



June 21, 2019

Olsson Associates

Jason Davidson

1525 Raleigh St, Suite 400

Denver

CO 80204

Project Name - Shaw E Unit 1 Tank Pull

Project Number - 019-

Attached are your analytical results for Shaw E Unit 1 Tank Pull received by Origins Laboratory, Inc. June 14, 2019. This project is associated with Origins project number Y906287-01.

The analytical results in the following report were analyzed under the guidelines of EPA Methods. These methods are identified as follows; "SW" are defined in SW-846, "EPA" are defined in 40CFR part 136 and "SM" are defined in the most current revision of Standard Methods For the Examination of Water and Wastewater.

The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. As such, this report shall not be reproduced except in full, without the written approval of Origin's laboratory.

Unless otherwise noted, the analytical results for all soil samples are reported on a wet weight basis. All analytical analyses were performed under NELAP guidelines unless noted by a data qualifier.

Any holding time exceedances, deviations from the method specifications or deviations from Origins Laboratory's Standard Operating Procedures are outlined in the case narrative.

Thank you for selecting Origins for your analytical needs. Please contact us with any questions concerning this report, or if we can help with anything at all.

Origins Laboratory, Inc.
303.433.1322
o-squad@oelabinc.com



1725 Elk Place, Denver, CO 80211 | Phone: 303.433.1322 | Fax: 303.265.9645

Olsson Associates
1525 Raleigh St, Suite 400
Denver CO 80204

Jason Davidson
Project Number: 019-
Project: Shaw E Unit 1 Tank Pull

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Base-05	Y906287-01	Soil	June 14, 2019 12:10	06/14/2019 13:37
SWS-04	Y906287-03	Soil	June 14, 2019 11:55	06/14/2019 13:37

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

Olsson Associates
 1525 Raleigh St, Suite 400
 Denver CO 80204

Jason Davidson
 Project Number: 019-
 Project: Shaw E Unit 1 Tank Pull

Chain of Custody **900287**

olsson

PROJECT NAME Shaw E Unit 1 Tank Pull	PROJECT NUMBER 019-	PHONE NUMBER 303-237-2072	CITY/STATE/ZIP Denver, CO	PM EMAIL jason.davidson@olsson.com	By Lab 13.1	DISPOSAL LAB USE ONLY: Temperature upon receipt: Yes No N/A Custody seals in tact: Yes No N/A	PAGE 1 of 1
COMPANY NAME Olsson	ADDRESS 1525 Raleigh St., Suite 400	PROJECT MANAGER Jason Davidson	SAMPLER Michael Clark	CLIENT COMPANY GWOC	Standard X	72hr	
SEND COPY OF ANALYTICAL TO CLIENT? YES: <input type="checkbox"/> NO: <input checked="" type="checkbox"/>	CLIENT NAME GWOC	CLIENT EMAIL	CLIENT PROJECT #	EC/GP/HSAR	48hr		
	Field ID	Matrix	Sample Date	Sample Time	24hr		
Lab ID					Same Day		
	Basis - 05	Soil	6/14/2019	12:10			
	SWN - 04	Soil	6/14/2019	1:50			Hold
	SWJ - 04	Soil	6/14/2019	1:55			
	SWN - 04	Soil	6/14/2019	12:00			Hold
	SWE - 04	Soil	6/14/2019	12:05			Hold

RELINQUISHED BY Michael Clark	PRINTED NAME Michael Clark	SIGNATURE <i>[Signature]</i>	DATE 6/14/19	TIME 1337
RECEIVED BY Jason Davidson			6/14/19	1337
RELINQUISHED BY				
RECEIVED BY				
RELINQUISHED BY				

Comments:

CC PACKAGE (check below)	
<input checked="" type="checkbox"/>	LEVEL II (Standard CC)
<input type="checkbox"/>	LEVEL III (Std CC + Terms)
<input type="checkbox"/>	LEVEL IV (Std CC + Terms + Raw Data)

Origins Laboratory, Inc.

Jen Pellegrini

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Jason Davidson
 Project Number: 019-
 Project: Shaw E Unit 1 Tank Pull

Origins Laboratory

F-012207-01-R1
 Effective Date: 01/09/12

Sample Receipt Checklist

Origins Work Order: Y906287

Client: OLSSON

Client Project ID: Shaw E Unit 1

Checklist Completed by: JTB

Shipped Via: HD
(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 6/14/19

Airbill #: NA

Matrix(s) Received: (Check all that apply): Soil/Solid Water Other: _____
(Describe)

Cooler Number/Temperature: 1 / 13.1 °C / _____ °C / _____ °C / _____ °C

Thermometer ID: T003

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C ^{(1)?}		<input checked="" type="checkbox"/>		<u>sampled same day</u>
Is there ice present (document if blue ice is used)	<input checked="" type="checkbox"/>			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		<input checked="" type="checkbox"/>		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		<input checked="" type="checkbox"/>		
Were all samples received intact ^{(1)?}	<input checked="" type="checkbox"/>			
Was adequate sample volume provided ^{(1)?}	<input checked="" type="checkbox"/>			
Are short holding time analytes or samples with HTs due within 48 hours present ^{(1)?}		<input checked="" type="checkbox"/>		
Is a chain-of-custody (COC) present and filled out completely ^{(1)?}	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received ^{(1)?}	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC ^{(1)?}	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client with date and time recorded ^{(1)?}	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.			<input checked="" type="checkbox"/>	
Are samples preserved that require preservation and was it checked ^{(1)?} (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity)/pH <2 for samples preserved with HNO ₃ , HCL, H ₂ SO ₄ / (pH >10 for samples preserved with NaAsO ₂ +NaOH, ZnAc+NaOH)			<input checked="" type="checkbox"/>	
Additional Comments (if any):				

⁽¹⁾If NO, then contact the client before proceeding with analysis and note date/time and person contacted as well as the corrective action to in the additional comments (above) and the case narrative.

Reviewed by (Project Manager) [Signature]

Date/Time Reviewed 6/18/19

Origins Laboratory, Inc.

Jefe Pellegrini

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Olsson Associates
 1525 Raleigh St, Suite 400
 Denver CO 80204

Jason Davidson
 Project Number: 019-
 Project: Shaw E Unit 1 Tank Pull

Base-05

6/14/2019 12:10:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y906287-01 (Soil)

Diesel Range Organics (DRO/TEPH) by EPA 8015D

Diesel (C10-C28)	ND	50.0	mg/kg	1	B9F1704	KDK	06/17/2019	06/18/2019	U
<i>Surrogate: o-Terphenyl</i>	85.5 %	50-150			"	"	"	"	

GBTEX + Naphthalene by EPA 8260D

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	B9F1703	KDK	06/17/2019	06/18/2019	U
Benzene	ND	0.002	"	"	"	KDK	"	"	U
Toluene	ND	0.002	"	"	"	KDK	"	"	U
Ethylbenzene	ND	0.002	"	"	"	KDK	"	"	U
Xylenes, total	ND	0.002	"	"	"	KDK	"	"	U
Naphthalene	ND	0.008	"	"	"	KDK	"	"	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>	110 %	70-130			"	"	"	"	
<i>Surrogate: Toluene-d8</i>	86.4 %	70-130			"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>	92.4 %	70-130			"	"	"	"	

Metals (Saturated Paste Prep)

Calcium	3.20		me/L	1	'[none]'		06/19/2019	06/20/2019	
Magnesium	0.80		"	"	"		"	"	
Sodium	13.71		"	"	"		"	"	

pH in Soil by EPA 9045D

Origins Laboratory, Inc.



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 Denver CO 80204

Jason Davidson
 Project Number: 019-
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Base-05

6/14/2019 12:10:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y906287-01 (Soil)

pH in Soil by EPA 9045D

pH	8.27		pH Units	1	B9F1705	OLAB	06/17/2019	06/17/2019	
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SAR by 20B Saturated Paste

SAR	9.69			1	'[none]'		06/19/2019	06/20/2019	
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.126	0.00500	mmhos/cm	1	B9F1706	OLAB	06/17/2019	06/17/2019	
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Jason Davidson
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SWS-04

6/14/2019 11:55:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y906287-03 (Soil)

Diesel Range Organics (DRO/TEPH) by EPA 8015D

Diesel (C10-C28)	ND	50.0	mg/kg	1	B9F1704	KDK	06/17/2019	06/18/2019	U
<i>Surrogate: o-Terphenyl</i>	81.3 %	50-150			"	"	"	"	

GBTEX + Naphthalene by EPA 8260D

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	B9F1703	KDK	06/17/2019	06/19/2019	U
Benzene	ND	0.002	"	"	"	KDK	"	"	U
Toluene	ND	0.002	"	"	"	KDK	"	"	U
Ethylbenzene	ND	0.002	"	"	"	KDK	"	"	U
Xylenes, total	ND	0.002	"	"	"	KDK	"	"	U
Naphthalene	ND	0.008	"	"	"	KDK	"	"	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>	110 %	70-130			"	"	"	"	
<i>Surrogate: Toluene-d8</i>	87.3 %	70-130			"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>	92.8 %	70-130			"	"	"	"	

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Jason Davidson
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Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B9F1703 - EPA 5030 (soil)										
Blank (B9F1703-BLK1)										
					Prepared: 06/17/2019 Analyzed: 06/17/2019					
Gasoline Range Hydrocarbons	ND	0.200	mg/kg							U
Benzene	ND	0.002	"							U
Toluene	ND	0.002	"							U
Ethylbenzene	ND	0.002	"							U
Xylenes, total	ND	0.002	"							U
Naphthalene	ND	0.008	"							U
Surrogate: 1,2-Dichloroethane-d4	0.15		"	0.125		123	70-130			
Surrogate: Toluene-d8	0.11		"	0.125		87.2	70-130			
Surrogate: 4-Bromofluorobenzene	0.11		"	0.125		91.2	70-130			

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Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9F1703 - EPA 5030 (soil)

LCS (B9F1703-BS1)

Prepared: 06/17/2019 Analyzed: 06/17/2019

Benzene	0.101	0.002	mg/kg	0.100		101	70-130			
Toluene	0.090	0.002	"	0.100		90.3	70-130			
Ethylbenzene	0.082	0.002	"	0.100		82.4	70-130			
m,p-Xylene	0.172	0.004	"	0.200		86.0	70-130			
o-Xylene	0.088	0.002	"	0.100		87.8	70-130			
Naphthalene	0.088	0.008	"	0.100		88.0	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.14		"	0.125		114	70-130			
Surrogate: Toluene-d8	0.11		"	0.125		90.8	70-130			
Surrogate: 4-Bromofluorobenzene	0.11		"	0.125		89.8	70-130			

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Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9F1703 - EPA 5030 (soil)

Matrix Spike (B9F1703-MS1)	Source: Y906266-01			Prepared: 06/17/2019 Analyzed: 06/17/2019						
Benzene	0.098	0.002	mg/kg	0.100	ND	97.7	70-130			
Toluene	0.086	0.002	"	0.100	ND	86.1	70-130			
Ethylbenzene	0.078	0.002	"	0.100	ND	78.2	70-130			
m,p-Xylene	0.165	0.004	"	0.200	ND	82.6	70-130			
o-Xylene	0.084	0.002	"	0.100	ND	84.3	70-130			
Naphthalene	0.087	0.008	"	0.100	ND	87.0	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.15		"	0.125		117	70-130			
Surrogate: Toluene-d8	0.11		"	0.125		90.4	70-130			
Surrogate: 4-Bromofluorobenzene	0.11		"	0.125		91.5	70-130			

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Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9F1703 - EPA 5030 (soil)

Matrix Spike Dup (B9F1703-MSD1)	Source: Y906266-01			Prepared: 06/17/2019 Analyzed: 06/17/2019						
Benzene	0.093	0.002	mg/kg	0.100	ND	92.5	70-130	5.47	20	
Toluene	0.081	0.002	"	0.100	ND	81.2	70-130	5.88	20	
Ethylbenzene	0.076	0.002	"	0.100	ND	76.4	70-130	2.28	20	
m,p-Xylene	0.161	0.004	"	0.200	ND	80.7	70-130	2.30	20	
o-Xylene	0.083	0.002	"	0.100	ND	83.2	70-130	1.27	20	
Naphthalene	0.092	0.008	"	0.100	ND	92.2	70-130	5.76	20	
Surrogate: 1,2-Dichloroethane-d4	0.15		"	0.125		119	70-130			
Surrogate: Toluene-d8	0.11		"	0.125		89.6	70-130			
Surrogate: 4-Bromofluorobenzene	0.12		"	0.125		93.9	70-130			

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Jason Davidson
 Project Number: 019-
 Project: Shaw E Unit 1 Tank Pull

Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B9F1704 - EPA 3580										
Blank (B9F1704-BLK1)										
					Prepared: 06/17/2019 Analyzed: 06/17/2019					
Diesel (C10-C28)	ND	50.0	mg/kg							U
Surrogate: o-Terphenyl	38		"	50.0		76.8	50-150			

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Extractable Petroleum Hydrocarbons by 8015D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B9F1704 - EPA 3580										
Blank (B9F1704-BLK2)										
					Prepared: 06/17/2019 Analyzed: 06/17/2019					
Diesel (C10-C28)	ND	50.0	mg/kg							U
Surrogate: o-Terphenyl	43		"	50.0		85.6	50-150			

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Extractable Petroleum Hydrocarbons by 8015D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B9F1704 - EPA 3580										
LCS (B9F1704-BS1)					Prepared: 06/17/2019 Analyzed: 06/17/2019					
Diesel (C10-C28)	1020	50.0	mg/kg	1000		102	70-130			
Surrogate: o-Terphenyl	43		"	50.0		86.6	50-150			

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Extractable Petroleum Hydrocarbons by 8015D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9F1704 - EPA 3580

LCS (B9F1704-BS2)

Prepared: 06/17/2019 Analyzed: 06/17/2019

Diesel (C10-C28)	975	50.0	mg/kg	1000		97.5	70-130			
Surrogate: o-Terphenyl	46		"	50.0		91.5	50-150			

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Extractable Petroleum Hydrocarbons by 8015D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9F1704 - EPA 3580

Matrix Spike (B9F1704-MS1)	Source: Y906266-01			Prepared: 06/17/2019 Analyzed: 06/17/2019						
Diesel (C10-C28)	957	50.0	mg/kg	1000	ND	95.7	70-130			
Surrogate: o-Terphenyl	43		"	50.0		86.2	50-150			

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Extractable Petroleum Hydrocarbons by 8015D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9F1704 - EPA 3580

Matrix Spike (B9F1704-MS2)	Source: Y906278-01			Prepared: 06/17/2019 Analyzed: 06/18/2019						
Diesel (C10-C28)	969	50.0	mg/kg	1000	ND	96.9	70-130			
Surrogate: o-Terphenyl	43		"	50.0		86.3	50-150			

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Jason Davidson
 Project Number: 019-
 Project: Shaw E Unit 1 Tank Pull

Extractable Petroleum Hydrocarbons by 8015D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9F1704 - EPA 3580

Matrix Spike Dup (B9F1704-MSD1)	Source: Y906266-01			Prepared: 06/17/2019 Analyzed: 06/17/2019						
Diesel (C10-C28)	944	50.0	mg/kg	1000	ND	94.4	70-130	1.41	35	
Surrogate: o-Terphenyl	42		"	50.0		83.1	50-150			

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Extractable Petroleum Hydrocarbons by 8015D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9F1704 - EPA 3580

Matrix Spike Dup (B9F1704-MSD2)	Source: Y906278-01			Prepared: 06/17/2019 Analyzed: 06/18/2019						
Diesel (C10-C28)	1020	50.0	mg/kg	1000	ND	102	70-130	4.80	35	
Surrogate: o-Terphenyl	45		"	50.0		89.6	50-150			

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Extractable Petroleum Hydrocarbons by 8015D - Quality Control
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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Classical Chemistry Parameters - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9F1705 - NO PREP

Duplicate (B9F1705-DUP1)

Source: Y906287-01

Prepared: 06/17/2019 Analyzed: 06/17/2019

pH	8.42		pH Units		8.27			1.80	25	
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Batch B9F1706 - NO PREP

Blank (B9F1706-BLK1)

Prepared: 06/17/2019 Analyzed: 06/17/2019

Specific Conductance (EC)	0.00330	0.00500	mmhos/cm							
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Duplicate (B9F1706-DUP1)

Source: Y906287-01

Prepared: 06/17/2019 Analyzed: 06/17/2019

Specific Conductance (EC)	0.153	0.00500	mmhos/cm		0.126			19.5	25	
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Origins Laboratory, 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.

Olsson Associates
1525 Raleigh St, Suite 400
Denver CO 80204

Jason Davidson
Project Number: 019-
Project: Shaw E Unit 1 Tank Pull

Notes and Definitions

U Sample is Non-Detect.

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

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Jen Pellegrini, Project Manager