

SITE ASSESSMENT REPORT

DUNCAN D20-12, 20-13

COGCC SPILL TRACKING # 459804
COGCC REMEDIATION # 12461

Prepared for:



2115 117th Avenue
Greeley, CO 80631

Prepared by:



6855 West 119th Avenue
Broomfield, Colorado, 80020

October 1, 2019

Mr. Jacob Evans
Noble Energy Inc.
2115 117th Avenue
Greeley, CO 80631

Subject: **Site Assessment Report**
 Duncan D20-12, 20-13
 API #: 05-123-15466
 Spill/Release Point ID #: 459804
 Remediation Project #: 12461
 NWSW S20 T3N R64W
 Weld County, Colorado

Dear Mr. Evans:

Below please find a copy of the above referenced Site Assessment Report (Report) for the Duncan D20-12, 20-13 site (Site) in Weld County, Colorado. The text below describes assessment activities and environmental sampling conducted at the Site between August 21, 2019 and August 23, 2019 (Assessment) by Tasman Geosciences, Inc. (Tasman), on behalf of Noble Energy, Inc. (Noble).

Introduction

The purpose of this document is to describe the results of site assessment and subsequent soil and groundwater sampling activities conducted as part of the Assessment. The activities described below were performed in response to the discovery of suspected impacted media beneath the Duncan D20-12, 20-13 tank battery during plug and abandonment procedures on December 10, 2018.

Facility Background

The Site is located approximately 7.5 miles north of the Town of Hudson in Weld County, Colorado, as shown on Figure 1. The Site is surrounded by crop land, and the legal description is the northwest $\frac{1}{4}$ of the southwest $\frac{1}{4}$ of Section 20, Township 3 North, Range 64 West, of the 6th Principal Meridian. The Site is located on terrain that slopes to the north-northeast. The Site is approximately 0.5 miles south of Weld County Road 32 and has coordinates of 40.210677°, -104.584405°.

On December 11, 2018, historic impacts were confirmed beneath the Duncan D20-12, 20-13 tank battery during plug and abandonment activities. The approximate release location is shown on Figure 2. A Form 19 was submitted to the Colorado Oil and Gas Conservation Commission (COGCC) on December 12, 2018. The COGCC subsequently issued Spill/Release Point ID Number 459804 for this event and the site was plugged and abandoned. Activities and results of the initial investigation and excavation were reported in the documents *Duncan D20-12, 20-13 Excavation Summary Report* and *Duncan D20-12, 20-13 Remedial Excavation Report*. A Form 27 was submitted on February 11, 2019 and COGCC subsequently issued Remediation Number 12461 for the project.

Site Assessment Activities

On August 21, 2019, Tasman returned to the site to further assess groundwater impacts associated with the historical release at the former Duncan D20-12, 20-13 produced water vessel. Six boreholes (BH01-BH06) were advanced using direct push drilling techniques and converted into temporary groundwater monitoring wells. During soil boring activities, soil samples were collected and field screened for volatile organic compounds (VOCs) using a photo-ionization detector (PID) and standard head space sampling techniques. A total of 11 soil samples were submitted to Summit Scientific laboratory (Summit) in Golden, Colorado for benzene, toluene, ethylbenzene and total xylenes (BTEX), Total Petroleum Hydrocarbons – Gasoline Range Organics (TPH-GRO) using United States Environmental Protection Agency (USEPA) Method 8260B, as well as Total Petroleum Hydrocarbons – Diesel Range Organics (TPH-DRO) using USEPA Method 8015. Soil analytical results are summarized in Table 1 and sample locations are illustrated in Figure 3. Boring logs are included as Attachment A and laboratory analytical reports are included as Attachment B.

Following the installation and development of the six monitoring wells, Tasman collected groundwater samples on August 23, 2019. Groundwater was encountered at approximately six feet below ground surface (ft. bgs). Groundwater samples collected from the six monitoring wells were submitted to Summit for BTEX analysis. Groundwater analytical results are summarized in Table 3 and illustrated on Figure 5. The complete laboratory analytical report is included as Attachment B. Groundwater potentiometric surface contours are illustrated on Figure 4 and groundwater elevation data is summarized in Table 2.

Results

Laboratory analytical results for the soil samples collected below the observed groundwater table at BH01 and BH05 indicate benzene concentrations are in exceedance of COGCC Table 910-1 soil standards.

Groundwater analytical results for samples BH01 and BH05 indicate benzene and total xylenes concentrations are in exceedance of COGCC Table 910-1 standards. All other groundwater samples were below applicable COGCC Table 910-1 standards.

Conclusions

Based upon field and laboratory data collected during site assessment activities, petroleum hydrocarbon soil impacts remain at the site below the observed groundwater table in the area of BH01 and BH05. Dissolved phase groundwater impacts also remain at the site in the area of BH01 and BH05. Additional site assessment activities will be conducted until groundwater and soil impacts have been delineated. Tasman will continue quarterly groundwater monitoring until four consecutive quarters of groundwater results below applicable COGCC Table 910-1 standards are achieved.

Remarks

The discussion and conclusions contained in this report represent the professional opinions of Tasman Geosciences, Inc. These opinions are based on currently available information and are arrived at in accordance with currently accepted geologic and engineering practices.

Please contact me at (720) 431-1190 if you require additional information.

Sincerely,
Tasman Geosciences, Inc.



Brandon Bruns, PE
Project Manager

Attachments:

Table 1 – Soil Analytical Data
Table 2 – Groundwater Elevation Data
Table 3 – Groundwater Analytical Data

Figure 1 – Site Location Map
Figure 2 – Site Overview
Figure 3 – Soil Analytical Results Map (8/21/2019)
Figure 4 – Groundwater Potentiometric Contour Map (8/23/2019)
Figure 5 - Groundwater Analytical Results Map (8/23/2019)

Attachment A – Boring Logs
Attachment B – Laboratory Analytical Data Reports

TABLES

TABLE 1
SOIL ANALYTICAL DATA
NOBLE ENERGY, INC. - DUNCAN D20-12, 20-13

Soil Sample ID	Date	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	Naphthalene (mg/kg)	TPH-GRO (mg/kg)	TPH-DRO (mg/kg)
COGCC Standard		0.17	85	100	175	23	500	
SS01@3'	12/10/18	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
SS02@3'	12/10/18	0.043	<0.0050	0.36	0.13	0.72	1,000	1,300
SS03@3'	12/10/18	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
SS04@3'	12/10/18	9.3	2.0	33	320	8.3	7,000	3,700
SS05@3'	06/06/19	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
SS06@3'	06/06/19	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
SS07@3'	06/06/19	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
SS08@3'	06/06/19	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
SS09@3'	06/06/19	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
SS10@3'	06/06/19	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
CS01	06/06/19	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
BH01@0-5'	08/21/19	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
BH01@15-17.5' ¹	08/21/19	0.20	<0.0050	0.55	3.8	0.38	72	170
BH01@17.5-20' ¹	08/21/19	0.18	<0.0050	0.42	2.7	0.22	<50	130
BH02@0-2'	08/21/19	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
BH03@0-2.5'	08/21/19	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
BH04@0-2.5'	08/21/19	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
BH04@18-20'	08/21/19	<0.0020	<0.0050	0.29	6.9	0.17	<50	100
BH05@0-2.5'	08/21/19	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
BH05@15-17.5' ¹	08/21/19	0.27	<0.0050	0.74	5.5	0.45	180	280
BH05@17.5-20'	08/21/19	0.12	<0.0050	0.48	3.1	0.28	<50	100
BH06@0-2.5'	08/21/19	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50

Soil Sample ID	Date	SAR	pH	EC (mmhos/cm)
COGCC Standard		<12	6-9	<4mmhos/cm
SS04@3'	12/10/18	4.01	8.43	2.95

COGCC = Colorado Oil and Gas Conservation Commission

TPH-GRO = Total petroleum hydrocarbons - gasoline range organics

TPH-DRO = Total petroleum hydrocarbons - diesel range organics

SAR = Sodium Absorption Ratio

EC = Specific Conductance

mg/kg = Milligrams per kilogram

mmhos/cm = Millimhos per centimeter

< = Analytical result is less than the indicated laboratory reporting limit

1. The laboratory applied an S-02 flag to the sample, meaning that the surrogate recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample extract.

Soil standards referenced from COGCC Table 910-1

Highlighted results are equal to or exceed the COGCC Table 910-1 standard

TABLE 2
GROUNDWATER ELEVATION DATA
NOBLE ENERGY, INC. - DUNCAN D20-12, 20-13

Monitoring Well ID	Date	Top of Casing Elevation (ft. AMSL)	Total Depth (ft. BTOC)	Depth to Water (ft.) ⁽¹⁾	Depth to LNAPL (ft.) ⁽¹⁾	LNAPL Thickness (ft.)	Groundwater Elevation* (ft. AMSL)
BH01	08/23/19	4772.46	21.77	5.32	ND	ND	4765.17
BH02	08/23/19	4773.47	17.30	5.47	ND	ND	4765.14
BH03	08/23/19	4770.68	14.10	5.83	ND	ND	4765.26
BH04	08/23/19	4773.76	20.74	5.62	ND	ND	4765.2
BH05	08/23/19	4772.36	20.15	5.56	ND	ND	4765.12
BH06	08/23/19	4772.64	16.63	5.53	ND	ND	4765.18

ft. = Feet

AMSL = Above mean sea level

BTOC = Below top of casing

LNAPL = Light non-aqueous phase liquid

ND = No LNAPL detected

* Groundwater elevation was 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 approximately 0.75

TABLE 3
GROUNDWATER ANALYTICAL DATA
NOBLE ENERGY, INC. - DUNCAN D20-12, 20-13

Monitoring Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
COGCC Standard		5	560	700	1,400
GW01	12/10/18	970	3.2	560	3,800
BH01	08/23/19	440	<1.0	490	1,400
BH02	08/23/19	<1.0	<1.0	<1.0	<2.0
BH03	08/23/19	<1.0	<1.0	<1.0	<2.0
BH04	08/23/19	<1.0	<1.0	<1.0	<2.0
BH05	08/23/19	340	<1.0	500	1,700
BH06	08/23/19	<1.0	<1.0	<1.0	<2.0

COGCC = Colorado Oil and Gas Conservation Commission

µg/L = Micrograms per liter

< = Analytical result is less than the indicated laboratory reporting limit

Groundwater standards referenced from COGCC Table 910-1

Highlighted results are equal to or exceed the COGCC Table 910-1 standard

FIGURES

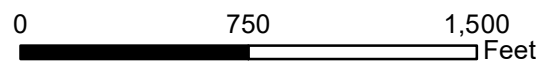
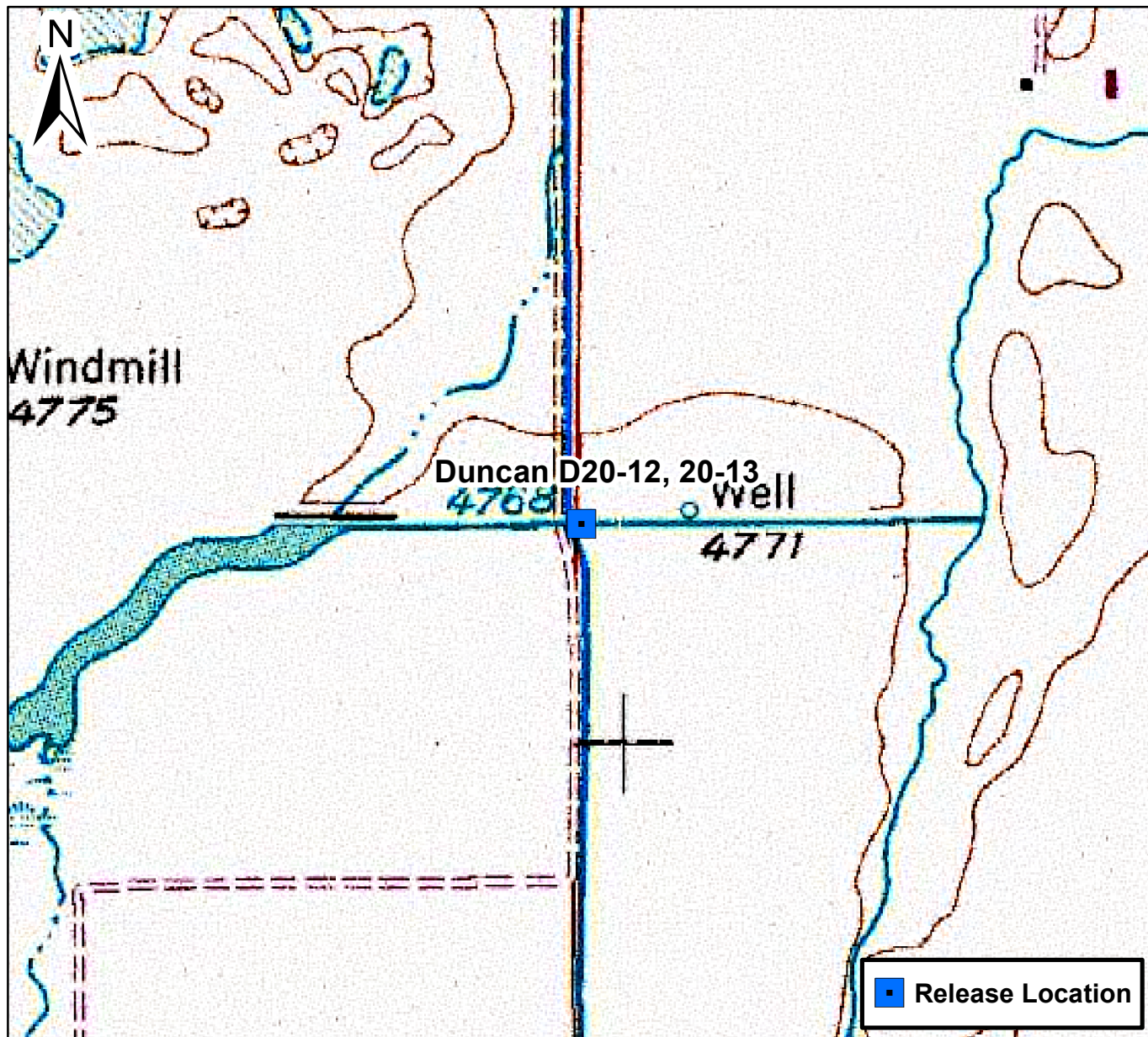



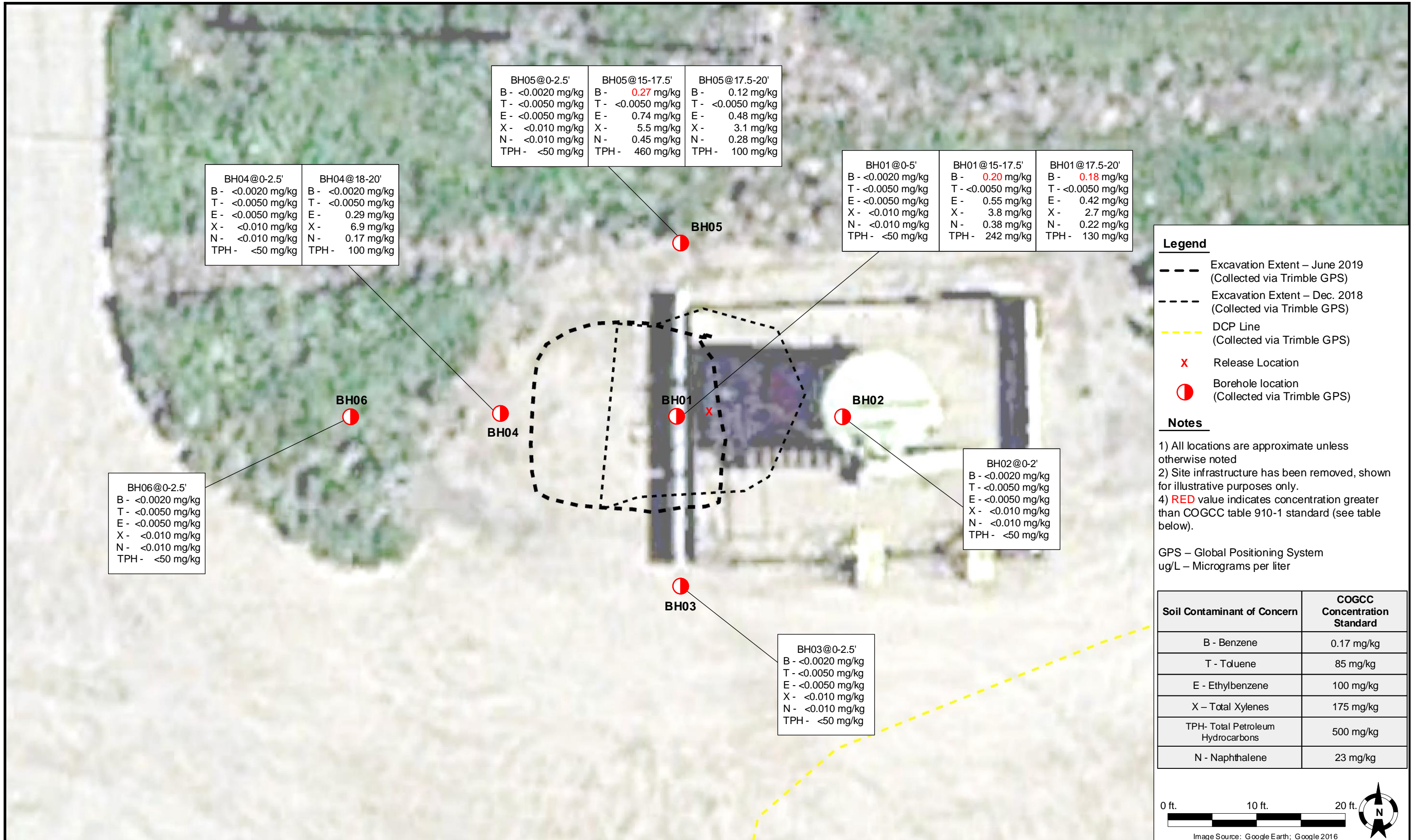
Figure 1

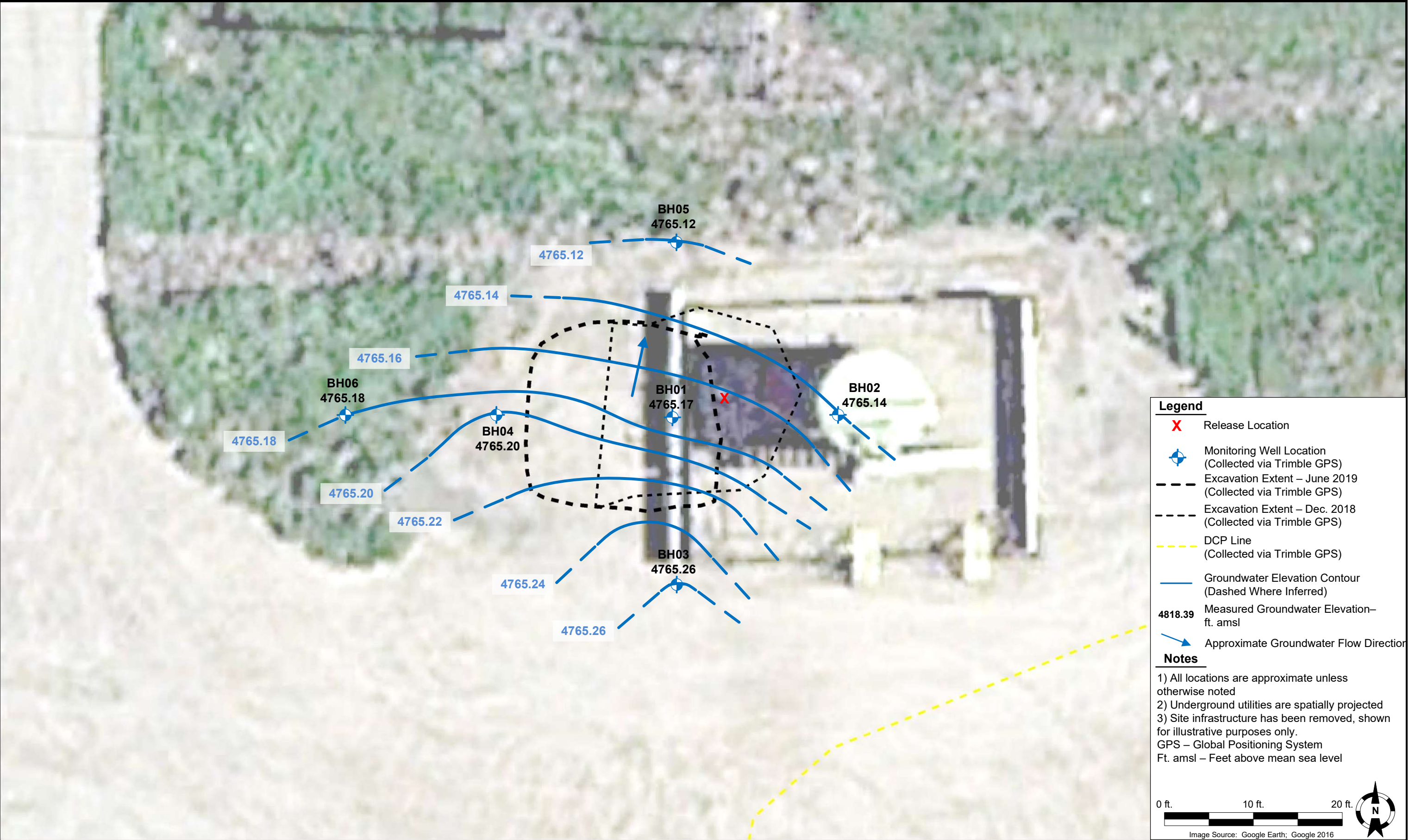
Site Location Map
Duncan D20-12, 20-13
NWSW S20 T3N R64W
Weld County, Colorado

