasoline by NWTPH-Gx

Batch ID: 23915

Analyst: CR

Gasoline	ND	3.79		mg/Kg-dry	1	3/22/2019 12:30:19 AM
Surr: Toluene-d8	98.0	65 - 135		%Rec	1	3/22/2019 12:30:19 AM
Surr: 4-Bromofluorobenzene	89.3	65 - 135		%Rec	1	3/22/2019 12:30:19 AM

Volatile Organic Compounds by EPA Method 8260C

Batch ID: 23915

Analyst: CR

Dichlorodifluoromethane (CFC-12)	ND	0.0151	Q	mg/Kg-dry	1	3/22/2019 12:30:19 AM
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Analytical Report

Work Order: 1903300
Date Reported: 5/8/2019

Client: Shannon & Wilson

Collection Date: 3/20/2019 12:00:00 PM

Project: Seattle Center Skate Plaza

Lab ID: 1903300-005

Matrix: Soil

Client Sample ID: HB-2:3

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Volatile Organic Compounds by EPA Method 8260C

Batch ID: 23915

Analyst: CR

Chloromethane	ND	0.0379	Q	mg/Kg-dry	1	3/22/2019 12:30:19 AM
Vinyl chloride	ND	0.0189		mg/Kg-dry	1	3/22/2019 12:30:19 AM
Bromomethane	ND	0.0379		mg/Kg-dry	1	3/22/2019 12:30:19 AM
Trichlorofluoromethane (CFC-11)	ND	0.0151		mg/Kg-dry	1	3/22/2019 12:30:19 AM
Chloroethane	ND	0.0379		mg/Kg-dry	1	3/22/2019 12:30:19 AM
1,1-Dichloroethene	ND	0.0151		mg/Kg-dry	1	3/22/2019 12:30:19 AM
Methylene chloride	ND	0.0151		mg/Kg-dry	1	3/22/2019 12:30:19 AM
trans-1,2-Dichloroethene	ND	0.0151		mg/Kg-dry	1	3/22/2019 12:30:19 AM
Methyl tert-butyl ether (MTBE)	ND	0.0379		mg/Kg-dry	1	3/22/2019 12:30:19 AM
1,1-Dichloroethane	ND	0.0151		mg/Kg-dry	1	3/22/2019 12:30:19 AM
2,2-Dichloropropane	ND	0.0757	Q	mg/Kg-dry	1	3/22/2019 12:30:19 AM
cis-1,2-Dichloroethene	ND	0.0151		mg/Kg-dry	1	3/22/2019 12:30:19 AM
Chloroform	ND	0.0151		mg/Kg-dry	1	3/22/2019 12:30:19 AM
1,1,1-Trichloroethane (TCA)	ND	0.0189		mg/Kg-dry	1	3/22/2019 12:30:19 AM
1,1-Dichloropropene	ND	0.0151		mg/Kg-dry	1	3/22/2019 12:30:19 AM
Carbon tetrachloride	ND	0.0189		mg/Kg-dry	1	3/22/2019 12:30:19 AM
1,2-Dichloroethane (EDC)	ND	0.0151		mg/Kg-dry	1	3/22/2019 12:30:19 AM
Benzene	ND	0.0151		mg/Kg-dry	1	3/22/2019 12:30:19 AM
Trichloroethene (TCE)	ND	0.0151		mg/Kg-dry	1	3/22/2019 12:30:19 AM
1,2-Dichloropropane	ND	0.0151		mg/Kg-dry	1	3/22/2019 12:30:19 AM
Bromodichloromethane	ND	0.0151		mg/Kg-dry	1	3/22/2019 12:30:19 AM
Dibromomethane	ND	0.0151		mg/Kg-dry	1	3/22/2019 12:30:19 AM
cis-1,3-Dichloropropene	ND	0.0151	Q	mg/Kg-dry	1	3/22/2019 12:30:19 AM
Toluene	ND	0.0151		mg/Kg-dry	1	3/22/2019 12:30:19 AM
trans-1,3-Dichloropropylene	ND	0.0151		mg/Kg-dry	1	3/22/2019 12:30:19 AM
1,1,2-Trichloroethane	ND	0.0151		mg/Kg-dry	1	3/22/2019 12:30:19 AM
1,3-Dichloropropane	ND	0.0189		mg/Kg-dry	1	3/22/2019 12:30:19 AM
Tetrachloroethene (PCE)	ND	0.0189		mg/Kg-dry	1	3/22/2019 12:30:19 AM
Dibromochloromethane	ND	0.0189		mg/Kg-dry	1	3/22/2019 12:30:19 AM
1,2-Dibromoethane (EDB)	ND	0.00379		mg/Kg-dry	1	3/22/2019 12:30:19 AM
Chlorobenzene	ND	0.0189		mg/Kg-dry	1	3/22/2019 12:30:19 AM
1,1,1,2-Tetrachloroethane	ND	0.0189		mg/Kg-dry	1	3/22/2019 12:30:19 AM
Ethylbenzene	ND	0.0189		mg/Kg-dry	1	3/22/2019 12:30:19 AM
m,p-Xylene	ND	0.0379		mg/Kg-dry	1	3/22/2019 12:30:19 AM
o-Xylene	ND	0.0189		mg/Kg-dry	1	3/22/2019 12:30:19 AM
Styrene	ND	0.0189		mg/Kg-dry	1	3/22/2019 12:30:19 AM
Isopropylbenzene	ND	0.0189		mg/Kg-dry	1	3/22/2019 12:30:19 AM
Bromoform	ND	0.0379		mg/Kg-dry	1	3/22/2019 12:30:19 AM
1,1,2,2-Tetrachloroethane	ND	0.0151		mg/Kg-dry	1	3/22/2019 12:30:19 AM



Analytical Report

Work Order: 1903300
Date Reported: 5/8/2019

Client: Shannon & Wilson

Collection Date: 3/20/2019 12:00:00 PM

Project: Seattle Center Skate Plaza

Lab ID: 1903300-005

Matrix: Soil

Client Sample ID: HB-2:3

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Volatile Organic Compounds by EPA Method 8260C

Batch ID: 23915

Analyst: CR

n-Propylbenzene	ND	0.0189		mg/Kg-dry	1	3/22/2019 12:30:19 AM
Bromobenzene	ND	0.0151		mg/Kg-dry	1	3/22/2019 12:30:19 AM
1,3,5-Trimethylbenzene	ND	0.0189		mg/Kg-dry	1	3/22/2019 12:30:19 AM
2-Chlorotoluene	ND	0.0189		mg/Kg-dry	1	3/22/2019 12:30:19 AM
4-Chlorotoluene	ND	0.0189		mg/Kg-dry	1	3/22/2019 12:30:19 AM
tert-Butylbenzene	ND	0.0189		mg/Kg-dry	1	3/22/2019 12:30:19 AM
1,2,3-Trichloropropane	ND	0.0189		mg/Kg-dry	1	3/22/2019 12:30:19 AM
1,2,4-Trichlorobenzene	ND	0.0189		mg/Kg-dry	1	3/22/2019 12:30:19 AM
sec-Butylbenzene	ND	0.0379		mg/Kg-dry	1	3/22/2019 12:30:19 AM
4-Isopropyltoluene	ND	0.0379		mg/Kg-dry	1	3/22/2019 12:30:19 AM
1,3-Dichlorobenzene	ND	0.0151		mg/Kg-dry	1	3/22/2019 12:30:19 AM
1,4-Dichlorobenzene	ND	0.0151		mg/Kg-dry	1	3/22/2019 12:30:19 AM
n-Butylbenzene	ND	0.0189		mg/Kg-dry	1	3/22/2019 12:30:19 AM
1,2-Dichlorobenzene	ND	0.0151		mg/Kg-dry	1	3/22/2019 12:30:19 AM
1,2-Dibromo-3-chloropropane	ND	0.379		mg/Kg-dry	1	3/22/2019 12:30:19 AM
1,2,4-Trimethylbenzene	ND	0.0151		mg/Kg-dry	1	3/22/2019 12:30:19 AM
Hexachlorobutadiene	ND	0.0379		mg/Kg-dry	1	3/22/2019 12:30:19 AM
Naphthalene	ND	0.0379		mg/Kg-dry	1	3/22/2019 12:30:19 AM
1,2,3-Trichlorobenzene	ND	0.0151		mg/Kg-dry	1	3/22/2019 12:30:19 AM
Surr: Dibromofluoromethane	96.2	56.5 - 129		%Rec	1	3/22/2019 12:30:19 AM
Surr: Toluene-d8	101	64.5 - 151		%Rec	1	3/22/2019 12:30:19 AM
Surr: 1-Bromo-4-fluorobenzene	92.9	54.8 - 168		%Rec	1	3/22/2019 12:30:19 AM

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria

Mercury by EPA Method 7471

Batch ID: 23965

Analyst: WF

Mercury	ND	0.261		mg/Kg-dry	1	3/27/2019 11:47:46 AM
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Total Metals by EPA Method 6020

Batch ID: 23912

Analyst: WC

Arsenic	3.09	0.218		mg/Kg-dry	1	3/21/2019 3:12:04 PM
Barium	91.6	0.436		mg/Kg-dry	1	3/21/2019 3:12:04 PM
Cadmium	ND	0.175		mg/Kg-dry	1	3/21/2019 3:12:04 PM
Chromium	23.3	0.0873		mg/Kg-dry	1	3/21/2019 3:12:04 PM
Lead	6.56	0.175		mg/Kg-dry	1	3/21/2019 3:12:04 PM
Selenium	1.17	0.436		mg/Kg-dry	1	3/21/2019 3:12:04 PM
Silver	ND	0.0873		mg/Kg-dry	1	3/21/2019 3:12:04 PM



Analytical Report

Work Order: 1903300
Date Reported: 5/8/2019

Client: Shannon & Wilson

Collection Date: 3/20/2019 12:00:00 PM

Project: Seattle Center Skate Plaza

Lab ID: 1903300-005

Matrix: Soil

Client Sample ID: HB-2:3

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Sample Moisture (Percent Moisture)

Batch ID: R50191 Analyst: CJ

Percent Moisture	9.76			wt%	1	3/21/2019 8:14:12 AM
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Work Order: 1903300
CLIENT: Shannon & Wilson
Project: Seattle Center Skate Plaza

QC SUMMARY REPORT

Hexavalent Chromium by EPA Method 7196

Sample ID: MB-24434		SampType: MBLK		Units: mg/Kg		Prep Date: 5/6/2019			RunNo: 51280			
Client ID: MBLKS		Batch ID: 24434					Analysis Date: 5/7/2019			SeqNo: 1009001		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Chromium, Hexavalent ND 0.500

Sample ID: LCS-24434		SampType: LCS			Units: mg/Kg		Prep Date: 5/6/2019			RunNo: 51280		
Client ID: LCSS		Batch ID: 24434			Analysis Date: 5/7/2019					SeqNo: 1009002		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Chromium, Hexavalent 2.24 0.500 2.500 0 89.7 65 135

Sample ID: 1904449-011ADUP		SampType: DUP		Units: mg/Kg-dry		Prep Date: 5/6/2019			RunNo: 51280		
Client ID: BATCH		Batch ID: 24434					Analysis Date: 5/7/2019			SeqNo: 1009004	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Chromium, Hexavalent ND 0.567 0 30

Sample ID: 1904449-011AMS		SampType: MS		Units: mg/Kg-dry		Prep Date: 5/6/2019			RunNo: 51280		
Client ID: BATCH		Batch ID: 24434					Analysis Date: 5/7/2019			SeqNo: 1009005	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Chromium, Hexavalent 2.85 0.573 2.863 0 99.6 65 135

Sample ID: 1904449-011AMSD		SampType: MSD		Units: mg/Kg-dry		Prep Date: 5/6/2019			RunNo: 51280		
Client ID: BATCH		Batch ID: 24434		Analysis Date: 5/7/2019					SeqNo: 1009006		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Chromium, Hexavalent 2.82 0.574 2.868 0 98.3 65 135 2.851 1.14 30



Work Order: 1903300
CLIENT: Shannon & Wilson
Project: Seattle Center Skate Plaza

QC SUMMARY REPORT

Hexavalent Chromium by EPA Method 7196

Sample ID: 1904478-005ADUP		SampType: DUP		Units: mg/Kg-dry		Prep Date: 5/6/2019		RunNo: 51280			
Client ID: BATCH		Batch ID: 24434				Analysis Date: 5/7/2019		SeqNo: 1009027			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	ND	0.513						0		30	

Sample ID: 1904478-005AMS		SampType: MS		Units: mg/Kg-dry		Prep Date: 5/6/2019		RunNo: 51280			
Client ID: BATCH		Batch ID: 24434				Analysis Date: 5/7/2019		SeqNo: 1009028			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	2.28	0.515	2.574	0	88.6	65	135				

Work Order: 1903300
CLIENT: Shannon & Wilson
Project: Seattle Center Skate Plaza

QC SUMMARY REPORT

Total Metals by EPA Method 6020

Sample ID: MB-23912		SampType: MBLK		Units: mg/Kg		Prep Date: 3/21/2019			RunNo: 50215		
Client ID: MBLKS		Batch ID: 23912					Analysis Date: 3/21/2019			SeqNo: 986291	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	ND	0.197									
Barium	ND	0.394									
Cadmium	ND	0.157									
Chromium	ND	0.0787									
Lead	ND	0.157									
Selenium	ND	0.394									
Silver	ND	0.0787									

Sample ID: LCS-23912	SampType: LCS	Units: mg/Kg				Prep Date: 3/21/2019			RunNo: 50215		
Client ID: LCSS	Batch ID: 23912	Analysis Date: 3/21/2019							SeqNo: 986292		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	37.7	0.192	38.46	0	97.9	80	120				
Barium	36.6	0.385	38.46	0	95.3	80	120				
Cadmium	1.80	0.154	1.923	0	93.5	80	120				
Chromium	37.5	0.0769	38.46	0	97.5	80	120				
Lead	19.0	0.154	19.23	0	98.8	80	120				
Selenium	3.71	0.385	3.846	0	96.4	80	120				
Silver	8.01	0.0769	9.615	0	83.3	80	120				

Sample ID: 1903267-001ADUP		SampType: DUP		Units: mg/Kg-dry		Prep Date: 3/21/2019			RunNo: 50215		
Client ID: BATCH		Batch ID: 23912					Analysis Date: 3/21/2019			SeqNo: 986294	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	2.22	0.215						2.450	9.91	20	
Barium	37.1	0.431						40.71	9.40	20	
Cadmium	ND	0.172						0		20	
Chromium	23.1	0.0862						26.95	15.6	20	
Lead	1.35	0.172						1.537	12.6	20	
Selenium	0.951	0.431						0.9705	1.98	20	

Work Order: 1903300
CLIENT: Shannon & Wilson
Project: Seattle Center Skate Plaza

QC SUMMARY REPORT

Total Metals by EPA Method 6020

Sample ID: 1903267-001ADUP	SampType: DUP	Units: mg/Kg-dry			Prep Date: 3/21/2019			RunNo: 50215			
Client ID: BATCH	Batch ID: 23912	Analysis Date: 3/21/2019						SeqNo: 986294			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Silver	ND	0.0862						0		20	

Sample ID: 1903267-001AMS	SampType: MS	Units: mg/Kg-dry				Prep Date: 3/21/2019			RunNo: 50215		
Client ID: BATCH	Batch ID: 23912	Analysis Date: 3/21/2019							SeqNo: 986298		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	39.0	0.212	42.42	2.450	86.1	75	125				
Barium	157	0.424	42.42	40.71	273	75	125				S
Cadmium	1.94	0.170	2.121	0.04677	89.2	75	125				
Chromium	53.9	0.0848	42.42	26.95	63.4	75	125				S
Lead	17.8	0.170	21.21	1.537	76.6	75	125				
Selenium	4.70	0.424	4.242	0.9705	88.0	75	125				
Silver	6.18	0.0848	10.60	0.06379	57.7	75	125				S

NOTES:

S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect (Antimony, Beryllium, Silver).

S - Outlying spike recovery(ies) observed. A duplicate analysis was performed and recovered within range (Barium, Chromium, Nickel, Thallium).

