

# **FREMONT ENVIRONMENTAL INC.**

November 12, 2018

Mr. Jacob Evans  
Noble Energy  
2115 117<sup>th</sup> Avenue  
Greeley, CO 80634

Subject:     **Excavation Report**  
          UPRC Federal 27-3F, 6F  
          API # 05-123-15368  
          NENW Sec 27, T4N, R66W  
          Weld County, Colorado  
          Fremont Project No. C018-169  
          Facility #327960, Spill #458845

Dear Mr. Evans:

Enclosed please find a copy of the above referenced Excavation Report for the UPRC Federal 27-3F, 6F release site in Weld County, Colorado. The enclosed report describes excavation actions to remove impacted soil from the site. Please contact me at (303) 956-8714 if you require any additional information.

Fremont appreciates the opportunity to provide this service.

Sincerely,  
**FREMONT ENVIRONMENTAL INC.**



Paul V. Henehan, P.E.  
Senior Consultant

Enclosure

**EXCAVATION REPORT**  
**NOBLE ENERGY INC.**  
**UPRC FEDERAL 27-3F, 6F**  
**WELD COUNTY, COLORADO**  
**FREMONT PROJECT NO. C018-169**  
**FACILITY #327960, SPILL #458845**

**Prepared by:**

**Fremont Environmental Inc.**  
**1759 Redwing Lane**  
**Broomfield, CO 80020**  
**(303) 956-8714**

**November 12, 2018**

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**EXCAVATION REPORT**  
**NOBLE ENERGY INC.**  
**UPRC FEDERAL 27-3F, 6F**  
**WELD COUNTY, COLORADO**  
**FREMONT PROJECT NO. C018-169**  
**FACILITY #327960, SPILL #458845**

**1.0 INTRODUCTION**

The purpose of this document is to present information collected during the excavation of petroleum-impacted soil at the UPRC Federal 27-3F, 6F former water vault release location in Weld County, Colorado. This one-day excavation project was completed on October 26, 2018.

**2.0 BACKGROUND INFORMATION**

**2.1 Site Location**

The UPRC Federal 27-3F, 6F site is located approximately 0.5 miles east of Gilcrest, Colorado in Weld County as shown on Figure 1. The site is located in a rural and agricultural area approximately 0.25 miles southeast of the intersection of County Road 42 and Highway 85. The location is further described as the NE  $\frac{1}{4}$  of the NW  $\frac{1}{4}$  of Section 27, Township 4N, Range 66W.

**2.2 Site History**

The site consists of the former water vault for the UPRC Federal 27-3F natural gas well. The UPRC Federal 27-3F well was drilled in 1992 to a depth of approximately 7,358 feet. Soil impacts were identified at the water vault during abandonment of the facility. These soil impacts initiated this excavation effort.

### **3.0 FIELD ACTIVITIES**

Remediation efforts consisted of the excavation of petroleum-impacted soil at this site. The soil consisted of roadbase which was underlain by sandy clay to a depth of at least eight feet. Ground water was encountered during the excavation work at approximately eight feet. The 17' x 21' x 8' deep excavated area is shown on Figure 3.

Excavation was initiated at the former water vault location on October 26, 2018. Soil removal was limited to the area immediately adjacent to and below the former water vault and aboveground storage tank. The exterior sidewall samples collected upon completion of the excavation work indicated that no residual soil impacts were present on the sidewalls. The sidewall samples were collected as grab samples near the lower portion of the excavation wall at a depth of six feet.

Ground water was present at the bottom of the excavation. When tested, the ground water sample had a benzene concentration of 47 ug/L, which is greater than the allowable limit of 5 ug/L described in the Colorado Oil and Gas Conservation Commission's (COGCC's) Table 910-1.

The soil samples were analyzed by Summit Scientific Inc. of Golden, Colorado for benzene, toluene, ethylbenzene and xylenes (BTEX), naphthalene, Total Petroleum Hydrocarbons - Gasoline Range Organics (TPH-GRO) by EPA method 8260C, and TPH - Diesel Range Organics (TPH-DRO) by EPA method 8015. The ground water sample was analyzed for BTEX by EPA method 8260C. The laboratory reports and chain-of-custody documentation are included in Appendix A.

Summaries of the laboratory data are included in Tables 1 and 2. Table 1 presents the laboratory analyses for each soil sample. A column stating whether the laboratory analyses passed or failed the COGCC Table 910-1 limits is provided. The laboratory

analyses indicated that all four soil samples collected from the sidewalls achieved the COGCC Table 910-1 limits.

