

FREMONT ENVIRONMENTAL INC.

March 8, 2024

Mr. Daniel Peterson
Noble Energy Inc.
2115 117th Avenue
Greeley, CO 80634

Subject: **Flowline Closure Data Submittal**
Pappenheim 2-32
API # 05-123-11851
SENE Sec. 32, T7N, R65W
Weld County, Colorado
Fremont Project No. C023-174
Remediation # 28062

Dear Mr. Peterson:

As you requested, Fremont Environmental Inc. (Fremont) personnel conducted flowline closure activities for the Noble Energy Inc. (Noble) Pappenheim 2-32. Impacted soil was not encountered during abandonment activities. Details of the Pappenheim 2-32 flowline closure activities are documented in the attached Closure Report. Groundwater was not encountered during flowline abandonment activities.

Please contact me at (303) 261-6246 if you require any additional information. Fremont appreciates the opportunity to provide this service.

Sincerely,

FREMONT ENVIRONMENTAL INC.



Stanley Gilbert
Environmental Scientist

Attachments:

- Facility Closure Checklist
- Tables
- Figures
- Photos
- Laboratory Report

1759 REDWING LANE, BROOMFIELD, CO 80020
(303) 956-8714 (DIRECT)

Flowline Closure Checklist

COGCC Rule 911.a.(4) Environmental Site Closure Assessment Field Form

<i>Additional Attachments:</i>		Tank Battery Closure		Wellhead Closure		Pit Closure		Partially Buried Vault Closure
<i>Site Name & COGCC Facility Number:</i>		<i>Date:</i>						<i>Remediation Project #:</i>
<i>Associated Wells:</i>		<i>Age of Site:</i>						<i>Number of Photos Attached:</i>

Starting point: (GPS coordinates and descriptions)

End point: (GPS coordinates and descriptions)

USCS Soil Type: _____ *Estimated Depth to Groundwater:* _____

Hydrocarbon Impacted Soils / Spills: (Note estimated size and if impact appears to be surficial or extends to an unknown depth)

Salt Crusted Soils or Impacted Vegetation: (Note estimated size and if impact appears to be surficial or extends to an unknown depth)

Flowlines

<i>Flowline type</i>								
<i>Depth</i>								
<i>Age</i>								
<i>Length</i>								
<i>Construction Material</i>								
<i>Were flowlines pulled?</i>								
<i>Visual Integrity of lines</i>								
<i>Visual impacts if trenched</i>								
<i>PID Readings if trenched</i>								
<i>Sample taken?</i>								
<i>Location/Sample ID#</i>								
<i>Photo Number(s)</i>								

Other observations regarding on location flowlines:

Summary

Was impacted soil identified?
 No Yes - less than 10 cubic yards Yes - more than 10 cubic yards

Total number of samples field screened: _____ *Total number of samples collected:* _____

Highest PID Reading: _____ *Total number of samples submitted to lab for analysis:* _____

If more than 10 cubic yards of impacted soil were observed:

Vertical extent: _____ *Estimated spill volume:* _____

Lateral extent: _____ *Volume of soil removed:* _____

Is additional investigation required?

Was groundwater encountered during the investigation?
 No Yes - not impacted or in contact with impacted soils Yes - groundwater impacted and/or in contact with impacted soils

Measured depth to groundwater: _____ *Was remedial groundwater removal conducted?* Yes No

Date Groundwater was encountered: _____ *Commencement date of removal:* _____

Sheen on groundwater? Yes No *Volume of groundwater removed prior to sampling:* _____

Free product observed? Yes No *Volume of groundwater removed post sampling:* _____

Total number of samples collected: _____ *Total Volume of groundwater removed:* _____

Total number of samples submitted to lab for analysis: _____

TABLE 1
SUMMARY OF VOLATILE ORGANIC SOIL CHEMISTRY DATA
NOBLE ENERGY INC.
PAPPENHEIM 02-32, WELD COUNTY, COLORADO
FREMONT PROJECT NO. C023-174

Sample ID	Sample Date	Depth (ft)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-Benzene (mg/kg)	Xylenes (mg/kg)	1,2,4-Trimethyl-Benzene (mg/kg)	1,3,5-Trimethyl-Benzene (mg/kg)	Naphthalene (mg/kg)	TPH GRO (mg/kg)	TPH DRO (mg/kg)	TPH ORO (mg/kg)
COGCC Table 915-1 Limits (Residential SSL)			1.2	490	5.8	58	30	27	2	500**		
COGCC Table 915-1 Limits (Protection of Groundwater SSL)			0.0026	0.69	0.78	9.9	0.0081	0.0087	0.0038	500**		
FL01 3feet	06/21/2023	3'	<0.0020	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0038	<50	<50	<50
FL02 3feet	06/21/2023	3'	<0.0020	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0038	<50	<50	<50

Bold faced values exceed the COGCC Table 915-1 concentrations

Red & blue highlighted 915-1 Limits indicate the referenced soil screening level (SSL)

* Indicates laboratory minimum detection limit in excess of SSL

** Summation of GRO+DRO+ORO must be less than 500 mg/kg

NA - Not analyzed

TABLE 2
SUMMARY OF POLYCYCLIC AROMATIC HYDROCARBON SOIL CHEMISTRY DATA
NOBLE ENERGY INC.
PAPPENHEIM 02-32, WELD COUNTY, COLORADO
FREMONT PROJECT NO. C023-174

Sample ID	Sample Date	Depth (ft)	Acenaphthene (mg/kg)	Anthracene (mg/kg)	Benzo (a) Anthracene (mg/kg)	Benzo (a) Pyrene (mg/kg)	Benzo (b) Fluoranthene (mg/kg)	Benzo (k) Fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenzo (a,h) Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno (1,2,3-cd) Pyrene (mg/kg)	Pyrene (mg/kg)	1-Methyl - Naphthalene (mg/kg)	2-Methyl - Naphthalene (mg/kg)
COGCC Table 915-1 Limits (Residential SSL)			360	1800	1.1	0.11	1.1	11	110	0.11	240	240	1.1	180	18	24
COGCC Table 915-1 Limits (Protection of Groundwater SSL)			0.55	5.8	0.011	0.24	0.3	2.9	9	0.096	8.9	0.54	0.98	1.3	0.006	0.019
FL01 3feet	06/21/2023	3'	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
FL02 3feet	06/21/2023	3'	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500

Bold faced values exceed the COGCC Table 915-1 concentrations

Red & blue highlighted 915-1 Limits indicate the referenced soil screening level (SSL)

