

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 Inspection Complaint 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: _____	Contact Name and Telephone: _____
Name of Operator: _____	_____
Address: _____	No: _____
City: _____ State: _____ Zip: _____	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: _____

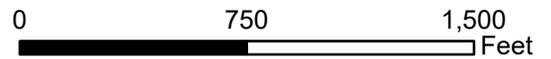
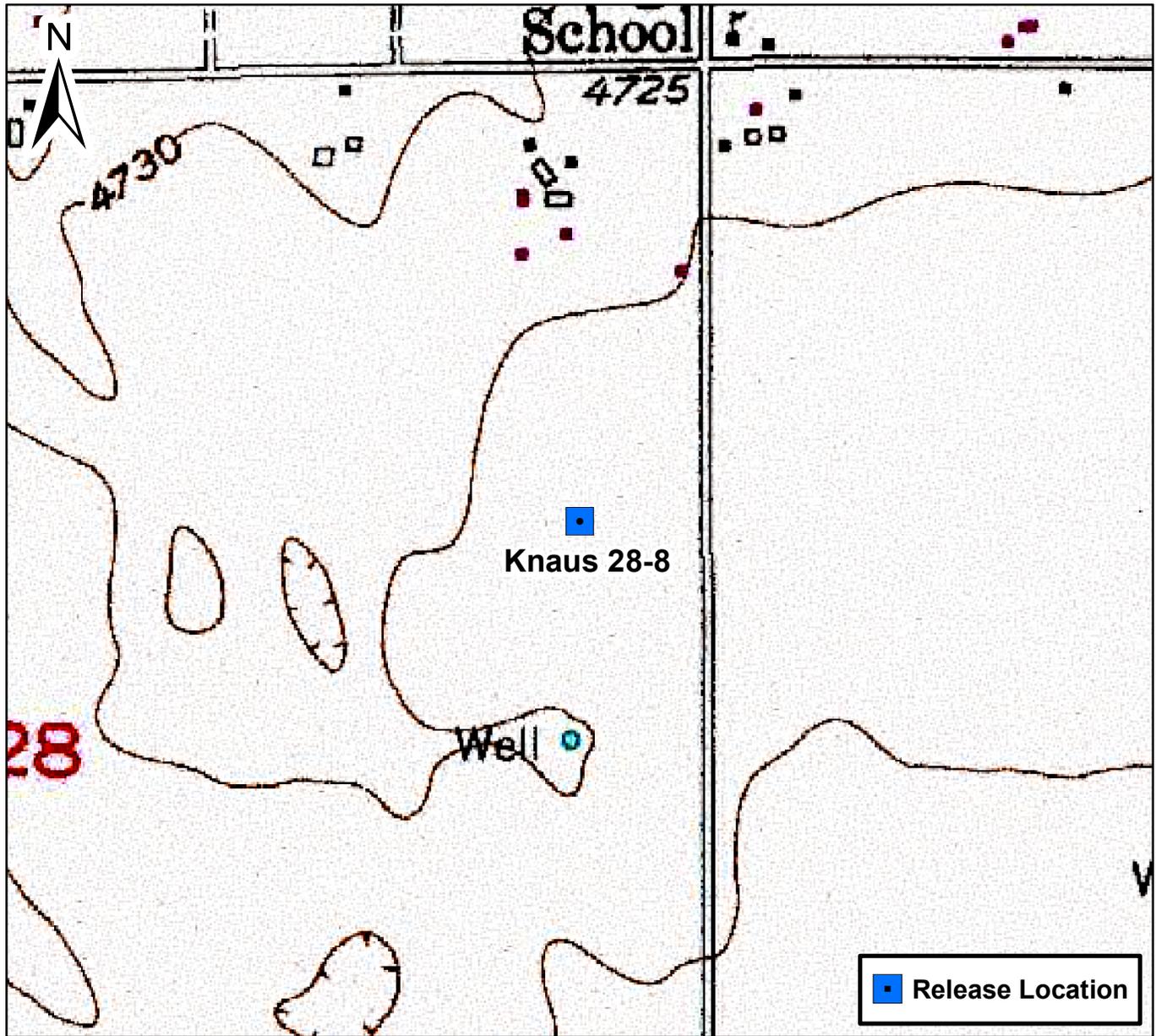
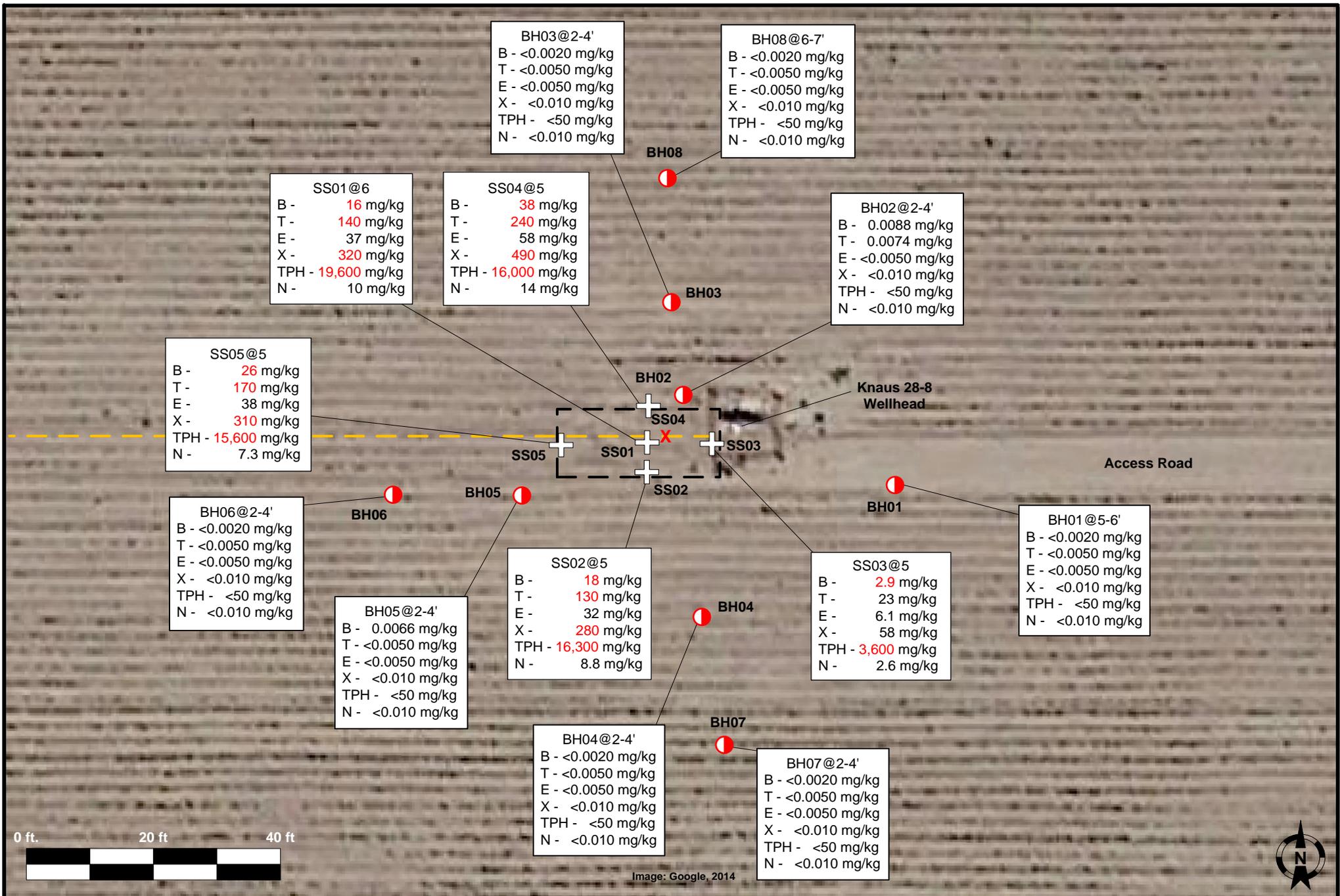