Table 2 presents the ground water analytical data; the water sample (W1) exceeded the COGCC Table 910-1 allowable limits for benzene and xylenes. The benzene concentration in this ground water sample was 47 ug/L, the xylenes concentration was 2,300 ug/L.

A total of 60 cubic yards of petroleum impacted soil was removed by Cachi's Oilfield Services Inc. from the location over this one-day project. The impacted soil was disposed of at the Waste Management Inc. Buffalo Ridge landfill in Keenesburg, Colorado as non-hazardous waste.

Gypsum was placed at the water table during backfilling to promote biodegradation of any residual petroleum in the soil and ground water. Gypsum, which is also known as hydrated calcium sulfate, releases sulfate into the ground water which can enhance anaerobic biodegradation of petroleum constituents.

#### **4.0 DISCUSSION**

As demonstrated by the soil sampling, the petroleum impacted soil was removed from the site by excavation after abandonment of the facility. This was confirmed by the analyses of the soil samples collected from the exterior sidewalls which were below the COGCC Table 910-1 limits. Approximately 60 cubic yards of impacted soil were removed and transported to the landfill.

Ground water was encountered during the excavation and one sample (W1) was collected and analyzed for BTEX. The benzene and xylenes concentrations exceeded the

COGCC Table 910-1 limit in this sample. The benzene concentration in sample "W1" was 47 ug/L.

Since the groundwater sample had a benzene concentration that exceeded the COGCC limit, monitoring wells will need to be installed at this site to delineate the horizontal extent of ground water impacts. Installation and monitoring of the wells will be discussed in separate reporting.

### **5.0 REMARKS**

The discussion and conclusions contained in this report represent our professional opinions. These opinions are based on currently available information and are arrived at in accordance with currently accepted hydrogeologic and engineering practices at this time and location. Other than this, no warranty is implied or intended.

This report was prepared by **FREMONT ENVIRONMENTAL INC.**



11/12/18

Date \_\_\_\_\_

\_\_\_\_\_  
Paul V. Henehan, P.E.

Senior Consultant

## TABLES

**TABLE 1**  
**SUMMARY OF SOIL CHEMISTRY DATA**  
**NOBLE ENERGY INC.**  
**UPRC FEDERAL 27-3F, 6F, WELD COUNTY, COLORADO**  
**FREMONT PROJECT NO. C018-169**

Sample	Depth (ft)	Date Sampled	Location	Pass or Fail	Benzene mg/kg	Toluene mg/kg	Ethyl-Benzene mg/kg	Xylenes mg/kg	Naphthalene mg/kg	TPH GRO mg/kg	TPH DRO mg/kg
N Wall 6 Ft	6	10/26/2018	Wall	Pass	<0.002	<0.005	<0.005	<0.005	<0.010	<50	<50
S Wall 6 Ft	6	10/26/2018	Wall	Pass	<0.002	<0.005	<0.005	<0.005	<0.010	<50	<50
E Wall 6 Ft	6	10/26/2018	Wall	Pass	<0.002	<0.005	<0.005	<0.005	<0.010	<50	<50
W Wall 6 Ft	6	10/26/2018	Wall	Pass	<0.002	<0.005	<0.005	<0.005	<0.010	<50	<50
COGCC Table 910-1 Limits					0.17	85	100	175	23	500	500

