

# **FREMONT ENVIRONMENTAL INC.**

November 14, 2018

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

Subject:     **Follow-up Site Investigation Report**  
              Bates #1, C3-2  
              API # 05-123-10929  
              SWNE Sec 3, T4N, R64W  
              Weld County, Colorado  
              Fremont Project No. C018-013  
              Facility #319242, Remediation #11124

Dear Mr. Evans:

Enclosed please find a copy of the above referenced Follow-up Site Investigation Report for the Bates #1, C3-2 site in Weld County, Colorado. The enclosed report describes site investigation and sampling efforts to assess soil and ground water quality at the site.

Since two COGCC-compliant semi-annual sampling events have occurred, Noble should request that the COGCC provide a No Further Action Determination (NFA) for this 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

**FOLLOW-UP SITE INVESTIGATION REPORT**

**NOBLE ENERGY INC.**

**BATES #1, C3-2**

**WELD COUNTY, COLORADO**

**FREMONT PROJECT NO. C018-013**

**FACILITY #319242, REMEDIATION #11124**

**Prepared by:**

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

**November 14, 2018**

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# **FOLLOW-UP SITE INVESTIGATION REPORT**

**NOBLE ENERGY INC.**

**BATES #1, C3-2**

**WELD COUNTY, COLORADO**

**FREMONT PROJECT NO. C018-013**

**FACILITY #319242, REMEDIATION #11124**

## **1.0 INTRODUCTION**

The purpose of this document is to present soil and ground water quality data collected during a follow-up site investigation at the Bates #1, C3-2 location in Weld County, Colorado. Impacted ground water had been identified at this location during facility abandonment due to a historical release from the facility's water vault. Five temporary monitoring wells were installed at this site on April 6, 2018 to delineate the magnitude and extent of subsurface impacts. An agreement with the landowner required the immediate removal of the temporary monitoring wells installed in April 2018 with a follow-up site investigation to be conducted in November 2018. Five new temporary monitoring wells were installed at the site on November 2, 2018; these wells were removed later that same day after sampling.

## **2.0 BACKGROUND INFORMATION**

### **2.1 Site Location**

The Bates #1, C3-2 site is located approximately three miles southeast of Kersey, Colorado in Weld County as shown on Figure 1. The site is located in a rural and agricultural area approximately 0.4 miles southwest of the intersection of County Road 50 and County Road 57. The location is further described as the SW  $\frac{1}{4}$  of the NE  $\frac{1}{4}$  of Section 3, Township 4N, Range 64W.

## **2.2 Site History**

The site consists of the former water vault for the Bates #1, C3-2 natural gas wells. The Bates #1 well was drilled in 1982 to a depth of approximately 6,915 feet. Soil impacts were identified at the water vault during abandonment of the facility.

Approximately 150 cubic yards of impacted soil were removed by Cachi's Oilfield Services, Inc. in March 2018 and disposed of at the Waste Management Inc. Northern Colorado landfill in Ault, Colorado as non-hazardous waste.

Laboratory analyses of the soil and ground water samples indicated that ground water impacts in excess of the COGCC's Table 910-1 limits were present in the excavation of the former water vault. The benzene concentration in the ground water sample was 56 ug/L which exceeds the limit of 5 ug/L. These ground water impacts initiated the investigation efforts.

## **3.0 SITE INVESTIGATION ACTIVITIES**

### **3.1 Soil Borings/Monitoring Wells**

A follow-up site investigation was conducted at the facility on November 2, 2018. Five soil borings were advanced utilizing a Geoprobe rig. These borings were temporarily completed as stickup 1-inch diameter monitoring wells; after soil and ground water sampling, each of the wells was abandoned. The five borings/monitoring wells were used to determine soil and ground water quality at the site. The locations of the temporary monitoring wells are illustrated on the attached figures.

Generally, the subsurface consists of sandy clay to a depth of approximately three feet which is then underlain by silty sand to a depth of at least 14 feet. Ground water is

present across the site at a depth of approximately eight feet. Geologic cross sections are presented on Figure 4.

The 1-inch diameter monitoring wells were constructed with 10 feet sections of well screen that were placed at a total depth of approximately 14 feet and temporarily completed as stickup vaults. Soil samples from each of the borings were evaluated in the field using a photoionization detector (PID). Logs of the monitoring wells are presented in Appendix A.

Soil samples were collected from each of the borings and sent to Summit Scientific, Inc. in Golden, Colorado for the analyses of benzene, toluene, ethylbenzene and xylenes (BTEX), naphthalene, total petroleum hydrocarbons-gasoline range organics (TPH-GRO), and TPH-diesel range organics (TPH-DRO).

Soil impacts were not observed in any of the five borings above the COGCC's Table 910-1 limits for BTEX, naphthalene, TPH-GRO and TPH-DRO. The soil chemistry is presented on Figure 5 and summarized on Table 1. The laboratory's report is provided in Appendix C.

### **3.2 Ground Water Monitoring**

Ground water levels were measured in the five monitoring wells on November 2, 2018 in accordance with the Sampling Plan included in Appendix B. The data are summarized in Table 2.

Water table contours inferred from the April 2018 data are illustrated on Figure 6 because the temporary wells installed in November 2018 were not surveyed. Based on these data,

ground water is inferred to flow to the northeast. The water table gradient had been calculated at approximately 0.013 feet per foot (ft/ft) for the April 2018 data.

### **3.3 Ground Water Sampling and Analysis**

Ground water samples were collected from the five monitoring wells on November 2, 2018. All ground water samples were submitted to Summit Scientific, Inc. for analyses of BTEX by EPA Method 8260B.

The ground water concentrations for the five monitoring wells were below their respective COGCC Table 910-1 values. The ground water chemistry is shown on Figure 7. The ground water analytical data are summarized in Table 2. A copy of the laboratory's report is presented in Appendix C.

## **4.0 DISCUSSION**

A follow-up site investigation was conducted at the Bates #1, C3-2 location in November 2018 as a result of a release from the former facility's water vault. A total of five temporary monitoring wells were used to delineate the magnitude and extent of ground water impacts.