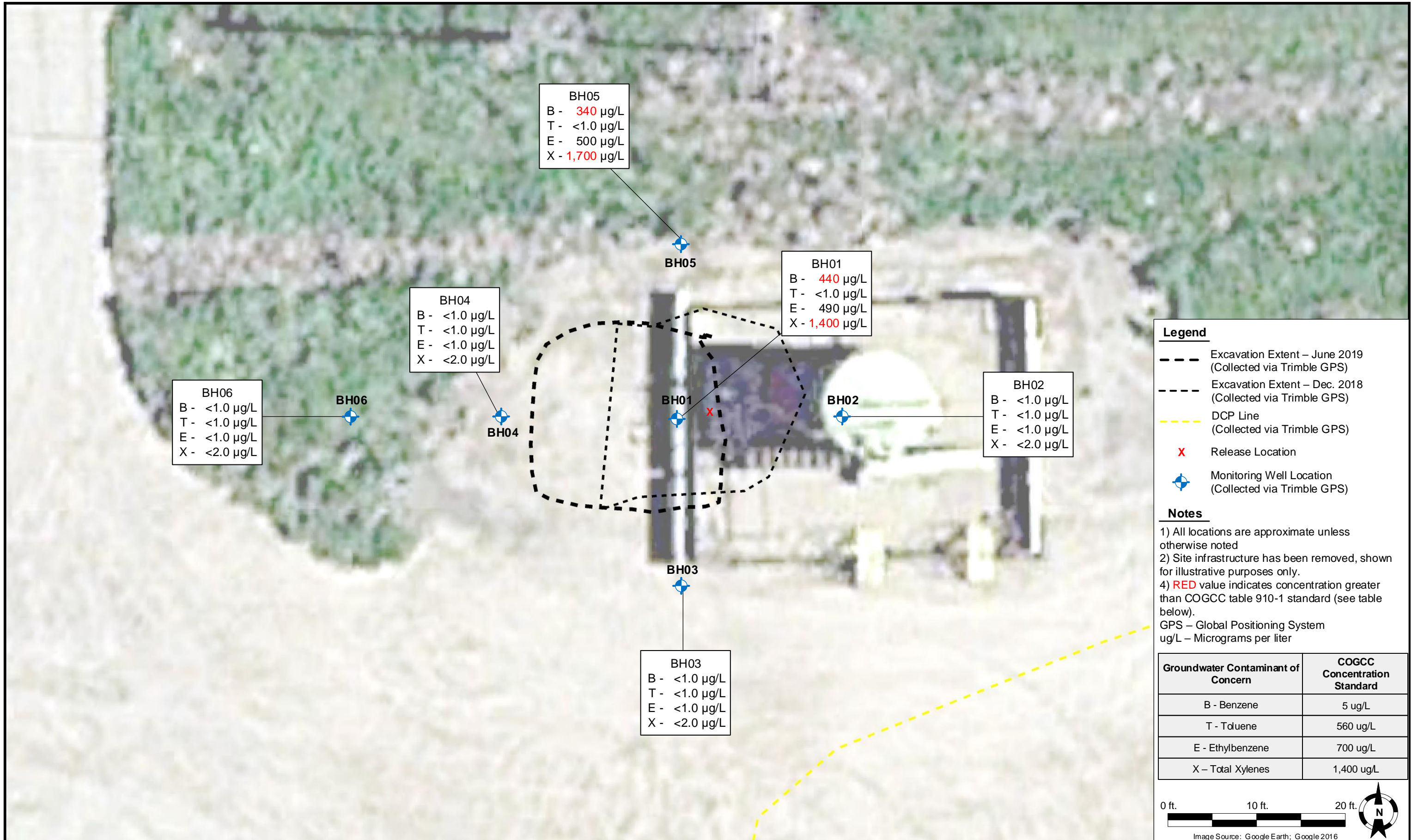




DATE: 9/10/2019	 TASMAN GEOSCIENCES	Tasman Geosciences, Inc. 6855 119 th St. Broomfield, CO 80020	Noble Energy, Inc. – DJ Basin Duncan D20-12, 20-13 NWSW, Section 20, Township 3 North, Range 64 West Weld County, Colorado	Site Overview	FIGURE 2
DESIGNED BY: JW					
DRAWN BY: MG					







Legend

- Excavation Extent – June 2019 (Collected via Trimble GPS)
- Excavation Extent – Dec. 2018 (Collected via Trimble GPS)
- DCP Line (Collected via Trimble GPS)
- X Release Location
- Monitoring Well Location (Collected via Trimble GPS)

Notes

1) All locations are approximate unless otherwise noted
2) Site infrastructure has been removed, shown for illustrative purposes only.
4) RED value indicates concentration greater than COGCC table 910-1 standard (see table below).
GPS – Global Positioning System
ug/L – Micrograms per liter

Groundwater Contaminant of Concern	COGCC Concentration Standard
B - Benzene	5 ug/L
T - Toluene	560 ug/L
E - Ethylbenzene	700 ug/L
X – Total Xylenes	1,400 ug/L

0 ft.10 ft.20 ft.

Image Source: Google Earth; Google 2016

ATTACHMENT A

BORING LOGS



6855 119th St.
Broomfield, Colorado 80020

CLIENT: Noble Energy

LOGGED BY: Tanner Cook

PROJECT MANAGER: Jake Whritenour

DRILLING CONTRACTOR: Site Services Drilling

DRILLING EQUIPMENT: Geoprobe

DRILL BIT SIZE (INCHES): 2

DATE STARTED - COMPLETED: 8/21/2019 - 8/21/2019

TOTAL WELL DEPTH (FT. BGS): 20

DEPTH TO WATER (FT. BGS): 3.5

Duncan D20-12, 20-13

BORING / WELL ID: BH01

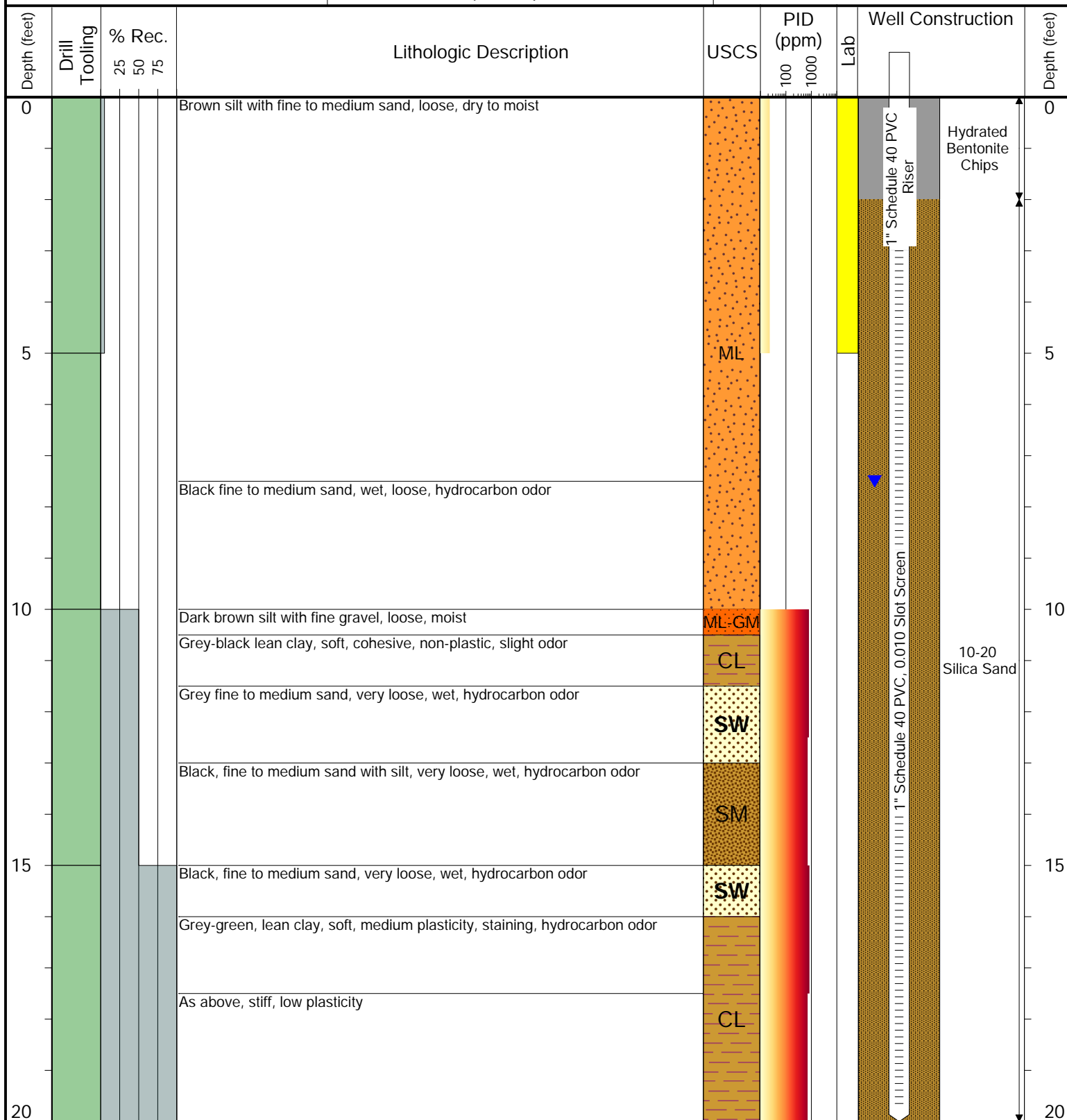
LOCATION: Weld County, Colorado

LATITUDE (WGS 84): 40.21068058

LONGITUDE (WGS 84): -104.584421

CASING ELEVATION (FT. AMSL): 4772.46

GROUND ELEVATION (FT. AMSL): 4770.49



Drilling / Sample Method:

Macro-Core

Hollow Stem Auger

Solid Stem Auger

Hand Auger

Laboratory Sample Types:

Geotechnical Lab

Analytical Chemistry Lab

Geotechnical & Analytical Chemistry Lab



6855 119th St.
Broomfield, Colorado 80020

CLIENT: Noble Energy

LOGGED BY: Tanner Cook

PROJECT MANAGER: Jake Whritenour

DRILLING CONTRACTOR: Site Services Drilling

DRILLING EQUIPMENT: Geoprobe

DRILL BIT SIZE (INCHES): 2

DATE STARTED - COMPLETED: 8/21/2019 - 8/21/2019

TOTAL WELL DEPTH (FT. BGS): 15

DEPTH TO WATER (FT. BGS): 3.5

Duncan D20-12, 20-13

BORING / WELL ID: BH02

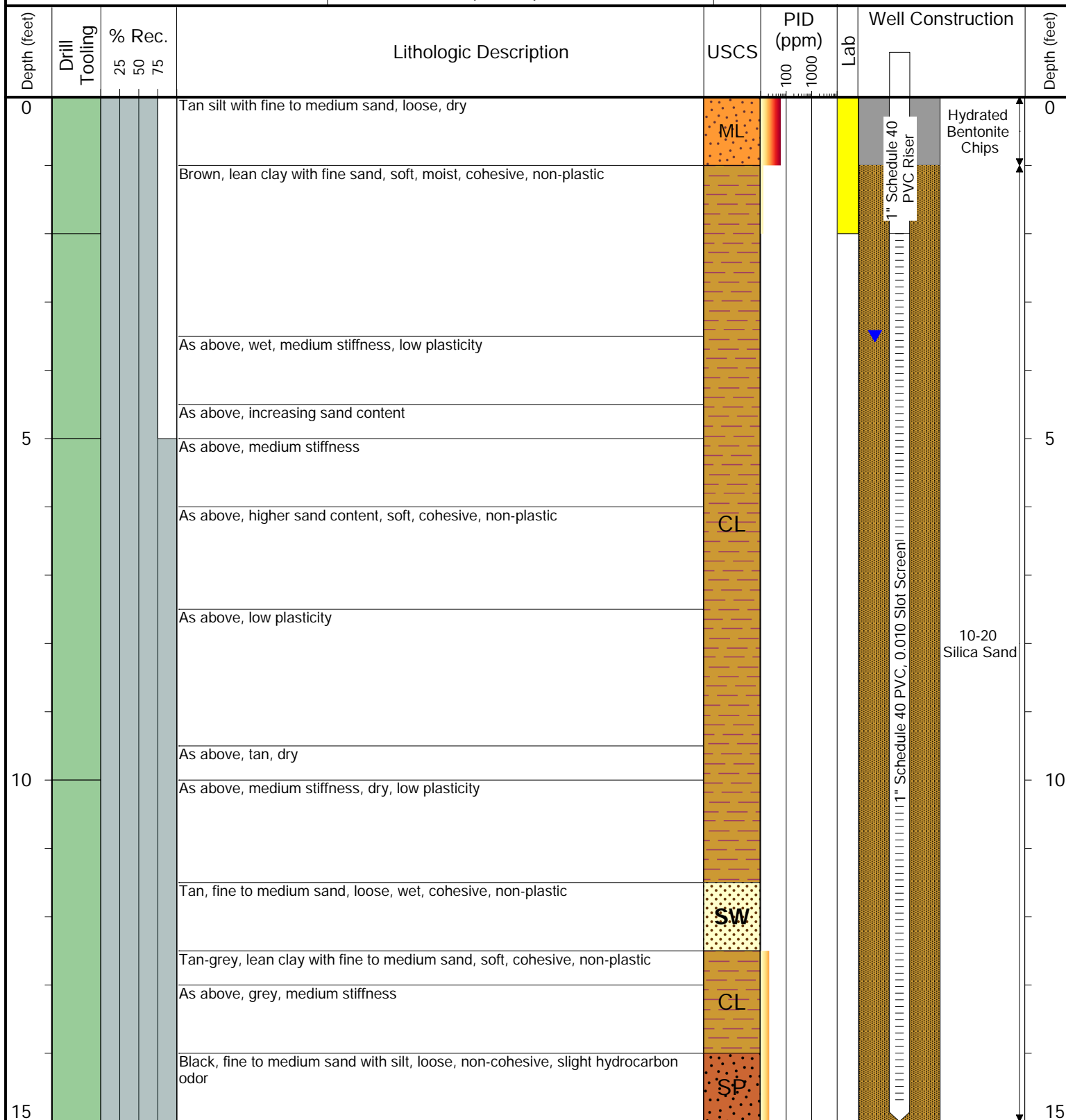
LOCATION: Weld County, Colorado

LATITUDE (WGS 84): 40.2106772

LONGITUDE (WGS 84): -104.5843575

CASING ELEVATION (FT. AMSL): 4773.47

GROUND ELEVATION (FT. AMSL): 4770.61



Drilling / Sample Method:

Macro-Core

Hollow Stem Auger

Solid Stem Auger

Hand Auger

Laboratory Sample Types:

Geotechnical Lab

Analytical Chemistry Lab

Geotechnical & Analytical Chemistry Lab



6855 119th St.
Broomfield, Colorado 80020

CLIENT: Noble Energy

LOGGED BY: Tanner Cook

PROJECT MANAGER: Jake Whritenour

DRILLING CONTRACTOR: Site Services Drilling

DRILLING EQUIPMENT: Geoprobe

DRILL BIT SIZE (INCHES): 2

DATE STARTED - COMPLETED: 8/21/2019 - 8/21/2019

TOTAL WELL DEPTH (FT. BGS): 15

DEPTH TO WATER (FT. BGS): 4.5

Duncan D20-12, 20-13

BORING / WELL ID: BH03

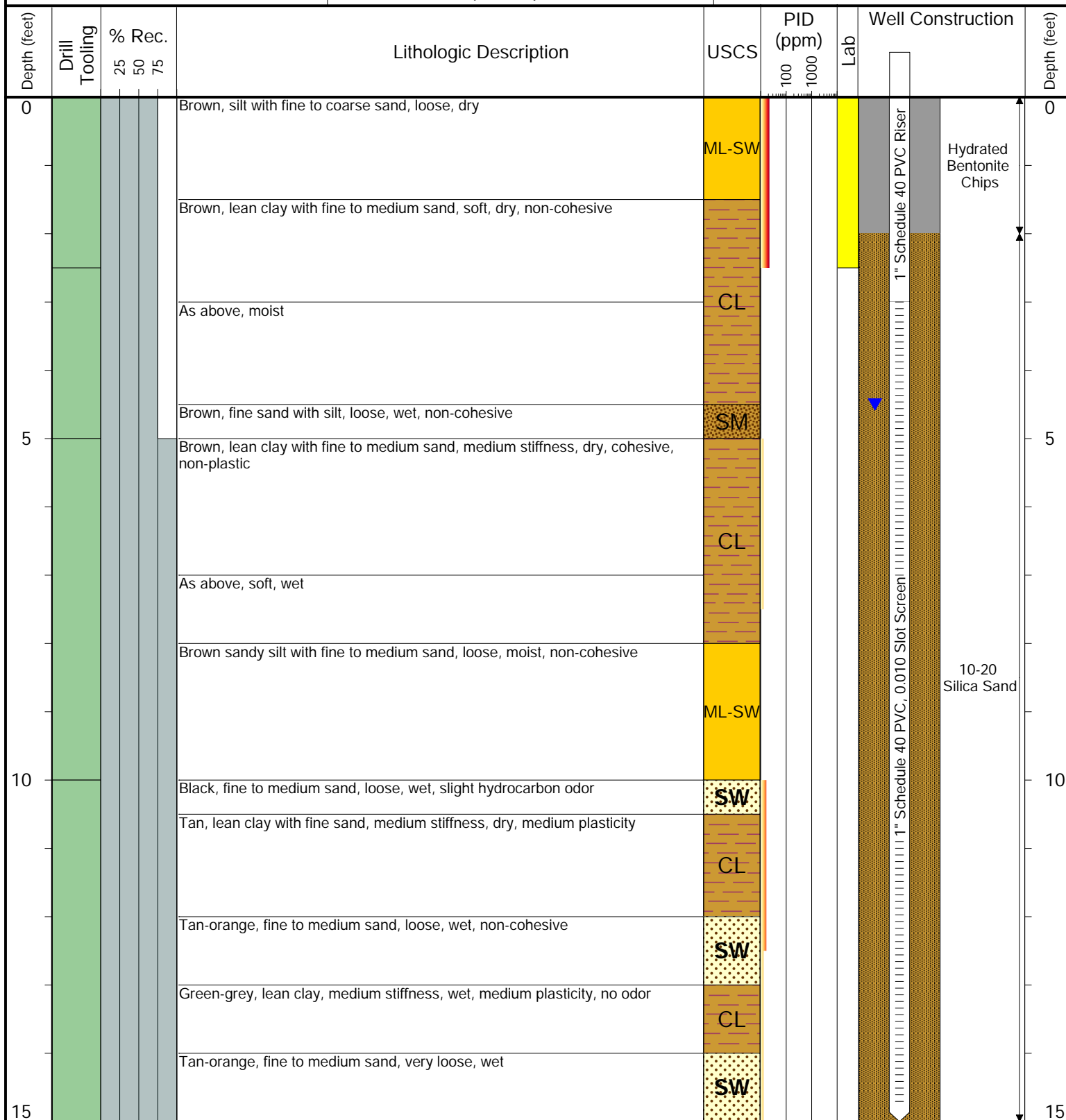
LOCATION: Weld County, Colorado

LATITUDE (WGS 84): 40.21062278

LONGITUDE (WGS 84): -104.584429

CASING ELEVATION (FT. AMSL): 4770.68

GROUND ELEVATION (FT. AMSL): 4771.09



Drilling / Sample Method:

