

**FOURTH QUARTER 2023 SITE MONITORING DATA
HIGHLAND 12-20 (FAC)**

**ECMC SPILL TRACKING # 483859
ECMC REMEDIATION # 24052**

Prepared for:



2115 117th Avenue
Greeley, CO 80631

Prepared by:



6855 W. 119th Ave
Broomfield, CO 80020

TABLE 1
GROUNDWATER ELEVATION DATA
NOBLE ENERGY, INC. - HIGHLAND 12-20 FACILITY



Monitoring Well ID	Date	Top of Casing Elevation (ft. AMSL)	Total Depth (ft. BTOC)	Depth to Water (ft. BGS) ⁽¹⁾	Depth to LNAPL (ft.) ⁽¹⁾	LNAPL Thickness (ft.)	Groundwater Elevation* (ft. AMSL)
BH01	05/24/23	4722.73	18.47	6.68	ND	ND	4716.23
BH01	08/10/23	4722.73	17.09	7.17	ND	ND	4715.74
BH01	11/09/23	4722.73	18.08	5.02	ND	ND	4717.89
BH02	05/24/23	4725.33	20.05	7.02	ND	ND	4715.95
BH02	08/10/23	4725.33	19.80	7.35	ND	ND	4715.62
BH02	11/09/23	Monitoring Well Destroyed					
BH03	05/24/23	4721.39	17.07	5.20	ND	ND	4716.33
BH03	08/10/23	4721.39	17.67	5.92	ND	ND	4715.61
BH03	11/09/23	4721.39	17.68	3.77	ND	ND	4717.76
BH04	05/24/23	4722.87	17.99	6.60	ND	ND	4716.43
BH04	08/10/23	4722.87	17.79	7.26	ND	ND	4715.77
BH04	11/09/23	4722.87	17.68	5.11	ND	ND	4717.92
BH05	05/24/23	4723.50	17.50	7.44	ND	ND	4716.24
BH05	08/10/23	4723.50	17.48	7.89	ND	ND	4715.79
BH05	11/09/23	4723.50	17.41	5.70	ND	ND	4717.98
BH06	05/24/23	4723.57	17.64	7.18	ND	ND	4716.59
BH06	08/10/23	4723.57	17.64	7.92	ND	ND	4715.85
BH06	11/09/23	4723.57	17.84	5.87	ND	ND	4717.90

Notes:

⁽¹⁾ Depth to water measurements were collected from top of casing and adjusted using survey data to reflect depth of water from ground surface.

* Groundwater elevation is corrected for product thickness (when present) using the following calculation:
Groundwater elevation = (TOC Elevation - Measured Depth to Water)+(LNAPL Thickness in Well x LNAPL Relative Density)
LNAPL relative density was estimated to be 0.75

Definitions:

- ft. = Feet
- AMSL = Above mean sea level
- BTOC = Below top of casing
- BGS = Below ground surface
- LNAPL = Light non-aqueous phase liquid
- ND = No LNAPL detected

TABLE 2
GROUNDWATER ANALYTICAL DATA
NOBLE ENERGY, INC. - HIGHLAND 12-20 FACILITY



Monitoring Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Naphthalene (µg/L)	1,2,4-TMB (µg/L)	1,3,5-TMB (µg/L)	Benz(a) (µg/L)	1-M (µg/L)	2-M (µg/L)	TDS (mg/L)	Chloride Ion (mg/L)	Sulfate Ion (mg/L)
ECMC Standard ⁽¹⁾		5	560	700	1,400	140	67	67	0.16 ⁽²⁾	1.1 ⁽³⁾	3.6 ⁽³⁾	<1.25 x Background	250 or <1.25 x Background	250 or <1.25 x Background
BH01	05/24/23	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<0.100	<0.500	<0.500	3,120	452	1,870
BH01	08/10/23	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<0.100	1.83	0.574	3,060	570	2,040
BH01	11/09/23	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<0.100	1.49	<0.500	2,610	262	1,210
BH02	05/24/23	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<0.100	<0.500	<0.500	3,490	493	2,160
BH02	08/10/23	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<0.100	<0.500	<0.500	2,980	521	2,310
BH02	11/09/23	Well Not Sampled - Monitoring Well Destroyed												
BH03	05/24/23	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<0.100	<0.500	<0.500	3,080	419	1,970
BH03	08/10/23	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<0.100	<0.500	<0.500	2,220	296	1,450
BH03	11/09/23	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<0.100	<0.500	<0.500	4,110	112	486
BH04 ⁽⁴⁾	05/24/23	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<0.100	<0.500	<0.500	3,620	580	2,260
BH04 ⁽⁴⁾	08/10/23	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<0.100	<0.500	<0.500	2,500	203	2,250
BH04 ⁽⁴⁾	11/09/23	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<0.100	<0.500	<0.500	4,510	128	579
BH05	05/24/23	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<0.100	<0.500	<0.500	3,190	449	2,000
BH05	08/10/23	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<0.100	<0.500	<0.500	2,770	474	2,000
BH05 ⁽⁴⁾	11/09/23	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<0.100	<0.500	<0.500	2,930	277	1,600
BH06 ⁽⁴⁾	05/24/23	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<0.100	<0.500	<0.500	2,590	259	1,220
BH06 ⁽⁴⁾	08/10/23	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<0.100	<0.500	<0.500	3,410	702	2,480
BH06 ⁽⁴⁾	11/09/23	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<0.100	<0.500	<0.500	4,200	104	560

Notes:

- ⁽¹⁾ Groundwater standards referenced from 2 CCR 404-1, Table 915-1 (January 15, 2021).
- ⁽²⁾ Groundwater standards referenced from 5 CCR 1002-41, Table A (June 30, 2020).
- ⁽³⁾ Groundwater standards referenced from USEPA Regional Screening Level (RSL) Resident Tapwater Table (TR=1E-06, HQ=0.1) November 2022.
- ⁽⁴⁾ Monitoring well used for inorganic background levels.