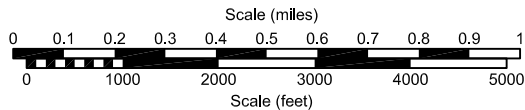
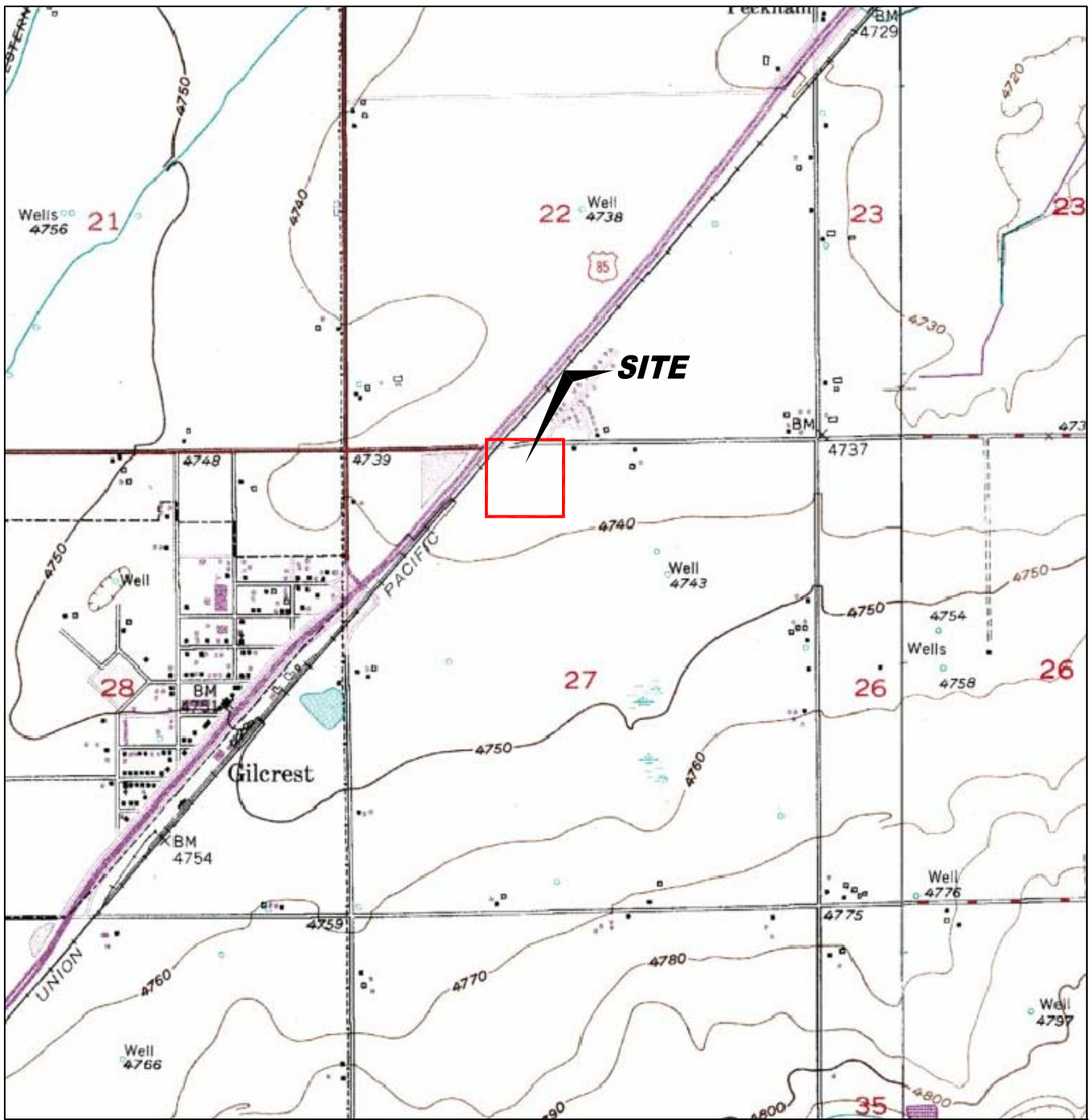
Bold faced values exceed the COGCC Table 910-1 concentrations

**TABLE 2**  
**SUMMARY OF GROUND WATER CHEMISTRY DATA**  
**NOBLE ENERGY INC.**  
**UPRC FEDERAL 27-3F, 6F, WELD COUNTY, COLORADO**  
**FREMONT PROJECT NO. C018-169**

SAMPLE LOCATION	DATE	BENZENE (µg/L)	TOLUENE (µg/L)	ETHYL BENZENE (µg/L)	TOTAL XYLENES (µg/L)
W1	10/26/18	<b>47</b>	180	110	<b>2,300</b>
Table 910-1 Limits		5	560	700	1,400

Bold face values exceed the COGCC limits

## FIGURES



USGS 7.5 MINUTE SERIES (TOPOGRAPHIC)

Figure 1  
SITE LOCATION MAP

**NOBLE UPRC FEDERAL 27-3F, 6F**  
NENW Section 27, T4N R66W  
Weld County, Colorado

Project No. <b>CO18-169</b>	Prepared by	Drawn by <b>TDA</b>
Date <b>11/6/18</b>	Reviewed by <b>PH</b>	Filename <b>18169T</b>