* Indicates laboratory minimum detection limit in excess of SSL

NA - Not analyzed

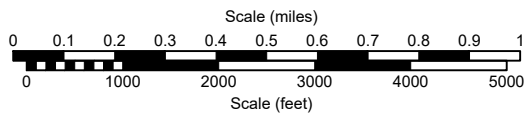
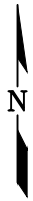
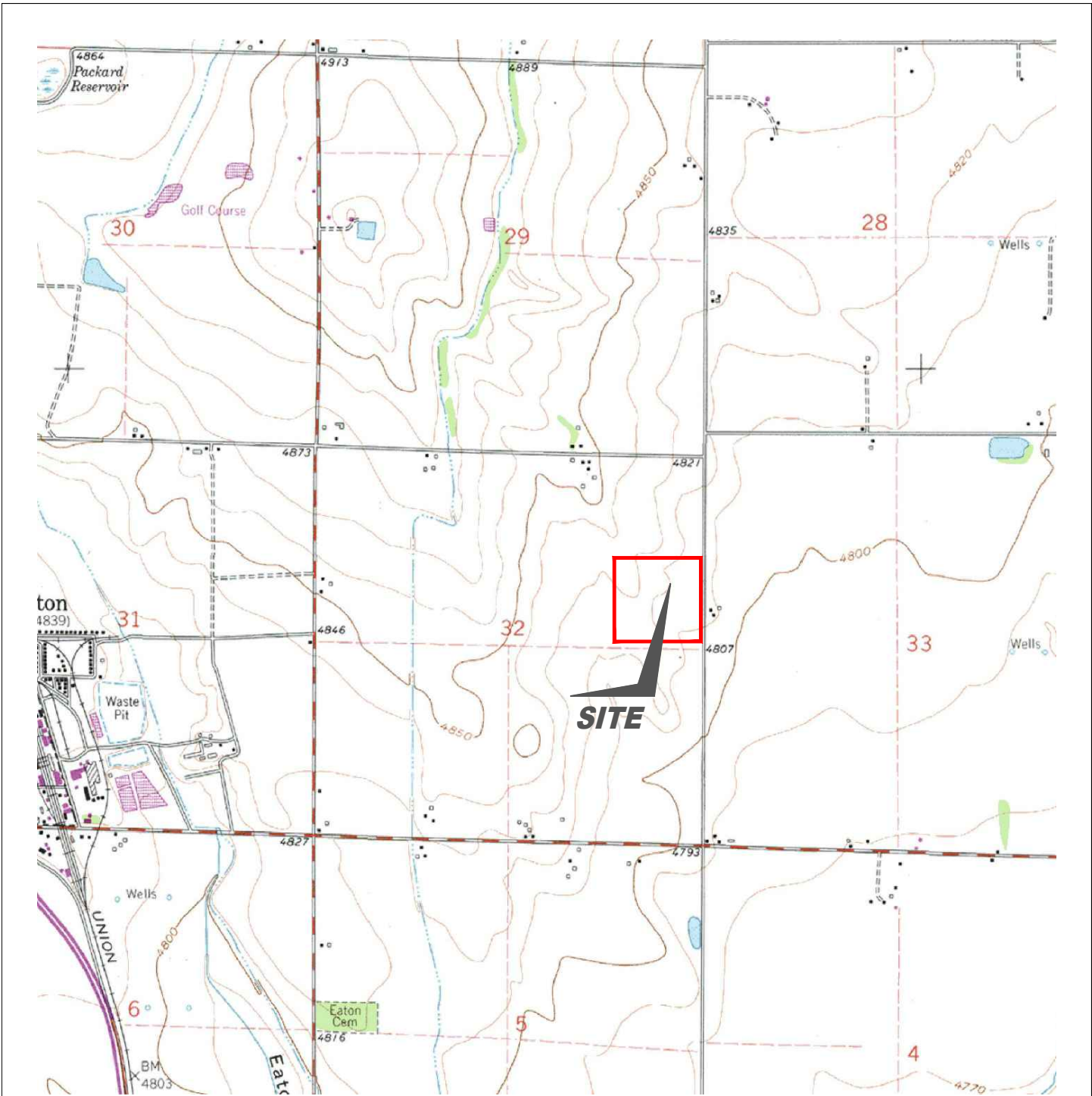
TABLE 3
SUMMARY OF SOIL SUITABILITY FOR RECLAMATION
NOBLE ENERGY INC.
PAPPENHEIM 02-32, WELD COUNTY, COLORADO
FREMONT PROJECT NO. C023-174

Sample ID	Sample Date	Depth (ft)	pH	EC (mmhos/cm)	SAR	Boron (mg/L)
COGCC Table 915-1 Soil Suitability Limits			6 - 8.3	<4	<6	2
FL01 3feet	06/21/2023	3'	7.66	0.724	0.328	0.121
FL02 3feet	06/21/2023	3'	7.83	0.268	0.0812	0.186

Bold faced values exceed the COGCC Table 915-1 concentrations

Yellow highlighted 915-1 Limits indicate the referenced soil screening level (SSL)

NA - Not analyzed



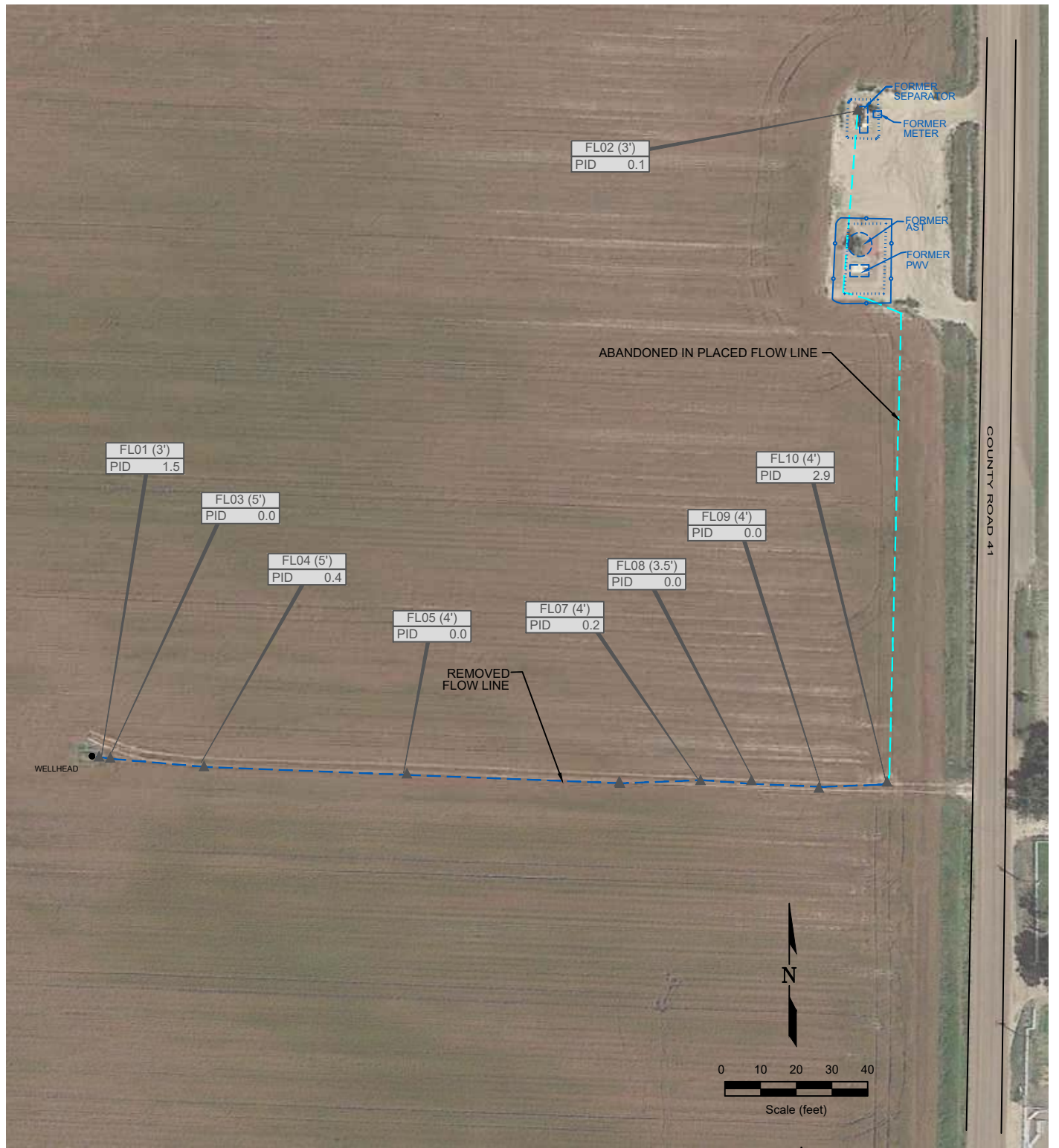
USGS 7.5 MINUTE SERIES (TOPOGRAPHIC)