Definitions:

- < = Analytical result is less than the indicated laboratory reporting limit
- ECMC = Colorado Energy and Carbon Management Commission
- mg/L = Milligrams per liter
- µg/L = Micrograms per liter
- 1,2,4 - TMB = 1,2,4 Trimethylbenzene
- 1,3,5 - TMB = 1,3,5 Trimethylbenzene
- Benz(a) = Benzanthracene
- 1-M = 1-Methylnaphthalene
- 2-M = 2-Methylnaphthalene
- TDS = Total Dissolved Solids

Highlighted results are equal to or exceed the regulatory standard

Bold results exceed the regulatory standard for inorganic parameters

The site-specific background assessment is on-going for groundwater inorganic constituents.

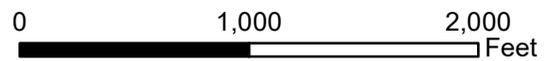
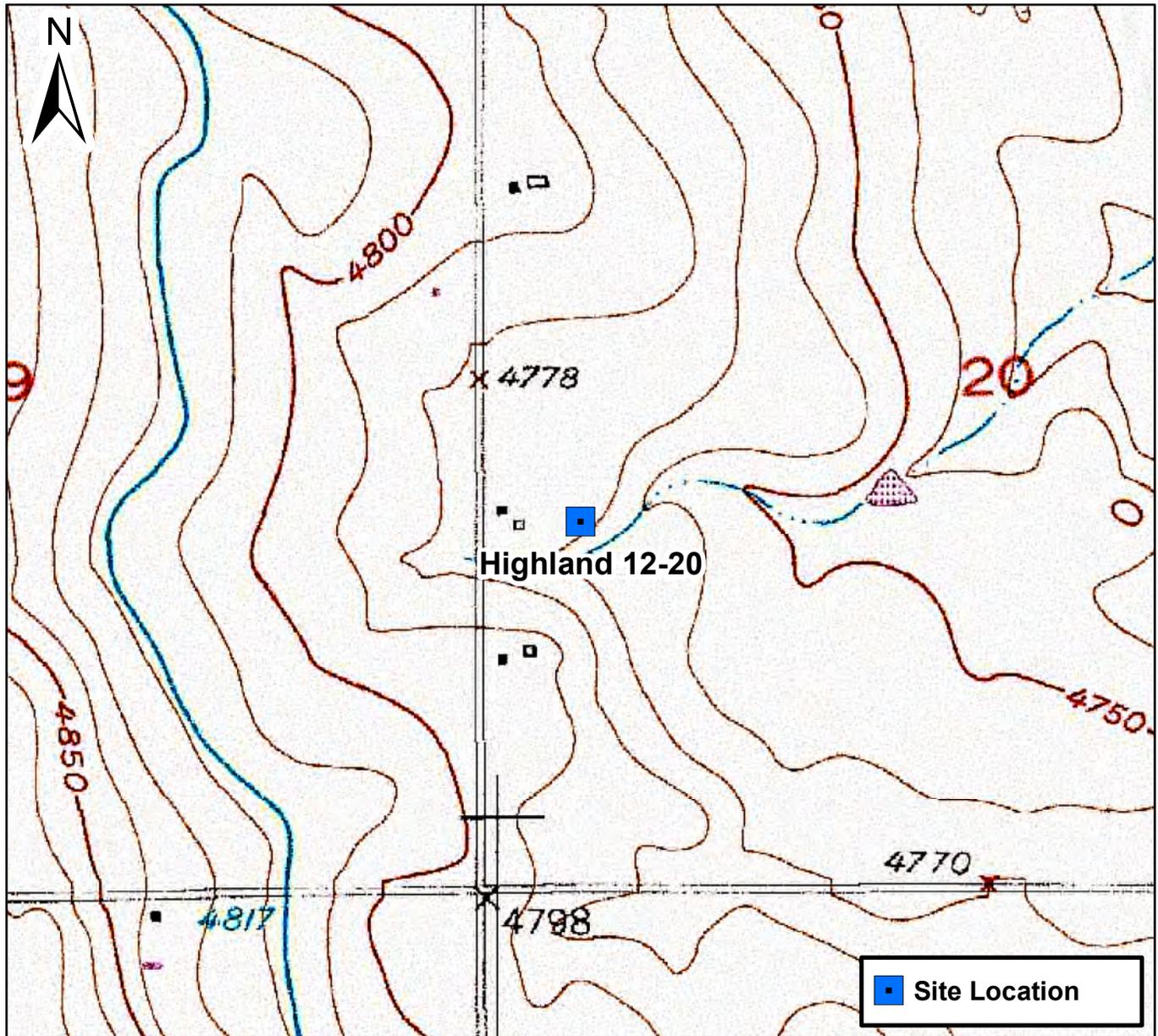
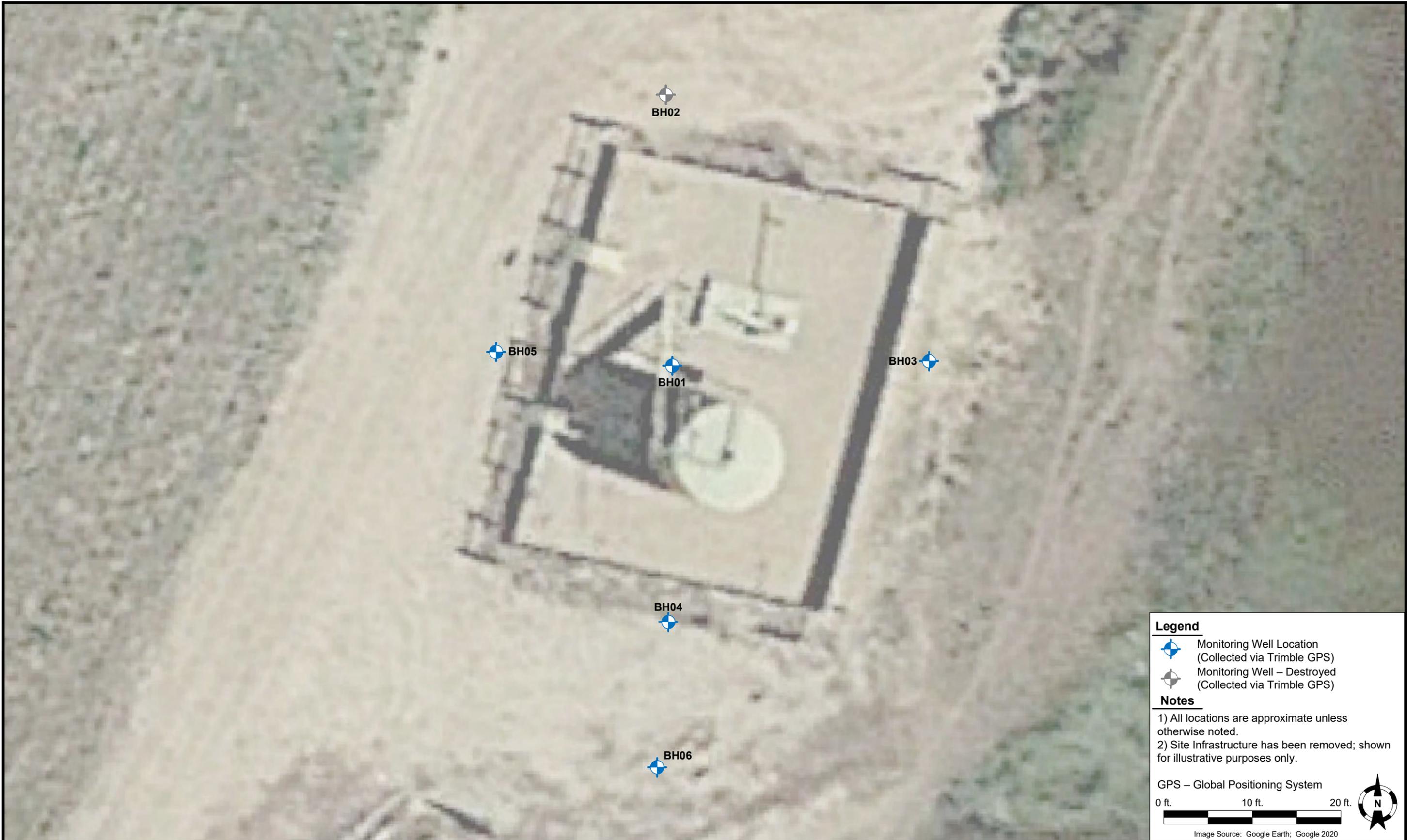


