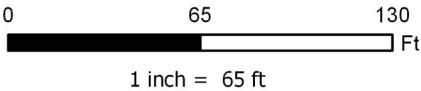




**Legend**

● Origin   ● Soil Sample Location   — Spill Path   ▨ Spill Areas



Project No: 018-065	UP 78-21 Spill Chevron USA, Inc. Rio Blanco County, Colorado SE/4 SE/4 Sec 24 T2S R123W	 <b>ENTRADA</b> CONSULTING GROUP	330 Grand Avenue, Unit C Grand Junction, CO 81501 970-549-1015	Figure
Map By: NDB				1
Date: 4-3-2018				



**Table 1**  
**UP 78-21 Spill**  
**Soil Data Summary**

SAMPLE SUMMARY	
Location Description	UP 78-21 Spill
Sample Type	Soil

LABORATORY DATA SUMMARY							
Sample ID	UP7821-SS1	UP7821-SS2	UP7821-SS3	UP7821-BG1	UP7821-BG2	COGCC TABLE 910-1 CONCENTRATION LEVELS	UNITS
Depth	0-6"	0-6"	0-6"	0-6"	0-6"		
Sample Date	3/21/2018	3/21/2018	3/21/2018	3/21/2018	3/21/2018		
Analytical Parameters							
TPH							
TPH Gasoline Range Organics	93 J	<3.0	<2.7	NT	NT	500	mg/kg
TPH Diesel Range Organics	900	4.0 J	<3.3	NT	NT		
BTEX							
Benzene	<0.0068	<0.0051	<0.0051	NT	NT	0.17	mg/kg
Toluene	<0.011	<0.0082	<0.0082	NT	NT	85	mg/kg
Ethylbenzene	<0.0084	<0.0063	<0.0063	NT	NT	100	mg/kg
Total Xylene	<0.034	<0.026	<0.026	NT	NT	175	mg/kg
Metals							
Arsenic	8.5	6.1	7.5	7.8	6.1	0.39	mg/kg
Barium	170	170	150	170	NT	15,000	mg/kg
Cadmium	0.76 J	0.47 J	0.46 J	0.86	NT	70	mg/kg
Chromium	11	11	10	16	NT	NA	mg/kg
Copper	19	19	19	24	NT	3,100	mg/kg
Lead	14	13	13	18	NT	400	mg/kg
Mercury	0.046	0.028	0.031	0.035	NT	23	mg/kg
Nickel	19	19	18	23	NT	1,600	mg/kg
Selenium	2.2	3.1	2.5	4.1	NT	390	mg/kg
Silver	<0.056	<0.055	<0.048	<0.42	NT	390	mg/kg
Zinc	82	81	79	91	NT	23,000	mg/kg
SAR Metals Analysis							
Calcium	1600	1000	2100	1500	NT	NA	mg/L
Magnesium	80	59	72	59	NT	NA	mg/L
Sodium	3400	2200	760	350	NT	NA	mg/L
Sodium Adsorption Ratio	23	18	4.4	2.4	NT	<12	ratio
Polynuclear Aromatic Hydrocarbons							
Acenaphthene	<0.0034	<0.0035	<0.0034	NT	NT	1,000	mg/kg
Anthracene	0.084	<0.0018	<0.0017	NT	NT	1,000	mg/kg
Benzo(a)anthracene	<0.0030	<0.0030	<0.0029	NT	NT	0.22	mg/kg
Benzo(a)pyrene	<0.0012	<0.0012	<0.0012	NT	NT	0.022	mg/kg
Benzo(b)fluoranthene	<0.0019	<0.0019	<0.0018	NT	NT	0.22	mg/kg
Benzo(k)fluoranthene	<0.0025	<0.0025	<0.0025	NT	NT	2.2	mg/kg
Chrysene	<0.0019	<0.0019	<0.0018	NT	NT	22	mg/kg
Dibenzo(a,h)anthracene	<0.0016	<0.0016	<0.0015	NT	NT	0.022	mg/kg
Fluoranthene	<0.0014	<0.0014	<0.0014	NT	NT	1,000	mg/kg
Fluorene	0.059	<0.0016	<0.0015	NT	NT	1,000	mg/kg
Indeno(1,2,3-cd)pyrene	<0.0015	<0.0015	<0.0015	NT	NT	0.22	mg/kg
Napthalene	<0.0091	<0.0092	<0.0089	NT	NT	23	mg/kg
Pyrene	<0.0018	<0.0018	<0.0017	NT	NT	1,000	mg/kg
General Chemistry							
Chromium, Hexavalent	<0.36	<0.38	<0.35	1.1 J	NT	23	mg/kg
Chromium, Trivalent	11	11	10	15	NT	120,000	mg/kg
Specific Conductivity	27	18	17	13	NT	<4 or 2 x the background	mmhos/cm
pH	7.24	7.91	7.44	7.63	NT	6-9	su

mg/kg - milligrams per kilogram  
mg/L - milligrams per liter  
J - indicates an estimated value  
mmhos/cm - millimhos per centimeter  
mv - millivolts  
su - standard units  
NA - not applicable  
NT - parameter was not tested

Over COGCC Table 910-1 concentration levels but under BACKGROUND level.  
Over COGCC Table 910-1 concentration levels and not within BACKGROUND level.  
Over COGCC Table 910-1 concentration levels



24-Mar-2021

Tim Dobransky  
Olsson Associates  
760 Horizon Drive  
Suite 102  
Grand Junction, CO 81506

Re: **UP 78-21 Spill**

Work Order: **18031460**

Dear Tim,

ALS Environmental received 5 samples on 23-Mar-2018 10:00 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 30.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA  
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

A handwritten signature in black ink, appearing to read "Chad Whelton".

Electronically approved by: Chad Whelton

Chad Whelton  
Project Manager

### Report of Laboratory Analysis

Certificate No: MN 026-999-449

ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

Environmental 

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RIGHT SOLUTIONS RIGHT PARTNER

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**Client:** Olsson Associates  
**Project:** UP 78-21 Spill  
**Work Order:** 18031460

**Work Order Sample Summary**

---

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
18031460-01	UP7821-SS1	Soil		3/21/2018 13:00	3/23/2018 10:00	<input type="checkbox"/>
18031460-02	UP7821-SS2	Soil		3/21/2018 13:10	3/23/2018 10:00	<input type="checkbox"/>
18031460-03	UP7821-SS3	Soil		3/21/2018 13:15	3/23/2018 10:00	<input type="checkbox"/>
18031460-04	UP7821-BG1	Soil		3/21/2018 13:20	3/23/2018 10:00	<input type="checkbox"/>
18031460-05	UP7821-BG2	Soil		3/21/2018 13:30	3/23/2018 10:00	<input type="checkbox"/>

---

**Client:** Olsson Associates**Project:** UP 78-21 Spill**Work Order:** 18031460**Case Narrative**

---

Batch 115891, Method DRLVI\_8015\_S, Sample 18031460-03A: Low DRO surrogate recovery due to sample matrix effects confirmed by re-extraction.

<b><u>Qualifier</u></b>	<b><u>Description</u></b>
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
Hr	BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated.
J	Analyte is present at an estimated concentration between the MDL and Report Limit
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

<b><u>Acronym</u></b>	<b><u>Description</u></b>
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

<b><u>Units Reported</u></b>	<b><u>Description</u></b>
% of sample	Percent of Sample
mg/Kg	Milligrams per Kilogram
mg/Kg-dry	Milligrams per Kilogram Dry Weight
mg/L	Milligrams per Liter
mmhos/cm @25°C	Millimhos-Centimeter at 25 Degrees Celcius
none	
s.u.	Standard Units

# ALS Group, USA

Date: 24-Mar-21

Client: Olsson Associates  
Project: UP 78-21 Spill  
Sample ID: UP7821-SS1  
Collection Date: 3/21/2018 01:00 PM