Soil impacts above the COGCC Table 910-1 limits were not observed in any of the soil borings. Excavation and removal of impacted soil had previously been completed during removal of the water vault in March 2018. Approximately 150 cubic yards of soil were excavated and disposed of at the Waste Management Buffalo Ridge Landfill as non-hazardous waste.

The data collected from the monitoring wells indicated that the ground water flow direction is to the northeast. Further, the BTEX concentrations in the five temporary monitoring wells were less than the COGCC Table 910-1 limits; these data are illustrated

on Figure 7. The temporary wells were abandoned immediately after ground water sampling.

Due to landowner restrictions, Noble completed two semi-annual temporary site investigations. Since both semi-annual sampling events have resulted in COGCC-compliant BTEX concentrations, Noble will request closure of this site.

### 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.**



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

11/14/18  
Date\_\_\_\_\_

Reviewed by:



\_\_\_\_\_  
Michael R. Gerstner  
Senior Geologist

11/14/18  
Date\_\_\_\_\_

## TABLES

**TABLE 1**  
**SUMMARY OF SOIL CHEMISTRY DATA**  
**NOBLE ENERGY INC.**  
**BATES #1, C3-2, WELD COUNTY, COLORADO**  
**FREMONT PROJECT NO. C018-013**

<b>SAMPLE LOCATION</b>	<b>DATE SAMPLED</b>	<b>DEPTH ft</b>	<b>BENZENE mg/kg</b>	<b>TOLUENE mg/kg</b>	<b>ETHYL BENZENE mg/kg</b>	<b>TOTAL XYLENES mg/kg</b>	<b>NAPHTH-ALENE mg/kg</b>	<b>TPH-GRO mg/kg</b>	<b>TPH-DRO mg/kg</b>
MW-1 6 Ft	04/06/18	6	<0.002	<0.005	<0.005	<0.010	<0.010	<50	<50
MW-2 6 Ft	04/06/18	6	<0.002	<0.005	<0.005	<0.010	<0.010	<50	<50
MW-3 6Ft	04/06/18	6	<0.002	<0.005	<0.005	<0.010	<0.010	<50	<50
MW-4 6 Ft	04/06/18	6	<0.002	<0.005	<0.005	<0.010	<0.010	<50	<50
MW-5 6 Ft	04/06/18	6	<0.002	<0.005	<0.005	<0.010	<0.010	<50	<50
MW-1R	11/02/18	6	<0.002	<0.005	<0.005	<0.010	<0.010	<50	<50
MW-2R	11/02/18	6	<0.002	<0.005	<0.005	<0.010	<0.010	<50	<50
MW-3R	11/02/18	6	<0.002	<0.005	<0.005	<0.010	<0.010	<50	<50
MW-4R	11/02/18	6	<0.002	<0.005	<0.005	<0.010	<0.010	<50	<50
MW-5R	11/02/18	6	<0.002	<0.005	<0.005	<0.010	<0.010	<50	<50
<b>COGCC Table 910-1 Concentrations</b>			<b>0.17</b>	<b>85</b>	<b>100</b>	<b>175</b>	<b>23</b>	<b>500*</b>	<b>500*</b>

The TPH-GRO and TPH-DRO concentrations are added together; if the sum of the two is >500 mg/kg, this exceeds the COGCC Table 910-1 limit

**TABLE 2**  
**SUMMARY OF GROUND WATER ELEVATION DATA AND CHEMISTRY DATA**  
**NOBLE ENERGY INC.**  
**BATES #1, C3-2, WELD COUNTY, COLORADO**  
**FREMONT PROJECT NO. C018-013**

<b>SAMPLE LOCATION</b>	<b>DATE</b>	<b>BENZENE (µg/L)</b>	<b>TOLUENE (µg/L)</b>	<b>ETHYL BENZENE (µg/L)</b>	<b>TOTAL XYLENES (µg/L)</b>	<b>TOC ELEVATION (feet)</b>	<b>DEPTH TO GROUND WATER (ft)</b>	<b>GROUND WATER ELEVATION (ft)</b>	<b>FREE PRODUCT THICKNESS (ft)</b>
MW-1	04/06/18	<1.0	<1.0	<1.0	<1.0	100.00	10.11	89.89	NP
MW-1R	11/02/18	<1.0	<1.0	<1.0	<1.0		NM	NM	NP
MW-2	04/06/18	<1.0	<1.0	<1.0	<1.0	98.55	8.88	89.67	NP
MW-2R	11/02/18	<1.0	<1.0	<1.0	<1.0		NM	NM	NP
MW-3	04/06/18	<1.0	<1.0	<1.0	<1.0	98.32	8.85	89.47	NP
MW-3R	11/02/18	<1.0	<1.0	<1.0	<1.0		NM	NM	NP
MW-4	04/06/18	<1.0	<1.0	<1.0	<1.0	98.66	9.04	89.62	NP
MW-4R	11/02/18	<1.0	<1.0	<1.0	<1.0		NM	NM	NP
MW-5	04/06/18	<1.0	<1.0	<1.0	<1.0	98.54	8.87	89.67	NP
MW-5R	11/02/18	<1.0	<1.0	<1.0	<1.0		NM	NM	NP
Table 910-1 Limits		5	560	700	1,400				

Bold face values exceed the COGCC limits

NP - No Free Product

## FIGURES





-  MONITORING WELL
-  CONTAINMENT BERM
-  FENCE LINE
-  LIMITS OF EXCAVATION
-  ABOVE GROUND STORAGE TANK
-  FORMER FACILITY
-  BUILDING
-  ABOVE GROUND STORAGE TANK
-  FORMER FACILITY
-  BUILDING

Figure 2  
SITE MAP

**Noble Bates #1, C3-2**  
SW NE Sec. 3, T4N, R64W - 40.34323°N 104.53432°W  
Weld County, Colorado

Project No. <b>C018-013</b>	Prepared by TDA	Drawn by <b>TDA</b>
Date <b>11/11/18</b>	Reviewed by	Filename <b>18013Q</b>



