



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: EMJ
Project Number: 21-1-12596-04
Project Manager: Shoshana Howard

Reported:
03-Aug-2021 16:23

MW-71:8.5-02042021
21B0101-03 (Solid)

Metals and Metallic Compounds

Method: EPA 7471B

Sampled: 02/04/2021 10:45

Instrument: HYDRA

Analyzed: 18-Feb-2021 14:34

Sample Preparation:

Preparation Method: SMM EPA 7471B

Preparation Batch: BJB0433

Prepared: 17-Feb-2021

Sample Size: 0.233 g (wet)

Final Volume: 50 mL

Dry Weight: 0.16 g

% Solids: 67.25

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00670	0.0319	0.106	mg/kg	

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Project Number: 21-1-12596-04
Project Manager: Shoshana Howard

Reported:
03-Aug-2021 16:23

MW-71:8.5-02042021
21B0101-03 (Solid)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 02/04/2021 10:45

Instrument: NT5

Analyzed: 12-Feb-2021 16:10

Sample Preparation: Preparation Method: EPA 5035 (Sodium Bisulfate)
Preparation Batch: BJB0418 Sample Size: 6.87 g (wet) Dry Weight: 5.06 g
Prepared: 12-Feb-2021 Final Volume: 5 mL % Solids: 73.67

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.17	0.73	ND	ug/kg	U
1,1-Dichloroethene	75-35-4	1	0.24	0.73	ND	ug/kg	U
trans-1,2-Dichloroethene	156-60-5	1	0.19	0.73	ND	ug/kg	U
cis-1,2-Dichloroethene	156-59-2	1	0.17	0.73	ND	ug/kg	U
Benzene	71-43-2	1	0.22	0.73	0.36	ug/kg	J
Trichloroethene	79-01-6	1	0.15	0.73	ND	ug/kg	U
Toluene	108-88-3	1	0.11	0.73	0.16	ug/kg	J
Tetrachloroethene	127-18-4	1	0.19	0.73	ND	ug/kg	U
Ethylbenzene	100-41-4	1	0.15	0.73	ND	ug/kg	U
m,p-Xylene	179601-23-1	1	0.29	1.46	ND	ug/kg	U
o-Xylene	95-47-6	1	0.16	0.73	ND	ug/kg	U
Xylenes, total	1330-20-7	1	0.45	1.46	ND	ug/kg	U
Surrogate: 1,2-Dichloroethane-d4				80-149 %	122	%	
Surrogate: Toluene-d8				77-120 %	101	%	
Surrogate: 4-Bromofluorobenzene				80-120 %	99.9	%	
Surrogate: 1,2-Dichlorobenzene-d4				80-120 %	105	%	


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 03-Aug-2021 16:23

MW-71:8.5-02042021
21B0101-03 (Solid)
Semivolatile Organic Compounds

Method: EPA 8270E

Sampled: 02/04/2021 10:45

Instrument: NT10

Analyzed: 06-Mar-2021 22:53

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 13.62 g (wet)	Dry Weight: 10.03 g
	Preparation Batch: BJB0517	Final Volume: 1 mL	% Solids: 73.67
	Prepared: 18-Feb-2021		
Sample Cleanup:	Cleanup Method: GPC	Initial Volume: 1 uL	
	Cleanup Batch: CJC0047	Final Volume: 1 uL	
	Cleaned: 05-Mar-2021		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	3.9	14.7	54.1	ug/kg	
2-Methylnaphthalene	91-57-6	1	4.2	14.7	7.1	ug/kg	J
Acenaphthylene	208-96-8	1	3.5	14.7	7.4	ug/kg	J
Acenaphthene	83-32-9	1	3.8	14.7	ND	ug/kg	U
Dibenzofuran	132-64-9	1	3.4	14.7	4.4	ug/kg	J
Fluorene	86-73-7	1	3.6	14.7	ND	ug/kg	U
Pentachlorophenol	87-86-5	1	23.0	73.4	ND	ug/kg	U
Phenanthrene	85-01-8	1	3.4	14.7	26.7	ug/kg	
Anthracene	120-12-7	1	4.4	14.7	ND	ug/kg	U
Fluoranthene	206-44-0	1	3.3	14.7	19.5	ug/kg	
Pyrene	129-00-0	1	4.1	14.7	19.4	ug/kg	
Benzo(a)anthracene	56-55-3	1	3.8	14.7	ND	ug/kg	U
Chrysene	218-01-9	1	3.8	14.7	5.3	ug/kg	J
Benzo(a)fluoranthene, Total		1	7.5	29.4	16.2	ug/kg	J
Benzo(a)pyrene	50-32-8	1	4.8	14.7	ND	ug/kg	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	4.4	14.7	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	1	4.5	14.7	ND	ug/kg	U
Benzo(g,h,i)perylene	191-24-2	1	4.3	14.7	9.7	ug/kg	J
Surrogate: Phenol-d5				29-120 %	65.3	%	
Surrogate: 2-Chlorophenol-d4				31-120 %	88.7	%	
Surrogate: 1,2-Dichlorobenzene-d4				32-120 %	72.5	%	
Surrogate: Nitrobenzene-d5				30-120 %	72.5	%	
Surrogate: 2-Fluorobiphenyl				35-120 %	80.0	%	
Surrogate: 2,4,6-Tribromophenol				24-134 %	84.8	%	
Surrogate: p-Terphenyl-d14				37-120 %	72.0	%	



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Reported:
03-Aug-2021 16:23

MW-71:8.5-02042021
21B0101-03 (Solid)

Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 02/04/2021 10:45

Instrument: FID4

Analyzed: 26-Feb-2021 12:31

Sample Preparation:

Preparation Method: EPA 3546 (Microwave)

Preparation Batch: BJB0456

Prepared: 17-Feb-2021

Sample Size: 10.04 g (wet)

Final Volume: 1 mL

Dry Weight: 7.40 g

% Solids: 73.67

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	6.76	ND	mg/kg	U
Motor Oil Range Organics (C24-C38)	RRO	1	13.5	21.8	mg/kg	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	98.8	%	

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Data File: \\target\share\chem2\fid4a,1\20210225,b\421B2560.D

Date : 26-FEB-2021 12:31

Client ID:

Sample Info: 21B0101-03

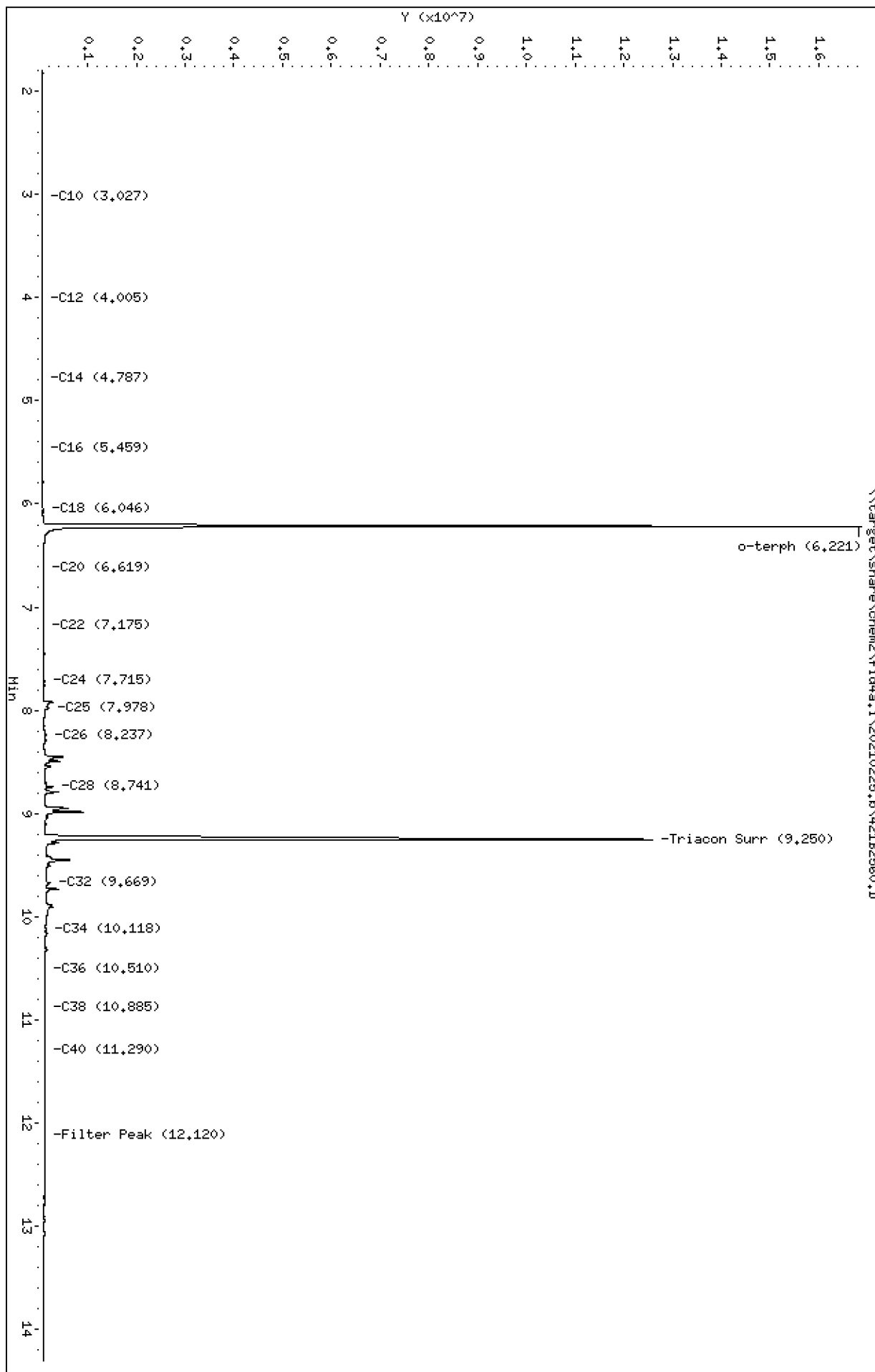
Column phase: RTX-1

Instrument: fid4a,1

Operator: CTO

Column diameter: 0.25

Page 1



Analytical Resources Inc.
TPH Quantitation Report

Data file: 20210225.b/421B2560.D

ARI ID: 21B0101-03

Method: 20210225.b\FID4TPH.m

Client ID:

Instrument: fid4a.i, CTO

Injection: 26-FEB-2021 12:31

Report Date: 03/02/2021

Dilution Factor: 1

Macro: 09-SEP-2019

RT Std: 419H1603.D

Calibration Dates: Gas:XX-XXX-XXXX Diesel:08-JAN-2021 M.Oil:08-JAN-2021

FID:4A RESULTS

Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc (mg/L)
C8	1.906	0.005	5296	1048	WATPHD	(C12-C24)	2986077	21.7
C10	3.027	-0.001	1208	417	WATPHM	(C24-C38)	16442790	161.5
C12	4.005	-0.002	2620	770	AK102	(C10-C25)	3616567	21.5
C14	4.787	0.003	3908	4395	AK103	(C25-C36)	14614932	194.4
C16	5.459	0.010	5640	4651	OR.DIES	(C10-C28)	8068408	41.2
C18	6.046	-0.001	16510	31069				
C20	6.619	0.006	26674	28505	JET-A	(C10-C18)	752680	4.5
C22	7.175	0.003	32610	86203				
C24	7.715	-0.003	52565	94002				
C25	7.978	-0.007	154357	256941				
C26	8.237	-0.009	87901	159055				
C28	8.741	-0.010	216617	243833				
C32	9.669	-0.010	178711	262957				
C34	10.118	0.012	80861	152915				
Filter Peak	12.120	-0.005	45062	22469	BUNKERC	(C10-C38)	19543567	495.1
C36	10.510	0.000	53922	13474				
C38	10.885	-0.010	53339	34419				
C40	11.290	-0.026	51965	64598				
o-terph	6.221	-0.000	16811721	18943741				
Triacon Surr	9.250	-0.002	12514945	17059629	NAS DIES	(C10-C24)	3100777	15.9

Range Times: NW Diesel(4.007 - 7.718) AK102(3.03 - 7.99) Jet A(3.03 - 6.05)
 NW M.Oil(7.72 - 10.89) AK103(7.99 - 10.51) OR Diesel(3.03 - 8.75)

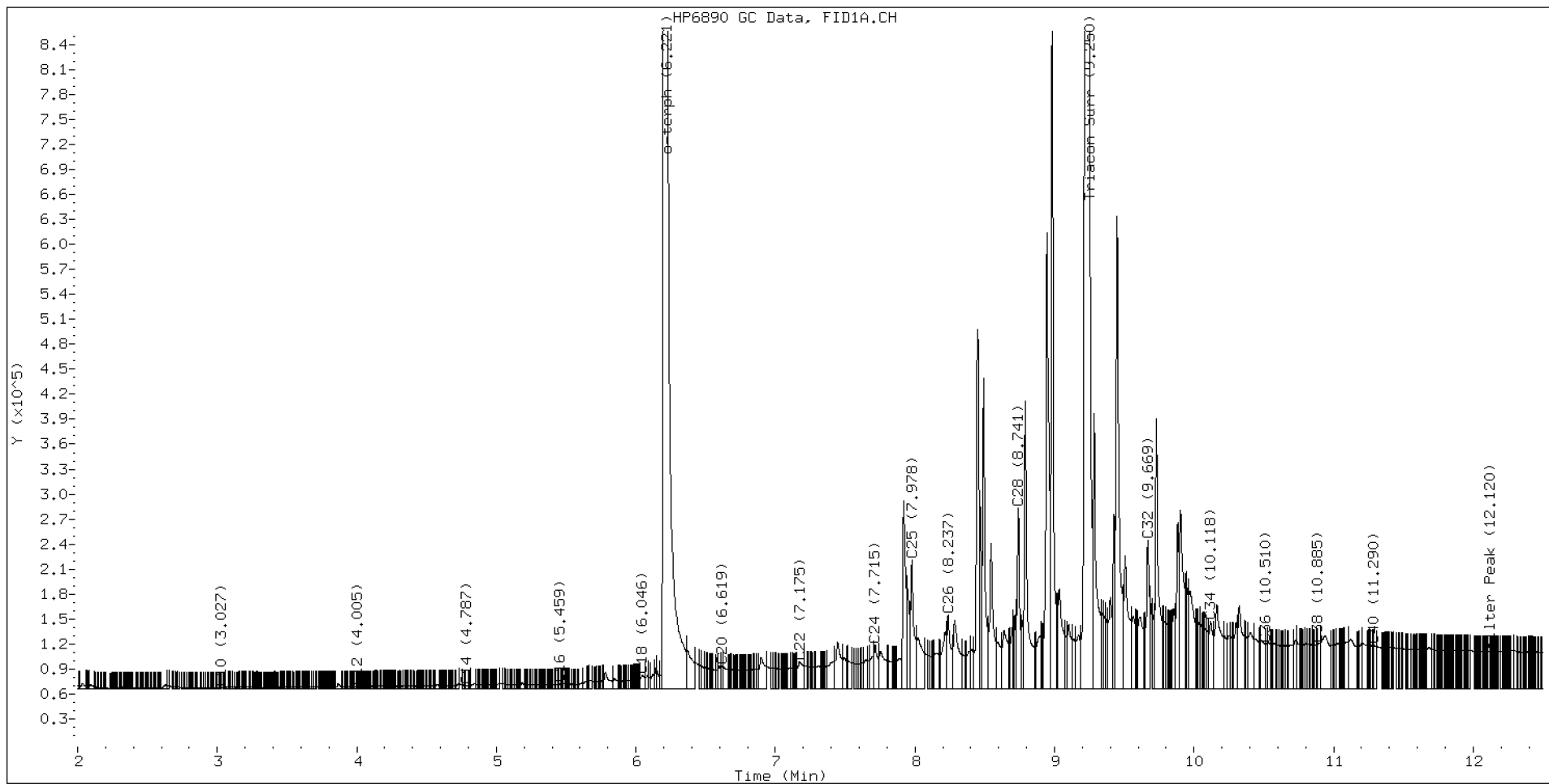
Surrogate	Area	Amount
o-Terphenyl	18943741	111.1
Triacontane	17059629	120.6

M Indicates the peak was manually integrated

Analyte	RF	Curve Date
o-Terph Surr	170577.7	25-OCT-2019
Triacon Surr	141415.7	25-OCT-2019
Gas	15000.0	XX-XXX-XXXX
Diesel	137498.1	08-JAN-2021
Motor Oil	101807.5	08-JAN-2021
AK102	168065.4	08-JAN-2021
AK103	75177.3	08-JAN-2021
JetA	165849.0	20-MAY-2020
OR Diesel	195999.1	25-OCT-2019
NAS Diesel	195148.2	25-OCT-2019
Bunker C	39477.2	13-MAR-2020

Datafile: FID4A, 20210225.b/421B2560.D

21B0101-03





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Reported:
03-Aug-2021 16:23

MW-71:15.5-02042021
21B0101-04 (Solid)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 02/04/2021 10:55

Instrument: NT5

Analyzed: 12-Feb-2021 16:34

Sample Preparation: Preparation Method: EPA 5035 (Sodium Bisulfate)
Preparation Batch: BJB0418 Sample Size: 7.53 g (wet) Dry Weight: 5.82 g
Prepared: 12-Feb-2021 Final Volume: 5 mL % Solids: 77.26

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.16	0.66	ND	ug/kg	U
1,1-Dichloroethene	75-35-4	1	0.22	0.66	ND	ug/kg	U
trans-1,2-Dichloroethene	156-60-5	1	0.18	0.66	ND	ug/kg	U
cis-1,2-Dichloroethene	156-59-2	1	0.16	0.66	ND	ug/kg	U
Benzene	71-43-2	1	0.20	0.66	0.37	ug/kg	J
Trichloroethene	79-01-6	1	0.14	0.66	ND	ug/kg	U
Toluene	108-88-3	1	0.10	0.66	0.14	ug/kg	J
Tetrachloroethene	127-18-4	1	0.17	0.66	ND	ug/kg	U
Ethylbenzene	100-41-4	1	0.13	0.66	ND	ug/kg	U
m,p-Xylene	179601-23-1	1	0.26	1.33	ND	ug/kg	U
o-Xylene	95-47-6	1	0.15	0.66	ND	ug/kg	U
Xylenes, total	1330-20-7	1	0.41	1.33	ND	ug/kg	U
Surrogate: 1,2-Dichloroethane-d4				80-149 %	126	%	
Surrogate: Toluene-d8				77-120 %	102	%	
Surrogate: 4-Bromofluorobenzene				80-120 %	102	%	
Surrogate: 1,2-Dichlorobenzene-d4				80-120 %	105	%	

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Reported:
 03-Aug-2021 16:23

MW-71:20.5-02042021
21B0101-05 (Solid)
Volatile Organic Compounds

Method: EPA 8260D

Sampled: 02/04/2021 11:05

Instrument: NT5

Analyzed: 12-Feb-2021 16:58

Sample Preparation:	Preparation Method: EPA 5035 (Sodium Bisulfate)	Sample Size: 7.86 g (wet)	Dry Weight: 6.06 g
	Preparation Batch: BJB0418	Final Volume: 5 mL	% Solids: 77.13
	Prepared: 12-Feb-2021		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.15	0.64	ND	ug/kg	U
1,1-Dichloroethene	75-35-4	1	0.21	0.64	ND	ug/kg	U
trans-1,2-Dichloroethene	156-60-5	1	0.17	0.64	ND	ug/kg	U
cis-1,2-Dichloroethene	156-59-2	1	0.15	0.64	0.37	ug/kg	J
Benzene	71-43-2	1	0.19	0.64	0.55	ug/kg	J
Trichloroethene	79-01-6	1	0.13	0.64	ND	ug/kg	U
Toluene	108-88-3	1	0.10	0.64	ND	ug/kg	U
Tetrachloroethene	127-18-4	1	0.16	0.64	ND	ug/kg	U
Ethylbenzene	100-41-4	1	0.13	0.64	ND	ug/kg	U
m,p-Xylene	179601-23-1	1	0.25	1.27	ND	ug/kg	U
o-Xylene	95-47-6	1	0.14	0.64	ND	ug/kg	U
Xylenes, total	1330-20-7	1	0.39	1.27	ND	ug/kg	U
Surrogate: 1,2-Dichloroethane-d4				80-149 %	78.8	%	*
Surrogate: Toluene-d8				77-120 %	99.7	%	
Surrogate: 4-Bromofluorobenzene				80-120 %	92.9	%	
Surrogate: 1,2-Dichlorobenzene-d4				80-120 %	95.3	%	


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Reported:
 03-Aug-2021 16:23

MW-71:20.5-02042021
21B0101-05RE1 (Solid)
Volatile Organic Compounds

Method: EPA 8260D

Sampled: 02/04/2021 11:05

Instrument: NT5

Analyzed: 22-Feb-2021 16:29

Sample Preparation:	Preparation Method: EPA 5035 (Sodium Bisulfate)	Sample Size: 7.25 g (wet)	Dry Weight: 5.59 g
	Preparation Batch: BJB0495	Final Volume: 5 mL	% Solids: 77.13
	Prepared: 22-Feb-2021		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.16	0.69	1.59	ug/kg	H
1,1-Dichloroethene	75-35-4	1	0.23	0.69	ND	ug/kg	H, U
trans-1,2-Dichloroethene	156-60-5	1	0.18	0.69	ND	ug/kg	U
cis-1,2-Dichloroethene	156-59-2	1	0.17	0.69	0.46	ug/kg	H, J
Benzene	71-43-2	1	0.20	0.69	0.53	ug/kg	H, J
Trichloroethene	79-01-6	1	0.15	0.69	ND	ug/kg	H, U
Toluene	108-88-3	1	0.10	0.69	ND	ug/kg	H, U
Tetrachloroethene	127-18-4	1	0.18	0.69	ND	ug/kg	H, U
Ethylbenzene	100-41-4	1	0.14	0.69	ND	ug/kg	H, U
m,p-Xylene	179601-23-1	1	0.27	1.38	ND	ug/kg	H, U
o-Xylene	95-47-6	1	0.15	0.69	ND	ug/kg	H, U
Xylenes, total	1330-20-7	1	0.42	1.38	ND	ug/kg	H, U
<i>Surrogate: 1,2-Dichloroethane-d4</i>					<i>80-149 %</i>	<i>119 %</i>	<i>H</i>
<i>Surrogate: Toluene-d8</i>					<i>77-120 %</i>	<i>104 %</i>	<i>H</i>
<i>Surrogate: 4-Bromofluorobenzene</i>					<i>80-120 %</i>	<i>101 %</i>	<i>H</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>					<i>80-120 %</i>	<i>102 %</i>	<i>H</i>


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Reported:
 03-Aug-2021 16:23

Trip Blank
21B0101-08 (Water)
Volatile Organic Compounds

Method: EPA 8260D

Sampled: 02/04/2021 08:40

Instrument: NT2

Analyzed: 11-Feb-2021 18:36

 Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)
 Preparation Batch: BJB0383 Sample Size: 10 mL
 Prepared: 11-Feb-2021 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4				80-129 %	118	%	
Surrogate: Toluene-d8				80-120 %	99.8	%	
Surrogate: 4-Bromofluorobenzene				80-120 %	87.5	%	
Surrogate: 1,2-Dichlorobenzene-d4				80-120 %	102	%	


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Reported:
 03-Aug-2021 16:23

Volatile Organic Compounds - Quality Control
Batch BJB0383 - EPA 5030C (Purge and Trap)

Instrument: NT2

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0383-BLK1)					Prepared: 11-Feb-2021 Analyzed: 11-Feb-2021 17:12						
Chloromethane	ND	0.27	0.50	ug/L							U
Vinyl Chloride	ND	0.08	0.20	ug/L							U
Bromomethane	ND	0.74	1.00	ug/L							U
Chloroethane	ND	0.18	0.20	ug/L							U
Trichlorofluoromethane	ND	0.13	0.20	ug/L							U
Acrolein	ND	2.70	5.00	ug/L							U
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.11	0.20	ug/L							U
Acetone	ND	4.33	5.00	ug/L							U
1,1-Dichloroethene	ND	0.08	0.20	ug/L							U
Iodomethane	ND	0.43	1.00	ug/L							U
Methylene Chloride	ND	0.53	1.00	ug/L							U
Acrylonitrile	ND	0.40	1.00	ug/L							U
Carbon Disulfide	ND	0.12	0.20	ug/L							U
trans-1,2-Dichloroethene	ND	0.07	0.20	ug/L							U
Vinyl Acetate	ND	0.12	0.20	ug/L							U
1,1-Dichloroethane	ND	0.09	0.20	ug/L							U
2-Butanone	ND	1.77	5.00	ug/L							U
2,2-Dichloropropane	ND	0.11	0.20	ug/L							U
cis-1,2-Dichloroethene	ND	0.08	0.20	ug/L							U
Chloroform	ND	0.05	0.20	ug/L							U
Bromochloromethane	ND	0.09	0.20	ug/L							U
1,1,1-Trichloroethane	ND	0.08	0.20	ug/L							U
1,1-Dichloropropene	ND	0.09	0.20	ug/L							U
Carbon tetrachloride	ND	0.09	0.20	ug/L							U
1,2-Dichloroethane	ND	0.08	0.20	ug/L							U
Benzene	ND	0.05	0.20	ug/L							U
Trichloroethene	ND	0.07	0.20	ug/L							U
1,2-Dichloropropane	ND	0.07	0.20	ug/L							U
Bromodichloromethane	ND	0.09	0.20	ug/L							U
Dibromomethane	ND	0.06	0.20	ug/L							U
2-Chloroethyl vinyl ether	ND	0.55	1.00	ug/L							U
4-Methyl-2-Pentanone	ND	1.90	5.00	ug/L							U
cis-1,3-Dichloropropene	ND	0.09	0.20	ug/L							U
Toluene	ND	0.05	0.20	ug/L							U
trans-1,3-Dichloropropene	ND	0.09	0.20	ug/L							U
2-Hexanone	ND	2.06	5.00	ug/L							U

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 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: EMJ
 Project Number: 21-1-12596-04
 Project Manager: Shoshana Howard

Reported:
 03-Aug-2021 16:23

Volatile Organic Compounds - Quality Control
Batch BJB0383 - EPA 5030C (Purge and Trap)

Instrument: NT2

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0383-BLK1)						Prepared: 11-Feb-2021 Analyzed: 11-Feb-2021 17:12					
1,1,2-Trichloroethane	ND	0.10	0.20	ug/L							U
1,3-Dichloropropane	ND	0.07	0.20	ug/L							U
Tetrachloroethene	ND	0.09	0.20	ug/L							U
Dibromochloromethane	ND	0.09	0.20	ug/L							U
1,2-Dibromoethane	ND	0.09	0.20	ug/L							U
Chlorobenzene	ND	0.06	0.20	ug/L							U
Ethylbenzene	ND	0.05	0.20	ug/L							U
1,1,1,2-Tetrachloroethane	ND	0.09	0.20	ug/L							U
m,p-Xylene	ND	0.14	0.40	ug/L							U
o-Xylene	ND	0.08	0.20	ug/L							U
Xylenes, total	ND	0.22	0.60	ug/L							U
Styrene	ND	0.09	0.20	ug/L							U
Bromoform	ND	0.15	0.20	ug/L							U
1,1,2,2-Tetrachloroethane	ND	0.10	0.20	ug/L							U
1,2,3-Trichloropropane	ND	0.16	0.50	ug/L							U
trans-1,4-Dichloro 2-Butene	ND	0.60	1.00	ug/L							U
n-Propylbenzene	ND	0.07	0.20	ug/L							U
Bromobenzene	ND	0.07	0.20	ug/L							U
Isopropyl Benzene	ND	0.07	0.20	ug/L							U
2-Chlorotoluene	ND	0.06	0.20	ug/L							U
4-Chlorotoluene	ND	0.06	0.20	ug/L							U
t-Butylbenzene	ND	0.07	0.20	ug/L							U
1,3,5-Trimethylbenzene	ND	0.07	0.20	ug/L							U
1,2,4-Trimethylbenzene	ND	0.10	0.20	ug/L							U
s-Butylbenzene	ND	0.06	0.20	ug/L							U
4-Isopropyl Toluene	ND	0.08	0.20	ug/L							U
1,3-Dichlorobenzene	ND	0.08	0.20	ug/L							U
1,4-Dichlorobenzene	ND	0.10	0.20	ug/L							U
n-Butylbenzene	ND	0.18	0.20	ug/L							U
1,2-Dichlorobenzene	ND	0.08	0.20	ug/L							U
1,2-Dibromo-3-chloropropane	ND	0.39	0.50	ug/L							U
1,2,4-Trichlorobenzene	ND	0.21	0.50	ug/L							U
Hexachloro-1,3-Butadiene	ND	0.41	0.50	ug/L							U
Naphthalene	ND	0.27	0.50	ug/L							U
1,2,3-Trichlorobenzene	ND	0.25	0.50	ug/L							U
Dichlorodifluoromethane	ND	0.13	0.20	ug/L							U

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: EMJ
Project Number: 21-1-12596-04
Project Manager: Shoshana Howard

Reported:
03-Aug-2021 16:23

Volatile Organic Compounds - Quality Control

Batch BJB0383 - EPA 5030C (Purge and Trap)

Instrument: NT2

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0383-BLK1)						Prepared: 11-Feb-2021 Analyzed: 11-Feb-2021 17:12					
Methyl tert-butyl Ether	ND	0.14	0.50	ug/L							U
2-Pentanone	ND	2.34	5.00	ug/L							U
Surrogate: 1,2-Dichloroethane-d4	5.50			ug/L	5.00		110	80-129			
Surrogate: Toluene-d8	4.79			ug/L	5.00		95.8	80-120			
Surrogate: 4-Bromofluorobenzene	4.55			ug/L	5.00		90.9	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	5.19			ug/L	5.00		104	80-120			

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 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: EMJ
 Project Number: 21-1-12596-04
 Project Manager: Shoshana Howard

Reported:
 03-Aug-2021 16:23

Volatile Organic Compounds - Quality Control
Batch BJB0383 - EPA 5030C (Purge and Trap)

Instrument: NT2

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJB0383-BS1)						Prepared: 11-Feb-2021 Analyzed: 11-Feb-2021 16:10					
Chloromethane	9.19	0.27	0.50	ug/L	10.0		91.9	60-138			
Vinyl Chloride	9.85	0.08	0.20	ug/L	10.0		98.5	66-133			
Bromomethane	10.2	0.74	1.00	ug/L	10.0		102	72-131			
Chloroethane	9.63	0.18	0.20	ug/L	10.0		96.3	60-155			
Trichlorofluoromethane	10.4	0.13	0.20	ug/L	10.0		104	62-141			
Acrolein	52.6	2.70	5.00	ug/L	50.0		105	52-190			
1,1,2-Trichloro-1,2,2-Trifluoroethane	10.4	0.11	0.20	ug/L	10.0		104	76-129			
Acetone	51.2	4.33	5.00	ug/L	50.0		102	58-142			
1,1-Dichloroethene	10.1	0.08	0.20	ug/L	10.0		101	69-135			
Iodomethane	10.0	0.43	1.00	ug/L	10.0		100	56-147			
Methylene Chloride	9.64	0.53	1.00	ug/L	10.0		96.4	65-135			
Acrylonitrile	9.86	0.40	1.00	ug/L	10.0		98.6	64-134			
Carbon Disulfide	10.0	0.12	0.20	ug/L	10.0		100	78-125			
trans-1,2-Dichloroethene	10.0	0.07	0.20	ug/L	10.0		100	78-128			
Vinyl Acetate	11.2	0.12	0.20	ug/L	10.0		112	55-138			
1,1-Dichloroethane	9.92	0.09	0.20	ug/L	10.0		99.2	76-124			
2-Butanone	53.0	1.77	5.00	ug/L	50.0		106	61-140			
2,2-Dichloropropane	10.6	0.11	0.20	ug/L	10.0		106	66-147			
cis-1,2-Dichloroethene	10.1	0.08	0.20	ug/L	10.0		101	80-121			
Chloroform	10.0	0.05	0.20	ug/L	10.0		100	80-122			
Bromochloromethane	10.0	0.09	0.20	ug/L	10.0		100	80-121			
1,1,1-Trichloroethane	10.3	0.08	0.20	ug/L	10.0		103	79-123			
1,1-Dichloropropene	10.7	0.09	0.20	ug/L	10.0		107	80-127			
Carbon tetrachloride	10.2	0.09	0.20	ug/L	10.0		102	53-137			
1,2-Dichloroethane	10.0	0.08	0.20	ug/L	10.0		100	75-123			
Benzene	10.3	0.05	0.20	ug/L	10.0		103	80-120			
Trichloroethene	10.0	0.07	0.20	ug/L	10.0		100	80-120			
1,2-Dichloropropane	9.99	0.07	0.20	ug/L	10.0		99.9	80-120			
Bromodichloromethane	10.2	0.09	0.20	ug/L	10.0		102	80-121			
Dibromomethane	10.3	0.06	0.20	ug/L	10.0		103	80-120			
2-Chloroethyl vinyl ether	8.84	0.55	1.00	ug/L	10.0		88.4	64-120			
4-Methyl-2-Pentanone	54.6	1.90	5.00	ug/L	50.0		109	67-133			
cis-1,3-Dichloropropene	11.0	0.09	0.20	ug/L	10.0		110	80-124			
Toluene	9.80	0.05	0.20	ug/L	10.0		98.0	80-120			
trans-1,3-Dichloropropene	10.8	0.09	0.20	ug/L	10.0		108	71-127			
2-Hexanone	56.2	2.06	5.00	ug/L	50.0		112	69-133			

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 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: EMJ
 Project Number: 21-1-12596-04
 Project Manager: Shoshana Howard

Reported:
 03-Aug-2021 16:23

Volatile Organic Compounds - Quality Control
Batch BJB0383 - EPA 5030C (Purge and Trap)

Instrument: NT2

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJB0383-BS1)						Prepared: 11-Feb-2021 Analyzed: 11-Feb-2021 16:10					
1,1,2-Trichloroethane	10.2	0.10	0.20	ug/L	10.0		102	80-121			
1,3-Dichloropropane	10.4	0.07	0.20	ug/L	10.0		104	80-120			
Tetrachloroethene	10.3	0.09	0.20	ug/L	10.0		103	80-120			
Dibromochloromethane	10.6	0.09	0.20	ug/L	10.0		106	65-135			
1,2-Dibromoethane	10.3	0.09	0.20	ug/L	10.0		103	80-121			
Chlorobenzene	10.0	0.06	0.20	ug/L	10.0		100	80-120			
Ethylbenzene	10.1	0.05	0.20	ug/L	10.0		101	80-120			
1,1,1,2-Tetrachloroethane	10.2	0.09	0.20	ug/L	10.0		102	80-120			
m,p-Xylene	21.6	0.14	0.40	ug/L	20.0		108	80-121			
o-Xylene	10.7	0.08	0.20	ug/L	10.0		107	80-121			
Xylenes, total	32.3	0.22	0.60	ug/L	30.0		108	76-127			
Styrene	8.23	0.09	0.20	ug/L	10.0		82.3	80-124			
Bromoform	9.03	0.15	0.20	ug/L	10.0		90.3	51-134			
1,1,2,2-Tetrachloroethane	10.0	0.10	0.20	ug/L	10.0		100	77-123			
1,2,3-Trichloropropane	9.93	0.16	0.50	ug/L	10.0		99.3	76-125			
trans-1,4-Dichloro 2-Butene	9.95	0.60	1.00	ug/L	10.0		99.5	55-129			
n-Propylbenzene	10.6	0.07	0.20	ug/L	10.0		106	78-130			
Bromobenzene	9.61	0.07	0.20	ug/L	10.0		96.1	80-120			
Isopropyl Benzene	11.0	0.07	0.20	ug/L	10.0		110	80-128			
2-Chlorotoluene	10.2	0.06	0.20	ug/L	10.0		102	78-122			
4-Chlorotoluene	10.5	0.06	0.20	ug/L	10.0		105	80-121			
t-Butylbenzene	11.3	0.07	0.20	ug/L	10.0		113	78-125			
1,3,5-Trimethylbenzene	11.4	0.07	0.20	ug/L	10.0		114	80-129			
1,2,4-Trimethylbenzene	11.4	0.10	0.20	ug/L	10.0		114	80-127			
s-Butylbenzene	11.7	0.06	0.20	ug/L	10.0		117	78-129			
4-Isopropyl Toluene	11.8	0.08	0.20	ug/L	10.0		118	79-130			
1,3-Dichlorobenzene	10.2	0.08	0.20	ug/L	10.0		102	80-120			
1,4-Dichlorobenzene	9.88	0.10	0.20	ug/L	10.0		98.8	80-120			
n-Butylbenzene	12.0	0.18	0.20	ug/L	10.0		120	74-129			
1,2-Dichlorobenzene	9.76	0.08	0.20	ug/L	10.0		97.6	80-120			
1,2-Dibromo-3-chloropropane	10.6	0.39	0.50	ug/L	10.0		106	62-123			
1,2,4-Trichlorobenzene	10.3	0.21	0.50	ug/L	10.0		103	64-124			
Hexachloro-1,3-Butadiene	11.3	0.41	0.50	ug/L	10.0		113	58-123			
Naphthalene	9.73	0.27	0.50	ug/L	10.0		97.3	50-134			
1,2,3-Trichlorobenzene	10.3	0.25	0.50	ug/L	10.0		103	49-133			
Dichlorodifluoromethane	10.6	0.13	0.20	ug/L	10.0		106	48-147			

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: EMJ
Project Number: 21-1-12596-04
Project Manager: Shoshana Howard

Reported:
03-Aug-2021 16:23

Volatile Organic Compounds - Quality Control

Batch BJB0383 - EPA 5030C (Purge and Trap)

Instrument: NT2

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJB0383-BS1)					Prepared: 11-Feb-2021		Analyzed: 11-Feb-2021 16:10				
Methyl tert-butyl Ether	10.5	0.14	0.50	ug/L	10.0		105	71-132			
2-Pentanone	46.4	2.34	5.00	ug/L	50.0		92.8	69-134			
Surrogate: 1,2-Dichloroethane-d4	5.06			ug/L	5.00		101	80-129			
Surrogate: Toluene-d8	5.06			ug/L	5.00		101	80-120			
Surrogate: 4-Bromofluorobenzene	5.03			ug/L	5.00		101	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	5.01			ug/L	5.00		100	80-120			

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 Project: EMJ
 Project Number: 21-1-12596-04
 Project Manager: Shoshana Howard

Reported:
 03-Aug-2021 16:23

Volatile Organic Compounds - Quality Control
Batch BJB0383 - EPA 5030C (Purge and Trap)

Instrument: NT2

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BJB0383-BSD1)						Prepared: 11-Feb-2021 Analyzed: 11-Feb-2021 16:30					
Chloromethane	9.89	0.27	0.50	ug/L	10.0		98.9	60-138	7.24	30	
Vinyl Chloride	10.8	0.08	0.20	ug/L	10.0		108	66-133	8.92	30	
Bromomethane	11.0	0.74	1.00	ug/L	10.0		110	72-131	7.51	30	
Chloroethane	11.2	0.18	0.20	ug/L	10.0		112	60-155	15.40	30	
Trichlorofluoromethane	12.3	0.13	0.20	ug/L	10.0		123	62-141	16.10	30	
Acrolein	54.9	2.70	5.00	ug/L	50.0		110	52-190	4.26	30	
1,1,2-Trichloro-1,2,2-Trifluoroethane	11.4	0.11	0.20	ug/L	10.0		114	76-129	9.05	30	
Acetone	53.6	4.33	5.00	ug/L	50.0		107	58-142	4.63	30	
1,1-Dichloroethene	10.9	0.08	0.20	ug/L	10.0		109	69-135	7.85	30	
Iodomethane	11.2	0.43	1.00	ug/L	10.0		112	56-147	10.80	30	
Methylene Chloride	10.1	0.53	1.00	ug/L	10.0		101	65-135	4.86	30	
Acrylonitrile	10.4	0.40	1.00	ug/L	10.0		104	64-134	5.75	30	
Carbon Disulfide	10.9	0.12	0.20	ug/L	10.0		109	78-125	8.24	30	
trans-1,2-Dichloroethene	10.6	0.07	0.20	ug/L	10.0		106	78-128	5.30	30	
Vinyl Acetate	11.7	0.12	0.20	ug/L	10.0		117	55-138	3.89	30	
1,1-Dichloroethane	10.5	0.09	0.20	ug/L	10.0		105	76-124	5.90	30	
2-Butanone	55.9	1.77	5.00	ug/L	50.0		112	61-140	5.21	30	
2,2-Dichloropropane	11.6	0.11	0.20	ug/L	10.0		116	66-147	9.16	30	
cis-1,2-Dichloroethene	10.7	0.08	0.20	ug/L	10.0		107	80-121	6.28	30	
Chloroform	10.5	0.05	0.20	ug/L	10.0		105	80-122	5.18	30	
Bromochloromethane	10.8	0.09	0.20	ug/L	10.0		108	80-121	7.20	30	
1,1,1-Trichloroethane	11.0	0.08	0.20	ug/L	10.0		110	79-123	6.31	30	
1,1-Dichloropropene	11.4	0.09	0.20	ug/L	10.0		114	80-127	5.69	30	
Carbon tetrachloride	11.0	0.09	0.20	ug/L	10.0		110	53-137	7.03	30	
1,2-Dichloroethane	10.6	0.08	0.20	ug/L	10.0		106	75-123	6.03	30	
Benzene	11.0	0.05	0.20	ug/L	10.0		110	80-120	7.10	30	
Trichloroethene	10.7	0.07	0.20	ug/L	10.0		107	80-120	6.63	30	
1,2-Dichloropropane	10.6	0.07	0.20	ug/L	10.0		106	80-120	6.04	30	
Bromodichloromethane	10.8	0.09	0.20	ug/L	10.0		108	80-121	5.30	30	
Dibromomethane	11.0	0.06	0.20	ug/L	10.0		110	80-120	7.04	30	
2-Chloroethyl vinyl ether	8.90	0.55	1.00	ug/L	10.0		89.0	64-120	0.63	30	
4-Methyl-2-Pentanone	56.6	1.90	5.00	ug/L	50.0		113	67-133	3.68	30	
cis-1,3-Dichloropropene	11.7	0.09	0.20	ug/L	10.0		117	80-124	6.27	30	
Toluene	10.5	0.05	0.20	ug/L	10.0		105	80-120	6.87	30	
trans-1,3-Dichloropropene	12.0	0.09	0.20	ug/L	10.0		120	71-127	10.50	30	
2-Hexanone	57.6	2.06	5.00	ug/L	50.0		115	69-133	2.46	30	

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 Shannon & Wilson, Inc
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 Project: EMJ
 Project Number: 21-1-12596-04
 Project Manager: Shoshana Howard

Reported:
 03-Aug-2021 16:23

Volatile Organic Compounds - Quality Control
Batch BJB0383 - EPA 5030C (Purge and Trap)

Instrument: NT2

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BJB0383-BSD1)						Prepared: 11-Feb-2021 Analyzed: 11-Feb-2021 16:30					
1,1,2-Trichloroethane	10.9	0.10	0.20	ug/L	10.0		109	80-121	6.28	30	
1,3-Dichloropropane	11.0	0.07	0.20	ug/L	10.0		110	80-120	5.03	30	
Tetrachloroethene	10.8	0.09	0.20	ug/L	10.0		108	80-120	4.91	30	
Dibromochloromethane	11.3	0.09	0.20	ug/L	10.0		113	65-135	6.03	30	
1,2-Dibromoethane	11.4	0.09	0.20	ug/L	10.0		114	80-121	10.50	30	
Chlorobenzene	10.6	0.06	0.20	ug/L	10.0		106	80-120	5.80	30	
Ethylbenzene	10.7	0.05	0.20	ug/L	10.0		107	80-120	5.40	30	
1,1,1,2-Tetrachloroethane	10.9	0.09	0.20	ug/L	10.0		109	80-120	6.17	30	
m,p-Xylene	23.1	0.14	0.40	ug/L	20.0		116	80-121	6.82	30	
o-Xylene	11.3	0.08	0.20	ug/L	10.0		113	80-121	5.73	30	
Xylenes, total	34.4	0.22	0.60	ug/L	30.0		115	76-127	6.46	30	
Styrene	8.89	0.09	0.20	ug/L	10.0		88.9	80-124	7.69	30	
Bromoform	9.68	0.15	0.20	ug/L	10.0		96.8	51-134	6.92	30	
1,1,2,2-Tetrachloroethane	10.6	0.10	0.20	ug/L	10.0		106	77-123	5.83	30	
1,2,3-Trichloropropane	10.4	0.16	0.50	ug/L	10.0		104	76-125	4.64	30	
trans-1,4-Dichloro 2-Butene	10.6	0.60	1.00	ug/L	10.0		106	55-129	6.56	30	
n-Propylbenzene	11.2	0.07	0.20	ug/L	10.0		112	78-130	5.12	30	
Bromobenzene	10.3	0.07	0.20	ug/L	10.0		103	80-120	6.77	30	
Isopropyl Benzene	11.5	0.07	0.20	ug/L	10.0		115	80-128	5.01	30	
2-Chlorotoluene	11.1	0.06	0.20	ug/L	10.0		111	78-122	7.77	30	
4-Chlorotoluene	11.1	0.06	0.20	ug/L	10.0		111	80-121	4.96	30	
t-Butylbenzene	12.1	0.07	0.20	ug/L	10.0		121	78-125	6.21	30	
1,3,5-Trimethylbenzene	12.1	0.07	0.20	ug/L	10.0		121	80-129	6.42	30	
1,2,4-Trimethylbenzene	12.2	0.10	0.20	ug/L	10.0		122	80-127	7.11	30	
s-Butylbenzene	12.5	0.06	0.20	ug/L	10.0		125	78-129	6.64	30	
4-Isopropyl Toluene	12.7	0.08	0.20	ug/L	10.0		127	79-130	7.30	30	
1,3-Dichlorobenzene	10.9	0.08	0.20	ug/L	10.0		109	80-120	6.35	30	
1,4-Dichlorobenzene	10.5	0.10	0.20	ug/L	10.0		105	80-120	6.47	30	
n-Butylbenzene	12.9	0.18	0.20	ug/L	10.0		129	74-129	7.99	30	
1,2-Dichlorobenzene	10.6	0.08	0.20	ug/L	10.0		106	80-120	7.89	30	
1,2-Dibromo-3-chloropropane	10.9	0.39	0.50	ug/L	10.0		109	62-123	2.47	30	
1,2,4-Trichlorobenzene	11.0	0.21	0.50	ug/L	10.0		110	64-124	6.12	30	
Hexachloro-1,3-Butadiene	12.2	0.41	0.50	ug/L	10.0		122	58-123	7.40	30	
Naphthalene	10.3	0.27	0.50	ug/L	10.0		103	50-134	5.86	30	
1,2,3-Trichlorobenzene	10.9	0.25	0.50	ug/L	10.0		109	49-133	5.59	30	
Dichlorodifluoromethane	11.2	0.13	0.20	ug/L	10.0		112	48-147	5.47	30	

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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: EMJ
Project Number: 21-1-12596-04
Project Manager: Shoshana Howard

Reported:
03-Aug-2021 16:23

Volatile Organic Compounds - Quality Control

Batch BJB0383 - EPA 5030C (Purge and Trap)

Instrument: NT2

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BJB0383-BSD1)						Prepared: 11-Feb-2021 Analyzed: 11-Feb-2021 16:30					
Methyl tert-butyl Ether	10.8	0.14	0.50	ug/L	10.0		108	71-132	3.13	30	
2-Pentanone	48.3	2.34	5.00	ug/L	50.0		96.7	69-134	4.13	30	
Surrogate: 1,2-Dichloroethane-d4	5.09			ug/L	5.00		102	80-129			
Surrogate: Toluene-d8	5.09			ug/L	5.00		102	80-120			
Surrogate: 4-Bromofluorobenzene	5.18			ug/L	5.00		104	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	5.04			ug/L	5.00		101	80-120			

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 Seattle WA, 98103-8636

 Project: EMJ
 Project Number: 21-1-12596-04
 Project Manager: Shoshana Howard

Reported:
 03-Aug-2021 16:23

Volatile Organic Compounds - Quality Control
Batch BJB0418 - EPA 5035 (Sodium Bisulfate)

Instrument: NT5

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0418-BLK1)						Prepared: 12-Feb-2021 Analyzed: 12-Feb-2021 13:52					
Chloromethane	ND	0.26	1.00	ug/kg							U
Vinyl Chloride	ND	0.24	1.00	ug/kg							U
Bromomethane	ND	0.19	1.00	ug/kg							U
Chloroethane	ND	0.46	1.00	ug/kg							U
Trichlorofluoromethane	ND	0.27	1.00	ug/kg							U
Acrolein	ND	3.81	5.00	ug/kg							U
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.29	2.00	ug/kg							U
Acetone	ND	0.48	5.00	ug/kg							U
1,1-Dichloroethene	ND	0.34	1.00	ug/kg							U
Iodomethane	ND	0.22	1.00	ug/kg							U
Methylene Chloride	ND	0.64	2.00	ug/kg							U
Acrylonitrile	ND	1.03	5.00	ug/kg							U
Carbon Disulfide	ND	0.56	1.00	ug/kg							U
trans-1,2-Dichloroethene	ND	0.27	1.00	ug/kg							U
Vinyl Acetate	ND	0.38	5.00	ug/kg							U
1,1-Dichloroethane	ND	0.20	1.00	ug/kg							U
2-Butanone	ND	0.51	5.00	ug/kg							U
2,2-Dichloropropane	ND	0.29	1.00	ug/kg							U
cis-1,2-Dichloroethene	ND	0.24	1.00	ug/kg							U
Chloroform	ND	0.23	1.00	ug/kg							U
Bromochloromethane	ND	0.32	1.00	ug/kg							U
1,1,1-Trichloroethane	ND	0.23	1.00	ug/kg							U
1,1-Dichloropropene	ND	0.31	1.00	ug/kg							U
Carbon tetrachloride	ND	0.21	1.00	ug/kg							U
1,2-Dichloroethane	ND	0.19	1.00	ug/kg							U
Benzene	ND	0.30	1.00	ug/kg							U
Trichloroethene	ND	0.21	1.00	ug/kg							U
1,2-Dichloropropane	ND	0.16	1.00	ug/kg							U
Bromodichloromethane	ND	0.25	1.00	ug/kg							U
Dibromomethane	ND	0.15	1.00	ug/kg							U
2-Chloroethyl vinyl ether	ND	0.28	5.00	ug/kg							U
4-Methyl-2-Pentanone	ND	0.42	5.00	ug/kg							U
cis-1,3-Dichloropropene	ND	0.23	1.00	ug/kg							U
Toluene	ND	0.15	1.00	ug/kg							U
trans-1,3-Dichloropropene	ND	0.22	1.00	ug/kg							U
2-Hexanone	ND	0.44	5.00	ug/kg							U

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 Seattle WA, 98103-8636

 Project: EMJ
 Project Number: 21-1-12596-04
 Project Manager: Shoshana Howard

Reported:
 03-Aug-2021 16:23

Volatile Organic Compounds - Quality Control
Batch BJB0418 - EPA 5035 (Sodium Bisulfate)

Instrument: NT5

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0418-BLK1)					Prepared: 12-Feb-2021 Analyzed: 12-Feb-2021 13:52						
1,1,2-Trichloroethane	ND	0.29	1.00	ug/kg							U
1,3-Dichloropropane	ND	0.21	1.00	ug/kg							U
Tetrachloroethene	ND	0.26	1.00	ug/kg							U
Dibromochloromethane	ND	0.27	1.00	ug/kg							U
1,2-Dibromoethane	ND	0.18	1.00	ug/kg							U
Chlorobenzene	ND	0.22	1.00	ug/kg							U
Ethylbenzene	ND	0.20	1.00	ug/kg							U
1,1,1,2-Tetrachloroethane	ND	0.23	1.00	ug/kg							U
m,p-Xylene	ND	0.39	2.00	ug/kg							U
o-Xylene	ND	0.22	1.00	ug/kg							U
Xylenes, total	ND	0.62	2.00	ug/kg							U
Styrene	ND	0.14	1.00	ug/kg							U
Bromoform	ND	0.30	1.00	ug/kg							U
1,1,2,2-Tetrachloroethane	ND	0.25	1.00	ug/kg							U
1,2,3-Trichloropropane	ND	0.52	2.00	ug/kg							U
trans-1,4-Dichloro 2-Butene	ND	0.44	5.00	ug/kg							U
n-Propylbenzene	ND	0.27	1.00	ug/kg							U
Bromobenzene	ND	0.15	1.00	ug/kg							U
Isopropyl Benzene	ND	0.23	1.00	ug/kg							U
2-Chlorotoluene	ND	0.30	1.00	ug/kg							U
4-Chlorotoluene	ND	0.28	1.00	ug/kg							U
t-Butylbenzene	ND	0.31	1.00	ug/kg							U
1,3,5-Trimethylbenzene	ND	0.25	1.00	ug/kg							U
1,2,4-Trimethylbenzene	ND	0.23	1.00	ug/kg							U
s-Butylbenzene	ND	0.24	1.00	ug/kg							U
4-Isopropyl Toluene	ND	0.24	1.00	ug/kg							U
1,3-Dichlorobenzene	0.43	0.23	1.00	ug/kg							J
1,4-Dichlorobenzene	0.52	0.23	1.00	ug/kg							J
n-Butylbenzene	0.53	0.26	1.00	ug/kg							J
1,2-Dichlorobenzene	0.52	0.29	1.00	ug/kg							J
1,2-Dibromo-3-chloropropane	ND	0.59	5.00	ug/kg							U
1,2,4-Trichlorobenzene	2.55	0.33	5.00	ug/kg							J
Hexachloro-1,3-Butadiene	1.41	0.41	5.00	ug/kg							J
Naphthalene	3.24	0.43	5.00	ug/kg							J
1,2,3-Trichlorobenzene	2.97	0.31	5.00	ug/kg							J
Dichlorodifluoromethane	ND	0.21	1.00	ug/kg							U

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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: EMJ
Project Number: 21-1-12596-04
Project Manager: Shoshana Howard

Reported:
03-Aug-2021 16:23

Volatile Organic Compounds - Quality Control

Batch BJB0418 - EPA 5035 (Sodium Bisulfate)

Instrument: NT5

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0418-BLK1)					Prepared: 12-Feb-2021 Analyzed: 12-Feb-2021 13:52						
Methyl tert-butyl Ether	ND	0.23	1.00	ug/kg							U
2-Pentanone	ND	5.00	5.00	ug/kg							U
Surrogate: 1,2-Dichloroethane-d4	54.1			ug/kg	50.0		108	80-149			
Surrogate: Toluene-d8	50.8			ug/kg	50.0		102	77-120			
Surrogate: 4-Bromofluorobenzene	50.2			ug/kg	50.0		100	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	49.9			ug/kg	50.0		99.9	80-120			

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 Project: EMJ
 Project Number: 21-1-12596-04
 Project Manager: Shoshana Howard

Reported:
 03-Aug-2021 16:23

Volatile Organic Compounds - Quality Control
Batch BJB0418 - EPA 5035 (Sodium Bisulfate)

Instrument: NT5

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJB0418-BS1)				Prepared: 12-Feb-2021 Analyzed: 12-Feb-2021 12:49							
Chloromethane	52.5			ug/kg	50.0		105	64-132			
Vinyl Chloride	58.7			ug/kg	50.0		117	74-135			
Bromomethane	51.3			ug/kg	50.0		103	53-144			
Chloroethane	50.5			ug/kg	50.0		101	55-149			
Trichlorofluoromethane	48.5			ug/kg	50.0		97.0	61-164			
Acrolein	350			ug/kg	250		140	59-140			Q
1,1,2-Trichloro-1,2,2-Trifluoroethane	54.9			ug/kg	50.0		110	74-143			
Acetone	303			ug/kg	250		121	48-137			Q
1,1-Dichloroethene	51.0			ug/kg	50.0		102	77-134			
Iodomethane	53.2			ug/kg	50.0		106	31-162			
Methylene Chloride	52.7			ug/kg	50.0		105	69-129			
Acrylonitrile	50.6			ug/kg	50.0		101	69-134			
Carbon Disulfide	53.2			ug/kg	50.0		106	71-137			
trans-1,2-Dichloroethene	51.9			ug/kg	50.0		104	79-130			
Vinyl Acetate	63.2			ug/kg	50.0		126	66-141			Q
1,1-Dichloroethane	51.2			ug/kg	50.0		102	80-126			
2-Butanone	267			ug/kg	250		107	70-132			
2,2-Dichloropropane	54.7			ug/kg	50.0		109	77-138			
cis-1,2-Dichloroethene	50.8			ug/kg	50.0		102	80-125			
Chloroform	51.3			ug/kg	50.0		103	80-126			
Bromochloromethane	50.5			ug/kg	50.0		101	80-129			
1,1,1-Trichloroethane	53.0			ug/kg	50.0		106	78-133			
1,1-Dichloropropene	51.5			ug/kg	50.0		103	63-145			
Carbon tetrachloride	49.5			ug/kg	50.0		98.9	71-129			
1,2-Dichloroethane	44.6			ug/kg	50.0		89.3	76-120			
Benzene	49.4			ug/kg	50.0		98.9	80-120			
Trichloroethene	50.1			ug/kg	50.0		100	80-120			
1,2-Dichloropropane	48.5			ug/kg	50.0		96.9	79-120			
Bromodichloromethane	48.4			ug/kg	50.0		96.9	80-122			
Dibromomethane	48.7			ug/kg	50.0		97.4	80-120			
2-Chloroethyl vinyl ether	47.2			ug/kg	50.0		94.5	51-129			
4-Methyl-2-Pentanone	246			ug/kg	250		98.4	73-121			
cis-1,3-Dichloropropene	50.4			ug/kg	50.0		101	80-120			
Toluene	47.8			ug/kg	50.0		95.7	75-120			
trans-1,3-Dichloropropene	50.3			ug/kg	50.0		101	80-124			
2-Hexanone	251			ug/kg	250		101	68-122			

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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: EMJ
Project Number: 21-1-12596-04
Project Manager: Shoshana Howard

Reported:
03-Aug-2021 16:23

Volatile Organic Compounds - Quality Control

Batch BJB0418 - EPA 5035 (Sodium Bisulfate)

Instrument: NT5

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJB0418-BS1)						Prepared: 12-Feb-2021 Analyzed: 12-Feb-2021 12:49					
1,1,2-Trichloroethane	48.2			ug/kg	50.0		96.5	79-120			
1,3-Dichloropropane	46.2			ug/kg	50.0		92.4	78-120			
Tetrachloroethene	49.8			ug/kg	50.0		99.7	74-124			
Dibromochloromethane	45.9			ug/kg	50.0		91.7	74-125			
1,2-Dibromoethane	48.6			ug/kg	50.0		97.2	80-120			
Chlorobenzene	48.0			ug/kg	50.0		96.0	78-120			
Ethylbenzene	48.8			ug/kg	50.0		97.7	80-125			
1,1,1,2-Tetrachloroethane	47.7			ug/kg	50.0		95.4	80-120			
m,p-Xylene	98.4			ug/kg	100		98.4	76-121			
o-Xylene	50.1			ug/kg	50.0		100	67-132			
Xylenes, total	149			ug/kg	150		99.0	67-132			
Styrene	49.7			ug/kg	50.0		99.5	80-120			
Bromoform	45.5			ug/kg	50.0		91.0	64-128			
1,1,2,2-Tetrachloroethane	45.1			ug/kg	50.0		90.2	74-120			
1,2,3-Trichloropropane	43.7			ug/kg	50.0		87.3	73-120			
trans-1,4-Dichloro 2-Butene	47.9			ug/kg	50.0		95.7	65-125			
n-Propylbenzene	49.8			ug/kg	50.0		99.5	72-124			
Bromobenzene	45.3			ug/kg	50.0		90.7	76-120			
Isopropyl Benzene	48.6			ug/kg	50.0		97.3	74-121			
2-Chlorotoluene	46.9			ug/kg	50.0		93.7	75-120			
4-Chlorotoluene	48.9			ug/kg	50.0		97.9	69-124			
t-Butylbenzene	48.5			ug/kg	50.0		97.1	72-122			
1,3,5-Trimethylbenzene	49.0			ug/kg	50.0		98.1	74-122			
1,2,4-Trimethylbenzene	49.5			ug/kg	50.0		98.9	75-121			
s-Butylbenzene	49.9			ug/kg	50.0		99.8	70-128			
4-Isopropyl Toluene	51.5			ug/kg	50.0		103	75-125			
1,3-Dichlorobenzene	49.3			ug/kg	50.0		98.5	75-120			
1,4-Dichlorobenzene	47.3			ug/kg	50.0		94.6	73-120			
n-Butylbenzene	53.0			ug/kg	50.0		106	73-130			
1,2-Dichlorobenzene	46.1			ug/kg	50.0		92.2	76-120			
1,2-Dibromo-3-chloropropane	51.9			ug/kg	50.0		104	72-136			
1,2,4-Trichlorobenzene	53.9			ug/kg	50.0		108	66-140			
Hexachloro-1,3-Butadiene	51.1			ug/kg	50.0		102	67-133			
Naphthalene	48.4			ug/kg	50.0		96.8	69-125			
1,2,3-Trichlorobenzene	49.8			ug/kg	50.0		99.5	68-132			
Dichlorodifluoromethane	61.1			ug/kg	50.0		122	67-142			Q

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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: EMJ
Project Number: 21-1-12596-04
Project Manager: Shoshana Howard

Reported:
03-Aug-2021 16:23

Volatile Organic Compounds - Quality Control

Batch BJB0418 - EPA 5035 (Sodium Bisulfate)

Instrument: NT5

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJB0418-BS1)					Prepared: 12-Feb-2021		Analyzed: 12-Feb-2021 12:49				
Methyl tert-butyl Ether	48.3			ug/kg	50.0		96.6	79-127			
2-Pentanone	249			ug/kg	250		99.8	77-120			
Surrogate: 1,2-Dichloroethane-d4	54.6			ug/kg	50.0		109	80-149			
Surrogate: Toluene-d8	50.7			ug/kg	50.0		101	77-120			
Surrogate: 4-Bromofluorobenzene	50.9			ug/kg	50.0		102	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	49.5			ug/kg	50.0		99.0	80-120			

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 Project: EMJ
 Project Number: 21-1-12596-04
 Project Manager: Shoshana Howard

Reported:
 03-Aug-2021 16:23

Volatile Organic Compounds - Quality Control
Batch BJB0418 - EPA 5035 (Sodium Bisulfate)

Instrument: NT5

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BJB0418-BS01)				Prepared: 12-Feb-2021 Analyzed: 12-Feb-2021 14:58							
Chloromethane	59.3			ug/kg	50.0		119	64-132	12.10	30	
Vinyl Chloride	65.2			ug/kg	50.0		130	74-135	10.50	30	
Bromomethane	57.9			ug/kg	50.0		116	53-144	12.20	30	
Chloroethane	56.2			ug/kg	50.0		112	55-149	10.70	30	
Trichlorofluoromethane	53.9			ug/kg	50.0		108	61-164	10.50	30	
Acrolein	395			ug/kg	250		158	59-140	12.20	30	*, Q
1,1,2-Trichloro-1,2,2-Trifluoroethane	61.8			ug/kg	50.0		124	74-143	11.80	30	
Acetone	337			ug/kg	250		135	48-137	10.60	30	Q
1,1-Dichloroethene	58.3			ug/kg	50.0		117	77-134	13.30	30	
Iodomethane	61.4			ug/kg	50.0		123	31-162	14.30	30	
Methylene Chloride	60.0			ug/kg	50.0		120	69-129	12.90	30	
Acrylonitrile	58.5			ug/kg	50.0		117	69-134	14.50	30	
Carbon Disulfide	60.3			ug/kg	50.0		121	71-137	12.40	30	
trans-1,2-Dichloroethene	58.9			ug/kg	50.0		118	79-130	12.60	30	
Vinyl Acetate	66.3			ug/kg	50.0		133	66-141	4.80	30	Q
1,1-Dichloroethane	59.2			ug/kg	50.0		118	80-126	14.50	30	
2-Butanone	304			ug/kg	250		122	70-132	13.10	30	
2,2-Dichloropropane	62.7			ug/kg	50.0		125	77-138	13.60	30	
cis-1,2-Dichloroethene	59.1			ug/kg	50.0		118	80-125	15.10	30	
Chloroform	59.9			ug/kg	50.0		120	80-126	15.50	30	
Bromochloromethane	60.1			ug/kg	50.0		120	80-129	17.30	30	
1,1,1-Trichloroethane	60.8			ug/kg	50.0		122	78-133	13.80	30	
1,1-Dichloropropene	58.0			ug/kg	50.0		116	63-145	11.90	30	
Carbon tetrachloride	56.7			ug/kg	50.0		113	71-129	13.60	30	
1,2-Dichloroethane	51.0			ug/kg	50.0		102	76-120	13.40	30	
Benzene	57.0			ug/kg	50.0		114	80-120	14.30	30	
Trichloroethene	56.5			ug/kg	50.0		113	80-120	11.90	30	
1,2-Dichloropropane	57.3			ug/kg	50.0		115	79-120	16.80	30	
Bromodichloromethane	56.2			ug/kg	50.0		112	80-122	14.70	30	
Dibromomethane	56.4			ug/kg	50.0		113	80-120	14.60	30	
2-Chloroethyl vinyl ether	54.0			ug/kg	50.0		108	51-129	13.40	30	
4-Methyl-2-Pentanone	273			ug/kg	250		109	73-121	10.40	30	
cis-1,3-Dichloropropene	57.3			ug/kg	50.0		115	80-120	13.00	30	
Toluene	54.2			ug/kg	50.0		108	75-120	12.40	30	
trans-1,3-Dichloropropene	57.8			ug/kg	50.0		116	80-124	13.80	30	
2-Hexanone	277			ug/kg	250		111	68-122	9.55	30	

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 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: EMJ
 Project Number: 21-1-12596-04
 Project Manager: Shoshana Howard

Reported:
 03-Aug-2021 16:23

Volatile Organic Compounds - Quality Control
Batch BJB0418 - EPA 5035 (Sodium Bisulfate)

Instrument: NT5

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BJB0418-BSD1)				Prepared: 12-Feb-2021 Analyzed: 12-Feb-2021 14:58							
1,1,2-Trichloroethane	55.1			ug/kg	50.0		110	79-120	13.20	30	
1,3-Dichloropropane	52.6			ug/kg	50.0		105	78-120	12.80	30	
Tetrachloroethene	55.4			ug/kg	50.0		111	74-124	10.60	30	
Dibromochloromethane	51.1			ug/kg	50.0		102	74-125	10.80	30	
1,2-Dibromoethane	55.1			ug/kg	50.0		110	80-120	12.60	30	
Chlorobenzene	53.3			ug/kg	50.0		107	78-120	10.40	30	
Ethylbenzene	55.4			ug/kg	50.0		111	80-125	12.60	30	
1,1,1,2-Tetrachloroethane	53.9			ug/kg	50.0		108	80-120	12.30	30	
m,p-Xylene	111			ug/kg	100		111	76-121	12.20	30	
o-Xylene	55.7			ug/kg	50.0		111	67-132	10.50	30	
Xylenes, total	167			ug/kg	150		111	67-132	11.60	30	
Styrene	55.8			ug/kg	50.0		112	80-120	11.40	30	
Bromoform	52.5			ug/kg	50.0		105	64-128	14.30	30	
1,1,2,2-Tetrachloroethane	51.0			ug/kg	50.0		102	74-120	12.30	30	
1,2,3-Trichloropropane	50.5			ug/kg	50.0		101	73-120	14.60	30	
trans-1,4-Dichloro 2-Butene	52.0			ug/kg	50.0		104	65-125	8.21	30	
n-Propylbenzene	55.1			ug/kg	50.0		110	72-124	10.10	30	
Bromobenzene	52.2			ug/kg	50.0		104	76-120	14.10	30	
Isopropyl Benzene	54.8			ug/kg	50.0		110	74-121	11.90	30	
2-Chlorotoluene	53.7			ug/kg	50.0		107	75-120	13.50	30	
4-Chlorotoluene	55.0			ug/kg	50.0		110	69-124	11.70	30	
t-Butylbenzene	53.6			ug/kg	50.0		107	72-122	10.00	30	
1,3,5-Trimethylbenzene	54.6			ug/kg	50.0		109	74-122	10.70	30	
1,2,4-Trimethylbenzene	55.6			ug/kg	50.0		111	75-121	11.70	30	
s-Butylbenzene	54.6			ug/kg	50.0		109	70-128	9.10	30	
4-Isopropyl Toluene	56.3			ug/kg	50.0		113	75-125	8.99	30	
1,3-Dichlorobenzene	55.2			ug/kg	50.0		110	75-120	11.40	30	
1,4-Dichlorobenzene	53.0			ug/kg	50.0		106	73-120	11.30	30	
n-Butylbenzene	57.1			ug/kg	50.0		114	73-130	7.50	30	
1,2-Dichlorobenzene	51.9			ug/kg	50.0		104	76-120	11.90	30	
1,2-Dibromo-3-chloropropane	55.9			ug/kg	50.0		112	72-136	7.38	30	
1,2,4-Trichlorobenzene	57.1			ug/kg	50.0		114	66-140	5.81	30	
Hexachloro-1,3-Butadiene	50.2			ug/kg	50.0		100	67-133	1.72	30	
Naphthalene	50.8			ug/kg	50.0		102	69-125	4.90	30	
1,2,3-Trichlorobenzene	52.4			ug/kg	50.0		105	68-132	5.13	30	
Dichlorodifluoromethane	67.6			ug/kg	50.0		135	67-142	10.00	30	Q

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Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: EMJ
Project Number: 21-1-12596-04
Project Manager: Shoshana Howard

Reported:
03-Aug-2021 16:23

Volatile Organic Compounds - Quality Control

Batch BJB0418 - EPA 5035 (Sodium Bisulfate)

Instrument: NT5

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BJB0418-BSD1)					Prepared: 12-Feb-2021 Analyzed: 12-Feb-2021 14:58						
Methyl tert-butyl Ether	57.0			ug/kg	50.0		114	79-127	16.50	30	
2-Pentanone	276			ug/kg	250		110	77-120	10.00	30	
Surrogate: 1,2-Dichloroethane-d4	55.9			ug/kg	50.0		112	80-149			
Surrogate: Toluene-d8	51.1			ug/kg	50.0		102	77-120			
Surrogate: 4-Bromofluorobenzene	51.5			ug/kg	50.0		103	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	50.2			ug/kg	50.0		100	80-120			

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 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: EMJ
 Project Number: 21-1-12596-04
 Project Manager: Shoshana Howard

Reported:
 03-Aug-2021 16:23

Volatile Organic Compounds - Quality Control
Batch BJB0495 - EPA 5035 (Sodium Bisulfate)

Instrument: NT5

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0495-BLK1)						Prepared: 22-Feb-2021 Analyzed: 22-Feb-2021 15:23					
Chloromethane	ND	0.26	1.00	ug/kg							U
Vinyl Chloride	ND	0.24	1.00	ug/kg							U
Bromomethane	ND	0.19	1.00	ug/kg							U
Chloroethane	ND	0.46	1.00	ug/kg							U
Trichlorofluoromethane	ND	0.27	1.00	ug/kg							U
Acrolein	ND	3.81	5.00	ug/kg							U
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.29	2.00	ug/kg							U
Acetone	ND	0.48	5.00	ug/kg							U
1,1-Dichloroethene	ND	0.34	1.00	ug/kg							U
Iodomethane	ND	0.22	1.00	ug/kg							U
Methylene Chloride	1.34	0.64	2.00	ug/kg							J
Acrylonitrile	ND	1.03	5.00	ug/kg							U
Carbon Disulfide	ND	0.56	1.00	ug/kg							U
trans-1,2-Dichloroethene	ND	0.27	1.00	ug/kg							U
Vinyl Acetate	ND	0.38	5.00	ug/kg							U
1,1-Dichloroethane	ND	0.20	1.00	ug/kg							U
2-Butanone	ND	0.51	5.00	ug/kg							U
2,2-Dichloropropane	ND	0.29	1.00	ug/kg							U
cis-1,2-Dichloroethene	ND	0.24	1.00	ug/kg							U
Chloroform	ND	0.23	1.00	ug/kg							U
Bromochloromethane	ND	0.32	1.00	ug/kg							U
1,1,1-Trichloroethane	ND	0.23	1.00	ug/kg							U
1,1-Dichloropropene	ND	0.31	1.00	ug/kg							U
Carbon tetrachloride	ND	0.21	1.00	ug/kg							U
1,2-Dichloroethane	ND	0.19	1.00	ug/kg							U
Benzene	ND	0.30	1.00	ug/kg							U
Trichloroethene	ND	0.21	1.00	ug/kg							U
1,2-Dichloropropane	ND	0.16	1.00	ug/kg							U
Bromodichloromethane	ND	0.25	1.00	ug/kg							U
Dibromomethane	ND	0.15	1.00	ug/kg							U
2-Chloroethyl vinyl ether	ND	0.28	5.00	ug/kg							U
4-Methyl-2-Pentanone	ND	0.42	5.00	ug/kg							U
cis-1,3-Dichloropropene	ND	0.23	1.00	ug/kg							U
Toluene	ND	0.15	1.00	ug/kg							U
trans-1,3-Dichloropropene	ND	0.22	1.00	ug/kg							U
2-Hexanone	ND	0.44	5.00	ug/kg							U

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 Shannon & Wilson, Inc
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 Seattle WA, 98103-8636

 Project: EMJ
 Project Number: 21-1-12596-04
 Project Manager: Shoshana Howard

Reported:
 03-Aug-2021 16:23

Volatile Organic Compounds - Quality Control
Batch BJB0495 - EPA 5035 (Sodium Bisulfate)

Instrument: NT5

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0495-BLK1)						Prepared: 22-Feb-2021 Analyzed: 22-Feb-2021 15:23					
1,1,2-Trichloroethane	ND	0.29	1.00	ug/kg							U
1,3-Dichloropropane	ND	0.21	1.00	ug/kg							U
Tetrachloroethene	ND	0.26	1.00	ug/kg							U
Dibromochloromethane	ND	0.27	1.00	ug/kg							U
1,2-Dibromoethane	ND	0.18	1.00	ug/kg							U
Chlorobenzene	ND	0.22	1.00	ug/kg							U
Ethylbenzene	ND	0.20	1.00	ug/kg							U
1,1,1,2-Tetrachloroethane	ND	0.23	1.00	ug/kg							U
m,p-Xylene	ND	0.39	2.00	ug/kg							U
o-Xylene	ND	0.22	1.00	ug/kg							U
Xylenes, total	ND	0.62	2.00	ug/kg							U
Styrene	ND	0.14	1.00	ug/kg							U
Bromoform	ND	0.30	1.00	ug/kg							U
1,1,2,2-Tetrachloroethane	ND	0.25	1.00	ug/kg							U
1,2,3-Trichloropropane	ND	0.52	2.00	ug/kg							U
trans-1,4-Dichloro 2-Butene	ND	0.44	5.00	ug/kg							U
n-Propylbenzene	ND	0.27	1.00	ug/kg							U
Bromobenzene	ND	0.15	1.00	ug/kg							U
Isopropyl Benzene	ND	0.23	1.00	ug/kg							U
2-Chlorotoluene	ND	0.30	1.00	ug/kg							U
4-Chlorotoluene	ND	0.28	1.00	ug/kg							U
t-Butylbenzene	ND	0.31	1.00	ug/kg							U
1,3,5-Trimethylbenzene	ND	0.25	1.00	ug/kg							U
1,2,4-Trimethylbenzene	ND	0.23	1.00	ug/kg							U
s-Butylbenzene	ND	0.24	1.00	ug/kg							U
4-Isopropyl Toluene	ND	0.24	1.00	ug/kg							U
1,3-Dichlorobenzene	ND	0.23	1.00	ug/kg							U
1,4-Dichlorobenzene	ND	0.23	1.00	ug/kg							U
n-Butylbenzene	ND	0.26	1.00	ug/kg							U
1,2-Dichlorobenzene	ND	0.29	1.00	ug/kg							U
1,2-Dibromo-3-chloropropane	ND	0.59	5.00	ug/kg							U
1,2,4-Trichlorobenzene	0.49	0.33	5.00	ug/kg							J
Hexachloro-1,3-Butadiene	ND	0.41	5.00	ug/kg							U
Naphthalene	1.37	0.43	5.00	ug/kg							J
1,2,3-Trichlorobenzene	0.60	0.31	5.00	ug/kg							J
Dichlorodifluoromethane	ND	0.21	1.00	ug/kg							U

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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: EMJ
Project Number: 21-1-12596-04
Project Manager: Shoshana Howard

Reported:
03-Aug-2021 16:23

Volatile Organic Compounds - Quality Control

Batch BJB0495 - EPA 5035 (Sodium Bisulfate)

Instrument: NT5

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0495-BLK1)					Prepared: 22-Feb-2021 Analyzed: 22-Feb-2021 15:23						
Methyl tert-butyl Ether	ND	0.23	1.00	ug/kg							U
2-Pentanone	ND	5.00	5.00	ug/kg							U
Surrogate: 1,2-Dichloroethane-d4	49.4			ug/kg	50.0		98.9	80-149			
Surrogate: Toluene-d8	50.7			ug/kg	50.0		101	77-120			
Surrogate: 4-Bromofluorobenzene	50.5			ug/kg	50.0		101	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	48.7			ug/kg	50.0		97.3	80-120			

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 Project: EMJ
 Project Number: 21-1-12596-04
 Project Manager: Shoshana Howard

Reported:
 03-Aug-2021 16:23

Volatile Organic Compounds - Quality Control
Batch BJB0495 - EPA 5035 (Sodium Bisulfate)

Instrument: NT5

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJB0495-BS1)				Prepared: 22-Feb-2021 Analyzed: 22-Feb-2021 14:21							
Chloromethane	44.3			ug/kg	50.0		88.6	64-132			
Vinyl Chloride	47.3			ug/kg	50.0		94.5	74-135			
Bromomethane	51.3			ug/kg	50.0		103	53-144			
Chloroethane	49.2			ug/kg	50.0		98.3	55-149			
Trichlorofluoromethane	55.6			ug/kg	50.0		111	61-164			
Acrolein	220			ug/kg	250		88.0	59-140			
1,1,2-Trichloro-1,2,2-Trifluoroethane	46.8			ug/kg	50.0		93.6	74-143			
Acetone	254			ug/kg	250		102	48-137			
1,1-Dichloroethene	44.7			ug/kg	50.0		89.4	77-134			
Iodomethane	41.9			ug/kg	50.0		83.7	31-162			
Methylene Chloride	44.7			ug/kg	50.0		89.5	69-129			
Acrylonitrile	47.9			ug/kg	50.0		95.8	69-134			
Carbon Disulfide	47.0			ug/kg	50.0		94.1	71-137			
trans-1,2-Dichloroethene	45.7			ug/kg	50.0		91.5	79-130			
Vinyl Acetate	36.8			ug/kg	50.0		73.6	66-141			Q
1,1-Dichloroethane	45.5			ug/kg	50.0		91.1	80-126			
2-Butanone	263			ug/kg	250		105	70-132			
2,2-Dichloropropane	46.2			ug/kg	50.0		92.4	77-138			
cis-1,2-Dichloroethene	46.5			ug/kg	50.0		93.0	80-125			
Chloroform	45.8			ug/kg	50.0		91.6	80-126			
Bromochloromethane	47.9			ug/kg	50.0		95.8	80-129			
1,1,1-Trichloroethane	46.4			ug/kg	50.0		92.8	78-133			
1,1-Dichloropropene	45.5			ug/kg	50.0		90.9	63-145			
Carbon tetrachloride	45.2			ug/kg	50.0		90.4	71-129			
1,2-Dichloroethane	45.0			ug/kg	50.0		89.9	76-120			
Benzene	45.8			ug/kg	50.0		91.5	80-120			
Trichloroethene	44.6			ug/kg	50.0		89.2	80-120			
1,2-Dichloropropane	45.7			ug/kg	50.0		91.4	79-120			
Bromodichloromethane	45.3			ug/kg	50.0		90.7	80-122			
Dibromomethane	45.9			ug/kg	50.0		91.9	80-120			
2-Chloroethyl vinyl ether	48.1			ug/kg	50.0		96.2	51-129			
4-Methyl-2-Pentanone	242			ug/kg	250		97.0	73-121			
cis-1,3-Dichloropropene	46.6			ug/kg	50.0		93.1	80-120			
Toluene	45.3			ug/kg	50.0		90.5	75-120			
trans-1,3-Dichloropropene	46.7			ug/kg	50.0		93.4	80-124			
2-Hexanone	248			ug/kg	250		99.3	68-122			

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: EMJ
Project Number: 21-1-12596-04
Project Manager: Shoshana Howard

Reported:
03-Aug-2021 16:23

Volatile Organic Compounds - Quality Control

Batch BJB0495 - EPA 5035 (Sodium Bisulfate)

Instrument: NT5

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJB0495-BS1)						Prepared: 22-Feb-2021	Analyzed: 22-Feb-2021 14:21				
1,1,2-Trichloroethane	47.2			ug/kg	50.0		94.4	79-120			
1,3-Dichloropropane	47.0			ug/kg	50.0		93.9	78-120			
Tetrachloroethene	45.7			ug/kg	50.0		91.4	74-124			
Dibromochloromethane	45.6			ug/kg	50.0		91.1	74-125			
1,2-Dibromoethane	46.9			ug/kg	50.0		93.9	80-120			
Chlorobenzene	46.1			ug/kg	50.0		92.2	78-120			
Ethylbenzene	46.7			ug/kg	50.0		93.5	80-125			
1,1,1,2-Tetrachloroethane	45.0			ug/kg	50.0		90.1	80-120			
m,p-Xylene	91.3			ug/kg	100		91.3	76-121			
o-Xylene	45.6			ug/kg	50.0		91.3	67-132			
Xylenes, total	137			ug/kg	150		91.3	67-132			
Styrene	46.9			ug/kg	50.0		93.9	80-120			
Bromoform	46.8			ug/kg	50.0		93.5	64-128			
1,1,2,2-Tetrachloroethane	47.0			ug/kg	50.0		94.1	74-120			
1,2,3-Trichloropropane	48.1			ug/kg	50.0		96.3	73-120			
trans-1,4-Dichloro 2-Butene	49.1			ug/kg	50.0		98.2	65-125			
n-Propylbenzene	47.7			ug/kg	50.0		95.5	72-124			
Bromobenzene	46.6			ug/kg	50.0		93.2	76-120			
Isopropyl Benzene	46.1			ug/kg	50.0		92.1	74-121			
2-Chlorotoluene	46.2			ug/kg	50.0		92.4	75-120			
4-Chlorotoluene	48.3			ug/kg	50.0		96.6	69-124			
t-Butylbenzene	45.8			ug/kg	50.0		91.6	72-122			
1,3,5-Trimethylbenzene	46.7			ug/kg	50.0		93.5	74-122			
1,2,4-Trimethylbenzene	47.1			ug/kg	50.0		94.2	75-121			
s-Butylbenzene	47.6			ug/kg	50.0		95.2	70-128			
4-Isopropyl Toluene	47.7			ug/kg	50.0		95.4	75-125			
1,3-Dichlorobenzene	47.6			ug/kg	50.0		95.2	75-120			
1,4-Dichlorobenzene	48.3			ug/kg	50.0		96.5	73-120			
n-Butylbenzene	49.0			ug/kg	50.0		98.0	73-130			
1,2-Dichlorobenzene	47.3			ug/kg	50.0		94.6	76-120			
1,2-Dibromo-3-chloropropane	52.3			ug/kg	50.0		105	72-136			
1,2,4-Trichlorobenzene	50.7			ug/kg	50.0		101	66-140			
Hexachloro-1,3-Butadiene	45.8			ug/kg	50.0		91.6	67-133			
Naphthalene	48.1			ug/kg	50.0		96.2	69-125			
1,2,3-Trichlorobenzene	48.0			ug/kg	50.0		95.9	68-132			
Dichlorodifluoromethane	52.1			ug/kg	50.0		104	67-142			

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: EMJ
Project Number: 21-1-12596-04
Project Manager: Shoshana Howard

Reported:
03-Aug-2021 16:23

Volatile Organic Compounds - Quality Control

Batch BJB0495 - EPA 5035 (Sodium Bisulfate)

Instrument: NT5

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJB0495-BS1)					Prepared: 22-Feb-2021		Analyzed: 22-Feb-2021 14:21				
Methyl tert-butyl Ether	48.3			ug/kg	50.0		96.7	79-127			
2-Pentanone	240			ug/kg	250		95.8	77-120			
Surrogate: 1,2-Dichloroethane-d4	52.1			ug/kg	50.0		104	80-149			
Surrogate: Toluene-d8	50.9			ug/kg	50.0		102	77-120			
Surrogate: 4-Bromofluorobenzene	49.3			ug/kg	50.0		98.7	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	50.3			ug/kg	50.0		101	80-120			

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 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: EMJ
 Project Number: 21-1-12596-04
 Project Manager: Shoshana Howard

Reported:
 03-Aug-2021 16:23

Volatile Organic Compounds - Quality Control
Batch BJB0495 - EPA 5035 (Sodium Bisulfate)

Instrument: NT5

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BJB0495-BS01)				Prepared: 22-Feb-2021 Analyzed: 22-Feb-2021 15:00							
Chloromethane	47.0			ug/kg	50.0		94.0	64-132	5.92	30	
Vinyl Chloride	50.0			ug/kg	50.0		100	74-135	5.64	30	
Bromomethane	51.9			ug/kg	50.0		104	53-144	1.28	30	
Chloroethane	50.5			ug/kg	50.0		101	55-149	2.77	30	
Trichlorofluoromethane	58.3			ug/kg	50.0		117	61-164	4.72	30	
Acrolein	236			ug/kg	250		94.3	59-140	6.90	30	
1,1,2-Trichloro-1,2,2-Trifluoroethane	47.8			ug/kg	50.0		95.6	74-143	2.01	30	
Acetone	239			ug/kg	250		95.6	48-137	6.16	30	
1,1-Dichloroethene	45.7			ug/kg	50.0		91.5	77-134	2.23	30	
Iodomethane	45.4			ug/kg	50.0		90.8	31-162	8.07	30	
Methylene Chloride	45.3			ug/kg	50.0		90.5	69-129	1.16	30	
Acrylonitrile	51.0			ug/kg	50.0		102	69-134	6.27	30	
Carbon Disulfide	48.6			ug/kg	50.0		97.2	71-137	3.31	30	
trans-1,2-Dichloroethene	47.7			ug/kg	50.0		95.4	79-130	4.22	30	
Vinyl Acetate	38.5			ug/kg	50.0		77.0	66-141	4.51	30	Q
1,1-Dichloroethane	48.1			ug/kg	50.0		96.2	80-126	5.42	30	
2-Butanone	265			ug/kg	250		106	70-132	0.74	30	
2,2-Dichloropropane	48.0			ug/kg	50.0		96.0	77-138	3.78	30	
cis-1,2-Dichloroethene	49.2			ug/kg	50.0		98.4	80-125	5.65	30	
Chloroform	49.0			ug/kg	50.0		97.9	80-126	6.71	30	
Bromochloromethane	49.8			ug/kg	50.0		99.6	80-129	3.89	30	
1,1,1-Trichloroethane	48.6			ug/kg	50.0		97.2	78-133	4.63	30	
1,1-Dichloropropene	46.1			ug/kg	50.0		92.1	63-145	1.32	30	
Carbon tetrachloride	46.2			ug/kg	50.0		92.5	71-129	2.21	30	
1,2-Dichloroethane	47.1			ug/kg	50.0		94.3	76-120	4.76	30	
Benzene	47.1			ug/kg	50.0		94.1	80-120	2.83	30	
Trichloroethene	45.6			ug/kg	50.0		91.1	80-120	2.11	30	
1,2-Dichloropropane	48.5			ug/kg	50.0		97.0	79-120	5.92	30	
Bromodichloromethane	47.3			ug/kg	50.0		94.7	80-122	4.34	30	
Dibromomethane	47.9			ug/kg	50.0		95.9	80-120	4.25	30	
2-Chloroethyl vinyl ether	49.6			ug/kg	50.0		99.3	51-129	3.09	30	
4-Methyl-2-Pentanone	254			ug/kg	250		101	73-121	4.52	30	
cis-1,3-Dichloropropene	48.7			ug/kg	50.0		97.3	80-120	4.36	30	
Toluene	46.6			ug/kg	50.0		93.3	75-120	3.04	30	
trans-1,3-Dichloropropene	48.7			ug/kg	50.0		97.4	80-124	4.17	30	
2-Hexanone	254			ug/kg	250		101	68-122	2.13	30	

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Analytical Resources, Incorporated
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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: EMJ
Project Number: 21-1-12596-04
Project Manager: Shoshana Howard

Reported:
03-Aug-2021 16:23

Volatile Organic Compounds - Quality Control

Batch BJB0495 - EPA 5035 (Sodium Bisulfate)

Instrument: NT5

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BJB0495-BS01)						Prepared: 22-Feb-2021 Analyzed: 22-Feb-2021 15:00					
1,1,2-Trichloroethane	49.2			ug/kg	50.0		98.3	79-120	4.12	30	
1,3-Dichloropropane	48.1			ug/kg	50.0		96.2	78-120	2.40	30	
Tetrachloroethene	45.6			ug/kg	50.0		91.2	74-124	0.19	30	
Dibromochloromethane	49.1			ug/kg	50.0		98.1	74-125	7.38	30	
1,2-Dibromoethane	49.4			ug/kg	50.0		98.7	80-120	5.01	30	
Chlorobenzene	47.5			ug/kg	50.0		95.1	78-120	3.10	30	
Ethylbenzene	47.3			ug/kg	50.0		94.7	80-125	1.27	30	
1,1,1,2-Tetrachloroethane	46.5			ug/kg	50.0		93.0	80-120	3.22	30	
m,p-Xylene	92.9			ug/kg	100		92.9	76-121	1.75	30	
o-Xylene	46.2			ug/kg	50.0		92.5	67-132	1.31	30	
Xylenes, total	139			ug/kg	150		92.8	67-132	1.60	30	
Styrene	48.0			ug/kg	50.0		96.1	80-120	2.33	30	
Bromoform	48.1			ug/kg	50.0		96.3	64-128	2.94	30	
1,1,2,2-Tetrachloroethane	50.5			ug/kg	50.0		101	74-120	7.03	30	
1,2,3-Trichloropropane	49.9			ug/kg	50.0		99.9	73-120	3.66	30	
trans-1,4-Dichloro 2-Butene	52.4			ug/kg	50.0		105	65-125	6.41	30	
n-Propylbenzene	48.6			ug/kg	50.0		97.2	72-124	1.75	30	
Bromobenzene	48.9			ug/kg	50.0		97.7	76-120	4.74	30	
Isopropyl Benzene	47.4			ug/kg	50.0		94.7	74-121	2.76	30	
2-Chlorotoluene	46.5			ug/kg	50.0		93.0	75-120	0.59	30	
4-Chlorotoluene	48.7			ug/kg	50.0		97.4	69-124	0.82	30	
t-Butylbenzene	47.3			ug/kg	50.0		94.6	72-122	3.16	30	
1,3,5-Trimethylbenzene	47.8			ug/kg	50.0		95.5	74-122	2.15	30	
1,2,4-Trimethylbenzene	48.4			ug/kg	50.0		96.8	75-121	2.78	30	
s-Butylbenzene	48.4			ug/kg	50.0		96.7	70-128	1.60	30	
4-Isopropyl Toluene	48.6			ug/kg	50.0		97.3	75-125	1.95	30	
1,3-Dichlorobenzene	48.1			ug/kg	50.0		96.1	75-120	0.91	30	
1,4-Dichlorobenzene	48.8			ug/kg	50.0		97.6	73-120	1.14	30	
n-Butylbenzene	49.1			ug/kg	50.0		98.3	73-130	0.30	30	
1,2-Dichlorobenzene	48.7			ug/kg	50.0		97.4	76-120	2.88	30	
1,2-Dibromo-3-chloropropane	50.8			ug/kg	50.0		102	72-136	2.85	30	
1,2,4-Trichlorobenzene	51.0			ug/kg	50.0		102	66-140	0.65	30	
Hexachloro-1,3-Butadiene	46.8			ug/kg	50.0		93.5	67-133	2.02	30	
Naphthalene	50.8			ug/kg	50.0		102	69-125	5.35	30	
1,2,3-Trichlorobenzene	50.0			ug/kg	50.0		100	68-132	4.14	30	
Dichlorodifluoromethane	53.3			ug/kg	50.0		107	67-142	2.30	30	

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Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: EMJ
Project Number: 21-1-12596-04
Project Manager: Shoshana Howard

Reported:
03-Aug-2021 16:23

Volatile Organic Compounds - Quality Control

Batch BJB0495 - EPA 5035 (Sodium Bisulfate)

Instrument: NT5

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BJB0495-BSD1)					Prepared: 22-Feb-2021 Analyzed: 22-Feb-2021 15:00						
Methyl tert-butyl Ether	51.1			ug/kg	50.0		102	79-127	5.61	30	
2-Pentanone	253			ug/kg	250		101	77-120	5.37	30	
Surrogate: 1,2-Dichloroethane-d4	53.5			ug/kg	50.0		107	80-149			
Surrogate: Toluene-d8	51.1			ug/kg	50.0		102	77-120			
Surrogate: 4-Bromofluorobenzene	49.6			ug/kg	50.0		99.2	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	50.6			ug/kg	50.0		101	80-120			

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 Seattle WA, 98103-8636

 Project: EMJ
 Project Number: 21-1-12596-04
 Project Manager: Shoshana Howard

Reported:
 03-Aug-2021 16:23

Semivolatile Organic Compounds - Quality Control
Batch BJB0517 - EPA 3546 (Microwave)

Instrument: NT10

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0517-BLK1)						Prepared: 18-Feb-2021 Analyzed: 06-Mar-2021 19:09					
Phenol	ND	8.2	20.0	ug/kg							U
bis(2-chloroethyl) ether	ND	6.8	20.0	ug/kg							U
2-Chlorophenol	ND	6.5	20.0	ug/kg							U
1,3-Dichlorobenzene	ND	5.1	20.0	ug/kg							U
1,4-Dichlorobenzene	ND	4.4	20.0	ug/kg							U
1,2-Dichlorobenzene	ND	4.7	20.0	ug/kg							U
Benzyl Alcohol	ND	14.9	20.0	ug/kg							U
2,2'-Oxybis(1-chloropropane)	ND	5.7	20.0	ug/kg							U
2-Methylphenol	ND	7.8	20.0	ug/kg							U
Hexachloroethane	ND	5.7	20.0	ug/kg							U
N-Nitroso-di-n-Propylamine	ND	10.8	20.0	ug/kg							U
4-Methylphenol	ND	14.7	20.0	ug/kg							U
Nitrobenzene	ND	8.0	20.0	ug/kg							U
Isophorone	ND	7.8	20.0	ug/kg							U
2-Nitrophenol	ND	6.9	20.0	ug/kg							U
2,4-Dimethylphenol	ND	26.8	100	ug/kg							U
Bis(2-Chloroethoxy)methane	ND	6.3	20.0	ug/kg							U
2,4-Dichlorophenol	ND	32.0	100	ug/kg							U
1,2,4-Trichlorobenzene	ND	6.0	20.0	ug/kg							U
Naphthalene	ND	5.3	20.0	ug/kg							U
Benzoic acid	ND	59.1	200	ug/kg							U
4-Chloroaniline	ND	33.7	100	ug/kg							U
Hexachlorobutadiene	ND	5.0	20.0	ug/kg							U
4-Chloro-3-Methylphenol	ND	28.9	100	ug/kg							U
2-Methylnaphthalene	ND	5.7	20.0	ug/kg							U
Hexachlorocyclopentadiene	ND	41.3	100	ug/kg							U
2,4,6-Trichlorophenol	ND	25.4	100	ug/kg							U
2,4,5-Trichlorophenol	ND	26.9	100	ug/kg							U
2-Chloronaphthalene	ND	4.4	20.0	ug/kg							U
2-Nitroaniline	ND	30.2	100	ug/kg							U
Acenaphthylene	ND	4.8	20.0	ug/kg							U
Dimethylphthalate	ND	6.4	20.0	ug/kg							U
2,6-Dinitrotoluene	ND	26.7	100	ug/kg							U
Acenaphthene	ND	5.1	20.0	ug/kg							U
3-Nitroaniline	ND	37.7	100	ug/kg							U
2,4-Dinitrophenol	ND	41.3	200	ug/kg							U

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 Shannon & Wilson, Inc
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 Seattle WA, 98103-8636

 Project: EMJ
 Project Number: 21-1-12596-04
 Project Manager: Shoshana Howard

Reported:
 03-Aug-2021 16:23

Semivolatle Organic Compounds - Quality Control
Batch BJB0517 - EPA 3546 (Microwave)

Instrument: NT10

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0517-BLK1)						Prepared: 18-Feb-2021 Analyzed: 06-Mar-2021 19:09					
Dibenzofuran	ND	4.6	20.0	ug/kg							U
4-Nitrophenol	ND	44.4	100	ug/kg							U
2,4-Dinitrotoluene	ND	22.9	100	ug/kg							U
Fluorene	ND	5.0	20.0	ug/kg							U
4-Chlorophenylphenyl ether	ND	7.0	20.0	ug/kg							U
Diethyl phthalate	ND	17.7	20.0	ug/kg							U
4-Nitroaniline	ND	34.9	100	ug/kg							U
4,6-Dinitro-2-methylphenol	ND	50.5	200	ug/kg							U
N-Nitrosodiphenylamine	ND	9.6	20.0	ug/kg							U
4-Bromophenyl phenyl ether	ND	6.1	20.0	ug/kg							U
Hexachlorobenzene	ND	4.7	20.0	ug/kg							U
Pentachlorophenol	ND	31.3	100	ug/kg							U
Phenanthrene	ND	4.7	20.0	ug/kg							U
Anthracene	ND	5.9	20.0	ug/kg							U
Carbazole	ND	7.4	20.0	ug/kg							U
Di-n-Butylphthalate	ND	5.3	20.0	ug/kg							U
Fluoranthene	ND	4.5	20.0	ug/kg							U
Pyrene	ND	5.6	20.0	ug/kg							U
Butylbenzylphthalate	ND	8.1	20.0	ug/kg							U
Benzo(a)anthracene	ND	5.2	20.0	ug/kg							U
3,3'-Dichlorobenzidine	ND	31.2	100	ug/kg							U
Chrysene	ND	5.2	20.0	ug/kg							U
bis(2-Ethylhexyl)phthalate	ND	28.8	50.0	ug/kg							U
Di-n-Octylphthalate	ND	8.7	20.0	ug/kg							U
Benzo(a)fluoranthene, Total	ND	10.2	40.0	ug/kg							U
Benzo(a)pyrene	ND	6.5	20.0	ug/kg							U
Indeno(1,2,3-cd)pyrene	ND	6.0	20.0	ug/kg							U
Dibenzo(a,h)anthracene	ND	6.2	20.0	ug/kg							U
Benzo(g,h,i)perylene	ND	5.8	20.0	ug/kg							U
1-Methylnaphthalene	ND	6.0	20.0	ug/kg							U
Surrogate: Phenol-d5	483			ug/kg	750		64.3	29-120			
Surrogate: 2-Chlorophenol-d4	669			ug/kg	750		89.2	31-120			
Surrogate: 1,2-Dichlorobenzene-d4	428			ug/kg	500		85.7	32-120			
Surrogate: Nitrobenzene-d5	482			ug/kg	500		96.4	30-120			
Surrogate: 2-Fluorobiphenyl	459			ug/kg	500		91.7	35-120			
Surrogate: 2,4,6-Tribromophenol	675			ug/kg	750		90.1	24-134			

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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: EMJ
Project Number: 21-1-12596-04
Project Manager: Shoshana Howard

Reported:
03-Aug-2021 16:23

Semivolatile Organic Compounds - Quality Control

Batch BJB0517 - EPA 3546 (Microwave)

Instrument: NT10

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0517-BLK1)						Prepared: 18-Feb-2021 Analyzed: 06-Mar-2021 19:09					
Surrogate: <i>p</i> -Terphenyl- <i>d</i> 14	472			ug/kg	500		94.4	37-120			

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 Seattle WA, 98103-8636

 Project: EMJ
 Project Number: 21-1-12596-04
 Project Manager: Shoshana Howard

Reported:
 03-Aug-2021 16:23

Semivolatiles Organic Compounds - Quality Control
Batch BJB0517 - EPA 3546 (Microwave)

Instrument: NT10

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJB0517-BS1)						Prepared: 18-Feb-2021 Analyzed: 06-Mar-2021 19:47					
Phenol	359	8.2	20.0	ug/kg	500		71.8	34-120			
bis(2-chloroethyl) ether	418	6.8	20.0	ug/kg	500		83.7	36-120			
2-Chlorophenol	398	6.5	20.0	ug/kg	500		79.7	39-120			
1,3-Dichlorobenzene	416	5.1	20.0	ug/kg	500		83.1	40-120			
1,4-Dichlorobenzene	420	4.4	20.0	ug/kg	500		84.0	39-120			
1,2-Dichlorobenzene	411	4.7	20.0	ug/kg	500		82.3	40-120			
Benzyl Alcohol	364	14.9	20.0	ug/kg	500		72.9	19-120			
2,2'-Oxybis(1-chloropropane)	401	5.7	20.0	ug/kg	500		80.2	32-120			
2-Methylphenol	314	7.8	20.0	ug/kg	500		62.8	28-120			
Hexachloroethane	448	5.7	20.0	ug/kg	500		89.6	38-120			
N-Nitroso-di-n-Propylamine	362	10.8	20.0	ug/kg	500		72.5	34-120			
4-Methylphenol	336	14.7	20.0	ug/kg	500		67.2	29-120			
Nitrobenzene	409	8.0	20.0	ug/kg	500		81.9	36-120			
Isophorone	423	7.8	20.0	ug/kg	500		84.6	37-120			
2-Nitrophenol	365	6.9	20.0	ug/kg	500		73.0	30-120			
2,4-Dimethylphenol	397	26.8	100	ug/kg	1300		30.6	10-120			
Bis(2-Chloroethoxy)methane	385	6.3	20.0	ug/kg	500		76.9	39-120			
2,4-Dichlorophenol	1040	32.0	100	ug/kg	1300		80.0	28-120			
1,2,4-Trichlorobenzene	373	6.0	20.0	ug/kg	500		74.7	35-120			
Naphthalene	383	5.3	20.0	ug/kg	500		76.5	43-120			
Benzoic acid	1570	59.1	200	ug/kg	2300		68.1	10-120			
4-Chloroaniline	681	33.7	100	ug/kg	1300		52.4	11-120			
Hexachlorobutadiene	393	5.0	20.0	ug/kg	500		78.7	37-120			
4-Chloro-3-Methylphenol	1170	28.9	100	ug/kg	1300		89.9	32-120			
2-Methylnaphthalene	367	5.7	20.0	ug/kg	500		73.4	43-120			
Hexachlorocyclopentadiene	694	41.3	100	ug/kg	1300		53.4	10-120			
2,4,6-Trichlorophenol	1140	25.4	100	ug/kg	1300		87.8	44.6-132			
2,4,5-Trichlorophenol	1180	26.9	100	ug/kg	1300		90.8	51.5-129			
2-Chloronaphthalene	457	4.4	20.0	ug/kg	500		91.4	40-120			
2-Nitroaniline	1490	30.2	100	ug/kg	1300		115	40-152			
Acenaphthylene	365	4.8	20.0	ug/kg	500		72.9	42-120			
Dimethylphthalate	406	6.4	20.0	ug/kg	500		81.1	43-120			
2,6-Dinitrotoluene	1360	26.7	100	ug/kg	1300		105	31-156			
Acenaphthene	392	5.1	20.0	ug/kg	500		78.4	45-120			
3-Nitroaniline	1150	37.7	100	ug/kg	1300		88.1	22-120			
2,4-Dinitrophenol	1880	41.3	200	ug/kg	2300		81.8	10-120			

Analytical Resources, Inc.

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 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: EMJ
 Project Number: 21-1-12596-04
 Project Manager: Shoshana Howard

Reported:
 03-Aug-2021 16:23

Semivolatile Organic Compounds - Quality Control
Batch BJB0517 - EPA 3546 (Microwave)

Instrument: NT10

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJB0517-BS1)						Prepared: 18-Feb-2021 Analyzed: 06-Mar-2021 19:47					
Dibenzofuran	392	4.6	20.0	ug/kg	500		78.3	43-120			
4-Nitrophenol	1040	44.4	100	ug/kg	1300		79.8	15-138			
2,4-Dinitrotoluene	1490	22.9	100	ug/kg	1300		115	44-150			
Fluorene	332	5.0	20.0	ug/kg	500		66.4	45-120			
4-Chlorophenylphenyl ether	300	7.0	20.0	ug/kg	500		60.1	36-141			
Diethyl phthalate	402	17.7	20.0	ug/kg	500		80.5	50-120			
4-Nitroaniline	1190	34.9	100	ug/kg	1300		91.4	24-168			
4,6-Dinitro-2-methylphenol	2460	50.5	200	ug/kg	2300		107	33-144			
N-Nitrosodiphenylamine	394	9.6	20.0	ug/kg	500		78.7	70-154			
4-Bromophenyl phenyl ether	449	6.1	20.0	ug/kg	500		89.8	39-120			
Hexachlorobenzene	432	4.7	20.0	ug/kg	500		86.5	33-120			
Pentachlorophenol	904	31.3	100	ug/kg	1300		69.5	16-120			
Phenanthrene	448	4.7	20.0	ug/kg	500		89.7	49-120			
Anthracene	422	5.9	20.0	ug/kg	500		84.4	45-120			
Carbazole	444	7.4	20.0	ug/kg	500		88.8	43-135			
Di-n-Butylphthalate	486	5.3	20.0	ug/kg	500		97.1	48-126			
Fluoranthene	469	4.5	20.0	ug/kg	500		93.9	53-145			
Pyrene	458	5.6	20.0	ug/kg	500		91.6	52-134			
Butylbenzylphthalate	459	8.1	20.0	ug/kg	500		91.7	45-132			
Benzo(a)anthracene	421	5.2	20.0	ug/kg	500		84.2	49-120			
3,3'-Dichlorobenzidine	590	31.2	100	ug/kg	800		73.7	10-120			
Chrysene	444	5.2	20.0	ug/kg	500		88.7	47-120			
bis(2-Ethylhexyl)phthalate	467	28.8	50.0	ug/kg	500		93.4	34-130			
Di-n-Octylphthalate	449	8.7	20.0	ug/kg	500		89.7	28-124			
Benzo(a)fluoranthene, Total	925	10.2	40.0	ug/kg	1000		92.5	30-160			
Benzo(a)pyrene	440	6.5	20.0	ug/kg	500		87.9	42-120			
Indeno(1,2,3-cd)pyrene	442	6.0	20.0	ug/kg	500		88.4	42-163			
Dibenzo(a,h)anthracene	449	6.2	20.0	ug/kg	500		89.8	30-133			
Benzo(g,h,i)perylene	447	5.8	20.0	ug/kg	500		89.4	46-148			
1-Methylnaphthalene	377	6.0	20.0	ug/kg	500		75.4	42-120			
Surrogate: Phenol-d5	652			ug/kg	750		86.9	29-120			
Surrogate: 2-Chlorophenol-d4	687			ug/kg	750		91.6	31-120			
Surrogate: 1,2-Dichlorobenzene-d4	412			ug/kg	500		82.5	32-120			
Surrogate: Nitrobenzene-d5	427			ug/kg	500		85.3	30-120			
Surrogate: 2-Fluorobiphenyl	448			ug/kg	500		89.6	35-120			
Surrogate: 2,4,6-Tribromophenol	663			ug/kg	750		88.4	24-134			

Analytical Resources, Inc.

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: EMJ
Project Number: 21-1-12596-04
Project Manager: Shoshana Howard

Reported:
03-Aug-2021 16:23

Semivolatile Organic Compounds - Quality Control

Batch BJB0517 - EPA 3546 (Microwave)

Instrument: NT10

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJB0517-BS1)						Prepared: 18-Feb-2021 Analyzed: 06-Mar-2021 19:47					
Surrogate: p-Terphenyl-d14	453			ug/kg	500		90.6	37-120			

Analytical Resources, Inc.

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 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: EMJ
 Project Number: 21-1-12596-04
 Project Manager: Shoshana Howard

Reported:
 03-Aug-2021 16:23

Semivolatile Organic Compounds - Quality Control
Batch BJB0517 - EPA 3546 (Microwave)

Instrument: NT10

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BJB0517-MS1)											
		Source: 21B0101-01		Prepared: 18-Feb-2021		Analyzed: 06-Mar-2021 21:01					
Phenol	429	9.5	23.2	ug/kg	580	ND	74.0	34-120			
bis(2-chloroethyl) ether	562	7.9	23.2	ug/kg	580	ND	96.8	36-120			
2-Chlorophenol	480	7.5	23.2	ug/kg	580	ND	82.7	39-120			
1,3-Dichlorobenzene	511	5.9	23.2	ug/kg	580	ND	88.0	40-120			
1,4-Dichlorobenzene	532	5.1	23.2	ug/kg	580	ND	91.8	39-120			
1,2-Dichlorobenzene	511	5.4	23.2	ug/kg	580	ND	88.1	40-120			
Benzyl Alcohol	448	17.3	23.2	ug/kg	580	ND	77.2	19-120			
2,2'-Oxybis(1-chloropropane)	507	6.6	23.2	ug/kg	580	ND	87.3	32-120			
2-Methylphenol	428	9.1	23.2	ug/kg	580	ND	73.8	28-120			
Hexachloroethane	564	6.6	23.2	ug/kg	580	ND	97.1	38-120			
N-Nitroso-di-n-Propylamine	509	12.5	23.2	ug/kg	580	ND	87.7	34-120			
4-Methylphenol	442	17.1	23.2	ug/kg	580	ND	76.2	29-120			
Nitrobenzene	520	9.2	23.2	ug/kg	580	ND	89.6	36-120			
Isophorone	550	9.0	23.2	ug/kg	580	ND	94.8	37-120			
2-Nitrophenol	430	8.0	23.2	ug/kg	580	ND	74.2	30-120			
2,4-Dimethylphenol	1010	31.1	116	ug/kg	1510	ND	67.2	10-120			
Bis(2-Chloroethoxy)methane	556	7.4	23.2	ug/kg	580	ND	95.9	39-120			
2,4-Dichlorophenol	1420	37.1	116	ug/kg	1510	ND	94.1	28-120			
1,2,4-Trichlorobenzene	495	6.9	23.2	ug/kg	580	ND	85.4	35-120			
Naphthalene	507	6.1	23.2	ug/kg	580	4.7	87.5	43-120			
Benzoic acid	146	68.6	232	ug/kg	2670	ND	5.47	10-120			*, J
4-Chloroaniline	681	39.1	116	ug/kg	1510	ND	45.1	11-120			
Hexachlorobutadiene	507	5.8	23.2	ug/kg	580	ND	87.4	37-120			
4-Chloro-3-Methylphenol	1560	33.5	116	ug/kg	1510	ND	103	32-120			
2-Methylnaphthalene	484	6.6	23.2	ug/kg	580	5.1	83.4	43-120			
Hexachlorocyclopentadiene	702	47.9	116	ug/kg	1510	ND	46.5	10-120			
2,4,6-Trichlorophenol	1300	29.5	116	ug/kg	1510	ND	86.1	44.6-132			
2,4,5-Trichlorophenol	1430	31.2	116	ug/kg	1510	ND	94.9	51.5-129			
2-Chloronaphthalene	549	5.2	23.2	ug/kg	580	ND	94.7	40-120			
2-Nitroaniline	1790	35.0	116	ug/kg	1510	ND	118	40-152			
Acenaphthylene	425	5.5	23.2	ug/kg	580	ND	73.2	42-120			
Dimethylphthalate	493	7.5	23.2	ug/kg	580	ND	85.0	43-120			
2,6-Dinitrotoluene	1590	31.0	116	ug/kg	1510	ND	106	31-156			
Acenaphthene	487	6.0	23.2	ug/kg	580	ND	84.0	45-120			
3-Nitroaniline	1060	43.7	116	ug/kg	1510	ND	70.3	22-120			
2,4-Dinitrophenol	1610	47.9	232	ug/kg	2670	ND	60.2	10-120			

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 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: EMJ
 Project Number: 21-1-12596-04
 Project Manager: Shoshana Howard

Reported:
 03-Aug-2021 16:23

Semivolatile Organic Compounds - Quality Control
Batch BJB0517 - EPA 3546 (Microwave)

Instrument: NT10

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BJB0517-MS1)		Source: 21B0101-01		Prepared: 18-Feb-2021 Analyzed: 06-Mar-2021 21:01							
Dibenzofuran	481	5.3	23.2	ug/kg	580	ND	83.0	43-120			
4-Nitrophenol	1050	51.5	116	ug/kg	1510	ND	69.8	15-138			
2,4-Dinitrotoluene	1810	26.6	116	ug/kg	1510	ND	120	44-150			
Fluorene	393	5.7	23.2	ug/kg	580	ND	67.7	45-120			
4-Chlorophenylphenyl ether	416	8.1	23.2	ug/kg	580	ND	71.8	36-141			
Diethyl phthalate	494	20.5	23.2	ug/kg	580	ND	85.1	50-120			
4-Nitroaniline	1360	40.5	116	ug/kg	1510	ND	90.3	24-168			
4,6-Dinitro-2-methylphenol	2450	58.6	232	ug/kg	2670	ND	92.0	33-144			
N-Nitrosodiphenylamine	508	11.1	23.2	ug/kg	580	ND	87.6	70-154			
4-Bromophenyl phenyl ether	555	7.0	23.2	ug/kg	580	ND	95.7	39-120			
Hexachlorobenzene	532	5.5	23.2	ug/kg	580	ND	91.7	33-120			
Pentachlorophenol	817	36.3	116	ug/kg	1510	ND	54.2	16-120			
Phenanthrene	594	5.4	23.2	ug/kg	580	12.6	99.9	49-120			
Anthracene	532	6.9	23.2	ug/kg	580	ND	91.7	45-120			
Carbazole	584	8.6	23.2	ug/kg	580	ND	101	43-135			
Di-n-Butylphthalate	623	6.2	23.2	ug/kg	580	23.6	103	48-126			
Fluoranthene	624	5.2	23.2	ug/kg	580	13.0	105	53-145			
Pyrene	602	6.4	23.2	ug/kg	580	13.9	101	52-134			
Butylbenzylphthalate	572	9.3	23.2	ug/kg	580	ND	98.7	45-132			
Benzo(a)anthracene	537	6.0	23.2	ug/kg	580	6.3	91.3	49-120			
3,3'-Dichlorobenzidine	368	36.2	116	ug/kg	928	ND	39.7	10-120			
Chrysene	593	6.1	23.2	ug/kg	580	10.8	100	47-120			
bis(2-Ethylhexyl)phthalate	655	33.4	58.0	ug/kg	580	ND	113	34-130			
Di-n-Octylphthalate	568	10.1	23.2	ug/kg	580	ND	97.9	28-124			
Benzo(a)fluoranthene, Total	1210	11.8	46.4	ug/kg	1160	21.1	102	30-160			
Benzo(a)pyrene	564	7.5	23.2	ug/kg	580	10.4	95.2	42-120			
Indeno(1,2,3-cd)pyrene	569	6.9	23.2	ug/kg	580	7.7	96.6	42-163			
Dibenzo(a,h)anthracene	594	7.1	23.2	ug/kg	580	ND	102	30-133			
Benzo(g,h,i)perylene	610	6.8	23.2	ug/kg	580	13.5	103	46-148			
1-Methylnaphthalene	501	6.9	23.2	ug/kg	580	ND	86.3	42-120			
Surrogate: Phenol-d5	1560			ug/kg	1740	759	89.5	29-120			
Surrogate: 2-Chlorophenol-d4	1640			ug/kg	1740	998	94.2	31-120			
Surrogate: 1,2-Dichlorobenzene-d4	1000			ug/kg	1160	659	86.5	32-120			
Surrogate: Nitrobenzene-d5	1060			ug/kg	1160	702	91.6	30-120			
Surrogate: 2-Fluorobiphenyl	1050			ug/kg	1160	676	90.8	35-120			
Surrogate: 2,4,6-Tribromophenol	1470			ug/kg	1740	899	84.4	24-134			

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: EMJ
Project Number: 21-1-12596-04
Project Manager: Shoshana Howard

Reported:
03-Aug-2021 16:23

Semivolatile Organic Compounds - Quality Control

Batch BJB0517 - EPA 3546 (Microwave)

Instrument: NT10

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BJB0517-MS1)		Source: 21B0101-01		Prepared: 18-Feb-2021		Analyzed: 06-Mar-2021 21:01					
Surrogate: <i>p</i> -Terphenyl- <i>d</i> 14	1050			ug/kg	1160	631	90.9	37-120			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

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 Shannon & Wilson, Inc
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 Seattle WA, 98103-8636

 Project: EMJ
 Project Number: 21-1-12596-04
 Project Manager: Shoshana Howard

Reported:
 03-Aug-2021 16:23

Semivolatile Organic Compounds - Quality Control
Batch BJB0517 - EPA 3546 (Microwave)

Instrument: NT10

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BJB0517-MSD1)											
		Source: 21B0101-01				Prepared: 18-Feb-2021	Analyzed: 06-Mar-2021 21:38				
Phenol	375	9.5	23.2	ug/kg	580	ND	64.6	34-120	13.60	30	
bis(2-chloroethyl) ether	509	7.9	23.2	ug/kg	580	ND	87.8	36-120	9.80	30	
2-Chlorophenol	377	7.5	23.2	ug/kg	580	ND	64.9	39-120	24.10	30	
1,3-Dichlorobenzene	475	5.9	23.2	ug/kg	580	ND	82.0	40-120	7.14	30	
1,4-Dichlorobenzene	487	5.1	23.2	ug/kg	580	ND	83.9	39-120	8.98	30	
1,2-Dichlorobenzene	465	5.4	23.2	ug/kg	580	ND	80.1	40-120	9.51	30	
Benzyl Alcohol	422	17.3	23.2	ug/kg	580	ND	72.7	19-120	6.02	30	
2,2'-Oxybis(1-chloropropane)	447	6.6	23.2	ug/kg	580	ND	77.0	32-120	12.50	30	
2-Methylphenol	376	9.1	23.2	ug/kg	580	ND	64.8	28-120	13.00	30	
Hexachloroethane	514	6.6	23.2	ug/kg	580	ND	88.6	38-120	9.15	30	
N-Nitroso-di-n-Propylamine	448	12.5	23.2	ug/kg	580	ND	77.2	34-120	12.70	30	
4-Methylphenol	376	17.1	23.2	ug/kg	580	ND	64.8	29-120	16.20	30	
Nitrobenzene	429	9.2	23.2	ug/kg	580	ND	73.9	36-120	19.20	30	
Isophorone	445	9.0	23.2	ug/kg	580	ND	76.7	37-120	21.20	30	
2-Nitrophenol	354	8.0	23.2	ug/kg	580	ND	61.0	30-120	19.50	30	
2,4-Dimethylphenol	865	31.1	116	ug/kg	1510	ND	57.4	10-120	15.80	30	
Bis(2-Chloroethoxy)methane	460	7.4	23.2	ug/kg	580	ND	79.3	39-120	18.90	30	
2,4-Dichlorophenol	1160	37.1	116	ug/kg	1510	ND	76.7	28-120	20.40	30	
1,2,4-Trichlorobenzene	431	6.9	23.2	ug/kg	580	ND	74.2	35-120	14.00	30	
Naphthalene	426	6.1	23.2	ug/kg	580	4.7	73.4	43-120	17.40	30	
Benzoic acid	ND	68.6	232	ug/kg	2670	ND		10-120			*, U
4-Chloroaniline	679	39.1	116	ug/kg	1510	ND	45.0	11-120	0.29	30	
Hexachlorobutadiene	421	5.8	23.2	ug/kg	580	ND	72.5	37-120	18.60	30	
4-Chloro-3-Methylphenol	1230	33.5	116	ug/kg	1510	ND	81.7	32-120	23.30	30	
2-Methylnaphthalene	396	6.6	23.2	ug/kg	580	5.1	68.3	43-120	19.90	30	
Hexachlorocyclopentadiene	609	47.9	116	ug/kg	1510	ND	40.4	10-120	14.10	30	
2,4,6-Trichlorophenol	1030	29.5	116	ug/kg	1510	ND	68.4	44.6-132	23.00	30	
2,4,5-Trichlorophenol	1160	31.2	116	ug/kg	1510	ND	77.0	51.5-129	20.80	30	
2-Chloronaphthalene	468	5.2	23.2	ug/kg	580	ND	80.7	40-120	16.00	30	
2-Nitroaniline	1530	35.0	116	ug/kg	1510	ND	101	40-152	15.50	30	
Acenaphthylene	374	5.5	23.2	ug/kg	580	ND	64.5	42-120	12.70	30	
Dimethylphthalate	434	7.5	23.2	ug/kg	580	ND	74.8	43-120	12.80	30	
2,6-Dinitrotoluene	1390	31.0	116	ug/kg	1510	ND	91.9	31-156	13.90	30	
Acenaphthene	410	6.0	23.2	ug/kg	580	ND	70.8	45-120	17.10	30	
3-Nitroaniline	970	43.7	116	ug/kg	1510	ND	64.3	22-120	8.88	30	
2,4-Dinitrophenol	1250	47.9	232	ug/kg	2670	ND	46.7	10-120	25.10	30	

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 Shannon & Wilson, Inc
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 Seattle WA, 98103-8636

 Project: EMJ
 Project Number: 21-1-12596-04
 Project Manager: Shoshana Howard

Reported:
 03-Aug-2021 16:23

Semivolatile Organic Compounds - Quality Control
Batch BJB0517 - EPA 3546 (Microwave)

Instrument: NT10

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BJB0517-MSD1)											
		Source: 21B0101-01		Prepared: 18-Feb-2021		Analyzed: 06-Mar-2021 21:38					
Dibenzofuran	405	5.3	23.2	ug/kg	580	ND	69.7	43-120	17.30	30	
4-Nitrophenol	779	51.5	116	ug/kg	1510	ND	51.6	15-138	29.90	30	
2,4-Dinitrotoluene	1540	26.6	116	ug/kg	1510	ND	102	44-150	16.00	30	
Fluorene	353	5.7	23.2	ug/kg	580	ND	60.8	45-120	10.80	30	
4-Chlorophenylphenyl ether	360	8.1	23.2	ug/kg	580	ND	62.0	36-141	14.60	30	
Diethyl phthalate	432	20.5	23.2	ug/kg	580	ND	74.5	50-120	13.30	30	
4-Nitroaniline	1200	40.5	116	ug/kg	1510	ND	79.9	24-168	12.30	30	
4,6-Dinitro-2-methylphenol	1910	58.6	232	ug/kg	2670	ND	71.7	33-144	24.70	30	
N-Nitrosodiphenylamine	423	11.1	23.2	ug/kg	580	ND	73.0	70-154	18.30	30	
4-Bromophenyl phenyl ether	442	7.0	23.2	ug/kg	580	ND	76.2	39-120	22.80	30	
Hexachlorobenzene	434	5.5	23.2	ug/kg	580	ND	74.8	33-120	20.30	30	
Pentachlorophenol	259	36.3	116	ug/kg	1510	ND	17.1	16-120	104.00	30	*
Phenanthrene	477	5.4	23.2	ug/kg	580	12.6	79.8	49-120	21.80	30	
Anthracene	434	6.9	23.2	ug/kg	580	ND	74.8	45-120	20.40	30	
Carbazole	470	8.6	23.2	ug/kg	580	ND	81.1	43-135	21.60	30	
Di-n-Butylphthalate	508	6.2	23.2	ug/kg	580	23.6	83.5	48-126	20.40	30	
Fluoranthene	508	5.2	23.2	ug/kg	580	13.0	84.9	53-145	20.60	30	
Pyrene	491	6.4	23.2	ug/kg	580	13.9	81.9	52-134	20.20	30	
Butylbenzylphthalate	483	9.3	23.2	ug/kg	580	ND	83.3	45-132	16.90	30	
Benzo(a)anthracene	436	6.0	23.2	ug/kg	580	6.3	73.9	49-120	20.70	30	
3,3'-Dichlorobenzidine	398	36.2	116	ug/kg	928	ND	42.9	10-120	7.76	30	
Chrysene	474	6.1	23.2	ug/kg	580	10.8	79.5	47-120	22.40	30	
bis(2-Ethylhexyl)phthalate	535	33.4	58.0	ug/kg	580	ND	92.1	34-130	20.30	30	
Di-n-Octylphthalate	474	10.1	23.2	ug/kg	580	ND	81.8	28-124	17.90	30	
Benzo(a)fluoranthene, Total	994	11.8	46.4	ug/kg	1160	21.1	83.5	30-160	19.40	30	
Benzo(a)pyrene	459	7.5	23.2	ug/kg	580	10.4	77.1	42-120	20.60	30	
Indeno(1,2,3-cd)pyrene	462	6.9	23.2	ug/kg	580	7.7	78.2	42-163	20.70	30	
Dibenzo(a,h)anthracene	482	7.1	23.2	ug/kg	580	ND	83.2	30-133	20.80	30	
Benzo(g,h,i)perylene	481	6.8	23.2	ug/kg	580	13.5	80.3	46-148	23.60	30	
1-Methylnaphthalene	400	6.9	23.2	ug/kg	580	ND	69.0	42-120	22.30	30	
Surrogate: Phenol-d5	1310			ug/kg	1740	759	75.4	29-120			
Surrogate: 2-Chlorophenol-d4	1410			ug/kg	1740	998	81.0	31-120			
Surrogate: 1,2-Dichlorobenzene-d4	891			ug/kg	1160	659	76.8	32-120			
Surrogate: Nitrobenzene-d5	888			ug/kg	1160	702	76.5	30-120			
Surrogate: 2-Fluorobiphenyl	900			ug/kg	1160	676	77.5	35-120			
Surrogate: 2,4,6-Tribromophenol	1120			ug/kg	1740	899	64.3	24-134			

Analytical Resources, Inc.

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: EMJ
Project Number: 21-1-12596-04
Project Manager: Shoshana Howard

Reported:
03-Aug-2021 16:23

Semivolatile Organic Compounds - Quality Control

Batch BJB0517 - EPA 3546 (Microwave)

Instrument: NT10

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BJB0517-MSD1)		Source: 21B0101-01		Prepared: 18-Feb-2021 Analyzed: 06-Mar-2021 21:38							
Surrogate: <i>p</i> -Terphenyl- <i>d</i> 14	866			ug/kg	1160	631	74.6	37-120			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Analytical Resources, Inc.

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: EMJ
Project Number: 21-1-12596-04
Project Manager: Shoshana Howard

Reported:
03-Aug-2021 16:23

Petroleum Hydrocarbons - Quality Control

Batch BJB0456 - EPA 3546 (Microwave)

Instrument: FID4

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0456-BLK1)				Prepared: 17-Feb-2021 Analyzed: 26-Feb-2021 10:25						
Diesel Range Organics (C12-C24)	ND	5.00	mg/kg							U
Motor Oil Range Organics (C24-C38)	ND	10.0	mg/kg							U
Surrogate: o-Terphenyl	11.9		mg/kg	11.3		106	50-150			

Analytical Resources, Inc.

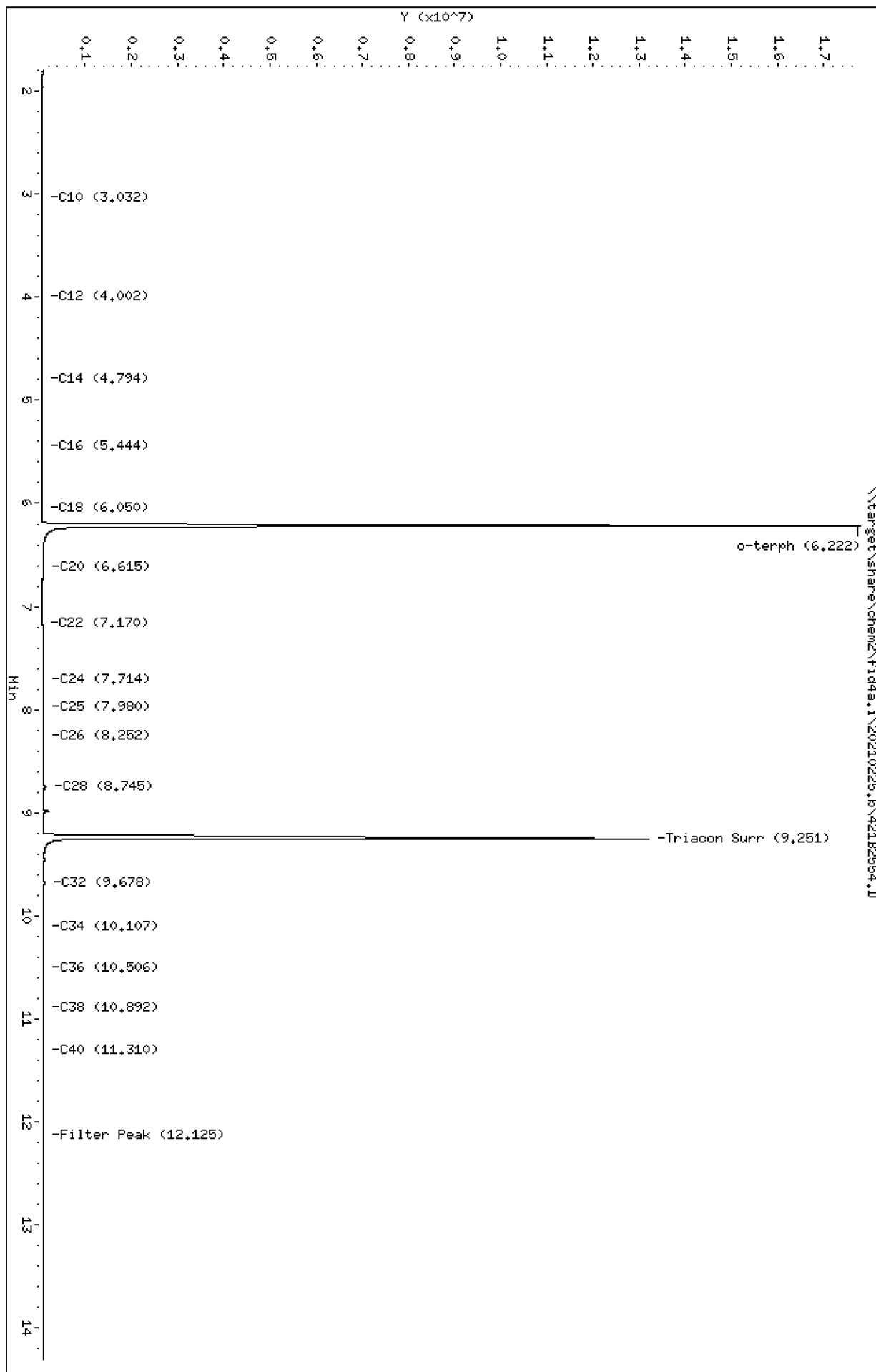
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Data File: \\target\share\chem2\fid4a,1\20210225,b\421B2554.D
Date : 26-FEB-2021 10:25
Client ID:
Sample Info: BJB0456-BLK1

Column phase: RTX-1

Instrument: fid4a,1
Operator: CTO
Column diameter: 0.25



Analytical Resources Inc.
TPH Quantitation Report

Data file: 20210225.b/421B2554.D

ARI ID: BJB0456-BLK1

Method: 20210225.b\FID4TPH.m

Client ID:

Instrument: fid4a.i, CTO

Injection: 26-FEB-2021 10:25

Report Date: 03/02/2021

Dilution Factor: 1

Macro: 09-SEP-2019

RT Std: 419H1603.D

Calibration Dates: Gas:XX-XXX-XXXX Diesel:08-JAN-2021 M.Oil:08-JAN-2021

FID:4A RESULTS

Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc (mg/L)
C8	1.909	0.008	10562	7306	WATPHD	(C12-C24)	1589165	11.6
C10	3.032	0.003	3501	1207	WATPHM	(C24-C38)	4574156	44.9
C12	4.002	-0.005	1078	263	AK102	(C10-C25)	1909468	11.4
C14	4.794	0.009	309	127	AK103	(C25-C36)	3644320	48.5
C16	5.444	-0.006	1938	1476	OR.DIES	(C10-C28)	3023845	15.4
C18	6.050	0.003	5047	2943				
C20	6.615	0.003	17011	14239	JET-A	(C10-C18)	285430	1.7
C22	7.170	-0.002	14729	3674				
C24	7.714	-0.004	20183	11042				
C25	7.980	-0.006	19689	9781				
C26	8.252	0.006	21727	46386				
C28	8.745	-0.005	77359	116415				
C32	9.678	-0.002	72429	230470				
C34	10.107	0.001	27086	16135				
Filter Peak	12.125	0.000	34899	12202	BUNKERC	(C10-C38)	6287419	159.3
C36	10.506	-0.003	29878	17878				
C38	10.892	-0.002	34273	10261				
C40	11.310	-0.006	35106	26308				
o-terph	6.222	0.000	17726872	20247659				
Triacon Surr	9.251	-0.001	13153034	18926711	NAS DIES	(C10-C24)	1713263	8.8

Range Times: NW Diesel(4.007 - 7.718) AK102(3.03 - 7.99) Jet A(3.03 - 6.05)
 NW M.Oil(7.72 - 10.89) AK103(7.99 - 10.51) OR Diesel(3.03 - 8.75)

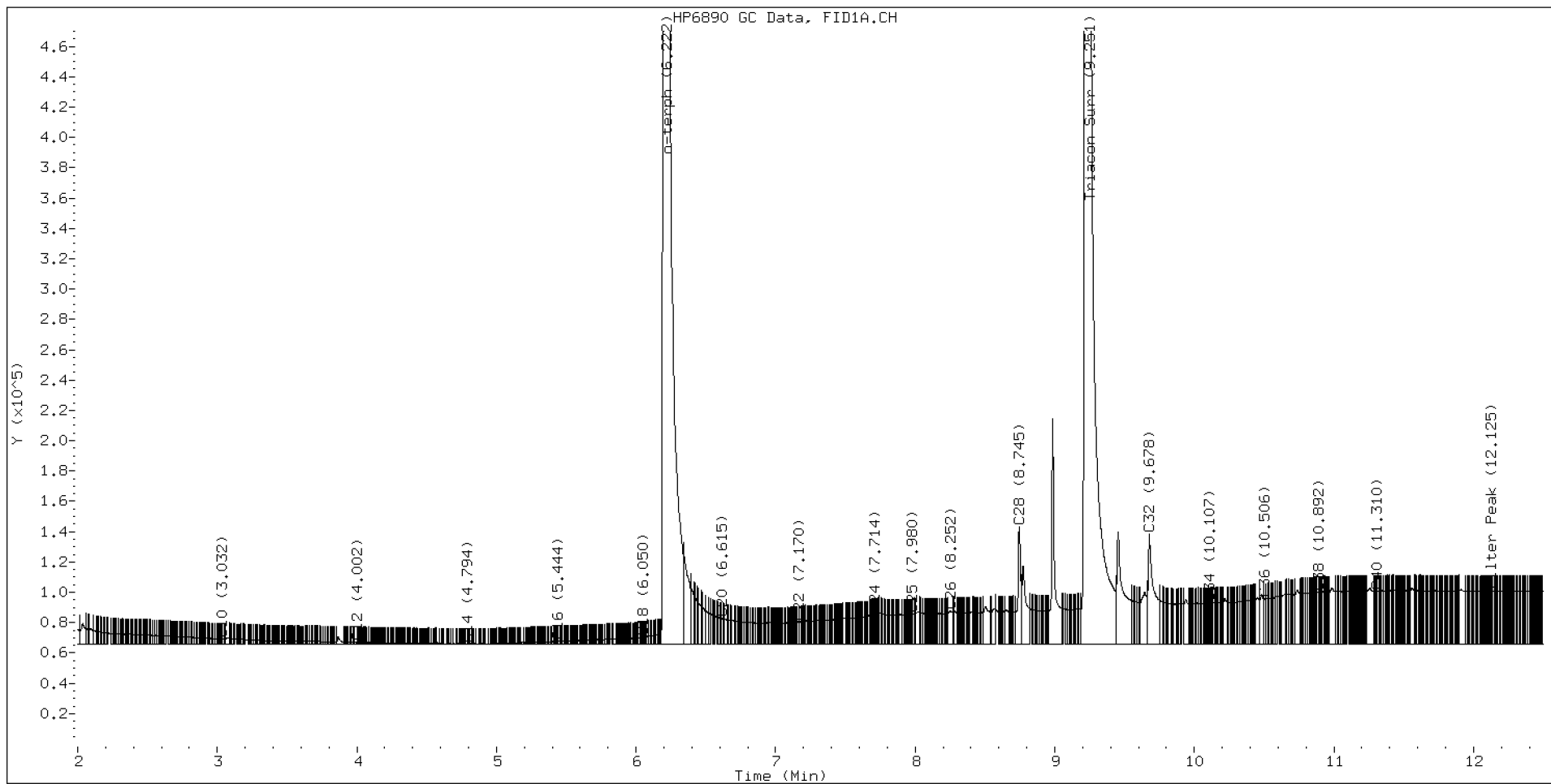
Surrogate	Area	Amount
o-Terphenyl	20247659	118.7
Triacontane	18926711	133.8

M Indicates the peak was manually integrated

Analyte	RF	Curve Date
o-Terph Surr	170577.7	25-OCT-2019
Triacon Surr	141415.7	25-OCT-2019
Gas	15000.0	XX-XXX-XXXX
Diesel	137498.1	08-JAN-2021
Motor Oil	101807.5	08-JAN-2021
AK102	168065.4	08-JAN-2021
AK103	75177.3	08-JAN-2021
JetA	165849.0	20-MAY-2020
OR Diesel	195999.1	25-OCT-2019
NAS Diesel	195148.2	25-OCT-2019
Bunker C	39477.2	13-MAR-2020

Datafile: FID4A, 20210225.b/421B2554.D

BJB0456-BLK1





Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: EMJ
Project Number: 21-1-12596-04
Project Manager: Shoshana Howard

Reported:
03-Aug-2021 16:23

Petroleum Hydrocarbons - Quality Control

Batch BJB0456 - EPA 3546 (Microwave)

Instrument: FID4

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJB0456-BS1)					Prepared: 17-Feb-2021 Analyzed: 26-Feb-2021 10:46					
Diesel Range Organics (C12-C24)	163	5.00	mg/kg	150		108	63-120			
Surrogate: o-Terphenyl	12.5		mg/kg	11.3		111	50-150			

Analytical Resources, Inc.

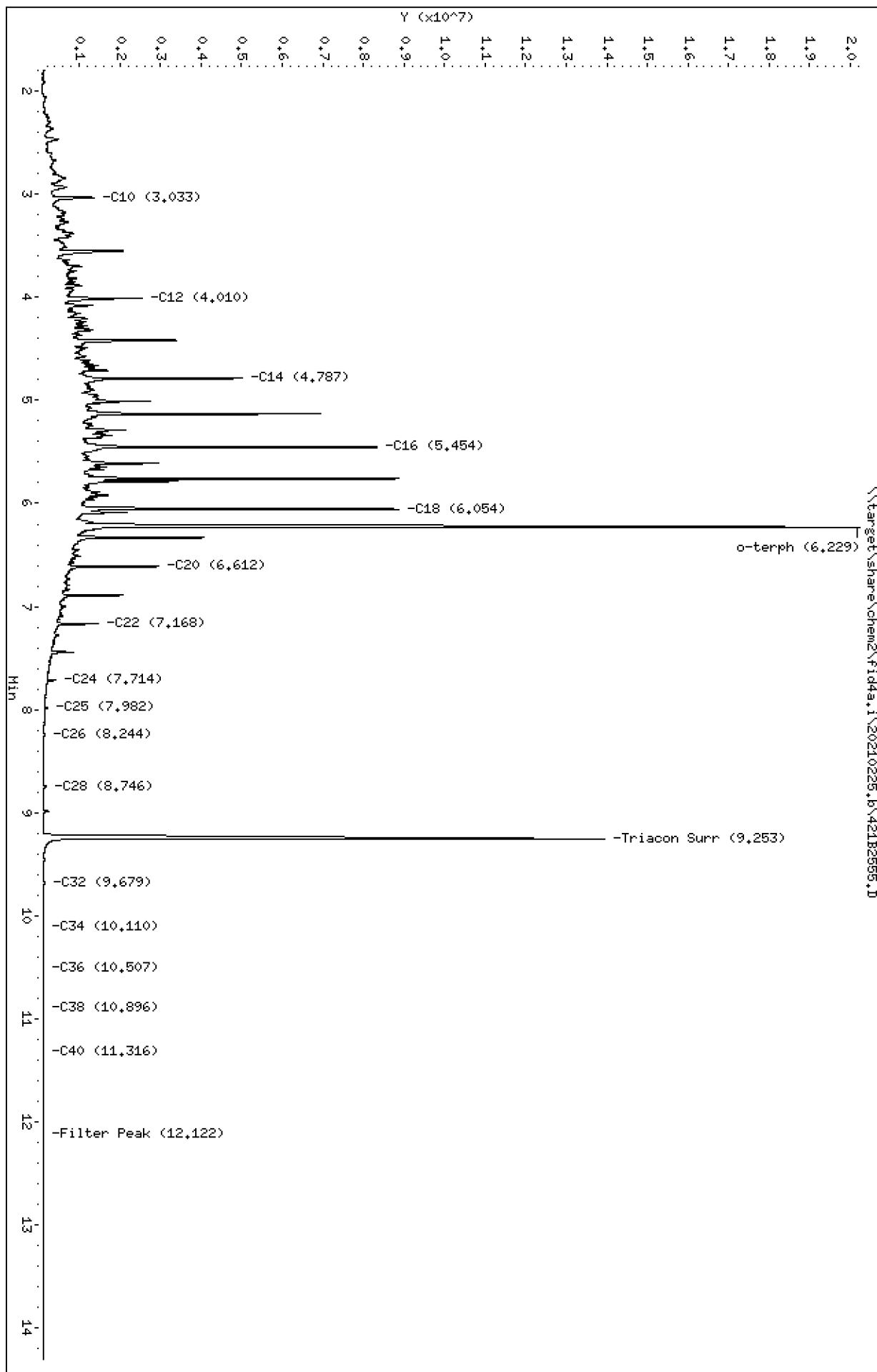
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Data File: \\target\share\chem2\fid4a,1\20210225,b\421B2555.D
Date : 26-FEB-2021 10:46
Client ID:
Sample Info: BJB0456-BS1

Column phase: RTX-1

Instrument: fid4a,1
Operator: CTO
Column diameter: 0.25



Analytical Resources Inc.
TPH Quantitation Report

Data file: 20210225.b/421B2555.D

ARI ID: BJB0456-BS1

Method: 20210225.b\FID4TPH.m

Client ID:

Instrument: fid4a.i, CTO

Injection: 26-FEB-2021 10:46

Report Date: 03/02/2021

Dilution Factor: 1

Macro: 09-SEP-2019

RT Std: 419H1603.D

Calibration Dates: Gas:XX-XXX-XXXX Diesel:08-JAN-2021 M.Oil:08-JAN-2021

FID:4A RESULTS

Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc (mg/L)
C8	1.912	0.011	82789	101430	WATPHD	(C12-C24)	223669564	1626.7
C10	3.033	0.005	1276221	1908063	WATPHM	(C24-C38)	5638763	55.4
C12	4.010	0.003	2458440	4373305	AK102	(C10-C25)	263795233	1569.6
C14	4.787	0.003	4943442	4934295	AK103	(C25-C36)	4276783	56.9
C16	5.454	0.005	8248615	9812712	OR.DIES	(C10-C28)	265976936	1357.0
C18	6.054	0.007	8812109	10135213				
C20	6.612	-0.000	2882830	3174007	JET-A	(C10-C18)	204824262	1235.0
C22	7.168	-0.004	1396476	1591054				
C24	7.714	-0.004	323868	531669				
C25	7.982	-0.004	131174	423117				
C26	8.244	-0.002	67623	137913				
C28	8.746	-0.004	98380	128830				
C32	9.679	-0.000	68406	168806				
C34	10.110	0.004	20696	12348				
Filter Peak	12.122	-0.004	24648	13528	BUNKERC	(C10-C38)	268624231	6804.5
C36	10.507	-0.003	22637	10174				
C38	10.896	0.001	25754	10276				
C40	11.316	-0.000	25719	7702				
o-terph	6.229	0.007	19061415	21293252				
Triacon Surr	9.253	0.001	13885046	20338288	NAS DIES	(C10-C24)	262985468	1347.6

Range Times: NW Diesel(4.007 - 7.718) AK102(3.03 - 7.99) Jet A(3.03 - 6.05)
 NW M.Oil(7.72 - 10.89) AK103(7.99 - 10.51) OR Diesel(3.03 - 8.75)

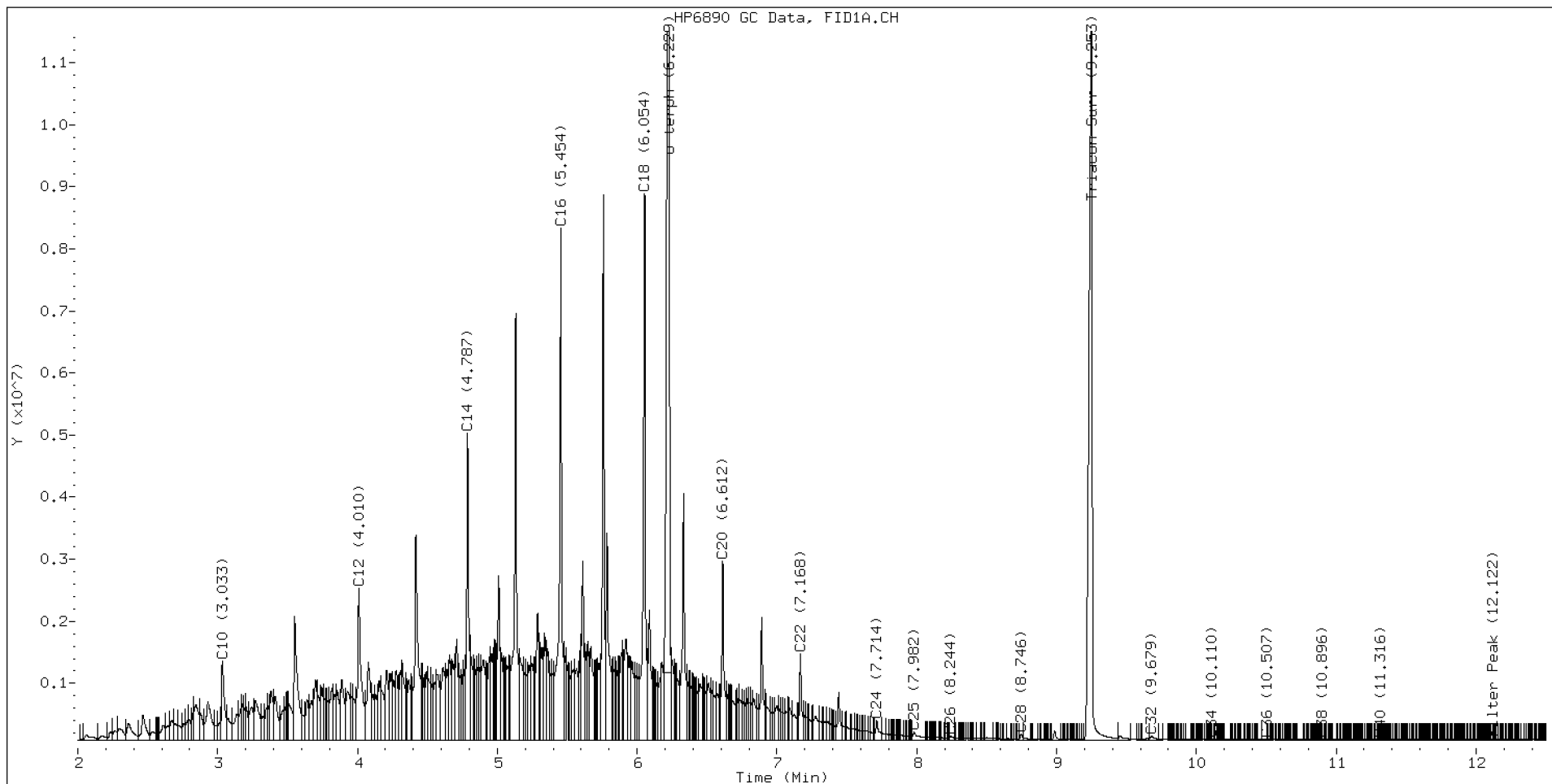
Surrogate	Area	Amount
o-Terphenyl	21293252	124.8 M
Triacontane	20338288	143.8

M Indicates the peak was manually integrated

Analyte	RF	Curve Date
o-Terph Surr	170577.7	25-OCT-2019
Triacon Surr	141415.7	25-OCT-2019
Gas	15000.0	XX-XXX-XXXX
Diesel	137498.1	08-JAN-2021
Motor Oil	101807.5	08-JAN-2021
AK102	168065.4	08-JAN-2021
AK103	75177.3	08-JAN-2021
JetA	165849.0	20-MAY-2020
OR Diesel	195999.1	25-OCT-2019
NAS Diesel	195148.2	25-OCT-2019
Bunker C	39477.2	13-MAR-2020

Datafile: FID4A, 20210225.b/421B2555.D

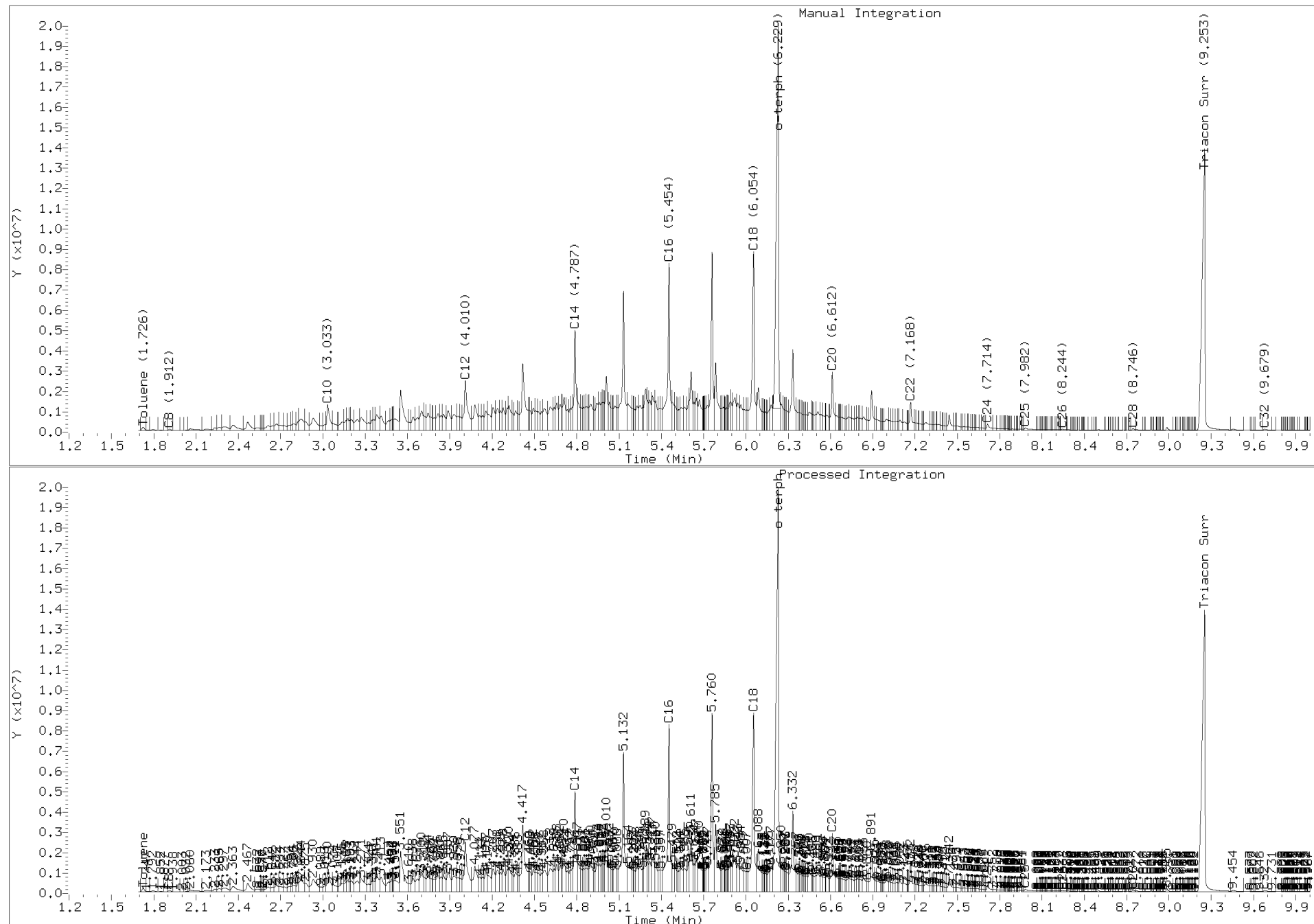
BJB0456-BS1



TPH Manual Integrations Report

Datafile: FID4A, 20210225.b/421B2555.D Injection: 26-FEB-2021 10:46

Lab ID:BJB0456-BS1





Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: EMJ
Project Number: 21-1-12596-04
Project Manager: Shoshana Howard

Reported:
03-Aug-2021 16:23

Petroleum Hydrocarbons - Quality Control

Batch BJB0456 - EPA 3546 (Microwave)

Instrument: FID4

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BJB0456-MS1)		Source: 21B0101-01		Prepared: 17-Feb-2021		Analyzed: 26-Feb-2021 11:28				
Diesel Range Organics (C12-C24)	203	5.80	mg/kg	174	10.1	111	63-120			
Surrogate: o-Terphenyl	14.6		mg/kg	13.1	14.2	112	50-150			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Analytical Resources, Inc.

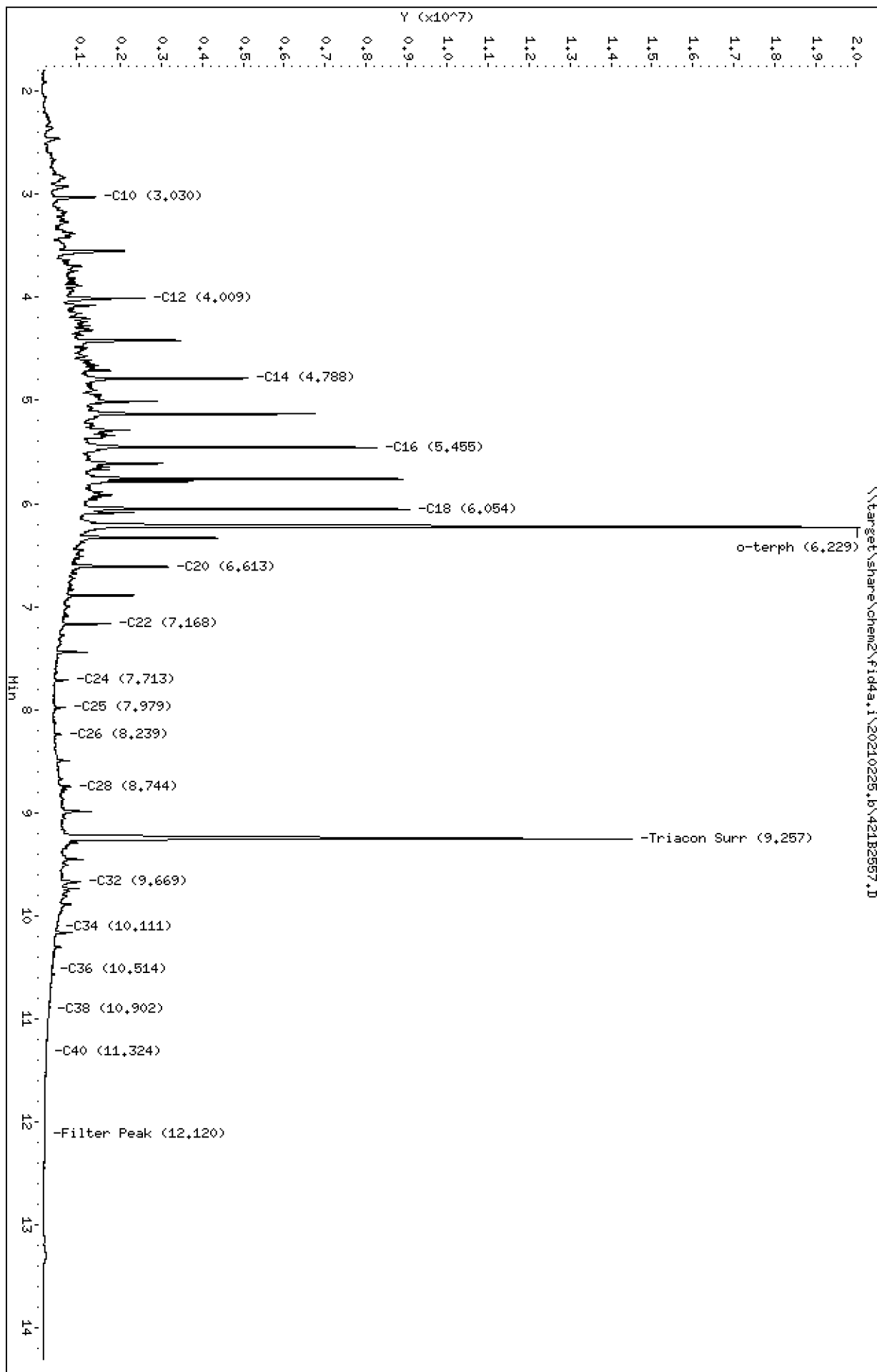
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Data File: \\target\share\chem2\fid4a,1\20210225,b\421B2557.D
Date: 26-FEB-2021 11:28
Client ID:
Sample Info: BJB0456-MS1

Column phase: RTX-1

Instrument: fid4a,1
Operator: CTO
Column diameter: 0.25



Analytical Resources Inc.
TPH Quantitation Report

Data file: 20210225.b/421B2557.D

ARI ID: BJB0456-MS1

Method: 20210225.b\FID4TPH.m

Client ID:

Instrument: fid4a.i, CTO

Injection: 26-FEB-2021 11:28

Report Date: 03/02/2021

Dilution Factor: 1

Macro: 09-SEP-2019

RT Std: 419H1603.D

Calibration Dates: Gas:XX-XXX-XXXX Diesel:08-JAN-2021 M.Oil:08-JAN-2021

FID:4A RESULTS

Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc (mg/L)
C8	1.911	0.010	97764	111080	WATPHD	(C12-C24)	240606474	1749.9
C10	3.030	0.001	1306872	1955215	WATPHM	(C24-C38)	73428145	721.2
C12	4.009	0.002	2530555	4298435	AK102	(C10-C25)	282558117	1681.2
C14	4.788	0.003	5033783	6585788	AK103	(C25-C36)	65789928	875.1
C16	5.455	0.006	8202070	9851217	OR.DIES	(C10-C28)	300822831	1534.8
C18	6.054	0.007	9005760	10434782				
C20	6.613	-0.000	3091530	4131799	JET-A	(C10-C18)	209292295	1261.9
C22	7.168	-0.004	1677364	1792156				
C24	7.713	-0.005	643487	939475				
C25	7.979	-0.006	567510	763040				
C26	8.239	-0.007	454914	717209				
C28	8.744	-0.006	699462	1174897				
C32	9.669	-0.010	933519	1765915				
C34	10.111	0.005	360618	125636				
Filter Peak	12.120	-0.005	58244	31576	BUNKERC	(C10-C38)	353121198	8944.9
C36	10.514	0.005	240732	36076				
C38	10.902	0.007	170250	59390				
C40	11.324	0.008	100983	30222				
o-terph	6.229	0.007	18784390	21464618				
Triacon Surr	9.257	0.005	13873275	20272837	NAS DIES	(C10-C24)	279693053	1433.2

Range Times: NW Diesel(4.007 - 7.718) AK102(3.03 - 7.99) Jet A(3.03 - 6.05)
 NW M.Oil(7.72 - 10.89) AK103(7.99 - 10.51) OR Diesel(3.03 - 8.75)

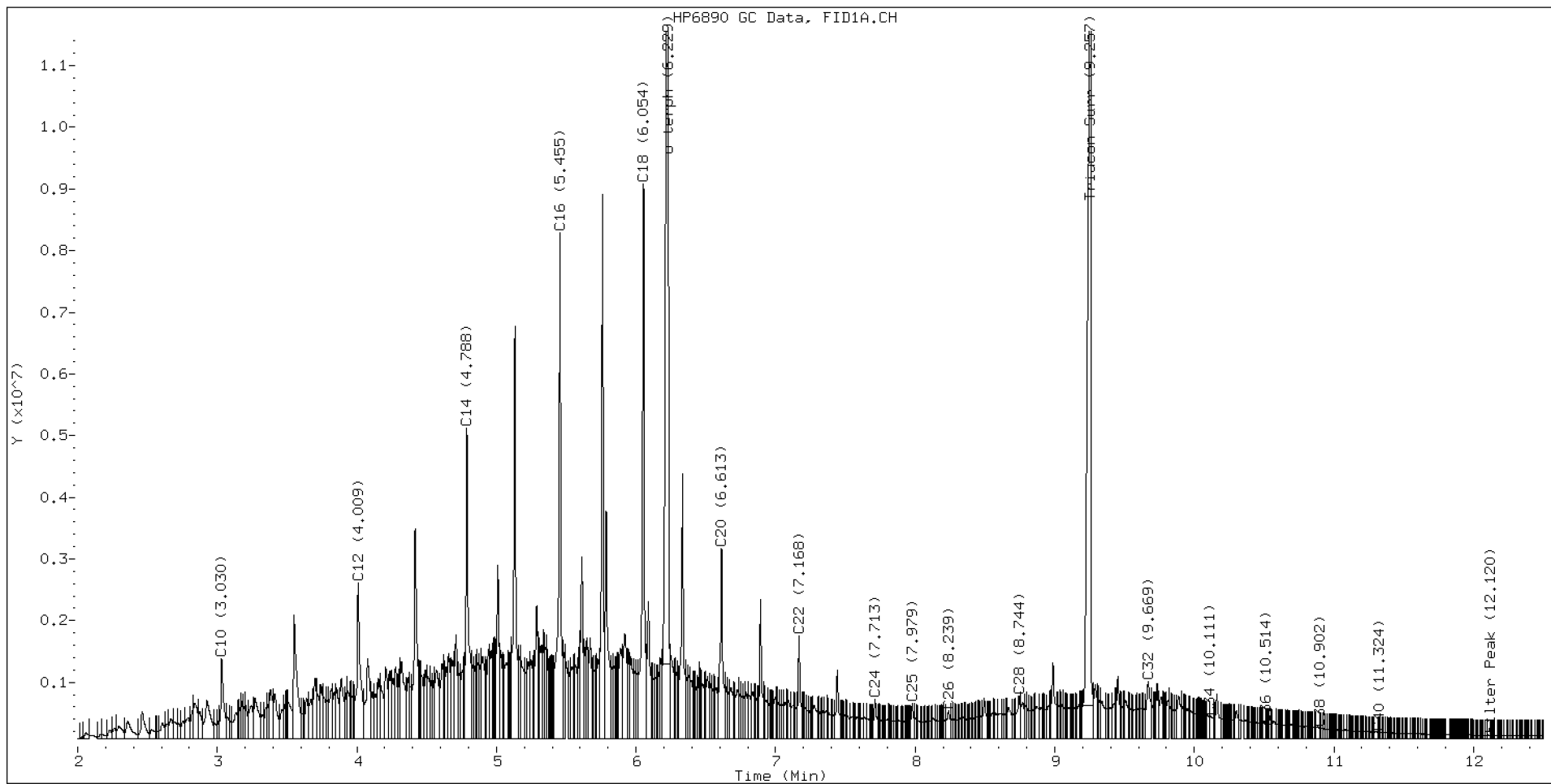
Surrogate	Area	Amount
o-Terphenyl	21464618	125.8 M
Triacontane	20272837	143.4 M

M Indicates the peak was manually integrated

Analyte	RF	Curve Date
o-Terph Surr	170577.7	25-OCT-2019
Triacon Surr	141415.7	25-OCT-2019
Gas	15000.0	XX-XXX-XXXX
Diesel	137498.1	08-JAN-2021
Motor Oil	101807.5	08-JAN-2021
AK102	168065.4	08-JAN-2021
AK103	75177.3	08-JAN-2021
JetA	165849.0	20-MAY-2020
OR Diesel	195999.1	25-OCT-2019
NAS Diesel	195148.2	25-OCT-2019
Bunker C	39477.2	13-MAR-2020

Datafile: FID4A, 20210225.b/421B2557.D

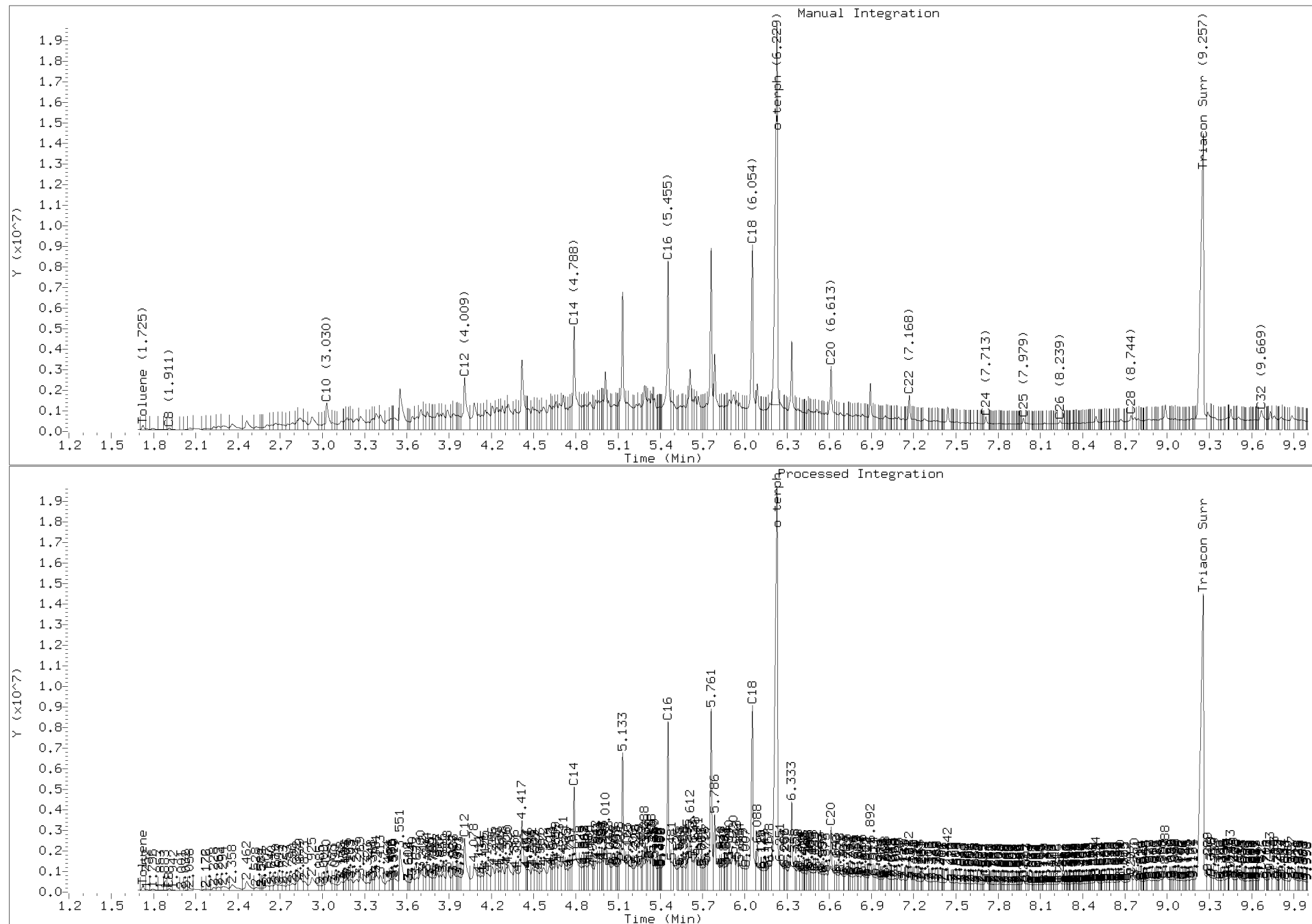
BJB0456-MS1



TPH Manual Integrations Report

Datafile: FID4A, 20210225.b/421B2557.D Injection: 26-FEB-2021 11:28

Lab ID:BJB0456-MS1





Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: EMJ
Project Number: 21-1-12596-04
Project Manager: Shoshana Howard

Reported:
03-Aug-2021 16:23

Petroleum Hydrocarbons - Quality Control

Batch BJB0456 - EPA 3546 (Microwave)

Instrument: FID4

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BJB0456-MSD1)		Source: 21B0101-01		Prepared: 17-Feb-2021		Analyzed: 26-Feb-2021 11:49				
Diesel Range Organics (C12-C24)	204	5.80	mg/kg	174	10.1	112	63-120	0.60	30	
Surrogate: o-Terphenyl	15.1		mg/kg	13.1	14.2	116	50-150			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Analytical Resources, Inc.

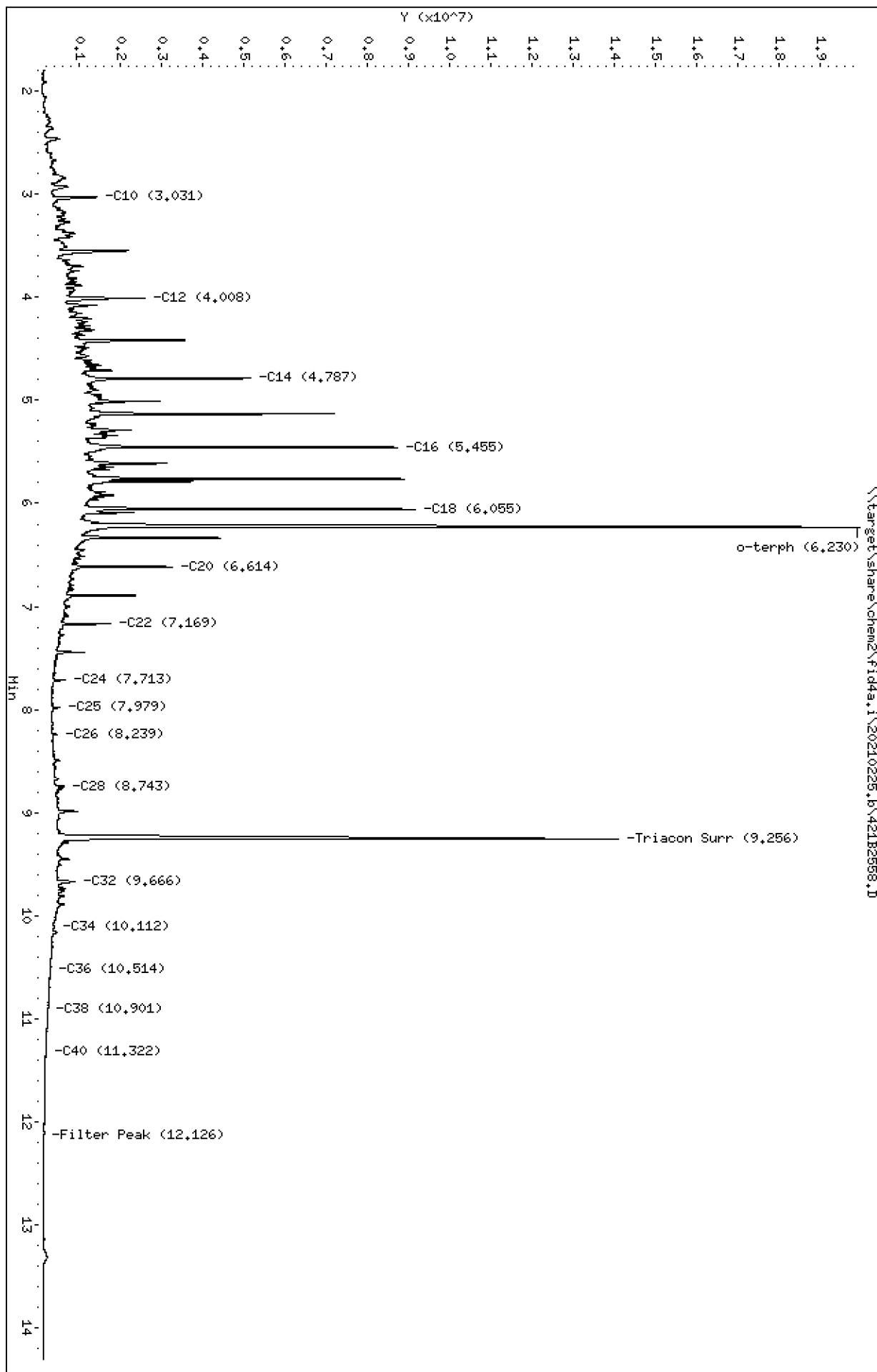
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Data File: \\target\share\chem2\fid4a,1\20210225,b\421B2558.D
Date: 26-FEB-2021 11:49
Client ID:
Sample Info: BJB0456-MSD1

Column phase: RTX-1

Instrument: fid4a,1
Operator: CTO
Column diameter: 0.25



Analytical Resources Inc.
TPH Quantitation Report

Data file: 20210225.b/421B2558.D

ARI ID: BJB0456-MSD1

Method: 20210225.b\FID4TPH.m

Client ID:

Instrument: fid4a.i, CTO

Injection: 26-FEB-2021 11:49

Report Date: 03/02/2021

Dilution Factor: 1

Macro: 09-SEP-2019

RT Std: 419H1603.D

Calibration Dates: Gas:XX-XXX-XXXX Diesel:08-JAN-2021 M.Oil:08-JAN-2021

FID:4A RESULTS

Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc (mg/L)
C8	1.911	0.009	100651	108676	WATPHD	(C12-C24)	242056371	1760.4
C10	3.031	0.003	1319721	1895567	WATPHM	(C24-C38)	58896955	578.5
C12	4.008	0.001	2507205	4329901	AK102	(C10-C25)	283889874	1689.2
C14	4.787	0.003	5088775	6685755	AK103	(C25-C36)	52497782	698.3
C16	5.455	0.005	8636193	10353269	OR.DIES	(C10-C28)	298972786	1525.4
C18	6.055	0.008	9086508	10639191				
C20	6.614	0.001	3183316	3588651	JET-A	(C10-C18)	213357858	1286.5
C22	7.169	-0.003	1656619	1887195				
C24	7.713	-0.005	574789	771150				
C25	7.979	-0.006	437155	691457				
C26	8.239	-0.007	360460	469062				
C28	8.743	-0.007	530560	697933				
C32	9.666	-0.013	797981	1782545				
C34	10.112	0.006	288530	100603				
Filter Peak	12.126	0.000	49437	31888	BUNKERC	(C10-C38)	340302440	8620.2
C36	10.514	0.004	196330	77921				
C38	10.901	0.006	147633	95272				
C40	11.322	0.006	88491	48351				
o-terph	6.230	0.008	18685193	22167288				
Triacon Surr	9.256	0.004	13607223	20381503	NAS DIES	(C10-C24)	281405486	1442.0

Range Times: NW Diesel(4.007 - 7.718) AK102(3.03 - 7.99) Jet A(3.03 - 6.05)
 NW M.Oil(7.72 - 10.89) AK103(7.99 - 10.51) OR Diesel(3.03 - 8.75)

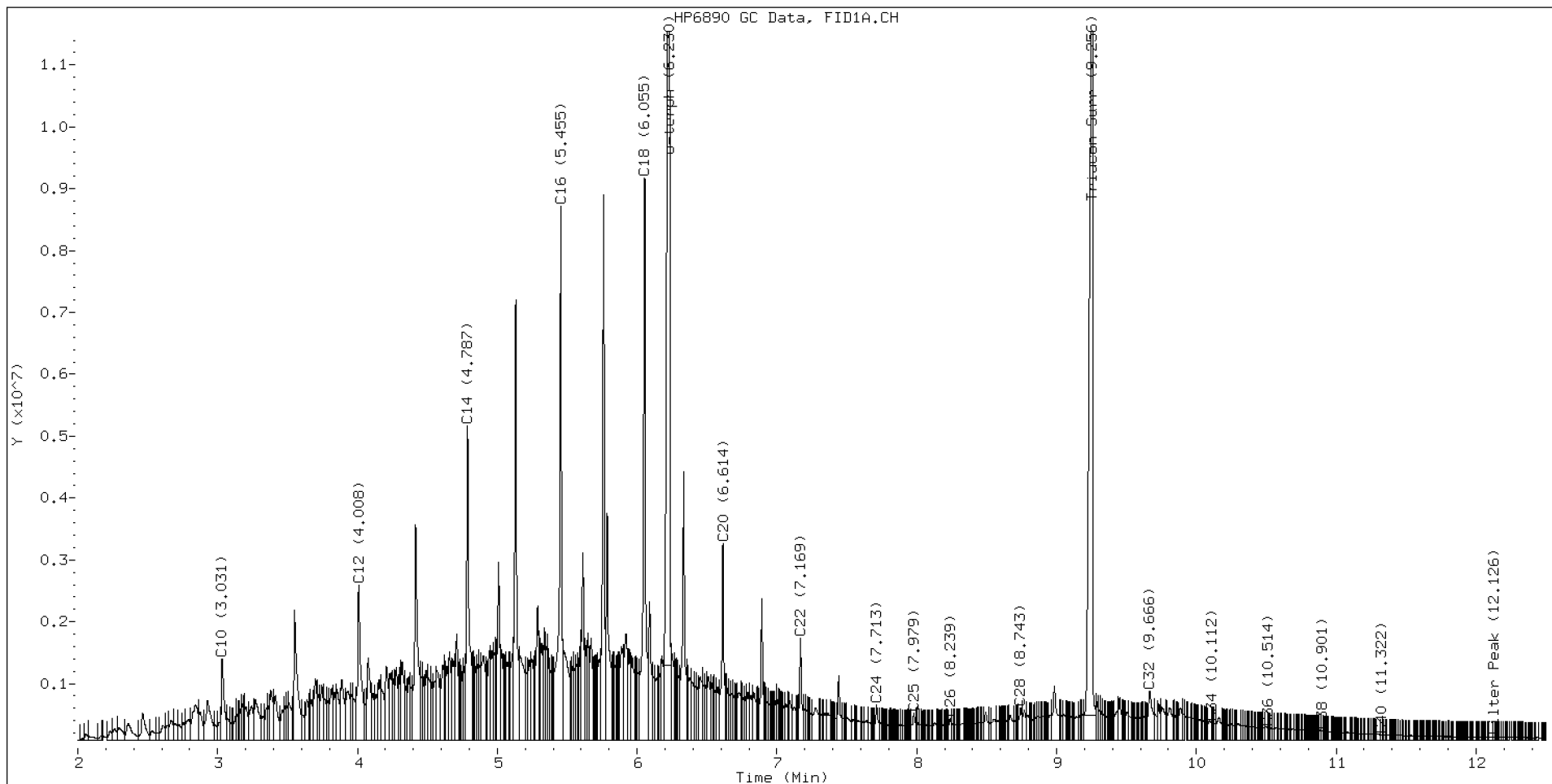
Surrogate	Area	Amount
o-Terphenyl	22167288	130.0 M
Triacontane	20381503	144.1 M

M Indicates the peak was manually integrated

Analyte	RF	Curve Date
o-Terph Surr	170577.7	25-OCT-2019
Triacon Surr	141415.7	25-OCT-2019
Gas	15000.0	XX-XXX-XXXX
Diesel	137498.1	08-JAN-2021
Motor Oil	101807.5	08-JAN-2021
AK102	168065.4	08-JAN-2021
AK103	75177.3	08-JAN-2021
JetA	165849.0	20-MAY-2020
OR Diesel	195999.1	25-OCT-2019
NAS Diesel	195148.2	25-OCT-2019
Bunker C	39477.2	13-MAR-2020

Datafile: FID4A, 20210225.b/421B2558.D

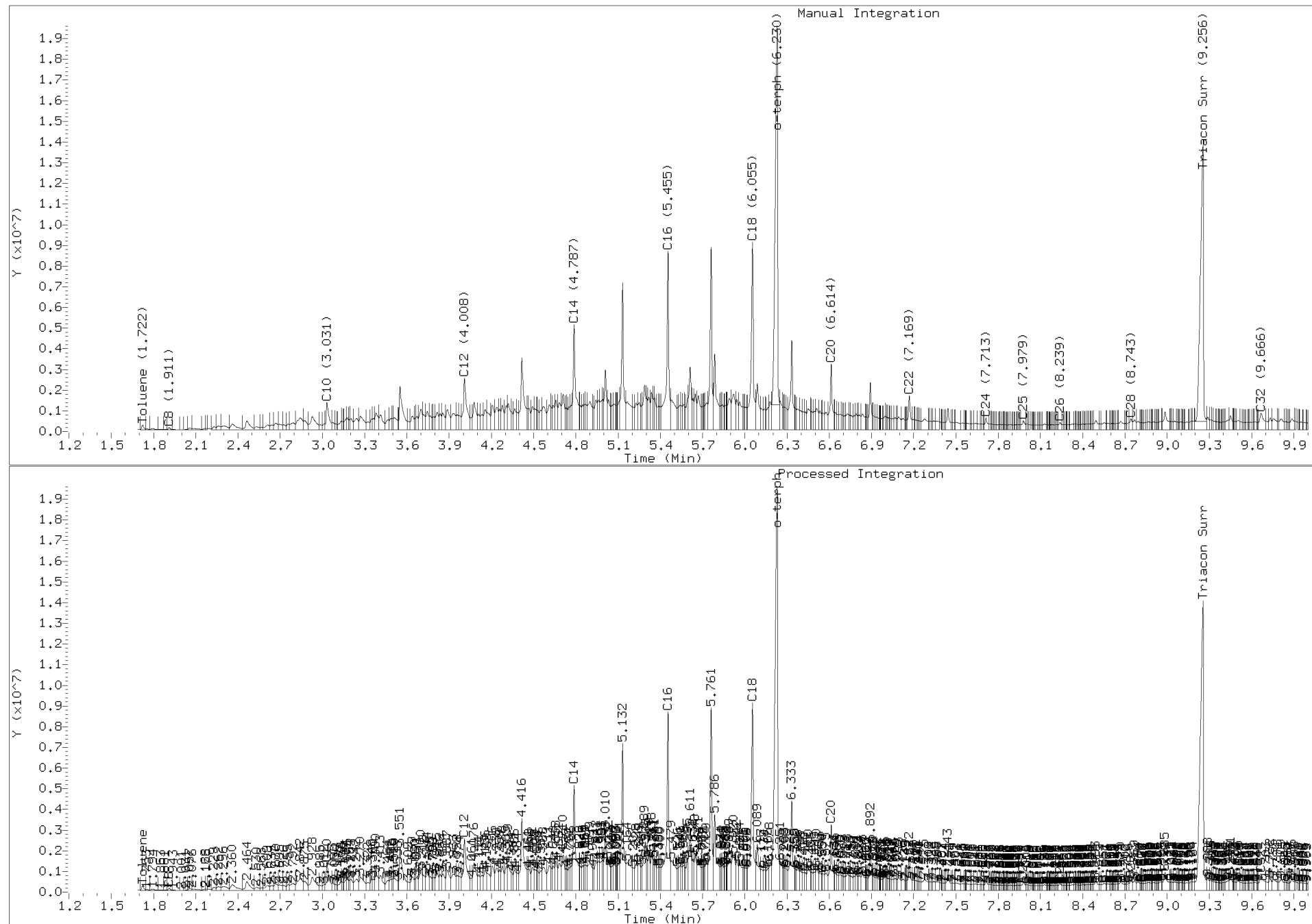
BJB0456-MSD1



TPH Manual Integrations Report

Datafile: FID4A, 20210225.b/421B2558.D Injection: 26-FEB-2021 11:49

Lab ID:BJB0456-MSD1





Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: EMJ
Project Number: 21-1-12596-04
Project Manager: Shoshana Howard

Reported:
03-Aug-2021 16:23

Metals and Metallic Compounds - Quality Control

Batch BJB0429 - SWN EPA 3050B

Instrument: ICPMS2

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0429-BLK1)						Prepared: 17-Feb-2021 Analyzed: 18-Feb-2021 20:05						
Barium	135	ND	0.06	0.50	mg/kg							U
Barium	137	ND	0.05	0.50	mg/kg							U
Chromium	52	ND	0.13	0.50	mg/kg							U
Chromium	53	ND	0.07	0.50	mg/kg							U
Cobalt	59	ND	0.03	0.20	mg/kg							U
Lead	208	ND	0.07	0.10	mg/kg							U
Silver	107	ND	0.02	0.20	mg/kg							U
Vanadium	51a	ND	0.04	0.20	mg/kg							U
Vanadium	51b	ND	0.02	0.20	mg/kg							U
Arsenic	75a	ND	0.02	0.20	mg/kg							U
Cadmium	111	ND	0.03	0.10	mg/kg							U
Cadmium	114	ND	0.04	0.10	mg/kg							U
Copper	63	ND	0.34	0.50	mg/kg							U
Copper	65	ND	0.35	0.50	mg/kg							U
Nickel	60	ND	0.05	0.50	mg/kg							U
Nickel	62	ND	0.22	0.50	mg/kg							U
Selenium	78	ND	0.44	0.50	mg/kg							U
Zinc	66	ND	0.8	4.0	mg/kg							U
Zinc	67	ND	0.9	4.0	mg/kg							U

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4611 S. 134th Place, Suite 100 • Tukwila, WA 98168 • Ph: (206) 695-6200 • Fax: (206) 695-6202



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400 N 34th St., Suite 100
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Project: EMJ
Project Number: 21-1-12596-04
Project Manager: Shoshana Howard

Reported:
03-Aug-2021 16:23

Metals and Metallic Compounds - Quality Control

Batch BJB0429 - SWN EPA 3050B

Instrument: ICPMS2

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJB0429-BS1)						Prepared: 17-Feb-2021 Analyzed: 18-Feb-2021 20:10						
Barium	135	25.0	0.06	0.50	mg/kg	25.0		100	80-120			
Barium	137	24.8	0.05	0.50	mg/kg	25.0		99.3	80-120			
Chromium	52	26.2	0.13	0.50	mg/kg	25.0		105	80-120			
Chromium	53	25.3	0.07	0.50	mg/kg	25.0		101	80-120			
Cobalt	59	24.9	0.03	0.20	mg/kg	25.0		99.5	80-120			
Lead	208	26.8	0.07	0.10	mg/kg	25.0		107	80-120			
Silver	107	26.0	0.02	0.20	mg/kg	25.0		104	80-120			
Vanadium	51a	26.3	0.04	0.20	mg/kg	25.0		105	80-120			
Vanadium	51b	26.0	0.02	0.20	mg/kg	25.0		104	80-120			
Arsenic	75a	24.3	0.02	0.20	mg/kg	25.0		97.3	80-120			
Cadmium	111	25.5	0.03	0.10	mg/kg	25.0		102	80-120			
Cadmium	114	25.5	0.04	0.10	mg/kg	25.0		102	80-120			
Copper	63	25.7	0.34	0.50	mg/kg	25.0		103	80-120			
Copper	65	25.3	0.35	0.50	mg/kg	25.0		101	80-120			
Nickel	60	24.6	0.05	0.50	mg/kg	25.0		98.6	80-120			
Nickel	62	24.5	0.22	0.50	mg/kg	25.0		97.9	80-120			
Zinc	66	77.2	0.8	4.0	mg/kg	80.0		96.5	80-120			
Zinc	67	72.9	0.9	4.0	mg/kg	80.0		91.1	80-120			

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Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: EMJ
Project Number: 21-1-12596-04
Project Manager: Shoshana Howard

Reported:
03-Aug-2021 16:23

Metals and Metallic Compounds - Quality Control

Batch BJB0433 - SMM EPA 7471B

Instrument: HYDRA

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0433-BLK1)						Prepared: 17-Feb-2021 Analyzed: 18-Feb-2021 13:34					
Mercury	ND	0.00525	0.0250	mg/kg							U

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Metals and Metallic Compounds - Quality Control

Batch BJB0433 - SMM EPA 7471B

Instrument: HYDRA

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJB0433-BS1)						Prepared: 17-Feb-2021 Analyzed: 18-Feb-2021 13:36					
Mercury	0.484	0.00525	0.0250	mg/kg	0.500		96.8	80-120			

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Certified Analyses included in this Report

Analyte	Certifications
EPA 6020B in Solid	
Silver-107	NELAP,DoD-ELAP,WADOE
Barium-135	NELAP,DoD-ELAP,WADOE,ADEC
Barium-137	NELAP,DoD-ELAP,WADOE,ADEC
Cobalt-59	NELAP,DoD-ELAP,WADOE
Chromium-52	NELAP,DoD-ELAP,WADOE,ADEC
Chromium-53	NELAP,DoD-ELAP,WADOE,ADEC
Lead-208	NELAP,DoD-ELAP,WADOE,ADEC
Vanadium-51a	NELAP,DoD-ELAP,WADOE,ADEC
Vanadium-51b	DoD-ELAP,WADOE,ADEC
EPA 6020B UCT-KED in Solid	
Arsenic-75a	NELAP,DoD-ELAP,WADOE,ADEC
Cadmium-111	NELAP,DoD-ELAP,WADOE,ADEC
Cadmium-114	NELAP,DoD-ELAP,WADOE,ADEC
Copper-63	NELAP,DoD-ELAP,WADOE
Copper-65	NELAP,DoD-ELAP,WADOE
Nickel-60	NELAP,DoD-ELAP,WADOE,ADEC
Nickel-62	NELAP,DoD-ELAP,WADOE,ADEC
Selenium-78	NELAP,DoD-ELAP,WADOE
Zinc-66	NELAP,DoD-ELAP,WADOE
Zinc-67	NELAP,DoD-ELAP,WADOE
EPA 7471B in Solid	
Mercury	WADOE,NELAP,DoD-ELAP
EPA 8260D in Solid	
Chloromethane	WADOE,DoD-ELAP,NELAP,ADEC
Vinyl Chloride	WADOE,DoD-ELAP,NELAP,ADEC
Bromomethane	WADOE,DoD-ELAP,NELAP,ADEC
Chloroethane	WADOE,DoD-ELAP,NELAP,ADEC
Trichlorofluoromethane	WADOE,DoD-ELAP,NELAP,ADEC
Acrolein	WADOE,DoD-ELAP,NELAP
1,1,2-Trichloro-1,2,2-Trifluoroethane	WADOE,DoD-ELAP,NELAP,ADEC
Acetone	WADOE,DoD-ELAP,NELAP
1,1-Dichloroethene	WADOE,DoD-ELAP,NELAP,ADEC
Iodomethane	WADOE,DoD-ELAP,NELAP,ADEC
Methylene Chloride	WADOE,DoD-ELAP,NELAP,ADEC



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Acrylonitrile	WADOE,DoD-ELAP,NELAP
Carbon Disulfide	WADOE,DoD-ELAP,NELAP,ADEC
trans-1,2-Dichloroethene	WADOE,DoD-ELAP,NELAP,ADEC
Vinyl Acetate	WADOE,DoD-ELAP,NELAP
1,1-Dichloroethane	WADOE,DoD-ELAP,NELAP,ADEC
2-Butanone	WADOE,DoD-ELAP,NELAP
2,2-Dichloropropane	WADOE,DoD-ELAP,NELAP
cis-1,2-Dichloroethene	WADOE,DoD-ELAP,NELAP,ADEC
Chloroform	WADOE,DoD-ELAP,NELAP,ADEC
Bromochloromethane	WADOE,DoD-ELAP,NELAP,ADEC
1,1,1-Trichloroethane	WADOE,DoD-ELAP,NELAP,ADEC
1,1-Dichloropropene	WADOE,DoD-ELAP,NELAP,ADEC
Carbon tetrachloride	WADOE,DoD-ELAP,NELAP,ADEC
1,2-Dichloroethane	WADOE,DoD-ELAP,NELAP,ADEC
Benzene	WADOE,DoD-ELAP,NELAP,ADEC
Trichloroethene	WADOE,DoD-ELAP,NELAP,ADEC
1,2-Dichloropropane	WADOE,DoD-ELAP,NELAP,ADEC
Bromodichloromethane	WADOE,DoD-ELAP,NELAP,ADEC
Dibromomethane	WADOE,DoD-ELAP,NELAP,ADEC
2-Chloroethyl vinyl ether	WADOE,DoD-ELAP,NELAP
4-Methyl-2-Pentanone	WADOE,DoD-ELAP,NELAP
cis-1,3-Dichloropropene	WADOE,DoD-ELAP,NELAP,ADEC
Toluene	WADOE,DoD-ELAP,NELAP,ADEC
trans-1,3-Dichloropropene	WADOE,DoD-ELAP,NELAP,ADEC
2-Hexanone	WADOE,DoD-ELAP,NELAP
1,1,2-Trichloroethane	WADOE,DoD-ELAP,NELAP,ADEC
1,3-Dichloropropane	WADOE,DoD-ELAP,NELAP,ADEC
Tetrachloroethene	WADOE,DoD-ELAP,NELAP,ADEC
Dibromochloromethane	WADOE,DoD-ELAP,NELAP,ADEC
1,2-Dibromoethane	WADOE,DoD-ELAP,NELAP,ADEC
Chlorobenzene	WADOE,DoD-ELAP,NELAP,ADEC
Ethylbenzene	WADOE,DoD-ELAP,NELAP,ADEC
1,1,1,2-Tetrachloroethane	WADOE,DoD-ELAP,NELAP,ADEC
m,p-Xylene	WADOE,DoD-ELAP,NELAP,ADEC
o-Xylene	WADOE,DoD-ELAP,NELAP,ADEC
Xylenes, total	WADOE
Styrene	WADOE,DoD-ELAP,NELAP,ADEC
Bromoform	WADOE,DoD-ELAP,NELAP,ADEC
1,1,2,2-Tetrachloroethane	WADOE,DoD-ELAP,NELAP,ADEC



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1,2,3-Trichloropropane	WADOE,DoD-ELAP,NELAP,ADEC
trans-1,4-Dichloro 2-Butene	WADOE,DoD-ELAP,NELAP
n-Propylbenzene	WADOE,DoD-ELAP,NELAP
Bromobenzene	WADOE,DoD-ELAP,NELAP,ADEC
Isopropyl Benzene	WADOE,DoD-ELAP,NELAP,ADEC
2-Chlorotoluene	WADOE,DoD-ELAP,NELAP
4-Chlorotoluene	WADOE,DoD-ELAP,NELAP
t-Butylbenzene	WADOE,DoD-ELAP,NELAP
1,3,5-Trimethylbenzene	WADOE,DoD-ELAP,NELAP
1,2,4-Trimethylbenzene	WADOE,DoD-ELAP,NELAP
s-Butylbenzene	WADOE,DoD-ELAP,NELAP
4-Isopropyl Toluene	WADOE,DoD-ELAP,NELAP
1,3-Dichlorobenzene	WADOE,DoD-ELAP,NELAP
1,4-Dichlorobenzene	WADOE,DoD-ELAP,NELAP
n-Butylbenzene	WADOE,DoD-ELAP,NELAP
1,2-Dichlorobenzene	WADOE,DoD-ELAP,NELAP
1,2-Dibromo-3-chloropropane	WADOE,DoD-ELAP,NELAP,ADEC
1,2,4-Trichlorobenzene	WADOE,DoD-ELAP,NELAP,ADEC
Hexachloro-1,3-Butadiene	WADOE,DoD-ELAP,NELAP,ADEC
Naphthalene	WADOE,DoD-ELAP,NELAP
1,2,3-Trichlorobenzene	WADOE,DoD-ELAP,NELAP,ADEC
Dichlorodifluoromethane	WADOE,DoD-ELAP,NELAP,ADEC
Methyl tert-butyl Ether	WADOE,DoD-ELAP,NELAP
n-Hexane	WADOE
2-Pentanone	WADOE
Dibromofluoromethane	WADOE
4-Bromofluorobenzene	WADOE

EPA 8260D in Water

Chloromethane	DoD-ELAP,ADEC,NELAP,WADOE
Vinyl Chloride	DoD-ELAP,ADEC,NELAP,WADOE
Bromomethane	DoD-ELAP,ADEC,NELAP,WADOE
Chloroethane	DoD-ELAP,ADEC,NELAP,WADOE
Trichlorofluoromethane	DoD-ELAP,ADEC,NELAP,WADOE
Acrolein	DoD-ELAP,NELAP,WADOE
1,1,2-Trichloro-1,2,2-Trifluoroethane	DoD-ELAP,ADEC,NELAP,WADOE
Acetone	DoD-ELAP,ADEC,NELAP,WADOE
1,1-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Iodomethane	DoD-ELAP,NELAP,WADOE
Methylene Chloride	DoD-ELAP,ADEC,NELAP,WADOE



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Acrylonitrile	DoD-ELAP,NELAP,WADOE
Carbon Disulfide	DoD-ELAP,NELAP,WADOE
trans-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Vinyl Acetate	DoD-ELAP,NELAP,WADOE
1,1-Dichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
2-Butanone	DoD-ELAP,NELAP,WADOE
2,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
cis-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Chloroform	DoD-ELAP,ADEC,NELAP,WADOE
Bromochloromethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1,1-Trichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
Carbon tetrachloride	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
Benzene	DoD-ELAP,ADEC,NELAP,WADOE
Trichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
Bromodichloromethane	DoD-ELAP,ADEC,NELAP,WADOE
Dibromomethane	DoD-ELAP,ADEC,NELAP,WADOE
2-Chloroethyl vinyl ether	DoD-ELAP,ADEC,NELAP,WADOE
4-Methyl-2-Pentanone	DoD-ELAP,NELAP,WADOE
cis-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
Toluene	DoD-ELAP,ADEC,NELAP,WADOE
trans-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
2-Hexanone	DoD-ELAP,NELAP,WADOE
1,1,2-Trichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,3-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
Tetrachloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Dibromochloromethane	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dibromoethane	DoD-ELAP,NELAP,WADOE
Chlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Ethylbenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,1,1,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,WADOE
m,p-Xylene	DoD-ELAP,ADEC,NELAP,WADOE
o-Xylene	DoD-ELAP,ADEC,NELAP,WADOE
Styrene	DoD-ELAP,NELAP,WADOE
Bromoform	DoD-ELAP,NELAP,WADOE
1,1,2,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,2,3-Trichloropropane	DoD-ELAP,ADEC,NELAP,WADOE



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trans-1,4-Dichloro 2-Butene	DoD-ELAP,ADEC,NELAP,WADOE
n-Propylbenzene	DoD-ELAP,NELAP,WADOE
Bromobenzene	DoD-ELAP,NELAP,WADOE
Isopropyl Benzene	DoD-ELAP,NELAP,WADOE
2-Chlorotoluene	DoD-ELAP,ADEC,NELAP,WADOE
4-Chlorotoluene	DoD-ELAP,ADEC,NELAP,WADOE
t-Butylbenzene	DoD-ELAP,NELAP,WADOE
1,3,5-Trimethylbenzene	DoD-ELAP,NELAP,WADOE
1,2,4-Trimethylbenzene	DoD-ELAP,NELAP,WADOE
s-Butylbenzene	DoD-ELAP,NELAP,WADOE
4-Isopropyl Toluene	DoD-ELAP,NELAP,WADOE
1,3-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,4-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
n-Butylbenzene	DoD-ELAP,NELAP,WADOE
1,2-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dibromo-3-chloropropane	DoD-ELAP,ADEC,NELAP,WADOE
1,2,4-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Hexachloro-1,3-Butadiene	DoD-ELAP,ADEC,NELAP,WADOE
Naphthalene	DoD-ELAP,ADEC,NELAP,WADOE
1,2,3-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Dichlorodifluoromethane	DoD-ELAP,ADEC,NELAP,WADOE
Methyl tert-butyl Ether	DoD-ELAP,ADEC,NELAP,WADOE
n-Hexane	WADOE
2-Pentanone	WADOE

EPA 8270E in Solid

Phenol	DoD-ELAP,NELAP,WADOE
bis(2-chloroethyl) ether	DoD-ELAP,NELAP,WADOE
2-Chlorophenol	DoD-ELAP,NELAP,WADOE
1,3-Dichlorobenzene	DoD-ELAP,NELAP,WADOE
1,4-Dichlorobenzene	DoD-ELAP,NELAP,WADOE
1,2-Dichlorobenzene	DoD-ELAP,NELAP,WADOE
Benzyl Alcohol	DoD-ELAP,NELAP,WADOE
2,2'-Oxybis(1-chloropropane)	DoD-ELAP,NELAP
2-Methylphenol	DoD-ELAP,NELAP,WADOE
Hexachloroethane	DoD-ELAP,NELAP,WADOE
N-Nitroso-di-n-Propylamine	DoD-ELAP,NELAP,WADOE
4-Methylphenol	DoD-ELAP,NELAP,WADOE
Nitrobenzene	DoD-ELAP,NELAP,WADOE
Isophorone	DoD-ELAP,NELAP,WADOE



Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: EMJ
Project Number: 21-1-12596-04
Project Manager: Shoshana Howard

Reported:
03-Aug-2021 16:23

2-Nitrophenol	DoD-ELAP,NELAP,WADOE
2,4-Dimethylphenol	DoD-ELAP,NELAP,WADOE
Bis(2-Chloroethoxy)methane	DoD-ELAP,NELAP,WADOE
2,4-Dichlorophenol	DoD-ELAP,NELAP,WADOE
1,2,4-Trichlorobenzene	DoD-ELAP,NELAP,WADOE
Naphthalene	DoD-ELAP,NELAP,WADOE,ADEC
Benzoic acid	DoD-ELAP,NELAP,WADOE
4-Chloroaniline	DoD-ELAP,NELAP,WADOE
Hexachlorobutadiene	DoD-ELAP,NELAP,WADOE
4-Chloro-3-Methylphenol	DoD-ELAP,NELAP,WADOE
2-Methylnaphthalene	DoD-ELAP,NELAP,WADOE,ADEC
Hexachlorocyclopentadiene	DoD-ELAP,NELAP,WADOE
2,4,6-Trichlorophenol	DoD-ELAP,NELAP,WADOE
2,4,5-Trichlorophenol	DoD-ELAP,NELAP,WADOE
2-Chloronaphthalene	DoD-ELAP,NELAP,WADOE
2-Nitroaniline	DoD-ELAP,NELAP,WADOE
Acenaphthylene	DoD-ELAP,NELAP,WADOE,ADEC
Dimethylphthalate	DoD-ELAP,NELAP,WADOE
2,6-Dinitrotoluene	DoD-ELAP,NELAP,WADOE
Acenaphthene	DoD-ELAP,NELAP,WADOE,ADEC
3-Nitroaniline	DoD-ELAP,NELAP,WADOE
2,4-Dinitrophenol	DoD-ELAP,NELAP,WADOE
Dibenzofuran	DoD-ELAP,NELAP,WADOE,ADEC
4-Nitrophenol	DoD-ELAP,NELAP,WADOE
2,4-Dinitrotoluene	DoD-ELAP,NELAP,WADOE
Fluorene	DoD-ELAP,NELAP,WADOE,ADEC
4-Chlorophenylphenyl ether	DoD-ELAP,NELAP
Diethyl phthalate	DoD-ELAP,NELAP,WADOE
4-Nitroaniline	DoD-ELAP,NELAP,WADOE
4,6-Dinitro-2-methylphenol	DoD-ELAP,NELAP,WADOE
N-Nitrosodiphenylamine	DoD-ELAP,NELAP,WADOE
4-Bromophenyl phenyl ether	DoD-ELAP,NELAP,WADOE
Hexachlorobenzene	DoD-ELAP,NELAP,WADOE
Pentachlorophenol	DoD-ELAP,NELAP,WADOE
Phenanthrene	DoD-ELAP,NELAP,WADOE,ADEC
Anthracene	DoD-ELAP,NELAP,WADOE,ADEC
Carbazole	DoD-ELAP,NELAP,WADOE,ADEC
Di-n-Butylphthalate	DoD-ELAP,NELAP,WADOE
Fluoranthene	DoD-ELAP,NELAP,WADOE,ADEC



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Pyrene	DoD-ELAP,NELAP,WADOE,ADEC
Butylbenzylphthalate	DoD-ELAP,NELAP,WADOE
Benzo(a)anthracene	DoD-ELAP,NELAP,WADOE,ADEC
3,3'-Dichlorobenzidine	DoD-ELAP,NELAP,WADOE
Chrysene	DoD-ELAP,NELAP,WADOE,ADEC
bis(2-Ethylhexyl)phthalate	DoD-ELAP,NELAP,WADOE
Di-n-Octylphthalate	DoD-ELAP,NELAP,WADOE
Benzo(b)fluoranthene	DoD-ELAP,NELAP,WADOE,ADEC
Benzo(k)fluoranthene	DoD-ELAP,NELAP,WADOE,ADEC
Benzo(a)fluoranthene, Total	WADOE,ADEC
Benzo(a)pyrene	DoD-ELAP,NELAP,WADOE,ADEC
Indeno(1,2,3-cd)pyrene	DoD-ELAP,NELAP,WADOE,ADEC
Dibenzo(a,h)anthracene	DoD-ELAP,NELAP,WADOE,ADEC
Benzo(g,h,i)perylene	DoD-ELAP,NELAP,WADOE,ADEC
N-Nitrosodimethylamine	DoD-ELAP,NELAP,WADOE
Aniline	DoD-ELAP,NELAP,WADOE
Retene	DoD-ELAP,NELAP,WADOE
Pyridine	DoD-ELAP,NELAP,WADOE
1-Methylnaphthalene	DoD-ELAP,NELAP,WADOE,ADEC
Azobenzene (1,2-DP-Hydrazine)	NELAP,WADOE
2,3,4,6-Tetrachlorophenol	DoD-ELAP,WADOE
Benzidine	DoD-ELAP,NELAP
Tetrachloroguaiacol	DoD-ELAP,WADOE
3,4,5-Trichloroguaiacol	WADOE
3,4,6-Trichloroguaiacol	WADOE
4,5,6-Trichloroguaiacol	WADOE
Guaiacol	WADOE

NWTPH-Dx in Solid

Diesel Range Organics (C12-C24)	DoD-ELAP,NELAP,WADOE
Diesel Range Organics (C10-C25)	DoD-ELAP,NELAP,WADOE
Diesel Range Organics (Tol-C18)	DoD-ELAP,NELAP,WADOE
Diesel Range Organics (C10-C24)	DoD-ELAP,NELAP,WADOE
Diesel Range Organics (C10-C28)	DoD-ELAP,NELAP,WADOE
Diesel Range Organics (C12-C22)	DoD-ELAP
Motor Oil Range Organics (C24-C38)	DoD-ELAP,NELAP,WADOE
Motor Oil Range Organics (C25-C36)	DoD-ELAP,NELAP,WADOE
Motor Oil Range Organics (C24-C40)	DoD-ELAP,NELAP,WADOE
Residual Range Organics (C23-C32)	DoD-ELAP
Mineral Oil Range Organics (C16-C28)	DoD-ELAP,NELAP,WADOE


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: EMJ
 Project Number: 21-1-12596-04
 Project Manager: Shoshana Howard

Reported:
 03-Aug-2021 16:23

Mineral Spirits Range Organics (Tol-C12)	DoD-ELAP,NELAP,WADOE
JP8 Range Organics (C8-C18)	DoD-ELAP,NELAP,WADOE
JP5 Range Organics (C10-C16)	DoD-ELAP,NELAP,WADOE
JP4 Range Organics (Tol-C14)	DoD-ELAP,NELAP,WADOE
Jet-A Range Organics (C10-C18)	DoD-ELAP,NELAP,WADOE
Kerosene Range Organics (Tol-C18)	DoD-ELAP,NELAP,WADOE
Stoddard Range Organics (C8-C12)	DoD-ELAP,NELAP,WADOE
Creosote Range Organics (C12-C22)	DoD-ELAP,NELAP,WADOE
Bunker C Range Organics (C10-C38)	DoD-ELAP,NELAP,WADOE
Transformer Oil Range Organics (C12-C28)	DoD-ELAP,NELAP,WADOE

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2023
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/28/2022
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2022
WADOE	WA Dept of Ecology	C558	06/30/2022
WA-DW	Ecology - Drinking Water	C558	06/30/2022



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03-Aug-2021 16:23

Notes and Definitions

U	This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
Q	Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20% RSD, <20% drift or minimum RRF)
J	Estimated concentration value detected below the reporting limit.
H	Hold time violation - Hold time was exceeded.
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL)
D1	Surrogate was not detected due to sample extract dilution
D	The reported value is from a dilution
*	Flagged value is not within established control limits.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
[2C]	Indicates this result was quantified on the second column on a dual column analysis.



Analytical Resources, Incorporated
Analytical Chemists and Consultants

04 August 2021

Meg Strong
Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle, WA 98103-8636

RE: Lower Duwamish

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)
21B0126

Associated SDG ID(s)
N/A

Susan
Dunniho

Digitally signed by Susan Dunniho
Date: 2021.08.04 09:50:19 -07'00'

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

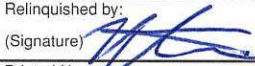
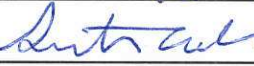
Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its



Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 21B0126		Turn-around Requested: Standard		Page: 1 of 1		 Analytical Resources, Incorporated Analytical Chemists and Consultants 4611 South 134th Place, Suite 100 Tukwila, WA 98168 206-695-6200 206-695-6201 (fax) www.arilabs.com								
ARI Client Company: Shannon & Wilson		Phone:		Date: 2/5/21				Ice Present?						
Client Contact: Shoshanna Howard				No. of Coolers: 2				Cooler Temps: 1.8/4.2						
Client Project Name: LDW														
Client Project #: 21-1-12596		Samplers: RSP		Analysis Requested							Notes/Comments			
Sample ID	Date	Time	Matrix	No. Containers	TPH-G	TPH-DX	BTX	HVOCs	PAHs	PCBs Metals Aroclors	Hex Chloro Chlorine	TOC	Grain Size	Metals
MW-10A:2-02052021	2/5/21	0900	Soil	5		X	X	X	X					X
MW-10A:5.4-02052021		0910		5		X	X	X	X					X
MW-10A:9-02052021		0915		5		X	X	X	X					X
MW-10A:15-02052021		0920		5		H	H	H	H					H
MW-10A:20-02052021		0925		5		H	H	H	H					H
MW-10A:9-02052021		1015	↓	5		X	X	X	X					X
TB-5-02052021		-	Water	4			X	X						
SB-2021-044:12-02052021		1114	Soil	1		X			X	X				
MW-65:20-02052021		1240	Soil	5		X	X	X	X	X	X			X
						X	X	X						
Comments/Special Instructions H = hold analysis X = run analysis		Relinquished by: (Signature) 		Received by: (Signature) 		Relinquished by: (Signature)		Received by: (Signature)						
		Printed Name: RYAN PETERSON		Printed Name: Samantha Cowen		Printed Name:		Printed Name:						
		Company: Shannon & Wilson		Company: ARI		Company:		Company:						
		Date & Time: 2/5/21 1410		Date & Time: 2/5/21 1410		Date & Time:		Date & Time:						

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-10R:2-02052021	21B0126-01	Solid	05-Feb-2021 09:00	05-Feb-2021 14:10
MW-10R:5.4-02052021	21B0126-02	Solid	05-Feb-2021 09:10	05-Feb-2021 14:10
MW-10R:9-02052021	21B0126-03	Solid	05-Feb-2021 09:15	05-Feb-2021 14:10
MW-10R:15-02052021	21B0126-04	Solid	05-Feb-2021 09:20	05-Feb-2021 14:10
MW-10R:20-02052021	21B0126-05	Solid	05-Feb-2021 09:25	05-Feb-2021 14:10
MW-104:9-02052021	21B0126-06	Solid	05-Feb-2021 10:15	05-Feb-2021 14:10
TB-5-02052021	21B0126-07	Water	05-Feb-2021 12:40	05-Feb-2021 14:10
SB-2021-044:12-02052021	21B0126-08	Solid	05-Feb-2021 11:14	05-Feb-2021 14:10
MW-65:20-02052021	21B0126-09	Solid	05-Feb-2021 12:40	05-Feb-2021 14:10

Analytical Resources, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

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Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

Work Order Case Narrative

Client: Shannon & Wilson, Inc
Project: Lower Duwamish
Work Order: 21B0126

Sample receipt

Samples as listed on the preceding page were received 05-Feb-2021 14:10 under ARI work order 21B0126. For details regarding sample receipt, please refer to the Cooler Receipt Form.