Work Order: 18031460  
Lab ID: 18031460-01  
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-FID</b>							
			Method: <b>SW8015D</b>		Prep: SW3546 / 3/26/18		Analyst: <b>MEB</b>
<b>DRO (C10-C28)</b>	<b>900</b>		<b>3.3</b>	<b>5.8</b>	<b>mg/Kg-dry</b>	1	3/27/2018 05:00
Surr: 4-Terphenyl-d14	75.1			34-130	%REC	1	3/27/2018 05:00
<b>GASOLINE RANGE ORGANICS BY GC-FID</b>							
			Method: <b>SW8015D</b>		Prep: SW5035 / 3/26/18		Analyst: <b>MEB</b>
<b>GRO (C6-C10)</b>	<b>93</b>	J	<b>69</b>	<b>170</b>	<b>mg/Kg</b>	25	3/27/2018 15:16
Surr: Toluene-d8	89.4			71-123	%REC	25	3/27/2018 15:16
<b>MERCURY BY CVAA</b>							
			Method: <b>SW7471B</b>		Prep: SW7471 / 3/28/18		Analyst: <b>RSB</b>
<b>Mercury</b>	<b>0.046</b>		<b>0.0020</b>	<b>0.020</b>	<b>mg/Kg-dry</b>	1	3/28/2018 17:46
<b>METALS ANALYSIS BY ICP</b>							
			Method: <b>SW6010D</b>		Prep: SW3050B / 3/27/18		Analyst: <b>HBA</b>
<b>Arsenic</b>	<b>8.5</b>		<b>0.12</b>	<b>0.45</b>	<b>mg/Kg-dry</b>	1	3/28/2018 08:14
<b>Barium</b>	<b>170</b>		<b>0.18</b>	<b>0.45</b>	<b>mg/Kg-dry</b>	1	3/28/2018 08:14
<b>Cadmium</b>	<b>0.76</b>	J	<b>0.043</b>	<b>0.90</b>	<b>mg/Kg-dry</b>	1	3/28/2018 08:14
<b>Chromium</b>	<b>11</b>		<b>0.025</b>	<b>0.45</b>	<b>mg/Kg-dry</b>	1	3/29/2018 14:38
<b>Copper</b>	<b>19</b>		<b>0.20</b>	<b>0.90</b>	<b>mg/Kg-dry</b>	1	3/28/2018 08:14
<b>Lead</b>	<b>14</b>		<b>0.095</b>	<b>0.45</b>	<b>mg/Kg-dry</b>	1	3/28/2018 08:14
<b>Nickel</b>	<b>19</b>		<b>0.18</b>	<b>0.45</b>	<b>mg/Kg-dry</b>	1	3/28/2018 08:14
<b>Selenium</b>	<b>2.2</b>		<b>0.25</b>	<b>0.90</b>	<b>mg/Kg-dry</b>	1	3/28/2018 08:14
Silver	U		0.056	0.45	mg/Kg-dry	1	3/28/2018 08:14
<b>Zinc</b>	<b>82</b>		<b>0.072</b>	<b>0.90</b>	<b>mg/Kg-dry</b>	1	3/28/2018 08:14
<b>SOLUBLE CATIONS FOR SAR</b>							
			Method: <b>SW6020B</b>		Prep: USDA Method 20B / 3/28/18		Analyst: <b>RH</b>
<b>Calcium</b>	<b>1,600</b>		<b>0.86</b>	<b>5.0</b>	<b>mg/L</b>	10	3/28/2018 13:50
<b>Magnesium</b>	<b>80</b>		<b>0.068</b>	<b>2.0</b>	<b>mg/L</b>	10	3/28/2018 13:50
<b>Sodium</b>	<b>3,400</b>		<b>3.4</b>	<b>20</b>	<b>mg/L</b>	100	3/28/2018 15:20
<b>SODIUM ADSORPTION RATIO</b>							
			Method: <b>USDA H60 METHOD 2</b>		Prep: USDA Method 20B / 3/28/18		Analyst: <b>RH</b>
<b>Sodium Adsorption Ratio</b>	<b>23</b>		<b>0.010</b>	<b>0.010</b>	<b>none</b>	1	3/28/2018
<b>POLYNUCLEAR AROMATIC HYDROCARBONS (PAHS)</b>							
			Method: <b>SW8270E</b>		Prep: SW3546 / 3/26/18		Analyst: <b>RM</b>
Acenaphthene	U		0.0034	0.048	mg/Kg-dry	1	3/27/2018 13:24
<b>Anthracene</b>	<b>0.084</b>		<b>0.0018</b>	<b>0.048</b>	<b>mg/Kg-dry</b>	1	3/27/2018 13:24
Benzo(a)anthracene	U		0.0030	0.048	mg/Kg-dry	1	3/27/2018 13:24
Benzo(a)pyrene	U		0.0012	0.048	mg/Kg-dry	1	3/27/2018 13:24
Benzo(b)fluoranthene	U		0.0019	0.048	mg/Kg-dry	1	3/27/2018 13:24
Benzo(k)fluoranthene	U		0.0025	0.048	mg/Kg-dry	1	3/27/2018 13:24
Chrysene	U		0.0019	0.048	mg/Kg-dry	1	3/27/2018 13:24
Dibenzo(a,h)anthracene	U		0.0016	0.048	mg/Kg-dry	1	3/27/2018 13:24
Fluoranthene	U		0.0014	0.048	mg/Kg-dry	1	3/27/2018 13:24

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

# ALS Group, USA

Date: 24-Mar-21

**Client:** Olsson Associates  
**Project:** UP 78-21 Spill  
**Sample ID:** UP7821-SS1  
**Collection Date:** 3/21/2018 01:00 PM

**Work Order:** 18031460  
**Lab ID:** 18031460-01  
**Matrix:** SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
<b>Fluorene</b>	<b>0.059</b>		<b>0.0016</b>	<b>0.048</b>	<b>mg/Kg-dry</b>	1	3/27/2018 13:24
Indeno(1,2,3-cd)pyrene	U		0.0015	0.048	mg/Kg-dry	1	3/27/2018 13:24
Naphthalene	U		0.0091	0.048	mg/Kg-dry	1	3/27/2018 13:24
Pyrene	U		0.0018	0.048	mg/Kg-dry	1	3/27/2018 13:24
Surr: 2-Fluorobiphenyl	58.5			20-140	%REC	1	3/27/2018 13:24
Surr: 4-Terphenyl-d14	41.4			22-172	%REC	1	3/27/2018 13:24
Surr: Nitrobenzene-d5	49.0			28-140	%REC	1	3/27/2018 13:24
<b>VOLATILE ORGANIC COMPOUNDS</b>			Method: <b>SW8260C</b>		Prep: SW5035 / 3/26/18		Analyst: <b>AK</b>
Benzene	U		0.0068	0.040	mg/Kg	1	3/29/2018 18:43
Ethylbenzene	U		0.0084	0.040	mg/Kg	1	3/29/2018 18:43
m,p-Xylene	U		0.019	0.080	mg/Kg	1	3/29/2018 18:43
o-Xylene	U		0.015	0.040	mg/Kg	1	3/29/2018 18:43
Toluene	U		0.011	0.040	mg/Kg	1	3/29/2018 18:43
Xylenes, Total	U		0.034	0.12	mg/Kg	1	3/29/2018 18:43
Surr: 1,2-Dichloroethane-d4	93.0			70-130	%REC	1	3/29/2018 18:43
Surr: 4-Bromofluorobenzene	104			70-130	%REC	1	3/29/2018 18:43
Surr: Dibromofluoromethane	85.2			70-130	%REC	1	3/29/2018 18:43
Surr: Toluene-d8	89.6			70-130	%REC	1	3/29/2018 18:43
<b>ELECTRICAL CONDUCTIVITY (SAR)</b>			Method: <b>USDA H60 METHOD 2</b>		Prep: USDA Method 20B / 3/28/18		Analyst: <b>ED</b>
Electrical Conductivity @ Saturation	27		0.011	0.10	mmhos/cm @25°	20	3/28/2018 17:40
<b>CHROMIUM, TRIVALENT</b>			Method: <b>CALCULATION</b>				Analyst: <b>JJG</b>
Chromium, Trivalent	11		0.36	1.2	mg/Kg-dry	1	3/30/2018 08:07
<b>CHROMIUM, HEXAVALENT</b>			Method: <b>SW7196A</b>		Prep: SW3060A / 3/26/18		Analyst: <b>RP</b>
Chromium, Hexavalent	U		0.36	1.2	mg/Kg-dry	1	3/27/2018 13:00
<b>MOISTURE</b>			Method: <b>SW3550C</b>				Analyst: <b>NW</b>
Moisture	14		0.025	0.050	% of sample	1	3/28/2018 15:55
<b>SOIL PH MEASURED IN WATER AT NOTED TEMP.</b>			Method: <b>SW9045D</b>		Prep: SW9045D / 3/27/18		Analyst: <b>RZM</b>
pH	7.24		0.10	0.10	s.u.	1	3/29/2018 11:24

**Note:** See Qualifiers page for a list of qualifiers and their definitions.



# ALS Group, USA

Date: 24-Mar-21

**Client:** Olsson Associates  
**Project:** UP 78-21 Spill  
**Sample ID:** UP7821-SS2  
**Collection Date:** 3/21/2018 01:10 PM