Figure 1

Site Location Map
 Knaus 28-8
 SENE S28 T6N R66W
 Weld County, Colorado





PROJECT NO:
DRAWN BY: ESS
DATE: 07/19/16

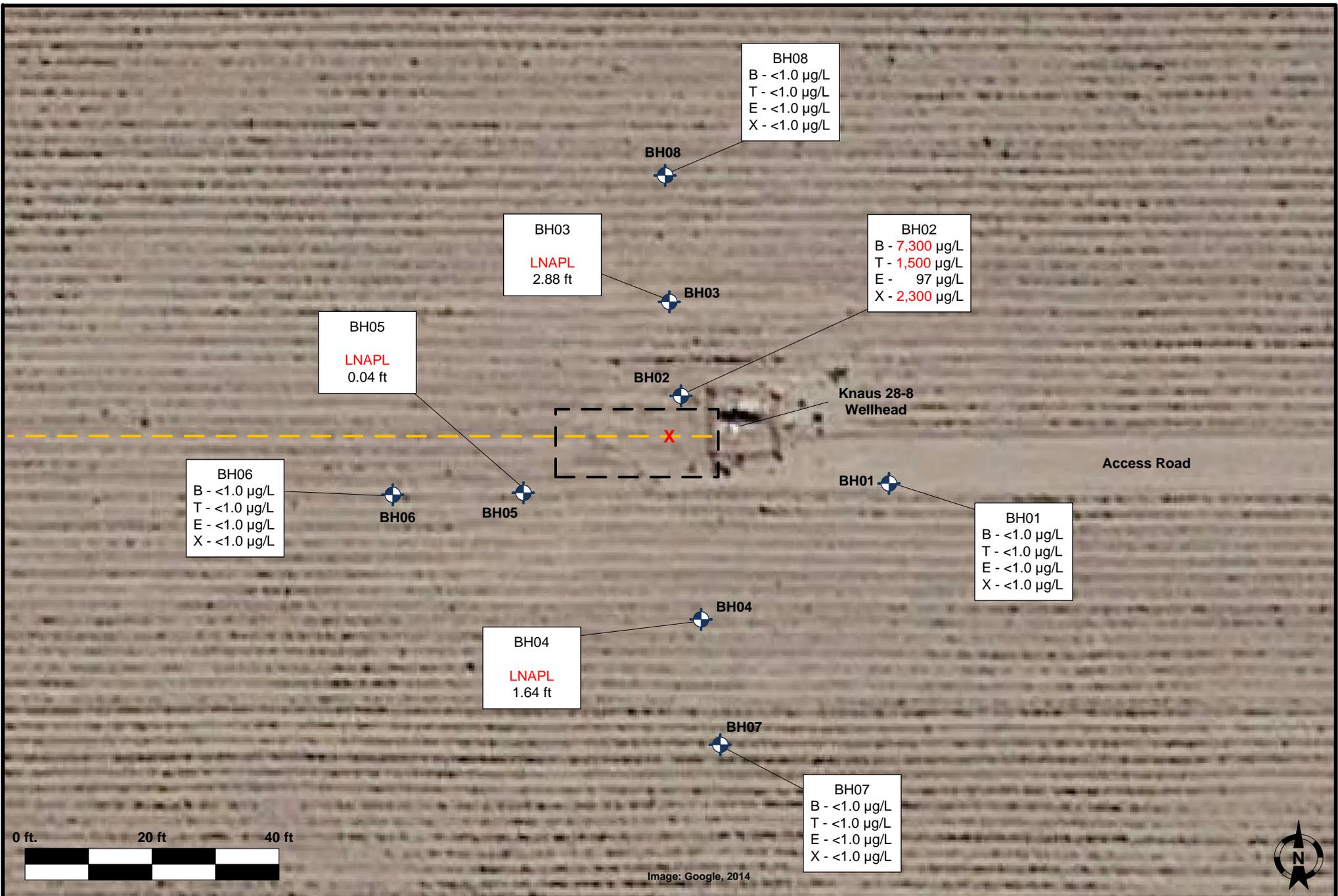


Facility Diagram
Knaus 28-8
Weld County, CO

LEGEND:	
	Borehole Soil Sample
	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
 µg/L 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', written in a cursive style.

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 Margvart

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)	8260 BTEX	8260B GBTEXN	8015 DRO		pH, EC, SAR	
SS0106	4/11/16	1425	1			X							X	X			
SS0205	4/11/16	1428	1			X							X	X			
SS0305	4/11/16	1431	1			X							X	X			
SS0405	4/11/16	1434	1			X							X	X			
SS0505	4/11/16	1437	1			X							X	X			
Relinquished by: Date/Time: 4/11/16 1700				Received by: Date/Time: 4/11/16 1700				Turn Around Time (Check)				Notes:					
Relinquished by: Date/Time: 4/11/16 1730				Received by: Date/Time: 4-11-16 1930				Sample Integrity: Temperature Upon Receipt: 56°C				Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No					

www.szscientific.com

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:
04/12/16 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: <i>o</i> -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 Bruns

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 Bruns

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
Surrogate: <i>o</i> -Terphenyl		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
Surrogate: 1,2-Dichloroethane-d4		99.4 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		148 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		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 Brunns

Reported:
04/12/16 06:48

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

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

Batch 1604113 - EPA 3550A

Blank (1604113-BLK1)

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

C10-C28 (DRO)	ND	50	mg/kg							
<i>Surrogate: o-Terphenyl</i>	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			
<i>Surrogate: o-Terphenyl</i>	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			
<i>Surrogate: o-Terphenyl</i>	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	
<i>Surrogate: o-Terphenyl</i>	12.5		"	12.1		104	30-150			

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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:
04/12/16 06:48

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

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

Batch 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	"							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0386</i>		<i>"</i>	<i>0.0400</i>		<i>96.5</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0421</i>		<i>"</i>	<i>0.0400</i>		<i>105</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0438</i>		<i>"</i>	<i>0.0400</i>		<i>109</i>	<i>21-167</i>			

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			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0374</i>		<i>"</i>	<i>0.0400</i>		<i>93.4</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0422</i>		<i>"</i>	<i>0.0400</i>		<i>106</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0421</i>		<i>"</i>	<i>0.0400</i>		<i>105</i>	<i>21-167</i>			

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			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0401</i>		<i>"</i>	<i>0.0385</i>		<i>104</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0402</i>		<i>"</i>	<i>0.0385</i>		<i>104</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0442</i>		<i>"</i>	<i>0.0385</i>		<i>115</i>	<i>21-167</i>			