Sample ID: 1903267-001AMSD	SampType: MSD	Units: mg/Kg-dry				Prep Date: 3/21/2019			RunNo: 50215		
Client ID: BATCH	Batch ID: 23912	Analysis Date: 3/21/2019							SeqNo: 986299		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	40.9	0.214	42.75	2.450	89.9	75	125	38.98	4.78	20	R
Barium	73.7	0.428	42.75	40.71	77.1	75	125	156.5	72.0	20	
Cadmium	2.10	0.171	2.138	0.04677	96.1	75	125	1.939	8.01	20	
Chromium	62.9	0.0855	42.75	26.95	84.0	75	125	53.85	15.4	20	
Lead	19.0	0.171	21.38	1.537	81.9	75	125	17.79	6.76	20	
Selenium	4.66	0.428	4.275	0.9705	86.2	75	125	4.704	1.03	20	S
Silver	6.46	0.0855	10.69	0.06379	59.8	75	125	6.184	4.35	20	

NOTES:

S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect (Antimony, Beryllium, Silver).

R - High RPD observed. The method is in control as indicated by the LCS.



Work Order: 1903300
CLIENT: Shannon & Wilson
Project: Seattle Center Skate Plaza

QC SUMMARY REPORT

Total Metals by EPA Method 6020

Sample ID: 1903267-001APDS		SampType: PDS		Units: mg/Kg-dry		Prep Date: 3/21/2019		RunNo: 50215			
Client ID: BATCH		Batch ID: 23912				Analysis Date: 3/21/2019		SeqNo: 986300			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Silver	1.36	0.0855	2.14	0.0638	60.8	75	125				S

NOTES:

S - Spike recovery indicates a possible matrix effect. The method is in control as indicated by the Laboratory Control Sample (LCS).

Work Order: 1903300
CLIENT: Shannon & Wilson
Project: Seattle Center Skate Plaza

QC SUMMARY REPORT

Mercury by EPA Method 7471

Sample ID: MB-23965		SampType: MBLK		Units: mg/Kg		Prep Date: 3/26/2019		RunNo: 50314			
Client ID: MBLKS		Batch ID: 23965				Analysis Date: 3/27/2019		SeqNo: 988529			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury ND 0.250

Sample ID: LCS-23965	SampType: LCS	Units: mg/Kg			Prep Date: 3/26/2019			RunNo: 50314			
Client ID: LCSS	Batch ID: 23965				Analysis Date: 3/27/2019			SeqNo: 988530			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury 0.506 0.250 0.5000 0 101 80 120

Sample ID: 1903289-001ADUP		SampType: DUP		Units: mg/Kg-dry		Prep Date: 3/26/2019			RunNo: 50314			
Client ID: BATCH		Batch ID: 23965					Analysis Date: 3/27/2019			SeqNo: 988532		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Mercury ND 0.285 0 20

Sample ID: 1903289-001AMS		SampType: MS		Units: mg/Kg-dry		Prep Date: 3/26/2019			RunNo: 50314		
Client ID: BATCH		Batch ID: 23965					Analysis Date: 3/27/2019			SeqNo: 988533	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury 0.508 0.275 0.5493 0.01881 89.0 70 130

Sample ID: 1903289-001AMSD		SampType: MSD		Units: mg/Kg-dry		Prep Date: 3/26/2019			RunNo: 50314		
Client ID: BATCH		Batch ID: 23965					Analysis Date: 3/27/2019			SeqNo: 988534	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury 0.556 0.275 0.5493 0.01881 97.8 70 130 0.5076 9.09 20

Work Order: 1903300
CLIENT: Shannon & Wilson
Project: Seattle Center Skate Plaza

QC SUMMARY REPORT

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Sample ID: MB-23918	SampType: MBLK	Units: mg/Kg			Prep Date: 3/21/2019			RunNo: 50232			
Client ID: MBLKS	Batch ID: 23918				Analysis Date: 3/21/2019			SeqNo: 986640			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	ND	20.0									
Heavy Oil	ND	50.0									
Surr: 2-Fluorobiphenyl	17.8		20.00		88.9	50	150				
Surr: o-Terphenyl	18.1		20.00		90.4	50	150				

Sample ID: LCS-23918		SampType: LCS			Units: mg/Kg		Prep Date: 3/21/2019			RunNo: 50232		
Client ID: LCSS		Batch ID: 23918			Analysis Date: 3/21/2019					SeqNo: 986641		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Diesel (Fuel Oil)	537	20.0	500.0	0	107	65	135				
Surr: 2-Fluorobiphenyl	18.2		20.00		91.0	50	150				
Surr: o-Terphenyl	17.9		20.00		89.4	50	150				

Sample ID: 1903289-001ADUP		SampType: DUP			Units: mg/Kg-dry		Prep Date: 3/21/2019		RunNo: 50232		
Client ID: BATCH		Batch ID: 23918			Analysis Date: 3/21/2019				SeqNo: 986644		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	ND	22.4						0		30	
Heavy Oil	ND	55.9						0		30	
Surr: 2-Fluorobiphenyl	22.7		22.38		101	50	150		0		
Surr: o-Terphenyl	23.3		22.38		104	50	150		0		

Sample ID: 1903289-001AMS		SampType: MS		Units: mg/Kg-dry		Prep Date: 3/21/2019		RunNo: 50232			
Client ID: BATCH		Batch ID: 23918		Analysis Date: 3/21/2019		SeqNo: 986645					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	657	22.8	571.1	0	115	65	135				
Surr: 2-Fluorobiphenyl	22.5		22.85		98.6	50	150				
Surr: o-Terphenyl	22.3		22.85		97.8	50	150				

Work Order: 1903300
CLIENT: Shannon & Wilson
Project: Seattle Center Skate Plaza

QC SUMMARY REPORT

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Sample ID: 1903289-001AMS		SampType: MS		Units: mg/Kg-dry		Prep Date: 3/21/2019			RunNo: 50232		
Client ID: BATCH		Batch ID: 23918					Analysis Date: 3/21/2019			SeqNo: 986645	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sample ID: 1903289-001AMSD	SampType: MSD	Units: mg/Kg-dry				Prep Date: 3/21/2019			RunNo: 50232		
Client ID: BATCH	Batch ID: 23918					Analysis Date: 3/21/2019			SeqNo: 986646		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	635	20.8	519.1	0	122	65	135	657.2	3.45	30	
Surr: 2-Fluorobiphenyl	21.1		20.76		102	50	150		0		
Surr: o-Terphenyl	20.4		20.76		98.3	50	150		0		

Sample ID: 1903296-001ADUP		SampType: DUP		Units: mg/Kg-dry		Prep Date: 3/21/2019			RunNo: 50285		
Client ID: BATCH		Batch ID: 23918					Analysis Date: 3/22/2019			SeqNo: 987577	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel (Fuel Oil)	ND	20.4						0		30	
Heavy Oil	62.9	51.0						62.84	0.0326	30	
Surr: 2-Fluorobiphenyl	23.2		20.41		113	50	150		0		
Surr: o-Terphenyl	24.7		20.41		121	50	150		0		

Work Order: 1903300
CLIENT: Shannon & Wilson
Project: Seattle Center Skate Plaza

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: MB-23919	SampType: MBLK	Units: µg/Kg			Prep Date: 3/21/2019			RunNo: 50230			
Client ID: MBLKS	Batch ID: 23919	Analysis Date: 3/21/2019						SeqNo: 986596			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	ND	40.0									
2-Methylnaphthalene	ND	40.0									
1-Methylnaphthalene	ND	40.0									
Acenaphthylene	ND	40.0									
Acenaphthene	ND	40.0									
Fluorene	ND	40.0									
Phenanthrene	ND	40.0									
Anthracene	ND	40.0									
Fluoranthene	ND	40.0									
Pyrene	ND	40.0									
Benz(a)anthracene	ND	40.0									
Chrysene	ND	40.0									
Benzo(b)fluoranthene	ND	40.0									
Benzo(k)fluoranthene	ND	40.0									
Benzo(a)pyrene	ND	40.0									
Indeno(1,2,3-cd)pyrene	ND	40.0									
Dibenz(a,h)anthracene	ND	40.0									
Benzo(g,h,i)perylene	ND	40.0									Q
Surr: 2-Fluorobiphenyl	351		500.0		70.3	19.4	157				
Surr: Terphenyl-d14 (surr)	457		500.0		91.3	31.5	173				

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria

Sample ID: LCS-23919	SampType: LCS	Units: µg/Kg			Prep Date: 3/21/2019			RunNo: 50230			
Client ID: LCSS	Batch ID: 23919				Analysis Date: 3/21/2019			SeqNo: 986597			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	805	40.0	1,000	0	80.5	52.9	134				
2-Methylnaphthalene	832	40.0	1,000	0	83.2	45.1	135				
1-Methylnaphthalene	845	40.0	1,000	0	84.5	55.5	133				
Acenaphthylene	821	40.0	1,000	0	82.1	32.8	136				

Work Order: 1903300
CLIENT: Shannon & Wilson
Project: Seattle Center Skate Plaza

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: LCS-23919	SampType: LCS	Units: µg/Kg				Prep Date: 3/21/2019			RunNo: 50230		
Client ID: LCSS	Batch ID: 23919	Analysis Date: 3/21/2019						SeqNo: 986597			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	783	40.0	1,000	0	78.3	42	137				
Fluorene	761	40.0	1,000	0	76.1	41.4	144				
Phenanthrene	747	40.0	1,000	0	74.7	36.6	141				
Anthracene	776	40.0	1,000	0	77.6	42.5	157				
Fluoranthene	805	40.0	1,000	0	80.5	43.4	144				
Pyrene	788	40.0	1,000	0	78.8	39.6	146				
Benz(a)anthracene	828	40.0	1,000	0	82.8	36.6	142				
Chrysene	843	40.0	1,000	0	84.3	43	165				
Benzo(b)fluoranthene	1,030	40.0	1,000	0	103	41	155				
Benzo(k)fluoranthene	785	40.0	1,000	0	78.5	30.6	164				
Benzo(a)pyrene	923	40.0	1,000	0	92.3	30.2	171				
Indeno(1,2,3-cd)pyrene	689	40.0	1,000	0	68.9	31.3	159				
Dibenz(a,h)anthracene	696	40.0	1,000	0	69.6	28	158				
Benzo(g,h,i)perylene	642	40.0	1,000	0	64.2	32.4	144				
Surr: 2-Fluorobiphenyl	381		500.0		76.2	19.4	157				
Surr: Terphenyl-d14 (surr)	454		500.0		90.9	31.5	173				

Sample ID: 1903289-002ADUP	SampType: DUP	Units: µg/Kg-dry				Prep Date: 3/21/2019			RunNo: 50230		
Client ID: BATCH	Batch ID: 23919					Analysis Date: 3/21/2019			SeqNo: 986600		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	ND	45.9						0		30	
2-Methylnaphthalene	ND	45.9						0		30	
1-Methylnaphthalene	ND	45.9						0		30	
Acenaphthylene	ND	45.9						0		30	
Acenaphthene	ND	45.9						0		30	
Fluorene	ND	45.9						0		30	
Phenanthrene	ND	45.9						0		30	
Anthracene	ND	45.9						0		30	
Fluoranthene	ND	45.9						0		30	

Work Order: 1903300
CLIENT: Shannon & Wilson
Project: Seattle Center Skate Plaza

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: 1903289-002ADUP		SampType: DUP		Units: µg/Kg-dry		Prep Date: 3/21/2019			RunNo: 50230		
Client ID: BATCH		Batch ID: 23919					Analysis Date: 3/21/2019			SeqNo: 986600	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Pyrene	ND	45.9						0		30	
Benz(a)anthracene	ND	45.9						0		30	
Chrysene	ND	45.9						0		30	
Benzo(b)fluoranthene	ND	45.9						0		30	
Benzo(k)fluoranthene	ND	45.9						0		30	
Benzo(a)pyrene	ND	45.9						0		30	
Indeno(1,2,3-cd)pyrene	ND	45.9						0		30	
Dibenz(a,h)anthracene	ND	45.9						0		30	
Benzo(g,h,i)perylene	ND	45.9						0		30	Q
Surr: 2-Fluorobiphenyl	340		574.1		59.2	19.4	157		0		
Surr: Terphenyl-d14 (surr)	315		574.1		54.8	31.5	173		0		

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria

Sample ID: 1903289-002AMS		SampType: MS		Units: µg/Kg-dry		Prep Date: 3/21/2019		RunNo: 50230			
Client ID: BATCH		Batch ID: 23919				Analysis Date: 3/21/2019		SeqNo: 986601			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	663	47.3	1,183	0	56.1	38.9	124				
2-Methylnaphthalene	699	47.3	1,183	0	59.1	42.8	151				
1-Methylnaphthalene	711	47.3	1,183	0	60.1	38.4	125				
Acenaphthylene	691	47.3	1,183	0	58.4	32.6	160				
Acenaphthene	651	47.3	1,183	0	55.1	31.7	126				
Fluorene	657	47.3	1,183	0	55.5	43.4	153				
Phenanthrene	614	47.3	1,183	0	51.9	23.8	135				
Anthracene	641	47.3	1,183	0	54.2	32.6	160				
Fluoranthene	637	47.3	1,183	0	53.8	28	144				
Pyrene	628	47.3	1,183	0	53.1	27.8	141				
Benz(a)anthracene	641	47.3	1,183	0	54.2	34.9	139				
Chrysene	706	47.3	1,183	0	59.7	45.2	146				
Benzo(b)fluoranthene	854	47.3	1,183	0	72.2	42.2	168				

Work Order: 1903300
CLIENT: Shannon & Wilson
Project: Seattle Center Skate Plaza

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: 1903289-002AMS		SampType: MS		Units: µg/Kg-dry		Prep Date: 3/21/2019		RunNo: 50230			
Client ID: BATCH		Batch ID: 23919				Analysis Date: 3/21/2019		SeqNo: 986601			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzo(k)fluoranthene	628	47.3	1,183	0	53.1	20.5	150				
Benzo(a)pyrene	754	47.3	1,183	0	63.8	34.4	179				
Indeno(1,2,3-cd)pyrene	550	47.3	1,183	0	46.5	11.8	140				
Dibenz(a,h)anthracene	557	47.3	1,183	0	47.1	17.3	156				
Benzo(g,h,i)perylene	507	47.3	1,183	0	42.9	24.9	119				
Surr: 2-Fluorobiphenyl	316		591.4		53.4	19.4	157				
Surr: Terphenyl-d14 (surr)	306		591.4		51.7	31.5	173				

Sample ID: 1903289-002AMSD		SampType: MSD		Units: µg/Kg-dry		Prep Date: 3/21/2019		RunNo: 50230			
Client ID: BATCH		Batch ID: 23919				Analysis Date: 3/22/2019		SeqNo: 986602			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	687	48.3	1,208	0	56.8	38.9	124	663.4	3.42	30	
2-Methylnaphthalene	729	48.3	1,208	0	60.4	42.8	151	699.4	4.14	30	
1-Methylnaphthalene	742	48.3	1,208	0	61.4	38.4	125	710.8	4.24	30	
Acenaphthylene	717	48.3	1,208	0	59.3	32.6	160	690.5	3.71	30	
Acenaphthene	698	48.3	1,208	0	57.8	31.7	126	651.2	6.95	30	
Fluorene	684	48.3	1,208	0	56.7	43.4	153	657.1	4.06	30	
Phenanthrene	653	48.3	1,208	0	54.0	23.8	135	614.5	6.03	30	
Anthracene	675	48.3	1,208	0	55.9	32.6	160	641.4	5.08	30	
Fluoranthene	696	48.3	1,208	0	57.7	28	144	636.7	8.95	30	
Pyrene	683	48.3	1,208	0	56.5	27.8	141	628.1	8.36	30	
Benz(a)anthracene	686	48.3	1,208	0	56.8	34.9	139	641.3	6.78	30	
Chrysene	731	48.3	1,208	0	60.5	45.2	146	705.9	3.47	30	
Benzo(b)fluoranthene	843	48.3	1,208	0	69.8	42.2	168	854.4	1.31	30	
Benzo(k)fluoranthene	684	48.3	1,208	0	56.7	20.5	150	627.9	8.60	30	
Benzo(a)pyrene	777	48.3	1,208	0	64.3	34.4	179	754.1	2.99	30	
Indeno(1,2,3-cd)pyrene	576	48.3	1,208	0	47.7	11.8	140	549.7	4.70	30	
Dibenz(a,h)anthracene	580	48.3	1,208	0	48.0	17.3	156	557.3	4.00	30	
Benzo(g,h,i)perylene	532	48.3	1,208	0	44.0	24.9	119	507.4	4.67	30	