Figure 1

Site Location Map
 Highland 12-20
 NWSW S20 T4N R64W
 Weld County, Colorado





DATE:	07/25/2023
DESIGNED BY:	JW
DRAWN BY:	HM



TASMAN Tasman, Inc.
6855 W 119th Avenue
Broomfield, CO 80020

**Noble Energy, Inc. – DJ Basin
Highland 12-20 Facility**
NWSW, Section 20, Township 4 North, Range 64 West
Weld County, Colorado

Site Overview Map

FIGURE
2



Legend

- Monitoring Well (Collected via Trimble GPS)
- Destroyed Monitoring Well (Collected via Trimble GPS)
- Groundwater Elevation Contour (Dashed Where Inferred)
- 4763.81** Measured Groundwater Elevation–ft. amsl
- Approximate Groundwater Flow Direction

Notes

- 1) All locations are approximate unless otherwise noted
- 2) Site Infrastructure has been removed; shown for illustrative purposes only.

GPS – Global Positioning System
ft. amsl – Feet above mean sea level

0 ft. 10 ft. 20 ft.

Image Source: Google Earth; Google 2021

DATE:	12/22/2023
DESIGNED BY:	JW
DRAWN BY:	LR

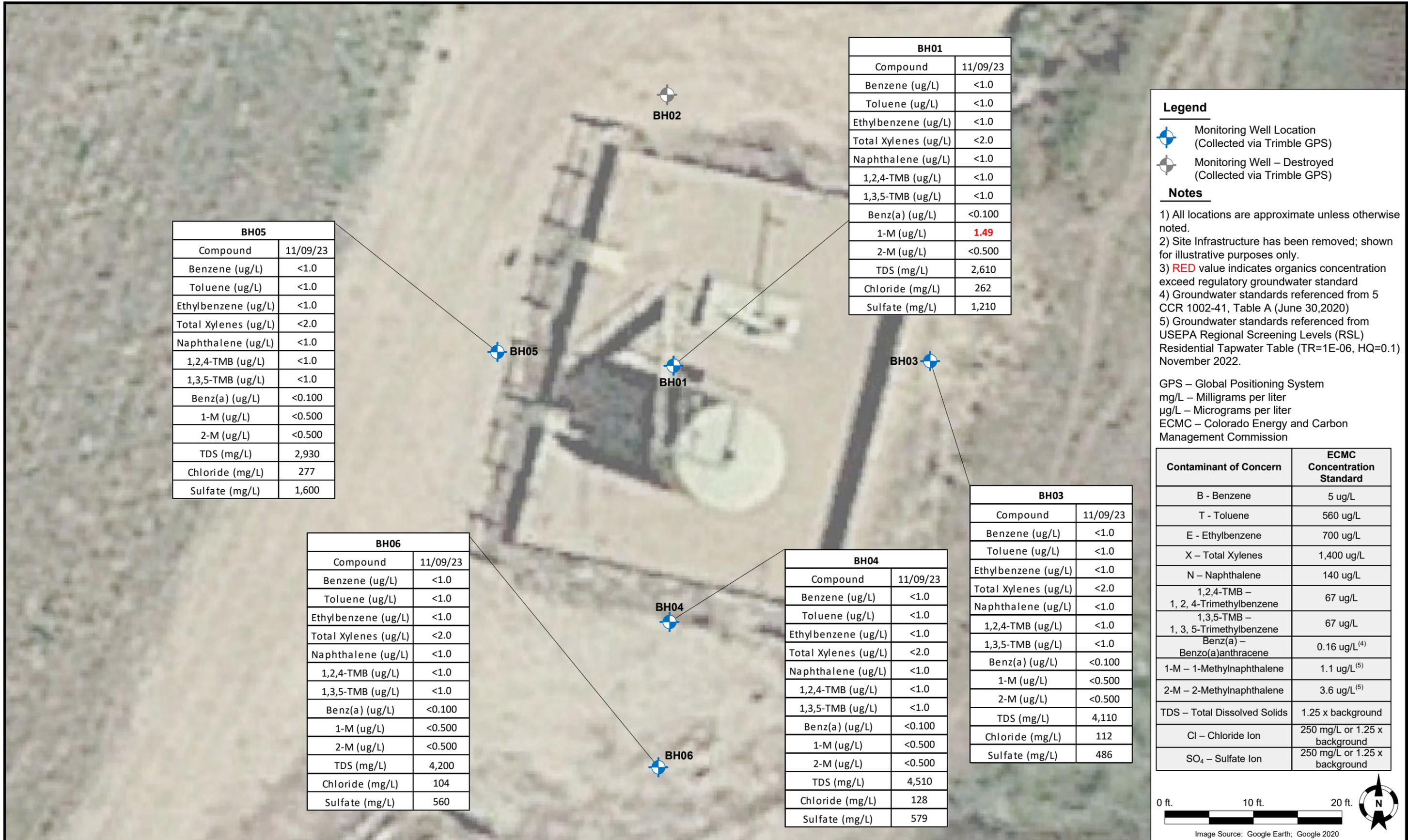


Tasman, Inc.
6855 W 119th Ave.
Broomfield, CO 80020

Noble Energy, Inc. – DJ Basin
Highland 12-20 FAC
NWSW, Section 20, Township 4 North, Range 64 West
Weld County, Colorado

Groundwater Potentiometric
Surface Contour Map
(11/09/2023)

FIGURE
3



DATE: 12/13/2023

DESIGNED BY: JW

DRAWN BY: PK

TASMAN Tasman, Inc.
 6855 W 119th Avenue
 Broomfield, CO 80020

Noble Energy, Inc. – DJ Basin
Highland 12-20 Facility
 NWSW, Section 20, Township 4 North, Range 64 West
 Weld County, Colorado

Groundwater Analytical
 Results Map
 (11/09/2023)

FIGURE
 4

Summit Scientific

4653 Table Mountain Drive, Golden, Colorado 80403

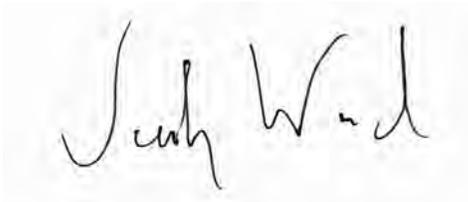
303.277.9310

November 16, 2023

Jacob Whritenour
Tasman Geosciences
6855 W. 119th Ave.
Broomfield, CO 80020
RE: Noble - Highland 12-20
Work Order #2311195

Enclosed are the results of analyses for samples received by Summit Scientific on 11/09/23 17:45. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads "Jacob Wood". The signature is written in a cursive style with a large initial 'J' and 'W'.

Jacob Wood For Paul Shrewsbury
President



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - Highland 12-20

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
11/16/23 10:06

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH01	2311195-01	Water	11/09/23 11:33	11/09/23 17:45
BH03	2311195-02	Water	11/09/23 11:23	11/09/23 17:45
BH04	2311195-03	Water	11/09/23 11:14	11/09/23 17:45
BH05	2311195-04	Water	11/09/23 11:13	11/09/23 17:45
BH06	2311195-05	Water	11/09/23 11:22	11/09/23 17:45

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.

Send Data To:		Send Invoice To:
Client: Noble/Tasman	Project Manager: Jake Whritenour	Company: <u>Noble</u>
Address: 6855 W. 119th Ave.	E-Mail: Jwhritenour@tasman-geo.com	Project Name/Location: <u>Highland 12-20 (FAC)</u>
City/State/Zip: Broomfield/CO/ 80020		AFE#:
Phone:	Project Name: <u>Highland 12-20 (FAC)</u>	PO/Billing Codes:
Sampler Name: <u>Aiden Franklin</u>	Project Number:	Contact:

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix			Analysis Requested					Special Instructions	
					HCl	HNO3	None	Other	Water	Soil	Air-Canister #	Other	BTEXN	1,2,4 & 1,3,5 TMBS	TDS, Cl, SO4	Benzothiazene		1-M, 2-M
1	BH01	11/9/23	11:33	3			2		X				X	X	X	X	X	
2	BH03	↓	11:23	↓			↓		↓				↓	↓	↓	↓	↓	
3	BH04	↓	11:14	↓			↓		↓				↓	↓	↓	↓	↓	
4	BH05	↓	11:13	↓			↓		↓				↓	↓	↓	↓	↓	
5	BH06	↓	11:22	↓			↓		↓				↓	↓	↓	↓	↓	
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		

Relinquished by: <u>Aiden Franklin</u>	Date/Time: <u>13:00 11/9/23</u>	Received by: Tasman Lock Box	Date/Time: <u>13:00 11/9/23</u>	TAT Business Days	Field DO	Notes:
Relinquished by: <u>Tasman Lock Box</u>	Date/Time: <u>11/9/23 1745</u>	Received by: <u>[Signature]</u>	Date/Time: <u>11/9/23 1745</u>	Same Day	Field EC	
Relinquished by:	Date/Time:	Received by:	Date/Time:	1 Day	Field ORP	
Relinquished by:	Date/Time:	Received by:	Date/Time:	2 Days	Field pH	
Relinquished by:	Date/Time:	Received by:	Date/Time:	3 Days	Field Temp.	
Temperature Upon Receipt: <u>11.2</u>	Corrected Temperature: <u>0</u>	IR gun #: <u>1</u>	HNO3 lot #:	Standard	Field Turb.	