PCB Aroclors - EPA Method SW8082A

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements except Aroclor 1260 which was out of control low in the closing CCV on column zb-5. Data reported from passing column zb-35.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

Volatiles - EPA Method SW8260D

The sample(s) were analyzed within the recommended holding times except 21B0126-03RE1 and 21B0126-06RE1. The samples initially analyzed in sequence SJB0269 had high surrogate recovery. This data was reported but RE data should be used. The samples were reanalyzed with unusable data due to instrument malfunction using all Sodium Bisulfate vials. The reanalysis was performed out of hold. Reanalysis used the Total Solids container which was not properly preserved and was opened to the environment which could lead to loss of analyte and/or contamination.

Initial and continuing calibrations were within method requirements except surrogate 1,2-Dichloromethand-d4 which was out of control high. All samples which contain analyte have been flagged with a "Q" qualifier.

Internal standard areas were within limits except 21B0126-03 and 21B0126-06 which were out of control high and were reanalyzed.

The surrogate percent recoveries were within control limits except 1,2-Dichloromethand-d4 which was out of control high in the ICV and has been "Q" qualified.

The method blank(s) were clean at the reporting limits.



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The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Polynuclear Aromatic Hydrocarbons (PAH) - EPA Method SW8270E-SIM

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements except Benzo(j)fluoranthene which was out of control low. All samples which contain analyte have been flagged with a "Q" qualifier.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

Sample specific QC was performed in association with sample 21B0126-02 in batch BJB0518. The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) were within advisory control limits.

Total Metals - EPA Method 6020B

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

Wet Chemistry

The sample(s) were prepared and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

Total Hg - EPA Method 7470/7471



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

Diesel/Heavy Oil Range Organics - WA-Ecology Method NW-TPHDx

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

REVISED to add trans-1,2-dichloroethene to VOC list.



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: SW

Project Name: LOW

COC No(s): _____ NA

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: 21B0126

Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of the cooler? YES NO

Were custody papers included with the cooler? YES NO

Were custody papers properly filled out (ink, signed, etc.) YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)

Time 1410 1.8 4.2

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: DOO 5200

Cooler Accepted by: SC Date: 2/5/21 Time: 1410

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES NO

What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? NA YES NO

How were bottles sealed in plastic bags? Individually Grouped Not

Did all bottles arrive in good condition (unbroken)? YES NO

Were all bottle labels complete and legible? YES NO

Did the number of containers listed on COC match with the number of containers received? YES NO

Did all bottle labels and tags agree with custody papers? YES NO

Were all bottles used correct for the requested analyses? YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs) ... NA YES NO

Were all VOC vials free of air bubbles? NA YES NO

Was sufficient amount of sample sent in each bottle? YES NO

Date VOC Trip Blank was made at ARI: _____ NA 1/15/21

Were the sample(s) split by ARI? NA YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: SC Date: 2/5/21 Time: 1422 Labels checked by: SC

**** Notify Project Manager of discrepancies or concerns ****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: _____

Date: _____


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 09:08

MW-10R:2-02052021
21B0126-01 (Solid)
Volatile Organic Compounds

Method: EPA 8260D		Sampled: 02/05/2021 09:00
Instrument: NT15 Analyst: PB		Analyzed: 02/19/2021 22:14
Sample Preparation:	Preparation Method: EPA 5035 (Sodium Bisulfate)	Extract ID: 21B0126-01 E
	Preparation Batch: BJB0637	Dry Weight: 3.99 g
	Sample Size: 4.85 g (wet)	% Solids: 82.19
	Prepared: 02/19/2021	Final Volume: 5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.29	1.25	ND	ug/kg	U
1,1-Dichloroethene	75-35-4	1	0.42	1.25	ND	ug/kg	U
trans-1,2-Dichloroethene	156-60-5	1	0.33	1.25	ND	ug/kg	U
cis-1,2-Dichloroethene	156-59-2	1	0.30	1.25	ND	ug/kg	U
Benzene	71-43-2	1	0.37	1.25	0.79	ug/kg	J
Trichloroethene	79-01-6	1	0.27	1.25	ND	ug/kg	U
Toluene	108-88-3	1	0.19	1.25	0.29	ug/kg	J
Tetrachloroethene	127-18-4	1	0.32	1.25	ND	ug/kg	U
Ethylbenzene	100-41-4	1	0.25	1.25	ND	ug/kg	U
m,p-Xylene	179601-23-1	1	0.49	2.51	ND	ug/kg	U
o-Xylene	95-47-6	1	0.28	1.25	ND	ug/kg	U
Xylenes, total	1330-20-7	1	0.77	2.51	ND	ug/kg	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-149 %	90.9	%	
<i>Surrogate: Toluene-d8</i>				77-120 %	96.0	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				80-120 %	91.1	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				80-120 %	102	%	



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

MW-10R:2-02052021 21B0126-01 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM		Sampled: 02/05/2021 09:00
Instrument: NT11 Analyst: VTS		Analyzed: 03/13/2021 12:54
Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Low Level	Extract ID: 21B0126-01 A 02
	Preparation Batch: BJB0518	Dry Weight: 10.04 g
	Prepared: 02/18/2021	% Solids: 82.19
Sample Cleanup:	Cleanup Method: Silica Gel	Extract ID: 21B0126-01 A 02
	Cleanup Batch: CJC0059	Initial Volume: 0.5 mL
	Cleaned: 05-Mar-2021	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Sulfur	Extract ID: 21B0126-01 A 02
	Cleanup Batch: CJC0057	Initial Volume: 0.5 mL
	Cleaned: 05-Mar-2021	Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.44	0.60	0.72	ug/kg	
1-Methylnaphthalene	90-12-0	1	0.11	0.50	1.50	ug/kg	
2-Methylnaphthalene	91-57-6	1	0.13	0.50	1.39	ug/kg	
Acenaphthylene	208-96-8	1	0.06	0.50	ND	ug/kg	U
Acenaphthene	83-32-9	1	0.09	0.50	ND	ug/kg	U
Dibenzofuran	132-64-9	1	0.13	0.50	0.83	ug/kg	
Fluorene	86-73-7	1	0.07	0.50	0.36	ug/kg	J
Phenanthrene	85-01-8	1	0.11	0.50	3.88	ug/kg	
Anthracene	120-12-7	1	0.07	0.50	0.57	ug/kg	
Fluoranthene	206-44-0	1	0.08	0.50	2.03	ug/kg	
Pyrene	129-00-0	1	0.09	0.50	2.50	ug/kg	
Benzo(a)anthracene	56-55-3	1	0.07	0.50	1.01	ug/kg	
Chrysene	218-01-9	1	0.07	0.50	1.90	ug/kg	
Benzo(b)fluoranthene	205-99-2	1	0.07	0.50	1.03	ug/kg	
Benzo(k)fluoranthene	207-08-9	1	0.10	0.50	0.34	ug/kg	J
Benzo(j)fluoranthene	205-82-3	1	0.10	0.50	0.38	ug/kg	J
Benzo(a)pyrene	50-32-8	1	0.09	0.50	0.75	ug/kg	
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.09	0.50	0.55	ug/kg	
Dibenzo(a,h)anthracene	53-70-3	1	0.10	0.50	0.17	ug/kg	J
Benzo(g,h,i)perylene	191-24-2	1	0.08	0.50	0.94	ug/kg	
Surrogate: 2-Methylnaphthalene-d10					30-160 %	45.5 %	
Surrogate: Dibenzo[a,h]anthracene-d14					30-160 %	70.9 %	
Surrogate: Fluoranthene-d10					30-160 %	64.5 %	

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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

MW-10R:2-02052021
21B0126-01 (Solid)

Petroleum Hydrocarbons

Method: NWTPH-Dx		Sampled: 02/05/2021 09:00
Instrument: FID4 Analyst: CTO		Analyzed: 02/26/2021 12:52
Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Extract ID: 21B0126-01 A 01
	Preparation Batch: BJB0456	Dry Weight: 8.25 g
	Prepared: 02/17/2021	% Solids: 82.19
	Sample Size: 10.04 g (wet)	
	Final Volume: 1 mL	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	6.06	ND	mg/kg	U
Motor Oil Range Organics (C24-C38)	RRO	1	12.1	17.3	mg/kg	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	117	%	

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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

MW-10R:2-02052021
21B0126-01 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B		Sampled: 02/05/2021 09:00	
Instrument: ICPMS2 Analyst: MCB		Analyzed: 02/19/2021 23:05	
Sample Preparation:	Preparation Method: SWN EPA 3050B	Extract ID: 21B0126-01 B 01	
	Preparation Batch: BJB0430	Sample Size: 1.038 g (wet)	Dry Weight: 0.83 g
	Prepared: 02/17/2021	Final Volume: 50 mL	% Solids: 80.23

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium	7440-39-3	20	0.07	0.60	51.0	mg/kg	
Chromium	7440-47-3	20	0.16	0.60	13.8	mg/kg	
Cobalt	7440-48-4	20	0.03	0.24	6.94	mg/kg	
Lead	7439-92-1	20	0.08	0.12	4.75	mg/kg	
Silver	7440-22-4	20	0.02	0.24	0.09	mg/kg	J
Vanadium	7440-62-2	20	0.05	0.24	39.0	mg/kg	

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Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

MW-10R:2-02052021
21B0126-01 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 02/05/2021 09:00

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/22/2021 20:14

Sample Preparation:

Preparation Method: SWN EPA 3050B

Extract ID: 21B0126-01 B 01

Preparation Batch: BJB0430

Sample Size: 1.038 g (wet)

Dry Weight: 0.83 g

Prepared: 02/17/2021

Final Volume: 50 mL

% Solids: 80.23

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	20	0.03	0.24	3.97	mg/kg	
Cadmium	7440-43-9	20	0.04	0.12	0.09	mg/kg	J
Copper	7440-50-8	20	0.41	0.60	20.9	mg/kg	
Nickel	7440-02-0	20	0.06	0.60	14.2	mg/kg	
Selenium	7782-49-2	20	0.53	0.60	2.00	mg/kg	
Zinc	7440-66-6	20	1.0	4.8	39.5	mg/kg	

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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

MW-10R:2-02052021
21B0126-01 (Solid)

Metals and Metallic Compounds

Method: EPA 7471B		Sampled: 02/05/2021 09:00
Instrument: HYDRA Analyst: BLC		Analyzed: 02/19/2021 10:15
Sample Preparation:	Preparation Method: SMM EPA 7471B	Extract ID: 21B0126-01 B
	Preparation Batch: BJB0434	Dry Weight: 0.21 g
	Sample Size: 0.259 g (wet)	% Solids: 80.23
	Prepared: 02/17/2021	Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00505	0.0241	0.0375	mg/kg	

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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

MW-10R:5.4-02052021
21B0126-02 (Solid)

Volatile Organic Compounds

Method: EPA 8260D
Instrument: NT15 Analyst: PB
Sample Preparation: Preparation Method: EPA 5035 (Sodium Bisulfate)
Preparation Batch: BJB0637 Sample Size: 3.85 g (wet)
Prepared: 02/19/2021 Final Volume: 5 mL
Extract ID: 21B0126-02 E
Dry Weight: 3.33 g
% Solids: 86.50

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.35	1.50	ND	ug/kg	U
1,1-Dichloroethene	75-35-4	1	0.50	1.50	ND	ug/kg	U
trans-1,2-Dichloroethene	156-60-5	1	0.40	1.50	ND	ug/kg	U
cis-1,2-Dichloroethene	156-59-2	1	0.36	1.50	ND	ug/kg	U
Benzene	71-43-2	1	0.44	1.50	0.62	ug/kg	J
Trichloroethene	79-01-6	1	0.32	1.50	ND	ug/kg	U
Toluene	108-88-3	1	0.23	1.50	0.24	ug/kg	J
Tetrachloroethene	127-18-4	1	0.39	1.50	ND	ug/kg	U
Ethylbenzene	100-41-4	1	0.30	1.50	ND	ug/kg	U
m,p-Xylene	179601-23-1	1	0.59	3.00	ND	ug/kg	U
o-Xylene	95-47-6	1	0.34	1.50	ND	ug/kg	U
Xylenes, total	1330-20-7	1	0.92	3.00	ND	ug/kg	U
Surrogate: 1,2-Dichloroethane-d4				80-149 %	124	%	
Surrogate: Toluene-d8				77-120 %	99.5	%	
Surrogate: 4-Bromofluorobenzene				80-120 %	99.7	%	
Surrogate: 1,2-Dichlorobenzene-d4				80-120 %	104	%	

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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

MW-10R:5.4-02052021 21B0126-02 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM		Sampled: 02/05/2021 09:10
Instrument: NT11 Analyst: VTS		Analyzed: 03/13/2021 13:27
Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Low Level	Extract ID: 21B0126-02 A 02
	Preparation Batch: BJB0518	Dry Weight: 10.00 g
	Prepared: 02/18/2021	% Solids: 86.50
Sample Cleanup:	Cleanup Method: Silica Gel	Extract ID: 21B0126-02 A 02
	Cleanup Batch: CJC0059	Initial Volume: 0.5 mL
	Cleaned: 05-Mar-2021	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Sulfur	Extract ID: 21B0126-02 A 02
	Cleanup Batch: CJC0057	Initial Volume: 0.5 mL
	Cleaned: 05-Mar-2021	Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.44	0.60	2.33	ug/kg	
1-Methylnaphthalene	90-12-0	1	0.11	0.50	1.67	ug/kg	
2-Methylnaphthalene	91-57-6	1	0.13	0.50	2.08	ug/kg	
Acenaphthylene	208-96-8	1	0.06	0.50	ND	ug/kg	U
Acenaphthene	83-32-9	1	0.09	0.50	ND	ug/kg	U
Dibenzofuran	132-64-9	1	0.13	0.50	1.16	ug/kg	
Fluorene	86-73-7	1	0.07	0.50	ND	ug/kg	U
Phenanthrene	85-01-8	1	0.11	0.50	4.72	ug/kg	
Anthracene	120-12-7	1	0.07	0.50	0.36	ug/kg	J
Fluoranthene	206-44-0	1	0.08	0.50	1.57	ug/kg	
Pyrene	129-00-0	1	0.09	0.50	1.79	ug/kg	
Benzo(a)anthracene	56-55-3	1	0.07	0.50	0.69	ug/kg	
Chrysene	218-01-9	1	0.07	0.50	1.59	ug/kg	
Benzo(b)fluoranthene	205-99-2	1	0.07	0.50	0.81	ug/kg	
Benzo(k)fluoranthene	207-08-9	1	0.10	0.50	0.22	ug/kg	J
Benzo(j)fluoranthene	205-82-3	1	0.10	0.50	0.21	ug/kg	Q, J
Benzo(a)pyrene	50-32-8	1	0.09	0.50	0.42	ug/kg	J
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.09	0.50	0.32	ug/kg	J
Dibenzo(a,h)anthracene	53-70-3	1	0.11	0.50	ND	ug/kg	U
Benzo(g,h,i)perylene	191-24-2	1	0.09	0.50	0.73	ug/kg	
Surrogate: 2-Methylnaphthalene-d10					30-160 %	48.3	%
Surrogate: Dibenzo[a,h]anthracene-d14					30-160 %	71.9	%
Surrogate: Fluoranthene-d10					30-160 %	62.1	%

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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

MW-10R:5.4-02052021
21B0126-02 (Solid)

Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 02/05/2021 09:10

Instrument: FID4 Analyst: CTO

Analyzed: 02/26/2021 13:13

Sample Preparation:

Preparation Method: EPA 3546 (Microwave)

Extract ID: 21B0126-02 A 01

Preparation Batch: BJB0456

Sample Size: 10 g (wet)

Dry Weight: 8.65 g

Prepared: 02/17/2021

Final Volume: 1 mL

% Solids: 86.50

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	5.78	ND	mg/kg	U
Motor Oil Range Organics (C24-C38)	RRO	1	11.6	22.6	mg/kg	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	96.6	%	

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Analytical Report

Shannon & Wilson, Inc
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Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

MW-10R:5.4-02052021
21B0126-02 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B		Sampled: 02/05/2021 09:10
Instrument: ICPMS2 Analyst: MCB		Analyzed: 02/19/2021 23:10
Sample Preparation:	Preparation Method: SWN EPA 3050B	Extract ID: 21B0126-02 B 01
	Preparation Batch: BJB0430	Dry Weight: 0.91 g
	Prepared: 02/17/2021	% Solids: 89.71
	Sample Size: 1.019 g (wet)	
	Final Volume: 50 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium	7440-39-3	20	0.06	0.55	28.0	mg/kg	
Chromium	7440-47-3	20	0.14	0.55	9.23	mg/kg	
Cobalt	7440-48-4	20	0.03	0.22	3.73	mg/kg	
Lead	7439-92-1	20	0.07	0.11	2.05	mg/kg	
Silver	7440-22-4	20	0.02	0.22	0.04	mg/kg	J
Vanadium	7440-62-2	20	0.04	0.22	30.2	mg/kg	

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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

MW-10R:5.4-02052021
21B0126-02 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 02/05/2021 09:10

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/19/2021 23:10

Sample Preparation:

Preparation Method: SWN EPA 3050B

Extract ID: 21B0126-02 B 01

Preparation Batch: BJB0430

Sample Size: 1.019 g (wet)

Dry Weight: 0.91 g

Prepared: 02/17/2021

Final Volume: 50 mL

% Solids: 89.71

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	20	0.02	0.22	2.05	mg/kg	
Cadmium	7440-43-9	20	0.03	0.11	ND	mg/kg	U
Copper	7440-50-8	20	0.37	0.55	9.17	mg/kg	
Nickel	7440-02-0	20	0.05	0.55	7.85	mg/kg	
Selenium	7782-49-2	20	0.48	0.55	1.31	mg/kg	
Zinc	7440-66-6	20	0.9	4.4	21.7	mg/kg	

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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

MW-10R:5.4-02052021
21B0126-02 (Solid)

Metals and Metallic Compounds

Method: EPA 7471B		Sampled: 02/05/2021 09:10
Instrument: HYDRA Analyst: BLC		Analyzed: 02/19/2021 10:17
Sample Preparation:	Preparation Method: SMM EPA 7471B	Extract ID: 21B0126-02 B
	Preparation Batch: BJB0434	Dry Weight: 0.25 g
	Sample Size: 0.275 g (wet)	% Solids: 89.71
	Prepared: 02/17/2021	Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00426	0.0203	0.0111	mg/kg	J

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 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 09:08

MW-10R:9-02052021
21B0126-03 (Solid)
Volatile Organic Compounds

Method: EPA 8260D		Sampled: 02/05/2021 09:15
Instrument: NT5 Analyst: PB		Analyzed: 02/12/2021 18:09
Sample Preparation:	Preparation Method: EPA 5035 (Sodium Bisulfate)	Extract ID: 21B0126-03 D
	Preparation Batch: BJB0418	Dry Weight: 2.75 g
	Sample Size: 4 g (wet)	% Solids: 68.68
	Prepared: 02/12/2021	
	Final Volume: 5 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.43	1.82	ND	ug/kg	U
1,1-Dichloroethene	75-35-4	1	0.61	1.82	ND	ug/kg	U
trans-1,2-Dichloroethene	156-60-5	1	0.48	1.82	ND	ug/kg	U
cis-1,2-Dichloroethene	156-59-2	1	0.44	1.82	ND	ug/kg	U
Benzene	71-43-2	1	0.54	1.82	1.08	ug/kg	J
Trichloroethene	79-01-6	1	0.39	1.82	ND	ug/kg	U
Toluene	108-88-3	1	0.27	1.82	ND	ug/kg	U
Tetrachloroethene	127-18-4	1	0.47	1.82	ND	ug/kg	U
Ethylbenzene	100-41-4	1	0.37	1.82	ND	ug/kg	U
m,p-Xylene	179601-23-1	1	0.71	3.64	ND	ug/kg	U
o-Xylene	95-47-6	1	0.41	1.82	ND	ug/kg	U
Xylenes, total	1330-20-7	1	1.12	3.64	ND	ug/kg	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-149 %	122	%	
<i>Surrogate: Toluene-d8</i>				77-120 %	103	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				80-120 %	102	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				80-120 %	102	%	



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Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

MW-10R:9-02052021 21B0126-03 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM		Sampled: 02/05/2021 09:15
Instrument: NT11 Analyst: VTS		Analyzed: 03/13/2021 16:10
Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Low Level	Extract ID: 21B0126-03 A 02
	Preparation Batch: BJB0518	Dry Weight: 10.03 g
	Prepared: 02/18/2021	% Solids: 68.68
Sample Cleanup:	Cleanup Method: Silica Gel	Extract ID: 21B0126-03 A 02
	Cleanup Batch: CJC0059	Initial Volume: 0.5 mL
	Cleaned: 05-Mar-2021	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Sulfur	Extract ID: 21B0126-03 A 02
	Cleanup Batch: CJC0057	Initial Volume: 0.5 mL
	Cleaned: 05-Mar-2021	Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.44	0.60	4.31	ug/kg	
1-Methylnaphthalene	90-12-0	1	0.11	0.50	1.75	ug/kg	
2-Methylnaphthalene	91-57-6	1	0.13	0.50	2.23	ug/kg	
Acenaphthylene	208-96-8	1	0.06	0.50	0.34	ug/kg	J
Acenaphthene	83-32-9	1	0.09	0.50	0.44	ug/kg	J
Dibenzofuran	132-64-9	1	0.13	0.50	1.20	ug/kg	
Fluorene	86-73-7	1	0.07	0.50	0.71	ug/kg	
Phenanthrene	85-01-8	1	0.11	0.50	5.55	ug/kg	
Anthracene	120-12-7	1	0.07	0.50	0.77	ug/kg	
Fluoranthene	206-44-0	1	0.08	0.50	4.75	ug/kg	
Pyrene	129-00-0	1	0.09	0.50	4.22	ug/kg	
Benzo(a)anthracene	56-55-3	1	0.07	0.50	0.84	ug/kg	
Chrysene	218-01-9	1	0.07	0.50	2.01	ug/kg	
Benzo(b)fluoranthene	205-99-2	1	0.07	0.50	1.57	ug/kg	
Benzo(k)fluoranthene	207-08-9	1	0.10	0.50	0.51	ug/kg	
Benzo(j)fluoranthene	205-82-3	1	0.10	0.50	0.57	ug/kg	Q
Benzo(a)pyrene	50-32-8	1	0.09	0.50	0.88	ug/kg	
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.09	0.50	1.45	ug/kg	
Dibenzo(a,h)anthracene	53-70-3	1	0.10	0.50	ND	ug/kg	U
Benzo(g,h,i)perylene	191-24-2	1	0.08	0.50	2.12	ug/kg	
Surrogate: 2-Methylnaphthalene-d10					30-160 %	44.6 %	
Surrogate: Dibenzo[a,h]anthracene-d14					30-160 %	68.3 %	
Surrogate: Fluoranthene-d10					30-160 %	58.5 %	

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Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

MW-10R:9-02052021
21B0126-03 (Solid)

Petroleum Hydrocarbons

Method: NWTPH-Dx		Sampled: 02/05/2021 09:15
Instrument: FID4 Analyst: CTO		Analyzed: 02/26/2021 13:34
Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Extract ID: 21B0126-03 A 01
	Preparation Batch: BJB0456	Dry Weight: 6.87 g
	Prepared: 02/17/2021	% Solids: 68.68
	Sample Size: 10 g (wet)	
	Final Volume: 1 mL	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	7.28	ND	mg/kg	U
Motor Oil Range Organics (C24-C38)	RRO	1	14.6	29.0	mg/kg	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	103	%	

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Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

MW-10R:9-02052021
21B0126-03 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B		Sampled: 02/05/2021 09:15
Instrument: ICPMS2 Analyst: MCB		Analyzed: 02/19/2021 23:16
Sample Preparation:	Preparation Method: SWN EPA 3050B	Extract ID: 21B0126-03 B 01
	Preparation Batch: BJB0430	Dry Weight: 0.72 g
	Prepared: 02/17/2021	% Solids: 70.12
	Sample Size: 1.03 g (wet)	
	Final Volume: 50 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium	7440-39-3	20	0.08	0.69	84.3	mg/kg	
Chromium	7440-47-3	20	0.18	0.69	19.3	mg/kg	
Cobalt	7440-48-4	20	0.04	0.28	7.06	mg/kg	
Lead	7439-92-1	20	0.09	0.14	5.16	mg/kg	
Silver	7440-22-4	20	0.02	0.28	0.06	mg/kg	J
Vanadium	7440-62-2	20	0.06	0.28	50.9	mg/kg	

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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

MW-10R:9-02052021
21B0126-03 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 02/05/2021 09:15

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/19/2021 23:16

Sample Preparation:

Preparation Method: SWN EPA 3050B

Extract ID: 21B0126-03 B 01

Preparation Batch: BJB0430

Sample Size: 1.03 g (wet)

Dry Weight: 0.72 g

Prepared: 02/17/2021

Final Volume: 50 mL

% Solids: 70.12

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	20	0.03	0.28	5.08	mg/kg	
Cadmium	7440-43-9	20	0.04	0.14	0.05	mg/kg	J
Copper	7440-50-8	20	0.47	0.69	38.8	mg/kg	
Nickel	7440-02-0	20	0.07	0.69	17.8	mg/kg	
Selenium	7782-49-2	20	0.61	0.69	2.61	mg/kg	
Zinc	7440-66-6	20	1.1	5.5	40.9	mg/kg	



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Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

MW-10R:9-02052021
21B0126-03 (Solid)

Metals and Metallic Compounds

Method: EPA 7471B		Sampled: 02/05/2021 09:15
Instrument: HYDRA Analyst: BLC		Analyzed: 02/19/2021 10:19
Sample Preparation:	Preparation Method: SMM EPA 7471B	Extract ID: 21B0126-03 B
	Preparation Batch: BJB0434	Dry Weight: 0.16 g
	Sample Size: 0.228 g (wet)	% Solids: 70.12
	Prepared: 02/17/2021	Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00657	0.0313	0.0420	mg/kg	

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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

MW-10R:9-02052021

21B0126-03RE1 (Solid)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 02/05/2021 09:15

Instrument: NT5 Analyst: PB

Analyzed: 02/23/2021 15:58

Sample Preparation:

Preparation Method: EPA 5035 (Sodium Bisulfate)

Extract ID: 21B0126-03RE1 D

Preparation Batch: BJB0694

Sample Size: 5.36 g (wet)

Dry Weight: 3.68 g

Prepared: 02/23/2021

Final Volume: 5 mL

% Solids: 68.68

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.32	1.36	ND	ug/kg	H, U
1,1-Dichloroethene	75-35-4	1	0.46	1.36	ND	ug/kg	H, U
trans-1,2-Dichloroethene	156-60-5	1	0.36	1.36	ND	ug/kg	U
cis-1,2-Dichloroethene	156-59-2	1	0.33	1.36	ND	ug/kg	H, U
Benzene	71-43-2	1	0.40	1.36	ND	ug/kg	H, U
Trichloroethene	79-01-6	1	0.29	1.36	ND	ug/kg	H, U
Toluene	108-88-3	1	0.21	1.36	0.97	ug/kg	H, J
Tetrachloroethene	127-18-4	1	0.35	1.36	ND	ug/kg	H, U
Ethylbenzene	100-41-4	1	0.27	1.36	ND	ug/kg	H, U
m,p-Xylene	179601-23-1	1	0.53	2.72	ND	ug/kg	H, U
o-Xylene	95-47-6	1	0.30	1.36	ND	ug/kg	H, U
Xylenes, total	1330-20-7	1	0.84	2.72	ND	ug/kg	H, U
Surrogate: 1,2-Dichloroethane-d4				80-149 %	140	%	H, Q
Surrogate: Toluene-d8				77-120 %	108	%	H
Surrogate: 4-Bromofluorobenzene				80-120 %	102	%	H
Surrogate: 1,2-Dichlorobenzene-d4				80-120 %	98.2	%	H

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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

MW-104:9-02052021
21B0126-06 (Solid)

Volatile Organic Compounds

Method: EPA 8260D
Instrument: NT5 Analyst: PB
Sample Preparation: Preparation Method: EPA 5035 (Sodium Bisulfate)
Preparation Batch: BJB0418 Sample Size: 4.27 g (wet)
Prepared: 02/12/2021 Final Volume: 5 mL
Extract ID: 21B0126-06 D
Dry Weight: 3.02 g
% Solids: 70.74

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.39	1.66	ND	ug/kg	U
1,1-Dichloroethene	75-35-4	1	0.56	1.66	ND	ug/kg	U
trans-1,2-Dichloroethene	156-60-5	1	0.44	1.66	ND	ug/kg	U
cis-1,2-Dichloroethene	156-59-2	1	0.40	1.66	ND	ug/kg	U
Benzene	71-43-2	1	0.49	1.66	1.84	ug/kg	
Trichloroethene	79-01-6	1	0.35	1.66	ND	ug/kg	U
Toluene	108-88-3	1	0.25	1.66	ND	ug/kg	U
Tetrachloroethene	127-18-4	1	0.43	1.66	ND	ug/kg	U
Ethylbenzene	100-41-4	1	0.33	1.66	ND	ug/kg	U
m,p-Xylene	179601-23-1	1	0.65	3.31	ND	ug/kg	U
o-Xylene	95-47-6	1	0.37	1.66	ND	ug/kg	U
Xylenes, total	1330-20-7	1	1.02	3.31	ND	ug/kg	U
Surrogate: 1,2-Dichloroethane-d4				80-149 %	116	%	
Surrogate: Toluene-d8				77-120 %	103	%	
Surrogate: 4-Bromofluorobenzene				80-120 %	96.5	%	
Surrogate: 1,2-Dichlorobenzene-d4				80-120 %	100	%	

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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

MW-104:9-02052021
21B0126-06 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM		Sampled: 02/05/2021 10:15
Instrument: NT11 Analyst: VTS		Analyzed: 03/13/2021 16:42
Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Low Level	Extract ID: 21B0126-06 A 02
	Preparation Batch: BJB0518	Dry Weight: 10.02 g
	Prepared: 02/18/2021	% Solids: 70.74
Sample Cleanup:	Cleanup Method: Silica Gel	Extract ID: 21B0126-06 A 02
	Cleanup Batch: CJC0059	Initial Volume: 0.5 mL
	Cleaned: 05-Mar-2021	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Sulfur	Extract ID: 21B0126-06 A 02
	Cleanup Batch: CJC0057	Initial Volume: 0.5 mL
	Cleaned: 05-Mar-2021	Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.44	0.60	20.6	ug/kg	
1-Methylnaphthalene	90-12-0	1	0.11	0.50	4.26	ug/kg	
2-Methylnaphthalene	91-57-6	1	0.13	0.50	6.16	ug/kg	
Acenaphthylene	208-96-8	1	0.06	0.50	2.56	ug/kg	
Acenaphthene	83-32-9	1	0.09	0.50	1.66	ug/kg	
Dibenzofuran	132-64-9	1	0.13	0.50	4.38	ug/kg	
Fluorene	86-73-7	1	0.07	0.50	2.95	ug/kg	
Phenanthrene	85-01-8	1	0.11	0.50	17.4	ug/kg	
Anthracene	120-12-7	1	0.07	0.50	1.93	ug/kg	
Fluoranthene	206-44-0	1	0.08	0.50	17.3	ug/kg	
Pyrene	129-00-0	1	0.09	0.50	16.8	ug/kg	
Benzo(a)anthracene	56-55-3	1	0.07	0.50	2.48	ug/kg	
Chrysene	218-01-9	1	0.07	0.50	6.11	ug/kg	
Benzo(b)fluoranthene	205-99-2	1	0.07	0.50	5.04	ug/kg	
Benzo(k)fluoranthene	207-08-9	1	0.10	0.50	1.90	ug/kg	
Benzo(j)fluoranthene	205-82-3	1	0.10	0.50	2.15	ug/kg	Q
Benzo(a)pyrene	50-32-8	1	0.09	0.50	3.51	ug/kg	
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.09	0.50	4.92	ug/kg	
Dibenzo(a,h)anthracene	53-70-3	1	0.10	0.50	0.77	ug/kg	
Benzo(g,h,i)perylene	191-24-2	1	0.08	0.50	7.28	ug/kg	
Surrogate: 2-Methylnaphthalene-d10					30-160 %	41.5 %	
Surrogate: Dibenzo[a,h]anthracene-d14					30-160 %	60.8 %	
Surrogate: Fluoranthene-d10					30-160 %	56.3 %	

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Analytical Report

Shannon & Wilson, Inc
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Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

MW-104:9-02052021
21B0126-06 (Solid)

Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 02/05/2021 10:15

Instrument: FID4 Analyst: CTO

Analyzed: 02/26/2021 13:56

Sample Preparation:

Preparation Method: EPA 3546 (Microwave)

Extract ID: 21B0126-06 A 01

Preparation Batch: BJB0456

Sample Size: 10.08 g (wet)

Dry Weight: 7.13 g

Prepared: 02/17/2021

Final Volume: 1 mL

% Solids: 70.74

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	7.01	ND	mg/kg	U
Motor Oil Range Organics (C24-C38)	RRO	1	14.0	19.2	mg/kg	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	106	%	

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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

MW-104:9-02052021
21B0126-06 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 02/05/2021 10:15

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/19/2021 23:21

Sample Preparation:

Preparation Method: SWN EPA 3050B

Extract ID: 21B0126-06 B 01

Preparation Batch: BJB0430

Sample Size: 1.015 g (wet)

Dry Weight: 0.72 g

Prepared: 02/17/2021

Final Volume: 50 mL

% Solids: 71.30

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium	7440-39-3	20	0.07	0.69	65.5	mg/kg	
Chromium	7440-47-3	20	0.18	0.69	15.9	mg/kg	
Cobalt	7440-48-4	20	0.04	0.28	5.63	mg/kg	
Lead	7439-92-1	20	0.09	0.14	6.81	mg/kg	
Silver	7440-22-4	20	0.02	0.28	0.07	mg/kg	J
Vanadium	7440-62-2	20	0.06	0.28	41.0	mg/kg	

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Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

MW-104:9-02052021
21B0126-06 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 02/05/2021 10:15

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/19/2021 23:21

Sample Preparation:

Preparation Method: SWN EPA 3050B

Extract ID: 21B0126-06 B 01

Preparation Batch: BJB0430

Sample Size: 1.015 g (wet)

Dry Weight: 0.72 g

Prepared: 02/17/2021

Final Volume: 50 mL

% Solids: 71.30

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	20	0.03	0.28	4.39	mg/kg	
Cadmium	7440-43-9	20	0.04	0.14	0.13	mg/kg	J
Copper	7440-50-8	20	0.47	0.69	32.5	mg/kg	
Nickel	7440-02-0	20	0.07	0.69	14.2	mg/kg	
Selenium	7782-49-2	20	0.61	0.69	1.77	mg/kg	
Zinc	7440-66-6	20	1.1	5.5	41.9	mg/kg	

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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

MW-104:9-02052021
21B0126-06 (Solid)

Metals and Metallic Compounds

Method: EPA 7471B		Sampled: 02/05/2021 10:15
Instrument: HYDRA Analyst: BLC		Analyzed: 02/19/2021 10:21
Sample Preparation:	Preparation Method: SMM EPA 7471B	Extract ID: 21B0126-06 B
	Preparation Batch: BJB0434	Dry Weight: 0.16 g
	Sample Size: 0.23 g (wet)	% Solids: 71.30
	Prepared: 02/17/2021	Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00640	0.0305	0.0431	mg/kg	

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Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

MW-104:9-02052021

21B0126-06RE1 (Solid)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 02/05/2021 10:15

Instrument: NT5 Analyst: PB

Analyzed: 02/23/2021 16:21

Sample Preparation:

Preparation Method: EPA 5035 (Sodium Bisulfate)

Extract ID: 21B0126-06RE1 D

Preparation Batch: BJB0694

Sample Size: 5.11 g (wet)

Dry Weight: 3.61 g

Prepared: 02/23/2021

Final Volume: 5 mL

% Solids: 70.74

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.33	1.38	ND	ug/kg	H, U
1,1-Dichloroethene	75-35-4	1	0.46	1.38	ND	ug/kg	H, U
trans-1,2-Dichloroethene	156-60-5	1	0.37	1.38	ND	ug/kg	U
cis-1,2-Dichloroethene	156-59-2	1	0.33	1.38	ND	ug/kg	H, U
Benzene	71-43-2	1	0.41	1.38	ND	ug/kg	H, U
Trichloroethene	79-01-6	1	0.29	1.38	ND	ug/kg	H, U
Toluene	108-88-3	1	0.21	1.38	1.05	ug/kg	H, J
Tetrachloroethene	127-18-4	1	0.36	1.38	ND	ug/kg	H, U
Ethylbenzene	100-41-4	1	0.28	1.38	ND	ug/kg	H, U
m,p-Xylene	179601-23-1	1	0.54	2.77	ND	ug/kg	H, U
o-Xylene	95-47-6	1	0.31	1.38	ND	ug/kg	H, U
Xylenes, total	1330-20-7	1	0.85	2.77	ND	ug/kg	H, U
Surrogate: 1,2-Dichloroethane-d4				80-149 %	140	%	H, Q
Surrogate: Toluene-d8				77-120 %	105	%	H
Surrogate: 4-Bromofluorobenzene				80-120 %	99.6	%	H
Surrogate: 1,2-Dichlorobenzene-d4				80-120 %	100	%	H

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

TB-5-02052021
21B0126-07 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 02/05/2021 12:40

Instrument: NT2 Analyst: PKC

Analyzed: 02/11/2021 18:56

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21B0126-07 B

Preparation Batch: BJB0383

Sample Size: 10 mL

Prepared: 02/11/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4				80-129 %	121	%	
Surrogate: Toluene-d8				80-120 %	99.3	%	
Surrogate: 4-Bromofluorobenzene				80-120 %	86.3	%	
Surrogate: 1,2-Dichlorobenzene-d4				80-120 %	105	%	

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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

SB-2021-044:12-02052021
21B0126-08 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM		Sampled: 02/05/2021 11:14
Instrument: NT11 Analyst: VTS		Analyzed: 03/13/2021 17:15
Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Low Level	Extract ID: 21B0126-08 A 02
	Preparation Batch: BJB0518	Dry Weight: 10.07 g
	Prepared: 02/18/2021	% Solids: 79.08
Sample Cleanup:	Cleanup Method: Silica Gel	Extract ID: 21B0126-08 A 02
	Cleanup Batch: CJC0059	Initial Volume: 0.5 mL
	Cleaned: 05-Mar-2021	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Sulfur	Extract ID: 21B0126-08 A 02
	Cleanup Batch: CJC0057	Initial Volume: 0.5 mL
	Cleaned: 05-Mar-2021	Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.44	0.60	0.64	ug/kg	
1-Methylnaphthalene	90-12-0	1	0.11	0.50	1.28	ug/kg	
2-Methylnaphthalene	91-57-6	1	0.13	0.50	1.02	ug/kg	
Acenaphthylene	208-96-8	1	0.06	0.50	ND	ug/kg	U
Acenaphthene	83-32-9	1	0.09	0.50	0.32	ug/kg	J
Dibenzofuran	132-64-9	1	0.13	0.50	0.79	ug/kg	
Fluorene	86-73-7	1	0.07	0.50	0.32	ug/kg	J
Phenanthrene	85-01-8	1	0.11	0.50	7.57	ug/kg	
Anthracene	120-12-7	1	0.07	0.50	1.76	ug/kg	
Fluoranthene	206-44-0	1	0.08	0.50	10.1	ug/kg	
Pyrene	129-00-0	1	0.09	0.50	12.4	ug/kg	
Benzo(a)anthracene	56-55-3	1	0.07	0.50	7.06	ug/kg	
Chrysene	218-01-9	1	0.07	0.50	7.47	ug/kg	
Benzo(b)fluoranthene	205-99-2	1	0.07	0.50	5.47	ug/kg	
Benzo(k)fluoranthene	207-08-9	1	0.10	0.50	2.67	ug/kg	
Benzo(j)fluoranthene	205-82-3	1	0.10	0.50	2.70	ug/kg	Q
Benzo(a)pyrene	50-32-8	1	0.09	0.50	7.50	ug/kg	
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.09	0.50	4.30	ug/kg	
Dibenzo(a,h)anthracene	53-70-3	1	0.10	0.50	1.29	ug/kg	
Benzo(g,h,i)perylene	191-24-2	1	0.08	0.50	4.92	ug/kg	
Surrogate: 2-Methylnaphthalene-d10					30-160 %	42.4 %	
Surrogate: Dibenzo[a,h]anthracene-d14					30-160 %	67.6 %	
Surrogate: Fluoranthene-d10					30-160 %	62.5 %	

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Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

SB-2021-044:12-02052021
21B0126-08 (Solid)

Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 02/05/2021 11:14

Instrument: FID4 Analyst: CTO

Analyzed: 02/26/2021 14:17

Sample Preparation:

Preparation Method: EPA 3546 (Microwave)

Extract ID: 21B0126-08 A 01

Preparation Batch: BJB0456

Sample Size: 10.04 g (wet)

Dry Weight: 7.94 g

Prepared: 02/17/2021

Final Volume: 1 mL

% Solids: 79.08

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	6.30	ND	mg/kg	U
Motor Oil Range Organics (C24-C38)	RRO	1	12.6	14.8	mg/kg	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	117	%	

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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

SB-2021-044:12-02052021
21B0126-08 (Solid)

Aroclor PCB

Method: EPA 8082A		Sampled: 02/05/2021 11:14	
Instrument: ECD7 Analyst: JGR		Analyzed: 03/07/2021 14:33	
Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Extract ID: 21B0126-08 A 03	
	Preparation Batch: BJB0519	Dry Weight: 12.52 g	
	Prepared: 02/18/2021	% Solids: 79.08	
Sample Cleanup:	Cleanup Method: Silica Gel	Extract ID: 21B0126-08 A 03	
	Cleanup Batch: CJC0015	Initial Volume: 2.5 mL	
	Cleaned: 02-Mar-2021	Final Volume: 2.5 mL	
Sample Cleanup:	Cleanup Method: Sulfuric Acid	Extract ID: 21B0126-08 A 03	
	Cleanup Batch: CJC0013	Initial Volume: 2.5 mL	
	Cleaned: 02-Mar-2021	Final Volume: 2.5 mL	
Sample Cleanup:	Cleanup Method: Sulfur	Extract ID: 21B0126-08 A 03	
	Cleanup Batch: CJC0014	Initial Volume: 2.5 mL	
	Cleaned: 02-Mar-2021	Final Volume: 2.5 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	5	7.8	20.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	5	7.8	20.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	5	7.8	20.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	5	7.8	20.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	5	7.8	20.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	5	7.8	20.0	433	ug/kg	D
Aroclor 1260	11096-82-5	5	2.9	20.0	49.8	ug/kg	D
Surrogate: Decachlorobiphenyl				40-126 %	88.8	%	
Surrogate: Tetrachlorometaxylene				44-120 %	58.9	%	
Surrogate: Decachlorobiphenyl [2C]				40-126 %	67.2	%	
Surrogate: Tetrachlorometaxylene [2C]				44-120 %	58.3	%	

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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

MW-65:20-02052021
21B0126-09 (Solid)

Volatile Organic Compounds

Method: EPA 8260D
Instrument: NT15 Analyst: PB
Sample Preparation: Preparation Method: EPA 5035 (Sodium Bisulfate)
Preparation Batch: BJB0637 Sample Size: 4.3 g (wet)
Prepared: 02/19/2021 Final Volume: 5 mL
Extract ID: 21B0126-09 E
Dry Weight: 3.41 g
% Solids: 79.26

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.34	1.47	ND	ug/kg	U
1,1-Dichloroethene	75-35-4	1	0.49	1.47	ND	ug/kg	U
trans-1,2-Dichloroethene	156-60-5	1	0.39	1.47	ND	ug/kg	U
cis-1,2-Dichloroethene	156-59-2	1	0.35	1.47	ND	ug/kg	U
Benzene	71-43-2	1	0.43	1.47	0.57	ug/kg	J
Trichloroethene	79-01-6	1	0.31	1.47	ND	ug/kg	U
Toluene	108-88-3	1	0.22	1.47	ND	ug/kg	U
Tetrachloroethene	127-18-4	1	0.38	1.47	ND	ug/kg	U
Ethylbenzene	100-41-4	1	0.30	1.47	ND	ug/kg	U
m,p-Xylene	179601-23-1	1	0.58	2.93	ND	ug/kg	U
o-Xylene	95-47-6	1	0.33	1.47	ND	ug/kg	U
Xylenes, total	1330-20-7	1	0.90	2.93	ND	ug/kg	U
Surrogate: 1,2-Dichloroethane-d4				80-149 %	88.6	%	
Surrogate: Toluene-d8				77-120 %	96.5	%	
Surrogate: 4-Bromofluorobenzene				80-120 %	92.3	%	
Surrogate: 1,2-Dichlorobenzene-d4				80-120 %	99.9	%	

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Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

MW-65:20-02052021 21B0126-09 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM		Sampled: 02/05/2021 12:40
Instrument: NT11 Analyst: VTS		Analyzed: 03/13/2021 17:47
Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Low Level	Extract ID: 21B0126-09 A 02
	Preparation Batch: BJB0518	Dry Weight: 10.12 g
	Prepared: 02/18/2021	% Solids: 79.26
Sample Cleanup:	Cleanup Method: Silica Gel	Extract ID: 21B0126-09 A 02
	Cleanup Batch: CJC0059	Initial Volume: 0.5 mL
	Cleaned: 05-Mar-2021	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Sulfur	Extract ID: 21B0126-09 A 02
	Cleanup Batch: CJC0057	Initial Volume: 0.5 mL
	Cleaned: 05-Mar-2021	Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.43	0.59	10.1	ug/kg	
1-Methylnaphthalene	90-12-0	1	0.10	0.49	2.18	ug/kg	
2-Methylnaphthalene	91-57-6	1	0.13	0.49	2.87	ug/kg	
Acenaphthylene	208-96-8	1	0.06	0.49	2.81	ug/kg	
Acenaphthene	83-32-9	1	0.09	0.49	3.28	ug/kg	
Dibenzofuran	132-64-9	1	0.12	0.49	1.82	ug/kg	
Fluorene	86-73-7	1	0.07	0.49	2.28	ug/kg	
Phenanthrene	85-01-8	1	0.11	0.49	11.4	ug/kg	
Anthracene	120-12-7	1	0.07	0.49	2.64	ug/kg	
Fluoranthene	206-44-0	1	0.08	0.49	10.3	ug/kg	
Pyrene	129-00-0	1	0.09	0.49	11.9	ug/kg	
Benzo(a)anthracene	56-55-3	1	0.07	0.49	1.92	ug/kg	
Chrysene	218-01-9	1	0.07	0.49	3.11	ug/kg	
Benzo(b)fluoranthene	205-99-2	1	0.07	0.49	2.28	ug/kg	
Benzo(k)fluoranthene	207-08-9	1	0.10	0.49	0.88	ug/kg	
Benzo(j)fluoranthene	205-82-3	1	0.10	0.49	1.00	ug/kg	Q
Benzo(a)pyrene	50-32-8	1	0.09	0.49	1.84	ug/kg	
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.09	0.49	1.78	ug/kg	
Dibenzo(a,h)anthracene	53-70-3	1	0.10	0.49	0.25	ug/kg	J
Benzo(g,h,i)perylene	191-24-2	1	0.08	0.49	2.82	ug/kg	
Surrogate: 2-Methylnaphthalene-d10					30-160 %	42.8 %	
Surrogate: Dibenzo[a,h]anthracene-d14					30-160 %	67.9 %	
Surrogate: Fluoranthene-d10					30-160 %	62.9 %	

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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

MW-65:20-02052021
21B0126-09 (Solid)

Petroleum Hydrocarbons

Method: NWTPH-Dx		Sampled: 02/05/2021 12:40
Instrument: FID4 Analyst: CTO		Analyzed: 02/26/2021 14:38
Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Extract ID: 21B0126-09 A 01
	Preparation Batch: BJB0456	Dry Weight: 7.95 g
	Prepared: 02/17/2021	% Solids: 79.26
	Sample Size: 10.03 g (wet)	
	Final Volume: 1 mL	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	6.29	7.04	mg/kg	
HC ID: DIESEL						
Motor Oil Range Organics (C24-C38)	RRO	1	12.6	25.3	mg/kg	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	109	%	

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 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 09:08

MW-65:20-02052021
21B0126-09 (Solid)
Aroclor PCB

Method: EPA 8082A			Sampled: 02/05/2021 12:40	
Instrument: ECD7 Analyst: JGR			Analyzed: 03/13/2021 12:35	
Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 15.8 g (wet) Final Volume: 2.5 mL	Extract ID: 21B0126-09 A 03	
	Preparation Batch: BJB0519		Dry Weight: 12.52 g	
	Prepared: 02/18/2021		% Solids: 79.26	
Sample Cleanup:	Cleanup Method: Silica Gel	Initial Volume: 2.5 mL Final Volume: 2.5 mL	Extract ID: 21B0126-09 A 03	
	Cleanup Batch: CJC0015			
	Cleaned: 02-Mar-2021			
Sample Cleanup:	Cleanup Method: Sulfuric Acid	Initial Volume: 2.5 mL Final Volume: 2.5 mL	Extract ID: 21B0126-09 A 03	
	Cleanup Batch: CJC0013			
	Cleaned: 02-Mar-2021			
Sample Cleanup:	Cleanup Method: Sulfur	Initial Volume: 2.5 mL Final Volume: 2.5 mL	Extract ID: 21B0126-09 A 03	
	Cleanup Batch: CJC0014			
	Cleaned: 02-Mar-2021			

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	1.6	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	1.6	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	1.6	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	1.6	4.0	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	0.6	4.0	2.1	ug/kg	J
Surrogate: Decachlorobiphenyl				40-126 %	69.6	%	
Surrogate: Tetrachlorometaxylene				44-120 %	70.8	%	
Surrogate: Decachlorobiphenyl [2C]				40-126 %	64.1	%	
Surrogate: Tetrachlorometaxylene [2C]				44-120 %	59.3	%	



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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

MW-65:20-02052021
21B0126-09 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 02/05/2021 12:40

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/19/2021 23:28

Sample Preparation:

Preparation Method: SWN EPA 3050B

Extract ID: 21B0126-09 B 01

Preparation Batch: BJB0430

Sample Size: 1.025 g (wet)

Dry Weight: 0.79 g

Prepared: 02/17/2021

Final Volume: 50 mL

% Solids: 76.87

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium	7440-39-3	20	0.07	0.63	58.7	mg/kg	
Chromium	7440-47-3	20	0.16	0.63	14.1	mg/kg	
Cobalt	7440-48-4	20	0.04	0.25	4.62	mg/kg	
Lead	7439-92-1	20	0.09	0.13	2.96	mg/kg	
Silver	7440-22-4	20	0.02	0.25	0.07	mg/kg	J
Vanadium	7440-62-2	20	0.05	0.25	44.3	mg/kg	

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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

MW-65:20-02052021
21B0126-09 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 02/05/2021 12:40

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/19/2021 23:28

Sample Preparation:

Preparation Method: SWN EPA 3050B

Extract ID: 21B0126-09 B 01

Preparation Batch: BJB0430

Sample Size: 1.025 g (wet)

Dry Weight: 0.79 g

Prepared: 02/17/2021

Final Volume: 50 mL

% Solids: 76.87

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	20	0.03	0.25	2.40	mg/kg	
Cadmium	7440-43-9	20	0.04	0.13	0.05	mg/kg	J
Copper	7440-50-8	20	0.43	0.63	19.6	mg/kg	
Nickel	7440-02-0	20	0.06	0.63	11.9	mg/kg	
Selenium	7782-49-2	20	0.56	0.63	2.46	mg/kg	
Zinc	7440-66-6	20	1.0	5.1	25.3	mg/kg	

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

MW-65:20-02052021
21B0126-09 (Solid)

Metals and Metallic Compounds

Method: EPA 7471B		Sampled: 02/05/2021 12:40
Instrument: HYDRA Analyst: BLC		Analyzed: 02/19/2021 10:24
Sample Preparation:	Preparation Method: SMM EPA 7471B	Extract ID: 21B0126-09 B
	Preparation Batch: BJB0434	Dry Weight: 0.22 g
	Prepared: 02/17/2021	% Solids: 76.87
	Sample Size: 0.286 g (wet)	
	Final Volume: 50 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00478	0.0227	0.0155	mg/kg	J

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Analytical Report

Shannon & Wilson, Inc
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Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

MW-65:20-02052021
21B0126-09 (Solid)

Wet Chemistry

Method: SM 3500-Cr B-09

Sampled: 02/05/2021 12:40

Instrument: UV1800-1 Analyst: WCW

Analyzed: 02/10/2021 19:03

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 21B0126-09 B

Preparation Batch: BJB0295

Sample Size: 2.93 g (wet)

Prepared: 02/09/2021

Final Volume: 100 g

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Hexavalent Chromium	1854-02-99	1.25	0.427	0.427	ND	mg/kg wet	U

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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

Volatile Organic Compounds - Quality Control

Batch BJB0383 - EPA 5030C (Purge and Trap)

Instrument: NT2 Analyst: PKC

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0383-BLK1)											
						Prepared: 11-Feb-2021 Analyzed: 11-Feb-2021 17:12					
Vinyl Chloride	ND	0.08	0.20	ug/L							U
1,1-Dichloroethene	ND	0.08	0.20	ug/L							U
trans-1,2-Dichloroethene	ND	0.07	0.20	ug/L							U
cis-1,2-Dichloroethene	ND	0.08	0.20	ug/L							U
Benzene	ND	0.05	0.20	ug/L							U
Trichloroethene	ND	0.07	0.20	ug/L							U
Toluene	ND	0.05	0.20	ug/L							U
Tetrachloroethene	ND	0.09	0.20	ug/L							U
Ethylbenzene	ND	0.05	0.20	ug/L							U
m,p-Xylene	ND	0.14	0.40	ug/L							U
o-Xylene	ND	0.08	0.20	ug/L							U
Xylenes, total	ND	0.22	0.60	ug/L							U
Surrogate: 1,2-Dichloroethane-d4	5.50			ug/L	5.00		110	80-129			
Surrogate: Toluene-d8	4.79			ug/L	5.00		95.8	80-120			
Surrogate: 4-Bromofluorobenzene	4.55			ug/L	5.00		90.9	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	5.19			ug/L	5.00		104	80-120			
LCS (BJB0383-BS1)											
						Prepared: 11-Feb-2021 Analyzed: 11-Feb-2021 16:10					
Vinyl Chloride	9.85	0.08	0.20	ug/L	10.0		98.5	66-133			
1,1-Dichloroethene	10.1	0.08	0.20	ug/L	10.0		101	69-135			
trans-1,2-Dichloroethene	10.0	0.07	0.20	ug/L	10.0		100	78-128			
cis-1,2-Dichloroethene	10.1	0.08	0.20	ug/L	10.0		101	80-121			
Benzene	10.3	0.05	0.20	ug/L	10.0		103	80-120			
Trichloroethene	10.0	0.07	0.20	ug/L	10.0		100	80-120			
Toluene	9.80	0.05	0.20	ug/L	10.0		98.0	80-120			
Tetrachloroethene	10.3	0.09	0.20	ug/L	10.0		103	80-120			
Ethylbenzene	10.1	0.05	0.20	ug/L	10.0		101	80-120			
m,p-Xylene	21.6	0.14	0.40	ug/L	20.0		108	80-121			
o-Xylene	10.7	0.08	0.20	ug/L	10.0		107	80-121			
Xylenes, total	32.3	0.22	0.60	ug/L	30.0		108	76-127			
Surrogate: 1,2-Dichloroethane-d4	5.06			ug/L	5.00		101	80-129			
Surrogate: Toluene-d8	5.06			ug/L	5.00		101	80-120			
Surrogate: 4-Bromofluorobenzene	5.03			ug/L	5.00		101	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	5.01			ug/L	5.00		100	80-120			

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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

Volatile Organic Compounds - Quality Control

Batch BJB0383 - EPA 5030C (Purge and Trap)

Instrument: NT2 Analyst: PKC

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BJB0383-BSD1)						Prepared: 11-Feb-2021 Analyzed: 11-Feb-2021 16:30					
Vinyl Chloride	10.8	0.08	0.20	ug/L	10.0		108	66-133	8.92	30	
1,1-Dichloroethene	10.9	0.08	0.20	ug/L	10.0		109	69-135	7.85	30	
trans-1,2-Dichloroethene	10.6	0.07	0.20	ug/L	10.0		106	78-128	5.30	30	
cis-1,2-Dichloroethene	10.7	0.08	0.20	ug/L	10.0		107	80-121	6.28	30	
Benzene	11.0	0.05	0.20	ug/L	10.0		110	80-120	7.10	30	
Trichloroethene	10.7	0.07	0.20	ug/L	10.0		107	80-120	6.63	30	
Toluene	10.5	0.05	0.20	ug/L	10.0		105	80-120	6.87	30	
Tetrachloroethene	10.8	0.09	0.20	ug/L	10.0		108	80-120	4.91	30	
Ethylbenzene	10.7	0.05	0.20	ug/L	10.0		107	80-120	5.40	30	
m,p-Xylene	23.1	0.14	0.40	ug/L	20.0		116	80-121	6.82	30	
o-Xylene	11.3	0.08	0.20	ug/L	10.0		113	80-121	5.73	30	
Xylenes, total	34.4	0.22	0.60	ug/L	30.0		115	76-127	6.46	30	
Surrogate: 1,2-Dichloroethane-d4	5.09			ug/L	5.00		102	80-129			
Surrogate: Toluene-d8	5.09			ug/L	5.00		102	80-120			
Surrogate: 4-Bromofluorobenzene	5.18			ug/L	5.00		104	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	5.04			ug/L	5.00		101	80-120			

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Analytical Resources, Incorporated
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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

Volatile Organic Compounds - Quality Control

Batch BJB0418 - EPA 5035 (Sodium Bisulfate)

Instrument: NT5 Analyst: PB

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0418-BLK1)											
						Prepared: 12-Feb-2021 Analyzed: 12-Feb-2021 13:52					
Vinyl Chloride	ND	0.24	1.00	ug/kg							U
1,1-Dichloroethene	ND	0.34	1.00	ug/kg							U
trans-1,2-Dichloroethene	ND	0.27	1.00	ug/kg							U
cis-1,2-Dichloroethene	ND	0.24	1.00	ug/kg							U
Benzene	ND	0.30	1.00	ug/kg							U
Trichloroethene	ND	0.21	1.00	ug/kg							U
Toluene	ND	0.15	1.00	ug/kg							U
Tetrachloroethene	ND	0.26	1.00	ug/kg							U
Ethylbenzene	ND	0.20	1.00	ug/kg							U
m,p-Xylene	ND	0.39	2.00	ug/kg							U
o-Xylene	ND	0.22	1.00	ug/kg							U
Xylenes, total	ND	0.62	2.00	ug/kg							U
<i>Surrogate: 1,2-Dichloroethane-d4</i>	54.1			ug/kg	50.0		108	80-149			
<i>Surrogate: Toluene-d8</i>	50.8			ug/kg	50.0		102	77-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	50.2			ug/kg	50.0		100	80-120			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	49.9			ug/kg	50.0		99.9	80-120			
LCS (BJB0418-BS1)											
						Prepared: 12-Feb-2021 Analyzed: 12-Feb-2021 12:49					
Vinyl Chloride	58.7			ug/kg	50.0		117	74-135			
1,1-Dichloroethene	51.0			ug/kg	50.0		102	77-134			
trans-1,2-Dichloroethene	51.9			ug/kg	50.0		104	79-130			
cis-1,2-Dichloroethene	50.8			ug/kg	50.0		102	80-125			
Benzene	49.4			ug/kg	50.0		98.9	80-120			
Trichloroethene	50.1			ug/kg	50.0		100	80-120			
Toluene	47.8			ug/kg	50.0		95.7	75-120			
Tetrachloroethene	49.8			ug/kg	50.0		99.7	74-124			
Ethylbenzene	48.8			ug/kg	50.0		97.7	80-125			
m,p-Xylene	98.4			ug/kg	100		98.4	76-121			
o-Xylene	50.1			ug/kg	50.0		100	67-132			
Xylenes, total	149			ug/kg	150		99.0	67-132			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	54.6			ug/kg	50.0		109	80-149			
<i>Surrogate: Toluene-d8</i>	50.7			ug/kg	50.0		101	77-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	50.9			ug/kg	50.0		102	80-120			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	49.5			ug/kg	50.0		99.0	80-120			

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Analytical Resources, Incorporated
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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

Volatile Organic Compounds - Quality Control

Batch BJB0418 - EPA 5035 (Sodium Bisulfate)

Instrument: NT5 Analyst: PB

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BJB0418-BS01)						Prepared: 12-Feb-2021	Analyzed: 12-Feb-2021 14:58				
Vinyl Chloride	65.2			ug/kg	50.0		130	74-135	10.50	30	
1,1-Dichloroethene	58.3			ug/kg	50.0		117	77-134	13.30	30	
trans-1,2-Dichloroethene	58.9			ug/kg	50.0		118	79-130	12.60	30	
cis-1,2-Dichloroethene	59.1			ug/kg	50.0		118	80-125	15.10	30	
Benzene	57.0			ug/kg	50.0		114	80-120	14.30	30	
Trichloroethene	56.5			ug/kg	50.0		113	80-120	11.90	30	
Toluene	54.2			ug/kg	50.0		108	75-120	12.40	30	
Tetrachloroethene	55.4			ug/kg	50.0		111	74-124	10.60	30	
Ethylbenzene	55.4			ug/kg	50.0		111	80-125	12.60	30	
m,p-Xylene	111			ug/kg	100		111	76-121	12.20	30	
o-Xylene	55.7			ug/kg	50.0		111	67-132	10.50	30	
Xylenes, total	167			ug/kg	150		111	67-132	11.60	30	
Surrogate: 1,2-Dichloroethane-d4	55.9			ug/kg	50.0		112	80-149			
Surrogate: Toluene-d8	51.1			ug/kg	50.0		102	77-120			
Surrogate: 4-Bromofluorobenzene	51.5			ug/kg	50.0		103	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	50.2			ug/kg	50.0		100	80-120			

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Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

Volatile Organic Compounds - Quality Control

Batch BJB0637 - EPA 5035 (Sodium Bisulfate)

Instrument: NT15 Analyst: PB

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0637-BLK1)											
						Prepared: 19-Feb-2021 Analyzed: 19-Feb-2021 21:50					
Vinyl Chloride	ND	0.24	1.00	ug/kg							U
1,1-Dichloroethene	ND	0.34	1.00	ug/kg							U
trans-1,2-Dichloroethene	ND	0.27	1.00	ug/kg							U
cis-1,2-Dichloroethene	ND	0.24	1.00	ug/kg							U
Benzene	ND	0.30	1.00	ug/kg							U
Trichloroethene	ND	0.21	1.00	ug/kg							U
Toluene	ND	0.15	1.00	ug/kg							U
Tetrachloroethene	ND	0.26	1.00	ug/kg							U
Ethylbenzene	ND	0.20	1.00	ug/kg							U
m,p-Xylene	ND	0.39	2.00	ug/kg							U
o-Xylene	ND	0.22	1.00	ug/kg							U
Xylenes, total	ND	0.62	2.00	ug/kg							U
Surrogate: 1,2-Dichloroethane-d4	57.4			ug/kg	50.0		115	80-149			
Surrogate: Toluene-d8	49.4			ug/kg	50.0		98.9	77-120			
Surrogate: 4-Bromofluorobenzene	49.0			ug/kg	50.0		98.0	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	52.1			ug/kg	50.0		104	80-120			
LCS (BJB0637-BS1)											
						Prepared: 19-Feb-2021 Analyzed: 19-Feb-2021 19:49					
Vinyl Chloride	47.6			ug/kg	50.0		95.2	74-135			
1,1-Dichloroethene	46.2			ug/kg	50.0		92.5	77-134			
trans-1,2-Dichloroethene	0.00			ug/kg	50.0			79-130			U
cis-1,2-Dichloroethene	48.8			ug/kg	50.0		97.6	80-125			
Benzene	46.5			ug/kg	50.0		93.0	80-120			
Trichloroethene	47.6			ug/kg	50.0		95.2	80-120			
Toluene	46.9			ug/kg	50.0		93.8	75-120			
Tetrachloroethene	45.1			ug/kg	50.0		90.1	74-124			
Ethylbenzene	46.9			ug/kg	50.0		93.7	80-125			
m,p-Xylene	93.9			ug/kg	100		93.9	76-121			
o-Xylene	48.8			ug/kg	50.0		97.5	67-132			
Xylenes, total	143			ug/kg	150		95.1	67-132			
Surrogate: 1,2-Dichloroethane-d4	53.7			ug/kg	50.0		107	80-149			
Surrogate: Toluene-d8	50.2			ug/kg	50.0		100	77-120			
Surrogate: 4-Bromofluorobenzene	50.0			ug/kg	50.0		100	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	50.1			ug/kg	50.0		100	80-120			


 Shannon & Wilson, Inc
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 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 09:08

Volatile Organic Compounds - Quality Control
Batch BJB0694 - EPA 5035 (Sodium Bisulfate)

Instrument: NT5 Analyst: PB

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0694-BLK1)											
						Prepared: 23-Feb-2021 Analyzed: 23-Feb-2021 15:08					
Vinyl Chloride	ND	0.24	1.00	ug/kg							U
1,1-Dichloroethene	ND	0.34	1.00	ug/kg							U
trans-1,2-Dichloroethene	ND	0.27	1.00	ug/kg							U
cis-1,2-Dichloroethene	ND	0.24	1.00	ug/kg							U
Benzene	ND	0.30	1.00	ug/kg							U
Trichloroethene	ND	0.21	1.00	ug/kg							U
Toluene	ND	0.15	1.00	ug/kg							U
Tetrachloroethene	ND	0.26	1.00	ug/kg							U
Ethylbenzene	ND	0.20	1.00	ug/kg							U
m,p-Xylene	ND	0.39	2.00	ug/kg							U
o-Xylene	ND	0.22	1.00	ug/kg							U
Xylenes, total	ND	0.62	2.00	ug/kg							U
<i>Surrogate: 1,2-Dichloroethane-d4</i>	66.0			ug/kg	50.0		132	80-149			Q
<i>Surrogate: Toluene-d8</i>	53.9			ug/kg	50.0		108	77-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	49.5			ug/kg	50.0		99.0	80-120			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	48.2			ug/kg	50.0		96.3	80-120			
LCS (BJB0694-BS1)											
						Prepared: 23-Feb-2021 Analyzed: 23-Feb-2021 08:56					
Vinyl Chloride	58.1			ug/kg	50.0		116	74-135			
1,1-Dichloroethene	54.2			ug/kg	50.0		108	77-134			
trans-1,2-Dichloroethene	0.00			ug/kg	50.0			79-130			U
cis-1,2-Dichloroethene	58.3			ug/kg	50.0		117	80-125			
Benzene	46.8			ug/kg	50.0		93.6	80-120			
Trichloroethene	45.4			ug/kg	50.0		90.7	80-120			
Toluene	46.4			ug/kg	50.0		92.8	75-120			
Tetrachloroethene	40.8			ug/kg	50.0		81.6	74-124			
Ethylbenzene	43.4			ug/kg	50.0		86.8	80-125			
m,p-Xylene	84.8			ug/kg	100		84.8	76-121			
o-Xylene	42.4			ug/kg	50.0		84.7	67-132			
Xylenes, total	127			ug/kg	150		84.7	67-132			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	68.0			ug/kg	50.0		136	80-149			Q
<i>Surrogate: Toluene-d8</i>	54.6			ug/kg	50.0		109	77-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	50.3			ug/kg	50.0		101	80-120			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	48.8			ug/kg	50.0		97.5	80-120			


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 09:08

Volatile Organic Compounds - Quality Control
Batch BJB0694 - EPA 5035 (Sodium Bisulfate)

Instrument: NT5 Analyst: PB

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BJB0694-BSD1)						Prepared: 23-Feb-2021 Analyzed: 23-Feb-2021 09:19					
Vinyl Chloride	60.3			ug/kg	50.0		121	74-135	3.78	30	
1,1-Dichloroethene	56.9			ug/kg	50.0		114	77-134	4.87	30	
trans-1,2-Dichloroethene	0.00			ug/kg	50.0			79-130			U
cis-1,2-Dichloroethene	60.8			ug/kg	50.0		122	80-125	4.25	30	
Benzene	48.4			ug/kg	50.0		96.8	80-120	3.35	30	
Trichloroethene	47.4			ug/kg	50.0		94.8	80-120	4.36	30	
Toluene	47.9			ug/kg	50.0		95.8	75-120	3.18	30	
Tetrachloroethene	42.0			ug/kg	50.0		83.9	74-124	2.80	30	
Ethylbenzene	45.4			ug/kg	50.0		90.7	80-125	4.38	30	
m,p-Xylene	87.8			ug/kg	100		87.8	76-121	3.52	30	
o-Xylene	43.2			ug/kg	50.0		86.3	67-132	1.90	30	
Xylenes, total	131			ug/kg	150		87.3	67-132	2.98	30	
Surrogate: 1,2-Dichloroethane-d4	67.8			ug/kg	50.0	136		80-149			Q
Surrogate: Toluene-d8	53.5			ug/kg	50.0	107		77-120			
Surrogate: 4-Bromofluorobenzene	50.6			ug/kg	50.0	101		80-120			
Surrogate: 1,2-Dichlorobenzene-d4	49.4			ug/kg	50.0	98.8		80-120			



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

Semivolatile Organic Compounds - SIM - Quality Control

Batch BJB0518 - EPA 3546 (Microwave) Low Level

Instrument: NT11 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0518-BLK1)						Prepared: 18-Feb-2021 Analyzed: 13-Mar-2021 11:50					
Naphthalene	ND	0.44	0.60	ug/kg							U
1-Methylnaphthalene	ND	0.11	0.50	ug/kg							U
2-Methylnaphthalene	ND	0.13	0.50	ug/kg							U
Acenaphthylene	ND	0.06	0.50	ug/kg							U
Acenaphthene	ND	0.09	0.50	ug/kg							U
Dibenzofuran	ND	0.13	0.50	ug/kg							U
Fluorene	ND	0.07	0.50	ug/kg							U
Phenanthrene	ND	0.11	0.50	ug/kg							U
Anthracene	ND	0.07	0.50	ug/kg							U
Fluoranthene	ND	0.08	0.50	ug/kg							U
Pyrene	ND	0.09	0.50	ug/kg							U
Benzo(a)anthracene	ND	0.07	0.50	ug/kg							U
Chrysene	ND	0.07	0.50	ug/kg							U
Benzo(b)fluoranthene	ND	0.07	0.50	ug/kg							U
Benzo(k)fluoranthene	ND	0.10	0.50	ug/kg							U
Benzo(j)fluoranthene	ND	0.10	0.50	ug/kg							U
Benzo(a)pyrene	ND	0.09	0.50	ug/kg							U
Indeno(1,2,3-cd)pyrene	ND	0.09	0.50	ug/kg							U
Dibenzo(a,h)anthracene	ND	0.11	0.50	ug/kg							U
Benzo(g,h,i)perylene	ND	0.09	0.50	ug/kg							U
Surrogate: 2-Methylnaphthalene-d10	6.80			ug/kg	15.0		45.3	30-160			
Surrogate: Dibenzo[a,h]anthracene-d14	9.37			ug/kg	15.0		62.5	30-160			
Surrogate: Fluoranthene-d10	8.17			ug/kg	15.0		54.5	30-160			

LCS (BJB0518-BS1)						Prepared: 18-Feb-2021 Analyzed: 13-Mar-2021 12:22					
Naphthalene	6.90	0.44	0.60	ug/kg	15.0		46.0	30-160			
1-Methylnaphthalene	7.24	0.11	0.50	ug/kg	15.0		48.3	30-160			
2-Methylnaphthalene	7.19	0.13	0.50	ug/kg	15.0		47.9	30-160			
Acenaphthylene	6.36	0.06	0.50	ug/kg	15.0		42.4	30-160			
Acenaphthene	6.81	0.09	0.50	ug/kg	15.0		45.4	30-160			
Dibenzofuran	6.95	0.13	0.50	ug/kg	15.0		46.3	30-160			
Fluorene	7.50	0.07	0.50	ug/kg	15.0		50.0	30-160			
Phenanthrene	7.68	0.11	0.50	ug/kg	15.0		51.2	30-160			
Anthracene	6.70	0.07	0.50	ug/kg	15.0		44.7	30-160			
Fluoranthene	8.35	0.08	0.50	ug/kg	15.0		55.7	30-160			

Analytical Resources, Inc.

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

Semivolatile Organic Compounds - SIM - Quality Control

Batch BJB0518 - EPA 3546 (Microwave) Low Level

Instrument: NT11 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJB0518-BS1)											
						Prepared: 18-Feb-2021 Analyzed: 13-Mar-2021 12:22					
Pyrene	8.44	0.09	0.50	ug/kg	15.0		56.3	30-160			
Benzo(a)anthracene	8.50	0.07	0.50	ug/kg	15.0		56.6	30-160			
Chrysene	8.24	0.07	0.50	ug/kg	15.0		54.9	30-160			
Benzo(b)fluoranthene	8.76	0.07	0.50	ug/kg	15.0		58.4	30-160			
Benzo(k)fluoranthene	8.11	0.10	0.50	ug/kg	15.0		54.1	30-160			
Benzo(j)fluoranthene	7.05	0.10	0.50	ug/kg	15.0		47.0	30-160			Q
Benzo(a)pyrene	7.47	0.09	0.50	ug/kg	15.0		49.8	30-160			
Indeno(1,2,3-cd)pyrene	9.58	0.09	0.50	ug/kg	15.0		63.8	30-160			
Dibenzo(a,h)anthracene	9.56	0.11	0.50	ug/kg	15.0		63.8	30-160			
Benzo(g,h,i)perylene	8.94	0.09	0.50	ug/kg	15.0		59.6	30-160			
Surrogate: 2-Methylnaphthalene-d10	7.44			ug/kg	15.0		49.6	30-160			
Surrogate: Dibenzo[a,h]anthracene-d14	9.78			ug/kg	15.0		65.2	30-160			
Surrogate: Fluoranthene-d10	8.46			ug/kg	15.0		56.4	30-160			
Matrix Spike (BJB0518-MS1)											
				Source: 21B0126-02		Prepared: 18-Feb-2021 Analyzed: 13-Mar-2021 13:59					
Naphthalene	10.2	0.44	0.60	ug/kg	15.0	2.33	52.1	30-160			
1-Methylnaphthalene	9.21	0.11	0.50	ug/kg	15.0	1.67	50.3	30-160			
2-Methylnaphthalene	9.30	0.13	0.50	ug/kg	15.0	2.08	48.1	30-160			
Acenaphthylene	7.04	0.06	0.50	ug/kg	15.0	ND	47.0	30-160			
Acenaphthene	7.45	0.09	0.50	ug/kg	15.0	ND	49.7	30-160			
Dibenzofuran	8.58	0.13	0.50	ug/kg	15.0	1.16	49.5	30-160			
Fluorene	8.36	0.07	0.50	ug/kg	15.0	ND	55.7	30-160			
Phenanthrene	12.6	0.11	0.50	ug/kg	15.0	4.72	52.6	30-160			
Anthracene	8.77	0.07	0.50	ug/kg	15.0	0.36	56.0	30-160			
Fluoranthene	11.1	0.08	0.50	ug/kg	15.0	1.57	63.6	30-160			
Pyrene	11.3	0.09	0.50	ug/kg	15.0	1.79	63.3	30-160			
Benzo(a)anthracene	9.67	0.07	0.50	ug/kg	15.0	0.69	59.9	30-160			
Chrysene	9.83	0.07	0.50	ug/kg	15.0	1.59	55.0	30-160			
Benzo(b)fluoranthene	9.95	0.07	0.50	ug/kg	15.0	0.81	60.9	30-160			
Benzo(k)fluoranthene	8.85	0.10	0.50	ug/kg	15.0	0.22	57.6	30-160			
Benzo(j)fluoranthene	7.55	0.10	0.50	ug/kg	15.0	0.21	48.9	30-160			Q
Benzo(a)pyrene	9.13	0.09	0.50	ug/kg	15.0	0.42	58.0	30-160			
Indeno(1,2,3-cd)pyrene	10.8	0.09	0.50	ug/kg	15.0	0.32	69.5	30-160			
Dibenzo(a,h)anthracene	10.5	0.11	0.50	ug/kg	15.0	ND	69.8	30-160			
Benzo(g,h,i)perylene	9.92	0.09	0.50	ug/kg	15.0	0.73	61.3	30-160			

Analytical Resources, Inc.

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 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 09:08

Semivolatile Organic Compounds - SIM - Quality Control
Batch BJB0518 - EPA 3546 (Microwave) Low Level

Instrument: NT11 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BJB0518-MS1)		Source: 21B0126-02		Prepared: 18-Feb-2021		Analyzed: 13-Mar-2021 13:59					
Surrogate: 2-Methylnaphthalene-d10	7.30			ug/kg	15.0	7.24	48.6	30-160			
Surrogate: Dibenzo[a,h]anthracene-d14	10.3			ug/kg	15.0	10.8	68.5	30-160			
Surrogate: Fluoranthene-d10	8.94			ug/kg	15.0	9.32	59.6	30-160			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike Dup (BJB0518-MSD1)		Source: 21B0126-02		Prepared: 18-Feb-2021		Analyzed: 13-Mar-2021 14:32					
Naphthalene	8.78	0.44	0.60	ug/kg	15.0	2.33	43.0	30-160	14.50	30	
1-Methylnaphthalene	9.41	0.11	0.50	ug/kg	15.0	1.67	51.6	30-160	2.14	30	
2-Methylnaphthalene	9.37	0.13	0.50	ug/kg	15.0	2.08	48.6	30-160	0.76	30	
Acenaphthylene	7.46	0.06	0.50	ug/kg	15.0	ND	49.7	30-160	5.68	30	
Acenaphthene	7.95	0.09	0.50	ug/kg	15.0	ND	53.0	30-160	6.39	30	
Dibenzofuran	8.47	0.13	0.50	ug/kg	15.0	1.16	48.8	30-160	1.23	30	
Fluorene	8.70	0.07	0.50	ug/kg	15.0	ND	58.0	30-160	4.01	30	
Phenanthrene	11.9	0.11	0.50	ug/kg	15.0	4.72	47.6	30-160	6.12	30	
Anthracene	8.30	0.07	0.50	ug/kg	15.0	0.36	52.9	30-160	5.52	30	
Fluoranthene	10.5	0.08	0.50	ug/kg	15.0	1.57	59.7	30-160	5.52	30	
Pyrene	10.7	0.09	0.50	ug/kg	15.0	1.79	59.7	30-160	4.84	30	
Benzo(a)anthracene	9.42	0.07	0.50	ug/kg	15.0	0.69	58.2	30-160	2.61	30	
Chrysene	9.69	0.07	0.50	ug/kg	15.0	1.59	54.0	30-160	1.44	30	
Benzo(b)fluoranthene	10.9	0.07	0.50	ug/kg	15.0	0.81	66.9	30-160	8.64	30	
Benzo(k)fluoranthene	7.83	0.10	0.50	ug/kg	15.0	0.22	50.7	30-160	12.30	30	
Benzo(j)fluoranthene	7.37	0.10	0.50	ug/kg	15.0	0.21	47.7	30-160	2.43	30	Q
Benzo(a)pyrene	9.03	0.09	0.50	ug/kg	15.0	0.42	57.4	30-160	1.10	30	
Indeno(1,2,3-cd)pyrene	10.4	0.09	0.50	ug/kg	15.0	0.32	67.1	30-160	3.47	30	
Dibenzo(a,h)anthracene	10.2	0.11	0.50	ug/kg	15.0	ND	68.1	30-160	2.47	30	
Benzo(g,h,i)perylene	9.61	0.09	0.50	ug/kg	15.0	0.73	59.2	30-160	3.11	30	
Surrogate: 2-Methylnaphthalene-d10	7.84			ug/kg	15.0	7.24	52.3	30-160			
Surrogate: Dibenzo[a,h]anthracene-d14	10.2			ug/kg	15.0	10.8	67.7	30-160			
Surrogate: Fluoranthene-d10	8.80			ug/kg	15.0	9.32	58.7	30-160			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

Petroleum Hydrocarbons - Quality Control

Batch BJB0456 - EPA 3546 (Microwave)

Instrument: FID4 Analyst: CTO

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0456-BLK1)									
				Prepared: 17-Feb-2021 Analyzed: 26-Feb-2021 10:25					
Diesel Range Organics (C12-C24)	ND	5.00	mg/kg						U
Motor Oil Range Organics (C24-C38)	ND	10.0	mg/kg						U
Surrogate: o-Terphenyl	11.9		mg/kg	11.3	106	50-150			
LCS (BJB0456-BS1)									
				Prepared: 17-Feb-2021 Analyzed: 26-Feb-2021 10:46					
Diesel Range Organics (C12-C24)	163	5.00	mg/kg	150	108	63-120			
Surrogate: o-Terphenyl	12.5		mg/kg	11.3	111	50-150			

Analytical Resources, Inc.

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4611 S. 134th Place, Suite 100 • Tukwila, WA 98168 • Ph: (206) 695-6200 • Fax: (206) 695-6202


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 09:08

Aroclor PCB - Quality Control
Batch BJB0519 - EPA 3546 (Microwave)

Instrument: ECD7 Analyst: JGR

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0519-BLK1)											
						Prepared: 18-Feb-2021 Analyzed: 04-Mar-2021 02:36					
Aroclor 1016	ND	1.6	4.0	ug/kg							U
Aroclor 1221	ND	1.6	4.0	ug/kg							U
Aroclor 1232	ND	1.6	4.0	ug/kg							U
Aroclor 1242	ND	1.6	4.0	ug/kg							U
Aroclor 1248	ND	1.6	4.0	ug/kg							U
Aroclor 1254	ND	1.6	4.0	ug/kg							U
Aroclor 1260	ND	0.6	4.0	ug/kg							U
Surrogate: Decachlorobiphenyl	5.15			ug/kg	8.00		64.4	40-126			
Surrogate: Tetrachlorometaxylene	6.70			ug/kg	8.00		83.7	44-120			
Surrogate: Decachlorobiphenyl [2C]	6.34			ug/kg	8.00		79.3	40-126			
Surrogate: Tetrachlorometaxylene [2C]	5.44			ug/kg	8.00		68.0	44-120			
LCS (BJB0519-BS1)											
						Prepared: 18-Feb-2021 Analyzed: 04-Mar-2021 02:56					
Aroclor 1016 [2C]	84.9	1.6	4.0	ug/kg	101		84.2	56-120			
Aroclor 1260 [2C]	77.2	0.6	4.0	ug/kg	101		76.6	58-120			
Surrogate: Decachlorobiphenyl	5.42			ug/kg	8.00		67.8	40-126			
Surrogate: Tetrachlorometaxylene	6.65			ug/kg	8.00		83.2	44-120			
Surrogate: Decachlorobiphenyl [2C]	6.86			ug/kg	8.00		85.7	40-126			
Surrogate: Tetrachlorometaxylene [2C]	5.49			ug/kg	8.00		68.7	44-120			
LCS Dup (BJB0519-BSD1)											
						Prepared: 18-Feb-2021 Analyzed: 04-Mar-2021 03:17					
Aroclor 1016 [2C]	83.8	1.6	4.0	ug/kg	101		83.1	56-120	1.34	30	
Aroclor 1260 [2C]	76.0	0.6	4.0	ug/kg	101		75.4	58-120	1.58	30	
Surrogate: Decachlorobiphenyl	5.33			ug/kg	8.00		66.6	40-126			
Surrogate: Tetrachlorometaxylene	6.40			ug/kg	8.00		80.0	44-120			
Surrogate: Decachlorobiphenyl [2C]	6.75			ug/kg	8.00		84.4	40-126			
Surrogate: Tetrachlorometaxylene [2C]	5.36			ug/kg	8.00		67.0	44-120			


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 09:08

Metals and Metallic Compounds - Quality Control
Batch BJB0430 - SWN EPA 3050B

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0430-BLK1)						Prepared: 17-Feb-2021 Analyzed: 18-Feb-2021 20:16						
Barium	135	ND	0.06	0.50	mg/kg							U
Barium	137	ND	0.05	0.50	mg/kg							U
Chromium	52	ND	0.13	0.50	mg/kg							U
Chromium	53	ND	0.07	0.50	mg/kg							U
Cobalt	59	ND	0.03	0.20	mg/kg							U
Lead	208	ND	0.07	0.10	mg/kg							U
Silver	107	ND	0.02	0.20	mg/kg							U
Vanadium	51a	ND	0.04	0.20	mg/kg							U
Vanadium	51b	ND	0.02	0.20	mg/kg							U
Arsenic	75a	ND	0.02	0.20	mg/kg							U
Cadmium	111	ND	0.03	0.10	mg/kg							U
Cadmium	114	ND	0.04	0.10	mg/kg							U
Copper	63	ND	0.34	0.50	mg/kg							U
Copper	65	ND	0.35	0.50	mg/kg							U
Nickel	60	ND	0.05	0.50	mg/kg							U
Nickel	62	ND	0.22	0.50	mg/kg							U
Selenium	78	ND	0.44	0.50	mg/kg							U
Zinc	66	ND	0.8	4.0	mg/kg							U
Zinc	67	ND	0.9	4.0	mg/kg							U
LCS (BJB0430-BS1)						Prepared: 17-Feb-2021 Analyzed: 18-Feb-2021 20:21						
Barium	135	23.9	0.06	0.50	mg/kg	25.0		95.6	80-120			
Barium	137	24.1	0.05	0.50	mg/kg	25.0		96.5	80-120			
Chromium	52	25.6	0.13	0.50	mg/kg	25.0		103	80-120			
Chromium	53	25.1	0.07	0.50	mg/kg	25.0		100	80-120			
Cobalt	59	25.0	0.03	0.20	mg/kg	25.0		100	80-120			
Lead	208	26.4	0.07	0.10	mg/kg	25.0		106	80-120			
Silver	107	26.1	0.02	0.20	mg/kg	25.0		104	80-120			
Vanadium	51a	25.8	0.04	0.20	mg/kg	25.0		103	80-120			
Vanadium	51b	25.7	0.02	0.20	mg/kg	25.0		103	80-120			
Arsenic	75a	23.9	0.02	0.20	mg/kg	25.0		95.6	80-120			
Cadmium	111	24.1	0.03	0.10	mg/kg	25.0		96.6	80-120			
Cadmium	114	24.0	0.04	0.10	mg/kg	25.0		96.0	80-120			
Copper	63	25.7	0.34	0.50	mg/kg	25.0		103	80-120			
Copper	65	25.3	0.35	0.50	mg/kg	25.0		101	80-120			



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

Metals and Metallic Compounds - Quality Control

Batch BJB0430 - SWN EPA 3050B

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJB0430-BS1)						Prepared: 17-Feb-2021 Analyzed: 18-Feb-2021 20:21						
Nickel	60	24.3	0.05	0.50	mg/kg	25.0		97.4	80-120			
Nickel	62	24.7	0.22	0.50	mg/kg	25.0		99.0	80-120			
Zinc	66	75.2	0.8	4.0	mg/kg	80.0		93.9	80-120			
Zinc	67	69.4	0.9	4.0	mg/kg	80.0		86.7	80-120			

Analytical Resources, Inc.

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

Metals and Metallic Compounds - Quality Control

Batch BJB0434 - SMM EPA 7471B

Instrument: HYDRA Analyst: BLC

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0434-BLK1)						Prepared: 17-Feb-2021 Analyzed: 19-Feb-2021 09:23					
Mercury	0.00878	0.00525	0.0250	mg/kg							J
LCS (BJB0434-BS1)						Prepared: 17-Feb-2021 Analyzed: 19-Feb-2021 09:26					
Mercury	0.527	0.00525	0.0250	mg/kg	0.500		105	80-120			

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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

Wet Chemistry - Quality Control

Batch BJB0295 - No Prep Wet Chem

Instrument: UV1800-1 Analyst: WCW

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0295-BLK1)											
						Prepared: 09-Feb-2021 Analyzed: 10-Feb-2021 17:46					
Hexavalent Chromium	ND	0.489	0.489	mg/kg							U
LCS (BJB0295-BS1)											
						Prepared: 09-Feb-2021 Analyzed: 10-Feb-2021 17:54					
Hexavalent Chromium	17.0	0.492	0.492	mg/kg	19.7		86.4	80-120			D
LCS (BJB0295-BS2)											
						Prepared: 09-Feb-2021 Analyzed: 10-Feb-2021 17:55					
Hexavalent Chromium	606	9.96	9.96	mg/kg	654		92.6	80-120			D

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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
04-Aug-2021 09:08

Certified Analyses included in this Report

Analyte	Certifications
EPA 6020B in Solid	
Silver-107	NELAP,DoD-ELAP,WADOE
Barium-135	NELAP,DoD-ELAP,WADOE,ADEC
Barium-137	NELAP,DoD-ELAP,WADOE,ADEC
Cobalt-59	NELAP,DoD-ELAP,WADOE
Chromium-52	NELAP,DoD-ELAP,WADOE,ADEC
Chromium-53	NELAP,DoD-ELAP,WADOE,ADEC
Lead-208	NELAP,DoD-ELAP,WADOE,ADEC
Vanadium-51a	NELAP,DoD-ELAP,WADOE,ADEC
Vanadium-51b	DoD-ELAP,WADOE,ADEC
EPA 6020B UCT-KED in Solid	
Arsenic-75a	NELAP,DoD-ELAP,WADOE,ADEC
Cadmium-111	NELAP,DoD-ELAP,WADOE,ADEC
Cadmium-114	NELAP,DoD-ELAP,WADOE,ADEC
Copper-63	NELAP,DoD-ELAP,WADOE
Copper-65	NELAP,DoD-ELAP,WADOE
Nickel-60	NELAP,DoD-ELAP,WADOE,ADEC
Nickel-62	NELAP,DoD-ELAP,WADOE,ADEC
Selenium-78	NELAP,DoD-ELAP,WADOE
Zinc-66	NELAP,DoD-ELAP,WADOE
Zinc-67	NELAP,DoD-ELAP,WADOE
EPA 7471B in Solid	
Mercury	WADOE,NELAP,DoD-ELAP
EPA 8082A in Solid	
Aroclor 1016	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1016 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1221	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1221 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1232	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1232 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1242	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1242 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1248	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1248 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1254	WADOE,DoD-ELAP,NELAP,ADEC



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Aroclor 1254 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1260	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1260 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1262	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1262 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1268	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1268 [2C]	WADOE,DoD-ELAP,NELAP,ADEC

EPA 8260D in Solid

Chloromethane	WADOE,DoD-ELAP,NELAP,ADEC
Vinyl Chloride	WADOE,DoD-ELAP,NELAP,ADEC
Bromomethane	WADOE,DoD-ELAP,NELAP,ADEC
Chloroethane	WADOE,DoD-ELAP,NELAP,ADEC
Trichlorofluoromethane	WADOE,DoD-ELAP,NELAP,ADEC
Acrolein	WADOE,DoD-ELAP,NELAP
1,1,2-Trichloro-1,2,2-Trifluoroethane	WADOE,DoD-ELAP,NELAP,ADEC
Acetone	WADOE,DoD-ELAP,NELAP
1,1-Dichloroethene	WADOE,DoD-ELAP,NELAP,ADEC
Iodomethane	WADOE,DoD-ELAP,NELAP,ADEC
Methylene Chloride	WADOE,DoD-ELAP,NELAP,ADEC
Acrylonitrile	WADOE,DoD-ELAP,NELAP
Carbon Disulfide	WADOE,DoD-ELAP,NELAP,ADEC
trans-1,2-Dichloroethene	WADOE,DoD-ELAP,NELAP,ADEC
Vinyl Acetate	WADOE,DoD-ELAP,NELAP
1,1-Dichloroethane	WADOE,DoD-ELAP,NELAP,ADEC
2-Butanone	WADOE,DoD-ELAP,NELAP
2,2-Dichloropropane	WADOE,DoD-ELAP,NELAP
cis-1,2-Dichloroethene	WADOE,DoD-ELAP,NELAP,ADEC
Chloroform	WADOE,DoD-ELAP,NELAP,ADEC
Bromochloromethane	WADOE,DoD-ELAP,NELAP,ADEC
1,1,1-Trichloroethane	WADOE,DoD-ELAP,NELAP,ADEC
1,1-Dichloropropene	WADOE,DoD-ELAP,NELAP,ADEC
Carbon tetrachloride	WADOE,DoD-ELAP,NELAP,ADEC
1,2-Dichloroethane	WADOE,DoD-ELAP,NELAP,ADEC
Benzene	WADOE,DoD-ELAP,NELAP,ADEC
Trichloroethene	WADOE,DoD-ELAP,NELAP,ADEC
1,2-Dichloropropane	WADOE,DoD-ELAP,NELAP,ADEC
Bromodichloromethane	WADOE,DoD-ELAP,NELAP,ADEC
Dibromomethane	WADOE,DoD-ELAP,NELAP,ADEC
2-Chloroethyl vinyl ether	WADOE,DoD-ELAP,NELAP



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4-Methyl-2-Pentanone	WADOE,DoD-ELAP,NELAP
cis-1,3-Dichloropropene	WADOE,DoD-ELAP,NELAP,ADEC
Toluene	WADOE,DoD-ELAP,NELAP,ADEC
trans-1,3-Dichloropropene	WADOE,DoD-ELAP,NELAP,ADEC
2-Hexanone	WADOE,DoD-ELAP,NELAP
1,1,2-Trichloroethane	WADOE,DoD-ELAP,NELAP,ADEC
1,3-Dichloropropane	WADOE,DoD-ELAP,NELAP,ADEC
Tetrachloroethene	WADOE,DoD-ELAP,NELAP,ADEC
Dibromochloromethane	WADOE,DoD-ELAP,NELAP,ADEC
1,2-Dibromoethane	WADOE,DoD-ELAP,NELAP,ADEC
Chlorobenzene	WADOE,DoD-ELAP,NELAP,ADEC
Ethylbenzene	WADOE,DoD-ELAP,NELAP,ADEC
1,1,1,2-Tetrachloroethane	WADOE,DoD-ELAP,NELAP,ADEC
m,p-Xylene	WADOE,DoD-ELAP,NELAP,ADEC
o-Xylene	WADOE,DoD-ELAP,NELAP,ADEC
Xylenes, total	WADOE
Styrene	WADOE,DoD-ELAP,NELAP,ADEC
Bromoform	WADOE,DoD-ELAP,NELAP,ADEC
1,1,1,2,2-Tetrachloroethane	WADOE,DoD-ELAP,NELAP,ADEC
1,2,3-Trichloropropane	WADOE,DoD-ELAP,NELAP,ADEC
trans-1,4-Dichloro 2-Butene	WADOE,DoD-ELAP,NELAP
n-Propylbenzene	WADOE,DoD-ELAP,NELAP
Bromobenzene	WADOE,DoD-ELAP,NELAP,ADEC
Isopropyl Benzene	WADOE,DoD-ELAP,NELAP,ADEC
2-Chlorotoluene	WADOE,DoD-ELAP,NELAP
4-Chlorotoluene	WADOE,DoD-ELAP,NELAP
t-Butylbenzene	WADOE,DoD-ELAP,NELAP
1,3,5-Trimethylbenzene	WADOE,DoD-ELAP,NELAP
1,2,4-Trimethylbenzene	WADOE,DoD-ELAP,NELAP
s-Butylbenzene	WADOE,DoD-ELAP,NELAP
4-Isopropyl Toluene	WADOE,DoD-ELAP,NELAP
1,3-Dichlorobenzene	WADOE,DoD-ELAP,NELAP
1,4-Dichlorobenzene	WADOE,DoD-ELAP,NELAP
n-Butylbenzene	WADOE,DoD-ELAP,NELAP
1,2-Dichlorobenzene	WADOE,DoD-ELAP,NELAP
1,2-Dibromo-3-chloropropane	WADOE,DoD-ELAP,NELAP,ADEC
1,2,4-Trichlorobenzene	WADOE,DoD-ELAP,NELAP,ADEC
Hexachloro-1,3-Butadiene	WADOE,DoD-ELAP,NELAP,ADEC
Naphthalene	WADOE,DoD-ELAP,NELAP



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1,2,3-Trichlorobenzene	WADOE, DoD-ELAP, NELAP, ADEC
Dichlorodifluoromethane	WADOE, DoD-ELAP, NELAP, ADEC
Methyl tert-butyl Ether	WADOE, DoD-ELAP, NELAP
n-Hexane	WADOE
2-Pentanone	WADOE
Dibromofluoromethane	WADOE
4-Bromofluorobenzene	WADOE

EPA 8260D in Water

Chloromethane	DoD-ELAP, ADEC, NELAP, WADOE
Vinyl Chloride	DoD-ELAP, ADEC, NELAP, WADOE
Bromomethane	DoD-ELAP, ADEC, NELAP, WADOE
Chloroethane	DoD-ELAP, ADEC, NELAP, WADOE
Trichlorofluoromethane	DoD-ELAP, ADEC, NELAP, WADOE
Acrolein	DoD-ELAP, NELAP, WADOE
1,1,2-Trichloro-1,2,2-Trifluoroethane	DoD-ELAP, ADEC, NELAP, WADOE
Acetone	DoD-ELAP, ADEC, NELAP, WADOE
1,1-Dichloroethene	DoD-ELAP, ADEC, NELAP, WADOE
Iodomethane	DoD-ELAP, NELAP, WADOE
Methylene Chloride	DoD-ELAP, ADEC, NELAP, WADOE
Acrylonitrile	DoD-ELAP, NELAP, WADOE
Carbon Disulfide	DoD-ELAP, NELAP, WADOE
trans-1,2-Dichloroethene	DoD-ELAP, ADEC, NELAP, WADOE
Vinyl Acetate	DoD-ELAP, NELAP, WADOE
1,1-Dichloroethane	DoD-ELAP, ADEC, NELAP, WADOE
2-Butanone	DoD-ELAP, NELAP, WADOE
2,2-Dichloropropane	DoD-ELAP, ADEC, NELAP, WADOE
cis-1,2-Dichloroethene	DoD-ELAP, ADEC, NELAP, WADOE
Chloroform	DoD-ELAP, ADEC, NELAP, WADOE
Bromochloromethane	DoD-ELAP, ADEC, NELAP, WADOE
1,1,1-Trichloroethane	DoD-ELAP, ADEC, NELAP, WADOE
1,1-Dichloropropene	DoD-ELAP, ADEC, NELAP, WADOE
Carbon tetrachloride	DoD-ELAP, ADEC, NELAP, WADOE
1,2-Dichloroethane	DoD-ELAP, ADEC, NELAP, WADOE
Benzene	DoD-ELAP, ADEC, NELAP, WADOE
Trichloroethene	DoD-ELAP, ADEC, NELAP, WADOE
1,2-Dichloropropane	DoD-ELAP, ADEC, NELAP, WADOE
Bromodichloromethane	DoD-ELAP, ADEC, NELAP, WADOE
Dibromomethane	DoD-ELAP, ADEC, NELAP, WADOE
2-Chloroethyl vinyl ether	DoD-ELAP, ADEC, NELAP, WADOE



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4-Methyl-2-Pentanone	DoD-ELAP,NELAP,WADOE
cis-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
Toluene	DoD-ELAP,ADEC,NELAP,WADOE
trans-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
2-Hexanone	DoD-ELAP,NELAP,WADOE
1,1,2-Trichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,3-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
Tetrachloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Dibromochloromethane	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dibromoethane	DoD-ELAP,NELAP,WADOE
Chlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Ethylbenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,1,1,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,WADOE
m,p-Xylene	DoD-ELAP,ADEC,NELAP,WADOE
o-Xylene	DoD-ELAP,ADEC,NELAP,WADOE
Styrene	DoD-ELAP,NELAP,WADOE
Bromoform	DoD-ELAP,NELAP,WADOE
1,1,2,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,2,3-Trichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
trans-1,4-Dichloro 2-Butene	DoD-ELAP,ADEC,NELAP,WADOE
n-Propylbenzene	DoD-ELAP,NELAP,WADOE
Bromobenzene	DoD-ELAP,NELAP,WADOE
Isopropyl Benzene	DoD-ELAP,NELAP,WADOE
2-Chlorotoluene	DoD-ELAP,ADEC,NELAP,WADOE
4-Chlorotoluene	DoD-ELAP,ADEC,NELAP,WADOE
t-Butylbenzene	DoD-ELAP,NELAP,WADOE
1,3,5-Trimethylbenzene	DoD-ELAP,NELAP,WADOE
1,2,4-Trimethylbenzene	DoD-ELAP,NELAP,WADOE
s-Butylbenzene	DoD-ELAP,NELAP,WADOE
4-Isopropyl Toluene	DoD-ELAP,NELAP,WADOE
1,3-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,4-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
n-Butylbenzene	DoD-ELAP,NELAP,WADOE
1,2-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dibromo-3-chloropropane	DoD-ELAP,ADEC,NELAP,WADOE
1,2,4-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Hexachloro-1,3-Butadiene	DoD-ELAP,ADEC,NELAP,WADOE
Naphthalene	DoD-ELAP,ADEC,NELAP,WADOE
1,2,3-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE



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Dichlorodifluoromethane	DoD-ELAP,ADEC,NELAP,WADOE
Methyl tert-butyl Ether	DoD-ELAP,ADEC,NELAP,WADOE
n-Hexane	WADOE
2-Pentanone	WADOE

NWTPH-Dx in Solid

Diesel Range Organics (C12-C24)	DoD-ELAP,NELAP,WADOE
Diesel Range Organics (C10-C25)	DoD-ELAP,NELAP,WADOE
Diesel Range Organics (Tol-C18)	DoD-ELAP,NELAP,WADOE
Diesel Range Organics (C10-C24)	DoD-ELAP,NELAP,WADOE
Diesel Range Organics (C10-C28)	DoD-ELAP,NELAP,WADOE
Diesel Range Organics (C12-C22)	DoD-ELAP
Motor Oil Range Organics (C24-C38)	DoD-ELAP,NELAP,WADOE
Motor Oil Range Organics (C25-C36)	DoD-ELAP,NELAP,WADOE
Motor Oil Range Organics (C24-C40)	DoD-ELAP,NELAP,WADOE
Residual Range Organics (C23-C32)	DoD-ELAP
Mineral Oil Range Organics (C16-C28)	DoD-ELAP,NELAP,WADOE
Mineral Spirits Range Organics (Tol-C12)	DoD-ELAP,NELAP,WADOE
JP8 Range Organics (C8-C18)	DoD-ELAP,NELAP,WADOE
JP5 Range Organics (C10-C16)	DoD-ELAP,NELAP,WADOE
JP4 Range Organics (Tol-C14)	DoD-ELAP,NELAP,WADOE
Jet-A Range Organics (C10-C18)	DoD-ELAP,NELAP,WADOE
Kerosene Range Organics (Tol-C18)	DoD-ELAP,NELAP,WADOE
Stoddard Range Organics (C8-C12)	DoD-ELAP,NELAP,WADOE
Creosote Range Organics (C12-C22)	DoD-ELAP,NELAP,WADOE
Bunker C Range Organics (C10-C38)	DoD-ELAP,NELAP,WADOE
Transformer Oil Range Organics (C12-C28)	DoD-ELAP,NELAP,WADOE

SM 3500-Cr B-09 in Solid

Hexavalent Chromium	DoD-ELAP,NELAP
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Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2023
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/28/2022
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2022
WADOE	WA Dept of Ecology	C558	06/30/2022
WA-DW	Ecology - Drinking Water	C558	06/30/2022



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04-Aug-2021 09:08

Notes and Definitions

*	Flagged value is not within established control limits.
D	The reported value is from a dilution
D1	Surrogate was not detected due to sample extract dilution
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL)
H	Hold time violation - Hold time was exceeded.
J	Estimated concentration value detected below the reporting limit.
P1	The reported value is greater than 40% difference between the concentrations determined on two GC columns where applicable.
Q	Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20% RSD, <20% drift or minimum RRF)
U	This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
[2C]	Indicates this result was quantified on the second column on a dual column analysis.