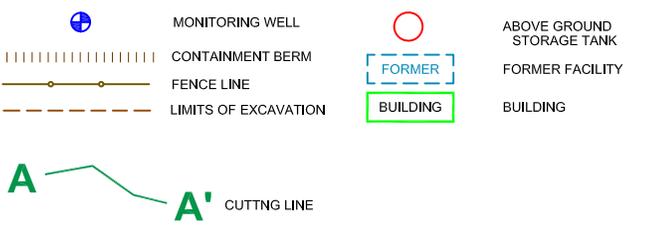
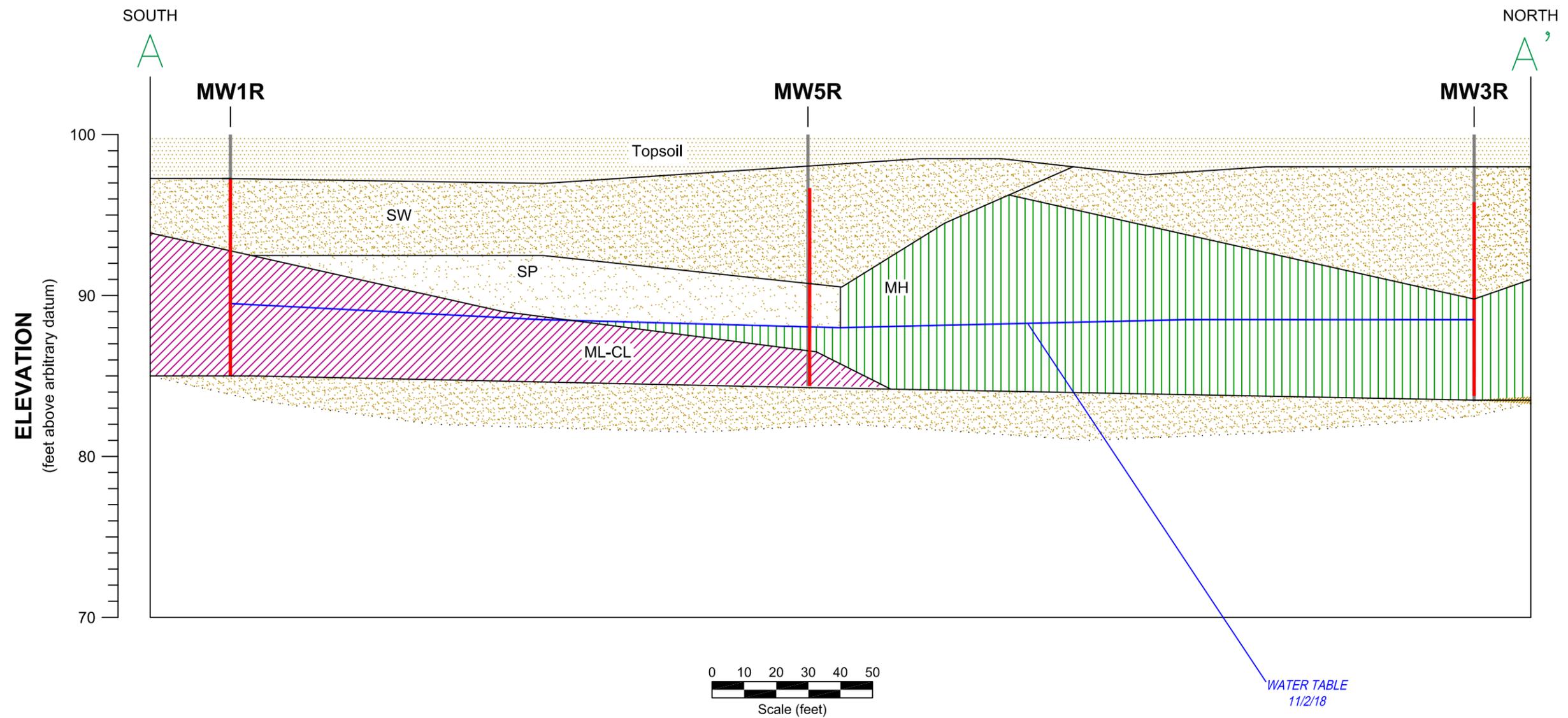


Figure 3  
**CROSS SECTION A-A' MAP**

**Noble Bates #1, C3-2**  
 SW NE Sec. 3, T4N, R64W - 40.34323°N 104.53432°W  
 Weld County, Colorado

Project No. <b>C018-013</b>	Prepared by	Drawn by <b>TDA</b>
Date <b>11/13/18</b>	Reviewed by	Filename <b>18013Q</b>