S₂

Sample Receipt Checklist

S2 Work Order# 231195

Client: NDAE Franman

Client Project ID: Highland 12-20 (FAC)

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"/>	
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 checked="" type="checkbox"/>	No Answer
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 type="checkbox"/>	<input checked="" 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 checked="" type="checkbox"/>	<input 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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	HCl
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"/>	
Additional Comments (if any):				

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

AS

Custodian Printed Name

11/9/23

Date/Time

2023



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - Highland 12-20

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
11/16/23 10:06

BH01
2311195-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/09/23 11:33**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BGK0388	11/10/23	11/11/23	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	
Naphthalene	ND	1.0		"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	

Date Sampled: **11/09/23 11:33**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4	15.9	119 %		23-173		"	"	"	"	
Surrogate: Toluene-d8	14.0	105 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	14.9	112 %		21-167		"	"	"	"	

PAH by EPA Method 8270D SIM

Date Sampled: **11/09/23 11:33**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzo (a) anthracene	ND	0.100		ug/l	1	BGK0422	11/13/23	11/14/23	EPA 8270D SIM	
1-Methylnaphthalene	1.49	0.500		"	"	"	"	"	"	
2-Methylnaphthalene	ND	0.500		"	"	"	"	"	"	

Date Sampled: **11/09/23 11:33**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 2-Methylnaphthalene-d10	1.26	63.1 %		40-150		"	"	"	"	
Surrogate: Fluoranthene-d10	1.36	67.8 %		40-150		"	"	"	"	

Total Dissolved Solids by SM2540C

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.



Tasman Geosciences
 6855 W. 119th Ave.
 Broomfield CO, 80020

Project: Noble - Highland 12-20

Project Number: [none]
 Project Manager: Jacob Whritenour

Reported:
 11/16/23 10:06

BH01
2311195-01 (Water)

Summit Scientific

Total Dissolved Solids by SM2540C

Date Sampled: **11/09/23 11:33**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Total Dissolved Solids	2610	10.0		mg/L	1	BGK0456	11/13/23	11/13/23	SM2540C	

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Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - Highland 12-20

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
11/16/23 10:06

BH03
2311195-02 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/09/23 11:23**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BGK0388	11/10/23	11/11/23	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	
Naphthalene	ND	1.0		"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	

Date Sampled: **11/09/23 11:23**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4	14.9	112 %		23-173		"	"	"	"	
Surrogate: Toluene-d8	14.4	108 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	14.6	110 %		21-167		"	"	"	"	

PAH by EPA Method 8270D SIM

Date Sampled: **11/09/23 11:23**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzo (a) anthracene	ND	0.100		ug/l	1	BGK0422	11/13/23	11/14/23	EPA 8270D SIM	
1-Methylnaphthalene	ND	0.500		"	"	"	"	"	"	
2-Methylnaphthalene	ND	0.500		"	"	"	"	"	"	

Date Sampled: **11/09/23 11:23**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 2-Methylnaphthalene-d10	1.43	71.3 %		40-150		"	"	"	"	
Surrogate: Fluoranthene-d10	1.64	81.9 %		40-150		"	"	"	"	

Total Dissolved Solids by SM2540C

Summit Scientific

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Tasman Geosciences
 6855 W. 119th Ave.
 Broomfield CO, 80020

Project: Noble - Highland 12-20

Project Number: [none]
 Project Manager: Jacob Whritenour

Reported:
 11/16/23 10:06

BH03
2311195-02 (Water)

Summit Scientific

Total Dissolved Solids by SM2540C

Date Sampled: **11/09/23 11:23**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Total Dissolved Solids	4110	10.0		mg/L	1	BGK0456	11/13/23	11/13/23	SM2540C	

Summit Scientific

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Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - Highland 12-20

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
11/16/23 10:06

BH04
2311195-03 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/09/23 11:14**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BGK0388	11/10/23	11/11/23	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	
Naphthalene	ND	1.0		"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	

Date Sampled: **11/09/23 11:14**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4	14.6	110 %		23-173		"	"	"	"	
Surrogate: Toluene-d8	13.8	104 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	14.5	109 %		21-167		"	"	"	"	

PAH by EPA Method 8270D SIM

Date Sampled: **11/09/23 11:14**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzo (a) anthracene	ND	0.100		ug/l	1	BGK0422	11/13/23	11/14/23	EPA 8270D SIM	
1-Methylnaphthalene	ND	0.500		"	"	"	"	"	"	
2-Methylnaphthalene	ND	0.500		"	"	"	"	"	"	

Date Sampled: **11/09/23 11:14**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 2-Methylnaphthalene-d10	1.25	62.3 %		40-150		"	"	"	"	
Surrogate: Fluoranthene-d10	1.49	74.7 %		40-150		"	"	"	"	

Total Dissolved Solids by SM2540C

Summit Scientific

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Tasman Geosciences
 6855 W. 119th Ave.
 Broomfield CO, 80020

Project: Noble - Highland 12-20

Project Number: [none]
 Project Manager: Jacob Whritenour

Reported:
 11/16/23 10:06

BH04
2311195-03 (Water)

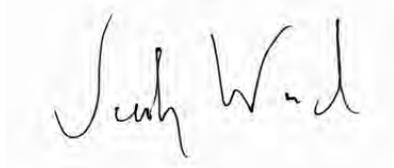
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Total Dissolved Solids by SM2540C

Date Sampled: **11/09/23 11:14**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Total Dissolved Solids	4510	10.0	mg/L	1	BGK0456	11/13/23	11/13/23	SM2540C	

Summit Scientific



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Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - Highland 12-20

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
11/16/23 10:06

BH05
2311195-04 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/09/23 11:13**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BGK0388	11/10/23	11/11/23	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	
Naphthalene	ND	1.0		"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	

Date Sampled: **11/09/23 11:13**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4	15.2	114 %		23-173		"	"	"	"	
Surrogate: Toluene-d8	14.3	107 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	14.7	110 %		21-167		"	"	"	"	

PAH by EPA Method 8270D SIM

Date Sampled: **11/09/23 11:13**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzo (a) anthracene	ND	0.100		ug/l	1	BGK0422	11/13/23	11/14/23	EPA 8270D SIM	
1-Methylnaphthalene	ND	0.500		"	"	"	"	"	"	
2-Methylnaphthalene	ND	0.500		"	"	"	"	"	"	