**LEGEND**

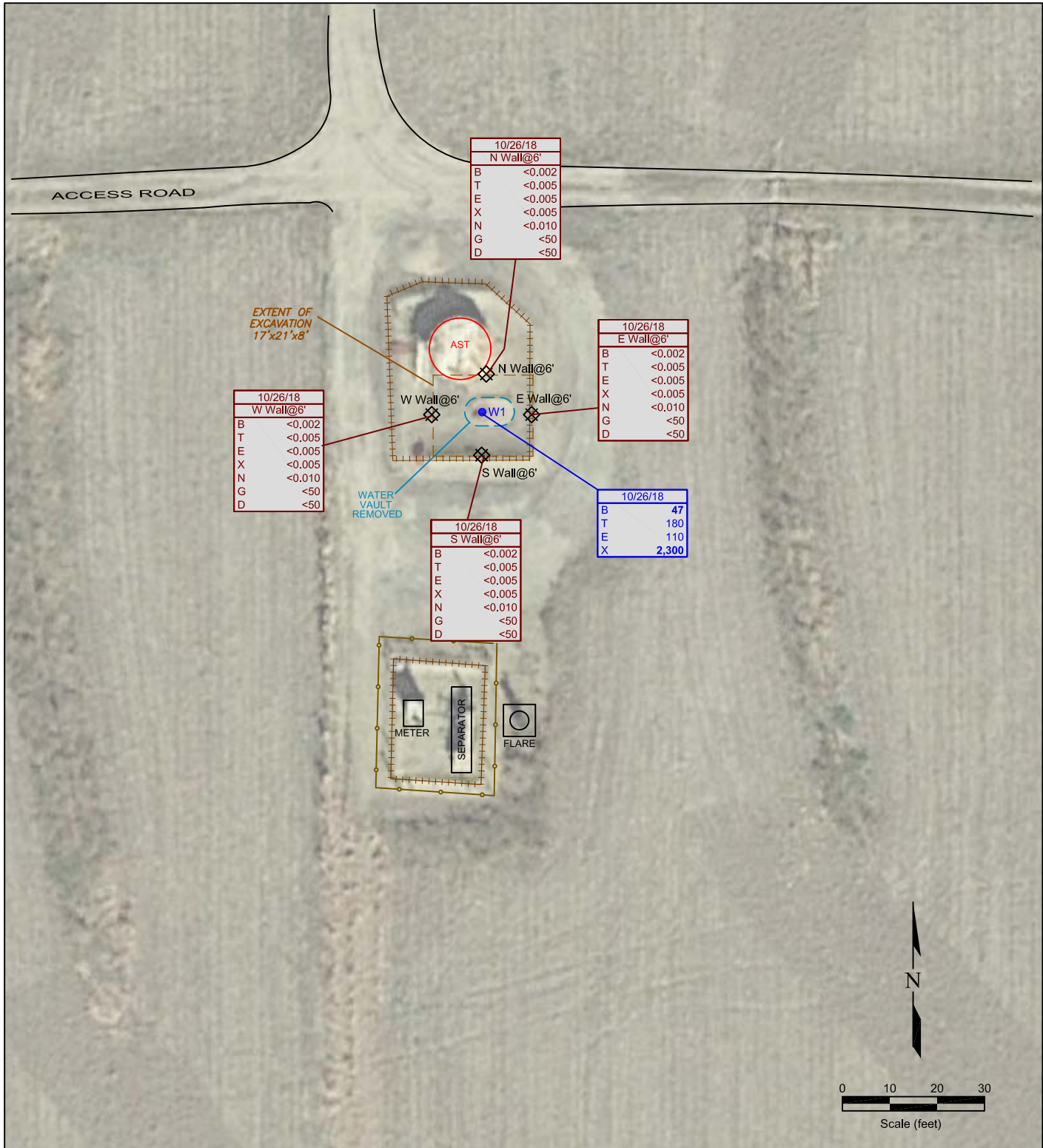
- CONTAINMENT WALL
- - - LIMITS OF EXCAVATION
- ⋯ CONTAINMENT BERM
- FENCE LINE
- ABOVE GROUND STORAGE TANK
- FORMER FORMER FACILITY

**Figure 2  
SITE MAP**

**NOBLE UPRC FEDERAL 27-3F, 6F**  
 NENW Section 27 T4N, R66W  
 Weld County, Colorado

Project No. <b>CO18-169</b>	Prepared by <b>TDA</b>	Drawn by <b>TDA</b>
Date <b>11/6/18</b>	Reviewed by <b>PH</b>	Filename <b>18169Q</b>





**LEGEND**

	WATER SAMPLE LOCATION		ABOVE GROUND STORAGE TANK
	SOIL SAMPLE LOCATION		FORMER FACILITY
	CONTAINMENT WALL		
	LIMITS OF EXCAVATION		
	CONTAINMENT BERM		
	FENCE LINE		