**Work Order:** 18031460  
**Lab ID:** 18031460-02  
**Matrix:** SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-FID</b>							
			Method: <b>SW8015D</b>		Prep: SW3546 / 3/26/18		Analyst: <b>MEB</b>
<b>DRO (C10-C28)</b>	<b>4.0</b>	J	<b>3.4</b>	<b>5.9</b>	<b>mg/Kg-dry</b>	1	3/27/2018 05:29
Surr: 4-Terphenyl-d14	58.6			34-130	%REC	1	3/27/2018 05:29
<b>GASOLINE RANGE ORGANICS BY GC-FID</b>							
			Method: <b>SW8015D</b>		Prep: SW5035 / 3/26/18		Analyst: <b>MEB</b>
<b>GRO (C6-C10)</b>		U	3.0	7.2	mg/Kg	1	3/27/2018 08:39
Surr: Toluene-d8	97.1			71-123	%REC	1	3/27/2018 08:39
<b>MERCURY BY CVAA</b>							
			Method: <b>SW7471B</b>		Prep: SW7471 / 3/28/18		Analyst: <b>RSB</b>
<b>Mercury</b>	<b>0.028</b>		<b>0.0023</b>	<b>0.023</b>	<b>mg/Kg-dry</b>	1	3/28/2018 17:49
<b>METALS ANALYSIS BY ICP</b>							
			Method: <b>SW6010D</b>		Prep: SW3050B / 3/27/18		Analyst: <b>HBA</b>
<b>Arsenic</b>	<b>6.1</b>		<b>0.12</b>	<b>0.44</b>	<b>mg/Kg-dry</b>	1	3/28/2018 08:20
<b>Barium</b>	<b>170</b>		<b>0.18</b>	<b>0.44</b>	<b>mg/Kg-dry</b>	1	3/28/2018 08:20
<b>Cadmium</b>	<b>0.47</b>	J	<b>0.043</b>	<b>0.89</b>	<b>mg/Kg-dry</b>	1	3/28/2018 08:20
<b>Chromium</b>	<b>11</b>		<b>0.025</b>	<b>0.44</b>	<b>mg/Kg-dry</b>	1	3/29/2018 14:44
<b>Copper</b>	<b>19</b>		<b>0.19</b>	<b>0.89</b>	<b>mg/Kg-dry</b>	1	3/28/2018 08:20
<b>Lead</b>	<b>13</b>		<b>0.094</b>	<b>0.44</b>	<b>mg/Kg-dry</b>	1	3/28/2018 08:20
<b>Nickel</b>	<b>19</b>		<b>0.18</b>	<b>0.44</b>	<b>mg/Kg-dry</b>	1	3/28/2018 08:20
<b>Selenium</b>	<b>3.1</b>		<b>0.25</b>	<b>0.89</b>	<b>mg/Kg-dry</b>	1	3/28/2018 08:20
Silver	U		0.055	0.44	mg/Kg-dry	1	3/28/2018 08:20
<b>Zinc</b>	<b>81</b>		<b>0.071</b>	<b>0.89</b>	<b>mg/Kg-dry</b>	1	3/28/2018 08:20
<b>SOLUBLE CATIONS FOR SAR</b>							
			Method: <b>SW6020B</b>		Prep: USDA Method 20B / 3/28/18		Analyst: <b>RH</b>
<b>Calcium</b>	<b>1,000</b>		<b>0.86</b>	<b>5.0</b>	<b>mg/L</b>	10	3/28/2018 13:55
<b>Magnesium</b>	<b>59</b>		<b>0.068</b>	<b>2.0</b>	<b>mg/L</b>	10	3/28/2018 13:55
<b>Sodium</b>	<b>2,200</b>		<b>3.4</b>	<b>20</b>	<b>mg/L</b>	100	3/28/2018 15:25
<b>SODIUM ADSORPTION RATIO</b>							
			Method: <b>USDA H60 METHOD 2</b>		Prep: USDA Method 20B / 3/28/18		Analyst: <b>RH</b>
<b>Sodium Adsorption Ratio</b>	<b>18</b>		<b>0.010</b>	<b>0.010</b>	<b>none</b>	1	3/28/2018
<b>POLYNUCLEAR AROMATIC HYDROCARBONS (PAHS)</b>							
			Method: <b>SW8270E</b>		Prep: SW3546 / 3/26/18		Analyst: <b>RM</b>
Acenaphthene	U		0.0035	0.049	mg/Kg-dry	1	3/27/2018 13:37
Anthracene	U		0.0018	0.049	mg/Kg-dry	1	3/27/2018 13:37
Benzo(a)anthracene	U		0.0030	0.049	mg/Kg-dry	1	3/27/2018 13:37
Benzo(a)pyrene	U		0.0012	0.049	mg/Kg-dry	1	3/27/2018 13:37
Benzo(b)fluoranthene	U		0.0019	0.049	mg/Kg-dry	1	3/27/2018 13:37
Benzo(k)fluoranthene	U		0.0025	0.049	mg/Kg-dry	1	3/27/2018 13:37
Chrysene	U		0.0019	0.049	mg/Kg-dry	1	3/27/2018 13:37
Dibenzo(a,h)anthracene	U		0.0016	0.049	mg/Kg-dry	1	3/27/2018 13:37
Fluoranthene	U		0.0014	0.049	mg/Kg-dry	1	3/27/2018 13:37

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

# ALS Group, USA

Date: 24-Mar-21

**Client:** Olsson Associates  
**Project:** UP 78-21 Spill  
**Sample ID:** UP7821-SS2  
**Collection Date:** 3/21/2018 01:10 PM

**Work Order:** 18031460  
**Lab ID:** 18031460-02  
**Matrix:** SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Fluorene	U		0.0016	0.049	mg/Kg-dry	1	3/27/2018 13:37
Indeno(1,2,3-cd)pyrene	U		0.0015	0.049	mg/Kg-dry	1	3/27/2018 13:37
Naphthalene	U		0.0092	0.049	mg/Kg-dry	1	3/27/2018 13:37
Pyrene	U		0.0018	0.049	mg/Kg-dry	1	3/27/2018 13:37
Surr: 2-Fluorobiphenyl	64.0			20-140	%REC	1	3/27/2018 13:37
Surr: 4-Terphenyl-d14	57.4			22-172	%REC	1	3/27/2018 13:37
Surr: Nitrobenzene-d5	54.9			28-140	%REC	1	3/27/2018 13:37
<b>VOLATILE ORGANIC COMPOUNDS</b>			Method: <b>SW8260C</b>		Prep: SW5035 / 3/26/18		Analyst: <b>AK</b>
Benzene	U		0.0051	0.030	mg/Kg	1	3/28/2018 19:36
Ethylbenzene	U		0.0063	0.030	mg/Kg	1	3/28/2018 19:36
m,p-Xylene	U		0.014	0.060	mg/Kg	1	3/28/2018 19:36
o-Xylene	U		0.012	0.030	mg/Kg	1	3/28/2018 19:36
Toluene	U		0.0082	0.030	mg/Kg	1	3/28/2018 19:36
Xylenes, Total	U		0.026	0.090	mg/Kg	1	3/28/2018 19:36
Surr: 1,2-Dichloroethane-d4	89.6			70-130	%REC	1	3/28/2018 19:36
Surr: 4-Bromofluorobenzene	94.6			70-130	%REC	1	3/28/2018 19:36
Surr: Dibromofluoromethane	81.0			70-130	%REC	1	3/28/2018 19:36
Surr: Toluene-d8	91.2			70-130	%REC	1	3/28/2018 19:36
<b>ELECTRICAL CONDUCTIVITY (SAR)</b>			Method: <b>USDA H60 METHOD 2</b>		Prep: USDA Method 20B / 3/28/18		Analyst: <b>ED</b>
Electrical Conductivity @ Saturation	18		0.011	0.10	mmhos/cm @25°	20	3/28/2018 17:40
<b>CHROMIUM, TRIVALENT</b>			Method: <b>CALCULATION</b>				Analyst: <b>JJG</b>
Chromium, Trivalent	11		0.38	1.2	mg/Kg-dry	1	3/30/2018 08:07
<b>CHROMIUM, HEXAVALENT</b>			Method: <b>SW7196A</b>		Prep: SW3060A / 3/26/18		Analyst: <b>RP</b>
Chromium, Hexavalent	U		0.38	1.2	mg/Kg-dry	1	3/27/2018 13:00
<b>MOISTURE</b>			Method: <b>SW3550C</b>				Analyst: <b>NW</b>
Moisture	18		0.025	0.050	% of sample	1	3/28/2018 16:50
<b>SOIL PH MEASURED IN WATER AT NOTED TEMP.</b>			Method: <b>SW9045D</b>		Prep: SW9045D / 3/27/18		Analyst: <b>RZM</b>
pH	7.91		0.10	0.10	s.u.	1	3/29/2018 11:24

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

# ALS Group, USA

Date: 24-Mar-21

**Client:** Olsson Associates  
**Project:** UP 78-21 Spill  
**Sample ID:** UP7821-SS3  
**Collection Date:** 3/21/2018 01:15 PM

**Work Order:** 18031460  
**Lab ID:** 18031460-03  
**Matrix:** SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-FID</b>							
			Method: <b>SW8015D</b>		Prep: SW3546 / 3/26/18		Analyst: <b>MEB</b>
DRO (C10-C28)	U		3.3	5.7	mg/Kg-dry	1	3/27/2018 05:59
Surr: 4-Terphenyl-d14	32.5	S		34-130	%REC	1	3/27/2018 05:59
<b>GASOLINE RANGE ORGANICS BY GC-FID</b>							
			Method: <b>SW8015D</b>		Prep: SW5035 / 3/26/18		Analyst: <b>MEB</b>
GRO (C6-C10)	U		2.7	6.5	mg/Kg	1	3/27/2018 09:05
Surr: Toluene-d8	96.5			71-123	%REC	1	3/27/2018 09:05
<b>MERCURY BY CVAA</b>							
			Method: <b>SW7471B</b>		Prep: SW7471 / 3/28/18		Analyst: <b>RSB</b>
Mercury	0.031		0.0022	0.022	mg/Kg-dry	1	3/28/2018 17:51
<b>METALS ANALYSIS BY ICP</b>							
			Method: <b>SW6010D</b>		Prep: SW3050B / 3/27/18		Analyst: <b>HBA</b>
Arsenic	7.5		0.10	0.38	mg/Kg-dry	1	3/28/2018 08:26
Barium	150		0.15	0.38	mg/Kg-dry	1	3/28/2018 08:26
Cadmium	0.46	J	0.037	0.77	mg/Kg-dry	1	3/28/2018 08:26
Chromium	10		0.021	0.38	mg/Kg-dry	1	3/29/2018 14:51
Copper	19		0.17	0.77	mg/Kg-dry	1	3/28/2018 08:26
Lead	13		0.081	0.38	mg/Kg-dry	1	3/28/2018 08:26
Nickel	18		0.15	0.38	mg/Kg-dry	1	3/28/2018 08:26
Selenium	2.5		0.21	0.77	mg/Kg-dry	1	3/28/2018 08:26
Silver	U		0.048	0.38	mg/Kg-dry	1	3/28/2018 08:26
Zinc	79		0.061	0.77	mg/Kg-dry	1	3/28/2018 08:26
<b>SOLUBLE CATIONS FOR SAR</b>							
			Method: <b>SW6020B</b>		Prep: USDA Method 20B / 3/28/18		Analyst: <b>RH</b>
Calcium	2,100		8.6	50	mg/L	100	3/28/2018 15:31
Magnesium	72		0.068	2.0	mg/L	10	3/28/2018 14:01
Sodium	760		0.34	2.0	mg/L	10	3/28/2018 14:01
<b>SODIUM ADSORPTION RATIO</b>							
			Method: <b>USDA H60 METHOD 2</b>		Prep: USDA Method 20B / 3/28/18		Analyst: <b>RH</b>
Sodium Adsorption Ratio	4.4		0.010	0.010	none	1	3/28/2018
<b>POLYNUCLEAR AROMATIC HYDROCARBONS (PAHS)</b>							
			Method: <b>SW8270E</b>		Prep: SW3546 / 3/26/18		Analyst: <b>RM</b>
Acenaphthene	U		0.0034	0.048	mg/Kg-dry	1	3/27/2018 13:51
Anthracene	U		0.0017	0.048	mg/Kg-dry	1	3/27/2018 13:51
Benzo(a)anthracene	U		0.0029	0.048	mg/Kg-dry	1	3/27/2018 13:51
Benzo(a)pyrene	U		0.0012	0.048	mg/Kg-dry	1	3/27/2018 13:51
Benzo(b)fluoranthene	U		0.0018	0.048	mg/Kg-dry	1	3/27/2018 13:51
Benzo(k)fluoranthene	U		0.0025	0.048	mg/Kg-dry	1	3/27/2018 13:51
Chrysene	U		0.0018	0.048	mg/Kg-dry	1	3/27/2018 13:51
Dibenzo(a,h)anthracene	U		0.0015	0.048	mg/Kg-dry	1	3/27/2018 13:51
Fluoranthene	U		0.0014	0.048	mg/Kg-dry	1	3/27/2018 13:51