Date Sampled: **11/09/23 11:13**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 2-Methylnaphthalene-d10	1.62	81.2 %		40-150		"	"	"	"	
Surrogate: Fluoranthene-d10	1.65	82.3 %		40-150		"	"	"	"	

Total Dissolved Solids by SM2540C

Summit Scientific

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Tasman Geosciences
 6855 W. 119th Ave.
 Broomfield CO, 80020

Project: Noble - Highland 12-20

Project Number: [none]
 Project Manager: Jacob Whritenour

Reported:
 11/16/23 10:06

BH05
2311195-04 (Water)

Summit Scientific

Total Dissolved Solids by SM2540C

Date Sampled: **11/09/23 11:13**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Total Dissolved Solids	2930	10.0		mg/L	1	BGK0456	11/13/23	11/13/23	SM2540C	

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Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - Highland 12-20

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
11/16/23 10:06

BH06
2311195-05 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/09/23 11:22**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BGK0388	11/10/23	11/11/23	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	
Naphthalene	ND	1.0		"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	

Date Sampled: **11/09/23 11:22**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4	14.6	110 %		23-173		"	"	"	"	
Surrogate: Toluene-d8	14.3	107 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	14.9	112 %		21-167		"	"	"	"	

PAH by EPA Method 8270D SIM

Date Sampled: **11/09/23 11:22**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzo (a) anthracene	ND	0.100		ug/l	1	BGK0422	11/13/23	11/14/23	EPA 8270D SIM	
1-Methylnaphthalene	ND	0.500		"	"	"	"	"	"	
2-Methylnaphthalene	ND	0.500		"	"	"	"	"	"	

Date Sampled: **11/09/23 11:22**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 2-Methylnaphthalene-d10	1.13	56.3 %		40-150		"	"	"	"	
Surrogate: Fluoranthene-d10	1.15	57.5 %		40-150		"	"	"	"	

Total Dissolved Solids by SM2540C

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Tasman Geosciences
 6855 W. 119th Ave.
 Broomfield CO, 80020

Project: Noble - Highland 12-20

Project Number: [none]
 Project Manager: Jacob Whritenour

Reported:
 11/16/23 10:06

BH06
2311195-05 (Water)

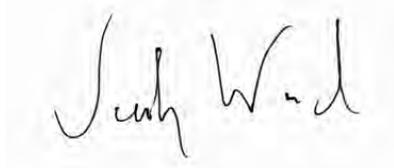
Summit Scientific

Total Dissolved Solids by SM2540C

Date Sampled: **11/09/23 11:22**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Total Dissolved Solids	4200	10.0		mg/L	1	BGK0456	11/13/23	11/13/23	SM2540C	

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Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - Highland 12-20

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
11/16/23 10:06

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

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

Batch BGK0388 - EPA 5030 Water MS

Blank (BGK0388-BLK1)

Prepared: 11/10/23 Analyzed: 11/13/23

Benzene	ND	1.0	ug/l								
Toluene	ND	1.0	"								
Ethylbenzene	ND	1.0	"								
Xylenes (total)	ND	2.0	"								
Naphthalene	ND	1.0	"								
1,2,4-Trimethylbenzene	ND	1.0	"								
1,3,5-Trimethylbenzene	ND	1.0	"								
<i>Surrogate: 1,2-Dichloroethane-d4</i>	15.3		"	13.3		115		23-173			
<i>Surrogate: Toluene-d8</i>	14.0		"	13.3		105		20-170			
<i>Surrogate: 4-Bromofluorobenzene</i>	14.4		"	13.3		108		21-167			

LCS (BGK0388-BS1)

Prepared: 11/10/23 Analyzed: 11/13/23

Benzene	34.7	1.0	ug/l	33.3		104		51-132			
Toluene	35.6	1.0	"	33.3		107		51-138			
Ethylbenzene	35.6	1.0	"	33.3		107		58-146			
m,p-Xylene	71.4	2.0	"	66.7		107		57-144			
o-Xylene	31.4	1.0	"	33.3		94.1		53-146			
Naphthalene	37.0	1.0	"	33.3		111		70-130			
1,2,4-Trimethylbenzene	32.0	1.0	"	33.3		96.0		70-130			
1,3,5-Trimethylbenzene	32.8	1.0	"	33.3		98.4		70-130			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	15.1		"	13.3		113		23-173			
<i>Surrogate: Toluene-d8</i>	14.1		"	13.3		106		20-170			
<i>Surrogate: 4-Bromofluorobenzene</i>	13.5		"	13.3		101		21-167			

Matrix Spike (BGK0388-MS1)

Source: 2311180-05

Prepared: 11/10/23 Analyzed: 11/13/23

Benzene	34.4	1.0	ug/l	33.3	ND	103		34-141			
Toluene	35.4	1.0	"	33.3	ND	106		27-151			
Ethylbenzene	35.6	1.0	"	33.3	ND	107		29-160			
m,p-Xylene	72.0	2.0	"	66.7	ND	108		20-166			
o-Xylene	31.1	1.0	"	33.3	ND	93.4		33-159			
Naphthalene	39.9	1.0	"	33.3	ND	120		70-130			
1,2,4-Trimethylbenzene	32.2	1.0	"	33.3	ND	96.5		70-130			
1,3,5-Trimethylbenzene	32.9	1.0	"	33.3	ND	98.8		70-130			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	15.0		"	13.3		113		23-173			
<i>Surrogate: Toluene-d8</i>	14.1		"	13.3		105		20-170			
<i>Surrogate: 4-Bromofluorobenzene</i>	13.5		"	13.3		101		21-167			

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Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - Highland 12-20