Work Order: 1903300
CLIENT: Shannon & Wilson
Project: Seattle Center Skate Plaza

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: 1903289-002AMSD		SampType: MSD		Units: µg/Kg-dry		Prep Date: 3/21/2019			RunNo: 50230		
Client ID: BATCH		Batch ID: 23919					Analysis Date: 3/22/2019			SeqNo: 986602	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: 2-Fluorobiphenyl	337		603.9		55.8	19.4	157		0		
Surr: Terphenyl-d14 (surr)	329		603.9		54.4	31.5	173		0		



Work Order: 1903300
CLIENT: Shannon & Wilson
Project: Seattle Center Skate Plaza

QC SUMMARY REPORT

Gasoline by NWTPH-Gx

Sample ID: LCS-23915	SampType: LCS	Units: mg/Kg			Prep Date: 3/21/2019			RunNo: 50220			
Client ID: LCSS	Batch ID: 23915				Analysis Date: 3/21/2019			SeqNo: 986446			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	23.6	5.00	25.00	0	94.4	65	135				
Surr: Toluene-d8	1.28		1.250		102	65	135				
Surr: 4-Bromofluorobenzene	1.27		1.250		102	65	135				

Sample ID: MB-23915		SampType: MBLK		Units: mg/Kg		Prep Date: 3/21/2019		RunNo: 50220			
Client ID: MBLKS		Batch ID: 23915				Analysis Date: 3/21/2019		SeqNo: 986447			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	ND	5.00									
Surr: Toluene-d8	1.22		1.250		97.5	65	135				
Surr: 4-Bromofluorobenzene	1.15		1.250		92.1	65	135				

Sample ID: 1903094-002BDUP		SampType: DUP		Units: mg/Kg-dry		Prep Date: 3/21/2019		RunNo: 50220			
Client ID: BATCH		Batch ID: 23915				Analysis Date: 3/21/2019		SeqNo: 986431			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	ND	4.98						0		30	
Surr: Toluene-d8	1.22		1.246		97.8	65	135		0		
Surr: 4-Bromofluorobenzene	1.13		1.246		90.6	65	135		0		

Sample ID: 1903300-001BDUP		SampType: DUP		Units: mg/Kg-dry		Prep Date: 3/21/2019		RunNo: 50220			
Client ID: HB-1:3		Batch ID: 23915				Analysis Date: 3/21/2019		SeqNo: 986438			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	ND	7.21						0		30	
Surr: Toluene-d8	1.75		1.802		97.1	65	135		0		
Surr: 4-Bromofluorobenzene	1.62		1.802		90.0	65	135		0		



Work Order: 1903300
CLIENT: Shannon & Wilson
Project: Seattle Center Skate Plaza

QC SUMMARY REPORT

Gasoline by NWTPH-Gx

Sample ID: 1903300-003BMS	SampType: MS	Units: mg/Kg-dry			Prep Date: 3/21/2019			RunNo: 50220			
Client ID: HB-5:3.5	Batch ID: 23915				Analysis Date: 3/22/2019			SeqNo: 986441			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Gasoline	33.2	6.27	31.33	2.882	96.7	65	135				
Surr: Toluene-d8	1.61		1.566		103	65	135				
Surr: 4-Bromofluorobenzene	1.62		1.566		104	65	135				

Sample ID: 1903300-003BMSD	SampType: MSD	Units: mg/Kg-dry				Prep Date: 3/21/2019				RunNo: 50220		
Client ID: HB-5:3.5	Batch ID: 23915					Analysis Date: 3/22/2019				SeqNo: 986442		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Gasoline	32.8	6.27	31.33	2.882	95.5	65	135	33.18	1.15	30	
Surr: Toluene-d8	1.59		1.566		102	65	135		0		
Surr: 4-Bromofluorobenzene	1.59		1.566		102	65	135		0		

Work Order: 1903300
CLIENT: Shannon & Wilson
Project: Seattle Center Skate Plaza

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260C

Sample ID: 1903094-002BDUP	SampType: DUP	Units: mg/Kg-dry			Prep Date: 3/21/2019			RunNo: 50218			
Client ID: BATCH	Batch ID: 23915	Analysis Date: 3/21/2019						SeqNo: 986401			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dichlorodifluoromethane (CFC-12)	ND	0.0199						0		30	Q
Chloromethane	ND	0.0498						0		30	Q
Vinyl chloride	ND	0.0249						0		30	
Bromomethane	ND	0.0498						0		30	
Trichlorofluoromethane (CFC-11)	ND	0.0199						0		30	
Chloroethane	ND	0.0498						0		30	
1,1-Dichloroethene	ND	0.0199						0		30	
Methylene chloride	ND	0.0199						0		30	
trans-1,2-Dichloroethene	ND	0.0199						0		30	
Methyl tert-butyl ether (MTBE)	ND	0.0498						0		30	
1,1-Dichloroethane	ND	0.0199						0		30	
2,2-Dichloropropane	ND	0.0997						0		30	
cis-1,2-Dichloroethene	ND	0.0199						0		30	
Chloroform	ND	0.0199						0		30	
1,1,1-Trichloroethane (TCA)	ND	0.0249						0		30	
1,1-Dichloropropene	ND	0.0199						0		30	
Carbon tetrachloride	ND	0.0249						0		30	
1,2-Dichloroethane (EDC)	ND	0.0199						0		30	
Benzene	ND	0.0199						0		30	
Trichloroethene (TCE)	ND	0.0199						0		30	
1,2-Dichloropropane	ND	0.0199						0		30	
Bromodichloromethane	ND	0.0199						0		30	
Dibromomethane	ND	0.0199						0		30	
cis-1,3-Dichloropropene	ND	0.0199						0		30	Q
Toluene	ND	0.0199						0		30	
trans-1,3-Dichloropropylene	ND	0.0199						0		30	
1,1,2-Trichloroethane	ND	0.0199						0		30	
1,3-Dichloropropane	ND	0.0249						0		30	
Tetrachloroethene (PCE)	ND	0.0249						0		30	
Dibromochloromethane	ND	0.0249						0		30	
1,2-Dibromoethane (EDB)	ND	0.00498						0		30	

Work Order: 1903300
CLIENT: Shannon & Wilson
Project: Seattle Center Skate Plaza

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260C

Sample ID: 1903094-002BDUP	SampType: DUP	Units: mg/Kg-dry			Prep Date: 3/21/2019			RunNo: 50218			
Client ID: BATCH	Batch ID: 23915	Analysis Date: 3/21/2019						SeqNo: 986401			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chlorobenzene	ND	0.0249						0		30	
1,1,1,2-Tetrachloroethane	ND	0.0249						0		30	
Ethylbenzene	ND	0.0249						0		30	
m,p-Xylene	ND	0.0498						0		30	
o-Xylene	ND	0.0249						0		30	
Styrene	ND	0.0249						0		30	
Isopropylbenzene	ND	0.0249						0		30	
Bromoform	ND	0.0498						0		30	
1,1,2,2-Tetrachloroethane	ND	0.0199						0		30	
n-Propylbenzene	ND	0.0249						0		30	
Bromobenzene	ND	0.0199						0		30	
1,3,5-Trimethylbenzene	ND	0.0249						0		30	
2-Chlorotoluene	ND	0.0249						0		30	
4-Chlorotoluene	ND	0.0249						0		30	
tert-Butylbenzene	ND	0.0249						0		30	
1,2,3-Trichloropropane	0.0382	0.0249						0.04257	10.8	30	
1,2,4-Trichlorobenzene	ND	0.0249						0		30	
sec-Butylbenzene	ND	0.0498						0		30	
4-Isopropyltoluene	ND	0.0498						0		30	
1,3-Dichlorobenzene	ND	0.0199						0		30	
1,4-Dichlorobenzene	ND	0.0199						0		30	
n-Butylbenzene	ND	0.0249						0		30	
1,2-Dichlorobenzene	ND	0.0199						0		30	
1,2-Dibromo-3-chloropropane	ND	0.498						0		30	
1,2,4-Trimethylbenzene	ND	0.0199						0		30	
Hexachlorobutadiene	ND	0.0498						0		30	
Naphthalene	ND	0.0498						0		30	
1,2,3-Trichlorobenzene	ND	0.0199						0		30	
Surr: Dibromofluoromethane	1.21		1.246		96.8	56.5	129		0		
Surr: Toluene-d8	1.30		1.246		104	64.5	151		0		
Surr: 1-Bromo-4-fluorobenzene	1.18		1.246		94.3	54.8	168		0		



Date: 5/8/2019

Work Order: 1903300
CLIENT: Shannon & Wilson
Project: Seattle Center Skate Plaza

QC SUMMARY REPORT**Volatile Organic Compounds by EPA Method 8260C**

Sample ID: 1903094-002BDUP	SampType: DUP	Units: mg/Kg-dry			Prep Date: 3/21/2019			RunNo: 50218			
Client ID: BATCH	Batch ID: 23915				Analysis Date: 3/21/2019			SeqNo: 986401			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria

Sample ID: 1903300-001BDUP		SampType: DUP		Units: mg/Kg-dry		Prep Date: 3/21/2019			RunNo: 50218			
Client ID: HB-1:3		Batch ID: 23915		Analysis Date: 3/21/2019							SeqNo: 986410	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Dichlorodifluoromethane (CFC-12)	ND	0.0288						0		30	Q	
Chloromethane	ND	0.0721						0		30	Q	
Vinyl chloride	ND	0.0360						0		30		
Bromomethane	ND	0.0721						0		30		
Trichlorofluoromethane (CFC-11)	ND	0.0288						0		30		
Chloroethane	ND	0.0721						0		30		
1,1-Dichloroethene	ND	0.0288						0		30		
Methylene chloride	ND	0.0288						0		30		
trans-1,2-Dichloroethene	ND	0.0288						0		30		
Methyl tert-butyl ether (MTBE)	ND	0.0721						0		30		
1,1-Dichloroethane	ND	0.0288						0		30		
2,2-Dichloropropane	ND	0.144						0		30	Q	
cis-1,2-Dichloroethene	ND	0.0288						0		30		
Chloroform	ND	0.0288						0		30		
1,1,1-Trichloroethane (TCA)	ND	0.0360						0		30		
1,1-Dichloropropene	ND	0.0288						0		30		
Carbon tetrachloride	ND	0.0360						0		30		
1,2-Dichloroethane (EDC)	ND	0.0288						0		30		
Benzene	ND	0.0288						0		30		
Trichloroethene (TCE)	ND	0.0288						0		30		
1,2-Dichloropropane	ND	0.0288						0		30		
Bromodichloromethane	ND	0.0288						0		30		
Dibromomethane	ND	0.0288						0		30		
cis-1,3-Dichloropropene	ND	0.0288						0		30	Q	

Work Order: 1903300
CLIENT: Shannon & Wilson
Project: Seattle Center Skate Plaza

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260C

Sample ID: 1903300-001BDUP	SampType: DUP	Units: mg/Kg-dry			Prep Date: 3/21/2019			RunNo: 50218			
Client ID: HB-1:3	Batch ID: 23915	Analysis Date: 3/21/2019						SeqNo: 986410			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Toluene	ND	0.0288						0		30	
trans-1,3-Dichloropropylene	ND	0.0288						0		30	
1,1,2-Trichloroethane	ND	0.0288						0		30	
1,3-Dichloropropane	ND	0.0360						0		30	
Tetrachloroethene (PCE)	ND	0.0360						0		30	
Dibromochloromethane	ND	0.0360						0		30	
1,2-Dibromoethane (EDB)	ND	0.00721						0		30	
Chlorobenzene	ND	0.0360						0		30	
1,1,1,2-Tetrachloroethane	ND	0.0360						0		30	
Ethylbenzene	ND	0.0360						0		30	
m,p-Xylene	ND	0.0721						0		30	
o-Xylene	ND	0.0360						0		30	
Styrene	ND	0.0360						0		30	
Isopropylbenzene	ND	0.0360						0		30	
Bromoform	ND	0.0721						0		30	
1,1,2,2-Tetrachloroethane	ND	0.0288						0		30	
n-Propylbenzene	ND	0.0360						0		30	
Bromobenzene	ND	0.0288						0		30	
1,3,5-Trimethylbenzene	ND	0.0360						0		30	
2-Chlorotoluene	ND	0.0360						0		30	
4-Chlorotoluene	ND	0.0360						0		30	
tert-Butylbenzene	ND	0.0360						0		30	
1,2,3-Trichloropropane	ND	0.0360						0		30	
1,2,4-Trichlorobenzene	ND	0.0360						0		30	
sec-Butylbenzene	ND	0.0721						0		30	
4-Isopropyltoluene	ND	0.0721						0		30	
1,3-Dichlorobenzene	ND	0.0288						0		30	
1,4-Dichlorobenzene	ND	0.0288						0		30	
n-Butylbenzene	ND	0.0360						0		30	
1,2-Dichlorobenzene	ND	0.0288						0		30	
1,2-Dibromo-3-chloropropane	ND	0.721						0		30	

Work Order: 1903300
CLIENT: Shannon & Wilson
Project: Seattle Center Skate Plaza

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260C

Sample ID: 1903300-001BDUP	SampType: DUP	Units: mg/Kg-dry				Prep Date: 3/21/2019			RunNo: 50218		
Client ID: HB-1:3	Batch ID: 23915	Analysis Date: 3/21/2019							SeqNo: 986410		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2,4-Trimethylbenzene	ND	0.0288						0		30	
Hexachlorobutadiene	ND	0.0721						0		30	
Naphthalene	ND	0.0721						0		30	
1,2,3-Trichlorobenzene	ND	0.0288						0		30	
Surr: Dibromofluoromethane	1.77		1.802		98.3	56.5	129		0		
Surr: Toluene-d8	1.89		1.802		105	64.5	151		0		
Surr: 1-Bromo-4-fluorobenzene	1.69		1.802		93.8	54.8	168		0		

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria

Sample ID: 1903296-002BMS	SampType: MS	Units: mg/Kg-dry				Prep Date: 3/21/2019			RunNo: 50218		
Client ID: BATCH	Batch ID: 23915	Analysis Date: 3/22/2019							SeqNo: 986407		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dichlorodifluoromethane (CFC-12)	0.821	0.0220	1.098	0	74.8	43.5	121				
Chloromethane	0.852	0.0549	1.098	0	77.6	45	130				
Vinyl chloride	0.938	0.0275	1.098	0	85.4	43.6	150				
Bromomethane	0.881	0.0549	1.098	0	80.2	21.3	120				
Trichlorofluoromethane (CFC-11)	1.01	0.0220	1.098	0	91.7	35	131				
Chloroethane	1.02	0.0549	1.098	0	92.6	31.9	123				
1,1-Dichloroethene	0.993	0.0220	1.098	0	90.4	47.3	147				
Methylene chloride	0.968	0.0220	1.098	0	88.1	54.7	142				
trans-1,2-Dichloroethene	0.939	0.0220	1.098	0	85.5	52	136				
Methyl tert-butyl ether (MTBE)	0.972	0.0549	1.098	0	88.5	58.5	167				
1,1-Dichloroethane	0.911	0.0220	1.098	0	82.9	51.8	141				
2,2-Dichloropropane	0.868	0.110	1.098	0	79.1	36	123				
cis-1,2-Dichloroethene	0.929	0.0220	1.098	0	84.5	58.6	136				
Chloroform	0.934	0.0220	1.098	0	85.1	53.2	129				
1,1,1-Trichloroethane (TCA)	0.956	0.0275	1.098	0	87.1	58.3	145				
1,1-Dichloropropene	0.944	0.0220	1.098	0	86.0	55.1	138				
Carbon tetrachloride	0.942	0.0275	1.098	0	85.7	53.3	144				

Work Order: 1903300
CLIENT: Shannon & Wilson
Project: Seattle Center Skate Plaza

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260C

Sample ID: 1903296-002BMS		SampType: MS		Units: mg/Kg-dry		Prep Date: 3/21/2019			RunNo: 50218		
Client ID: BATCH		Batch ID: 23915					Analysis Date: 3/22/2019			SeqNo: 986407	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