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

# ALS Group, USA

Date: 24-Mar-21

**Client:** Olsson Associates  
**Project:** UP 78-21 Spill  
**Sample ID:** UP7821-SS3  
**Collection Date:** 3/21/2018 01:15 PM

**Work Order:** 18031460  
**Lab ID:** 18031460-03  
**Matrix:** SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Fluorene	U		0.0015	0.048	mg/Kg-dry	1	3/27/2018 13:51
Indeno(1,2,3-cd)pyrene	U		0.0015	0.048	mg/Kg-dry	1	3/27/2018 13:51
Naphthalene	U		0.0089	0.048	mg/Kg-dry	1	3/27/2018 13:51
Pyrene	U		0.0017	0.048	mg/Kg-dry	1	3/27/2018 13:51
Surr: 2-Fluorobiphenyl	57.7			20-140	%REC	1	3/27/2018 13:51
Surr: 4-Terphenyl-d14	36.0			22-172	%REC	1	3/27/2018 13:51
Surr: Nitrobenzene-d5	30.5			28-140	%REC	1	3/27/2018 13:51
<b>VOLATILE ORGANIC COMPOUNDS</b>			Method: <b>SW8260C</b>		Prep: SW5035 / 3/26/18		Analyst: <b>AK</b>
Benzene	U		0.0051	0.030	mg/Kg	1	3/28/2018 20:00
Ethylbenzene	U		0.0063	0.030	mg/Kg	1	3/28/2018 20:00
m,p-Xylene	U		0.014	0.060	mg/Kg	1	3/28/2018 20:00
o-Xylene	U		0.012	0.030	mg/Kg	1	3/28/2018 20:00
Toluene	U		0.0082	0.030	mg/Kg	1	3/28/2018 20:00
Xylenes, Total	U		0.026	0.090	mg/Kg	1	3/28/2018 20:00
Surr: 1,2-Dichloroethane-d4	87.8			70-130	%REC	1	3/28/2018 20:00
Surr: 4-Bromofluorobenzene	95.4			70-130	%REC	1	3/28/2018 20:00
Surr: Dibromofluoromethane	78.6			70-130	%REC	1	3/28/2018 20:00
Surr: Toluene-d8	92.2			70-130	%REC	1	3/28/2018 20:00
<b>ELECTRICAL CONDUCTIVITY (SAR)</b>			Method: <b>USDA H60 METHOD 2</b>		Prep: USDA Method 20B / 3/28/18		Analyst: <b>ED</b>
Electrical Conductivity @ Saturation	17		0.011	0.10	mmhos/cm @25°	20	3/28/2018 17:40
<b>CHROMIUM, TRIVALENT</b>			Method: <b>CALCULATION</b>				Analyst: <b>JJG</b>
Chromium, Trivalent	10		0.36	1.2	mg/Kg-dry	1	3/30/2018 08:07
<b>CHROMIUM, HEXAVALENT</b>			Method: <b>SW7196A</b>		Prep: SW3060A / 3/26/18		Analyst: <b>RP</b>
Chromium, Hexavalent	U		0.35	1.1	mg/Kg-dry	1	3/27/2018 13:00
<b>MOISTURE</b>			Method: <b>SW3550C</b>				Analyst: <b>NW</b>
Moisture	13		0.025	0.050	% of sample	1	3/28/2018 16:50
<b>SOIL PH MEASURED IN WATER AT NOTED TEMP.</b>			Method: <b>SW9045D</b>		Prep: SW9045D / 3/27/18		Analyst: <b>RZM</b>
pH	7.44		0.10	0.10	s.u.	1	3/29/2018 11:24

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

# ALS Group, USA

Date: 24-Mar-21

Client: Olsson Associates  
Project: UP 78-21 Spill  
Sample ID: UP7821-BG1  
Collection Date: 3/21/2018 01:20 PM

Work Order: 18031460  
Lab ID: 18031460-04  
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
<b>MERCURY BY CVAA</b>							
Mercury	0.035		Method: SW7471B 0.0021	0.021	mg/Kg-dry	1	Prep: SW7471 / 3/28/18 Analyst: RSH 3/28/2018 17:54
<b>METALS ANALYSIS BY ICP</b>							
Arsenic	7.8		Method: SW6010D 0.11	0.42	mg/Kg-dry	1	Prep: SW3050B / 3/27/18 Analyst: HBA 3/29/2018 14:57
Barium	170		0.17	0.42	mg/Kg-dry	1	3/29/2018 14:57
Cadmium	0.86		0.041	0.42	mg/Kg-dry	1	3/29/2018 14:57
Chromium	16		0.024	0.42	mg/Kg-dry	1	3/29/2018 14:57
Copper	24		0.19	0.42	mg/Kg-dry	1	3/29/2018 14:57
Lead	18		0.090	0.42	mg/Kg-dry	1	3/29/2018 14:57
Nickel	23		0.17	0.42	mg/Kg-dry	1	3/29/2018 14:57
Selenium	4.1		0.24	0.85	mg/Kg-dry	1	3/29/2018 14:57
Silver	U		0.052	0.42	mg/Kg-dry	1	3/29/2018 14:57
Zinc	91		0.068	0.85	mg/Kg-dry	1	3/29/2018 14:57
<b>SOLUBLE CATIONS FOR SAR</b>							
Calcium	1,500		Method: SW6020B 0.86	5.0	mg/L	10	Prep: USDA Method 20B / 3/28/18 Analyst: RH 3/28/2018 14:06
Magnesium	59		0.068	2.0	mg/L	10	3/28/2018 14:06
Sodium	350		0.34	2.0	mg/L	10	3/28/2018 14:06
<b>SODIUM ADSORPTION RATIO</b>							
Sodium Adsorption Ratio	2.4		Method: USDA H60 METHOD 2 0.010	0.010	none	1	Prep: USDA Method 20B / 3/28/18 Analyst: RH 3/28/2018
<b>ELECTRICAL CONDUCTIVITY (SAR)</b>							
Electrical Conductivity @ Saturation	13		Method: USDA H60 METHOD 2 0.011	0.10	mmhos/cm @25°	20	Prep: USDA Method 20B / 3/28/18 Analyst: ED 3/28/2018 17:40
<b>CHROMIUM, TRIVALENT</b>							
Chromium, Trivalent	15		Method: CALCULATION 0.35	1.1	mg/Kg-dry	1	Analyst: JJG 3/30/2018 08:07
<b>CHROMIUM, HEXAVALENT</b>							
Chromium, Hexavalent	1.1	J	Method: SW7196A 0.35	1.1	mg/Kg-dry	1	Prep: SW3060A / 3/26/18 Analyst: RP 3/27/2018 13:00
<b>MOISTURE</b>							
Moisture	12		Method: SW3550C 0.025	0.050	% of sample	1	Analyst: NW 3/28/2018 16:50
<b>SOIL PH MEASURED IN WATER AT NOTED TEMP.</b>							
pH	7.63		Method: SW9045D 0.10	0.10	s.u.	1	Prep: SW9045D / 3/27/18 Analyst: RZM 3/29/2018 11:24

Note: See Qualifiers page for a list of qualifiers and their definitions.

## ALS Group, USA

Date: 24-Mar-21

**Client:** Olsson Associates  
**Project:** UP 78-21 Spill  
**Sample ID:** UP7821-BG2  
**Collection Date:** 3/21/2018 01:30 PM

**Work Order:** 18031460  
**Lab ID:** 18031460-05  
**Matrix:** SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
<hr/>							
<b>METALS ANALYSIS BY ICP</b>			Method: <b>SW6010D</b>		Prep: SW3050B / 3/27/18		Analyst: <b>HBA</b>
Arsenic	6.1		0.11	0.42	mg/Kg-dry	1	3/29/2018 15:04
<b>MOISTURE</b>			Method: <b>SW3550C</b>				Analyst: <b>NW</b>
Moisture	11		0.025	0.050	% of sample	1	3/28/2018 16:50

**Note:** See Qualifiers page for a list of qualifiers and their definitions.



**Client:** Olsson Associates  
**Work Order:** 18031460  
**Project:** UP 78-21 Spill

# QC BATCH REPORT

Batch ID: **115891** Instrument ID **GC8** Method: **SW8015D**

MBLK				Sample ID: <b>DBLKS1-115891-115891</b>		Units: <b>mg/Kg</b>		Analysis Date: <b>3/29/2018 10:24 AM</b>		
Client ID:		Run ID: <b>GC8_180328B</b>		SeqNo: <b>4956893</b>		Prep Date: <b>3/26/2018</b>		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	U	5.0								
Surr: 4-Terphenyl-d14	3.733	0	3.33	0	112	34-130	0			

LCS				Sample ID: <b>DLCSS1-115891-115891</b>		Units: <b>mg/Kg</b>		Analysis Date: <b>3/29/2018 10:53 AM</b>		
Client ID:		Run ID: <b>GC8_180328B</b>		SeqNo: <b>4956894</b>		Prep Date: <b>3/26/2018</b>		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	309.9	5.0	333	0	93.1	65-122	0			
Surr: 4-Terphenyl-d14	2.567	0	3.33	0	77.1	34-130	0			