Analytical Resources, Incorporated
Analytical Chemists and Consultants

05 May 2021

Meg Strong
Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle, WA 98103-8636

RE: Lower Duwamish

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)
21D0061

Associated SDG ID(s)
N/A

Shelly
Fishel

Digitally signed by
Shelly Fishel
Date: 2021.05.05
13:46:39 -07'00'

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



21D0061

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: <u>21D0061</u>		Turn-around Requested: <u>Standard</u>			Page: <u>1</u> of <u>5</u>							
ARI Client Company: <u>Shannon & Wilson</u>		Phone: _____			Date: <u>1/25/21</u>	Ice Present? <u>Yes</u>						
Client Contact: <u>Shoshana Howard</u>					No. of Coolers: <u>4</u>	Cooler Temps: <u>See CRF</u>						
Client Project Name: <u>LDW</u>		Analysis Requested										
Client Project #: <u>21-1-1296</u>		Samplers: <u>RBF, CTC, MAH</u>										
Sample ID	Date	Time	Matrix	No. Containers	TRI-G	TRI-Dx	STEX	HVOCs	PAHs	PCB Analytes	Metals	Notes/Comments
SB-2020-017:2-01252021	1/25/21	0908	Soil	7	X	X	X	X	X	X	X	
SB-2020-017:5-01252021		0915	Soil	7	X	X	X	X	X	X	X	
SB-2020-017:10:5-01252021		0920		7	X	X	X	X	X	X	X	
SB-2020-017:12:6-01252021		0930		7	H	H	H	H	H	H	H	
SB-2020-039:2-01252021		1010		7	X	X	X	X	X		X	
SB-2020-039:7:4-01252021		1015		7	X	X	X	X	X		X	
SB-2020-039:10:7-01252021		1020		7	X	X	X	X	X		X	
SB-2020-039:13:2-01252021		1025		7	H	H	H	H	H		H	
SB-2020-009:2-01252021		1100		7	X	X	X	X	X		X	
SB-2020-004:6-01252021	✓	1105	✓	7	X	X	X	X	X		X	
Comments/Special Instructions X = run analysis H = hold analysis		Relinquished by: (Signature) <u>[Signature]</u> Printed Name: <u>RYAN PETERSON</u> Company: <u>Shannon & Wilson</u> Date & Time: <u>1/25/21 1640</u>		Received by: (Signature) <u>[Signature]</u> Printed Name: <u>Jacob Harte</u> Company: <u>ARI2</u> Date & Time: <u>01/25/2021 1640</u>		Relinquished by: (Signature) _____ Printed Name: _____ Company: _____ Date & Time: _____		Received by: (Signature) _____ Printed Name: _____ Company: _____ Date & Time: _____				



Analytical Resources, Incorporated
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4611 South 134th Place, Suite 100
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206-695-6200 206-695-6201 (fax)
www.arilabs.com

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21D0061

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: <u>21A0352</u>		Turn-around Requested: <u>Standard</u>		Page: <u>2</u> of <u>5</u>	
ARI Client Company: <u>Shannon & Wilson</u>		Phone:		Date: <u>1/25/21</u>	Ice Present? <u>Yes</u>
Client Contact: <u>Shoshana Howard</u>				No. of Coolers: <u>4</u>	Cooler Temps: <u>See CCE</u>
Client Project Name: <u>LDW</u>		Analysis Requested			
Client Project #: <u>21-1-12596</u>		Samplers: <u>CCT, RBP, MCH</u>		Notes/Comments	
Sample ID	Date	Time	Matrix	No. Containers	
SB-2020-009:10.8-01252021	1/25/21	1110	Soil	7	X X X X X X
SB-2020-009:13.3-01252021		1115	Soil	7	H H H H H H
TSA-2020-004:1.2-01252021		1145		1	
TSA-2020-004:1.7-01252021		1150		1	
TSA-2020-004:3-01252021		1155		1	
TSA-2020-004:6-01252021		1200		1	
Asphalt-001-01252021		1205	asphalt	1	
TSA-2020-005:1.2-01252021		1215	Soil	1	
TSA-2020-005:1.7-01252021		1220		1	
TSA-2020-005:3-01252021		1225		1	
Comments/Special Instructions X = run analysis H = hold analysis		Relinquished by: (Signature) <u>[Signature]</u> Printed Name: <u>RYAN PETERSON</u> Company: <u>Shannon & Wilson</u> Date & Time: <u>1/25/21 1640</u>		Received by: (Signature) <u>[Signature]</u> Printed Name: <u>Shoshana Howard</u> Company: <u>ARI</u> Date & Time: <u>01/25/2021 1640</u>	
		Relinquished by: (Signature) _____ Printed Name: _____ Company: _____ Date & Time: _____		Received by: (Signature) _____ Printed Name: _____ Company: _____ Date & Time: _____	



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Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: <u>21A0352</u>		Turn-around Requested: <u>Standard</u>			Page: <u>3</u> of <u>5</u>							
ARI Client Company: <u>Shannon & Wilson</u>		Phone:			Date: <u>4/25/21</u>	Ice Present? <u>Yes</u>						
Client Contact: <u>Shoshana Howard</u>		No. of Coolers: <u>4</u>			Cooler Temps: <u>See CRF</u>							
Client Project Name: <u>LDW</u>		Analysis Requested										
Client Project #: <u>21-1-12596</u>		Samplers: <u>RBP, CTC, MCH</u>										
Sample ID	Date	Time	Matrix	No. Containers	TALG	TAL-Dr	BTEX	HVOCs	PAHs	PCB Analysis	Metals	Notes/Comments
TSA-2020-005:6-01252021	4/25/21	1230	Soil	1						H		
TSA-2020-100:1.2-01252021		1300	Soil	1						X		
Asphalt-002-01252021		1245	Asphalt	1						X		
TSA-2020-006:1.2-01252021		1245	Soil	1						X		
TSA-2020-006:1.7-01252021		1250		1						H		21A0352-24
TSA-2020-006:3-01252021		1255		1						H		
TSA-2020-006:6-01252021		1300		1						H		
SB-2020-011:1-01252021		1340		2		X			X		X	
SB-2020-011:3-01252021		1347		2		X			X		X	
SB-2020-011:10-01252021		1350		2		X			X		X	
Comments/Special Instructions X = run analysis H = hold analysis	Relinquished by: (Signature): <u>[Signature]</u>		Received by: (Signature): <u>[Signature]</u>		Relinquished by: (Signature):		Received by: (Signature):					
	Printed Name: <u>NATHAN PETERSON</u>		Printed Name: <u>Lawrence</u>		Printed Name:		Printed Name:					
	Company: <u>Shannon & Wilson</u>		Company: <u>A&Z</u>		Company:		Company:					
	Date & Time: <u>4/25/21 1640</u>		Date & Time: <u>01/25/2021 1640</u>		Date & Time:		Date & Time:					

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Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 21A0352		Turn-around Requested: Standard		Page: 4 of 5																																																																																																	
ARI Client Company: Shannon & Wilson		Phone:		Date: 1/25/21	Ice Present? Yes																																																																																																
Client Contact: Shoshanna Howard				No. of Coolers: 4	Cooler Temps: See CRF																																																																																																
Client Project Name: LDW		<table border="1"> <thead> <tr> <th colspan="7">Analysis Requested</th> <th>Notes/Comments</th> </tr> <tr> <th>TPH-G</th> <th>TPH-Dx</th> <th>BTEX</th> <th>HVOCs</th> <th>PAHs</th> <th>PCB Analysis</th> <th>Metals</th> <th>Total Organic Carbon and Grain Size Analysis</th> </tr> </thead> <tbody> <tr> <td></td> <td>H</td> <td></td> <td></td> <td>H</td> <td></td> <td>H</td> <td></td> </tr> <tr> <td></td> <td>X</td> <td></td> <td></td> <td>X</td> <td></td> <td>X</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td>X</td> <td></td> <td></td> </tr> <tr> <td></td> <td>X</td> <td></td> <td></td> <td>X</td> <td></td> <td>X</td> <td></td> </tr> <tr> <td></td> <td>X</td> <td></td> <td></td> <td>X</td> <td></td> <td>X</td> <td></td> </tr> <tr> <td></td> <td>X</td> <td></td> <td></td> <td>X</td> <td></td> <td>X</td> <td></td> </tr> <tr> <td></td> <td>H</td> <td></td> <td></td> <td>H</td> <td></td> <td>H</td> <td></td> </tr> <tr> <td></td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td>X</td> <td></td> </tr> <tr> <td></td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td>X</td> <td>X</td> </tr> <tr> <td></td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td>X</td> <td></td> </tr> </tbody> </table>				Analysis Requested							Notes/Comments	TPH-G	TPH-Dx	BTEX	HVOCs	PAHs	PCB Analysis	Metals	Total Organic Carbon and Grain Size Analysis		H			H		H			X			X		X							X				X			X		X			X			X		X			X			X		X			H			H		H			X	X	X	X		X			X	X	X	X		X	X		X	X	X	X		X	
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Client Project #: 21-1-12596	Samplers: RSP, CTC, MATH																																																																																																				
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SB-2020-011:13.9-01252021	1/25/21	1355	Soil	2																																																																																																	
SB-2020-011:1-01252021		1400	↓	2																																																																																																	
Asphalt-003-01252021		1420	Asphalt	1																																																																																																	
SB-2020-012:2-01252021		1421	Soil	2																																																																																																	
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SB-2020-012:12.6-01252021		1430	↓	2																																																																																																	
MW-66:1.2-012521		1305	↓	5																																																																																																	
MW-66:5.5-012521		1320	↓	6																																																																																																	
MW-66:10.0-012521		1350	↓	5																																																																																																	
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	Printed Name: Ryan Peterson	Printed Name: Jacob Laitz		Printed Name:	Printed Name:																																																																																																
	Company: Shannon & Wilson	Company: ARZ		Company:	Company:																																																																																																
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21D0061

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: <u>21A0352</u>		Turn-around Requested: <u>Standard</u>		Page: <u>5</u> of <u>5</u>								
ARI Client Company: <u>Shannon & Wilson</u>		Phone:		Date: <u>1/25/21</u>	Ice Present? <u>Yes</u>							
Client Contact: <u>Shoshann Howard</u>				No. of Coolers: <u>4</u>	Cooler Temps: <u>See CPE</u>							
Client Project Name: <u>LDW</u>				Analysis Requested								
Client Project #: <u>21-1-12596</u>		Samplers: <u>RSP, GTC, MRH</u>		Notes/Comments								
Sample ID	Date	Time	Matrix	No. Containers	TALG	TPH-Dx	BTEX	HVOCs	PAHs	PCB Analysis	Metals	Total Organic Carbon and Grain Size Analysis
MW-66-15.5-012521	1/25/21	1400	Soil	6		H	H	H	H		H	X
MW-66-20.5-012521		1415		5		H	H	H	H		H	X
SB-2020-034-10.7-01252021		1525		6	X	X	X	X				
SB-2020-102-10.7-01252021		1600		6	X	X	X	X				
SB-2020-034-11.5-01252021		1545		6	X	X	X					
SB-2020-034-21-01252021		1550		6	X	X	X					
As Found TB-1-01252021		1600	Water	1	X		X	X				
Comments/Special Instructions												
Relinquished by: (Signature) <u>[Signature]</u>		Received by: (Signature) <u>[Signature]</u>		Relinquished by: (Signature)		Received by: (Signature)						
Printed Name: <u>RYAN PETERSON</u>		Printed Name: <u>Sacoby Walter</u>		Printed Name:		Printed Name:						
Company: <u>Shannon & Wilson</u>		Company: <u>ARI</u>		Company:		Company:						
Date & Time: <u>1/25/21 1640</u>		Date & Time: <u>01/25/2021 1640</u>		Date & Time:		Date & Time:						



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Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: <u>21D0061</u>		Turn-around Requested: <u>Standard</u>		Page: <u>1</u> of <u>11</u>																																																																																																		
ARI Client Company: <u>Shannon & Wilson</u>		Phone:		Date: <u>1/26/21</u>	Ice Present? <u>Yes</u>																																																																																																	
Client Contact: <u>Shoshana Howard</u>		No. of Coolers: <u>6</u>		Cooler Temps: <u>See CCF</u>																																																																																																		
Client Project Name: <u>LDW</u>		<table border="1"> <thead> <tr> <th colspan="8">Analysis Requested</th> <th>Notes/Comments</th> </tr> <tr> <th>TH-G</th> <th>TH-DX</th> <th>BTEX</th> <th>HVOCs</th> <th>PHHs</th> <th>Full List SVOCs</th> <th>PCB Analysis</th> <th>Metals</th> </tr> </thead> <tbody> <tr> <td>X</td> <td></td> <td>X</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>X</td> <td>X</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>X</td> <td>X</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>X</td> <td>X</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>X</td> <td>X</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>X</td> <td></td> </tr> <tr> <td></td> <td>X</td> <td></td> <td></td> <td>X</td> <td></td> <td>NO</td> <td>X</td> </tr> <tr> <td></td> <td>X</td> <td></td> <td></td> <td>X</td> <td></td> <td></td> <td>X</td> </tr> <tr> <td></td> <td>X</td> <td></td> <td></td> <td>X</td> <td></td> <td></td> <td>X</td> </tr> </tbody> </table>				Analysis Requested								Notes/Comments	TH-G	TH-DX	BTEX	HVOCs	PHHs	Full List SVOCs	PCB Analysis	Metals	X		X	X					X	X	X						X	X	X						X	X	X	X					X	X	X						X	X	X												X			X			X		NO	X		X			X			X		X			X			X
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Client Project #: <u>21-1-12546</u>	Samplers: <u>MRH, RBP</u>																																																																																																					
Sample ID	Date	Time	Matrix	No. Containers																																																																																																		
TR-2-01262021	1/26/21	0800	Water	1																																																																																																		
SB-2021-035:11-01262021		0855	Soil	6																																																																																																		
SB-2021-035:138-01262021		0900		6																																																																																																		
SB-2021-033:11-01262021		0930		6																																																																																																		
SB-2021-033:15-01262021		0935		6																																																																																																		
SB-2021-033:18-01262021		0940		6																																																																																																		
Asphalt-004-01262021		1020		1																																																																																																		
SB-2021-046:2-01262021		1030		3																																																																																																		
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SB-2021-046:107-01262021	✓	1035	✓	2																																																																																																		
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	Printed Name: <u>RYAN PERCIBON</u>	Printed Name: <u>Jacob Galt</u>		Printed Name:																																																																																																		
	Company: <u>S&W</u>	Company: <u>ARI</u>		Company:																																																																																																		
	Date & Time: <u>1/27/21 05:1705</u>	Date & Time: <u>01/27/2021 1705</u>		Date & Time:																																																																																																		

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21D0061

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: <u>21A0376</u>		Turn-around Requested: <u>Standard</u>		Page: <u>2</u> of <u>11</u>																																																																																																													
ARI Client Company: <u>Shannon & Wilson</u>		Phone:		Date: <u>1/26/21</u>	Ice Present? <u>Yes</u>																																																																																																												
Client Contact: <u>Shoshana Howard</u>		No. of Coolers: <u>6</u>		Cooler Temps: <u>See CRF</u>																																																																																																													
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Client Project #: <u>21-1-12596</u>		Samplers: <u>RBP, MCH</u>																																																																																																															
Sample ID	Date	Time	Matrix	No. Containers																																																																																																													
<u>SB-2021-046:13.1-01262021</u>	<u>1/26/21</u>	<u>1040</u>	<u>Sol 1</u>	<u>3</u>																																																																																																													
<u>SB-2021-065:12-01262021</u>		<u>1140</u>		<u>5</u>																																																																																																													
<u>SB-2021-003:10.3-01262021</u>		<u>1145</u>		<u>5</u>																																																																																																													
<u>SB-2021-003:11.5-01262021</u>		<u>1150</u>		<u>5</u>																																																																																																													
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<u>SB-2021-038:2-01262021</u>		<u>1230</u>		<u>2</u>																																																																																																													
<u>SB-2021-038:6.4-01262021</u>		<u>1235</u>		<u>2</u>																																																																																																													
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Printed Name: <u>RYAN PETERSON</u>		Printed Name: <u>Jacob Latta</u>		Printed Name:																																																																																																													
Company: <u>S&W</u>		Company: <u>ARI</u>		Company:																																																																																																													
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2100061
Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: <u>21A0376</u>		Turn-around Requested: <u>Standard</u>		Page: <u>3</u> of <u>11</u>																																																																																																	
ARI Client Company: <u>Shannon & Wilson</u>		Phone:		Date: <u>4/27/21</u>	Ice Present? <u>Yes</u>																																																																																																
Client Contact: <u>Shoshana Howard</u>		No. of Coolers: <u>6</u>		Cooler Temps: <u>See CRF</u>																																																																																																	
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Client Project #: <u>21-12546</u>	Samplers: <u>RBP, JXs</u>																																																																																																				
Sample ID	Date	Time	Matrix	No. Containers																																																																																																	
SB-2021-018:25-01272021	4/27/21	1025	Soil	1																																																																																																	
SB-2021-018:5.5-01272021		1030		1																																																																																																	
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SB-2021-019:0.8-01272021		1100		1																																																																																																	
SB-2021-019:2.5-01272021		1105		1																																																																																																	
SB-2021-019:5-01272021		1110		1																																																																																																	
SB-2021-019:7-01272021		1115		1																																																																																																	
SB-2021-019:8.5-01272021		1120		1																																																																																																	
Comments/Special Instructions: X = run analysis H = hold analysis		Relinquished by: (Signature) <u>[Signature]</u> Printed Name: <u>KEVIN PETERSON</u> Company: <u>SEW</u> Date & Time: <u>4/27/21 1705</u>	Received by: (Signature) <u>[Signature]</u> Printed Name: <u>Seamus Laith</u> Company: <u>ARI</u> Date & Time: <u>01/07/2021 1705</u>	Relinquished by: (Signature) Printed Name: Company: Date & Time:	Received by: (Signature) Printed Name: Company: Date & Time:																																																																																																

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21D0061

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: <u>21D0061</u>		Turn-around Requested: <u>Standard</u>		Page: <u>4</u> of <u>11</u>	
ARI Client Company: <u>Shannon & Wilson</u>		Phone:		Date: <u>1/27/21</u>	Ice Present? <u>Yes</u>
Client Contact: <u>Shoshana Howard</u>				No. of Coolers: <u>6</u>	Cooler Temps: <u>See CPE</u>
Client Project Name: <u>LDW</u>					
Client Project #: <u>21-1-12596</u>		Samplers: <u>RSP, JXS</u>			
Sample ID	Date	Time	Matrix	No. Containers	
SB-2021-019:12-01272021	1/27/21	1125	Soil	1	H
SB-2021-020:1.5-01272021		1140		1	X
SB-2021-020:2.2-01272021		1145		1	X
SB-2021-020:6-01272021		1150		1	X
SB-2021-020:7-01272021		1155		1	X
SB-2021-020:8.2-01272021		1200		1	H
SB-2021-020:11-01272021		1205		1	H
SB-2021-021:1.5-01272021		1230		1	X
SB-2021-021:2.5-01272021		1235		1	X
SB-2021-021:5.2-01272021	✓	1240	✓	1	X
Comments/Special Instructions X = run analysis H = hold analysis		Relinquished by: (Signature) <u>[Signature]</u> Printed Name: <u>R VAN PETERSON</u> Company: <u>S & W</u> Date & Time: <u>1/27/21 1705</u>		Received by: (Signature) <u>[Signature]</u> Printed Name: <u>Seob Lalk</u> Company: <u>ARI</u> Date & Time: <u>01/07/2021 1705</u>	
		Relinquished by: (Signature)		Received by: (Signature)	
		Printed Name:		Printed Name:	
		Company:		Company:	
		Date & Time:		Date & Time:	



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Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)
www.arilabs.com

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Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: <u>21D0061</u>		Turn-around Requested: <u>Standard</u>		Page: <u>5</u> of <u>11</u>	
ARI Client Company: <u>Shannon & Wilson</u>		Phone:		Date:	Ice Present? <u>Yes</u>
Client Contact: <u>Shoshana Howard</u>		No. of Coolers: <u>6</u>		Cooler Temps: <u>See CRF</u>	
Client Project Name: <u>LDW</u>		Analysis Requested			
Client Project #: <u>21-1-12546</u>		Samplers: <u>RSP, 5XS</u>		Notes/Comments	
Sample ID	Date	Time	Matrix	No. Containers	
SB-2021-021:7-01272021	1/27/21	1245	Soil	1	
SB-2021-021:10-01272021		1250		1	
SB-2021-021:11-01272021		1255		1	
SB-2021-021:12-01272021		1300		1	
SB-2021-022:1.5-01272021		1305		1	
SB-2021-022:2.5-01272021		1310		1	
SB-2021-022:5.5-01272021		1315		1	
SB-2021-022:7-01272021		1320		1	
SB-2021-022:10-01272021		1325		1	
SB-2021-022:11-01272021		1330		1	
Comments/Special Instructions <u>X = Run analysis</u> <u>H = Hold analysis</u>		Relinquished by: (Signature) <u>[Signature]</u> Printed Name: <u>RYAN PETERSON</u> Company: <u>S&W</u> Date & Time: <u>1/27/21 1705</u>		Received by: (Signature) <u>[Signature]</u> Printed Name: <u>Jacob [Signature]</u> Company: <u>ARI</u> Date & Time: <u>01/27/2021 1705</u>	
		Relinquished by: (Signature) Printed Name: Company: Date & Time:		Received by: (Signature) Printed Name: Company: Date & Time:	



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Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: <u>21D0061</u>		Turn-around Requested: <u>Standard</u>		Page: <u>6</u> of <u>11</u>	
ARI Client Company: <u>Shannon & Wilson</u>		Phone:		Date: <u>1/27/21</u>	Ice Present? <u>Yes</u>
Client Contact: <u>Shoshana Howard</u>				No. of Coolers: <u>6</u>	Cooler Temps: <u>See CRF</u>
Client Project Name: <u>LDW</u>					
Client Project #: <u>21-1-12596</u>		Samplers: <u>RBL, JXS</u>		Analysis Requested	
Sample ID	Date	Time	Matrix	No. Containers	Notes/Comments
SB-2021-023:1.5-01272021	1/27/21	1340	Soil	1	
SB-2021-023:2.7-01272021		1345		1	
SB-2021-023:5.5-01272021		1350		1	
SB-2021-023:7-01272021		1355		1	
SB-2021-023:10-01272021		1400		1	
SB-2021-023:11-01272021		1405		1	
SB-2021-024:0.5-01272021		1410		1	
SB-2021-024:2.4-01272021		1415		1	
SB-2021-024:5.6-01272021		1420		1	
SB-2021-024:7-01272021		1425		1	
Comments/Special Instructions		Relinquished by: (Signature) <u>[Signature]</u>		Received by: (Signature) <u>[Signature]</u>	
		Printed Name: <u>RYAN PETERSON</u>		Printed Name: <u>Jacob L. Laiter</u>	
		Company: <u>S&W</u>		Company:	
		Date & Time: <u>1/27/21 1705</u>		Date & Time: <u>01/07/2021 1705</u>	



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Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 21D0061		Turn-around Requested: Standard		Page: 7 of 11	
ARI Client Company: Shannon & Wilson		Phone:		Date: 1/27/21	Ice Present? Yes
Client Contact: Shoshana Howard		No. of Coolers: 6		Cooler Temps: See CPE	
Client Project Name: LDW		Analysis Requested			
Client Project #: 21-1-12546					
Samplers: RBP, JXS		Notes/Comments			
Sample ID	Date	Time	Matrix	No. Containers	
SB-2021-024:3.4-01272021	1/27/21	1430	Soil	1	H
SB-2021-024:11-01272021		1435		1	H
SB-2021-026:1.5-01272021		1450		1	X
SB-2021-026:3-01272021		1455		1	X
SB-2021-026:5.5-01272021		1500		1	X
SB-2021-026:7-01272021		1505		1	X
SB-2021-026:10-01272021		1510		1	H
SB-2021-026:11-01272021		1515		1	H
SB-2021-025:1.5-01272021		1550		1	X
SB-2021-025:2.5-01272021	✓	1555	✓	1	X
Comments/Special Instructions X = run analysis H = hold analysis		Relinquished by: (Signature) <i>[Signature]</i> Printed Name: RYAN PETERSON Company: SEW Date & Time: 1/27/21 1705		Received by: (Signature) <i>[Signature]</i> Printed Name: Jacob Leald Company: ARZ Date & Time: 01/27/2021 1705	
		Relinquished by: (Signature)		Received by: (Signature)	
		Printed Name:		Printed Name:	
		Company:		Company:	
Date & Time:		Date & Time:		Date & Time:	



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ARI Assigned Number: 21A0370		Turn-around Requested: Standard		Page: 8 of 11		Analytical Resources, Incorporated Analytical Chemists and Consultant 4611 South 134th Place, Suite 100 Tukwila, WA 98168 206-695-6200 206-695-6201 (fax) www.arilabs.com								
ARI Client Company: Shannon & Wilson		Phone:		Date: 1/27/21	Ice Present? Yes									
Client Contact: Shoshana Howard				No. of Coolers: 6	Cooler Temps: See CRF									
Client Project Name: LDW				Analysis Requested										
Client Project #: 21-1-17596		Samplers: RBP, 5x5						PCH		Arclos		Notes/Comments		
Sample ID	Date	Time	Matrix	No. Containers										
S8-2021-025: S.5-01272021	1/27/21	1600	Soil	1		X					X			
S8-2021-025: S.6S-01272021	↓	1605	↓	1		X					X			
S8-2021-025: 10-01272021	↓	1610	↓	1		H					H	21A0370-73A		
S8-2021-025: 11-01272021	↓	1615	↓	1		H					H	21A0370-74A		
Aren9 Comp-01272021	↓	1630	↓	1		X					X			
Comments/Special Instructions X = run analysis H = hold analysis				Relinquished by: (Signature)		Received by: (Signature)		Relinquished by: (Signature)		Received by: (Signature)				
				Printed Name: RYAN PETERSON		Printed Name: Jacob Walter		Printed Name:		Printed Name:				
				Company: S&W		Company: ARZ		Company:		Company:				
				Date & Time: 1/27/21 1705		Date & Time: 01/27/2021 1705		Date & Time:		Date & Time:				

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

21D0061

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: <u>21D0061</u>		Turn-around Requested: <u>Standard</u>		Page: <u>9</u> of <u>11</u>												
ARI Client Company: <u>Shannon & Wilson, Inc.</u>		Phone: <u>206-632-8020</u>		Date:	Ice Present? <u>Yes</u>											
Client Contact: <u>Shoshana Howard</u>		No. of Coolers: <u>6</u>		Cooler Temps: <u>See GRF</u>												
Client Project Name: <u>EMJ</u>		Analysis Requested														
Client Project #: <u>2112596</u>																
Samplers: <u>CTC</u>		Notes/Comments														
Sample ID	Date	Time	Matrix	No. Containers	TPH-G	TPH-Dx	BTEX	HVOCs	PAHs	Full list SVOCs	PcB arectors	metals	TOC	Grain Size	NOTES	Hex Chrome
MW-76:15-01262021	1/26	0850	S	2		X				X		X				
MW-76:15.0-01262021	1/26	0855	S	2		X				X		X				
MW-76:15.5-01262021	1/26	0905	S	2		⊗				⊗		⊗			⊗ Hold	21A0576-78
MW-76:20.5-01262021	1/26	0915	S	2		⊗				⊗		⊗			⊗ Hold	
MW-100:5.0-01262021	1/26	0858	S	2		X				X		X				
MW-67:0.5-01262021	1/26	1320	S	5		X		X		X		X				X
MW-67:5.5-01262021	1/26	1325	S	6		X		X		X		X	X	X		X
MW-67:9.0-01262021	1/26	1335	S	6		X		X		X		X	X	X		X
MW-67:16.0-01262021	1/26	1350	S	5		⊗		X		⊗		⊗			⊗ Hold	⊗
MW-67:20.5-01262021	1/26	1400	S	5		⊗		X		⊗		⊗			⊗ Hold	⊗
Comments/Special Instructions <u>Please refer to EMJ analyte list.</u>		Relinquished by: (Signature) <u>[Signature]</u>		Received by: (Signature) <u>[Signature]</u>												
		Printed Name: <u>RYAN PETERSON</u>		Printed Name: <u>Jacob Laik</u>												
		Company: <u>S&W</u>		Company: <u>ARI</u>												
		Date & Time: <u>1/27/21 1705</u>		Date & Time: <u>01/27/2021 1705</u>												
		Relinquished by: (Signature)		Received by: (Signature)												
		Printed Name:		Printed Name:												
		Company:		Company:												
		Date & Time:		Date & Time:												

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21D0061

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: <u>21A0376</u>		Turn-around Requested: <u>Standard</u>		Page: <u>10</u> of <u>11</u>									
ARI Client Company: <u>Shannon & Wilson</u>		Phone: <u>206-632-8020</u>		Date: <u>11/27/2021</u>	Ice Present? <u>Yes</u>								
Client Contact: <u>Shoshana Howard</u>		No. of Coolers: <u>6</u>		Cooler Temps: <u>See CRF</u>									
Client Project Name: <u>LDW</u>		Analysis Requested											
Client Project #: <u>21-1-12590</u>		Notes/Comments											
Samplers: <u>M/KH</u>													
Sample ID	Date	Time	Matrix	No. Containers	TPH-D ₅	BTEX	HVOCs	PAHs	Metals	Grainsize			
MW-58: 4.5 - 01272021	11/27/2021	1005	Soil	5	X	X	X	X	X				
MW-58: 5.5 - 01272021		1015		6	X	X	X	X	X	X			
MW-58: 8.4 - 01272021		1025		5	X	X	X	X	X				
MW-58: 15 - 01272021		1035		6	*H	H*	*H	*H	*H	*H			hold 21A0376-39B
MW-58: 20 - 01272021		1045		5	*H	*H	*H	*H	*H				hold
MW-57: 5 - 01272021		1330		2	X			X	X				
MW-57: 6 - 01272021		1340		2	X			X	X				
MW-57: 10 - 01272021		1345		2	X			X	X				
MW-57: 15.5 - 01272021		1355		2	*H			*H	*H				hold 21A0376-94A
MW-57: 20 - 01272021		1405		2	*H			*H	*H				hold
Comments/Special Instructions <u>H=hold</u>		Relinquished by: (Signature) <u>[Signature]</u> Printed Name: <u>RIAN PETERSON</u> Company: <u>SW</u> Date & Time: <u>11/27/21 1705</u>		Received by: (Signature) <u>[Signature]</u> Printed Name: <u>Jacob [Signature]</u> Company: <u>ARI</u> Date & Time: <u>01/07/2021 1705</u>		Relinquished by: (Signature) _____ Printed Name: _____ Company: _____ Date & Time: _____		Received by: (Signature) _____ Printed Name: _____ Company: _____ Date & Time: _____					

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21D0061
Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: <u>21B0005</u>		Turn-around Requested: <u>Standard</u>		Page: <u>1</u> of <u>7</u>	
ARI Client Company: <u>Shannon & Wilson</u>		Phone: <u></u>		Date: <u>1/28/21</u>	Ice Present? <u>Yes</u>
Client Contact: <u>Shoshuna Howard</u>				No. of Coolers: <u>5</u>	Cooler Temps: <u>See CRF</u>
Client Project Name: <u>LDW</u>					
Client Project #: <u>21-1-12596</u>		Samplers: <u>RBP</u>		Analysis Requested	
				Notes/Comments	
Sample ID	Date	Time	Matrix	No. Containers	
SB-2021-040:2-01282021	1/28/21	0905	Soil	2	
SB-2021-040:5-01282021		0910		2	
SB-2021-040:10,4-01282021		0915		2	
SB-2021-040:13,7-01282021		0920		2	
SB-2021-010:1.5-01282021		0930		2	
SB-2021-010:6-01282021		0935		2	
SB-2021-010:11-01282021		0940		2	
SB-2021-010:12,7-01282021		0945		2	
SB-2021-104:6-01282021		1000		2	
SB-2021-002:3-01282021		1100		2	
Comments/Special Instructions		Relinquished by:		Received by:	
X = van analysis H = hold analysis		(Signature) <u>[Signature]</u>		(Signature) <u>[Signature]</u>	
		Printed Name: <u>RYAN PETERSON</u>		Printed Name: <u>Jacob Walter</u>	
		Company: <u>S & W</u>		Company: <u>ARI</u>	
		Date & Time: <u>1/28/21 1653</u>		Date & Time: <u>01/29/2021 1653</u>	
		Relinquished by:		Received by:	
		(Signature)		(Signature)	
		Printed Name:		Printed Name:	
		Company:		Company:	
		Date & Time:		Date & Time:	



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21D0061

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: <u>21D0061</u>		Turn-around Requested: <u>Standard</u>		Page: <u>2</u> of <u>7</u>	
ARI Client Company: <u>Shannon & Wilson</u>		Phone: _____		Date: <u>1/28/21</u>	Ice Present? <u>Yes</u>
Client Contact: <u>Shoshana Howard</u>		No. of Coolers: <u>5</u>		Cooler Temps: <u>See CRF</u>	
Client Project Name: <u>LDW</u>		Analysis Requested			
Client Project #: <u>21-1-12546</u>		Notes/Comments			
Samplers: <u>MRH, RSP</u>					
Sample ID	Date	Time	Matrix	No. Containers	
SB-2021-002:6-01282021	1/28/21	1110	Soil	2	
SB-2021-105:6-01282021		1200		2	
SB-2021-041:2-01282021		1230		7	
SB-2021-041:6-01282021		1245		7	
SB-2021-041:105-01282021		1300		7	
SB-2021-041:133-01282021		1305		7	
SB-2021-041:14-01282021		1310		7	
SB-2021-041:23-01282021		1315		7	
SB-2021-106:2-01282021		1330		7	
SB-2021-027:2.2-01282021		1355			
Comments/Special Instructions		Relinquished by:		Received by:	
X = run analysis H = hold analysis		(Signature) <u>[Signature]</u>		(Signature) <u>[Signature]</u>	
		Printed Name: <u>RYAN PETERSON</u>		Printed Name: <u>Jacob [unclear]</u>	
Company: <u>S&W</u>		Company: <u>ARI</u>		Company: _____	
Date & Time: <u>1/29/21 1653</u>		Date & Time: <u>01/29/2021 1653</u>		Date & Time: _____	



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Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: <u>2100005</u>		Turn-around Requested: <u>Standard</u>		Page: <u>3</u> of <u>7</u>	
ARI Client Company: <u>Shannon & Wilson</u>		Phone: _____		Date: <u>1/28/21</u>	Ice Present? <u>Yes</u>
Client Contact: <u>Shoshana Howard</u>		No. of Coolers: <u>5</u>		Cooler Temps: <u>See CRF</u>	
Client Project Name: <u>LDW</u>		Analysis Requested			
Client Project #: <u>21-1-12546</u>		Samplers: <u>RSP, MAH</u>			
Sample ID	Date	Time	Matrix	No. Containers	Notes/Comments
SB-2021-027:5,3-01282021	1/28/21	1400	Soil	2	
SB-2021-027:10-01282021		1405	↓	2	
SB-2021-027:15-01282021		1410	↓	2	
TB-3-01282021		-	Water	1	
Stain-003-01282021	↓	1455	Asphalt	1	
Stain-002-01242021	1/24/21	0930	↓	1	
Stain-001-01242021		0942	↓	1	
Asphalt-005-01242021		1000	↓	1	
Auger Water-01242021		1100	Water	2	
Probe Water-01242021	↓	1110	Water	2	
Comments/Special Instructions		Relinquished by:		Received by:	
X = run analy SFS H = hold analysis		(Signature) <u>[Signature]</u>		(Signature) <u>[Signature]</u>	
		Printed Name: <u>RYAN PETERSON</u>		Printed Name: <u>Seah Lait</u>	
		Company: <u>S&W</u>		Company: <u>ARI</u>	
		Date & Time: <u>1/24/21 1653</u>		Date & Time: <u>01/29/2021 1653</u>	
		Relinquished by:		Received by:	
		(Signature)		(Signature)	
		Printed Name:		Printed Name:	
		Company:		Company:	
		Date & Time:		Date & Time:	



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Total + Absorb
 Metals
 Waters have
 different metals
 list them soil
 list them soil
 Lab to filter.

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21D0061

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: <u>21B0005</u>		Turn-around Requested: <u>Standard</u>		Page: <u>5</u> of <u>7</u>											
ARI Client Company: <u>Shannon & Wilson, Inc.</u>		Phone: <u>206-632-8020</u>		Date: <u>1/26/21</u>	Ice Present? <u>Yes</u>										
Client Contact: <u>Shoshana Howard</u>		No. of Coolers: <u>5</u>		Cooler Temps: <u>See CRF</u>											
Client Project Name: <u>EMJ</u>		Analysis Requested													
Client Project #: <u>21-1-12596</u>															
Samplers: <u>CTC</u>		Notes/Comments													
Sample ID	Date	Time	Matrix	No. Containers	TPH-G	TPH-DX	BTEX	HVOCs	PAHs	Silica (Full list)	PCB Aroclors	Metals	Hex. Chrome	T.D.C.	Grain Size
SB-2021-068:1.0-01262021	1/26	1120	Soil	5		X	X	X		X	X	X			
SB-2021-068:5.5-01262021	1/26	1135	Soil	5		X	X	X		X	X	X			(X) = hold
MW-62:20-01282021	1/28	0925	Soil	2		(X)			(X)			(X)	(X)		
MW-64:1.5-01282021	1/28	1250	Soil	2		(X)			(X)			(X)	(X)		
MW-64:5.2-01282021	1/28	1305	Soil	2		X			X			X	X		
MW-64:9.0-01282021	1/28	1310	Soil	2		X			X			X	X		
MW-64:14.0-01282021	1/28	1330	Soil	2		X			X			X	X		
MW-64:20.5-01282021	1/28	1335	Soil	2		(X)			(X)			(X)	(X)		
MW-64:35.5-01282021	1/28	1415	Soil	2		(X)			(X)			(X)	(X)		
MW-64:45.5-01282021	1/28	1455	Soil	2		(X)			(X)			(X)	(X)		
Comments/Special Instructions • Refer to EMJ analyte list		Relinquished by: (Signature) <u>[Signature]</u> Printed Name: <u>RYAN PETERSON</u> Company: <u>SKW</u> Date & Time: <u>1/26/21 1653</u>		Received by: (Signature) <u>[Signature]</u> Printed Name: <u>Jacob [Signature]</u> Company: <u>ARC</u> Date & Time: <u>01/26/2021 1653</u>											
		Relinquished by: (Signature) _____ Printed Name: _____ Company: _____ Date & Time: _____		Received by: (Signature) _____ Printed Name: _____ Company: _____ Date & Time: _____											

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ARI Assigned Number: <u>010005</u>	Turn-around Requested: <u>Standard</u>	Page: <u>6</u> of <u>7</u>
ARI Client Company: <u>Shannon & Wilson, Inc.</u>	Phone: <u>206-632-8020</u>	Date: <u>1/29/21</u> Ice Present? <u>Yes</u>
Client Contact: <u>Shoshana Howard</u>	No. of Coolers: <u>5</u>	Cooler Temps: <u>See CRF</u>
Client Project Name: <u>-</u>		



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[illegible]

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ARI Assigned Number:

Turn-around Requested:

Standard

Page: 7 of 7

ARI Client Company:

Phone: _____

Company: Shannon & Wilson

200-695-6911

Client Contact:

Shoshana Howard

Date: 11/29/2021

Ice Present?	Yes
--------------	-----

No. of Coolers: 5

Cooler Temps: See CRF

Client Project Name:

LDW

Client Project #:

24-1-124596

Samplers:

METH

Analysis Requested	
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Notes/Comments

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21D0061

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: <u>21B0101</u>		Turn-around Requested: <u>Standard</u>		Page: <u>1</u> of <u>2</u>																											
ARI Client Company: <u>Shannon & Wilson, Inc.</u>		Phone: <u>206-632-8020</u>		Date: <u>2/4/21</u>	Ice Present? <u>Yes</u>																										
Client Contact: <u>Shoshana Howard</u>		No. of Coolers: <u>2</u>		Cooler Temps: <u>5.5</u> <u>3.6</u>																											
Client Project Name: <u>EMJ</u>		Analysis Requested <table border="1"> <tr> <th>TPH-G</th> <th>TPH-Dx</th> <th>BTEX</th> <th>HVOCs</th> <th>PAHs</th> <th>SVOCs</th> <th>PCB aryls</th> <th>Metals</th> <th>Hex. Chrome</th> <th>T.O.C.</th> <th>Grain Size</th> <th>Porosity</th> <th>Notes/Comments</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>⊗ = Hold</td> </tr> </table>				TPH-G	TPH-Dx	BTEX	HVOCs	PAHs	SVOCs	PCB aryls	Metals	Hex. Chrome	T.O.C.	Grain Size	Porosity	Notes/Comments													⊗ = Hold
TPH-G	TPH-Dx					BTEX	HVOCs	PAHs	SVOCs	PCB aryls	Metals	Hex. Chrome	T.O.C.	Grain Size	Porosity	Notes/Comments															
												⊗ = Hold																			
Client Project #: <u>21-1-12596</u>		Samplers: <u>CTC</u>																													
Sample ID	Date	Time	Matrix	No. Containers																											
MW-65:20.5 -02042021	2/4		soil	5		⊗	X	X	⊗		⊗	⊗																			
MW-71:1.5 -02042021	2/4	1030	Soil	5		X	X	X	X		X																				
MW-71:5.0 -02042021	2/4	1035	Soil	5		X	X	X	X		X																				
MW-71:8.5 -02042021	2/4	1045	Soil	5		X	X	X	X		X																				
MW-71:15.5 -02042021	2/4	1055	Soil	5		⊗	X	X	⊗		⊗		21B0101-04A																		
MW-71:20.5 -02042021	2/4	1105	Soil	5		⊗	X	X	⊗		⊗																				
MW-10R: -02042021	2/4		Soil	5		X	X	X	X		X																				
MW-10R: -02042021	2/4		Soil	5		X	X	X	X		X																				
MW-10R: -02042021	2/4		Soil	5		X	X	X	X		X																				
MW-10R: -02042021	2/4		Soil	5		⊗	⊗	⊗	⊗		⊗																				
Comments/Special Instructions • Refer to EMJ analyte list.		Relinquished by: <u>[Signature]</u> (Signature) Printed Name: <u>Christian Canfield</u> Company: <u>SWI</u> Date & Time: <u>2/4/2021 1240</u>		Received by: <u>[Signature]</u> (Signature) Printed Name: <u>Isaac Harte</u> Company: <u>ARI</u> Date & Time: <u>02/04/2021 1240</u>		Relinquished by: _____ (Signature) Printed Name: _____ Company: _____ Date & Time: _____		Received by: _____ (Signature) Printed Name: _____ Company: _____ Date & Time: _____																							

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21D0061

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: <u>21B0101</u>		Turn-around Requested: <u>Standard</u>		Page: <u>2</u> of <u>2</u>													
ARI Client Company: <u>Shannon & Wilson, Inc.</u>		Phone: <u>206-632-8020</u>		Date: <u>2/4/21</u>	Ice Present? <u>Yes</u>												
Client Contact: <u>Shoshana Howard</u>				No. of Coolers: <u>2</u>	Cooler Temps: <u>5.5 36</u>												
Client Project Name: <u>EMJ</u>				Analysis Requested													
Client Project #: <u>21-1-12596</u>		Samplers: <u>CTC</u>															
Sample ID	Date	Time	Matrix	No. Containers	TPH-G	TPH-DK	BTEX	HWCS	PAHs	SVOCS	PCB analytes	Metals	Hex. Chloride	T.O.C.	Grain Size	Porosity	Notes/Comments
MW-10R: 02092021	2/4		Soil	5		☒	☒	☒	☒								
MW-104: 02042021	2/4		Soil	5		X	X	X	X			X					
MW-54-14 S-02042021	2/4	0840	soil	5		☒	☒	☒	☒	☒	☒	☒					21B0101-064
MW-54-20 S-02042021	2/4	0900	Soil	5		☒	☒	☒	☒	☒	☒	☒					
Trip Blank	2/4		Water	3				X	X								
Comments/Special Instructions • Refer to EMJ analyte list.	Relinquished by: (Signature) <u>[Signature]</u>		Received by: (Signature) <u>[Signature]</u>		Relinquished by: (Signature)		Received by: (Signature)										
	Printed Name: <u>Christian Canfield</u>		Printed Name: <u>Jacob Lerth</u>		Printed Name:		Printed Name:										
	Company: <u>SWI</u>		Company: <u>ARI</u>		Company:		Company:										
	Date & Time: <u>2/4/2021 1040</u>		Date & Time: <u>02/04/2021 1040</u>		Date & Time:		Date & Time:										

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21D0061

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: <u>21D0061</u>		Turn-around Requested: <u>Standard</u>		Page: <u>1</u> of <u>1</u>										
ARI Client Company: <u>Shannon & Wilson</u>		Phone: _____		Date: <u>2/5/21</u>	Ice Present? _____									
Client Contact: <u>Shoshanna Howard</u>				No. of Coolers: <u>2</u>	Cooler Temps: <u>1.8/4.2</u>									
Client Project Name: <u>LDW</u>														
Client Project #: <u>21-1-12596</u>		Samplers: <u>RSP</u>												
Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested								Notes/Comments	
					TPH-G	TPH-DL	BTEX	HVOCs	PAHs	PCBs Metals Metals	Hex Chlorine Chlorine	TOC	Grain Size	Metals
MW-101:2-02052021	2/5/21	0900	Soil	5		X	X	X	X					X
MW-101:5.4-02052021		0910		5		X	X	X	X					X
MW-101:4-02052021		0915		5		X	X	X	X					X
MW-101:15-02052021		0920		5		H	H	H	H					H
MW-101:20-02052021		0925		5		H	H	H	H					H
MW-104:9-02052021		1015	↓	5		X	X	X	X					X
TB-5-02052021		-	Water	4			X	X						
SB-204-044:12-02052021		1114	Soil	1		X			X	X				
MW-65:20-02052021		1240	Soil	5		X	X	X	X	X	X			X
						X	X	X						
Comments/Special Instructions H = hold analysis X = run analysis		Relinquished by: (Signature) <u>[Signature]</u>		Received by: (Signature) <u>[Signature]</u>		Relinquished by: (Signature)		Received by: (Signature)						
		Printed Name: <u>RYAN PETERSON</u>		Printed Name: <u>Shannan Wilson</u>		Printed Name:		Printed Name:						
		Company: <u>Shannon & Wilson</u>		Company: <u>ARI</u>		Company:		Company:						
		Date & Time: <u>2/5/21 1410</u>		Date & Time: <u>2/5/21 1410</u>		Date & Time:		Date & Time:						

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21D0061
Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 21B0087		Turn-around Requested: Standard		Page: 2 of 4																																																																																																																																																
ARI Client Company: Shannon & Wilson, Inc.		Phone: 206-632-8020		Date: 2/3/21	Ice Present? Yes																																																																																																																																															
Client Contact: Shoshana Howard		No. of Coolers: 4		Cooler Temps: See CRF																																																																																																																																																
Client Project Name: EMS		<table border="1"> <thead> <tr> <th colspan="10">Analysis Requested</th> <th>Notes/Comments</th> </tr> <tr> <th>TPH-G</th> <th>TPH-Dx</th> <th>BTEX</th> <th>HVOCs</th> <th>PAHs</th> <th>SVOCs</th> <th>ReB aromatics</th> <th>metals</th> <th>Hex Chroma</th> <th>T.O.C.</th> <th>Grain Size</th> <th>Porosity</th> </tr> </thead> <tbody> <tr> <td></td> <td>X</td> <td></td> <td></td> <td>X</td> <td></td> <td></td> <td>X</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>X</td> <td></td> <td></td> <td>X</td> <td></td> <td></td> <td>X</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>X</td> <td></td> <td></td> <td>X</td> <td></td> <td></td> <td>X</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>⊗ run</td> <td></td> <td></td> <td>⊗ run</td> <td></td> <td></td> <td>⊗ run</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>⊗ run</td> <td></td> <td></td> <td>⊗ run</td> <td></td> <td></td> <td>⊗ run</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>X</td> <td></td> <td></td> <td>X</td> <td></td> <td></td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td></td> </tr> <tr> <td></td> <td>X</td> <td></td> <td></td> <td>X</td> <td></td> <td></td> <td>X</td> <td>X</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>X</td> <td></td> <td></td> <td>X</td> <td></td> <td></td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td></td> </tr> <tr> <td></td> <td>⊗</td> <td></td> <td></td> <td>⊗</td> <td></td> <td></td> <td>⊗</td> <td>⊗</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>⊗</td> <td></td> <td></td> <td>⊗</td> <td></td> <td></td> <td>⊗</td> <td>⊗</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>				Analysis Requested										Notes/Comments	TPH-G	TPH-Dx	BTEX	HVOCs	PAHs	SVOCs	ReB aromatics	metals	Hex Chroma	T.O.C.	Grain Size	Porosity		X			X			X						X			X			X						X			X			X						⊗ run			⊗ run			⊗ run						⊗ run			⊗ run			⊗ run						X			X			X	X	X				X			X			X	X					X			X			X	X	X				⊗			⊗			⊗	⊗					⊗			⊗			⊗	⊗			
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Client Project #: 21-1-12596	Samplers: CTC																																																																																																																																																			
Sample ID	Date	Time	Matrix	No. Containers																																																																																																																																																
MW-22R:1.0-02032021	2/3	1355	Soil	2																																																																																																																																																
MW-22R:5.5-02032021	2/3	1400	Soil	2																																																																																																																																																
MW-22R:9.0-02032021	2/3	1410	Soil	2																																																																																																																																																
MW-22R:15.5-02032021	2/3	1420	Soil	2																																																																																																																																																
MW-22R:20.5-02032021	2/3	1435	Soil	2																																																																																																																																																
MW-55:1.5-02032021	2/3	1110	Soil	3																																																																																																																																																
MW-55:5.5-02032021	2/3	1120	Soil	2																																																																																																																																																
MW-55:9.5-02032021	2/3	1135	Soil	3																																																																																																																																																
MW-55:15.5-02032021	2/3	1145	Soil	2																																																																																																																																																
MW-55:20.5-02032021	2/3	1155	Soil	2																																																																																																																																																
Comments/Special Instructions Refer to EMS analyte list					Relinquished by: (Signature) <i>M. Williams</i>																																																																																																																																															
					Received by: (Signature) <i>Seab Latta</i>																																																																																																																																															
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21D0061

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: <u>21D0061</u>		Turn-around Requested: <u>Standard</u>		Page: <u>3</u> of <u>4</u>	
ARI Client Company: <u>Shannon & Wilson</u>		Phone: <u>206-695-6811</u>		Date: <u>2/3/21</u>	Ice Present? <u>Yes</u>
Client Contact: <u>Shoshana Howard</u>		No. of Coolers: <u>4</u>		Cooler Temps: <u>See CRF</u>	
Client Project Name: <u>LDW</u>		Analysis Requested			
Client Project #: <u>21-1-12596</u>		Samplers: <u>MRA</u>			
Sample ID	Date	Time	Matrix	No. Containers	Notes/Comments
MW-54.1 - 02032021	2/3/21	1530	Soil	5	
MW-54.5.5 - 02032021		1535		5	
MW-54.9 - 02032021		1545		5	
MW-102.5.5 - 02032021		1600		5	
Comments/Special Instructions		Relinquished by: (Signature) <u>M. Hall</u>		Received by: (Signature) <u>Jacob Walte</u>	
		Printed Name: <u>Mitchell Halford</u>		Printed Name: <u>Jacob Walte</u>	
		Company: <u>S & W</u>		Company:	
		Date & Time: <u>2/3/21 1640</u>		Date & Time: <u>02/03/2021 1640</u>	



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21D0061
Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 21B0087		Turn-around Requested: Standard		Page: 4 of 4									
ARI Client Company: Shannon & Wilson		Phone: (206) 695-6811		Date: 2/3/21	Ice Present? Yes								
Client Contact: Shoshana Howard				No. of Coolers: 4	Cooler Temps: See CRE								
Client Project Name: LDW				Analysis Requested									
Client Project #: 21-1-12496		Samplers: MRH		Notes/Comments									
Sample ID	Date	Time	Matrix	No. Containers	TPH-D _x	BTEX	HVOCs	PAHs	PCB analytes	Metals	Total organic carbon	Grain size	
MW-70: 55-02032021	2/3/21	0850	Soil	6	H	X	X	H	H	H			
MW-70: 45-02032021	↓	0915	↓	6	H	X	X	H	H	H			
MW-70: 55-02032021	↓	0940	↓	6	H	X	X	H	H	H			
Trip Blank	2/3/21			1		X	X						
MW-53: 1-02032021	2/3/21	1320	Soil	5	X	X	X	X	X	X			
MW-53: 9.5-02032021	↓	1340	↓	6	X	X	X	X	X	X	X	X	
MW-53: 11-02032021	↓	1350	↓	6	X	X	X	X	X	X		X	
MW-53: 14.5-02032021	↓	1400	↓	5	H	H	H	H	H	H		X	
MW-53: 20-02032021	↓	1410	↓	5	H	H	H	H	H	H			21B0087-27A
Comments/Special Instructions H=hold													
Relinquished by: (Signature) <i>m Hall</i> Printed Name: Mitchell Hallfield Company: SWI Date & Time: 2/3/21 1640				Received by: (Signature) <i>Jacob Walter</i> Printed Name: Jacob Walter Company: ARZ Date & Time: 02/03/2021 1640				Relinquished by: (Signature) Printed Name: Company: Date & Time:				Received by: (Signature) Printed Name: Company: Date & Time:	



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21D0061

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: <u>21B0051</u>		Turn-around Requested: <u>Standard</u>		Page: <u>1</u> of <u>6</u>																																																																																																					
ARI Client Company: <u>Shannon & Wilson</u>		Phone: <u></u>		Date: <u>2/1/21</u>	Ice Present? <u>Yes</u>																																																																																																				
Client Contact: <u>Shoshana Howard</u>		No. of Coolers: <u>4</u>		Cooler Temps: <u>See CRF</u>																																																																																																					
Client Project Name: <u>LDiv</u>		Analysis Requested																																																																																																							
Client Project #: <u>21-1-12546</u>		Samplers: <u>RSP</u>																																																																																																							
Sample ID	Date	Time	Matrix	No. Containers	Notes/Comments																																																																																																				
MW-60:15-02012021	2/1/21	1020	Soil	7																																																																																																					
MW-60:5-02012021		1208		8																																																																																																					
MW-60:9-02012021		1226		8																																																																																																					
MW-60:16-02012021		1240		7																																																																																																					
MW-60:21-02012021		1256		7																																																																																																					
TB-4-02012021		—	Water	1																																																																																																					
MW-61:15-02012021		1425	Soil	4																																																																																																					
MW-61:6-02012021		1435	Soil	4																																																																																																					
MW-61:9-02012021		1445	Soil	1																																																																																																					
MW-61:11-02012021		1455		5																																																																																																					
<table border="1"> <thead> <tr> <th>TPH-G</th> <th>TPH-Dx</th> <th>BTEX</th> <th>HVOCs</th> <th>PAHs</th> <th>Full Lab SVOCs</th> <th>PCB Analysis</th> <th>Metals</th> <th>TCC</th> <th>Grain Size Analysis</th> </tr> </thead> <tbody> <tr> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td>X</td> <td>X</td> <td></td> <td></td> </tr> <tr> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> </tr> <tr> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> </tr> <tr> <td>H</td> <td>H</td> <td>H</td> <td>H</td> <td>H</td> <td></td> <td>H</td> <td>H</td> <td></td> <td></td> </tr> <tr> <td>H</td> <td>H</td> <td>H</td> <td>H</td> <td>H</td> <td></td> <td>H</td> <td>H</td> <td></td> <td></td> </tr> <tr> <td>X</td> <td></td> <td>X</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>X</td> <td>X</td> <td></td> <td></td> <td>X</td> <td></td> <td>X</td> <td>X</td> <td></td> <td></td> </tr> <tr> <td>X</td> <td>X</td> <td></td> <td></td> <td>X</td> <td></td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> </tr> <tr> <td>X</td> <td>X</td> <td></td> <td></td> <td>X</td> <td></td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> </tr> </tbody> </table>						TPH-G	TPH-Dx	BTEX	HVOCs	PAHs	Full Lab SVOCs	PCB Analysis	Metals	TCC	Grain Size Analysis	X	X	X	X	X		X	X			X	X	X	X	X		X	X	X	X	X	X	X	X	X		X	X	X	X	H	H	H	H	H		H	H			H	H	H	H	H		H	H			X		X	X							X	X			X		X	X			X	X			X		X	X	X	X	X	X			X		X	X	X	X
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Comments/Special Instructions H = hold analysis X = run analysis		Relinquished by: (Signature) <u>[Signature]</u> Printed Name: <u>CHAN PETERSON</u> Company: <u>S&W</u> Date & Time: <u>2/2/21 1655</u>		Received by: (Signature) <u>[Signature]</u> Printed Name: <u>Kenny Dang</u> Company: <u>ARI</u> Date & Time: <u>2/2/21 1655</u>																																																																																																					
		Relinquished by: (Signature) <u></u> Printed Name: <u></u> Company: <u></u> Date & Time: <u></u>		Received by: (Signature) <u></u> Printed Name: <u></u> Company: <u></u> Date & Time: <u></u>																																																																																																					



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21D0061

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 21D0061		Turn-around Requested: Standard		Page: 2 of 6	
ARI Client Company: Shannon & Wilson		Phone:		Date: 2/1/21	Ice Present? Yes
Client Contact: Shoshana Howard				No. of Coolers: 4	Cooler Temps: See CRF
Client Project Name: LDW				Analysis Requested	
Client Project #: 21-1-12596		Samplers: RSP		Notes/Comments	
Sample ID	Date	Time	Matrix	No. Containers	TPH+ TPH-2x STEX HVOCS PAHs Pill Lest SOCS PLS Archeol Metals TBC Grain Size
MW-61:16-02022021	2/1/21	1505	Soil	4	H H H H H H H H
MW-61:21-02022021	2/1/21	1515	Soil	4	H H H H H H H H
MW-74:3-02022021 MW-74:15-02022021	2/2/21	0910	Soil	2	X X X X X X X X
MW-74:6-02022021		0915		2	X X X X X X X X
MW-74:10.3-02022021		0920		2	X X X X X X X X
MW-74:15-02022021		0925		2	H H H H H H H H
MW-74:19.8-02022021		0930		2	H H H H H H H H
MW-101:10.3-02022021		1020		2	X X X X X X X X
MW-47:1.5-02022021		1010		7	X X X X X X X X
SB-2021-047:1.5-02022021		1010		7	X X X X X X X X
Comments/Special Instructions X = run analysis H = hold analysis		Relinquished by: (Signature) <i>[Signature]</i> Printed Name: <i>ALAN PETERSON</i> Company: <i>SEW</i> Date & Time: <i>2/2/21 1655</i>		Received by: (Signature) <i>[Signature]</i> Printed Name: <i>Kenny Dong</i> Company: <i>ARI</i> Date & Time: <i>2/2/21 1655</i>	



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21D0061

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 21B0081		Turn-around Requested: Standard		Page: 3 of 6	
ARI Client Company: Shannon & Wilson		Phone: Shannon Howard		Date: 2/2/21	Ice Present? Yes
Client Contact: Shannon Howard		No. of Coolers: 4		Cooler Temps: See CRF	
Client Project Name: LDW		Analysis Requested			
Client Project #: 21-1-12546		Notes/Comments			
Samplers: RBP, MRH					
Sample ID	Date	Time	Matrix	No. Containers	
SB-204-047.7.1-02022021	2/2/21	1020	Soil	7	X
SB-204-047.10.5-02022021		1030		7	H
SB-201-047.12.7-02022021		1035		7	H
MW-73.32-02022021		1110		7	X
MW-73.7-02022021		1125		7	X
MW-73.11-02022021		1130		9	X
MW-73.15-02022021		1135		7	X
MW-73.17.7-02022021		1140		7	X
MW-72.1-02022021		1240		2	X
MW-72.5-02022021		1245		2	X
Comments/Special Instructions H = Hold analysis X = Run analysis		Relinquished by: (Signature) [Signature] Printed Name: RYAN PETERSON Company: S&W Date & Time: 2/2/21 1655		Received by: (Signature) [Signature] Printed Name: Kenny Dang Company: ARI Date & Time: 2/2/21 1655	
		Relinquished by: (Signature) [Signature] Printed Name: [Signature] Company: [Signature] Date & Time: [Signature]		Received by: (Signature) [Signature] Printed Name: [Signature] Company: [Signature] Date & Time: [Signature]	



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21B0081-21A/B

strong gasoline odor

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21D0061

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 21B0081		Turn-around Requested: Standard		Page: 4 of 6		 Analytical Resources, Incorporated Analytical Chemists and Consultants 4611 South 134th Place, Suite 100 Tukwila, WA 98168 206-695-6200 206-695-6201 (fax) www.arilabs.com							
ARI Client Company: Shannon & Wilson		Phone:		Date: 2/2/21				Ice Present? Yes					
Client Contact: Shoshana Howard				No. of Coolers: 4				Cooler Temps: See CRF					
Client Project Name: LDW				Analysis Requested				Notes/Comments					
Client Project #: 21-1-12596		Samplers: RSP, MCH		TAG	TPH-A	BTEX	HVOCs	PAHs	PCB Analysis	Metal	Full Lab SVCS	Heavy Metal Chain of Custody	
Sample ID	Date	Time	Matrix	No. Containers									
MW-72:10.4-02022021	2/2/21	1250	Soil	2		X				X	X		
MW-72:10.4-MS/MSD		1250		2		X				X	X		MS/MSD
MW-72:15-02022021		1255		2		H				H	H		21B0081-31B
MW-72:18.4-02022021		1300		2		H				H	H		
MW-65:2-02022021		1350		5		X	X	X	X	X	X	X	All Hold
MW-65:2-MS/MSD		1350		5		X	X	X	X	X	X	X	MS/MSD Hold All Hold
MW-65:5-02022021		1410		5		X	X	X	X	X	X	X	All Hold
MW-65:11.4-02022021		1420		5		H	H	H	H	H	H		21B0081-35A
MW-65:13-02022021		1425		5		X	X	X	X	X	X	X	
MW-70:10-02022021		1510		5	X	X	X	X	X	X	X	X	
Comments/Special Instructions H= hold analysis X= run analysis				Relinquished by: (Signature) 		Received by: (Signature) 		Relinquished by: (Signature)		Received by: (Signature)			
				Printed Name: RYAN PETERSON		Printed Name: Kenny Dang		Printed Name:		Printed Name:			
				Company: S&W		Company: ARI		Company:		Company:			
				Date & Time: 2/2/21 1655		Date & Time: 2/2/21 1655		Date & Time:		Date & Time:			

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21D0061
Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 21B0081		Turn-around Requested: Standard		Page: 5 of 6								
ARI Client Company: Shannon & Wilson		Phone:		Date: 2/1/21	Ice Present? Yes							
Client Contact: Shoshana Howard				No. of Coolers: 4	Cooler Temps: See CRF							
Client Project Name: LDW				Analysis Requested								
Client Project #: 21-12546		Samplers: MLH		Notes/Comments								
Sample ID	Date	Time	Matrix	No. Containers	TH-C	TH-D	STEX	HVLS	GMH	PCB Analysis	Metals	
MW-70:4.3-02022021	2/1/21	1515	Soil	5	X	X	X	X	X		X	
MW-70:8-02022021		1525		5	X	X	X	X	X		X	
MW-70:15-02022021		1545		5	H	H	H	H	H		H	
MW-70:20-02022021		1615		5	H	H	H	H	H		H	
Comments/Special Instructions H = hold analysis X = run analysis												
Relinquished by: (Signature) <i>[Signature]</i>		Received by: (Signature) <i>[Signature]</i>		Relinquished by: (Signature)		Received by: (Signature)						
Printed Name: MIAN PETERSON		Printed Name: Kenny Dang		Printed Name:		Printed Name:						
Company: S&W		Company: ARI		Company:		Company:						
Date & Time: 2/1/21 1655		Date & Time: 2/2/21 1655		Date & Time:		Date & Time:						



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21D0061
Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 21B0081		Turn-around Requested: Standard		Page: 6 of 6													
ARI Client Company: SWI		Phone: 206-632-8020		Date: 2/2/21	Ice Present? Yes												
Client Contact: Shoshana Howard				No. of Coolers: 4	Cooler Temps: See CRF												
Client Project Name: EMJ				 Analytical Resources, Incorporated Analytical Chemists and Consultants 4611 South 134th Place, Suite 100 Tukwila, WA 98168 206-695-6200 206-695-6201 (fax) www.arilabs.com													
Client Project #: 21-1-12596		Samplers: CTC															
Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested										Notes/Comments		
					TPH-G	TPH-Dx	BTEX	HVOCs	PAHs	SVOCs	PCB analytes	metals	Hex. Chrome	T.O.C.	Grain Size	Porosity	
MW-68:8.5-02022021	2/2	0935	soil	5		X	X	X		X	X	X					
MW-68:15.5-02022021	2/2	0955	Soil	5		⊗	⊗	⊗		⊗	⊗	⊗					21B0081-43A/B
MW-68:20.5-02022021	2/2	1010	Soil	5		⊗	⊗	⊗		⊗	⊗	⊗					
MW-56:1.0-02022021	2/2	1245	Soil	2		X			X			X					
MW-56:5.5-02022021	2/2	1250	Soil	2		X			X			X					
MW-56:8.0-02022021	2/2	1300	Soil	2		X			X			X					
MW-56:16.0-02022021	2/2	1320	Soil	2		⊗			⊗			⊗					
MW-56:20.5-02022021	2/2	1330	Soil	2		⊗			⊗			⊗					
MW-101:8.0-02022021	2/2	1305	Soil	2		X			X			X					
Comments/Special Instructions				Relinquished by: (Signature) <i>[Signature]</i>	Received by: (Signature) <i>[Signature]</i>		Relinquished by: (Signature)		Received by: (Signature)								
				Printed Name: RIVAN PETERSON	Printed Name: Kenny Dang		Printed Name:		Printed Name:								
				Company: SWI	Company: ARI		Company:		Company:								
				Date & Time: 2/2/21 1655	Date & Time: 2/2/21 1655		Date & Time:		Date & Time:								

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Lower Duwamish follow-ups and questions

Shoshana Howard <SKH@shanwil.com>

Mon 3/29/2021 3:04 PM

To: Sue Dunnihoo <lmsadm@arilabs.com>

Cc: Kelly Bottem <kelly.bottem@arilabs.com>; Shelly Fishel <shelly.fishel@arilabs.com>

Hi Sue,

We went through the soil data for the Lower Duwamish project (21A0352, 21A0376, 21B0005, 21B0081, 21B0087, 21B0101, and 21B0126) and have some questions/comments and follow-up requests:

- On work order 21B0081, there is a sample name that is showing as MW-7.3:3.2-02022021. That should be MW-73:3.2-02022021. Can the report be updated?
- Typically we only ran PAHs for soil samples, but for a few samples, the full list was requested.
 - Within work order 21A0376, full list SVOCs were requested on samples MW-76:1.5-01262021, MW-76:5.0-01262021, MW-100:5.0-01262021, MW-67:0.5-01262021, MW-67:5.5-01262021, and MW-67:9.0-01262021. It looks like only the PAHs were provided. Were the other SVOCs included and can they be reported? If not, are they out of hold or could this be added?
 - Within work orders 21B0005 and 21B0081, full list SVOCs were provided for SB-2021-068:1.0-02262021, SB-2021-068:5.5-02262021, MW-72:1-02022021, MW-72:5-02022021, MW-72:10.9-02022021, and MW-72:10.9-MS/MSD, but the RLs seem to be high; this project needs the low levels. Can you advise on what can be done?
 - Not sure on hold times for SVOCs vs PAHs. If the hold time is extended by freezing, can we please run full list SVOCs (with the low levels) for 21B0005 samples MW-75:1.5-01282021, MW-75:6.0-01282021, and MW-75:8.5-01282021? Our field team should have marked these on the COC.
- See below for follow-ups requested (sorted by work order). Ideally these would all be lumped into one work order. I believe the metals should be fine for hold time except mercury. Please don't run mercury if outside of hold time. Let me know if anything else would be outside of hold time. Diesel and VOCs are outside of hold, right? I didn't request any follows on those compounds for that reason, but let me know if I'm wrong and I may want to add a few.

Follow-ups:

21A0352	SB-2021-009:13.3-01252021	Metals
	TSA-2021-004:1.7-01252021	PCBs
	TSA-2021-004:3-01252021	PCBs
	TSA-2021-005:1.7-01252021	PCBs
	TSA-2021-005:3-01252021	PCBs
	TSA-2021-006:1.7-01252021	PCBs
	MW-66:15.5-012521	Metals
21A0376	SB-2021-046:13.9-01262021	Metals and PAHs
	SB-2021-038:12.9-01262021	PAHs
	SB-2021-018:8.2-01272021	PCBs
	SB-2021-025:10-01272021	PCBs
	SB-2021-025:11-01272021	PCBs
	MW-76:15.5-01262021	Metals and PAHs
	MW-58:15-01272021	PAHs
	MW-57:15.3-01272021	PAHs
	MW-62:15-01272021	PAHs
21B0005	SB-2021-040:13.7-01282021	PAHs
	SB-2021-041:13.3-01282021	PAHs

	TSA-2021-007:1.3-01292021	PCBs
	SB-2021-006:20-01292021	PAHs
21B0101	MW-71:15.5-02042021	PAHs
	MW-54:14.5-02042021	PCBs
21B0126	MW-10R:15-02052021	PAHs
21B0087	MW-55:15.5-02032021	Metals and PAHs
	MW-53:15.8-01032021	PAHs and PCBs
	MW-61:16-02012021	Metals
	MW-74:15-02022021	Metals
	SB-2021-047:10.5-02022021	Metals, PAHs, and PCBs
	MW-72:15-02022021	Metals
	SB-2021-65:11.9-02022021	PAHs
	MW-70:15-02022021	PAHs
	MW-68:15.5-02022021	Metals and PAHs

Thanks!

Shoshana Howard, PE / Senior Engineer

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Direct: (206) 695-6811 skh@shanwil.com



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
05-May-2021 12:19

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SB-2021-009:13.3-01252021	21D0061-01	Solid	25-Jan-2021 11:15	06-Apr-2021 11:58
TSA-2021-004:1.7-01252021	21D0061-02	Solid	25-Jan-2021 11:50	06-Apr-2021 11:58
TSA-2021-004:3-01252021	21D0061-03	Solid	25-Jan-2021 11:55	06-Apr-2021 11:58
TSA-2021-005:1.7-01252021	21D0061-04	Solid	25-Jan-2021 12:20	06-Apr-2021 11:58
TSA-2021-005:3-01252021	21D0061-05	Solid	25-Jan-2021 12:25	06-Apr-2021 11:58
TSA-2021-006:1.7-01252021	21D0061-06	Solid	25-Jan-2021 12:50	06-Apr-2021 11:58
MW-66:15.5-012521	21D0061-07	Solid	25-Jan-2021 14:00	06-Apr-2021 11:58
SB-2021-046:13.9-1262021	21D0061-08	Solid	26-Jan-2021 10:40	06-Apr-2021 11:58
SB-2021-038:12.9-1262021	21D0061-09	Solid	26-Jan-2021 12:45	06-Apr-2021 11:58
SB-2021-018:8.2-1272021	21D0061-10	Solid	27-Jan-2021 10:40	06-Apr-2021 11:58
SB-2021-025:10-1272021	21D0061-11	Solid	27-Jan-2021 16:10	06-Apr-2021 11:58
SB-2021-025:11-1272021	21D0061-12	Solid	27-Jan-2021 16:15	06-Apr-2021 11:58
MW-76:15.5-01262021	21D0061-13	Solid	26-Jan-2021 09:05	06-Apr-2021 11:58
MW-58:15-01272021	21D0061-14	Solid	27-Jan-2021 10:35	06-Apr-2021 11:58
MW-57:15.3-01272021	21D0061-15	Solid	27-Jan-2021 13:55	06-Apr-2021 11:58
MW-62:15-01272021	21D0061-16	Solid	27-Jan-2021 16:05	06-Apr-2021 11:58
SB-2021-040:13.7-01282021	21D0061-17	Solid	28-Jan-2021 09:20	06-Apr-2021 11:58
SB-2021-041:13.3-01282021	21D0061-18	Solid	28-Jan-2021 13:05	06-Apr-2021 11:58
TSA-2021-007:1.3-01292021	21D0061-19	Solid	29-Jan-2021 16:05	06-Apr-2021 11:58
SB-2021-006:20-01292021	21D0061-20	Solid	29-Jan-2021 14:50	06-Apr-2021 11:58
MW-71:15.5-02042021	21D0061-21	Solid	04-Feb-2021 10:55	06-Apr-2021 11:58
MW-54:14.5-02042021	21D0061-22	Solid	04-Feb-2021 08:40	06-Apr-2021 11:58
MW-10R:15-02052021	21D0061-23	Solid	05-Feb-2021 09:20	06-Apr-2021 11:58
MW-55:15.5-02032021	21D0061-24	Solid	03-Feb-2021 11:45	06-Apr-2021 11:58
MW-53:15.8-02032021	21D0061-25	Solid	03-Feb-2021 14:00	06-Apr-2021 11:58
MW-61:16-02012021	21D0061-26	Solid	01-Feb-2021 15:05	06-Apr-2021 11:58
MW-74:15-02022021	21D0061-27	Solid	02-Feb-2021 09:25	06-Apr-2021 11:58
SB-2021-047:10.5-02022021	21D0061-28	Solid	02-Feb-2021 10:30	06-Apr-2021 11:58
MW-72:15-02022021	21D0061-29	Solid	02-Feb-2021 12:55	06-Apr-2021 11:58
SB-2021-65:11.9-02022021	21D0061-30	Solid	02-Feb-2021 14:20	06-Apr-2021 11:58
MW-70:15-02022021	21D0061-31	Solid	01-Feb-2021 15:45	06-Apr-2021 11:58
MW-68:15.5-02022021	21D0061-32	Solid	02-Feb-2021 09:55	06-Apr-2021 11:58

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Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
05-May-2021 12:19

Work Order Case Narrative

Client: Shannon & Wilson, Inc
Project: Lower Duwamish
Work Order: 21D0061

Sample receipt

Samples as listed on the preceding page were received 06-Apr-2021 11:58 under ARI work order 21D0061. For details regarding sample receipt, please refer to the Cooler Receipt Form.

PCB Aroclors - EPA Method SW8082A

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements except Aroclor 1260 which was out of control low in continuing calibration verification (CCV4 and CCV6) on column zb-5. Data reported from passing column zb-35.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits except Decachlorobiphenyl on both columns and Tetrachlorometaxylene on column zb-5 in sample 21D0061-02. Deviations have been flagged.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

Sample specific QC was performed in association with sample 21D0061-04 in batch BJD0238. The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) were within advisory control limits.

Polynuclear Aromatic Hydrocarbons (PAH) - EPA Method SW8270E-SIM

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements except Acenaphthalene, Dibenzofuran and Benzo(b)fluoranthene which were out of control low in the initial calibration verification (ICV). All samples which contain analyte have been flagged with a "Q" qualifier.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits except Fluoranthene. All samples which contain analyte have been flagged with a "B" qualifier.



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Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
05-May-2021 12:19

The blank spike (BS/LCS) percent recoveries were within control limits.

Sample specific QC was performed in association with sample 21D0061-09 in batch BJD0249. The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) were within advisory control limits.

Total Metals - EPA Method 6020B

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

Sample specific QC was performed in association with sample 21D0061-01 in batch BJD0279. The duplicate (DUP) relative percent difference (RPD) were within advisory control limits. The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) were within advisory control limits. The post digestion spike percent recovery was within control limits.



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
05-May-2021 12:19

SB-2021-009:13.3-01252021
21D0061-01 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 01/25/2021 11:15

Instrument: ICPMS2 Analyst: MCB

Analyzed: 04/14/2021 20:39

Sample Preparation:

Preparation Method: SWN EPA 3050B

Extract ID: 21D0061-01 A 01

Preparation Batch: BJD0279

Sample Size: 1.016 g (wet)

Dry Weight: 0.78 g

Prepared: 04/13/2021

Final Volume: 50 mL

% Solids: 77.22

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium	7440-39-3	20	0.15	0.64	40.5	mg/kg	
Chromium	7440-47-3	20	0.33	0.64	11.9	mg/kg	
Cobalt	7440-48-4	20	0.02	0.25	5.77	mg/kg	
Iron	7439-89-6	20	23	46	10800	mg/kg	
Lead	7439-92-1	20	0.07	0.13	2.32	mg/kg	
Silver	7440-22-4	20	0.03	0.25	0.07	mg/kg	J
Vanadium	7440-62-2	20	0.07	0.25	41.0	mg/kg	

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
05-May-2021 12:19

SB-2021-009:13.3-01252021
21D0061-01 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 01/25/2021 11:15

Instrument: ICPMS2 Analyst: MCB

Analyzed: 04/14/2021 20:39

Sample Preparation:

Preparation Method: SWN EPA 3050B

Extract ID: 21D0061-01 A 01

Preparation Batch: BJD0279

Sample Size: 1.016 g (wet)

Dry Weight: 0.78 g

Prepared: 04/13/2021

Final Volume: 50 mL

% Solids: 77.22

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	20	0.05	0.25	1.91	mg/kg	
Cadmium	7440-43-9	20	0.04	0.13	0.24	mg/kg	
Copper	7440-50-8	20	0.22	0.64	18.8	mg/kg	
Nickel	7440-02-0	20	0.10	0.64	11.5	mg/kg	
Selenium	7782-49-2	20	0.23	0.64	1.31	mg/kg	
Zinc	7440-66-6	20	3.7	6.4	27.5	mg/kg	

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 Shannon & Wilson, Inc
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 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 05-May-2021 12:19

TSA-2021-004:1.7-01252021
21D0061-02 (Solid)
Aroclor PCB

Method: EPA 8082A		Sampled: 01/25/2021 11:50	
Instrument: ECD7 Analyst: JGR		Analyzed: 04/22/2021 01:48	
Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Extract ID: 21D0061-02 A 01	
	Preparation Batch: BJD0238	Dry Weight: 12.59 g	
	Prepared: 04/09/2021	% Solids: 93.24	
Sample Cleanup:	Cleanup Method: Silica Gel	Extract ID: 21D0061-02 A 01	
	Cleanup Batch: CJD0206	Initial Volume: 2.5 mL	
	Cleaned: 20-Apr-2021	Final Volume: 2.5 mL	
Sample Cleanup:	Cleanup Method: Sulfuric Acid	Extract ID: 21D0061-02 A 01	
	Cleanup Batch: CJD0204	Initial Volume: 2.5 mL	
	Cleaned: 20-Apr-2021	Final Volume: 2.5 mL	
Sample Cleanup:	Cleanup Method: Sulfur	Extract ID: 21D0061-02 A 01	
	Cleanup Batch: CJD0205	Initial Volume: 2.5 mL	
	Cleaned: 20-Apr-2021	Final Volume: 2.5 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	10	15.5	39.7	ND	ug/kg	U
Aroclor 1221	11104-28-2	10	15.5	39.7	ND	ug/kg	U
Aroclor 1232	11141-16-5	10	15.5	39.7	ND	ug/kg	U
Aroclor 1242	53469-21-9	10	15.5	39.7	ND	ug/kg	U
Aroclor 1248	12672-29-6	10	15.5	39.7	ND	ug/kg	U
Aroclor 1254	11097-69-1	10	15.5	39.7	537	ug/kg	D
Aroclor 1260	11096-82-5	10	5.8	39.7	ND	ug/kg	U
Aroclor 1262	37324-23-5	10	5.8	39.7	ND	ug/kg	U
Aroclor 1268	11100-14-4	10	5.8	39.7	225	ug/kg	D
<i>Surrogate: Decachlorobiphenyl</i>				40-126 %	146	%	*
<i>Surrogate: Tetrachlorometaxylene</i>				44-120 %	43.2	%	*
<i>Surrogate: Decachlorobiphenyl [2C]</i>				40-126 %	127	%	*
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				44-120 %	50.2	%	


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 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 05-May-2021 12:19

TSA-2021-004:3-01252021
21D0061-03 (Solid)
Aroclor PCB

Method: EPA 8082A		Sampled: 01/25/2021 11:55	
Instrument: ECD7 Analyst: JGR		Analyzed: 04/22/2021 02:08	
Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Extract ID: 21D0061-03 A 01	
	Preparation Batch: BJD0238	Dry Weight: 12.56 g	
	Prepared: 04/09/2021	% Solids: 88.84	
Sample Cleanup:	Cleanup Method: Silica Gel	Extract ID: 21D0061-03 A 01	
	Cleanup Batch: CJD0206	Initial Volume: 2.5 mL	
	Cleaned: 20-Apr-2021	Final Volume: 2.5 mL	
Sample Cleanup:	Cleanup Method: Sulfuric Acid	Extract ID: 21D0061-03 A 01	
	Cleanup Batch: CJD0204	Initial Volume: 2.5 mL	
	Cleaned: 20-Apr-2021	Final Volume: 2.5 mL	
Sample Cleanup:	Cleanup Method: Sulfur	Extract ID: 21D0061-03 A 01	
	Cleanup Batch: CJD0205	Initial Volume: 2.5 mL	
	Cleaned: 20-Apr-2021	Final Volume: 2.5 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	1.6	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	1.6	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	1.6	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	1.6	4.0	3.6	ug/kg	J
Aroclor 1260	11096-82-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	0.6	4.0	2.1	ug/kg	J
<i>Surrogate: Decachlorobiphenyl</i>					40-126 %	72.2	%
<i>Surrogate: Tetrachlorometaxylene</i>					44-120 %	75.3	%
<i>Surrogate: Decachlorobiphenyl [2C]</i>					40-126 %	83.7	%
<i>Surrogate: Tetrachlorometaxylene [2C]</i>					44-120 %	68.3	%


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 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 05-May-2021 12:19

TSA-2021-005:1.7-01252021
21D0061-04 (Solid)
Aroclor PCB

Method: EPA 8082A		Sampled: 01/25/2021 12:20	
Instrument: ECD7 Analyst: JGR		Analyzed: 04/22/2021 02:29	
Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Extract ID: 21D0061-04 A 01	
	Preparation Batch: BJD0238	Dry Weight: 12.52 g	
	Prepared: 04/09/2021	% Solids: 93.35	
Sample Cleanup:	Cleanup Method: Silica Gel	Extract ID: 21D0061-04 A 01	
	Cleanup Batch: CJD0206	Initial Volume: 2.5 mL	
	Cleaned: 20-Apr-2021	Final Volume: 2.5 mL	
Sample Cleanup:	Cleanup Method: Sulfuric Acid	Extract ID: 21D0061-04 A 01	
	Cleanup Batch: CJD0204	Initial Volume: 2.5 mL	
	Cleaned: 20-Apr-2021	Final Volume: 2.5 mL	
Sample Cleanup:	Cleanup Method: Sulfur	Extract ID: 21D0061-04 A 01	
	Cleanup Batch: CJD0205	Initial Volume: 2.5 mL	
	Cleaned: 20-Apr-2021	Final Volume: 2.5 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	1.6	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	1.6	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	1.6	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	1.6	4.0	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	0.6	4.0	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>				40-126 %	80.5	%	
<i>Surrogate: Tetrachlorometaxylene</i>				44-120 %	84.9	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				40-126 %	91.9	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				44-120 %	72.5	%	


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 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 05-May-2021 12:19

TSA-2021-005:3-01252021
21D0061-05 (Solid)
Aroclor PCB

Method: EPA 8082A		Sampled: 01/25/2021 12:25	
Instrument: ECD7 Analyst: JGR		Analyzed: 04/22/2021 03:30	
Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Extract ID: 21D0061-05 A 01	
	Preparation Batch: BJD0238	Dry Weight: 12.50 g	
	Prepared: 04/09/2021	% Solids: 84.66	
Sample Cleanup:	Cleanup Method: Silica Gel	Extract ID: 21D0061-05 A 01	
	Cleanup Batch: CJD0206	Initial Volume: 2.5 mL	
	Cleaned: 20-Apr-2021	Final Volume: 2.5 mL	
Sample Cleanup:	Cleanup Method: Sulfuric Acid	Extract ID: 21D0061-05 A 01	
	Cleanup Batch: CJD0204	Initial Volume: 2.5 mL	
	Cleaned: 20-Apr-2021	Final Volume: 2.5 mL	
Sample Cleanup:	Cleanup Method: Sulfur	Extract ID: 21D0061-05 A 01	
	Cleanup Batch: CJD0205	Initial Volume: 2.5 mL	
	Cleaned: 20-Apr-2021	Final Volume: 2.5 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	1.6	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	1.6	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	1.6	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	1.6	4.0	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	0.6	4.0	0.9	ug/kg	J
Aroclor 1262	37324-23-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	0.6	4.0	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>				40-126 %	69.5	%	
<i>Surrogate: Tetrachlorometaxylene</i>				44-120 %	73.8	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				40-126 %	78.2	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				44-120 %	64.7	%	


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 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 05-May-2021 12:19

TSA-2021-006:1.7-01252021
21D0061-06 (Solid)
Aroclor PCB

Method: EPA 8082A		Sampled: 01/25/2021 12:50	
Instrument: ECD7 Analyst: JGR		Analyzed: 04/22/2021 03:51	
Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Extract ID: 21D0061-06 A 01	
	Preparation Batch: BJD0238	Dry Weight: 12.56 g	
	Prepared: 04/09/2021	% Solids: 90.74	
Sample Cleanup:	Cleanup Method: Silica Gel	Extract ID: 21D0061-06 A 01	
	Cleanup Batch: CJD0206	Initial Volume: 2.5 mL	
	Cleaned: 20-Apr-2021	Final Volume: 2.5 mL	
Sample Cleanup:	Cleanup Method: Sulfuric Acid	Extract ID: 21D0061-06 A 01	
	Cleanup Batch: CJD0204	Initial Volume: 2.5 mL	
	Cleaned: 20-Apr-2021	Final Volume: 2.5 mL	
Sample Cleanup:	Cleanup Method: Sulfur	Extract ID: 21D0061-06 A 01	
	Cleanup Batch: CJD0205	Initial Volume: 2.5 mL	
	Cleaned: 20-Apr-2021	Final Volume: 2.5 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	1.6	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	1.6	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	1.6	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	1.6	4.0	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	0.6	4.0	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>				40-126 %	69.2	%	
<i>Surrogate: Tetrachlorometaxylene</i>				44-120 %	72.6	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				40-126 %	78.1	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				44-120 %	64.3	%	



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
05-May-2021 12:19

MW-66:15.5-012521
21D0061-07 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 01/25/2021 14:00

Instrument: ICPMS2 Analyst: MCB

Analyzed: 04/14/2021 20:35

Sample Preparation:

Preparation Method: SWN EPA 3050B

Extract ID: 21D0061-07 A 01

Preparation Batch: BJD0279

Sample Size: 1.074 g (wet)

Dry Weight: 0.80 g

Prepared: 04/13/2021

Final Volume: 50 mL

% Solids: 74.18

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium	7440-39-3	20	0.14	0.63	71.7	mg/kg	
Chromium	7440-47-3	20	0.33	0.63	15.1	mg/kg	
Cobalt	7440-48-4	20	0.02	0.25	9.89	mg/kg	
Iron	7439-89-6	20	23	45	13100	mg/kg	
Lead	7439-92-1	20	0.07	0.13	3.64	mg/kg	
Silver	7440-22-4	20	0.03	0.25	0.10	mg/kg	J
Vanadium	7440-62-2	20	0.07	0.25	44.1	mg/kg	

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
05-May-2021 12:19

MW-66:15.5-012521
21D0061-07 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 01/25/2021 14:00

Instrument: ICPMS2 Analyst: MCB

Analyzed: 04/14/2021 20:35

Sample Preparation:

Preparation Method: SWN EPA 3050B

Extract ID: 21D0061-07 A 01

Preparation Batch: BJD0279

Sample Size: 1.074 g (wet)

Dry Weight: 0.80 g

Prepared: 04/13/2021

Final Volume: 50 mL

% Solids: 74.18

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	20	0.05	0.25	2.98	mg/kg	
Cadmium	7440-43-9	20	0.04	0.13	0.07	mg/kg	J
Copper	7440-50-8	20	0.44	0.63	21.5	mg/kg	
Nickel	7440-02-0	20	0.10	0.63	16.4	mg/kg	
Selenium	7782-49-2	20	0.23	0.63	1.45	mg/kg	
Zinc	7440-66-6	20	3.7	6.3	42.6	mg/kg	

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Analytical Resources, Incorporated
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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
05-May-2021 12:19

SB-2021-046:13.9-1262021
21D0061-08 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM		Sampled: 01/26/2021 10:40
Instrument: NT11 Analyst: VTS		Analyzed: 04/20/2021 14:14
Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Low Level	Extract ID: 21D0061-08 A 02
	Preparation Batch: BJD0249	Dry Weight: 10.01 g
	Prepared: 04/12/2021	% Solids: 73.15
Sample Cleanup:	Cleanup Method: Silica Gel	Extract ID: 21D0061-08 A 02
	Cleanup Batch: CJD0194	Initial Volume: 0.5 mL
	Cleaned: 19-Apr-2021	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Sulfur	Extract ID: 21D0061-08 A 02
	Cleanup Batch: CJD0193	Initial Volume: 0.5 mL
	Cleaned: 19-Apr-2021	Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.44	0.60	0.53	ug/kg	J
1-Methylnaphthalene	90-12-0	1	0.11	0.50	1.07	ug/kg	
2-Methylnaphthalene	91-57-6	1	0.13	0.50	1.11	ug/kg	
Acenaphthylene	208-96-8	1	0.06	0.50	0.07	ug/kg	J
Acenaphthene	83-32-9	1	0.09	0.50	0.12	ug/kg	J
Dibenzofuran	132-64-9	1	0.13	0.50	0.42	ug/kg	J
Fluorene	86-73-7	1	0.07	0.50	0.20	ug/kg	J
Phenanthrene	85-01-8	1	0.11	0.50	2.61	ug/kg	
Anthracene	120-12-7	1	0.07	0.50	0.12	ug/kg	J
Fluoranthene	206-44-0	1	0.08	0.50	0.67	ug/kg	B
Pyrene	129-00-0	1	0.09	0.50	0.87	ug/kg	
Benzo(a)anthracene	56-55-3	1	0.07	0.50	0.24	ug/kg	J
Chrysene	218-01-9	1	0.07	0.50	0.72	ug/kg	
Benzo(b)fluoranthene	205-99-2	1	0.07	0.50	0.23	ug/kg	J
Benzo(k)fluoranthene	207-08-9	1	0.10	0.50	0.11	ug/kg	J
Benzo(j)fluoranthene	205-82-3	1	0.10	0.50	0.11	ug/kg	J
Benzo(a)pyrene	50-32-8	1	0.09	0.50	0.09	ug/kg	J
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.09	0.50	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	1	0.10	0.50	ND	ug/kg	U
Benzo(g,h,i)perylene	191-24-2	1	0.08	0.50	0.24	ug/kg	J
Surrogate: 2-Methylnaphthalene-d10					30-160 %	56.9 %	
Surrogate: Dibenzo[a,h]anthracene-d14					30-160 %	69.6 %	
Surrogate: Fluoranthene-d10					30-160 %	73.0 %	

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Analytical Resources, Incorporated
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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
05-May-2021 12:19

SB-2021-046:13.9-1262021
21D0061-08 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 01/26/2021 10:40

Instrument: ICPMS2 Analyst: MCB

Analyzed: 04/14/2021 21:26

Sample Preparation:

Preparation Method: SWN EPA 3050B

Extract ID: 21D0061-08 B 01

Preparation Batch: BJD0279

Sample Size: 1.078 g (wet)

Dry Weight: 0.79 g

Prepared: 04/13/2021

Final Volume: 50 mL

% Solids: 73.28

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium	7440-39-3	20	0.14	0.63	74.6	mg/kg	
Chromium	7440-47-3	20	0.33	0.63	16.2	mg/kg	
Cobalt	7440-48-4	20	0.02	0.25	5.86	mg/kg	
Iron	7439-89-6	20	23	46	14900	mg/kg	
Lead	7439-92-1	20	0.07	0.13	3.46	mg/kg	
Silver	7440-22-4	20	0.03	0.25	0.12	mg/kg	J
Vanadium	7440-62-2	20	0.07	0.25	45.3	mg/kg	

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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
05-May-2021 12:19

SB-2021-046:13.9-1262021
21D0061-08 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 01/26/2021 10:40

Instrument: ICPMS2 Analyst: MCB

Analyzed: 04/14/2021 21:26

Sample Preparation:

Preparation Method: SWN EPA 3050B

Extract ID: 21D0061-08 B 01

Preparation Batch: BJD0279

Sample Size: 1.078 g (wet)

Dry Weight: 0.79 g

Prepared: 04/13/2021

Final Volume: 50 mL

% Solids: 73.28

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	20	0.05	0.25	4.86	mg/kg	
Cadmium	7440-43-9	20	0.04	0.13	ND	mg/kg	U
Copper	7440-50-8	20	0.22	0.63	27.7	mg/kg	
Nickel	7440-02-0	20	0.10	0.63	14.2	mg/kg	
Selenium	7782-49-2	20	0.23	0.63	1.52	mg/kg	
Zinc	7440-66-6	20	3.7	6.3	32.0	mg/kg	

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Shannon & Wilson, Inc
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Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
05-May-2021 12:19

SB-2021-038:12.9-1262021
21D0061-09 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM		Sampled: 01/26/2021 12:45
Instrument: NT11 Analyst: VTS		Analyzed: 04/20/2021 14:46
Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Low Level	Extract ID: 21D0061-09 A 02
	Preparation Batch: BJD0249	Dry Weight: 10.03 g
	Prepared: 04/12/2021	% Solids: 78.84
Sample Cleanup:	Cleanup Method: Silica Gel	Initial Volume: 0.5 mL
	Cleanup Batch: CJD0194	Final Volume: 0.5 mL
	Cleaned: 19-Apr-2021	Extract ID: 21D0061-09 A 02
Sample Cleanup:	Cleanup Method: Sulfur	Initial Volume: 0.5 mL
	Cleanup Batch: CJD0193	Final Volume: 0.5 mL
	Cleaned: 19-Apr-2021	Extract ID: 21D0061-09 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.44	0.60	ND	ug/kg	U
1-Methylnaphthalene	90-12-0	1	0.11	0.50	0.46	ug/kg	J
2-Methylnaphthalene	91-57-6	1	0.13	0.50	0.73	ug/kg	
Acenaphthylene	208-96-8	1	0.06	0.50	0.16	ug/kg	J
Acenaphthene	83-32-9	1	0.09	0.50	0.56	ug/kg	
Dibenzofuran	132-64-9	1	0.13	0.50	0.14	ug/kg	J
Fluorene	86-73-7	1	0.07	0.50	0.26	ug/kg	J
Phenanthrene	85-01-8	1	0.11	0.50	3.17	ug/kg	
Anthracene	120-12-7	1	0.07	0.50	0.14	ug/kg	J
Fluoranthene	206-44-0	1	0.08	0.50	0.38	ug/kg	J, B
Pyrene	129-00-0	1	0.09	0.50	0.39	ug/kg	J
Benzo(a)anthracene	56-55-3	1	0.07	0.50	0.09	ug/kg	J
Chrysene	218-01-9	1	0.07	0.50	0.32	ug/kg	J
Benzo(b)fluoranthene	205-99-2	1	0.07	0.50	0.15	ug/kg	J
Benzo(k)fluoranthene	207-08-9	1	0.10	0.50	ND	ug/kg	U
Benzo(j)fluoranthene	205-82-3	1	0.10	0.50	ND	ug/kg	U
Benzo(a)pyrene	50-32-8	1	0.09	0.50	ND	ug/kg	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.09	0.50	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	1	0.10	0.50	ND	ug/kg	U
Benzo(g,h,i)perylene	191-24-2	1	0.08	0.50	ND	ug/kg	U
Surrogate: 2-Methylnaphthalene-d10					30-160 %	55.8	%
Surrogate: Dibenzo[a,h]anthracene-d14					30-160 %	61.1	%
Surrogate: Fluoranthene-d10					30-160 %	67.4	%

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 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 05-May-2021 12:19

SB-2021-018:8.2-1272021
21D0061-10 (Solid)
Aroclor PCB

Method: EPA 8082A		Sampled: 01/27/2021 10:40	
Instrument: ECD7 Analyst: JGR		Analyzed: 04/22/2021 04:11	
Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Extract ID: 21D0061-10 A 01	
	Preparation Batch: BJD0238	Dry Weight: 12.50 g	
	Prepared: 04/09/2021	% Solids: 71.55	
Sample Cleanup:	Cleanup Method: Silica Gel	Extract ID: 21D0061-10 A 01	
	Cleanup Batch: CJD0206	Initial Volume: 2.5 mL	
	Cleaned: 20-Apr-2021	Final Volume: 2.5 mL	
Sample Cleanup:	Cleanup Method: Sulfuric Acid	Extract ID: 21D0061-10 A 01	
	Cleanup Batch: CJD0204	Initial Volume: 2.5 mL	
	Cleaned: 20-Apr-2021	Final Volume: 2.5 mL	
Sample Cleanup:	Cleanup Method: Sulfur	Extract ID: 21D0061-10 A 01	
	Cleanup Batch: CJD0205	Initial Volume: 2.5 mL	
	Cleaned: 20-Apr-2021	Final Volume: 2.5 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	1.6	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	1.6	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	1.6	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	1.6	4.0	4.8	ug/kg	
Aroclor 1260	11096-82-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	0.6	4.0	30.7	ug/kg	
<i>Surrogate: Decachlorobiphenyl</i>					40-126 %	79.4	%
<i>Surrogate: Tetrachlorometaxylene</i>					44-120 %	64.5	%
<i>Surrogate: Decachlorobiphenyl [2C]</i>					40-126 %	74.0	%
<i>Surrogate: Tetrachlorometaxylene [2C]</i>					44-120 %	56.5	%


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 05-May-2021 12:19

SB-2021-025:10-1272021
21D0061-11 (Solid)
Aroclor PCB

Method: EPA 8082A		Sampled: 01/27/2021 16:10	
Instrument: ECD7 Analyst: JGR		Analyzed: 04/22/2021 04:31	
Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Extract ID: 21D0061-11 A 01	
	Preparation Batch: BJD0238	Dry Weight: 12.54 g	
	Prepared: 04/09/2021	% Solids: 76.89	
Sample Cleanup:	Cleanup Method: Silica Gel	Extract ID: 21D0061-11 A 01	
	Cleanup Batch: CJD0206	Initial Volume: 2.5 mL	
	Cleaned: 20-Apr-2021	Final Volume: 2.5 mL	
Sample Cleanup:	Cleanup Method: Sulfuric Acid	Extract ID: 21D0061-11 A 01	
	Cleanup Batch: CJD0204	Initial Volume: 2.5 mL	
	Cleaned: 20-Apr-2021	Final Volume: 2.5 mL	
Sample Cleanup:	Cleanup Method: Sulfur	Extract ID: 21D0061-11 A 01	
	Cleanup Batch: CJD0205	Initial Volume: 2.5 mL	
	Cleaned: 20-Apr-2021	Final Volume: 2.5 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	1.6	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	1.6	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	1.6	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	1.6	4.0	52.0	ug/kg	P1
Aroclor 1260	11096-82-5	1	0.6	4.0	76.8	ug/kg	
Aroclor 1262	37324-23-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	0.6	4.0	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>					40-126 %	89.9	%
<i>Surrogate: Tetrachlorometaxylene</i>					44-120 %	58.4	%
<i>Surrogate: Decachlorobiphenyl [2C]</i>					40-126 %	84.9	%
<i>Surrogate: Tetrachlorometaxylene [2C]</i>					44-120 %	72.0	%


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 05-May-2021 12:19

SB-2021-025:11-1272021
21D0061-12 (Solid)
Aroclor PCB

Method: EPA 8082A		Sampled: 01/27/2021 16:15	
Instrument: ECD7 Analyst: JGR		Analyzed: 04/22/2021 04:52	
Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Extract ID: 21D0061-12 A 01	
	Preparation Batch: BJD0238	Dry Weight: 12.50 g	
	Prepared: 04/09/2021	% Solids: 78.33	
Sample Cleanup:	Cleanup Method: Silica Gel	Extract ID: 21D0061-12 A 01	
	Cleanup Batch: CJD0206	Initial Volume: 2.5 mL	
	Cleaned: 20-Apr-2021	Final Volume: 2.5 mL	
Sample Cleanup:	Cleanup Method: Sulfuric Acid	Extract ID: 21D0061-12 A 01	
	Cleanup Batch: CJD0204	Initial Volume: 2.5 mL	
	Cleaned: 20-Apr-2021	Final Volume: 2.5 mL	
Sample Cleanup:	Cleanup Method: Sulfur	Extract ID: 21D0061-12 A 01	
	Cleanup Batch: CJD0205	Initial Volume: 2.5 mL	
	Cleaned: 20-Apr-2021	Final Volume: 2.5 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	1.6	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	1.6	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	1.6	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	1.6	4.0	1.7	ug/kg	J
Aroclor 1260	11096-82-5	1	0.6	4.0	1.7	ug/kg	J
Aroclor 1262	37324-23-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	0.6	4.0	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>				40-126 %	71.3	%	
<i>Surrogate: Tetrachlorometaxylene</i>				44-120 %	71.4	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				40-126 %	76.0	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				44-120 %	65.3	%	



Analytical Resources, Incorporated
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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
05-May-2021 12:19

MW-76:15.5-01262021
21D0061-13 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM		Sampled: 01/26/2021 09:05
Instrument: NT11 Analyst: VTS		Analyzed: 04/20/2021 18:03
Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Low Level	Extract ID: 21D0061-13 A 02
	Preparation Batch: BJD0249	Sample Size: 13.68 g (wet)
	Prepared: 04/12/2021	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Silica Gel	Extract ID: 21D0061-13 A 02
	Cleanup Batch: CJD0194	Initial Volume: 0.5 mL
	Cleaned: 19-Apr-2021	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Sulfur	Extract ID: 21D0061-13 A 02
	Cleanup Batch: CJD0193	Initial Volume: 0.5 mL
	Cleaned: 19-Apr-2021	Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.45	0.61	4.87	ug/kg	
1-Methylnaphthalene	90-12-0	1	0.11	0.51	4.00	ug/kg	
2-Methylnaphthalene	91-57-6	1	0.13	0.51	4.32	ug/kg	
Acenaphthylene	208-96-8	1	0.06	0.51	0.64	ug/kg	Q
Acenaphthene	83-32-9	1	0.09	0.51	6.27	ug/kg	
Dibenzofuran	132-64-9	1	0.13	0.51	3.62	ug/kg	Q
Fluorene	86-73-7	1	0.07	0.51	6.28	ug/kg	
Phenanthrene	85-01-8	1	0.12	0.51	25.8	ug/kg	
Anthracene	120-12-7	1	0.08	0.51	3.87	ug/kg	
Fluoranthene	206-44-0	1	0.08	0.51	15.8	ug/kg	B
Pyrene	129-00-0	1	0.09	0.51	13.1	ug/kg	
Benzo(a)anthracene	56-55-3	1	0.07	0.51	2.92	ug/kg	
Chrysene	218-01-9	1	0.07	0.51	4.33	ug/kg	
Benzo(b)fluoranthene	205-99-2	1	0.07	0.51	2.07	ug/kg	
Benzo(k)fluoranthene	207-08-9	1	0.10	0.51	0.97	ug/kg	
Benzo(j)fluoranthene	205-82-3	1	0.10	0.51	1.05	ug/kg	
Benzo(a)pyrene	50-32-8	1	0.09	0.51	1.64	ug/kg	
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.09	0.51	1.26	ug/kg	
Dibenzo(a,h)anthracene	53-70-3	1	0.11	0.51	0.28	ug/kg	J
Benzo(g,h,i)perylene	191-24-2	1	0.09	0.51	1.92	ug/kg	
Surrogate: 2-Methylnaphthalene-d10					30-160 %	58.3	%
Surrogate: Dibenzo[a,h]anthracene-d14					30-160 %	82.3	%
Surrogate: Fluoranthene-d10					30-160 %	72.2	%

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
05-May-2021 12:19

MW-76:15.5-01262021
21D0061-13 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 01/26/2021 09:05

Instrument: ICPMS2 Analyst: MCB

Analyzed: 04/14/2021 22:01

Sample Preparation:

Preparation Method: SWN EPA 3050B

Extract ID: 21D0061-13 B 01

Preparation Batch: BJD0279

Sample Size: 1.02 g (wet)

Dry Weight: 0.69 g

Prepared: 04/13/2021

Final Volume: 50 mL

% Solids: 67.49

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium	7440-39-3	20	0.17	0.73	48.6	mg/kg	
Chromium	7440-47-3	20	0.38	0.73	14.6	mg/kg	
Cobalt	7440-48-4	20	0.03	0.29	6.66	mg/kg	
Iron	7439-89-6	20	26	52	18600	mg/kg	
Lead	7439-92-1	20	0.08	0.15	8.74	mg/kg	
Silver	7440-22-4	20	0.03	0.29	0.13	mg/kg	J
Vanadium	7440-62-2	20	0.08	0.29	44.8	mg/kg	

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
05-May-2021 12:19

MW-76:15.5-01262021
21D0061-13 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 01/26/2021 09:05

Instrument: ICPMS2 Analyst: MCB

Analyzed: 04/14/2021 22:01

Sample Preparation:

Preparation Method: SWN EPA 3050B

Extract ID: 21D0061-13 B 01

Preparation Batch: BJD0279

Sample Size: 1.02 g (wet)

Dry Weight: 0.69 g

Prepared: 04/13/2021

Final Volume: 50 mL

% Solids: 67.49

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	20	0.06	0.29	7.62	mg/kg	
Cadmium	7440-43-9	20	0.04	0.15	0.15	mg/kg	
Copper	7440-50-8	20	0.25	0.73	26.6	mg/kg	
Nickel	7440-02-0	20	0.12	0.73	13.8	mg/kg	
Selenium	7782-49-2	20	0.26	0.73	1.30	mg/kg	
Zinc	7440-66-6	20	4.2	7.3	42.9	mg/kg	

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 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 05-May-2021 12:19