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:
04/12/16 06:48

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

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

Batch 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. Whiskow
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								
BH02	4/15/16	1330	2	X				X								
BH04	4/15/16	1332	3	X				X								
BH06	4/15/16	1335	3	X				X								
BH07	4/15/16	1325	3	X				X								
BH01@ 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:								
				Same Day <input checked="" type="checkbox"/> 72 Hours <input type="checkbox"/>				On Ice								
				24 Hours <input type="checkbox"/> Standard <input type="checkbox"/>												
				48 Hours <input type="checkbox"/>												
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>	Sample Integrity:												
				Temperature Upon Receipt: <u>38°C</u>												
				Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No												

www.s2scientific.com



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: <u>Noble/Tasman</u>	Project Manager: <u>Brandon Bruns, Invoice: Jacob Evans</u>
Address: _____	E-Mail: <u>bruns@tasman-glc.com</u>
City/State/Zip: _____	Project Name: <u>KNAUS 28-8</u>
Phone: <u>970 470 9042</u> Fax: _____	Project Number: _____
Sampler Name: <u>P. Erin J. Whittaker</u>	

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
BH06 @ 2-4'	4/15/16	1155	1		X			X				X	X		
BH07 @ 2-4'	4/15/16	1230	1		X			X				X	X		
Relinquished by: _____		Date/Time: <u>4/15/16 1700</u>		Received by: <u>MB</u>		Date/Time: <u>4/15/16 1700</u>		Turn Around Time (Check)				Notes: <u>on file</u>			
Relinquished by: _____		Date/Time: _____		Received by: _____		Date/Time: _____		Same Day <input checked="" type="checkbox"/> 72 Hours <input type="checkbox"/> 24 Hours <input type="checkbox"/> Standard <input type="checkbox"/> 48 Hours <input type="checkbox"/>							
Relinquished by: <u>MB</u>		Date/Time: <u>4/15/16 1750</u>		Received in Lab by: <u>MB</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							

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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

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

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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

BH02
1604111-02 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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 Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<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

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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
1604111-03 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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 Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<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 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	8.0	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

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

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

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 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 13:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		94.8 %	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 Bruns

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 Bruns

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		"	"	"	"	

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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		"	"	"	"	

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6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8

Project Number: [none]
Project Manager: Brandon Bruns

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		"	"	"	"	

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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		"	"	"	"	

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Project: Knaus 28-8

Project Number: [none]
Project Manager: Brandon Bruns

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: <i>o</i> -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		"	"	"	"	

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6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8

Project Number: [none]
Project Manager: Brandon Bruns

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: <i>o</i> -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		"	"	"	"	

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6899 Pecos Street
Denver CO, 80221

Project: Knaus 28-8

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
04/17/16 12:55

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

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

Batch 1604158 - EPA 3550A

Blank (1604158-BLK1)

Prepared & Analyzed: 04/15/16

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

LCS (1604158-BS1)

Prepared & Analyzed: 04/15/16

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

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			
<i>Surrogate: o-Terphenyl</i>	<i>12.3</i>		"	<i>12.5</i>		<i>98.4</i>		<i>30-150</i>			

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	
<i>Surrogate: o-Terphenyl</i>	<i>12.9</i>		"	<i>12.5</i>		<i>103</i>		<i>30-150</i>			

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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		Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

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	"							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0397</i>		<i>"</i>	<i>0.0400</i>		<i>99.3</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0386</i>		<i>"</i>	<i>0.0400</i>		<i>96.4</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0410</i>		<i>"</i>	<i>0.0400</i>		<i>102</i>	<i>21-167</i>			

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			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0382</i>		<i>"</i>	<i>0.0400</i>		<i>95.4</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0408</i>		<i>"</i>	<i>0.0400</i>		<i>102</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0399</i>		<i>"</i>	<i>0.0400</i>		<i>99.8</i>	<i>21-167</i>			

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			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0403</i>		<i>"</i>	<i>0.0391</i>		<i>103</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0390</i>		<i>"</i>	<i>0.0391</i>		<i>99.7</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0396</i>		<i>"</i>	<i>0.0391</i>		<i>101</i>	<i>21-167</i>			

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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	Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

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	ND	103	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 Brunns

Reported:
04/17/16 12:55

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

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

Batch 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				
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>13.2</i>		<i>"</i>	<i>13.3</i>		<i>98.8</i>	<i>37-154</i>				
<i>Surrogate: Toluene-d8</i>	<i>13.1</i>		<i>"</i>	<i>13.3</i>		<i>98.2</i>	<i>45-149</i>				
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>14.9</i>		<i>"</i>	<i>13.3</i>		<i>112</i>	<i>45-146</i>				
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	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>16.1</i>		<i>"</i>	<i>13.3</i>		<i>121</i>	<i>37-154</i>				
<i>Surrogate: Toluene-d8</i>	<i>13.6</i>		<i>"</i>	<i>13.3</i>		<i>102</i>	<i>45-149</i>				
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>15.6</i>		<i>"</i>	<i>13.3</i>		<i>117</i>	<i>45-146</i>				

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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

Summit Scientific

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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 'Paul 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

1605251

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
BH08@6-7'	5/26/16	905	1		X			X				X	X		
Relinquished by: <u>G. A. Aisp</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:			
								Same Day <input type="checkbox"/> 72 Hours <input checked="" type="checkbox"/> 24 Hours <input type="checkbox"/> Standard <input checked="" type="checkbox"/> 48 Hours <input type="checkbox"/>							
Relinquished by: <u>[Signature]</u>		Date/Time: <u>5-26-16 17:40</u>		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"/>							

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.



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: <i>o</i> -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

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:
06/02/16 12:06

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

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

Batch 1605302 - EPA 3550A

Blank (1605302-BLK1)

Prepared & Analyzed: 05/31/16

C10-C28 (DRO)	ND	50	mg/kg							
<i>Surrogate: o-Terphenyl</i>	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			
<i>Surrogate: o-Terphenyl</i>	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			
<i>Surrogate: o-Terphenyl</i>	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	
<i>Surrogate: o-Terphenyl</i>	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		Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

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	"							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0420</i>		<i>"</i>	<i>0.0400</i>		<i>105</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0387</i>		<i>"</i>	<i>0.0400</i>		<i>96.7</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0425</i>		<i>"</i>	<i>0.0400</i>		<i>106</i>	<i>21-167</i>			

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			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0363</i>		<i>"</i>	<i>0.0400</i>		<i>90.8</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0497</i>		<i>"</i>	<i>0.0400</i>		<i>124</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0418</i>		<i>"</i>	<i>0.0400</i>		<i>104</i>	<i>21-167</i>			

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			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0415</i>		<i>"</i>	<i>0.0400</i>		<i>104</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0472</i>		<i>"</i>	<i>0.0400</i>		<i>118</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0417</i>		<i>"</i>	<i>0.0400</i>		<i>104</i>	<i>21-167</i>			

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

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

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

Batch 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	ND	120	10-158	10.3	42	
Benzene	0.120	0.0020	"	0.100	ND	127	30-134	9.16	34	
Toluene	0.127	0.0050	"	0.100	ND	139	22-153	21.1	24	
Ethylbenzene	0.138	0.0050	"	0.0992	ND	131	10-159	20.2	68	
m,p-Xylene	0.126	0.0050	"	0.0980	ND	129	31-151	20.3	38	
o-Xylene										
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			

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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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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 flourish at the end.

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	8015 DRO		pH, EC, SAR
BH01	06/20/16	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: <u>06/21/16 1730</u>	Received by:	Date/Time: <u>6/21/16 1720</u>	Turn Around Time (Check) Same Day <input type="checkbox"/> 24 Hours <input type="checkbox"/> 48 Hours <input type="checkbox"/> 72 Hours <input type="checkbox"/> Standard <input checked="" type="checkbox"/>	Notes: <u>Price</u>
Relinquished by:	Date/Time: <u>6/22/16 9:20</u>	Received by:	Date/Time: <u>6/22/16 9:20</u>		
Relinquished by:	Date/Time:	Received in Lab by:	Date/Time:		

Sample Integrity: Temperature Upon Receipt: 6.5C
Intact: Yes No

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

Sample Receipt Checklist

S2 Work Order: 1606229

Client: Noble/Tasman Client Project ID: Knaus 28-8

Shipped Via: plu Airbill #: _____
(UPS, FedEx, Hand Delivered, Pick-up, etc.)

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⁾ ?			✓	
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⁾ ?	✓			
Was adequate sample volume provided ⁽¹⁾ ?	✓			
If custody seals are present, are they intact ⁽¹⁾ ?			✓	
Are short holding time analytes or samples with HTs due within 48 hours present?			✓	
Is a chain-of-custody (COC) form present and filled out completely ⁽¹⁾ ?	✓			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	✓			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	✓			
Is the COC properly relinquished by the client w/ date and time recorded ⁽¹⁾ ?	✓			
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.		✓		
Are samples preserved that require preservation (excluding cooling) ⁽¹⁾ ?			✓	
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⁾ ?			✓	
Record the pH in Comments.				
If dissolved metals are requested, were samples field filtered?			✓	
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

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

BH02
1606229-02 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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 Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<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		"	"	"	"	

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

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
<i>Surrogate: 1,2-Dichloroethane-d4</i>		82.6 %	37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		97.9 %	45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		90.8 %	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

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
<i>Surrogate: 1,2-Dichloroethane-d4</i>		81.6 %	37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		95.6 %	45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		90.7 %	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

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
<i>Surrogate: 1,2-Dichloroethane-d4</i>		81.6 %	37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		96.9 %	45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		90.2 %	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:
06/27/16 10:12

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

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

Batch 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			

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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

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

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

Batch 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

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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

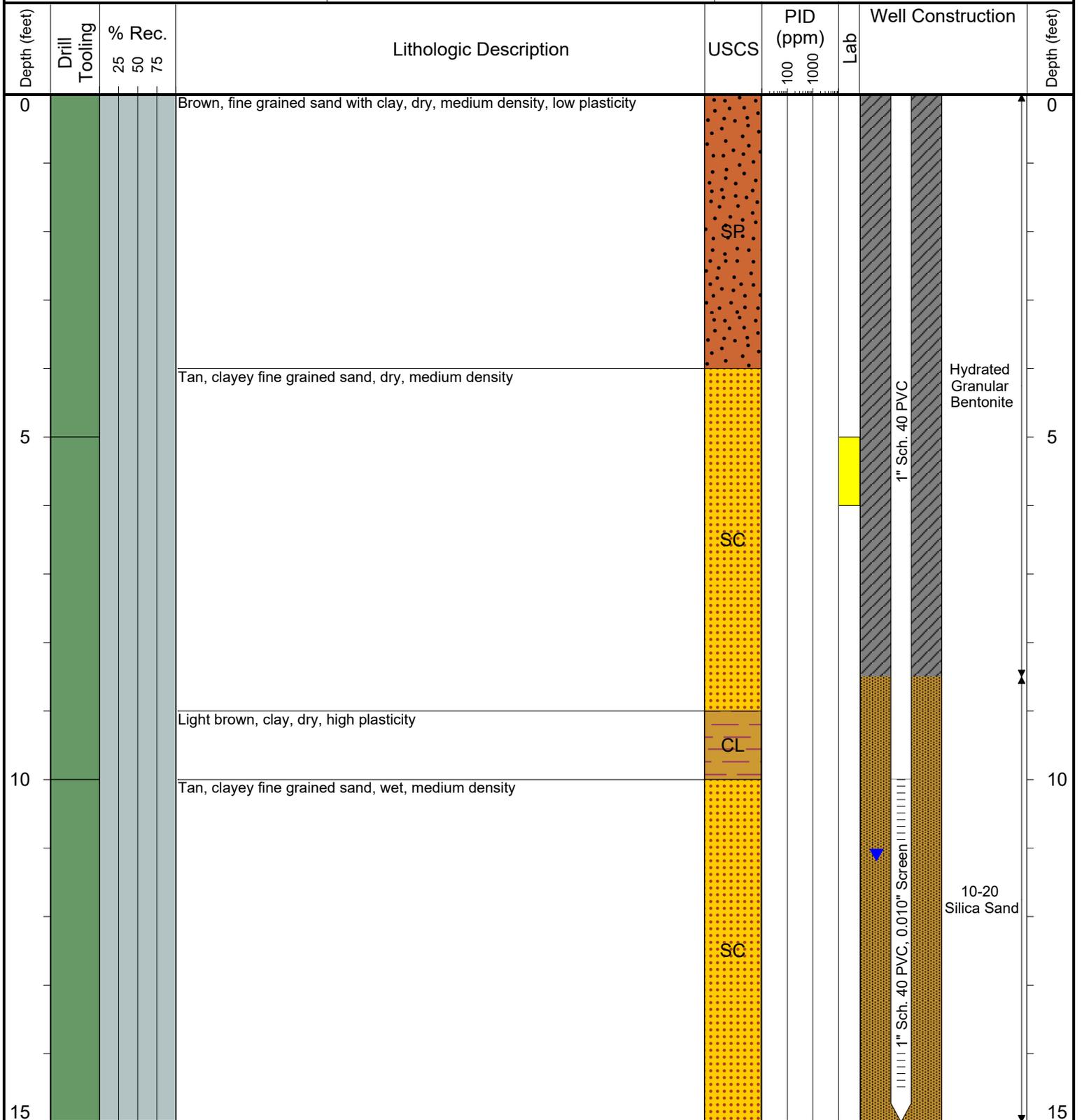
Notes and Definitions

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



6899 Pecos Street, Unit C
Denver, Colorado 80221

CLIENT: Noble Energy, Inc.	Knaus 28-8
LOGGED BY: Jake Whritenour	
PROJECT MANAGER: Brandon Bruns, P.E.	BORING / WELL ID: BH01
DRILLING CONTRACTOR: Site Services Drilling	
DRILLING EQUIPMENT: Geoprobe	LOCATION: Weld County, CO
DRILL BIT SIZE (INCHES): 2.375	LATITUDE (DEGREES): 40.461734230184
DATE STARTED - COMPLETED: 4/15/16	LONGITUDE (DEGREES): -104.77506443425
TOTAL BORING DEPTH (FT. BGS): 15	CASING ELEVATION (FT. AMSL): 4660.12
DEPTH TO WATER (FT. BGS): 11.1	GROUND ELEVATION (FT. AMSL): 4657.59



Drilling / Sample Method:

- Macro-Core
- CME Continuous Core

Laboratory Sample Types:

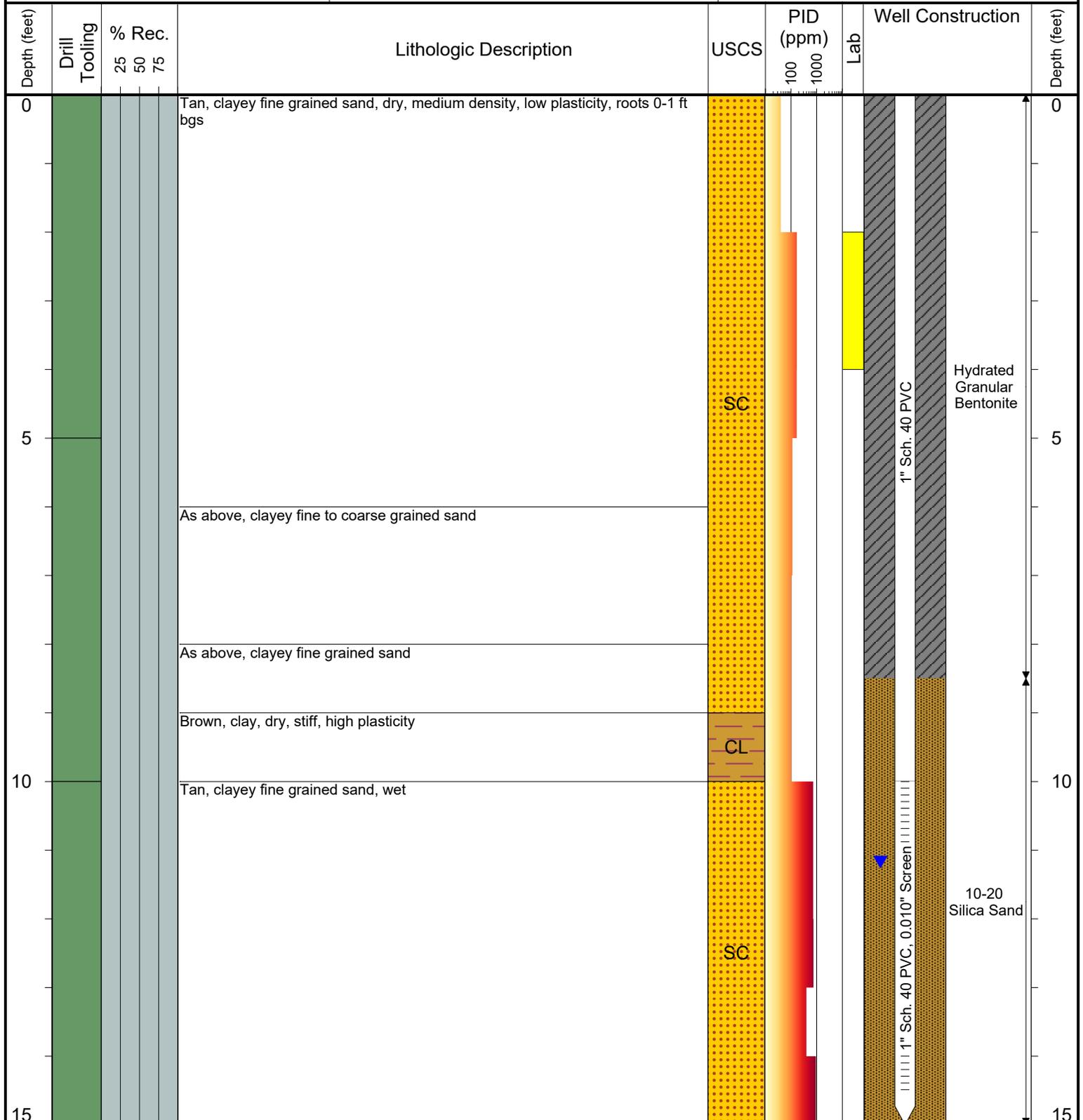
- Split Spoon
- Geotechnical Lab
- Analytical Chemistry Lab
- Geotechnical & Analytical Chemistry Lab



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 (Green), CME Continuous Core (Dark Green), Split Spoon (Light Green), Hollow Stem Auger (Blue)

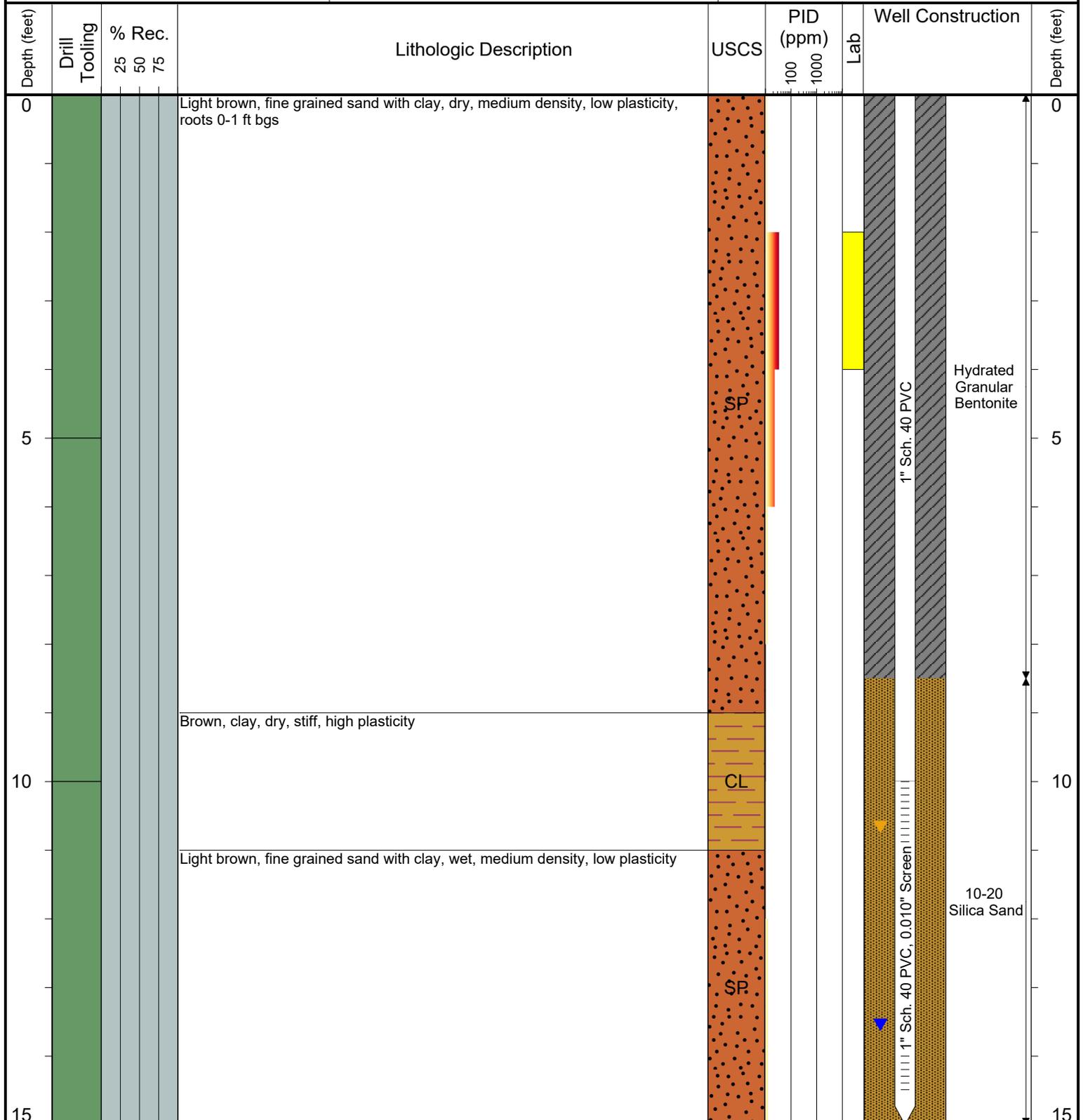
Laboratory Sample Types:
 Geotechnical Lab (Purple), Analytical Chemistry Lab (Yellow), Geotechnical & Analytical Chemistry Lab (Blue/Yellow Diagonal)