MS				Sample ID: <b>18031458-02A MS</b>		Units: <b>mg/Kg</b>		Analysis Date: <b>3/27/2018 03:33 AM</b>		
Client ID:		Run ID: <b>GC8_180326A</b>		SeqNo: <b>4951577</b>		Prep Date: <b>3/26/2018</b>		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	296.8	4.9	325.9	99.53	60.5	65-122	0			S
Surr: 4-Terphenyl-d14	2.055	0	3.259	0	63.1	34-130	0			

MSD				Sample ID: <b>18031458-02A MSD</b>		Units: <b>mg/Kg</b>		Analysis Date: <b>3/27/2018 04:02 AM</b>		
Client ID:		Run ID: <b>GC8_180326A</b>		SeqNo: <b>4951578</b>		Prep Date: <b>3/26/2018</b>		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	256.3	5.0	330	99.53	47.5	65-122	296.8	14.6	30	S
Surr: 4-Terphenyl-d14	1.701	0	3.3	0	51.6	34-130	2.055	18.9	30	

The following samples were analyzed in this batch:

18031460-01A 18031460-02A 18031460-03A

Client: Olsson Associates  
 Work Order: 18031460  
 Project: UP 78-21 Spill

## QC BATCH REPORT

Batch ID: **115938** Instrument ID **GC10** Method: **SW8015D**

<b>MBLK</b>		Sample ID: <b>MBLK-115938-115938</b>				Units: <b>µg/Kg-dry</b>		Analysis Date: <b>3/27/2018 07:22 AM</b>		
Client ID:		Run ID: <b>GC10_180326B</b>				SeqNo: <b>4952639</b>		Prep Date: <b>3/26/2018</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	U	5,000								
<i>Surr: Toluene-d8</i>	4854	0	5000	0	97.1	71-123	0			

<b>LCS</b>		Sample ID: <b>LCS-115938-115938</b>				Units: <b>µg/Kg-dry</b>		Analysis Date: <b>3/27/2018 06:30 AM</b>		
Client ID:		Run ID: <b>GC10_180326B</b>				SeqNo: <b>4952638</b>		Prep Date: <b>3/26/2018</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	436400	5,000	500000	0	87.3	71-123	0			
<i>Surr: Toluene-d8</i>	5218	0	5000	0	104	71-123	0			

<b>MS</b>		Sample ID: <b>18031458-01A MS</b>				Units: <b>µg/Kg-dry</b>		Analysis Date: <b>3/27/2018 08:39 PM</b>		
Client ID:		Run ID: <b>GC10_180327A</b>				SeqNo: <b>4954266</b>		Prep Date: <b>3/26/2018</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	551100	5,000	500000	0	110	71-123	0			
<i>Surr: Toluene-d8</i>	5152	0	5000	0	103	71-123	0			

<b>MSD</b>		Sample ID: <b>18031458-01A MSD</b>				Units: <b>µg/Kg-dry</b>		Analysis Date: <b>3/27/2018 09:05 PM</b>		
Client ID:		Run ID: <b>GC10_180327A</b>				SeqNo: <b>4954267</b>		Prep Date: <b>3/26/2018</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	496700	5,000	500000	0	99.3	71-123	551100	10.4	30	
<i>Surr: Toluene-d8</i>	4695	0	5000	0	93.9	71-123	5152	9.28	30	

The following samples were analyzed in this batch:

18031460-01A	18031460-02A	18031460-03A
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Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Olsson Associates  
Work Order: 18031460  
Project: UP 78-21 Spill

## QC BATCH REPORT

Batch ID: **116067** Instrument ID **HG1** Method: **SW7471B**

<b>MBLK</b>		Sample ID: <b>MBLK-116067-116067</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>3/28/2018 05:23 PM</b>		
Client ID:		Run ID: <b>HG1_180328A</b>				SeqNo: <b>4956554</b>		Prep Date: <b>3/28/2018</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Mercury	0.003167	0.020								J
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<b>LCS</b>		Sample ID: <b>LCS-116067-116067</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>3/28/2018 05:26 PM</b>		
Client ID:		Run ID: <b>HG1_180328A</b>				SeqNo: <b>4956555</b>		Prep Date: <b>3/28/2018</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Mercury	0.165	0.020	0.1665	0	99.1	80-120	0			
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<b>MS</b>		Sample ID: <b>18031458-01AMS</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>3/28/2018 05:31 PM</b>		
Client ID:		Run ID: <b>HG1_180328A</b>				SeqNo: <b>4956557</b>		Prep Date: <b>3/28/2018</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Mercury	0.1627	0.019	0.1586	0.04566	73.8	75-125	0			S
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<b>MSD</b>		Sample ID: <b>18031458-01AMSD</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>3/28/2018 05:33 PM</b>		
Client ID:		Run ID: <b>HG1_180328A</b>				SeqNo: <b>4956558</b>		Prep Date: <b>3/28/2018</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Mercury	0.1934	0.019	0.1571	0.04566	94.1	75-125	0.1627	17.2	35	
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The following samples were analyzed in this batch:

18031460-01A	18031460-02A	18031460-03A
18031460-04A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Olsson Associates  
 Work Order: 18031460  
 Project: UP 78-21 Spill

## QC BATCH REPORT

Batch ID: **115976** Instrument ID **ICP2** Method: **SW6010D**

Sample ID: <b>MBLK-115976-115976</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>3/28/2018 06:08 AM</b>				
Client ID:		Run ID: <b>ICP2_180327B</b>			SeqNo: <b>4953644</b>		Prep Date: <b>3/27/2018</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	U	0.25								
Barium	U	0.25								
Cadmium	U	0.50								
Chromium	U	0.25								
Copper	U	0.50								
Lead	U	0.25								
Nickel	U	0.25								
Selenium	U	0.50								
Silver	0.04125	0.25								J
Zinc	U	0.50								

LCS				Sample ID: LCS-115976-115976				Units: mg/Kg			Analysis Date: 3/28/2018 06:15 AM		
Client ID:			Run ID: ICP2_180327B				SeqNo: 4953645			Prep Date: 3/27/2018		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual			
Arsenic	4.495	0.25	5	0	89.9	80-120	0						
Barium	5.502	0.25	5	0	110	80-120	0						
Cadmium	4.77	0.50	5	0	95.4	80-120	0						
Copper	5.256	0.50	5	0	105	80-120	0						
Lead	4.62	0.25	5	0	92.4	80-120	0						
Nickel	4.995	0.25	5	0	99.9	80-120	0						
Selenium	4.525	0.50	5	0	90.5	80-120	0						
Silver	5.178	0.25	5	0	104	80-120	0						
Zinc	4.743	0.50	5	0	94.9	80-120	0						

LCS				Sample ID: LCS-115976-115976				Units: mg/Kg		Analysis Date: 3/29/2018 12:25 PM		
Client ID:			Run ID: ICP2_180329A			SeqNo: 4957091		Prep Date: 3/27/2018		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual		
Chromium	5.031	0.25	5	0	101	80-120	0					

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Olsson Associates  
 Work Order: 18031460  
 Project: UP 78-21 Spill

## QC BATCH REPORT

Batch ID: **115976** Instrument ID **ICP2** Method: **SW6010D**

MS				Sample ID: <b>18031458-01AMS</b>			Units: <b>mg/Kg</b>		Analysis Date: <b>3/28/2018 07:55 AM</b>	
Client ID:		Run ID: <b>ICP2_180327B</b>			SeqNo: <b>4953661</b>		Prep Date: <b>3/27/2018</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	13.05	0.37	7.429	5.956	95.4	75-125	0			
Barium	480.4	0.37	7.429	497.1	-224	75-125	0			SO
Cadmium	7.04	0.74	7.429	0.1807	92.3	75-125	0			
Copper	31.34	0.74	7.429	20.36	148	75-125	0			S
Lead	38.69	0.37	7.429	28.89	132	75-125	0			S
Nickel	20.91	0.37	7.429	14.63	84.6	75-125	0			
Selenium	8.432	0.74	7.429	1.756	89.9	75-125	0			
Silver	8.263	0.37	7.429	-0.03481	112	75-125	0			
Zinc	149.5	0.74	7.429	141.5	107	75-125	0			O

MS				Sample ID: <b>18031458-01AMS</b>			Units: <b>mg/Kg</b>		Analysis Date: <b>3/29/2018 02:00 PM</b>	
Client ID:		Run ID: <b>ICP2_180329A</b>			SeqNo: <b>4957432</b>		Prep Date: <b>3/27/2018</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium	25.5	0.37	7.429	13.49	162	75-125	0			S

MSD				Sample ID: <b>18031458-01AMSD</b>			Units: <b>mg/Kg</b>		Analysis Date: <b>3/28/2018 08:01 AM</b>	
Client ID:		Run ID: <b>ICP2_180327B</b>			SeqNo: <b>4953662</b>		Prep Date: <b>3/27/2018</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	12.04	0.37	7.429	5.956	81.9	75-125	13.05	8.02	20	
Barium	456.8	0.37	7.429	497.1	-543	75-125	480.4	5.05	20	SO
Cadmium	6.828	0.74	7.429	0.1807	89.5	75-125	7.04	3.07	20	
Copper	27.16	0.74	7.429	20.36	91.6	75-125	31.34	14.3	20	
Lead	37.52	0.37	7.429	28.89	116	75-125	38.69	3.08	20	
Nickel	19.57	0.37	7.429	14.63	66.5	75-125	20.91	6.63	20	S
Selenium	8.218	0.74	7.429	1.756	87	75-125	8.432	2.57	20	
Silver	7.995	0.37	7.429	-0.03481	108	75-125	8.263	3.3	20	
Zinc	131.2	0.74	7.429	141.5	-139	75-125	149.5	13.1	20	SO