1,2-Dichloroethane (EDC)	0.949	0.0220	1.098	0	86.4	51.3	139				
Benzene	0.953	0.0220	1.098	0	86.8	63.5	133				
Trichloroethene (TCE)	0.961	0.0220	1.098	0	87.5	61.6	147				
1,2-Dichloropropane	0.938	0.0220	1.098	0	85.4	59	136				
Bromodichloromethane	0.943	0.0220	1.098	0	85.9	50.7	141				
Dibromomethane	0.938	0.0220	1.098	0	85.4	50.6	137				
cis-1,3-Dichloropropene	0.882	0.0220	1.098	0	80.3	50.4	138				
Toluene	0.977	0.0220	1.098	0	89.0	63.4	132				
trans-1,3-Dichloropropylene	0.927	0.0220	1.098	0	84.4	44.1	147				
1,1,2-Trichloroethane	0.960	0.0220	1.098	0	87.4	51.6	137				
1,3-Dichloropropane	0.968	0.0275	1.098	0	88.2	53.1	134				
Tetrachloroethene (PCE)	0.974	0.0275	1.098	0	88.7	35.6	158				
Dibromochloromethane	0.942	0.0275	1.098	0	85.8	55.3	140				
1,2-Dibromoethane (EDB)	0.956	0.00549	1.098	0	87.0	50.4	136				
Chlorobenzene	0.971	0.0275	1.098	0	88.4	60	133				
1,1,1,2-Tetrachloroethane	0.953	0.0275	1.098	0	86.8	53.1	142				
Ethylbenzene	0.984	0.0275	1.098	0	89.6	54.5	134				
m,p-Xylene	1.96	0.0549	2.197	0	89.4	53.1	132				
o-Xylene	0.970	0.0275	1.098	0	88.3	53.3	139				
Styrene	0.972	0.0275	1.098	0	88.5	51.1	132				
Isopropylbenzene	0.982	0.0275	1.098	0	89.4	58.9	138				
Bromoform	0.939	0.0549	1.098	0	85.5	57.9	130				
1,1,2,2-Tetrachloroethane	0.944	0.0220	1.098	0	85.9	51.9	131				
n-Propylbenzene	1.00	0.0275	1.098	0	91.2	53.6	140				
Bromobenzene	0.948	0.0220	1.098	0	86.3	54.2	140				
1,3,5-Trimethylbenzene	1.05	0.0275	1.098	0	95.8	51.8	136				
2-Chlorotoluene	0.981	0.0275	1.098	0	89.4	51.6	136				
4-Chlorotoluene	0.990	0.0275	1.098	0	90.2	50.1	139				
tert-Butylbenzene	0.992	0.0275	1.098	0	90.3	50.5	135				
1,2,3-Trichloropropane	0.978	0.0275	1.098	0	89.0	50.5	131				
1,2,4-Trichlorobenzene	0.938	0.0275	1.098	0	85.4	50.8	130				

Work Order: 1903300
CLIENT: Shannon & Wilson
Project: Seattle Center Skate Plaza

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260C

Sample ID: 1903296-002BMS		SampType: MS			Units: mg/Kg-dry		Prep Date: 3/21/2019			RunNo: 50218		
Client ID: BATCH		Batch ID: 23915			Analysis Date: 3/22/2019			SeqNo: 986407				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

sec-Butylbenzene	1.01	0.0549	1.098	0	91.6	52.6	141				
4-Isopropyltoluene	1.02	0.0549	1.098	0	92.5	52.9	134				
1,3-Dichlorobenzene	0.947	0.0220	1.098	0	86.2	52.6	131				
1,4-Dichlorobenzene	0.968	0.0220	1.098	0	88.1	52.9	129				
n-Butylbenzene	1.00	0.0275	1.098	0	91.4	52.6	130				
1,2-Dichlorobenzene	0.966	0.0220	1.098	0	88.0	55.8	129				
1,2-Dibromo-3-chloropropane	0.939	0.549	1.098	0	85.5	40.5	131				
1,2,4-Trimethylbenzene	1.07	0.0220	1.098	0	97.7	50.6	137				
Hexachlorobutadiene	0.945	0.0549	1.098	0	86.1	40.6	158				
Naphthalene	0.953	0.0549	1.098	0	86.8	52.3	124				
1,2,3-Trichlorobenzene	0.979	0.0220	1.098	0	89.2	54.4	124				
Surr: Dibromofluoromethane	1.31		1.373		95.5	56.5	129				
Surr: Toluene-d8	1.45		1.373		106	64.5	151				
Surr: 1-Bromo-4-fluorobenzene	1.42		1.373		104	54.8	168				

Sample ID: 1903296-002BMSD		SampType: MSD			Units: mg/Kg-dry		Prep Date: 3/21/2019		RunNo: 50218		
Client ID: BATCH		Batch ID: 23915			Analysis Date: 3/22/2019				SeqNo: 986408		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Dichlorodifluoromethane (CFC-12)	0.711	0.0220	1.098	0	64.7	43.5	121	0.8214	14.4	30	
Chloromethane	0.774	0.0549	1.098	0	70.5	45	130	0.8521	9.55	30	
Vinyl chloride	0.839	0.0275	1.098	0	76.4	43.6	150	0.9377	11.1	30	
Bromomethane	0.821	0.0549	1.098	0	74.8	21.3	120	0.8809	7.02	30	
Trichlorofluoromethane (CFC-11)	0.886	0.0220	1.098	0	80.7	35	131	1.007	12.7	30	
Chloroethane	0.885	0.0549	1.098	0	80.6	31.9	123	1.018	13.9	30	
1,1-Dichloroethene	0.880	0.0220	1.098	0	80.1	47.3	147	0.9929	12.1	30	
Methylene chloride	0.868	0.0220	1.098	0	79.0	54.7	142	0.9676	10.8	30	
trans-1,2-Dichloroethene	0.852	0.0220	1.098	0	77.5	52	136	0.9388	9.72	30	
Methyl tert-butyl ether (MTBE)	0.987	0.0549	1.098	0	89.9	58.5	167	0.9716	1.61	30	
1,1-Dichloroethane	0.826	0.0220	1.098	0	75.2	51.8	141	0.9108	9.80	30	

Work Order: 1903300
CLIENT: Shannon & Wilson
Project: Seattle Center Skate Plaza

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260C

Sample ID: 1903296-002BMSD	SampType: MSD	Units: mg/Kg-dry				Prep Date: 3/21/2019			RunNo: 50218		
Client ID: BATCH	Batch ID: 23915	Analysis Date: 3/22/2019							SeqNo: 986408		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
2,2-Dichloropropane	0.802	0.110	1.098	0	73.0	36	123	0.8684	7.92	30	
cis-1,2-Dichloroethene	0.844	0.0220	1.098	0	76.9	58.6	136	0.9286	9.53	30	
Chloroform	0.843	0.0220	1.098	0	76.8	53.2	129	0.9342	10.3	30	
1,1,1-Trichloroethane (TCA)	0.857	0.0275	1.098	0	78.1	58.3	145	0.9564	10.9	30	
1,1-Dichloropropene	0.881	0.0220	1.098	0	80.2	55.1	138	0.9444	6.91	30	
Carbon tetrachloride	0.857	0.0275	1.098	0	78.0	53.3	144	0.9416	9.40	30	
1,2-Dichloroethane (EDC)	0.881	0.0220	1.098	0	80.3	51.3	139	0.9487	7.35	30	
Benzene	0.891	0.0220	1.098	0	81.2	63.5	133	0.9532	6.71	30	
Trichloroethene (TCE)	0.900	0.0220	1.098	0	81.9	61.6	147	0.9614	6.62	30	
1,2-Dichloropropane	0.898	0.0220	1.098	0	81.7	59	136	0.9375	4.36	30	
Bromodichloromethane	0.881	0.0220	1.098	0	80.2	50.7	141	0.9433	6.86	30	
Dibromomethane	0.880	0.0220	1.098	0	80.1	50.6	137	0.9382	6.42	30	
cis-1,3-Dichloropropene	0.848	0.0220	1.098	0	77.2	50.4	138	0.8817	3.85	30	
Toluene	0.906	0.0220	1.098	0	82.4	63.4	132	0.9773	7.62	30	
trans-1,3-Dichloropropylene	0.909	0.0220	1.098	0	82.8	44.1	147	0.9272	1.97	30	
1,1,2-Trichloroethane	0.948	0.0220	1.098	0	86.3	51.6	137	0.9604	1.31	30	
1,3-Dichloropropane	0.949	0.0275	1.098	0	86.4	53.1	134	0.9684	2.00	30	
Tetrachloroethene (PCE)	0.918	0.0275	1.098	0	83.6	35.6	158	0.9742	5.90	30	
Dibromochloromethane	0.919	0.0275	1.098	0	83.7	55.3	140	0.9419	2.42	30	
1,2-Dibromoethane (EDB)	0.943	0.00549	1.098	0	85.8	50.4	136	0.9556	1.38	30	
Chlorobenzene	0.918	0.0275	1.098	0	83.5	60	133	0.9713	5.68	30	
1,1,1,2-Tetrachloroethane	0.937	0.0275	1.098	0	85.3	53.1	142	0.9531	1.72	30	
Ethylbenzene	0.930	0.0275	1.098	0	84.6	54.5	134	0.9844	5.72	30	
m,p-Xylene	1.84	0.0549	2.197	0	83.9	53.1	132	1.965	6.37	30	
o-Xylene	0.908	0.0275	1.098	0	82.7	53.3	139	0.9697	6.57	30	
Styrene	0.916	0.0275	1.098	0	83.4	51.1	132	0.9719	5.89	30	
Isopropylbenzene	0.920	0.0275	1.098	0	83.8	58.9	138	0.9817	6.45	30	
Bromoform	0.941	0.0549	1.098	0	85.7	57.9	130	0.9388	0.271	30	
1,1,2,2-Tetrachloroethane	0.969	0.0220	1.098	0	88.2	51.9	131	0.9436	2.63	30	
n-Propylbenzene	0.939	0.0275	1.098	0	85.5	53.6	140	1.002	6.53	30	
Bromobenzene	0.923	0.0220	1.098	0	84.0	54.2	140	0.9481	2.70	30	

Work Order: 1903300
CLIENT: Shannon & Wilson
Project: Seattle Center Skate Plaza

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260C

Sample ID: 1903296-002BMSD		SampType: MSD		Units: mg/Kg-dry		Prep Date: 3/21/2019		RunNo: 50218			
Client ID: BATCH		Batch ID: 23915				Analysis Date: 3/22/2019		SeqNo: 986408			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,3,5-Trimethylbenzene	0.991	0.0275	1.098	0	90.2	51.8	136	1.052	6.02	30	
2-Chlorotoluene	0.923	0.0275	1.098	0	84.0	51.6	136	0.9814	6.12	30	
4-Chlorotoluene	0.938	0.0275	1.098	0	85.4	50.1	139	0.9903	5.44	30	
tert-Butylbenzene	0.926	0.0275	1.098	0	84.3	50.5	135	0.9916	6.80	30	
1,2,3-Trichloropropane	0.996	0.0275	1.098	0	90.6	50.5	131	0.9777	1.82	30	
1,2,4-Trichlorobenzene	0.995	0.0275	1.098	0	90.6	50.8	130	0.9380	5.87	30	
sec-Butylbenzene	0.934	0.0549	1.098	0	85.0	52.6	141	1.006	7.46	30	
4-Isopropyltoluene	0.952	0.0549	1.098	0	86.7	52.9	134	1.016	6.43	30	
1,3-Dichlorobenzene	0.973	0.0220	1.098	0	88.6	52.6	131	0.9472	2.66	30	
1,4-Dichlorobenzene	0.978	0.0220	1.098	0	89.0	52.9	129	0.9675	1.05	30	
n-Butylbenzene	0.999	0.0275	1.098	0	91.0	52.6	130	1.004	0.503	30	
1,2-Dichlorobenzene	0.986	0.0220	1.098	0	89.8	55.8	129	0.9663	2.05	30	
1,2-Dibromo-3-chloropropane	1.07	0.549	1.098	0	97.5	40.5	131	0.9386	13.2	30	
1,2,4-Trimethylbenzene	1.00	0.0220	1.098	0	91.2	50.6	137	1.073	6.85	30	
Hexachlorobutadiene	0.980	0.0549	1.098	0	89.2	40.6	158	0.9455	3.61	30	
Naphthalene	1.01	0.0549	1.098	0	92.3	52.3	124	0.9533	6.18	30	
1,2,3-Trichlorobenzene	1.05	0.0220	1.098	0	95.9	54.4	124	0.9795	7.26	30	
Surr: Dibromofluoromethane	1.26		1.373		91.6	56.5	129		0		
Surr: Toluene-d8	1.41		1.373		103	64.5	151		0		
Surr: 1-Bromo-4-fluorobenzene	1.37		1.373		99.7	54.8	168		0		

Sample ID: LCS-23915		SampType: LCS		Units: mg/Kg		Prep Date: 3/21/2019		RunNo: 50218			
Client ID: LCSS		Batch ID: 23915				Analysis Date: 3/22/2019		SeqNo: 986417			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dichlorodifluoromethane (CFC-12)	0.607	0.0200	1.000	0	60.7	14.3	167				
Chloromethane	0.690	0.0500	1.000	0	69.0	32	156				
Vinyl chloride	0.758	0.0250	1.000	0	75.8	43.4	151				
Bromomethane	0.895	0.0500	1.000	0	89.5	35	155				
Trichlorofluoromethane (CFC-11)	0.873	0.0200	1.000	0	87.3	33.8	156				

Work Order: 1903300
CLIENT: Shannon & Wilson
Project: Seattle Center Skate Plaza

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260C

Sample ID: LCS-23915	SampType: LCS	Units: mg/Kg			Prep Date: 3/21/2019			RunNo: 50218			
Client ID: LCSS	Batch ID: 23915	Analysis Date: 3/22/2019						SeqNo: 986417			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloroethane	0.847	0.0500	1.000	0	84.7	33.1	147				
1,1-Dichloroethene	0.856	0.0200	1.000	0	85.6	30.9	145				
Methylene chloride	0.846	0.0200	1.000	0	84.6	46.3	140				
trans-1,2-Dichloroethene	0.810	0.0200	1.000	0	81.0	68	130				
Methyl tert-butyl ether (MTBE)	0.923	0.0500	1.000	0	92.3	44.1	152				
1,1-Dichloroethane	0.808	0.0200	1.000	0	80.8	61.9	137				
2,2-Dichloropropane	0.899	0.100	1.000	0	89.9	35.5	186				
cis-1,2-Dichloroethene	0.809	0.0200	1.000	0	80.9	71.3	135				
Chloroform	0.815	0.0200	1.000	0	81.5	69	145				
1,1,1-Trichloroethane (TCA)	0.849	0.0250	1.000	0	84.9	69	132				
1,1-Dichloropropene	0.868	0.0200	1.000	0	86.8	72.7	131				
Carbon tetrachloride	0.865	0.0250	1.000	0	86.5	63.4	137				
1,2-Dichloroethane (EDC)	0.862	0.0200	1.000	0	86.2	50.9	162				
Benzene	0.859	0.0200	1.000	0	85.9	64.3	133				
Trichloroethene (TCE)	0.883	0.0200	1.000	0	88.3	65.5	137				
1,2-Dichloropropane	0.864	0.0200	1.000	0	86.4	63.2	142				
Bromodichloromethane	0.858	0.0200	1.000	0	85.8	53.4	131				
Dibromomethane	0.857	0.0200	1.000	0	85.7	60.1	146				
cis-1,3-Dichloropropene	0.847	0.0200	1.000	0	84.7	59.1	143				
Toluene	0.870	0.0200	1.000	0	87.0	67	144				
trans-1,3-Dichloropropylene	0.909	0.0200	1.000	0	90.9	49.2	149				
1,1,2-Trichloroethane	0.919	0.0200	1.000	0	91.9	56.9	147				
1,3-Dichloropropane	0.915	0.0250	1.000	0	91.5	56.1	153				
Tetrachloroethene (PCE)	0.896	0.0250	1.000	0	89.6	52.7	150				
Dibromochloromethane	0.895	0.0250	1.000	0	89.5	70.6	144				
1,2-Dibromoethane (EDB)	0.935	0.00500	1.000	0	93.5	50.5	154				
Chlorobenzene	0.867	0.0250	1.000	0	86.7	84.9	125				
1,1,1,2-Tetrachloroethane	0.913	0.0250	1.000	0	91.3	65.9	141				
Ethylbenzene	0.890	0.0250	1.000	0	89.0	74	129				
m,p-Xylene	1.76	0.0500	2.000	0	88.0	70	124				
o-Xylene	0.875	0.0250	1.000	0	87.5	68.1	139				