Macro-Core

Solid Stem Auger

Hollow Stem Auger

Hand Auger

Laboratory Sample Types:

Geotechnical Lab

Analytical Chemistry Lab

Geotechnical & Analytical Chemistry Lab



6855 119th St.
Broomfield, Colorado 80020

CLIENT: Noble Energy

LOGGED BY: Tanner Cook

PROJECT MANAGER: Jake Whritenour

DRILLING CONTRACTOR: Site Services Drilling

DRILLING EQUIPMENT: Geoprobe

DRILL BIT SIZE (INCHES): 2

DATE STARTED - COMPLETED: 8/21/2019 - 8/21/2019

TOTAL WELL DEPTH (FT. BGS): 20

DEPTH TO WATER (FT. BGS): 3.5

Duncan D20-12, 20-13

BORING / WELL ID: BH04

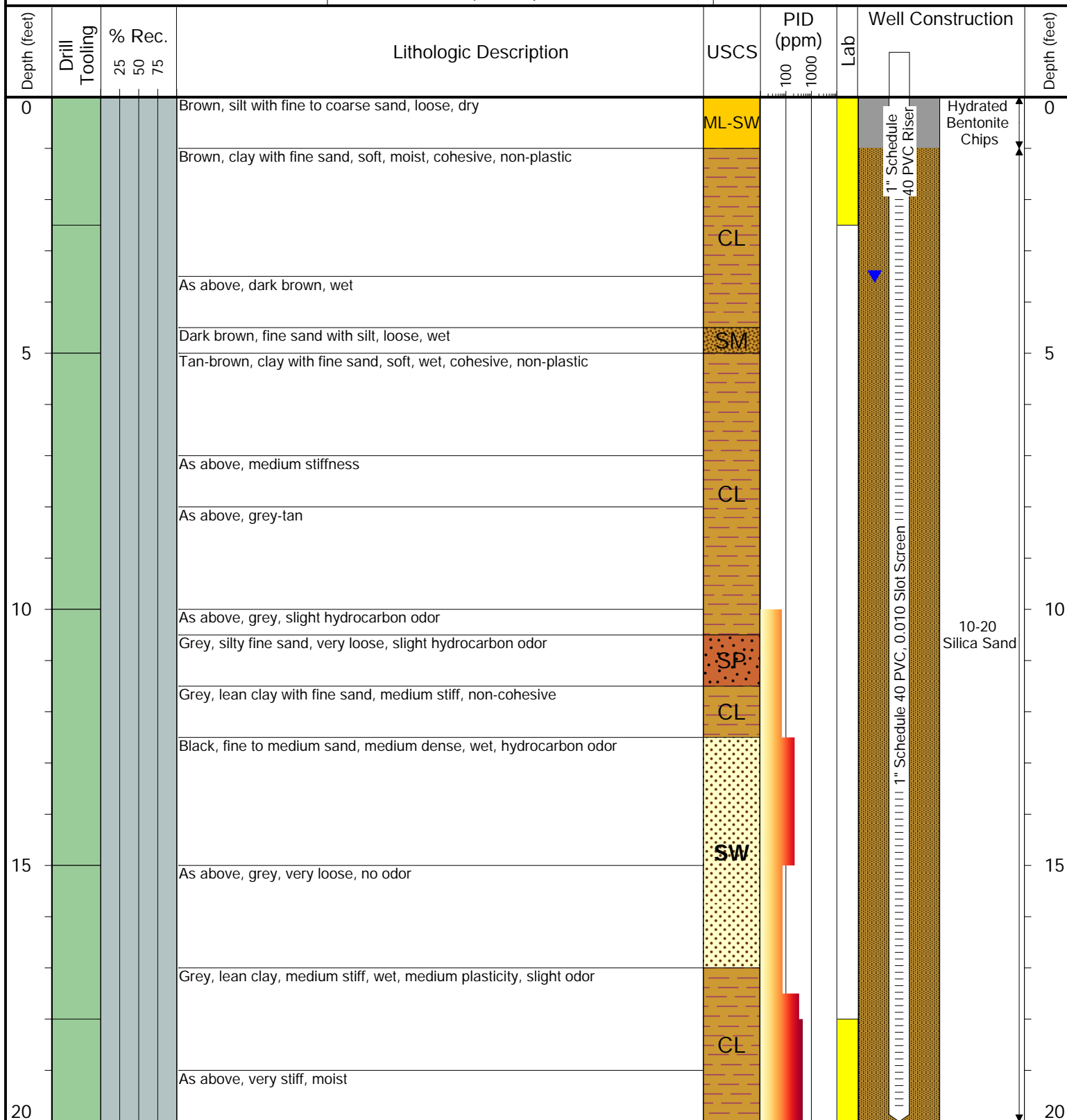
LOCATION: Weld County, Colorado

LATITUDE (WGS 84): 40.21067549

LONGITUDE (WGS 84): -104.5844914

CASING ELEVATION (FT. AMSL): 4773.76

GROUND ELEVATION (FT. AMSL): 4770.82



Drilling / Sample Method:

Macro-Core

Hollow Stem Auger

Solid Stem Auger

Hand Auger

Laboratory Sample Types:

Geotechnical Lab

Analytical Chemistry Lab

Geotechnical & Analytical Chemistry Lab



6855 119th St.
Broomfield, Colorado 80020

CLIENT: Noble Energy

LOGGED BY: Tanner Cook

PROJECT MANAGER: Jake Whritenour

DRILLING CONTRACTOR: Site Services Drilling

DRILLING EQUIPMENT: Geoprobe

DRILL BIT SIZE (INCHES): 2

DATE STARTED - COMPLETED: 8/21/2019 - 8/21/2019

TOTAL WELL DEPTH (FT. BGS): 20

DEPTH TO WATER (FT. BGS): 4

Duncan D20-12, 20-13

BORING / WELL ID: BH05

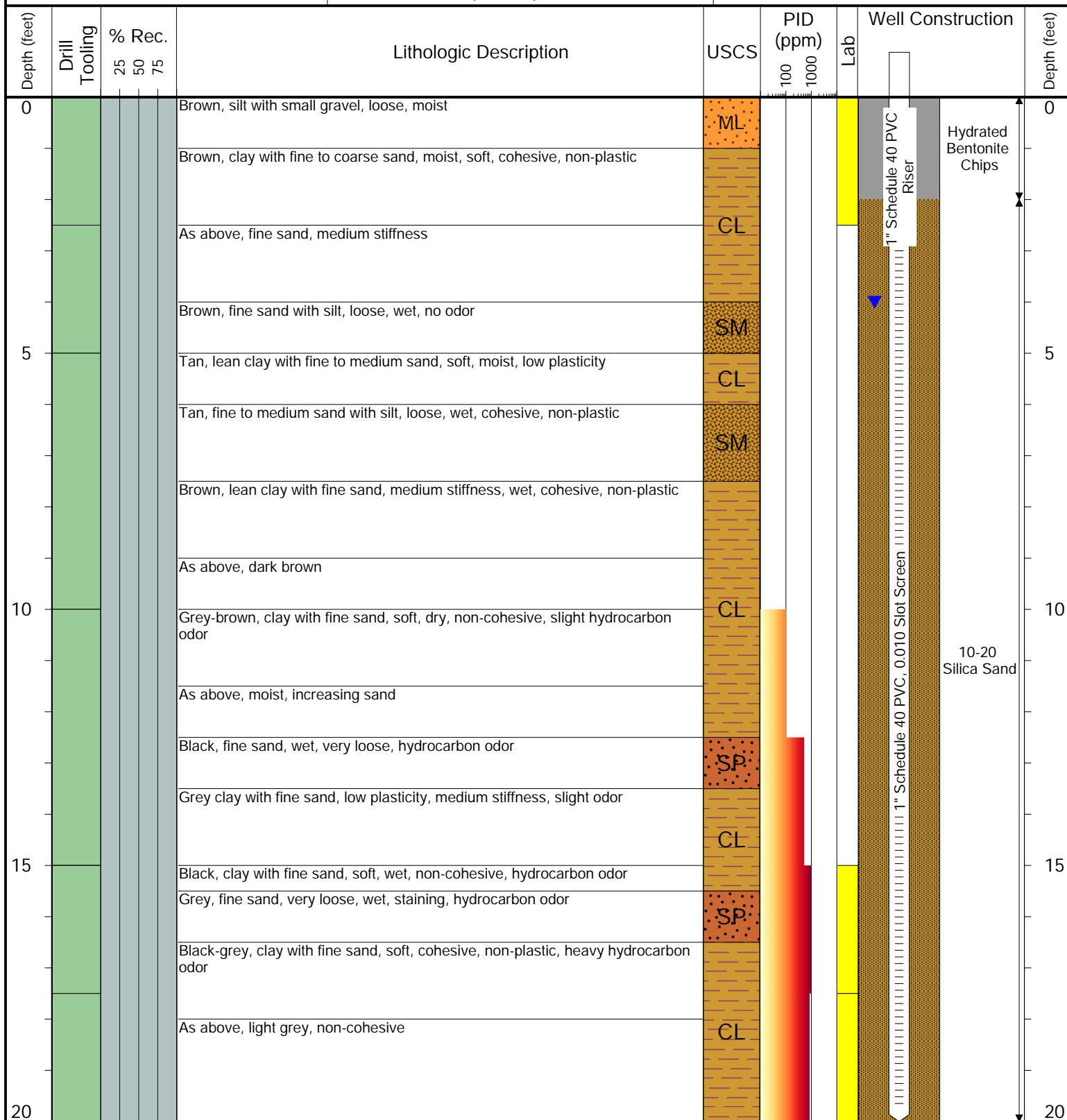
LOCATION: Weld County, Colorado

LATITUDE (WGS 84): 40.21071589

LONGITUDE (WGS 84): -104.5844476

CASING ELEVATION (FT. AMSL): 4772.36

GROUND ELEVATION (FT. AMSL): 4770.68



Drilling / Sample Method:

Macro-Core

Hollow Stem Auger

Solid Stem Auger

Hand Auger

Laboratory Sample Types:

Geotechnical Lab

Analytical Chemistry Lab

Geotechnical & Analytical Chemistry Lab



6855 119th St.
Broomfield, Colorado 80020

CLIENT: Noble Energy

LOGGED BY: Tanner Cook

PROJECT MANAGER: Jake Whritenour

DRILLING CONTRACTOR: Site Services Drilling

DRILLING EQUIPMENT: Geoprobe

DRILL BIT SIZE (INCHES): 2

DATE STARTED - COMPLETED: 8/21/2019 - 8/21/2019

TOTAL WELL DEPTH (FT. BGS): 15

DEPTH TO WATER (FT. BGS): 3.5

Duncan D20-12, 20-13

BORING / WELL ID: BH06

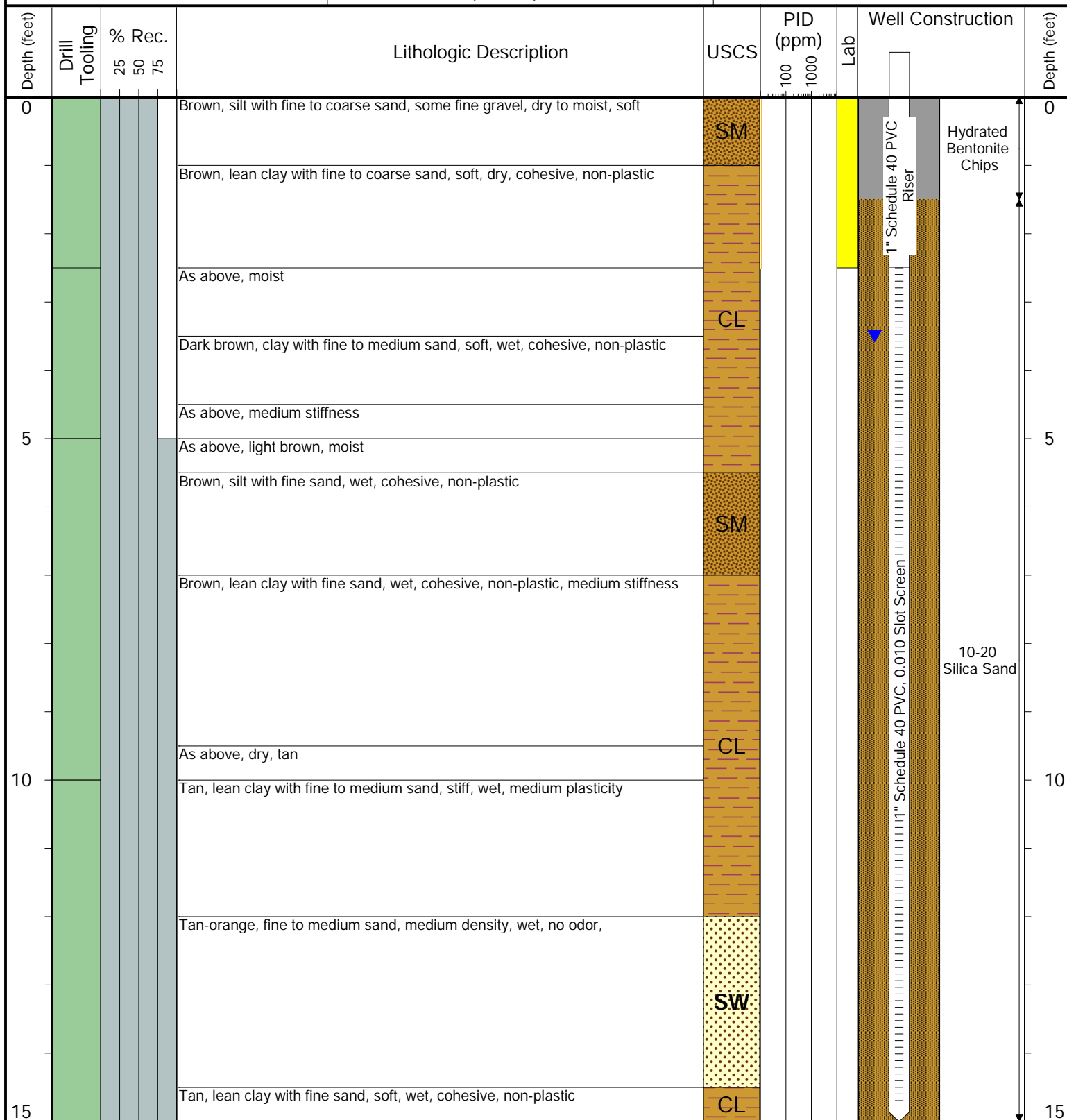
LOCATION: Weld County, Colorado

LATITUDE (WGS 84): 40.21067318

LONGITUDE (WGS 84): -104.5845637

CASING ELEVATION (FT. AMSL): 4772.64

GROUND ELEVATION (FT. AMSL): 4770.71



Drilling / Sample Method:

Macro-Core

Hollow Stem Auger

Solid Stem Auger

Hand Auger

Laboratory Sample Types:

Geotechnical Lab

Analytical Chemistry Lab

Geotechnical & Analytical Chemistry Lab

ATTACHMENT B

LABORATORY ANALYTICAL DATA REPORT

Summit Scientific

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

August 29, 2019

Brandon Bruns

Tasman Geosciences

6855 W. 119th Ave.

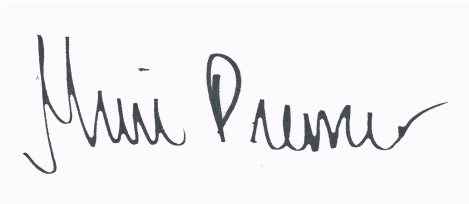
Broomfield, CO 80020

RE: Noble - Duncan D20-12, 20-13

Work Order # 1908266

Enclosed are the results of analyses for samples received by Summit Scientific on 08/21/19 17:30. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, reading "Muri Premier", on a light blue background.

Muri Premier For Ben Shrewsbury

Laboratory Manager



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

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
08/29/19 17:10

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH01@0-5'	1908266-01	Soil	08/21/19 12:45	08/21/19 17:30
BH01@15-17.5'	1908266-02	Soil	08/21/19 13:00	08/21/19 17:30
BH01@17.5-20'	1908266-03	Soil	08/21/19 13:05	08/21/19 17:30
BH02@0-2'	1908266-04	Soil	08/21/19 09:10	08/21/19 17:30
BH03@0-2.5'	1908266-05	Soil	08/21/19 12:00	08/21/19 17:30
BH04@0-2.5'	1908266-06	Soil	08/21/19 10:55	08/21/19 17:30
BH04@18-20'	1908266-07	Soil	08/21/19 11:10	08/21/19 17:30
BH05@17.5-20'	1908266-08	Soil	08/21/19 10:05	08/21/19 17:30
BH05@15-17.5'	1908266-09	Soil	08/21/19 10:15	08/21/19 17:30
BH06@0-2.5'	1908266-10	Soil	08/21/19 14:10	08/21/19 17:30
BH05@0-2.5'	1908266-11	Soil	08/21/19 10:10	08/21/19 17:30

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Summit Scientific

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

Page 1 of 2

Client: Noble/Tasman
Address: 6855 119th St
City/State/Zip: Broomfield CO
Phone: 303-487-1228 Fax: -
Sampler Name: Tanner Cook

Project Manager: Brandon Bruns, Invoice: Jacob Evans
E-Mail: Bbruns@tasman-geo.com
Project Name: Duncan D20-12, 20-13
Project Number: —

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix		Analyze For:								Special Instructions				
				HCl	HNO ₃	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)	8260 BTEX	8260B GBTEXN	8015 DRO	pH, EC, SAR							
BH01 @ 0-5'		1245	1			X			X													
BH01 @ 15-17.5'		1300																				
BH01 @ 17.5-20		1305																				
BH02 @ 0-2'		0910																				
BH03 @ 0-2.5'		1200																				
BH04 @ 0-2.5'		1055																				
BH04 @ 18-20		1110																				
BH05 @ 17.5-20		1005																				
BH05 @ 15-17.5		1015																				
BH06 @ 0-2.5		1410																				
Relinquished by: <u>Tanner Cook</u> Date/Time: <u>8/21/19 1550</u>				Received by: <u>Tasman Loch Box</u> Date/Time: <u>8/21/19 1550</u>				Turn Around Time (Check) Same Day <input type="checkbox"/> 72 Hours <input type="checkbox"/> 24 Hours <input type="checkbox"/> Standard <input checked="" type="checkbox"/> 48 Hours <input type="checkbox"/>												Notes:		
Relinquished by: <u>Tasman Loch Box</u> Date/Time: <u>8/21/19 1730</u>				Received by: <u>[Signature]</u> Date/Time: <u>8/21/19 1730</u>				Sample Integrity: <u>4.7</u>														
Relinquished by: _____ Date/Time: _____				Received in Lab by: _____ Date/Time: _____				Temperature Upon Receipt: _____ Intact: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>														

Summit Scientific

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

Page 2 of 2

Client: Noble/Tasman
Address: 6855 119th St.-
City/State/Zip: Broomfield, CO
Phone: 303-487-1228 Fax: -
Sampler Name: Tanner Cook

Project Manager: Brandon Bruns, Invoice: Jacob Evans
E-Mail: Bbruns@tasman-geo.com
Project Name: Duncan 020-12, 20-13
Project Number: -

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix			Analyze For:								Special Instructions			
				HCl	HNO ₃	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)	8260 BTEX	8260B GBTEXN	8015 DRO	pH, EC, SAR							
BH05@0-2.5	8/21/19	1010	1			X		X						X	X							
Relinquished by: <u>Tanner Cook</u>				Date/Time: <u>8/21/19 1550</u>				Received by: <u>Tasman Loch Box</u>				Date/Time: <u>8/21/19 1550</u>				Turn Around Time (Check)				Notes:		
																Same Day <input type="checkbox"/> 72 Hours <input type="checkbox"/> 24 Hours <input type="checkbox"/> Standard <input checked="" type="checkbox"/> 48 Hours <input type="checkbox"/>						
Relinquished by: <u>Tasman Loch Box</u>				Date/Time: <u>8/21/19 1730</u>				Received by: <u>[Signature]</u>				Date/Time: <u>8/21/19 1730</u>				Sample Integrity: <u>4.7</u>						
Relinquished by:				Date/Time:				Received in Lab by:				Date/Time:				Temperature Upon Receipt: <u>4.7</u>						
																Intact: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>						

Sample Receipt Checklist

S2 Work Order _____

Client: Noble/TASMAN Client Project ID: Duncan DZ0-12,20-13

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

Matrix (check all that apply): _____ Air ☒ Soil/Solid _____ Water _____ Other: _____
(Describe)

Temp (°C)	4.7
-----------	-----

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature at 4°C +/- 2°C ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
NOTE: If samples are delivered the same day of sampling, this requirement is met provided that there is evidence that cooling has begun.				
Were all samples received intact ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
If custody seals are present, are they intact ⁽¹⁾ ?			<input checked="" type="checkbox"/>	
Are samples with holding times due within 48 hours sample due within 48 hours present?		<input checked="" type="checkbox"/>		
Is a chain-of-custody (COC) form present and filled out completely ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client w/ date and time recorded ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.			<input checked="" type="checkbox"/>	
Are samples preserved that require preservation (excluding cooling) ⁽¹⁾ ?			<input checked="" type="checkbox"/>	
Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect				
If samples are acid preserved for metals, is the pH ≤ 2 ⁽¹⁾ ?			<input checked="" type="checkbox"/>	
Record the pH in Comments.				
If dissolved metals are requested, were samples field filtered?			<input checked="" type="checkbox"/>	

Additional Comments (if any):

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

RZ
Custodian Printed Name or Initials

[Signature]
Signature of Custodian

08/21/19
Date/Time 1802



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

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
08/29/19 17:10

BH01@0-5'
1908266-01 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **08/21/19 12:45**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Benzene	ND	0.0020	mg/kg	1	1908314	08/23/19	08/23/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **08/21/19 12:45**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: 1,2-Dichloroethane-d4		87.2 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		92.5 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		103 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **08/21/19 12:45**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
C10-C28 (DRO)	ND	50	mg/kg	1	1908315	"	08/24/19	EPA 8015M	

Date Sampled: **08/21/19 12:45**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: o-Terphenyl		105 %	30-150		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



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

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
08/29/19 17:10

BH01@15-17.5'
1908266-02 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **08/21/19 13:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	0.20	0.0020	mg/kg	1	1908314	08/23/19	08/23/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	0.55	0.0050	"	"	"	"	"	"	
Xylenes (total)	3.8	1.0	"	100	"	"	"	"	
Naphthalene	0.38	0.010	"	1	"	"	"	"	
Gasoline Range Hydrocarbons	72	50	"	"	"	"	"	"	

Date Sampled: **08/21/19 13:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		138 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		83.2 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		241 %	21-167		"	"	"	"	S-02

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **08/21/19 13:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	170	50	mg/kg	1	1908315	"	08/24/19	EPA 8015M	

Date Sampled: **08/21/19 13:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		98.6 %	30-150		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



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

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
08/29/19 17:10

BH01@17.5-20'
1908266-03 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **08/21/19 13:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	0.18	0.0020	mg/kg	1	1908314	08/23/19	08/23/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	0.42	0.0050	"	"	"	"	"	"	
Xylenes (total)	2.7	1.0	"	100	"	"	"	"	
Naphthalene	0.22	0.010	"	1	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **08/21/19 13:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		124 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		85.6 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		174 %	21-167		"	"	"	"	S-02

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **08/21/19 13:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	130	50	mg/kg	1	1908315	"	08/24/19	EPA 8015M	

Date Sampled: **08/21/19 13:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		99.5 %	30-150		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



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

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
08/29/19 17:10

BH02@0-2'
1908266-04 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **08/21/19 09:10**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	0.0020	mg/kg	1	1908314	08/23/19	08/23/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **08/21/19 09:10**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		87.7 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		90.9 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		115 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **08/21/19 09:10**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	50	mg/kg	1	1908315	"	08/24/19	EPA 8015M	

Date Sampled: **08/21/19 09:10**

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

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



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

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
08/29/19 17:10

BH03@0-2.5'
1908266-05 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **08/21/19 12:00**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	0.0020	mg/kg	1	1908314	08/23/19	08/23/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **08/21/19 12:00**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		84.2 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		92.8 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **08/21/19 12:00**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	50	mg/kg	1	1908315	"	08/24/19	EPA 8015M	

Date Sampled: **08/21/19 12:00**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl		96.7 %	30-150		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



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

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
08/29/19 17:10

BH04@0-2.5'
1908266-06 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **08/21/19 10:55**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	0.0020	mg/kg	1	1908314	08/23/19	08/23/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **08/21/19 10:55**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		86.9 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		93.1 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		100 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **08/21/19 10:55**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	50	mg/kg	1	1908315	"	08/24/19	EPA 8015M	

Date Sampled: **08/21/19 10:55**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl		96.9 %	30-150		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



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

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
08/29/19 17:10

BH04@18-20'
1908266-07 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **08/21/19 11:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1908314	08/23/19	08/23/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	0.29	0.0050	"	"	"	"	"	"	
Xylenes (total)	6.9	1.0	"	100	"	"	"	"	
Naphthalene	0.17	0.010	"	1	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **08/21/19 11:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		99.8 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		89.3 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		150 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **08/21/19 11:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	100	50	mg/kg	1	1908315	"	08/24/19	EPA 8015M	

Date Sampled: **08/21/19 11:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		95.9 %	30-150		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



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

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
08/29/19 17:10

BH05@17.5-20'
1908266-08 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **08/21/19 10:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	0.12	0.0020	mg/kg	1	1908314	08/23/19	08/23/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	0.48	0.0050	"	"	"	"	"	"	
Xylenes (total)	3.1	1.0	"	100	"	"	"	"	
Naphthalene	0.28	0.010	"	1	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **08/21/19 10:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		107 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		88.3 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		142 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **08/21/19 10:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	100	50	mg/kg	1	1908315	"	08/24/19	EPA 8015M	

Date Sampled: **08/21/19 10:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		95.7 %	30-150		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



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

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
08/29/19 17:10

BH05@15-17.5'
1908266-09 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **08/21/19 10:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	0.27	0.0020	mg/kg	1	1908314	08/23/19	08/23/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	0.74	0.0050	"	"	"	"	"	"	
Xylenes (total)	5.5	1.0	"	100	"	"	"	"	
Naphthalene	0.45	0.010	"	1	"	"	"	"	
Gasoline Range Hydrocarbons	180	50	"	"	"	"	"	"	

Date Sampled: **08/21/19 10:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		128 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		84.4 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		278 %	21-167		"	"	"	"	S-02

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **08/21/19 10:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	280	50	mg/kg	1	1908315	"	08/24/19	EPA 8015M	

Date Sampled: **08/21/19 10:15**

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

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



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

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
08/29/19 17:10

BH06@0-2.5'
1908266-10 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **08/21/19 14:10**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	0.0020	mg/kg	1	1908314	08/23/19	08/23/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **08/21/19 14:10**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		84.8 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		90.9 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **08/21/19 14:10**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	50	mg/kg	1	1908315	"	08/24/19	EPA 8015M	

Date Sampled: **08/21/19 14:10**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl		98.3 %	30-150		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



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

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
08/29/19 17:10

BH05@0-2.5'
1908266-11 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **08/21/19 10:10**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	0.0020	mg/kg	1	1908314	08/23/19	08/24/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **08/21/19 10:10**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		85.6 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		94.5 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		104 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **08/21/19 10:10**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	50	mg/kg	1	1908315	"	08/24/19	EPA 8015M	

Date Sampled: **08/21/19 10:10**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl		100 %	30-150		"	"	"	"	

Summit Scientific

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

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]
Project Manager: Brandon Brun

Reported:
08/29/19 17:10

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

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

Batch 1908314 - EPA 5030 Soil MS

Blank (1908314-BLK1)

Prepared & Analyzed: 08/23/19

Benzene	ND	0.0020	mg/kg							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
Naphthalene	ND	0.010	"							
Gasoline Range Hydrocarbons	ND	50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0354		"	0.0400		88.4	23-173			
Surrogate: Toluene-d8	0.0371		"	0.0400		92.8	20-170			
Surrogate: 4-Bromofluorobenzene	0.0396		"	0.0400		98.9	21-167			

LCS (1908314-BS1)

Prepared & Analyzed: 08/23/19

Benzene	0.0841	0.0020	mg/kg	0.100		84.1	70-130			
Toluene	0.0894	0.0050	"	0.100		89.4	70-130			
Ethylbenzene	0.0933	0.0050	"	0.100		93.3	70-130			
m,p-Xylene	0.193	0.010	"	0.200		96.7	70-130			
o-Xylene	0.0927	0.0050	"	0.100		92.7	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0346		"	0.0400		86.6	23-173			
Surrogate: Toluene-d8	0.0371		"	0.0400		92.7	20-170			
Surrogate: 4-Bromofluorobenzene	0.0402		"	0.0400		100	21-167			

Matrix Spike (1908314-MS1)

Source: 1908266-01

Prepared & Analyzed: 08/23/19

Benzene	0.0845	0.0020	mg/kg	0.100	ND	84.5	70-130			
Toluene	0.0907	0.0050	"	0.100	ND	90.7	70-130			
Ethylbenzene	0.0928	0.0050	"	0.100	ND	92.8	70-130			
m,p-Xylene	0.193	0.010	"	0.200	ND	96.3	70-130			
o-Xylene	0.0939	0.0050	"	0.100	ND	93.9	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0352		"	0.0400		87.9	23-173			
Surrogate: Toluene-d8	0.0379		"	0.0400		94.8	20-170			
Surrogate: 4-Bromofluorobenzene	0.0402		"	0.0400		100	21-167			

Summit Scientific

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

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]
Project Manager: Brandon Brun