MSD				Sample ID: <b>18031458-01AMSD</b>			Units: <b>mg/Kg</b>		Analysis Date: <b>3/29/2018 02:06 PM</b>	
Client ID:		Run ID: <b>ICP2_180329A</b>			SeqNo: <b>4957433</b>		Prep Date: <b>3/27/2018</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium	22.98	0.37	7.429	13.49	128	75-125	25.5	10.4	20	S

The following samples were analyzed in this batch:

18031460-01A	18031460-02A	18031460-03A
18031460-04A	18031460-05A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Olsson Associates  
 Work Order: 18031460  
 Project: UP 78-21 Spill

## QC BATCH REPORT

Batch ID: **116060** Instrument ID **ICPMS2** Method: **SW6020B**

DUP					Sample ID: 18031460-04BDUP		Units: mg/L		Analysis Date: 3/28/2018 02:11 PM		
Client ID: UP7821-BG1			Run ID: ICPMS2_180328A			SeqNo: 4955860		Prep Date: 3/28/2018		DF: 10	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Calcium	1541	5.0	0	0	0	0-0	1521	1.31			
Magnesium	54.8	2.0	0	0	0	0-0	58.75	6.96			
Sodium	315.3	2.0	0	0	0	0-0	346.6	9.46			

The following samples were analyzed in this batch:

18031460-01B 18031460-02B 18031460-03B  
 18031460-04B

Batch ID: **116060** Instrument ID **SAR** Method: **USDA H60 Method**

DUP				Sample ID: 18031460-04BDUP				Units: none		Analysis Date: 3/28/2018		
Client ID: UP7821-BG1			Run ID: SAR_180328A			SeqNo: 4955902		Prep Date: 3/28/2018		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual		
Sodium Adsorption Ratio	2.15	0.010	0	0	0		2.373	9.87	50			

The following samples were analyzed in this batch:

18031460-01B 18031460-02B 18031460-03B  
 18031460-04B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.



Client: Olsson Associates  
 Work Order: 18031460  
 Project: UP 78-21 Spill

## QC BATCH REPORT

Batch ID: **115890** Instrument ID **SVMS6** Method: **SW8270E**

MBLK				Sample ID: SBLKS1-115890-115890				Units: µg/Kg		Analysis Date: 3/27/2018 10:43 AM		
Client ID:			Run ID: SVMS6_180327A			SeqNo: 4954105		Prep Date: 3/26/2018		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual		
Acenaphthene	U	42										
Anthracene	U	42										
Benzo(a)anthracene	U	42										
Benzo(a)pyrene	U	42										
Benzo(b)fluoranthene	U	42										
Benzo(k)fluoranthene	U	42										
Chrysene	U	42										
Dibenzo(a,h)anthracene	U	42										
Fluoranthene	U	42										
Fluorene	U	42										
Indeno(1,2,3-cd)pyrene	U	42										
Naphthalene	U	42										
Pyrene	U	42										
Surr: 2-Fluorobiphenyl	2624	0	3333	0	78.7	20-140		0				
Surr: 4-Terphenyl-d14	3788	0	3333	0	114	22-172		0				
Surr: Nitrobenzene-d5	2477	0	3333	0	74.3	28-140		0				

LCS				Sample ID: SLCSS1-115890-115890			Units: µg/Kg		Analysis Date: 3/27/2018 10:56 AM		
Client ID:		Run ID: SVMS6_180327A			SeqNo: 4954106		Prep Date: 3/26/2018		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Acenaphthene	1082	42	1333	0	81.2	40-140	0				
Anthracene	1129	42	1333	0	84.7	40-140	0				
Benzo(a)anthracene	1107	42	1333	0	83.1	40-140	0				
Benzo(a)pyrene	1285	42	1333	0	96.4	40-140	0				
Benzo(b)fluoranthene	857.6	42	1333	0	64.3	40-140	0				
Benzo(k)fluoranthene	1206	42	1333	0	90.5	40-140	0				
Chrysene	1193	42	1333	0	89.5	40-140	0				
Dibenzo(a,h)anthracene	1313	42	1333	0	98.5	40-140	0				
Fluoranthene	1400	42	1333	0	105	40-140	0				
Fluorene	1119	42	1333	0	83.9	40-140	0				
Indeno(1,2,3-cd)pyrene	1267	42	1333	0	95	40-140	0				
Naphthalene	1274	42	1333	0	95.6	40-140	0				
Pyrene	1129	42	1333	0	84.7	40-140	0				
Surr: 2-Fluorobiphenyl	2720	0	3333	0	81.6	20-140	0				
Surr: 4-Terphenyl-d14	3896	0	3333	0	117	22-172	0				
Surr: Nitrobenzene-d5	3570	0	3333	0	107	28-140	0				

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Olsson Associates  
 Work Order: 18031460  
 Project: UP 78-21 Spill

## QC BATCH REPORT

Batch ID: **115890** Instrument ID **SVMS6** Method: **SW8270E**

MS				Sample ID: <b>18031458-01A MS</b>			Units: <b>µg/Kg</b>		Analysis Date: <b>3/27/2018 11:10 AM</b>	
Client ID:		Run ID: <b>SVMS6_180327A</b>			SeqNo: <b>4954107</b>		Prep Date: <b>3/26/2018</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	350.1	42	1332	0	26.3	40-140	0			S
Anthracene	284.3	42	1332	0	21.3	40-140	0			S
Benzo(a)anthracene	300.4	42	1332	0	22.5	40-140	0			S
Benzo(a)pyrene	327.2	42	1332	0	24.6	40-140	0			S
Benzo(b)fluoranthene	633.8	42	1332	0	47.6	40-140	0			
Benzo(k)fluoranthene	660.9	42	1332	0	49.6	40-140	0			
Chrysene	282.8	42	1332	0	21.2	40-140	0			S
Dibenzo(a,h)anthracene	337.3	42	1332	0	25.3	40-140	0			S
Fluoranthene	384.7	42	1332	0	28.9	40-140	0			S
Fluorene	332.7	42	1332	0	25	40-140	0			S
Indeno(1,2,3-cd)pyrene	366.7	42	1332	0	27.5	40-140	0			S
Naphthalene	376.9	42	1332	0	28.3	40-140	0			S
Pyrene	391.6	42	1332	0	29.4	40-140	0			S
Surr: 2-Fluorobiphenyl	653.9	0	3331	0	19.6	20-140	0			S
Surr: 4-Terphenyl-d14	877.5	0	3331	0	26.3	22-172	0			
Surr: Nitrobenzene-d5	826.3	0	3331	0	24.8	28-140	0			S

MSD				Sample ID: <b>18031458-01A MSD</b>			Units: <b>µg/Kg</b>		Analysis Date: <b>3/27/2018 11:23 AM</b>	
Client ID:		Run ID: <b>SVMS6_180327A</b>			SeqNo: <b>4954108</b>		Prep Date: <b>3/26/2018</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	198	40	1285	0	15.4	40-140	350.1	55.5	30	SR
Anthracene	148.6	40	1285	0	11.6	40-140	284.3	62.7	30	SR
Benzo(a)anthracene	174.8	40	1285	0	13.6	40-140	300.4	52.9	30	SR
Benzo(a)pyrene	158	40	1285	0	12.3	40-140	327.2	69.7	30	SR
Benzo(b)fluoranthene	125.6	40	1285	0	9.77	40-140	633.8	134	30	SR
Benzo(k)fluoranthene	96.45	40	1285	0	7.51	40-140	660.9	149	30	SR
Chrysene	166.2	40	1285	0	12.9	40-140	282.8	51.9	30	SR
Dibenzo(a,h)anthracene	251.3	40	1285	0	19.6	40-140	337.3	29.2	30	S
Fluoranthene	200	40	1285	0	15.6	40-140	384.7	63.2	30	SR
Fluorene	181.9	40	1285	0	14.2	40-140	332.7	58.6	30	SR
Indeno(1,2,3-cd)pyrene	267.7	40	1285	0	20.8	40-140	366.7	31.2	30	SR
Naphthalene	238.9	40	1285	0	18.6	40-140	376.9	44.8	30	SR
Pyrene	201.9	40	1285	0	15.7	40-140	391.6	63.9	30	SR
Surr: 2-Fluorobiphenyl	472.7	0	3212	0	14.7	20-140	653.9	32.2	0	S
Surr: 4-Terphenyl-d14	499.4	0	3212	0	15.5	22-172	877.5	54.9	0	S
Surr: Nitrobenzene-d5	697.9	0	3212	0	21.7	28-140	826.3	16.8	0	S

The following samples were analyzed in this batch:

18031460-01A	18031460-02A	18031460-03A
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Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Olsson Associates  
 Work Order: 18031460  
 Project: UP 78-21 Spill

## QC BATCH REPORT

Batch ID: **115937** Instrument ID **VMS9** Method: **SW8260C**

MBLK Sample ID: <b>MBLK-115937-115937</b>				Units: <b>µg/Kg-dry</b>		Analysis Date: <b>3/27/2018 01:02 AM</b>				
Client ID:		Run ID: <b>VMS9_180326B</b>		SeqNo: <b>4951540</b>		Prep Date: <b>3/26/2018</b>		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	30	0	0	0	0-0	0			
Ethylbenzene	U	30	0	0	0	0-0	0			
m,p-Xylene	U	60	0	0	0	0-0	0			
o-Xylene	U	30	0	0	0	0-0	0			
Toluene	U	30	0	0	0	0-0	0			
Xylenes, Total	U	90	0	0	0	0-0	0			
Surr: 1,2-Dichloroethane-d4	935.5	0	1000	0	93.6	70-130	0			
Surr: 4-Bromofluorobenzene	961	0	1000	0	96.1	70-130	0			
Surr: Dibromofluoromethane	881	0	1000	0	88.1	70-130	0			
Surr: Toluene-d8	927	0	1000	0	92.7	70-130	0			

