

State of Colorado
Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203 (303)894-2100 Fax:(303)894-2109



FOR OGCC USE ONLY

SITE INVESTIGATION AND REMEDIATION WORKPLAN

This form shall be submitted to the Director for approval prior to the initiation of site investigation and remediation activities. Form 27 is intended to be used whenever possible. Additional documentation will be required when large volumes of soil and groundwater have been impacted or involve large facilities with multiple source areas. See Rule 910. Attach as many pages as needed to fully describe the proposed work.

OGCC Employee:

Spill Complaint
Inspection NOAV

Tracking No:

CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

Spill or Release Plug & Abandon Central Facility Closure Site/Facility Closure Other (describe): _____

OGCC Operator Number: _____

Name of Operator: _____

Address: _____

City: _____ State: _____ Zip: _____

Contact Name and Telephone: _____

No: _____

Fax: _____

API Number: _____

County: _____

Facility Name: _____

Facility Number: _____

Well Name: _____

Well Number: _____

Location: (QtrQtr, Sec, Twp, Rng, Meridian): _____ Latitude: _____ Longitude: _____

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc): _____

Site Conditions: Is location within a sensitive area (according to Rule 901e)? Y N If yes, attach evaluation.

Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.): _____

Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: _____

Potential receptors (water wells within 1/4 mi, surface waters, etc.): _____

Description of Impact (if previously provided, refer to that form or document):

Impacted Media (check):	Extent of Impact:	How Determined:
Soils	_____	_____
Vegetation	_____	_____
Groundwater	_____	_____
Surface Water	_____	_____

REMEDIALTION WORKPLAN

Describe initial action taken (if previously provided, refer to that form or document):

Describe how source is to be removed:

Describe how remediation of existing impacts is to be accomplished, including removal and disposal at an injection well or licensed facility, land treatment on site, removal of impacted groundwater, insitu bioremediation, burning of oily vegetation, etc.:



Tracking Number:	_____
Name of Operator:	_____
OGCC Operator No:	_____
Received Date:	_____
Well Name & No:	_____
Facility Name & No:	_____

REMEDIATION WORKPLAN (Cont.)

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.):

Describe reclamation plan. Discuss existing and new grade recontouring; method and testing of compaction alleviation; and reseeding program, including location of new seed, seed mix and noxious weed prevention. Attach diagram or drawing. Use additional sheet for description if required.

Attach samples and analytical results taken to verify remediation of impacts. Show locations of samples on an onsite schematic or drawing.

Is further site investigation required? Y N If yes, describe:

Final disposition of E&P waste (landtreated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.):

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: _____	Date Site Investigation Completed: _____	Date Remediation Plan Submitted: _____
Remediation Start Date: _____	Anticipated Completion Date: _____	Actual Completion Date: _____

I hereby certify that the statements made in this form are, to the best of my knowledge, true, correct, and complete.

Print Name: _____ Signed: _____

Title: _____ Date: _____

OGCC Approved: _____ Title: _____ Date: _____

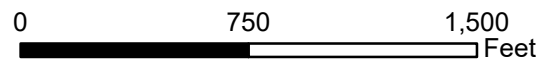
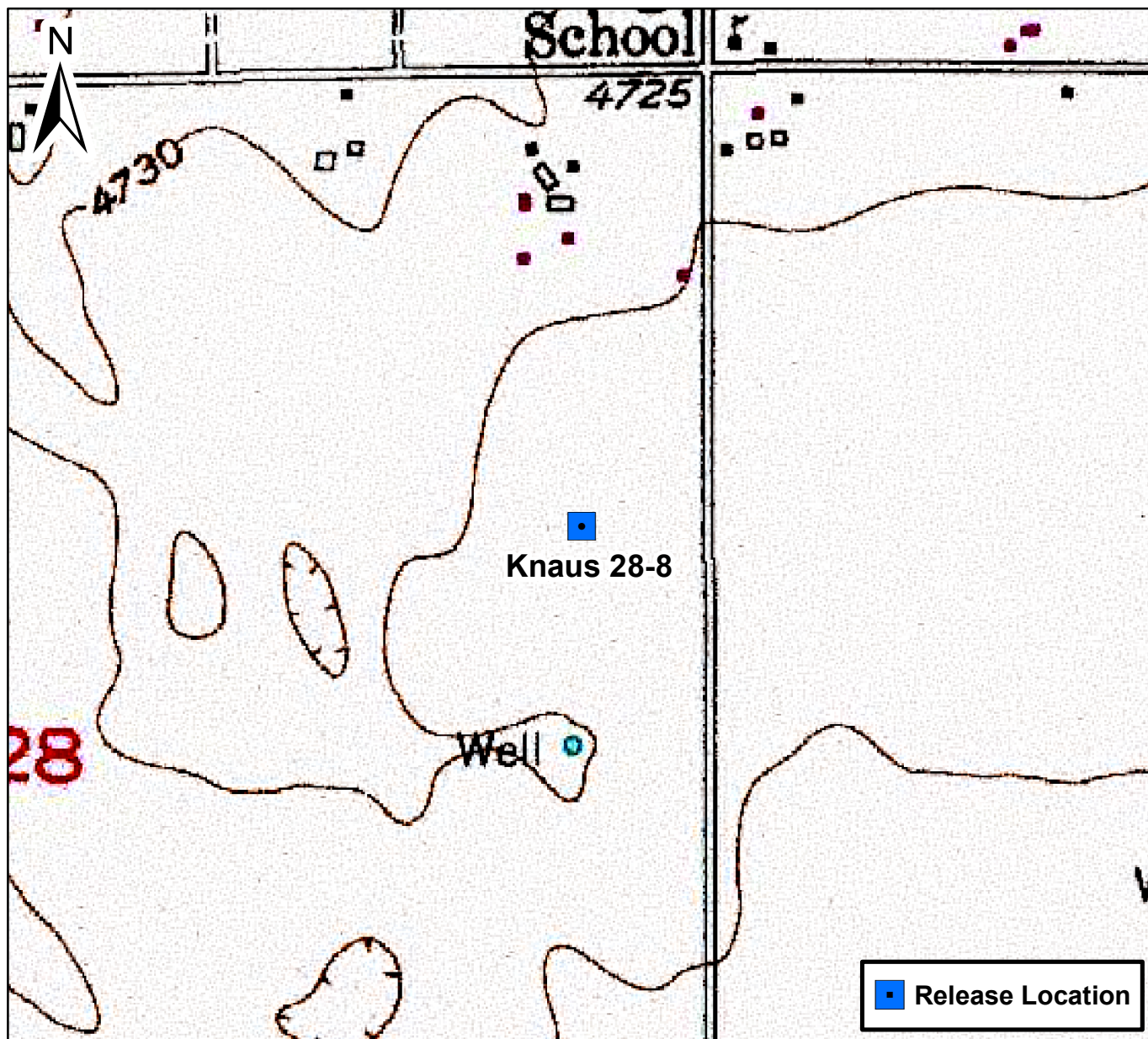


Figure 1

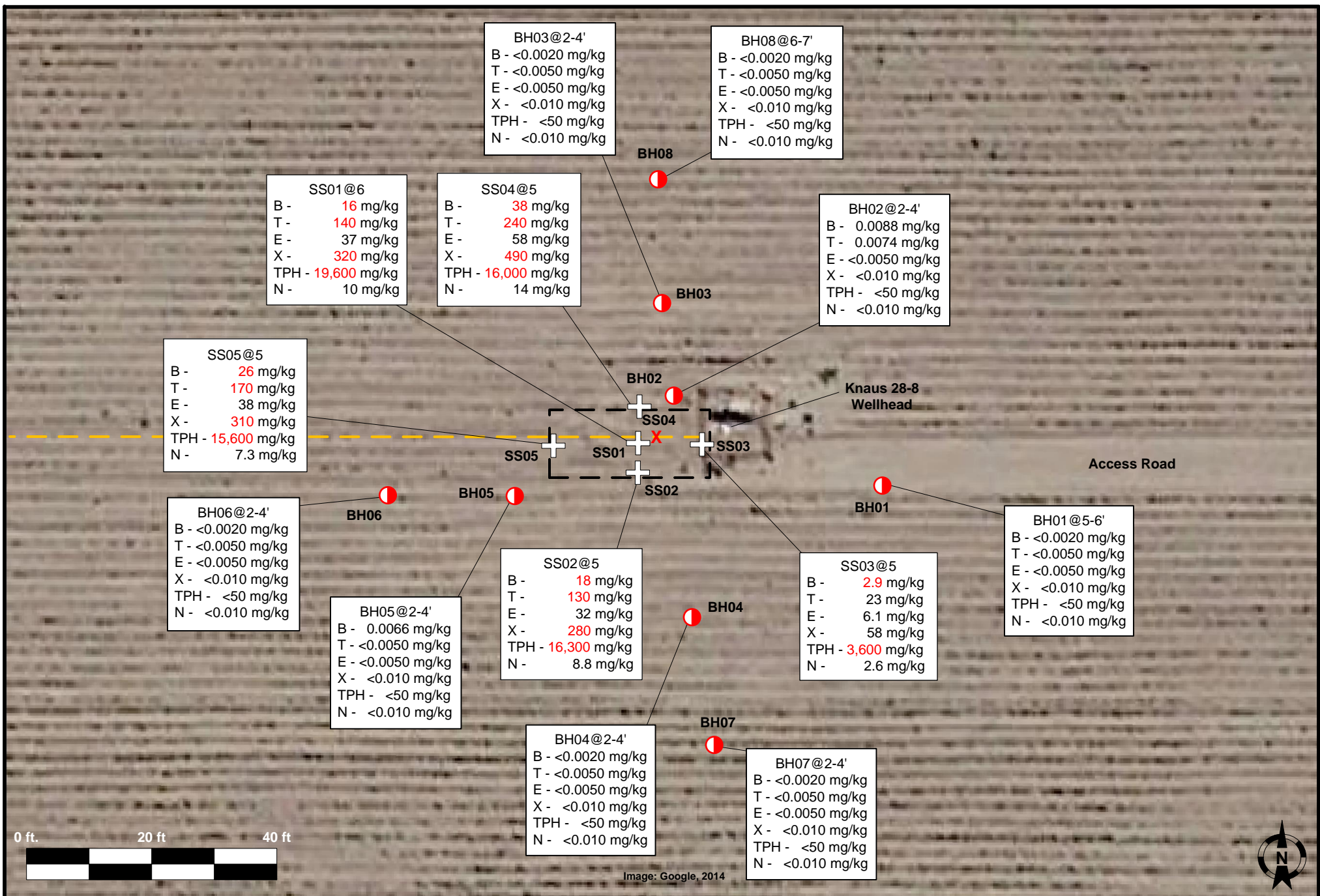
Site Location Map

Knaus 28-8

SENE S28 T6N R66W

Weld County, Colorado





PROJECT NO:

DRAWN BY: ESS

DATE: 07/19/16



Facility Diagram

Knaus 28-8
Weld County, CO

LEGEND:

● Borehole Soil Sample

X Approximate Release Location

⊕ Excavation Soil Sample Location

--- Excavation Area
(Approximate)

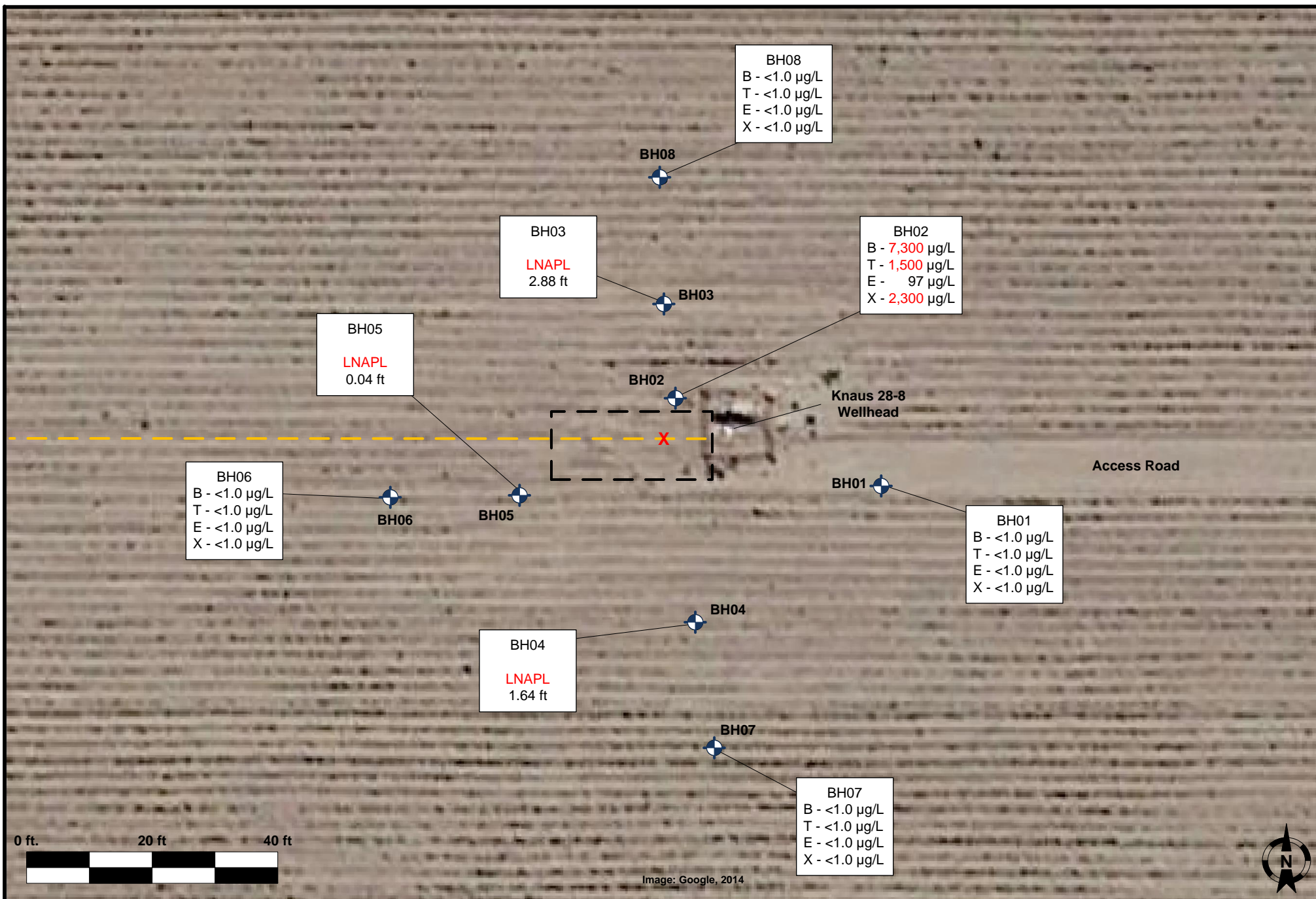
--- Noble Flow Line
Location

mg/kg Milligrams Per Kilogram

B - Benzene
T - Toluene
E - Ethylbenzene
X - Total Xylenes
TPH - Total Petroleum Hydrocarbons
N - Naphthalene

Excavation and Borehole
Soil Sampling Map
(04/11/15 – 05/31/16)

Figure 2



PROJECT NO:

DRAWN BY: ESS

DATE: 07/19/16



Facility Diagram

Knaus 28-8
Weld County, CO

LEGEND:



Groundwater Monitoring Well



Approximate Release Location



Excavation Area
(Approximate)



Noble Flow Line Location



Micrograms Per Liter

B - Benzene
T - Toluene
E - Ethylbenzene
X - Total Xylenes

Groundwater Analytical
Results Map
(06/21/16)

Figure 3

TABLE 1
SOIL ANALYTICAL DATA
NOBLE ENERGY, INC. - KNAUS 28-8 FLOW LINE

Soil Sample ID	Date	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	TPH-GRO (mg/kg)	TPH-DRO (mg/kg)	Naphthalene (mg/kg)
COGCC Standard		0.17	85	100	175	500		23
SS01@6	04/11/16	16	140	37	320	7,600	12,000	10
SS02@5	04/11/16	18	130	32	280	7,500	8,800	8.8
SS03@5	04/11/16	2.9	23	6.1	58	2,300	1,300	2.6
SS04@5	04/11/16	38	240	58	460	12,000	14,000	14
SS05@5	04/11/16	26	170	38	310	8,600	7,000	7.3
BH01@5-6'	04/15/16	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010
BH02@2-4'	04/15/16	0.0088	0.0074	<0.0050	<0.010	<50	<50	<0.010
BH03@2-4'	04/15/16	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010
BH04@2-4'	04/15/16	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010
BH05@2-4'	04/15/16	0.0066	<0.0050	<0.0050	<0.010	<50	<50	<0.010
BH06@2-4'	04/15/16	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010
BH07@2-4'	04/15/16	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010
BH08@6-7'	05/26/16	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010

COGCC = Colorado Oil and Gas Conservation Commission

TPH-GRO = Total petroleum hydrocarbons - gasoline range organics

TPH-DRO = Total petroleum hydrocarbons - diesel range organics

mg/kg = Milligrams per kilogram

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

Soil standards referenced from COGCC Table 910-1

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

TABLE 2
GROUNDWATER ANALYTICAL DATA
NOBLE ENERGY, INC. - KNAUS 28-8 FLOW LINE

Monitoring Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
COGCC Standard		5	560	700	1,400
BH01	04/15/16	<1.0	<1.0	<1.0	<1.0
BH01	06/21/16	<1.0	<1.0	<1.0	<1.0
BH02	04/15/16	5,300	3,900	130	1,200
BH02	06/21/16	7,300	1,500	97	2,300
BH03	04/15/16	Not Sampled - LNAPL Present			
BH03	06/21/16	Not Sampled - LNAPL Present			
BH04	04/15/16	1,700	2,600	130	1,200
BH04	06/21/16	Not Sampled - LNAPL Present			
BH05	04/15/16	Not Sampled - LNAPL Present			
BH05	06/21/16	Not Sampled - LNAPL Present			
BH06	04/15/16	<1.0	8.0	<1.0	<1.0
BH06	06/21/16	<1.0	<1.0	<1.0	<1.0
BH07	04/15/16	<1.0	<1.0	<1.0	<1.0
BH07	06/21/16	<1.0	<1.0	<1.0	<1.0
BH08	06/21/16	<1.0	<1.0	<1.0	<1.0

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

TABLE 3
GROUNDWATER ELEVATION DATA
NOBLE ENERGY, INC. - KNAUS 28-8 FLOW LINE

Monitoring Well ID	Date	Top of Casing Elevation (ft. AMSL)	Total Depth (ft. BTOC)	Depth to Water (ft. BTOC)	Depth to LNAPL (ft. BTOC)	LNAPL Thickness (ft.)	Groundwater Elevation* (ft. AMSL)
BH01	04/15/16	4660.12	16.81	14.29	ND	ND	4645.83
BH01	06/21/16	4660.12	16.24	13.63	ND	ND	4646.49
BH01	07/08/16	4658.07 ¹	NM	10.71	ND	ND	4647.36
BH02	04/15/16	4660.56	17.71	17.13	ND	ND	4643.43
BH02	06/21/16	4660.56	17.71	13.99	ND	ND	4646.57
BH02	07/08/16	4660.56	NM	13.04	ND	ND	4647.52
BH03	04/15/16	4660.75	17.41	14.66	Trace	<0.01	4646.09
BH03	06/21/16	4660.75	17.41	16.42	13.54	2.88	4646.49
BH03	07/08/16	4660.75	NM	13.32	13.24	0.08	4647.49
BH04	04/15/16	4659.97	17.24	14.47	ND	ND	4645.50
BH04	06/21/16	4659.97	17.24	14.76	13.12	1.64	4646.44
BH04	07/08/16	4659.97	NM	12.75	12.60	0.15	4647.33
BH05	04/15/16	4661.14	17.11	15.06	Trace	<0.01	4646.08
BH05	06/21/16	4661.14	16.81	14.60	14.56	0.04	4646.57
BH05	07/08/16	4661.14	NM	13.74	13.72	0.02	4647.42
BH06	04/15/16	4660.85	16.65	14.77	ND	ND	4646.08
BH06	06/21/16	4660.85	16.62	14.24	ND	ND	4646.61
BH06	07/08/16	4660.85	NM	13.39	ND	ND	4647.46
BH07	04/15/16	4660.84	17.20	14.90	ND	ND	4645.94
BH07	06/21/16	4660.84	16.91	14.38	ND	ND	4646.46
BH07	07/08/16	4660.84	NM	13.56	ND	ND	4647.28
BH08	06/21/16	4661.26	22.25	14.62	ND	ND	4646.64
BH08	07/08/16	4661.26	NM	13.71	ND	ND	4647.55

ft. = Feet

AMSL = Above mean sea level

BTOC = Below top of casing

LNAPL = Light non-aqueous phase liquid

ND = No LNAPL detected

NM = Not Measured

* 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

¹ Approximately 2.05 ft of casing broken off of BH01 prior to gauging on 7/8/16

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

April 12, 2016

Brandon Bruns
Tasman Geosciences
6899 Pecos Street
Denver, CO 80221
RE: Knaus 28-8

Enclosed are the results of analyses for samples received by Summit Scientific on 04/11/16 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', with a stylized, cursive script.

Paul Shrewsbury
President



Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
04/12/16 06:48

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS01@6	1604071-01	Soil	04/11/16 14:25	04/11/16 17:30
SS02@5	1604071-02	Soil	04/11/16 14:28	04/11/16 17:30
SS03@5	1604071-03	Soil	04/11/16 14:31	04/11/16 17:30
SS04@5	1604071-04	Soil	04/11/16 14:34	04/11/16 17:30
SS05@5	1604071-05	Soil	04/11/16 14:37	04/11/16 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.

Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
04/12/16 06:48

Summit Scientific 1604071

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

Page 1 of 1

Client: Noble/Tasman
Address:
City/State/Zip:
Phone: Fax:
Sampler Name: Brad Margawet

Project Manager: Brandon Bruns, Invoice: Tacob Evans
E-Mail: _____
Project Name: Knaus 28-3
Project Number: _____

				Preservative		Matrix				Analyze For:											
Sample Description	Date Sampled	Time Sampled	Number of Containers	HCl	HNO ₃	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)	8260 BTEX	8260B GBTEXN	8015 DRO	pH, EC, SAR				Special Instructions		
SS0106	4/11/16	1425	1			X			X				X	X							
SS0205	4/11/16	1428	1			X			X				X	X							
SS0305	4/11/16	1431	1			X			X				X	X							
SS0405	4/11/16	1434	1			X			X				X	X							
SS0505	4/11/16	1437	1			X			X				X	X							
Relinquished by: [Signature] Date/Time: 4/11/16 1700				Received by: [Signature] Date/Time: 4/11/16 1700				Turn Around Time (Check) Same Day <input checked="" type="checkbox"/> 72 Hours <input type="checkbox"/> 24 Hours <input type="checkbox"/> Standard <input type="checkbox"/> 48 Hours <input type="checkbox"/>												Notes: on ice	
Relinquished by: [Signature] Date/Time: 4/11/16 1730				Received by: [Signature] Date/Time: 4-11-16 1930				Sample Integrity: Temperature Upon Receipt: 56°C Intact: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>													

www.szscientific.com



Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
04/12/16 06:48

SS01@6
1604071-01 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: 04/11/16 14:25

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	12000	50	mg/kg	1	1604113	04/11/16	04/11/16	8015M	

Date Sampled: 04/11/16 14:25

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		196 %	30-150		"	"	"	"	S-02

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: 04/11/16 14:25

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	10	1.0	mg/kg	100	1604112	04/11/16	04/11/16	EPA 8260B	
Benzene	16	0.20	"	"	"	"	"	"	
Toluene	140	0.50	"	"	"	"	"	"	E
Ethylbenzene	37	0.50	"	"	"	"	"	"	
Xylenes (total)	320	1.0	"	"	"	"	"	"	E
Gasoline Range Hydrocarbons	7600	50	"	"	"	"	"	"	

Date Sampled: 04/11/16 14:25

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		101 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		144 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		134 %	21-167		"	"	"	"	

Summit Scientific

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
04/12/16 06:48

SS02@5
1604071-02 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **04/11/16 14:28**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	8800	50	mg/kg	1	1604113	04/11/16	04/11/16	8015M	

Date Sampled: **04/11/16 14:28**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		137 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/11/16 14:28**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	8.8	1.0	mg/kg	100	1604112	04/11/16	04/11/16	EPA 8260B	
Benzene	18	0.20	"	"	"	"	"	"	
Toluene	130	0.50	"	"	"	"	"	"	E
Ethylbenzene	32	0.50	"	"	"	"	"	"	
Xylenes (total)	280	1.0	"	"	"	"	"	"	E
Gasoline Range Hydrocarbons	7500	50	"	"	"	"	"	"	

Date Sampled: **04/11/16 14:28**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		104 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		141 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		134 %	21-167		"	"	"	"	

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
04/12/16 06:48

SS03@5
1604071-03 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **04/11/16 14:31**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	1300	50	mg/kg	1	1604113	04/11/16	04/11/16	8015M	

Date Sampled: **04/11/16 14:31**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		119 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/11/16 14:31**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	2.6	1.0	mg/kg	100	1604112	04/11/16	04/11/16	EPA 8260B	
Benzene	2.9	0.20	"	"	"	"	"	"	
Toluene	23	0.50	"	"	"	"	"	"	
Ethylbenzene	6.1	0.50	"	"	"	"	"	"	
Xylenes (total)	58	1.0	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	2300	50	"	"	"	"	"	"	

Date Sampled: **04/11/16 14:31**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		99.2 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		119 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		108 %	21-167		"	"	"	"	

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
04/12/16 06:48

SS04@5
1604071-04 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **04/11/16 14:34**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	14000	50	mg/kg	1	1604113	04/11/16	04/11/16	8015M	

Date Sampled: **04/11/16 14:34**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		225 %	30-150		"	"	"	"	S-02

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/11/16 14:34**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	14	1.0	mg/kg	100	1604112	04/11/16	04/11/16	EPA 8260B	
Benzene	38	0.20	"	"	"	"	"	"	
Toluene	240	0.50	"	"	"	"	"	"	E
Ethylbenzene	58	0.50	"	"	"	"	"	"	
Xylenes (total)	490	1.0	"	"	"	"	"	"	E
Gasoline Range Hydrocarbons	12000	50	"	"	"	"	"	"	E

Date Sampled: **04/11/16 14:34**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		100 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		161 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		139 %	21-167		"	"	"	"	

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
04/12/16 06:48

SS05@5
1604071-05 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **04/11/16 14:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	7000	50	mg/kg	1	1604113	04/11/16	04/12/16	8015M	

Date Sampled: **04/11/16 14:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		162 %	30-150		"	"	"	"	S-02

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/11/16 14:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	7.3	1.0	mg/kg	100	1604112	04/11/16	04/11/16	EPA 8260B	
Benzene	26	0.20	"	"	"	"	"	"	
Toluene	170	0.50	"	"	"	"	"	"	E
Ethylbenzene	38	0.50	"	"	"	"	"	"	
Xylenes (total)	310	1.0	"	"	"	"	"	"	E
Gasoline Range Hydrocarbons	8600	50	"	"	"	"	"	"	

Date Sampled: **04/11/16 14:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		99.4 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		148 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		134 %	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
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
04/12/16 06:48

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

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

Batch 1604113 - EPA 3550A

Blank (1604113-BLK1)

Prepared: 04/11/16 Analyzed: 04/12/16

C10-C28 (DRO) ND 50 mg/kg

Surrogate: o-Terphenyl 13.4 " 12.5 107 30-150

LCS (1604113-BS1)

Prepared: 04/11/16 Analyzed: 04/12/16

C10-C28 (DRO) 492 50 mg/kg 499 98.6 73-134

Surrogate: o-Terphenyl 13.6 " 12.5 109 30-150

Matrix Spike (1604113-MS1)

Source: 1604069-01

Prepared: 04/11/16 Analyzed: 04/12/16

C10-C28 (DRO) 462 50 mg/kg 489 31.1 88.1 50-148

Surrogate: o-Terphenyl 12.5 " 12.3 102 30-150

Matrix Spike Dup (1604113-MSD1)

Source: 1604069-01

Prepared: 04/11/16 Analyzed: 04/12/16

C10-C28 (DRO) 450 50 mg/kg 482 31.1 87.0 50-148 2.70 13

Surrogate: o-Terphenyl 12.5 " 12.1 104 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
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
04/12/16 06:48

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 1604112 - EPA 5030 Soil MS

Blank (1604112-BLK1)

Prepared: 04/11/16 Analyzed: 04/12/16

Naphthalene	ND	0.010	mg/kg							
Benzene	ND	0.0020	"							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
Gasoline Range Hydrocarbons	ND	50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0386		"	0.0400		96.5	23-173			
Surrogate: Toluene-d8	0.0421		"	0.0400		105	20-170			
Surrogate: 4-Bromofluorobenzene	0.0438		"	0.0400		109	21-167			

LCS (1604112-BS1)

Prepared: 04/11/16 Analyzed: 04/12/16

Naphthalene	ND	0.010	mg/kg				66-138			
Benzene	0.0964	0.0020	"	0.100		96.4	58-130			
Toluene	0.0959	0.0050	"	0.100		95.9	61-134			
Ethylbenzene	0.106	0.0050	"	0.0992		107	74-139			
m,p-Xylene	0.220	0.010	"	0.200		110	73-137			
o-Xylene	0.103	0.0050	"	0.0980		105	73-141			
Surrogate: 1,2-Dichloroethane-d4	0.0374		"	0.0400		93.4	23-173			
Surrogate: Toluene-d8	0.0422		"	0.0400		106	20-170			
Surrogate: 4-Bromofluorobenzene	0.0421		"	0.0400		105	21-167			

Matrix Spike (1604112-MS1)

Source: 1604069-01

Prepared: 04/11/16 Analyzed: 04/12/16

Naphthalene	ND	0.010	mg/kg		ND		10-158			
Benzene	0.0922	0.0020	"	0.0963	ND	95.7	30-131			
Toluene	0.0930	0.0050	"	0.0963	ND	96.5	30-134			
Ethylbenzene	0.100	0.0050	"	0.0956	ND	105	22-153			
m,p-Xylene	0.207	0.010	"	0.192	ND	108	10-159			
o-Xylene	0.0983	0.0050	"	0.0944	ND	104	31-151			
Surrogate: 1,2-Dichloroethane-d4	0.0401		"	0.0385		104	23-173			
Surrogate: Toluene-d8	0.0402		"	0.0385		104	20-170			
Surrogate: 4-Bromofluorobenzene	0.0442		"	0.0385		115	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
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
04/12/16 06:48

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 1604112 - EPA 5030 Soil MS

Matrix Spike Dup (1604112-MSD1)		Source: 1604069-01			Prepared: 04/11/16		Analyzed: 04/12/16			
Naphthalene	ND	0.010	mg/kg		ND		10-158			42
Benzene	0.0963	0.0020	"	0.0980	ND	98.2	30-131	4.35		34
Toluene	0.0961	0.0050	"	0.0980	ND	98.1	30-134	3.32		30
Ethylbenzene	0.102	0.0050	"	0.0973	ND	104	22-153	1.49		24
m,p-Xylene	0.212	0.010	"	0.196	ND	108	10-159	2.07		68
o-Xylene	0.0980	0.0050	"	0.0961	ND	102	31-151	0.300		38
Surrogate: 1,2-Dichloroethane-d4	0.0400		"	0.0392		102	23-173			
Surrogate: Toluene-d8	0.0409		"	0.0392		104	20-170			
Surrogate: 4-Bromofluorobenzene	0.0436		"	0.0392		111	21-167			

Summit Scientific

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



Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
04/12/16 06:48

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.

E The concentration indicated for this analyte is an estimated value above the calibration range of the instrument.

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

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

April 17, 2016

Brandon Bruns
Tasman Geosciences
6899 Pecos Street
Denver, CO 80221
RE: Knaus 28-8

Enclosed are the results of analyses for samples received by Summit Scientific on 04/15/16 17:45. 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', with a stylized, cursive script.

Paul Shrewsbury
President



Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
04/17/16 12:55

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH01	1604111-01	Water	04/15/16 13:20	04/15/16 17:45
BH02	1604111-02	Water	04/15/16 13:30	04/15/16 17:45
BH04	1604111-03	Water	04/15/16 13:32	04/15/16 17:45
BH06	1604111-04	Water	04/15/16 13:35	04/15/16 17:45
BH07	1604111-05	Water	04/15/16 13:25	04/15/16 17:45
BH01@5-6'	1604111-06	Soil	04/15/16 10:00	04/15/16 17:45
BH02@2-4'	1604111-07	Soil	04/15/16 10:15	04/15/16 17:45
BH03@2-4'	1604111-08	Soil	04/15/16 10:35	04/15/16 17:45
BH04@2-4'	1604111-09	Soil	04/15/16 10:55	04/15/16 17:45
BH05@2-4'	1604111-10	Soil	04/15/16 11:15	04/15/16 17:45
BH06@2-4'	1604111-11	Soil	04/15/16 11:55	04/15/16 17:45
BH07@2-4'	1604111-12	Soil	04/15/16 12:30	04/15/16 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.



Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
04/17/16 12:55

Summit Scientific 1604111.1

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

Page 1 of 2

Client: Noble/Tasman

Address: _____

City/State/Zip: _____

Phone: 970 470 9042 Fax: _____

Sampler Name: R Irvin J. Whisker

Project Manager: Brandon Bruns, Invoice: Jacob Evans

E-Mail: Bbruns@tasman-geo.com

Project Name: Knaus 28-8

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	4/15/16	1320	3	X				X					X					
BH02	4/15/16	1330	2	X				X					X					
BH04	4/15/16	1332	3	X				X					X					
BH06	4/15/16	1335	3	X				X					X					
BH07	4/15/16	1325	3	X				X					X					
BH08 5-6'	4/15/16	1000	1		X			X					X	X				
BH02@2-4'	4/15/16	1015	1		X			X					X	X				
BH03@2-4'	4/15/16	1035	1		X			X					X	X				
BH04@2-4'	4/15/16	1055	1		X			X					X	X				
BH05@2-4'	4/15/16	1115	1		X			X					X	X				

Relinquished by: <u>[Signature]</u>	Date/Time: <u>4/15/16 1700</u>	Received by: <u>[Signature]</u>	Date/Time: <u>4/15/16 1700</u>	Turn Around Time (Check)	Notes:
Relinquished by: <u>[Signature]</u>	Date/Time: <u>4/15/16 1750</u>	Received by: <u>[Signature]</u>	Date/Time: <u>4-15-16 1750</u>	Same Day <input checked="" type="checkbox"/> 72 Hours <input type="checkbox"/> 24 Hours <input type="checkbox"/> Standard <input type="checkbox"/> 48 Hours <input type="checkbox"/>	On ice
Relinquished by: _____	Date/Time: _____	Received in Lab by: _____	Date/Time: _____	Sample Integrity: <u>38°C</u> Temperature Upon Receipt: <u>38°C</u> Intact: Yes <input type="checkbox"/> No <input type="checkbox"/>	

www.s2scientific.com

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.

[Signature]



Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
04/17/16 12:55

Summit Scientific 1604111.2

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

Page 2 of 2

Client: Noble/Tasman

Address: _____

City/State/Zip: _____

Phone: 970 470 9042 Fax: _____

Sampler Name: E. Irvin J. Whittaker

Project Manager: Brandon Bruns, Invoice: Jacob Evans

E-Mail: bbruns@tasman-geo.com

Project Name: Knaus 28-8

Project Number: _____

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative			Matrix			Analyze For:					Special Instructions														
				HCl	HNO ₃	None	Groundwater	Soil	Air - Canister Serial #	Other (Specify)	8260 BTEX	8260B GBTEXN	8015 DRO	pH, EC, SAR															
BH0602-4'	4/15/16	1155	1		X		X					X	X																
BH0702-4'	4/15/16	1230	1		X		X					X	X																

Relinquished by: _____	Date/Time: <u>4/15/16 1700</u>	Received by: <u>MD</u>	Date/Time: <u>4/15/16 1700</u>	Turn Around Time (Check) Same Day <input checked="" type="checkbox"/> 72 Hours <input type="checkbox"/> 24 Hours <input type="checkbox"/> Standard <input type="checkbox"/> 48 Hours <input type="checkbox"/>	Notes: <u>on file</u>
Relinquished by: <u>MD</u>	Date/Time: <u>4/15/16 1750</u>	Received by: <u>MD</u>	Date/Time: <u>4-15-16 1750</u>	Sample Integrity: Temperature Upon Receipt: <u>3.8°C</u> Intact: <input checked="" type="radio"/> Yes <input type="radio"/> No	
Relinquished by: _____	Date/Time: _____	Received in Lab by: _____	Date/Time: _____		

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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
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
04/17/16 12:55

BH01
1604111-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/15/16 13:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1604169	04/15/16	04/15/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **04/15/16 13:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		97.3 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		103 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		109 %	45-146		"	"	"	"	

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
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
04/17/16 12:55

BH02
1604111-02 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/15/16 13:30**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	5300	100		ug/l	100	1604169	04/15/16	04/15/16	EPA 8260B	
Toluene	3900	100		"	"	"	"	"	"	
Ethylbenzene	130	1.0		"	1	"	"	04/15/16	"	
Xylenes (total)	1200	1.0		"	"	"	"	"	"	

Date Sampled: **04/15/16 13:30**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<i>Surrogate: 1,2-Dichloroethane-d4</i>		106 %		37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		104 %		45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		106 %		45-146		"	"	"	"	

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
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
04/17/16 12:55

BH04
1604111-03 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/15/16 13:32**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	1700	100		ug/l	100	1604169	04/15/16	04/15/16	EPA 8260B	
Toluene	2600	100		"	"	"	"	"	"	
Ethylbenzene	130	1.0		"	1	"	"	04/15/16	"	
Xylenes (total)	1200	1.0		"	"	"	"	"	"	

Date Sampled: **04/15/16 13:32**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<i>Surrogate: 1,2-Dichloroethane-d4</i>		104 %		37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		104 %		45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		108 %		45-146		"	"	"	"	

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
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
04/17/16 12:55

BH06
1604111-04 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/15/16 13:35**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	1604169	04/15/16	04/15/16	EPA 8260B	
Toluene	8.0	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **04/15/16 13:35**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		100 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		104 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		109 %	45-146		"	"	"	"	

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
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
04/17/16 12:55

BH07
1604111-05 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/15/16 13:25**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	1604169	04/15/16	04/15/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **04/15/16 13:25**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		94.8 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		104 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		108 %	45-146		"	"	"	"	

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
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
04/17/16 12:55

BH01@5-6'
1604111-06 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **04/15/16 10:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1604158	04/15/16	04/16/16	8015M	

Date Sampled: **04/15/16 10:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		99.0 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/15/16 10:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1604156	04/15/16	04/15/16	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **04/15/16 10:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		109 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		97.6 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %	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
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
04/17/16 12:55

BH02@2-4'
1604111-07 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **04/15/16 10:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1604158	04/15/16	04/16/16	8015M	

Date Sampled: **04/15/16 10:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		98.5 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/15/16 10:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1604156	04/15/16	04/15/16	EPA 8260B	
Benzene	0.0088	0.0020	"	"	"	"	"	"	
Toluene	0.0074	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **04/15/16 10:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		111 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.8 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.5 %	21-167		"	"	"	"	

Summit Scientific

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
04/17/16 12:55

BH03@2-4'
1604111-08 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **04/15/16 10:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1604158	04/15/16	04/16/16	8015M	

Date Sampled: **04/15/16 10:35**

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

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/15/16 10:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1604156	04/15/16	04/15/16	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **04/15/16 10:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		107 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		96.8 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.7 %	21-167		"	"	"	"	

Summit Scientific

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
04/17/16 12:55

BH04@2-4'
1604111-09 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **04/15/16 10:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1604158	04/15/16	04/16/16	8015M	

Date Sampled: **04/15/16 10:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		99.7 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/15/16 10:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1604156	04/15/16	04/15/16	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **04/15/16 10:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		109 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		96.8 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.3 %	21-167		"	"	"	"	

Summit Scientific

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
04/17/16 12:55

BH05@2-4'
1604111-10 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **04/15/16 11:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1604158	04/15/16	04/16/16	8015M	

Date Sampled: **04/15/16 11:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		98.8 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/15/16 11:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1604156	04/15/16	04/15/16	EPA 8260B	
Benzene	0.0066	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **04/15/16 11:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		107 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.6 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.8 %	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
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
04/17/16 12:55

BH06@2-4'
1604111-11 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **04/15/16 11:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1604158	04/15/16	04/16/16	8015M	

Date Sampled: **04/15/16 11:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		99.0 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/15/16 11:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1604156	04/15/16	04/15/16	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **04/15/16 11:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		106 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		97.0 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		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
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
04/17/16 12:55

BH07@2-4'
1604111-12 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **04/15/16 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1604158	04/15/16	04/16/16	8015M	

Date Sampled: **04/15/16 12:30**

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

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/15/16 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1604156	04/15/16	04/16/16	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **04/15/16 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		104 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		94.7 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		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
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
04/17/16 12:55

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

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

Batch 1604158 - EPA 3550A

Blank (1604158-BLK1)

Prepared & Analyzed: 04/15/16

C10-C28 (DRO)	ND	50	mg/kg							
Surrogate: o-Terphenyl	13.7		"	12.5		110	30-150			

LCS (1604158-BS1)

Prepared & Analyzed: 04/15/16

C10-C28 (DRO)	557	50	mg/kg	499		112	73-134			
Surrogate: o-Terphenyl	13.1		"	12.5		105	30-150			

Matrix Spike (1604158-MS1)

Source: 1604099-04

Prepared & Analyzed: 04/15/16

C10-C28 (DRO)	467	50	mg/kg	499	27.1	88.2	50-148			
Surrogate: o-Terphenyl	12.3		"	12.5		98.4	30-150			

Matrix Spike Dup (1604158-MSD1)

Source: 1604099-04

Prepared & Analyzed: 04/15/16

C10-C28 (DRO)	490	50	mg/kg	499	27.1	92.8	50-148	4.86	13	
Surrogate: o-Terphenyl	12.9		"	12.5		103	30-150			

Summit Scientific

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
04/17/16 12:55

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 1604156 - EPA 5030 Soil MS

Blank (1604156-BLK1)

Prepared & Analyzed: 04/15/16

Naphthalene	ND	0.010	mg/kg							
Benzene	ND	0.0020	"							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
Gasoline Range Hydrocarbons	ND	50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0397		"	0.0400	99.3	23-173				
Surrogate: Toluene-d8	0.0386		"	0.0400	96.4	20-170				
Surrogate: 4-Bromofluorobenzene	0.0410		"	0.0400	102	21-167				

LCS (1604156-BS1)

Prepared & Analyzed: 04/15/16

Naphthalene	ND	0.010	mg/kg				66-138			
Benzene	0.0971	0.0020	"	0.100	97.1	58-130				
Toluene	0.106	0.0050	"	0.100	106	61-134				
Ethylbenzene	0.114	0.0050	"	0.0992	115	74-139				
m,p-Xylene	0.218	0.010	"	0.200	109	73-137				
o-Xylene	0.106	0.0050	"	0.0980	108	73-141				
Surrogate: 1,2-Dichloroethane-d4	0.0382		"	0.0400	95.4	23-173				
Surrogate: Toluene-d8	0.0408		"	0.0400	102	20-170				
Surrogate: 4-Bromofluorobenzene	0.0399		"	0.0400	99.8	21-167				

Matrix Spike (1604156-MS1)

Source: 1604099-04

Prepared & Analyzed: 04/15/16

Naphthalene	ND	0.010	mg/kg		ND		10-158			
Benzene	0.0998	0.0020	"	0.0978	ND	102	30-131			
Toluene	0.108	0.0050	"	0.0978	ND	111	30-134			
Ethylbenzene	0.119	0.0050	"	0.0971	ND	123	22-153			
m,p-Xylene	0.227	0.010	"	0.195	ND	116	10-159			
o-Xylene	0.111	0.0050	"	0.0959	ND	116	31-151			
Surrogate: 1,2-Dichloroethane-d4	0.0403		"	0.0391		103	23-173			
Surrogate: Toluene-d8	0.0390		"	0.0391		99.7	20-170			
Surrogate: 4-Bromofluorobenzene	0.0396		"	0.0391		101	21-167			

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
04/17/16 12:55

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 1604156 - EPA 5030 Soil MS

Matrix Spike Dup (1604156-MSD1)

Source: 1604099-04

Prepared & Analyzed: 04/15/16

Naphthalene	ND	0.010	mg/kg		ND		10-158		42	
Benzene	0.102	0.0020	"	0.0996	ND	103	30-131	2.51	34	
Toluene	0.112	0.0050	"	0.0996	ND	113	30-134	3.60	30	
Ethylbenzene	0.127	0.0050	"	0.0988	ND	128	22-153	6.19	24	
m,p-Xylene	0.242	0.010	"	0.199	ND	122	10-159	6.54	68	
o-Xylene	0.118	0.0050	"	0.0976	ND	120	31-151	5.85	38	
Surrogate: 1,2-Dichloroethane-d4	0.0408		"	0.0398		102	23-173			
Surrogate: Toluene-d8	0.0388		"	0.0398		97.5	20-170			
Surrogate: 4-Bromofluorobenzene	0.0410		"	0.0398		103	21-167			

Batch 1604169 - EPA 5030 Water MS

Blank (1604169-BLK1)

Prepared: 04/15/16 Analyzed: 04/16/16

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	12.6		"	13.3		94.7	37-154			
Surrogate: Toluene-d8	14.0		"	13.3		105	45-149			
Surrogate: 4-Bromofluorobenzene	13.9		"	13.3		104	45-146			

LCS (1604169-BS1)

Prepared: 04/15/16 Analyzed: 04/16/16

Benzene	33.4	1.0	ug/l	33.3		100	51-132			
Toluene	32.6	1.0	"	33.3		97.8	51-138			
Ethylbenzene	35.0	1.0	"	33.1		106	58-146			
m,p-Xylene	72.7	2.0	"	66.5		109	57-144			
o-Xylene	33.2	1.0	"	32.7		102	53-146			
Surrogate: 1,2-Dichloroethane-d4	13.1		"	13.3		98.0	37-154			
Surrogate: Toluene-d8	14.1		"	13.3		106	45-149			
Surrogate: 4-Bromofluorobenzene	14.4		"	13.3		108	45-146			

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
04/17/16 12:55

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 1604169 - EPA 5030 Water MS

Matrix Spike (1604169-MS1)		Source: 1604108-01			Prepared: 04/15/16		Analyzed: 04/16/16			
Benzene	33.6	1.0	ug/l	33.3	ND	101	34-141			
Toluene	32.2	1.0	"	33.3	ND	96.6	27-151			
Ethylbenzene	58.2	1.0	"	33.1	23.2	106	29-160			
m,p-Xylene	301	2.0	"	66.5	237	97.4	20-166			
o-Xylene	55.6	1.0	"	32.7	22.0	103	33-159			
Surrogate: 1,2-Dichloroethane-d4	13.2		"	13.3		98.8	37-154			
Surrogate: Toluene-d8	13.1		"	13.3		98.2	45-149			
Surrogate: 4-Bromofluorobenzene	14.9		"	13.3		112	45-146			
Matrix Spike Dup (1604169-MSD1)		Source: 1604108-01			Prepared: 04/15/16		Analyzed: 04/16/16			
Benzene	33.6	1.0	ug/l	33.3	ND	101	34-141	0.208	32	
Toluene	32.1	1.0	"	33.3	ND	96.4	27-151	0.218	25	
Ethylbenzene	52.4	1.0	"	33.1	23.2	88.2	29-160	10.5	50	
m,p-Xylene	247	2.0	"	66.5	237	15.3	20-166	19.9	36	QM-07
o-Xylene	50.0	1.0	"	32.7	22.0	85.7	33-159	10.6	26	
Surrogate: 1,2-Dichloroethane-d4	16.1		"	13.3		121	37-154			
Surrogate: Toluene-d8	13.6		"	13.3		102	45-149			
Surrogate: 4-Bromofluorobenzene	15.6		"	13.3		117	45-146			

Summit Scientific

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
04/17/16 12:55

Notes and Definitions

QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS/LCSD recovery.

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference

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Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

June 02, 2016

Brandon Bruns
Tasman Geosciences
6899 Pecos Street
Denver, CO 80221
RE: Knaus 28-8

Enclosed are the results of analyses for samples received by Summit Scientific on 05/26/16 15:27. 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', with a stylized, cursive script.

Paul Shrewsbury
President



Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
06/02/16 12:06

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH08@6-7'	1605251-01	Soil	05/26/16 09:05	05/26/16 15:27

Summit Scientific

741 Corporate Circle Suite 1 ♦ Golden, Colorado 80401
303-277-9310 ♦ 303-374-5933 Fax

Page 1 of 1

Client: Noble/Tasman

Address:

City/State/Zip:

Phone:

Fax:

Sampler Name: Eric Siegel

Project Manager: Brandon Bruns, Invoice: Jacob Evans

E-Mail:

Project Name: Knaus 28-8

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)	8280 BTEX	8280B GBTEXN	8015 DRO		pH, EC, SAR			
BH08@6-7'	5/26/16	905	1			X			X				X	X					
Relinquished by: <u>S. A. Ayl</u>				Date/Time: <u>5/26/16</u>		Received by: <u>[Signature]</u>				Date/Time: <u>5-26-16 15:27</u>		Turn Around Time (Check)				Notes:			
Relinquished by: <u>[Signature]</u>				Date/Time: <u>5-26-16 17:40</u>		Received by:				Date/Time:		Same Day <input type="checkbox"/> 72 Hours <input checked="" type="checkbox"/>							
												24 Hours <input type="checkbox"/> Standard <input type="checkbox"/>							
												48 Hours <input type="checkbox"/>							
Relinquished by:				Date/Time:		Received in Lab by:				Date/Time:		Sample Integrity:							
												Temperature Upon Receipt: <u>5.7</u>							
												Intact: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>							

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Summit Scientific

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
06/02/16 12:06

BH08@6-7'
1605251-01 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: 05/26/16 09:05

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1605302	05/31/16	05/31/16	8015M	

Date Sampled: 05/26/16 09:05

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		110 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: 05/26/16 09:05

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1605308	05/31/16	05/31/16	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: 05/26/16 09:05

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		118 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.6 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		104 %	21-167		"	"	"	"	

Summit Scientific

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
06/02/16 12:06

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

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

Batch 1605302 - EPA 3550A

Blank (1605302-BLK1)

Prepared & Analyzed: 05/31/16

C10-C28 (DRO)	ND	50	mg/kg							
Surrogate: o-Terphenyl	13.8		"	12.5		111	30-150			

LCS (1605302-BS1)

Prepared & Analyzed: 05/31/16

C10-C28 (DRO)	582	50	mg/kg	499		117	73-134			
Surrogate: o-Terphenyl	13.5		"	12.5		108	30-150			

Matrix Spike (1605302-MS1)

Source: 1605251-01

Prepared & Analyzed: 05/31/16

C10-C28 (DRO)	580	50	mg/kg	454	ND	128	50-148			
Surrogate: o-Terphenyl	13.0		"	11.4		114	30-150			

Matrix Spike Dup (1605302-MSD1)

Source: 1605251-01

Prepared & Analyzed: 05/31/16

C10-C28 (DRO)	531	50	mg/kg	453	ND	117	50-148	8.75	13	
Surrogate: o-Terphenyl	12.8		"	11.3		113	30-150			

Summit Scientific

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
06/02/16 12:06

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 1605308 - EPA 5030 Soil MS

Blank (1605308-BLK1)

Prepared & Analyzed: 05/31/16

Naphthalene	ND	0.010	mg/kg							
Benzene	ND	0.0020	"							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
Gasoline Range Hydrocarbons	ND	50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0420		"	0.0400		105	23-173			
Surrogate: Toluene-d8	0.0387		"	0.0400		96.7	20-170			
Surrogate: 4-Bromofluorobenzene	0.0425		"	0.0400		106	21-167			

LCS (1605308-BS1)

Prepared & Analyzed: 05/31/16

Naphthalene	ND	0.010	mg/kg				66-138			
Benzene	0.0907	0.0020	"	0.100		90.7	58-130			
Toluene	0.0943	0.0050	"	0.100		94.3	61-134			
Ethylbenzene	0.0860	0.0050	"	0.0992		86.6	74-139			
m,p-Xylene	0.162	0.010	"	0.200		81.3	73-137			
o-Xylene	0.0780	0.0050	"	0.0980		79.6	73-141			
Surrogate: 1,2-Dichloroethane-d4	0.0363		"	0.0400		90.8	23-173			
Surrogate: Toluene-d8	0.0497		"	0.0400		124	20-170			
Surrogate: 4-Bromofluorobenzene	0.0418		"	0.0400		104	21-167			

Matrix Spike (1605308-MS1)

Source: 1605252-01

Prepared & Analyzed: 05/31/16

Naphthalene	ND	0.010	mg/kg		ND		10-158			
Benzene	0.108	0.0020	"	0.100	ND	108	30-131			
Toluene	0.116	0.0050	"	0.100	ND	116	30-134			
Ethylbenzene	0.112	0.0050	"	0.0992	ND	113	22-153			
m,p-Xylene	0.214	0.010	"	0.200	ND	107	10-159			
o-Xylene	0.103	0.0050	"	0.0980	ND	105	31-151			
Surrogate: 1,2-Dichloroethane-d4	0.0415		"	0.0400		104	23-173			
Surrogate: Toluene-d8	0.0472		"	0.0400		118	20-170			
Surrogate: 4-Bromofluorobenzene	0.0417		"	0.0400		104	21-167			

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
06/02/16 12:06

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 1605308 - EPA 5030 Soil MS

Matrix Spike Dup (1605308-MSD1)		Source: 1605252-01			Prepared & Analyzed: 05/31/16					
Naphthalene	ND	0.010	mg/kg		ND		10-158		42	
Benzene	0.120	0.0020	"	0.100	ND	120	30-131	10.3	34	
Toluene	0.127	0.0050	"	0.100	ND	127	30-134	9.16	30	
Ethylbenzene	0.138	0.0050	"	0.0992	ND	139	22-153	21.1	24	
m,p-Xylene	0.262	0.010	"	0.200	ND	131	10-159	20.2	68	
o-Xylene	0.126	0.0050	"	0.0980	ND	129	31-151	20.3	38	
Surrogate: 1,2-Dichloroethane-d4	0.0449		"	0.0400		112	23-173			
Surrogate: Toluene-d8	0.0426		"	0.0400		106	20-170			
Surrogate: 4-Bromofluorobenzene	0.0407		"	0.0400		102	21-167			

Summit Scientific

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
06/02/16 12:06

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

Summit Scientific

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A handwritten signature in black ink, appearing to be 'MSM'.

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

June 27, 2016

Brandon Bruns
Tasman Geosciences
6899 Pecos Street
Denver, CO 80221
RE: Knaus 28-8

Enclosed are the results of analyses for samples received by Summit Scientific on 06/21/16 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', with a stylized, cursive script.

Paul Shrewsbury
President



Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
06/27/16 10:12

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH01	1606229-01	Water	06/21/16 11:45	06/21/16 17:30
BH02	1606229-02	Water	06/21/16 12:00	06/21/16 17:30
BH06	1606229-03	Water	06/21/16 12:15	06/21/16 17:30
BH07	1606229-04	Water	06/21/16 12:30	06/21/16 17:30
BH08	1606229-05	Water	06/21/16 12:45	06/21/16 17:30

Summit Scientific

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
06/27/16 10:12

Summit Scientific

1606229


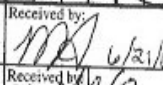
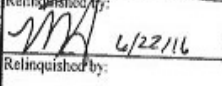
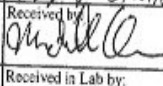
741 Corporate Circle Suite I • Golden, Colorado 80401
303-277-9310 • 303-374-5933 Fax

Client: Noble/Tasman
Address: —
City/State/Zip: —
Phone: 720-616-4383 Fax: —
Sampler Name: SW, RT

Page 1 of 1

Project Manager: Brandon Bruns, Invoice: Jacob Evans
E-Mail: bbruns@tasman-geo.com, jacob.evans@tasman-geo.com
Project Name: Knaus 28-8
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	9015 DRO	
BH01	06/21/16	1145	3			X		X				X			
BH02	06/21/16	1200	3			X		X				X			
BH06	06/21/16	1215	3			X		X				X			
BH07	06/21/16	1230	3			X		X				X			
BH08	06/21/16	1245	3			X		X				X			

Relinquished by: 	Date/Time: 06/21/16 1730	Received by: 	Date/Time: 6/21/16 1720	Turn Around Time (Check)	Notes: Price
Relinquished by: 	Date/Time: 6/22/16 9:20	Received by: 	Date/Time: 6/22/16 9:20	Same Day <input type="checkbox"/>	
Relinquished by:	Date/Time:	Received in Lab by:	Date/Time:	24 Hours <input type="checkbox"/>	

Sample Integrity:	6.5c
Temperature Upon Receipt:	
Intact: Yes <input type="checkbox"/> No <input type="checkbox"/>	

Summit Scientific

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
06/27/16 10:12

Sample Receipt Checklist

S2 Work Order: 1606229

Client: Noble/Tasman

Client Project ID: Knaus 28-8

Shipped Via: PLU

(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Airbill #: _____

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

Cooler ID					
Temp (°C)	<u>6.5</u>				

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature just above 0°C to ≤ 6°C ⁽¹⁾ ?			<input checked="" type="checkbox"/>	
NOTE: If samples are delivered the same day of sampling, this requirement is waived 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 short holding time analytes or samples with HTs 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.				

Nakita
Custodian Printed Name

[Signature]
Signature or Initials of Custodian

6/22/16 9:20
Date/Time

[Signature]



Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
06/27/16 10:12

BH01
1606229-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/21/16 11:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1606236	06/24/16	06/24/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **06/21/16 11:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		80.9 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		95.6 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		89.2 %	45-146		"	"	"	"	

Summit Scientific

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
06/27/16 10:12

BH02
1606229-02 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/21/16 12:00**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	7300	100	ug/l	100	1606236	06/24/16	06/24/16	EPA 8260B	
Toluene	1500	100	"	"	"	"	"	"	
Ethylbenzene	97	1.0	"	1	"	"	"	"	
Xylenes (total)	2300	100	"	100	"	"	"	"	

Date Sampled: **06/21/16 12:00**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
<i>Surrogate: 1,2-Dichloroethane-d4</i>		81.2 %	37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		97.2 %	45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		93.2 %	45-146		"	"	"	"	

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
06/27/16 10:12

BH06
1606229-03 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/21/16 12:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1606236	06/24/16	06/24/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **06/21/16 12:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		82.6 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		97.9 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		90.8 %	45-146		"	"	"	"	

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
06/27/16 10:12

BH07
1606229-04 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/21/16 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1606236	06/24/16	06/24/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **06/21/16 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		81.6 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		95.6 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		90.7 %	45-146		"	"	"	"	

Summit Scientific

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
06/27/16 10:12

BH08
1606229-05 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/21/16 12:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1606236	06/24/16	06/24/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **06/21/16 12:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		81.6 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		96.9 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		90.2 %	45-146		"	"	"	"	

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
06/27/16 10:12

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 1606236 - EPA 5030 Water MS

Blank (1606236-BLK1)

Prepared & Analyzed: 06/23/16

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	10.5		"	13.3		78.6	37-154			
Surrogate: Toluene-d8	12.9		"	13.3		96.5	45-149			
Surrogate: 4-Bromofluorobenzene	12.1		"	13.3		91.0	45-146			

LCS (1606236-BS1)

Prepared & Analyzed: 06/23/16

Benzene	31.1	1.0	ug/l	33.3		93.4	51-132			
Toluene	35.9	1.0	"	33.3		108	51-138			
Ethylbenzene	37.4	1.0	"	33.1		113	58-146			
m,p-Xylene	79.0	2.0	"	66.5		119	57-144			
o-Xylene	36.1	1.0	"	32.7		110	53-146			
Surrogate: 1,2-Dichloroethane-d4	11.3		"	13.3		84.6	37-154			
Surrogate: Toluene-d8	12.9		"	13.3		96.9	45-149			
Surrogate: 4-Bromofluorobenzene	12.3		"	13.3		92.0	45-146			

Matrix Spike (1606236-MS1)

Source: 1606245-02

Prepared & Analyzed: 06/23/16

Benzene	32.0	1.0	ug/l	33.3	ND	96.1	34-141			
Toluene	36.6	1.0	"	33.3	3.24	100	27-151			
Ethylbenzene	38.1	1.0	"	33.1	ND	115	29-160			
m,p-Xylene	80.0	2.0	"	66.5	6.60	110	20-166			
o-Xylene	36.8	1.0	"	32.7	3.42	102	33-159			
Surrogate: 1,2-Dichloroethane-d4	11.1		"	13.3		83.1	37-154			
Surrogate: Toluene-d8	12.9		"	13.3		96.5	45-149			
Surrogate: 4-Bromofluorobenzene	12.1		"	13.3		90.5	45-146			

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
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
06/27/16 10:12

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 1606236 - EPA 5030 Water MS

Matrix Spike Dup (1606236-MSD1)	Source: 1606245-02			Prepared & Analyzed: 06/24/16						
Benzene	31.8	1.0	ug/l	33.3	ND	95.4	34-141	0.689	32	
Toluene	35.5	1.0	"	33.3	3.24	96.8	27-151	3.05	25	
Ethylbenzene	37.3	1.0	"	33.1	ND	113	29-160	2.07	50	
m,p-Xylene	78.5	2.0	"	66.5	6.60	108	20-166	1.97	36	
o-Xylene	35.8	1.0	"	32.7	3.42	99.2	33-159	2.56	26	
Surrogate: 1,2-Dichloroethane-d4	12.4		"	13.3		93.2	37-154			
Surrogate: Toluene-d8	12.7		"	13.3		95.5	45-149			
Surrogate: 4-Bromofluorobenzene	12.2		"	13.3		91.3	45-146			

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
6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
06/27/16 10:12

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

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.

A handwritten signature in black ink, appearing to be 'MSM'.



6899 Pecos Street, Unit C
Denver, Colorado 80221

CLIENT: Noble Energy, Inc.

LOGGED BY: Jake Whritenour

PROJECT MANAGER: Brandon Bruns, P.E.

DRILLING CONTRACTOR: Site Services Drilling

DRILLING EQUIPMENT: Geoprobe

DRILL BIT SIZE (INCHES): 2.375

DATE STARTED - COMPLETED: 4/15/16

TOTAL BORING DEPTH (FT. BGS): 15

DEPTH TO WATER (FT. BGS): 11.1

Knaus 28-8

BORING / WELL ID: BH01

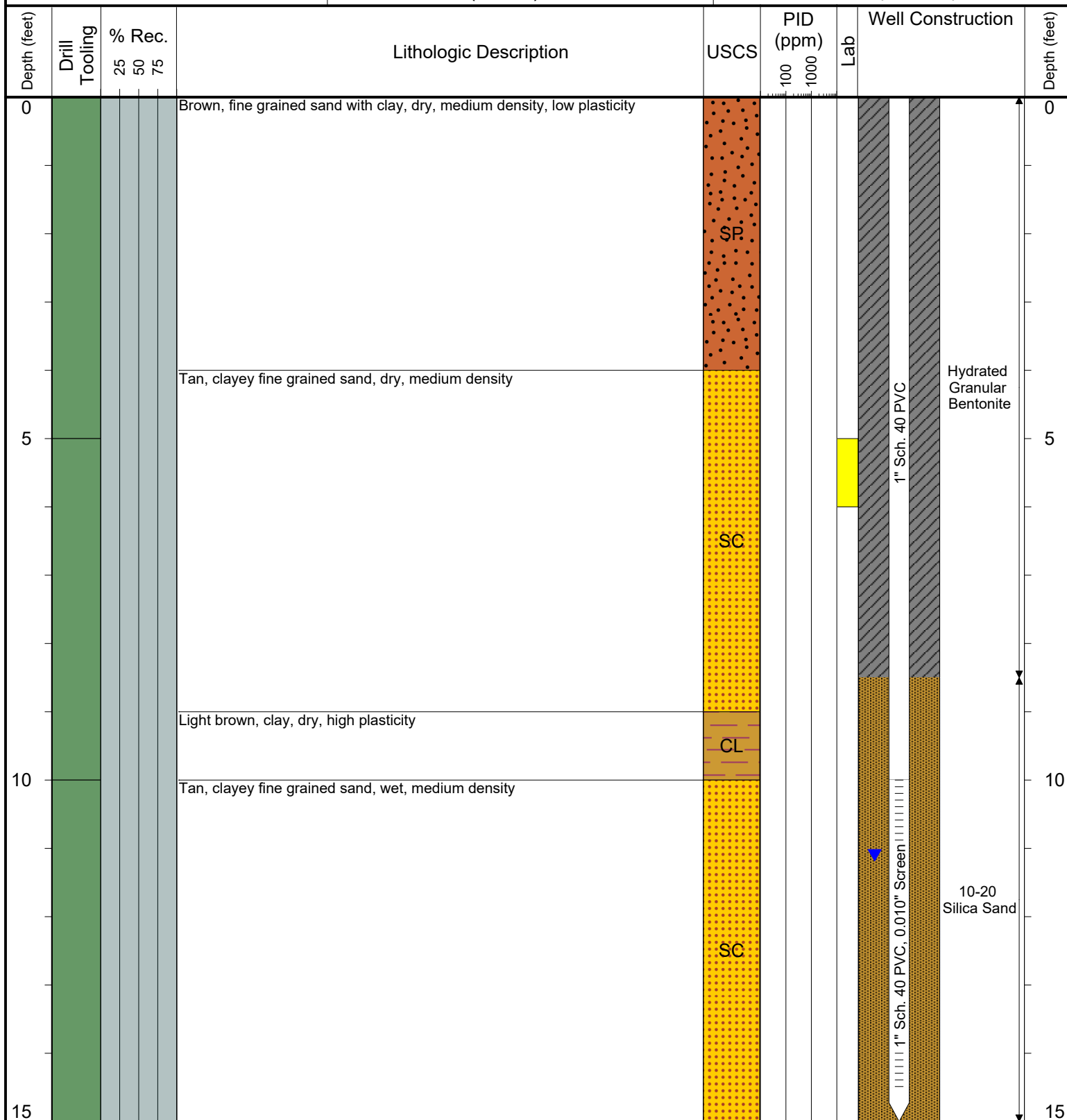
LOCATION: Weld County, CO

LATITUDE (DEGREES): 40.461734230184

LONGITUDE (DEGREES): -104.77506443425

CASING ELEVATION (FT. AMSL): 4660.12

GROUND ELEVATION (FT. AMSL): 4657.59



Drilling / Sample Method:

Macro-Core
 CME Continuous Core

Split Spoon
 Hollow Stem Auger

Laboratory Sample Types:

Geotechnical Lab
 Analytical Chemistry Lab
 Geotechnical & Analytical Chemistry Lab



6899 Pecos Street, Unit C
Denver, Colorado 80221

CLIENT: Noble Energy, Inc.

LOGGED BY: Jake Whritenour

PROJECT MANAGER: Brandon Bruns, P.E.

DRILLING CONTRACTOR: Site Services Drilling

DRILLING EQUIPMENT: Geoprobe

DRILL BIT SIZE (INCHES): 2.375

DATE STARTED - COMPLETED: 4/15/16

TOTAL BORING DEPTH (FT. BGS): 15

DEPTH TO WATER (FT. BGS): 11.17

Knaus 28-8

BORING / WELL ID: BH02

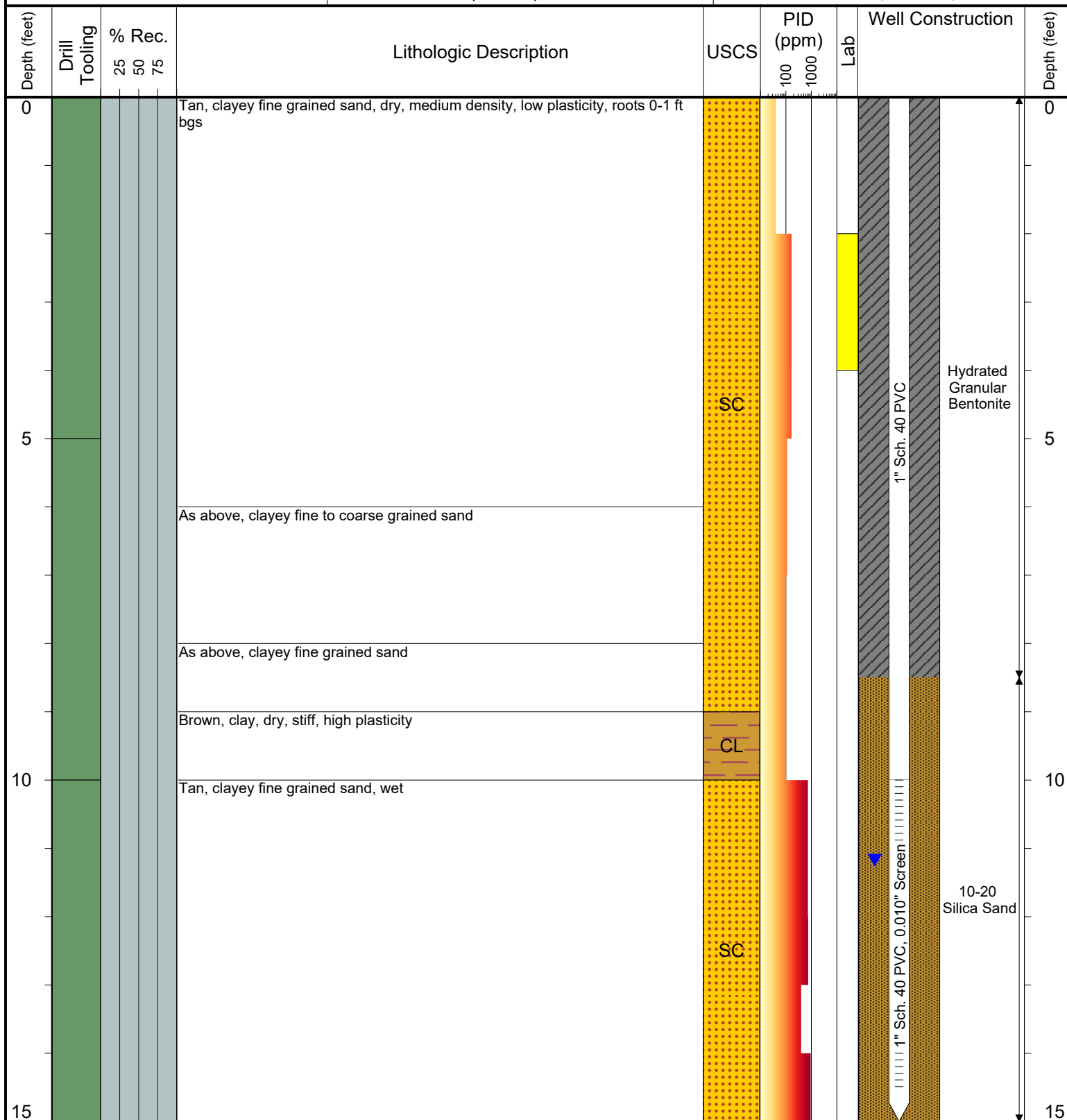
LOCATION: Weld County, CO

LATITUDE (DEGREES): 40.461773673727

LONGITUDE (DEGREES): -104.77518326851

CASING ELEVATION (FT. AMSL): 4660.56

GROUND ELEVATION (FT. AMSL): 4657.74



Drilling / Sample Method:

Macro-Core
CME Continuous Core

Split Spoon
Hollow Stem Auger

Laboratory Sample Types:

Geotechnical Lab
Analytical Chemistry Lab
Geotechnical & Analytical Chemistry Lab



6899 Pecos Street, Unit C
Denver, Colorado 80221

CLIENT: Noble Energy, Inc.

LOGGED BY: Jake Whritenour

PROJECT MANAGER: Brandon Bruns, P.E.

DRILLING CONTRACTOR: Site Services Drilling

DRILLING EQUIPMENT: Geoprobe

DRILL BIT SIZE (INCHES): 2.375

DATE STARTED - COMPLETED: 4/15/16

TOTAL BORING DEPTH (FT. BGS): 15

DEPTH TO WATER (FT. BGS): 13.54

Knaus 28-8

BORING / WELL ID: BH03

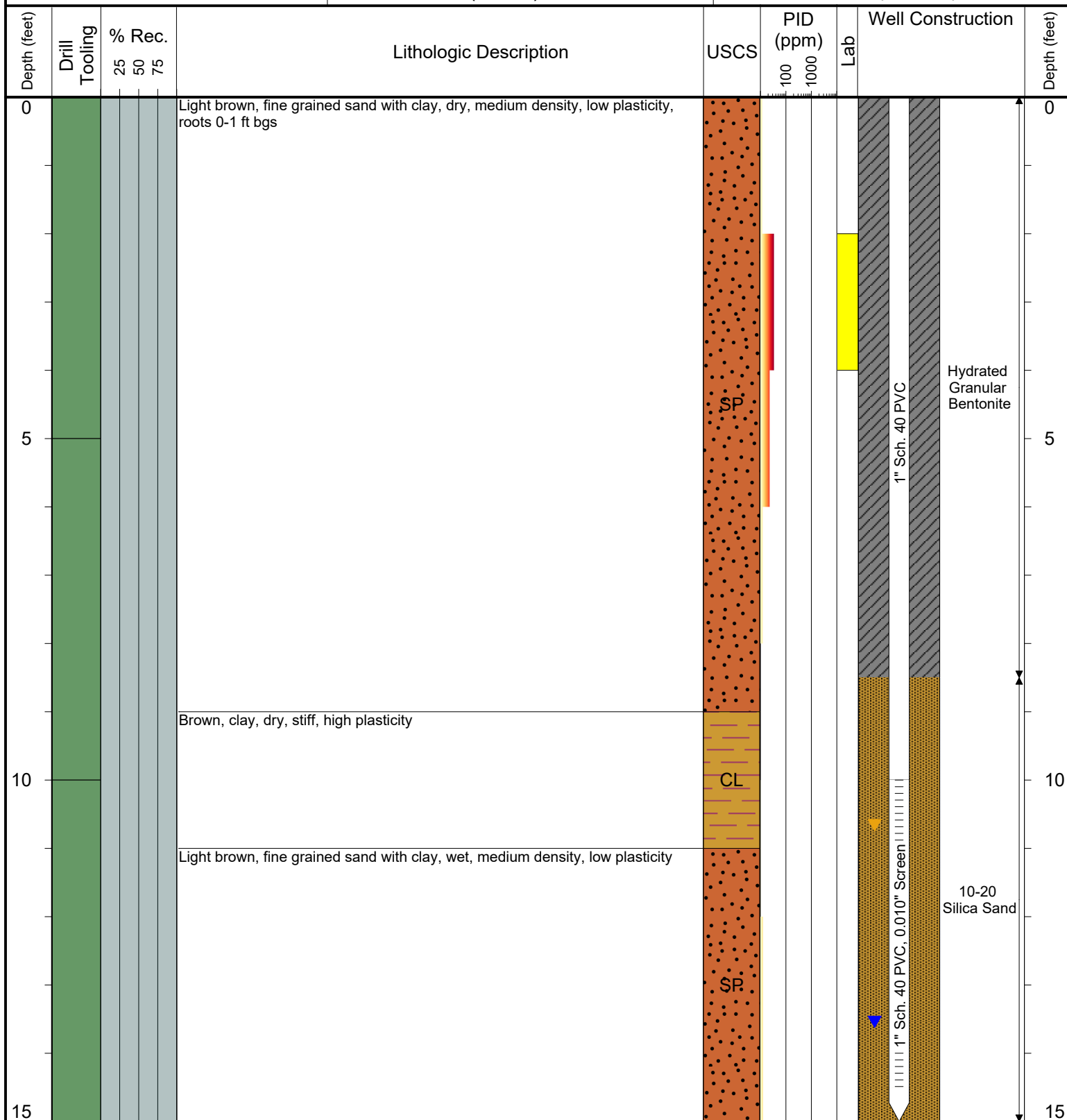
LOCATION: Weld County, CO

LATITUDE (DEGREES): 40.461813738253

LONGITUDE (DEGREES): -104.77518803808

CASING ELEVATION (FT. AMSL): 4660.75

GROUND ELEVATION (FT. AMSL): 4657.87





6899 Pecos Street, Unit C
Denver, Colorado 80221

CLIENT: Noble Energy, Inc.

LOGGED BY: Jake Whritenour

PROJECT MANAGER: Brandon Bruns, P.E.

DRILLING CONTRACTOR: Site Services Drilling

DRILLING EQUIPMENT: Geoprobe

DRILL BIT SIZE (INCHES): 2.375

DATE STARTED - COMPLETED: 4/15/16

TOTAL BORING DEPTH (FT. BGS): 15

DEPTH TO WATER (FT. BGS): 12.41

Knaus 28-8

BORING / WELL ID: BH04

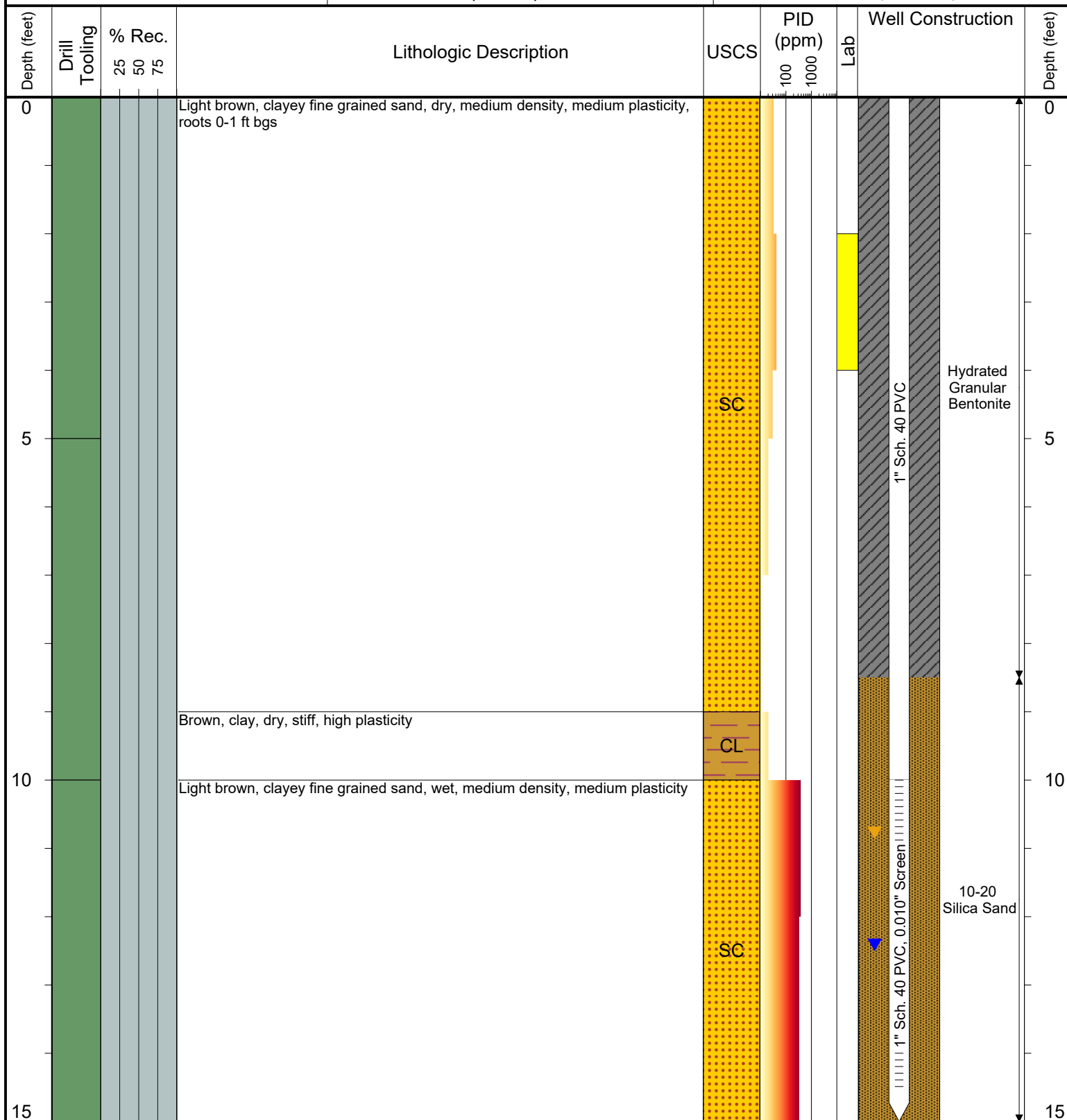
LOCATION: Weld County, CO

LATITUDE (DEGREES): 40.461675009572

LONGITUDE (DEGREES): -104.77517180375

CASING ELEVATION (FT. AMSL): 4659.97

GROUND ELEVATION (FT. AMSL): 4657.62



Drilling / Sample Method:

Macro-Core
CME Continuous Core

Split Spoon
Hollow Stem Auger

Laboratory Sample Types:

Geotechnical Lab
Analytical Chemistry Lab
Geotechnical & Analytical Chemistry Lab



6899 Pecos Street, Unit C
Denver, Colorado 80221

CLIENT: Noble Energy, Inc.

LOGGED BY: Jake Whritenour

PROJECT MANAGER: Brandon Bruns, P.E.

DRILLING CONTRACTOR: Site Services Drilling

DRILLING EQUIPMENT: Geoprobe

DRILL BIT SIZE (INCHES): 2.375

DATE STARTED - COMPLETED: 4/15/16

TOTAL BORING DEPTH (FT. BGS): 15

DEPTH TO WATER (FT. BGS): 11.43

Knaus 28-8

BORING / WELL ID: BH05

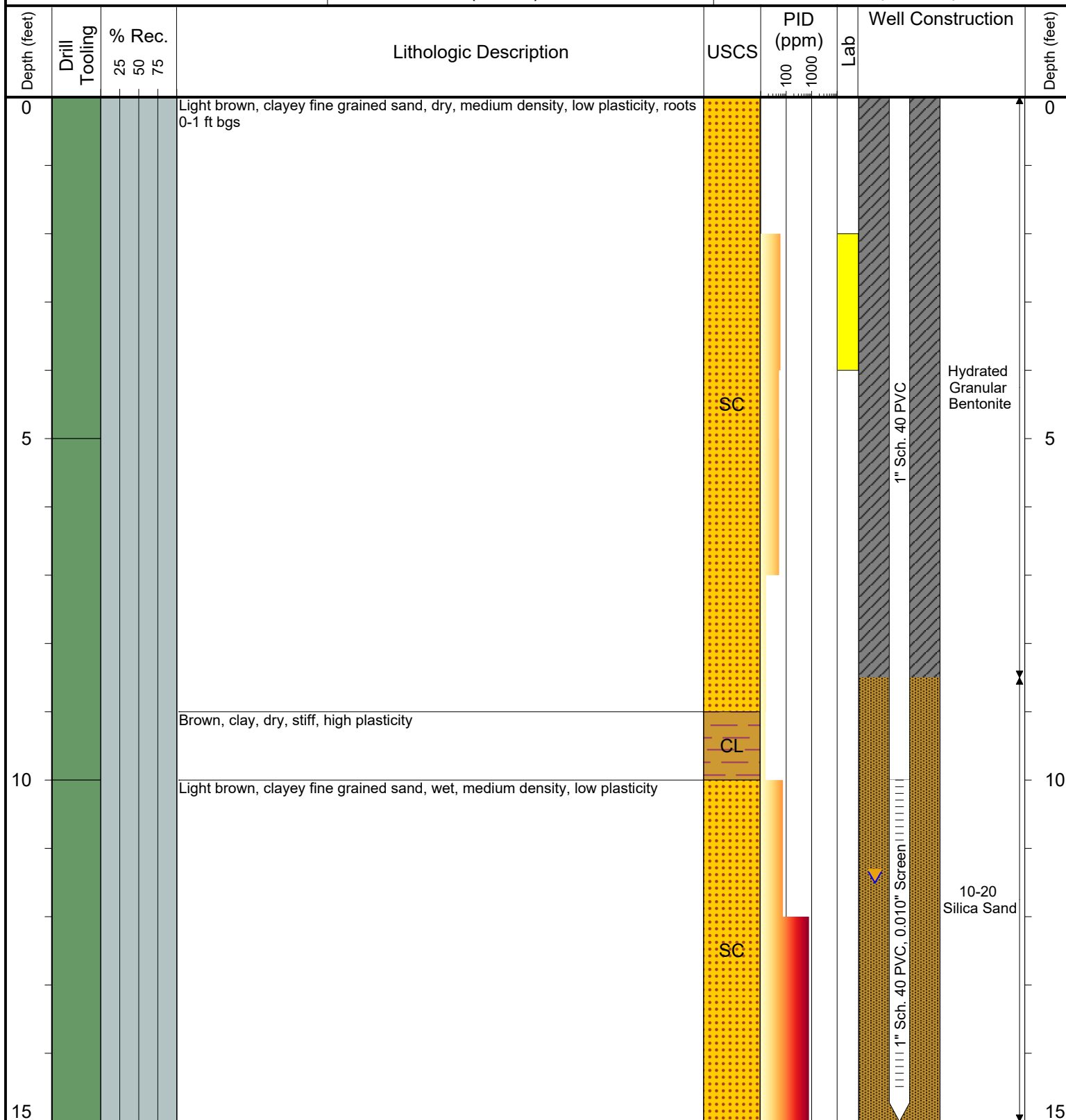
LOCATION: Weld County, CO

LATITUDE (DEGREES): 40.461730664917

LONGITUDE (DEGREES): -104.77527293341

CASING ELEVATION (FT. AMSL): 4661.14

GROUND ELEVATION (FT. AMSL): 4657.97



Drilling / Sample Method:

Macro-Core
CME Continuous Core

Split Spoon
Hollow Stem Auger

Laboratory Sample Types:

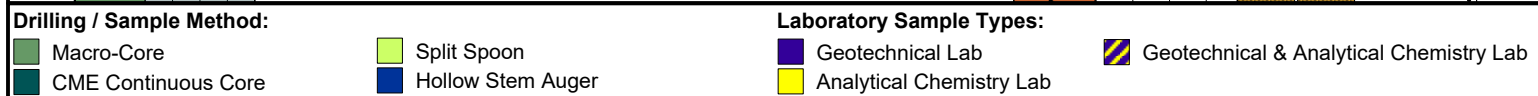
Geotechnical Lab
Analytical Chemistry Lab
Geotechnical & Analytical Chemistry Lab



DEPTH TO WATER (FT. BGS): 11.44

BORING / WELL ID: BH06

GROUND ELEVATION (FT. AMSL): 4658.05





6899 Pecos Street, Unit C
Denver, Colorado 80221

CLIENT: Noble Energy, Inc.

LOGGED BY: Jake Whritenour

PROJECT MANAGER: Brandon Bruns, P.E.

DRILLING CONTRACTOR: Site Services Drilling

DRILLING EQUIPMENT: Geoprobe

DRILL BIT SIZE (INCHES): 2.375

DATE STARTED - COMPLETED: 4/15/16

TOTAL BORING DEPTH (FT. BGS): 15

DEPTH TO WATER (FT. BGS): 11.14

Knaus 28-8

BORING / WELL ID: BH07

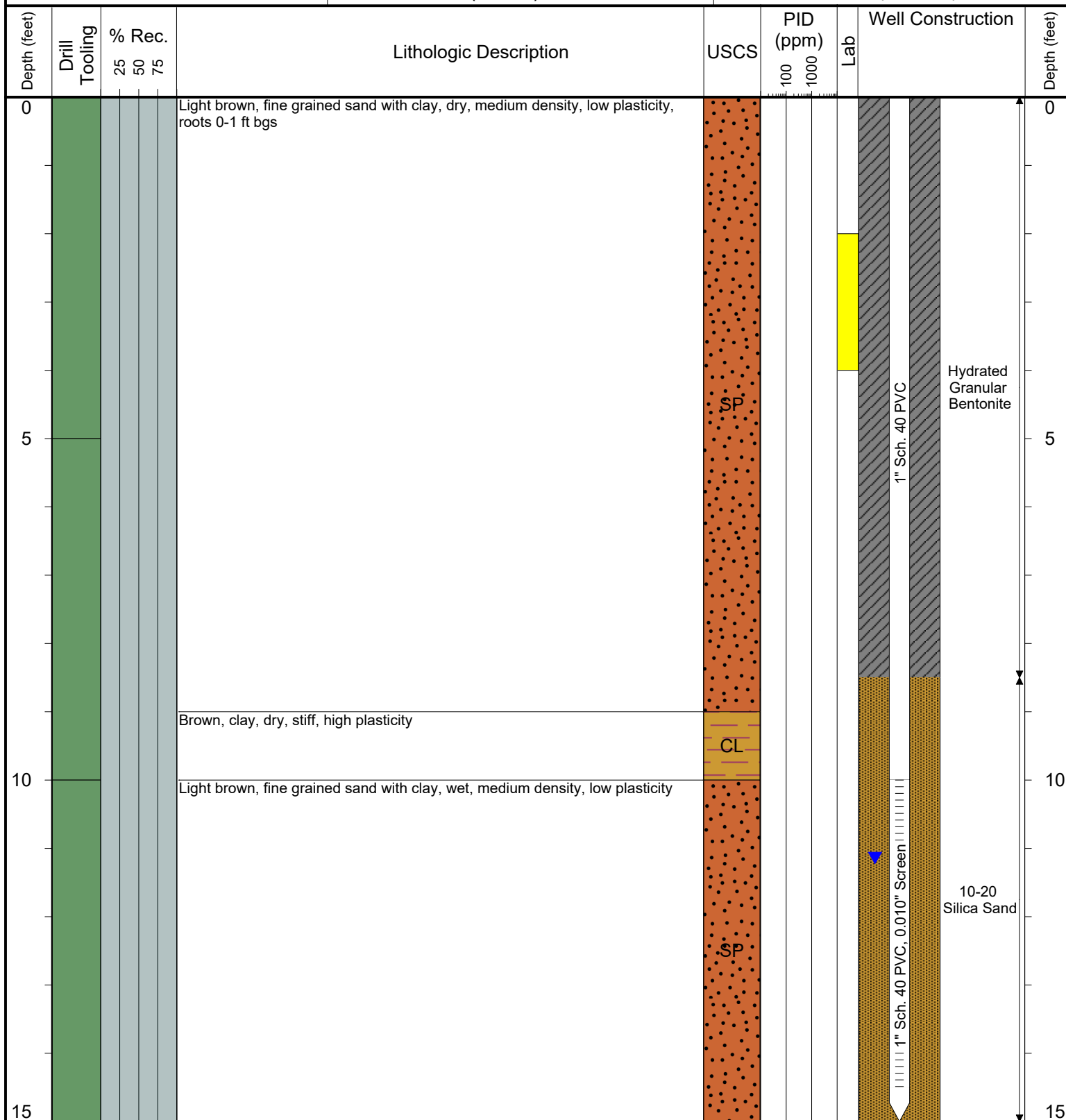
LOCATION: Weld County, CO

LATITUDE (DEGREES): 40.461620170455

LONGITUDE (DEGREES): -104.77516091178

CASING ELEVATION (FT. AMSL): 4660.84

GROUND ELEVATION (FT. AMSL): 4657.6



Drilling / Sample Method:

Macro-Core
CME Continuous Core

Split Spoon
Hollow Stem Auger

Laboratory Sample Types:

Geotechnical Lab
Analytical Chemistry Lab
Geotechnical & Analytical Chemistry Lab



6899 Pecos Street, Unit C
Denver, Colorado 80221

CLIENT: Noble Energy, Inc.

LOGGED BY: Eric Siegel, P.G.

PROJECT MANAGER: Brandon Bruns, P.E.

DRILLING CONTRACTOR: Site Services Drilling

DRILLING EQUIPMENT: Geoprobe

DRILL BIT SIZE (INCHES): 2.375

DATE STARTED - COMPLETED: 5/26/16

TOTAL BORING DEPTH (FT. BGS): 20

DEPTH TO WATER (FT. BGS): 11.3

Knaus 28-8

BORING / WELL ID: BH08

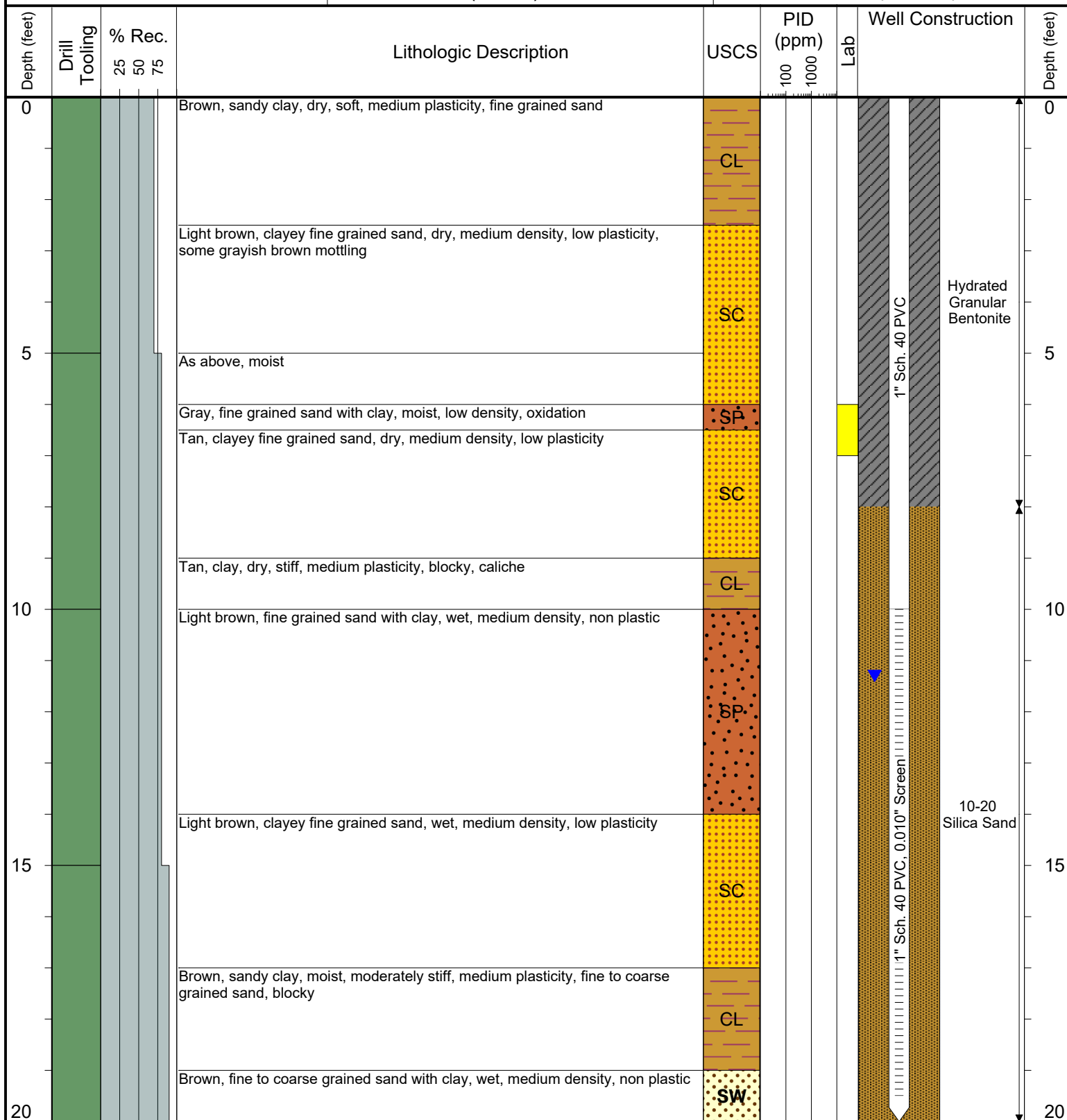
LOCATION: Weld County, CO

LATITUDE (DEGREES): 40.461868955763

LONGITUDE (DEGREES): -104.77519004811

CASING ELEVATION (FT. AMSL): 4661.26

GROUND ELEVATION (FT. AMSL): 4657.94



Drilling / Sample Method:

Macro-Core

CME Continuous Core

Split Spoon

Hollow Stem Auger

Laboratory Sample Types:

Geotechnical Lab

Analytical Chemistry Lab

Geotechnical & Analytical Chemistry Lab