Work Order: 1903300
CLIENT: Shannon & Wilson
Project: Seattle Center Skate Plaza

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260C

Sample ID: LCS-23915	SampType: LCS	Units: mg/Kg				Prep Date: 3/21/2019			RunNo: 50218		
Client ID: LCSS	Batch ID: 23915	Analysis Date: 3/22/2019						SeqNo: 986417			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Styrene	0.870	0.0250	1.000	0	87.0	73.3	146				
Isopropylbenzene	0.884	0.0250	1.000	0	88.4	70	130				
Bromoform	0.905	0.0500	1.000	0	90.5	44.3	130				
1,1,2,2-Tetrachloroethane	0.916	0.0200	1.000	0	91.6	44.8	165				
n-Propylbenzene	0.914	0.0250	1.000	0	91.4	75.8	139				
Bromobenzene	0.877	0.0200	1.000	0	87.7	49.2	144				
1,3,5-Trimethylbenzene	0.965	0.0250	1.000	0	96.5	76.5	135				
2-Chlorotoluene	0.894	0.0250	1.000	0	89.4	76.7	129				
4-Chlorotoluene	0.903	0.0250	1.000	0	90.3	77.5	125				
tert-Butylbenzene	0.895	0.0250	1.000	0	89.5	66.2	130				
1,2,3-Trichloropropane	0.939	0.0250	1.000	0	93.9	67.9	136				
1,2,4-Trichlorobenzene	0.929	0.0250	1.000	0	92.9	65.5	150				
sec-Butylbenzene	0.924	0.0500	1.000	0	92.4	75.6	133				
4-Isopropyltoluene	0.935	0.0500	1.000	0	93.5	76.8	131				
1,3-Dichlorobenzene	0.911	0.0200	1.000	0	91.1	48.6	144				
1,4-Dichlorobenzene	0.918	0.0200	1.000	0	91.8	72.6	126				
n-Butylbenzene	0.977	0.0250	1.000	0	97.7	78.4	140				
1,2-Dichlorobenzene	0.936	0.0200	1.000	0	93.6	72.8	126				
1,2-Dibromo-3-chloropropane	0.968	0.500	1.000	0	96.8	40.2	155				
1,2,4-Trimethylbenzene	0.979	0.0200	1.000	0	97.9	77.5	129				
Hexachlorobutadiene	0.929	0.0500	1.000	0	92.9	42	151				
Naphthalene	0.915	0.0500	1.000	0	91.5	46.5	167				
1,2,3-Trichlorobenzene	0.944	0.0200	1.000	0	94.4	64.5	149				
Surr: Dibromofluoromethane	1.18		1.250		94.1	56.5	129				
Surr: Toluene-d8	1.33		1.250		106	64.5	151				
Surr: 1-Bromo-4-fluorobenzene	1.28		1.250		102	54.8	168				



Work Order: 1903300
CLIENT: Shannon & Wilson
Project: Seattle Center Skate Plaza

QC SUMMARY REPORT

Sample Moisture (Percent Moisture)

Sample ID: 1903289-002ADUP		SampType: DUP			Units: wt%		Prep Date: 3/21/2019			RunNo: 50191		
Client ID: BATCH		Batch ID: R50191			Analysis Date: 3/21/2019			SeqNo: 985679				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Percent Moisture	19.6	0.500						26.99	31.5	20	R	

Sample ID: 1903300-002ADUP		SampType: DUP			Units: wt%		Prep Date: 3/21/2019			RunNo: 50191		
Client ID: HB-4:3.5		Batch ID: R50191			Analysis Date: 3/21/2019			SeqNo: 985692				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Percent Moisture	18.9	0.500						17.38	8.41	20		

Client Name: **SW**

Work Order Number: **1903300**

Logged by: **Clare Griggs**

Date Received: **3/20/2019 1:08:00 PM**

Chain of Custody

1. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐
2. How was the sample delivered? Client

Log In

3. Coolers are present? Yes ☒ No ☐ NA ☐
4. Shipping container/cooler in good condition? Yes ☒ No ☐
5. Custody Seals present on shipping container/cooler?
(Refer to comments for Custody Seals not intact) Yes ☐ No ☐ Not Required ☒
6. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
7. Were all items received at a temperature of $>0^{\circ}\text{C}$ to 10.0°C * Yes ☒ No ☐ NA ☐
8. Sample(s) in proper container(s)? Yes ☒ No ☐
9. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
10. Are samples properly preserved? Yes ☒ No ☐
11. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
12. Is there headspace in the VOA vials? Yes ☐ No ☐ NA ☒
13. Did all samples containers arrive in good condition(unbroken)? Yes ☒ No ☐
14. Does paperwork match bottle labels? Yes ☒ No ☐
15. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
16. Is it clear what analyses were requested? Yes ☒ No ☐
17. Were all holding times able to be met? Yes ☒ No ☐

Special Handling (if applicable)

18. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

Person Notified:	<input type="text"/>	Date:	<input type="text"/>
By Whom:	<input type="text"/>	Via:	<input type="checkbox"/> eMail <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> In Person
Regarding:	<input type="text"/>		
Client Instructions:	<input type="text"/>		

19. Additional remarks:

Item Information

Item #	Temp $^{\circ}\text{C}$
Cooler	3.9
Sample	3.1
Temp Blank	1.1

* Note: DoD/ELAP and TNI require items to be received at $4^{\circ}\text{C} \pm 2^{\circ}\text{C}$



Fremont

Analytical

3600 Fremont Ave. N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Chain of Custody Record & Laboratory Services Agreement

Date: 3/20/2019 Page: 1 of: 1

Project Name: SEATTLE CENTRE SKATE PARK

Project No: 102998-001

Collected by: DJR

Location:

Report To (PM): DAVID RANDALL

PM Email: DJR@SHAWNLI.COM

Laboratory Project No (Internal): 1907500

Special Remarks:

Sample Disposal: ☐ Return to client ☐ Disposal by lab (after 30 days)

Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	VOCs (EPA 8260 / 624)	GC/BTEX	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HID)	Diesel/Heavy Oil Range Organics (DO)	SVOCs (EPA 8270 / 625)	PAHs (EPA 8270 - SIM)	PCBs (EPA 8270 - SIM)	Metals** (EPA 6020 / 200.8)	Total (T) Dissolved (D)	Anions (IC)***	EDB (8011)	Comments	
1 HB-1:3	3/20/19	0830	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X		
2 HB-4:3.5		0900	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X		
3 HB-5:3.5		1000	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X		
4 HB-3:3.5		1100	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X		
5 HB-2:3		1200	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X		
6																		
7																		
8																		
9																		
10																		

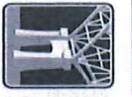
*Matrix: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water

**Metals (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL Individual: Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl U V Zn

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above and that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.

Relinquished	Date/Time	Received	Date/Time
X <u>[Signature]</u>	<u>03/20/2019 1308</u>	X <u>[Signature]</u>	<u>3/20/19 1308</u>
Relinquished	Date/Time	Received	Date/Time
X		X	



Fremont
Analytical

3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Chain of Custody Record & Laboratory Services Agreement

Date: 3/20/2019 Page: 1 of 1

Project Name: SEATTLE CENTER SKATE PLAZA

Project No: 102998-001

Collected by: DJE

Location:

Report To (PM): DAVID RAYDAU

PM Email: DJE@SHAWAN.COM

Laboratory Project No (Internal): 1903300

Special Remarks:

Sample Disposal: ☐ Return to client ☐ Disposal by lab (after 30 days)

Client: SHAWAN & WILSON

Address: 400 N. 34th St

City, State Zip: Seattle

Telephone: 206-695-6918

Fax:

Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	VOCs (EPA 8260 / 624)													Hexavalent Chromium													Comments																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
				GY/8TEX	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCID)	Diesel/Heavy Oil Range Organics (DH)	SVOCs (EPA 8270 / 625)	PAHs (EPA 8270 - SIM)	PCBs (EPA 8082 / 608)	Metals** (EPA 6020 / 200.8)	Total (T) Dissolved (D)	Anions (IC)***	EDB (8011)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											

*Matrix: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water

**Metals (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL Individual: Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl U V Zn

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate/Nitrite

I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above and that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.

Relinquished

Date/Time

03/20/2019 1308

Received

Date/Time

3/20/19 1308

Relinquished

Date/Time

Received

Date/Time

Turn-around Time:
☒ Standard
☐ 3 Day
☐ 2 Day
☐ Next Day
☐ Same Day (specify) _____



Fremont
Analytical

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Shannon & Wilson

Dave Randall
400 N. 34th Street, Suite 100
Seattle, WA 98103

RE: Seattle Center Skate Plaza
Work Order Number: 1905255

May 24, 2019

Attention Dave Randall:

Fremont Analytical, Inc. received 2 sample(s) on 5/17/2019 for the analyses presented in the following report.

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)
Sample Moisture (Percent Moisture)

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Mike Ridgeway
Laboratory Director

CLIENT: Shannon & Wilson
Project: Seattle Center Skate Plaza
Work Order: 1905255

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1905255-001	HB-2:C1	05/16/2019 11:45 AM	05/17/2019 9:12 AM
1905255-002	HB-2:C2	05/16/2019 11:48 AM	05/17/2019 9:12 AM

CLIENT: Shannon & Wilson
Project: Seattle Center Skate Plaza

I. SAMPLE RECEIPT:

Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:

Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:

Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

- * - Flagged value is not within established control limits
- B - Analyte detected in the associated Method Blank
- D - Dilution was required
- E - Value above quantitation range
- H - Holding times for preparation or analysis exceeded
- I - Analyte with an internal standard that does not meet established acceptance criteria
- J - Analyte detected below Reporting Limit
- N - Tentatively Identified Compound (TIC)
- Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
- S - Spike recovery outside accepted recovery limits
- ND - Not detected at the Reporting Limit
- R - High relative percent difference observed

Acronyms:

- %Rec - Percent Recovery
- CCB - Continued Calibration Blank
- CCV - Continued Calibration Verification
- DF - Dilution Factor
- HEM - Hexane Extractable Material
- ICV - Initial Calibration Verification
- LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
- MB or MBLANK - Method Blank
- MDL - Method Detection Limit
- MS/MSD - Matrix Spike / Matrix Spike Duplicate
- PDS - Post Digestion Spike
- Ref Val - Reference Value
- RL - Reporting Limit
- RPD - Relative Percent Difference
- SD - Serial Dilution
- SGT - Silica Gel Treatment
- SPK - Spike
- Surr - Surrogate



Analytical Report

Work Order: 1905255
Date Reported: 5/24/2019

Client: Shannon & Wilson

Collection Date: 5/16/2019 11:45:00 AM

Project: Seattle Center Skate Plaza

Lab ID: 1905255-001

Matrix: Soil

Client Sample ID: HB-2:C1

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Batch ID: 24671

Analyst: SB

Naphthalene	ND	45.3		µg/Kg-dry	1	5/23/2019 6:31:46 PM
2-Methylnaphthalene	ND	45.3		µg/Kg-dry	1	5/23/2019 6:31:46 PM
1-Methylnaphthalene	ND	45.3		µg/Kg-dry	1	5/23/2019 6:31:46 PM
Acenaphthylene	ND	45.3		µg/Kg-dry	1	5/23/2019 6:31:46 PM
Acenaphthene	ND	45.3		µg/Kg-dry	1	5/23/2019 6:31:46 PM
Fluorene	ND	45.3		µg/Kg-dry	1	5/23/2019 6:31:46 PM
Phenanthrene	ND	45.3		µg/Kg-dry	1	5/23/2019 6:31:46 PM
Anthracene	ND	45.3		µg/Kg-dry	1	5/23/2019 6:31:46 PM
Fluoranthene	ND	45.3		µg/Kg-dry	1	5/23/2019 6:31:46 PM
Pyrene	ND	45.3		µg/Kg-dry	1	5/23/2019 6:31:46 PM
Benz(a)anthracene	ND	45.3		µg/Kg-dry	1	5/23/2019 6:31:46 PM
Chrysene	ND	45.3		µg/Kg-dry	1	5/23/2019 6:31:46 PM
Benzo(b)fluoranthene	ND	45.3		µg/Kg-dry	1	5/23/2019 6:31:46 PM
Benzo(k)fluoranthene	ND	45.3		µg/Kg-dry	1	5/23/2019 6:31:46 PM
Benzo(a)pyrene	ND	45.3		µg/Kg-dry	1	5/23/2019 6:31:46 PM
Indeno(1,2,3-cd)pyrene	ND	45.3		µg/Kg-dry	1	5/23/2019 6:31:46 PM
Dibenz(a,h)anthracene	ND	45.3		µg/Kg-dry	1	5/23/2019 6:31:46 PM
Benzo(g,h,i)perylene	ND	45.3		µg/Kg-dry	1	5/23/2019 6:31:46 PM
Surr: 2-Fluorobiphenyl	88.7	19.4 - 157		%Rec	1	5/23/2019 6:31:46 PM
Surr: Terphenyl-d14 (surr)	85.3	31.5 - 173		%Rec	1	5/23/2019 6:31:46 PM

Sample Moisture (Percent Moisture)

Batch ID: R51593

Analyst: PA

Percent Moisture	16.9	0.500		wt%	1	5/21/2019 2:07:16 PM
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Analytical Report

Work Order: 1905255
Date Reported: 5/24/2019

Client: Shannon & Wilson

Collection Date: 5/16/2019 11:48:00 AM

Project: Seattle Center Skate Plaza

Lab ID: 1905255-002

Matrix: Soil

Client Sample ID: HB-2:C2

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Batch ID: 24671

Analyst: SB

Naphthalene	ND	47.2		µg/Kg-dry	1	5/23/2019 8:07:19 PM
2-Methylnaphthalene	ND	47.2		µg/Kg-dry	1	5/23/2019 8:07:19 PM
1-Methylnaphthalene	ND	47.2		µg/Kg-dry	1	5/23/2019 8:07:19 PM
Acenaphthylene	ND	47.2		µg/Kg-dry	1	5/23/2019 8:07:19 PM
Acenaphthene	ND	47.2		µg/Kg-dry	1	5/23/2019 8:07:19 PM
Fluorene	ND	47.2		µg/Kg-dry	1	5/23/2019 8:07:19 PM
Phenanthrene	ND	47.2		µg/Kg-dry	1	5/23/2019 8:07:19 PM
Anthracene	ND	47.2		µg/Kg-dry	1	5/23/2019 8:07:19 PM
Fluoranthene	ND	47.2		µg/Kg-dry	1	5/23/2019 8:07:19 PM
Pyrene	ND	47.2		µg/Kg-dry	1	5/23/2019 8:07:19 PM
Benz(a)anthracene	ND	47.2		µg/Kg-dry	1	5/23/2019 8:07:19 PM
Chrysene	ND	47.2		µg/Kg-dry	1	5/23/2019 8:07:19 PM
Benzo(b)fluoranthene	ND	47.2		µg/Kg-dry	1	5/23/2019 8:07:19 PM
Benzo(k)fluoranthene	ND	47.2		µg/Kg-dry	1	5/23/2019 8:07:19 PM
Benzo(a)pyrene	ND	47.2		µg/Kg-dry	1	5/23/2019 8:07:19 PM
Indeno(1,2,3-cd)pyrene	ND	47.2		µg/Kg-dry	1	5/23/2019 8:07:19 PM
Dibenz(a,h)anthracene	ND	47.2		µg/Kg-dry	1	5/23/2019 8:07:19 PM
Benzo(g,h,i)perylene	ND	47.2		µg/Kg-dry	1	5/23/2019 8:07:19 PM
Surr: 2-Fluorobiphenyl	87.0	19.4 - 157		%Rec	1	5/23/2019 8:07:19 PM
Surr: Terphenyl-d14 (surr)	86.8	31.5 - 173		%Rec	1	5/23/2019 8:07:19 PM