MW-58:15-01272021
21D0061-14 (Solid)
Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM		Sampled: 01/27/2021 10:35
Instrument: NT11 Analyst: VTS		Analyzed: 04/20/2021 18:36
Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Low Level	Extract ID: 21D0061-14 A 02
	Preparation Batch: BJD0249	Dry Weight: 10.01 g
	Prepared: 04/12/2021	% Solids: 77.58
Sample Cleanup:	Cleanup Method: Silica Gel	Extract ID: 21D0061-14 A 02
	Cleanup Batch: CJD0194	
	Cleaned: 19-Apr-2021	
Sample Cleanup:	Cleanup Method: Sulfur	Extract ID: 21D0061-14 A 02
	Cleanup Batch: CJD0193	
	Cleaned: 19-Apr-2021	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.44	0.60	27.4	ug/kg	
1-Methylnaphthalene	90-12-0	1	0.11	0.50	15.9	ug/kg	
2-Methylnaphthalene	91-57-6	1	0.13	0.50	31.3	ug/kg	
Acenaphthylene	208-96-8	1	0.06	0.50	ND	ug/kg	U
Acenaphthene	83-32-9	1	0.09	0.50	0.32	ug/kg	J
Dibenzofuran	132-64-9	1	0.13	0.50	0.19	ug/kg	J
Fluorene	86-73-7	1	0.07	0.50	0.72	ug/kg	
Phenanthrene	85-01-8	1	0.11	0.50	1.85	ug/kg	
Anthracene	120-12-7	1	0.07	0.50	0.13	ug/kg	J
Fluoranthene	206-44-0	1	0.08	0.50	0.91	ug/kg	B
Pyrene	129-00-0	1	0.09	0.50	1.16	ug/kg	
Benzo(a)anthracene	56-55-3	1	0.07	0.50	0.27	ug/kg	J
Chrysene	218-01-9	1	0.07	0.50	0.61	ug/kg	
Benzo(b)fluoranthene	205-99-2	1	0.07	0.50	0.37	ug/kg	J
Benzo(k)fluoranthene	207-08-9	1	0.10	0.50	0.17	ug/kg	J
Benzo(j)fluoranthene	205-82-3	1	0.10	0.50	0.17	ug/kg	J
Benzo(a)pyrene	50-32-8	1	0.09	0.50	0.13	ug/kg	J
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.09	0.50	0.16	ug/kg	J
Dibenzo(a,h)anthracene	53-70-3	1	0.10	0.50	ND	ug/kg	U
Benzo(g,h,i)perylene	191-24-2	1	0.08	0.50	0.28	ug/kg	J
Surrogate: 2-Methylnaphthalene-d10					30-160 %	54.5 %	
Surrogate: Dibenzo[a,h]anthracene-d14					30-160 %	77.9 %	
Surrogate: Fluoranthene-d10					30-160 %	68.6 %	


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 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 05-May-2021 12:19

MW-57:15.3-01272021
21D0061-15 (Solid)
Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM		Sampled: 01/27/2021 13:55
Instrument: NT11 Analyst: VTS		Analyzed: 04/20/2021 19:08
Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Low Level	Extract ID: 21D0061-15 A 02
	Preparation Batch: BJD0249	Dry Weight: 10.02 g
	Prepared: 04/12/2021	% Solids: 75.82
Sample Cleanup:	Cleanup Method: Silica Gel	Extract ID: 21D0061-15 A 02
	Cleanup Batch: CJD0194	Initial Volume: 0.5 mL
	Cleaned: 19-Apr-2021	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Sulfur	Extract ID: 21D0061-15 A 02
	Cleanup Batch: CJD0193	Initial Volume: 0.5 mL
	Cleaned: 19-Apr-2021	Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.44	0.60	1.45	ug/kg	
1-Methylnaphthalene	90-12-0	1	0.11	0.50	2.08	ug/kg	
2-Methylnaphthalene	91-57-6	1	0.13	0.50	2.36	ug/kg	
Acenaphthylene	208-96-8	1	0.06	0.50	0.12	ug/kg	J
Acenaphthene	83-32-9	1	0.09	0.50	0.25	ug/kg	J
Dibenzofuran	132-64-9	1	0.13	0.50	0.61	ug/kg	Q
Fluorene	86-73-7	1	0.07	0.50	0.29	ug/kg	J
Phenanthrene	85-01-8	1	0.11	0.50	3.49	ug/kg	
Anthracene	120-12-7	1	0.07	0.50	0.26	ug/kg	J
Fluoranthene	206-44-0	1	0.08	0.50	2.12	ug/kg	B
Pyrene	129-00-0	1	0.09	0.50	2.43	ug/kg	
Benzo(a)anthracene	56-55-3	1	0.07	0.50	1.09	ug/kg	
Chrysene	218-01-9	1	0.07	0.50	1.74	ug/kg	
Benzo(b)fluoranthene	205-99-2	1	0.07	0.50	1.10	ug/kg	
Benzo(k)fluoranthene	207-08-9	1	0.10	0.50	0.59	ug/kg	
Benzo(j)fluoranthene	205-82-3	1	0.10	0.50	0.68	ug/kg	
Benzo(a)pyrene	50-32-8	1	0.09	0.50	1.17	ug/kg	
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.09	0.50	0.80	ug/kg	
Dibenzo(a,h)anthracene	53-70-3	1	0.10	0.50	0.19	ug/kg	J
Benzo(g,h,i)perylene	191-24-2	1	0.08	0.50	1.54	ug/kg	
Surrogate: 2-Methylnaphthalene-d10					30-160 %	53.5 %	
Surrogate: Dibenzo[a,h]anthracene-d14					30-160 %	67.6 %	
Surrogate: Fluoranthene-d10					30-160 %	62.1 %	


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 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 05-May-2021 12:19

MW-62:15-01272021
21D0061-16 (Solid)
Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM		Sampled: 01/27/2021 16:05
Instrument: NT11 Analyst: VTS		Analyzed: 04/20/2021 19:41
Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Low Level	Extract ID: 21D0061-16 A 02
	Preparation Batch: BJD0249	Dry Weight: 10.01 g
	Prepared: 04/12/2021	% Solids: 74.18
Sample Cleanup:	Cleanup Method: Silica Gel	Extract ID: 21D0061-16 A 02
	Cleanup Batch: CJD0194	
	Cleaned: 19-Apr-2021	
Sample Cleanup:	Cleanup Method: Sulfur	Extract ID: 21D0061-16 A 02
	Cleanup Batch: CJD0193	
	Cleaned: 19-Apr-2021	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.44	0.60	0.59	ug/kg	J
1-Methylnaphthalene	90-12-0	1	0.11	0.50	1.60	ug/kg	
2-Methylnaphthalene	91-57-6	1	0.13	0.50	1.19	ug/kg	
Acenaphthylene	208-96-8	1	0.06	0.50	ND	ug/kg	U
Acenaphthene	83-32-9	1	0.09	0.50	0.21	ug/kg	J
Dibenzofuran	132-64-9	1	0.13	0.50	0.46	ug/kg	J
Fluorene	86-73-7	1	0.07	0.50	0.17	ug/kg	J
Phenanthrene	85-01-8	1	0.11	0.50	2.82	ug/kg	
Anthracene	120-12-7	1	0.07	0.50	0.19	ug/kg	J
Fluoranthene	206-44-0	1	0.08	0.50	0.97	ug/kg	B
Pyrene	129-00-0	1	0.09	0.50	1.41	ug/kg	
Benzo(a)anthracene	56-55-3	1	0.07	0.50	0.35	ug/kg	J
Chrysene	218-01-9	1	0.07	0.50	0.81	ug/kg	
Benzo(b)fluoranthene	205-99-2	1	0.07	0.50	0.37	ug/kg	J
Benzo(k)fluoranthene	207-08-9	1	0.10	0.50	0.16	ug/kg	J
Benzo(j)fluoranthene	205-82-3	1	0.10	0.50	0.15	ug/kg	J
Benzo(a)pyrene	50-32-8	1	0.09	0.50	0.19	ug/kg	J
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.09	0.50	0.16	ug/kg	J
Dibenzo(a,h)anthracene	53-70-3	1	0.10	0.50	ND	ug/kg	U
Benzo(g,h,i)perylene	191-24-2	1	0.08	0.50	0.43	ug/kg	J
Surrogate: 2-Methylnaphthalene-d10					30-160 %	56.1 %	
Surrogate: Dibenzo[a,h]anthracene-d14					30-160 %	74.4 %	
Surrogate: Fluoranthene-d10					30-160 %	70.0 %	


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 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 05-May-2021 12:19

SB-2021-040:13.7-01282021
21D0061-17 (Solid)
Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM		Sampled: 01/28/2021 09:20	
Instrument: NT11 Analyst: VTS		Analyzed: 04/20/2021 20:13	
Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Low Level	Extract ID: 21D0061-17 A 02	
	Preparation Batch: BJD0249	Sample Size: 13.5 g (wet)	Dry Weight: 10.05 g
	Prepared: 04/12/2021	Final Volume: 0.5 mL	% Solids: 74.43
Sample Cleanup:	Cleanup Method: Silica Gel	Extract ID: 21D0061-17 A 02	
	Cleanup Batch: CJD0194	Initial Volume: 0.5 mL	
	Cleaned: 19-Apr-2021	Final Volume: 0.5 mL	
Sample Cleanup:	Cleanup Method: Sulfur	Extract ID: 21D0061-17 A 02	
	Cleanup Batch: CJD0193	Initial Volume: 0.5 mL	
	Cleaned: 19-Apr-2021	Final Volume: 0.5 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.44	0.60	ND	ug/kg	U
1-Methylnaphthalene	90-12-0	1	0.11	0.50	0.48	ug/kg	J
2-Methylnaphthalene	91-57-6	1	0.13	0.50	0.51	ug/kg	
Acenaphthylene	208-96-8	1	0.06	0.50	ND	ug/kg	U
Acenaphthene	83-32-9	1	0.09	0.50	0.18	ug/kg	J
Dibenzofuran	132-64-9	1	0.13	0.50	0.19	ug/kg	J
Fluorene	86-73-7	1	0.07	0.50	0.23	ug/kg	J
Phenanthrene	85-01-8	1	0.11	0.50	1.31	ug/kg	
Anthracene	120-12-7	1	0.07	0.50	0.07	ug/kg	J
Fluoranthene	206-44-0	1	0.08	0.50	0.45	ug/kg	J, B
Pyrene	129-00-0	1	0.09	0.50	0.53	ug/kg	
Benzo(a)anthracene	56-55-3	1	0.07	0.50	0.12	ug/kg	J
Chrysene	218-01-9	1	0.07	0.50	0.45	ug/kg	J
Benzo(b)fluoranthene	205-99-2	1	0.07	0.50	0.17	ug/kg	J
Benzo(k)fluoranthene	207-08-9	1	0.10	0.50	ND	ug/kg	U
Benzo(j)fluoranthene	205-82-3	1	0.10	0.50	ND	ug/kg	U
Benzo(a)pyrene	50-32-8	1	0.09	0.50	ND	ug/kg	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.09	0.50	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	1	0.10	0.50	ND	ug/kg	U
Benzo(g,h,i)perylene	191-24-2	1	0.08	0.50	0.09	ug/kg	J
Surrogate: 2-Methylnaphthalene-d10					30-160 %	53.7	%
Surrogate: Dibenzo[a,h]anthracene-d14					30-160 %	66.3	%
Surrogate: Fluoranthene-d10					30-160 %	65.6	%


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 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 05-May-2021 12:19

SB-2021-041:13.3-01282021
21D0061-18 (Solid)
Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM		Sampled: 01/28/2021 13:05
Instrument: NT11 Analyst: VTS		Analyzed: 04/20/2021 20:46
Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Low Level	Extract ID: 21D0061-18 A 02
	Preparation Batch: BJD0249	Dry Weight: 10.00 g
	Prepared: 04/12/2021	% Solids: 74.21
Sample Cleanup:	Cleanup Method: Silica Gel	Extract ID: 21D0061-18 A 02
	Cleanup Batch: CJD0194	
	Cleaned: 19-Apr-2021	
Sample Cleanup:	Cleanup Method: Sulfur	Extract ID: 21D0061-18 A 02
	Cleanup Batch: CJD0193	
	Cleaned: 19-Apr-2021	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.44	0.60	ND	ug/kg	U
1-Methylnaphthalene	90-12-0	1	0.11	0.50	0.55	ug/kg	
2-Methylnaphthalene	91-57-6	1	0.13	0.50	0.53	ug/kg	
Acenaphthylene	208-96-8	1	0.06	0.50	ND	ug/kg	U
Acenaphthene	83-32-9	1	0.09	0.50	ND	ug/kg	U
Dibenzofuran	132-64-9	1	0.13	0.50	0.22	ug/kg	J
Fluorene	86-73-7	1	0.07	0.50	0.18	ug/kg	J
Phenanthrene	85-01-8	1	0.11	0.50	1.72	ug/kg	
Anthracene	120-12-7	1	0.07	0.50	0.10	ug/kg	J
Fluoranthene	206-44-0	1	0.08	0.50	0.37	ug/kg	J, B
Pyrene	129-00-0	1	0.09	0.50	0.49	ug/kg	J
Benzo(a)anthracene	56-55-3	1	0.07	0.50	0.17	ug/kg	J
Chrysene	218-01-9	1	0.07	0.50	0.55	ug/kg	
Benzo(b)fluoranthene	205-99-2	1	0.07	0.50	0.16	ug/kg	J
Benzo(k)fluoranthene	207-08-9	1	0.10	0.50	ND	ug/kg	U
Benzo(j)fluoranthene	205-82-3	1	0.10	0.50	ND	ug/kg	U
Benzo(a)pyrene	50-32-8	1	0.09	0.50	0.11	ug/kg	J
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.09	0.50	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	1	0.10	0.50	ND	ug/kg	U
Benzo(g,h,i)perylene	191-24-2	1	0.08	0.50	0.12	ug/kg	J
Surrogate: 2-Methylnaphthalene-d10					30-160 %	53.3	%
Surrogate: Dibenzo[a,h]anthracene-d14					30-160 %	63.2	%
Surrogate: Fluoranthene-d10					30-160 %	65.0	%


 Shannon & Wilson, Inc
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 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 05-May-2021 12:19

TSA-2021-007:1.3-01292021
21D0061-19 (Solid)
Aroclor PCB

Method: EPA 8082A		Sampled: 01/29/2021 16:05	
Instrument: ECD7 Analyst: JGR		Analyzed: 04/22/2021 05:12	
Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Extract ID: 21D0061-19 A 01	
	Preparation Batch: BJD0238	Dry Weight: 12.50 g	
	Prepared: 04/09/2021	% Solids: 93.45	
Sample Cleanup:	Cleanup Method: Silica Gel	Extract ID: 21D0061-19 A 01	
	Cleanup Batch: CJD0206	Initial Volume: 2.5 mL	
	Cleaned: 20-Apr-2021	Final Volume: 2.5 mL	
Sample Cleanup:	Cleanup Method: Sulfuric Acid	Extract ID: 21D0061-19 A 01	
	Cleanup Batch: CJD0204	Initial Volume: 2.5 mL	
	Cleaned: 20-Apr-2021	Final Volume: 2.5 mL	
Sample Cleanup:	Cleanup Method: Sulfur	Extract ID: 21D0061-19 A 01	
	Cleanup Batch: CJD0205	Initial Volume: 2.5 mL	
	Cleaned: 20-Apr-2021	Final Volume: 2.5 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	1.6	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	1.6	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	1.6	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	1.6	4.0	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	0.6	4.0	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>				40-126 %	70.3	%	
<i>Surrogate: Tetrachlorometaxylene</i>				44-120 %	74.5	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				40-126 %	81.7	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				44-120 %	63.7	%	



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
05-May-2021 12:19

SB-2021-006:20-01292021

21D0061-20 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM		Sampled: 01/29/2021 14:50
Instrument: NT11 Analyst: VTS		Analyzed: 04/20/2021 21:19
Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Low Level	Extract ID: 21D0061-20 A 02
	Preparation Batch: BJD0249	Sample Size: 12.79 g (wet)
	Prepared: 04/12/2021	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Silica Gel	Extract ID: 21D0061-20 A 02
	Cleanup Batch: CJD0194	Initial Volume: 0.5 mL
	Cleaned: 19-Apr-2021	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Sulfur	Extract ID: 21D0061-20 A 02
	Cleanup Batch: CJD0193	Initial Volume: 0.5 mL
	Cleaned: 19-Apr-2021	Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.44	0.60	1.13	ug/kg	
1-Methylnaphthalene	90-12-0	1	0.11	0.50	0.95	ug/kg	
2-Methylnaphthalene	91-57-6	1	0.13	0.50	2.09	ug/kg	
Acenaphthylene	208-96-8	1	0.06	0.50	ND	ug/kg	U
Acenaphthene	83-32-9	1	0.09	0.50	1.48	ug/kg	
Dibenzofuran	132-64-9	1	0.13	0.50	ND	ug/kg	U
Fluorene	86-73-7	1	0.07	0.50	0.38	ug/kg	J
Phenanthrene	85-01-8	1	0.11	0.50	0.79	ug/kg	
Anthracene	120-12-7	1	0.07	0.50	0.10	ug/kg	J
Fluoranthene	206-44-0	1	0.08	0.50	0.30	ug/kg	J, B
Pyrene	129-00-0	1	0.09	0.50	0.51	ug/kg	
Benzo(a)anthracene	56-55-3	1	0.07	0.50	ND	ug/kg	U
Chrysene	218-01-9	1	0.07	0.50	0.13	ug/kg	J
Benzo(b)fluoranthene	205-99-2	1	0.07	0.50	0.07	ug/kg	J
Benzo(k)fluoranthene	207-08-9	1	0.10	0.50	ND	ug/kg	U
Benzo(j)fluoranthene	205-82-3	1	0.10	0.50	ND	ug/kg	U
Benzo(a)pyrene	50-32-8	1	0.09	0.50	ND	ug/kg	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.09	0.50	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	1	0.10	0.50	ND	ug/kg	U
Benzo(g,h,i)perylene	191-24-2	1	0.08	0.50	ND	ug/kg	U
Surrogate: 2-Methylnaphthalene-d10					30-160 %	61.7 %	
Surrogate: Dibenzo[a,h]anthracene-d14					30-160 %	60.3 %	
Surrogate: Fluoranthene-d10					30-160 %	70.7 %	

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 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 05-May-2021 12:19

MW-71:15.5-02042021
21D0061-21 (Solid)
Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM		Sampled: 02/04/2021 10:55
Instrument: NT11 Analyst: VTS		Analyzed: 04/20/2021 21:51
Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Low Level	Extract ID: 21D0061-21 A 02
	Preparation Batch: BJD0249	Dry Weight: 10.02 g
	Prepared: 04/12/2021	% Solids: 74.50
Sample Cleanup:	Cleanup Method: Silica Gel	Extract ID: 21D0061-21 A 02
	Cleanup Batch: CJD0194	
	Cleaned: 19-Apr-2021	
Sample Cleanup:	Cleanup Method: Sulfur	Extract ID: 21D0061-21 A 02
	Cleanup Batch: CJD0193	
	Cleaned: 19-Apr-2021	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.44	0.60	10.2	ug/kg	
1-Methylnaphthalene	90-12-0	1	0.11	0.50	1.91	ug/kg	
2-Methylnaphthalene	91-57-6	1	0.13	0.50	0.87	ug/kg	
Acenaphthylene	208-96-8	1	0.06	0.50	ND	ug/kg	U
Acenaphthene	83-32-9	1	0.09	0.50	20.8	ug/kg	
Dibenzofuran	132-64-9	1	0.13	0.50	0.81	ug/kg	Q
Fluorene	86-73-7	1	0.07	0.50	2.95	ug/kg	
Phenanthrene	85-01-8	1	0.11	0.50	1.80	ug/kg	
Anthracene	120-12-7	1	0.07	0.50	0.11	ug/kg	J
Fluoranthene	206-44-0	1	0.08	0.50	0.49	ug/kg	J, B
Pyrene	129-00-0	1	0.09	0.50	0.59	ug/kg	
Benzo(a)anthracene	56-55-3	1	0.07	0.50	0.24	ug/kg	J
Chrysene	218-01-9	1	0.07	0.50	0.73	ug/kg	
Benzo(b)fluoranthene	205-99-2	1	0.07	0.50	0.29	ug/kg	J
Benzo(k)fluoranthene	207-08-9	1	0.10	0.50	0.18	ug/kg	J
Benzo(j)fluoranthene	205-82-3	1	0.10	0.50	0.21	ug/kg	J
Benzo(a)pyrene	50-32-8	1	0.09	0.50	0.12	ug/kg	J
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.09	0.50	0.10	ug/kg	J
Dibenzo(a,h)anthracene	53-70-3	1	0.10	0.50	ND	ug/kg	U
Benzo(g,h,i)perylene	191-24-2	1	0.08	0.50	0.22	ug/kg	J
Surrogate: 2-Methylnaphthalene-d10					30-160 %	55.5	%
Surrogate: Dibenzo[a,h]anthracene-d14					30-160 %	52.1	%
Surrogate: Fluoranthene-d10					30-160 %	61.9	%



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Analytical Report

Shannon & Wilson, Inc
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Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
05-May-2021 12:19

MW-54:14.5-02042021
21D0061-22 (Solid)

Aroclor PCB

Method: EPA 8082A		Sampled: 02/04/2021 08:40	
Instrument: ECD7 Analyst: JGR		Analyzed: 04/22/2021 06:14	
Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Extract ID: 21D0061-22 A 01	
	Preparation Batch: BJD0238	Dry Weight: 12.54 g	
	Prepared: 04/09/2021	% Solids: 80.58	
Sample Cleanup:	Cleanup Method: Silica Gel	Extract ID: 21D0061-22 A 01	
	Cleanup Batch: CJD0206	Initial Volume: 2.5 mL	
	Cleaned: 20-Apr-2021	Final Volume: 2.5 mL	
Sample Cleanup:	Cleanup Method: Sulfuric Acid	Extract ID: 21D0061-22 A 01	
	Cleanup Batch: CJD0204	Initial Volume: 2.5 mL	
	Cleaned: 20-Apr-2021	Final Volume: 2.5 mL	
Sample Cleanup:	Cleanup Method: Sulfur	Extract ID: 21D0061-22 A 01	
	Cleanup Batch: CJD0205	Initial Volume: 2.5 mL	
	Cleaned: 20-Apr-2021	Final Volume: 2.5 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	1.6	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	1.6	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	1.6	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	1.6	4.0	6.1	ug/kg	
Aroclor 1260	11096-82-5	1	0.6	4.0	1.9	ug/kg	J
Aroclor 1262	37324-23-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	0.6	4.0	ND	ug/kg	U
Surrogate: Decachlorobiphenyl				40-126 %	73.1	%	
Surrogate: Tetrachlorometaxylene				44-120 %	74.0	%	
Surrogate: Decachlorobiphenyl [2C]				40-126 %	79.7	%	
Surrogate: Tetrachlorometaxylene [2C]				44-120 %	65.6	%	

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 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 05-May-2021 12:19

MW-10R:15-02052021
21D0061-23 (Solid)
Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM		Sampled: 02/05/2021 09:20
Instrument: NT11 Analyst: VTS		Analyzed: 04/20/2021 22:24
Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Low Level	Extract ID: 21D0061-23 A 02
	Preparation Batch: BJD0249	Dry Weight: 10.02 g
	Prepared: 04/12/2021	% Solids: 72.60
Sample Cleanup:	Cleanup Method: Silica Gel	Extract ID: 21D0061-23 A 02
	Cleanup Batch: CJD0194	
	Cleaned: 19-Apr-2021	
Sample Cleanup:	Cleanup Method: Sulfur	Extract ID: 21D0061-23 A 02
	Cleanup Batch: CJD0193	
	Cleaned: 19-Apr-2021	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.44	0.60	0.74	ug/kg	
1-Methylnaphthalene	90-12-0	1	0.11	0.50	1.38	ug/kg	
2-Methylnaphthalene	91-57-6	1	0.13	0.50	1.34	ug/kg	
Acenaphthylene	208-96-8	1	0.06	0.50	ND	ug/kg	U
Acenaphthene	83-32-9	1	0.09	0.50	0.21	ug/kg	J
Dibenzofuran	132-64-9	1	0.13	0.50	0.49	ug/kg	J
Fluorene	86-73-7	1	0.07	0.50	0.22	ug/kg	J
Phenanthrene	85-01-8	1	0.11	0.50	2.61	ug/kg	
Anthracene	120-12-7	1	0.07	0.50	0.16	ug/kg	J
Fluoranthene	206-44-0	1	0.08	0.50	0.62	ug/kg	B
Pyrene	129-00-0	1	0.09	0.50	1.05	ug/kg	
Benzo(a)anthracene	56-55-3	1	0.07	0.50	0.27	ug/kg	J
Chrysene	218-01-9	1	0.07	0.50	0.65	ug/kg	
Benzo(b)fluoranthene	205-99-2	1	0.07	0.50	0.30	ug/kg	J
Benzo(k)fluoranthene	207-08-9	1	0.10	0.50	0.12	ug/kg	J
Benzo(j)fluoranthene	205-82-3	1	0.10	0.50	0.13	ug/kg	J
Benzo(a)pyrene	50-32-8	1	0.09	0.50	0.13	ug/kg	J
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.09	0.50	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	1	0.10	0.50	ND	ug/kg	U
Benzo(g,h,i)perylene	191-24-2	1	0.08	0.50	0.28	ug/kg	J
Surrogate: 2-Methylnaphthalene-d10					30-160 %	57.9 %	
Surrogate: Dibenzo[a,h]anthracene-d14					30-160 %	72.0 %	
Surrogate: Fluoranthene-d10					30-160 %	68.8 %	



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Analytical Report

Shannon & Wilson, Inc
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Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
05-May-2021 12:19

MW-55:15.5-02032021
21D0061-24 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM		Sampled: 02/03/2021 11:45
Instrument: NT11 Analyst: VTS		Analyzed: 04/21/2021 17:49
Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Low Level	Extract ID: 21D0061-24 A 02
	Preparation Batch: BJD0249	Dry Weight: 10.00 g
	Prepared: 04/12/2021	% Solids: 77.43
Sample Cleanup:	Cleanup Method: Silica Gel	Extract ID: 21D0061-24 A 02
	Cleanup Batch: CJD0194	
	Cleaned: 19-Apr-2021	
Sample Cleanup:	Cleanup Method: Sulfur	Extract ID: 21D0061-24 A 02
	Cleanup Batch: CJD0193	
	Cleaned: 19-Apr-2021	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.44	0.60	1.08	ug/kg	
1-Methylnaphthalene	90-12-0	1	0.11	0.50	1.83	ug/kg	
2-Methylnaphthalene	91-57-6	1	0.13	0.50	1.70	ug/kg	
Acenaphthylene	208-96-8	1	0.06	0.50	0.54	ug/kg	Q
Acenaphthene	83-32-9	1	0.09	0.50	1.51	ug/kg	
Dibenzofuran	132-64-9	1	0.13	0.50	0.94	ug/kg	Q
Fluorene	86-73-7	1	0.07	0.50	1.44	ug/kg	
Phenanthrene	85-01-8	1	0.11	0.50	11.0	ug/kg	
Anthracene	120-12-7	1	0.07	0.50	1.22	ug/kg	
Fluoranthene	206-44-0	1	0.08	0.50	8.55	ug/kg	B
Pyrene	129-00-0	1	0.09	0.50	9.35	ug/kg	
Benzo(a)anthracene	56-55-3	1	0.07	0.50	2.83	ug/kg	
Chrysene	218-01-9	1	0.07	0.50	4.51	ug/kg	
Benzo(b)fluoranthene	205-99-2	1	0.07	0.50	3.10	ug/kg	Q
Benzo(k)fluoranthene	207-08-9	1	0.10	0.50	1.74	ug/kg	
Benzo(j)fluoranthene	205-82-3	1	0.10	0.50	1.43	ug/kg	
Benzo(a)pyrene	50-32-8	1	0.09	0.50	4.06	ug/kg	
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.09	0.50	2.76	ug/kg	
Dibenzo(a,h)anthracene	53-70-3	1	0.10	0.50	0.71	ug/kg	
Benzo(g,h,i)perylene	191-24-2	1	0.08	0.50	3.37	ug/kg	
Surrogate: 2-Methylnaphthalene-d10					30-160 %	55.9 %	
Surrogate: Dibenzo[a,h]anthracene-d14					30-160 %	87.4 %	
Surrogate: Fluoranthene-d10					30-160 %	71.0 %	

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Analytical Report

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Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
05-May-2021 12:19

MW-55:15.5-02032021
21D0061-24 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 02/03/2021 11:45

Instrument: ICPMS2 Analyst: MCB

Analyzed: 04/14/2021 21:31

Sample Preparation:

Preparation Method: SWN EPA 3050B

Extract ID: 21D0061-24 B 01

Preparation Batch: BJD0279

Sample Size: 1.047 g (wet)

Dry Weight: 0.74 g

Prepared: 04/13/2021

Final Volume: 50 mL

% Solids: 71.00

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium	7440-39-3	20	0.15	0.67	40.2	mg/kg	
Chromium	7440-47-3	20	0.35	0.67	11.4	mg/kg	
Cobalt	7440-48-4	20	0.02	0.27	6.01	mg/kg	
Iron	7439-89-6	20	24	48	10600	mg/kg	
Lead	7439-92-1	20	0.07	0.13	2.12	mg/kg	
Silver	7440-22-4	20	0.03	0.27	0.07	mg/kg	J
Vanadium	7440-62-2	20	0.08	0.27	41.1	mg/kg	

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Analytical Report

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Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
05-May-2021 12:19

MW-55:15.5-02032021
21D0061-24 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 02/03/2021 11:45

Instrument: ICPMS2 Analyst: MCB

Analyzed: 04/14/2021 21:31

Sample Preparation:

Preparation Method: SWN EPA 3050B

Extract ID: 21D0061-24 B 01

Preparation Batch: BJD0279

Sample Size: 1.047 g (wet)

Dry Weight: 0.74 g

Prepared: 04/13/2021

Final Volume: 50 mL

% Solids: 71.00

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	20	0.05	0.27	2.87	mg/kg	
Cadmium	7440-43-9	20	0.04	0.13	0.06	mg/kg	J
Copper	7440-50-8	20	0.23	0.67	18.6	mg/kg	
Nickel	7440-02-0	20	0.11	0.67	11.7	mg/kg	
Selenium	7782-49-2	20	0.24	0.67	0.84	mg/kg	
Zinc	7440-66-6	20	3.9	6.7	24.4	mg/kg	

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Analytical Report

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Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
05-May-2021 12:19

MW-53:15.8-02032021
21D0061-25 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM		Sampled: 02/03/2021 14:00
Instrument: NT11 Analyst: VTS		Analyzed: 04/21/2021 18:21
Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Low Level	Extract ID: 21D0061-25 A 02
	Preparation Batch: BJD0249	Dry Weight: 10.00 g
	Prepared: 04/12/2021	% Solids: 74.84
Sample Cleanup:	Cleanup Method: Silica Gel	Extract ID: 21D0061-25 A 02
	Cleanup Batch: CJD0194	Initial Volume: 0.5 mL
	Cleaned: 19-Apr-2021	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Sulfur	Extract ID: 21D0061-25 A 02
	Cleanup Batch: CJD0193	Initial Volume: 0.5 mL
	Cleaned: 19-Apr-2021	Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.44	0.60	3.72	ug/kg	
1-Methylnaphthalene	90-12-0	1	0.11	0.50	3.18	ug/kg	
2-Methylnaphthalene	91-57-6	1	0.13	0.50	3.44	ug/kg	
Acenaphthylene	208-96-8	1	0.06	0.50	1.03	ug/kg	Q
Acenaphthene	83-32-9	1	0.09	0.50	2.16	ug/kg	
Dibenzofuran	132-64-9	1	0.13	0.50	2.29	ug/kg	Q
Fluorene	86-73-7	1	0.07	0.50	2.77	ug/kg	
Phenanthrene	85-01-8	1	0.11	0.50	9.80	ug/kg	
Anthracene	120-12-7	1	0.07	0.50	3.01	ug/kg	
Fluoranthene	206-44-0	1	0.08	0.50	15.0	ug/kg	B
Pyrene	129-00-0	1	0.09	0.50	14.1	ug/kg	
Benzo(a)anthracene	56-55-3	1	0.07	0.50	4.26	ug/kg	
Chrysene	218-01-9	1	0.07	0.50	6.28	ug/kg	
Benzo(b)fluoranthene	205-99-2	1	0.07	0.50	4.50	ug/kg	Q
Benzo(k)fluoranthene	207-08-9	1	0.10	0.50	1.89	ug/kg	
Benzo(j)fluoranthene	205-82-3	1	0.10	0.50	1.80	ug/kg	
Benzo(a)pyrene	50-32-8	1	0.09	0.50	3.52	ug/kg	
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.09	0.50	2.74	ug/kg	
Dibenzo(a,h)anthracene	53-70-3	1	0.11	0.50	0.67	ug/kg	
Benzo(g,h,i)perylene	191-24-2	1	0.09	0.50	3.50	ug/kg	
Surrogate: 2-Methylnaphthalene-d10					30-160 %	52.8	%
Surrogate: Dibenzo[a,h]anthracene-d14					30-160 %	82.9	%
Surrogate: Fluoranthene-d10					30-160 %	66.9	%

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 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 05-May-2021 12:19

MW-53:15.8-02032021
21D0061-25 (Solid)
Aroclor PCB

Method: EPA 8082A		Sampled: 02/03/2021 14:00	
Instrument: ECD7 Analyst: JGR		Analyzed: 04/22/2021 06:34	
Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Extract ID: 21D0061-25 A 01	
	Preparation Batch: BJD0238	Dry Weight: 12.55 g	
	Prepared: 04/09/2021	% Solids: 74.84	
Sample Cleanup:	Cleanup Method: Silica Gel	Extract ID: 21D0061-25 A 01	
	Cleanup Batch: CJD0206	Initial Volume: 2.5 mL	
	Cleaned: 20-Apr-2021	Final Volume: 2.5 mL	
Sample Cleanup:	Cleanup Method: Sulfuric Acid	Extract ID: 21D0061-25 A 01	
	Cleanup Batch: CJD0204	Initial Volume: 2.5 mL	
	Cleaned: 20-Apr-2021	Final Volume: 2.5 mL	
Sample Cleanup:	Cleanup Method: Sulfur	Extract ID: 21D0061-25 A 01	
	Cleanup Batch: CJD0205	Initial Volume: 2.5 mL	
	Cleaned: 20-Apr-2021	Final Volume: 2.5 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	1.6	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	1.6	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	1.6	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	1.6	4.0	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	0.6	4.0	5.0	ug/kg	
Aroclor 1268	11100-14-4	1	0.6	4.0	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>				40-126 %	66.9	%	
<i>Surrogate: Tetrachlorometaxylene</i>				44-120 %	66.2	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				40-126 %	65.5	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				44-120 %	59.7	%	



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
05-May-2021 12:19

MW-61:16-02012021
21D0061-26 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B	Sampled: 02/01/2021 15:05
Instrument: ICPMS2 Analyst: MCB	Analyzed: 04/14/2021 21:36
Sample Preparation:	Preparation Method: SWN EPA 3050B
	Preparation Batch: BJD0279
	Sample Size: 1.034 g (wet)
	Final Volume: 50 mL
	Extract ID: 21D0061-26 A 01
	Dry Weight: 0.82 g
	% Solids: 78.99

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium	7440-39-3	20	0.14	0.61	30.3	mg/kg	
Chromium	7440-47-3	20	0.32	0.61	12.4	mg/kg	
Cobalt	7440-48-4	20	0.02	0.24	4.45	mg/kg	
Iron	7439-89-6	20	22	44	12000	mg/kg	
Lead	7439-92-1	20	0.06	0.12	2.34	mg/kg	
Silver	7440-22-4	20	0.03	0.24	0.05	mg/kg	J
Vanadium	7440-62-2	20	0.07	0.24	42.4	mg/kg	

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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
05-May-2021 12:19

MW-61:16-02012021
21D0061-26 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 02/01/2021 15:05

Instrument: ICPMS2 Analyst: MCB

Analyzed: 04/14/2021 21:36

Sample Preparation:

Preparation Method: SWN EPA 3050B

Extract ID: 21D0061-26 A 01

Preparation Batch: BJD0279

Sample Size: 1.034 g (wet)

Dry Weight: 0.82 g

Prepared: 04/13/2021

Final Volume: 50 mL

% Solids: 78.99

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	20	0.05	0.24	2.53	mg/kg	
Cadmium	7440-43-9	20	0.04	0.12	0.05	mg/kg	J
Copper	7440-50-8	20	0.21	0.61	14.2	mg/kg	
Nickel	7440-02-0	20	0.10	0.61	9.74	mg/kg	
Selenium	7782-49-2	20	0.22	0.61	1.00	mg/kg	
Zinc	7440-66-6	20	3.6	6.1	23.5	mg/kg	

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Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
05-May-2021 12:19

MW-74:15-02022021
21D0061-27 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 02/02/2021 09:25

Instrument: ICPMS2 Analyst: MCB

Analyzed: 04/14/2021 21:41

Sample Preparation:

Preparation Method: SWN EPA 3050B

Extract ID: 21D0061-27 A 01

Preparation Batch: BJD0279

Sample Size: 1.075 g (wet)

Dry Weight: 0.88 g

Prepared: 04/13/2021

Final Volume: 50 mL

% Solids: 81.79

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium	7440-39-3	20	0.13	0.57	42.2	mg/kg	
Chromium	7440-47-3	20	0.30	0.57	28.6	mg/kg	
Cobalt	7440-48-4	20	0.02	0.23	7.23	mg/kg	
Iron	7439-89-6	20	21	41	17500	mg/kg	
Lead	7439-92-1	20	0.06	0.11	7.65	mg/kg	
Silver	7440-22-4	20	0.03	0.23	0.08	mg/kg	J
Vanadium	7440-62-2	20	0.06	0.23	44.7	mg/kg	

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Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
05-May-2021 12:19

MW-74:15-02022021
21D0061-27 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 02/02/2021 09:25

Instrument: ICPMS2 Analyst: MCB

Analyzed: 04/14/2021 21:41

Sample Preparation:

Preparation Method: SWN EPA 3050B

Extract ID: 21D0061-27 A 01

Preparation Batch: BJD0279

Sample Size: 1.075 g (wet)

Dry Weight: 0.88 g

Prepared: 04/13/2021

Final Volume: 50 mL

% Solids: 81.79

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	20	0.04	0.23	3.51	mg/kg	
Cadmium	7440-43-9	20	0.03	0.11	0.06	mg/kg	J
Copper	7440-50-8	20	0.20	0.57	34.8	mg/kg	
Nickel	7440-02-0	20	0.09	0.57	32.3	mg/kg	
Selenium	7782-49-2	20	0.20	0.57	1.13	mg/kg	
Zinc	7440-66-6	20	3.3	5.7	35.9	mg/kg	

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 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 05-May-2021 12:19

SB-2021-047:10.5-02022021
21D0061-28 (Solid)
Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM		Sampled: 02/02/2021 10:30
Instrument: NT11 Analyst: VTS		Analyzed: 04/21/2021 18:54
Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Low Level	Extract ID: 21D0061-28 A 02
	Preparation Batch: BJD0249	Dry Weight: 10.01 g
	Prepared: 04/12/2021	% Solids: 71.60
Sample Cleanup:	Cleanup Method: Silica Gel	Extract ID: 21D0061-28 A 02
	Cleanup Batch: CJD0194	
	Cleaned: 19-Apr-2021	
Sample Cleanup:	Cleanup Method: Sulfur	Extract ID: 21D0061-28 A 02
	Cleanup Batch: CJD0193	
	Cleaned: 19-Apr-2021	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.44	0.60	ND	ug/kg	U
1-Methylnaphthalene	90-12-0	1	0.11	0.50	0.32	ug/kg	J
2-Methylnaphthalene	91-57-6	1	0.13	0.50	0.40	ug/kg	J
Acenaphthylene	208-96-8	1	0.06	0.50	ND	ug/kg	U
Acenaphthene	83-32-9	1	0.09	0.50	ND	ug/kg	U
Dibenzofuran	132-64-9	1	0.13	0.50	0.15	ug/kg	J
Fluorene	86-73-7	1	0.07	0.50	ND	ug/kg	U
Phenanthrene	85-01-8	1	0.11	0.50	0.83	ug/kg	
Anthracene	120-12-7	1	0.07	0.50	ND	ug/kg	U
Fluoranthene	206-44-0	1	0.08	0.50	0.40	ug/kg	J, B
Pyrene	129-00-0	1	0.09	0.50	0.39	ug/kg	J
Benzo(a)anthracene	56-55-3	1	0.07	0.50	0.13	ug/kg	J
Chrysene	218-01-9	1	0.07	0.50	0.35	ug/kg	J
Benzo(b)fluoranthene	205-99-2	1	0.07	0.50	0.25	ug/kg	J
Benzo(k)fluoranthene	207-08-9	1	0.10	0.50	ND	ug/kg	U
Benzo(j)fluoranthene	205-82-3	1	0.10	0.50	ND	ug/kg	U
Benzo(a)pyrene	50-32-8	1	0.09	0.50	ND	ug/kg	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.09	0.50	0.21	ug/kg	J
Dibenzo(a,h)anthracene	53-70-3	1	0.10	0.50	ND	ug/kg	U
Benzo(g,h,i)perylene	191-24-2	1	0.08	0.50	0.15	ug/kg	J
Surrogate: 2-Methylnaphthalene-d10					30-160 %	57.4	%
Surrogate: Dibenzo[a,h]anthracene-d14					30-160 %	84.3	%
Surrogate: Fluoranthene-d10					30-160 %	68.6	%



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Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
05-May-2021 12:19

SB-2021-047:10.5-02022021
21D0061-28 (Solid)

Aroclor PCB

Method: EPA 8082A		Sampled: 02/02/2021 10:30	
Instrument: ECD7 Analyst: JGR		Analyzed: 04/22/2021 06:54	
Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Extract ID: 21D0061-28 A 01	
	Preparation Batch: BJD0238	Sample Size: 17.48 g (wet)	Dry Weight: 12.52 g
	Prepared: 04/09/2021	Final Volume: 2.5 mL	% Solids: 71.60
Sample Cleanup:	Cleanup Method: Silica Gel	Extract ID: 21D0061-28 A 01	
	Cleanup Batch: CJD0206	Initial Volume: 2.5 mL	
	Cleaned: 20-Apr-2021	Final Volume: 2.5 mL	
Sample Cleanup:	Cleanup Method: Sulfuric Acid	Extract ID: 21D0061-28 A 01	
	Cleanup Batch: CJD0204	Initial Volume: 2.5 mL	
	Cleaned: 20-Apr-2021	Final Volume: 2.5 mL	
Sample Cleanup:	Cleanup Method: Sulfur	Extract ID: 21D0061-28 A 01	
	Cleanup Batch: CJD0205	Initial Volume: 2.5 mL	
	Cleaned: 20-Apr-2021	Final Volume: 2.5 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	1.6	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	1.6	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	1.6	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	1.6	4.0	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	0.6	4.0	ND	ug/kg	U
Surrogate: Decachlorobiphenyl				40-126 %	73.7	%	
Surrogate: Tetrachlorometaxylene				44-120 %	72.7	%	
Surrogate: Decachlorobiphenyl [2C]				40-126 %	83.3	%	
Surrogate: Tetrachlorometaxylene [2C]				44-120 %	65.0	%	

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Analytical Report

Shannon & Wilson, Inc
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Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
05-May-2021 12:19

SB-2021-047:10.5-02022021
21D0061-28 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 02/02/2021 10:30

Instrument: ICPMS2 Analyst: MCB

Analyzed: 04/14/2021 21:45

Sample Preparation:

Preparation Method: SWN EPA 3050B

Extract ID: 21D0061-28 B 01

Preparation Batch: BJD0279

Sample Size: 1.044 g (wet)

Dry Weight: 0.81 g

Prepared: 04/13/2021

Final Volume: 50 mL

% Solids: 77.98

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium	7440-39-3	20	0.14	0.61	33.1	mg/kg	
Chromium	7440-47-3	20	0.32	0.61	10.4	mg/kg	
Cobalt	7440-48-4	20	0.02	0.25	5.55	mg/kg	
Iron	7439-89-6	20	22	44	10200	mg/kg	
Lead	7439-92-1	20	0.06	0.12	1.62	mg/kg	
Silver	7440-22-4	20	0.03	0.25	0.05	mg/kg	J
Vanadium	7440-62-2	20	0.07	0.25	34.6	mg/kg	

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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
05-May-2021 12:19

SB-2021-047:10.5-02022021
21D0061-28 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 02/02/2021 10:30

Instrument: ICPMS2 Analyst: MCB

Analyzed: 04/14/2021 21:45

Sample Preparation:

Preparation Method: SWN EPA 3050B

Extract ID: 21D0061-28 B 01

Preparation Batch: BJD0279

Sample Size: 1.044 g (wet)

Dry Weight: 0.81 g

Prepared: 04/13/2021

Final Volume: 50 mL

% Solids: 77.98

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	20	0.05	0.25	2.04	mg/kg	
Cadmium	7440-43-9	20	0.04	0.12	ND	mg/kg	U
Copper	7440-50-8	20	0.21	0.61	12.3	mg/kg	
Nickel	7440-02-0	20	0.10	0.61	8.89	mg/kg	
Selenium	7782-49-2	20	0.22	0.61	0.77	mg/kg	
Zinc	7440-66-6	20	3.6	6.1	22.4	mg/kg	

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Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
05-May-2021 12:19

MW-72:15-02022021
21D0061-29 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B	Sampled: 02/02/2021 12:55
Instrument: ICPMS2 Analyst: MCB	Analyzed: 04/14/2021 21:50
Sample Preparation:	Preparation Method: SWN EPA 3050B
	Preparation Batch: BJD0279
	Sample Size: 1.082 g (wet)
	Final Volume: 50 mL
	Extract ID: 21D0061-29 A 01
	Dry Weight: 0.88 g
	% Solids: 81.52

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium	7440-39-3	20	0.13	0.57	30.3	mg/kg	
Chromium	7440-47-3	20	0.29	0.57	11.8	mg/kg	
Cobalt	7440-48-4	20	0.02	0.23	3.96	mg/kg	
Iron	7439-89-6	20	21	41	9820	mg/kg	
Lead	7439-92-1	20	0.06	0.11	2.18	mg/kg	
Silver	7440-22-4	20	0.02	0.23	0.05	mg/kg	J
Vanadium	7440-62-2	20	0.06	0.23	31.9	mg/kg	

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Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
05-May-2021 12:19

MW-72:15-02022021
21D0061-29 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 02/02/2021 12:55

Instrument: ICPMS2 Analyst: MCB

Analyzed: 04/14/2021 21:50

Sample Preparation:

Preparation Method: SWN EPA 3050B

Extract ID: 21D0061-29 A 01

Preparation Batch: BJD0279

Sample Size: 1.082 g (wet)

Dry Weight: 0.88 g

Prepared: 04/13/2021

Final Volume: 50 mL

% Solids: 81.52

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	20	0.04	0.23	2.47	mg/kg	
Cadmium	7440-43-9	20	0.03	0.11	0.04	mg/kg	J
Copper	7440-50-8	20	0.20	0.57	13.4	mg/kg	
Nickel	7440-02-0	20	0.09	0.57	8.24	mg/kg	
Selenium	7782-49-2	20	0.20	0.57	0.80	mg/kg	
Zinc	7440-66-6	20	3.3	5.7	22.0	mg/kg	

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Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
05-May-2021 12:19

SB-2021-65:11.9-02022021
21D0061-30 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM		Sampled: 02/02/2021 14:20
Instrument: NT11 Analyst: VTS		Analyzed: 04/21/2021 19:26
Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Low Level	Extract ID: 21D0061-30 A 01
	Preparation Batch: BJD0249	Dry Weight: 10.03 g
	Prepared: 04/12/2021	% Solids: 69.41
Sample Cleanup:	Cleanup Method: Silica Gel	Extract ID: 21D0061-30 A 01
	Cleanup Batch: CJD0194	Initial Volume: 0.5 mL
	Cleaned: 19-Apr-2021	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Sulfur	Extract ID: 21D0061-30 A 01
	Cleanup Batch: CJD0193	Initial Volume: 0.5 mL
	Cleaned: 19-Apr-2021	Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.44	0.60	3.98	ug/kg	
1-Methylnaphthalene	90-12-0	1	0.11	0.50	4.08	ug/kg	
2-Methylnaphthalene	91-57-6	1	0.13	0.50	4.75	ug/kg	
Acenaphthylene	208-96-8	1	0.06	0.50	0.82	ug/kg	Q
Acenaphthene	83-32-9	1	0.09	0.50	1.53	ug/kg	
Dibenzofuran	132-64-9	1	0.13	0.50	2.83	ug/kg	Q
Fluorene	86-73-7	1	0.07	0.50	2.95	ug/kg	
Phenanthrene	85-01-8	1	0.11	0.50	15.4	ug/kg	
Anthracene	120-12-7	1	0.07	0.50	2.66	ug/kg	
Fluoranthene	206-44-0	1	0.08	0.50	19.3	ug/kg	B
Pyrene	129-00-0	1	0.09	0.50	18.6	ug/kg	
Benzo(a)anthracene	56-55-3	1	0.07	0.50	4.48	ug/kg	
Chrysene	218-01-9	1	0.07	0.50	7.77	ug/kg	
Benzo(b)fluoranthene	205-99-2	1	0.07	0.50	7.30	ug/kg	Q
Benzo(k)fluoranthene	207-08-9	1	0.10	0.50	3.23	ug/kg	
Benzo(j)fluoranthene	205-82-3	1	0.10	0.50	3.04	ug/kg	
Benzo(a)pyrene	50-32-8	1	0.09	0.50	5.67	ug/kg	
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.09	0.50	5.70	ug/kg	
Dibenzo(a,h)anthracene	53-70-3	1	0.10	0.50	1.41	ug/kg	
Benzo(g,h,i)perylene	191-24-2	1	0.08	0.50	7.30	ug/kg	
Surrogate: 2-Methylnaphthalene-d10					30-160 %	53.9	%
Surrogate: Dibenzo[a,h]anthracene-d14					30-160 %	81.1	%
Surrogate: Fluoranthene-d10					30-160 %	69.3	%

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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
05-May-2021 12:19

MW-70:15-02022021
21D0061-31 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM		Sampled: 02/01/2021 15:45
Instrument: NT11 Analyst: VTS		Analyzed: 04/21/2021 19:59
Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Low Level	Extract ID: 21D0061-31 A 01
	Preparation Batch: BJD0249	Dry Weight: 10.04 g
	Prepared: 04/12/2021	% Solids: 78.74
Sample Cleanup:	Cleanup Method: Silica Gel	Extract ID: 21D0061-31 A 01
	Cleanup Batch: CJD0194	Initial Volume: 0.5 mL
	Cleaned: 19-Apr-2021	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Sulfur	Extract ID: 21D0061-31 A 01
	Cleanup Batch: CJD0193	Initial Volume: 0.5 mL
	Cleaned: 19-Apr-2021	Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.44	0.60	3.39	ug/kg	
1-Methylnaphthalene	90-12-0	1	0.11	0.50	1.00	ug/kg	
2-Methylnaphthalene	91-57-6	1	0.13	0.50	1.42	ug/kg	
Acenaphthylene	208-96-8	1	0.06	0.50	ND	ug/kg	U
Acenaphthene	83-32-9	1	0.09	0.50	0.96	ug/kg	
Dibenzofuran	132-64-9	1	0.13	0.50	0.89	ug/kg	Q
Fluorene	86-73-7	1	0.07	0.50	1.09	ug/kg	
Phenanthrene	85-01-8	1	0.11	0.50	4.59	ug/kg	
Anthracene	120-12-7	1	0.07	0.50	0.65	ug/kg	
Fluoranthene	206-44-0	1	0.08	0.50	1.59	ug/kg	B
Pyrene	129-00-0	1	0.09	0.50	1.46	ug/kg	
Benzo(a)anthracene	56-55-3	1	0.07	0.50	0.40	ug/kg	J
Chrysene	218-01-9	1	0.07	0.50	0.73	ug/kg	
Benzo(b)fluoranthene	205-99-2	1	0.07	0.50	0.39	ug/kg	J
Benzo(k)fluoranthene	207-08-9	1	0.10	0.50	ND	ug/kg	U
Benzo(j)fluoranthene	205-82-3	1	0.10	0.50	0.11	ug/kg	J
Benzo(a)pyrene	50-32-8	1	0.09	0.50	0.17	ug/kg	J
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.09	0.50	0.19	ug/kg	J
Dibenzo(a,h)anthracene	53-70-3	1	0.10	0.50	ND	ug/kg	U
Benzo(g,h,i)perylene	191-24-2	1	0.08	0.50	0.34	ug/kg	J
Surrogate: 2-Methylnaphthalene-d10					30-160 %	55.2	%
Surrogate: Dibenzo[a,h]anthracene-d14					30-160 %	80.3	%
Surrogate: Fluoranthene-d10					30-160 %	65.6	%

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 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 05-May-2021 12:19

MW-68:15.5-02022021
21D0061-32 (Solid)
Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM		Sampled: 02/02/2021 09:55
Instrument: NT11 Analyst: VTS		Analyzed: 04/21/2021 20:32
Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Low Level	Extract ID: 21D0061-32 A 01
	Preparation Batch: BJD0249	Dry Weight: 10.05 g
	Prepared: 04/12/2021	% Solids: 73.55
Sample Cleanup:	Cleanup Method: Silica Gel	Extract ID: 21D0061-32 A 01
	Cleanup Batch: CJD0194	Initial Volume: 0.5 mL
	Cleaned: 19-Apr-2021	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Sulfur	Extract ID: 21D0061-32 A 01
	Cleanup Batch: CJD0193	Initial Volume: 0.5 mL
	Cleaned: 19-Apr-2021	Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.44	0.60	1.86	ug/kg	
1-Methylnaphthalene	90-12-0	1	0.11	0.50	2.91	ug/kg	
2-Methylnaphthalene	91-57-6	1	0.13	0.50	3.37	ug/kg	
Acenaphthylene	208-96-8	1	0.06	0.50	ND	ug/kg	U
Acenaphthene	83-32-9	1	0.09	0.50	0.11	ug/kg	J
Dibenzofuran	132-64-9	1	0.13	0.50	0.82	ug/kg	Q
Fluorene	86-73-7	1	0.07	0.50	0.13	ug/kg	J
Phenanthrene	85-01-8	1	0.11	0.50	2.84	ug/kg	
Anthracene	120-12-7	1	0.07	0.50	0.32	ug/kg	J
Fluoranthene	206-44-0	1	0.08	0.50	0.93	ug/kg	B
Pyrene	129-00-0	1	0.09	0.50	1.17	ug/kg	
Benzo(a)anthracene	56-55-3	1	0.07	0.50	0.61	ug/kg	
Chrysene	218-01-9	1	0.07	0.50	0.88	ug/kg	
Benzo(b)fluoranthene	205-99-2	1	0.07	0.50	0.98	ug/kg	Q
Benzo(k)fluoranthene	207-08-9	1	0.10	0.50	0.24	ug/kg	J
Benzo(j)fluoranthene	205-82-3	1	0.10	0.50	0.21	ug/kg	J
Benzo(a)pyrene	50-32-8	1	0.09	0.50	0.48	ug/kg	J
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.09	0.50	0.31	ug/kg	J
Dibenzo(a,h)anthracene	53-70-3	1	0.10	0.50	0.12	ug/kg	J
Benzo(g,h,i)perylene	191-24-2	1	0.08	0.50	0.56	ug/kg	
Surrogate: 2-Methylnaphthalene-d10					30-160 %	56.8	%
Surrogate: Dibenzo[a,h]anthracene-d14					30-160 %	82.3	%
Surrogate: Fluoranthene-d10					30-160 %	68.1	%



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
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Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
05-May-2021 12:19

MW-68:15.5-02022021
21D0061-32 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B		Sampled: 02/02/2021 09:55
Instrument: ICPMS2 Analyst: MCB		Analyzed: 04/14/2021 21:55
Sample Preparation:	Preparation Method: SWN EPA 3050B	Extract ID: 21D0061-32 B 01
	Preparation Batch: BJD0279	Dry Weight: 0.80 g
	Prepared: 04/13/2021	% Solids: 78.19
	Sample Size: 1.022 g (wet)	
	Final Volume: 50 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium	7440-39-3	20	0.14	0.63	16.9	mg/kg	
Chromium	7440-47-3	20	0.33	0.63	8.33	mg/kg	
Cobalt	7440-48-4	20	0.02	0.25	2.65	mg/kg	
Iron	7439-89-6	20	23	45	7050	mg/kg	
Lead	7439-92-1	20	0.07	0.13	1.03	mg/kg	
Silver	7440-22-4	20	0.03	0.25	0.03	mg/kg	J
Vanadium	7440-62-2	20	0.07	0.25	30.1	mg/kg	

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Analytical Resources, Incorporated
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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
05-May-2021 12:19

MW-68:15.5-02022021
21D0061-32 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 02/02/2021 09:55

Instrument: ICPMS2 Analyst: MCB

Analyzed: 04/14/2021 21:55

Sample Preparation:

Preparation Method: SWN EPA 3050B

Extract ID: 21D0061-32 B 01

Preparation Batch: BJD0279

Sample Size: 1.022 g (wet)

Dry Weight: 0.80 g

Prepared: 04/13/2021

Final Volume: 50 mL

% Solids: 78.19

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	20	0.05	0.25	1.51	mg/kg	
Cadmium	7440-43-9	20	0.04	0.13	ND	mg/kg	U
Copper	7440-50-8	20	0.22	0.63	6.56	mg/kg	
Nickel	7440-02-0	20	0.10	0.63	5.63	mg/kg	
Selenium	7782-49-2	20	0.23	0.63	0.44	mg/kg	J
Zinc	7440-66-6	20	3.7	6.3	15.6	mg/kg	

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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
05-May-2021 12:19

Semivolatile Organic Compounds - SIM - Quality Control

Batch BJD0249 - EPA 3546 (Microwave) Low Level

Instrument: NT11 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJD0249-BLK1)						Prepared: 12-Apr-2021 Analyzed: 20-Apr-2021 12:36					
Naphthalene	ND	0.44	0.60	ug/kg							U
1-Methylnaphthalene	ND	0.11	0.50	ug/kg							U
2-Methylnaphthalene	ND	0.13	0.50	ug/kg							U
Acenaphthylene	ND	0.06	0.50	ug/kg							U
Acenaphthene	ND	0.09	0.50	ug/kg							U
Dibenzofuran	ND	0.13	0.50	ug/kg							U
Fluorene	ND	0.07	0.50	ug/kg							U
Phenanthrene	ND	0.11	0.50	ug/kg							U
Anthracene	ND	0.07	0.50	ug/kg							U
Fluoranthene	0.54	0.08	0.50	ug/kg							
Pyrene	0.25	0.09	0.50	ug/kg							J
Benzo(a)anthracene	ND	0.07	0.50	ug/kg							U
Chrysene	0.08	0.07	0.50	ug/kg							J
Benzo(b)fluoranthene	ND	0.07	0.50	ug/kg							U
Benzo(k)fluoranthene	ND	0.10	0.50	ug/kg							U
Benzo(j)fluoranthene	ND	0.10	0.50	ug/kg							U
Benzo(a)pyrene	ND	0.09	0.50	ug/kg							U
Indeno(1,2,3-cd)pyrene	ND	0.09	0.50	ug/kg							U
Dibenzo(a,h)anthracene	ND	0.11	0.50	ug/kg							U
Benzo(g,h,i)perylene	ND	0.09	0.50	ug/kg							U
Surrogate: 2-Methylnaphthalene-d10	8.74			ug/kg	15.0		58.3	30-160			
Surrogate: Dibenzo[a,h]anthracene-d14	10.3			ug/kg	15.0		68.4	30-160			
Surrogate: Fluoranthene-d10	10.3			ug/kg	15.0		68.5	30-160			
LCS (BJD0249-BS1)						Prepared: 12-Apr-2021 Analyzed: 20-Apr-2021 13:41					
Naphthalene	8.04	0.44	0.60	ug/kg	15.0		53.6	30-160			
1-Methylnaphthalene	8.92	0.11	0.50	ug/kg	15.0		59.5	30-160			
2-Methylnaphthalene	8.57	0.13	0.50	ug/kg	15.0		57.1	30-160			
Acenaphthylene	7.15	0.06	0.50	ug/kg	15.0		47.7	30-160			Q
Acenaphthene	7.66	0.09	0.50	ug/kg	15.0		51.1	30-160			
Dibenzofuran	7.89	0.13	0.50	ug/kg	15.0		52.6	30-160			Q
Fluorene	8.57	0.07	0.50	ug/kg	15.0		57.1	30-160			
Phenanthrene	9.96	0.11	0.50	ug/kg	15.0		66.4	30-160			
Anthracene	9.31	0.07	0.50	ug/kg	15.0		62.1	30-160			
Fluoranthene	11.2	0.08	0.50	ug/kg	15.0		74.8	30-160			B

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 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 05-May-2021 12:19

Semivolatile Organic Compounds - SIM - Quality Control
Batch BJD0249 - EPA 3546 (Microwave) Low Level

Instrument: NT11 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJD0249-BS1)					Prepared: 12-Apr-2021 Analyzed: 20-Apr-2021 13:41						
Pyrene	10.9	0.09	0.50	ug/kg	15.0		72.4	30-160			
Benzo(a)anthracene	9.77	0.07	0.50	ug/kg	15.0		65.1	30-160			
Chrysene	10.1	0.07	0.50	ug/kg	15.0		67.4	30-160			
Benzo(b)fluoranthene	8.79	0.07	0.50	ug/kg	15.0		58.6	30-160			
Benzo(k)fluoranthene	10.4	0.10	0.50	ug/kg	15.0		69.6	30-160			
Benzo(j)fluoranthene	11.2	0.10	0.50	ug/kg	15.0		74.7	30-160			
Benzo(a)pyrene	9.23	0.09	0.50	ug/kg	15.0		61.5	30-160			
Indeno(1,2,3-cd)pyrene	10.1	0.09	0.50	ug/kg	15.0		67.6	30-160			
Dibenzo(a,h)anthracene	9.75	0.11	0.50	ug/kg	15.0		65.0	30-160			
Benzo(g,h,i)perylene	9.96	0.09	0.50	ug/kg	15.0		66.4	30-160			
<i>Surrogate: 2-Methylnaphthalene-d10</i>	8.98			ug/kg	15.0		59.9	30-160			
<i>Surrogate: Dibenzo[a,h]anthracene-d14</i>	10.1			ug/kg	15.0		67.1	30-160			
<i>Surrogate: Fluoranthene-d10</i>	10.6			ug/kg	15.0		70.8	30-160			
Matrix Spike (BJD0249-MS1)					Source: 21D0061-09 Prepared: 12-Apr-2021 Analyzed: 20-Apr-2021 15:19						
Naphthalene	8.49	0.44	0.60	ug/kg	15.0	ND	56.6	30-160			
1-Methylnaphthalene	9.06	0.11	0.50	ug/kg	15.0	0.46	57.3	30-160			
2-Methylnaphthalene	9.38	0.13	0.50	ug/kg	15.0	0.73	57.6	30-160			
Acenaphthylene	7.49	0.06	0.50	ug/kg	15.0	0.16	48.9	30-160			Q
Acenaphthene	8.36	0.09	0.50	ug/kg	15.0	0.56	52.0	30-160			
Dibenzofuran	8.18	0.13	0.50	ug/kg	15.0	0.14	53.6	30-160			Q
Fluorene	8.94	0.07	0.50	ug/kg	15.0	0.26	57.9	30-160			
Phenanthrene	12.7	0.11	0.50	ug/kg	15.0	3.17	63.8	30-160			
Anthracene	9.92	0.07	0.50	ug/kg	15.0	0.14	65.2	30-160			
Fluoranthene	11.4	0.08	0.50	ug/kg	15.0	0.38	73.1	30-160			B
Pyrene	11.6	0.09	0.50	ug/kg	15.0	0.39	74.5	30-160			
Benzo(a)anthracene	10.5	0.07	0.50	ug/kg	15.0	0.09	69.6	30-160			
Chrysene	10.7	0.07	0.50	ug/kg	15.0	0.32	69.3	30-160			
Benzo(b)fluoranthene	9.01	0.07	0.50	ug/kg	15.0	0.15	59.1	30-160			
Benzo(k)fluoranthene	10.7	0.10	0.50	ug/kg	15.0	ND	71.1	30-160			
Benzo(j)fluoranthene	11.2	0.10	0.50	ug/kg	15.0	ND	74.8	30-160			
Benzo(a)pyrene	10.0	0.09	0.50	ug/kg	15.0	ND	67.0	30-160			
Indeno(1,2,3-cd)pyrene	10.4	0.09	0.50	ug/kg	15.0	ND	69.5	30-160			
Dibenzo(a,h)anthracene	9.98	0.11	0.50	ug/kg	15.0	ND	66.5	30-160			
Benzo(g,h,i)perylene	10.2	0.09	0.50	ug/kg	15.0	ND	67.7	30-160			


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 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 05-May-2021 12:19

Semivolatile Organic Compounds - SIM - Quality Control
Batch BJD0249 - EPA 3546 (Microwave) Low Level

Instrument: NT11 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BJD0249-MS1)		Source: 21D0061-09		Prepared: 12-Apr-2021		Analyzed: 20-Apr-2021 15:19					
Surrogate: 2-Methylnaphthalene-d10	8.99			ug/kg	15.0	8.35	59.9	30-160			
Surrogate: Dibenzo[a,h]anthracene-d14	10.2			ug/kg	15.0	9.14	68.2	30-160			
Surrogate: Fluoranthene-d10	10.5			ug/kg	15.0	10.1	70.2	30-160			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike Dup (BJD0249-MSD1)		Source: 21D0061-09		Prepared: 12-Apr-2021		Analyzed: 20-Apr-2021 15:52					
Naphthalene	8.49	0.44	0.60	ug/kg	15.0	ND	56.6	30-160	0.04	30	
1-Methylnaphthalene	9.07	0.11	0.50	ug/kg	15.0	0.46	57.4	30-160	0.14	30	
2-Methylnaphthalene	9.30	0.13	0.50	ug/kg	15.0	0.73	57.1	30-160	0.88	30	
Acenaphthylene	7.52	0.06	0.50	ug/kg	15.0	0.16	49.1	30-160	0.38	30	Q
Acenaphthene	8.56	0.09	0.50	ug/kg	15.0	0.56	53.3	30-160	2.28	30	
Dibenzofuran	8.29	0.13	0.50	ug/kg	15.0	0.14	54.3	30-160	1.26	30	Q
Fluorene	9.10	0.07	0.50	ug/kg	15.0	0.26	58.9	30-160	1.75	30	
Phenanthrene	12.4	0.11	0.50	ug/kg	15.0	3.17	61.8	30-160	2.31	30	
Anthracene	9.97	0.07	0.50	ug/kg	15.0	0.14	65.5	30-160	0.49	30	
Fluoranthene	10.9	0.08	0.50	ug/kg	15.0	0.38	70.4	30-160	3.71	30	B
Pyrene	11.2	0.09	0.50	ug/kg	15.0	0.39	72.1	30-160	3.12	30	
Benzo(a)anthracene	10.3	0.07	0.50	ug/kg	15.0	0.09	68.2	30-160	2.09	30	
Chrysene	10.3	0.07	0.50	ug/kg	15.0	0.32	66.6	30-160	3.89	30	
Benzo(b)fluoranthene	8.73	0.07	0.50	ug/kg	15.0	0.15	57.2	30-160	3.16	30	
Benzo(k)fluoranthene	10.5	0.10	0.50	ug/kg	15.0	ND	69.8	30-160	1.85	30	
Benzo(j)fluoranthene	11.2	0.10	0.50	ug/kg	15.0	ND	74.8	30-160	0.02	30	
Benzo(a)pyrene	9.81	0.09	0.50	ug/kg	15.0	ND	65.4	30-160	2.40	30	
Indeno(1,2,3-cd)pyrene	10.4	0.09	0.50	ug/kg	15.0	ND	69.0	30-160	0.70	30	
Dibenzo(a,h)anthracene	9.89	0.11	0.50	ug/kg	15.0	ND	65.9	30-160	0.94	30	
Benzo(g,h,i)perylene	10.1	0.09	0.50	ug/kg	15.0	ND	67.2	30-160	0.72	30	
Surrogate: 2-Methylnaphthalene-d10	8.80			ug/kg	15.0	8.35	58.7	30-160			
Surrogate: Dibenzo[a,h]anthracene-d14	9.81			ug/kg	15.0	9.14	65.4	30-160			
Surrogate: Fluoranthene-d10	10.4			ug/kg	15.0	10.1	69.2	30-160			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 05-May-2021 12:19

Aroclor PCB - Quality Control
Batch BJD0238 - EPA 3546 (Microwave)

Instrument: ECD7 Analyst: JGR

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJD0238-BLK1)						Prepared: 09-Apr-2021 Analyzed: 22-Apr-2021 00:47					
Aroclor 1016	ND	1.6	4.0	ug/kg							U
Aroclor 1221	ND	1.6	4.0	ug/kg							U
Aroclor 1232	ND	1.6	4.0	ug/kg							U
Aroclor 1242	ND	1.6	4.0	ug/kg							U
Aroclor 1248	ND	1.6	4.0	ug/kg							U
Aroclor 1254	ND	1.6	4.0	ug/kg							U
Aroclor 1260	ND	0.6	4.0	ug/kg							U
Aroclor 1262	ND	0.6	4.0	ug/kg							U
Aroclor 1268	ND	0.6	4.0	ug/kg							U
Surrogate: Decachlorobiphenyl	6.34			ug/kg	8.00		79.2	40-126			
Surrogate: Tetrachlorometaxylene	6.59			ug/kg	8.00		82.4	44-120			
Surrogate: Decachlorobiphenyl [2C]	7.24			ug/kg	8.00		90.5	40-126			
Surrogate: Tetrachlorometaxylene [2C]	6.00			ug/kg	8.00		75.0	44-120			
LCS (BJD0238-BS1)						Prepared: 09-Apr-2021 Analyzed: 22-Apr-2021 01:07					
Aroclor 1016	89.9	1.6	4.0	ug/kg	101		89.2	56-120			
Aroclor 1260 [2C]	93.2	0.6	4.0	ug/kg	101		92.5	58-120			
Surrogate: Decachlorobiphenyl	5.97			ug/kg	8.00		74.7	40-126			
Surrogate: Tetrachlorometaxylene	6.54			ug/kg	8.00		81.7	44-120			
Surrogate: Decachlorobiphenyl [2C]	6.79			ug/kg	8.00		84.9	40-126			
Surrogate: Tetrachlorometaxylene [2C]	5.59			ug/kg	8.00		69.9	44-120			
LCS Dup (BJD0238-BSD1)						Prepared: 09-Apr-2021 Analyzed: 22-Apr-2021 01:28					
Aroclor 1016 [2C]	106	1.6	4.0	ug/kg	101		105	56-120	17.20	30	
Aroclor 1260 [2C]	98.0	0.6	4.0	ug/kg	101		97.2	58-120	4.96	30	
Surrogate: Decachlorobiphenyl	6.24			ug/kg	8.00		78.0	40-126			
Surrogate: Tetrachlorometaxylene	6.43			ug/kg	8.00		80.4	44-120			
Surrogate: Decachlorobiphenyl [2C]	7.09			ug/kg	8.00		88.6	40-126			
Surrogate: Tetrachlorometaxylene [2C]	5.82			ug/kg	8.00		72.7	44-120			
Matrix Spike (BJD0238-MS1)						Source: 21D0061-04 Prepared: 09-Apr-2021 Analyzed: 22-Apr-2021 02:49					
Aroclor 1016	92.9	1.6	4.0	ug/kg	101	ND	92.1	56-120			
Aroclor 1260	85.4	0.6	4.0	ug/kg	101	ND	84.7	58-120			
Surrogate: Decachlorobiphenyl	6.43			ug/kg	8.00		80.3	40-126			

Analytical Resources, Inc.

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 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 05-May-2021 12:19

Aroclor PCB - Quality Control
Batch BJD0238 - EPA 3546 (Microwave)

Instrument: ECD7 Analyst: JGR

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BJD0238-MS1)		Source: 21D0061-04		Prepared: 09-Apr-2021		Analyzed: 22-Apr-2021 02:49					
Surrogate: Tetrachlorometaxylene	7.20			ug/kg	8.00		90.0	44-120			
Surrogate: Decachlorobiphenyl [2C]	7.41			ug/kg	8.00		92.6	40-126			
Surrogate: Tetrachlorometaxylene [2C]	6.10			ug/kg	8.00		76.3	44-120			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike Dup (BJD0238-MSD1)		Source: 21D0061-04		Prepared: 09-Apr-2021		Analyzed: 22-Apr-2021 03:10					
Aroclor 1016	81.9	1.6	4.0	ug/kg	101	ND	81.2	56-120	12.60	30	
Aroclor 1260	74.7	0.6	4.0	ug/kg	101	ND	74.1	58-120	13.40	30	
Surrogate: Decachlorobiphenyl	5.49			ug/kg	8.00		68.6	40-126			
Surrogate: Tetrachlorometaxylene	5.81			ug/kg	8.00		72.7	44-120			
Surrogate: Decachlorobiphenyl [2C]	6.32			ug/kg	8.00		79.0	40-126			
Surrogate: Tetrachlorometaxylene [2C]	4.98			ug/kg	8.00		62.3	44-120			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.


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 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 05-May-2021 12:19

Metals and Metallic Compounds - Quality Control
Batch BJD0279 - SWN EPA 3050B

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJD0279-BLK1)						Prepared: 13-Apr-2021 Analyzed: 14-Apr-2021 20:20						
Barium	135	ND	0.11	0.50	mg/kg							U
Barium	137	ND	0.08	0.50	mg/kg							U
Chromium	52	ND	0.26	0.50	mg/kg							U
Chromium	53	ND	0.24	0.50	mg/kg							U
Lead	208	ND	0.05	0.10	mg/kg							U
Silver	107	ND	0.02	0.20	mg/kg							U
Arsenic	75a	ND	0.04	0.20	mg/kg							U
Cadmium	111	ND	0.03	0.10	mg/kg							U
Cadmium	114	ND	0.04	0.10	mg/kg							U
Copper	63	ND	0.17	0.50	mg/kg							U
Copper	65	ND	0.35	0.50	mg/kg							U
Nickel	60	ND	0.08	0.50	mg/kg							U
Nickel	62	ND	0.22	0.50	mg/kg							U
Selenium	78	ND	0.18	0.50	mg/kg							U
Zinc	66	ND	2.9	5.0	mg/kg							U
Zinc	67	ND	0.9	4.0	mg/kg							U
Blank (BJD0279-BLK2)						Prepared: 13-Apr-2021 Analyzed: 15-Apr-2021 20:19						
Cobalt	59	ND	0.02	0.20	mg/kg							U
Iron	54	ND	18	36	mg/kg							U
Iron	57	ND	7	36	mg/kg							U
Vanadium	51a	ND	0.06	0.20	mg/kg							U
Vanadium	51b	ND	0.05	0.20	mg/kg							U
LCS (BJD0279-BS1)						Prepared: 13-Apr-2021 Analyzed: 14-Apr-2021 20:25						
Barium	135	24.8	0.11	0.50	mg/kg	25.0		99.3	80-120			
Barium	137	24.8	0.08	0.50	mg/kg	25.0		99.3	80-120			
Chromium	52	24.3	0.26	0.50	mg/kg	25.0		97.4	80-120			
Chromium	53	25.5	0.24	0.50	mg/kg	25.0		102	80-120			
Lead	208	25.9	0.05	0.10	mg/kg	25.0		104	80-120			
Silver	107	27.2	0.02	0.20	mg/kg	25.0		109	80-120			
Arsenic	75a	24.3	0.04	0.20	mg/kg	25.0		97.2	80-120			
Cadmium	111	24.8	0.03	0.10	mg/kg	25.0		99.0	80-120			
Cadmium	114	24.2	0.04	0.10	mg/kg	25.0		96.9	80-120			
Copper	63	26.7	0.17	0.50	mg/kg	25.0		107	80-120			


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 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 05-May-2021 12:19

Metals and Metallic Compounds - Quality Control
Batch BJD0279 - SWN EPA 3050B

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJD0279-BS1)						Prepared: 13-Apr-2021 Analyzed: 14-Apr-2021 20:25						
Copper	65	26.1	0.35	0.50	mg/kg	25.0		104	80-120			
Nickel	60	26.1	0.08	0.50	mg/kg	25.0		104	80-120			
Nickel	62	25.9	0.22	0.50	mg/kg	25.0		104	80-120			
Selenium	78	76.7	0.18	0.50	mg/kg	80.0		95.8	80-120			
Zinc	66	80.1	2.9	5.0	mg/kg	80.0		100	80-120			
Zinc	67	74.2	0.9	4.0	mg/kg	80.0		92.8	80-120			
LCS (BJD0279-BS2)						Prepared: 13-Apr-2021 Analyzed: 15-Apr-2021 20:24						
Cobalt	59	25.6	0.02	0.20	mg/kg	25.0		102	80-120			
Iron	54	498	18	36	mg/kg	500		99.5	80-120			
Iron	57	481	7	36	mg/kg	500		96.3	80-120			
Vanadium	51a	23.9	0.06	0.20	mg/kg	25.0		95.5	80-120			
Vanadium	51b	23.7	0.05	0.20	mg/kg	25.0		94.8	80-120			
Duplicate (BJD0279-DUP1)						Source: 21D0061-01 Prepared: 13-Apr-2021 Analyzed: 14-Apr-2021 20:44						
Barium	135	41.3	0.15	0.64	mg/kg		40.5			1.98	20	
Chromium	52	11.8	0.33	0.64	mg/kg		11.9			0.93	20	
Lead	208	2.21	0.07	0.13	mg/kg		2.32			4.86	20	
Silver	107	0.07	0.03	0.26	mg/kg		0.07			5.31	20	J
Arsenic	75a	1.87	0.05	0.26	mg/kg		1.91			2.12	20	
Cadmium	111	0.20	0.04	0.13	mg/kg		0.24			20.40	20	L
Copper	63	18.4	0.22	0.64	mg/kg		18.8			1.85	20	
Nickel	60	11.8	0.10	0.64	mg/kg		11.5			2.71	20	
Selenium	78	0.85	0.23	0.64	mg/kg		1.31			43.00	20	L
Zinc	66	26.4	3.7	6.4	mg/kg		27.5			3.90	20	
Duplicate (BJD0279-DUP2)						Source: 21D0061-01 Prepared: 13-Apr-2021 Analyzed: 15-Apr-2021 20:34						
Cobalt	59	5.88	0.02	0.26	mg/kg		5.77			1.87	20	
Iron	54	10300	23	46	mg/kg		10800			4.20	20	
Vanadium	51a	39.4	0.07	0.26	mg/kg		41.0			4.10	20	
Matrix Spike (BJD0279-MS1)						Source: 21D0061-01 Prepared: 13-Apr-2021 Analyzed: 14-Apr-2021 20:49						
Arsenic	75a	32.3	0.05	0.26	mg/kg	31.9	1.91	95.1	75-125			
Cadmium	111	31.7	0.04	0.13	mg/kg	31.9	0.24	98.7	75-125			
Copper	63	51.4	0.22	0.64	mg/kg	31.9	18.8	102	75-125			
Nickel	60	46.1	0.10	0.64	mg/kg	31.9	11.5	108	75-125			


 Shannon & Wilson, Inc
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 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 05-May-2021 12:19

Metals and Metallic Compounds - Quality Control
Batch BJD0279 - SWN EPA 3050B

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BJD0279-MS1)		Source: 21D0061-01		Prepared: 13-Apr-2021		Analyzed: 14-Apr-2021 20:49						
Selenium	78	97.9	0.23	0.64	mg/kg	102	1.31	94.6	75-125			
Zinc	66	127	3.7	6.4	mg/kg	102	27.5	97.9	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike (BJD0279-MS2)		Source: 21D0061-01		Prepared: 13-Apr-2021		Analyzed: 15-Apr-2021 20:40						
Barium	135	74.3	0.15	0.64	mg/kg	31.9	40.5	106	75-125			
Chromium	52	44.2	0.33	0.64	mg/kg	31.9	11.9	101	75-125			
Cobalt	59	39.7	0.02	0.26	mg/kg	31.9	5.77	106	75-125			
Iron	54	11400	23	46	mg/kg	638	10800	92.9	75-125			
Lead	208	33.4	0.07	0.13	mg/kg	31.9	2.32	97.4	75-125			
Silver	107	32.6	0.03	0.26	mg/kg	31.9	0.07	102	75-125			
Vanadium	51a	70.9	0.07	0.26	mg/kg	31.9	41.0	93.6	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike Dup (BJD0279-MSD1)		Source: 21D0061-01		Prepared: 13-Apr-2021		Analyzed: 14-Apr-2021 20:54						
Barium	135	75.2	0.15	0.64	mg/kg	31.8	40.5	109	75-125	1.21	20	
Chromium	52	40.7	0.33	0.64	mg/kg	31.8	11.9	90.3	75-125	8.34	20	
Lead	208	34.1	0.07	0.13	mg/kg	31.8	2.32	99.9	75-125	2.16	20	
Silver	107	33.5	0.03	0.25	mg/kg	31.8	0.07	105	75-125	2.83	20	
Arsenic	75a	31.9	0.05	0.25	mg/kg	31.8	1.91	94.3	75-125	1.00	20	
Cadmium	111	31.9	0.04	0.13	mg/kg	31.8	0.24	99.5	75-125	0.57	20	
Copper	63	50.4	0.22	0.64	mg/kg	31.8	18.8	99.5	75-125	1.97	20	
Nickel	60	45.2	0.10	0.64	mg/kg	31.8	11.5	106	75-125	1.90	20	
Selenium	78	97.4	0.23	0.64	mg/kg	102	1.31	94.4	75-125	0.42	20	
Zinc	66	129	3.7	6.4	mg/kg	102	27.5	99.5	75-125	1.12	20	

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike Dup (BJD0279-MSD2)		Source: 21D0061-01		Prepared: 13-Apr-2021		Analyzed: 15-Apr-2021 20:45						
Cobalt	59	37.4	0.02	0.25	mg/kg	31.8	5.77	99.4	75-125	5.98	20	
Iron	54	11300	23	46	mg/kg	637	10800	80.7	75-125	0.70	20	
Vanadium	51a	68.8	0.07	0.25	mg/kg	31.8	41.0	87.2	75-125	2.97	20	

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Post Spike (BJD0279-PS1)		Source: 21D0061-01		Prepared: 13-Apr-2021		Analyzed: 14-Apr-2021 21:00						
Nickel	60	665			mg/kg	500	11.5	96.9	80-120			

Analytical Resources, Inc.

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Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
05-May-2021 12:19

Certified Analyses included in this Report

Analyte	Certifications
EPA 6020B in Solid	
Silver-107	NELAP,DoD-ELAP,WADOE
Silver-107	DoD-ELAP,WADOE
Silver-107	NELAP,DoD-ELAP
Silver-107	NELAP,DoD-ELAP,WADOE
Barium-135	DoD-ELAP,WADOE,ADEC
Barium-135	NELAP,DoD-ELAP,WADOE,ADEC
Barium-135	NELAP,DoD-ELAP,ADEC
Barium-135	NELAP,DoD-ELAP,WADOE,ADEC
Barium-137	NELAP,DoD-ELAP,WADOE,ADEC
Barium-137	DoD-ELAP,WADOE,ADEC
Barium-137	NELAP,DoD-ELAP,WADOE,ADEC
Barium-137	NELAP,DoD-ELAP,ADEC
Cobalt-59	NELAP,DoD-ELAP,WADOE
Cobalt-59	NELAP,DoD-ELAP
Cobalt-59	DoD-ELAP,WADOE
Cobalt-59	NELAP,DoD-ELAP,WADOE
Chromium-52	NELAP,DoD-ELAP,WADOE,ADEC
Chromium-52	NELAP,DoD-ELAP,ADEC
Chromium-52	DoD-ELAP,WADOE,ADEC
Chromium-52	NELAP,DoD-ELAP,WADOE,ADEC
Chromium-53	NELAP,DoD-ELAP,WADOE,ADEC
Chromium-53	NELAP,DoD-ELAP,ADEC
Chromium-53	DoD-ELAP,WADOE,ADEC
Chromium-53	NELAP,DoD-ELAP,WADOE,ADEC
Iron-54	NELAP,DoD-ELAP,WADOE
Iron-54	NELAP,DoD-ELAP
Iron-54	DoD-ELAP,WADOE
Iron-54	NELAP,DoD-ELAP,WADOE
Iron-57	DoD-ELAP,WADOE
Iron-57	NELAP,DoD-ELAP
Iron-57	NELAP,DoD-ELAP,WADOE
Iron-57	NELAP,DoD-ELAP,WADOE
Lead-208	DoD-ELAP,WADOE,ADEC
Lead-208	NELAP,DoD-ELAP,ADEC
Lead-208	NELAP,DoD-ELAP,WADOE,ADEC



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Reported:
05-May-2021 12:19

Lead-208	NELAP,DoD-ELAP,WADOE,ADEC
Vanadium-51a	NELAP,DoD-ELAP,WADOE,ADEC
Vanadium-51a	DoD-ELAP,WADOE,ADEC
Vanadium-51a	NELAP,DoD-ELAP,ADEC
Vanadium-51a	NELAP,DoD-ELAP,WADOE,ADEC
Vanadium-51b	DoD-ELAP,WADOE,ADEC
Vanadium-51b	DoD-ELAP,WADOE,ADEC
Vanadium-51b	DoD-ELAP,ADEC
Vanadium-51b	DoD-ELAP,WADOE,ADEC

EPA 6020B UCT-KED in Solid

Arsenic-75a	NELAP,DoD-ELAP,ADEC
Arsenic-75a	NELAP,DoD-ELAP,WADOE,ADEC
Arsenic-75a	DoD-ELAP,WADOE,ADEC
Arsenic-75a	NELAP,DoD-ELAP,WADOE,ADEC
Cadmium-111	NELAP,DoD-ELAP,WADOE,ADEC
Cadmium-111	NELAP,DoD-ELAP,ADEC
Cadmium-111	DoD-ELAP,WADOE,ADEC
Cadmium-111	NELAP,DoD-ELAP,WADOE,ADEC
Cadmium-114	NELAP,DoD-ELAP,WADOE,ADEC
Cadmium-114	NELAP,DoD-ELAP,WADOE,ADEC
Cadmium-114	NELAP,DoD-ELAP,ADEC
Cadmium-114	DoD-ELAP,WADOE,ADEC
Copper-63	NELAP,DoD-ELAP,WADOE
Copper-63	NELAP,DoD-ELAP,WADOE
Copper-63	NELAP,DoD-ELAP
Copper-63	DoD-ELAP,WADOE
Copper-65	DoD-ELAP,WADOE
Copper-65	NELAP,DoD-ELAP
Copper-65	NELAP,DoD-ELAP,WADOE
Copper-65	NELAP,DoD-ELAP,WADOE
Nickel-60	NELAP,DoD-ELAP,ADEC
Nickel-60	DoD-ELAP,WADOE,ADEC
Nickel-60	NELAP,DoD-ELAP,WADOE,ADEC
Nickel-60	NELAP,DoD-ELAP,WADOE,ADEC
Nickel-62	NELAP,DoD-ELAP,WADOE,ADEC
Nickel-62	NELAP,DoD-ELAP,ADEC
Nickel-62	NELAP,DoD-ELAP,WADOE,ADEC
Nickel-62	DoD-ELAP,WADOE,ADEC
Selenium-78	DoD-ELAP,WADOE



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Project Number: Lower Duwamish
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Selenium-78	NELAP,DoD-ELAP
Selenium-78	NELAP,DoD-ELAP,WADOE
Selenium-78	NELAP,DoD-ELAP,WADOE
Zinc-66	NELAP,DoD-ELAP,WADOE
Zinc-66	DoD-ELAP,WADOE
Zinc-66	NELAP,DoD-ELAP
Zinc-66	NELAP,DoD-ELAP,WADOE
Zinc-67	NELAP,DoD-ELAP,WADOE
Zinc-67	DoD-ELAP,WADOE
Zinc-67	NELAP,DoD-ELAP,WADOE
Zinc-67	NELAP,DoD-ELAP

EPA 8082A in Solid

Aroclor 1016	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1016	WADOE,DoD-ELAP,CALAP,ADEC
Aroclor 1016	DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1016	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1016 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1016 [2C]	WADOE,DoD-ELAP,CALAP,ADEC
Aroclor 1016 [2C]	DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1016 [2C]	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1221	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1221	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1221	WADOE,DoD-ELAP,CALAP,ADEC
Aroclor 1221	DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1221 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1221 [2C]	WADOE,DoD-ELAP,CALAP,ADEC
Aroclor 1221 [2C]	DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1221 [2C]	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1232	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1232	WADOE,DoD-ELAP,CALAP,ADEC
Aroclor 1232	DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1232	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1232 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1232 [2C]	WADOE,DoD-ELAP,CALAP,ADEC
Aroclor 1232 [2C]	DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1232 [2C]	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1242	WADOE,DoD-ELAP,CALAP,ADEC
Aroclor 1242	DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1242	WADOE,DoD-ELAP,NELAP,ADEC



Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
05-May-2021 12:19

Aroclor 1242	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1242 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1242 [2C]	WADOE,DoD-ELAP,CALAP,ADEC
Aroclor 1242 [2C]	DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1242 [2C]	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1248	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1248	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1248	DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1248	WADOE,DoD-ELAP,CALAP,ADEC
Aroclor 1248 [2C]	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1248 [2C]	DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1248 [2C]	WADOE,DoD-ELAP,CALAP,ADEC
Aroclor 1248 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1254	WADOE,DoD-ELAP,CALAP,ADEC
Aroclor 1254	DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1254	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1254	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1254 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1254 [2C]	WADOE,DoD-ELAP,CALAP,ADEC
Aroclor 1254 [2C]	DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1254 [2C]	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1260	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1260	WADOE,DoD-ELAP,CALAP,ADEC
Aroclor 1260	DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1260	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1260 [2C]	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1260 [2C]	DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1260 [2C]	WADOE,DoD-ELAP,CALAP,ADEC
Aroclor 1260 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1262	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1262	WADOE,DoD-ELAP,CALAP,ADEC
Aroclor 1262	DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1262	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1262 [2C]	DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1262 [2C]	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1262 [2C]	WADOE,DoD-ELAP,CALAP,ADEC
Aroclor 1262 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1268	WADOE,DoD-ELAP,CALAP,ADEC
Aroclor 1268	DoD-ELAP,NELAP,CALAP,ADEC



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
05-May-2021 12:19

Aroclor 1268	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1268	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1268 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1268 [2C]	WADOE,DoD-ELAP,CALAP,ADEC
Aroclor 1268 [2C]	DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1268 [2C]	WADOE,DoD-ELAP,NELAP,CALAP,ADEC

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2023
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/28/2022

Analytical Resources, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

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Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
05-May-2021 12:19

Notes and Definitions

*	Flagged value is not within established control limits.
B	This analyte was detected in the method blank.
D	The reported value is from a dilution
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL)
J	Estimated concentration value detected below the reporting limit.
L	Analyte concentration is ≤ 5 times the reporting limit and the replicate control limit defaults to $\pm$ RL instead of 20% RPD
P1	The reported value is greater than 40% difference between the concentrations determined on two GC columns where applicable.
Q	Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria ($<20\%$ RSD, $<20\%$ drift or minimum RRF)
U	This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
[2C]	Indicates this result was quantified on the second column on a dual column analysis.



Analytical Resources, Incorporated
Analytical Chemists and Consultants

02 August 2021

Meg Strong
Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle, WA 98103-8636

RE: Lower Duwamish

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)
21B0160

Associated SDG ID(s)
N/A

Susan
Dunniho

Digitally signed by Susan
Dunniho
Date: 2021.08.02 11:15:04
-07'00'

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

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Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

21B0160 ARISample FINAL 02 Aug 2021 1048 - Page 2 of 119



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
TB-1-20211002	21B0160-01	Water	10-Feb-2021 14:34	10-Feb-2021 16:10
MW-66-20211002	21B0160-02	Water	10-Feb-2021 09:30	10-Feb-2021 16:10
MW-66-20211002	21B0160-03	Water	10-Feb-2021 09:30	10-Feb-2021 16:10
MW-51-20211002	21B0160-04	Water	10-Feb-2021 11:36	10-Feb-2021 16:10
MW-76-20211002	21B0160-05	Water	10-Feb-2021 12:59	10-Feb-2021 16:10
MW-76-20211002	21B0160-06	Water	10-Feb-2021 12:59	10-Feb-2021 16:10
MW-100-20211002	21B0160-07	Water	10-Feb-2021 13:14	10-Feb-2021 16:10
MW-100-20211002	21B0160-08	Water	10-Feb-2021 12:59	10-Feb-2021 16:10
MW-56-20211002	21B0160-09	Water	10-Feb-2021 14:34	10-Feb-2021 16:10
MW-56-20211002	21B0160-10	Water	10-Feb-2021 14:34	10-Feb-2021 16:10

Analytical Resources, Inc.

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Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

Work Order Case Narrative

Client: Shannon & Wilson, Inc
Project: Lower Duwamish
Work Order: 21B0160

Sample receipt

Samples as listed on the preceding page were received 10-Feb-2021 16:10 under ARI work order 21B0160. For details regarding sample receipt, please refer to the Cooler Receipt Form.

PCB Aroclors - EPA Method SW8082A

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits except Tetrachlorometaxylene which was out of control low in sample 21B0160-04. Deviation has been flagged.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

Sample specific QC was performed in association with sample 21B0160-02 in batch BJB0451. The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) were within advisory control limits except Aroclor 1260 which was out of control low in the MSD. Deviation has been flagged.

Gasoline by NWTPH-q (GC/MS)

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.



Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

Volatiles - EPA Method SW8260D

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Sample specific QC was performed in association with sample 21B0160-02 in batch BJB0615. The matrix spike/matrix spike duplicate (MS/MSD) spike recoveries and relative percent difference (RPD) were within advisory control limits except Vinyl Chloride and 1,1-Dichloroethene which were out of control high in the MS and MSD. Deviations have been flagged.

Semivolatiles - EPA Method SW8270E

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements except 4,6-Dinitro-2-Methylphenol and 2-Nitrophenol which were out of control high and 1,2,4-Trichlorobenzene and Hexachlorobutadiene which were out of control low. All samples which contain analyte have been flagged with a "Q" qualifier.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike/blank spike duplicate (BS/BSD aka LCS/LCSD) percent recoveries were within control limits except Hexachlorobutadiene and 4-Chloroaniline which were out of control low and have been flagged within the QC section of this report. The BS/BSD relative percent difference (RPD) were within control limits.

Polynuclear Aromatic Hydrocarbons (PAH) - EPA Method SW8270E-SIM

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.



Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

Sample specific QC was performed in association with sample 21B0160-02 in batch BJB0449. The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) were within advisory control limits.

Total and Dissolved Metals - EPA Method 6020B

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits except Dissolve Manganese. All samples which contain analyte have been flagged with a "B" qualifier.

The blank spike (BS/LCS) percent recoveries were within control limits.

Sample specific QC was performed in association with sample 21B0160-02 in Total Metals batch BJB0514 and in association with sample 21B0160-03 in Dissolved Metals batch BJB0603. The duplicate (DUP) relative percent difference (RPD) were within advisory control limits. The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) were within advisory control limits except Total Iron which was out of control low in the MS.

Wet Chemistry

The sample(s) were prepared and analyzed within the recommended holding times except Sulfite. The Sulfite holding time was exceeded upon sample receipt.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

Sample specific QC was performed in association with sample 21B0160-09 in Sulfite batch BJB0357 and Ferrous Iron batch BJB0359. The matrix spike (MS) percent recoveries and the duplicate (DUP) relative percent difference (RPD) were within advisory control limits.

Total Hg - EPA Method 7470/7471

The sample(s) were digested and analyzed within the recommended holding times.



Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

Sample specific QC was performed in association with sample 21B0160-02 in Total Mercury batch BJB0616 and in association with sample 21B0160-03 in Dissolved Mercury batch BJB0544. The duplicate (DUP) relative percent difference (RPD) were within advisory control limits. The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) were within advisory control limits.

Volatile Gases - MEE by RSK175

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Diesel/Heavy Oil Range Organics - WA-Ecology Method NW-TPHDx

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

Sample specific QC was performed in association with sample 21B0160-02 in batch BJB0444. The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) were within advisory control limits.

Volatiles - EPA Method 8260D-SIM (Selected Ion Monitoring)

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Sample specific QC was performed in association with sample 21B0160-02 in batch BJB0621. The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) were within advisory control limits.

REVISED to add trans-1,2-dichloroethene to the VOC list.