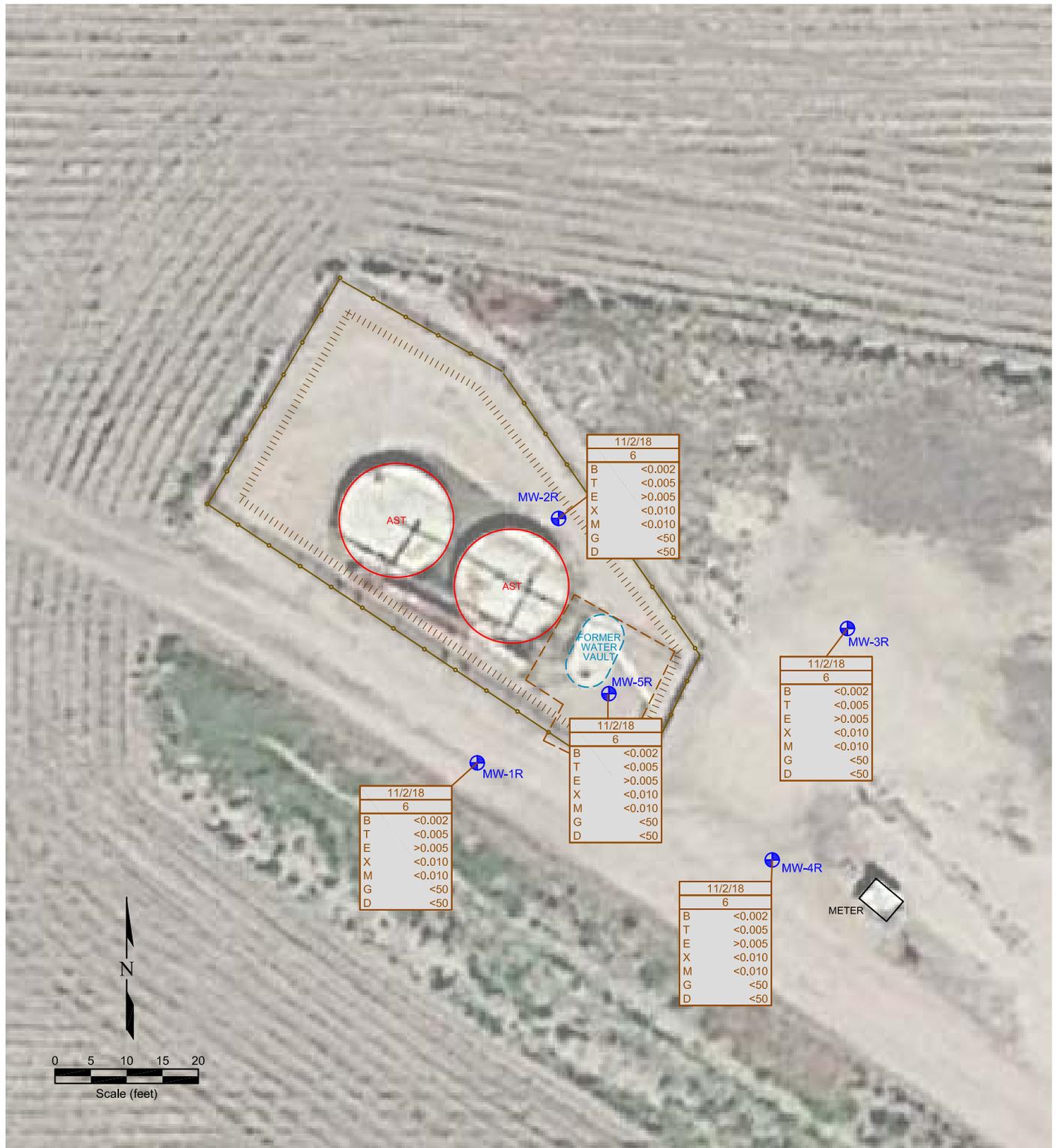


**LEGEND**

	Clay, high plasticity		Sand, well-graded		Asphalt	 Cased interval Screened interval Uncased interval Plug-back interval
	Clay low plasticity		Sand, poorly-graded		Concrete	
	Silt, high plasticity		Gravel well-graded		Basin fill	
	Silt, low plasticity		Gravel poorly-graded			

Figure 4  
**CROSS-SECTION A-A' MAP**  
 November 2, 2018  
**Noble - Bates #1, C3-2**  
 SW NE Sec. 3, Section 23, T4N, R64W  
 Weld County, Colorado

Project No. <b>CO18-013</b>	Prepared by	Drawn by
Date <b>11/13/18</b>	Reviewed by	Filename <b>18013X</b>



	MONITORING WELL		ABOVE GROUND STORAGE TANK
	CONTAINMENT BERM		FORMER FACILITY
	FENCE LINE		BUILDING
	LIMITS OF EXCAVATION		

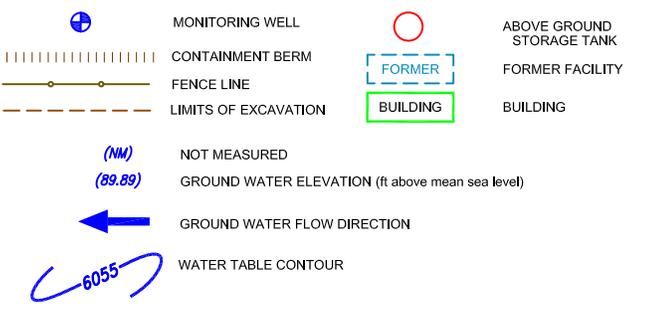
11/2/18	
6	
B	<0.002
T	<0.005
E	>0.005
X	<0.010
M	<0.010
G	<50
D	<50

DATE SAMPLED	11/2/18
BENZENE (mg/kg)	<0.002
TOLUENE (mg/kg)	<0.005
ETHYLBENZENE (mg/kg)	>0.005
TOTAL XYLENES (mg/kg)	<0.010
NAPHTHALENE (mg/kg)	<0.010
TPH-GRO (mg/kg)	<50
TPH-DRO (mg/kg)	<50

**Figure 5**  
**SOIL CHEMISTRY MAP**  
**November 2, 2018**

**Noble Bates #1, C3-2**  
SW NE Sec. 3, T4N, R64W - 40.34323°N 104.53432°W  
Weld County, Colorado

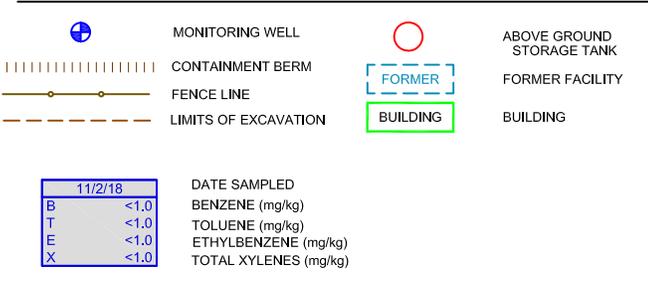
Project No. <b>C018-013</b>	Prepared by	Drawn by <b>TDA</b>	
Date <b>11/11/18</b>	Reviewed by	Filename <b>18013Q</b>	



**Figure 6**  
**INFERRED GROUND WATER CONTOUR MAP**  
 November 2, 2018

**Noble Bates #1, C3-2**  
 SW NE Sec. 3, T4N, R64W - 40.34323°N 104.53432°W  
 Weld County, Colorado

Project No. <b>C018-013</b>	Prepared by	Drawn by <b>TDA</b>	
Date <b>11/11/18</b>	Reviewed by	Filename <b>18013Q</b>	