LCS Sample ID: <b>LCS-115937-115937</b>				Units: <b>µg/Kg-dry</b>		Analysis Date: <b>3/26/2018 11:49 PM</b>				
Client ID:		Run ID: <b>VMS9_180326B</b>		SeqNo: <b>4951537</b>		Prep Date: <b>3/26/2018</b>		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	879.5	30	1000	0	88	75-125	0			
Ethylbenzene	992	30	1000	0	99.2	75-125	0			
m,p-Xylene	2028	60	2000	0	101	80-125	0			
o-Xylene	1022	30	1000	0	102	75-125	0			
Toluene	994.5	30	1000	0	99.4	70-125	0			
Xylenes, Total	3050	90	3000	0	102	75-125	0			
Surr: 1,2-Dichloroethane-d4	910	0	1000	0	91	70-130	0			
Surr: 4-Bromofluorobenzene	1034	0	1000	0	103	70-130	0			
Surr: Dibromofluoromethane	952.5	0	1000	0	95.2	70-130	0			
Surr: Toluene-d8	1006	0	1000	0	101	70-130	0			

MS Sample ID: <b>18031458-01A MS</b>				Units: <b>µg/Kg-dry</b>		Analysis Date: <b>3/27/2018 09:07 AM</b>				
Client ID:		Run ID: <b>VMS9_180326B</b>		SeqNo: <b>4951548</b>		Prep Date: <b>3/26/2018</b>		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	1360	41	1381	0	98.4	75-125	0			
Ethylbenzene	1518	41	1381	0	110	75-125	0			
m,p-Xylene	3137	83	2762	0	114	80-125	0			
o-Xylene	1551	41	1381	0	112	75-125	0			
Toluene	1541	41	1381	0	112	70-125	0			
Xylenes, Total	4688	120	4143	0	113	75-125	0			
Surr: 1,2-Dichloroethane-d4	1226	0	1381	0	88.8	70-130	0			
Surr: 4-Bromofluorobenzene	1424	0	1381	0	103	70-130	0			
Surr: Dibromofluoromethane	1157	0	1381	0	83.8	70-130	0			
Surr: Toluene-d8	1363	0	1381	0	98.7	70-130	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Olsson Associates  
 Work Order: 18031460  
 Project: UP 78-21 Spill

## QC BATCH REPORT

Batch ID: **115937** Instrument ID **VMS9** Method: **SW8260C**

MSD				Sample ID: <b>18031458-01A MSD</b>			Units: <b>µg/Kg-dry</b>		Analysis Date: <b>3/27/2018 09:32 AM</b>	
Client ID:		Run ID: <b>VMS9_180326B</b>			SeqNo: <b>4951550</b>		Prep Date: <b>3/26/2018</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	1353	41	1381	0	98	75-125	1360	0.509	30	
Ethylbenzene	1515	41	1381	0	110	75-125	1518	0.228	30	
m,p-Xylene	3113	83	2762	0	113	80-125	3137	0.773	30	
o-Xylene	1554	41	1381	0	112	75-125	1551	0.178	30	
Toluene	1585	41	1381	0	115	70-125	1541	2.78	30	
Xylenes, Total	4666	120	4143	0	113	75-125	4688	0.458	30	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>1241</i>	<i>0</i>	<i>1381</i>	<i>0</i>	<i>89.9</i>	<i>70-130</i>	<i>1226</i>	<i>1.23</i>	<i>30</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>1450</i>	<i>0</i>	<i>1381</i>	<i>0</i>	<i>105</i>	<i>70-130</i>	<i>1424</i>	<i>1.78</i>	<i>30</i>	
<i>Surr: Dibromofluoromethane</i>	<i>1141</i>	<i>0</i>	<i>1381</i>	<i>0</i>	<i>82.6</i>	<i>70-130</i>	<i>1157</i>	<i>1.38</i>	<i>30</i>	
<i>Surr: Toluene-d8</i>	<i>1443</i>	<i>0</i>	<i>1381</i>	<i>0</i>	<i>104</i>	<i>70-130</i>	<i>1363</i>	<i>5.71</i>	<i>30</i>	

The following samples were analyzed in this batch:

18031460-01A	18031460-02A	18031460-03A
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Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Olsson Associates  
 Work Order: 18031460  
 Project: UP 78-21 Spill

# QC BATCH REPORT

Batch ID: **115932** Instrument ID **WETCHEM** Method: **SW7196A**

<b>MBLK</b>		Sample ID: <b>MBLK-115932-115932</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>3/27/2018 01:00 PM</b>		
Client ID:		Run ID: <b>WETCHEM_180327E</b>		SeqNo: <b>4951725</b>		Prep Date: <b>3/26/2018</b>		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Chromium, Hexavalent U 1.0

<b>LCS</b>		Sample ID: <b>LCS-115932-115932</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>3/27/2018 01:00 PM</b>		
Client ID:		Run ID: <b>WETCHEM_180327E</b>		SeqNo: <b>4951726</b>		Prep Date: <b>3/26/2018</b>		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Chromium, Hexavalent 5.337 0.99 4.95 0 108 80-120 0

<b>MS</b>		Sample ID: <b>18031309-01A MS</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>3/27/2018 01:00 PM</b>		
Client ID:		Run ID: <b>WETCHEM_180327E</b>		SeqNo: <b>4951728</b>		Prep Date: <b>3/26/2018</b>		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Chromium, Hexavalent 4.25 1.0 5 0.198 81 75-125 0

<b>MS</b>		Sample ID: <b>18031309-01A MSI</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>3/27/2018 01:00 PM</b>		
Client ID:		Run ID: <b>WETCHEM_180327E</b>		SeqNo: <b>4951730</b>		Prep Date: <b>3/26/2018</b>		DF: <b>100</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Chromium, Hexavalent 1346 96 1624 0.198 82.9 75-125 0

<b>MS</b>		Sample ID: <b>18031463-02A MS</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>3/27/2018 01:00 PM</b>		
Client ID:		Run ID: <b>WETCHEM_180327E</b>		SeqNo: <b>4951742</b>		Prep Date: <b>3/26/2018</b>		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Chromium, Hexavalent 4 1.0 5 -0.04902 81 75-125 0

<b>MS</b>		Sample ID: <b>18031463-02A MSI</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>3/27/2018 01:00 PM</b>		
Client ID:		Run ID: <b>WETCHEM_180327E</b>		SeqNo: <b>4951744</b>		Prep Date: <b>3/26/2018</b>		DF: <b>100</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Chromium, Hexavalent 1561 99 1672 -0.04902 93.4 75-125 0

<b>MSD</b>		Sample ID: <b>18031309-01A MSD</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>3/27/2018 01:00 PM</b>		
Client ID:		Run ID: <b>WETCHEM_180327E</b>		SeqNo: <b>4951729</b>		Prep Date: <b>3/26/2018</b>		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Chromium, Hexavalent 4.63 1.0 5 0.198 88.6 75-125 4.25 8.56 20

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Olsson Associates  
**Work Order:** 18031460  
**Project:** UP 78-21 Spill

## QC BATCH REPORT

Batch ID: **115932** Instrument ID **WETCHEM** Method: **SW7196A**

MSD				Sample ID: 18031463-02A MSD				Units: mg/Kg		Analysis Date: 3/27/2018 01:00 PM			
Client ID:				Run ID: WETCHEM_180327E				SeqNo: 4951743		Prep Date: 3/26/2018		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual		
Chromium, Hexavalent		3.75	1.0	5	-0.04902	76	75-125	4	6.45	20			

The following samples were analyzed in this batch:

18031460-01A	18031460-02A	18031460-03A
18031460-04A		

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.



Client: Olsson Associates  
 Work Order: 18031460  
 Project: UP 78-21 Spill

## QC BATCH REPORT

Batch ID: **116031** Instrument ID **WETCHEM** Method: **SW9045D**

<b>LCS</b>		Sample ID: <b>LCS-116031-116031</b>				Units: <b>s.u.</b>		Analysis Date: <b>3/29/2018 11:24 AM</b>		
Client ID:		Run ID: <b>WETCHEM_180329G</b>				SeqNo: <b>4956937</b>		Prep Date: <b>3/27/2018</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

pH 3.94 0.10 4 0 98.5 90-110 0

<b>DUP</b>		Sample ID: <b>18031458-01A DUP</b>				Units: <b>s.u.</b>		Analysis Date: <b>3/29/2018 11:24 AM</b>		
Client ID:		Run ID: <b>WETCHEM_180329G</b>				SeqNo: <b>4956940</b>		Prep Date: <b>3/27/2018</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

pH 7.19 0.10 0 0 0 0-0 7.2 0.139 20

<b>DUP</b>		Sample ID: <b>18031463-06A DUP</b>				Units: <b>s.u.</b>		Analysis Date: <b>3/29/2018 11:24 AM</b>		
Client ID:		Run ID: <b>WETCHEM_180329G</b>				SeqNo: <b>4956951</b>		Prep Date: <b>3/27/2018</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

pH 7.85 0.10 0 0 0 0-0 7.88 0.381 20

The following samples were analyzed in this batch:

18031460-01A	18031460-02A	18031460-03A
18031460-04A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Olsson Associates  
**Work Order:** 18031460  
**Project:** UP 78-21 Spill

## QC BATCH REPORT

Batch ID: **116060** Instrument ID **Titration 1** Method: **USDA H60 Method**

<b>DUP</b>		Sample ID: <b>18031460-04BDUP</b>				Units: <b>mmhos/cm @25°</b>		Analysis Date: <b>3/28/2018 05:40 PM</b>		
Client ID: <b>UP7821-BG1</b>		Run ID: <b>TITRATOR 1_180328B</b>		SeqNo: <b>4955787</b>		Prep Date: <b>3/28/2018</b>		DF: <b>20</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Electrical Conductivity @ Saturation	11.9	0.10	0	0	0		12.5	4.9	50	

The following samples were analyzed in this batch:

18031460-01B	18031460-02B	18031460-03B
18031460-04B		

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Olsson Associates  
Work Order: 18031460  
Project: UP 78-21 Spill