<table border="1"> <tr><td>10/26/18</td><td>DATE SAMPLED</td></tr> <tr><td>B</td><td>47</td></tr> <tr><td>T</td><td>180</td></tr> <tr><td>E</td><td>110</td></tr> <tr><td>X</td><td>2,300</td></tr> </table>	10/26/18	DATE SAMPLED	B	47	T	180	E	110	X	2,300	DATE SAMPLED BENZENE (ug/L) TOLUENE (ug/L) ETHYLBENZENE (ug/L) TOTAL XYLENES (ug/L)	<table border="1"> <tr><td>10/26/18</td><td>DATE SAMPLED</td></tr> <tr><td>N Wall@6'</td><td>DEPTH (ft) and LOCATION</td></tr> <tr><td>B</td><td>&lt;0.002</td></tr> <tr><td>T</td><td>&lt;0.005</td></tr> <tr><td>E</td><td>&lt;0.005</td></tr> <tr><td>X</td><td>&lt;0.005</td></tr> <tr><td>N</td><td>&lt;0.010</td></tr> <tr><td>G</td><td>&lt;50</td></tr> <tr><td>D</td><td>&lt;50</td></tr> </table>	10/26/18	DATE SAMPLED	N Wall@6'	DEPTH (ft) and LOCATION	B	<0.002	T	<0.005	E	<0.005	X	<0.005	N	<0.010	G	<50	D	<50	DATE SAMPLED BENZENE (mg/kg) TOLUENE (mg/kg) ETHYLBENZENE (mg/kg) TOTAL XYLENES (mg/kg) NAPHTHALENE (mg/kg) TPH-GRO (mg/kg) TPH-DRO (mg/kg)
10/26/18	DATE SAMPLED																														
B	47																														
T	180																														
E	110																														
X	2,300																														
10/26/18	DATE SAMPLED																														
N Wall@6'	DEPTH (ft) and LOCATION																														
B	<0.002																														
T	<0.005																														
E	<0.005																														
X	<0.005																														
N	<0.010																														
G	<50																														
D	<50																														

**Figure 3**  
**EXTENT OF EXCAVATION WITH**  
**GROUND WATER and SOIL CHEMISTRY MAP**  
**OCTOBER 26, 2018**  
**NOBLE UPRC FEDERAL 27-3F, 6F**  
**NENW Section 27 T4N, R66W**  
**Weld County, Colorado**

Project No. <b>CO18-169</b>	Prepared by	Drawn by <b>TDA</b>
Date <b>11/6/18</b>	Reviewed by <b>PH</b>	Filename <b>18169S</b>



**APPENDIX A**

**LABORATORY DOCUMENTATION**

# Summit Scientific

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4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

November 02, 2018

Paul Henehan

Fremont Environmental

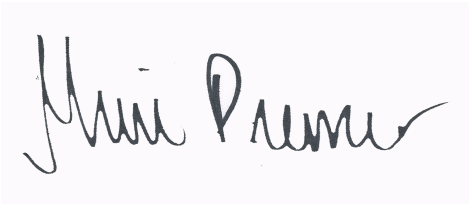
PO Box 1289

Wellington, CO 80549

RE: Noble - UPRC Federal 27-3F, 6F

Enclosed are the results of analyses for samples received by Summit Scientific on 10/26/18 16:50. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads "Muri Premer". The signature is written in a cursive style with a large initial "M" and a long, sweeping underline.

Muri Premer For Ben Shrewsbury

Laboratory Manager



Fremont Environmental  
PO Box 1289  
Wellington CO, 80549

Project: Noble - UPRC Federal 27-3F, 6F

Project Number: [none]  
Project Manager: Paul Henehan

**Reported:**  
11/02/18 17:29

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
N Wall 6 Ft	1810347-01	Soil	10/26/18 00:00	10/26/18 16:50
S Wall 6 Ft	1810347-02	Soil	10/26/18 00:00	10/26/18 16:50
E Wall 6 Ft	1810347-03	Soil	10/26/18 00:00	10/26/18 16:50
W Wall 6 Ft	1810347-04	Soil	10/26/18 00:00	10/26/18 16:50
W1	1810347-05	Water	10/26/18 00:00	10/26/18 16:50

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.*

# Summit Scientific

1810347

741 Corporate Circle Suite I ♦ Golden, Colorado 80401  
303-277-9310 ♦ 303-374-5933 Fax

Page 1 of 1

Client: FREMONT  
Address: \_\_\_\_\_  
City/State/Zip: \_\_\_\_\_  
Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
Sampler Name: HENELAN

Project Manager: HENELAN BILL TO HOWARD  
E-Mail: \_\_\_\_\_  
Project Name: NOBLE - UPRC FEDERAL 27-3F, 6F  
Project Number: \_\_\_\_\_