**Figure 7**  
**GROUND WATER CHEMISTRY MAP**  
**November 2, 2018**

**Noble Bates #1, C3-2**  
 SW NE Sec. 3, T4N, R64W - 40.34323°N 104.53432°W  
 Weld County, Colorado

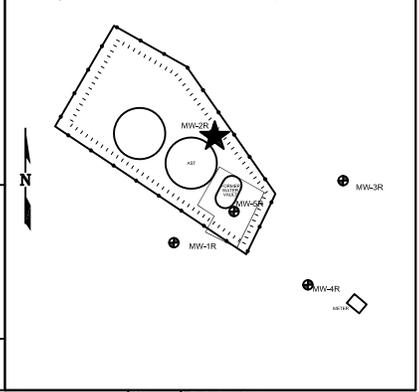
Project No. <b>C018-013</b>	Prepared by	Drawn by <b>TDA</b>	
Date <b>11/11/18</b>	Reviewed by	Filename <b>18013Q</b>	

APPENDIX A  
**BORING LOGS**



# BORING/WELL CONSTRUCTION LOG

Boring/Well Location Sketch Map



Page 1 of

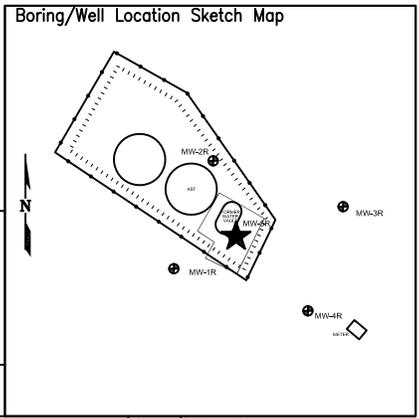
Boring/Well No. <b>MW-2R</b>		Total Depth <b>14'</b>	Location <b>Noble Energy Bates #1, C3-2 SW NE Sec 3, T4N, R64W Weld County, Colorado</b>		
Project No./Name <b>C018-013/Noble Bates #1, C3-2</b>			Drilling Contractor/Driller <b>DrillPro</b>		
Geologist/Office <b>Paul Henehan</b>			Approved By		
Drilling Equipment/Method <b>Geoprobe</b>			Size/Type of Bit <b>2.5" direct push</b>	Sampling Method <b>direct push</b>	Start/Finish Date <b>11/2/18</b>
Well Installed? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Casing Mtrl./Dia. <b>PVC/1"</b>	Screen: Type <b>Slotted</b>   Mtrl. <b>PVC</b>   Length <b>10'</b>   Dia. <b>1"</b>   Slot Size <b>0.010"</b>		
Elevation of: (ft. above datum)		Ground Surface	Top of Well Casing	Top of Screen	Bottom of Screen
					Ground Water Surface/Date Measured

DEPTH (feet)	WELL CONSTRUCTION		LITHOLOGY		Penetration Rate (blows/6")	Recovery (%)	Sample Interval (feet)	PID Values (ppm)
			GRAPHIC LOG	VISUAL DESCRIPTION				
	Bentonite	Blank	1"	1"				
5	#10-20 Silica Sand	Screen	1"	1"				0
10								105
15								86
20								2





# BORING/WELL CONSTRUCTION LOG



Page 1 of 1

Boring/Well No. <b>MW-5R</b>		Total Depth <b>14'</b>		Location <b>Noble Energy Bates #1, C3-2 SW NE Sec 3, T4N, R64W Weld County, Colorado</b>			
Project No./Name <b>C018-013/Noble Bates #1, C3-2</b>				Drilling Contractor/Driller <b>DrillPro</b>			
Geologist/Office <b>Paul Henehan</b>				Approved By			
Drilling Equipment/Method <b>GeoProbe</b>				Size/Type of Bit <b>2.5" direct push</b>		Sampling Method <b>direct push</b>	Start/Finish Date <b>11/2/18</b>
Well Installed? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Casing Mtrl./Dia. <b>PVC/1"</b>		Screen: Type <b>Slotted</b> Mtrl. <b>PVC</b> Length <b>10'</b> Dia. <b>1"</b> Slot Size <b>0.010"</b>			
Elevation of: (ft. above datum)		Ground Surface	Top of Well Casing	Top of Screen	Bottom of Screen	Ground Water Surface/Date Measured	

DEPTH (feet)	WELL CONSTRUCTION		LITHOLOGY		Penetration Rate (blows/6")	Recovery (%)	Sample Interval (feet)	PID Values (ppm)
			GRAPHIC LOG	VISUAL DESCRIPTION				
	Bentonite	Blank	1"	1"				
5	#10-20 Silica Sand	Screen	1"	1"				0
10								4 29
15								1
20								1

**APPENDIX B**

**SAMPLING PLAN**

## SAMPLING METHODS AND PROCEDURES

### Water Level Measurements

All ground water level measurements will be obtained using an electric measuring device, which indicates when a probe is in contact with ground water. Measurements will be obtained by lowering the device into the well until the water surface had been encountered, and by measuring the distance from the top of the inside riser pipe to the probe. All of the measurements will be recorded to the nearest 0.01 ft. To minimize cross-contamination, the water level indicator will be decontaminated with isopropyl alcohol and distilled water between each well.

### Monitoring Well Sampling

All monitoring wells were sampled from the “cleanest” to the “most contaminated” according to the protocols listed below.

#### Field Protocol

- Step 1            Measure water level in each well.
- Step 2            Purge each monitoring well by evacuating a minimum of three well bore volumes using a disposable polyethylene bailer.
- Step 3            Collect water samples using a disposable polyethylene bailer.
- Step 4            Cool samples to approximately 4°C for transportation.
- Step 5            Store water samples and transport to a specific laboratory, following all documentation and chain-of-custody procedures.

Upon completion of ground water sampling, a chain-of-custody log will be completed. Chain-of-custody records include the following information: project, project number, shipped by, shipped to, suspected hazard, sampling point, location, field identification number, date collected, sample type, number of containers, analysis required, and sampler's signature.

The chain-of-custody records will be shipped with the samples to the laboratory. Upon arrival at the laboratory the samples will be checked in and signed by the appropriate laboratory personnel. Laboratory identification numbers will be noted on the chain-of-custody record. Upon completion of the laboratory analysis, the completed chain-of-custody record will be returned to the project manager.

### **Analytical Methods**

The following list identifies the various chemical constituents and analytical methods which will be used for their quantification.