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Shannon & Wilson

Project Name: LDW

COC No(s): NA

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: NA

Assigned ARI Job No: 21B0160

Tracking No: NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of the cooler? YES NO

Were custody papers included with the cooler? YES YES NO

Were custody papers properly filled out (ink, signed, etc.) YES YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)

Time 1610 4.7 5.4 1.9

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: DOQ 5206

Cooler Accepted by: KD Date: 2/10/21 Time: 1610

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES NO

What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: NA

Was sufficient ice used (if appropriate)? NA YES YES NO

How were bottles sealed in plastic bags? Individually Grouped Grouped Not

Did all bottles arrive in good condition (unbroken)? YES YES NO

Were all bottle labels complete and legible? YES YES NO

Did the number of containers listed on COC match with the number of containers received? YES YES NO

Did all bottle labels and tags agree with custody papers? YES YES NO

Were all bottles used correct for the requested analyses? YES YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs) ... NA YES YES NO

Were all VOC vials free of air bubbles? NA YES YES NO

Was sufficient amount of sample sent in each bottle? YES YES NO

Date VOC Trip Blank was made at ARI: NA 2/18/21

Were the sample(s) split by ARI? NA YES Date/Time: Equipment: Split by:

Samples Logged by: SE Date: 2/11/21 Time: 0842 Labels checked by: SC

**** Notify Project Manager of discrepancies or concerns ****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: Date:



WORK ORDER

21B0160

Client: Shannon & Wilson, Inc

Project Manager: Amanda Volgardsen Johnson

Project: Lower Duwamish

Project Number: 21-1-12596

Preservation Confirmation

Container ID	Container Type	pH	
21B0160-01 A	VOA Vial, Clear, 40 mL, HCL		
21B0160-02 A	HDPE NM, 500 mL, 1:1 HNO3	< 2	Pass
21B0160-02 B	HDPE NM, 500 mL, 1:1 HNO3	< 2	Pass
21B0160-02 C	Glass NM, Amber, 500 mL		
21B0160-02 D	Glass NM, Amber, 500 mL		
21B0160-02 E	Glass NM, Amber, 500 mL		
21B0160-02 F	Glass NM, Amber, 500 mL		
21B0160-02 G	Glass NM, Amber, 500 mL		
21B0160-02 H	Glass NM, Amber, 500 mL		
21B0160-02 I	Glass NM, Amber, 500 mL		
21B0160-02 J	Glass NM, Amber, 500 mL		
21B0160-02 K	Glass NM, Amber, 500 mL		
21B0160-02 L	Glass NM, Amber, 500 mL		
21B0160-02 M	Glass NM, Amber, 500 mL		
21B0160-02 N	Glass NM, Amber, 500 mL		
21B0160-02 O	VOA Vial, Clear, 40 mL, HCL		
21B0160-02 P	VOA Vial, Clear, 40 mL, HCL		
21B0160-02 Q	VOA Vial, Clear, 40 mL, HCL		
21B0160-02 R	VOA Vial, Clear, 40 mL, HCL		
21B0160-02 S	VOA Vial, Clear, 40 mL, HCL		
21B0160-02 T	VOA Vial, Clear, 40 mL, HCL		
21B0160-02 U	VOA Vial, Clear, 40 mL, HCL		
21B0160-02 V	VOA Vial, Clear, 40 mL, HCL		
21B0160-03 A	HDPE NM, 500 mL	> 2	Fail
21B0160-03 B	HDPE NM, 500 mL	> 2	Fail
21B0160-04 A	Glass NM, Amber, 500 mL		
21B0160-04 B	Glass NM, Amber, 500 mL		
21B0160-04 C	Glass NM, Amber, 500 mL		
21B0160-04 D	Glass NM, Amber, 500 mL		
21B0160-04 E	VOA Vial, Clear, 40 mL, HCL		
21B0160-04 F	VOA Vial, Clear, 40 mL, HCL		
21B0160-04 G	VOA Vial, Clear, 40 mL, HCL		
21B0160-04 H	VOA Vial, Clear, 40 mL, HCL		
21B0160-04 I	VOA Vial, Clear, 40 mL, HCL		
21B0160-04 J	VOA Vial, Clear, 40 mL, HCL		



WORK ORDER

21B0160

Client: Shannon & Wilson, Inc

Project Manager: Amanda Volgardsen Johnson

Project: Lower Duwamish

Project Number: 21-1-12596

21B0160-05 A	HDPE NM, 500 mL, 1:1 HNO3	< 2	Pass
21B0160-05 B	Glass NM, Amber, 500 mL		
21B0160-05 C	Glass NM, Amber, 500 mL		
21B0160-05 D	Glass NM, Amber, 500 mL		
21B0160-05 E	Glass NM, Amber, 500 mL		
21B0160-05 F	Glass NM, Amber, 500 mL		
21B0160-05 G	Glass NM, Amber, 500 mL		
21B0160-05 H	VOA Vial, Clear, 40 mL, HCL		
21B0160-05 I	VOA Vial, Clear, 40 mL, HCL		
21B0160-05 J	VOA Vial, Clear, 40 mL, HCL		
21B0160-05 K	VOA Vial, Clear, 40 mL, HCL		
21B0160-06 A	HDPE NM, 500 mL	> 2	Fail
21B0160-07 A	HDPE NM, 500 mL, 1:1 HNO3	< 2	Pass
21B0160-07 B	Glass NM, Amber, 500 mL		
21B0160-07 C	Glass NM, Amber, 500 mL		
21B0160-07 D	Glass NM, Amber, 500 mL		
21B0160-07 E	Glass NM, Amber, 500 mL		
21B0160-07 F	Glass NM, Amber, 500 mL		
21B0160-07 G	Glass NM, Amber, 500 mL		
21B0160-07 H	VOA Vial, Clear, 40 mL, HCL		
21B0160-07 I	VOA Vial, Clear, 40 mL, HCL		
21B0160-07 J	VOA Vial, Clear, 40 mL, HCL		
21B0160-07 K	VOA Vial, Clear, 40 mL, HCL		
21B0160-08 A	HDPE NM, 500 mL	> 2	Fail
21B0160-09 A	HDPE NM, 500 mL, 1:1 HNO3	< 2	Pass
21B0160-09 B	Glass NM, Amber, 500 mL		
21B0160-09 C	Glass NM, Amber, 500 mL		
21B0160-09 D	Glass NM, Amber, 500 mL		
21B0160-09 E	Glass NM, Amber, 500 mL		
21B0160-09 F	VOA Vial, Clear, 40 mL, HCL		
21B0160-09 G	VOA Vial, Clear, 40 mL, HCL		
21B0160-09 H	VOA Vial, Clear, 40 mL, HCL		
21B0160-09 I	VOA Vial, Clear, 40 mL, HCL		
21B0160-09 J	VOA Vial, Clear, 40 mL, HCL		
21B0160-09 K	VOA Vial, Clear, 40 mL, HCL		
21B0160-09 L	Small OJ, 500 mL, EDTA	Lab to check pH	
21B0160-09 M	Glass NM, Amber, 250 mL, 2 mL HCL	Lab to check pH	



WORK ORDER

21B0160

Client: Shannon & Wilson, Inc

Project Manager: Amanda Volgardsen Johnson

Project: Lower Duwamish

Project Number: 21-1-12596

21B0160-10 A HDPE NM, 500 mL

> 2

Fail

21B0160-10 B HDPE NM, 500 mL

> 2

Fail

SC

Preservation Confirmed By

2/11/21

Date



WORK ORDER

21B0160

Client: Shannon & Wilson, Inc

Project Manager: Amanda Volgardsen Johnson

Project: Lower Duwamish

Project Number: 21-1-12596

Preservation Confirmation

Container ID	Container Type	pH	
21B0160-01 A	VOA Vial, Clear, 40 mL, HCL		
21B0160-02 A	HDPE NM, 500 mL, 1:1 HNO ₃	< 2	Pass
21B0160-02 B	HDPE NM, 500 mL, 1:1 HNO ₃	< 2	Pass
21B0160-02 C	Glass NM, Amber, 500 mL		
21B0160-02 D	Glass NM, Amber, 500 mL		
21B0160-02 E	Glass NM, Amber, 500 mL		
21B0160-02 F	Glass NM, Amber, 500 mL		
21B0160-02 G	Glass NM, Amber, 500 mL		
21B0160-02 H	Glass NM, Amber, 500 mL		
21B0160-02 I	Glass NM, Amber, 500 mL		
21B0160-02 J	Glass NM, Amber, 500 mL		
21B0160-02 K	Glass NM, Amber, 500 mL		
21B0160-02 L	Glass NM, Amber, 500 mL		
21B0160-02 M	Glass NM, Amber, 500 mL		
21B0160-02 N	Glass NM, Amber, 500 mL		
21B0160-02 O	VOA Vial, Clear, 40 mL, HCL		
21B0160-02 P	VOA Vial, Clear, 40 mL, HCL		
21B0160-02 Q	VOA Vial, Clear, 40 mL, HCL		
21B0160-02 R	VOA Vial, Clear, 40 mL, HCL		
21B0160-02 S	VOA Vial, Clear, 40 mL, HCL		
21B0160-02 T	VOA Vial, Clear, 40 mL, HCL		
21B0160-02 U	VOA Vial, Clear, 40 mL, HCL		
21B0160-02 V	VOA Vial, Clear, 40 mL, HCL		
21B0160-03 A	HDPE NM, 500 mL	> 2	Fail
21B0160-03 B	HDPE NM, 500 mL	> 2	Fail ①
21B0160-04 A	Glass NM, Amber, 500 mL		
21B0160-04 B	Glass NM, Amber, 500 mL		
21B0160-04 C	Glass NM, Amber, 500 mL		
21B0160-04 D	Glass NM, Amber, 500 mL		
21B0160-04 E	VOA Vial, Clear, 40 mL, HCL		
21B0160-04 F	VOA Vial, Clear, 40 mL, HCL		
21B0160-04 G	VOA Vial, Clear, 40 mL, HCL		
21B0160-04 H	VOA Vial, Clear, 40 mL, HCL		
21B0160-04 I	VOA Vial, Clear, 40 mL, HCL		
21B0160-04 J	VOA Vial, Clear, 40 mL, HCL		

① Filtered at 0.45 µm and preserved to pH < 2.0 with 0.75 ml Conc. HNO₃ (I10976),
ML
2/11/21



WORK ORDER

21B0160

Client: Shannon & Wilson, Inc

Project Manager: Amanda Volgardsen Johnson

Project: Lower Duwamish

Project Number: 21-1-12596

21B0160-05 A	HDPE NM, 500 mL, 1:1 HNO ₃	< 2	Pass
21B0160-05 B	Glass NM, Amber, 500 mL		
21B0160-05 C	Glass NM, Amber, 500 mL		
21B0160-05 D	Glass NM, Amber, 500 mL		
21B0160-05 E	Glass NM, Amber, 500 mL		
21B0160-05 F	Glass NM, Amber, 500 mL		
21B0160-05 G	Glass NM, Amber, 500 mL		
21B0160-05 H	VOA Vial, Clear, 40 mL, HCL		
21B0160-05 I	VOA Vial, Clear, 40 mL, HCL		
21B0160-05 J	VOA Vial, Clear, 40 mL, HCL		
21B0160-05 K	VOA Vial, Clear, 40 mL, HCL		
21B0160-06 A	HDPE NM, 500 mL	> 2	Fail ①
21B0160-07 A	HDPE NM, 500 mL, 1:1 HNO ₃	< 2	Pass
21B0160-07 B	Glass NM, Amber, 500 mL		
21B0160-07 C	Glass NM, Amber, 500 mL		
21B0160-07 D	Glass NM, Amber, 500 mL		
21B0160-07 E	Glass NM, Amber, 500 mL		
21B0160-07 F	Glass NM, Amber, 500 mL		
21B0160-07 G	Glass NM, Amber, 500 mL		
21B0160-07 H	VOA Vial, Clear, 40 mL, HCL		
21B0160-07 I	VOA Vial, Clear, 40 mL, HCL		
21B0160-07 J	VOA Vial, Clear, 40 mL, HCL		
21B0160-07 K	VOA Vial, Clear, 40 mL, HCL		
21B0160-08 A	HDPE NM, 500 mL	> 2	Fail ①
21B0160-09 A	HDPE NM, 500 mL, 1:1 HNO ₃	< 2	Pass
21B0160-09 B	Glass NM, Amber, 500 mL		
21B0160-09 C	Glass NM, Amber, 500 mL		
21B0160-09 D	Glass NM, Amber, 500 mL		
21B0160-09 E	Glass NM, Amber, 500 mL		
21B0160-09 F	VOA Vial, Clear, 40 mL, HCL		
21B0160-09 G	VOA Vial, Clear, 40 mL, HCL		
21B0160-09 H	VOA Vial, Clear, 40 mL, HCL		
21B0160-09 I	VOA Vial, Clear, 40 mL, HCL		
21B0160-09 J	VOA Vial, Clear, 40 mL, HCL		
21B0160-09 K	VOA Vial, Clear, 40 mL, HCL		
21B0160-09 L	Small OJ, 500 mL, EDTA	Lab to check pH	
21B0160-09 M	Glass NM, Amber, 250 mL, 2 mL HCl	Lab to check pH	

① Filtered at 0.45 um and preserved to pH < 2.0 with 0.75 ml conc. HNO₃ (110976)
2/11/21



WORK ORDER

21B0160

Client: Shannon & Wilson, Inc

Project Manager: Amanda Volgardsen Johnson

Project: Lower Duwamish

Project Number: 21-1-12596

21B0160-10 A HDPE NM, 500 mL

> 2

Fail

21B0160-10 B HDPE NM, 500 mL

> 2

Fail ①

SC

Preservation Confirmed By

2/11/21

Date

① Filtered at 0.45 um and
preserved to pH < 2.0 with 0.75 ml
Conc. HNO₃ (#10976). ml 2/11/21



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

TB-1-20211002
21B0160-01 (Water)

Volatile Organic Compounds

Method: EPA 8260D
Instrument: NT2 Analyst: PKC

Sampled: 02/10/2021 14:34

Analyzed: 02/22/2021 12:06

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) Sample Size: 10 mL
Preparation Batch: BJB0615 Final Volume: 10 mL
Prepared: 02/22/2021 Extract ID: 21B0160-01 A

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4				80-129 %	107	%	
Surrogate: Toluene-d8				80-120 %	98.4	%	
Surrogate: 4-Bromofluorobenzene				80-120 %	96.7	%	
Surrogate: 1,2-Dichlorobenzene-d4				80-120 %	99.7	%	

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Analytical Resources, Incorporated
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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

TB-1-20211002
21B0160-01 (Water)

Volatile Organic Compounds

Method: NWTPHg	Sampled: 02/10/2021 14:34
Instrument: NT2 Analyst: PKC	Analyzed: 02/22/2021 12:06
Sample Preparation:	Extract ID: 21B0160-01 A
Preparation Method: EPA 5030C (Purge and Trap)	
Preparation Batch: BJB0615	Sample Size: 10 mL
Prepared: 02/22/2021	Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)	GRO	1	100	ND	ug/L	U
Surrogate: Toluene-d8			80-120 %	98.4	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	96.7	%	

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 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 02-Aug-2021 10:48

MW-66-20211002
21B0160-02 (Water)
Volatile Organic Compounds

Method: EPA 8260D

Sampled: 02/10/2021 09:30

Instrument: NT2 Analyst: PKC

Analyzed: 02/22/2021 13:48

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21B0160-02 O

Preparation Batch: BJB0615

Sample Size: 10 mL

Prepared: 02/22/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	0.09	ug/L	J
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	112	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	99.0	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				80-120 %	95.9	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				80-120 %	101	%	



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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-66-20211002

21B0160-02 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 02/10/2021 09:30

Instrument: NT16 Analyst: PB

Analyzed: 02/22/2021 16:48

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21B0160-02 R

Preparation Batch: BJB0621

Sample Size: 10 mL

Prepared: 02/22/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	ND	ng/L	U
Surrogate: 1,2-Dichloroethane-d4				80-129 %	121	%	
Surrogate: Toluene-d8				80-120 %	91.9	%	
Surrogate: 4-Bromofluorobenzene				75-125 %	103	%	

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 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 02-Aug-2021 10:48

MW-66-20211002
21B0160-02 (Water)
Semivolatile Organic Compounds - SIM

 Method: EPA 8270E-SIM
 Instrument: NT11 Analyst: VTS
 Sampled: 02/10/2021 09:30
 Analyzed: 03/11/2021 01:10

 Sample Preparation: Preparation Method: EPA 3510C SepF
 Preparation Batch: BJB0449 Sample Size: 500 mL
 Prepared: 02/15/2021 Final Volume: 0.5 mL
 Extract ID: 21B0160-02 F 01

 Sample Cleanup: Cleanup Method: Silica Gel
 Cleanup Batch: CJC0072 Initial Volume: 0.5 mL
 Cleaned: 08-Mar-2021 Final Volume: 0.5 mL
 Extract ID: 21B0160-02 F 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.001	0.010	0.006	ug/L	J
2-Methylnaphthalene	91-57-6	1	0.001	0.010	0.005	ug/L	J
1-Methylnaphthalene	90-12-0	1	0.0009	0.010	0.003	ug/L	J
Acenaphthylene	208-96-8	1	0.002	0.010	ND	ug/L	U
Acenaphthene	83-32-9	1	0.003	0.010	ND	ug/L	U
Dibenzofuran	132-64-9	1	0.002	0.010	0.002	ug/L	J
Fluorene	86-73-7	1	0.002	0.010	ND	ug/L	U
Phenanthrene	85-01-8	1	0.001	0.010	0.002	ug/L	J
Anthracene	120-12-7	1	0.001	0.010	ND	ug/L	U
Carbazole	86-74-8	1	0.001	0.010	ND	ug/L	U
Fluoranthene	206-44-0	1	0.002	0.010	ND	ug/L	U
Pyrene	129-00-0	1	0.001	0.010	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	0.0008	0.010	ND	ug/L	U
Chrysene	218-01-9	1	0.0009	0.010	ND	ug/L	U
Benzo(b)fluoranthene	205-99-2	1	0.0005	0.010	ND	ug/L	U
Benzo(k)fluoranthene	207-08-9	1	0.003	0.010	ND	ug/L	U
Benzo(j)fluoranthene	205-82-3	1	0.002	0.010	ND	ug/L	U
Benzofluoranthenes, Total		1	0.004	0.010	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.002	0.010	ND	ug/L	U
Perylene	1985-5-0	1	0.006	0.010	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.001	0.010	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.001	0.010	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.001	0.010	ND	ug/L	U
Surrogate: 2-Methylnaphthalene-d10					42-120 %	71.9 %	
Surrogate: Dibenzo[a,h]anthracene-d14					29-120 %	43.3 %	
Surrogate: Fluoranthene-d10					57-120 %	75.0 %	



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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-66-20211002

21B0160-02 (Water)

Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 02/10/2021 09:30

Instrument: FID4 Analyst: CTO

Analyzed: 02/19/2021 23:25

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21B0160-02 C 01

Preparation Batch: BJB0444

Sample Size: 500 mL

Prepared: 02/15/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.100	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	0.200	ND	mg/L	U
Surrogate: o-Terphenyl			50-150 %	111	%	

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 Shannon & Wilson, Inc
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 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 02-Aug-2021 10:48

MW-66-20211002
21B0160-02 (Water)
Aroclor PCB

Method: EPA 8082A			Sampled: 02/10/2021 09:30
Instrument: ECD7 Analyst: JGR			Analyzed: 03/12/2021 09:25
Sample Preparation:	Preparation Method: EPA 3510C SepF		Extract ID: 21B0160-02 I 01
	Preparation Batch: BJB0451		
	Prepared: 02/15/2021		
	Sample Size: 425 mL		
	Final Volume: 1 mL		
Sample Cleanup:	Cleanup Method: Silica Gel		Extract ID: 21B0160-02 I 01
	Cleanup Batch: CJC0080		
	Cleaned: 08-Mar-2021		
	Initial Volume: 1 mL		
	Final Volume: 1 mL		
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:21B0160-02 I 01
	Cleanup Batch: CJC0078		
	Cleaned: 08-Mar-2021		
	Initial Volume: 1 mL		
	Final Volume: 1 mL		
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:21B0160-02 I 01
	Cleanup Batch: CJC0079		
	Cleaned: 08-Mar-2021		
	Initial Volume: 1 mL		
	Final Volume: 1 mL		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	0.021	0.118	ND	ug/L	U
Aroclor 1221	11104-28-2	1	0.021	0.118	ND	ug/L	U
Aroclor 1232	11141-16-5	1	0.021	0.118	ND	ug/L	U
Aroclor 1242	53469-21-9	1	0.021	0.118	ND	ug/L	U
Aroclor 1248	12672-29-6	1	0.021	0.118	ND	ug/L	U
Aroclor 1254	11097-69-1	1	0.021	0.118	ND	ug/L	U
Aroclor 1260	11096-82-5	1	0.020	0.118	ND	ug/L	U
Surrogate: Decachlorobiphenyl				26-120 %	54.0	%	
Surrogate: Tetrachlorometaxylene				39-120 %	49.4	%	
Surrogate: Decachlorobiphenyl [2C]				26-120 %	51.9	%	
Surrogate: Tetrachlorometaxylene [2C]				39-120 %	42.0	%	



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Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-66-20211002

21B0160-02 (Water)

Metals and Metallic Compounds

Method: EPA 6020B
Instrument: ICPMS1 Analyst: MCB

Sampled: 02/10/2021 09:30

Analyzed: 02/19/2021 19:46

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BJB0514 Sample Size: 25 mL
Prepared: 02/17/2021 Final Volume: 25 mL

Extract ID: 21B0160-02 A 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	2	12.5	40.0	16700	ug/L	D

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/19/2021 03:46

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BJB0514 Sample Size: 25 mL
Prepared: 02/17/2021 Final Volume: 25 mL

Extract ID: 21B0160-02 A 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium	7440-39-3	1	0.0560	0.500	3.56	ug/L	
Chromium	7440-47-3	2	0.260	1.00	ND	ug/L	U
Cobalt	7440-48-4	1	0.0290	0.200	0.348	ug/L	
Lead	7439-92-1	1	0.0680	0.100	ND	ug/L	U
Manganese	7439-96-5	2	0.170	1.00	424	ug/L	D
Silver	7440-22-4	1	0.0170	0.200	ND	ug/L	U
Vanadium	7440-62-2	2	0.0800	0.400	1.14	ug/L	D

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-66-20211002

21B0160-02 (Water)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 02/10/2021 09:30

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/19/2021 03:46

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21B0160-02 A 01

Preparation Batch: BJB0514

Sample Size: 25 mL

Prepared: 02/17/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0220	0.200	3.68	ug/L	
Cadmium	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Copper	7440-50-8	1	0.340	0.500	ND	ug/L	U
Nickel	7440-02-0	1	0.0500	0.500	0.927	ug/L	
Zinc	7440-66-6	1	0.820	4.00	7.31	ug/L	

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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-66-20211002
21B0160-02RE1 (Water)

Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 02/10/2021 09:30

Instrument: HYDRA Analyst: BLC

Analyzed: 02/25/2021 11:36

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21B0160-02RE1 A

Preparation Batch: BJB0616

Sample Size: 20 mL

Prepared: 02/12/2021

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.000013	0.000100	ND	mg/L	U

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-66-20211002

21B0160-03 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B	Sampled: 02/10/2021 09:30
Instrument: ICPMS2 Analyst: MCB	Analyzed: 02/23/2021 18:28
Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
	Preparation Batch: BJB0603
	Sample Size: 25 mL
	Final Volume: 25 mL
	Extract ID: 21B0160-03 B 02
	Filtration Batch: BJB0360
	Filtration Date: 02/11/2021 09:50

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.0560	0.500	0.937	ug/L	
Chromium, Dissolved	7440-47-3	1	0.130	0.500	0.147	ug/L	J
Cobalt, Dissolved	7440-48-4	1	0.0290	0.200	0.338	ug/L	
Iron, Dissolved	7439-89-6	1	6.27	20.0	12300	ug/L	
Lead, Dissolved	7439-92-1	1	0.0680	0.100	ND	ug/L	U
Manganese, Dissolved	7439-96-5	5	0.425	2.50	335	ug/L	B, D
Silver, Dissolved	7440-22-4	1	0.0170	0.200	ND	ug/L	U
Vanadium, Dissolved	7440-62-2	1	0.0400	0.200	0.355	ug/L	

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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-66-20211002

21B0160-03 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 02/10/2021 09:30

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/23/2021 18:28

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21B0160-03 B 02

Preparation Batch: BJB0603

Sample Size: 25 mL

Filtration Batch: BJB0360

Prepared: 02/22/2021

Final Volume: 25 mL

Filtration Date: 02/11/2021 09:50

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	2.61	ug/L	
Cadmium, Dissolved	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Copper, Dissolved	7440-50-8	1	0.340	0.500	ND	ug/L	U
Nickel, Dissolved	7440-02-0	1	0.0500	0.500	0.813	ug/L	
Selenium, Dissolved	7782-49-2	1	0.440	0.500	ND	ug/L	U
Zinc, Dissolved	7440-66-6	1	0.820	4.00	8.57	ug/L	

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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-66-20211002

21B0160-03 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 7470A				Sampled: 02/10/2021 09:30			
Instrument: HYDRA Analyst: BLC				Analyzed: 02/19/2021 14:54			
Sample Preparation:	Preparation Method: TWM EPA 7470A			Extract ID: 21B0160-03 B 01			
	Preparation Batch: BJB0544			Filtration Batch: BJB0360			
	Prepared: 02/18/2021			Filtration Date: 02/11/2021 09:50			
	Sample Size: 20 mL						
	Final Volume: 20 mL						
Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury, Dissolved	7439-97-6	1	0.000013	0.000100	ND	mg/L	U

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Analytical Report

Shannon & Wilson, Inc
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Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-51-20211002

21B0160-04 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 02/10/2021 11:36

Instrument: NT2 Analyst: PKC

Analyzed: 02/22/2021 14:08

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21B0160-04 G

Preparation Batch: BJB0615

Sample Size: 10 mL

Prepared: 02/22/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	0.84	ug/L	
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	0.46	ug/L	
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4				80-129 %	109	%	
Surrogate: Toluene-d8				80-120 %	99.4	%	
Surrogate: 4-Bromofluorobenzene				80-120 %	94.3	%	
Surrogate: 1,2-Dichlorobenzene-d4				80-120 %	101	%	

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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-51-20211002

21B0160-04 (Water)

Volatile Organic Compounds

Method: NWTPHg

Sampled: 02/10/2021 11:36

Instrument: NT2 Analyst: PKC

Analyzed: 02/22/2021 14:08

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21B0160-04 G

Preparation Batch: BJB0615

Sample Size: 10 mL

Prepared: 02/22/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)	GRO	1	100	ND	ug/L	U
Surrogate: Toluene-d8			80-120 %	99.4	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	94.3	%	

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Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-51-20211002

21B0160-04 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 02/10/2021 11:36

Instrument: NT16 Analyst: PB

Analyzed: 02/22/2021 17:08

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21B0160-04 H

Preparation Batch: BJB0621

Sample Size: 10 mL

Prepared: 02/22/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	569	ng/L	
Surrogate: 1,2-Dichloroethane-d4				80-129 %	122	%	
Surrogate: Toluene-d8				80-120 %	91.6	%	
Surrogate: 4-Bromofluorobenzene				75-125 %	104	%	

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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-51-20211002

21B0160-04 (Water)

Semivolatile Organic Compounds

Method: EPA 8270E

Sampled: 02/10/2021 11:36

Instrument: NT10 Analyst: VTS

Analyzed: 02/25/2021 18:51

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21B0160-04 C 01

Preparation Batch: BJB0460

Sample Size: 955 mL

Prepared: 02/17/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	0.01	0.2	ND	ug/L	U
bis(2-chloroethyl) ether	111-44-4	1	0.03	0.2	ND	ug/L	U
2-Chlorophenol	95-57-8	1	0.03	0.2	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.03	0.2	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.03	0.2	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.03	0.2	ND	ug/L	U
Benzyl Alcohol	100-51-6	1	0.02	0.2	ND	ug/L	U
2,2'-Oxybis(1-chloropropane)	108-60-1	1	0.03	0.2	ND	ug/L	U
2-Methylphenol	95-48-7	1	0.03	0.2	ND	ug/L	U
Hexachloroethane	67-72-1	1	0.04	0.2	ND	ug/L	U
N-Nitroso-di-n-Propylamine	621-64-7	1	0.04	0.2	ND	ug/L	U
4-Methylphenol	106-44-5	1	0.03	0.2	ND	ug/L	U
Nitrobenzene	98-95-3	1	0.03	0.2	ND	ug/L	U
Isophorone	78-59-1	1	0.03	0.2	ND	ug/L	U
2-Nitrophenol	88-75-5	1	0.04	1.0	ND	ug/L	U
2,4-Dimethylphenol	105-67-9	1	0.3	1.0	ND	ug/L	U
Bis(2-Chloroethoxy)methane	111-91-1	1	0.03	0.2	ND	ug/L	U
2,4-Dichlorophenol	120-83-2	1	0.1	1.0	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.03	0.2	ND	ug/L	U
Naphthalene	91-20-3	1	0.03	0.2	ND	ug/L	U
Benzoic acid	65-85-0	1	0.1	2.1	0.3	ug/L	J
4-Chloroaniline	106-47-8	1	0.04	1.0	ND	ug/L	U
Hexachlorobutadiene	87-68-3	1	0.04	0.2	ND	ug/L	U
4-Chloro-3-Methylphenol	59-50-7	1	0.1	1.0	ND	ug/L	U
2-Methylnaphthalene	91-57-6	1	0.03	0.2	ND	ug/L	U
Hexachlorocyclopentadiene	77-47-4	1	0.1	1.0	ND	ug/L	U
2,4,6-Trichlorophenol	88-06-2	1	0.2	1.0	ND	ug/L	U
2,4,5-Trichlorophenol	95-95-4	1	0.1	1.0	ND	ug/L	U
2-Chloronaphthalene	91-58-7	1	0.03	0.2	ND	ug/L	U
2-Nitroaniline	88-74-4	1	0.2	1.0	ND	ug/L	U
Acenaphthylene	208-96-8	1	0.02	0.2	ND	ug/L	U
Dimethylphthalate	131-11-3	1	0.04	0.2	ND	ug/L	U
2,6-Dinitrotoluene	606-20-2	1	0.2	1.0	ND	ug/L	U
Acenaphthene	83-32-9	1	0.03	0.2	ND	ug/L	U
3-Nitroaniline	99-09-2	1	0.2	1.0	ND	ug/L	U

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-51-20211002

21B0160-04 (Water)

Semivolatile Organic Compounds

Method: EPA 8270E

Sampled: 02/10/2021 11:36

Instrument: NT10 Analyst: VTS

Analyzed: 02/25/2021 18:51

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
2,4-Dinitrophenol	51-28-5	1	0.2	2.1	ND	ug/L	U
Dibenzofuran	132-64-9	1	0.02	0.2	ND	ug/L	U
4-Nitrophenol	100-02-7	1	0.06	1.0	ND	ug/L	U
2,4-Dinitrotoluene	121-14-2	1	0.1	1.0	ND	ug/L	U
Fluorene	86-73-7	1	0.02	0.2	ND	ug/L	U
4-Chlorophenylphenyl ether	7005-72-3	1	0.02	0.2	ND	ug/L	U
Diethyl phthalate	84-66-2	1	0.06	0.2	0.09	ug/L	J
4-Nitroaniline	100-01-6	1	0.2	1.0	ND	ug/L	U
4,6-Dinitro-2-methylphenol	534-52-1	1	0.4	2.1	ND	ug/L	U
N-Nitrosodiphenylamine	86-30-6	1	0.03	0.2	ND	ug/L	U
4-Bromophenyl phenyl ether	101-55-3	1	0.02	0.2	ND	ug/L	U
Hexachlorobenzene	118-74-1	1	0.04	0.2	ND	ug/L	U
Pentachlorophenol	87-86-5	1	0.1	1.0	ND	ug/L	U
Phenanthrene	85-01-8	1	0.02	0.2	ND	ug/L	U
Anthracene	120-12-7	1	0.03	0.2	ND	ug/L	U
Carbazole	86-74-8	1	0.04	0.2	ND	ug/L	U
Di-n-Butylphthalate	84-74-2	1	0.05	0.2	ND	ug/L	U
Fluoranthene	206-44-0	1	0.03	0.2	ND	ug/L	U
Pyrene	129-00-0	1	0.03	0.2	ND	ug/L	U
Butylbenzylphthalate	85-68-7	1	0.07	0.2	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	0.04	0.2	ND	ug/L	U
3,3'-Dichlorobenzidine	91-94-1	1	0.4	1.0	ND	ug/L	U
Chrysene	218-01-9	1	0.04	0.2	ND	ug/L	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	0.2	0.2	ND	ug/L	U
Di-n-Octylphthalate	117-84-0	1	0.05	0.2	ND	ug/L	U
Benzo(a)fluoranthene, Total		1	0.08	0.4	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.05	0.2	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.06	0.2	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.07	0.2	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.04	0.2	ND	ug/L	U
1-Methylnaphthalene	90-12-0	1	0.03	0.2	ND	ug/L	U
<i>Surrogate: 2-Fluorophenol</i>					30-160 %	51.3 %	
<i>Surrogate: Phenol-d5</i>					30-160 %	32.1 %	
<i>Surrogate: 2-Chlorophenol-d4</i>					30-160 %	88.5 %	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>					30-160 %	69.1 %	
<i>Surrogate: Nitrobenzene-d5</i>					30-160 %	82.3 %	
<i>Surrogate: 2-Fluorobiphenyl</i>					30-160 %	78.8 %	
<i>Surrogate: 2,4,6-Tribromophenol</i>					30-160 %	93.1 %	

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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-51-20211002

21B0160-04 (Water)

Semivolatile Organic Compounds

Method: EPA 8270E

Sampled: 02/10/2021 11:36

Instrument: NT10 Analyst: VTS

Analyzed: 02/25/2021 18:51

Analyte	CAS Number	Recovery	Recovery	Units	Notes
		Limits			
Surrogate: p-Terphenyl-d14		30-160 %	54.0	%	

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 Shannon & Wilson, Inc
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 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 02-Aug-2021 10:48

MW-51-20211002
21B0160-04 (Water)
Aroclor PCB

Method: EPA 8082A			Sampled: 02/10/2021 11:36
Instrument: ECD7 Analyst: JGR			Analyzed: 03/12/2021 10:27
Sample Preparation:	Preparation Method: EPA 3510C SepF		Extract ID: 21B0160-04 A 01
	Preparation Batch: BJB0451		
	Prepared: 02/15/2021		
Sample Cleanup:	Sample Size: 500 mL		Extract ID: 21B0160-04 A 01
	Final Volume: 1 mL		
	Cleanup Method: Silica Gel		
Sample Cleanup:	Cleanup Batch: CJC0080		Extract ID: 21B0160-04 A 01
	Cleaned: 08-Mar-2021		
	Initial Volume: 1 mL		
Sample Cleanup:	Final Volume: 1 mL		Extract ID: 21B0160-04 A 01
	Cleanup Method: Sulfuric Acid		
	Cleanup Batch: CJC0078		
Sample Cleanup:	Cleaned: 08-Mar-2021		Extract ID: 21B0160-04 A 01
	Initial Volume: 1 mL		
	Final Volume: 1 mL		
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID: 21B0160-04 A 01
	Cleanup Batch: CJC0079		
	Cleaned: 08-Mar-2021		
Sample Cleanup:	Initial Volume: 1 mL		Extract ID: 21B0160-04 A 01
	Final Volume: 1 mL		
	Cleanup Method: Sulfuric Acid		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	0.018	0.100	ND	ug/L	U
Aroclor 1221	11104-28-2	1	0.018	0.100	ND	ug/L	U
Aroclor 1232	11141-16-5	1	0.018	0.100	ND	ug/L	U
Aroclor 1242	53469-21-9	1	0.018	0.100	ND	ug/L	U
Aroclor 1248	12672-29-6	1	0.018	0.100	ND	ug/L	U
Aroclor 1254	11097-69-1	1	0.018	0.100	ND	ug/L	U
Aroclor 1260	11096-82-5	1	0.017	0.100	ND	ug/L	U
<i>Surrogate: Decachlorobiphenyl</i>				26-120 %	35.5	%	
<i>Surrogate: Tetrachlorometaxylene</i>				39-120 %	36.4	%	*
<i>Surrogate: Decachlorobiphenyl [2C]</i>				26-120 %	34.8	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				39-120 %	31.7	%	*



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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-76-20211002

21B0160-05 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 02/10/2021 12:59

Instrument: NT2 Analyst: PKC

Analyzed: 02/22/2021 14:28

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21B0160-05 H

Preparation Batch: BJB0615

Sample Size: 10 mL

Prepared: 02/22/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4				80-129 %	109	%	
Surrogate: Toluene-d8				80-120 %	100	%	
Surrogate: 4-Bromofluorobenzene				80-120 %	94.2	%	
Surrogate: 1,2-Dichlorobenzene-d4				80-120 %	100	%	

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-76-20211002

21B0160-05 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 02/10/2021 12:59

Instrument: NT16 Analyst: PB

Analyzed: 02/22/2021 17:28

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21B0160-05 J

Preparation Batch: BJB0621

Sample Size: 10 mL

Prepared: 02/22/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	ND	ng/L	U
Surrogate: 1,2-Dichloroethane-d4				80-129 %	106	%	
Surrogate: Toluene-d8				80-120 %	90.5	%	
Surrogate: 4-Bromofluorobenzene				75-125 %	102	%	

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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-76-20211002

21B0160-05 (Water)

Semivolatile Organic Compounds

Method: EPA 8270E

Sampled: 02/10/2021 12:59

Instrument: NT10 Analyst: VTS

Analyzed: 02/25/2021 19:28

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21B0160-05 F 01

Preparation Batch: BJB0460

Sample Size: 950 mL

Prepared: 02/17/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	0.01	0.2	ND	ug/L	U
bis(2-chloroethyl) ether	111-44-4	1	0.03	0.2	ND	ug/L	U
2-Chlorophenol	95-57-8	1	0.03	0.2	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.03	0.2	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.03	0.2	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.03	0.2	ND	ug/L	U
Benzyl Alcohol	100-51-6	1	0.02	0.2	ND	ug/L	U
2,2'-Oxybis(1-chloropropane)	108-60-1	1	0.03	0.2	ND	ug/L	U
2-Methylphenol	95-48-7	1	0.03	0.2	ND	ug/L	U
Hexachloroethane	67-72-1	1	0.04	0.2	ND	ug/L	U
N-Nitroso-di-n-Propylamine	621-64-7	1	0.04	0.2	ND	ug/L	U
4-Methylphenol	106-44-5	1	0.03	0.2	ND	ug/L	U
Nitrobenzene	98-95-3	1	0.03	0.2	ND	ug/L	U
Isophorone	78-59-1	1	0.03	0.2	ND	ug/L	U
2-Nitrophenol	88-75-5	1	0.04	1.1	ND	ug/L	U
2,4-Dimethylphenol	105-67-9	1	0.3	1.1	ND	ug/L	U
Bis(2-Chloroethoxy)methane	111-91-1	1	0.03	0.2	ND	ug/L	U
2,4-Dichlorophenol	120-83-2	1	0.1	1.1	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.03	0.2	ND	ug/L	U
Naphthalene	91-20-3	1	0.03	0.2	ND	ug/L	U
Benzoic acid	65-85-0	1	0.1	2.1	ND	ug/L	U
4-Chloroaniline	106-47-8	1	0.04	1.1	ND	ug/L	U
Hexachlorobutadiene	87-68-3	1	0.04	0.2	ND	ug/L	U
4-Chloro-3-Methylphenol	59-50-7	1	0.1	1.1	ND	ug/L	U
2-Methylnaphthalene	91-57-6	1	0.03	0.2	ND	ug/L	U
Hexachlorocyclopentadiene	77-47-4	1	0.1	1.1	ND	ug/L	U
2,4,6-Trichlorophenol	88-06-2	1	0.2	1.1	ND	ug/L	U
2,4,5-Trichlorophenol	95-95-4	1	0.1	1.1	ND	ug/L	U
2-Chloronaphthalene	91-58-7	1	0.03	0.2	ND	ug/L	U
2-Nitroaniline	88-74-4	1	0.2	1.1	ND	ug/L	U
Acenaphthylene	208-96-8	1	0.02	0.2	ND	ug/L	U
Dimethylphthalate	131-11-3	1	0.04	0.2	ND	ug/L	U
2,6-Dinitrotoluene	606-20-2	1	0.2	1.1	ND	ug/L	U
Acenaphthene	83-32-9	1	0.03	0.2	0.4	ug/L	
3-Nitroaniline	99-09-2	1	0.2	1.1	ND	ug/L	U

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-76-20211002

21B0160-05 (Water)

Semivolatile Organic Compounds

Method: EPA 8270E

Sampled: 02/10/2021 12:59

Instrument: NT10 Analyst: VTS

Analyzed: 02/25/2021 19:28

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
2,4-Dinitrophenol	51-28-5	1	0.2	2.1	ND	ug/L	U
Dibenzofuran	132-64-9	1	0.02	0.2	ND	ug/L	U
4-Nitrophenol	100-02-7	1	0.06	1.1	ND	ug/L	U
2,4-Dinitrotoluene	121-14-2	1	0.1	1.1	ND	ug/L	U
Fluorene	86-73-7	1	0.02	0.2	ND	ug/L	U
4-Chlorophenylphenyl ether	7005-72-3	1	0.02	0.2	ND	ug/L	U
Diethyl phthalate	84-66-2	1	0.06	0.2	0.2	ug/L	J
4-Nitroaniline	100-01-6	1	0.2	1.1	ND	ug/L	U
4,6-Dinitro-2-methylphenol	534-52-1	1	0.4	2.1	ND	ug/L	U
N-Nitrosodiphenylamine	86-30-6	1	0.03	0.2	ND	ug/L	U
4-Bromophenyl phenyl ether	101-55-3	1	0.02	0.2	ND	ug/L	U
Hexachlorobenzene	118-74-1	1	0.04	0.2	ND	ug/L	U
Pentachlorophenol	87-86-5	1	0.1	1.1	ND	ug/L	U
Phenanthrene	85-01-8	1	0.02	0.2	0.4	ug/L	
Anthracene	120-12-7	1	0.03	0.2	ND	ug/L	U
Carbazole	86-74-8	1	0.04	0.2	ND	ug/L	U
Di-n-Butylphthalate	84-74-2	1	0.05	0.2	ND	ug/L	U
Fluoranthene	206-44-0	1	0.03	0.2	ND	ug/L	U
Pyrene	129-00-0	1	0.03	0.2	ND	ug/L	U
Butylbenzylphthalate	85-68-7	1	0.07	0.2	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	0.04	0.2	ND	ug/L	U
3,3'-Dichlorobenzidine	91-94-1	1	0.4	1.1	ND	ug/L	U
Chrysene	218-01-9	1	0.04	0.2	ND	ug/L	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	0.2	0.2	ND	ug/L	U
Di-n-Octylphthalate	117-84-0	1	0.05	0.2	ND	ug/L	U
Benzo(a)fluoranthene, Total		1	0.08	0.4	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.05	0.2	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.06	0.2	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.07	0.2	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.04	0.2	ND	ug/L	U
1-Methylnaphthalene	90-12-0	1	0.03	0.2	ND	ug/L	U
Surrogate: 2-Fluorophenol				30-160 %	51.3	%	
Surrogate: Phenol-d5				30-160 %	30.7	%	
Surrogate: 2-Chlorophenol-d4				30-160 %	85.4	%	
Surrogate: 1,2-Dichlorobenzene-d4				30-160 %	67.7	%	
Surrogate: Nitrobenzene-d5				30-160 %	79.1	%	
Surrogate: 2-Fluorobiphenyl				30-160 %	88.9	%	
Surrogate: 2,4,6-Tribromophenol				30-160 %	108	%	

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-76-20211002

21B0160-05 (Water)

Semivolatile Organic Compounds

Method: EPA 8270E

Sampled: 02/10/2021 12:59

Instrument: NT10 Analyst: VTS

Analyzed: 02/25/2021 19:28

Analyte	CAS Number	Recovery	Recovery	Units	Notes
		Limits			
Surrogate: p-Terphenyl-d14		30-160 %	67.8	%	

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 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 02-Aug-2021 10:48

MW-76-20211002
21B0160-05 (Water)
Semivolatile Organic Compounds - SIM

 Method: EPA 8270E-SIM
 Instrument: NT11 Analyst: VTS
 Sampled: 02/10/2021 12:59
 Analyzed: 03/11/2021 02:47

 Sample Preparation: Preparation Method: EPA 3510C SepF
 Preparation Batch: BJB0449 Sample Size: 500 mL
 Prepared: 02/15/2021 Final Volume: 0.5 mL
 Extract ID: 21B0160-05 D 01

 Sample Cleanup: Cleanup Method: Silica Gel
 Cleanup Batch: CJC0072 Initial Volume: 0.5 mL
 Cleaned: 08-Mar-2021 Final Volume: 0.5 mL
 Extract ID: 21B0160-05 D 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.001	0.010	0.004	ug/L	J
2-Methylnaphthalene	91-57-6	1	0.001	0.010	0.002	ug/L	J
1-Methylnaphthalene	90-12-0	1	0.0009	0.010	0.002	ug/L	J
Acenaphthylene	208-96-8	1	0.002	0.010	0.002	ug/L	J
Acenaphthene	83-32-9	1	0.003	0.010	0.353	ug/L	
Dibenzofuran	132-64-9	1	0.002	0.010	0.002	ug/L	J
Fluorene	86-73-7	1	0.002	0.010	0.015	ug/L	
Phenanthrene	85-01-8	1	0.001	0.010	0.304	ug/L	
Anthracene	120-12-7	1	0.001	0.010	0.012	ug/L	
Carbazole	86-74-8	1	0.001	0.010	ND	ug/L	U
Fluoranthene	206-44-0	1	0.002	0.010	0.012	ug/L	
Pyrene	129-00-0	1	0.001	0.010	0.005	ug/L	J
Benzo(a)anthracene	56-55-3	1	0.0008	0.010	ND	ug/L	U
Chrysene	218-01-9	1	0.0009	0.010	ND	ug/L	U
Benzo(b)fluoranthene	205-99-2	1	0.0005	0.010	ND	ug/L	U
Benzo(k)fluoranthene	207-08-9	1	0.003	0.010	ND	ug/L	U
Benzo(j)fluoranthene	205-82-3	1	0.002	0.010	ND	ug/L	U
Benzofluoranthenes, Total		1	0.004	0.010	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.002	0.010	ND	ug/L	U
Perylene	1985-5-0	1	0.006	0.010	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.001	0.010	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.001	0.010	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.001	0.010	ND	ug/L	U
Surrogate: 2-Methylnaphthalene-d10					42-120 %	71.5 %	
Surrogate: Dibenzo[a,h]anthracene-d14					29-120 %	46.5 %	
Surrogate: Fluoranthene-d10					57-120 %	74.8 %	



Analytical Resources, Incorporated
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Analytical Report

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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-76-20211002

21B0160-05 (Water)

Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 02/10/2021 12:59

Instrument: FID4 Analyst: CTO

Analyzed: 02/19/2021 23:46

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21B0160-05 B 01

Preparation Batch: BJB0444

Sample Size: 500 mL

Prepared: 02/15/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.100	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	0.200	ND	mg/L	U
Surrogate: o-Terphenyl			50-150 %	110	%	

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Analytical Resources, Incorporated
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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-76-20211002

21B0160-05 (Water)

Metals and Metallic Compounds

Method: EPA 6020B
Instrument: ICPMS1 Analyst: MCB

Sampled: 02/10/2021 12:59

Analyzed: 02/19/2021 19:35

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix
Preparation Batch: BJB0514 Sample Size: 25 mL
Prepared: 02/17/2021 Final Volume: 25 mL

Extract ID: 21B0160-05 A 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	2	12.5	40.0	15500	ug/L	D
Manganese	7439-96-5	5	0.425	2.50	641	ug/L	D

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/19/2021 03:32

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix
Preparation Batch: BJB0514 Sample Size: 25 mL
Prepared: 02/17/2021 Final Volume: 25 mL

Extract ID: 21B0160-05 A 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium	7440-39-3	1	0.0560	0.500	1.93	ug/L	
Chromium	7440-47-3	2	0.260	1.00	ND	ug/L	U
Cobalt	7440-48-4	1	0.0290	0.200	0.140	ug/L	J
Lead	7439-92-1	1	0.0680	0.100	ND	ug/L	U
Silver	7440-22-4	1	0.0170	0.200	ND	ug/L	U
Vanadium	7440-62-2	2	0.0800	0.400	0.844	ug/L	D

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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-76-20211002

21B0160-05 (Water)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 02/10/2021 12:59

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/19/2021 03:32

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21B0160-05 A 01

Preparation Batch: BJB0514

Sample Size: 25 mL

Prepared: 02/17/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0220	0.200	0.510	ug/L	
Cadmium	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Copper	7440-50-8	1	0.340	0.500	ND	ug/L	U
Nickel	7440-02-0	1	0.0500	0.500	0.101	ug/L	J
Selenium	7782-49-2	1	0.440	0.500	ND	ug/L	U
Zinc	7440-66-6	1	0.820	4.00	ND	ug/L	U

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Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-76-20211002
21B0160-05RE1 (Water)

Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 02/10/2021 12:59

Instrument: HYDRA Analyst: BLC

Analyzed: 02/25/2021 11:46

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21B0160-05RE1 A

Preparation Batch: BJB0616

Sample Size: 20 mL

Prepared: 02/22/2021

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.000013	0.000100	ND	mg/L	U

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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-76-20211002

21B0160-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B	Sampled: 02/10/2021 12:59
Instrument: ICPMS2 Analyst: MCB	Analyzed: 02/23/2021 18:13
Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
	Preparation Batch: BJB0603
	Sample Size: 25 mL
	Final Volume: 25 mL
	Extract ID: 21B0160-06 A 02
	Filtration Batch: BJB0360
	Filtration Date: 02/11/2021 09:50

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.0560	0.500	0.933	ug/L	
Chromium, Dissolved	7440-47-3	1	0.130	0.500	0.142	ug/L	J
Cobalt, Dissolved	7440-48-4	1	0.0290	0.200	0.113	ug/L	J
Iron, Dissolved	7439-89-6	1	6.27	20.0	7590	ug/L	
Lead, Dissolved	7439-92-1	1	0.0680	0.100	ND	ug/L	U
Manganese, Dissolved	7439-96-5	5	0.425	2.50	592	ug/L	B, D
Silver, Dissolved	7440-22-4	1	0.0170	0.200	ND	ug/L	U
Vanadium, Dissolved	7440-62-2	1	0.0400	0.200	0.0980	ug/L	J

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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-76-20211002

21B0160-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 02/10/2021 12:59

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/23/2021 18:13

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21B0160-06 A 02

Preparation Batch: BJB0603

Sample Size: 25 mL

Filtration Batch: BJB0360

Prepared: 02/22/2021

Final Volume: 25 mL

Filtration Date: 02/11/2021 09:50

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	0.291	ug/L	
Cadmium, Dissolved	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Copper, Dissolved	7440-50-8	1	0.340	0.500	ND	ug/L	U
Nickel, Dissolved	7440-02-0	1	0.0500	0.500	0.113	ug/L	J
Selenium, Dissolved	7782-49-2	1	0.440	0.500	ND	ug/L	U
Zinc, Dissolved	7440-66-6	1	0.820	4.00	ND	ug/L	U

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-76-20211002

21B0160-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 7470A				Sampled: 02/10/2021 12:59			
Instrument: HYDRA Analyst: BLC				Analyzed: 02/19/2021 15:08			
Sample Preparation:	Preparation Method: TWM EPA 7470A			Extract ID: 21B0160-06 A 01			
	Preparation Batch: BJB0544			Filtration Batch: BJB0360			
	Prepared: 02/18/2021			Filtration Date: 02/11/2021 09:50			
		Sample Size: 20 mL					
		Final Volume: 20 mL					
Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury, Dissolved	7439-97-6	1	0.000013	0.000100	ND	mg/L	U

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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-100-20211002

21B0160-07 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 02/10/2021 13:14

Instrument: NT2 Analyst: PKC

Analyzed: 02/22/2021 14:49

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21B0160-07 I

Preparation Batch: BJB0615

Sample Size: 10 mL

Prepared: 02/22/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4				80-129 %	109	%	
Surrogate: Toluene-d8				80-120 %	98.6	%	
Surrogate: 4-Bromofluorobenzene				80-120 %	92.8	%	
Surrogate: 1,2-Dichlorobenzene-d4				80-120 %	99.6	%	

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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-100-20211002

21B0160-07 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 02/10/2021 13:14

Instrument: NT16 Analyst: PB

Analyzed: 02/22/2021 17:48

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21B0160-07 J

Preparation Batch: BJB0621

Sample Size: 10 mL

Prepared: 02/22/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	ND	ng/L	U
Surrogate: 1,2-Dichloroethane-d4				80-129 %	103	%	
Surrogate: Toluene-d8				80-120 %	88.6	%	
Surrogate: 4-Bromofluorobenzene				75-125 %	101	%	

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Analytical Report

Shannon & Wilson, Inc
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Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-100-20211002

21B0160-07 (Water)

Semivolatile Organic Compounds

Method: EPA 8270E

Sampled: 02/10/2021 13:14

Instrument: NT10 Analyst: VTS

Analyzed: 02/25/2021 20:05

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21B0160-07 F 01

Preparation Batch: BJB0460

Sample Size: 910 mL

Prepared: 02/17/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	0.01	0.2	ND	ug/L	U
bis(2-chloroethyl) ether	111-44-4	1	0.03	0.2	ND	ug/L	U
2-Chlorophenol	95-57-8	1	0.03	0.2	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.03	0.2	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.03	0.2	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.04	0.2	ND	ug/L	U
Benzyl Alcohol	100-51-6	1	0.03	0.2	ND	ug/L	U
2,2'-Oxybis(1-chloropropane)	108-60-1	1	0.03	0.2	ND	ug/L	U
2-Methylphenol	95-48-7	1	0.03	0.2	ND	ug/L	U
Hexachloroethane	67-72-1	1	0.04	0.2	ND	ug/L	U
N-Nitroso-di-n-Propylamine	621-64-7	1	0.04	0.2	ND	ug/L	U
4-Methylphenol	106-44-5	1	0.03	0.2	ND	ug/L	U
Nitrobenzene	98-95-3	1	0.03	0.2	ND	ug/L	U
Isophorone	78-59-1	1	0.03	0.2	ND	ug/L	U
2-Nitrophenol	88-75-5	1	0.04	1.1	ND	ug/L	U
2,4-Dimethylphenol	105-67-9	1	0.3	1.1	ND	ug/L	U
Bis(2-Chloroethoxy)methane	111-91-1	1	0.03	0.2	ND	ug/L	U
2,4-Dichlorophenol	120-83-2	1	0.1	1.1	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.04	0.2	ND	ug/L	U
Naphthalene	91-20-3	1	0.03	0.2	ND	ug/L	U
Benzoic acid	65-85-0	1	0.1	2.2	ND	ug/L	U
4-Chloroaniline	106-47-8	1	0.05	1.1	ND	ug/L	U
Hexachlorobutadiene	87-68-3	1	0.04	0.2	ND	ug/L	U
4-Chloro-3-Methylphenol	59-50-7	1	0.1	1.1	ND	ug/L	U
2-Methylnaphthalene	91-57-6	1	0.03	0.2	ND	ug/L	U
Hexachlorocyclopentadiene	77-47-4	1	0.2	1.1	ND	ug/L	U
2,4,6-Trichlorophenol	88-06-2	1	0.2	1.1	ND	ug/L	U
2,4,5-Trichlorophenol	95-95-4	1	0.1	1.1	ND	ug/L	U
2-Chloronaphthalene	91-58-7	1	0.03	0.2	ND	ug/L	U
2-Nitroaniline	88-74-4	1	0.2	1.1	ND	ug/L	U
Acenaphthylene	208-96-8	1	0.02	0.2	ND	ug/L	U
Dimethylphthalate	131-11-3	1	0.04	0.2	ND	ug/L	U
2,6-Dinitrotoluene	606-20-2	1	0.2	1.1	ND	ug/L	U
Acenaphthene	83-32-9	1	0.03	0.2	0.4	ug/L	
3-Nitroaniline	99-09-2	1	0.2	1.1	ND	ug/L	U

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-100-20211002

21B0160-07 (Water)

Semivolatile Organic Compounds

Method: EPA 8270E

Sampled: 02/10/2021 13:14

Instrument: NT10 Analyst: VTS

Analyzed: 02/25/2021 20:05

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
2,4-Dinitrophenol	51-28-5	1	0.2	2.2	ND	ug/L	U
Dibenzofuran	132-64-9	1	0.02	0.2	ND	ug/L	U
4-Nitrophenol	100-02-7	1	0.06	1.1	ND	ug/L	U
2,4-Dinitrotoluene	121-14-2	1	0.1	1.1	ND	ug/L	U
Fluorene	86-73-7	1	0.02	0.2	ND	ug/L	U
4-Chlorophenylphenyl ether	7005-72-3	1	0.02	0.2	ND	ug/L	U
Diethyl phthalate	84-66-2	1	0.07	0.2	0.1	ug/L	J
4-Nitroaniline	100-01-6	1	0.2	1.1	ND	ug/L	U
4,6-Dinitro-2-methylphenol	534-52-1	1	0.4	2.2	ND	ug/L	U
N-Nitrosodiphenylamine	86-30-6	1	0.03	0.2	ND	ug/L	U
4-Bromophenyl phenyl ether	101-55-3	1	0.02	0.2	ND	ug/L	U
Hexachlorobenzene	118-74-1	1	0.04	0.2	ND	ug/L	U
Pentachlorophenol	87-86-5	1	0.2	1.1	ND	ug/L	U
Phenanthrene	85-01-8	1	0.02	0.2	0.4	ug/L	
Anthracene	120-12-7	1	0.03	0.2	ND	ug/L	U
Carbazole	86-74-8	1	0.04	0.2	ND	ug/L	U
Di-n-Butylphthalate	84-74-2	1	0.06	0.2	ND	ug/L	U
Fluoranthene	206-44-0	1	0.04	0.2	ND	ug/L	U
Pyrene	129-00-0	1	0.03	0.2	ND	ug/L	U
Butylbenzylphthalate	85-68-7	1	0.07	0.2	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	0.04	0.2	ND	ug/L	U
3,3'-Dichlorobenzidine	91-94-1	1	0.4	1.1	ND	ug/L	U
Chrysene	218-01-9	1	0.04	0.2	ND	ug/L	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	0.2	0.2	ND	ug/L	U
Di-n-Octylphthalate	117-84-0	1	0.05	0.2	ND	ug/L	U
Benzo(a)fluoranthene, Total		1	0.09	0.4	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.05	0.2	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.06	0.2	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.07	0.2	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.05	0.2	ND	ug/L	U
1-Methylnaphthalene	90-12-0	1	0.03	0.2	ND	ug/L	U
<i>Surrogate: 2-Fluorophenol</i>					30-160 %	53.3 %	
<i>Surrogate: Phenol-d5</i>					30-160 %	32.7 %	
<i>Surrogate: 2-Chlorophenol-d4</i>					30-160 %	87.6 %	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>					30-160 %	67.3 %	
<i>Surrogate: Nitrobenzene-d5</i>					30-160 %	80.4 %	
<i>Surrogate: 2-Fluorobiphenyl</i>					30-160 %	82.5 %	
<i>Surrogate: 2,4,6-Tribromophenol</i>					30-160 %	99.3 %	

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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-100-20211002

21B0160-07 (Water)

Semivolatile Organic Compounds

Method: EPA 8270E

Sampled: 02/10/2021 13:14

Instrument: NT10 Analyst: VTS

Analyzed: 02/25/2021 20:05

Analyte	CAS Number	Recovery	Recovery	Units	Notes
		Limits			
Surrogate: p-Terphenyl-d14		30-160 %	57.5	%	

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 Shannon & Wilson, Inc
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 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 02-Aug-2021 10:48

MW-100-20211002
21B0160-07 (Water)
Semivolatile Organic Compounds - SIM

 Method: EPA 8270E-SIM
 Instrument: NT11 Analyst: VTS
 Sampled: 02/10/2021 13:14
 Analyzed: 03/11/2021 03:19

 Sample Preparation: Preparation Method: EPA 3510C SepF
 Preparation Batch: BJB0449 Sample Size: 500 mL
 Prepared: 02/15/2021 Final Volume: 0.5 mL
 Extract ID: 21B0160-07 D 01

 Sample Cleanup: Cleanup Method: Silica Gel
 Cleanup Batch: CJC0072 Initial Volume: 0.5 mL
 Cleaned: 08-Mar-2021 Final Volume: 0.5 mL
 Extract ID: 21B0160-07 D 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.001	0.010	0.004	ug/L	J
2-Methylnaphthalene	91-57-6	1	0.001	0.010	0.003	ug/L	J
1-Methylnaphthalene	90-12-0	1	0.0009	0.010	0.002	ug/L	J
Acenaphthylene	208-96-8	1	0.002	0.010	ND	ug/L	U
Acenaphthene	83-32-9	1	0.003	0.010	0.378	ug/L	
Dibenzofuran	132-64-9	1	0.002	0.010	0.002	ug/L	J
Fluorene	86-73-7	1	0.002	0.010	0.016	ug/L	
Phenanthrene	85-01-8	1	0.001	0.010	0.347	ug/L	
Anthracene	120-12-7	1	0.001	0.010	0.014	ug/L	
Carbazole	86-74-8	1	0.001	0.010	ND	ug/L	U
Fluoranthene	206-44-0	1	0.002	0.010	0.014	ug/L	
Pyrene	129-00-0	1	0.001	0.010	0.006	ug/L	J
Benzo(a)anthracene	56-55-3	1	0.0008	0.010	ND	ug/L	U
Chrysene	218-01-9	1	0.0009	0.010	ND	ug/L	U
Benzo(b)fluoranthene	205-99-2	1	0.0005	0.010	ND	ug/L	U
Benzo(k)fluoranthene	207-08-9	1	0.003	0.010	ND	ug/L	U
Benzo(j)fluoranthene	205-82-3	1	0.002	0.010	ND	ug/L	U
Benzofluoranthenes, Total		1	0.004	0.010	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.002	0.010	ND	ug/L	U
Perylene	1985-5-0	1	0.006	0.010	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.001	0.010	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.001	0.010	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.001	0.010	ND	ug/L	U
Surrogate: 2-Methylnaphthalene-d10					42-120 %	69.2 %	
Surrogate: Dibenzo[a,h]anthracene-d14					29-120 %	43.9 %	
Surrogate: Fluoranthene-d10					57-120 %	73.5 %	



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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-100-20211002

21B0160-07 (Water)

Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 02/10/2021 13:14

Instrument: FID4 Analyst: CTO

Analyzed: 02/20/2021 00:06

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21B0160-07 B 01

Preparation Batch: BJB0444

Sample Size: 500 mL

Prepared: 02/15/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.100	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	0.200	ND	mg/L	U
Surrogate: o-Terphenyl			50-150 %	106	%	

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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-100-20211002

21B0160-07 (Water)

Metals and Metallic Compounds

Method: EPA 6020B
Instrument: ICPMS1 Analyst: MCB

Sampled: 02/10/2021 13:14

Analyzed: 02/19/2021 19:39

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix
Preparation Batch: BJB0514 Sample Size: 25 mL
Prepared: 02/17/2021 Final Volume: 25 mL

Extract ID: 21B0160-07 A 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	2	12.5	40.0	15300	ug/L	D
Manganese	7439-96-5	5	0.425	2.50	639	ug/L	D

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/19/2021 03:37

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix
Preparation Batch: BJB0514 Sample Size: 25 mL
Prepared: 02/17/2021 Final Volume: 25 mL

Extract ID: 21B0160-07 A 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium	7440-39-3	1	0.0560	0.500	1.91	ug/L	
Chromium	7440-47-3	2	0.260	1.00	0.386	ug/L	J, D
Cobalt	7440-48-4	1	0.0290	0.200	0.125	ug/L	J
Lead	7439-92-1	1	0.0680	0.100	ND	ug/L	U
Silver	7440-22-4	1	0.0170	0.200	ND	ug/L	U
Vanadium	7440-62-2	2	0.0800	0.400	0.832	ug/L	D

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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-100-20211002

21B0160-07 (Water)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 02/10/2021 13:14

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/19/2021 03:37

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21B0160-07 A 01

Preparation Batch: BJB0514

Sample Size: 25 mL

Prepared: 02/17/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0220	0.200	0.524	ug/L	
Cadmium	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Copper	7440-50-8	1	0.340	0.500	ND	ug/L	U
Nickel	7440-02-0	1	0.0500	0.500	0.0930	ug/L	J
Selenium	7782-49-2	1	0.440	0.500	ND	ug/L	U
Zinc	7440-66-6	1	0.820	4.00	ND	ug/L	U

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-100-20211002
21B0160-07RE1 (Water)

Metals and Metallic Compounds

Method: EPA 7470A		Sampled: 02/10/2021 13:14
Instrument: HYDRA Analyst: BLC		Analyzed: 02/25/2021 11:48
Sample Preparation:	Preparation Method: TWM EPA 7470A	Extract ID: 21B0160-07RE1 A
	Preparation Batch: BJB0616	Sample Size: 20 mL
	Prepared: 02/22/2021	Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.000013	0.000100	ND	mg/L	U

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Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-100-20211002

21B0160-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B	Sampled: 02/10/2021 12:59
Instrument: ICPMS2 Analyst: MCB	Analyzed: 02/23/2021 18:18
Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
	Preparation Batch: BJB0603
	Sample Size: 25 mL
	Final Volume: 25 mL
	Extract ID: 21B0160-08 A 02
	Filtration Batch: BJB0360
	Filtration Date: 02/11/2021 09:50

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.0560	0.500	0.872	ug/L	
Chromium, Dissolved	7440-47-3	1	0.130	0.500	0.148	ug/L	J
Cobalt, Dissolved	7440-48-4	1	0.0290	0.200	0.128	ug/L	J
Iron, Dissolved	7439-89-6	1	6.27	20.0	7550	ug/L	
Lead, Dissolved	7439-92-1	1	0.0680	0.100	ND	ug/L	U
Manganese, Dissolved	7439-96-5	5	0.425	2.50	595	ug/L	B, D
Silver, Dissolved	7440-22-4	1	0.0170	0.200	ND	ug/L	U
Vanadium, Dissolved	7440-62-2	1	0.0400	0.200	0.101	ug/L	J

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Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-100-20211002

21B0160-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 02/10/2021 12:59

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/23/2021 18:18

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21B0160-08 A 02

Preparation Batch: BJB0603

Sample Size: 25 mL

Filtration Batch: BJB0360

Prepared: 02/22/2021

Final Volume: 25 mL

Filtration Date: 02/11/2021 09:50

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	0.306	ug/L	
Cadmium, Dissolved	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Copper, Dissolved	7440-50-8	1	0.340	0.500	ND	ug/L	U
Nickel, Dissolved	7440-02-0	1	0.0500	0.500	0.114	ug/L	J
Selenium, Dissolved	7782-49-2	1	0.440	0.500	ND	ug/L	U
Zinc, Dissolved	7440-66-6	1	0.820	4.00	ND	ug/L	U

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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-100-20211002

21B0160-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 7470A				Sampled: 02/10/2021 12:59			
Instrument: HYDRA Analyst: BLC				Analyzed: 02/19/2021 15:10			
Sample Preparation:	Preparation Method: TWM EPA 7470A			Extract ID: 21B0160-08 A 01			
	Preparation Batch: BJB0544			Filtration Batch: BJB0360			
	Prepared: 02/18/2021			Filtration Date: 02/11/2021 09:50			
		Sample Size: 20 mL					
		Final Volume: 20 mL					
Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury, Dissolved	7439-97-6	1	0.000013	0.000100	ND	mg/L	U

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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-56-20211002

21B0160-09 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 02/10/2021 14:34

Instrument: NT2 Analyst: PKC

Analyzed: 02/22/2021 15:09

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21B0160-09 I

Preparation Batch: BJB0615

Sample Size: 10 mL

Prepared: 02/22/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4				80-129 %	111	%	
Surrogate: Toluene-d8				80-120 %	99.4	%	
Surrogate: 4-Bromofluorobenzene				80-120 %	92.7	%	
Surrogate: 1,2-Dichlorobenzene-d4				80-120 %	100	%	

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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-56-20211002

21B0160-09 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 02/10/2021 14:34

Instrument: NT16 Analyst: PB

Analyzed: 02/22/2021 18:08

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21B0160-09 H

Preparation Batch: BJB0621

Sample Size: 10 mL

Prepared: 02/22/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	ND	ng/L	U
Surrogate: 1,2-Dichloroethane-d4				80-129 %	108	%	
Surrogate: Toluene-d8				80-120 %	90.1	%	
Surrogate: 4-Bromofluorobenzene				75-125 %	102	%	

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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-56-20211002

21B0160-09 (Water)

Dissolved Gases

Method: EPA RSK-175

Sampled: 02/10/2021 14:34

Instrument: FID6 Analyst: PB

Analyzed: 02/22/2021 18:52

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21B0160-09 F

Preparation Batch: BJB0627

Sample Size: 10 mL

Prepared: 02/22/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Methane	74-82-8	1	0.65	5670	ug/L	
Ethane	74-84-0	1	1.23	ND	ug/L	U
Ethene	74-85-1	1	1.14	ND	ug/L	U
Acetylene	74-86-2	1	1.06	ND	ug/L	U
Surrogate: Propane			72-122 %	103	%	

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 Project: Lower Duwamish
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 02-Aug-2021 10:48

MW-56-20211002
21B0160-09 (Water)
Semivolatile Organic Compounds - SIM

 Method: EPA 8270E-SIM
 Instrument: NT11 Analyst: VTS
 Sampled: 02/10/2021 14:34
 Analyzed: 03/11/2021 03:51

 Sample Preparation: Preparation Method: EPA 3510C SepF
 Preparation Batch: BJB0449 Sample Size: 500 mL
 Prepared: 02/15/2021 Final Volume: 0.5 mL
 Extract ID: 21B0160-09 D 01

 Sample Cleanup: Cleanup Method: Silica Gel
 Cleanup Batch: CJC0072 Initial Volume: 0.5 mL
 Cleaned: 08-Mar-2021 Final Volume: 0.5 mL
 Extract ID: 21B0160-09 D 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.001	0.010	0.003	ug/L	J
2-Methylnaphthalene	91-57-6	1	0.001	0.010	0.002	ug/L	J
1-Methylnaphthalene	90-12-0	1	0.0009	0.010	0.001	ug/L	J
Acenaphthylene	208-96-8	1	0.002	0.010	ND	ug/L	U
Acenaphthene	83-32-9	1	0.003	0.010	0.095	ug/L	
Dibenzofuran	132-64-9	1	0.002	0.010	ND	ug/L	U
Fluorene	86-73-7	1	0.002	0.010	0.006	ug/L	J
Phenanthrene	85-01-8	1	0.001	0.010	0.006	ug/L	J
Anthracene	120-12-7	1	0.001	0.010	ND	ug/L	U
Carbazole	86-74-8	1	0.001	0.010	ND	ug/L	U
Fluoranthene	206-44-0	1	0.002	0.010	0.002	ug/L	J
Pyrene	129-00-0	1	0.001	0.010	0.001	ug/L	J
Benzo(a)anthracene	56-55-3	1	0.0008	0.010	ND	ug/L	U
Chrysene	218-01-9	1	0.0009	0.010	ND	ug/L	U
Benzo(b)fluoranthene	205-99-2	1	0.0005	0.010	ND	ug/L	U
Benzo(k)fluoranthene	207-08-9	1	0.003	0.010	ND	ug/L	U
Benzo(j)fluoranthene	205-82-3	1	0.002	0.010	ND	ug/L	U
Benzofluoranthenes, Total		1	0.004	0.010	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.002	0.010	ND	ug/L	U
Perylene	1985-5-0	1	0.006	0.010	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.001	0.010	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.001	0.010	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.001	0.010	ND	ug/L	U
Surrogate: 2-Methylnaphthalene-d10					42-120 %	70.3	%
Surrogate: Dibenzo[a,h]anthracene-d14					29-120 %	44.8	%
Surrogate: Fluoranthene-d10					57-120 %	76.7	%



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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-56-20211002

21B0160-09 (Water)

Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 02/10/2021 14:34

Instrument: FID4 Analyst: CTO

Analyzed: 02/20/2021 00:27

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21B0160-09 B 01

Preparation Batch: BJB0444

Sample Size: 500 mL

Prepared: 02/15/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.100	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	0.200	ND	mg/L	U
Surrogate: o-Terphenyl			50-150 %	107	%	

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Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-56-20211002

21B0160-09 (Water)

Metals and Metallic Compounds

Method: EPA 6020B
Instrument: ICPMS1 Analyst: MCB

Sampled: 02/10/2021 14:34

Analyzed: 02/19/2021 19:42

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix
Preparation Batch: BJB0514 Sample Size: 25 mL
Prepared: 02/17/2021 Final Volume: 25 mL

Extract ID: 21B0160-09 A 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	2	12.5	40.0	17800	ug/L	D
Manganese	7439-96-5	5	0.425	2.50	582	ug/L	D

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/19/2021 03:42

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix
Preparation Batch: BJB0514 Sample Size: 25 mL
Prepared: 02/17/2021 Final Volume: 25 mL

Extract ID: 21B0160-09 A 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium	7440-39-3	1	0.0560	0.500	2.33	ug/L	
Chromium	7440-47-3	2	0.260	1.00	0.358	ug/L	J, D
Cobalt	7440-48-4	1	0.0290	0.200	0.191	ug/L	J
Lead	7439-92-1	1	0.0680	0.100	0.106	ug/L	
Silver	7440-22-4	1	0.0170	0.200	ND	ug/L	U
Vanadium	7440-62-2	2	0.0800	0.400	1.05	ug/L	D

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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-56-20211002

21B0160-09 (Water)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 02/10/2021 14:34

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/19/2021 03:42

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21B0160-09 A 01

Preparation Batch: BJB0514

Sample Size: 25 mL

Prepared: 02/17/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0220	0.200	0.475	ug/L	
Cadmium	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Copper	7440-50-8	1	0.340	0.500	ND	ug/L	U
Nickel	7440-02-0	1	0.0500	0.500	0.193	ug/L	J
Selenium	7782-49-2	1	0.440	0.500	ND	ug/L	U
Zinc	7440-66-6	1	0.820	4.00	ND	ug/L	U

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Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-56-20211002

21B0160-09 (Water)

Wet Chemistry

Method: EPA 300.0

Sampled: 02/10/2021 14:34

Instrument: IC930 Analyst: WCW

Analyzed: 02/11/2021 14:33

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 21B0160-09 E

Preparation Batch: BJB0365

Sample Size: 10 mL

Prepared: 02/11/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	0.100	0.100	3.44	mg/L	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.100	0.100	ND	mg/L	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.100	0.100	ND	mg/L	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	0.100	0.100	1.65	mg/L	

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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-56-20211002

21B0160-09 (Water)

Wet Chemistry

Method: SM 4500-SO3 B-00

Sampled: 02/10/2021 14:34

Instrument: N/A Analyst: UW

Analyzed: 02/11/2021 09:46

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 21B0160-09

Preparation Batch: BJB0357

Sample Size: 50 mL

Prepared: 02/11/2021

Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfite	14265-45-3	1	1.4	1.4	ND	mg/L	H, U

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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-56-20211002
21B0160-09RE1 (Water)

Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 02/10/2021 14:34

Instrument: HYDRA Analyst: BLC

Analyzed: 02/25/2021 11:50

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21B0160-09RE1 A

Preparation Batch: BJB0616

Sample Size: 20 mL

Prepared: 02/22/2021

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.000013	0.000100	ND	mg/L	U

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-56-20211002
21B0160-09RE3 (Water)

Wet Chemistry

Method: SM 3500-Fe B-97

Sampled: 02/10/2021 14:34

Instrument: UV1800-2 Analyst: BF

Analyzed: 02/11/2021 13:26

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 21B0160-09RE3 M

Preparation Batch: BJB0359

Sample Size: 5 mL

Prepared: 02/11/2021

Final Volume: 5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Ferrous Iron		20	0.800	0.800	19.7	mg/L	D



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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-56-20211002

21B0160-10 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B	Sampled: 02/10/2021 14:34
Instrument: ICPMS2 Analyst: MCB	Analyzed: 02/23/2021 18:23
Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
	Preparation Batch: BJB0603
	Sample Size: 25 mL
	Final Volume: 25 mL
	Extract ID: 21B0160-10 B 02
	Filtration Batch: BJB0360
	Filtration Date: 02/11/2021 09:50

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.0560	0.500	0.757	ug/L	
Chromium, Dissolved	7440-47-3	1	0.130	0.500	0.189	ug/L	J
Cobalt, Dissolved	7440-48-4	1	0.0290	0.200	0.157	ug/L	J
Iron, Dissolved	7439-89-6	1	6.27	20.0	13000	ug/L	
Lead, Dissolved	7439-92-1	1	0.0680	0.100	ND	ug/L	U
Manganese, Dissolved	7439-96-5	5	0.425	2.50	546	ug/L	B, D
Silver, Dissolved	7440-22-4	1	0.0170	0.200	ND	ug/L	U
Vanadium, Dissolved	7440-62-2	1	0.0400	0.200	0.197	ug/L	J

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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-56-20211002

21B0160-10 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED		Sampled: 02/10/2021 14:34
Instrument: ICPMS2 Analyst: MCB		Analyzed: 02/23/2021 18:23
Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix	Extract ID: 21B0160-10 B 02
	Preparation Batch: BJB0603	Filtration Batch: BJB0360
	Prepared: 02/22/2021	Filtration Date: 02/11/2021 09:50
	Sample Size: 25 mL	
	Final Volume: 25 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	0.324	ug/L	
Cadmium, Dissolved	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Copper, Dissolved	7440-50-8	1	0.340	0.500	ND	ug/L	U
Nickel, Dissolved	7440-02-0	1	0.0500	0.500	0.128	ug/L	J
Selenium, Dissolved	7782-49-2	1	0.440	0.500	ND	ug/L	U
Zinc, Dissolved	7440-66-6	1	0.820	4.00	1.17	ug/L	J

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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

MW-56-20211002

21B0160-10 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 7470A						Sampled: 02/10/2021 14:34		
Instrument: HYDRA Analyst: BLC						Analyzed: 02/19/2021 15:13		
Sample Preparation:	Preparation Method: TWM EPA 7470A					Extract ID: 21B0160-10 B 01		
	Preparation Batch: BJB0544					Filtration Batch: BJB0360		
	Prepared: 02/18/2021					Filtration Date: 02/11/2021 09:50		
		Sample Size: 20 mL						
		Final Volume: 20 mL						
Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes	
Mercury, Dissolved	7439-97-6	1	0.000013	0.000100	ND	mg/L	U	

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 Shannon & Wilson, Inc
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 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 02-Aug-2021 10:48

Volatile Organic Compounds - Quality Control
Batch BJB0615 - EPA 5030C (Purge and Trap)

Instrument: NT2 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0615-BLK1)										
					Prepared: 22-Feb-2021		Analyzed: 22-Feb-2021 11:46			
Gasoline Range Organics (Tol-Nap)	ND	100	ug/L							U
Surrogate: Toluene-d8	4.96		ug/L	5.00		99.1	80-120			
Surrogate: 4-Bromofluorobenzene	4.70		ug/L	5.00		94.1	80-120			
Blank (BJB0615-BLK2)										
					Prepared: 22-Feb-2021		Analyzed: 22-Feb-2021 11:46			
Vinyl Chloride	ND	0.08	0.20	ug/L						U
1,1-Dichloroethene	ND	0.08	0.20	ug/L						U
trans-1,2-Dichloroethene	ND	0.07	0.20	ug/L						U
cis-1,2-Dichloroethene	ND	0.08	0.20	ug/L						U
Benzene	ND	0.05	0.20	ug/L						U
Trichloroethene	ND	0.07	0.20	ug/L						U
Toluene	ND	0.05	0.20	ug/L						U
Tetrachloroethene	ND	0.09	0.20	ug/L						U
Ethylbenzene	ND	0.05	0.20	ug/L						U
m,p-Xylene	ND	0.14	0.40	ug/L						U
o-Xylene	ND	0.08	0.20	ug/L						U
Xylenes, total	ND	0.22	0.60	ug/L						U
Surrogate: 1,2-Dichloroethane-d4	5.22		ug/L	5.00		104	80-129			
Surrogate: Toluene-d8	4.96		ug/L	5.00		99.1	80-120			
Surrogate: 4-Bromofluorobenzene	4.70		ug/L	5.00		94.1	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	4.95		ug/L	5.00		99.1	80-120			
LCS (BJB0615-BS1)										
					Prepared: 22-Feb-2021		Analyzed: 22-Feb-2021 10:02			
Gasoline Range Organics (Tol-Nap)	1030	100	ug/L	1000		103	72-128			
Surrogate: Toluene-d8	5.01		ug/L	5.00		100	80-120			
Surrogate: 4-Bromofluorobenzene	4.74		ug/L	5.00		94.9	80-120			
LCS (BJB0615-BS2)										
					Prepared: 22-Feb-2021		Analyzed: 22-Feb-2021 10:42			
Vinyl Chloride	11.5	0.08	0.20	ug/L	10.0	115	66-133			
1,1-Dichloroethene	11.7	0.08	0.20	ug/L	10.0	117	69-135			
trans-1,2-Dichloroethene	11.1	0.07	0.20	ug/L	10.0	111	78-128			
cis-1,2-Dichloroethene	9.80	0.08	0.20	ug/L	10.0	98.0	80-121			
Benzene	10.3	0.05	0.20	ug/L	10.0	103	80-120			
Trichloroethene	10.3	0.07	0.20	ug/L	10.0	103	80-120			

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 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 02-Aug-2021 10:48

Volatile Organic Compounds - Quality Control
Batch BJB0615 - EPA 5030C (Purge and Trap)

Instrument: NT2 Analyst: PKC

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJB0615-BS2)											
						Prepared: 22-Feb-2021		Analyzed: 22-Feb-2021 10:42			
Toluene	10.1	0.05	0.20	ug/L	10.0		101	80-120			
Tetrachloroethene	10.1	0.09	0.20	ug/L	10.0		101	80-120			
Ethylbenzene	10.0	0.05	0.20	ug/L	10.0		100	80-120			
m,p-Xylene	20.5	0.14	0.40	ug/L	20.0		103	80-121			
o-Xylene	10.0	0.08	0.20	ug/L	10.0		100	80-121			
Xylenes, total	30.5	0.22	0.60	ug/L	30.0		102	76-127			
Surrogate: 1,2-Dichloroethane-d4	5.20			ug/L	5.00		104	80-129			
Surrogate: Toluene-d8	5.00			ug/L	5.00		99.9	80-120			
Surrogate: 4-Bromofluorobenzene	4.89			ug/L	5.00		97.8	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	4.98			ug/L	5.00		99.6	80-120			
LCS Dup (BJB0615-BSD1)											
						Prepared: 22-Feb-2021		Analyzed: 22-Feb-2021 10:22			
Gasoline Range Organics (Tol-Nap)	1150		100	ug/L	1000		115	72-128	11.20	30	
Surrogate: Toluene-d8	5.06			ug/L	5.00		101	80-120			
Surrogate: 4-Bromofluorobenzene	4.75			ug/L	5.00		94.9	80-120			
LCS Dup (BJB0615-BSD2)											
						Prepared: 22-Feb-2021		Analyzed: 22-Feb-2021 11:03			
Vinyl Chloride	12.4	0.08	0.20	ug/L	10.0		124	66-133	7.16	30	
1,1-Dichloroethene	12.3	0.08	0.20	ug/L	10.0		123	69-135	5.07	30	
trans-1,2-Dichloroethene	11.9	0.07	0.20	ug/L	10.0		119	78-128	6.99	30	
cis-1,2-Dichloroethene	10.3	0.08	0.20	ug/L	10.0		103	80-121	5.17	30	
Benzene	10.9	0.05	0.20	ug/L	10.0		109	80-120	5.38	30	
Trichloroethene	10.6	0.07	0.20	ug/L	10.0		106	80-120	3.11	30	
Toluene	10.7	0.05	0.20	ug/L	10.0		107	80-120	5.35	30	
Tetrachloroethene	10.7	0.09	0.20	ug/L	10.0		107	80-120	5.58	30	
Ethylbenzene	10.6	0.05	0.20	ug/L	10.0		106	80-120	5.80	30	
m,p-Xylene	21.6	0.14	0.40	ug/L	20.0		108	80-121	5.01	30	
o-Xylene	10.4	0.08	0.20	ug/L	10.0		104	80-121	4.22	30	
Xylenes, total	32.0	0.22	0.60	ug/L	30.0		107	76-127	4.75	30	
Surrogate: 1,2-Dichloroethane-d4	5.33			ug/L	5.00		107	80-129			
Surrogate: Toluene-d8	5.03			ug/L	5.00		101	80-120			
Surrogate: 4-Bromofluorobenzene	4.91			ug/L	5.00		98.2	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	4.95			ug/L	5.00		99.1	80-120			


 Shannon & Wilson, Inc
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 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 02-Aug-2021 10:48

Volatile Organic Compounds - Quality Control
Batch BJB0615 - EPA 5030C (Purge and Trap)

Instrument: NT2 Analyst: PKC

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BJB0615-MS1)											
Source: 21B0160-02				Prepared: 22-Feb-2021 Analyzed: 22-Feb-2021 18:52							
Vinyl Chloride	14.0	0.08	0.20	ug/L	10.0	ND	140	66-133			*
1,1-Dichloroethene	14.6	0.08	0.20	ug/L	10.0	ND	146	69-135			*
trans-1,2-Dichloroethene	13.7	0.07	0.20	ug/L	10.0	0.09	137	78-128			*
cis-1,2-Dichloroethene	11.3	0.08	0.20	ug/L	10.0	ND	113	80-121			
Benzene	11.6	0.05	0.20	ug/L	10.0	ND	116	80-120			
Trichloroethene	11.1	0.07	0.20	ug/L	10.0	ND	111	80-120			
Toluene	11.4	0.05	0.20	ug/L	10.0	ND	114	80-120			
Tetrachloroethene	10.9	0.09	0.20	ug/L	10.0	ND	109	80-120			
Ethylbenzene	10.9	0.05	0.20	ug/L	10.0	ND	109	80-120			
m,p-Xylene	22.6	0.14	0.40	ug/L	20.0	ND	113	80-121			
o-Xylene	10.9	0.08	0.20	ug/L	10.0	ND	109	80-121			
Xylenes, total	33.5	0.22	0.60	ug/L	30.0	ND	112	76-127			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	5.40			ug/L	5.00	5.59	108	80-129			
<i>Surrogate: Toluene-d8</i>	5.07			ug/L	5.00	4.95	101	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	4.84			ug/L	5.00	4.79	96.8	80-120			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	4.91			ug/L	5.00	5.03	98.2	80-120			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike Dup (BJB0615-MSD1)											
Source: 21B0160-02				Prepared: 22-Feb-2021 Analyzed: 22-Feb-2021 19:12							
Vinyl Chloride	13.5	0.08	0.20	ug/L	10.0	ND	135	66-133	3.50	30	*
1,1-Dichloroethene	13.6	0.08	0.20	ug/L	10.0	ND	136	69-135	6.60	30	*
trans-1,2-Dichloroethene	13.1	0.07	0.20	ug/L	10.0	0.09	130	78-128	5.11	30	*
cis-1,2-Dichloroethene	10.8	0.08	0.20	ug/L	10.0	ND	108	80-121	4.35	30	
Benzene	11.2	0.05	0.20	ug/L	10.0	ND	112	80-120	3.75	30	
Trichloroethene	10.9	0.07	0.20	ug/L	10.0	ND	109	80-120	1.57	30	
Toluene	10.9	0.05	0.20	ug/L	10.0	ND	109	80-120	4.50	30	
Tetrachloroethene	10.7	0.09	0.20	ug/L	10.0	ND	107	80-120	2.18	30	
Ethylbenzene	10.7	0.05	0.20	ug/L	10.0	ND	107	80-120	1.91	30	
m,p-Xylene	21.8	0.14	0.40	ug/L	20.0	ND	109	80-121	3.53	30	
o-Xylene	10.5	0.08	0.20	ug/L	10.0	ND	105	80-121	3.35	30	
Xylenes, total	32.4	0.22	0.60	ug/L	30.0	ND	108	76-127	3.47	30	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	5.48			ug/L	5.00	5.59	110	80-129			
<i>Surrogate: Toluene-d8</i>	5.04			ug/L	5.00	4.95	101	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	4.83			ug/L	5.00	4.79	96.6	80-120			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	4.93			ug/L	5.00	5.03	98.5	80-120			



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Analytical Report

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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

Volatile Organic Compounds - Quality Control

Batch BJB0615 - EPA 5030C (Purge and Trap)

Instrument: NT2 Analyst: PKC

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BJB0615-MSD1)		Source: 21B0160-02		Prepared: 22-Feb-2021 Analyzed: 22-Feb-2021 19:12							

Recovery limits for target analytes in MS/MSD QC samples are advisory only.


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 02-Aug-2021 10:48

Volatile Organic Compounds - SIM - Quality Control
Batch BJB0621 - EPA 5030C (Purge and Trap)

Instrument: NT16 Analyst: PB

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0621-BLK1)						Prepared: 22-Feb-2021 Analyzed: 22-Feb-2021 12:11					
Vinyl chloride	ND	5.01	20.0	ng/L							U
Surrogate: 1,2-Dichloroethane-d4	5910			ng/L	5000		118	80-129			
Surrogate: Toluene-d8	4620			ng/L	5000		92.3	80-120			
Surrogate: 4-Bromofluorobenzene	5180			ng/L	5000		104	75-125			
LCS (BJB0621-BS1)						Prepared: 22-Feb-2021 Analyzed: 22-Feb-2021 11:09					
Vinyl chloride	4380	5.01	20.0	ng/L	4000		110	62-141			
Surrogate: 1,2-Dichloroethane-d4	5790			ng/L	5000		116	80-129			
Surrogate: Toluene-d8	4810			ng/L	5000		96.2	80-120			
Surrogate: 4-Bromofluorobenzene	5400			ng/L	5000		108	75-125			
LCS Dup (BJB0621-BSD1)						Prepared: 22-Feb-2021 Analyzed: 22-Feb-2021 11:51					
Vinyl chloride	4550	5.01	20.0	ng/L	4000		114	62-141	3.81	30	
Surrogate: 1,2-Dichloroethane-d4	5640			ng/L	5000		113	80-129			
Surrogate: Toluene-d8	4780			ng/L	5000		95.7	80-120			
Surrogate: 4-Bromofluorobenzene	5350			ng/L	5000		107	75-125			
Matrix Spike (BJB0621-MS1)						Source: 21B0160-02 Prepared: 22-Feb-2021 Analyzed: 22-Feb-2021 19:49					
Vinyl chloride	4030	5.01	20.0	ng/L	4000	ND	101	62-141			
Surrogate: 1,2-Dichloroethane-d4	5990			ng/L	5000	6040	120	80-129			
Surrogate: Toluene-d8	4700			ng/L	5000	4590	93.9	80-120			
Surrogate: 4-Bromofluorobenzene	5400			ng/L	5000	5140	108	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike Dup (BJB0621-MSD1)						Source: 21B0160-02 Prepared: 22-Feb-2021 Analyzed: 22-Feb-2021 20:09					
Vinyl chloride	4040	5.01	20.0	ng/L	4000	ND	101	62-141	0.13	30	
Surrogate: 1,2-Dichloroethane-d4	5960			ng/L	5000	6040	119	80-129			
Surrogate: Toluene-d8	4720			ng/L	5000	4590	94.4	80-120			
Surrogate: 4-Bromofluorobenzene	5420			ng/L	5000	5140	108	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 02-Aug-2021 10:48

Dissolved Gases - Quality Control
Batch BJB0627 - EPA 5030C (Purge and Trap)

Instrument: FID6 Analyst: PB

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0627-BLK1)		Prepared: 22-Feb-2021 Analyzed: 22-Feb-2021 12:56								
Methane	ND	0.65	ug/L							U
Ethane	ND	1.23	ug/L							U
Ethene	ND	1.14	ug/L							U
Acetylene	ND	1.06	ug/L							U
Surrogate: Propane	1960		ug/L	1800		109	72-122			
LCS (BJB0627-BS1)		Prepared: 22-Feb-2021 Analyzed: 22-Feb-2021 11:37								
Methane	643	0.65	ug/L	656		98.0	80-120			
Ethane	1310	1.23	ug/L	1230		106	80-120			
Ethene	1020	1.14	ug/L	1150		89.0	80-120			
Acetylene	935	1.06	ug/L	1060		88.2	73-123			
Surrogate: Propane	1960		ug/L	1800		109	62-122			
LCS Dup (BJB0627-BSD1)		Prepared: 22-Feb-2021 Analyzed: 22-Feb-2021 12:30								
Methane	633	0.65	ug/L	656		96.6	80-120	1.44	30	
Ethane	1320	1.23	ug/L	1230		108	80-120	1.30	30	
Ethene	1030	1.14	ug/L	1150		89.5	80-120	0.50	30	
Acetylene	934	1.06	ug/L	1060		88.1	73-123	0.03	30	
Surrogate: Propane	1940		ug/L	1800		108	62-122			


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 02-Aug-2021 10:48

Semivolatile Organic Compounds - Quality Control
Batch BJB0460 - EPA 3510C SepF

Instrument: NT10 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0460-BLK1)						Prepared: 17-Feb-2021 Analyzed: 25-Feb-2021 16:59					
Phenol	ND	0.01	0.2	ug/L							U
bis(2-chloroethyl) ether	ND	0.03	0.2	ug/L							U
2-Chlorophenol	ND	0.03	0.2	ug/L							U
1,3-Dichlorobenzene	ND	0.03	0.2	ug/L							U
1,4-Dichlorobenzene	ND	0.03	0.2	ug/L							U
1,2-Dichlorobenzene	ND	0.03	0.2	ug/L							U
Benzyl Alcohol	ND	0.02	0.2	ug/L							U
2,2'-Oxybis(1-chloropropane)	ND	0.03	0.2	ug/L							U
2-Methylphenol	ND	0.03	0.2	ug/L							U
Hexachloroethane	ND	0.04	0.2	ug/L							U
N-Nitroso-di-n-Propylamine	ND	0.04	0.2	ug/L							U
4-Methylphenol	ND	0.03	0.2	ug/L							U
Nitrobenzene	ND	0.03	0.2	ug/L							U
Isophorone	ND	0.03	0.2	ug/L							U
2-Nitrophenol	ND	0.04	1.0	ug/L							U
2,4-Dimethylphenol	ND	0.3	1.0	ug/L							U
Bis(2-Chloroethoxy)methane	ND	0.03	0.2	ug/L							U
2,4-Dichlorophenol	ND	0.1	1.0	ug/L							U
1,2,4-Trichlorobenzene	ND	0.03	0.2	ug/L							U
Naphthalene	ND	0.03	0.2	ug/L							U
Benzoic acid	ND	0.1	2.0	ug/L							U
4-Chloroaniline	ND	0.04	1.0	ug/L							U
Hexachlorobutadiene	ND	0.04	0.2	ug/L							U
4-Chloro-3-Methylphenol	ND	0.1	1.0	ug/L							U
2-Methylnaphthalene	ND	0.03	0.2	ug/L							U
Hexachlorocyclopentadiene	ND	0.1	1.0	ug/L							U
2,4,6-Trichlorophenol	ND	0.2	1.0	ug/L							U
2,4,5-Trichlorophenol	ND	0.1	1.0	ug/L							U
2-Chloronaphthalene	ND	0.03	0.2	ug/L							U
2-Nitroaniline	ND	0.2	1.0	ug/L							U
Acenaphthylene	ND	0.02	0.2	ug/L							U
Dimethylphthalate	ND	0.04	0.2	ug/L							U
2,6-Dinitrotoluene	ND	0.2	1.0	ug/L							U
Acenaphthene	ND	0.03	0.2	ug/L							U
3-Nitroaniline	ND	0.2	1.0	ug/L							U



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

Semivolatile Organic Compounds - Quality Control

Batch BJB0460 - EPA 3510C SepF

Instrument: NT10 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0460-BLK1)						Prepared: 17-Feb-2021 Analyzed: 25-Feb-2021 16:59					
2,4-Dinitrophenol	ND	0.2	2.0	ug/L							U
Dibenzofuran	ND	0.02	0.2	ug/L							U
4-Nitrophenol	ND	0.06	1.0	ug/L							U
2,4-Dinitrotoluene	ND	0.1	1.0	ug/L							U
Fluorene	ND	0.02	0.2	ug/L							U
4-Chlorophenylphenyl ether	ND	0.02	0.2	ug/L							U
Diethyl phthalate	ND	0.06	0.2	ug/L							U
4-Nitroaniline	ND	0.2	1.0	ug/L							U
4,6-Dinitro-2-methylphenol	ND	0.4	2.0	ug/L							U
N-Nitrosodiphenylamine	ND	0.03	0.2	ug/L							U
4-Bromophenyl phenyl ether	ND	0.02	0.2	ug/L							U
Hexachlorobenzene	ND	0.04	0.2	ug/L							U
Pentachlorophenol	ND	0.1	1.0	ug/L							U
Phenanthrene	ND	0.02	0.2	ug/L							U
Anthracene	ND	0.03	0.2	ug/L							U
Carbazole	ND	0.04	0.2	ug/L							U
Di-n-Butylphthalate	ND	0.05	0.2	ug/L							U
Fluoranthene	ND	0.03	0.2	ug/L							U
Pyrene	ND	0.03	0.2	ug/L							U
Butylbenzylphthalate	ND	0.07	0.2	ug/L							U
Benzo(a)anthracene	ND	0.04	0.2	ug/L							U
3,3'-Dichlorobenzidine	ND	0.3	1.0	ug/L							U
Chrysene	ND	0.04	0.2	ug/L							U
bis(2-Ethylhexyl)phthalate	ND	0.2	0.2	ug/L							U
Di-n-Octylphthalate	ND	0.05	0.2	ug/L							U
Benzo(a)fluoranthene, Total	ND	0.08	0.4	ug/L							U
Benzo(a)pyrene	ND	0.05	0.2	ug/L							U
Indeno(1,2,3-cd)pyrene	ND	0.06	0.2	ug/L							U
Dibenzo(a,h)anthracene	ND	0.07	0.2	ug/L							U
Benzo(g,h,i)perylene	ND	0.04	0.2	ug/L							U
1-Methylnaphthalene	ND	0.03	0.2	ug/L							U
Surrogate: 2-Fluorophenol	3.52			ug/L	7.50		46.9	30-160			
Surrogate: Phenol-d5	2.02			ug/L	7.50		27.0	30-160			*
Surrogate: 2-Chlorophenol-d4	6.22			ug/L	7.50		82.9	30-160			
Surrogate: 1,2-Dichlorobenzene-d4	3.19			ug/L	5.00		63.9	30-160			

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 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 02-Aug-2021 10:48

Semivolatile Organic Compounds - Quality Control
Batch BJB0460 - EPA 3510C SepF

Instrument: NT10 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0460-BLK1)						Prepared: 17-Feb-2021	Analyzed: 25-Feb-2021 16:59				
Surrogate: Nitrobenzene-d5	3.80			ug/L	5.00		76.0	30-160			
Surrogate: 2-Fluorobiphenyl	4.19			ug/L	5.00		83.9	30-160			
Surrogate: 2,4,6-Tribromophenol	7.80			ug/L	7.50		104	30-160			
Surrogate: p-Terphenyl-d14	3.62			ug/L	5.00		72.5	30-160			
LCS (BJB0460-BS1)						Prepared: 17-Feb-2021	Analyzed: 25-Feb-2021 17:36				
Phenol	1.8	0.01	0.2	ug/L	5.00		36.5	30-160			
bis(2-chloroethyl) ether	4.6	0.03	0.2	ug/L	5.00		92.4	30-160			
2-Chlorophenol	3.8	0.03	0.2	ug/L	5.00		75.6	30-160			
1,3-Dichlorobenzene	3.8	0.03	0.2	ug/L	5.00		76.5	30-160			
1,4-Dichlorobenzene	3.8	0.03	0.2	ug/L	5.00		76.8	30-160			
1,2-Dichlorobenzene	3.8	0.03	0.2	ug/L	5.00		76.7	30-160			
Benzyl Alcohol	2.9	0.02	0.2	ug/L	5.00		57.4	30-160			
2,2'-Oxybis(1-chloropropane)	4.0	0.03	0.2	ug/L	5.00		80.4	30-160			
2-Methylphenol	3.1	0.03	0.2	ug/L	5.00		63.0	30-160			
Hexachloroethane	3.7	0.04	0.2	ug/L	5.00		73.8	30-160			
N-Nitroso-di-n-Propylamine	3.7	0.04	0.2	ug/L	5.00		74.2	30-160			
4-Methylphenol	3.1	0.03	0.2	ug/L	5.00		62.2	30-160			
Nitrobenzene	3.9	0.03	0.2	ug/L	5.00		78.5	30-160			
Isophorone	4.3	0.03	0.2	ug/L	5.00		86.6	30-160			
2-Nitrophenol	4.8	0.04	1.0	ug/L	5.00		95.5	30-160			Q
2,4-Dimethylphenol	8.7	0.3	1.0	ug/L	13.0		66.9	30-160			
Bis(2-Chloroethoxy)methane	3.8	0.03	0.2	ug/L	5.00		75.1	30-160			
2,4-Dichlorophenol	11.4	0.1	1.0	ug/L	13.0		87.3	30-160			
1,2,4-Trichlorobenzene	1.9	0.03	0.2	ug/L	5.00		38.5	30-160			Q
Naphthalene	3.8	0.03	0.2	ug/L	5.00		76.0	30-160			
Benzoic acid	9.3	0.1	2.0	ug/L	23.0		40.3	30-160			
4-Chloroaniline	1.6	0.04	1.0	ug/L	13.0		12.4	30-160			*
Hexachlorobutadiene	2.1	0.04	0.2	ug/L	5.00		42.2	30-160			Q
4-Chloro-3-Methylphenol	12.2	0.1	1.0	ug/L	13.0		93.5	30-160			
2-Methylnaphthalene	3.7	0.03	0.2	ug/L	5.00		73.3	30-160			
Hexachlorocyclopentadiene	6.5	0.1	1.0	ug/L	13.0		50.3	30-160			
2,4,6-Trichlorophenol	13.6	0.2	1.0	ug/L	13.0		105	30-160			
2,4,5-Trichlorophenol	13.7	0.1	1.0	ug/L	13.0		105	30-160			
2-Chloronaphthalene	4.7	0.03	0.2	ug/L	5.00		93.8	30-160			



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

Semivolatile Organic Compounds - Quality Control

Batch BJB0460 - EPA 3510C SepF

Instrument: NT10 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJB0460-BS1)						Prepared: 17-Feb-2021 Analyzed: 25-Feb-2021 17:36					
2-Nitroaniline	14.0	0.2	1.0	ug/L	13.0		108	30-160			
Acenaphthylene	4.1	0.02	0.2	ug/L	5.00		81.6	30-160			
Dimethylphthalate	4.5	0.04	0.2	ug/L	5.00		90.0	30-160			
2,6-Dinitrotoluene	14.3	0.2	1.0	ug/L	13.0		110	30-160			
Acenaphthene	4.3	0.03	0.2	ug/L	5.00		86.1	30-160			
3-Nitroaniline	12.9	0.2	1.0	ug/L	13.0		99.0	30-160			
2,4-Dinitrophenol	19.6	0.2	2.0	ug/L	23.0		85.3	30-160			
Dibenzofuran	4.3	0.02	0.2	ug/L	5.00		86.9	30-160			
4-Nitrophenol	4.5	0.06	1.0	ug/L	13.0		34.5	30-160			
2,4-Dinitrotoluene	16.0	0.1	1.0	ug/L	13.0		123	30-160			
Fluorene	3.7	0.02	0.2	ug/L	5.00		74.4	30-160			
4-Chlorophenylphenyl ether	3.4	0.02	0.2	ug/L	5.00		68.4	30-160			
Diethyl phthalate	4.8	0.06	0.2	ug/L	5.00		95.1	30-160			
4-Nitroaniline	13.4	0.2	1.0	ug/L	13.0		103	30-160			
4,6-Dinitro-2-methylphenol	24.4	0.4	2.0	ug/L	23.0		106	30-160			Q
N-Nitrosodiphenylamine	3.9	0.03	0.2	ug/L	5.00		78.9	30-160			
4-Bromophenyl phenyl ether	4.8	0.02	0.2	ug/L	5.00		95.9	30-160			
Hexachlorobenzene	5.1	0.04	0.2	ug/L	5.00		102	30-160			
Pentachlorophenol	8.7	0.1	1.0	ug/L	13.0		66.8	30-160			
Phenanthrene	4.6	0.02	0.2	ug/L	5.00		91.1	30-160			
Anthracene	4.4	0.03	0.2	ug/L	5.00		88.9	30-160			
Carbazole	4.8	0.04	0.2	ug/L	5.00		95.7	30-160			
Di-n-Butylphthalate	4.7	0.05	0.2	ug/L	5.00		94.3	30-160			
Fluoranthene	4.8	0.03	0.2	ug/L	5.00		95.4	30-160			
Pyrene	4.7	0.03	0.2	ug/L	5.00		93.4	30-160			
Butylbenzylphthalate	4.5	0.07	0.2	ug/L	5.00		89.9	30-160			
Benzo(a)anthracene	4.4	0.04	0.2	ug/L	5.00		89.0	30-160			
3,3'-Dichlorobenzidine	6.5	0.3	1.0	ug/L	8.00		80.9	30-160			
Chrysene	4.6	0.04	0.2	ug/L	5.00		92.0	30-160			
bis(2-Ethylhexyl)phthalate	4.7	0.2	0.2	ug/L	5.00		93.8	30-160			
Di-n-Octylphthalate	4.5	0.05	0.2	ug/L	5.00		89.5	30-160			
Benzo(a)fluoranthene, Total	9.1	0.08	0.4	ug/L	10.0		90.6	30-160			
Benzo(a)pyrene	4.4	0.05	0.2	ug/L	5.00		88.7	30-160			
Indeno(1,2,3-cd)pyrene	4.2	0.06	0.2	ug/L	5.00		84.7	30-160			
Dibenzo(a,h)anthracene	4.4	0.07	0.2	ug/L	5.00		87.2	30-160			

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

Semivolatile Organic Compounds - Quality Control

Batch BJB0460 - EPA 3510C SepF

Instrument: NT10 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJB0460-BS1)											
						Prepared: 17-Feb-2021 Analyzed: 25-Feb-2021 17:36					
Benzo(g,h,i)perylene	4.5	0.04	0.2	ug/L	5.00		89.3	30-160			
1-Methylnaphthalene	3.8	0.03	0.2	ug/L	5.00		76.0	30-160			
Surrogate: 2-Fluorophenol	4.54			ug/L	7.50		60.6	30-160			
Surrogate: Phenol-d5	3.04			ug/L	7.50		40.6	30-160			
Surrogate: 2-Chlorophenol-d4	7.32			ug/L	7.50		97.6	30-160			
Surrogate: 1,2-Dichlorobenzene-d4	3.64			ug/L	5.00		72.7	30-160			
Surrogate: Nitrobenzene-d5	4.04			ug/L	5.00		80.8	30-160			
Surrogate: 2-Fluorobiphenyl	4.51			ug/L	5.00		90.3	30-160			
Surrogate: 2,4,6-Tribromophenol	7.75			ug/L	7.50		103	30-160			
Surrogate: p-Terphenyl-d14	3.92			ug/L	5.00		78.4	30-160			
LCS Dup (BJB0460-BSD1)											
						Prepared: 17-Feb-2021 Analyzed: 25-Feb-2021 18:14					
Phenol	1.9	0.01	0.2	ug/L	5.00		38.4	30-160	5.07	30	
bis(2-chloroethyl) ether	4.7	0.03	0.2	ug/L	5.00		94.3	30-160	2.10	30	
2-Chlorophenol	3.9	0.03	0.2	ug/L	5.00		78.0	30-160	3.05	30	
1,3-Dichlorobenzene	3.9	0.03	0.2	ug/L	5.00		78.8	30-160	2.97	30	
1,4-Dichlorobenzene	4.0	0.03	0.2	ug/L	5.00		80.4	30-160	4.56	30	
1,2-Dichlorobenzene	3.9	0.03	0.2	ug/L	5.00		78.1	30-160	1.85	30	
Benzyl Alcohol	3.0	0.02	0.2	ug/L	5.00		59.5	30-160	3.57	30	
2,2'-Oxybis(1-chloropropane)	4.1	0.03	0.2	ug/L	5.00		82.9	30-160	3.04	30	
2-Methylphenol	3.4	0.03	0.2	ug/L	5.00		67.3	30-160	6.59	30	
Hexachloroethane	3.8	0.04	0.2	ug/L	5.00		75.7	30-160	2.65	30	
N-Nitroso-di-n-Propylamine	3.9	0.04	0.2	ug/L	5.00		77.8	30-160	4.67	30	
4-Methylphenol	3.2	0.03	0.2	ug/L	5.00		64.7	30-160	3.94	30	
Nitrobenzene	4.0	0.03	0.2	ug/L	5.00		80.1	30-160	2.01	30	
Isophorone	4.5	0.03	0.2	ug/L	5.00		89.6	30-160	3.44	30	
2-Nitrophenol	4.9	0.04	1.0	ug/L	5.00		98.7	30-160	3.28	30	Q
2,4-Dimethylphenol	9.7	0.3	1.0	ug/L	13.0		74.3	30-160	10.50	30	
Bis(2-Chloroethoxy)methane	3.9	0.03	0.2	ug/L	5.00		77.8	30-160	3.52	30	
2,4-Dichlorophenol	11.9	0.1	1.0	ug/L	13.0		91.6	30-160	4.78	30	
1,2,4-Trichlorobenzene	2.0	0.03	0.2	ug/L	5.00		39.3	30-160	2.22	30	Q
Naphthalene	3.9	0.03	0.2	ug/L	5.00		77.0	30-160	1.39	30	
Benzoic acid	9.8	0.1	2.0	ug/L	23.0		42.6	30-160	5.59	30	
4-Chloroaniline	1.9	0.04	1.0	ug/L	13.0		14.8	30-160	17.60	30	*
Hexachlorobutadiene	3.0	0.04	0.2	ug/L	5.00		59.4	30-160	33.80	30	*, Q

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

Semivolatile Organic Compounds - Quality Control

Batch BJB0460 - EPA 3510C SepF

Instrument: NT10 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BJB0460-BSD1)					Prepared: 17-Feb-2021 Analyzed: 25-Feb-2021 18:14						
4-Chloro-3-Methylphenol	12.9	0.1	1.0	ug/L	13.0		99.3	30-160	6.02	30	
2-Methylnaphthalene	3.8	0.03	0.2	ug/L	5.00		76.3	30-160	4.00	30	
Hexachlorocyclopentadiene	6.6	0.1	1.0	ug/L	13.0		50.8	30-160	0.90	30	
2,4,6-Trichlorophenol	12.7	0.2	1.0	ug/L	13.0		97.5	30-160	7.01	30	
2,4,5-Trichlorophenol	12.8	0.1	1.0	ug/L	13.0		98.2	30-160	7.10	30	
2-Chloronaphthalene	4.3	0.03	0.2	ug/L	5.00		86.3	30-160	8.32	30	
2-Nitroaniline	13.6	0.2	1.0	ug/L	13.0		104	30-160	3.27	30	
Acenaphthylene	3.7	0.02	0.2	ug/L	5.00		74.0	30-160	9.68	30	
Dimethylphthalate	4.1	0.04	0.2	ug/L	5.00		82.6	30-160	8.53	30	
2,6-Dinitrotoluene	13.8	0.2	1.0	ug/L	13.0		106	30-160	3.40	30	
Acenaphthene	4.0	0.03	0.2	ug/L	5.00		79.6	30-160	7.86	30	
3-Nitroaniline	12.7	0.2	1.0	ug/L	13.0		97.9	30-160	1.18	30	
2,4-Dinitrophenol	19.9	0.2	2.0	ug/L	23.0		86.5	30-160	1.40	30	
Dibenzofuran	4.0	0.02	0.2	ug/L	5.00		79.1	30-160	9.35	30	
4-Nitrophenol	5.1	0.06	1.0	ug/L	13.0		39.6	30-160	13.60	30	
2,4-Dinitrotoluene	15.6	0.1	1.0	ug/L	13.0		120	30-160	2.50	30	
Fluorene	3.4	0.02	0.2	ug/L	5.00		68.8	30-160	7.84	30	
4-Chlorophenylphenyl ether	3.1	0.02	0.2	ug/L	5.00		62.7	30-160	8.70	30	
Diethyl phthalate	4.6	0.06	0.2	ug/L	5.00		91.1	30-160	4.25	30	
4-Nitroaniline	12.9	0.2	1.0	ug/L	13.0		99.1	30-160	4.13	30	
4,6-Dinitro-2-methylphenol	27.0	0.4	2.0	ug/L	23.0		117	30-160	10.00	30	Q
N-Nitrosodiphenylamine	4.1	0.03	0.2	ug/L	5.00		82.6	30-160	4.69	30	
4-Bromophenyl phenyl ether	4.9	0.02	0.2	ug/L	5.00		98.7	30-160	2.91	30	
Hexachlorobenzene	5.4	0.04	0.2	ug/L	5.00		108	30-160	5.17	30	
Pentachlorophenol	9.6	0.1	1.0	ug/L	13.0		74.0	30-160	10.30	30	
Phenanthrene	4.8	0.02	0.2	ug/L	5.00		95.8	30-160	5.06	30	
Anthracene	4.7	0.03	0.2	ug/L	5.00		93.2	30-160	4.80	30	
Carbazole	5.1	0.04	0.2	ug/L	5.00		103	30-160	7.12	30	
Di-n-Butylphthalate	5.1	0.05	0.2	ug/L	5.00		103	30-160	8.48	30	
Fluoranthene	5.1	0.03	0.2	ug/L	5.00		102	30-160	6.97	30	
Pyrene	4.9	0.03	0.2	ug/L	5.00		98.1	30-160	4.90	30	
Butylbenzylphthalate	4.7	0.07	0.2	ug/L	5.00		95.0	30-160	5.47	30	
Benzo(a)anthracene	4.8	0.04	0.2	ug/L	5.00		95.2	30-160	6.69	30	
3,3'-Dichlorobenzidine	7.9	0.3	1.0	ug/L	8.00		99.3	30-160	20.40	30	
Chrysene	4.9	0.04	0.2	ug/L	5.00		97.0	30-160	5.36	30	

Analytical Resources, Inc.

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

Semivolatile Organic Compounds - Quality Control

Batch BJB0460 - EPA 3510C SepF

Instrument: NT10 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BJB0460-BSD1)						Prepared: 17-Feb-2021	Analyzed: 25-Feb-2021 18:14				
bis(2-Ethylhexyl)phthalate	4.9	0.2	0.2	ug/L	5.00		97.9	30-160	4.36	30	
Di-n-Octylphthalate	4.6	0.05	0.2	ug/L	5.00		92.3	30-160	3.08	30	
Benzo(a)fluoranthenes, Total	9.5	0.08	0.4	ug/L	10.0		95.0	30-160	4.72	30	
Benzo(a)pyrene	4.6	0.05	0.2	ug/L	5.00		91.1	30-160	2.67	30	
Indeno(1,2,3-cd)pyrene	4.3	0.06	0.2	ug/L	5.00		85.3	30-160	0.74	30	
Dibenzo(a,h)anthracene	4.4	0.07	0.2	ug/L	5.00		88.7	30-160	1.71	30	
Benzo(g,h,i)perylene	4.5	0.04	0.2	ug/L	5.00		90.0	30-160	0.82	30	
1-Methylnaphthalene	4.0	0.03	0.2	ug/L	5.00		79.8	30-160	4.94	30	
Surrogate: 2-Fluorophenol	4.75			ug/L	7.50		63.3	30-160			
Surrogate: Phenol-d5	3.25			ug/L	7.50		43.3	30-160			
Surrogate: 2-Chlorophenol-d4	7.43			ug/L	7.50		99.1	30-160			
Surrogate: 1,2-Dichlorobenzene-d4	3.65			ug/L	5.00		73.1	30-160			
Surrogate: Nitrobenzene-d5	4.10			ug/L	5.00		82.0	30-160			
Surrogate: 2-Fluorobiphenyl	4.09			ug/L	5.00		81.9	30-160			
Surrogate: 2,4,6-Tribromophenol	7.10			ug/L	7.50		94.7	30-160			
Surrogate: p-Terphenyl-d14	3.75			ug/L	5.00		74.9	30-160			

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

Semivolatile Organic Compounds - SIM - Quality Control

Batch BJB0449 - EPA 3510C SepF

Instrument: NT11 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0449-BLK1)						Prepared: 15-Feb-2021 Analyzed: 11-Mar-2021 00:06					
Naphthalene	0.004	0.001	0.010	ug/L							J
2-Methylnaphthalene	0.002	0.001	0.010	ug/L							J
1-Methylnaphthalene	0.001	0.0009	0.010	ug/L							J
Acenaphthylene	ND	0.002	0.010	ug/L							U
Acenaphthene	ND	0.003	0.010	ug/L							U
Dibenzofuran	ND	0.002	0.010	ug/L							U
Fluorene	ND	0.002	0.010	ug/L							U
Phenanthrene	ND	0.001	0.010	ug/L							U
Anthracene	ND	0.001	0.010	ug/L							U
Carbazole	ND	0.001	0.010	ug/L							U
Fluoranthene	ND	0.002	0.010	ug/L							U
Pyrene	ND	0.001	0.010	ug/L							U
Benzo(a)anthracene	ND	0.0008	0.010	ug/L							U
Chrysene	ND	0.0009	0.010	ug/L							U
Benzo(b)fluoranthene	ND	0.0005	0.010	ug/L							U
Benzo(k)fluoranthene	ND	0.003	0.010	ug/L							U
Benzo(j)fluoranthene	ND	0.002	0.010	ug/L							U
Benzofluoranthenes, Total	ND	0.004	0.010	ug/L							U
Benzo(a)pyrene	ND	0.002	0.010	ug/L							U
Perylene	ND	0.006	0.010	ug/L							U
Indeno(1,2,3-cd)pyrene	ND	0.001	0.010	ug/L							U
Dibenzo(a,h)anthracene	ND	0.001	0.010	ug/L							U
Benzo(g,h,i)perylene	ND	0.001	0.010	ug/L							U
Surrogate: 2-Methylnaphthalene-d10	0.198			ug/L	0.300		65.9	42-120			
Surrogate: Dibenzo[a,h]anthracene-d14	0.139			ug/L	0.300		46.4	29-120			
Surrogate: Fluoranthene-d10	0.211			ug/L	0.300		70.5	57-120			

LCS (BJB0449-BS1)						Prepared: 15-Feb-2021 Analyzed: 11-Mar-2021 00:38					
Naphthalene	0.201	0.001	0.010	ug/L	0.300		67.0	37-120			
2-Methylnaphthalene	0.201	0.001	0.010	ug/L	0.300		67.1	37-120			
1-Methylnaphthalene	0.206	0.0009	0.010	ug/L	0.300		68.6	29-120			
Acenaphthylene	0.189	0.002	0.010	ug/L	0.300		63.0	41-120			
Acenaphthene	0.198	0.003	0.010	ug/L	0.300		65.9	41-120			
Dibenzofuran	0.208	0.002	0.010	ug/L	0.300		69.2	38-120			
Fluorene	0.217	0.002	0.010	ug/L	0.300		72.4	43-120			

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

Semivolatile Organic Compounds - SIM - Quality Control

Batch BJB0449 - EPA 3510C SepF

Instrument: NT11 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJB0449-BS1)											
						Prepared: 15-Feb-2021 Analyzed: 11-Mar-2021 00:38					
Phenanthrene	0.210	0.001	0.010	ug/L	0.300		69.9	41-120			
Anthracene	0.154	0.001	0.010	ug/L	0.300		51.3	40-120			
Carbazole	0.204	0.001	0.010	ug/L	0.300		68.0	30-160			
Fluoranthene	0.216	0.002	0.010	ug/L	0.300		71.9	45-120			
Pyrene	0.215	0.001	0.010	ug/L	0.300		71.6	41-120			
Benzo(a)anthracene	0.186	0.0008	0.010	ug/L	0.300		62.1	42-120			
Chrysene	0.213	0.0009	0.010	ug/L	0.300		71.2	44-120			
Benzo(b)fluoranthene	0.177	0.0005	0.010	ug/L	0.300		59.0	44-120			
Benzo(k)fluoranthene	0.238	0.003	0.010	ug/L	0.300		79.5	50-120			
Benzo(j)fluoranthene	0.271	0.002	0.010	ug/L	0.300		90.4	39-160			
Benzofluoranthenes, Total	0.687	0.004	0.010	ug/L	0.900		76.3	46-120			
Benzo(a)pyrene	0.155	0.002	0.010	ug/L	0.300		51.6	35-120			
Perylene	0.173	0.006	0.010	ug/L	0.300		57.8	30-160			
Indeno(1,2,3-cd)pyrene	0.196	0.001	0.010	ug/L	0.300		65.2	37-120			
Dibenzo(a,h)anthracene	0.181	0.001	0.010	ug/L	0.300		60.3	34-120			
Benzo(g,h,i)perylene	0.194	0.001	0.010	ug/L	0.300		64.5	38-120			
Surrogate: 2-Methylnaphthalene-d10	0.225			ug/L	0.300		75.0	42-120			
Surrogate: Dibenzo[a,h]anthracene-d14	0.169			ug/L	0.300		56.2	29-120			
Surrogate: Fluoranthene-d10	0.233			ug/L	0.300		77.6	57-120			
Matrix Spike (BJB0449-MS1)											
				Source: 21B0160-02		Prepared: 15-Feb-2021 Analyzed: 11-Mar-2021 01:42					
Naphthalene	0.207	0.001	0.010	ug/L	0.300	0.006	67.0	37-120			
2-Methylnaphthalene	0.210	0.001	0.010	ug/L	0.300	0.005	68.5	37-120			
1-Methylnaphthalene	0.213	0.0009	0.010	ug/L	0.300	0.003	70.0	29-120			
Acenaphthylene	0.202	0.002	0.010	ug/L	0.300	ND	67.3	41-120			
Acenaphthene	0.207	0.003	0.010	ug/L	0.300	ND	69.1	41-120			
Dibenzofuran	0.215	0.002	0.010	ug/L	0.300	0.002	70.8	38-120			
Fluorene	0.226	0.002	0.010	ug/L	0.300	ND	75.3	43-120			
Phenanthrene	0.220	0.001	0.010	ug/L	0.300	0.002	72.9	41-120			
Anthracene	0.184	0.001	0.010	ug/L	0.300	ND	61.4	40-120			
Carbazole	0.214	0.001	0.010	ug/L	0.300	ND	71.4	30-160			
Fluoranthene	0.224	0.002	0.010	ug/L	0.300	ND	74.8	45-120			
Pyrene	0.224	0.001	0.010	ug/L	0.300	ND	74.7	41-120			
Benzo(a)anthracene	0.202	0.0008	0.010	ug/L	0.300	ND	67.2	42-120			
Chrysene	0.227	0.0009	0.010	ug/L	0.300	ND	75.6	44-120			

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 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 02-Aug-2021 10:48

Semivolatile Organic Compounds - SIM - Quality Control
Batch BJB0449 - EPA 3510C SepF

Instrument: NT11 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BJB0449-MS1)		Source: 21B0160-02		Prepared: 15-Feb-2021		Analyzed: 11-Mar-2021 01:42					
Benzo(b)fluoranthene	0.172	0.0005	0.010	ug/L	0.300	ND	57.4	44-120			
Benzo(k)fluoranthene	0.243	0.003	0.010	ug/L	0.300	ND	81.0	50-120			
Benzo(j)fluoranthene	0.285	0.002	0.010	ug/L	0.300	ND	95.0	39-160			
Benzofluoranthenes, Total	0.700	0.004	0.010	ug/L	0.900	ND	77.8	46-120			
Benzo(a)pyrene	0.195	0.002	0.010	ug/L	0.300	ND	65.1	35-120			
Perylene	0.203	0.006	0.010	ug/L	0.300	ND	67.7	30-160			
Indeno(1,2,3-cd)pyrene	0.196	0.001	0.010	ug/L	0.300	ND	65.3	37-120			
Dibenzo(a,h)anthracene	0.178	0.001	0.010	ug/L	0.300	ND	59.4	34-120			
Benzo(g,h,i)perylene	0.193	0.001	0.010	ug/L	0.300	ND	64.3	38-120			
<i>Surrogate: 2-Methylnaphthalene-d10</i>	0.222			ug/L	0.300	0.216	74.0	42-120			
<i>Surrogate: Dibenzo[a,h]anthracene-d14</i>	0.168			ug/L	0.300	0.130	56.1	29-120			
<i>Surrogate: Fluoranthene-d10</i>	0.233			ug/L	0.300	0.225	77.8	57-120			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike Dup (BJB0449-MSD1)		Source: 21B0160-02		Prepared: 15-Feb-2021		Analyzed: 11-Mar-2021 02:15					
Naphthalene	0.220	0.001	0.010	ug/L	0.300	0.006	71.4	37-120	6.24	30	
2-Methylnaphthalene	0.224	0.001	0.010	ug/L	0.300	0.005	73.0	37-120	6.31	30	
1-Methylnaphthalene	0.228	0.0009	0.010	ug/L	0.300	0.003	74.9	29-120	6.63	30	
Acenaphthylene	0.216	0.002	0.010	ug/L	0.300	ND	72.0	41-120	6.82	30	
Acenaphthene	0.223	0.003	0.010	ug/L	0.300	ND	74.3	41-120	7.26	30	
Dibenzofuran	0.234	0.002	0.010	ug/L	0.300	0.002	77.3	38-120	8.73	30	
Fluorene	0.242	0.002	0.010	ug/L	0.300	ND	80.8	43-120	7.05	30	
Phenanthrene	0.233	0.001	0.010	ug/L	0.300	0.002	77.2	41-120	5.67	30	
Anthracene	0.192	0.001	0.010	ug/L	0.300	ND	63.9	40-120	3.94	30	
Carbazole	0.228	0.001	0.010	ug/L	0.300	ND	76.0	30-160	6.27	30	
Fluoranthene	0.240	0.002	0.010	ug/L	0.300	ND	79.8	45-120	6.57	30	
Pyrene	0.238	0.001	0.010	ug/L	0.300	ND	79.3	41-120	5.92	30	
Benzo(a)anthracene	0.209	0.0008	0.010	ug/L	0.300	ND	69.6	42-120	3.56	30	
Chrysene	0.237	0.0009	0.010	ug/L	0.300	ND	78.9	44-120	4.28	30	
Benzo(b)fluoranthene	0.187	0.0005	0.010	ug/L	0.300	ND	62.2	44-120	7.98	30	
Benzo(k)fluoranthene	0.258	0.003	0.010	ug/L	0.300	ND	86.0	50-120	6.02	30	
Benzo(j)fluoranthene	0.298	0.002	0.010	ug/L	0.300	ND	99.4	39-160	4.53	30	
Benzofluoranthenes, Total	0.743	0.004	0.010	ug/L	0.900	ND	82.5	46-120	5.90	30	
Benzo(a)pyrene	0.200	0.002	0.010	ug/L	0.300	ND	66.7	35-120	2.41	30	
Perylene	0.213	0.006	0.010	ug/L	0.300	ND	71.1	30-160	4.82	30	

Analytical Resources, Inc.

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

Semivolatile Organic Compounds - SIM - Quality Control

Batch BJB0449 - EPA 3510C SepF

Instrument: NT11 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BJB0449-MSD1)		Source: 21B0160-02		Prepared: 15-Feb-2021 Analyzed: 11-Mar-2021 02:15							
Indeno(1,2,3-cd)pyrene	0.208	0.001	0.010	ug/L	0.300	ND	69.3	37-120	5.93	30	
Dibenzo(a,h)anthracene	0.190	0.001	0.010	ug/L	0.300	ND	63.3	34-120	6.36	30	
Benzo(g,h,i)perylene	0.206	0.001	0.010	ug/L	0.300	ND	68.6	38-120	6.48	30	
<i>Surrogate: 2-Methylnaphthalene-d10</i>	0.232			ug/L	0.300	0.216	77.2	42-120			
<i>Surrogate: Dibenzo[a,h]anthracene-d14</i>	0.172			ug/L	0.300	0.130	57.4	29-120			
<i>Surrogate: Fluoranthene-d10</i>	0.241			ug/L	0.300	0.225	80.5	57-120			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Analytical Resources, Inc.

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

Petroleum Hydrocarbons - Quality Control

Batch BJB0444 - EPA 3510C SepF

Instrument: FID4 Analyst: CTO

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0444-BLK1)				Prepared: 15-Feb-2021 Analyzed: 19-Feb-2021 22:01						
Diesel Range Organics (C12-C24)	ND	0.100	mg/L							U
Motor Oil Range Organics (C24-C38)	ND	0.200	mg/L							U
Surrogate: o-Terphenyl	0.236		mg/L	0.225		105	50-150			
LCS (BJB0444-BS1)				Prepared: 15-Feb-2021 Analyzed: 19-Feb-2021 22:22						
Diesel Range Organics (C12-C24)	2.81	0.100	mg/L	3.00		93.6	56-120			
Surrogate: o-Terphenyl	0.236		mg/L	0.225		105	50-150			
Matrix Spike (BJB0444-MS1)				Source: 21B0160-02 Prepared: 15-Feb-2021 Analyzed: 19-Feb-2021 22:43						
Diesel Range Organics (C12-C24)	3.04	0.100	mg/L	3.00	ND	99.9	56-120			
Surrogate: o-Terphenyl	0.245		mg/L	0.225	0.249	109	50-150			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.										
Matrix Spike Dup (BJB0444-MSD1)				Source: 21B0160-02 Prepared: 15-Feb-2021 Analyzed: 19-Feb-2021 23:04						
Diesel Range Organics (C12-C24)	3.00	0.100	mg/L	3.00	ND	98.3	56-120	1.60	30	
Surrogate: o-Terphenyl	0.244		mg/L	0.225	0.249	108	50-150			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.										

Analytical Resources, Inc.

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 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 02-Aug-2021 10:48

Aroclor PCB - Quality Control
Batch BJB0451 - EPA 3510C SepF

Instrument: ECD7 Analyst: JGR

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0451-BLK1)											
						Prepared: 15-Feb-2021 Analyzed: 12-Mar-2021 08:44					
Aroclor 1016	ND	0.018	0.100	ug/L							U
Aroclor 1221	ND	0.018	0.100	ug/L							U
Aroclor 1232	ND	0.018	0.100	ug/L							U
Aroclor 1242	ND	0.018	0.100	ug/L							U
Aroclor 1248	ND	0.018	0.100	ug/L							U
Aroclor 1254	ND	0.018	0.100	ug/L							U
Aroclor 1260	ND	0.017	0.100	ug/L							U
Surrogate: Decachlorobiphenyl	0.0385			ug/L	0.0800		48.1	26-120			
Surrogate: Tetrachlorometaxylene	0.0336			ug/L	0.0800		42.0	39-120			
Surrogate: Decachlorobiphenyl [2C]	0.0356			ug/L	0.0800		44.4	26-120			
Surrogate: Tetrachlorometaxylene [2C]	0.0293			ug/L	0.0800		36.7	39-120			*
LCS (BJB0451-BS1)											
						Prepared: 15-Feb-2021 Analyzed: 12-Mar-2021 09:05					
Aroclor 1016 [2C]	0.565	0.018	0.100	ug/L	1.00		56.5	51-120			
Aroclor 1260 [2C]	0.569	0.017	0.100	ug/L	1.00		56.9	56-120			
Surrogate: Decachlorobiphenyl	0.0400			ug/L	0.0800		50.0	26-120			
Surrogate: Tetrachlorometaxylene	0.0379			ug/L	0.0800		47.3	39-120			
Surrogate: Decachlorobiphenyl [2C]	0.0393			ug/L	0.0800		49.2	26-120			
Surrogate: Tetrachlorometaxylene [2C]	0.0323			ug/L	0.0800		40.4	39-120			
Matrix Spike (BJB0451-MS1)											
				Source: 21B0160-02		Prepared: 15-Feb-2021 Analyzed: 12-Mar-2021 09:46					
Aroclor 1016	0.614	0.020	0.114	ug/L	1.14	ND	54.0	51-120			
Aroclor 1260	0.649	0.020	0.114	ug/L	1.14	ND	57.1	56-120			
Surrogate: Decachlorobiphenyl	0.0466			ug/L	0.0909		51.3	26-120			
Surrogate: Tetrachlorometaxylene	0.0487			ug/L	0.0909		53.6	39-120			
Surrogate: Decachlorobiphenyl [2C]	0.0470			ug/L	0.0909		51.7	26-120			
Surrogate: Tetrachlorometaxylene [2C]	0.0412			ug/L	0.0909		45.3	39-120			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike Dup (BJB0451-MSD1)											
				Source: 21B0160-02		Prepared: 15-Feb-2021 Analyzed: 12-Mar-2021 10:06					
Aroclor 1016	0.614	0.019	0.108	ug/L	1.08	ND	57.1	51-120	0.04	30	
Aroclor 1260	0.600	0.019	0.108	ug/L	1.08	ND	55.8	56-120	7.85	30	*
Surrogate: Decachlorobiphenyl	0.0440			ug/L	0.0860		51.2	26-120			
Surrogate: Tetrachlorometaxylene	0.0434			ug/L	0.0860		50.4	39-120			



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

Aroclor PCB - Quality Control

Batch BJB0451 - EPA 3510C SepF

Instrument: ECD7 Analyst: JGR

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BJB0451-MSD1)		Source: 21B0160-02		Prepared: 15-Feb-2021		Analyzed: 12-Mar-2021 10:06					
Surrogate: Decachlorobiphenyl [2C]	0.0449			ug/L	0.0860		52.2	26-120			
Surrogate: Tetrachlorometaxylene [2C]	0.0384			ug/L	0.0860		44.7	39-120			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

Metals and Metallic Compounds - Quality Control

Batch BJB0399 - TWM EPA 7470A

Instrument: HYDRA Analyst: BLC

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0399-BLK1)						Prepared: 12-Feb-2021 Analyzed: 15-Feb-2021 14:42					
Mercury	0.000022	0.000013	0.000100	mg/L							J
LCS (BJB0399-BS1)						Prepared: 12-Feb-2021 Analyzed: 15-Feb-2021 14:44					
Mercury	0.00163	0.000013	0.000100	mg/L	0.00200		81.7	80-120			

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 Project: Lower Duwamish
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 02-Aug-2021 10:48

Metals and Metallic Compounds - Quality Control
Batch BJB0514 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0514-BLK2)						Prepared: 17-Feb-2021 Analyzed: 19-Feb-2021 17:23						
Iron	54	ND	6.27	20.0	ug/L							U
Iron	57	13.3	1.40	20.0	ug/L							J
LCS (BJB0514-BS2)						Prepared: 17-Feb-2021 Analyzed: 19-Feb-2021 17:26						
Iron	54	4820	6.27	20.0	ug/L	5000		96.4	80-120			
Iron	57	4970	1.40	20.0	ug/L	5000		99.3	80-120			B
Duplicate (BJB0514-DUP3)						Source: 21B0160-02 Prepared: 17-Feb-2021 Analyzed: 19-Feb-2021 19:49						
Iron	54	16000	12.5	40.0	ug/L		16700			4.24	20	D
Matrix Spike (BJB0514-MS3)						Source: 21B0160-02 Prepared: 17-Feb-2021 Analyzed: 19-Feb-2021 19:53						
Iron	54	21000	12.5	40.0	ug/L	5000	16700	84.7	75-125			D

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike Dup (BJB0514-MSD3)						Source: 21B0160-02 Prepared: 17-Feb-2021 Analyzed: 19-Feb-2021 19:57						
Iron	54	20100	12.5	40.0	ug/L	5000	16700	66.6	75-125	4.43	20	*, D

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0514-BLK1)						Prepared: 17-Feb-2021 Analyzed: 18-Feb-2021 15:44						
Barium	135	ND	0.0560	0.500	ug/L							U
Barium	137	ND	0.0530	0.500	ug/L							U
Chromium	52	ND	0.130	0.500	ug/L							U
Chromium	53	0.119	0.0700	0.500	ug/L							J
Cobalt	59	ND	0.0290	0.200	ug/L							U
Lead	208	ND	0.0680	0.100	ug/L							U
Manganese	55	ND	0.0850	0.500	ug/L							U
Silver	107	ND	0.0170	0.200	ug/L							U
Vanadium	51a	ND	0.0400	0.200	ug/L							U
Vanadium	51b	0.0180	0.0160	0.200	ug/L							J
Arsenic	75a	ND	0.0220	0.200	ug/L							U
Cadmium	111	ND	0.0300	0.100	ug/L							U
Cadmium	114	ND	0.0400	0.100	ug/L							U



Analytical Resources, Incorporated
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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

Metals and Metallic Compounds - Quality Control

Batch BJB0514 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0514-BLK1)						Prepared: 17-Feb-2021 Analyzed: 18-Feb-2021 15:44						
Copper	63	ND	0.340	0.500	ug/L							U
Copper	65	ND	0.350	0.500	ug/L							U
Nickel	60	ND	0.0500	0.500	ug/L							U
Nickel	62	ND	0.220	0.500	ug/L							U
Selenium	78	ND	0.440	0.500	ug/L							U
Zinc	66	ND	0.820	4.00	ug/L							U
Zinc	67	ND	0.940	4.00	ug/L							U

LCS (BJB0514-BS1)						Prepared: 17-Feb-2021 Analyzed: 18-Feb-2021 15:36						
Barium	135	24.6	0.0560	0.500	ug/L	25.0		98.5	80-120			
Barium	137	24.9	0.0530	0.500	ug/L	25.0		99.5	80-120			
Chromium	52	25.9	0.130	0.500	ug/L	25.0		104	80-120			
Chromium	53	25.4	0.0700	0.500	ug/L	25.0		102	80-120			
Cobalt	59	25.5	0.0290	0.200	ug/L	25.0		102	80-120			
Lead	208	26.4	0.0680	0.100	ug/L	25.0		106	80-120			
Manganese	55	25.8	0.0850	0.500	ug/L	25.0		103	80-120			
Silver	107	25.8	0.0170	0.200	ug/L	25.0		103	80-120			
Vanadium	51a	26.7	0.0400	0.200	ug/L	25.0		107	80-120			
Vanadium	51b	26.5	0.0160	0.200	ug/L	25.0		106	80-120			
Arsenic	75a	24.9	0.0220	0.200	ug/L	25.0		99.7	80-120			
Cadmium	111	26.0	0.0300	0.100	ug/L	25.0		104	80-120			
Cadmium	114	25.4	0.0400	0.100	ug/L	25.0		102	80-120			
Copper	63	25.4	0.340	0.500	ug/L	25.0		102	80-120			
Copper	65	25.6	0.350	0.500	ug/L	25.0		103	80-120			
Nickel	60	25.0	0.0500	0.500	ug/L	25.0		100	80-120			
Nickel	62	25.0	0.220	0.500	ug/L	25.0		99.9	80-120			
Zinc	66	80.9	0.820	4.00	ug/L	80.0		101	80-120			
Zinc	67	75.8	0.940	4.00	ug/L	80.0		94.7	80-120			

Duplicate (BJB0514-DUP1)						Source: 21B0160-02 Prepared: 17-Feb-2021 Analyzed: 19-Feb-2021 03:52						
Barium	135	3.54	0.0560	0.500	ug/L	3.56		0.39	20			
Cobalt	59	0.360	0.0290	0.200	ug/L	0.348		3.39	20			
Lead	208	ND	0.0680	0.100	ug/L	ND						U
Silver	107	ND	0.0170	0.200	ug/L	ND						U
Arsenic	75a	3.53	0.0220	0.200	ug/L	3.68		4.13	20			

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 Project: Lower Duwamish
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 02-Aug-2021 10:48

Metals and Metallic Compounds - Quality Control
Batch BJB0514 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Duplicate (BJB0514-DUP1)		Source: 21B0160-02				Prepared: 17-Feb-2021		Analyzed: 19-Feb-2021 03:52				
Cadmium	111	ND	0.0300	0.100	ug/L		ND					U
Copper	63	ND	0.340	0.500	ug/L		ND					U
Nickel	60	0.819	0.0500	0.500	ug/L		0.927			12.40	20	
Selenium	78	ND	0.440	0.500	ug/L		ND					U
Zinc	66	7.52	0.820	4.00	ug/L		7.31			2.81	20	
Duplicate (BJB0514-DUP5)		Source: 21B0160-02				Prepared: 17-Feb-2021		Analyzed: 20-Feb-2021 03:00				
Chromium	52	ND	0.260	1.00	ug/L		ND					U
Manganese	55	407	0.170	1.00	ug/L		424			3.95	20	D
Vanadium	51a	1.10	0.0800	0.400	ug/L		1.14			3.75	20	D
Matrix Spike (BJB0514-MS1)		Source: 21B0160-02				Prepared: 17-Feb-2021		Analyzed: 19-Feb-2021 03:57				
Barium	135	28.8	0.0560	0.500	ug/L	25.0	3.56	101	75-125			
Cobalt	59	26.5	0.0290	0.200	ug/L	25.0	0.348	105	75-125			
Lead	208	25.2	0.0680	0.100	ug/L	25.0	ND	101	75-125			
Silver	107	24.5	0.0170	0.200	ug/L	25.0	ND	97.8	75-125			
Arsenic	75a	28.2	0.0220	0.200	ug/L	25.0	3.68	97.9	75-125			
Cadmium	111	25.2	0.0300	0.100	ug/L	25.0	ND	101	75-125			
Copper	63	25.3	0.340	0.500	ug/L	25.0	ND	101	75-125			
Nickel	60	25.7	0.0500	0.500	ug/L	25.0	0.927	99.1	75-125			
Zinc	66	81.7	0.820	4.00	ug/L	80.0	7.31	93.0	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike (BJB0514-MS5)		Source: 21B0160-02				Prepared: 17-Feb-2021		Analyzed: 20-Feb-2021 03:05				
Chromium	52	22.6	0.260	1.00	ug/L	25.0	ND	90.3	75-125			D
Manganese	55	434	0.170	1.00	ug/L	25.0	424	42.6	75-125			HC, D
Vanadium	51a	24.3	0.0800	0.400	ug/L	25.0	1.14	92.6	75-125			D

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike Dup (BJB0514-MSD1)		Source: 21B0160-02				Prepared: 17-Feb-2021		Analyzed: 19-Feb-2021 04:03				
Barium	135	29.3	0.0560	0.500	ug/L	25.0	3.56	103	75-125	1.69	20	
Cobalt	59	26.9	0.0290	0.200	ug/L	25.0	0.348	106	75-125	1.33	20	
Lead	208	25.8	0.0680	0.100	ug/L	25.0	ND	103	75-125	2.44	20	
Silver	107	24.6	0.0170	0.200	ug/L	25.0	ND	98.3	75-125	0.47	20	
Arsenic	75a	28.8	0.0220	0.200	ug/L	25.0	3.68	101	75-125	2.32	20	

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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

Metals and Metallic Compounds - Quality Control

Batch BJB0514 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BJB0514-MSD1)		Source: 21B0160-02			Prepared: 17-Feb-2021 Analyzed: 19-Feb-2021 04:03							
Cadmium	111	25.3	0.0300	0.100	ug/L	25.0	ND	101	75-125	0.44	20	
Copper	63	25.5	0.340	0.500	ug/L	25.0	ND	102	75-125	0.72	20	
Nickel	60	26.0	0.0500	0.500	ug/L	25.0	0.927	100	75-125	1.18	20	
Selenium	78	78.4	0.440	0.500	ug/L	80.0	ND	98.0	75-125	7.23	20	
Zinc	66	84.9	0.820	4.00	ug/L	80.0	7.31	96.9	75-125	3.78	20	

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike Dup (BJB0514-MSD5)		Source: 21B0160-02			Prepared: 17-Feb-2021 Analyzed: 20-Feb-2021 03:12							
Chromium	52	23.9	0.260	1.00	ug/L	25.0	ND	95.6	75-125	5.68	20	D
Manganese	55	440	0.170	1.00	ug/L	25.0	424	66.4	75-125	1.36	20	HC, D
Vanadium	51a	25.3	0.0800	0.400	ug/L	25.0	1.14	96.8	75-125	4.22	20	D

Recovery limits for target analytes in MS/MSD QC samples are advisory only.



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

Metals and Metallic Compounds - Quality Control

Batch BJB0616 - TWM EPA 7470A

Instrument: HYDRA Analyst: BLC

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0616-BLK1)						Prepared: 22-Feb-2021 Analyzed: 25-Feb-2021 11:32					
Mercury	ND	0.000013	0.000100	mg/L							U
LCS (BJB0616-BS1)						Prepared: 22-Feb-2021 Analyzed: 25-Feb-2021 11:34					
Mercury	0.00224	0.000013	0.000100	mg/L	0.00200		112	80-120			
Duplicate (BJB0616-DUP1)						Source: 21B0160-02RE1 Prepared: 22-Feb-2021 Analyzed: 25-Feb-2021 11:39					
Mercury	ND	0.000013	0.000100	mg/L		ND					U
Matrix Spike (BJB0616-MS1)						Source: 21B0160-02RE1 Prepared: 22-Feb-2021 Analyzed: 25-Feb-2021 11:41					
Mercury	0.00111	0.000013	0.000100	mg/L	0.00100	ND	111	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike Dup (BJB0616-MSD1)						Source: 21B0160-02RE1 Prepared: 22-Feb-2021 Analyzed: 25-Feb-2021 11:43					
Mercury	0.00118	0.000013	0.000100	mg/L	0.00100	ND	118	75-125	5.96	20	
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											

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Analytical Report

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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BJB0544 - TWM EPA 7470A

Instrument: HYDRA Analyst: BLC

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0544-BLK1)						Prepared: 18-Feb-2021 Analyzed: 19-Feb-2021 14:49					
Mercury, Dissolved	ND	0.000013	0.000100	mg/L							U
LCS (BJB0544-BS1)						Prepared: 18-Feb-2021 Analyzed: 19-Feb-2021 14:52					
Mercury, Dissolved	0.00208	0.000013	0.000100	mg/L	0.00200		104	80-120			
Duplicate (BJB0544-DUP1)						Source: 21B0160-03 Prepared: 18-Feb-2021 Analyzed: 19-Feb-2021 14:56					
Mercury, Dissolved	ND	0.000013	0.000100	mg/L		ND					U
Matrix Spike (BJB0544-MS1)						Source: 21B0160-03 Prepared: 18-Feb-2021 Analyzed: 19-Feb-2021 14:59					
Mercury, Dissolved	0.00106	0.000013	0.000100	mg/L	0.00100	ND	106	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike Dup (BJB0544-MSD1)						Source: 21B0160-03 Prepared: 18-Feb-2021 Analyzed: 19-Feb-2021 15:06					
Mercury, Dissolved	0.00100	0.000013	0.000100	mg/L	0.00100	ND	100	75-125	5.80	20	
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											

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Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BJB0603 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0603-BLK1)						Prepared: 22-Feb-2021 Analyzed: 23-Feb-2021 18:03						
Barium, Dissolved	135	ND	0.0560	0.500	ug/L							U
Barium, Dissolved	137	ND	0.0530	0.500	ug/L							U
Chromium, Dissolved	52	0.240	0.130	0.500	ug/L							J
Chromium, Dissolved	53	0.164	0.0700	0.500	ug/L							J
Cobalt, Dissolved	59	ND	0.0290	0.200	ug/L							U
Iron, Dissolved	54	9.35	6.27	20.0	ug/L							J
Iron, Dissolved	57	ND	1.40	20.0	ug/L							U
Lead, Dissolved	208	ND	0.0680	0.100	ug/L							U
Manganese, Dissolved	55	0.693	0.0850	0.500	ug/L							
Silver, Dissolved	107	ND	0.0170	0.200	ug/L							U
Vanadium, Dissolved	51a	ND	0.0400	0.200	ug/L							U
Vanadium, Dissolved	51b	0.0170	0.0160	0.200	ug/L							J
Arsenic, Dissolved	75a	ND	0.0220	0.200	ug/L							U
Cadmium, Dissolved	111	ND	0.0300	0.100	ug/L							U
Cadmium, Dissolved	114	ND	0.0400	0.100	ug/L							U
Copper, Dissolved	63	ND	0.340	0.500	ug/L							U
Copper, Dissolved	65	ND	0.350	0.500	ug/L							U
Nickel, Dissolved	60	ND	0.0500	0.500	ug/L							U
Nickel, Dissolved	62	ND	0.220	0.500	ug/L							U
Selenium, Dissolved	78	ND	0.440	0.500	ug/L							U
Zinc, Dissolved	66	ND	0.820	4.00	ug/L							U
Zinc, Dissolved	67	ND	0.940	4.00	ug/L							U

LCS (BJB0603-BS1)						Prepared: 22-Feb-2021 Analyzed: 23-Feb-2021 18:08						
Barium, Dissolved	135	26.1	0.0560	0.500	ug/L	25.0		104	80-120			
Barium, Dissolved	137	26.4	0.0530	0.500	ug/L	25.0		106	80-120			
Chromium, Dissolved	52	26.3	0.130	0.500	ug/L	25.0		105	80-120			
Chromium, Dissolved	53	26.4	0.0700	0.500	ug/L	25.0		105	80-120			
Cobalt, Dissolved	59	26.4	0.0290	0.200	ug/L	25.0		106	80-120			
Iron, Dissolved	54	5180	6.27	20.0	ug/L	5000		104	80-120			
Iron, Dissolved	57	5240	1.40	20.0	ug/L	5000		105	80-120			
Lead, Dissolved	208	26.0	0.0680	0.100	ug/L	25.0		104	80-120			
Manganese, Dissolved	55	26.7	0.0850	0.500	ug/L	25.0		107	80-120			B
Silver, Dissolved	107	26.3	0.0170	0.200	ug/L	25.0		105	80-120			
Vanadium, Dissolved	51a	25.6	0.0400	0.200	ug/L	25.0		102	80-120			

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 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 02-Aug-2021 10:48

Metals and Metallic Compounds (dissolved) - Quality Control
Batch BJB0603 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJB0603-BS1)						Prepared: 22-Feb-2021 Analyzed: 23-Feb-2021 18:08						
Vanadium, Dissolved	51b	25.6	0.0160	0.200	ug/L	25.0		102	80-120			
Arsenic, Dissolved	75a	25.8	0.0220	0.200	ug/L	25.0		103	80-120			
Cadmium, Dissolved	111	25.1	0.0300	0.100	ug/L	25.0		100	80-120			
Cadmium, Dissolved	114	25.5	0.0400	0.100	ug/L	25.0		102	80-120			
Copper, Dissolved	63	26.3	0.340	0.500	ug/L	25.0		105	80-120			
Copper, Dissolved	65	26.6	0.350	0.500	ug/L	25.0		106	80-120			
Nickel, Dissolved	60	26.5	0.0500	0.500	ug/L	25.0		106	80-120			
Nickel, Dissolved	62	26.1	0.220	0.500	ug/L	25.0		104	80-120			
Selenium, Dissolved	78	79.2	0.440	0.500	ug/L	80.0		99.0	80-120			
Zinc, Dissolved	66	79.6	0.820	4.00	ug/L	80.0		99.5	80-120			
Zinc, Dissolved	67	76.7	0.940	4.00	ug/L	80.0		95.8	80-120			
Duplicate (BJB0603-DUP1)						Source: 21B0160-03 Prepared: 22-Feb-2021 Analyzed: 23-Feb-2021 18:33						
Barium, Dissolved	135	0.921	0.0560	0.500	ug/L		0.937			1.72	20	
Chromium, Dissolved	52	ND	0.130	0.500	ug/L		0.147					U
Cobalt, Dissolved	59	0.321	0.0290	0.200	ug/L		0.338			5.16	20	
Iron, Dissolved	54	12500	6.27	20.0	ug/L		12300			1.76	20	
Lead, Dissolved	208	ND	0.0680	0.100	ug/L		ND					U
Silver, Dissolved	107	ND	0.0170	0.200	ug/L		ND					U
Vanadium, Dissolved	51a	0.343	0.0400	0.200	ug/L		0.355			3.44	20	
Arsenic, Dissolved	75a	2.65	0.0220	0.200	ug/L		2.61			1.67	20	
Cadmium, Dissolved	111	ND	0.0300	0.100	ug/L		ND					U
Copper, Dissolved	63	ND	0.340	0.500	ug/L		ND					U
Nickel, Dissolved	60	0.900	0.0500	0.500	ug/L		0.813			10.20	20	
Selenium, Dissolved	78	ND	0.440	0.500	ug/L		ND					U
Zinc, Dissolved	66	8.57	0.820	4.00	ug/L		8.57			0.02	20	
Duplicate (BJB0603-DUP2)						Source: 21B0160-03 Prepared: 22-Feb-2021 Analyzed: 24-Feb-2021 14:58						
Manganese, Dissolved	55	343	0.425	2.50	ug/L		335			2.31	20	D, B
Matrix Spike (BJB0603-MS1)						Source: 21B0160-03 Prepared: 22-Feb-2021 Analyzed: 23-Feb-2021 18:39						
Barium, Dissolved	135	26.9	0.0560	0.500	ug/L	25.0	0.937	104	75-125			
Chromium, Dissolved	52	23.6	0.130	0.500	ug/L	25.0	0.147	93.9	75-125			
Cobalt, Dissolved	59	27.3	0.0290	0.200	ug/L	25.0	0.338	108	75-125			
Iron, Dissolved	54	17100	6.27	20.0	ug/L	5000	12300	96.5	75-125			
Lead, Dissolved	208	26.8	0.0680	0.100	ug/L	25.0	ND	107	75-125			

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 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 02-Aug-2021 10:48

Metals and Metallic Compounds (dissolved) - Quality Control
Batch BJB0603 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BJB0603-MS1)		Source: 21B0160-03			Prepared: 22-Feb-2021 Analyzed: 23-Feb-2021 18:39							
Silver, Dissolved	107	25.6	0.0170	0.200	ug/L	25.0	ND	102	75-125			
Vanadium, Dissolved	51a	23.8	0.0400	0.200	ug/L	25.0	0.355	93.8	75-125			
Arsenic, Dissolved	75a	28.4	0.0220	0.200	ug/L	25.0	2.61	103	75-125			
Cadmium, Dissolved	111	26.3	0.0300	0.100	ug/L	25.0	ND	105	75-125			
Copper, Dissolved	63	25.9	0.340	0.500	ug/L	25.0	ND	103	75-125			
Nickel, Dissolved	60	27.2	0.0500	0.500	ug/L	25.0	0.813	106	75-125			
Selenium, Dissolved	78	76.7	0.440	0.500	ug/L	80.0	ND	95.9	75-125			
Zinc, Dissolved	66	87.5	0.820	4.00	ug/L	80.0	8.57	98.7	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike (BJB0603-MS2)		Source: 21B0160-03			Prepared: 22-Feb-2021 Analyzed: 24-Feb-2021 15:03							
Manganese, Dissolved	55	367	0.425	2.50	ug/L	25.0	335	128	75-125			HC, D, B

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike Dup (BJB0603-MSD1)		Source: 21B0160-03			Prepared: 22-Feb-2021 Analyzed: 23-Feb-2021 18:45							
Barium, Dissolved	135	26.6	0.0560	0.500	ug/L	25.0	0.937	102	75-125	1.18	20	
Chromium, Dissolved	52	23.1	0.130	0.500	ug/L	25.0	0.147	91.7	75-125	2.43	20	
Cobalt, Dissolved	59	26.2	0.0290	0.200	ug/L	25.0	0.338	104	75-125	4.10	20	
Iron, Dissolved	54	16800	6.27	20.0	ug/L	5000	12300	88.8	75-125	2.26	20	
Lead, Dissolved	208	26.2	0.0680	0.100	ug/L	25.0	ND	105	75-125	2.24	20	
Silver, Dissolved	107	25.0	0.0170	0.200	ug/L	25.0	ND	100	75-125	2.39	20	
Vanadium, Dissolved	51a	23.4	0.0400	0.200	ug/L	25.0	0.355	92.4	75-125	1.49	20	
Arsenic, Dissolved	75a	27.1	0.0220	0.200	ug/L	25.0	2.61	98.0	75-125	4.48	20	
Cadmium, Dissolved	111	24.2	0.0300	0.100	ug/L	25.0	ND	96.7	75-125	8.32	20	
Copper, Dissolved	63	25.5	0.340	0.500	ug/L	25.0	ND	102	75-125	1.43	20	
Nickel, Dissolved	60	26.8	0.0500	0.500	ug/L	25.0	0.813	104	75-125	1.44	20	
Selenium, Dissolved	78	74.9	0.440	0.500	ug/L	80.0	ND	93.6	75-125	2.36	20	
Zinc, Dissolved	66	83.5	0.820	4.00	ug/L	80.0	8.57	93.7	75-125	4.62	20	

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike Dup (BJB0603-MSD2)		Source: 21B0160-03			Prepared: 22-Feb-2021 Analyzed: 24-Feb-2021 15:08							
Manganese, Dissolved	55	366	0.425	2.50	ug/L	25.0	335	123	75-125	0.40	20	HC, D, B

Recovery limits for target analytes in MS/MSD QC samples are advisory only.



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

Wet Chemistry - Quality Control

Batch BJB0357 - No Prep Wet Chem

Instrument: N/A

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0357-BLK1)						Prepared: 11-Feb-2021 Analyzed: 11-Feb-2021 09:46					
Sulfite	ND	1.4	1.4	mg/L							U
LCS (BJB0357-BS1)						Prepared: 11-Feb-2021 Analyzed: 11-Feb-2021 09:46					
Sulfite	3.9	1.4	1.4	mg/L	4.98		78.9	75-100			
Duplicate (BJB0357-DUP1)						Source: 21B0160-09 Prepared: 11-Feb-2021 Analyzed: 11-Feb-2021 09:46					
Sulfite	ND	1.4	1.4	mg/L		ND					H, U

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

Wet Chemistry - Quality Control

Batch BJB0359 - No Prep Wet Chem

Instrument: UV1800-2 Analyst: BF

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0359-BLK1)						Prepared: 11-Feb-2021 Analyzed: 11-Feb-2021 12:16					
Ferrous Iron	ND	0.040	0.040	mg/L							U
LCS (BJB0359-BS1)						Prepared: 11-Feb-2021 Analyzed: 11-Feb-2021 12:17					
Ferrous Iron	0.493	0.040	0.040	mg/L	0.501		98.5	90-110			
Duplicate (BJB0359-DUP4)						Source: 21B0160-09RE3 Prepared: 11-Feb-2021 Analyzed: 11-Feb-2021 13:26					
Ferrous Iron	20.7	0.800	0.800	mg/L		19.7			4.96	20	D
Matrix Spike (BJB0359-MS5)						Source: 21B0160-09RE3 Prepared: 11-Feb-2021 Analyzed: 11-Feb-2021 13:28					
Ferrous Iron	37.8	2.00	2.00	mg/L	20.0	19.7	90.5	75-125			D

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

Wet Chemistry - Quality Control

Batch BJB0365 - No Prep Wet Chem

Instrument: IC930 Analyst: WCW

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0365-BLK1)						Prepared: 11-Feb-2021 Analyzed: 11-Feb-2021 12:33					
Chloride	ND	0.100	0.100	mg/L							U
Nitrate-N	ND	0.100	0.100	mg/L							U
Nitrite-N	ND	0.100	0.100	mg/L							U
Sulfate	ND	0.100	0.100	mg/L							U
LCS (BJB0365-BS1)						Prepared: 11-Feb-2021 Analyzed: 11-Feb-2021 12:53					
Chloride	4.85	0.100	0.100	mg/L	5.00		97.0	90-110			
Nitrate-N	5.09	0.100	0.100	mg/L	5.00		102	90-110			
Nitrite-N	4.98	0.100	0.100	mg/L	5.00		99.7	90-110			
Sulfate	5.27	0.100	0.100	mg/L	5.00		105	90-110			

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Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
02-Aug-2021 10:48

Certified Analyses included in this Report

Analyte	Certifications
EPA 300.0 in Water	
Chloride	DoD-ELAP,WADOE,WA-DW,NELAP
Nitrate-N	DoD-ELAP,WADOE,WA-DW,NELAP
Nitrite-N	DoD-ELAP,WADOE,WA-DW,NELAP
Sulfate	DoD-ELAP,WADOE,WA-DW,NELAP
EPA 6020B in Water	
Silver-107	WADOE,WA-DW,DoD-ELAP,NELAP
Barium-135	NELAP,WADOE,DoD-ELAP,ADEC
Barium-137	NELAP,WADOE,DoD-ELAP,ADEC
Cobalt-59	DoD-ELAP,NELAP,WADOE
Chromium-52	NELAP,WADOE,DoD-ELAP,ADEC
Chromium-53	NELAP,WADOE,DoD-ELAP,ADEC
Iron-54	NELAP,WADOE,DoD-ELAP
Iron-57	NELAP,WADOE,DoD-ELAP
Manganese-55	NELAP,WADOE,DoD-ELAP
Lead-208	NELAP,WADOE,DoD-ELAP,ADEC
Vanadium-51a	NELAP,DoD-ELAP,WADOE,ADEC
Vanadium-51b	NELAP,DoD-ELAP,WADOE,ADEC
Silver-107	WA-DW,DoD-ELAP,NELAP
Barium-135	NELAP,WADOE,DoD-ELAP,ADEC
Barium-137	NELAP,WADOE,DoD-ELAP,ADEC
Cobalt-59	NELAP,DoD-ELAP,WADOE
Chromium-52	NELAP,WADOE,DoD-ELAP,ADEC
Chromium-53	NELAP,WADOE,DoD-ELAP,ADEC
Iron-54	NELAP,WADOE,DoD-ELAP
Iron-57	NELAP,WADOE,DoD-ELAP
Manganese-55	NELAP,WADOE,DoD-ELAP
Lead-208	NELAP,WADOE,DoD-ELAP,ADEC
Vanadium-51a	NELAP,DoD-ELAP,WADOE,ADEC
Vanadium-51b	NELAP,DoD-ELAP,WADOE,ADEC
EPA 6020B UCT-KED in Water	
Arsenic-75a	WADOE,WA-DW,DoD-ELAP,ADEC,NELAP
Cadmium-111	NELAP,WADOE,DoD-ELAP,ADEC
Cadmium-114	NELAP,WADOE,DoD-ELAP,ADEC
Copper-63	NELAP,WADOE,DoD-ELAP



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Copper-65	NELAP,WADOE,DoD-ELAP
Nickel-60	NELAP,WADOE,DoD-ELAP,ADEC
Nickel-62	NELAP,WADOE,DoD-ELAP,ADEC
Selenium-78	NELAP,WADOE,DoD-ELAP
Zinc-66	WADOE,WA-DW,DoD-ELAP
Zinc-67	WADOE,WA-DW,DoD-ELAP
Arsenic-75a	NELAP,WADOE,DoD-ELAP,ADEC
Cadmium-111	NELAP,WADOE,DoD-ELAP,ADEC
Cadmium-114	NELAP,WADOE,DoD-ELAP,ADEC
Copper-63	NELAP,WADOE,DoD-ELAP
Copper-65	NELAP,WADOE,DoD-ELAP
Nickel-60	NELAP,WADOE,DoD-ELAP,ADEC
Nickel-62	NELAP,WADOE,DoD-ELAP,ADEC
Selenium-78	NELAP,WADOE,DoD-ELAP
Zinc-66	NELAP,WADOE,DoD-ELAP
Zinc-67	NELAP,WADOE,DoD-ELAP

EPA 7470A in Water

Mercury	WADOE,NELAP,DoD-ELAP
Mercury	WADOE,NELAP,DoD-ELAP

EPA 8082A in Water

Aroclor 1016	ADEC,DoD-ELAP,NELAP,WADOE
Aroclor-1016 (1)	ADEC
Aroclor-1016 (2)	ADEC
Aroclor-1016 (3)	ADEC
Aroclor-1016 (4)	ADEC
Aroclor 1016 [2C]	ADEC,DoD-ELAP,NELAP,WADOE
Aroclor-1016 (1) [2C]	ADEC
Aroclor-1016 (2) [2C]	ADEC
Aroclor-1016 (3) [2C]	ADEC
Aroclor-1016 (4) [2C]	ADEC
Aroclor 1221	ADEC,DoD-ELAP,NELAP,WADOE
Aroclor-1221 (1)	ADEC
Aroclor-1221 (2)	ADEC
Aroclor-1221 (3)	ADEC
Aroclor 1221 [2C]	ADEC,DoD-ELAP,NELAP,WADOE
Aroclor-1221 (1) [2C]	ADEC
Aroclor-1221 (2) [2C]	ADEC
Aroclor-1221 (3) [2C]	ADEC
Aroclor-1221 (4) [2C]	ADEC



Shannon & Wilson, Inc
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Reported:
02-Aug-2021 10:48

Aroclor 1232	ADEC,DoD-ELAP,NELAP,WADOE
Aroclor-1232 (1)	ADEC
Aroclor-1232 (2)	ADEC
Aroclor-1232 (3)	ADEC
Aroclor-1232 (4)	ADEC
Aroclor 1232 [2C]	ADEC,DoD-ELAP,NELAP,WADOE
Aroclor-1232 (1) [2C]	ADEC
Aroclor-1232 (2) [2C]	ADEC
Aroclor-1232 (3) [2C]	ADEC
Aroclor-1232 (4) [2C]	ADEC
Aroclor 1242	ADEC,DoD-ELAP,NELAP,WADOE
Aroclor-1242 (1)	ADEC
Aroclor-1242 (2)	ADEC
Aroclor-1242 (3)	ADEC
Aroclor-1242 (4)	ADEC
Aroclor 1242 [2C]	ADEC,DoD-ELAP,NELAP,WADOE
Aroclor-1242 (1) [2C]	ADEC
Aroclor-1242 (2) [2C]	ADEC
Aroclor-1242 (3) [2C]	ADEC
Aroclor-1242 (4) [2C]	ADEC
Aroclor 1248	ADEC,DoD-ELAP,NELAP,WADOE
Aroclor-1248 (1)	ADEC
Aroclor-1248 (2)	ADEC
Aroclor-1248 (3)	ADEC
Aroclor-1248 (4)	ADEC
Aroclor 1248 [2C]	ADEC,DoD-ELAP,NELAP,WADOE
Aroclor-1248 (1) [2C]	ADEC
Aroclor-1248 (2) [2C]	ADEC
Aroclor-1248 (3) [2C]	ADEC
Aroclor-1248 (4) [2C]	ADEC
Aroclor 1254	ADEC,DoD-ELAP,NELAP,WADOE
Aroclor-1254 (1)	ADEC
Aroclor-1254 (2)	ADEC
Aroclor-1254 (3)	ADEC
Aroclor-1254 (4)	ADEC
Aroclor-1254 (5)	ADEC
Aroclor 1254 [2C]	ADEC,DoD-ELAP,NELAP,WADOE
Aroclor-1254 (1) [2C]	ADEC
Aroclor-1254 (2) [2C]	ADEC



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Aroclor-1254 (3) [2C]	ADEC
Aroclor-1254 (4) [2C]	ADEC
Aroclor-1254 (5) [2C]	ADEC
Aroclor 1260	ADEC,DoD-ELAP,NELAP,WADOE
Aroclor-1260 (1)	ADEC
Aroclor-1260 (2)	ADEC
Aroclor-1260 (3)	ADEC
Aroclor-1260 (4)	ADEC
Aroclor-1260 (5)	ADEC
Aroclor 1260 [2C]	ADEC,DoD-ELAP,NELAP,WADOE
Aroclor-1260 (1) [2C]	ADEC
Aroclor-1260 (2) [2C]	ADEC
Aroclor-1260 (3) [2C]	ADEC
Aroclor-1260 (4) [2C]	ADEC
Aroclor 1262	ADEC,DoD-ELAP,NELAP,WADOE
Aroclor-1262 (1)	ADEC
Aroclor-1262 (2)	ADEC
Aroclor-1262 (3)	ADEC
Aroclor-1262 (4)	ADEC
Aroclor-1262 (5)	ADEC
Aroclor 1262 [2C]	ADEC,DoD-ELAP,NELAP,WADOE
Aroclor-1262 (1) [2C]	ADEC
Aroclor-1262 (2) [2C]	ADEC
Aroclor-1262 (3) [2C]	ADEC
Aroclor-1262 (4) [2C]	ADEC
Aroclor-1262 (5) [2C]	ADEC
Aroclor 1268	ADEC,DoD-ELAP,NELAP,WADOE
Aroclor-1268 (1)	ADEC
Aroclor-1268 (2)	ADEC
Aroclor-1268 (3)	ADEC
Aroclor-1268 (4)	ADEC
Aroclor 1268 [2C]	ADEC,DoD-ELAP,NELAP,WADOE
Aroclor-1268 (1) [2C]	ADEC
Aroclor-1268 (2) [2C]	ADEC
Aroclor-1268 (3) [2C]	ADEC
Aroclor-1268 (4) [2C]	ADEC

EPA 8260D in Water

Chloromethane	DoD-ELAP,ADEC,NELAP,WADOE
Vinyl Chloride	DoD-ELAP,ADEC,NELAP,WADOE



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Bromomethane	DoD-ELAP,ADEC,NELAP,WADOE
Chloroethane	DoD-ELAP,ADEC,NELAP,WADOE
Trichlorofluoromethane	DoD-ELAP,ADEC,NELAP,WADOE
Acrolein	DoD-ELAP,NELAP,WADOE
1,1,2-Trichloro-1,2,2-Trifluoroethane	DoD-ELAP,ADEC,NELAP,WADOE
Acetone	DoD-ELAP,ADEC,NELAP,WADOE
1,1-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Iodomethane	DoD-ELAP,NELAP,WADOE
Methylene Chloride	DoD-ELAP,ADEC,NELAP,WADOE
Acrylonitrile	DoD-ELAP,NELAP,WADOE
Carbon Disulfide	DoD-ELAP,NELAP,WADOE
trans-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Vinyl Acetate	DoD-ELAP,NELAP,WADOE
1,1-Dichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
2-Butanone	DoD-ELAP,NELAP,WADOE
2,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
cis-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Chloroform	DoD-ELAP,ADEC,NELAP,WADOE
Bromochloromethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1,1-Trichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
Carbon tetrachloride	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
Benzene	DoD-ELAP,ADEC,NELAP,WADOE
Trichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
Bromodichloromethane	DoD-ELAP,ADEC,NELAP,WADOE
Dibromomethane	DoD-ELAP,ADEC,NELAP,WADOE
2-Chloroethyl vinyl ether	DoD-ELAP,ADEC,NELAP,WADOE
4-Methyl-2-Pentanone	DoD-ELAP,NELAP,WADOE
cis-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
Toluene	DoD-ELAP,ADEC,NELAP,WADOE
trans-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
2-Hexanone	DoD-ELAP,NELAP,WADOE
1,1,2-Trichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,3-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
Tetrachloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Dibromochloromethane	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dibromoethane	DoD-ELAP,NELAP,WADOE



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Chlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Ethylbenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,1,1,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,WADOE
m,p-Xylene	DoD-ELAP,ADEC,NELAP,WADOE
o-Xylene	DoD-ELAP,ADEC,NELAP,WADOE
Styrene	DoD-ELAP,NELAP,WADOE
Bromoform	DoD-ELAP,NELAP,WADOE
1,1,2,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,2,3-Trichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
trans-1,4-Dichloro 2-Butene	DoD-ELAP,ADEC,NELAP,WADOE
n-Propylbenzene	DoD-ELAP,NELAP,WADOE
Bromobenzene	DoD-ELAP,NELAP,WADOE
Isopropyl Benzene	DoD-ELAP,NELAP,WADOE
2-Chlorotoluene	DoD-ELAP,ADEC,NELAP,WADOE
4-Chlorotoluene	DoD-ELAP,ADEC,NELAP,WADOE
t-Butylbenzene	DoD-ELAP,NELAP,WADOE
1,3,5-Trimethylbenzene	DoD-ELAP,NELAP,WADOE
1,2,4-Trimethylbenzene	DoD-ELAP,NELAP,WADOE
s-Butylbenzene	DoD-ELAP,NELAP,WADOE
4-Isopropyl Toluene	DoD-ELAP,NELAP,WADOE
1,3-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,4-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
n-Butylbenzene	DoD-ELAP,NELAP,WADOE
1,2-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dibromo-3-chloropropane	DoD-ELAP,ADEC,NELAP,WADOE
1,2,4-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Hexachloro-1,3-Butadiene	DoD-ELAP,ADEC,NELAP,WADOE
Naphthalene	DoD-ELAP,ADEC,NELAP,WADOE
1,2,3-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Dichlorodifluoromethane	DoD-ELAP,ADEC,NELAP,WADOE
Methyl tert-butyl Ether	DoD-ELAP,ADEC,NELAP,WADOE
n-Hexane	WADOE
2-Pentanone	WADOE

EPA 8260D-SIM in Water

Acrylonitrile	NELAP,WADOE
Vinyl chloride	NELAP,WADOE
1,1-Dichloroethene	NELAP,WADOE
cis-1,2-Dichloroethene	NELAP,WADOE
trans-1,2-Dichloroethene	NELAP,WADOE



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Trichloroethene	NELAP,WADOE
Tetrachloroethene	NELAP,WADOE
1,1,2,2-Tetrachloroethane	NELAP,WADOE
1,2-Dichloroethane	NELAP,WADOE
Benzene	NELAP,WADOE

EPA 8270E in Water

Phenol	NELAP,DoD-ELAP
bis(2-chloroethyl) ether	NELAP,DoD-ELAP
2-Chlorophenol	NELAP,DoD-ELAP
1,3-Dichlorobenzene	NELAP,DoD-ELAP
1,4-Dichlorobenzene	NELAP,DoD-ELAP
1,2-Dichlorobenzene	NELAP,DoD-ELAP
Benzyl Alcohol	NELAP,DoD-ELAP
2,2'-Oxybis(1-chloropropane)	NELAP,DoD-ELAP
2-Methylphenol	NELAP,DoD-ELAP
Hexachloroethane	NELAP,DoD-ELAP
N-Nitroso-di-n-Propylamine	NELAP,DoD-ELAP
4-Methylphenol	NELAP,DoD-ELAP
Nitrobenzene	NELAP,DoD-ELAP
Isophorone	NELAP,DoD-ELAP
2-Nitrophenol	NELAP,DoD-ELAP
2,4-Dimethylphenol	NELAP,DoD-ELAP
Bis(2-Chloroethoxy)methane	NELAP,DoD-ELAP
2,4-Dichlorophenol	NELAP,DoD-ELAP
1,2,4-Trichlorobenzene	NELAP,DoD-ELAP
Naphthalene	NELAP,DoD-ELAP
Benzoic acid	NELAP,DoD-ELAP
4-Chloroaniline	NELAP,DoD-ELAP
Hexachlorobutadiene	NELAP,DoD-ELAP
4-Chloro-3-Methylphenol	NELAP,DoD-ELAP
2-Methylnaphthalene	NELAP,DoD-ELAP
Hexachlorocyclopentadiene	NELAP,DoD-ELAP
2,4,6-Trichlorophenol	NELAP,DoD-ELAP
2,4,5-Trichlorophenol	NELAP,DoD-ELAP
2-Chloronaphthalene	NELAP,DoD-ELAP
2-Nitroaniline	NELAP,DoD-ELAP
Acenaphthylene	NELAP,DoD-ELAP
Dimethylphthalate	NELAP,DoD-ELAP
2,6-Dinitrotoluene	NELAP,DoD-ELAP



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Acenaphthene	NELAP,DoD-ELAP
3-Nitroaniline	NELAP,DoD-ELAP
2,4-Dinitrophenol	NELAP,DoD-ELAP
Dibenzofuran	NELAP,DoD-ELAP
4-Nitrophenol	NELAP,DoD-ELAP
2,4-Dinitrotoluene	NELAP,DoD-ELAP
Fluorene	NELAP,DoD-ELAP
4-Chlorophenylphenyl ether	NELAP,DoD-ELAP
Diethyl phthalate	NELAP,DoD-ELAP
4-Nitroaniline	NELAP,DoD-ELAP
4,6-Dinitro-2-methylphenol	NELAP,DoD-ELAP
N-Nitrosodiphenylamine	NELAP,DoD-ELAP
4-Bromophenyl phenyl ether	NELAP,DoD-ELAP
Hexachlorobenzene	NELAP,DoD-ELAP
Pentachlorophenol	NELAP,DoD-ELAP
Phenanthrene	NELAP,DoD-ELAP
Anthracene	NELAP,DoD-ELAP
Carbazole	NELAP,DoD-ELAP
Di-n-Butylphthalate	NELAP,DoD-ELAP
Fluoranthene	NELAP,DoD-ELAP
Pyrene	NELAP,DoD-ELAP
Butylbenzylphthalate	NELAP,DoD-ELAP
Benzo(a)anthracene	NELAP,DoD-ELAP
3,3'-Dichlorobenzidine	NELAP,DoD-ELAP
Chrysene	NELAP,DoD-ELAP
bis(2-Ethylhexyl)phthalate	NELAP,DoD-ELAP
Di-n-Octylphthalate	NELAP,DoD-ELAP
Benzo(b)fluoranthene	NELAP,DoD-ELAP
Benzo(k)fluoranthene	NELAP,DoD-ELAP
Benzo(a)pyrene	NELAP,DoD-ELAP
Indeno(1,2,3-cd)pyrene	NELAP,DoD-ELAP
Dibenzo(a,h)anthracene	NELAP,DoD-ELAP
Benzo(g,h,i)perylene	NELAP,DoD-ELAP
N-Nitrosodimethylamine	NELAP,DoD-ELAP
1-Methylnaphthalene	NELAP,DoD-ELAP

EPA 8270E-SIM in Water

Naphthalene	ADEC,DoD-ELAP,NELAP,WADOE
2-Methylnaphthalene	ADEC,DoD-ELAP,NELAP



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1-Methylnaphthalene	ADEC, DoD-ELAP, NELAP, WADOE
Biphenyl	NELAP
Acenaphthylene	ADEC, DoD-ELAP, NELAP, WADOE
Acenaphthene	ADEC, DoD-ELAP, NELAP, WADOE
Dibenzofuran	ADEC, DoD-ELAP, NELAP
Fluorene	ADEC, DoD-ELAP, NELAP, WADOE
Phenanthrene	ADEC, DoD-ELAP, NELAP, WADOE
Anthracene	ADEC, DoD-ELAP, NELAP, WADOE
Carbazole	NELAP
Fluoranthene	ADEC, DoD-ELAP, NELAP, WADOE
Pyrene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(a)anthracene	ADEC, DoD-ELAP, NELAP, WADOE
Chrysene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(b)fluoranthene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(k)fluoranthene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(j)fluoranthene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(e)pyrene	NELAP
Benzo(a)pyrene	ADEC, DoD-ELAP, NELAP, WADOE
Perylene	ADEC, NELAP
Indeno(1,2,3-cd)pyrene	ADEC, DoD-ELAP, NELAP, WADOE
Dibenzo(a,h)anthracene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(g,h,i)perylene	ADEC, DoD-ELAP, NELAP, WADOE

EPA RSK-175 in Water

Methane	NELAP
Ethane	NELAP
Ethene	NELAP
Acetylene	NELAP

NWTPH-Dx in Water

Diesel Range Organics (C12-C24)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C10-C25)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (Tol-C18)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C10-C24)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C10-C28)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C12-C22)	DoD-ELAP
Diesel Range Organics (C12-C25)	DoD-ELAP
Motor Oil Range Organics (C24-C38)	DoD-ELAP, NELAP, WADOE
Motor Oil Range Organics (C25-C36)	DoD-ELAP, NELAP, WADOE
Motor Oil Range Organics (C24-C40)	DoD-ELAP, NELAP, WADOE
Residual Range Organics (C23-C32)	DoD-ELAP



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Mineral Spirits Range Organics (Tol-C12)	DoD-ELAP,NELAP,WADOE
Mineral Oil Range Organics (C16-C28)	DoD-ELAP,NELAP,WADOE
Kerosene Range Organics (Tol-C18)	DoD-ELAP,NELAP,WADOE
JP8 Range Organics (C8-C18)	DoD-ELAP,NELAP,WADOE
JP5 Range Organics (C10-C16)	DoD-ELAP,NELAP,WADOE
JP4 Range Organics (Tol-C14)	DoD-ELAP,NELAP,WADOE
Jet-A Range Organics (C10-C18)	DoD-ELAP,NELAP,WADOE
Creosote Range Organics (C12-C22)	DoD-ELAP,NELAP,WADOE
Bunker C Range Organics (C10-C38)	DoD-ELAP,NELAP,WADOE
Stoddard Range Organics (C8-C12)	DoD-ELAP,NELAP,WADOE
Transformer Oil Range Organics (C12-C28)	DoD-ELAP,NELAP,WADOE

NWTPHg in Water

Gasoline Range Organics (Tol-Nap)	WADOE,DoD-ELAP
Gasoline Range Organics (2MP-TMB)	WADOE,DoD-ELAP
Gasoline Range Organics (Tol-C12)	WADOE,DoD-ELAP
Gasoline Range Organics (C6-C10)	WADOE,ADEC,DoD-ELAP
Gasoline Range Organics (C5-C12)	WADOE,DoD-ELAP

SM 3500-Fe B-97 in Water

Ferrous Iron	WADOE,NELAP
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SM 4500-SO3 B-00 in Water

Sulfite	WADOE,NELAP
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Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2023
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/28/2022
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2022
WADOE	WA Dept of Ecology	C558	06/30/2022
WA-DW	Ecology - Drinking Water	C558	06/30/2022



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Notes and Definitions

*	Flagged value is not within established control limits.
B	This analyte was detected in the method blank.
D	The reported value is from a dilution
D1	Surrogate was not detected due to sample extract dilution
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL)
H	Hold time violation - Hold time was exceeded.
HC	The natural concentration of the spiked analyte is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
J	Estimated concentration value detected below the reporting limit.
Q	Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20% RSD, <20% drift or minimum RRF)
U	This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
[2C]	Indicates this result was quantified on the second column on a dual column analysis.



Analytical Resources, Incorporated
Analytical Chemists and Consultants

04 August 2021

Meg Strong
Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle, WA 98103-8636

RE: Lower Duwamish

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)
21B0174

Associated SDG ID(s)
N/A

Susan
Dunniho

Digitally signed by
Susan Dunniho
Date: 2021.08.04
12:00:04 -07'00'

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its



Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 21B0174		Turn-around Requested: Standard		Page: 1 of 1	
ARI Client Company: Shannon & Wilson		Phone: 206-695-6911		Date: 2/11/21	Ice Present? Yes
Client Contact: Shoshana Howard		No. of Coolers: 3		Cooler Temps: SECRET	
Client Project Name: LON		Analysis Requested			
Client Project #: 21-1-12590		Samplers: MRH/DES			
Sample ID	Date	Time	Matrix	No. Containers	Notes/Comments
TB-2-20211102	2/11/21	0840	Water	1	X
MW-48-20211102	2/11/21	0842		4	X
MW-25-20211102	2/11/21	0925		8	X
EB-2-20211102	2/11/21	1030		16	X
MW-70-20211102	2/11/21	1231		14	X
MW-69-20211102	2/11/21	1313		15	X
MW-55-20211102	2/11/21	1500		11	X
MW-24-20211102	2/11/21	1612		10	X
Comments/Special Instructions: Lab to filter for metals MW-25-20211102 = Arsenic only METAL MW-24-20211102 = METALS and Arsenic only					
Relinquished by: (Signature) D. Schlicht		Received by: (Signature) Jacob Leith		Relinquished by: (Signature)	
Printed Name: DANIEL SCHWICHT		Printed Name: Jacob Leith		Printed Name:	
Company: SWI		Company: ADZ		Company:	
Date & Time: 11-FEB-21, 17:02		Date & Time: 02/11/2021 1702		Date & Time:	



Analytical Resources, Incorporated
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 206-695-6200 206-695-6201 (fax)
 www.arilabs.com

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
04-Aug-2021 11:52

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-55-20211102	21B0174-01	Water	11-Feb-2021 15:00	11-Feb-2021 17:02
MW-55-20211102	21B0174-02	Water	11-Feb-2021 15:00	11-Feb-2021 17:02
TB-2-20211102	21B0174-03	Water	11-Feb-2021 08:40	11-Feb-2021 17:02
MW48-20211102	21B0174-04	Water	11-Feb-2021 08:42	11-Feb-2021 17:02
MW-25-20211102	21B0174-05	Water	11-Feb-2021 09:25	11-Feb-2021 17:02
MW-25-20211102	21B0174-06	Water	11-Feb-2021 09:25	11-Feb-2021 17:02
EB-2-20211102	21B0174-07	Water	11-Feb-2021 10:30	11-Feb-2021 17:02
EB-2-20211102	21B0174-08	Water	11-Feb-2021 10:30	11-Feb-2021 17:02
MW-70-20211102	21B0174-09	Water	11-Feb-2021 12:31	11-Feb-2021 17:02
MW-70-20211102	21B0174-10	Water	11-Feb-2021 12:31	11-Feb-2021 17:02
MW-69-20211102	21B0174-11	Water	11-Feb-2021 13:13	11-Feb-2021 17:02
MW-69-20211102	21B0174-12	Water	11-Feb-2021 13:13	11-Feb-2021 17:02
MW-24-20211102	21B0174-13	Water	11-Feb-2021 16:12	11-Feb-2021 17:02
MW-24-20211102	21B0174-14	Water	11-Feb-2021 16:12	11-Feb-2021 17:02

Analytical Resources, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

4611 S. 134th Place, Suite 100 • Tukwila, WA 98168 • Ph: (206) 695-6200 • Fax: (206) 695-6202



Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
04-Aug-2021 11:52

Work Order Case Narrative

Client: Shannon & Wilson, Inc
Project: Lower Duwamish
Work Order: 21B0174

Sample receipt

Samples as listed on the preceding page were received 11-Feb-2021 17:02 under ARI work order 21B0174. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Volatiles - EPA Method SW8260D

The sample(s) were analyzed within the recommended holding times.

The result for 1,1-dichloroethene was high of limits in the initial calibration verification SJB0357-ICV1. The results for vinyl chloride and 1,1-dichloroethene were high of limits in SJB0357-CCV1. Associated positive results have been "Q"-flagged.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Gasoline Range Organics - WA-Ecology Method NW-TPHG

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Diesel Range Organics - WA-Ecology Method NW-TPHD

The sample(s) were extracted and analyzed within the recommended holding times.



Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
04-Aug-2021 11:52

Initial and continuing calibrations were within method requirements.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Semivolatiles - EPA Method SW8270E

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recovery for pheno-d5 was outside limits low.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Polynuclear Aromatic Hydrocarbons (PAH) - EPA Method SW8270E-SIM

The sample(s) were extracted and analyzed within the recommended holding times.

The recovery for dibenzo(a,h)anthracene was low of limits for the second source calibration check SIH03040SCV1.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

PCB Aroclors - EPA Method SW8082A

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.



Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
04-Aug-2021 11:52

Internal standard areas were within limits.

The surrogate percent recovery for Tetrachloro-m-xylene (TCMX) was outside limits low on the second column. The recovery of TCMX is an indication of blow-down efficiencies and no corrective action was required.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) were within advisory control limits.

Total Metals - EPA Method 6020B

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) were within advisory control limits.

Wet Chemistry

The sample(s) were prepared and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within limits.

The reference material (SRM) percent recoveries were within control limits.

The matrix spike (MS) percent recovery for hexavalent chromium was low outside limits. A post-spike was performed to confirm matrix interference. The post-spike recovery was also low outside control limits.

The duplicate (DUP) relative percent difference (RPD) was within advisory control limits.

REVISION to correct VOC and SVOC lists



WORK ORDER

21B0174

Client: Shannon & Wilson, Inc

Project Manager: Amanda Volgardsen Johnson

Project: Lower Duwamish

Project Number: Lower Duwamish

Preservation Confirmation

Container ID	Container Type	pH
21B0174-01 A	HDPE NM, 500 mL	
21B0174-01 A 01	HDPE NM, 500 mL	
21B0174-01 B	HDPE NM, 500 mL, 1:1 HNO3	< 2 Pass
21B0174-01 C	Glass NM, Amber, 500 mL	
21B0174-01 D	Glass NM, Amber, 500 mL	
21B0174-01 E	Glass NM, Amber, 500 mL	
21B0174-01 F	Glass NM, Amber, 500 mL	
21B0174-01 G	VOA Vial, Clear, 40 mL, HCL	
21B0174-01 H	VOA Vial, Clear, 40 mL, HCL	
21B0174-01 I	VOA Vial, Clear, 40 mL, HCL	
21B0174-01 J	VOA Vial, Clear, 40 mL, HCL	
21B0174-02 A	HDPE NM, 500 mL	> 2 Fail
21B0174-03 A	VOA Vial, Clear, 40 mL, HCL	
21B0174-04 A	VOA Vial, Amber, 40 mL, HCL	
21B0174-04 B	VOA Vial, Amber, 40 mL, HCL	
21B0174-04 C	VOA Vial, Amber, 40 mL, HCL	
21B0174-04 D	VOA Vial, Amber, 40 mL, HCL	
21B0174-05 A	HDPE NM, 500 mL, 1:1 HNO3	< 2 Pass
21B0174-05 B	Glass NM, Amber, 500 mL	
21B0174-05 C	Glass NM, Amber, 500 mL	
21B0174-05 D	VOA Vial, Amber, 40 mL, HCL	
21B0174-05 E	VOA Vial, Clear, 40 mL, HCL	
21B0174-05 F	VOA Vial, Clear, 40 mL, HCL	
21B0174-05 G	VOA Vial, Clear, 40 mL, HCL	
21B0174-06 A	HDPE NM, 500 mL	> 2 Fail
21B0174-07 A	HDPE NM, 500 mL, 1:1 HNO3	< 2 Pass
21B0174-07 B	Glass NM, Amber, 500 mL	
21B0174-07 C	Glass NM, Amber, 500 mL	
21B0174-07 D	Glass NM, Amber, 500 mL	
21B0174-07 E	Glass NM, Amber, 500 mL	
21B0174-07 F	Glass NM, Amber, 500 mL	
21B0174-07 G	Glass NM, Amber, 500 mL	
21B0174-07 H	Glass NM, Amber, 500 mL	
21B0174-07 I	Glass NM, Amber, 500 mL	
21B0174-07 J	VOA Vial, Clear, 40 mL, HCL	



WORK ORDER

21B0174

Client: Shannon & Wilson, Inc

Project Manager: Amanda Volgardsen Johnson

Project: Lower Duwamish

Project Number: Lower Duwamish

21B0174-07 K	VOA Vial, Clear, 40 mL, HCL	
21B0174-07 L	VOA Vial, Clear, 40 mL, HCL	
21B0174-07 M	VOA Vial, Clear, 40 mL, HCL	
21B0174-07 N	VOA Vial, Clear, 40 mL, HCL	
21B0174-07 O	VOA Vial, Clear, 40 mL, HCL	
21B0174-08 A	HDPE NM, 500 mL	>2 Fail
21B0174-09 A	HDPE NM, 500 mL, 1:1 HNO3	<2 Pass
21B0174-09 B	Glass NM, Amber, 500 mL	
21B0174-09 C	Glass NM, Amber, 500 mL	
21B0174-09 D	Glass NM, Amber, 500 mL	
21B0174-09 E	Glass NM, Amber, 500 mL	
21B0174-09 F	Glass NM, Amber, 500 mL	
21B0174-09 G	Glass NM, Amber, 500 mL	
21B0174-09 H	VOA Vial, Clear, 40 mL, HCL	
21B0174-09 I	VOA Vial, Clear, 40 mL, HCL	
21B0174-09 J	VOA Vial, Clear, 40 mL, HCL	
21B0174-09 K	VOA Vial, Clear, 40 mL, HCL	
21B0174-09 L	VOA Vial, Clear, 40 mL, HCL	
21B0174-09 M	VOA Vial, Clear, 40 mL, HCL	
21B0174-10 A	HDPE NM, 500 mL	>2 Fail
21B0174-11 A	HDPE NM, 500 mL, 1:1 HNO3	<2 Pass
21B0174-11 B	HDPE NM, 500 mL, 1:1 HNO3	<2 Pass
21B0174-11 C	Glass NM, Amber, 500 mL	
21B0174-11 D	Glass NM, Amber, 500 mL	
21B0174-11 E	Glass NM, Amber, 500 mL	
21B0174-11 F	Glass NM, Amber, 500 mL	
21B0174-11 G	Glass NM, Amber, 500 mL	
21B0174-11 H	Glass NM, Amber, 500 mL	
21B0174-11 I	VOA Vial, Clear, 40 mL, HCL	
21B0174-11 J	VOA Vial, Clear, 40 mL, HCL	
21B0174-11 K	VOA Vial, Clear, 40 mL, HCL	
21B0174-11 L	VOA Vial, Clear, 40 mL, HCL	
21B0174-11 M	VOA Vial, Clear, 40 mL, HCL	
21B0174-11 N	VOA Vial, Clear, 40 mL, HCL	
21B0174-12 A	HDPE NM, 500 mL	>2 Fail
21B0174-13 A	HDPE NM, 500 mL, 1:1 HNO3	<2 Pass
21B0174-13 B	Glass NM, Amber, 500 mL	



WORK ORDER

21B0174

Client: Shannon & Wilson, Inc

Project Manager: Amanda Volgardsen Johnson

Project: Lower Duwamish

Project Number: Lower Duwamish

21B0174-13 C	Glass NM, Amber, 500 mL
21B0174-13 D	Glass NM, Amber, 500 mL
21B0174-13 E	Glass NM, Amber, 500 mL
21B0174-13 F	VOA Vial, Clear, 40 mL, HCL
21B0174-13 G	VOA Vial, Clear, 40 mL, HCL
21B0174-13 H	VOA Vial, Clear, 40 mL, HCL
21B0174-13 I	VOA Vial, Clear, 40 mL, HCL
21B0174-14 A	HDPE NM, 500 mL

> 2 Fail

KD

Preservation Confirmed By

2/12/21

Date



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Shannon & Hilson

Project Name: LDN

COC No(s): _____ NA

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: 2180174

Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of the cooler? YES NO

Were custody papers included with the cooler? YES NO

Were custody papers properly filled out (ink, signed, etc.) YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)

Time 1702 2.4 4.3 3.1

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: DOO 5206

Cooler Accepted by: TSW Date: 02/11/2021 Time: 1702

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES NO

What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? NA YES NO

How were bottles sealed in plastic bags? Individually Grouped Not

Did all bottles arrive in good condition (unbroken)? YES NO

Were all bottle labels complete and legible? YES NO

Did the number of containers listed on COC match with the number of containers received? YES NO

Did all bottle labels and tags agree with custody papers? YES NO

Were all bottles used correct for the requested analyses? YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs) ... NA YES NO

Were all VOC vials free of air bubbles? NA YES NO

Was sufficient amount of sample sent in each bottle? YES NO

Date VOC Trip Blank was made at ARI: NA 2/8/21

Were the sample(s) split by ARI? NA YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: KD Date: 2/12/21 Time: 0920 Labels checked by: KD

**** Notify Project Manager of discrepancies or concerns ****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

Tot metals / Diss metals label were blank for EB-2-20211102.
used process of elimination to determine where bottles belong.

By: KD

Date: 2/12/21



WORK ORDER

21B0174

Client: Shannon & Wilson, Inc

Project Manager: Amanda Volgardsen Johnson

Project: Lower Duwamish

Project Number: Lower Duwamish

Preservation Confirmation

Container ID	Container Type	pH
21B0174-01 A	HDPE NM, 500 mL	
21B0174-01 A 01	HDPE NM, 500 mL	
21B0174-01 B	HDPE NM, 500 mL, 1:1 HNO ₃	< 2 Pass
21B0174-01 C	Glass NM, Amber, 500 mL	
21B0174-01 D	Glass NM, Amber, 500 mL	
21B0174-01 E	Glass NM, Amber, 500 mL	
21B0174-01 F	Glass NM, Amber, 500 mL	
21B0174-01 G	VOA Vial, Clear, 40 mL, HCL	
21B0174-01 H	VOA Vial, Clear, 40 mL, HCL	
21B0174-01 I	VOA Vial, Clear, 40 mL, HCL	
21B0174-01 J	VOA Vial, Clear, 40 mL, HCL	
21B0174-02 A	HDPE NM, 500 mL	> 2 Fail (1)
21B0174-03 A	VOA Vial, Clear, 40 mL, HCL	
21B0174-04 A	VOA Vial, Amber, 40 mL, HCL	
21B0174-04 B	VOA Vial, Amber, 40 mL, HCL	
21B0174-04 C	VOA Vial, Amber, 40 mL, HCL	
21B0174-04 D	VOA Vial, Amber, 40 mL, HCL	
21B0174-05 A	HDPE NM, 500 mL, 1:1 HNO ₃	< 2 Pass
21B0174-05 B	Glass NM, Amber, 500 mL	
21B0174-05 C	Glass NM, Amber, 500 mL	
21B0174-05 D	VOA Vial, Amber, 40 mL, HCL	
21B0174-05 E	VOA Vial, Clear, 40 mL, HCL	
21B0174-05 F	VOA Vial, Clear, 40 mL, HCL	
21B0174-05 G	VOA Vial, Clear, 40 mL, HCL	
21B0174-06 A	HDPE NM, 500 mL	> 2 Fail (1)
21B0174-07 A	HDPE NM, 500 mL, 1:1 HNO ₃	< 2 Pass
21B0174-07 B	Glass NM, Amber, 500 mL	
21B0174-07 C	Glass NM, Amber, 500 mL	
21B0174-07 D	Glass NM, Amber, 500 mL	
21B0174-07 E	Glass NM, Amber, 500 mL	
21B0174-07 F	Glass NM, Amber, 500 mL	
21B0174-07 G	Glass NM, Amber, 500 mL	
21B0174-07 H	Glass NM, Amber, 500 mL	
21B0174-07 I	Glass NM, Amber, 500 mL	
21B0174-07 J	VOA Vial, Clear, 40 mL, HCL	

① Filtered at 0.45um and preserved
to pH < 2.0 with 0.75ml conc. HNO₃ (110976).
ml
2/12/21



WORK ORDER

21B0174

Client: Shannon & Wilson, Inc

Project Manager: Amanda Volgardsen Johnson

Project: Lower Duwamish

Project Number: Lower Duwamish

21B0174-07 K	VOA Vial, Clear, 40 mL, HCL		
21B0174-07 L	VOA Vial, Clear, 40 mL, HCL		
21B0174-07 M	VOA Vial, Clear, 40 mL, HCL		
21B0174-07 N	VOA Vial, Clear, 40 mL, HCL		
21B0174-07 O	VOA Vial, Clear, 40 mL, HCL		
21B0174-08 A	HDPE NM, 500 mL	>2 Fail	①
21B0174-09 A	HDPE NM, 500 mL, 1:1 HNO ₃	<2 Pass	
21B0174-09 B	Glass NM, Amber, 500 mL		
21B0174-09 C	Glass NM, Amber, 500 mL		
21B0174-09 D	Glass NM, Amber, 500 mL		
21B0174-09 E	Glass NM, Amber, 500 mL		
21B0174-09 F	Glass NM, Amber, 500 mL		
21B0174-09 G	Glass NM, Amber, 500 mL		
21B0174-09 H	VOA Vial, Clear, 40 mL, HCL		
21B0174-09 I	VOA Vial, Clear, 40 mL, HCL		
21B0174-09 J	VOA Vial, Clear, 40 mL, HCL		
21B0174-09 K	VOA Vial, Clear, 40 mL, HCL		
21B0174-09 L	VOA Vial, Clear, 40 mL, HCL		
21B0174-09 M	VOA Vial, Clear, 40 mL, HCL		
21B0174-10 A	HDPE NM, 500 mL	>2 Fail	①
21B0174-11 A	HDPE NM, 500 mL, 1:1 HNO ₃	<2 Pass	
21B0174-11 B	HDPE NM, 500 mL, 1:1 HNO ₃	<2 Pass	
21B0174-11 C	Glass NM, Amber, 500 mL		
21B0174-11 D	Glass NM, Amber, 500 mL		
21B0174-11 E	Glass NM, Amber, 500 mL		
21B0174-11 F	Glass NM, Amber, 500 mL		
21B0174-11 G	Glass NM, Amber, 500 mL		
21B0174-11 H	Glass NM, Amber, 500 mL		
21B0174-11 I	VOA Vial, Clear, 40 mL, HCL		
21B0174-11 J	VOA Vial, Clear, 40 mL, HCL		
21B0174-11 K	VOA Vial, Clear, 40 mL, HCL		
21B0174-11 L	VOA Vial, Clear, 40 mL, HCL		
21B0174-11 M	VOA Vial, Clear, 40 mL, HCL		
21B0174-11 N	VOA Vial, Clear, 40 mL, HCL		
21B0174-12 A	HDPE NM, 500 mL	>2 Fail	①
21B0174-13 A	HDPE NM, 500 mL, 1:1 HNO ₃	<2 Pass	
21B0174-13 B	Glass NM, Amber, 500 mL		

① Filtered at 0.45 μ m and presented to
pH < 2.0 with 0.75 ml conc. HNO₃ (110976).
ml

Reviewed By

Date



WORK ORDER

21B0174

Client: Shannon & Wilson, Inc

Project Manager: Amanda Volgardsen Johnson

Project: Lower Duwamish

Project Number: Lower Duwamish

21B0174-13 C Glass NM, Amber, 500 mL

21B0174-13 D Glass NM, Amber, 500 mL

21B0174-13 E Glass NM, Amber, 500 mL

21B0174-13 F VOA Vial, Clear, 40 mL, HCL

21B0174-13 G VOA Vial, Clear, 40 mL, HCL

21B0174-13 H VOA Vial, Clear, 40 mL, HCL

21B0174-13 I VOA Vial, Clear, 40 mL, HCL

21B0174-14 A HDPE NM, 500 mL

> 2 Fail

①

KD

Preservation Confirmed By

2/12/21

Date

① Filtered at 0.45 μ m and preserved
to pH < 2.0 with 0.75 ml ^{conc} HNO₃ (I10976).
mm 2/12/21


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 11:52

MW-55-20211102
21B0174-01 (Water)
Volatile Organic Compounds

Method: EPA 8260D

Sampled: 02/11/2021 15:00

Instrument: NT2 Analyst: PKC

Analyzed: 02/23/2021 15:33

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21B0174-01 H

Preparation Batch: BJB0669

Sample Size: 10 mL

Prepared: 02/23/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	121	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	101	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				80-120 %	88.8	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				80-120 %	101	%	


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 11:52

MW-55-20211102
21B0174-01 (Water)
Semivolatile Organic Compounds - SIM

 Method: EPA 8270E-SIM
 Instrument: NT11 Analyst: VTS
 Sampled: 02/11/2021 15:00
 Analyzed: 03/11/2021 04:23

 Sample Preparation: Preparation Method: EPA 3510C SepF
 Preparation Batch: BJB0449 Sample Size: 500 mL
 Prepared: 02/15/2021 Final Volume: 0.5 mL
 Extract ID: 21B0174-01 C 01

 Sample Cleanup: Cleanup Method: Silica Gel
 Cleanup Batch: CJC0072 Initial Volume: 0.5 mL
 Cleaned: 08-Mar-2021 Final Volume: 0.5 mL
 Extract ID: 21B0174-01 C 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.001	0.010	0.007	ug/L	J
2-Methylnaphthalene	91-57-6	1	0.001	0.010	0.023	ug/L	
1-Methylnaphthalene	90-12-0	1	0.0009	0.010	0.012	ug/L	
Acenaphthylene	208-96-8	1	0.002	0.010	ND	ug/L	U
Acenaphthene	83-32-9	1	0.003	0.010	0.121	ug/L	
Dibenzofuran	132-64-9	1	0.002	0.010	0.003	ug/L	J
Fluorene	86-73-7	1	0.002	0.010	0.003	ug/L	J
Phenanthrene	85-01-8	1	0.001	0.010	0.010	ug/L	
Anthracene	120-12-7	1	0.001	0.010	0.001	ug/L	J
Carbazole	86-74-8	1	0.001	0.010	ND	ug/L	U
Fluoranthene	206-44-0	1	0.002	0.010	0.003	ug/L	J
Pyrene	129-00-0	1	0.001	0.010	0.002	ug/L	J
Benzo(a)anthracene	56-55-3	1	0.0008	0.010	ND	ug/L	U
Chrysene	218-01-9	1	0.0009	0.010	ND	ug/L	U
Benzo(b)fluoranthene	205-99-2	1	0.0005	0.010	ND	ug/L	U
Benzo(k)fluoranthene	207-08-9	1	0.003	0.010	ND	ug/L	U
Benzo(j)fluoranthene	205-82-3	1	0.002	0.010	ND	ug/L	U
Benzo(a)fluoranthene, Total		1	0.004	0.010	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.002	0.010	ND	ug/L	U
Perylene	1985-5-0	1	0.006	0.010	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.001	0.010	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.001	0.010	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.001	0.010	ND	ug/L	U
Surrogate: 2-Methylnaphthalene-d10					42-120 %	70.9 %	
Surrogate: Dibenzo[a,h]anthracene-d14					29-120 %	42.5 %	
Surrogate: Fluoranthene-d10					57-120 %	73.6 %	



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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
04-Aug-2021 11:52

MW-55-20211102

21B0174-01 (Water)

Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 02/11/2021 15:00

Instrument: FID4 Analyst: CTO

Analyzed: 03/12/2021 19:26

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21B0174-01 E 01

Preparation Batch: BJB0484

Sample Size: 450 mL

Prepared: 02/18/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.111	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	0.222	ND	mg/L	U
Surrogate: o-Terphenyl			50-150 %	110	%	

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 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 11:52

MW-55-20211102
21B0174-01 (Water)
Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 02/11/2021 15:00

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/23/2021 19:53

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21B0174-01 B 01

Preparation Batch: BJB0618

Sample Size: 25 mL

Prepared: 02/22/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium	7440-39-3	1	0.0560	0.500	2.07	ug/L	
Chromium	7440-47-3	1	0.130	0.500	0.219	ug/L	J
Cobalt	7440-48-4	1	0.0290	0.200	0.339	ug/L	
Iron	7439-89-6	1	1.40	20.0	2480	ug/L	
Lead	7439-92-1	1	0.0680	0.100	ND	ug/L	U
Manganese	7439-96-5	5	0.425	2.50	333	ug/L	D
Silver	7440-22-4	1	0.0170	0.200	ND	ug/L	U
Vanadium	7440-62-2	1	0.0400	0.200	0.874	ug/L	


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 Project: Lower Duwamish
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 Project Manager: Meg Strong

Reported:
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MW-55-20211102
21B0174-01 (Water)
Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 02/11/2021 15:00

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/23/2021 19:53

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21B0174-01 B 01

Preparation Batch: BJB0618

Sample Size: 25 mL

Prepared: 02/22/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0220	0.200	0.417	ug/L	
Cadmium	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Copper	7440-50-8	1	0.340	0.500	0.466	ug/L	J
Nickel	7440-02-0	1	0.0500	0.500	0.377	ug/L	J
Selenium	7782-49-2	1	0.440	0.500	ND	ug/L	U
Zinc	7440-66-6	1	0.820	4.00	ND	ug/L	U



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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
04-Aug-2021 11:52

MW-55-20211102

21B0174-01 (Water)

Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 02/11/2021 15:00

Instrument: HYDRA Analyst: BLC

Analyzed: 02/19/2021 15:19

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21B0174-01 B

Preparation Batch: BJB0561

Sample Size: 20 mL

Prepared: 02/19/2021

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.000013	0.000100	ND	mg/L	U

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Shannon & Wilson, Inc
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Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
04-Aug-2021 11:52

MW-55-20211102

21B0174-01 (Water)

Wet Chemistry

Method: SM 3500-Cr B-09

Sampled: 02/11/2021 15:00

Instrument: UV1800-2 Analyst: BF

Analyzed: 02/11/2021 18:16

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 21B0174-01 A 01

Preparation Batch: BJB0396

Sample Size: 40 mL

Prepared: 02/11/2021

Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Hexavalent Chromium	1854-02-99	1.25	0.013	0.013	ND	mg/L	U


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Reported:
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MW-55-20211102
21B0174-02 (Water)
Metals and Metallic Compounds (dissolved)

Method: EPA 6020B

Sampled: 02/11/2021 15:00

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/23/2021 21:53

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21B0174-02 A 02

Preparation Batch: BJB0662

Sample Size: 25 mL

Filtration Batch: BJB0415

Prepared: 02/23/2021

Final Volume: 25 mL

Filtration Date: 02/12/2021 13:39

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.0560	0.500	1.82	ug/L	
Chromium, Dissolved	7440-47-3	1	0.130	0.500	ND	ug/L	U
Cobalt, Dissolved	7440-48-4	1	0.0290	0.200	0.329	ug/L	
Iron, Dissolved	7439-89-6	1	1.40	20.0	1780	ug/L	
Lead, Dissolved	7439-92-1	1	0.0680	0.100	ND	ug/L	U
Manganese, Dissolved	7439-96-5	5	0.425	2.50	330	ug/L	D
Silver, Dissolved	7440-22-4	1	0.0170	0.200	ND	ug/L	U
Vanadium, Dissolved	7440-62-2	1	0.0400	0.200	0.437	ug/L	



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Project: Lower Duwamish
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Project Manager: Meg Strong

Reported:
04-Aug-2021 11:52

MW-55-20211102

21B0174-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 02/11/2021 15:00

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/23/2021 21:53

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21B0174-02 A 02

Preparation Batch: BJB0662

Sample Size: 25 mL

Filtration Batch: BJB0415

Prepared: 02/23/2021

Final Volume: 25 mL

Filtration Date: 02/12/2021 13:39

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	0.362	ug/L	
Cadmium, Dissolved	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Copper, Dissolved	7440-50-8	1	0.340	0.500	ND	ug/L	U
Nickel, Dissolved	7440-02-0	1	0.0500	0.500	0.628	ug/L	
Selenium, Dissolved	7782-49-2	1	0.440	0.500	ND	ug/L	U
Zinc, Dissolved	7440-66-6	1	0.820	4.00	ND	ug/L	U



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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
04-Aug-2021 11:52

MW-55-20211102

21B0174-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 7470A

Sampled: 02/11/2021 15:00

Instrument: HYDRA Analyst: BLC

Analyzed: 02/25/2021 12:02

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21B0174-02 A 01

Preparation Batch: BJB0653

Sample Size: 20 mL

Filtration Batch: BJB0415

Prepared: 02/23/2021

Final Volume: 20 mL

Filtration Date: 02/12/2021 13:39

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury, Dissolved	7439-97-6	1	0.000013	0.000100	ND	mg/L	U

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 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 11:52

TB-2-20211102
21B0174-03 (Water)
Volatile Organic Compounds

Method: EPA 8260D

Sampled: 02/11/2021 08:40

Instrument: NT2 Analyst: PKC

Analyzed: 02/23/2021 13:06

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21B0174-03 A

Preparation Batch: BJB0669

Sample Size: 10 mL

Prepared: 02/23/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	117	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	101	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				80-120 %	89.5	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				80-120 %	100	%	



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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
04-Aug-2021 11:52

TB-2-20211102
21B0174-03 (Water)

Volatile Organic Compounds

Method: NWTPHg

Sampled: 02/11/2021 08:40

Instrument: NT2 Analyst: PKC

Analyzed: 02/23/2021 13:06

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21B0174-03 A

Preparation Batch: BJB0669

Sample Size: 10 mL

Prepared: 02/23/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)	GRO	1	100	ND	ug/L	U
Surrogate: Toluene-d8			80-120 %	101	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	89.5	%	

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 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 11:52

MW48-20211102
21B0174-04 (Water)
Volatile Organic Compounds

Method: EPA 8260D

Sampled: 02/11/2021 08:42

Instrument: NT2 Analyst: PKC

Analyzed: 02/23/2021 15:53

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21B0174-04 B

Preparation Batch: BJB0669

Sample Size: 10 mL

Prepared: 02/23/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	118	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	101	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				80-120 %	88.0	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				80-120 %	100	%	


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 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 11:52

MW-25-20211102
21B0174-05 (Water)
Volatile Organic Compounds

Method: EPA 8260D

Sampled: 02/11/2021 09:25

Instrument: NT2 Analyst: PKC

Analyzed: 02/23/2021 16:13

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21B0174-05 D

Preparation Batch: BJB0669

Sample Size: 10 mL

Prepared: 02/23/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	120	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	101	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				80-120 %	91.0	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				80-120 %	101	%	


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 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 11:52

MW-25-20211102
21B0174-05 (Water)
Semivolatile Organic Compounds - SIM

 Method: EPA 8270E-SIM
 Instrument: NT11 Analyst: VTS
 Sampled: 02/11/2021 09:25
 Analyzed: 03/11/2021 04:55

 Sample Preparation: Preparation Method: EPA 3510C SepF
 Preparation Batch: BJB0449 Sample Size: 500 mL
 Prepared: 02/15/2021 Final Volume: 0.5 mL
 Extract ID: 21B0174-05 C 01

 Sample Cleanup: Cleanup Method: Silica Gel
 Cleanup Batch: CJC0072 Initial Volume: 0.5 mL
 Cleaned: 08-Mar-2021 Final Volume: 0.5 mL
 Extract ID: 21B0174-05 C 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.001	0.010	0.003	ug/L	J
2-Methylnaphthalene	91-57-6	1	0.001	0.010	0.002	ug/L	J
1-Methylnaphthalene	90-12-0	1	0.0009	0.010	0.001	ug/L	J
Acenaphthylene	208-96-8	1	0.002	0.010	ND	ug/L	U
Acenaphthene	83-32-9	1	0.003	0.010	0.114	ug/L	
Dibenzofuran	132-64-9	1	0.002	0.010	ND	ug/L	U
Fluorene	86-73-7	1	0.002	0.010	0.003	ug/L	J
Phenanthrene	85-01-8	1	0.001	0.010	0.040	ug/L	
Anthracene	120-12-7	1	0.001	0.010	0.003	ug/L	J
Carbazole	86-74-8	1	0.001	0.010	ND	ug/L	U
Fluoranthene	206-44-0	1	0.002	0.010	0.006	ug/L	J
Pyrene	129-00-0	1	0.001	0.010	0.003	ug/L	J
Benzo(a)anthracene	56-55-3	1	0.0008	0.010	ND	ug/L	U
Chrysene	218-01-9	1	0.0009	0.010	ND	ug/L	U
Benzo(b)fluoranthene	205-99-2	1	0.0005	0.010	ND	ug/L	U
Benzo(k)fluoranthene	207-08-9	1	0.003	0.010	ND	ug/L	U
Benzo(j)fluoranthene	205-82-3	1	0.002	0.010	ND	ug/L	U
Benzo(a)fluoranthene, Total		1	0.004	0.010	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.002	0.010	ND	ug/L	U
Perylene	1985-5-0	1	0.006	0.010	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.001	0.010	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.001	0.010	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.001	0.010	ND	ug/L	U
Surrogate: 2-Methylnaphthalene-d10					42-120 %	67.8	%
Surrogate: Dibenzo[a,h]anthracene-d14					29-120 %	38.9	%
Surrogate: Fluoranthene-d10					57-120 %	74.2	%



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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
04-Aug-2021 11:52

MW-25-20211102

21B0174-05 (Water)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 02/11/2021 09:25

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/23/2021 19:48

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21B0174-05 A 01

Preparation Batch: BJB0618

Sample Size: 25 mL

Prepared: 02/22/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0220	0.200	131	ug/L	

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Analytical Report

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Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
04-Aug-2021 11:52

MW-25-20211102

21B0174-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 02/11/2021 09:25

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/23/2021 21:58

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21B0174-06 A 02

Preparation Batch: BJB0662

Sample Size: 25 mL

Filtration Batch: BJB0415

Prepared: 02/23/2021

Final Volume: 25 mL

Filtration Date: 02/12/2021 13:39

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	91.6	ug/L	

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 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 11:52

EB-2-20211102
21B0174-07 (Water)
Volatile Organic Compounds

Method: EPA 8260D

Sampled: 02/11/2021 10:30

Instrument: NT2 Analyst: PKC

Analyzed: 02/23/2021 16:34

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21B0174-07 J

Preparation Batch: BJB0669

Sample Size: 10 mL

Prepared: 02/23/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	117	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	100	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				80-120 %	88.4	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				80-120 %	101	%	



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
04-Aug-2021 11:52

EB-2-20211102
21B0174-07 (Water)

Volatile Organic Compounds

Method: NWTPHg

Sampled: 02/11/2021 10:30

Instrument: NT2 Analyst: LH

Analyzed: 02/24/2021 12:14

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21B0174-07 N

Preparation Batch: BJB0698

Sample Size: 10 mL

Prepared: 02/24/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)	GRO	1	100	ND	ug/L	U
Surrogate: Toluene-d8			80-120 %	101	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	90.0	%	

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Analytical Report

Shannon & Wilson, Inc
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Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
04-Aug-2021 11:52

EB-2-20211102
21B0174-07 (Water)

Semivolatile Organic Compounds

Method: EPA 8270E
Instrument: NT10 Analyst: VTS

Sampled: 02/11/2021 10:30

Analyzed: 02/25/2021 20:42

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BJB0460 Sample Size: 945 mL
Prepared: 02/17/2021 Final Volume: 1 mL

Extract ID: 21B0174-07 F 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
1,4-Dichlorobenzene	106-46-7	1	0.03	0.2	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.03	0.2	ND	ug/L	U
2,4-Dimethylphenol	105-67-9	1	0.3	1.1	ND	ug/L	U
Benzoic acid	65-85-0	1	0.1	2.1	ND	ug/L	U
N-Nitrosodiphenylamine	86-30-6	1	0.03	0.2	ND	ug/L	U
Pentachlorophenol	87-86-5	1	0.1	1.1	ND	ug/L	U
Di-n-Butylphthalate	84-74-2	1	0.05	0.2	ND	ug/L	U
Butylbenzylphthalate	85-68-7	1	0.07	0.2	ND	ug/L	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	0.2	0.2	ND	ug/L	U
<i>Surrogate: 2-Fluorophenol</i>				30-160 %	55.3	%	
<i>Surrogate: Phenol-d5</i>				30-160 %	33.2	%	
<i>Surrogate: 2-Chlorophenol-d4</i>				30-160 %	93.1	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				30-160 %	72.0	%	
<i>Surrogate: Nitrobenzene-d5</i>				30-160 %	86.0	%	
<i>Surrogate: 2-Fluorobiphenyl</i>				30-160 %	83.2	%	
<i>Surrogate: 2,4,6-Tribromophenol</i>				30-160 %	99.0	%	
<i>Surrogate: p-Terphenyl-d14</i>				30-160 %	62.6	%	

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 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 11:52

EB-2-20211102
21B0174-07 (Water)
Semivolatile Organic Compounds - SIM

 Method: EPA 8270E-SIM Sampled: 02/11/2021 10:30
 Instrument: NT11 Analyst: VTS Analyzed: 03/11/2021 12:53

 Sample Preparation: Preparation Method: EPA 3510C SepF Extract ID: 21B0174-07 B 01
 Preparation Batch: BJB0449 Sample Size: 500 mL
 Prepared: 02/15/2021 Final Volume: 0.5 mL

 Sample Cleanup: Cleanup Method: Silica Gel Extract ID: 21B0174-07 B 01
 Cleanup Batch: CJC0072 Initial Volume: 0.5 mL
 Cleaned: 08-Mar-2021 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.001	0.010	0.010	ug/L	J
2-Methylnaphthalene	91-57-6	1	0.001	0.010	0.004	ug/L	J
1-Methylnaphthalene	90-12-0	1	0.0009	0.010	0.002	ug/L	J
Acenaphthylene	208-96-8	1	0.002	0.010	ND	ug/L	U
Acenaphthene	83-32-9	1	0.003	0.010	ND	ug/L	U
Dibenzofuran	132-64-9	1	0.002	0.010	ND	ug/L	U
Fluorene	86-73-7	1	0.002	0.010	ND	ug/L	U
Phenanthrene	85-01-8	1	0.001	0.010	ND	ug/L	U
Anthracene	120-12-7	1	0.001	0.010	ND	ug/L	U
Carbazole	86-74-8	1	0.001	0.010	ND	ug/L	U
Fluoranthene	206-44-0	1	0.002	0.010	ND	ug/L	U
Pyrene	129-00-0	1	0.001	0.010	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	0.0008	0.010	ND	ug/L	U
Chrysene	218-01-9	1	0.0009	0.010	ND	ug/L	U
Benzo(b)fluoranthene	205-99-2	1	0.0005	0.010	ND	ug/L	U
Benzo(k)fluoranthene	207-08-9	1	0.003	0.010	ND	ug/L	U
Benzo(j)fluoranthene	205-82-3	1	0.002	0.010	ND	ug/L	U
Benzofluoranthenes, Total		1	0.004	0.010	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.002	0.010	ND	ug/L	U
Perylene	1985-5-0	1	0.006	0.010	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.001	0.010	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.001	0.010	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.001	0.010	ND	ug/L	U
Surrogate: 2-Methylnaphthalene-d10					42-120 %	66.4 %	
Surrogate: Dibenzo[a,h]anthracene-d14					29-120 %	42.4 %	
Surrogate: Fluoranthene-d10					57-120 %	72.6 %	



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Analytical Report

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Project Manager: Meg Strong

Reported:
04-Aug-2021 11:52

EB-2-20211102
21B0174-07 (Water)

Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 02/11/2021 10:30

Instrument: FID4 Analyst: CTO

Analyzed: 03/12/2021 19:48

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21B0174-07 G 01

Preparation Batch: BJB0484

Sample Size: 440 mL

Prepared: 02/18/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.114	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	0.227	ND	mg/L	U
Surrogate: o-Terphenyl			50-150 %	112	%	

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 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 11:52

EB-2-20211102
21B0174-07 (Water)
Aroclor PCB

Method: EPA 8082A			Sampled: 02/11/2021 10:30
Instrument: ECD7 Analyst: JGR			Analyzed: 03/12/2021 10:47
Sample Preparation:	Preparation Method: EPA 3510C SepF		Extract ID: 21B0174-07 D 01
	Preparation Batch: BJB0451		
	Prepared: 02/15/2021		
	Sample Size: 460 mL		
	Final Volume: 1 mL		
Sample Cleanup:	Cleanup Method: Silica Gel		Extract ID: 21B0174-07 D 01
	Cleanup Batch: CJC0080		
	Cleaned: 08-Mar-2021		
	Initial Volume: 1 mL		
	Final Volume: 1 mL		
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:21B0174-07 D 01
	Cleanup Batch: CJC0078		
	Cleaned: 08-Mar-2021		
	Initial Volume: 1 mL		
	Final Volume: 1 mL		
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:21B0174-07 D 01
	Cleanup Batch: CJC0079		
	Cleaned: 08-Mar-2021		
	Initial Volume: 1 mL		
	Final Volume: 1 mL		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	0.019	0.109	ND	ug/L	U
Aroclor 1221	11104-28-2	1	0.019	0.109	ND	ug/L	U
Aroclor 1232	11141-16-5	1	0.019	0.109	ND	ug/L	U
Aroclor 1242	53469-21-9	1	0.019	0.109	ND	ug/L	U
Aroclor 1248	12672-29-6	1	0.019	0.109	ND	ug/L	U
Aroclor 1254	11097-69-1	1	0.019	0.109	ND	ug/L	U
Aroclor 1260	11096-82-5	1	0.019	0.109	ND	ug/L	U
Surrogate: Decachlorobiphenyl				26-120 %	44.3	%	
Surrogate: Tetrachlorometaxylene				39-120 %	48.0	%	
Surrogate: Decachlorobiphenyl [2C]				26-120 %	40.8	%	
Surrogate: Tetrachlorometaxylene [2C]				39-120 %	41.0	%	



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Reported:
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EB-2-20211102
21B0174-07 (Water)

Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 02/11/2021 10:30

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/23/2021 20:46

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21B0174-07 A 01

Preparation Batch: BJB0618

Sample Size: 25 mL

Prepared: 02/22/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium	7440-39-3	1	0.0560	0.500	0.0570	ug/L	J
Chromium	7440-47-3	1	0.130	0.500	0.298	ug/L	J
Cobalt	7440-48-4	1	0.0290	0.200	ND	ug/L	U
Iron	7439-89-6	1	6.27	20.0	29.2	ug/L	
Lead	7439-92-1	1	0.0680	0.100	ND	ug/L	U
Manganese	7439-96-5	1	0.0850	0.500	0.458	ug/L	J
Silver	7440-22-4	1	0.0170	0.200	ND	ug/L	U
Vanadium	7440-62-2	1	0.0400	0.200	ND	ug/L	U


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 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 11:52

EB-2-20211102
21B0174-07 (Water)
Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 02/11/2021 10:30

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/23/2021 20:46

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21B0174-07 A 01

Preparation Batch: BJB0618

Sample Size: 25 mL

Prepared: 02/22/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0220	0.200	0.130	ug/L	J
Cadmium	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Copper	7440-50-8	1	0.340	0.500	ND	ug/L	U
Nickel	7440-02-0	1	0.0500	0.500	0.0740	ug/L	J
Selenium	7782-49-2	1	0.440	0.500	ND	ug/L	U
Zinc	7440-66-6	1	0.820	4.00	ND	ug/L	U



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Analytical Report

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Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
04-Aug-2021 11:52

EB-2-20211102
21B0174-07 (Water)

Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 02/11/2021 10:30

Instrument: HYDRA Analyst: BLC

Analyzed: 02/19/2021 15:55

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21B0174-07 A

Preparation Batch: BJB0561

Sample Size: 20 mL

Prepared: 02/19/2021

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.000013	0.000100	ND	mg/L	U

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 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 11:52

EB-2-20211102
21B0174-08 (Water)
Metals and Metallic Compounds (dissolved)

Method: EPA 6020B		Sampled: 02/11/2021 10:30
Instrument: ICPMS2 Analyst: MCB		Analyzed: 02/23/2021 22:04
Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix	Extract ID: 21B0174-08 A 02
	Preparation Batch: BJB0662	Filtration Batch: BJB0415
	Prepared: 02/23/2021	Filtration Date: 02/12/2021 13:39
	Sample Size: 25 mL	
	Final Volume: 25 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.0560	0.500	ND	ug/L	U
Chromium, Dissolved	7440-47-3	1	0.130	0.500	ND	ug/L	U
Cobalt, Dissolved	7440-48-4	1	0.0290	0.200	ND	ug/L	U
Iron, Dissolved	7439-89-6	1	6.27	20.0	15.0	ug/L	J
Lead, Dissolved	7439-92-1	1	0.0680	0.100	ND	ug/L	U
Manganese, Dissolved	7439-96-5	1	0.0850	0.500	0.194	ug/L	J
Silver, Dissolved	7440-22-4	1	0.0170	0.200	ND	ug/L	U
Vanadium, Dissolved	7440-62-2	1	0.0400	0.200	ND	ug/L	U


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 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 11:52

EB-2-20211102
21B0174-08 (Water)
Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 02/11/2021 10:30

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/23/2021 22:04

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21B0174-08 A 02

Preparation Batch: BJB0662

Sample Size: 25 mL

Filtration Batch: BJB0415

Prepared: 02/23/2021

Final Volume: 25 mL

Filtration Date: 02/12/2021 13:39

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	0.0430	ug/L	J
Cadmium, Dissolved	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Copper, Dissolved	7440-50-8	1	0.340	0.500	ND	ug/L	U
Nickel, Dissolved	7440-02-0	1	0.0500	0.500	0.255	ug/L	J
Selenium, Dissolved	7782-49-2	1	0.440	0.500	ND	ug/L	U
Zinc, Dissolved	7440-66-6	1	0.820	4.00	ND	ug/L	U



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Analytical Report

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Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
04-Aug-2021 11:52

EB-2-20211102
21B0174-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 7470A						Sampled: 02/11/2021 10:30		
Instrument: HYDRA Analyst: BLC						Analyzed: 02/25/2021 12:11		
Sample Preparation:	Preparation Method: TWM EPA 7470A					Extract ID: 21B0174-08 A 01		
	Preparation Batch: BJB0653					Filtration Batch: BJB0415		
	Prepared: 02/23/2021					Filtration Date: 02/12/2021 13:39		
					Sample Size: 20 mL			
					Final Volume: 20 mL			
Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes	
Mercury, Dissolved	7439-97-6	1	0.000013	0.000100	ND	mg/L	U	

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 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 11:52

MW-70-20211102
21B0174-09 (Water)
Volatile Organic Compounds

Method: EPA 8260D

Sampled: 02/11/2021 12:31

Instrument: NT2 Analyst: PKC

Analyzed: 02/23/2021 16:54

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21B0174-09 I

Preparation Batch: BJB0669

Sample Size: 10 mL

Prepared: 02/23/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	0.54	ug/L	
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	0.26	ug/L	
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	1.02	ug/L	
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	0.05	ug/L	J
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>					80-129 %	119	%
<i>Surrogate: Toluene-d8</i>					80-120 %	101	%
<i>Surrogate: 4-Bromofluorobenzene</i>					80-120 %	88.8	%
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>					80-120 %	102	%



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Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
04-Aug-2021 11:52

MW-70-20211102

21B0174-09 (Water)

Volatile Organic Compounds

Method: NWTPHg

Sampled: 02/11/2021 12:31

Instrument: NT2 Analyst: LH

Analyzed: 02/24/2021 12:34

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21B0174-09 K

Preparation Batch: BJB0698

Sample Size: 10 mL

Prepared: 02/24/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)	GRO	1	100	ND	ug/L	U
Surrogate: Toluene-d8			80-120 %	101	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	89.5	%	

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 Shannon & Wilson, Inc
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 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 11:52

MW-70-20211102
21B0174-09 (Water)
Semivolatile Organic Compounds - SIM

 Method: EPA 8270E-SIM
 Instrument: NT11 Analyst: VTS
 Sampled: 02/11/2021 12:31
 Analyzed: 03/11/2021 05:59

 Sample Preparation: Preparation Method: EPA 3510C SepF
 Preparation Batch: BJB0449 Sample Size: 500 mL
 Prepared: 02/15/2021 Final Volume: 0.5 mL
 Extract ID: 21B0174-09 B 01

 Sample Cleanup: Cleanup Method: Silica Gel
 Cleanup Batch: CJC0072 Initial Volume: 0.5 mL
 Cleaned: 08-Mar-2021 Final Volume: 0.5 mL
 Extract ID: 21B0174-09 B 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.001	0.010	0.028	ug/L	
2-Methylnaphthalene	91-57-6	1	0.001	0.010	0.010	ug/L	
1-Methylnaphthalene	90-12-0	1	0.0009	0.010	0.007	ug/L	J
Acenaphthylene	208-96-8	1	0.002	0.010	ND	ug/L	U
Acenaphthene	83-32-9	1	0.003	0.010	0.008	ug/L	J
Dibenzofuran	132-64-9	1	0.002	0.010	0.005	ug/L	J
Fluorene	86-73-7	1	0.002	0.010	0.006	ug/L	J
Phenanthrene	85-01-8	1	0.001	0.010	0.008	ug/L	J
Anthracene	120-12-7	1	0.001	0.010	ND	ug/L	U
Carbazole	86-74-8	1	0.001	0.010	0.001	ug/L	J
Fluoranthene	206-44-0	1	0.002	0.010	ND	ug/L	U
Pyrene	129-00-0	1	0.001	0.010	0.001	ug/L	J
Benzo(a)anthracene	56-55-3	1	0.0008	0.010	ND	ug/L	U
Chrysene	218-01-9	1	0.0009	0.010	ND	ug/L	U
Benzo(b)fluoranthene	205-99-2	1	0.0005	0.010	ND	ug/L	U
Benzo(k)fluoranthene	207-08-9	1	0.003	0.010	ND	ug/L	U
Benzo(j)fluoranthene	205-82-3	1	0.002	0.010	ND	ug/L	U
Benzofluoranthenes, Total		1	0.004	0.010	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.002	0.010	ND	ug/L	U
Perylene	1985-5-0	1	0.006	0.010	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.001	0.010	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.001	0.010	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.001	0.010	ND	ug/L	U
Surrogate: 2-Methylnaphthalene-d10					42-120 %	69.6 %	
Surrogate: Dibenzo[a,h]anthracene-d14					29-120 %	39.4 %	
Surrogate: Fluoranthene-d10					57-120 %	75.4 %	



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Analytical Report

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Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
04-Aug-2021 11:52

MW-70-20211102

21B0174-09 (Water)

Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 02/11/2021 12:31

Instrument: FID4 Analyst: CTO

Analyzed: 03/12/2021 20:09

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21B0174-09 F 01

Preparation Batch: BJB0484

Sample Size: 460 mL

Prepared: 02/18/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.109	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	0.217	ND	mg/L	U
Surrogate: o-Terphenyl			50-150 %	109	%	

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 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 11:52

MW-70-20211102
21B0174-09 (Water)
Aroclor PCB

Method: EPA 8082A

Sampled: 02/11/2021 12:31

Instrument: ECD7 Analyst: JGR

Analyzed: 03/12/2021 11:08

Sample Preparation:	Preparation Method: EPA 3510C SepF Preparation Batch: BJB0451 Prepared: 02/15/2021	Sample Size: 455 mL Final Volume: 1 mL	Extract ID: 21B0174-09 D 01
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJC0080 Cleaned: 08-Mar-2021	Initial Volume: 1 mL Final Volume: 1 mL	Extract ID: 21B0174-09 D 01
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJC0078 Cleaned: 08-Mar-2021	Initial Volume: 1 mL Final Volume: 1 mL	Extract ID: 21B0174-09 D 01
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJC0079 Cleaned: 08-Mar-2021	Initial Volume: 1 mL Final Volume: 1 mL	Extract ID: 21B0174-09 D 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	0.019	0.110	ND	ug/L	U
Aroclor 1221	11104-28-2	1	0.019	0.110	ND	ug/L	U
Aroclor 1232	11141-16-5	1	0.019	0.110	ND	ug/L	U
Aroclor 1242	53469-21-9	1	0.019	0.110	ND	ug/L	U
Aroclor 1248	12672-29-6	1	0.019	0.110	ND	ug/L	U
Aroclor 1254	11097-69-1	1	0.019	0.110	ND	ug/L	U
Aroclor 1260	11096-82-5	1	0.019	0.110	ND	ug/L	U
Surrogate: Decachlorobiphenyl				26-120 %	43.7	%	
Surrogate: Tetrachlorometaxylene				39-120 %	46.6	%	
Surrogate: Decachlorobiphenyl [2C]				26-120 %	39.2	%	
Surrogate: Tetrachlorometaxylene [2C]				39-120 %	39.8	%	



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Project: Lower Duwamish
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Project Manager: Meg Strong

Reported:
04-Aug-2021 11:52

MW-70-20211102

21B0174-09 (Water)

Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 02/11/2021 12:31

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/24/2021 17:12

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21B0174-09 A 01

Preparation Batch: BJB0618

Sample Size: 25 mL

Prepared: 02/22/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium	7440-39-3	5	0.280	2.50	247	ug/L	D
Chromium	7440-47-3	5	0.650	2.50	4.57	ug/L	D
Iron	7439-89-6	5	31.4	100	49700	ug/L	D
Lead	7439-92-1	5	0.340	0.500	0.660	ug/L	D
Silver	7440-22-4	5	0.0850	1.00	ND	ug/L	U
Vanadium	7440-62-2	5	0.200	1.00	ND	ug/L	U



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Project Manager: Meg Strong

Reported:
04-Aug-2021 11:52

MW-70-20211102

21B0174-09 (Water)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 02/11/2021 12:31

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/24/2021 17:12

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21B0174-09 A 01

Preparation Batch: BJB0618

Sample Size: 25 mL

Prepared: 02/22/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Cadmium	7440-43-9	5	0.150	0.500	ND	ug/L	U

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Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
04-Aug-2021 11:52

MW-70-20211102

21B0174-09 (Water)

Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 02/11/2021 12:31

Instrument: HYDRA Analyst: BLC

Analyzed: 02/19/2021 15:38

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21B0174-09 A

Preparation Batch: BJB0561

Sample Size: 20 mL

Prepared: 02/19/2021

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.000013	0.000100	ND	mg/L	U

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Reported:
04-Aug-2021 11:52

MW-70-20211102
21B0174-09RE1 (Water)

Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 02/11/2021 12:31

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/24/2021 17:46

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21B0174-09RE1 A 01

Preparation Batch: BJB0618

Sample Size: 25 mL

Prepared: 02/22/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Cobalt	7440-48-4	10	0.290	2.00	0.330	ug/L	J, D
Manganese	7439-96-5	10	0.850	5.00	2080	ug/L	D

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Reported:
 04-Aug-2021 11:52

MW-70-20211102
21B0174-09RE1 (Water)
Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 02/11/2021 12:31

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/24/2021 17:46

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21B0174-09RE1 A 01

Preparation Batch: BJB0618

Sample Size: 25 mL

Prepared: 02/22/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	10	0.220	2.00	2.34	ug/L	D
Copper	7440-50-8	10	3.40	5.00	ND	ug/L	U
Nickel	7440-02-0	10	0.500	5.00	2.99	ug/L	J, D
Selenium	7782-49-2	10	4.40	5.00	6.12	ug/L	D
Zinc	7440-66-6	10	8.20	40.0	ND	ug/L	U


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Reported:
 04-Aug-2021 11:52

MW-70-20211102
21B0174-10 (Water)
Metals and Metallic Compounds (dissolved)

Method: EPA 6020B

Sampled: 02/11/2021 12:31

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/24/2021 17:21

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21B0174-10 A 02

Preparation Batch: BJB0662

Sample Size: 25 mL

Filtration Batch: BJB0415

Prepared: 02/23/2021

Final Volume: 25 mL

Filtration Date: 02/12/2021 13:39

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	5	0.280	2.50	196	ug/L	D
Chromium, Dissolved	7440-47-3	5	0.650	2.50	3.13	ug/L	D
Cobalt, Dissolved	7440-48-4	5	0.145	1.00	0.265	ug/L	J, D
Iron, Dissolved	7439-89-6	5	31.4	100	39400	ug/L	D
Lead, Dissolved	7439-92-1	5	0.340	0.500	ND	ug/L	U
Silver, Dissolved	7440-22-4	5	0.0850	1.00	ND	ug/L	U


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 Project: Lower Duwamish
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Reported:
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MW-70-20211102
21B0174-10 (Water)
Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 02/11/2021 12:31

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/24/2021 17:21

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21B0174-10 A 02

Preparation Batch: BJB0662

Sample Size: 25 mL

Filtration Batch: BJB0415

Prepared: 02/23/2021

Final Volume: 25 mL

Filtration Date: 02/12/2021 13:39

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	5	0.110	1.00	1.02	ug/L	D
Cadmium, Dissolved	7440-43-9	5	0.150	0.500	ND	ug/L	U
Copper, Dissolved	7440-50-8	5	1.70	2.50	ND	ug/L	U
Nickel, Dissolved	7440-02-0	5	0.250	2.50	0.705	ug/L	J, D
Selenium, Dissolved	7782-49-2	5	2.20	2.50	7.23	ug/L	D
Zinc, Dissolved	7440-66-6	5	4.10	20.0	ND	ug/L	U



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Analytical Report

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Project: Lower Duwamish
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Project Manager: Meg Strong

Reported:
04-Aug-2021 11:52

MW-70-20211102

21B0174-10 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 7470A

Sampled: 02/11/2021 12:31

Instrument: HYDRA Analyst: BLC

Analyzed: 02/25/2021 12:13

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21B0174-10 A 01

Preparation Batch: BJB0653

Sample Size: 20 mL

Filtration Batch: BJB0415

Prepared: 02/23/2021

Final Volume: 20 mL

Filtration Date: 02/12/2021 13:39

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury, Dissolved	7439-97-6	1	0.000013	0.000100	ND	mg/L	U

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Shannon & Wilson, Inc
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Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
04-Aug-2021 11:52

MW-70-20211102
21B0174-10RE1 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B		Sampled: 02/11/2021 12:31
Instrument: ICPMS2 Analyst: MCB		Analyzed: 02/24/2021 17:56
Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix	Extract ID: 21B0174-10RE1 A 02
	Preparation Batch: BJB0662	Filtration Batch: BJB0415
	Prepared: 02/23/2021	Filtration Date: 02/12/2021 13:39
	Sample Size: 25 mL	
	Final Volume: 25 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Manganese, Dissolved	7439-96-5	20	1.70	10.0	2120	ug/L	D
Vanadium, Dissolved	7440-62-2	20	0.800	4.00	ND	ug/L	U

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Reported:
 04-Aug-2021 11:52

MW-69-20211102
21B0174-11 (Water)
Volatile Organic Compounds

Method: EPA 8260D

Sampled: 02/11/2021 13:13

Instrument: NT2 Analyst: PKC

Analyzed: 02/23/2021 17:14

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21B0174-11 I

Preparation Batch: BJB0669

Sample Size: 10 mL

Prepared: 02/23/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	0.89	ug/L	
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	0.13	ug/L	J
Benzene	71-43-2	1	0.05	0.20	2.69	ug/L	
Trichloroethene	79-01-6	1	0.07	0.20	0.21	ug/L	
Toluene	108-88-3	1	0.05	0.20	0.21	ug/L	
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	0.06	ug/L	J
m,p-Xylene	179601-23-1	1	0.14	0.40	0.28	ug/L	J
o-Xylene	95-47-6	1	0.08	0.20	0.11	ug/L	J
Xylenes, total	1330-20-7	1	0.22	0.60	0.40	ug/L	J
<i>Surrogate: 1,2-Dichloroethane-d4</i>					80-129 %	118 %	
<i>Surrogate: Toluene-d8</i>					80-120 %	103 %	
<i>Surrogate: 4-Bromofluorobenzene</i>					80-120 %	89.5 %	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>					80-120 %	102 %	



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Analytical Report

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Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
04-Aug-2021 11:52

MW-69-20211102

21B0174-11 (Water)

Volatile Organic Compounds

Method: NWTPHg

Sampled: 02/11/2021 13:13

Instrument: NT2 Analyst: LH

Analyzed: 02/24/2021 12:54

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21B0174-11 J

Preparation Batch: BJB0698

Sample Size: 10 mL

Prepared: 02/24/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)	GRO	1	100	455	ug/L	
HC ID: GAS						
Surrogate: Toluene-d8			80-120 %	102	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	89.2	%	

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 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 11:52

MW-69-20211102
21B0174-11 (Water)
Semivolatile Organic Compounds

Method: EPA 8270E

Sampled: 02/11/2021 13:13

Instrument: NT10 Analyst: VTS

Analyzed: 02/25/2021 21:19

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21B0174-11 E 01

Preparation Batch: BJB0460

Sample Size: 895 mL

Prepared: 02/17/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
1,4-Dichlorobenzene	106-46-7	1	0.03	0.2	5.1	ug/L	
1,2-Dichlorobenzene	95-50-1	1	0.04	0.2	1.5	ug/L	
2,4-Dimethylphenol	105-67-9	1	0.3	1.1	ND	ug/L	U
Benzoic acid	65-85-0	1	0.1	2.2	ND	ug/L	U
N-Nitrosodiphenylamine	86-30-6	1	0.03	0.2	ND	ug/L	U
Pentachlorophenol	87-86-5	1	0.2	1.1	ND	ug/L	U
Di-n-Butylphthalate	84-74-2	1	0.06	0.2	ND	ug/L	U
Butylbenzylphthalate	85-68-7	1	0.07	0.2	ND	ug/L	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	0.2	0.2	ND	ug/L	U
<i>Surrogate: 2-Fluorophenol</i>				30-160 %	58.6	%	
<i>Surrogate: Phenol-d5</i>				30-160 %	39.2	%	
<i>Surrogate: 2-Chlorophenol-d4</i>				30-160 %	98.5	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				30-160 %	75.9	%	
<i>Surrogate: Nitrobenzene-d5</i>				30-160 %	81.2	%	
<i>Surrogate: 2-Fluorobiphenyl</i>				30-160 %	85.6	%	
<i>Surrogate: 2,4,6-Tribromophenol</i>				30-160 %	91.0	%	
<i>Surrogate: p-Terphenyl-d14</i>				30-160 %	85.0	%	



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Analytical Report

Shannon & Wilson, Inc
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Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
04-Aug-2021 11:52

MW-69-20211102

21B0174-11 (Water)

Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 02/11/2021 13:13

Instrument: FID4 Analyst: CTO

Analyzed: 03/12/2021 20:30

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21B0174-11 G 01

Preparation Batch: BJB0484

Sample Size: 470 mL

Prepared: 02/18/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.106	0.992	mg/L	
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	1	0.213	ND	mg/L	U
Surrogate: o-Terphenyl			50-150 %	107	%	

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 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 11:52

MW-69-20211102
21B0174-11 (Water)
Aroclor PCB

Method: EPA 8082A

Sampled: 02/11/2021 13:13

Instrument: ECD7 Analyst: JGR

Analyzed: 03/12/2021 11:28

Sample Preparation:	Preparation Method: EPA 3510C SepF Preparation Batch: BJB0451 Prepared: 02/15/2021	Sample Size: 455 mL Final Volume: 1 mL	Extract ID: 21B0174-11 C 01
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJC0080 Cleaned: 08-Mar-2021	Initial Volume: 1 mL Final Volume: 1 mL	Extract ID: 21B0174-11 C 01
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJC0078 Cleaned: 08-Mar-2021	Initial Volume: 1 mL Final Volume: 1 mL	Extract ID: 21B0174-11 C 01
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJC0079 Cleaned: 08-Mar-2021	Initial Volume: 1 mL Final Volume: 1 mL	Extract ID: 21B0174-11 C 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	0.019	0.110	ND	ug/L	U
Aroclor 1221	11104-28-2	1	0.019	0.110	ND	ug/L	U
Aroclor 1232	11141-16-5	1	0.019	0.110	ND	ug/L	U
Aroclor 1242	53469-21-9	1	0.019	0.110	ND	ug/L	U
Aroclor 1248	12672-29-6	1	0.019	0.110	ND	ug/L	U
Aroclor 1254	11097-69-1	1	0.019	0.110	ND	ug/L	U
Aroclor 1260	11096-82-5	1	0.019	0.110	ND	ug/L	U
Surrogate: Decachlorobiphenyl				26-120 %	46.7	%	
Surrogate: Tetrachlorometaxylene				39-120 %	39.5	%	
Surrogate: Decachlorobiphenyl [2C]				26-120 %	44.2	%	
Surrogate: Tetrachlorometaxylene [2C]				39-120 %	41.8	%	


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 Project Manager: Meg Strong

Reported:
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MW-69-20211102
21B0174-11 (Water)
Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 02/11/2021 13:13

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/23/2021 20:56

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21B0174-11 A 01

Preparation Batch: BJB0618

Sample Size: 25 mL

Prepared: 02/22/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium	7440-39-3	1	0.0560	0.500	28.5	ug/L	
Chromium	7440-47-3	1	0.130	0.500	1.37	ug/L	
Cobalt	7440-48-4	1	0.0290	0.200	0.496	ug/L	
Iron	7439-89-6	20	28.0	400	32700	ug/L	D
Lead	7439-92-1	1	0.0680	0.100	0.135	ug/L	
Manganese	7439-96-5	20	1.70	10.0	2310	ug/L	D
Silver	7440-22-4	1	0.0170	0.200	ND	ug/L	U
Vanadium	7440-62-2	1	0.0400	0.200	8.09	ug/L	


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MW-69-20211102
21B0174-11 (Water)
Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 02/11/2021 13:13

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/23/2021 20:56

Sample Preparation:

 Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21B0174-11 A 01

Preparation Batch: BJB0618

Sample Size: 25 mL

Prepared: 02/22/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0220	0.200	1.66	ug/L	
Cadmium	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Copper	7440-50-8	1	0.340	0.500	0.596	ug/L	
Nickel	7440-02-0	1	0.0500	0.500	0.627	ug/L	
Selenium	7782-49-2	1	0.440	0.500	0.478	ug/L	J
Zinc	7440-66-6	1	0.820	4.00	3.84	ug/L	J



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Analytical Report

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Project: Lower Duwamish
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Project Manager: Meg Strong

Reported:
04-Aug-2021 11:52

MW-69-20211102

21B0174-11 (Water)

Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 02/11/2021 13:13

Instrument: HYDRA Analyst: BLC

Analyzed: 02/19/2021 15:40

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21B0174-11 A

Preparation Batch: BJB0561

Sample Size: 20 mL

Prepared: 02/19/2021

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.000013	0.000100	ND	mg/L	U

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 Project: Lower Duwamish
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Reported:
 04-Aug-2021 11:52

MW-69-20211102
21B0174-12 (Water)
Metals and Metallic Compounds (dissolved)

Method: EPA 6020B

Sampled: 02/11/2021 13:13

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/23/2021 21:01

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21B0174-12 A 02

Preparation Batch: BJB0662

Sample Size: 25 mL

Filtration Batch: BJB0415

Prepared: 02/23/2021

Final Volume: 25 mL

Filtration Date: 02/12/2021 13:39

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.0560	0.500	10.5	ug/L	
Chromium, Dissolved	7440-47-3	1	0.130	0.500	0.541	ug/L	
Cobalt, Dissolved	7440-48-4	1	0.0290	0.200	0.417	ug/L	
Iron, Dissolved	7439-89-6	1	6.27	20.0	17100	ug/L	
Lead, Dissolved	7439-92-1	1	0.0680	0.100	ND	ug/L	U
Manganese, Dissolved	7439-96-5	20	1.70	10.0	2270	ug/L	D
Silver, Dissolved	7440-22-4	1	0.0170	0.200	ND	ug/L	U
Vanadium, Dissolved	7440-62-2	1	0.0400	0.200	0.668	ug/L	


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Reported:
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MW-69-20211102
21B0174-12 (Water)
Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 02/11/2021 13:13

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/23/2021 21:01

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21B0174-12 A 02

Preparation Batch: BJB0662

Sample Size: 25 mL

Filtration Batch: BJB0415

Prepared: 02/23/2021

Final Volume: 25 mL

Filtration Date: 02/12/2021 13:39

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	0.887	ug/L	
Cadmium, Dissolved	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Copper, Dissolved	7440-50-8	1	0.340	0.500	ND	ug/L	U
Nickel, Dissolved	7440-02-0	1	0.0500	0.500	0.418	ug/L	J
Selenium, Dissolved	7782-49-2	1	0.440	0.500	ND	ug/L	U
Zinc, Dissolved	7440-66-6	1	0.820	4.00	3.08	ug/L	J



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Project: Lower Duwamish
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Project Manager: Meg Strong

Reported:
04-Aug-2021 11:52

MW-69-20211102

21B0174-12 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 7470A

Sampled: 02/11/2021 13:13

Instrument: HYDRA Analyst: BLC

Analyzed: 02/25/2021 12:16

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21B0174-12 A 01

Preparation Batch: BJB0653

Sample Size: 20 mL

Filtration Batch: BJB0415

Prepared: 02/23/2021

Final Volume: 20 mL

Filtration Date: 02/12/2021 13:39

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury, Dissolved	7439-97-6	1	0.000013	0.000100	ND	mg/L	U

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 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 11:52

MW-24-20211102
21B0174-13 (Water)
Volatile Organic Compounds

Method: EPA 8260D

Sampled: 02/11/2021 16:12

Instrument: NT2 Analyst: PKC

Analyzed: 02/23/2021 17:35

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21B0174-13 G

Preparation Batch: BJB0669

Sample Size: 10 mL

Prepared: 02/23/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	113	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	102	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				80-120 %	87.7	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				80-120 %	101	%	


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Reported:
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MW-24-20211102
21B0174-13 (Water)
Semivolatile Organic Compounds

Method: EPA 8270E

Sampled: 02/11/2021 16:12

Instrument: NT10 Analyst: VTS

Analyzed: 02/25/2021 21:56

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21B0174-13 D 01

Preparation Batch: BJB0460

Sample Size: 950 mL

Prepared: 02/17/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
1,4-Dichlorobenzene	106-46-7	1	0.03	0.2	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.03	0.2	ND	ug/L	U
2,4-Dimethylphenol	105-67-9	1	0.3	1.1	ND	ug/L	U
Benzoic acid	65-85-0	1	0.1	2.1	ND	ug/L	U
N-Nitrosodiphenylamine	86-30-6	1	0.03	0.2	ND	ug/L	U
Pentachlorophenol	87-86-5	1	0.1	1.1	ND	ug/L	U
Di-n-Butylphthalate	84-74-2	1	0.05	0.2	ND	ug/L	U
Butylbenzylphthalate	85-68-7	1	0.07	0.2	ND	ug/L	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	0.2	0.2	ND	ug/L	U
<i>Surrogate: 2-Fluorophenol</i>				30-160 %	50.3	%	
<i>Surrogate: Phenol-d5</i>				30-160 %	32.3	%	
<i>Surrogate: 2-Chlorophenol-d4</i>				30-160 %	83.9	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				30-160 %	65.9	%	
<i>Surrogate: Nitrobenzene-d5</i>				30-160 %	75.3	%	
<i>Surrogate: 2-Fluorobiphenyl</i>				30-160 %	74.8	%	
<i>Surrogate: 2,4,6-Tribromophenol</i>				30-160 %	91.7	%	
<i>Surrogate: p-Terphenyl-d14</i>				30-160 %	54.2	%	


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Reported:
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MW-24-20211102
21B0174-13 (Water)
Semivolatile Organic Compounds - SIM

 Method: EPA 8270E-SIM Sampled: 02/11/2021 16:12
 Instrument: NT11 Analyst: VTS Analyzed: 03/11/2021 06:31

 Sample Preparation: Preparation Method: EPA 3510C SepF Extract ID: 21B0174-13 B 01
Preparation Batch: BJB0449 Sample Size: 500 mL
Prepared: 02/15/2021 Final Volume: 0.5 mL

 Sample Cleanup: Cleanup Method: Silica Gel Extract ID: 21B0174-13 B 01
Cleanup Batch: CJC0072 Initial Volume: 0.5 mL
Cleaned: 08-Mar-2021 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.001	0.010	0.004	ug/L	J
2-Methylnaphthalene	91-57-6	1	0.001	0.010	0.002	ug/L	J
1-Methylnaphthalene	90-12-0	1	0.0009	0.010	0.001	ug/L	J
Acenaphthylene	208-96-8	1	0.002	0.010	ND	ug/L	U
Acenaphthene	83-32-9	1	0.003	0.010	ND	ug/L	U
Dibenzofuran	132-64-9	1	0.002	0.010	ND	ug/L	U
Fluorene	86-73-7	1	0.002	0.010	ND	ug/L	U
Phenanthrene	85-01-8	1	0.001	0.010	0.002	ug/L	J
Anthracene	120-12-7	1	0.001	0.010	ND	ug/L	U
Carbazole	86-74-8	1	0.001	0.010	ND	ug/L	U
Fluoranthene	206-44-0	1	0.002	0.010	ND	ug/L	U
Pyrene	129-00-0	1	0.001	0.010	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	0.0008	0.010	ND	ug/L	U
Chrysene	218-01-9	1	0.0009	0.010	ND	ug/L	U
Benzo(b)fluoranthene	205-99-2	1	0.0005	0.010	ND	ug/L	U
Benzo(k)fluoranthene	207-08-9	1	0.003	0.010	ND	ug/L	U
Benzo(j)fluoranthene	205-82-3	1	0.002	0.010	ND	ug/L	U
Benzo(a)fluoranthene, Total		1	0.004	0.010	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.002	0.010	ND	ug/L	U
Perylene	1985-5-0	1	0.006	0.010	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.001	0.010	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.001	0.010	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.001	0.010	ND	ug/L	U
<i>Surrogate: 2-Methylnaphthalene-d10</i>					42-120 %	66.9 %	
<i>Surrogate: Dibenzo[a,h]anthracene-d14</i>					29-120 %	43.5 %	
<i>Surrogate: Fluoranthene-d10</i>					57-120 %	76.4 %	



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Project: Lower Duwamish
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Project Manager: Meg Strong

Reported:
04-Aug-2021 11:52

MW-24-20211102

21B0174-13 (Water)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 02/11/2021 16:12

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/23/2021 21:44

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21B0174-13 A 01

Preparation Batch: BJB0618

Sample Size: 25 mL

Prepared: 02/22/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0220	0.200	34.6	ug/L	

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Reported:
04-Aug-2021 11:52

MW-24-20211102

21B0174-14 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 02/11/2021 16:12

Instrument: ICPMS2 Analyst: MCB

Analyzed: 02/23/2021 21:49

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21B0174-14 A 02

Preparation Batch: BJB0662

Sample Size: 25 mL

Filtration Batch: BJB0415

Prepared: 02/23/2021

Final Volume: 25 mL

Filtration Date: 02/12/2021 13:39

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	8.43	ug/L	

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 Project Number: Lower Duwamish
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Reported:
 04-Aug-2021 11:52

Volatile Organic Compounds - Quality Control
Batch BJB0669 - EPA 5030C (Purge and Trap)

Instrument: NT2 Analyst: PKC

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0669-BLK1)											
						Prepared: 23-Feb-2021 Analyzed: 23-Feb-2021 11:44					
Vinyl Chloride	ND	0.08	0.20	ug/L							U
1,1-Dichloroethene	ND	0.08	0.20	ug/L							U
trans-1,2-Dichloroethene	ND	0.07	0.20	ug/L							U
cis-1,2-Dichloroethene	ND	0.08	0.20	ug/L							U
Benzene	ND	0.05	0.20	ug/L							U
Trichloroethene	ND	0.07	0.20	ug/L							U
Toluene	ND	0.05	0.20	ug/L							U
Tetrachloroethene	ND	0.09	0.20	ug/L							U
Ethylbenzene	ND	0.05	0.20	ug/L							U
m,p-Xylene	ND	0.14	0.40	ug/L							U
o-Xylene	ND	0.08	0.20	ug/L							U
Xylenes, total	ND	0.22	0.60	ug/L							U
Surrogate: 1,2-Dichloroethane-d4	5.68			ug/L	5.00		114	80-129			
Surrogate: Toluene-d8	5.03			ug/L	5.00		101	80-120			
Surrogate: 4-Bromofluorobenzene	4.53			ug/L	5.00		90.5	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	4.99			ug/L	5.00		99.8	80-120			
Blank (BJB0669-BLK2)											
						Prepared: 23-Feb-2021 Analyzed: 23-Feb-2021 11:44					
Gasoline Range Organics (Tol-Nap)	ND		100	ug/L							U
Surrogate: Toluene-d8	5.03			ug/L	5.00		101	80-120			
Surrogate: 4-Bromofluorobenzene	4.53			ug/L	5.00		90.5	80-120			
LCS (BJB0669-BS1)											
						Prepared: 23-Feb-2021 Analyzed: 23-Feb-2021 10:19					
Vinyl Chloride	12.0	0.08	0.20	ug/L	10.0		120	66-133			
1,1-Dichloroethene	12.1	0.08	0.20	ug/L	10.0		121	69-135			Q
trans-1,2-Dichloroethene	11.6	0.07	0.20	ug/L	10.0		116	78-128			
cis-1,2-Dichloroethene	9.09	0.08	0.20	ug/L	10.0		90.9	80-121			
Benzene	9.62	0.05	0.20	ug/L	10.0		96.2	80-120			
Trichloroethene	9.05	0.07	0.20	ug/L	10.0		90.5	80-120			
Toluene	9.45	0.05	0.20	ug/L	10.0		94.5	80-120			
Tetrachloroethene	9.08	0.09	0.20	ug/L	10.0		90.8	80-120			
Ethylbenzene	9.14	0.05	0.20	ug/L	10.0		91.4	80-120			
m,p-Xylene	18.7	0.14	0.40	ug/L	20.0		93.6	80-121			
o-Xylene	8.96	0.08	0.20	ug/L	10.0		89.6	80-121			
Xylenes, total	27.7	0.22	0.60	ug/L	30.0		92.2	76-127			


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 11:52

Volatile Organic Compounds - Quality Control
Batch BJB0669 - EPA 5030C (Purge and Trap)

Instrument: NT2 Analyst: PKC

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJB0669-BS1)											
						Prepared: 23-Feb-2021	Analyzed: 23-Feb-2021 10:19				
Surrogate: 1,2-Dichloroethane-d4	5.43			ug/L	5.00		109	80-129			
Surrogate: Toluene-d8	5.07			ug/L	5.00		101	80-120			
Surrogate: 4-Bromofluorobenzene	4.69			ug/L	5.00		93.8	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	4.96			ug/L	5.00		99.3	80-120			
LCS (BJB0669-BS2)											
						Prepared: 23-Feb-2021	Analyzed: 23-Feb-2021 09:38				
Gasoline Range Organics (Tol-Nap)	1080		100	ug/L	1000		108	72-128			
Surrogate: Toluene-d8	5.16			ug/L	5.00		103	80-120			
Surrogate: 4-Bromofluorobenzene	4.64			ug/L	5.00		92.7	80-120			
LCS Dup (BJB0669-BSD1)											
						Prepared: 23-Feb-2021	Analyzed: 23-Feb-2021 10:39				
Vinyl Chloride	12.5	0.08	0.20	ug/L	10.0		125	66-133	4.51	30	
1,1-Dichloroethene	12.8	0.08	0.20	ug/L	10.0		128	69-135	5.66	30	Q
trans-1,2-Dichloroethene	12.5	0.07	0.20	ug/L	10.0		125	78-128	7.59	30	
cis-1,2-Dichloroethene	9.57	0.08	0.20	ug/L	10.0		95.7	80-121	5.10	30	
Benzene	9.86	0.05	0.20	ug/L	10.0		98.6	80-120	2.40	30	
Trichloroethene	9.28	0.07	0.20	ug/L	10.0		92.8	80-120	2.50	30	
Toluene	9.59	0.05	0.20	ug/L	10.0		95.9	80-120	1.49	30	
Tetrachloroethene	9.12	0.09	0.20	ug/L	10.0		91.2	80-120	0.41	30	
Ethylbenzene	9.29	0.05	0.20	ug/L	10.0		92.9	80-120	1.63	30	
m,p-Xylene	19.2	0.14	0.40	ug/L	20.0		96.0	80-121	2.63	30	
o-Xylene	9.21	0.08	0.20	ug/L	10.0		92.1	80-121	2.75	30	
Xylenes, total	28.4	0.22	0.60	ug/L	30.0		94.7	76-127	2.67	30	
Surrogate: 1,2-Dichloroethane-d4	5.54			ug/L	5.00		111	80-129			
Surrogate: Toluene-d8	5.03			ug/L	5.00		101	80-120			
Surrogate: 4-Bromofluorobenzene	4.78			ug/L	5.00		95.6	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	5.00			ug/L	5.00		100	80-120			
LCS Dup (BJB0669-BSD2)											
						Prepared: 23-Feb-2021	Analyzed: 23-Feb-2021 09:59				
Gasoline Range Organics (Tol-Nap)	1080		100	ug/L	1000		108	72-128	0.23	30	
Surrogate: Toluene-d8	5.18			ug/L	5.00		104	80-120			
Surrogate: 4-Bromofluorobenzene	4.68			ug/L	5.00		93.6	80-120			

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 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 11:52

Volatile Organic Compounds - Quality Control
Batch BJB0698 - EPA 5030C (Purge and Trap)

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0698-BLK1)		Prepared: 24-Feb-2021 Analyzed: 24-Feb-2021 11:53								
Gasoline Range Organics (Tol-Nap)	ND	100	ug/L							U
Surrogate: Toluene-d8	5.10		ug/L	5.00		102	80-120			
Surrogate: 4-Bromofluorobenzene	4.48		ug/L	5.00		89.7	80-120			
LCS (BJB0698-BS1)		Prepared: 24-Feb-2021 Analyzed: 24-Feb-2021 10:32								
Gasoline Range Organics (Tol-Nap)	1190	100	ug/L	1000		119	72-128			
Surrogate: Toluene-d8	5.13		ug/L	5.00		103	80-120			
Surrogate: 4-Bromofluorobenzene	4.60		ug/L	5.00		92.1	80-120			
LCS Dup (BJB0698-BSD1)		Prepared: 24-Feb-2021 Analyzed: 24-Feb-2021 11:13								
Gasoline Range Organics (Tol-Nap)	1140	100	ug/L	1000		114	72-128	4.66	30	
Surrogate: Toluene-d8	5.21		ug/L	5.00		104	80-120			
Surrogate: 4-Bromofluorobenzene	4.62		ug/L	5.00		92.4	80-120			


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 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 11:52

Semivolatile Organic Compounds - Quality Control
Batch BJB0460 - EPA 3510C SepF

Instrument: NT10 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0460-BLK1)											
						Prepared: 17-Feb-2021 Analyzed: 25-Feb-2021 16:59					
1,4-Dichlorobenzene	ND	0.03	0.2	ug/L							U
1,2-Dichlorobenzene	ND	0.03	0.2	ug/L							U
2,4-Dimethylphenol	ND	0.3	1.0	ug/L							U
Benzoic acid	ND	0.1	2.0	ug/L							U
N-Nitrosodiphenylamine	ND	0.03	0.2	ug/L							U
Pentachlorophenol	ND	0.1	1.0	ug/L							U
Di-n-Butylphthalate	ND	0.05	0.2	ug/L							U
Butylbenzylphthalate	ND	0.07	0.2	ug/L							U
bis(2-Ethylhexyl)phthalate	ND	0.2	0.2	ug/L							U
<i>Surrogate: 2-Fluorophenol</i>	3.52			ug/L	7.50		46.9	30-160			
<i>Surrogate: Phenol-d5</i>	2.02			ug/L	7.50		27.0	30-160			*
<i>Surrogate: 2-Chlorophenol-d4</i>	6.22			ug/L	7.50		82.9	30-160			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	3.19			ug/L	5.00		63.9	30-160			
<i>Surrogate: Nitrobenzene-d5</i>	3.80			ug/L	5.00		76.0	30-160			
<i>Surrogate: 2-Fluorobiphenyl</i>	4.19			ug/L	5.00		83.9	30-160			
<i>Surrogate: 2,4,6-Tribromophenol</i>	7.80			ug/L	7.50		104	30-160			
<i>Surrogate: p-Terphenyl-d14</i>	3.62			ug/L	5.00		72.5	30-160			
LCS (BJB0460-BS1)											
						Prepared: 17-Feb-2021 Analyzed: 25-Feb-2021 17:36					
1,4-Dichlorobenzene	3.8	0.03	0.2	ug/L	5.00		76.8	30-160			
1,2-Dichlorobenzene	3.8	0.03	0.2	ug/L	5.00		76.7	30-160			
2,4-Dimethylphenol	8.7	0.3	1.0	ug/L	13.0		66.9	30-160			
Benzoic acid	9.3	0.1	2.0	ug/L	23.0		40.3	30-160			
N-Nitrosodiphenylamine	3.9	0.03	0.2	ug/L	5.00		78.9	30-160			
Pentachlorophenol	8.7	0.1	1.0	ug/L	13.0		66.8	30-160			
Di-n-Butylphthalate	4.7	0.05	0.2	ug/L	5.00		94.3	30-160			
Butylbenzylphthalate	4.5	0.07	0.2	ug/L	5.00		89.9	30-160			
bis(2-Ethylhexyl)phthalate	4.7	0.2	0.2	ug/L	5.00		93.8	30-160			
<i>Surrogate: 2-Fluorophenol</i>	4.54			ug/L	7.50		60.6	30-160			
<i>Surrogate: Phenol-d5</i>	3.04			ug/L	7.50		40.6	30-160			
<i>Surrogate: 2-Chlorophenol-d4</i>	7.32			ug/L	7.50		97.6	30-160			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	3.64			ug/L	5.00		72.7	30-160			
<i>Surrogate: Nitrobenzene-d5</i>	4.04			ug/L	5.00		80.8	30-160			
<i>Surrogate: 2-Fluorobiphenyl</i>	4.51			ug/L	5.00		90.3	30-160			


 Shannon & Wilson, Inc
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 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 11:52

Semivolatile Organic Compounds - Quality Control
Batch BJB0460 - EPA 3510C SepF

Instrument: NT10 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJB0460-BS1)						Prepared: 17-Feb-2021	Analyzed: 25-Feb-2021 17:36				
Surrogate: 2,4,6-Tribromophenol	7.75			ug/L	7.50		103	30-160			
Surrogate: p-Terphenyl-d14	3.92			ug/L	5.00		78.4	30-160			
LCS Dup (BJB0460-BSD1)						Prepared: 17-Feb-2021	Analyzed: 25-Feb-2021 18:14				
1,4-Dichlorobenzene	4.0	0.03	0.2	ug/L	5.00		80.4	30-160	4.56	30	
1,2-Dichlorobenzene	3.9	0.03	0.2	ug/L	5.00		78.1	30-160	1.85	30	
2,4-Dimethylphenol	9.7	0.3	1.0	ug/L	13.0		74.3	30-160	10.50	30	
Benzoic acid	9.8	0.1	2.0	ug/L	23.0		42.6	30-160	5.59	30	
N-Nitrosodiphenylamine	4.1	0.03	0.2	ug/L	5.00		82.6	30-160	4.69	30	
Pentachlorophenol	9.6	0.1	1.0	ug/L	13.0		74.0	30-160	10.30	30	
Di-n-Butylphthalate	5.1	0.05	0.2	ug/L	5.00		103	30-160	8.48	30	
Butylbenzylphthalate	4.7	0.07	0.2	ug/L	5.00		95.0	30-160	5.47	30	
bis(2-Ethylhexyl)phthalate	4.9	0.2	0.2	ug/L	5.00		97.9	30-160	4.36	30	
Surrogate: 2-Fluorophenol	4.75			ug/L	7.50		63.3	30-160			
Surrogate: Phenol-d5	3.25			ug/L	7.50		43.3	30-160			
Surrogate: 2-Chlorophenol-d4	7.43			ug/L	7.50		99.1	30-160			
Surrogate: 1,2-Dichlorobenzene-d4	3.65			ug/L	5.00		73.1	30-160			
Surrogate: Nitrobenzene-d5	4.10			ug/L	5.00		82.0	30-160			
Surrogate: 2-Fluorobiphenyl	4.09			ug/L	5.00		81.9	30-160			
Surrogate: 2,4,6-Tribromophenol	7.10			ug/L	7.50		94.7	30-160			
Surrogate: p-Terphenyl-d14	3.75			ug/L	5.00		74.9	30-160			



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish
Project Number: Lower Duwamish
Project Manager: Meg Strong

Reported:
04-Aug-2021 11:52

Semivolatile Organic Compounds - SIM - Quality Control

Batch BJB0449 - EPA 3510C SepF

Instrument: NT11 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0449-BLK1)						Prepared: 15-Feb-2021 Analyzed: 11-Mar-2021 00:06					
Naphthalene	0.004	0.001	0.010	ug/L							J
2-Methylnaphthalene	0.002	0.001	0.010	ug/L							J
1-Methylnaphthalene	0.001	0.0009	0.010	ug/L							J
Acenaphthylene	ND	0.002	0.010	ug/L							U
Acenaphthene	ND	0.003	0.010	ug/L							U
Dibenzofuran	ND	0.002	0.010	ug/L							U
Fluorene	ND	0.002	0.010	ug/L							U
Phenanthrene	ND	0.001	0.010	ug/L							U
Anthracene	ND	0.001	0.010	ug/L							U
Carbazole	ND	0.001	0.010	ug/L							U
Fluoranthene	ND	0.002	0.010	ug/L							U
Pyrene	ND	0.001	0.010	ug/L							U
Benzo(a)anthracene	ND	0.0008	0.010	ug/L							U
Chrysene	ND	0.0009	0.010	ug/L							U
Benzo(b)fluoranthene	ND	0.0005	0.010	ug/L							U
Benzo(k)fluoranthene	ND	0.003	0.010	ug/L							U
Benzo(j)fluoranthene	ND	0.002	0.010	ug/L							U
Benzofluoranthenes, Total	ND	0.004	0.010	ug/L							U
Benzo(a)pyrene	ND	0.002	0.010	ug/L							U
Perylene	ND	0.006	0.010	ug/L							U
Indeno(1,2,3-cd)pyrene	ND	0.001	0.010	ug/L							U
Dibenzo(a,h)anthracene	ND	0.001	0.010	ug/L							U
Benzo(g,h,i)perylene	ND	0.001	0.010	ug/L							U
Surrogate: 2-Methylnaphthalene-d10	0.198			ug/L	0.300		65.9	42-120			
Surrogate: Dibenzo[a,h]anthracene-d14	0.139			ug/L	0.300		46.4	29-120			
Surrogate: Fluoranthene-d10	0.211			ug/L	0.300		70.5	57-120			

LCS (BJB0449-BS1)						Prepared: 15-Feb-2021 Analyzed: 11-Mar-2021 00:38					
Naphthalene	0.201	0.001	0.010	ug/L	0.300		67.0	37-120			
2-Methylnaphthalene	0.201	0.001	0.010	ug/L	0.300		67.1	37-120			
1-Methylnaphthalene	0.206	0.0009	0.010	ug/L	0.300		68.6	29-120			
Acenaphthylene	0.189	0.002	0.010	ug/L	0.300		63.0	41-120			
Acenaphthene	0.198	0.003	0.010	ug/L	0.300		65.9	41-120			
Dibenzofuran	0.208	0.002	0.010	ug/L	0.300		69.2	38-120			
Fluorene	0.217	0.002	0.010	ug/L	0.300		72.4	43-120			

Analytical Resources, Inc.

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 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 11:52

Semivolatile Organic Compounds - SIM - Quality Control
Batch BJB0449 - EPA 3510C SepF

Instrument: NT11 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJB0449-BS1)						Prepared: 15-Feb-2021 Analyzed: 11-Mar-2021 00:38					
Phenanthrene	0.210	0.001	0.010	ug/L	0.300		69.9	41-120			
Anthracene	0.154	0.001	0.010	ug/L	0.300		51.3	40-120			
Carbazole	0.204	0.001	0.010	ug/L	0.300		68.0	30-160			
Fluoranthene	0.216	0.002	0.010	ug/L	0.300		71.9	45-120			
Pyrene	0.215	0.001	0.010	ug/L	0.300		71.6	41-120			
Benzo(a)anthracene	0.186	0.0008	0.010	ug/L	0.300		62.1	42-120			
Chrysene	0.213	0.0009	0.010	ug/L	0.300		71.2	44-120			
Benzo(b)fluoranthene	0.177	0.0005	0.010	ug/L	0.300		59.0	44-120			
Benzo(k)fluoranthene	0.238	0.003	0.010	ug/L	0.300		79.5	50-120			
Benzo(j)fluoranthene	0.271	0.002	0.010	ug/L	0.300		90.4	39-160			
Benzofluoranthenes, Total	0.687	0.004	0.010	ug/L	0.900		76.3	46-120			
Benzo(a)pyrene	0.155	0.002	0.010	ug/L	0.300		51.6	35-120			
Perylene	0.173	0.006	0.010	ug/L	0.300		57.8	30-160			
Indeno(1,2,3-cd)pyrene	0.196	0.001	0.010	ug/L	0.300		65.2	37-120			
Dibenzo(a,h)anthracene	0.181	0.001	0.010	ug/L	0.300		60.3	34-120			
Benzo(g,h,i)perylene	0.194	0.001	0.010	ug/L	0.300		64.5	38-120			
Surrogate: 2-Methylnaphthalene-d10	0.225			ug/L	0.300		75.0	42-120			
Surrogate: Dibenzo[a,h]anthracene-d14	0.169			ug/L	0.300		56.2	29-120			
Surrogate: Fluoranthene-d10	0.233			ug/L	0.300		77.6	57-120			


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 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 11:52

Petroleum Hydrocarbons - Quality Control
Batch BJB0484 - EPA 3510C SepF

Instrument: FID4 Analyst: CTO

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0484-BLK1)										
					Prepared: 18-Feb-2021 Analyzed: 12-Mar-2021 16:59					
Diesel Range Organics (C12-C24)	ND	0.100	mg/L							U
Motor Oil Range Organics (C24-C38)	ND	0.200	mg/L							U
Surrogate: o-Terphenyl	0.239		mg/L	0.225	106		50-150			
LCS (BJB0484-BS1)										
					Prepared: 18-Feb-2021 Analyzed: 12-Mar-2021 17:20					
Diesel Range Organics (C12-C24)	3.00	0.100	mg/L	3.00		100	56-120			
Surrogate: o-Terphenyl	0.251		mg/L	0.225	112		50-150			
LCS Dup (BJB0484-BSD1)										
					Prepared: 18-Feb-2021 Analyzed: 12-Mar-2021 17:41					
Diesel Range Organics (C12-C24)	3.01	0.100	mg/L	3.00		100	56-120	0.12	30	
Surrogate: o-Terphenyl	0.240		mg/L	0.225	106		50-150			


 Shannon & Wilson, Inc
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 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 11:52

Aroclor PCB - Quality Control
Batch BJB0451 - EPA 3510C SepF

Instrument: ECD7 Analyst: JGR

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0451-BLK1)						Prepared: 15-Feb-2021 Analyzed: 12-Mar-2021 08:44					
Aroclor 1016	ND	0.018	0.100	ug/L							U
Aroclor 1221	ND	0.018	0.100	ug/L							U
Aroclor 1232	ND	0.018	0.100	ug/L							U
Aroclor 1242	ND	0.018	0.100	ug/L							U
Aroclor 1248	ND	0.018	0.100	ug/L							U
Aroclor 1254	ND	0.018	0.100	ug/L							U
Aroclor 1260	ND	0.017	0.100	ug/L							U
Surrogate: Decachlorobiphenyl	0.0385			ug/L	0.0800		48.1	26-120			
Surrogate: Tetrachlorometaxylene	0.0336			ug/L	0.0800		42.0	39-120			
Surrogate: Decachlorobiphenyl [2C]	0.0356			ug/L	0.0800		44.4	26-120			
Surrogate: Tetrachlorometaxylene [2C]	0.0293			ug/L	0.0800		36.7	39-120			*
LCS (BJB0451-BS1)						Prepared: 15-Feb-2021 Analyzed: 12-Mar-2021 09:05					
Aroclor 1016 [2C]	0.565	0.018	0.100	ug/L	1.00		56.5	51-120			
Aroclor 1260 [2C]	0.569	0.017	0.100	ug/L	1.00		56.9	56-120			
Surrogate: Decachlorobiphenyl	0.0400			ug/L	0.0800		50.0	26-120			
Surrogate: Tetrachlorometaxylene	0.0379			ug/L	0.0800		47.3	39-120			
Surrogate: Decachlorobiphenyl [2C]	0.0393			ug/L	0.0800		49.2	26-120			
Surrogate: Tetrachlorometaxylene [2C]	0.0323			ug/L	0.0800		40.4	39-120			


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 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 11:52

Metals and Metallic Compounds - Quality Control
Batch BJB0561 - TWM EPA 7470A

Instrument: HYDRA Analyst: BLC

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0561-BLK1)					Prepared: 19-Feb-2021 Analyzed: 19-Feb-2021 15:15						
Mercury	ND	0.000013	0.000100	mg/L							U
LCS (BJB0561-BS1)					Prepared: 19-Feb-2021 Analyzed: 19-Feb-2021 15:17						
Mercury	0.00201	0.000013	0.000100	mg/L	0.00200		100	80-120			
Duplicate (BJB0561-DUP1)					Source: 21B0174-01 Prepared: 19-Feb-2021 Analyzed: 19-Feb-2021 15:22						
Mercury	ND	0.000013	0.000100	mg/L		ND					U
Matrix Spike (BJB0561-MS1)					Source: 21B0174-01 Prepared: 19-Feb-2021 Analyzed: 19-Feb-2021 15:24						
Mercury	0.00107	0.000013	0.000100	mg/L	0.00100	ND	107	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike Dup (BJB0561-MSD1)					Source: 21B0174-01 Prepared: 19-Feb-2021 Analyzed: 19-Feb-2021 15:26						
Mercury	0.00106	0.000013	0.000100	mg/L	0.00100	ND	106	75-125	0.69	20	
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											


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 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 11:52

Metals and Metallic Compounds - Quality Control
Batch BJB0618 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0618-BLK1)						Prepared: 22-Feb-2021 Analyzed: 23-Feb-2021 19:38						
Barium	135	ND	0.0560	0.500	ug/L							U
Barium	137	ND	0.0530	0.500	ug/L							U
Chromium	52	0.149	0.130	0.500	ug/L							J
Chromium	53	0.109	0.0700	0.500	ug/L							J
Cobalt	59	ND	0.0290	0.200	ug/L							U
Iron	54	ND	6.27	20.0	ug/L							U
Iron	57	ND	1.40	20.0	ug/L							U
Lead	208	ND	0.0680	0.100	ug/L							U
Manganese	55	ND	0.0850	0.500	ug/L							U
Silver	107	ND	0.0170	0.200	ug/L							U
Vanadium	51a	ND	0.0400	0.200	ug/L							U
Vanadium	51b	ND	0.0160	0.200	ug/L							U
Arsenic	75a	ND	0.0220	0.200	ug/L							U
Cadmium	111	ND	0.0300	0.100	ug/L							U
Cadmium	114	ND	0.0400	0.100	ug/L							U
Copper	63	ND	0.340	0.500	ug/L							U
Copper	65	ND	0.350	0.500	ug/L							U
Nickel	60	ND	0.0500	0.500	ug/L							U
Nickel	62	ND	0.220	0.500	ug/L							U
Selenium	78	ND	0.440	0.500	ug/L							U
Zinc	66	ND	0.820	4.00	ug/L							U
Zinc	67	ND	0.940	4.00	ug/L							U

LCS (BJB0618-BS1)						Prepared: 22-Feb-2021 Analyzed: 23-Feb-2021 19:43						
Barium	135	25.3	0.0560	0.500	ug/L	25.0		101	80-120			
Barium	137	25.7	0.0530	0.500	ug/L	25.0		103	80-120			
Chromium	52	25.7	0.130	0.500	ug/L	25.0		103	80-120			
Chromium	53	25.8	0.0700	0.500	ug/L	25.0		103	80-120			
Cobalt	59	25.8	0.0290	0.200	ug/L	25.0		103	80-120			
Iron	54	5200	6.27	20.0	ug/L	5000		104	80-120			
Iron	57	5140	1.40	20.0	ug/L	5000		103	80-120			
Lead	208	26.0	0.0680	0.100	ug/L	25.0		104	80-120			
Manganese	55	25.7	0.0850	0.500	ug/L	25.0		103	80-120			
Silver	107	25.9	0.0170	0.200	ug/L	25.0		104	80-120			
Vanadium	51a	25.4	0.0400	0.200	ug/L	25.0		102	80-120			


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 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 11:52

Metals and Metallic Compounds - Quality Control
Batch BJB0618 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJB0618-BS1)												
						Prepared: 22-Feb-2021		Analyzed: 23-Feb-2021 19:43				
Vanadium	51b	25.5	0.0160	0.200	ug/L	25.0		102	80-120			
Arsenic	75a	25.7	0.0220	0.200	ug/L	25.0		103	80-120			
Cadmium	111	24.9	0.0300	0.100	ug/L	25.0		99.7	80-120			
Cadmium	114	25.6	0.0400	0.100	ug/L	25.0		102	80-120			
Copper	63	25.6	0.340	0.500	ug/L	25.0		102	80-120			
Copper	65	25.9	0.350	0.500	ug/L	25.0		104	80-120			
Nickel	60	25.9	0.0500	0.500	ug/L	25.0		104	80-120			
Nickel	62	24.9	0.220	0.500	ug/L	25.0		99.6	80-120			
Selenium	78	81.1	0.440	0.500	ug/L	80.0		101	80-120			
Zinc	66	80.6	0.820	4.00	ug/L	80.0		101	80-120			
Zinc	67	79.0	0.940	4.00	ug/L	80.0		98.8	80-120			
Duplicate (BJB0618-DUP1)												
						Source: 21B0174-01		Prepared: 22-Feb-2021 Analyzed: 23-Feb-2021 19:58				
Barium	135	2.02	0.0560	0.500	ug/L		2.07			2.64	20	
Chromium	52	0.199	0.130	0.500	ug/L		0.219			9.57	20	J
Cobalt	59	0.344	0.0290	0.200	ug/L		0.339			1.46	20	
Iron	57	2540	1.40	20.0	ug/L		2480			2.49	20	
Lead	208	ND	0.0680	0.100	ug/L		ND					U
Silver	107	ND	0.0170	0.200	ug/L		ND					U
Vanadium	51a	0.871	0.0400	0.200	ug/L		0.874			0.34	20	
Arsenic	75a	0.490	0.0220	0.200	ug/L		0.417			16.10	20	
Cadmium	111	ND	0.0300	0.100	ug/L		ND					U
Copper	63	0.463	0.340	0.500	ug/L		0.466			0.65	20	J
Nickel	60	0.366	0.0500	0.500	ug/L		0.377			2.96	20	J
Selenium	78	ND	0.440	0.500	ug/L		ND					U
Zinc	66	ND	0.820	4.00	ug/L		ND					U
Duplicate (BJB0618-DUP2)												
						Source: 21B0174-01		Prepared: 22-Feb-2021 Analyzed: 24-Feb-2021 19:41				
Manganese	55	335	0.425	2.50	ug/L		333			0.62	20	D
Matrix Spike (BJB0618-MS1)												
						Source: 21B0174-01		Prepared: 22-Feb-2021 Analyzed: 23-Feb-2021 20:04				
Barium	135	27.9	0.0560	0.500	ug/L	25.0	2.07	103	75-125			
Chromium	52	23.7	0.130	0.500	ug/L	25.0	0.219	94.1	75-125			
Cobalt	59	27.3	0.0290	0.200	ug/L	25.0	0.339	108	75-125			
Iron	57	7460	1.40	20.0	ug/L	5000	2480	99.8	75-125			
Lead	208	26.7	0.0680	0.100	ug/L	25.0	ND	107	75-125			


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 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 11:52

Metals and Metallic Compounds - Quality Control
Batch BJB0618 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BJB0618-MS1)		Source: 21B0174-01			Prepared: 22-Feb-2021 Analyzed: 23-Feb-2021 20:04							
Silver	107	25.7	0.0170	0.200	ug/L	25.0	ND	103	75-125			
Vanadium	51a	24.4	0.0400	0.200	ug/L	25.0	0.874	94.2	75-125			
Arsenic	75a	26.0	0.0220	0.200	ug/L	25.0	0.417	102	75-125			
Cadmium	111	23.9	0.0300	0.100	ug/L	25.0	ND	95.6	75-125			
Copper	63	26.5	0.340	0.500	ug/L	25.0	0.466	104	75-125			
Nickel	60	27.0	0.0500	0.500	ug/L	25.0	0.377	107	75-125			
Selenium	78	78.5	0.440	0.500	ug/L	80.0	ND	98.1	75-125			
Zinc	66	80.3	0.820	4.00	ug/L	80.0	ND	100	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike (BJB0618-MS2)		Source: 21B0174-01			Prepared: 22-Feb-2021 Analyzed: 24-Feb-2021 19:47							
Manganese	55	362	0.425	2.50	ug/L	25.0	333	116	75-125			HC, D

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike Dup (BJB0618-MSD1)		Source: 21B0174-01			Prepared: 22-Feb-2021 Analyzed: 23-Feb-2021 20:10							
Barium	135	28.2	0.0560	0.500	ug/L	25.0	2.07	105	75-125	1.06	20	
Chromium	52	24.2	0.130	0.500	ug/L	25.0	0.219	95.8	75-125	1.75	20	
Cobalt	59	26.7	0.0290	0.200	ug/L	25.0	0.339	105	75-125	2.08	20	
Iron	57	7370	1.40	20.0	ug/L	5000	2480	97.8	75-125	1.33	20	
Lead	208	26.8	0.0680	0.100	ug/L	25.0	ND	107	75-125	0.54	20	
Silver	107	26.1	0.0170	0.200	ug/L	25.0	ND	104	75-125	1.52	20	
Vanadium	51a	24.4	0.0400	0.200	ug/L	25.0	0.874	94.1	75-125	0.06	20	
Arsenic	75a	25.7	0.0220	0.200	ug/L	25.0	0.417	101	75-125	1.27	20	
Cadmium	111	26.1	0.0300	0.100	ug/L	25.0	ND	104	75-125	8.66	20	
Copper	63	26.2	0.340	0.500	ug/L	25.0	0.466	103	75-125	1.21	20	
Nickel	60	27.3	0.0500	0.500	ug/L	25.0	0.377	108	75-125	1.13	20	
Selenium	78	76.4	0.440	0.500	ug/L	80.0	ND	95.5	75-125	2.67	20	
Zinc	66	79.8	0.820	4.00	ug/L	80.0	ND	99.7	75-125	0.58	20	

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike Dup (BJB0618-MSD2)		Source: 21B0174-01			Prepared: 22-Feb-2021 Analyzed: 24-Feb-2021 19:53							
Manganese	55	365	0.425	2.50	ug/L	25.0	333	128	75-125	0.79	20	HC, D

Recovery limits for target analytes in MS/MSD QC samples are advisory only.


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 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 11:52

Metals and Metallic Compounds (dissolved) - Quality Control
Batch BJB0653 - TWM EPA 7470A

Instrument: HYDRA Analyst: BLC

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0653-BLK1)						Prepared: 23-Feb-2021 Analyzed: 25-Feb-2021 11:53					
Mercury, Dissolved	ND	0.000013	0.000100	mg/L							U
LCS (BJB0653-BS1)						Prepared: 23-Feb-2021 Analyzed: 25-Feb-2021 12:00					
Mercury, Dissolved	0.00218	0.000013	0.000100	mg/L	0.00200		109	80-120			
Duplicate (BJB0653-DUP1)						Source: 21B0174-02 Prepared: 23-Feb-2021 Analyzed: 25-Feb-2021 12:04					
Mercury, Dissolved	ND	0.000013	0.000100	mg/L		ND					U
Matrix Spike (BJB0653-MS1)						Source: 21B0174-02 Prepared: 23-Feb-2021 Analyzed: 25-Feb-2021 12:07					
Mercury, Dissolved	0.00106	0.000013	0.000100	mg/L	0.00100	ND	106	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike Dup (BJB0653-MSD1)						Source: 21B0174-02 Prepared: 23-Feb-2021 Analyzed: 25-Feb-2021 12:09					
Mercury, Dissolved	0.00109	0.000013	0.000100	mg/L	0.00100	ND	109	75-125	2.47	20	
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											


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 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
 04-Aug-2021 11:52

Metals and Metallic Compounds (dissolved) - Quality Control
Batch BJB0662 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0662-BLK1)						Prepared: 23-Feb-2021 Analyzed: 23-Feb-2021 20:36						
Barium, Dissolved	135	ND	0.0560	0.500	ug/L							U
Barium, Dissolved	137	ND	0.0530	0.500	ug/L							U
Chromium, Dissolved	52	0.148	0.130	0.500	ug/L							J
Chromium, Dissolved	53	0.141	0.0700	0.500	ug/L							J
Cobalt, Dissolved	59	ND	0.0290	0.200	ug/L							U
Iron, Dissolved	54	9.56	6.27	20.0	ug/L							J
Iron, Dissolved	57	ND	1.40	20.0	ug/L							U
Lead, Dissolved	208	ND	0.0680	0.100	ug/L							U
Manganese, Dissolved	55	ND	0.0850	0.500	ug/L							U
Silver, Dissolved	107	ND	0.0170	0.200	ug/L							U
Vanadium, Dissolved	51a	ND	0.0400	0.200	ug/L							U
Vanadium, Dissolved	51b	ND	0.0160	0.200	ug/L							U
Arsenic, Dissolved	75a	ND	0.0220	0.200	ug/L							U
Cadmium, Dissolved	111	ND	0.0300	0.100	ug/L							U
Cadmium, Dissolved	114	ND	0.0400	0.100	ug/L							U
Copper, Dissolved	63	ND	0.340	0.500	ug/L							U
Copper, Dissolved	65	ND	0.350	0.500	ug/L							U
Nickel, Dissolved	60	ND	0.0500	0.500	ug/L							U
Nickel, Dissolved	62	ND	0.220	0.500	ug/L							U
Selenium, Dissolved	78	ND	0.440	0.500	ug/L							U
Zinc, Dissolved	66	1.15	0.820	4.00	ug/L							J
Zinc, Dissolved	67	0.997	0.940	4.00	ug/L							J

LCS (BJB0662-BS1)

Prepared: 23-Feb-2021 Analyzed: 23-Feb-2021 20:41

Barium, Dissolved	135	25.8	0.0560	0.500	ug/L	25.0	103	80-120
Barium, Dissolved	137	26.1	0.0530	0.500	ug/L	25.0	104	80-120
Chromium, Dissolved	52	25.3	0.130	0.500	ug/L	25.0	101	80-120
Cobalt, Dissolved	59	25.7	0.0290	0.200	ug/L	25.0	103	80-120
Chromium, Dissolved	53	25.1	0.0700	0.500	ug/L	25.0	100	80-120
Iron, Dissolved	54	5000	6.27	20.0	ug/L	5000	100	80-120
Iron, Dissolved	57	5100	1.40	20.0	ug/L	5000	102	80-120
Lead, Dissolved	208	26.0	0.0680	0.100	ug/L	25.0	104	80-120
Manganese, Dissolved	55	25.7	0.0850	0.500	ug/L	25.0	103	80-120
Silver, Dissolved	107	25.9	0.0170	0.200	ug/L	25.0	104	80-120
Vanadium, Dissolved	51a	25.5	0.0400	0.200	ug/L	25.0	102	80-120


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Reported:
 04-Aug-2021 11:52

Metals and Metallic Compounds (dissolved) - Quality Control
Batch BJB0662 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJB0662-BS1)						Prepared: 23-Feb-2021 Analyzed: 23-Feb-2021 20:41						
Vanadium, Dissolved	51b	25.5	0.0160	0.200	ug/L	25.0		102	80-120			
Arsenic, Dissolved	75a	24.8	0.0220	0.200	ug/L	25.0		99.2	80-120			
Cadmium, Dissolved	111	25.1	0.0300	0.100	ug/L	25.0		100	80-120			
Cadmium, Dissolved	114	25.1	0.0400	0.100	ug/L	25.0		101	80-120			
Copper, Dissolved	63	25.1	0.340	0.500	ug/L	25.0		100	80-120			
Copper, Dissolved	65	24.9	0.350	0.500	ug/L	25.0		99.7	80-120			
Nickel, Dissolved	60	25.1	0.0500	0.500	ug/L	25.0		100	80-120			
Nickel, Dissolved	62	25.2	0.220	0.500	ug/L	25.0		101	80-120			
Selenium, Dissolved	78	74.8	0.440	0.500	ug/L	80.0		93.5	80-120			
Zinc, Dissolved	66	76.4	0.820	4.00	ug/L	80.0		95.5	80-120			
Zinc, Dissolved	67	73.7	0.940	4.00	ug/L	80.0		92.1	80-120			
Duplicate (BJB0662-DUP1)						Source: 21B0174-12 Prepared: 23-Feb-2021 Analyzed: 23-Feb-2021 21:06						
Barium, Dissolved	135	10.3	0.0560	0.500	ug/L		10.5			1.18	20	
Chromium, Dissolved	52	0.454	0.130	0.500	ug/L		0.541			17.50	20	J
Cobalt, Dissolved	59	0.403	0.0290	0.200	ug/L		0.417			3.41	20	
Iron, Dissolved	54	17000	6.27	20.0	ug/L		17100			0.34	20	
Lead, Dissolved	208	ND	0.0680	0.100	ug/L		ND					U
Silver, Dissolved	107	ND	0.0170	0.200	ug/L		ND					U
Vanadium, Dissolved	51a	0.693	0.0400	0.200	ug/L		0.668			3.67	20	
Arsenic, Dissolved	75a	0.917	0.0220	0.200	ug/L		0.887			3.33	20	
Cadmium, Dissolved	111	ND	0.0300	0.100	ug/L		ND					U
Copper, Dissolved	63	ND	0.340	0.500	ug/L		ND					U
Nickel, Dissolved	60	0.453	0.0500	0.500	ug/L		0.418			8.04	20	J
Selenium, Dissolved	78	ND	0.440	0.500	ug/L		ND					U
Zinc, Dissolved	66	3.10	0.820	4.00	ug/L		3.08			0.94	20	J
Duplicate (BJB0662-DUP2)						Source: 21B0174-12 Prepared: 23-Feb-2021 Analyzed: 24-Feb-2021 19:15						
Manganese, Dissolved	55	2270	1.70	10.0	ug/L		2270			0.36	20	D
Matrix Spike (BJB0662-MS1)						Source: 21B0174-12 Prepared: 23-Feb-2021 Analyzed: 23-Feb-2021 21:11						
Barium, Dissolved	135	36.4	0.0560	0.500	ug/L	25.0	10.5	104	75-125			
Chromium, Dissolved	52	22.3	0.130	0.500	ug/L	25.0	0.541	87.1	75-125			
Cobalt, Dissolved	59	26.0	0.0290	0.200	ug/L	25.0	0.417	102	75-125			
Iron, Dissolved	54	21000	6.27	20.0	ug/L	5000	17100	78.0	75-125			
Lead, Dissolved	208	24.9	0.0680	0.100	ug/L	25.0	ND	99.5	75-125			

Analytical Resources, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.


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 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish
 Project Number: Lower Duwamish
 Project Manager: Meg Strong

Reported:
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Metals and Metallic Compounds (dissolved) - Quality Control
Batch BJB0662 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BJB0662-MS1)		Source: 21B0174-12			Prepared: 23-Feb-2021		Analyzed: 23-Feb-2021 21:11					
Silver, Dissolved	107	25.1	0.0170	0.200	ug/L	25.0	ND	100	75-125			
Vanadium, Dissolved	51a	22.9	0.0400	0.200	ug/L	25.0	0.668	88.8	75-125			
Arsenic, Dissolved	75a	25.7	0.0220	0.200	ug/L	25.0	0.887	99.4	75-125			
Cadmium, Dissolved	111	23.3	0.0300	0.100	ug/L	25.0	ND	93.1	75-125			
Copper, Dissolved	63	23.9	0.340	0.500	ug/L	25.0	ND	95.7	75-125			
Nickel, Dissolved	60	24.8	0.0500	0.500	ug/L	25.0	0.418	97.7	75-125			
Selenium, Dissolved	78	75.7	0.440	0.500	ug/L	80.0	ND	94.6	75-125			
Zinc, Dissolved	66	75.8	0.820	4.00	ug/L	80.0	3.08	90.9	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike (BJB0662-MS2)		Source: 21B0174-12			Prepared: 23-Feb-2021		Analyzed: 24-Feb-2021 19:20					
Manganese, Dissolved	55	2280	1.70	10.0	ug/L	25.0	2270	71.5	75-125			HC, D

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike Dup (BJB0662-MSD1)		Source: 21B0174-12			Prepared: 23-Feb-2021		Analyzed: 23-Feb-2021 21:17					
Barium, Dissolved	135	35.8	0.0560	0.500	ug/L	25.0	10.5	102	75-125	1.53	20	
Chromium, Dissolved	52	22.0	0.130	0.500	ug/L	25.0	0.541	85.8	75-125	1.46	20	
Cobalt, Dissolved	59	26.0	0.0290	0.200	ug/L	25.0	0.417	102	75-125	0.03	20	
Iron, Dissolved	54	21300	6.27	20.0	ug/L	5000	17100	84.1	75-125	1.44	20	
Lead, Dissolved	208	24.9	0.0680	0.100	ug/L	25.0	ND	99.6	75-125	0.11	20	
Silver, Dissolved	107	25.3	0.0170	0.200	ug/L	25.0	ND	101	75-125	0.89	20	
Vanadium, Dissolved	51a	22.7	0.0400	0.200	ug/L	25.0	0.668	88.2	75-125	0.73	20	
Arsenic, Dissolved	75a	26.2	0.0220	0.200	ug/L	25.0	0.887	101	75-125	1.61	20	
Cadmium, Dissolved	111	24.0	0.0300	0.100	ug/L	25.0	ND	96.0	75-125	3.05	20	
Copper, Dissolved	63	23.7	0.340	0.500	ug/L	25.0	ND	94.8	75-125	0.94	20	
Nickel, Dissolved	60	25.1	0.0500	0.500	ug/L	25.0	0.418	98.8	75-125	1.05	20	
Selenium, Dissolved	78	76.2	0.440	0.500	ug/L	80.0	ND	95.3	75-125	0.73	20	
Zinc, Dissolved	66	73.6	0.820	4.00	ug/L	80.0	3.08	88.2	75-125	2.85	20	

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike Dup (BJB0662-MSD2)		Source: 21B0174-12			Prepared: 23-Feb-2021		Analyzed: 24-Feb-2021 19:27					
Manganese, Dissolved	55	2300	1.70	10.0	ug/L	25.0	2270	148	75-125	0.84	20	HC, D

Recovery limits for target analytes in MS/MSD QC samples are advisory only.


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 Project Manager: Meg Strong

Reported:
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Wet Chemistry - Quality Control
Batch BJB0396 - No Prep Wet Chem

Instrument: UV1800-2 Analyst: BF

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJB0396-BLK1)					Prepared: 11-Feb-2021 Analyzed: 11-Feb-2021 18:15						
Hexavalent Chromium	ND	0.013	0.013	mg/L							U
LCS (BJB0396-BS1)					Prepared: 11-Feb-2021 Analyzed: 11-Feb-2021 18:15						
Hexavalent Chromium	0.607	0.013	0.013	mg/L	0.625		97.1	85-115			D
Duplicate (BJB0396-DUP1)					Source: 21B0174-01 Prepared: 11-Feb-2021 Analyzed: 11-Feb-2021 18:16						
Hexavalent Chromium	ND	0.013	0.013	mg/L		ND					U
Matrix Spike (BJB0396-MS1)					Source: 21B0174-01 Prepared: 11-Feb-2021 Analyzed: 11-Feb-2021 18:16						
Hexavalent Chromium	ND	0.013	0.013	mg/L	0.0625	ND		85-115			*, K, U
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Post Spike (BJB0396-PS1)					Source: 21B0174-01 Prepared: 11-Feb-2021 Analyzed: 11-Feb-2021 18:24						
Hexavalent Chromium	0.011			mg/L	0.0300	ND	28.2	85-115			*



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Project: Lower Duwamish
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Certified Analyses included in this Report

Analyte	Certifications
EPA 6020B in Water	
Silver-107	WADOE,WA-DW,DoD-ELAP,NELAP
Barium-135	NELAP,WADOE,DoD-ELAP,ADEC
Barium-137	NELAP,WADOE,DoD-ELAP,ADEC
Cobalt-59	DoD-ELAP,NELAP,WADOE
Chromium-52	NELAP,WADOE,DoD-ELAP,ADEC
Chromium-53	NELAP,WADOE,DoD-ELAP,ADEC
Iron-54	NELAP,WADOE,DoD-ELAP
Iron-57	NELAP,WADOE,DoD-ELAP
Manganese-55	NELAP,WADOE,DoD-ELAP
Lead-208	NELAP,WADOE,DoD-ELAP,ADEC
Vanadium-51a	NELAP,DoD-ELAP,WADOE,ADEC
Vanadium-51b	NELAP,DoD-ELAP,WADOE,ADEC
Silver-107	WA-DW,DoD-ELAP,NELAP
Barium-135	NELAP,WADOE,DoD-ELAP,ADEC
Barium-137	NELAP,WADOE,DoD-ELAP,ADEC
Cobalt-59	NELAP,DoD-ELAP,WADOE
Chromium-52	NELAP,WADOE,DoD-ELAP,ADEC
Chromium-53	NELAP,WADOE,DoD-ELAP,ADEC
Iron-54	NELAP,WADOE,DoD-ELAP
Iron-57	NELAP,WADOE,DoD-ELAP
Manganese-55	NELAP,WADOE,DoD-ELAP
Lead-208	NELAP,WADOE,DoD-ELAP,ADEC
Vanadium-51a	NELAP,DoD-ELAP,WADOE,ADEC
Vanadium-51b	NELAP,DoD-ELAP,WADOE,ADEC
EPA 6020B UCT-KED in Water	
Arsenic-75a	WADOE,WA-DW,DoD-ELAP,ADEC,NELAP
Cadmium-111	NELAP,WADOE,DoD-ELAP,ADEC
Cadmium-114	NELAP,WADOE,DoD-ELAP,ADEC
Copper-63	NELAP,WADOE,DoD-ELAP
Copper-65	NELAP,WADOE,DoD-ELAP
Nickel-60	NELAP,WADOE,DoD-ELAP,ADEC
Nickel-62	NELAP,WADOE,DoD-ELAP,ADEC
Selenium-78	NELAP,WADOE,DoD-ELAP
Zinc-66	WADOE,WA-DW,DoD-ELAP
Zinc-67	WADOE,WA-DW,DoD-ELAP



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Arsenic-75a	NELAP,WADOE,DoD-ELAP,ADEC
Cadmium-111	NELAP,WADOE,DoD-ELAP,ADEC
Cadmium-114	NELAP,WADOE,DoD-ELAP,ADEC
Copper-63	NELAP,WADOE,DoD-ELAP
Copper-65	NELAP,WADOE,DoD-ELAP
Nickel-60	NELAP,WADOE,DoD-ELAP,ADEC
Nickel-62	NELAP,WADOE,DoD-ELAP,ADEC
Selenium-78	NELAP,WADOE,DoD-ELAP
Zinc-66	NELAP,WADOE,DoD-ELAP
Zinc-67	NELAP,WADOE,DoD-ELAP

EPA 7470A in Water

Mercury	WADOE,NELAP,DoD-ELAP
Mercury	WADOE,NELAP,DoD-ELAP

EPA 8082A in Water

Aroclor 1016	ADEC,DoD-ELAP,NELAP,WADOE
Aroclor-1016 (1)	ADEC
Aroclor-1016 (2)	ADEC
Aroclor-1016 (3)	ADEC
Aroclor-1016 (4)	ADEC
Aroclor 1016 [2C]	ADEC,DoD-ELAP,NELAP,WADOE
Aroclor-1016 (1) [2C]	ADEC
Aroclor-1016 (2) [2C]	ADEC
Aroclor-1016 (3) [2C]	ADEC
Aroclor-1016 (4) [2C]	ADEC
Aroclor 1221	ADEC,DoD-ELAP,NELAP,WADOE
Aroclor-1221 (1)	ADEC
Aroclor-1221 (2)	ADEC
Aroclor-1221 (3)	ADEC
Aroclor 1221 [2C]	ADEC,DoD-ELAP,NELAP,WADOE
Aroclor-1221 (1) [2C]	ADEC
Aroclor-1221 (2) [2C]	ADEC
Aroclor-1221 (3) [2C]	ADEC
Aroclor-1221 (4) [2C]	ADEC
Aroclor 1232	ADEC,DoD-ELAP,NELAP,WADOE
Aroclor-1232 (1)	ADEC
Aroclor-1232 (2)	ADEC
Aroclor-1232 (3)	ADEC
Aroclor-1232 (4)	ADEC
Aroclor 1232 [2C]	ADEC,DoD-ELAP,NELAP,WADOE



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Aroclor-1232 (1) [2C]	ADEC
Aroclor-1232 (2) [2C]	ADEC
Aroclor-1232 (3) [2C]	ADEC
Aroclor-1232 (4) [2C]	ADEC
Aroclor 1242	ADEC, DoD-ELAP, NELAP, WADOE
Aroclor-1242 (1)	ADEC
Aroclor-1242 (2)	ADEC
Aroclor-1242 (3)	ADEC
Aroclor-1242 (4)	ADEC
Aroclor 1242 [2C]	ADEC, DoD-ELAP, NELAP, WADOE
Aroclor-1242 (1) [2C]	ADEC
Aroclor-1242 (2) [2C]	ADEC
Aroclor-1242 (3) [2C]	ADEC
Aroclor-1242 (4) [2C]	ADEC
Aroclor 1248	ADEC, DoD-ELAP, NELAP, WADOE
Aroclor-1248 (1)	ADEC
Aroclor-1248 (2)	ADEC
Aroclor-1248 (3)	ADEC
Aroclor-1248 (4)	ADEC
Aroclor 1248 [2C]	ADEC, DoD-ELAP, NELAP, WADOE
Aroclor-1248 (1) [2C]	ADEC
Aroclor-1248 (2) [2C]	ADEC
Aroclor-1248 (3) [2C]	ADEC
Aroclor-1248 (4) [2C]	ADEC
Aroclor 1254	ADEC, DoD-ELAP, NELAP, WADOE
Aroclor-1254 (1)	ADEC
Aroclor-1254 (2)	ADEC
Aroclor-1254 (3)	ADEC
Aroclor-1254 (4)	ADEC
Aroclor-1254 (5)	ADEC
Aroclor 1254 [2C]	ADEC, DoD-ELAP, NELAP, WADOE
Aroclor-1254 (1) [2C]	ADEC
Aroclor-1254 (2) [2C]	ADEC
Aroclor-1254 (3) [2C]	ADEC
Aroclor-1254 (4) [2C]	ADEC
Aroclor-1254 (5) [2C]	ADEC
Aroclor 1260	ADEC, DoD-ELAP, NELAP, WADOE
Aroclor-1260 (1)	ADEC
Aroclor-1260 (2)	ADEC



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Aroclor-1260 (3)	ADEC
Aroclor-1260 (4)	ADEC
Aroclor-1260 (5)	ADEC
Aroclor 1260 [2C]	ADEC,DoD-ELAP,NELAP,WADOE
Aroclor-1260 (1) [2C]	ADEC
Aroclor-1260 (2) [2C]	ADEC
Aroclor-1260 (3) [2C]	ADEC
Aroclor-1260 (4) [2C]	ADEC
Aroclor 1262	ADEC,DoD-ELAP,NELAP,WADOE
Aroclor-1262 (1)	ADEC
Aroclor-1262 (2)	ADEC
Aroclor-1262 (3)	ADEC
Aroclor-1262 (4)	ADEC
Aroclor-1262 (5)	ADEC
Aroclor 1262 [2C]	ADEC,DoD-ELAP,NELAP,WADOE
Aroclor-1262 (1) [2C]	ADEC
Aroclor-1262 (2) [2C]	ADEC
Aroclor-1262 (3) [2C]	ADEC
Aroclor-1262 (4) [2C]	ADEC
Aroclor-1262 (5) [2C]	ADEC
Aroclor 1268	ADEC,DoD-ELAP,NELAP,WADOE
Aroclor-1268 (1)	ADEC
Aroclor-1268 (2)	ADEC
Aroclor-1268 (3)	ADEC
Aroclor-1268 (4)	ADEC
Aroclor 1268 [2C]	ADEC,DoD-ELAP,NELAP,WADOE
Aroclor-1268 (1) [2C]	ADEC
Aroclor-1268 (2) [2C]	ADEC
Aroclor-1268 (3) [2C]	ADEC
Aroclor-1268 (4) [2C]	ADEC

EPA 8260D in Water

Chloromethane	DoD-ELAP,ADEC,NELAP,WADOE
Vinyl Chloride	DoD-ELAP,ADEC,NELAP,WADOE
Bromomethane	DoD-ELAP,ADEC,NELAP,WADOE
Chloroethane	DoD-ELAP,ADEC,NELAP,WADOE
Trichlorofluoromethane	DoD-ELAP,ADEC,NELAP,WADOE
Acrolein	DoD-ELAP,NELAP,WADOE
1,1,2-Trichloro-1,2,2-Trifluoroethane	DoD-ELAP,ADEC,NELAP,WADOE
Acetone	DoD-ELAP,ADEC,NELAP,WADOE



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1,1-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Iodomethane	DoD-ELAP,NELAP,WADOE
Methylene Chloride	DoD-ELAP,ADEC,NELAP,WADOE
Acrylonitrile	DoD-ELAP,NELAP,WADOE
Carbon Disulfide	DoD-ELAP,NELAP,WADOE
trans-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Vinyl Acetate	DoD-ELAP,NELAP,WADOE
1,1-Dichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
2-Butanone	DoD-ELAP,NELAP,WADOE
2,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
cis-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Chloroform	DoD-ELAP,ADEC,NELAP,WADOE
Bromochloromethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1,1-Trichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
Carbon tetrachloride	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
Benzene	DoD-ELAP,ADEC,NELAP,WADOE
Trichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
Bromodichloromethane	DoD-ELAP,ADEC,NELAP,WADOE
Dibromomethane	DoD-ELAP,ADEC,NELAP,WADOE
2-Chloroethyl vinyl ether	DoD-ELAP,ADEC,NELAP,WADOE
4-Methyl-2-Pentanone	DoD-ELAP,NELAP,WADOE
cis-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
Toluene	DoD-ELAP,ADEC,NELAP,WADOE
trans-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
2-Hexanone	DoD-ELAP,NELAP,WADOE
1,1,2-Trichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,3-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
Tetrachloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Dibromochloromethane	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dibromoethane	DoD-ELAP,NELAP,WADOE
Chlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Ethylbenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,1,1,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,WADOE
m,p-Xylene	DoD-ELAP,ADEC,NELAP,WADOE
o-Xylene	DoD-ELAP,ADEC,NELAP,WADOE
Styrene	DoD-ELAP,NELAP,WADOE



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Bromoform	DoD-ELAP,NELAP,WADOE
1,1,2,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,2,3-Trichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
trans-1,4-Dichloro 2-Butene	DoD-ELAP,ADEC,NELAP,WADOE
n-Propylbenzene	DoD-ELAP,NELAP,WADOE
Bromobenzene	DoD-ELAP,NELAP,WADOE
Isopropyl Benzene	DoD-ELAP,NELAP,WADOE
2-Chlorotoluene	DoD-ELAP,ADEC,NELAP,WADOE
4-Chlorotoluene	DoD-ELAP,ADEC,NELAP,WADOE
t-Butylbenzene	DoD-ELAP,NELAP,WADOE
1,3,5-Trimethylbenzene	DoD-ELAP,NELAP,WADOE
1,2,4-Trimethylbenzene	DoD-ELAP,NELAP,WADOE
s-Butylbenzene	DoD-ELAP,NELAP,WADOE
4-Isopropyl Toluene	DoD-ELAP,NELAP,WADOE
1,3-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,4-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
n-Butylbenzene	DoD-ELAP,NELAP,WADOE
1,2-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dibromo-3-chloropropane	DoD-ELAP,ADEC,NELAP,WADOE
1,2,4-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Hexachloro-1,3-Butadiene	DoD-ELAP,ADEC,NELAP,WADOE
Naphthalene	DoD-ELAP,ADEC,NELAP,WADOE
1,2,3-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Dichlorodifluoromethane	DoD-ELAP,ADEC,NELAP,WADOE
Methyl tert-butyl Ether	DoD-ELAP,ADEC,NELAP,WADOE
n-Hexane	WADOE
2-Pentanone	WADOE

EPA 8270E in Water

Phenol	NELAP,DoD-ELAP
bis(2-chloroethyl) ether	NELAP,DoD-ELAP
2-Chlorophenol	NELAP,DoD-ELAP
1,3-Dichlorobenzene	NELAP,DoD-ELAP
1,4-Dichlorobenzene	NELAP,DoD-ELAP
1,2-Dichlorobenzene	NELAP,DoD-ELAP
Benzyl Alcohol	NELAP,DoD-ELAP
2,2'-Oxybis(1-chloropropane)	NELAP,DoD-ELAP
2-Methylphenol	NELAP,DoD-ELAP
Hexachloroethane	NELAP,DoD-ELAP
N-Nitroso-di-n-Propylamine	NELAP,DoD-ELAP



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4-Methylphenol	NELAP,DoD-ELAP
Nitrobenzene	NELAP,DoD-ELAP
Isophorone	NELAP,DoD-ELAP
2-Nitrophenol	NELAP,DoD-ELAP
2,4-Dimethylphenol	NELAP,DoD-ELAP
Bis(2-Chloroethoxy)methane	NELAP,DoD-ELAP
2,4-Dichlorophenol	NELAP,DoD-ELAP
1,2,4-Trichlorobenzene	NELAP,DoD-ELAP
Naphthalene	NELAP,DoD-ELAP
Benzoic acid	NELAP,DoD-ELAP
4-Chloroaniline	NELAP,DoD-ELAP
Hexachlorobutadiene	NELAP,DoD-ELAP
4-Chloro-3-Methylphenol	NELAP,DoD-ELAP
2-Methylnaphthalene	NELAP,DoD-ELAP
Hexachlorocyclopentadiene	NELAP,DoD-ELAP
2,4,6-Trichlorophenol	NELAP,DoD-ELAP
2,4,5-Trichlorophenol	NELAP,DoD-ELAP
2-Chloronaphthalene	NELAP,DoD-ELAP
2-Nitroaniline	NELAP,DoD-ELAP
Acenaphthylene	NELAP,DoD-ELAP
Dimethylphthalate	NELAP,DoD-ELAP
2,6-Dinitrotoluene	NELAP,DoD-ELAP
Acenaphthene	NELAP,DoD-ELAP
3-Nitroaniline	NELAP,DoD-ELAP
2,4-Dinitrophenol	NELAP,DoD-ELAP
Dibenzofuran	NELAP,DoD-ELAP
4-Nitrophenol	NELAP,DoD-ELAP
2,4-Dinitrotoluene	NELAP,DoD-ELAP
Fluorene	NELAP,DoD-ELAP
4-Chlorophenylphenyl ether	NELAP,DoD-ELAP
Diethyl phthalate	NELAP,DoD-ELAP
4-Nitroaniline	NELAP,DoD-ELAP
4,6-Dinitro-2-methylphenol	NELAP,DoD-ELAP
N-Nitrosodiphenylamine	NELAP,DoD-ELAP
4-Bromophenyl phenyl ether	NELAP,DoD-ELAP
Hexachlorobenzene	NELAP,DoD-ELAP
Pentachlorophenol	NELAP,DoD-ELAP
Phenanthrene	NELAP,DoD-ELAP
Anthracene	NELAP,DoD-ELAP



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Carbazole	NELAP,DoD-ELAP
Di-n-Butylphthalate	NELAP,DoD-ELAP
Fluoranthene	NELAP,DoD-ELAP
Pyrene	NELAP,DoD-ELAP
Butylbenzylphthalate	NELAP,DoD-ELAP
Benzo(a)anthracene	NELAP,DoD-ELAP
3,3'-Dichlorobenzidine	NELAP,DoD-ELAP
Chrysene	NELAP,DoD-ELAP
bis(2-Ethylhexyl)phthalate	NELAP,DoD-ELAP
Di-n-Octylphthalate	NELAP,DoD-ELAP
Benzo(b)fluoranthene	NELAP,DoD-ELAP
Benzo(k)fluoranthene	NELAP,DoD-ELAP
Benzo(a)fluoranthene, Total	NELAP
Benzo(a)pyrene	NELAP,DoD-ELAP
Indeno(1,2,3-cd)pyrene	NELAP,DoD-ELAP
Dibenzo(a,h)anthracene	NELAP,DoD-ELAP
Benzo(g,h,i)perylene	NELAP,DoD-ELAP
N-Nitrosodimethylamine	NELAP,DoD-ELAP
1-Methylnaphthalene	NELAP,DoD-ELAP

EPA 8270E-SIM in Water

Naphthalene	ADEC,DoD-ELAP,NELAP,WADOE
2-Methylnaphthalene	ADEC,DoD-ELAP,NELAP
1-Methylnaphthalene	ADEC,DoD-ELAP,NELAP,WADOE
Biphenyl	NELAP
Acenaphthylene	ADEC,DoD-ELAP,NELAP,WADOE
Acenaphthene	ADEC,DoD-ELAP,NELAP,WADOE
Dibenzofuran	ADEC,DoD-ELAP,NELAP
Fluorene	ADEC,DoD-ELAP,NELAP,WADOE
Phenanthrene	ADEC,DoD-ELAP,NELAP,WADOE
Anthracene	ADEC,DoD-ELAP,NELAP,WADOE
Carbazole	NELAP
Fluoranthene	ADEC,DoD-ELAP,NELAP,WADOE
Pyrene	ADEC,DoD-ELAP,NELAP,WADOE
Benzo(a)anthracene	ADEC,DoD-ELAP,NELAP,WADOE
Chrysene	ADEC,DoD-ELAP,NELAP,WADOE
Benzo(b)fluoranthene	ADEC,DoD-ELAP,NELAP,WADOE
Benzo(k)fluoranthene	ADEC,DoD-ELAP,NELAP,WADOE
Benzo(j)fluoranthene	ADEC,DoD-ELAP,NELAP,WADOE
Benzo(e)pyrene	NELAP



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Benzo(a)pyrene	ADEC, DoD-ELAP, NELAP, WADOE
Perylene	ADEC, NELAP
Indeno(1,2,3-cd)pyrene	ADEC, DoD-ELAP, NELAP, WADOE
Dibenzo(a,h)anthracene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(g,h,i)perylene	ADEC, DoD-ELAP, NELAP, WADOE

NWTPH-Dx in Water

Diesel Range Organics (C12-C24)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C10-C25)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (Tol-C18)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C10-C24)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C10-C28)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C12-C22)	DoD-ELAP
Diesel Range Organics (C12-C25)	DoD-ELAP
Motor Oil Range Organics (C24-C38)	DoD-ELAP, NELAP, WADOE
Motor Oil Range Organics (C25-C36)	DoD-ELAP, NELAP, WADOE
Motor Oil Range Organics (C24-C40)	DoD-ELAP, NELAP, WADOE
Residual Range Organics (C23-C32)	DoD-ELAP
Mineral Spirits Range Organics (Tol-C12)	DoD-ELAP, NELAP, WADOE
Mineral Oil Range Organics (C16-C28)	DoD-ELAP, NELAP, WADOE
Kerosene Range Organics (Tol-C18)	DoD-ELAP, NELAP, WADOE
JP8 Range Organics (C8-C18)	DoD-ELAP, NELAP, WADOE
JP5 Range Organics (C10-C16)	DoD-ELAP, NELAP, WADOE
JP4 Range Organics (Tol-C14)	DoD-ELAP, NELAP, WADOE
Jet-A Range Organics (C10-C18)	DoD-ELAP, NELAP, WADOE
Creosote Range Organics (C12-C22)	DoD-ELAP, NELAP, WADOE
Bunker C Range Organics (C10-C38)	DoD-ELAP, NELAP, WADOE
Stoddard Range Organics (C8-C12)	DoD-ELAP, NELAP, WADOE
Transformer Oil Range Organics (C12-C28)	DoD-ELAP, NELAP, WADOE

NWTPHg in Water

Gasoline Range Organics (Tol-Nap)	WADOE, DoD-ELAP
Gasoline Range Organics (2MP-TMB)	WADOE, DoD-ELAP
Gasoline Range Organics (Tol-C12)	WADOE, DoD-ELAP
Gasoline Range Organics (C6-C10)	WADOE, ADEC, DoD-ELAP
Gasoline Range Organics (C5-C12)	WADOE, DoD-ELAP

SM 3500-Cr B-09 in Water

Hexavalent Chromium	WADOE, NELAP
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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

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Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2023
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/28/2022
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2022
WADOE	WA Dept of Ecology	C558	06/30/2022
WA-DW	Ecology - Drinking Water	C558	06/30/2022



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Notes and Definitions

*	Flagged value is not within established control limits.
B	This analyte was detected in the method blank.
D	The reported value is from a dilution
D1	Surrogate was not detected due to sample extract dilution
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL)
HC	The natural concentration of the spiked analyte is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
J	Estimated concentration value detected below the reporting limit.
K	Hexavalent Chromium post spike performed on a pH adjusted sample to verify matrix interference.
Q	Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20% RSD, <20% drift or minimum RRF)
U	This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
[2C]	Indicates this result was quantified on the second column on a dual column analysis.

Important Information

About Your Geotechnical/Environmental Report

CONSULTING SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.

Consultants prepare reports to meet the specific needs of specific individuals. A report prepared for a civil engineer may not be adequate for a construction contractor or even another civil engineer. Unless indicated otherwise, your consultant prepared your report expressly for you and expressly for the purposes you indicated. No one other than you should apply this report for its intended purpose without first conferring with the consultant. No party should apply this report for any purpose other than that originally contemplated without first conferring with the consultant.

THE CONSULTANT'S REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

A geotechnical/environmental report is based on a subsurface exploration plan designed to consider a unique set of project-specific factors. Depending on the project, these may include the general nature of the structure and property involved; its size and configuration; its historical use and practice; the location of the structure on the site and its orientation; other improvements such as access roads, parking lots, and underground utilities; and the additional risk created by scope-of-service limitations imposed by the client. To help avoid costly problems, ask the consultant to evaluate how any factors that change subsequent to the date of the report may affect the recommendations. Unless your consultant indicates otherwise, your report should not be used (1) when the nature of the proposed project is changed (for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one, or chemicals are discovered on or near the site); (2) when the size, elevation, or configuration of the proposed project is altered; (3) when the location or orientation of the proposed project is modified; (4) when there is a change of ownership; or (5) for application to an adjacent site. Consultants cannot accept responsibility for problems that may occur if they are not consulted after factors that were considered in the development of the report have changed.

SUBSURFACE CONDITIONS CAN CHANGE.

Subsurface conditions may be affected as a result of natural processes or human activity. Because a geotechnical/environmental report is based on conditions that existed at the time of subsurface exploration, construction decisions should not be based on a report whose adequacy may have been affected by time. Ask the consultant to advise if additional tests are desirable before construction starts; for example, groundwater conditions commonly vary seasonally.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes, or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical/environmental report. The consultant should be kept apprised of any such events and should be consulted to determine if additional tests are necessary.

MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.

Site exploration and testing identifies actual surface and subsurface conditions only at those points where samples are taken. The data were extrapolated by your consultant, who then applied judgment to render an opinion about overall subsurface conditions. The actual interface between materials may be far more gradual or abrupt than your report indicates. Actual conditions in areas not sampled may differ from those predicted in your report. While nothing can be done to prevent such situations, you and your consultant can work together to help reduce their impacts. Retaining

your consultant to observe subsurface construction operations can be particularly beneficial in this respect.

A REPORT'S CONCLUSIONS ARE PRELIMINARY.

The conclusions contained in your consultant's report are preliminary, because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site. Actual subsurface conditions can be discerned only during earthwork; therefore, you should retain your consultant to observe actual conditions and to provide conclusions. Only the consultant who prepared the report is fully familiar with the background information needed to determine whether or not the report's recommendations based on those conclusions are valid and whether or not the contractor is abiding by applicable recommendations. The consultant who developed your report cannot assume responsibility or liability for the adequacy of the report's recommendations if another party is retained to observe construction.

THE CONSULTANT'S REPORT IS SUBJECT TO MISINTERPRETATION.

Costly problems can occur when other design professionals develop their plans based on misinterpretation of a geotechnical/environmental report. To help avoid these problems, the consultant should be retained to work with other project design professionals to explain relevant geotechnical, geological, hydrogeological, and environmental findings, and to review the adequacy of their plans and specifications relative to these issues.

BORING LOGS AND/OR MONITORING WELL DATA SHOULD NOT BE SEPARATED FROM THE REPORT.

Final boring logs developed by the consultant are based upon interpretation of field logs (assembled by site personnel), field test results, and laboratory and/or office evaluation of field samples and data. Only final boring logs and data are customarily included in geotechnical/environmental reports. These final logs should not, under any circumstances, be redrawn for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process.

To reduce the likelihood of boring log or monitoring well misinterpretation, contractors should be given ready access to the complete geotechnical engineering/environmental report prepared or authorized for their use. If access is provided only to the report prepared for you, you should advise contractors of the report's limitations, assuming that a contractor was not one of the specific persons for whom the report was prepared, and that developing construction cost estimates was not one of the specific purposes for which it was prepared. While a contractor may gain important knowledge from a report prepared for another party, the contractor should discuss the report with your consultant and perform the additional or alternative work believed necessary to obtain the data specifically appropriate for construction cost estimating purposes. Some clients hold the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes that aggravate them to a disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY.

Because geotechnical/environmental engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims

being lodged against consultants. To help prevent this problem, 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 the consultant's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

**The preceding paragraphs are based on information
provided by the GBA, Silver Spring, Maryland**