Figure 1
SITE LOCATION MAP

Noble Energy, Inc. ~ Pappenheim 2-32
 SENE Sec. 32, T7N, R65W, 6th PM
 Weld County, Colorado
 40.532940°, -104.680130°

Project # CO23-174	API # 05-123-11851	Facility #
Date 3/10/24	Remediation # 28062	Filename 23174TFL





LEGEND

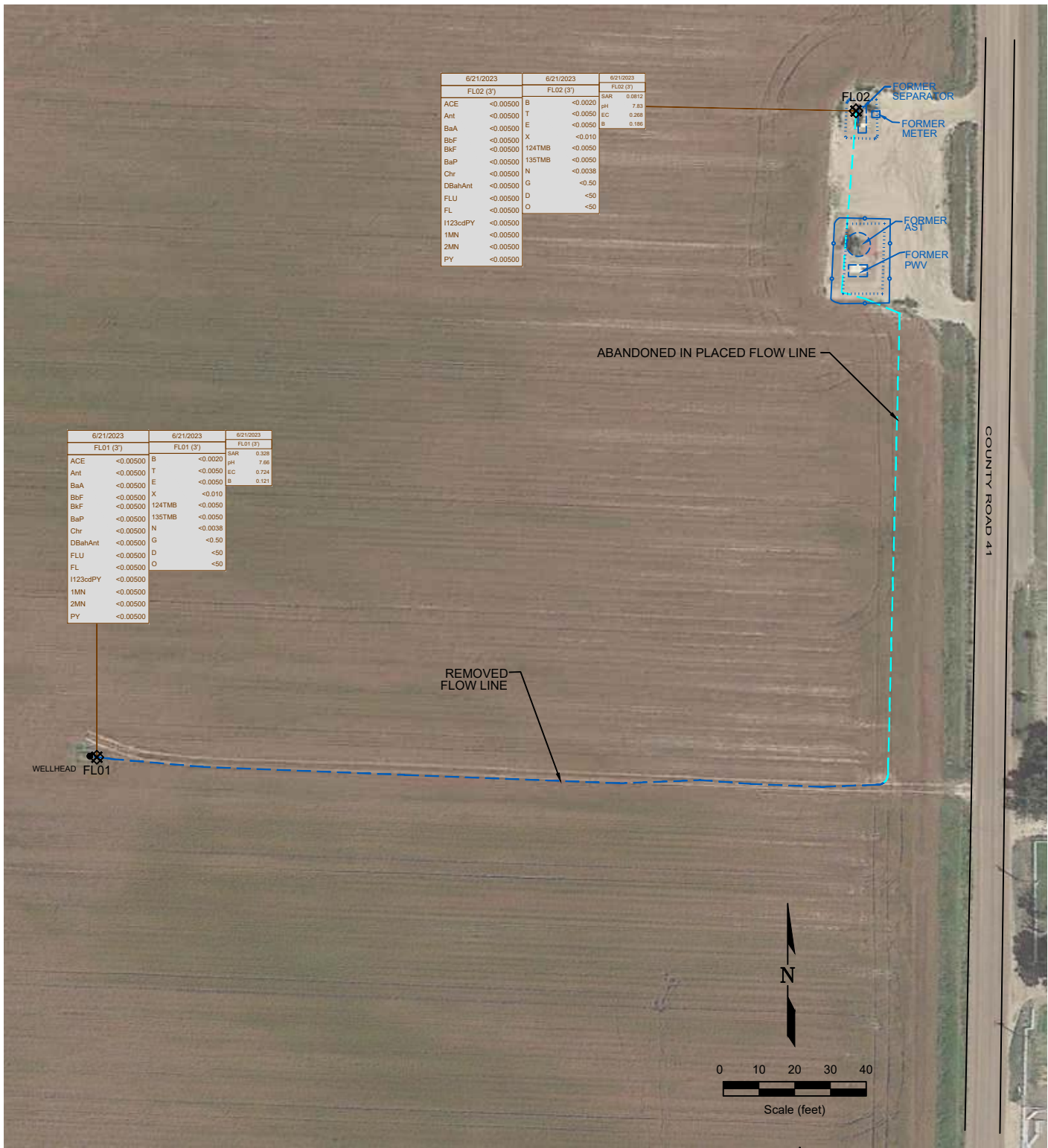
- WELLHEAD LOCATION
 - ▲ PID READING LOCATION
 - ABOVE GROUND STORAGE TANK
 - FORMER FACILITY
 - BUILDING
 - ABANDONED IN PLACED FLOW LINE
 - REMOVED FLOW LINE
 - CONTAINMENT BERM
 - FENCE LINE
- FL01
PID 0.1
PID READING SAMPLE IDENTIFICATION AND DEPTH (ft)
PHOTO IONIZATION DETECTION / PARTS PER MILLION

**Figure 2
SITE MAP**

Noble Energy, Inc. ~ Pappenheim 2-32
 SENE Sec. 32, T7N, R65W, 6th PM
 Weld County, Colorado
 40.532940°, -104.680130°

Project # CO23-174	API # 05-123-11851	Facility #
Date 3/10/24	Remediation # 28062	Filename 23174QFL





LEGEND

- WELLHEAD LOCATION
- ⊗ SOIL SAMPLE LOCATION
- ABOVE-GROUND STORAGE TANK
- FORMER FACILITY
- BUILDING
- ABANDONED IN PLACED FLOW LINE
- REMOVED FLOW LINE
- CONTAINMENT BERM
- FENCE LINE

6/21/2023	DATE SAMPLED	6/21/2023	DATE SAMPLED	6/21/2023	DATE SAMPLED
FL01 (3')	SAMPLE ID and DEPTH (ft)	FL01 (3')	SAMPLE ID and DEPTH (ft)	FL01 (3')	SAMPLE ID and DEPTH (ft)
ACE <0.00500	ACENAPHTHENE (mg/kg)	B <0.0020	BENZENE (mg/kg)	SAR 0.328	SAR (unitless)
Ant <0.00500	ANTHRACENE (mg/kg)	T <0.0050	TOLUENE (mg/kg)	pH 7.66	pH (pH units)
BaA <0.00500	BENZO (A) ANTHRACENE (mg/kg)	E <0.0050	ETHYLBENZENE (mg/kg)	EC 0.724	EC (microhm/cm)
BbF <0.00500	BENZO (K) FLUORANTHENE (mg/kg)	X <0.010	TOTAL XYLENES (mg/kg)	B 0.121	BORON (mg/L)
BkF <0.00500		124TMB <0.0050	1,2,4-TRIMETHYLBENZENE (mg/kg)	NA	NOT ANALYZED
BaP <0.00500	BENZO (A) PYRENE (mg/kg)	135TMB <0.0050	1,3,5-TRIMETHYLBENZENE (mg/kg)		
Chr <0.00500	CHRYSENE (mg/kg)	N <0.0038	NAPHTHALENE (mg/kg)		
DBahAnt <0.00500	FLUORANTHENE (mg/kg)	G <0.50	TPH-GRO (mg/kg)		
FLU <0.00500	FLUORANTHENE (mg/kg)	D <0.50	TPH-DRO (mg/kg)		
FL <0.00500	FLUORANTHENE (mg/kg)	O <0.50	TPH-ORO (mg/kg)		
1123cdPY <0.00500	1-METHYLNAPHTHALENE (mg/kg)				
1MN <0.00500	2-METHYLNAPHTHALENE (mg/kg)				
2MN <0.00500	PYRENE (mg/kg)				
PY <0.00500					

Figure 3
SOIL CHEMISTRY MAP

Noble Energy, Inc. ~ Pappenheim 2-32
SENE Sec. 32, T7N, R65W, 6th PM
Weld County, Colorado
40.532940°, -104.680130°

Project # CO23-174	API # 05-123-11851	Facility #
Date 3/10/24	Remediation # 28062	Filename 23174QFL



Description:

#1A - Pappenheim 2-32 (Flowline) - FL01 3 Feet - No Impacts Noted - PID: 1.5ppm

Photo Log



Description:

#1B - Pappenheim 2-32 (Flowline) - FL03@5.0' - No Impacts Noted - PID: 0.0ppm

Photo Log



Description:

#1C - Pappenheim 2-32 (Flowline) - FL04@5.0' - No Impacts Noted - PID: 0.4ppm

Photo Log



Description:

#1D - Pappenheim 2-32 (Flowline) - FL05@4.0' - No Impacts Noted - PID: 0.0ppm

Photo Log



Description:

#1E - Pappenheim 2-32 (Flowline) - FL06@4.0' - No Impacts Noted - PID: 0.0ppm

Photo Log



Description:

#1F - Pappenheim 2-32 (Flowline) - FL07@4.0' - No Impacts Noted - PID: 0.2ppm

Photo Log



Description:

#1G - Pappenheim 2-32 (Flowline) - FL08@3.5' - No Impacts Noted - PID: 0.0ppm

Photo Log



Description:

#1H - Pappenheim 2-32 (Flowline) - FL09@4.0' - No Impacts Noted - PID: 0.0ppm

Photo Log



Description:

#11 - Pappenheim 2-32 (Flowline) - FL10@4.0' - Cut and Capped - No Impacts Noted - PID: 2.9ppm

Photo Log



Description:

#1J - Pappenheim 2-32 (Flowline) - FL02 3 Feet - Cut and Capped - No Impacts Noted - PID: 0.1ppm

Summit Scientific

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

July 03, 2023

Paul Henchan
Fremont Environmental
PO Box 1289
Wellington, CO 80549

RE: Noble - Pappenheim 02-32 FL

Work Order #2306425

Enclosed are the results of analyses for samples received by Summit Scientific on 06/21/23 16:38. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Scott Sheely For Paul Shrewsbury
President



Fremont Environmental
PO Box 1289
Wellington CO, 80549

Project: Noble - Pappenheim 02-32 FL

Project Number: UWRWE-A3114-ABN
Project Manager: Paul Henchan

Reported:
07/03/23 12:16

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FL01 3feet	2306425-01	Soil	06/21/23 10:53	06/21/23 16:38
FL02 3feet	2306425-02	Soil	06/21/23 10:35	06/21/23 16:38

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.



4653 Table Mountain Drive
Golden, CO 80403
303-277-9310

Lab ID	Page	of
2306425		1

Send Data To:		Send Invoice To:
Client: Fremont Environmental	Project Manager: Paul Henchan	Company: Noble
Address:	E-Mail: Fremont Distribution List	Project Name/Location: Pappenheim 02-32 FL
City/State/Zip:		AFE#:
Phone: 303-261-6246	Project Name: Pappenheim 02-32 FL	PO/Billing Codes: UWRWE-A3114-ABN
Sampler Name: Stanley Gilbert	Project Number:	Contact: Mike Montoya

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix		Air-Canister #	Other	Analysis Requested						Special Instructions
					HCl	HNO3	None	Other	Water	Soil			BTEX, TMBs, Naph.	TPH	PAH (915)	EC, SAR, Ph, Boron	Metals (915)	TDS, Chloride, Sulfate	
1	FLO1 3 feet	6/21/23	10:53	2			X			X		X	X	X	X				
2	FLO2 3 feet	6/21/23	10:35	2			X			X		X	X	X	X				
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			
11																			
12																			
13																			
14																			
15																			

Relinquished by:	Date/Time: 6/21/23 16:38	Received by: Summit North	Date/Time: 6/21/23 16:38	TAT Business Days	Field DO	Notes:
Relinquished by:	Date/Time: 6/21/23 16:38	Received by:	Date/Time: 6/21/23 16:38	Same Day	Field EC	
				1 Day	Field ORP	
				2 Days	Field pH	
				3 Days	Field Temp.	
				Standard	Field Turb.	
Temperature Upon Receipt: 11.0	Corrected Temperature: 0	IR gun #: 1	HNO3 lot #:			

S₂

Sample Receipt Checklist

S2 Work Order# 2306425

Client: Fremont Client Project ID: Pappenheim 02-32 FL

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

Matrix (Check all that apply) Air Soil/Solid Water Other

Temp (°C)

Thermometer #

	Yes	No	N/A	Comments (if any)
If samples require cooling, is the temperature < 6°C? ⁽¹⁾ NOTE: If samples are delivered the same day of sampling, this requirement is met if there is evidence that cooling has begun.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	on ICE
If custody seals are present, are they intact? ⁽¹⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are samples due within 48 hours present?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Are water samples with short hold times present? Note the short hold analysis in the comments column - pH, Nitrate/Nitrite, Ferrous Iron (Fe ²⁺), Hexavalent Chromium (Cr ⁶⁺ , Cr VI), COD/BOD, Total Coliform, E. Coli, Total Residual Chlorine (TRC), Dissolved Oxygen	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input 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"/>	
Is the COC properly relinquished by the client w/ date and time recorded? ⁽¹⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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"/>	
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"/>	
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⁾ Note the type of preservative in the comments column – HCl, H ₂ SO ₄ , NaOH, HNO ₃ , etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
If samples are acid preserved for metals, is the pH ≤ 2? ⁽¹⁾ 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"/>	
<u>Additional Comments (if any):</u>				
⁽¹⁾ If NO, then contact the client before proceeding with analysis and note in case narrative.				

AS
Custodian Printed Name

4/21/23
Date/Time



Fremont Environmental
PO Box 1289
Wellington CO, 80549

Project: Noble - Pappenheim 02-32 FL

Project Number: UWRWE-A3114-ABN
Project Manager: Paul Henchan

Reported:
07/03/23 12:16

FL01 3feet
2306425-01 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/21/23 10:53**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	0.0020		mg/kg	1	BGF0810	06/22/23	06/22/23	EPA 8260B	
Toluene	ND	0.0050		"	"	"	"	"	"	
Ethylbenzene	ND	0.0050		"	"	"	"	"	"	
Xylenes (total)	ND	0.010		"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.0050		"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.0050		"	"	"	"	"	"	
Naphthalene	ND	0.0038		"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50		"	"	"	"	"	"	

Date Sampled: **06/21/23 10:53**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4	0.0454	113 %		50-150		"	"	"	"	
Surrogate: Toluene-d8	0.0416	104 %		50-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	0.0416	104 %		50-150		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/21/23 10:53**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
C10-C28 (DRO)	ND	50		mg/kg	1	BGF0812	06/22/23	06/22/23	EPA 8015M	
C28-C36 (ORO)	ND	50		"	"	"	"	"	"	

Date Sampled: **06/21/23 10:53**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: o-Terphenyl	12.1	96.6 %		30-150		"	"	"	"	

PAH by EPA Method 8270D SIM

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Fremont Environmental
PO Box 1289
Wellington CO, 80549

Project: Noble - Pappenheim 02-32 FL

Project Number: UWRWE-A3114-ABN
Project Manager: Paul Henchan

Reported:
07/03/23 12:16

FL01 3feet
2306425-01 (Soil)

Summit Scientific

PAH by EPA Method 8270D SIM

Date Sampled: **06/21/23 10:53**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	BGF0780	06/22/23	06/23/23	EPA 8270D SIM	
Anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.00500	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Chrysene	ND	0.00500	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.00500	"	"	"	"	"	"	
Fluoranthene	ND	0.00500	"	"	"	"	"	"	
Fluorene	ND	0.00500	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.00500	"	"	"	"	"	"	
Pyrene	ND	0.00500	"	"	"	"	"	"	
1-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	
2-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	

Date Sampled: **06/21/23 10:53**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10	0.0155	46.6 %	40-150		"	"	"	"	
Surrogate: Fluoranthene-d10	0.0246	73.7 %	40-150		"	"	"	"	

Total Metals by EPA 6020B Hot Water Soluble Extraction

Date Sampled: **06/21/23 10:53**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Boron	0.121	0.0100	mg/L	1	BGF0820	06/22/23	06/26/23	EPA 6020B	

Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction

Date Sampled: **06/21/23 10:53**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Fremont Environmental
PO Box 1289
Wellington CO, 80549

Project: Noble - Pappenheim 02-32 FL
Project Number: UWRWE-A3114-ABN
Project Manager: Paul Henchan

Reported:
07/03/23 12:16

FL01 3feet
2306425-01 (Soil)

Summit Scientific

Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	37.5	0.0561	mg/L dry	1	BGF0902	06/26/23	06/29/23	EPA 6020B	
Magnesium	14.1	0.0561	"	"	"	"	"	"	
Sodium	9.28	0.0561	"	"	"	"	"	"	

Calculated Analysis

Date Sampled: **06/21/23 10:53**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.328	0.00100	units	1	BGF1123	06/30/23	06/30/23	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **06/21/23 10:53**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	89.1		%	1	BGF0804	06/22/23	06/22/23	Calculation	

Specific Conductance by EPA Method 120.1, Saturated Paste Extraction

Date Sampled: **06/21/23 10:53**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.724	0.0100	mmhos/cm	1	BGF0982	06/27/23	06/27/23	EPA 120.1	

Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction

Date Sampled: **06/21/23 10:53**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	7.66		pH Units	1	BGF0983	06/27/23	06/27/23	EPA 9045D	

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PO Box 1289
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Project: Noble - Pappenheim 02-32 FL

Project Number: UWRWE-A3114-ABN
Project Manager: Paul Henchan

Reported:
07/03/23 12:16

FL02 3feet
2306425-02 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/21/23 10:35**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	0.0020		mg/kg	1	BGF0810	06/22/23	06/22/23	EPA 8260B	
Toluene	ND	0.0050		"	"	"	"	"	"	
Ethylbenzene	ND	0.0050		"	"	"	"	"	"	
Xylenes (total)	ND	0.010		"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.0050		"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.0050		"	"	"	"	"	"	
Naphthalene	ND	0.0038		"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50		"	"	"	"	"	"	

Date Sampled: **06/21/23 10:35**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4	0.0439	110 %		50-150		"	"	"	"	
Surrogate: Toluene-d8	0.0413	103 %		50-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	0.0415	104 %		50-150		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/21/23 10:35**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
C10-C28 (DRO)	ND	50		mg/kg	1	BGF0812	06/22/23	06/22/23	EPA 8015M	
C28-C36 (ORO)	ND	50		"	"	"	"	"	"	

Date Sampled: **06/21/23 10:35**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: o-Terphenyl	12.1	96.4 %		30-150		"	"	"	"	

PAH by EPA Method 8270D SIM

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Project: Noble - Pappenheim 02-32 FL

Project Number: UWRWE-A3114-ABN
Project Manager: Paul Henchan

Reported:
07/03/23 12:16

FL02 3feet
2306425-02 (Soil)

Summit Scientific

PAH by EPA Method 8270D SIM

Date Sampled: **06/21/23 10:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	BGF0780	06/22/23	06/23/23	EPA 8270D SIM	
Anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.00500	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Chrysene	ND	0.00500	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.00500	"	"	"	"	"	"	
Fluoranthene	ND	0.00500	"	"	"	"	"	"	
Fluorene	ND	0.00500	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.00500	"	"	"	"	"	"	
Pyrene	ND	0.00500	"	"	"	"	"	"	
1-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	
2-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	

Date Sampled: **06/21/23 10:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10	0.0192	57.6 %	40-150		"	"	"	"	
Surrogate: Fluoranthene-d10	0.0290	86.9 %	40-150		"	"	"	"	

Total Metals by EPA 6020B Hot Water Soluble Extraction

Date Sampled: **06/21/23 10:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Boron	0.186	0.0100	mg/L	1	BGF0820	06/22/23	06/26/23	EPA 6020B	

Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction

Date Sampled: **06/21/23 10:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Project: Noble - Pappenheim 02-32 FL
Project Number: UWRWE-A3114-ABN
Project Manager: Paul Henchan

Reported:
07/03/23 12:16

FL02 3feet
2306425-02 (Soil)

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Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	43.3	0.0606	mg/L dry	1	BGF0902	06/26/23	06/29/23	EPA 6020B	
Magnesium	8.44	0.0606	"	"	"	"	"	"	
Sodium	2.23	0.0606	"	"	"	"	"	"	

Calculated Analysis

Date Sampled: **06/21/23 10:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.0812	0.00100	units	1	BGF1123	06/30/23	06/30/23	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **06/21/23 10:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	82.4		%	1	BGF0804	06/22/23	06/22/23	Calculation	

Specific Conductance by EPA Method 120.1, Saturated Paste Extraction

Date Sampled: **06/21/23 10:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.268	0.0100	mmhos/cm	1	BGF0982	06/27/23	06/27/23	EPA 120.1	

Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction

Date Sampled: **06/21/23 10:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	7.83		pH Units	1	BGF0983	06/27/23	06/27/23	EPA 9045D	

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Project: Noble - Pappenheim 02-32 FL

Project Number: UWRWE-A3114-ABN
Project Manager: Paul Henchan

Reported:
07/03/23 12:16

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 BGF0810 - EPA 5030 Soil MS

Blank (BGF0810-BLK1)

Prepared & Analyzed: 06/22/23

Benzene	ND	0.0020	mg/kg								
Toluene	ND	0.0050	"								
Ethylbenzene	ND	0.0050	"								
Xylenes (total)	ND	0.010	"								
1,2,4-Trimethylbenzene	ND	0.0050	"								
1,3,5-Trimethylbenzene	ND	0.0050	"								
Naphthalene	ND	0.0038	"								
Gasoline Range Hydrocarbons	ND	0.50	"								
Surrogate: 1,2-Dichloroethane-d4	0.0441		"	0.0400		110	50-150				
Surrogate: Toluene-d8	0.0421		"	0.0400		105	50-150				
Surrogate: 4-Bromofluorobenzene	0.0425		"	0.0400		106	50-150				

LCS (BGF0810-BS1)

Prepared & Analyzed: 06/22/23

Benzene	0.0944	0.0020	mg/kg	0.125		75.5	70-130				
Toluene	0.124	0.0050	"	0.125		99.2	70-130				
Ethylbenzene	0.148	0.0050	"	0.125		118	70-130				
m,p-Xylene	0.306	0.010	"	0.250		122	70-130				
o-Xylene	0.141	0.0050	"	0.125		113	70-130				
1,2,4-Trimethylbenzene	0.156	0.0050	"	0.125		125	70-130				
1,3,5-Trimethylbenzene	0.155	0.0050	"	0.125		124	70-130				
Naphthalene	0.146	0.0038	"	0.125		117	70-130				
Surrogate: 1,2-Dichloroethane-d4	0.0430		"	0.0400		107	50-150				
Surrogate: Toluene-d8	0.0413		"	0.0400		103	50-150				
Surrogate: 4-Bromofluorobenzene	0.0405		"	0.0400		101	50-150				

Matrix Spike (BGF0810-MS1)

Source: 2306389-01

Prepared & Analyzed: 06/22/23

Benzene	0.0956	0.0020	mg/kg	0.125	ND	76.5	70-130				
Toluene	0.126	0.0050	"	0.125	ND	101	70-130				
Ethylbenzene	0.142	0.0050	"	0.125	ND	113	70-130				
m,p-Xylene	0.303	0.010	"	0.250	ND	121	70-130				
o-Xylene	0.141	0.0050	"	0.125	ND	113	70-130				
1,2,4-Trimethylbenzene	0.155	0.0050	"	0.125	ND	124	70-130				
1,3,5-Trimethylbenzene	0.154	0.0050	"	0.125	ND	123	70-130				
Naphthalene	0.154	0.0038	"	0.125	ND	123	70-130				
Surrogate: 1,2-Dichloroethane-d4	0.0453		"	0.0400		113	50-150				
Surrogate: Toluene-d8	0.0426		"	0.0400		106	50-150				
Surrogate: 4-Bromofluorobenzene	0.0411		"	0.0400		103	50-150				

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Project: Noble - Pappenheim 02-32 FL

Project Number: UWRWE-A3114-ABN
 Project Manager: Paul Henchan

Reported:
 07/03/23 12:16

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 BGF0810 - EPA 5030 Soil MS

Matrix Spike Dup (BGF0810-MSD1)	Source: 2306389-01			Prepared & Analyzed: 06/22/23						
Benzene	0.0943	0.0020	mg/kg	0.125	ND	75.4	70-130	1.39	30	
Toluene	0.127	0.0050	"	0.125	ND	102	70-130	0.616	30	
Ethylbenzene	0.151	0.0050	"	0.125	ND	121	70-130	6.36	30	
m,p-Xylene	0.311	0.010	"	0.250	ND	125	70-130	2.80	30	
o-Xylene	0.144	0.0050	"	0.125	ND	115	70-130	2.19	30	
1,2,4-Trimethylbenzene	0.154	0.0050	"	0.125	ND	123	70-130	0.659	30	
1,3,5-Trimethylbenzene	0.155	0.0050	"	0.125	ND	124	70-130	0.892	30	
Naphthalene	0.155	0.0038	"	0.125	ND	124	70-130	0.331	30	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0436</i>		<i>"</i>	<i>0.0400</i>		<i>109</i>	<i>50-150</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0420</i>		<i>"</i>	<i>0.0400</i>		<i>105</i>	<i>50-150</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0408</i>		<i>"</i>	<i>0.0400</i>		<i>102</i>	<i>50-150</i>			

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Project: Noble - Pappenheim 02-32 FL
 Project Number: UWRWE-A3114-ABN
 Project Manager: Paul Henchan

Reported:
 07/03/23 12:16

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 BGF0812 - EPA 3550A

Blank (BGF0812-BLK1)

Prepared & Analyzed: 06/22/23

C10-C28 (DRO)	ND	50	mg/kg								
C28-C36 (ORO)	ND	50	"								
Surrogate: <i>o</i> -Terphenyl	12.0		"	12.5		95.7	30-150				

LCS (BGF0812-BS1)

Prepared & Analyzed: 06/22/23

C10-C28 (DRO)	660	50	mg/kg	500		132	70-130				QLCS-01
Surrogate: <i>o</i> -Terphenyl	11.9		"	12.5		95.4	30-150				

Matrix Spike (BGF0812-MS1)

Source: 2306389-01

Prepared & Analyzed: 06/22/23

C10-C28 (DRO)	667	50	mg/kg	500	26.2	128	70-130				
Surrogate: <i>o</i> -Terphenyl	12.1		"	12.5		96.5	30-150				

Matrix Spike Dup (BGF0812-MSD1)

Source: 2306389-01

Prepared & Analyzed: 06/22/23

C10-C28 (DRO)	675	50	mg/kg	500	26.2	130	70-130	1.21	20		
Surrogate: <i>o</i> -Terphenyl	11.7		"	12.5		93.9	30-150				

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Project: Noble - Pappenheim 02-32 FL

Project Number: UWRWE-A3114-ABN
Project Manager: Paul Henchan

Reported:
07/03/23 12:16

PAH by EPA Method 8270D SIM - Quality Control

Summit Scientific

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

Batch BGF0780 - EPA 5030 Soil MS

Blank (BGF0780-BLK1)

Prepared & Analyzed: 06/22/23

Acenaphthene	ND	0.00500	mg/kg							
Anthracene	ND	0.00500	"							
Benzo (a) anthracene	ND	0.00500	"							
Benzo (a) pyrene	ND	0.00500	"							
Benzo (b) fluoranthene	ND	0.00500	"							
Benzo (k) fluoranthene	ND	0.00500	"							
Chrysene	ND	0.00500	"							
Dibenz (a,h) anthracene	ND	0.00500	"							
Fluoranthene	ND	0.00500	"							
Fluorene	ND	0.00500	"							
Indeno (1,2,3-cd) pyrene	ND	0.00500	"							
Pyrene	ND	0.00500	"							
1-Methylnaphthalene	ND	0.00500	"							
2-Methylnaphthalene	ND	0.00500	"							
<i>Surrogate: 2-Methylnaphthalene-d10</i>	<i>0.0303</i>		<i>"</i>	<i>0.0333</i>		<i>90.9</i>	<i>40-150</i>			
<i>Surrogate: Fluoranthene-d10</i>	<i>0.0391</i>		<i>"</i>	<i>0.0333</i>		<i>117</i>	<i>40-150</i>			

LCS (BGF0780-BS1)

Prepared & Analyzed: 06/22/23

Acenaphthene	0.0352	0.00500	mg/kg	0.0333	106	31-137
Anthracene	0.0368	0.00500	"	0.0333	111	30-120
Benzo (a) anthracene	0.0398	0.00500	"	0.0333	119	30-120
Benzo (a) pyrene	0.0328	0.00500	"	0.0333	98.3	30-120
Benzo (b) fluoranthene	0.0346	0.00500	"	0.0333	104	30-120
Benzo (k) fluoranthene	0.0323	0.00500	"	0.0333	96.8	30-120
Chrysene	0.0370	0.00500	"	0.0333	111	30-120
Dibenz (a,h) anthracene	0.0324	0.00500	"	0.0333	97.3	30-120
Fluoranthene	0.0366	0.00500	"	0.0333	110	30-120
Fluorene	0.0350	0.00500	"	0.0333	105	30-120
Indeno (1,2,3-cd) pyrene	0.0356	0.00500	"	0.0333	107	30-120
Pyrene	0.0380	0.00500	"	0.0333	114	35-142
1-Methylnaphthalene	0.0334	0.00500	"	0.0333	100	35-142
2-Methylnaphthalene	0.0299	0.00500	"	0.0333	89.7	35-142
<i>Surrogate: 2-Methylnaphthalene-d10</i>	<i>0.0338</i>		<i>"</i>	<i>0.0333</i>	<i>101</i>	<i>40-150</i>
<i>Surrogate: Fluoranthene-d10</i>	<i>0.0390</i>		<i>"</i>	<i>0.0333</i>	<i>117</i>	<i>40-150</i>

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Project: Noble - Pappenheim 02-32 FL

Project Number: UWRWE-A3114-ABN
Project Manager: Paul Henchan

Reported:
07/03/23 12:16

PAH by EPA Method 8270D SIM - Quality Control

Summit Scientific

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

Batch BGF0780 - EPA 5030 Soil MS

Matrix Spike (BGF0780-MS1)	Source: 2306402-01			Prepared & Analyzed: 06/22/23						
Acenaphthene	0.0309	0.00500	mg/kg	0.0333	ND	92.7	31-137			
Anthracene	0.0314	0.00500	"	0.0333	ND	94.2	30-120			
Benzo (a) anthracene	0.0351	0.00500	"	0.0333	ND	105	30-120			
Benzo (a) pyrene	0.0300	0.00500	"	0.0333	ND	90.2	30-120			
Benzo (b) fluoranthene	0.0309	0.00500	"	0.0333	ND	92.7	30-120			
Benzo (k) fluoranthene	0.0296	0.00500	"	0.0333	ND	88.7	30-120			
Chrysene	0.0326	0.00500	"	0.0333	ND	97.9	30-120			
Dibenz (a,h) anthracene	0.0292	0.00500	"	0.0333	ND	87.5	30-120			
Fluoranthene	0.0314	0.00500	"	0.0333	ND	94.1	30-120			
Fluorene	0.0293	0.00500	"	0.0333	ND	87.9	30-120			
Indeno (1,2,3-cd) pyrene	0.0328	0.00500	"	0.0333	ND	98.4	30-120			
Pyrene	0.0341	0.00500	"	0.0333	ND	102	35-142			
1-Methylnaphthalene	0.0299	0.00500	"	0.0333	ND	89.8	15-130			
2-Methylnaphthalene	0.0267	0.00500	"	0.0333	ND	80.0	15-130			
<i>Surrogate: 2-Methylnaphthalene-d10</i>	<i>0.0314</i>	<i>"</i>	<i>"</i>	<i>0.0333</i>	<i>"</i>	<i>94.1</i>	<i>40-150</i>			
<i>Surrogate: Fluoranthene-d10</i>	<i>0.0334</i>	<i>"</i>	<i>"</i>	<i>0.0333</i>	<i>"</i>	<i>100</i>	<i>40-150</i>			

