

# FREMONT ENVIRONMENTAL INC.

December 3, 2015

#9233

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

Subject:     **NFA Request**  
              Spike State 12-6 Water Vault  
              API # 05-123-17228  
              SENW Sec 12, T3N, R65W  
              Weld County, Colorado  
              Fremont Project No. C015-053  
              Facility #329357 (Location)

Dear Mr. Evans:

As you requested, Fremont Environmental Inc. (Fremont) personnel sampled the soil immediately adjacent to the water vault at the Spike State 12-6 location on the Gutterson Ranch. This sampling was required to determine whether residual soil impacts were present following the overfilling of the water vault in March 2014.

As shown on Figure 2, soil samples were collected on all four sides of the concrete water vault at a depth of two feet. The samples were submitted to Summit Scientific Inc. of Golden, Colorado for the analyses of benzene, toluene, ethyl benzene and xylenes (BTEX), total petroleum hydrocarbons - gasoline range organics (TPH-GRO), TPH - diesel range organics (TPH-DRO) and naphthalene. These data are summarized on Table 1 and shown on Figure 2. The laboratory report is also attached.

The laboratory data indicates that all four soil samples had concentrations that were less than their respective Colorado Oil and Gas Conservation Commission (COGCCs) Table 910-1 limits. In addition, each sample had concentrations that were less than the laboratory's detection limits for those constituents.

The laboratory data indicate that there are no residual petroleum constituents in the soil immediately adjacent to the water vault. Therefore, Noble Energy Inc. should request that the COGCC provide a No Further Action (NFA) determination 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.**

A handwritten signature in blue ink, appearing to read "Paul Henehan", with a long horizontal flourish extending to the right.

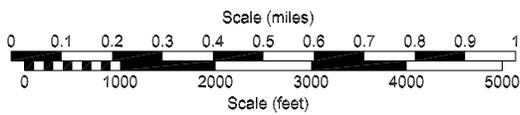
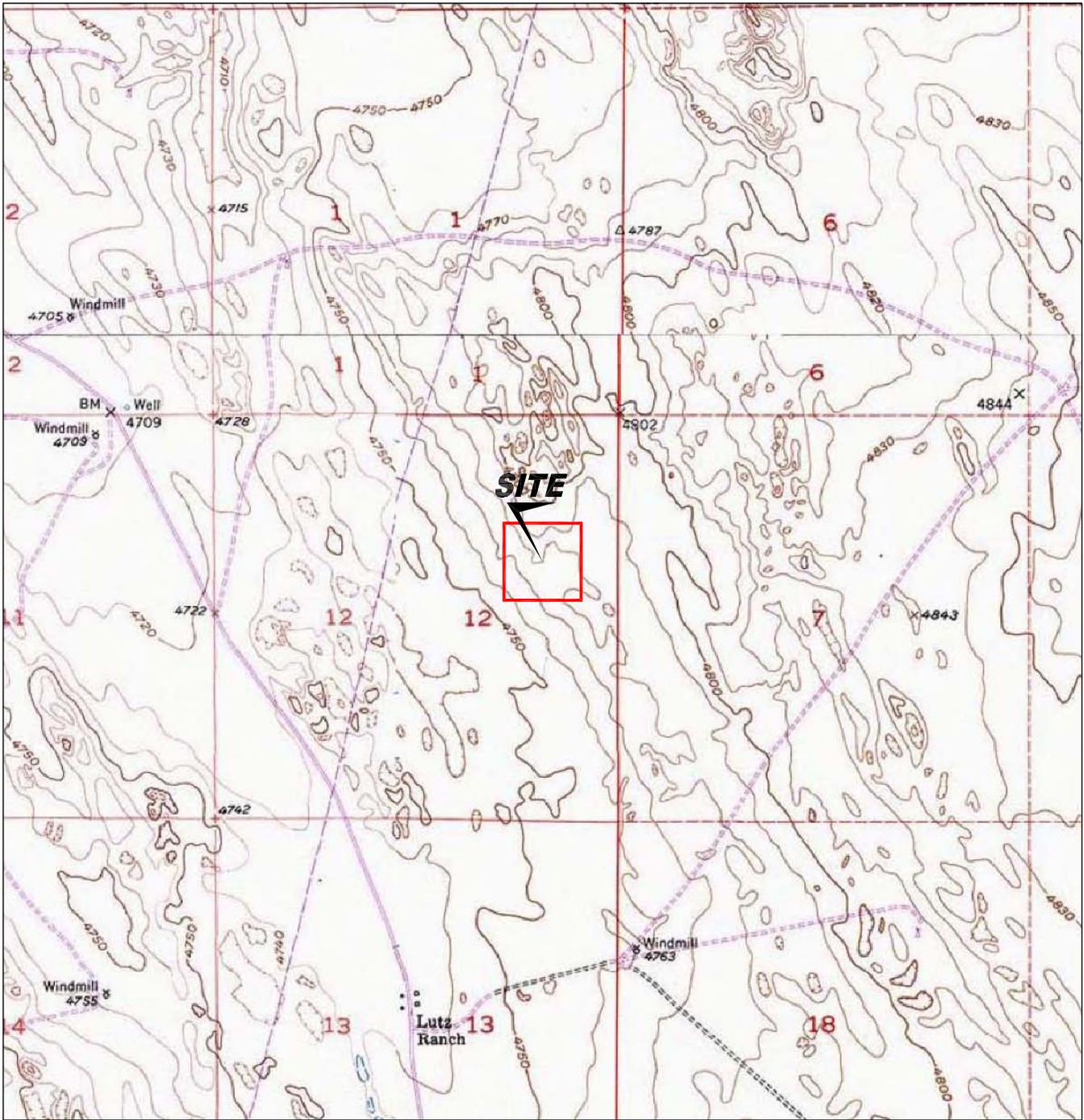
Paul V. Henehan, P.E.  
Senior Consultant

Enclosure

**TABLE 1**  
**SUMMARY OF SOIL CHEMISTRY DATA**  
**NOBLE ENERGY INC.**  
**SPIKES STATE 12-6, WELD COUNTY, COLORADO**  
**FREMONT PROJECT NO. C015-053**

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
North - 2'	2	11/4/2015	Sidewall	Pass	<0.002	<0.005	<0.005	<0.01	<0.01	<50	<50
South - 2'	2	11/4/2015	Sidewall	Pass	<0.002	<0.005	<0.005	<0.01	<0.01	<50	<50
East - 2'	2	11/4/2015	Sidewall	Pass	<0.002	<0.005	<0.005	<0.01	<0.01	<50	<50
West - 2'	2	11/4/2015	Sidewall	Pass	<0.002	<0.005	<0.005	<0.01	<0.01	<50	<50
COGCC Table 910 Limits					0.17	85	100	175	23	500	500

Bold faced values exceed the COGCC Table 910-1 concentrations



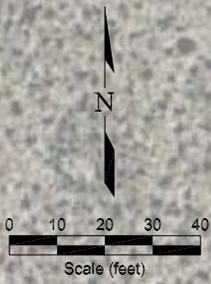
USGS 7.5 MINUTE SERIES (TOPOGRAPHIC)

Figure 1  
**SITE LOCATION MAP**

**Noble Spike State 12-6**  
 SE NW Section 12, T3N, R64W  
 Weld County, Colorado

Project No. C015-053	Prepared by	Drawn by JMA
Date 11/10/15	Reviewed by	Filename 15053T





**LEGEND**

- CONTAINMENT BERM
- CONTAINMENT WALL
- FENCE LINE
- ABOVE GROUND STORAGE TANK
- FORMER FACILITY
- SOIL SAMPLE LOCATION

11/4/15 2' sidewall	
B	<0.002
T	<0.005
E	<0.005
X	<0.01
N	<0.01
G	<50
D	<50

DATE SAMPLED  
 DEPTH (ft) and LOCATION  
 BENZENE (mg/kg)  
 TOLUENE (mg/kg)  
 ETHYLBENZENE (mg/kg)  
 TOTAL XYLENES (mg/kg)  
 NAPHTHALENE (mg/kg)  
 TPH-GRO (mg/kg)  
 TPH-DRO (mg/kg)

Figure 2  
**SITE MAP**

**Noble Spike State 12-6**  
 SE NW Section 12, T3N, R64W  
 Weld County, Colorado

Project No. <b>C015-053</b>	Prepared by	Drawn by <b>JMA</b>
Date <b>11/23/15</b>	Reviewed by	Filename <b>15053R</b>



# Summit Scientific

---

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

November 05, 2015

Paul Henehan

Fremont Environmental

1630 South College Avenue

Ft. Collins, CO 80525

RE: Noble - Spike State 3, 4, 5, 6 Vault

Enclosed are the results of analyses for samples received by Summit Scientific on 11/04/15 16:12. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

DRAFT REPORT

DATA SUBJECT TO CHANGE



Fremont Environmental  
1630 South College Avenue  
Ft. Collins CO, 80525

Project: Noble - Spike State 3, 4, 5, 6 Vault

Project Number: [none]  
Project Manager: Paul Henehan

**Reported:**  
11/05/15 06:50

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
North 2 FT	1511026-01	Soil	11/04/15 00:00	11/04/15 16:12
South 2 FT	1511026-02	Soil	11/04/15 00:00	11/04/15 16:12
East 2 FT	1511026-03	Soil	11/04/15 00:00	11/04/15 16:12
West 2 FT	1511026-04	Soil	11/04/15 00:00	11/04/15 16:12

DRAFT REPORT

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Fremont Environmental  
1630 South College Avenue  
Ft. Collins CO, 80525

Project: Noble - Spike State 3, 4, 5, 6 Vault

Project Number: [none]  
Project Manager: Paul Henehan

Reported:  
11/05/15 06:50

# Summit Scientific 1511026

S<sub>2</sub>

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

Page 1 of 1

Client: FREMONT/NOBLE Project Manager: HENEHAN  
Address: \_\_\_\_\_ E-Mail: \_\_\_\_\_  
City/State/Zip: \_\_\_\_\_  
Phone: 3032568714 Fax: \_\_\_\_\_ Project Name: NOBLE - SPIKE STATE 3,4,5,6 VAULT  
Sampler Name: HENEHAN Project Number: \_\_\_\_\_

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix				Analysis Requested				Special Instructions
					HCl	HNO <sub>3</sub>	None	Other (Specify)	Groundwater	Soil	Air-Canister #	Other (Specify)	BTEX	SVOC	VOC	Metals	
1	NORTH - ZPT	11/4/15		1			✓		✓				✓	✓	✓		
2	SOUTH - ZPT			1			✓		✓				✓	✓	✓		
3	EAST - ZPT			1			✓		✓				✓	✓	✓		
4	WEST - ZPT			1			✓		✓				✓	✓	✓		
5																	
6																	
7																	
8																	
9																	
10																	

Relinquished by: <u>[Signature]</u>	Date/Time: <u>11/4/15 16:12</u>	Received by: <u>[Signature]</u>	Date/Time: <u>11-4-15 16:12</u>	Turn Around Time (Check)	Notes:
Relinquished by: <u>[Signature]</u>	Date/Time: <u>11-4-15 17:55</u>	Received by:	Date/Time:	Same Day <input checked="" type="checkbox"/> 72 hours <input type="checkbox"/>	24 hours <input type="checkbox"/> Standard <input type="checkbox"/> 48 hours <input type="checkbox"/> THURS AM PER Sample Integrity: Temperature Upon Receipt: <u>18.7°C</u> Intact: <input checked="" type="radio"/> Yes <input type="radio"/> No
Relinquished by:	Date/Time:	Received by:	Date/Time:		

www.s2scientific.com



Fremont Environmental  
1630 South College Avenue  
Ft. Collins CO, 80525

Project: Noble - Spike State 3, 4, 5, 6 Vault

Project Number: [none]  
Project Manager: Paul Henehan

**Reported:**  
11/05/15 06:50

**North 2 FT**  
**1511026-01 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: 11/04/15 00:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1511044	11/04/15	11/04/15	8015M	

Date Sampled: 11/04/15 00:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		102 %	30-150		"	"	"	"	

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

Date Sampled: 11/04/15 00:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1511042	11/04/15	11/04/15	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: 11/04/15 00:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		101 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		96.5 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.1 %	21-167		"	"	"	"	

DRAFT REPORT

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Fremont Environmental  
1630 South College Avenue  
Ft. Collins CO, 80525

Project: Noble - Spike State 3, 4, 5, 6 Vault

Project Number: [none]  
Project Manager: Paul Henehan

**Reported:**  
11/05/15 06:50

**South 2 FT**  
**1511026-02 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: 11/04/15 00:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1511044	11/04/15	11/04/15	8015M	

Date Sampled: 11/04/15 00:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		103 %	30-150		"	"	"	"	

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

Date Sampled: 11/04/15 00:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1511042	11/04/15	11/04/15	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: 11/04/15 00:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		105 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		97.3 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.1 %	21-167		"	"	"	"	

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Fremont Environmental  
1630 South College Avenue  
Ft. Collins CO, 80525

Project: Noble - Spike State 3, 4, 5, 6 Vault

Project Number: [none]  
Project Manager: Paul Henehan

**Reported:**  
11/05/15 06:50

**East 2 FT**  
**1511026-03 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: 11/04/15 00:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1511044	11/04/15	11/04/15	8015M	

Date Sampled: 11/04/15 00:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		103 %	30-150		"	"	"	"	

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

Date Sampled: 11/04/15 00:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1511042	11/04/15	11/04/15	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: 11/04/15 00:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		106 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.4 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		94.9 %	21-167		"	"	"	"	

DRAFT REPORT

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Fremont Environmental  
1630 South College Avenue  
Ft. Collins CO, 80525

Project: Noble - Spike State 3, 4, 5, 6 Vault

Project Number: [none]  
Project Manager: Paul Henehan

**Reported:**  
11/05/15 06:50

**West 2 FT**  
**1511026-04 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: 11/04/15 00:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1511044	11/04/15	11/04/15	8015M	

Date Sampled: 11/04/15 00:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		97.5 %	30-150		"	"	"	"	

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

Date Sampled: 11/04/15 00:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1511042	11/04/15	11/04/15	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: 11/04/15 00:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		100 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		94.6 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		92.5 %	21-167		"	"	"	"	

DRAFT REPORT

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Fremont Environmental  
1630 South College Avenue  
Ft. Collins CO, 80525

Project: Noble - Spike State 3, 4, 5, 6 Vault

Project Number: [none]  
Project Manager: Paul Henehan

**Reported:**  
11/05/15 06:50

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

DRAFT REPORT

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Fremont Environmental  
1630 South College Avenue  
Ft. Collins CO, 80525

Project: Noble - Spike State 3, 4, 5, 6 Vault

Project Number: [none]  
Project Manager: Paul Henehan

**Reported:**  
11/05/15 06:50

### 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

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DRAFT REPORT

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