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



Drilling / Sample Method:
 Macro-Core (Green square)
 CME Continuous Core (Dark Green square)
 Split Spoon (Light Green square)
 Hollow Stem Auger (Blue square)

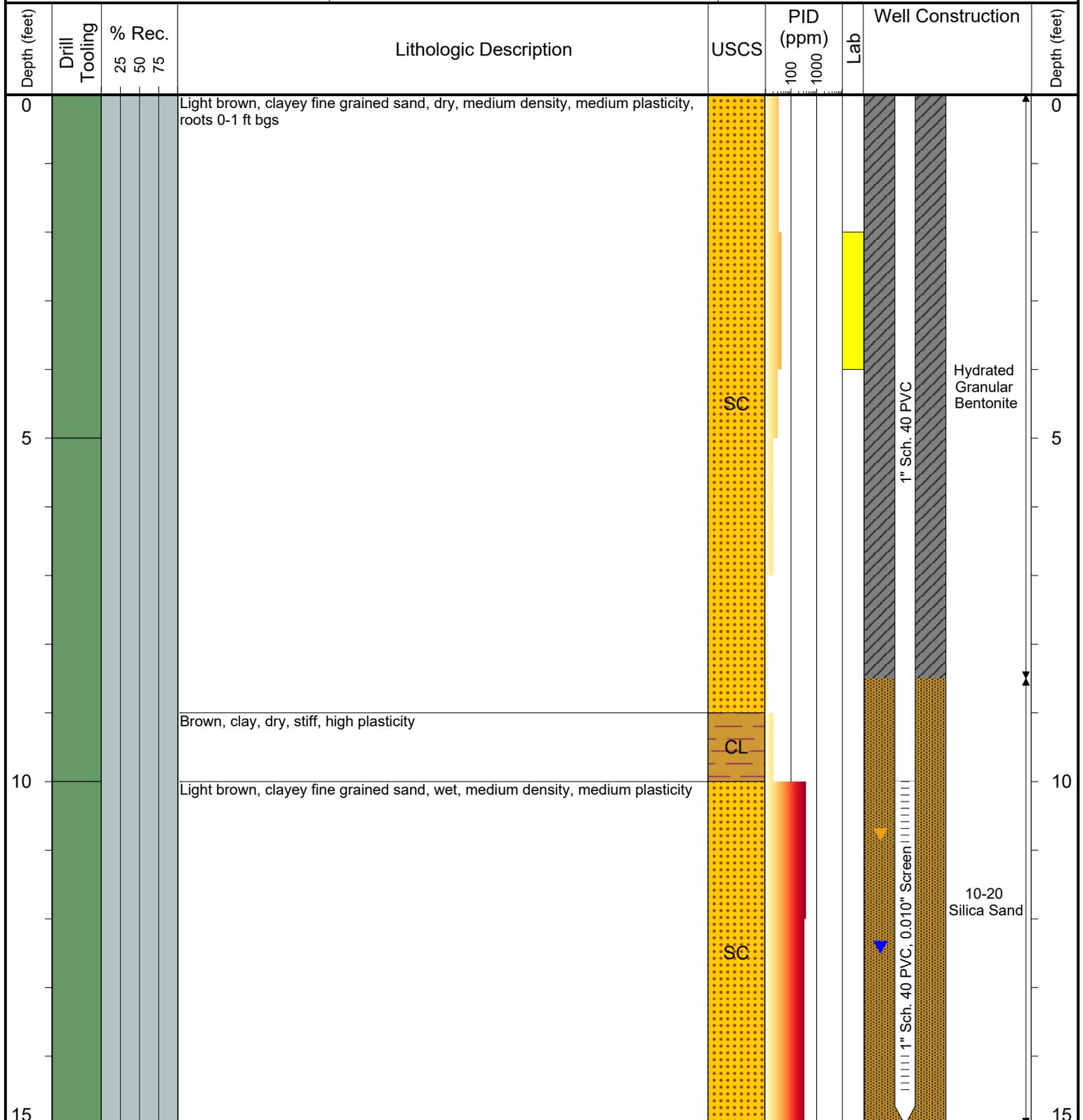
Laboratory Sample Types:
 Geotechnical Lab (Purple square)
 Analytical Chemistry Lab (Yellow square)
 Geotechnical & Analytical Chemistry Lab (Blue and Yellow diagonal square)



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 (Green), CME Continuous Core (Dark Green), Split Spoon (Light Green), Hollow Stem Auger (Blue)

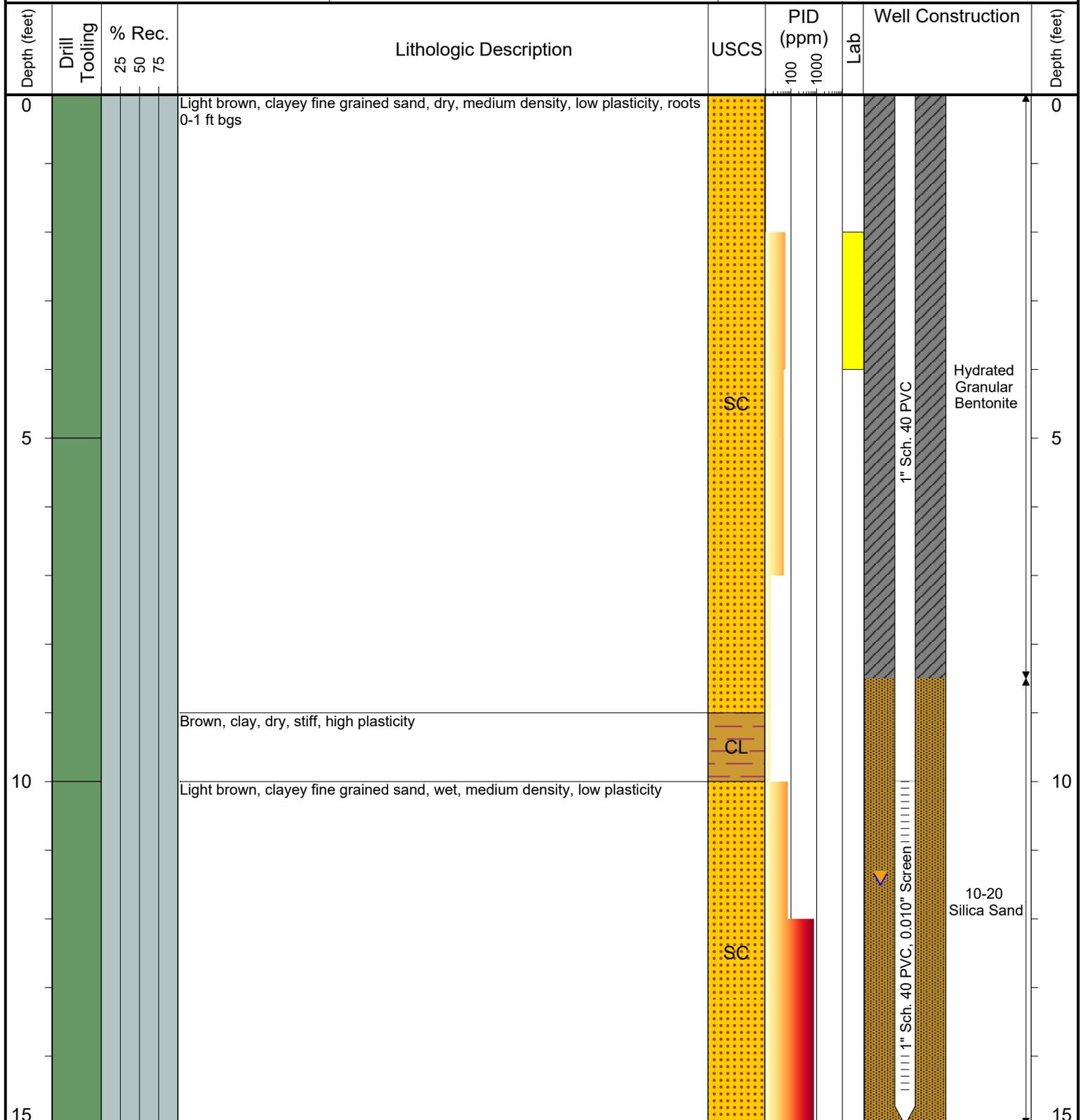
Laboratory Sample Types:
 Geotechnical Lab (Purple), Analytical Chemistry Lab (Yellow), Geotechnical & Analytical Chemistry Lab (Blue/Yellow Diagonal)



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 (Green square)
 CME Continuous Core (Dark Green square)
 Split Spoon (Light Green square)
 Hollow Stem Auger (Blue square)

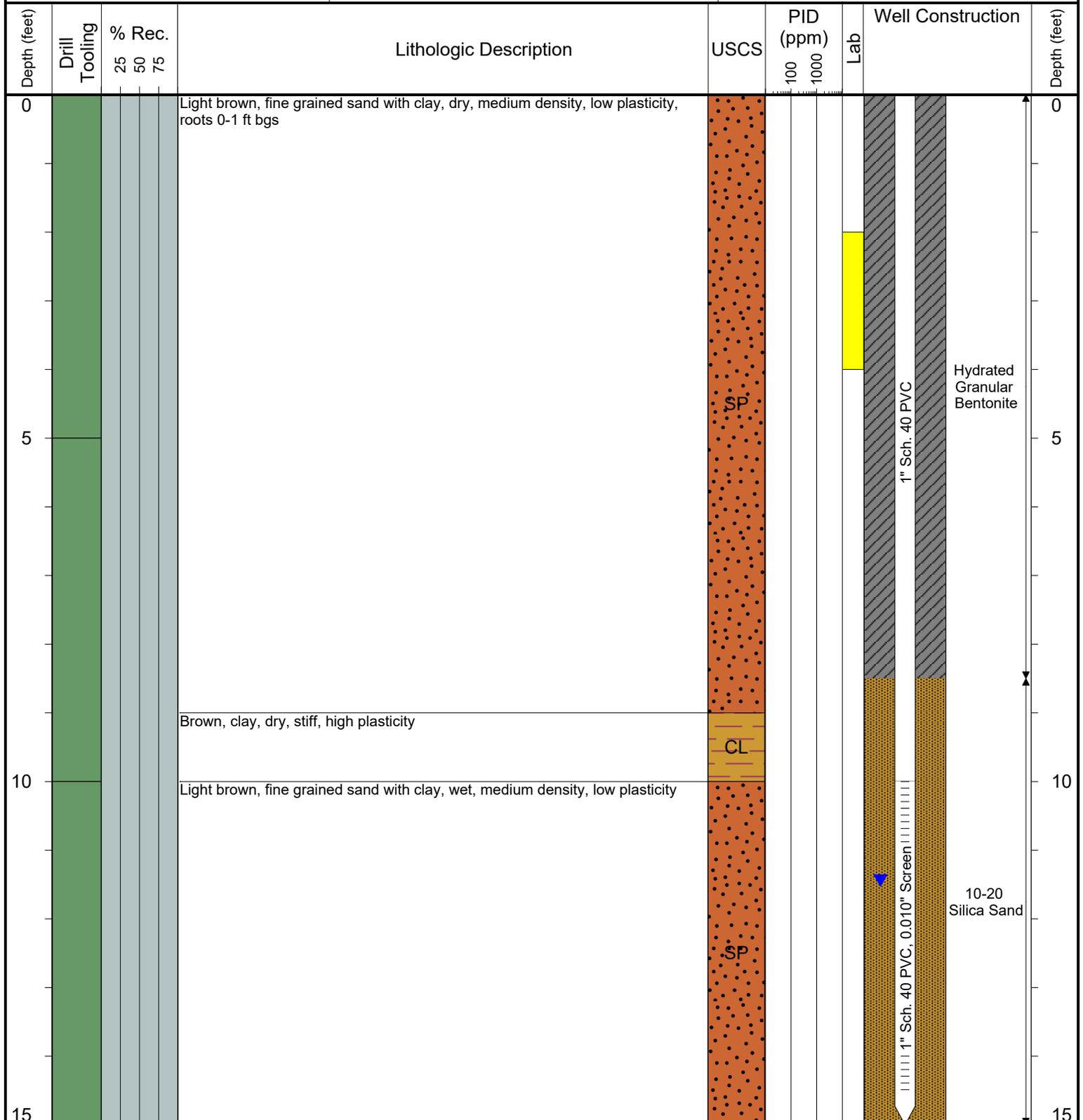
Laboratory Sample Types:
 Geotechnical Lab (Purple square)
 Analytical Chemistry Lab (Yellow square)
 Geotechnical & Analytical Chemistry Lab (Blue and Yellow diagonal square)



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): 11.44

Knaus 28-8
BORING / WELL ID: BH06
 LOCATION: Weld County, CO
 LATITUDE (DEGREES): 40.461730714864
 LONGITUDE (DEGREES): -104.77534591589
 CASING ELEVATION (FT. AMSL): 4660.85
 GROUND ELEVATION (FT. AMSL): 4658.05



Drilling / Sample Method:
 Macro-Core (Green box)
 CME Continuous Core (Dark Green box)
 Split Spoon (Light Green box)
 Hollow Stem Auger (Blue box)

Laboratory Sample Types:
 Geotechnical Lab (Purple box)
 Analytical Chemistry Lab (Yellow box)
 Geotechnical & Analytical Chemistry Lab (Blue and Yellow striped box)



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

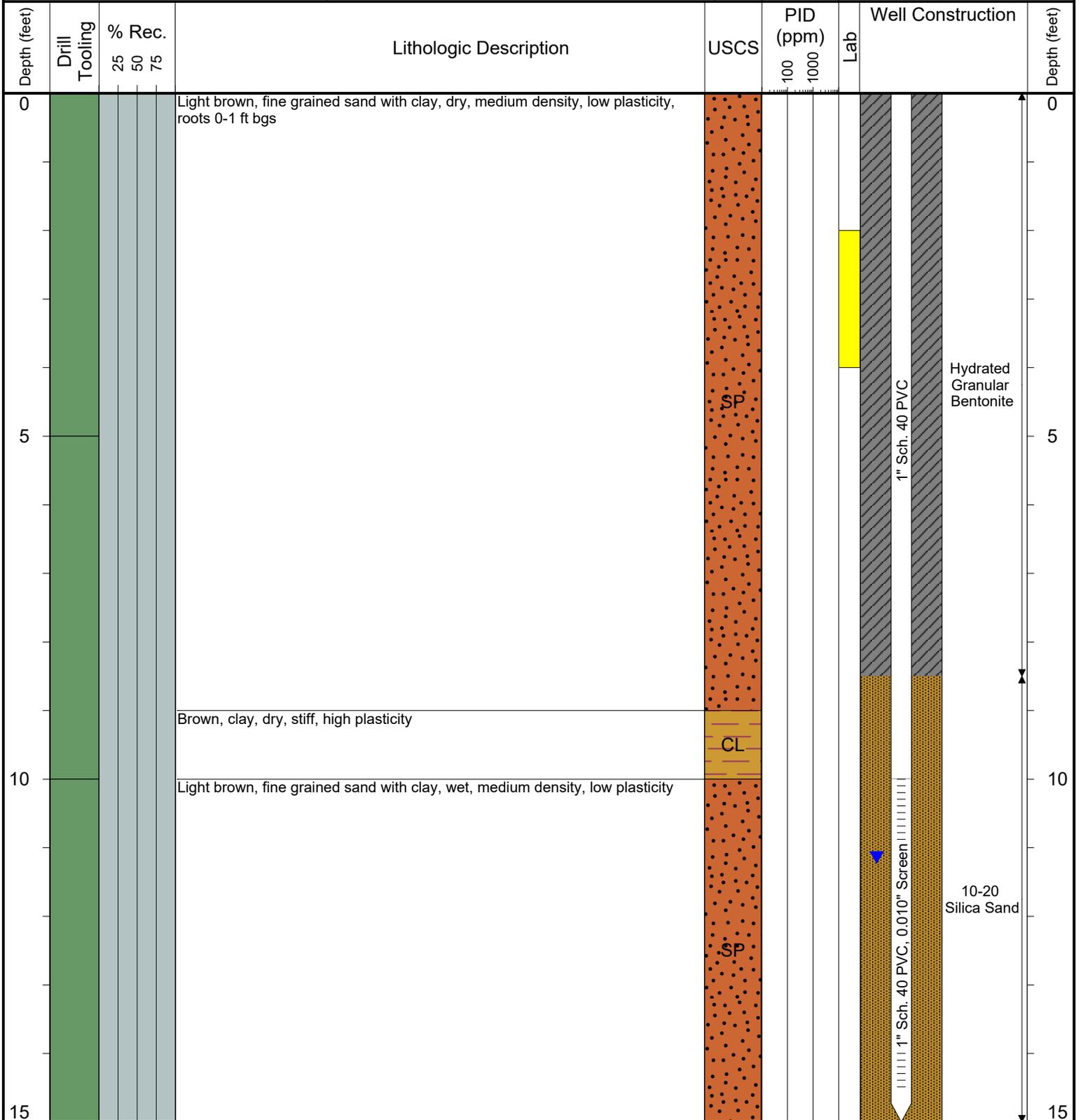
LOCATION: Weld County, CO

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

Laboratory Sample Types:

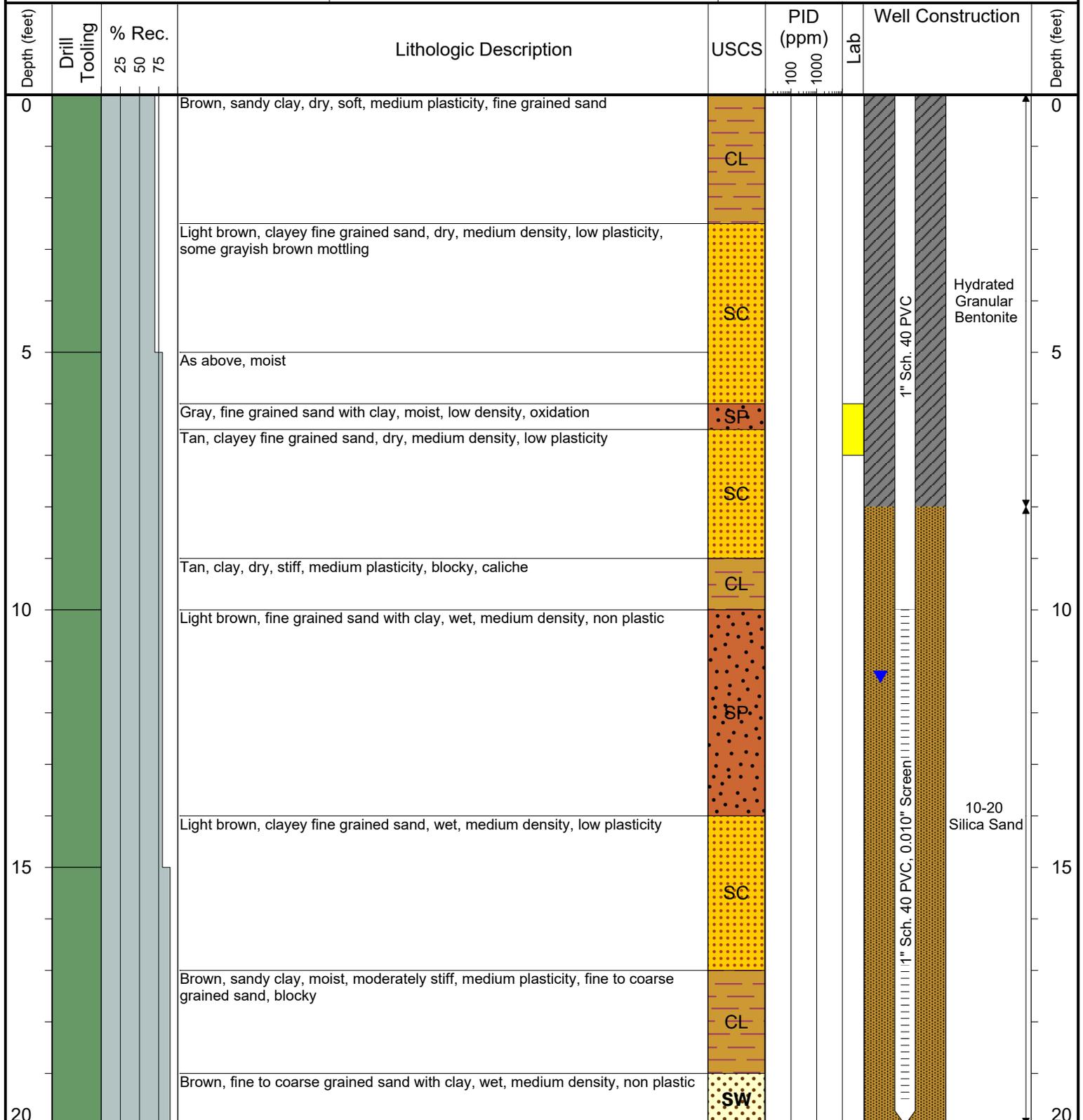
- Split Spoon
- Geotechnical Lab
- Analytical Chemistry Lab
- Geotechnical & Analytical Chemistry Lab



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 (Green)
 CME Continuous Core (Dark Green)
 Split Spoon (Light Green)
 Hollow Stem Auger (Blue)

Laboratory Sample Types:
 Geotechnical Lab (Purple)
 Analytical Chemistry Lab (Yellow)
 Geotechnical & Analytical Chemistry Lab (Blue/Yellow)