<u>Chemical Parameter</u>	<u>Method</u>
Benzene, Toluene, Ethylbenzene and Total Xylenes (BTEX)	EPA Method – 8260B

APPENDIX C

LABORATORY DOCUMENTATION

# Summit Scientific

---

4653 Table Mountain Drive, Golden, Colorado 80403

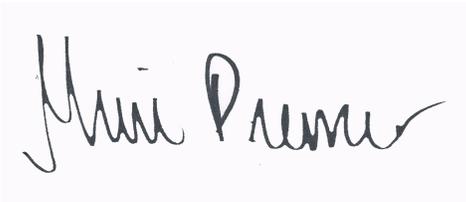
303.277.9310

November 08, 2018

Paul Henehan  
Fremont Environmental  
PO Box 1289  
Wellington, CO 80549  
RE: Noble - Bates #1

Enclosed are the results of analyses for samples received by Summit Scientific on 11/02/18 17:13. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink on a light blue background. The signature reads "Muri Premer" in a cursive, flowing script.

Muri Premer For Ben Shrewsbury  
Laboratory Manager



Fremont Environmental  
PO Box 1289  
Wellington CO, 80549

Project: Noble - Bates #1

Project Number: [none]  
Project Manager: Paul Henehan

**Reported:**  
11/08/18 10:16

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-1R	1811036-01	Soil	11/02/18 00:00	11/02/18 17:13
MW-2R	1811036-02	Soil	11/02/18 00:00	11/02/18 17:13
MW-3R	1811036-03	Soil	11/02/18 00:00	11/02/18 17:13
MW-4R	1811036-04	Soil	11/02/18 00:00	11/02/18 17:13
MW-5R	1811036-05	Soil	11/02/18 00:00	11/02/18 17:13
MW-1	1811036-06	Water	11/02/18 00:00	11/02/18 17:13
MW-2	1811036-07	Water	11/02/18 00:00	11/02/18 17:13
MW-3	1811036-08	Water	11/02/18 00:00	11/02/18 17:13
MW-4	1811036-09	Water	11/02/18 00:00	11/02/18 17:13
MW-5	1811036-10	Water	11/02/18 00:00	11/02/18 17:13

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.*

1811036

# Summit Scientific

S<sub>2</sub>

4653 Table Mountain Drive ♦ Golden, Colorado 80403

303-277-9310 ♦ 303-374-5933 (f)

Page 1 of 1

Client: Fremont Environmental

Project Manager: Paul Henehan

Address: P.O Box 1289

E-Mail: paulh@fremontenv.com, kenr@fremontenv.com

City/State/Zip: Wellington, CO 80549

Bill to: JACOB

Phone: 303-956-8714

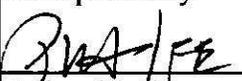
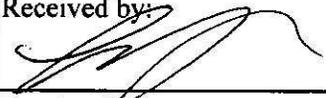
Project Name: NOBLE - BATES #1

Sampler Name: HENEHAN

Project Number:

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix				Analysis Requested						Special Instructions	
					HCl	HNO3	None	Other	Water	Soil	Air-Canister #	Other	BTEX	Naphthalene	GRO	DRO	SAR	EC		pH
1	MW-1R	11/2/18		1			✓			✓										
2	MW-2R			1																
3	MW-3R			1																
4	MW-4R			1																
5	MW-5R			1																
6	MW-1			2					✓											
7	MW-2			2																
8	MW-3			2																
9	MW-4			2																
10	MW-5			2																

Relinquished by: 	Date/Time: 11/2/18 1713	Received by: 	Date/Time: 11.2.18 1715	<b>Turn Around Time</b> (Check) Same Day _____ 72 hours 24 hours _____ Standard <input checked="" type="checkbox"/> 48 hours _____ <b>Sample Integrity:</b> Temperature Upon Receipt: 7.5 Samples Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<b>Notes:</b>
Relinquished by:	Date/Time:	Received by:	Date/Time:		
Relinquished by:	Date/Time:	Received by:	Date/Time:		

**Sample Receipt Checklist**

S2 Work Order 1811036

Client: Fremont Client Project ID: Noble - Bates #1

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>7.5</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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all samples received intact <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If custody seals are present, are they intact <sup>(1)</sup> ?	<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 <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the COC properly relinquished by the client w/ date and time recorded <sup>(1)</sup> ?	<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 checked="" type="checkbox"/>	<input type="checkbox"/>	
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	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
If samples are acid preserved for metals, is the pH ≤ 2 <sup>(1)</sup> ? Record the pH in Comments.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
If dissolved metals are requested, were samples field filtered?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
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

11.2.18 1850  
Date/Time



Fremont Environmental  
 PO Box 1289  
 Wellington CO, 80549

Project: Noble - Bates #1

Project Number: [none]  
 Project Manager: Paul Henehan

**Reported:**  
 11/08/18 10:16

**MW-1R**  
**1811036-01 (Soil)**

**Summit Scientific**

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

Date Sampled: **11/02/18 00:00**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	0.0020		mg/kg	1	1811049	11/05/18	11/07/18	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: **11/02/18 00:00**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		94.8 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		96.5 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		100 %		21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **11/02/18 00:00**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
C10-C28 (DRO)	ND	50		mg/kg	1	1811048	11/05/18	11/06/18	EPA 8015M	

Date Sampled: **11/02/18 00:00**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: o-Terphenyl		97.2 %		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 - Bates #1

Project Number: [none]  
 Project Manager: Paul Henehan

**Reported:**  
 11/08/18 10:16

**MW-2R**  
**1811036-02 (Soil)**

**Summit Scientific**

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

Date Sampled: **11/02/18 00:00**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Benzene	ND	0.0020	mg/kg	1	1811049	11/05/18	11/07/18	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: **11/02/18 00:00**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: 1,2-Dichloroethane-d4		96.3 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		97.3 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.8 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **11/02/18 00:00**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
C10-C28 (DRO)	ND	50	mg/kg	1	1811048	11/05/18	11/06/18	EPA 8015M	

Date Sampled: **11/02/18 00:00**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: o-Terphenyl		95.2 %	30-150		"	"	"	"	

Summit Scientific

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Fremont Environmental  
 PO Box 1289  
 Wellington CO, 80549

Project: Noble - Bates #1

Project Number: [none]  
 Project Manager: Paul Henehan

**Reported:**  
 11/08/18 10:16

**MW-3R**  
**1811036-03 (Soil)**

**Summit Scientific**

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

Date Sampled: **11/02/18 00:00**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Benzene	ND	0.0020	mg/kg	1	1811049	11/05/18	11/07/18	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: **11/02/18 00:00**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: 1,2-Dichloroethane-d4		95.1 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		95.6 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.8 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **11/02/18 00:00**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
C10-C28 (DRO)	ND	50	mg/kg	1	1811048	11/05/18	11/06/18	EPA 8015M	

Date Sampled: **11/02/18 00:00**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: o-Terphenyl		91.2 %	30-150		"	"	"	"	

Summit Scientific

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Fremont Environmental  
 PO Box 1289  
 Wellington CO, 80549

Project: Noble - Bates #1

Project Number: [none]  
 Project Manager: Paul Henehan

**Reported:**  
 11/08/18 10:16

**MW-4R**  
**1811036-04 (Soil)**

**Summit Scientific**

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

Date Sampled: **11/02/18 00:00**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Benzene	ND	0.0020	mg/kg	1	1811049	11/05/18	11/07/18	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: **11/02/18 00:00**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: 1,2-Dichloroethane-d4		101 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		97.4 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.4 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **11/02/18 00:00**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
C10-C28 (DRO)	ND	50	mg/kg	1	1811048	11/05/18	11/06/18	EPA 8015M	

Date Sampled: **11/02/18 00:00**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: o-Terphenyl		91.8 %	30-150		"	"	"	"	

Summit Scientific

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Fremont Environmental  
 PO Box 1289  
 Wellington CO, 80549

Project: Noble - Bates #1

Project Number: [none]  
 Project Manager: Paul Henehan

**Reported:**  
 11/08/18 10:16

**MW-5R**  
**1811036-05 (Soil)**

**Summit Scientific**

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

Date Sampled: **11/02/18 00:00**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Benzene	ND	0.0020	mg/kg	1	1811049	11/05/18	11/07/18	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: **11/02/18 00:00**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: 1,2-Dichloroethane-d4		95.6 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		96.2 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.2 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **11/02/18 00:00**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
C10-C28 (DRO)	ND	50	mg/kg	1	1811048	11/05/18	11/06/18	EPA 8015M	

Date Sampled: **11/02/18 00:00**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: o-Terphenyl		95.5 %	30-150		"	"	"	"	

Summit Scientific

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Fremont Environmental  
 PO Box 1289  
 Wellington CO, 80549

Project: Noble - Bates #1

Project Number: [none]  
 Project Manager: Paul Henehan

**Reported:**  
 11/08/18 10:16

**MW-1**  
**1811036-06 (Water)**

**Summit Scientific**

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

Date Sampled: **11/02/18 00:00**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	1811046	11/05/18	11/07/18	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **11/02/18 00:00**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		109 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		96.6 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		112 %		21-167		"	"	"	"	

Summit Scientific

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Fremont Environmental  
 PO Box 1289  
 Wellington CO, 80549

Project: Noble - Bates #1

Project Number: [none]  
 Project Manager: Paul Henehan

**Reported:**  
 11/08/18 10:16

**MW-2**  
**1811036-07 (Water)**

**Summit Scientific**

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

Date Sampled: **11/02/18 00:00**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	1811046	11/05/18	11/07/18	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **11/02/18 00:00**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		116 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		100 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		126 %		21-167		"	"	"	"	

Summit Scientific

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Fremont Environmental  
 PO Box 1289  
 Wellington CO, 80549

Project: Noble - Bates #1

Project Number: [none]  
 Project Manager: Paul Henehan

**Reported:**  
 11/08/18 10:16

**MW-3**  
**1811036-08 (Water)**

**Summit Scientific**

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

Date Sampled: **11/02/18 00:00**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	1811046	11/05/18	11/07/18	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **11/02/18 00:00**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		112 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		104 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		119 %		21-167		"	"	"	"	

Summit Scientific

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Fremont Environmental  
 PO Box 1289  
 Wellington CO, 80549

Project: Noble - Bates #1

Project Number: [none]  
 Project Manager: Paul Henehan

**Reported:**  
 11/08/18 10:16

**MW-4**  
**1811036-09 (Water)**

**Summit Scientific**

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

Date Sampled: **11/02/18 00:00**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	1811046	11/05/18	11/07/18	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **11/02/18 00:00**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		106 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		98.0 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		111 %		21-167		"	"	"	"	

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 - Bates #1

Project Number: [none]  
 Project Manager: Paul Henehan

**Reported:**  
 11/08/18 10:16

**MW-5**  
**1811036-10 (Water)**

**Summit Scientific**

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

Date Sampled: **11/02/18 00:00**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	1811046	11/05/18	11/07/18	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **11/02/18 00:00**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		103 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		99.3 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		133 %		21-167		"	"	"	"	

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 - Bates #1

Project Number: [none]  
Project Manager: Paul Henehan

**Reported:**  
11/08/18 10:16

### 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 1811046 - EPA 5030 Water MS

##### Blank (1811046-BLK1)

Prepared: 11/05/18 Analyzed: 11/06/18

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	2.0	"							
Surrogate: 1,2-Dichloroethane-d4	13.3		"	13.2		101	23-173			
Surrogate: Toluene-d8	12.9		"	13.3		96.5	20-170			
Surrogate: 4-Bromofluorobenzene	13.3		"	13.3		100	21-167			

##### LCS (1811046-BS1)

Prepared: 11/05/18 Analyzed: 11/06/18

Benzene	25.5	1.0	ug/l	33.3		76.5	70-130			
Toluene	26.4	1.0	"	33.3		79.2	70-130			
Ethylbenzene	26.6	1.0	"	33.3		79.7	70-130			
m,p-Xylene	57.0	2.0	"	66.7		85.5	70-130			
o-Xylene	28.4	1.0	"	33.3		85.2	70-130			
Surrogate: 1,2-Dichloroethane-d4	13.3		"	13.2		101	23-173			
Surrogate: Toluene-d8	12.9		"	13.3		97.1	20-170			
Surrogate: 4-Bromofluorobenzene	13.1		"	13.3		98.3	21-167			

##### Matrix Spike (1811046-MS1)

Source: 1811036-06

Prepared: 11/05/18 Analyzed: 11/06/18

Benzene	31.4	1.0	ug/l	33.3	ND	94.2	70-130			
Toluene	31.8	1.0	"	33.3	ND	95.3	70-130			
Ethylbenzene	33.7	1.0	"	33.3	ND	101	70-130			
m,p-Xylene	67.9	2.0	"	66.7	ND	102	70-130			
o-Xylene	33.2	1.0	"	33.3	ND	99.6	70-130			
Surrogate: 1,2-Dichloroethane-d4	13.2		"	13.2		100	23-173			
Surrogate: Toluene-d8	12.8		"	13.3		95.8	20-170			
Surrogate: 4-Bromofluorobenzene	13.3		"	13.3		99.6	21-167			

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Fremont Environmental  
PO Box 1289  
Wellington CO, 80549

Project: Noble - Bates #1

Project Number: [none]  
Project Manager: Paul Henehan

Reported:  
11/08/18 10:16

**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 1811046 - EPA 5030 Water MS**

**Matrix Spike Dup (1811046-MSD1)**

Source: 1811036-06

Prepared: 11/05/18 Analyzed: 11/06/18

Benzene	23.7	1.0	ug/l	33.3	ND	71.0	70-130	28.1	30	
Toluene	25.1	1.0	"	33.3	ND	75.4	70-130	23.3	30	
Ethylbenzene	27.8	1.0	"	33.3	ND	83.5	70-130	19.1	30	
m,p-Xylene	56.0	2.0	"	66.7	ND	84.0	70-130	19.2	30	
o-Xylene	27.7	1.0	"	33.3	ND	83.2	70-130	17.9	30	
Surrogate: 1,2-Dichloroethane-d4	13.3		"	13.2		101	23-173			
Surrogate: Toluene-d8	12.8		"	13.3		96.4	20-170			
Surrogate: 4-Bromofluorobenzene	12.9		"	13.3		96.8	21-167			

**Batch 1811049 - EPA 5030 Soil MS**

**Blank (1811049-BLK1)**

Prepared: 11/05/18 Analyzed: 11/06/18

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	0.0400		"	0.0396		101	23-173			
Surrogate: Toluene-d8	0.0386		"	0.0400		96.5	20-170			
Surrogate: 4-Bromofluorobenzene	0.0400		"	0.0400		100	21-167			

**LCS (1811049-BS1)**

Prepared: 11/05/18 Analyzed: 11/06/18

Benzene	0.0765	0.0020	mg/kg	0.100		76.5	70-130			
Toluene	0.0792	0.0050	"	0.100		79.2	70-130			
Ethylbenzene	0.0796	0.0050	"	0.100		79.6	70-130			
m,p-Xylene	0.171	0.010	"	0.200		85.5	70-130			
o-Xylene	0.0852	0.0050	"	0.100		85.2	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0400		"	0.0396		101	23-173			
Surrogate: Toluene-d8	0.0388		"	0.0400		97.0	20-170			
Surrogate: 4-Bromofluorobenzene	0.0393		"	0.0400		98.2	21-167			

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 Project Manager: Paul Henehan

**Reported:**  
 11/08/18 10:16

**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 1811049 - EPA 5030 Soil MS**

<b>Matrix Spike (1811049-MS1)</b>	<b>Source: 1811033-02</b>			Prepared: 11/05/18 Analyzed: 11/06/18						
Benzene	0.0942	0.0020	mg/kg	0.100	ND	94.2	70-130			
Toluene	0.0952	0.0050	"	0.100	ND	95.2	70-130			
Ethylbenzene	0.101	0.0050	"	0.100	ND	101	70-130			
m,p-Xylene	0.204	0.010	"	0.200	ND	102	70-130			
o-Xylene	0.0996	0.0050	"	0.100	ND	99.6	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0397		"	0.0396		100	23-173			
Surrogate: Toluene-d8	0.0383		"	0.0400		95.8	20-170			
Surrogate: 4-Bromofluorobenzene	0.0398		"	0.0400		99.6	21-167			

<b>Matrix Spike Dup (1811049-MSD1)</b>	<b>Source: 1811033-02</b>			Prepared: 11/05/18 Analyzed: 11/06/18						
Benzene	0.0710	0.0020	mg/kg	0.100	ND	71.0	70-130	28.1	30	
Toluene	0.0754	0.0050	"	0.100	ND	75.4	70-130	23.3	30	
Ethylbenzene	0.0835	0.0050	"	0.100	ND	83.5	70-130	19.1	30	
m,p-Xylene	0.168	0.010	"	0.200	ND	84.0	70-130	19.2	30	
o-Xylene	0.0832	0.0050	"	0.100	ND	83.2	70-130	17.9	30	
Surrogate: 1,2-Dichloroethane-d4	0.0399		"	0.0396		101	23-173			
Surrogate: Toluene-d8	0.0386		"	0.0400		96.4	20-170			
Surrogate: 4-Bromofluorobenzene	0.0387		"	0.0400		96.8	21-167			

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Project: Noble - Bates #1

Project Number: [none]  
 Project Manager: Paul Henehan

**Reported:**  
 11/08/18 10:16

**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 1811048 - EPA 3550A**

**Blank (1811048-BLK1)**

Prepared: 11/05/18 Analyzed: 11/06/18

C10-C28 (DRO) ND 50 mg/kg

**LCS (1811048-BS1)**

Prepared: 11/05/18 Analyzed: 11/06/18

C10-C28 (DRO) 531 50 mg/kg 500 106 70-130

**Matrix Spike (1811048-MS1)**

**Source: 1811033-02**

Prepared: 11/05/18 Analyzed: 11/06/18

C10-C28 (DRO) 586 50 mg/kg 500 18.4 113 70-130

**Matrix Spike Dup (1811048-MSD1)**

**Source: 1811033-02**

Prepared: 11/05/18 Analyzed: 11/06/18

C10-C28 (DRO) 576 50 mg/kg 500 18.4 112 70-130 1.67 20

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Project: Noble - Bates #1

Project Number: [none]  
Project Manager: Paul Henehan

**Reported:**  
11/08/18 10:16

### 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