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
11/16/23 10:06

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

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

Batch BGK0388 - EPA 5030 Water MS

Matrix Spike Dup (BGK0388-MSD1)	Source: 2311180-05			Prepared: 11/10/23 Analyzed: 11/13/23					
Benzene	35.0	1.0	ug/l	33.3	ND	105	34-141	1.73	30
Toluene	35.9	1.0	"	33.3	ND	108	27-151	1.34	30
Ethylbenzene	28.1	1.0	"	33.3	ND	84.4	29-160	23.5	30
m,p-Xylene	58.2	2.0	"	66.7	ND	87.3	20-166	21.2	30
o-Xylene	25.1	1.0	"	33.3	ND	75.4	33-159	21.3	30
Naphthalene	35.9	1.0	"	33.3	ND	108	70-130	10.6	30
1,2,4-Trimethylbenzene	25.4	1.0	"	33.3	ND	76.1	70-130	23.6	30
1,3,5-Trimethylbenzene	25.9	1.0	"	33.3	ND	77.6	70-130	24.0	30
Surrogate: 1,2-Dichloroethane-d4	16.7		"	13.3		125	23-173		
Surrogate: Toluene-d8	16.8		"	13.3		126	20-170		
Surrogate: 4-Bromofluorobenzene	17.4		"	13.3		130	21-167		

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Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - Highland 12-20

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
11/16/23 10:06

PAH by EPA Method 8270D SIM - Quality Control

Summit Scientific

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

Batch BGK0422 - EPA 5030 Water MS

Blank (BGK0422-BLK1)

Prepared: 11/13/23 Analyzed: 11/14/23

Benzo (a) anthracene	ND	0.100	ug/l							
1-Methylnaphthalene	ND	0.500	"							
2-Methylnaphthalene	ND	0.500	"							
Surrogate: 2-Methylnaphthalene-d10	1.46		"	2.00		73.2	40-150			
Surrogate: Fluoranthene-d10	1.92		"	2.00		95.8	40-150			

LCS (BGK0422-BS1)

Prepared: 11/13/23 Analyzed: 11/14/23

Benzo (a) anthracene	1.80	0.100	ug/l	2.00		90.2	30-120			
1-Methylnaphthalene	1.94	0.500	"	2.00		97.2	30-120			
2-Methylnaphthalene	2.15	0.500	"	2.00		108	0-200			
Surrogate: 2-Methylnaphthalene-d10	1.42		"	2.00		71.1	40-150			
Surrogate: Fluoranthene-d10	1.91		"	2.00		95.6	40-150			

LCS Dup (BGK0422-BS1)

Prepared: 11/13/23 Analyzed: 11/14/23

Benzo (a) anthracene	1.71	0.100	ug/l	2.00		85.3	30-120	5.63	30	
1-Methylnaphthalene	1.74	0.500	"	2.00		86.8	30-120	11.3	30	
2-Methylnaphthalene	1.94	0.500	"	2.00		96.9	0-200	10.5	200	
Surrogate: 2-Methylnaphthalene-d10	1.49		"	2.00		74.5	40-150			
Surrogate: Fluoranthene-d10	1.80		"	2.00		90.2	40-150			

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Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - Highland 12-20

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
11/16/23 10:06

Total Dissolved Solids by SM2540C - Quality Control
Summit Scientific

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

Batch BGK0456 - General Preparation

Blank (BGK0456-BLK1)

Prepared & Analyzed: 11/13/23

Total Dissolved Solids ND 10.0 mg/L

Duplicate (BGK0456-DUP1)

Source: 2311173-11

Prepared & Analyzed: 11/13/23

Total Dissolved Solids 1310 10.0 mg/L 1260 3.66 20

Summit Scientific

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Report To: Paul Shrewsbury
Company: Summit Scientific
4653 Table Mountain Drive
Golden CO 80403

Bill To: Accounts Payable
Company: Summit Scientific
4653 Table Mountain Drive
Golden CO 80403

Task No.: 231110070
Client PO:
Client Project: 2311195

Date Received: 11/10/23
Date Reported: 11/15/23
Matrix: Wastewater

Customer Sample ID 2311195 BH01
Sample Date/Time: 11/9/23 11:33 AM
Lab Number: 231110070-01

Test	Result / Units	Method	RL	MDL	Date Analyzed	QC Batch ID	Analyzed By
Chloride	262 mg/L	EPA 300.0	1.00	0.007	11/11/23	QC69304	NRP
Sulfate	1210 mg/L	EPA 300.0	1.00	0.012	11/11/23	QC69308	NRP

Abbreviations/References:

RL = Reporting Limit = Minimum Level
MDL = Method Detection Limit
mg/L = Milligrams Per Liter or PPM
ug/L = Micrograms Per Liter or PPB
mpn/100 mls = Most Probable Number Index/ 100 mls
Date Analyzed = Date Test Completed

(d) RPD acceptable due to low duplicate and sample concentrations.
(s) The accuracy of the spike recovery value is reduced due to the analyte concentration in the sample being disproportionate to the spike level. The laboratory control sample recovery was acceptable

ND = Not Detected at Reporting Limit.

Report To: Paul Shrewsbury
Company: Summit Scientific
4653 Table Mountain Drive
Golden CO 80403

Bill To: Accounts Payable
Company: Summit Scientific
4653 Table Mountain Drive
Golden CO 80403

Task No.: 231110070
Client PO:
Client Project: 2311195

Date Received: 11/10/23
Date Reported: 11/15/23
Matrix: Wastewater

Customer Sample ID 2311195 BH03
Sample Date/Time: 11/9/23 11:23 AM
Lab Number: 231110070-02

Test	Result / Units	Method	RL	MDL	Date Analyzed	QC Batch ID	Analyzed By
Chloride	112 mg/L	EPA 300.0	1.00	0.007	11/11/23	QC69304	NRP
Sulfate	486 mg/L	EPA 300.0	1.00	0.012	11/11/23	QC69308	NRP

Abbreviations/References:

RL = Reporting Limit = Minimum Level
MDL = Method Detection Limit
mg/L = Milligrams Per Liter or PPM
ug/L = Micrograms Per Liter or PPB
mpn/100 mls = Most Probable Number Index/ 100 mls
Date Analyzed = Date Test Completed

(d) RPD acceptable due to low duplicate and sample concentrations.
(s) The accuracy of the spike recovery value is reduced due to the analyte concentration in the sample being disproportionate to the spike level. The laboratory control sample recovery was acceptable

ND = Not Detected at Reporting Limit.

Report To: Paul Shrewsbury
Company: Summit Scientific
4653 Table Mountain Drive
Golden CO 80403

Bill To: Accounts Payable
Company: Summit Scientific
4653 Table Mountain Drive
Golden CO 80403

Task No.: 231110070
Client PO:
Client Project: 2311195

Date Received: 11/10/23
Date Reported: 11/15/23
Matrix: Wastewater

Customer Sample ID 2311195 BH04
Sample Date/Time: 11/9/23 11:14 AM
Lab Number: 231110070-03

Test	Result / Units	Method	RL	MDL	Date Analyzed	QC Batch ID	Analyzed By
Chloride	128 mg/L	EPA 300.0	1.00	0.007	11/11/23	QC69304	NRP
Sulfate	579 mg/L	EPA 300.0	1.00	0.012	11/11/23	QC69308	NRP

Abbreviations/References:

RL = Reporting Limit = Minimum Level
MDL = Method Detection Limit
mg/L = Milligrams Per Liter or PPM
ug/L = Micrograms Per Liter or PPB
mpn/100 mls = Most Probable Number Index/ 100 mls
Date Analyzed = Date Test Completed

(d) RPD acceptable due to low duplicate and sample concentrations.
(s) The accuracy of the spike recovery value is reduced due to the analyte concentration in the sample being disproportionate to the spike level. The laboratory control sample recovery was acceptable

ND = Not Detected at Reporting Limit.

Report To: Paul Shrewsbury
Company: Summit Scientific
4653 Table Mountain Drive
Golden CO 80403

Bill To: Accounts Payable
Company: Summit Scientific
4653 Table Mountain Drive
Golden CO 80403

Task No.: 231110070
Client PO:
Client Project: 2311195

Date Received: 11/10/23
Date Reported: 11/15/23
Matrix: Wastewater

Customer Sample ID 2311195 BH05
Sample Date/Time: 11/9/23 11:13 AM
Lab Number: 231110070-04

Test	Result / Units	Method	RL	MDL	Date Analyzed	QC Batch ID	Analyzed By
Chloride	277 mg/L	EPA 300.0	1.00	0.007	11/11/23	QC69304	NRP
Sulfate	1600 mg/L	EPA 300.0	1.00	0.012	11/11/23	QC69308	NRP

Abbreviations/References:

RL = Reporting Limit = Minimum Level
MDL = Method Detection Limit
mg/L = Milligrams Per Liter or PPM
ug/L = Micrograms Per Liter or PPB
mpn/100 mls = Most Probable Number Index/ 100 mls
Date Analyzed = Date Test Completed

(d) RPD acceptable due to low duplicate and sample concentrations.
(s) The accuracy of the spike recovery value is reduced due to the analyte concentration in the sample being disproportionate to the spike level. The laboratory control sample recovery was acceptable

ND = Not Detected at Reporting Limit.

Report To: Paul Shrewsbury
Company: Summit Scientific
4653 Table Mountain Drive
Golden CO 80403

Bill To: Accounts Payable
Company: Summit Scientific
4653 Table Mountain Drive
Golden CO 80403

Task No.: 231110070	Date Received: 11/10/23
Client PO:	Date Reported: 11/15/23
Client Project: 2311195	Matrix: Wastewater

Customer Sample ID 2311195 BH06
Sample Date/Time: 11/9/23 11:22 AM
Lab Number: 231110070-05

Test	Result / Units	Method	RL	MDL	Date Analyzed	QC Batch ID	Analyzed By
Chloride	104 mg/L	EPA 300.0	1.00	0.007	11/11/23	QC69304	NRP
Sulfate	560 mg/L	EPA 300.0	1.00	0.012	11/11/23	QC69308	NRP

Abbreviations/References:

RL = Reporting Limit = Minimum Level
MDL = Method Detection Limit
mg/L = Milligrams Per Liter or PPM
ug/L = Micrograms Per Liter or PPB
mpn/100 mls = Most Probable Number Index/ 100 mls
Date Analyzed = Date Test Completed

(d) RPD acceptable due to low duplicate and sample concentrations.
(s) The accuracy of the spike recovery value is reduced due to the analyte concentration in the sample being disproportionate to the spike level. The laboratory control sample recovery was acceptable

ND = Not Detected at Reporting Limit.

Analytical QC Summary

TASK NO: 231110070

Report To: Paul Shrewsbury
Company: Summit Scientific

Receive Date: 11/10/23
Project Name: 2311195

Test	QC Batch ID	QC Type	Result	Method	Prep Date
Chloride	QC69304	Blank	ND	EPA 300.0	11/10/23
Sulfate	QC69308	Blank	ND	EPA 300.0	11/10/23

Test	QC Batch ID	QC Type	Limits	% Rec	RPD	Method
Chloride	QC69304	Duplicate	0 - 20	-	2.0	EPA 300.0
		LCS	90 - 110	105.8	-	
		MS	75 - 125	105.8	-	
Sulfate	QC69308	Duplicate	0 - 20	-	3.6	EPA 300.0
		LCS	90 - 110	103.8	-	
		MS	75 - 125	109.5	-	

All analyses were performed in accordance with approved methods under the latest revision to 40 CFR Part 136 unless otherwise identified. Based on my inquiry of the person or persons directly responsible for analyzing the wastewater samples and generating the report (s), the analyses, report, and information submitted are, to the best of my knowledge and belief, true, accurate, and complete.



DATA APPROVED FOR RELEASE BY

Abbreviations/ References:

RL = Reporting Limit = Minimum Level
MDL = Method Detection Limit
mg/L = Milligrams Per Liter or PPM
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(d) RPD acceptable due to low duplicate and sample concentrations.
(s) The accuracy of the spike recovery value is reduced due to the analyte concentration in the sample being disproportionate to the spike level. The laboratory control sample recovery was acceptable

ND = Not Detected at Reporting Limit.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - Highland 12-20

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
11/16/23 10:06

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