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix			Analyze For:					Special Instructions			
				HCl	HNO <sub>3</sub>	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)	BTEX	GR/DRO	NAAPHTHALENE	SAR		EC	PH	
N. WALL 6 FT	10/26/18		1			✓							✓	✓	✓				
S. WALL 6 FT			1			✓							✓	✓	✓				
E. WALL 6 FT			1			✓							✓	✓	✓				
W. WALL 6 FT			1			✓							✓	✓	✓				
WI			2			✓		✓					✓						
Relinquished by: <u>[Signature]</u> Date/Time: <u>10/26/18 1650</u>				Received by: <u>[Signature]</u> Date/Time: <u>10-26-18 1650</u>				Turn Around Time (Check)					Notes:						
Relinquished by: _____ Date/Time: _____				Received by: _____ Date/Time: _____				Same Day <input type="checkbox"/>					72 Hours <input type="checkbox"/>						
Relinquished by: _____ Date/Time: _____				Received in Lab by: _____ Date/Time: _____				24 Hours <input type="checkbox"/>					Standard <input checked="" type="checkbox"/>						
Relinquished by: _____ Date/Time: _____				Received in Lab by: _____ Date/Time: _____				48 Hours <input type="checkbox"/>					Sample Integrity:						
								Temperature Upon Receipt: <u>5.6</u>					Intact: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>						

**Sample Receipt Checklist**

S2 Work Order 1810347

Client: Freemont Client Project ID: Noble - UPRC Federal 27-3F, 6F

Shipped Via: H.D./P.U./FedEx/UPS/USPS/Other H.D. Airbill #: \_\_\_\_\_

Matrix (check all that apply):  Air  Soil/Solid  Water  Other: \_\_\_\_\_  
(Describe)

Temp (°C)	<u>5.6</u>
-----------	------------

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature at 4°C +/- 2°C <sup>(1)</sup> ?				
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 <sup>(1)</sup> ?	/			
Was adequate sample volume provided <sup>(1)</sup> ?	/			
If custody seals are present, are they intact <sup>(1)</sup> ?			/	
Are samples with holding times due within 48 hours sample due within 48 hours present?			/	
Is a chain-of-custody (COC) form present and filled out completely <sup>(1)</sup> ?	/			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	/			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	/			
Is the COC properly relinquished by the client w/ date and time recorded <sup>(1)</sup> ?	/			
For volatiles in water – is there headspace present? <b>If yes, contact client and note in narrative.</b>		/		
Are samples preserved that require preservation (excluding cooling) <sup>(1)</sup> ?			/	
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 <sup>(1)</sup> ?			/	
Record the pH in Comments.			/	
If dissolved metals are requested, were samples field filtered?			/	
Additional Comments (if any):				
<sup>(1)</sup> If NO, then contact the client before proceeding with analysis and note in case narrative.				

UP  
Custodian Printed Name or Initials

[Signature]  
Signature of Custodian

10.26.18 1659  
Date/Time



Fremont Environmental  
 PO Box 1289  
 Wellington CO, 80549

Project: Noble - UPRC Federal 27-3F, 6F

Project Number: [none]  
 Project Manager: Paul Henehan

**Reported:**  
 11/02/18 17:29

**N Wall 6 Ft**  
**1810347-01 (Soil)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **10/26/18 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1810432	10/30/18	10/31/18	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: **10/26/18 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		105 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.4 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **10/26/18 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1810433	10/30/18	11/02/18	EPA 8015M	

Date Sampled: **10/26/18 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		110 %	30-150		"	"	"	"	

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.



Fremont Environmental  
 PO Box 1289  
 Wellington CO, 80549

Project: Noble - UPRC Federal 27-3F, 6F

Project Number: [none]  
 Project Manager: Paul Henehan

**Reported:**  
 11/02/18 17:29

**S Wall 6 Ft**  
**1810347-02 (Soil)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **10/26/18 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1810432	10/30/18	10/31/18	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: **10/26/18 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		108 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.3 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **10/26/18 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1810433	10/30/18	11/02/18	EPA 8015M	

Date Sampled: **10/26/18 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		97.6 %	30-150		"	"	"	"	

Summit Scientific

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Fremont Environmental  
 PO Box 1289  
 Wellington CO, 80549

Project: Noble - UPRC Federal 27-3F, 6F

Project Number: [none]  
 Project Manager: Paul Henehan

**Reported:**  
 11/02/18 17:29

**E Wall 6 Ft**  
**1810347-03 (Soil)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **10/26/18 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1810432	10/30/18	10/31/18	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: **10/26/18 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		107 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		97.6 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **10/26/18 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1810433	10/30/18	11/02/18	EPA 8015M	

Date Sampled: **10/26/18 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		99.4 %	30-150		"	"	"	"	

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.



Fremont Environmental  
 PO Box 1289  
 Wellington CO, 80549

Project: Noble - UPRC Federal 27-3F, 6F

Project Number: [none]  
 Project Manager: Paul Henehan

**Reported:**  
 11/02/18 17:29

**W Wall 6 Ft**  
**1810347-04 (Soil)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **10/26/18 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1810432	10/30/18	10/31/18	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: **10/26/18 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		106 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		101 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		108 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **10/26/18 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1810433	10/30/18	11/02/18	EPA 8015M	

Date Sampled: **10/26/18 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		118 %	30-150		"	"	"	"	

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Fremont Environmental  
 PO Box 1289  
 Wellington CO, 80549

Project: Noble - UPRC Federal 27-3F, 6F

Project Number: [none]  
 Project Manager: Paul Henehan

**Reported:**  
 11/02/18 17:29

**W1**

**1810347-05 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **10/26/18 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Benzene</b>	<b>47</b>	1.0	ug/l	1	1810428	10/30/18	10/31/18	EPA 8260B	
<b>Toluene</b>	<b>180</b>	1.0	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>110</b>	1.0	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>2300</b>	50	"	25	"	"	"	"	

Date Sampled: **10/26/18 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		102 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		105 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		124 %	21-167		"	"	"	"	

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Fremont Environmental  
PO Box 1289  
Wellington CO, 80549

Project: Noble - UPRC Federal 27-3F, 6F

Project Number: [none]  
Project Manager: Paul Henehan

**Reported:**  
11/02/18 17:29

### Volatile Organic Compounds by EPA Method 8260B - Quality Control

#### Summit Scientific

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

#### Batch 1810428 - EPA 5030 Water MS

##### Blank (1810428-BLK1)

Prepared: 10/30/18 Analyzed: 10/31/18

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	2.0	"							
Surrogate: 1,2-Dichloroethane-d4	12.9		"	13.2		97.7	23-173			
Surrogate: Toluene-d8	13.5		"	13.3		101	20-170			
Surrogate: 4-Bromofluorobenzene	15.9		"	13.3		119	21-167			

##### LCS (1810428-BS1)

Prepared: 10/30/18 Analyzed: 10/31/18

Benzene	26.2	1.0	ug/l	33.3		78.8	70-130			
Toluene	26.9	1.0	"	33.3		80.6	70-130			
Ethylbenzene	28.9	1.0	"	33.3		86.6	70-130			
m,p-Xylene	56.4	2.0	"	66.7		84.6	70-130			
o-Xylene	30.0	1.0	"	33.3		90.1	70-130			
Surrogate: 1,2-Dichloroethane-d4	13.7		"	13.2		104	23-173			
Surrogate: Toluene-d8	13.2		"	13.3		99.2	20-170			
Surrogate: 4-Bromofluorobenzene	14.7		"	13.3		110	21-167			

##### Matrix Spike (1810428-MS1)

Source: 1810324-19

Prepared: 10/30/18 Analyzed: 10/31/18

Benzene	328	1.0	ug/l	33.3	409	NR	70-130			E
Toluene	27.8	1.0	"	33.3	ND	83.3	70-130			
Ethylbenzene	302	1.0	"	33.3	283	57.3	70-130			E
m,p-Xylene	279	2.0	"	66.7	245	50.2	70-130			E
o-Xylene	31.3	1.0	"	33.3	ND	93.9	70-130			
Surrogate: 1,2-Dichloroethane-d4	18.9		"	13.2		143	23-173			
Surrogate: Toluene-d8	13.4		"	13.3		100	20-170			
Surrogate: 4-Bromofluorobenzene	18.0		"	13.3		135	21-167			

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Fremont Environmental  
PO Box 1289  
Wellington CO, 80549

Project: Noble - UPRC Federal 27-3F, 6F

Project Number: [none]  
Project Manager: Paul Henehan

**Reported:**  
11/02/18 17:29

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

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

**Batch 1810428 - EPA 5030 Water MS**

**Matrix Spike Dup (1810428-MSD1)**

Source: 1810324-19

Prepared: 10/30/18 Analyzed: 10/31/18

Benzene	308	1.0	ug/l	33.3	409	NR	70-130	6.37	30	E
Toluene	28.7	1.0	"	33.3	ND	86.0	70-130	3.19	30	
Ethylbenzene	287	1.0	"	33.3	283	10.3	70-130	5.32	30	E
m,p-Xylene	264	2.0	"	66.7	245	27.3	70-130	5.64	30	E
o-Xylene	31.6	1.0	"	33.3	ND	94.8	70-130	0.954	30	
Surrogate: 1,2-Dichloroethane-d4	17.0		"	13.2		128	23-173			
Surrogate: Toluene-d8	13.6		"	13.3		102	20-170			
Surrogate: 4-Bromofluorobenzene	17.8		"	13.3		133	21-167			

**Batch 1810432 - EPA 5030 Soil MS**

**Blank (1810432-BLK1)**

Prepared: 10/30/18 Analyzed: 10/31/18

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	0.0408		"	0.0396		103	23-173			
Surrogate: Toluene-d8	0.0396		"	0.0400		99.0	20-170			
Surrogate: 4-Bromofluorobenzene	0.0400		"	0.0400		100	21-167			

**LCS (1810432-BS1)**

Prepared: 10/30/18 Analyzed: 10/31/18

Benzene	0.0946	0.0020	mg/kg	0.100		94.6	70-130			
Toluene	0.0964	0.0050	"	0.100		96.4	70-130			
Ethylbenzene	0.103	0.0050	"	0.100		103	70-130			
m,p-Xylene	0.206	0.010	"	0.200		103	70-130			
o-Xylene	0.102	0.0050	"	0.100		102	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0413		"	0.0396		104	23-173			
Surrogate: Toluene-d8	0.0394		"	0.0400		98.4	20-170			
Surrogate: 4-Bromofluorobenzene	0.0396		"	0.0400		98.9	21-167			

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Wellington CO, 80549

Project: Noble - UPRC Federal 27-3F, 6F

Project Number: [none]  
Project Manager: Paul Henehan

**Reported:**  
11/02/18 17:29

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

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

**Batch 1810432 - EPA 5030 Soil MS**

**Matrix Spike (1810432-MS1)**

Source: 1810343-01

Prepared: 10/30/18 Analyzed: 10/31/18

Benzene	0.108	0.0020	mg/kg	0.100	ND	108	70-130			
Toluene	0.112	0.0050	"	0.100	ND	112	70-130			
Ethylbenzene	0.115	0.0050	"	0.100	ND	115	70-130			
m,p-Xylene	0.227	0.010	"	0.200	ND	113	70-130			
o-Xylene	0.112	0.0050	"	0.100	ND	112	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0412		"	0.0396		104	23-173			
Surrogate: Toluene-d8	0.0403		"	0.0400		101	20-170			
Surrogate: 4-Bromofluorobenzene	0.0395		"	0.0400		98.8	21-167			

**Matrix Spike Dup (1810432-MSD1)**

Source: 1810343-01

Prepared: 10/30/18 Analyzed: 10/31/18

Benzene	0.0976	0.0020	mg/kg	0.100	ND	97.6	70-130	9.76	30	
Toluene	0.102	0.0050	"	0.100	ND	102	70-130	9.45	30	
Ethylbenzene	0.108	0.0050	"	0.100	ND	108	70-130	5.83	30	
m,p-Xylene	0.216	0.010	"	0.200	ND	108	70-130	4.62	30	
o-Xylene	0.106	0.0050	"	0.100	ND	106	70-130	6.01	30	
Surrogate: 1,2-Dichloroethane-d4	0.0410		"	0.0396		103	23-173			
Surrogate: Toluene-d8	0.0393		"	0.0400		98.2	20-170			
Surrogate: 4-Bromofluorobenzene	0.0394		"	0.0400		98.6	21-167			

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 Wellington CO, 80549

Project: Noble - UPRC Federal 27-3F, 6F

Project Number: [none]  
 Project Manager: Paul Henehan

**Reported:**  
 11/02/18 17:29

**Extractable Petroleum Hydrocarbons by 8015 - Quality Control**  
**Summit Scientific**

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

**Batch 1810433 - EPA 3550A**

**Blank (1810433-BLK1)**

Prepared: 10/30/18 Analyzed: 11/01/18

C10-C28 (DRO) ND 50 mg/kg

**LCS (1810433-BS1)**

Prepared: 10/30/18 Analyzed: 11/01/18

C10-C28 (DRO) 485 50 mg/kg 500 97.0 70-130

**Matrix Spike (1810433-MS1)**

**Source: 1810343-01**

Prepared: 10/30/18 Analyzed: 11/01/18

C10-C28 (DRO) 484 50 mg/kg 500 ND 96.8 70-130

**Matrix Spike Dup (1810433-MSD1)**

**Source: 1810343-01**

Prepared: 10/30/18 Analyzed: 11/01/18

C10-C28 (DRO) 482 50 mg/kg 500 ND 96.5 70-130 0.319 20

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Project: Noble - UPRC Federal 27-3F, 6F

Project Number: [none]  
Project Manager: Paul Henehan

**Reported:**  
11/02/18 17:29

### Notes and Definitions

- E The concentration indicated for this analyte is an estimated value above the calibration range of the instrument.
- 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