Matrix Spike Dup (BGF0780-MSD1)	Source: 2306402-01			Prepared & Analyzed: 06/22/23						
Acenaphthene	0.0236	0.00500	mg/kg	0.0333	ND	70.7	31-137	27.0	30	
Anthracene	0.0248	0.00500	"	0.0333	ND	74.3	30-120	23.6	30	
Benzo (a) anthracene	0.0284	0.00500	"	0.0333	ND	85.3	30-120	21.1	30	
Benzo (a) pyrene	0.0233	0.00500	"	0.0333	ND	69.9	30-120	25.3	30	
Benzo (b) fluoranthene	0.0246	0.00500	"	0.0333	ND	73.7	30-120	22.9	30	
Benzo (k) fluoranthene	0.0225	0.00500	"	0.0333	ND	67.6	30-120	26.9	30	
Chrysene	0.0253	0.00500	"	0.0333	ND	75.9	30-120	25.3	30	
Dibenz (a,h) anthracene	0.0222	0.00500	"	0.0333	ND	66.7	30-120	26.9	30	
Fluoranthene	0.0246	0.00500	"	0.0333	ND	73.8	30-120	24.2	30	
Fluorene	0.0227	0.00500	"	0.0333	ND	68.1	30-120	25.3	30	
Indeno (1,2,3-cd) pyrene	0.0250	0.00500	"	0.0333	ND	75.1	30-120	26.9	30	
Pyrene	0.0269	0.00500	"	0.0333	ND	80.7	35-142	23.4	30	
1-Methylnaphthalene	0.0193	0.00500	"	0.0333	ND	58.0	15-130	42.9	50	
2-Methylnaphthalene	0.0176	0.00500	"	0.0333	ND	52.8	15-130	40.8	50	
<i>Surrogate: 2-Methylnaphthalene-d10</i>	<i>0.0208</i>	<i>"</i>	<i>"</i>	<i>0.0333</i>	<i>"</i>	<i>62.5</i>	<i>40-150</i>			
<i>Surrogate: Fluoranthene-d10</i>	<i>0.0269</i>	<i>"</i>	<i>"</i>	<i>0.0333</i>	<i>"</i>	<i>80.6</i>	<i>40-150</i>			

Summit Scientific

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Fremont Environmental
 PO Box 1289
 Wellington CO, 80549

Project: Noble - Pappenheim 02-32 FL

Project Number: UWRWE-A3114-ABN
 Project Manager: Paul Henchan

Reported:
 07/03/23 12:16

Total Metals by EPA 6020B Hot Water Soluble Extraction - Quality Control
Summit Scientific

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

Batch BGF0820 - EPA 3050B

Blank (BGF0820-BLK1)

Prepared: 06/22/23 Analyzed: 06/26/23

Boron ND 0.0100 mg/L

LCS (BGF0820-BS1)

Prepared: 06/22/23 Analyzed: 06/26/23

Boron 4.43 0.0100 mg/L 5.00 88.7 80-120

Duplicate (BGF0820-DUP1)

Source: 2306391-01

Prepared: 06/22/23 Analyzed: 06/26/23

Boron 0.204 0.0100 mg/L 0.304 39.3 20 QR-04

Matrix Spike (BGF0820-MS1)

Source: 2306391-01

Prepared: 06/22/23 Analyzed: 06/26/23

Boron 4.81 0.0100 mg/L 5.00 0.304 90.1 75-125

Matrix Spike Dup (BGF0820-MSD1)

Source: 2306391-01

Prepared: 06/22/23 Analyzed: 06/26/23

Boron 4.61 0.0100 mg/L 5.00 0.304 86.2 75-125 4.07 25

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Project: Noble - Pappenheim 02-32 FL

Project Number: UWRWE-A3114-ABN
 Project Manager: Paul Henchan

Reported:
 07/03/23 12:16

Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction - Quality Control

Summit Scientific

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

Batch BGF0902 - General Preparation

Blank (BGF0902-BLK1)

Prepared: 06/26/23 Analyzed: 06/29/23

Calcium	ND	0.0500	mg/L wet							
Magnesium	ND	0.0500	"							
Sodium	ND	0.0500	"							

LCS (BGF0902-BS1)

Prepared: 06/26/23 Analyzed: 06/29/23

Calcium	4.06	0.0500	mg/L wet	5.00	81.3	70-130				
Magnesium	5.46	0.0500	"	5.00	109	70-130				
Sodium	5.36	0.0500	"	5.00	107	70-130				

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Project: Noble - Pappenheim 02-32 FL

Project Number: UWRWE-A3114-ABN
 Project Manager: Paul Henchan

Reported:
 07/03/23 12:16

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

Summit Scientific

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

Batch BGF0804 - General Preparation

Duplicate (BGF0804-DUP1)

Source: 2306400-40

Prepared & Analyzed: 06/22/23

% Solids	90.7		%		88.5			2.48	20	
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Summit Scientific

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Project: Noble - Pappenheim 02-32 FL

Project Number: UWRWE-A3114-ABN
 Project Manager: Paul Henchan

Reported:
 07/03/23 12:16

Specific Conductance by EPA Method 120.1, Saturated Paste Extraction - Quality Control

Summit Scientific

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

Batch BGF0982 - General Preparation

Blank (BGF0982-BLK1)

Prepared & Analyzed: 06/27/23

Specific Conductance (EC) ND 0.0100 mmhos/cm

LCS (BGF0982-BS1)

Prepared & Analyzed: 06/27/23

Specific Conductance (EC) 0.154 0.0100 mmhos/cm 0.150 103 95-105

Duplicate (BGF0982-DUP1)

Source: 2306425-01

Prepared & Analyzed: 06/27/23

Specific Conductance (EC) 0.707 0.0100 mmhos/cm 0.724 2.32 20

Summit Scientific

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Project: Noble - Pappenheim 02-32 FL

Project Number: UWRWE-A3114-ABN
 Project Manager: Paul Henchan

Reported:
 07/03/23 12:16

Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction - Quality Control

Summit Scientific

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

Batch BGF0983 - General Preparation

LCS (BGF0983-BS1)

Prepared & Analyzed: 06/27/23

pH 9.01 pH Units 9.18 98.1 95-105

Duplicate (BGF0983-DUP1)

Source: 2306425-01

Prepared & Analyzed: 06/27/23

pH 7.68 pH Units 7.66 0.261 20

Summit Scientific

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Project: Noble - Pappenheim 02-32 FL

Project Number: UWRWE-A3114-ABN
Project Manager: Paul Henchan

Reported:
07/03/23 12:16

Notes and Definitions

- QR-04 The RPD value for the sample duplicate or MS/MSD was outside of QC acceptance. QC batch accepted based on LCS and/or LCSD recovery and/or RPD values.
- QLCS-01 The spike recovery was outside acceptance limits for this analyte indicating a potential high bias. The corresponding samples did not exhibit concentrations above reporting level for this analyte. Data quality is not affected.
- 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