Reported:
08/29/19 17:10

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

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

Batch 1908314 - EPA 5030 Soil MS

Matrix Spike Dup (1908314-MSD1)		Source: 1908266-01			Prepared & Analyzed: 08/23/19					
Benzene	0.0853	0.0020	mg/kg	0.100	ND	85.3	70-130	0.848	30	
Toluene	0.0907	0.0050	"	0.100	ND	90.7	70-130	0.00	30	
Ethylbenzene	0.0937	0.0050	"	0.100	ND	93.7	70-130	0.998	30	
m,p-Xylene	0.192	0.010	"	0.200	ND	96.2	70-130	0.0156	30	
o-Xylene	0.0933	0.0050	"	0.100	ND	93.3	70-130	0.641	30	
Surrogate: 1,2-Dichloroethane-d4	0.0360		"	0.0400		90.0	23-173			
Surrogate: Toluene-d8	0.0373		"	0.0400		93.2	20-170			
Surrogate: 4-Bromofluorobenzene	0.0404		"	0.0400		101	21-167			

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



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

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
08/29/19 17:10

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

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

Batch 1908315 - EPA 3550A

Blank (1908315-BLK1)

Prepared & Analyzed: 08/23/19

C10-C28 (DRO) ND 50 mg/kg

LCS (1908315-BS1)

Prepared: 08/23/19 Analyzed: 08/24/19

C10-C28 (DRO) 444 50 mg/kg 500 88.8 70-130

Matrix Spike (1908315-MS1)

Source: 1908266-01

Prepared: 08/23/19 Analyzed: 08/24/19

C10-C28 (DRO) 567 50 mg/kg 500 34.0 107 70-130

Matrix Spike Dup (1908315-MSD1)

Source: 1908266-01

Prepared: 08/23/19 Analyzed: 08/24/19

C10-C28 (DRO) 505 50 mg/kg 500 34.0 94.2 70-130 11.5 20

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 - Duncan D20-12, 20-13

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
08/29/19 17:10

Notes and Definitions

S-02	The surrogate recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample extract.
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

Summit Scientific

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

September 03, 2019

Brandon Bruns

Tasman Geosciences

6855 W. 119th Ave.

Broomfield, CO 80020

RE: Noble - Duncan D20-12, 20-13

Work Order # 1908298

Enclosed are the results of analyses for samples received by Summit Scientific on 08/23/19 17:30. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read 'P. Shrewsbury', written in a cursive style.

Paul Shrewsbury For Ben Shrewsbury

Laboratory Manager



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

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
09/03/19 07:16

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH01	1908298-01	Water	08/23/19 11:30	08/23/19 17:30
BH02	1908298-02	Water	08/23/19 11:20	08/23/19 17:30
BH03	1908298-03	Water	08/23/19 11:00	08/23/19 17:30
BH04	1908298-04	Water	08/23/19 11:18	08/23/19 17:30
BH05	1908298-05	Water	08/23/19 11:05	08/23/19 17:30
BH06	1908298-06	Water	08/23/19 10:58	08/23/19 17:30

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.

1908298

Summit Scientific

S₂

4653 Table Mountain Drive ♦ Golden, Colorado 80403
303-277-9310 ♦ 303-374-5933 (f)

Page 1 of 1

Client: Noble Enegry Project Manager: Brandon Bruns, Invoice: Jacob Evans


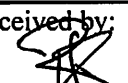


Address: E-Mail: bbruns@tasman-geo.com

City/State/Zip:

Phone: Project Name: Duncan D 20-12, 20-13

Sampler Name: Kevin Chritz Project Number:

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix				Analysis Requested								Special Instructions
					HCl	HNO ₃	None	Other	Water	Soil	Air-Canister #	Other	BTEX								
1	BH01	8/23/2019	11:30	3			X		X					X							
2	BH02	8/23/2019	11:20	3	X				X					X							
3	BH03	8/23/2019	11:00	3	X				X					X							
4	BH04	8/23/2019	11:18	3			X		X					X							
5	BH05	8/23/2019	11:05	3			X		X					X							
6	BH06	8/23/2019	10:58	3	X				X					X							
7																					
8																					
9																					
10																					

Relinquished by: 	Date/Time: 8/23/2019 12:39	Received by: Tasman Box	Date/Time: 8/23/2019 12:39	Turn Around Time (Check) Same Day <input type="checkbox"/> 72 hours 24 hours <input type="checkbox"/> Standard <input checked="" type="checkbox"/> 48 hours <input type="checkbox"/>	Notes:
Relinquished by: Tasman Box	Date/Time: 8/23/2019 1730	Received by: 	Date/Time: 8/23/19 1730	Sample Integrity: 	
Relinquished by:	Date/Time:	Received by:	Date/Time:	Temperature Upon Receipt:  Samples Intact: <input checked="" type="radio"/> Yes <input type="radio"/> No	

Sample Receipt Checklist

S2 Work Order

1908298

Client: NOBLE ENERGY

Client Project ID: DUNCAN D 20-12, 20-13

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

Airbill #:

☐ ☒ ☐ ☐ ☐

Matrix (check all that apply):

☐ Air

☐ Soil/Solid

☒ Water

☐ Other:

(Describe)

Temp (°C)

5.8

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature at 4°C +/- 2°C ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
NOTE: If samples are delivered the same day of sampling, this requirement is met provided that there is evidence that cooling has begun.				
Were all samples received intact ⁽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"/>	
If custody seals are present, are they intact ⁽¹⁾ ?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Are samples with holding times due within 48 hours sample due within 48 hours present?	<input type="checkbox"/>	<input 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"/>	
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"/>	
Is the COC properly relinquished by the client w/ date and time recorded ⁽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⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	HCl
Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect				
If samples are acid preserved for metals, is the pH ≤ 2 ⁽¹⁾ ?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Record the pH in Comments.				
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.

RZ

Custodian Printed Name or Initials

RZ

Signature of Custodian

8/23/19

Date/Time



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

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
09/03/19 07:16

BH01
1908298-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **08/23/19 11:30**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	440	100		ug/l	100	1908325	08/26/19	08/31/19	EPA 8260B	
Toluene	ND	1.0		"	1	"	"	"	"	
Ethylbenzene	490	100		"	100	"	"	"	"	
Xylenes (total)	1400	200		"	"	"	"	"	"	

Date Sampled: **08/23/19 11:30**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		116 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		100 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.7 %		21-167		"	"	"	"	

Summit Scientific

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

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
09/03/19 07:16

BH02
1908298-02 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **08/23/19 11:20**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	1908325	08/26/19	08/31/19	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **08/23/19 11:20**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		116 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		96.5 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.6 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
09/03/19 07:16

BH03
1908298-03 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **08/23/19 11:00**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	1908325	08/26/19	08/31/19	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **08/23/19 11:00**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		118 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.2 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.8 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
09/03/19 07:16

BH04
1908298-04 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **08/23/19 11:18**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	1908325	08/26/19	08/31/19	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **08/23/19 11:18**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		120 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		101 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.0 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
09/03/19 07:16

BH05
1908298-05 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **08/23/19 11:05**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	340	100	ug/l	100	1908325	08/26/19	08/31/19	EPA 8260B	
Toluene	ND	1.0	"	1	"	"	"	"	
Ethylbenzene	500	100	"	100	"	"	"	"	
Xylenes (total)	1700	200	"	"	"	"	"	"	

Date Sampled: **08/23/19 11:05**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		117 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.7 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.6 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
09/03/19 07:16

BH06
1908298-06 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **08/23/19 10:58**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	1908325	08/26/19	08/31/19	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **08/23/19 10:58**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		122 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		100 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.3 %	21-167		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



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

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
09/03/19 07:16

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

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

Batch 1908325 - EPA 5030 Water MS

Blank (1908325-BLK1)

Prepared: 08/26/19 Analyzed: 08/31/19

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	2.0	"							
Surrogate: 1,2-Dichloroethane-d4	12.8		"	13.3		96.2	23-173			
Surrogate: Toluene-d8	12.2		"	13.3		91.5	20-170			
Surrogate: 4-Bromofluorobenzene	14.1		"	13.3		106	21-167			

LCS (1908325-BS1)

Prepared: 08/26/19 Analyzed: 08/31/19

Benzene	26.5	1.0	ug/l	33.3		79.6	51-132			
Toluene	29.0	1.0	"	33.3		87.0	51-138			
Ethylbenzene	29.5	1.0	"	33.3		88.4	58-146			
m,p-Xylene	61.7	2.0	"	66.7		92.6	57-144			
o-Xylene	29.7	1.0	"	33.3		89.0	53-146			
Surrogate: 1,2-Dichloroethane-d4	13.4		"	13.3		101	23-173			
Surrogate: Toluene-d8	12.5		"	13.3		93.7	20-170			
Surrogate: 4-Bromofluorobenzene	13.7		"	13.3		102	21-167			

Matrix Spike (1908325-MS1)

Source: 1908296-01

Prepared: 08/26/19 Analyzed: 08/31/19

Benzene	26.3	1.0	ug/l	33.3	ND	78.8	34-141			
Toluene	29.1	1.0	"	33.3	ND	87.4	27-151			
Ethylbenzene	29.5	1.0	"	33.3	ND	88.5	29-160			
m,p-Xylene	60.7	2.0	"	66.7	ND	91.1	20-166			
o-Xylene	29.2	1.0	"	33.3	ND	87.6	33-159			
Surrogate: 1,2-Dichloroethane-d4	13.2		"	13.3		99.3	23-173			
Surrogate: Toluene-d8	12.3		"	13.3		92.6	20-170			
Surrogate: 4-Bromofluorobenzene	13.7		"	13.3		103	21-167			

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



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

Project: Noble - Duncan D20-12, 20-13

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
09/03/19 07:16

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

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

Batch 1908325 - EPA 5030 Water MS

Matrix Spike Dup (1908325-MSD1)	Source: 1908296-01			Prepared: 08/26/19 Analyzed: 08/31/19						
Benzene	26.6	1.0	ug/l	33.3	ND	80.0	34-141	1.40	30	
Toluene	28.9	1.0	"	33.3	ND	86.7	27-151	0.793	30	
Ethylbenzene	29.0	1.0	"	33.3	ND	87.1	29-160	1.57	30	
m,p-Xylene	60.5	2.0	"	66.7	ND	90.7	20-166	0.429	30	
o-Xylene	29.4	1.0	"	33.3	ND	88.2	33-159	0.717	30	
Surrogate: 1,2-Dichloroethane-d4	14.4		"	13.3		108	23-173			
Surrogate: Toluene-d8	12.6		"	13.3		94.5	20-170			
Surrogate: 4-Bromofluorobenzene	13.4		"	13.3		100	21-167			

Summit Scientific

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Reported:
09/03/19 07:16

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference