



July 12, 2018

Mr. Jacob Evans
Sr. EHS Specialist
2115 117th Avenue
Greeley, CO 80634

**Subject: Water Vault Removal
Trebor B 12-1,8,17
40.415006 , -104.49442
SE¼ SE¼ T5N-R64W-S12 L01
Weld County, Colorado
Location ID 11376900**

Dear Mr. Evans,

This letter is being provided by URS to present the results from the water vault removal at the Trebor B 12-1,8,17 site (site).

On June 20th, 2018, URS collected soil samples following the removal of the water vault at the site. A soil sample was collected from each of the four sidewalls and the floor for field screening. The sidewall soil sample with the highest photoionization detector (PID) reading (Trebor-B12-1-Southwall) and the floor soil sample (Trebor-B12-1-Floor) were submitted for laboratory analysis. The sampling was performed in accordance with Noble guidance document Closure of Buried or Partially Buried Produced Water Vessels as per Colorado Oil and Gas Conservation Commission (COGCC) Rule 905.b.(1-4).

Based on laboratory analytical results, neither soil samples exceeded the Colorado Oil and Gas Conservation Commission (COGCC) Table 910-1 concentration limits for benzene, toluene, ethylbenzene, total xylenes (BTEX), naphthalene, or total petroleum hydrocarbons (TPH). The additional analysis of the sidewall sample for specific conductance, pH, and

URS Corporation

6200 S. Quebec Street

Greenwood Village, CO 80111

Tel: 303.694.2770

Fax: 303.694.3946



sodium adsorption ratio (SAR) also did not exceed COGCC Table 910-1 concentration limits.

If you have any questions or require further information, please contact Jim Litz at (303) 228-3066.

Sincerely,

URS Corporation

A handwritten signature in black ink, appearing to read "James Ford".

James Ford
Project Geologist

A handwritten signature in black ink, appearing to read "James Litz".

James Litz, P.E.
Project Manager

Attachments: **Figures**

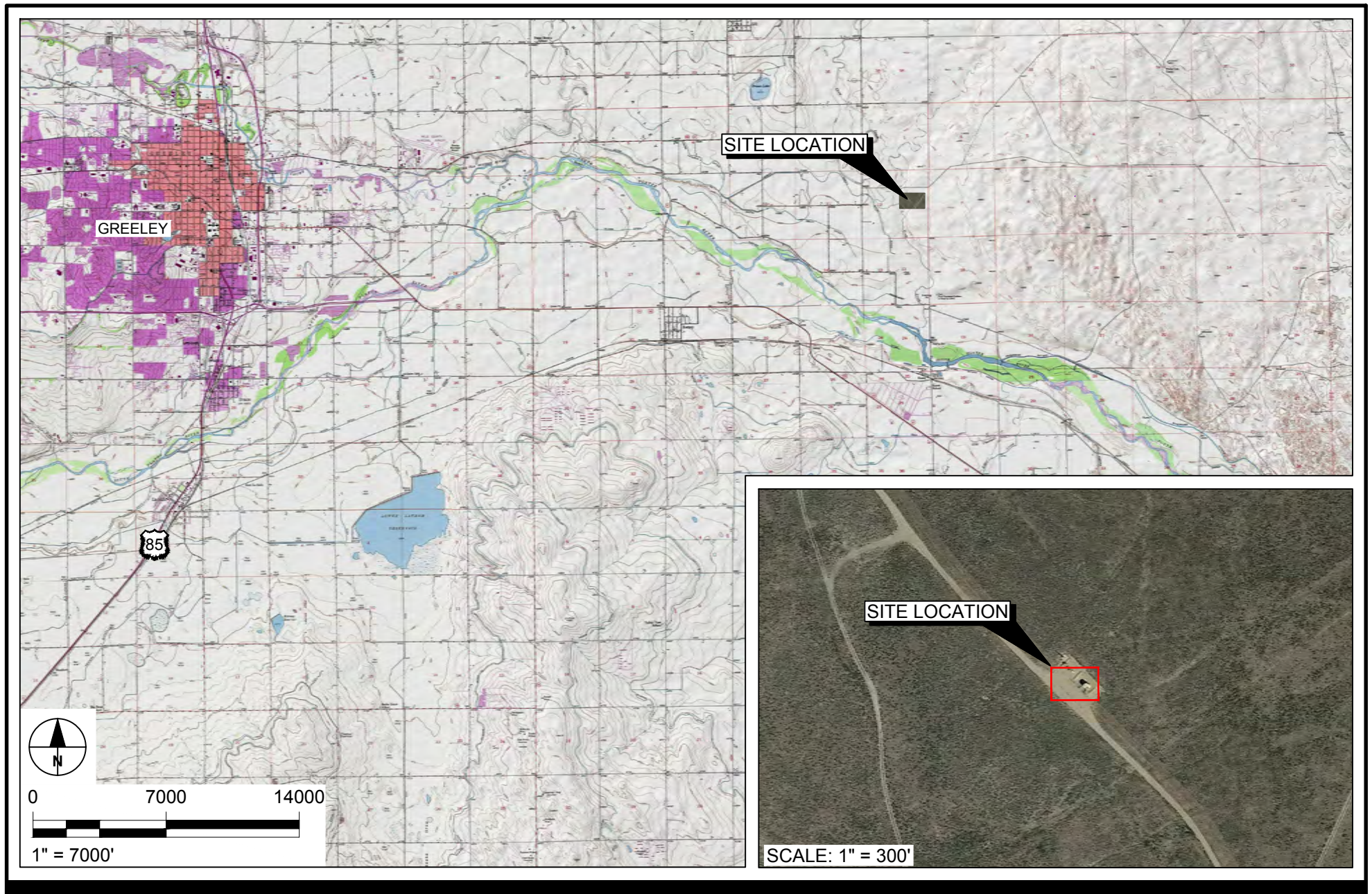
Figure 1 - Site Vicinity Map

Figure 2 – Soil Analytical Results

Laboratory Analytical Report



Figures



Trebor B 12-1,8,17
40.415006 , -104.49442
SE¼ SE¼ T5N-R64W-S12 L01
Weld County, Colorado Date: 07/11/18

SITE VICINITY MAP

AECOM

Figure: 1

Note:

ft bgs = feet below ground surface
 DRO = Diesel Range Organics
 GRO = Gasoline Range Organics
 mg/kg = milligrams/kilogram
 ND (50) = Non-Detect (Detection Limit)

LEGEND

● SAMPLE LOCATIONS



Trebor B 12-1,8,17
 40.415006 , -104.49442
 SE¼ SE¼ T5N-R64W-S12 L01
 Weld County, Colorado Date: 07/11/18
 Facility ID 11376900

SOIL ANALYTICAL RESULTS

AECOM

Figure: 2



Laboratory Analytical Report

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

June 29, 2018

Jim Litz
AECOM
1601 Prospect Parkway
Ft. Collins, CO 80525
RE: Noble - Trebor B 12-1,8,17

Enclosed are the results of analyses for samples received by Summit Scientific on 06/20/18 17:06. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paul Shrewsbury For Ben Shrewsbury
Laboratory Manager



AECOM
1601 Prospect Parkway
Ft. Collins CO, 80525

Project: Noble - Trebor B 12-1,8,17

Project Number: [none]
Project Manager: Jim Litz

Reported:
06/29/18 08:10

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Trebor-B12-1-Floor	1806258-01	Soil	06/20/18 10:00	06/20/18 17:06
Trebor-B12-1-Southwall	1806258-02	Soil	06/20/18 10:10	06/20/18 17:06

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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.

1806258

Page 1 of 1

Project Manager: Jim Litz
E-Mail: jim.litz@acc.com
Project Name: Noble Water Vessels
Project Number: RC # 815893311 Account # 247839 Release # 1013

www.s2scientific.com

Sample Receipt Checklist

S2 Work Order: 1806258

Client: ARCOM Noble Energy Client Project ID: Noble water Vessels

Shipped Via: Hand Airbill #: _____
(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Matrix (check all that apply): ☐ Air ☒ Soil/Solid ☐ Water ☐ Other: _____
(Describe)

Temp (°C)	<u>5.2</u>
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Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature at 4°C +/- 2°C ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
NOTE: If samples are delivered the same day of sampling, this requirement is met provided that there is evidence that cooling has begun.				
Were all samples received intact ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was adequate sample volume provided ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If custody seals are present, are they intact ⁽¹⁾ ?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Are samples with holding times due within 48 hours sample due within 48 hours present?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Is a chain-of-custody (COC) form present and filled out completely ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the COC properly relinquished by the client w/ date and time recorded ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Are samples preserved that require preservation (excluding cooling) ⁽¹⁾ ?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect				
If samples are acid preserved for metals, is the pH ≤ 2 ⁽¹⁾ ?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Record the pH in Comments.				
If dissolved metals are requested, were samples field filtered?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Additional Comments (if any):				

⁽¹⁾ If NO, then contact the client before proceeding with analysis and note in case narrative.

CP
Custodian Printed Name or Initials

[Signature]
Signature or Initials of Custodian

6.20.18 1206
Date/Time



AECOM
1601 Prospect Parkway
Ft. Collins CO, 80525

Project: Noble - Trebor B 12-1,8,17

Project Number: [none]
Project Manager: Jim Litz

Reported:
06/29/18 08:10

Trebor-B12-1-Floor
1806258-01 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/20/18 10:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1806330	06/22/18	06/26/18	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **06/20/18 10:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		96.0 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		95.7 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.8 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/20/18 10:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1806327	06/22/18	06/27/18	EPA 8015M	

Date Sampled: **06/20/18 10:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		86.8 %	30-150		"	"	"	"	

Summit Scientific

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AECOM
1601 Prospect Parkway
Ft. Collins CO, 80525

Project: Noble - Trebor B 12-1,8,17

Project Number: [none]
Project Manager: Jim Litz

Reported:
06/29/18 08:10

**Trebor-B12-1-Southwall
1806258-02 (Soil)**

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/20/18 10:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1806330	06/22/18	06/26/18	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **06/20/18 10:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		96.9 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.3 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.1 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/20/18 10:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1806327	06/22/18	06/27/18	EPA 8015M	

Date Sampled: **06/20/18 10:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		85.4 %	30-150		"	"	"	"	

Soluble Nutrients by EPA 6020/USDA60 6(2, 3A) - Dry Weight Basis

Date Sampled: **06/20/18 10:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	858	11.2	mg/kg dry	1	1806370	06/26/18	06/26/18	EPA 6020B	
Magnesium	107	5.58	"	"	"	"	"	"	

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AECOM
1601 Prospect Parkway
Ft. Collins CO, 80525

Project: Noble - Trebor B 12-1,8,17

Project Number: [none]
Project Manager: Jim Litz

Reported:
06/29/18 08:10

**Trebor-B12-1-Southwall
1806258-02 (Soil)**

Summit Scientific

Soluble Nutrients by EPA 6020/USDA60 6(2, 3A) - Dry Weight Basis

Sodium	76.5	5.58	mg/kg dry	1	1806370	06/26/18	06/26/18	EPA 6020B
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Calculated Analysis

Date Sampled: **06/20/18 10:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.655	0.100	units	1	1806387	06/27/18	06/27/18	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **06/20/18 10:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	89.6		%	1	1806336	06/22/18	06/25/18	Calculation	
pH	8.98		pH Units	"	1806337	06/22/18	06/22/18	EPA 9045D	

Specific Conductance by EPA Method 120.1

Date Sampled: **06/20/18 10:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.276	0.0100	mmhos/cm	1	1806338	06/22/18	06/22/18	EPA 120.1	

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AECOM
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Ft. Collins CO, 80525

Project: Noble - Trebor B 12-1,8,17

Project Number: [none]
Project Manager: Jim Litz

Reported:
06/29/18 08:10

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

Analyte	Reporting			Spike Level	Source		%REC		RPD	
	Result	Limit	Units		Result	%REC	Limits	RPD	Limit	Notes

Batch 1806330 - EPA 5030 Soil MS

Blank (1806330-BLK1)

Prepared: 06/22/18 Analyzed: 06/26/18

Benzene	ND	0.0020	mg/kg							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
Naphthalene	ND	0.010	"							
Gasoline Range Hydrocarbons	ND	50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0376		"	0.0396	94.8	23-173				
Surrogate: Toluene-d8	0.0399		"	0.0400	99.8	20-170				
Surrogate: 4-Bromofluorobenzene	0.0384		"	0.0400	96.1	21-167				

LCS (1806330-BS1)

Prepared: 06/22/18 Analyzed: 06/26/18

Benzene	0.0891	0.0020	mg/kg	0.100	89.1	70-130				
Toluene	0.0999	0.0050	"	0.100	99.9	70-130				
Ethylbenzene	0.114	0.0050	"	0.100	114	70-130				
m,p-Xylene	0.228	0.010	"	0.200	114	70-130				
o-Xylene	0.104	0.0050	"	0.100	104	70-130				
Surrogate: 1,2-Dichloroethane-d4	0.0360		"	0.0396	90.8	23-173				
Surrogate: Toluene-d8	0.0391		"	0.0400	97.8	20-170				
Surrogate: 4-Bromofluorobenzene	0.0387		"	0.0400	96.8	21-167				

Matrix Spike (1806330-MS1)

Source: 1806248-01

Prepared: 06/22/18 Analyzed: 06/26/18

Benzene	0.0905	0.0020	mg/kg	0.100	ND	90.5	70-130			
Toluene	0.102	0.0050	"	0.100	ND	102	70-130			
Ethylbenzene	0.115	0.0050	"	0.100	ND	115	70-130			
m,p-Xylene	0.229	0.010	"	0.200	ND	115	70-130			
o-Xylene	0.102	0.0050	"	0.100	ND	102	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0363		"	0.0396	91.7	23-173				
Surrogate: Toluene-d8	0.0397		"	0.0400	99.2	20-170				
Surrogate: 4-Bromofluorobenzene	0.0382		"	0.0400	95.4	21-167				

Summit Scientific

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AECOM
1601 Prospect Parkway
Ft. Collins CO, 80525

Project: Noble - Trebor B 12-1,8,17

Project Number: [none]
Project Manager: Jim Litz

Reported:
06/29/18 08:10

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1806330 - EPA 5030 Soil MS

Matrix Spike Dup (1806330-MSD1)	Source: 1806248-01			Prepared: 06/22/18 Analyzed: 06/26/18						
Benzene	0.0909	0.0020	mg/kg	0.100	ND	90.9	70-130	0.430	30	
Toluene	0.102	0.0050	"	0.100	ND	102	70-130	0.206	30	
Ethylbenzene	0.113	0.0050	"	0.100	ND	113	70-130	1.34	30	
m,p-Xylene	0.225	0.010	"	0.200	ND	112	70-130	1.98	30	
o-Xylene	0.101	0.0050	"	0.100	ND	101	70-130	1.30	30	
Surrogate: 1,2-Dichloroethane-d4	0.0369		"	0.0396		93.1	23-173			
Surrogate: Toluene-d8	0.0397		"	0.0400		99.2	20-170			
Surrogate: 4-Bromofluorobenzene	0.0375		"	0.0400		93.7	21-167			

Summit Scientific

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AECOM
1601 Prospect Parkway
Ft. Collins CO, 80525

Project: Noble - Trebor B 12-1,8,17

Project Number: [none]
Project Manager: Jim Litz

Reported:
06/29/18 08:10

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1806327 - EPA 3550A

Blank (1806327-BLK1)

Prepared: 06/22/18 Analyzed: 06/27/18

C10-C28 (DRO) ND 50 mg/kg

LCS (1806327-BS1)

Prepared: 06/22/18 Analyzed: 06/27/18

C10-C28 (DRO) 520 50 mg/kg 500 104 70-130

Matrix Spike (1806327-MS1)

Source: 1806241-01

Prepared: 06/22/18 Analyzed: 06/27/18

C10-C28 (DRO) 505 50 mg/kg 500 ND 101 70-130

Matrix Spike Dup (1806327-MSD1)

Source: 1806241-01

Prepared: 06/22/18 Analyzed: 06/27/18

C10-C28 (DRO) 577 50 mg/kg 500 ND 115 70-130 13.4 20

Summit Scientific

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AECOM
1601 Prospect Parkway
Ft. Collins CO, 80525

Project: Noble - Trebor B 12-1,8,17

Project Number: [none]
Project Manager: Jim Litz

Reported:
06/29/18 08:10

Soluble Nutrients by EPA 6020/USDA60 6(2, 3A) - Dry Weight Basis - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1806370 - General Preparation

Blank (1806370-BLK1)

Prepared & Analyzed: 06/26/18

Calcium	ND	10.0	mg/kg wet
Magnesium	ND	5.00	"
Sodium	ND	5.00	"

LCS (1806370-BS1)

Prepared & Analyzed: 06/26/18

Calcium	566	10.0	mg/kg wet	500	113	70-130
Magnesium	542	5.00	"	500	108	70-130
Sodium	608	5.00	"	500	122	70-130

Duplicate (1806370-DUP1)

Source: 1806258-02

Prepared & Analyzed: 06/26/18

Calcium	868	11.2	mg/kg dry	858	1.23	20
Magnesium	101	5.58	"	107	5.71	20
Sodium	70.6	5.58	"	76.5	8.06	20

Matrix Spike (1806370-MS1)

Source: 1806258-02

Prepared & Analyzed: 06/26/18

Calcium	1540	11.2	mg/kg dry	558	858	122	70-130
Magnesium	529	5.58	"	558	107	75.6	70-130
Sodium	513	5.58	"	558	76.5	78.2	70-130

Matrix Spike Dup (1806370-MSD1)

Source: 1806258-02

Prepared & Analyzed: 06/26/18

Calcium	1470	11.2	mg/kg dry	558	858	110	70-130	4.42	25
Magnesium	529	5.58	"	558	107	75.5	70-130	0.0283	25
Sodium	514	5.58	"	558	76.5	78.4	70-130	0.271	25

Summit Scientific

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.



AECOM
1601 Prospect Parkway
Ft. Collins CO, 80525

Project: Noble - Trebor B 12-1,8,17

Project Number: [none]
Project Manager: Jim Litz

Reported:
06/29/18 08:10

Physical Parameters by APHA/ASTM/EPA Methods - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1806336 - General Preparation

Duplicate (1806336-DUP1) **Source: 1806258-02** Prepared: 06/22/18 Analyzed: 06/25/18

% Solids	90.4		%		89.6			0.833	20	
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Batch 1806337 - General Preparation

LCS (1806337-BS1) Prepared & Analyzed: 06/22/18

pH	9.2		pH Units	9.18	99.9	95-105				
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Duplicate (1806337-DUP1) **Source: 1806258-02** Prepared & Analyzed: 06/22/18

pH	9.0		pH Units		9.0			0.111	20	
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AECOM
1601 Prospect Parkway
Ft. Collins CO, 80525

Project: Noble - Trebor B 12-1,8,17

Project Number: [none]
Project Manager: Jim Litz

Reported:
06/29/18 08:10

Specific Conductance by EPA Method 120.1 - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1806338 - General Preparation

LCS (1806338-BS1)

Prepared & Analyzed: 06/22/18

Specific Conductance (EC)	0.750	0.0100	mmhos/cm	0.750	100	90-110
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Duplicate (1806338-DUP1)

Source: 1806258-02

Prepared & Analyzed: 06/22/18

Specific Conductance (EC)	0.270	0.0100	mmhos/cm	0.276	2.18	20
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AECOM
1601 Prospect Parkway
Ft. Collins CO, 80525

Project: Noble - Trebor B 12-1,8,17

Project Number: [none]
Project Manager: Jim Litz

Reported:
06/29/18 08:10

Notes and Definitions

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