Sample Moisture (Percent Moisture)

Batch ID: R51593

Analyst: PA

Percent Moisture	18.5	0.500		wt%	1	5/21/2019 2:07:16 PM
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Work Order: 1905255
CLIENT: Shannon & Wilson
Project: Seattle Center Skate Plaza

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: MB-24671	SampType: MBLK	Units: µg/Kg			Prep Date: 5/22/2019			RunNo: 51695			
Client ID: MBLKS	Batch ID: 24671	Analysis Date: 5/23/2019						SeqNo: 1019519			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	ND	40.0									
2-Methylnaphthalene	ND	40.0									
1-Methylnaphthalene	ND	40.0									
Acenaphthylene	ND	40.0									
Acenaphthene	ND	40.0									
Fluorene	ND	40.0									
Phenanthrene	ND	40.0									
Anthracene	ND	40.0									
Fluoranthene	ND	40.0									
Pyrene	ND	40.0									
Benzo(a)anthracene	ND	40.0									
Chrysene	ND	40.0									
Benzo(b)fluoranthene	ND	40.0									
Benzo(k)fluoranthene	ND	40.0									
Benzo(a)pyrene	ND	40.0									
Indeno(1,2,3-cd)pyrene	ND	40.0									
Dibenz(a,h)anthracene	ND	40.0									
Benzo(g,h,i)perylene	ND	40.0									
Surr: 2-Fluorobiphenyl	661		500.0		132	19.4	157				
Surr: Terphenyl-d14 (surr)	618		500.0		124	31.5	173				

Sample ID: LCS-24671	SampType: LCS	Units: µg/Kg			Prep Date: 5/22/2019			RunNo: 51695			
Client ID: LCSS	Batch ID: 24671				Analysis Date: 5/23/2019			SeqNo: 1019521			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	940	40.0	1,000	0	94.0	52.9	134				
2-Methylnaphthalene	937	40.0	1,000	0	93.7	45.1	135				
1-Methylnaphthalene	935	40.0	1,000	0	93.5	55.7	141				
Acenaphthylene	944	40.0	1,000	0	94.4	32.8	136				
Acenaphthene	948	40.0	1,000	0	94.8	42	137				

Work Order: 1905255
CLIENT: Shannon & Wilson
Project: Seattle Center Skate Plaza

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: LCS-24671	SampType: LCS	Units: µg/Kg				Prep Date: 5/22/2019			RunNo: 51695		
Client ID: LCSS	Batch ID: 24671	Analysis Date: 5/23/2019						SeqNo: 1019521			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluorene	954	40.0	1,000	0	95.4	41.4	144				
Phenanthrene	930	40.0	1,000	0	93.0	36.6	141				
Anthracene	913	40.0	1,000	0	91.3	42.5	157				
Fluoranthene	987	40.0	1,000	0	98.7	43.4	144				
Pyrene	995	40.0	1,000	0	99.5	39.6	146				
Benz(a)anthracene	1,070	40.0	1,000	0	107	36.6	142				
Chrysene	947	40.0	1,000	0	94.7	43	165				
Benzo(b)fluoranthene	917	40.0	1,000	0	91.7	41	155				
Benzo(k)fluoranthene	1,050	40.0	1,000	0	105	30.6	164				
Benzo(a)pyrene	1,010	40.0	1,000	0	101	30.2	171				
Indeno(1,2,3-cd)pyrene	963	40.0	1,000	0	96.3	31.3	159				
Dibenz(a,h)anthracene	1,000	40.0	1,000	0	100	28	158				
Benzo(g,h,i)perylene	889	40.0	1,000	0	88.9	32.4	144				
Surr: 2-Fluorobiphenyl	673		500.0		135	19.4	157				
Surr: Terphenyl-d14 (surr)	639		500.0		128	31.5	173				

Sample ID: 1905255-001ADUP	SampType: DUP	Units: µg/Kg-dry				Prep Date: 5/22/2019			RunNo: 51695		
Client ID: HB-2:C1	Batch ID: 24671	Analysis Date: 5/23/2019							SeqNo: 1019525		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	ND	45.7						0		30	
2-Methylnaphthalene	ND	45.7						0		30	
1-Methylnaphthalene	ND	45.7						0		30	
Acenaphthylene	ND	45.7						0		30	
Acenaphthene	ND	45.7						0		30	
Fluorene	ND	45.7						0		30	
Phenanthrene	ND	45.7						0		30	
Anthracene	ND	45.7						0		30	
Fluoranthene	ND	45.7						0		30	
Pyrene	ND	45.7						0		30	

Work Order: 1905255
CLIENT: Shannon & Wilson
Project: Seattle Center Skate Plaza

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: 1905255-001ADUP		SampType: DUP		Units: µg/Kg-dry		Prep Date: 5/22/2019		RunNo: 51695			
Client ID: HB-2:C1		Batch ID: 24671				Analysis Date: 5/23/2019		SeqNo: 1019525			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benz(a)anthracene	ND	45.7						0		30	
Chrysene	ND	45.7						0		30	
Benzo(b)fluoranthene	ND	45.7						0		30	
Benzo(k)fluoranthene	ND	45.7						0		30	
Benzo(a)pyrene	ND	45.7						0		30	
Indeno(1,2,3-cd)pyrene	ND	45.7						0		30	
Dibenz(a,h)anthracene	ND	45.7						0		30	
Benzo(g,h,i)perylene	ND	45.7						0		30	
Surr: 2-Fluorobiphenyl	536		571.1		93.9	19.4	157		0		
Surr: Terphenyl-d14 (surr)	559		571.1		97.9	31.5	173		0		

Sample ID: 1905255-001AMS		SampType: MS		Units: µg/Kg-dry		Prep Date: 5/22/2019		RunNo: 51695			
Client ID: HB-2:C1		Batch ID: 24671				Analysis Date: 5/23/2019		SeqNo: 1019527			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	867	44.2	1,104	0	78.5	38.9	124				
2-Methylnaphthalene	876	44.2	1,104	0	79.3	42.8	151				
1-Methylnaphthalene	861	44.2	1,104	0	77.9	38.4	125				
Acenaphthylene	913	44.2	1,104	0	82.7	32.6	160				
Acenaphthene	868	44.2	1,104	0	78.6	31.7	126				
Fluorene	882	44.2	1,104	0	79.9	43.4	153				
Phenanthrene	849	44.2	1,104	0	76.9	23.8	135				
Anthracene	900	44.2	1,104	0	81.5	32.6	160				
Fluoranthene	962	44.2	1,104	0	87.1	28	144				
Pyrene	956	44.2	1,104	0	86.5	27.8	141				
Benz(a)anthracene	1,070	44.2	1,104	0	97.3	34.9	139				
Chrysene	856	44.2	1,104	0	77.6	45.2	146				
Benzo(b)fluoranthene	1,010	44.2	1,104	0	91.5	42.2	168				
Benzo(k)fluoranthene	874	44.2	1,104	0	79.1	20.5	150				
Benzo(a)pyrene	1,040	44.2	1,104	0	94.2	34.4	179				

Work Order: 1905255
CLIENT: Shannon & Wilson
Project: Seattle Center Skate Plaza

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: 1905255-001AMS		SampType: MS		Units: µg/Kg-dry		Prep Date: 5/22/2019		RunNo: 51695			
Client ID: HB-2:C1		Batch ID: 24671				Analysis Date: 5/23/2019		SeqNo: 1019527			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Indeno(1,2,3-cd)pyrene	884	44.2	1,104	0	80.1	11.8	140				
Dibenz(a,h)anthracene	909	44.2	1,104	0	82.4	17.3	156				
Benzo(g,h,i)perylene	792	44.2	1,104	0	71.7	24.9	119				
Surr: 2-Fluorobiphenyl	577		552.2		104	19.4	157				
Surr: Terphenyl-d14 (surr)	563		552.2		102	31.5	173				

Sample ID: 1905255-001AMSD		SampType: MSD		Units: µg/Kg-dry		Prep Date: 5/22/2019		RunNo: 51695			
Client ID: HB-2:C1		Batch ID: 24671				Analysis Date: 5/23/2019		SeqNo: 1019528			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	990	46.8	1,171	0	84.6	38.9	124	867.0	13.3	30	
2-Methylnaphthalene	1,010	46.8	1,171	0	86.5	42.8	151	876.1	14.5	30	
1-Methylnaphthalene	933	46.8	1,171	0	79.7	38.4	125	860.8	8.05	30	
Acenaphthylene	1,060	46.8	1,171	0	90.5	32.6	160	913.5	14.8	30	
Acenaphthene	1,000	46.8	1,171	0	85.5	31.7	126	868.0	14.2	30	
Fluorene	1,000	46.8	1,171	0	85.8	43.4	153	882.1	13.0	30	
Phenanthrene	992	46.8	1,171	0	84.7	23.8	135	849.2	15.5	30	
Anthracene	1,050	46.8	1,171	0	89.7	32.6	160	900.1	15.4	30	
Fluoranthene	1,110	46.8	1,171	0	94.9	28	144	961.7	14.5	30	
Pyrene	1,100	46.8	1,171	0	94.3	27.8	141	955.6	14.4	30	
Benz(a)anthracene	1,240	46.8	1,171	0	106	34.9	139	1,074	14.1	30	
Chrysene	1,000	46.8	1,171	0	85.6	45.2	146	856.5	15.7	30	
Benzo(b)fluoranthene	1,200	46.8	1,171	0	102	42.2	168	1,011	17.1	30	
Benzo(k)fluoranthene	1,020	46.8	1,171	0	87.5	20.5	150	874.0	15.9	30	
Benzo(a)pyrene	1,200	46.8	1,171	0	103	34.4	179	1,041	14.5	30	
Indeno(1,2,3-cd)pyrene	1,080	46.8	1,171	0	92.0	11.8	140	884.2	19.7	30	
Dibenz(a,h)anthracene	1,100	46.8	1,171	0	93.9	17.3	156	909.5	18.9	30	
Benzo(g,h,i)perylene	953	46.8	1,171	0	81.4	24.9	119	792.3	18.5	30	
Surr: 2-Fluorobiphenyl	652		585.5		111	19.4	157		0		
Surr: Terphenyl-d14 (surr)	635		585.5		108	31.5	173		0		



Date: 5/24/2019

Work Order: 1905255
CLIENT: Shannon & Wilson
Project: Seattle Center Skate Plaza

QC SUMMARY REPORT

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: 1905255-001AMSD	SampType: MSD	Units: µg/Kg-dry	Prep Date: 5/22/2019	RunNo: 51695							
Client ID: HB-2:C1	Batch ID: 24671		Analysis Date: 5/23/2019	SeqNo: 1019528							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual



Work Order: 1905255
CLIENT: Shannon & Wilson
Project: Seattle Center Skate Plaza

QC SUMMARY REPORT

Sample Moisture (Percent Moisture)

Sample ID: 1905302-001ADUP		SampType: DUP		Units: wt%		Prep Date: 5/21/2019			RunNo: 51593		
Client ID: BATCH		Batch ID: R51593					Analysis Date: 5/21/2019			SeqNo: 1017298	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	8.27	0.500						8.530	3.12	20	

Sample ID: 1905255-002ADUP		SampType: DUP		Units: wt%		Prep Date: 5/21/2019			RunNo: 51593		
Client ID: HB-2:C2		Batch ID: R51593					Analysis Date: 5/21/2019			SeqNo: 1017309	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	18.4	0.500						18.54	0.804	20	

Client Name: **SW**

Work Order Number: **1905255**

Logged by: **Mike Ridgeway**

Date Received: **5/17/2019 9:12:00 AM**

Chain of Custody

1. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐
2. How was the sample delivered? Client

Log In

3. Coolers are present? Yes ☒ No ☐ NA ☐
4. Shipping container/cooler in good condition? Yes ☒ No ☐
5. Custody Seals present on shipping container/cooler?
(Refer to comments for Custody Seals not intact) Yes ☐ No ☒ Not Required ☐
6. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
7. Were all items received at a temperature of $>0^{\circ}\text{C}$ to 10.0°C * Yes ☒ No ☐ NA ☐
8. Sample(s) in proper container(s)? Yes ☒ No ☐
9. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
10. Are samples properly preserved? Yes ☒ No ☐
11. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
12. Is there headspace in the VOA vials? Yes ☐ No ☐ NA ☒
13. Did all samples containers arrive in good condition(unbroken)? Yes ☒ No ☐
14. Does paperwork match bottle labels? Yes ☒ No ☐
15. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
16. Is it clear what analyses were requested? Yes ☒ No ☐
17. Were all holding times able to be met? Yes ☒ No ☐

Special Handling (if applicable)

18. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

Person Notified:	<input type="text"/>	Date:	<input type="text"/>
By Whom:	<input type="text"/>	Via:	<input type="checkbox"/> eMail <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> In Person
Regarding:	<input type="text"/>		
Client Instructions:	<input type="text"/>		

19. Additional remarks:

Item Information

Item #	Temp $^{\circ}\text{C}$
Cooler	4.9
Sample	5.3

* Note: DoD/ELAP and TNI require items to be received at $4^{\circ}\text{C} \pm 2^{\circ}\text{C}$



3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Chain of Custody Record & Laboratory Services Agreement

Date: 5/17/2019 Page: 1 of 1

Project Name: Seattle Center Skate Plaza

Project No: 102998-002

Collected by: Matthew Harman

Location: Seattle, WA

Report To (PM): Dave Randall

PM Email: DJR@shawnil.com

Laboratory Project No (Internal): 1905255

Special Remarks:

Sample Disposal: ☐ Return to client ☐ Disposal by lab (after 30 days)

Client: Shannon Wilson

Address: 400 34th ST N, STE 100

City, State, Zip: Seattle, WA, 98103

Telephone: 206-695-6737

Fax:

Sample Name Sample Date Sample Time Sample Type (Matrix)*

1 HB-2:1C1

5/16/19 1145

Soil

2 HB-2:1C2

5/16/19 1148

Soil

3

4

5

6

7

8

9

10

VOCs (EPA 8260 / 624)
GX/BTEX
BTEX
Gasoline Range Organics (GX)
Hydrocarbon Identification (HCID)
Diesel/Heavy Oil Range Organics (DH)
SVOCs (EPA 8270 / 625)
PAHs (EPA 8270 - SIM)
PCBs (EPA 8082 / 608)
Metals** (EPA 6020 / 200.8)
Total (T) / Dissolved (D)
Anions (IC)***
EDB (8011)

Comments

*Matrix: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water

**Metals (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL Individual: Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti U V Zn

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above and that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.

Relinquished Date/Time

5/17/19

09:10

Received

5/17/19

09:12

PA 5/17

0912

0912

0912

0912

0912

0912

0912

0912

0912

Turn-around Time:
☒ Standard
☐ 3 Day
☐ 2 Day
☐ Next Day
Same Day (specify)

Appendix B

Waste Disposal Information

APPENDIX B: WASTE DISPOSAL INFORMATION

NON-HAZARDOUS WASTE MANIFEST		1. Generator ID Number N/A	2. Page 1 of 2	3. Emergency Response Phone (800)424-9300	4. Waste Tracking Number 9CR61119-CWM1	
5. Generator's Name and Mailing Address SEATTLE CENTER REDEVELOPMENT 621 BROAD STREET SEATTLE WA 98109 Generator's Phone: (206)694-7347			Generator's Site Address (if different than mailing address)			
6. Transporter 1 Company Name CHEMICAL WASTE MANAGEMENT, INC.			U.S. EPA ID Number ORD082452353			
7. Transporter 2 Company Name UPRR			U.S. EPA ID Number NED001782910			
8. Designated Facility Name and Site Address CHEMICAL WASTE MANAGEMENT, INC. 17826 CEDAR SPRING LANE ARLINGTON OR 97912-9709 Facility's Phone: (503)454-2843			U.S. EPA ID Number ORD082452353			
GENERATOR	9. Waste Shipping Name and Description		10. Containers		11. Total Quantity	12. Unit Wt./Vol.
			No.	Type		
	1. MATERIAL NOT REGULATED BY D.O.T. OR342077		1	CM	400	F
	2.					
	3.					
4.						
13. Special Handling Instructions and Additional Information 1. OR342077 HOPPETRIUM HYDROCARBON EXCAVATED SOIL						
14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.						
Generator's/Offoror's Printed/Typed Name Joe Lee			Signature 		Month Day Year 06/07/19	
INT'L	15. International Shipments <input type="checkbox"/> Import to U.S. <input type="checkbox"/> Export from U.S.		Port of entry/exit: Date leaving U.S.:			
TRANSPORTER	16. Transporter Acknowledgment of Receipt of Materials					
	Transporter 1 Printed/Typed Name BCE CARBON		Signature 		Month Day Year 06/11/19	
	Transporter 2 Printed/Typed Name		Signature		Month Day Year	
DESIGNATED FACILITY	17. Discrepancy					
	17a. Discrepancy Indication Space <input type="checkbox"/> Quantity <input type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> Full Rejection					
	Manifest Reference Number:					
	17b. Alternate Facility (or Generator)		U.S. EPA ID Number			
	Facility's Phone:					
17c. Signature of Alternate Facility (or Generator)		Month Day Year				
18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a						
Printed/Typed Name		Signature		Month Day Year		

IMPORTANT INFORMATION

Important Information

About Your Environmental Site Assessment/Evaluation Report

ENVIRONMENTAL SITE ASSESSMENTS/EVALUATIONS ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.

This report was prepared to meet the needs you specified with respect to your specific site and your risk management preferences. Unless indicated otherwise, we prepared your report expressly for you and for the purposes you indicated. No one other than you should use this report for any purpose without first conferring with us. No one is authorized to use this report for any purpose other than that originally contemplated without our prior written consent.

The findings and conclusions documented in this site assessment/evaluation have been prepared for specific application to this project and have been developed in a manner consistent with that level of care and skill normally exercised by members of the environmental science profession currently practicing under similar conditions in this area. The conclusions presented are based on interpretation of information currently available to us and are made within the operational scope, budget, and schedule constraints of this project. No warranty, express or implied, is made.

OUR REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

Our environmental site assessment is based on several factors and may include (but not be limited to) reviewing public documents to chronicle site ownership for the past 30, 40, or more years; investigating the site's regulatory history to learn about permits granted or citations issued; determining prior uses of the site and those adjacent to it; reviewing available topographic and real estate maps, historical aerial photos, geologic information, and hydrologic data; reviewing readily available published information about surface and subsurface conditions; reviewing federal and state lists of known and potentially contaminated sites; evaluating the potential for naturally occurring hazards; and interviewing public officials, owners/operators, and/or adjacent owners with respect to local concerns and environmental conditions.

Except as noted within the text of the report, no sampling or quantitative laboratory testing was performed by us as part of this site assessment. Where such analyses were conducted by an outside laboratory, Shannon & Wilson relied upon the data provided and did not conduct an independent evaluation regarding the reliability of the data.

CONDITIONS CAN CHANGE.

Site conditions, both surface and subsurface, may be affected as a result of natural processes or human influence. An environmental site assessment/evaluation is based on conditions that existed at the time of the evaluation. Because so many aspects of a historical review rely on third-party information, most consultants will refuse to certify (warrant) that a site is free of contaminants, as it is impossible to know with absolute certainty if such a condition exists. Contaminants may be present in areas that were not surveyed or sampled or may migrate to areas that showed no signs of contamination at the time they were studied.

Unless your consultant indicates otherwise, your report should not be construed to represent geotechnical subsurface conditions at or adjacent to the site and does not provide sufficient information for construction-related activities. Your report also should not be used following floods, earthquakes, or other acts of nature; if the size or configuration of the site is altered; if the location of the site is modified; or if there is a change of ownership and/or use of the property.

INCIDENTAL DAMAGE MAY OCCUR DURING SAMPLING ACTIVITIES.

Incidental damage to a facility may occur during sampling activities. Asbestos and lead-based paint sampling often require destructive sampling of pipe insulation, floor tile, walls, doors, ceiling tile, roofing, and other building materials. Shannon & Wilson does not provide for paint repair. Limited repair of asbestos sample locations is provided. However, Shannon & Wilson neither warrants repairs made by our field personnel, nor are we held liable for injuries or damages as a result of those repairs. If you desire a specific form of repair, such as those provided by a licensed roofing contractor, you need to request the specific repair at the time of the proposal. The owner is responsible for repair methods that are not specified in the proposal.

READ RESPONSIBILITY CLAUSES CAREFULLY.

Environmental site assessments/evaluations are less exact than other design disciplines because they are based extensively on judgment and opinion and there may not have been any (or very limited) investigation of actual subsurface conditions. Wholly unwarranted claims have been lodged against consultants. To limit this exposure, consultants have developed a number of clauses for use in their contracts, reports, and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that identify where responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses may appear in this report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

Consultants cannot accept responsibility for problems that may develop if they are not consulted after factors considered in their reports have changed or conditions at the site have changed. Therefore, it is incumbent upon you to notify your consultant of any factors that may have changed prior to submission of the final assessment/evaluation.

An assessment/evaluation of a site helps reduce your risk but does not eliminate it. Even the most rigorous professional assessment may fail to identify all existing conditions.

ONE OF THE OBLIGATIONS OF YOUR CONSULTANT IS TO PROTECT THE SAFETY, HEALTH, PROPERTY, AND WELFARE OF THE PUBLIC.

If our environmental site assessment/evaluation discloses the existence of conditions that may endanger the safety, health, property, or welfare of the public, we may be obligated under rules of professional conduct, statutory law, or common law to notify you and others of these conditions.

The preceding paragraphs are based on information provided by the ASFE/Association of Engineering Firms Practicing in the Geosciences, Silver Spring, Maryland

APPENDIX B

NOISE ANALYSIS REPORT



5309 Shilshole Avenue, NW
Suite 200
Seattle, WA 98107
206.789.9658 **phone**
206.789.9684 **fax**

www.esassoc.com

memorandum

date December 18, 2018

to Jill Crary and Julia Levitt, Seattle Center

cc Molly Adolfson and Claire Hoffman, ESA

from Aaron Booy, Jessica Conquest, and Chris Sanchez, ESA

subject Proposed Skatepark at Seattle Center - Noise Analysis Report

Introduction

This memorandum presents the results of a noise monitoring survey conducted in October of 2018 to identify potential noise impacts associated with development of a new skatepark in Uptown. To allow for development of the Seattle Center Arena Renovation Project, the Seattle City Council approved agreements that allow Oak View Group (OVG), a private developer, to demolish the Seattle Center skatepark. The agreement between the City and OVG provides for \$500,000 of funding toward relocating the skatepark. The City and City Council, through collaboration with the Seattle Center, have identified a new skatepark site located across the street from the Seattle Center campus on a portion of the Broad Street right-of-way (Figure 1).

The proposed skatepark would be located on a portion of the Broad Street right-of-way that has been closed to vehicles since 2014. The vacant right-of-way is at approximately 319 6th Avenue North, Seattle, WA 98109 and is surrounded by commercial and public utility uses that are zoned for Seattle Mixed Uptown (SM-UP 160 (M)). Development of the site into a skatepark would result in a change of use from vacant land to a recreation facility that would be used from dawn to dusk; therefore, increased noise may occur at the site. Noise-sensitive receptors nearest the project site are hotels (Hyatt House and Best Western Executive Inn) and outdoor gathering spaces associated with the Space Needle (both of which are approximately 200 feet to the southwest of the proposed site).

To analyze the potential for noise impacts from a new skatepark, monitoring was conducted at the proposed site (to document existing conditions) and at two existing similar skateparks to establish reference noise levels in order to predict future conditions. The skatepark at Seattle Center was closed and was unavailable for noise monitoring, so two existing skateparks with similar conditions were monitored. This analysis will support project permitting and environmental compliance under the Washington State Environmental Policy Act (SEPA).

Figure 1. Proposed Site



Regulatory Framework

This noise analysis is based on the City of Seattle's Noise Ordinance (Seattle Municipal Code [SMC] 25.08.410). Table 1 lists the exterior sound level limits described in the SMC, which are based on the zoning district of receiving property.

Table 1. City of Seattle Exterior Sound Limits [dB(A)]

District of Sound Source	Zoning District of Receiving Property		
	Residential Day / Night	Commercial	Industrial
Residential	55 / 45	57	60
Commercial	57 / 47	60	65
Industrial	60 / 50	65	70

Source: SMC Chapter 25.08.410

Notes:

- The ordinance provides that noise limits are to be based on the Leq during the measurement interval, using a minimum measurement interval of 1 minute for a constant sound source, or a 1-hour measurement for a non-continuous sound source.
- Daytime represents the hours between 7 a.m. and 10 p.m. on weekdays and between 9 a.m. and 10 p.m. on weekends and legal holidays.

Methodology

Noise is defined as unwanted sound. The manner in which people respond to noise depends on its composition, intensity, frequency, and duration. The loudness of sound as interpreted by the human ear depends on fluctuations in air pressure. Sound is highly variable from the quietest to loudest sounds perceived. Noise impacts to humans are measured in terms of air pressure, expressed in decibels or dB. Because of the variability in the loudness of sound, changes in sound (noise) are measured on a logarithmic scale. Because noise is measured on a logarithmic scale, an increase in noise of 10 dB would be considered twice as loud. A 3 dB change is a barely perceivable difference for the human ear.

Noise level measurements:

The *Hourly Equivalent Sound Level* [$Leq(h)$], which describes a receiver's cumulative noise exposure from all events over a 1-hour period.

When considering the effects that noise has on an individual, it is important to take into account the frequency response of the human ear, which has increased sensitivity to certain frequencies of sound - particularly lower frequencies. To account for the human ear sensitivity, the A-weighting scale, which best estimates the way in which the human ear responds, is commonly used. A decibel on the A-weighted scale is referred to as dB(A).

To analyze the potential for noise impacts from a new skatepark, monitoring was conducted at the proposed site (to document existing conditions) and at two existing nearby skateparks (see Figure 2) to establish reference noise levels from skate park activity for the purposes of predicting future conditions on and around the project site. The data was then analyzed to determine conformance with the SMC (Table 1).

Figure 2. Noise Monitoring Locations



Existing noise levels were measured using a long-term noise monitoring meter (Larson Davis SoundTrack LxT) for approximately three days (the afternoon of Friday, October 19th through the afternoon of Monday, October 22nd) to capture typical use conditions at all three sites during the weekend periods when skate park use would be most active. It was dry (i.e., no precipitation) throughout the monitoring period. All of the meters were placed on trees at similar heights and at similar setbacks from skatepark activity (when applicable). The meter deployed at the Proposed Skatepark site was located in a street tree approximately 25 feet from the nearest travel lane along Taylor Avenue N (Figure 3). The meter deployed at the Jefferson Skatepark was located in a tree approximately 30 feet east of the skatepark and 16 feet northwest of the Jefferson Park Gold Driving Range (Figure 4). The closest street to the Jefferson Skatepark meter was Beacon Avenue S, located approximately 335 feet to the east, and parking lot areas for Jefferson Park were located approximately 160 feet to the northeast of the meter. The meter deployed at the Lower Woodland Skatepark was located on the trunk of a tree approximately 36 feet to the west of the skatepark (Figure 5). The closest street to the Lower Woodland Skatepark meter was Greenlake Way N, located approximately 595 feet to the east, and parking lot areas for Lower Woodland Park were located approximately 300 feet to the north of the meter. Meters were located such that there were no hills, walls, or other barriers between the meters and the skate parks that could attenuate monitored noise levels.

Figure 3. Proposed Skatepark Monitoring Location



Figure 4. Jefferson Skatepark Monitoring Location



Figure 5. Lower Woodland Skatepark Monitoring Location



Affected Environment

This section documents the existing noise conditions monitored at the Proposed Skatepark Monitoring Site. Table 2 provides the average of daytime hourly equivalent sound levels [Leq(h)] measured on four consecutive days (October 19 thru October 22). For each day, the Leq(h) levels describe the cumulative noise exposure from all events during the daytime hours (7 a.m. to 10 p.m. on weekdays and 9 a.m. to 10 p.m. on weekends). Appendix A (Tables A-1 through A-4) document the Leq(h) levels for each one-hour period during both daytime and nighttime hours as measured at the Proposed Skatepark Monitoring site.

Noise monitoring data collected on Saturday contained continuous elevated noise levels of 69 to 77 dB(A) from an anomalous noise source or event between 9:00 and 10:00 AM¹. Consequently, these data points were not considered in the calculation of the existing average daytime ambient noise level to conservatively characterize

Table 2. Noise Measurements (Average Daytime dB(A) Leq(h) Sound Levels), Proposed Skatepark Site

Day	Average Daytime Leq
Friday 10/19/18	59.9
Saturday 10/20/18	67.1
Sunday 10/21/18	58.3
Monday 10/22/18	58.4

Source: Measured by ESA

the project site environment on Saturday. Disregarding the data points for this two-hour period on Saturday morning, the existing daytime noise environment was consistently between 57 and 61 dB(A) Leq(h). Table 2 presents the hour by hour monitoring data collected each day of the monitoring period at the project site.

Potential for Impacts

This section documents the existing noise conditions at the two existing, operating skateparks: Lower Woodland Skatepark and Jefferson Skatepark. The Skatepark at Seattle Center was permanently closed and therefore unavailable for monitoring. These two existing Skateparks were chosen for monitoring because they were identified by City staff and common online review forums as popular, well used skateparks within City of Seattle parks. Lower Woodland and Jefferson Skateparks were also selected because they are setback from adjacent

¹ The average daytime Leq was approximately 9 to 10 dB(A) higher on Saturday October 20 than on the other three days. This was due to measured noise conditions at 77 dB(A) Leq(h) during the 9 AM and 10 AM hours on Saturday morning. Review of the data log for these hours shows that a noise source (or sources) generated noise measured between 72 dB(A) and 88 dB(A) from 8:28 to 9:15AM, and then again from 79 to 81 dB(A) from 9:30 AM to 10:02 AM. The noise meter did not record audio associated with these noise events, so it is uncertain what activity created the increased noise. However, the measured noise levels were generally continuous at one dB(A) level for intervals of 3 minutes or more, suggesting that noise was likely generated by a motor vehicle or other piece of machinery generating steady-state noise located in close proximity to the noise meter.

arterial roadways, minimizing the influence of other dominant environmental noise sources to the greatest extent feasible. Both of these existing skatepark locations provided opportunity for secure placement of the noise monitoring equipment.

Table 3 provides existing average daytime sound level (Leq) at a distance of approximately 30 feet from skate park activity. These data indicate that noise levels at Jefferson Skatepark were consistently 2 to 4 dB(A) greater than at Lower Woodland Skatepark likely as the result of higher activity levels. Appendix B (Tables B-1 through B-4) document the existing hourly equivalent sound level [Leq(h)].

Table 3. Comparable Skatepark Noise Average Daytime Leq Measurements

Day	Lower Woodland Skatepark Leq	Jefferson Skatepark Leq
Friday 10/19/18	55.8	61.8
Saturday 10/20/18	58.4	61.3
Sunday 10/21/18	58.5	61.0
Monday 10/22/18	55.8	61.8

Source: Measured by ESA

Summary of Findings

The Proposed Skatepark site is surrounded by commercial and public utility uses that are zoned for Seattle Mixed Uptown (SM-UP 160 (M)); this same zoning designation extends across the Proposed Skatepark Site. The closest existing noise sensitive receivers to the Proposed Skatepark site are the Hyatt House hotel (201 5th Avenue North), the Best Western Executive Inn hotel (200 Taylor Ave N, Seattle, WA 98109), and outdoor gathering spaces associated with the Space Needle. The outdoor gathering spaces associated with the Space Needle and Seattle Center are closest to the Proposed Skatepark, located approximately 200 feet to the southwest. The hotels and are located further away, setback 240 or more feet from the proposed site. Consistent with the City's Noise Ordinance, zoning district for all receiving properties is commercial because the zoning designation is SM-UP 160 (M).

At the Proposed Skatepark monitoring site, and at both existing skatepark monitoring sites, the measured noise environment was generally at or approaching the 60 dB(A) limit set by SMC (between commercially zoned properties) (Table 1). At all locations, occasional hourly Leq measurements exceeded the 60 dB(A) limit. For example, at the Proposed Skatepark monitoring site, measured noise was at 64 dB(A) Leq at 8:00 AM on Friday morning. On Friday evening, noise conditions at Jefferson Park were measured at 66 dB(A) Leq during 8:00 PM and 9:00 PM hours. Monitored noise environments at all three locations were influenced by a variety of noise

sources, including traffic noise from surrounding roadways, other park and pedestrian uses, and overhead airplanes.

Table 4 provides the average daytime Leq at the Proposed Skatepark location as well as the two existing skateparks.

Table 4. Existing Noise Measurements (Leq)

Day	Proposed Skatepark Site Leq	Lower Woodland Skatepark Leq	Jefferson Skatepark Leq
Friday 10/19/18	59.9	55.8	60.2
Saturday 10/20/18	69.0	58.2	61
Sunday 10/21/18	58.3	58	60.6
Monday 10/22/18	59.9	55.8	60.2

Source: Measured by ESA

Based on review of the existing noise environments between the Proposed Skatepark location and the comparison existing skateparks, it is not anticipated that future use of the Seattle Center Skatepark, once developed and operational, would significantly alter the existing noise environment surrounding the proposed location. The noise levels at the Lower Woodland site were generally lower than the Proposed Skatepark Monitoring Site. The noise levels at the Jefferson Skatepark were generally equivalent to the Proposed Skatepark Monitoring Site. The noise environments at both of the existing skateparks are influenced by multiple noise sources in addition to skatepark activities. With consideration of these additional sources, and the average noise levels measured adjacent to both skateparks generally occurring at or below the 60 dB(A) Leq threshold, and the distance of the closest receiving properties being 200 to 240 feet away, we do not anticipate a potential for adverse noise impacts or exceedances of SMC limits. Assuming that all of the noise recorded at existing skateparks was a result of skatepark activity, the noise level experience at the nearest sensitive receptors (200 feet or greater away from the Proposed Skatepark location) would be at or below 50 dB(A). The City's exterior sound level limits regulate only the sound generated by a specific activity /use on the 'sound source' property as experienced by adjacent properties, and are not cumulative with other existing surrounding noise.

APPENDIX A

Noise Measurements for Proposed Skatepark Site

Table A-1. Noise Measurements for Friday October 19, 2018 [Leq(h)]

Day	Time of Day	Leq(h)
Friday 10/19/18	Daytime	
	4:00pm	61
	5:00pm	61
	6:00pm	59
	7:00pm	60
	8:00pm	58
	9:00pm	60
	10:00pm	58
	Nighttime	
	11:00pm	57

Source: Measured by ESA

Table A-2. Noise Measurements for Saturday October 20, 2018 [Leq(h)]

Day	Time of Day	Leq(h)
Saturday 10/20/18	Nighttime	
	12:00 AM	57
	1:00 AM	55
	2:00 AM	55
	3:00 AM	54
	4:00 AM	55
	5:00 AM	57
	6:00 AM	63
	7:00 AM	59
	8:00 AM	77
	Daytime	
	9:00 AM	77
	10:00 AM	69
	11:00 AM	60
	12:00 PM	59
	1:00 PM	59
	2:00 PM	59
	3:00 PM	60
	4:00 PM	59
	5:00 PM	58
	6:00 PM	59
	7:00 PM	61
	8:00 PM	58
	9:00 PM	58
	10:00 PM	57
	Nighttime	
	11:00 PM	57

Source: Measured by ESA

Table A-3. Existing Noise Measurements for Sunday October 21, 2018 [Leq(h)]

Day	Time of Day	Leq(h)
Sunday 10/21/18	Nighttime	
	12:00 AM	57
	1:00 AM	56
	2:00 AM	55
	3:00 AM	54
	4:00 AM	60
	5:00 AM	54
	6:00 AM	55
	7:00 AM	58
	8:00 AM	58
	Daytime	
	9:00 AM	57
	10:00 AM	60
	11:00 AM	57
	12:00 PM	58
	1:00 PM	57
	2:00 PM	59
	3:00 PM	59
	4:00 PM	59
	5:00 PM	59
	6:00 PM	59
	7:00 PM	57
	8:00 PM	56
	9:00 PM	59
	10:00 PM	57
	Nighttime	
	11:00 PM	56

Source: Measured by ESA

Table A-4. Existing Noise Measurements for Monday October 22, 2018 [Leq(h)]

Day	Time of Day	Leq(h)
Monday 10/22/18	Nighttime	
	12:00 AM	55
	1:00 AM	53
	2:00 AM	53
	3:00 AM	53
	4:00 AM	56
	5:00 AM	57
	6:00 AM	57
	Daytime	
	7:00 AM	62
	8:00 AM	64
	9:00 AM	60
	10:00 AM	58
	11:00 AM	58
	12:00 PM	59
	1:00 PM	57
	2:00 PM	60
	3:00 PM	59

Source: Measured by ESA

APPENDIX B

Comparable Skatepark Noise Measurements

Table B-1. Noise Measurements for Friday October 19, 2018 [Leq(h)]

Day	Time of Day	Lower Woodland Skatepark Leq(h)	Jefferson Skatepark Leq(h)
Friday 10/19/18	Daytime		
	5:00pm	N/A	63
	6:00pm	62	63
	7:00pm	56	64
	8:00pm	56	66
	9:00pm	56	66
	10:00pm	55	63
	Nighttime		
	11:00pm	54	59

Source: Measured by ESA

Table B-2. Noise Measurements for Saturday October 20, 2018 [Leq(h)]

Day	Time of Day	Lower Woodland Skatepark Leq(h)	Jefferson Skatepark Leq(h)
Saturday 10/20/18	Nighttime		
	12:00 AM	51	55
	1:00 AM	49	52
	2:00 AM	48	51
	3:00 AM	47	53
	4:00 AM	49	55
	5:00 AM	51	56
	6:00 AM	54	58
	7:00 AM	55	59
	8:00 AM	58	58
	Daytime		
	9:00 AM	57	59
	10:00 AM	59	61
	11:00 AM	57	59
	12:00 PM	58	60
	1:00 PM	58	60
	2:00 PM	60	62
	3:00 PM	62	61
	4:00 PM	61	62
	5:00 PM	59	60
	6:00 PM	58	62
	7:00 PM	54	62
	8:00 PM	54	63
	9:00 PM	53	63
	10:00 PM	53	63
	Nighttime		
	11:00 PM	53	57

Source: Measured by ESA

Table B-3. Noise Measurements for Sunday October 21, 2018 [Leq(h)]

Day	Time of Day	Lower Woodland Skatepark Leq(h)	Jefferson Skatepark Leq(h)
Sunday 10/21/18	Nighttime		
	12:00 AM	52	55
	1:00 AM	50	54
	2:00 AM	49	52
	3:00 AM	44	51
	4:00 AM	46	50
	5:00 AM	45	53
	6:00 AM	50	54
	7:00 AM	48	55
	8:00 AM	50	57
	Daytime		
	9:00 AM	55	58
	10:00 AM	55	59
	11:00 AM	57	59
	12:00 PM	58	60
	1:00 PM	60	60
	2:00 PM	62	62
	3:00 PM	61	61
	4:00 PM	62	61
	5:00 PM	61	62
	6:00 PM	54	61
	7:00 PM	54	64
	8:00 PM	54	61
	9:00 PM	51	62
	10:00 PM	52	61
	Nighttime		
	11:00 PM	48	58

Source: Measured by ESA

Table B-4. Noise Measurements for Monday October 22, 2018 [Leq(h)]

Day	Time of Day	Lower Woodland Skatepark Leq(h)	Jefferson Skatepark Leq(h)
Monday 10/22/18	Nighttime		
	12:00 AM	42	53
	1:00 AM	41	49
	2:00 AM	36	46
	3:00 AM	39	45
	4:00 AM	44	51
	5:00 AM	45	56
	6:00 AM	50	54
	Daytime		
	7:00 AM	52	54
	8:00 AM	52	57
	9:00 AM	52	55
	10:00 AM	53	59
	11:00 AM	52	56
	12:00 PM	53	57
	1:00 PM	55	59
	2:00 PM	N/A	59

Source: Measured by ESA

APPENDIX C

HISTORIC AND CULTURAL PRESERVATION MEMO

memorandum

date February 14, 2019

to Julia Levitt, Seattle Center

cc Claire Hoffman, ESA

from Jenny Dellert, ESA

subject Historic and Cultural Preservation

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers located on or near the site? If so, specifically describe.

There are no buildings or structures on the project site over 45 years old, and no recorded cultural resources listed on or determined eligible for listing on the National Register of Historic Places (NRHP), Washington Heritage Register (WHR), King County Landmarks List, or City of Seattle Landmarks List within the project site. The SCL Broad Street Substation and Annex are adjacent to the project site, with buildings and switchyard dating to ca. 1949–1951 (BOLA, 2017). The Broad Street Substation is also a Seattle landmark (Pratt and Howard, 2018a, 2018b). The Annex is directly adjacent to the project site, while the substation is across Taylor St to the east.

Seattle Center is approximately 1,500 feet west of the project site. KeyArena (formerly known as the Century 21-World's Fair Coliseum) was constructed in 1961 for the World's Fair and designed by Paul Thiry (ESA, 2018b; Lazzaretto et al., 2017). The building is currently being renovated (ESA, 2018b). KeyArena was listed in the WHR on March 8, 2018 and is a designated Seattle Landmark (ESA, 2018b).

Additional landmarked buildings and structures in Seattle Center are noted in Table 1 (City of Seattle, 2019; ESA, 2018b; Pratt and Howard, 2018a, 2018b).

TABLE 1
ADDITIONAL CITY OF SEATTLE LANDMARKS NEAR PROJECT AREA

Name	Designated Year
Bressi Garage	2017
Horiuchi Mural	2004
Kobe Bell (Friendship Bell)	2004
Monorail and Monorail Cars	2003
Northwest Rooms, International Fountain Pavilion, and International Plaza	2013
Pacific Science Center	2017

Seattle Center House (Armory)	2010
Space Needle	1998

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

The Washington State Department of Archaeology and Historic Preservation (DAHP) Statewide Predictive Model, used to assess the risk of encountering precontact archaeological resources, classifies the project site as Very High Risk (DAHP, 2019a). This classification is likely based on the site's proximity to Lake Union, Smith Cove, and Elliott Bay. However, the Predictive Model does not take into account recent land modifications.

ESA conducted background research using a 0.5-mile radius from the project site. According to the DAHP WISAARD online database (i.e., the Washington Information System for Architectural & Archaeological Records Data; DAHP, 2019c), there are no recorded archaeological sites or cemeteries within or adjacent to the project site. The nearest recorded resources are approximately 0.1 mile northeast of the project site, and include two archaeological sites (SDOT Maintenance Yard Site 45KI958 [a multi-component site with precontact lithic material and historic-period commercial and residential properties and debris concentration] and Harrison Street Regrade Site 45KI1146 [historic road, public works, and structure with debris]) (Elliott, 2013; Valentino, 2015a; Van Galder, 2010). Site 45KI958 has been recommended Not Eligible for listing on the NRHP (Valentino, 2015b). Site 45KI1146 has been determined Not Eligible for listing on the NRHP (Sterner, 2013).

Approximately 0.47 mile northwest of the project site are two additional archaeological sites (the Northern Pacific Railroad belt line Westlake Ave. N Segment Site 45KI502 [historic railroad property] and the Queen Anne Counterbalance Track Site 45KI1185 [historic railroad property]) (Cole, 2000; Scott, 2014). Neither site has been formally evaluated.

Approximately 0.3 mile southeast of the project site is the Seattle Cemetery (also known as Denny Park 45KI85, which was listed on the WHR on December 9, 1970) (Corley, 1969a; DAHP, 2019a). There are seven additional register-listed properties within 0.5 mile of the project site, including the Seattle, Chief of the Suquamish Statue (45KI574), Century 21-Washington State Coliseum (also known as KeyArena or Seattle World's Fair-Coliseum [45KI1379]), the Queen Anne Post Office (45KI1026), the Hull Building (45KI73), the Bell Apartments (45KI95), the Barnes Building (45KI92), and the Windham Apartments (45KI742) (Barnes, 1974; Corley, 1969b; Howard and Johnson, 2010; Krafft, 1982; Kreissman, 1983; Lawrence and Sokol Furesz, 2006; Lazzaretto et al., 2017).

A single windshield survey was conducted of the project site (Courtois et al., 1999). The investigation, which was performed in advanced of a regional link light rail project, identified no cultural resources within the project site.

Within 0.5 mile of the project site, 19 additional cultural resources investigations have been conducted. The studies consisted of historic property surveys and surface and subsurface reconnaissance, including testing and data recovery, as well as archaeological monitoring. The projects ranged from small cellular tower replacements to large-scale transportation improvement endeavors (Bartoy, 2011; Blake and Huber, 2011; Bundy and Walker Gray, 2008; Dellert et al., 2013; Dugas and Robbins, 2001; Earley, 2018; Forsman et al., 1997; Gillespie et al., 2008; Gillis et al., 2005; Miss et al., 2008; NWAA, 2006; Pinyerd, 2013; Piper and Rinck, 2014; Rooke et al.,

2010; Sullivan, 2009; Valentino, 2015b; Wegener et al., 2010; Witt, 2008). A historic landmark study was conducted for Seattle Center in 2013 (Artifacts Consulting, Inc. and HistoryLink.org, 2013). Several buildings and structures included in Seattle Center have been landmarked and/or are historically significant/character-defining elements that are near the proposed Skateplaza location, including the Space Needle, the Armory, and portions of the Monorail. Additional Seattle landmarks within Seattle Center include KeyArena, the Pacific Science Center, Kobe Bell, and Horiuchi Mural (see Table 1 above) (Artifacts Consulting, Inc. and HistoryLink.org, 2013; ESA, 2018; Pratt and Howard, 2018a, 2018b).

There is evidence of Native American occupation and land use in the general vicinity of the project site, along the shorelines of Elliott Bay and Smith Cove, and a former prairie area in between the two waterbodies (Hilbert et al., 2001).

Historic and modern aerial photographs from 1936 to 2002 show the project site as an active roadway, and development increased in the vicinity (NETR Online, 1936, 1968, 1969, 1980, 2002). By the 2014, the roadway was closed and repurposed as a right-of-way (NETR Online, 2015).

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.

Geographic Information System (GIS) data layers for archaeological sites, cemeteries, historic properties, register-listed properties, cultural resource surveys, and the Predictive Model were reviewed on DAHP's WISAARD database (DAHP, 2019b). Ethnographic sources and historic-period maps and aerial photographs were also examined (Anderson, 1907; GLO, 1866; Hilbert et al., 2001; Kroll, 1912, 1926; Metsker, 1936; NETR Online, 1936, 1968, 1969; Sanborn, 1888, 1893, 1905, 1905-1950; USGS, 1903, 1908, 1909, 1911, 1922, 1936, 1955, 1964, 1969; USSG 1856, 1863).

Local historic register information was reviewed online via the King County Landmarks List (King County HPP, 2018) and City of Seattle Landmarks List (2019), and the historic landmark study for Seattle Center was also reviewed (Artifacts Consulting, Inc. and HistoryLink.org, 2013). Additionally, the historic context and a historic resources study of the Uptown area were also reviewed (Pratt and Howard, 2018a, 2018b).

The historic documentation for the Broad Street Substation and Annex and the Environmental Impact Statement (EIS) for the nearby Seattle Center Arena project were also reviewed (BOLA, 2017; ESA, 2018b).

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.

The project site would be excavated to approximately 5 feet below ground surface (bgs). The site is currently a right-of-way and formerly a roadway. Road grade prism and fill likely extends beyond the proposed excavation depth. Should the depth of road prism and fill in the bore logs measure deeper than 5 feet bgs, it is unlikely that intact cultural resources would be encountered during excavation.

As a BMP, an Inadvertent Discovery Plan (IDP) should be prepared for use during project construction. The IDP will identify the procedures and protocols to follow in the event of an archaeological resources discovery. The IDP will include pre-construction briefings for construction personnel and on-call response if a discovery is made

during construction. In the event that cultural resources are inadvertently discovered, construction would be temporarily halted in the immediate vicinity of the discovery and Seattle Center, DAHP, and affected tribes would be notified. Mitigation and/or avoidance measures would be coordinated with Seattle Center, DAHP, and other stakeholders.

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