## QC BATCH REPORT

Batch ID: **R232696** Instrument ID **MOIST** Method: **SW3550C**

<b>MBLK</b>		Sample ID: <b>WBLKS-R232696</b>				Units: % of sample		Analysis Date: <b>3/28/2018 03:55 PM</b>		
Client ID:		Run ID: <b>MOIST_180328B</b>		SeqNo: <b>4956746</b>		Prep Date:		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture	0.03	0.050								J
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<b>LCS</b>		Sample ID: <b>LCS-R232696</b>				Units: % of sample		Analysis Date: <b>3/28/2018 03:55 PM</b>		
Client ID:		Run ID: <b>MOIST_180328B</b>		SeqNo: <b>4956745</b>		Prep Date:		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture	100	0.050	100	0	100	99.5-100.5	0			
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<b>DUP</b>		Sample ID: <b>18031414-10A DUP</b>				Units: % of sample		Analysis Date: <b>3/28/2018 03:55 PM</b>		
Client ID:		Run ID: <b>MOIST_180328B</b>		SeqNo: <b>4956733</b>		Prep Date:		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture	53.55	0.050	0	0	0	0-0	53.36	0.355	10	
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<b>DUP</b>		Sample ID: <b>18031414-12A DUP</b>				Units: % of sample		Analysis Date: <b>3/28/2018 03:55 PM</b>		
Client ID:		Run ID: <b>MOIST_180328B</b>		SeqNo: <b>4956736</b>		Prep Date:		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture	22.97	0.050	0	0	0	0-0	22.88	0.393	10	
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The following samples were analyzed in this batch:

18031460-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Olsson Associates  
 Work Order: 18031460  
 Project: UP 78-21 Spill

## QC BATCH REPORT

Batch ID: **R232699** Instrument ID **MOIST** Method: **SW3550C**

<b>MBLK</b>		Sample ID: <b>WBLKS-R232699</b>				Units: % of sample		Analysis Date: <b>3/28/2018 04:50 PM</b>		
Client ID:		Run ID: <b>MOIST_180328C</b>				SeqNo: <b>4956771</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	U	0.050								

<b>LCS</b>		Sample ID: <b>LCS-R232699</b>				Units: % of sample		Analysis Date: <b>3/28/2018 04:50 PM</b>		
Client ID:		Run ID: <b>MOIST_180328C</b>				SeqNo: <b>4956770</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	99.99	0.050	100	0	100	99.5-100.5	0			

<b>DUP</b>		Sample ID: <b>18031460-02A DUP</b>				Units: % of sample		Analysis Date: <b>3/28/2018 04:50 PM</b>		
Client ID: <b>UP7821-SS2</b>		Run ID: <b>MOIST_180328C</b>				SeqNo: <b>4956749</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	17.58	0.050	0	0	0	0-0	17.88	1.69	10	

<b>DUP</b>		Sample ID: <b>18031465-06B DUP</b>				Units: % of sample		Analysis Date: <b>3/28/2018 04:50 PM</b>		
Client ID:		Run ID: <b>MOIST_180328C</b>				SeqNo: <b>4956766</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	13.23	0.050	0	0	0	0-0	13	1.75	10	

The following samples were analyzed in this batch:

18031460-02A	18031460-03A	18031460-04A
18031460-05A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.



# Chain of Custody Form

Page 1 of 1

COC ID: 123456

- |  |  |  |
|--|--|--|
| <input type="checkbox"/> Cincinnati, OH<br>+1 513 733 5336   | <input checked="" type="checkbox"/> Holland, MI<br>+1 616 399 6070 | <input type="checkbox"/> Salt Lake City, UT<br>+1 801 266 7700 |
| <input type="checkbox"/> Everett, WA<br>+1 425 356 2600      | <input type="checkbox"/> Houston, TX<br>+1 281 530 5656            | <input type="checkbox"/> Spring City, PA<br>+1 610 948 4903    |
| <input type="checkbox"/> Fort Collins, CO<br>+1 970 490 1511 | <input type="checkbox"/> Middletown, PA<br>+1 717 944 5541         | <input type="checkbox"/> York, PA<br>+1 717 505 5280           |

<b>ALS Project Manager:</b>		<b>Work Order #:</b> 18031460																							
<b>Customer Information</b>		<b>Project Information</b>																							
Purchase Order		Project Name	UP 78-21 Spill																						
Work Order		Project Number	013.3287.400.400004																						
Company Name	Olsson Associates	Bill To Company	Olsson Associates																						
Send Report To	Tim Dobransky	Invoice Attn.	Dana Mack																						
Address	760 Horizon Drive, Ste. 102	Address																							
City/State/Zip	Grand Junction, CO 81506	City/State/Zip																							
Phone	970.263.7800	Phone																							
Fax	970.263.7456	Fax																							
e-Mail Address	tdobransky@entradainc.com	e-Mail Address	dmack@olssonassociates.com																						
		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2">Parameter/Method Request for Analysis</th> </tr> <tr><td>A</td><td>TPH (GRO &amp; DRO)</td></tr> <tr><td>B</td><td>BTEX</td></tr> <tr><td>C</td><td>PAH (See Attached List) CO Table 910</td></tr> <tr><td>D</td><td>Electrical Conductivity</td></tr> <tr><td>E</td><td>Sodium Adsorption Ratio</td></tr> <tr><td>F</td><td>pH</td></tr> <tr><td>G</td><td>Metals (See Attached List) CO Table 910</td></tr> <tr><td>H</td><td>Arsenic Only</td></tr> <tr><td>I</td><td></td></tr> <tr><td>J</td><td></td></tr> </table>		Parameter/Method Request for Analysis		A	TPH (GRO & DRO)	B	BTEX	C	PAH (See Attached List) CO Table 910	D	Electrical Conductivity	E	Sodium Adsorption Ratio	F	pH	G	Metals (See Attached List) CO Table 910	H	Arsenic Only	I		J	
Parameter/Method Request for Analysis																									
A	TPH (GRO & DRO)																								
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C	PAH (See Attached List) CO Table 910																								
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E	Sodium Adsorption Ratio																								
F	pH																								
G	Metals (See Attached List) CO Table 910																								
H	Arsenic Only																								
I																									
J																									
No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold								
1	UP7821-SS1	03/21/18	1300	Soil	8	2	X	X	X	X	X	X	X												
2	UP7821-SS2	03/21/18	1310	Soil	8	2	X	X	X	X	X	X	X												
3	UP7821-SS3	03/21/18	1315	Soil	8	2	X	X	X	X	X	X	X												
4	UP7821-BG1	03/21/18	1320	Soil	8	2				X	X	X	X												
5	UP7821-BG2	03/21/18	1330	Soil	8	1								X											
6																									
7																									
8																									
9																									
10																									

<b>Sampler(s): Please Print &amp; Sign</b> Tim Dobransky		<b>Shipment Method:</b> FedEx	<b>Required Turnaround Time:</b> <input type="checkbox"/> STD 10 Wk Days <input checked="" type="checkbox"/> 5 Wk Days <input type="checkbox"/> Other _____ <input type="checkbox"/> 2 Wk Days <input type="checkbox"/> 24 Hour	<b>Results Due Date:</b>
<b>Relinquished by:</b>	<b>Date:</b> 3/22/18	<b>Time:</b> 1200	<b>Received by:</b>	<b>Notes:</b> Chevron Pricing Applies - Per Bruce Schlatter
<b>Relinquished by:</b>	<b>Date:</b> 3-22-18	<b>Time:</b> 1830	<b>Received by (Laboratory):</b> 3/23/18 1800	<b>Cooler Temp.</b> 3.8°C
<b>Logged by (Laboratory):</b> DFS	<b>Date:</b> 3/23/18	<b>Time:</b> 1230	<b>Checked by (Laboratory):</b>	<b>QC Package: (Check Box Below)</b>
<b>Preservative Key:</b> 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035				<input checked="" type="checkbox"/> Level II: Standard QC <input type="checkbox"/> Level III: Std QC + Raw Data <input type="checkbox"/> Level IV: SW846 CLP-Like Other: _____

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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Sample Receipt Checklist

Client Name: **OLSSON**

Date/Time Received: **23-Mar-18 10:00**

Work Order: **18031460**

Received by: **DS**

Checklist completed by **Diane Shaw**

23-Mar-18

Reviewed by: **Chad Whelton**

23-Mar-18

eSignature

Date

eSignature

Date

Matrices: **Soil**

Carrier name: **FedEx**

Shipping container/cooler in good condition? Yes ☒ No ☐ Not Present ☐

Custody seals intact on shipping container/cooler? Yes ☐ No ☐ Not Present ☒

Custody seals intact on sample bottles? Yes ☐ No ☐ Not Present ☒

Chain of custody present? Yes ☒ No ☐

Chain of custody signed when relinquished and received? Yes ☒ No ☐

Chain of custody agrees with sample labels? Yes ☒ No ☐

Samples in proper container/bottle? Yes ☒ No ☐

Sample containers intact? Yes ☒ No ☐

Sufficient sample volume for indicated test? Yes ☒ No ☐

All samples received within holding time? Yes ☒ No ☐

Container/Temp Blank temperature in compliance? Yes ☒ No ☐

Sample(s) received on ice? Yes ☒ No ☐

Temperature(s)/Thermometer(s): **3.8/3.8 c** **SR2**

Cooler(s)/Kit(s):

Date/Time sample(s) sent to storage: **3/23/2018 12:50:24 PM**

Water - VOA vials have zero headspace? Yes ☐ No ☐ No VOA vials submitted ☒

Water - pH acceptable upon receipt? Yes ☐ No ☐ N/A ☒

pH adjusted? Yes ☐ No ☐ N/A ☒

pH adjusted by: -

Login Notes:

-----

Client Contacted:

Date Contacted:

Person Contacted:

Contacted By:

Regarding:

Comments:

CorrectiveAction: