



Extraction Oil & Gas
Hiner 36 Tank Battery
COGCC Location ID: 446538
Temporary Monitoring Well Layout &
GW Elevations for the
11/5/2019 Sampling Event

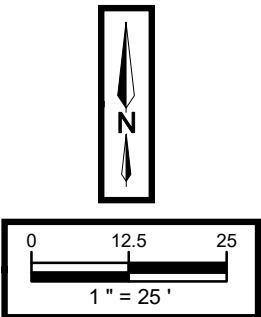
Legal Description: NENE, Sec 36, T6N R66W
County: Weld
Land Use: Non-Cropland
Topography: Not Available
Run-Off Risk: Low
Soil Type: Aquolls and Aquents
Receiving Waters: Cache la Poudre River



- BH01**
80.60-ft
- Temp. Monitoring Well Location & Relative GW Elevation
- Estimated Groundwater Contour
- Estimated Groundwater Flow Direction

* Sample ID in Purple font indicates a regulatory exceedance.

* Concentration Units in ug/L.
* ND - Non-Detect



Sample ID	Latitude NAD83	Longitude NAD83
BH01	40.449073	-104.719683
BH02	40.448991	-104.720012
BH03	40.448818	-104.719963
BH04	40.448891	-104.719792
BH05	40.448684	-104.719802
BH06	40.448807	-104.719347
BH07	40.449160	-104.719593

Spatial data collected for this project was acquired using a GPS with submeter accuracy. Illustration discrepancies may be present in this diagram due to the inherent limitations of data accuracy for both project data and the underlying aerial imagery. To accurately reflect field conditions, illustrated data may have been manually corrected in order to fit with the aerial imagery reference points and other collected data points.



Laboratory Results Summary Table - Groundwater Hiner 36

			Organic Compounds (µg/L)			
COGCC Allowable Concentration (Water)			5	1000	700	10000
Location	Sample Date	Sample ID	Benzene	Toluene	Ethylbenzene	Xylenes - total
Hiner 36 Pad	11/5/19	BH01	20	<1.0	<1.0	<2.0
Hiner 36 Pad	11/5/19	BH02	<1.0	<1.0	<1.0	<2.0
Hiner 36 Pad	11/5/19	BH03	3	<1.0	<1.0	<2.0
Hiner 36 Pad	11/5/19	BH04	<1.0	<1.0	<1.0	<2.0
Hiner 36 Pad	11/5/19	BH05	<1.0	<1.0	<1.0	<2.0
Hiner 36 Pad	11/5/19	BH06	<1.0	<1.0	<1.0	<2.0
Hiner 36 Pad	11/5/19	BH07	2.2	<1.0	<1.0	<2.0

Attachment A

Laboratory Analytical Report

Summit Scientific

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

November 13, 2019

Maggie Graham

Extraction Oil&Gas

370 17th Street Suite 5300

Denver, CO 80202

RE: Hiner 36

Work Order # 1911053

Enclosed are the results of analyses for samples received by Summit Scientific on 11/05/19 17:55. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink on a light blue background. The signature is written in a cursive style and appears to read "Muri Premier".

Muri Premier For Paul Shrewsbury

President



Extraction Oil&Gas
370 17th Street Suite 5300
Denver CO, 80202

Project: Hiner 36

Project Number: [none]

Project Manager: Maggie Graham

Reported:
11/13/19 17:03

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH01	1911053-01	Water	11/05/19 15:00	11/05/19 17:55
BH02	1911053-02	Water	11/05/19 13:05	11/05/19 17:55
BH03	1911053-03	Water	11/05/19 14:30	11/05/19 17:55
BH04	1911053-04	Water	11/05/19 12:50	11/05/19 17:55
BH05	1911053-05	Water	11/05/19 13:30	11/05/19 17:55
BH06	1911053-06	Water	11/05/19 12:00	11/05/19 17:55
BH07	1911053-07	Water	11/05/19 14:00	11/05/19 17:55

Summit Scientific

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

Summit Scientific

303-277-9310 ♦ 303-374-5933 Fax

Client: APEX Companies, LLC

Address: 176 Cole Blvd. Suite 250

City/State/Zip: Lakewood, Colorado 80101

Phone: 720-501-5065

Fax:

Sampler Name: Ryan Finley

Project Manager: Maggie Graham 720-501-5065; 907-538-7699c

E-Mail: DenverRemediation@ApexCos.onmicrosoft.com

Project Name: Hiner 36 battery

Project Number: TBD

www.s2scientific.com

Sample Receipt Checklist

S2 Work Order 1911053

Client: Aperx/XOG Client Project ID: Hiner 36 Battery

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

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

Temp (°C) 17.4

Thermometer ID: 61857155-K

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

AT
Custodian Printed Name or Initials

[Signature]
Signature of Custodian

11-5-18, 755
Date/Time



Extraction Oil&Gas
370 17th Street Suite 5300
Denver CO, 80202

Project: Hiner 36
Project Number: [none]
Project Manager: Maggie Graham

Reported:
11/13/19 17:03

BH01
1911053-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/05/19 15:00**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	20	1.0		ug/l	1	1911059	11/06/19	11/13/19	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **11/05/19 15:00**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		121 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		79.4 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.7 %		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.



Extraction Oil&Gas
370 17th Street Suite 5300
Denver CO, 80202

Project: Hiner 36
Project Number: [none]
Project Manager: Maggie Graham

Reported:
11/13/19 17:03

BH02
1911053-02 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/05/19 13:05**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	1911059	11/06/19	11/13/19	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **11/05/19 13:05**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		122 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		79.1 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.8 %	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.



Extraction Oil&Gas
370 17th Street Suite 5300
Denver CO, 80202

Project: Hiner 36
Project Number: [none]
Project Manager: Maggie Graham

Reported:
11/13/19 17:03

BH03
1911053-03 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/05/19 14:30**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	3.0	1.0		ug/l	1	1911059	11/06/19	11/13/19	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **11/05/19 14:30**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		120 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		76.9 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		107 %		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.



Extraction Oil&Gas
370 17th Street Suite 5300
Denver CO, 80202

Project: Hiner 36
Project Number: [none]
Project Manager: Maggie Graham

Reported:
11/13/19 17:03

BH04
1911053-04 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/05/19 12:50**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	1911059	11/06/19	11/13/19	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **11/05/19 12:50**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		121 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		76.9 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.4 %	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.



Extraction Oil&Gas
370 17th Street Suite 5300
Denver CO, 80202

Project: Hiner 36
Project Number: [none]
Project Manager: Maggie Graham

Reported:
11/13/19 17:03

BH05
1911053-05 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/05/19 13:30**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	1911059	11/06/19	11/13/19	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **11/05/19 13:30**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		136 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		78.6 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.5 %	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.



Extraction Oil&Gas
370 17th Street Suite 5300
Denver CO, 80202

Project: Hiner 36
Project Number: [none]
Project Manager: Maggie Graham

Reported:
11/13/19 17:03

BH06
1911053-06 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/05/19 12:00**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	1911059	11/06/19	11/13/19	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **11/05/19 12:00**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		134 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		80.2 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		92.0 %	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.



Extraction Oil&Gas
370 17th Street Suite 5300
Denver CO, 80202

Project: Hiner 36
Project Number: [none]
Project Manager: Maggie Graham

Reported:
11/13/19 17:03

BH07
1911053-07 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/05/19 14:00**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	2.2	1.0		ug/l	1	1911059	11/06/19	11/13/19	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **11/05/19 14:00**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		128 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		75.5 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.4 %		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.



Extraction Oil&Gas
370 17th Street Suite 5300
Denver CO, 80202

Project: Hiner 36

Project Number: [none]
Project Manager: Maggie Graham

Reported:
11/13/19 17:03

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 1911059 - EPA 5030 Water MS

Blank (1911059-BLK1)

Prepared: 11/06/19 Analyzed: 11/12/19

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	2.0	"							
Surrogate: 1,2-Dichloroethane-d4	14.9		"	13.3		112	23-173			
Surrogate: Toluene-d8	9.60		"	13.3		72.0	20-170			
Surrogate: 4-Bromofluorobenzene	12.6		"	13.3		94.4	21-167			

LCS (1911059-BS1)

Prepared: 11/06/19 Analyzed: 11/12/19

Benzene	36.2	1.0	ug/l	33.3		109	51-132			
Toluene	26.6	1.0	"	33.3		79.9	51-138			
Ethylbenzene	35.7	1.0	"	33.3		107	58-146			
m,p-Xylene	70.0	2.0	"	66.7		105	57-144			
o-Xylene	33.9	1.0	"	33.3		102	53-146			
Surrogate: 1,2-Dichloroethane-d4	15.5		"	13.3		116	23-173			
Surrogate: Toluene-d8	9.82		"	13.3		73.7	20-170			
Surrogate: 4-Bromofluorobenzene	13.1		"	13.3		98.4	21-167			

Matrix Spike (1911059-MS1)

Source: 1911051-01

Prepared: 11/06/19 Analyzed: 11/12/19

Benzene	39.3	1.0	ug/l	33.3	ND	118	34-141			
Toluene	29.1	1.0	"	33.3	ND	87.2	27-151			
Ethylbenzene	36.4	1.0	"	33.3	ND	109	29-160			
m,p-Xylene	71.0	2.0	"	66.7	ND	107	20-166			
o-Xylene	34.6	1.0	"	33.3	ND	104	33-159			
Surrogate: 1,2-Dichloroethane-d4	17.3		"	13.3		130	23-173			
Surrogate: Toluene-d8	10.8		"	13.3		81.0	20-170			
Surrogate: 4-Bromofluorobenzene	12.9		"	13.3		96.5	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.



Extraction Oil&Gas
370 17th Street Suite 5300
Denver CO, 80202

Project: Hiner 36

Project Number: [none]

Project Manager: Maggie Graham

Reported:
11/13/19 17:03

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 1911059 - EPA 5030 Water MS

Matrix Spike Dup (1911059-MSD1)		Source: 1911051-01			Prepared: 11/06/19 Analyzed: 11/12/19					
Benzene	35.2	1.0	ug/l	33.3	ND	106	34-141	11.0	30	
Toluene	28.4	1.0	"	33.3	ND	85.2	27-151	2.33	30	
Ethylbenzene	34.5	1.0	"	33.3	ND	103	29-160	5.50	30	
m,p-Xylene	67.8	2.0	"	66.7	ND	102	20-166	4.68	30	
o-Xylene	33.4	1.0	"	33.3	ND	100	33-159	3.35	30	
Surrogate: 1,2-Dichloroethane-d4	15.9		"	13.3		119	23-173			
Surrogate: Toluene-d8	10.7		"	13.3		80.6	20-170			
Surrogate: 4-Bromofluorobenzene	12.5		"	13.3		93.6	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.



Extraction Oil&Gas
370 17th Street Suite 5300
Denver CO, 80202

Project: Hiner 36

Project Number: [none]
Project Manager: Maggie Graham

Reported:
11/13/19 17:03

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

Attachment B

Boring Logs



SOIL BORING LOG

Project Number 744.1902.1
446538

Boring Number BH-01

Sheet 1 of 1

← Boring Location Sketch

Project Hiner 36 Pad Location N 16th Ave., N 23rd Ave Greeley, CO

Drilling Method & Equipment Direct Push Drilling Contractor Drill Pro

Date 6/10/19 Water Level ~ 6' Start 1100 Finish 1120 Logger David Puchrik

Depth Below Surface	Sample			Standard Penetration Test Results	Soil Description	Symbol of USCS Log	Staining	PID Readings (ppm)	PID Reading Depths (bgs)
	Interval	Depth/Time	Recovery						
				6"/6"/6"/6"	USCS Group Symbol, Name, Gradation or Plasticity, Particle Size Distribution, Color, Moisture Content Relative Density or Consistency, Soil Structure, Mineralogy, Stain or Odor				
5					2' - Clayey sand and gravel, stained grey. moist from potholing HC odor	GC		1.5	
					4' same as above less clayey, HC odor	SP		490	5
10					6-10 poorly graded sands loose, saturated, stained slight odor	GP		6.5	
					10-13 poorly graded sand with gravels, loose, no staining, coarse sands	GP		1.4	10
15					13-15 poorly graded sand stained, fine to medium sands loose	SP		1.1	
								50	15
20									
25									
30									
35									

Total Depth(s) =

151

Soil Sample(s):

BH01 @ 4' 0920
BH01 @ 13.5-14' 1120

Rationale

client request

Additional Information:



SOIL BORING LOG

Project Number
744.1902.1
446538

Boring Number
BH02

Sheet
1 of 1

← Boring Location Sketch

Project Hiner 36 Pad Location N 16th Ave., N 23rd Ave Greeley, CO

Drilling Method & Equipment Direct Push Drilling Contractor Drill Pro

Date 6/10/19 Water Level ~ 5' Start 1130 Finish 1150 Logger David Puchrik

Depth Below Surface	Sample			Standard Penetration Test Results 6" / 6" / 6" / 6"	Soil Description USCS Group Symbol, Name, Gradation or Plasticity, Particle Size Distribution, Color, Moisture Content Relative Density or Consistency, Soil Structure, Mineralogy, Stain or Odor	Symbol of USCS Log	Staining	PID Readings (ppm)	PID Reading Depths (bgs)
	Interval	Depth/Time	Recovery						
5					2' clayey sand and gravel, dark brown, moist from potholing	GP		0.5 <	
					4' same as above, less clayey. Hc odor.			520 <	5
10					6-12 poorly graded sands and gravel			21.9 <	
					stained from 8-10' with Hc odor			49.9 <	10
15					12-15 same as above less gravels, coarse sands. Stained from 13.5-14.5.			5.7 <	
								110 <	15
								15 <	
20									20
25									25
30									30
35									35
Total Depth(s) = <u>15</u>				Soil Sample(s): <u>BH02 @ 4'</u> <u>0940</u> <u>BH02 @ 8-8.5'</u> <u>1140</u>		Rationale <u>client request</u>		Additional Information:	



SOIL BORING LOG

Project Number
744.1902.1
446538

Boring Number
BH03

Sheet
1 of 1

← Boring Location Sketch

Project Hiner 36 Pad Location N 16th Ave., N 23rd Ave Greeley, CO

Drilling Method & Equipment Direct Push Drilling Contractor Drill Pro

Date 6/10/19 Water Level ~5 Start 1215 Finish 1230 Logger David Puchrik

Depth Below Surface	Sample			Standard Penetration Test Results 6" / 6" / 6" / 6"	Soil Description USCS Group Symbol, Name, Gradation or Plasticity, Particle Size Distribution, Color, Moisture Content Relative Density or Consistency, Soil Structure, Mineralogy, Stain or Odor	Symbol of USCS Log	Staining	PID Readings (ppm)	PID Reading Depths (bgs)
	Interval	Depth/Time	Recovery						
5					2' Clayey sand and gravel grey, moist from potholing.			1.2 <	
					4' Same as above, less clayey, HC odor			280 <	5
10					6-8.5 same as above			37.3 <	
					staining 6-13.5'			18.2 <	10
15					8.5-15 poorly graded sands and gravels			94.9 <	
					coarsening downward			367 <	15
								12.4 <	
20									20
25									25
30									30
35									35

Total Depth(s) =

15'

Soil Sample(s):

1030 BH03 @ 4'
1215 BH03 @ 13.5-14'

Rationale

client
Request

Additional Information:



SOIL BORING LOG

← Boring Location Sketch

Project Number 744.1902.1
446538

Boring Number BH04

Sheet 1 of 1

Project Hiner 36 Pad Location N 16th Ave., N 23rd Ave Greeley, CO

Drilling Method & Equipment Direct Push Drilling Contractor Drill Pro

Date 6/10/19 Water Level ~5 Start 1200 Finish 1215 Logger David Puchrik

Depth Below Surface	Sample			Standard Penetration Test Results	Soil Description USCS Group Symbol, Name, Gradation or Plasticity, Particle Size Distribution, Color, Moisture Content Relative Density or Consistency, Soil Structure, Mineralogy, Stain or Odor	Symbol of USCS Log	Staining	PID Readings (ppm)	PID Reading Depths (bgs)
	Interval	Depth/Time	Recovery						
				6"/6"/6"/6"					
5					2' clayey sand and gravel, moist from potholing. NO HC odor	GC		0.5 <	
					4' same as above, less clayey, no stain/odor.			3.8 <	5
10					6-15' poorly graded sands with gravel's, saturated stained from 6-12', loose, sands coarser with depth			10.4 <	
								6.7 <	10
15								4.6 <	
								1.1 <	15
20									
25									
30									
35									
Total Depth(s) = 151				Soil Sample(s): BH04 @ 6-8' 1215'		Rationale client request		Additional Information:	

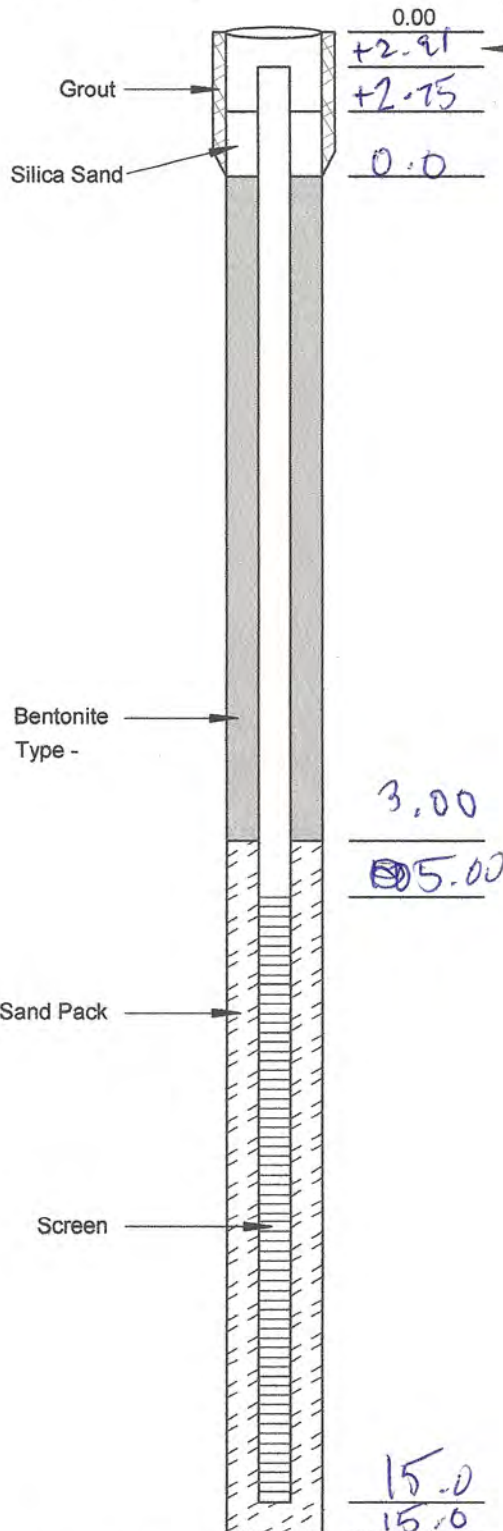


WELL CONSTRUCTION LOG

Well Completion Detail

Street Box
Diam. = N/A

Surveyed Dif.
Btwn. GS and
TOC



Project 744.1902.1
Number 446538

Well Number B151 B7101

Drilling Summary

Total Depth of Hole: 15
Hole Diameter: 2.25
Drilling Company: Drill Pro
Driller: Ron
Rig Type: Direct Push
Bits: Solid Core
Geologist: D. Puchrik

Time Log

	Start		Finish	
	Date	Time	Date	Time
Drilling:	6/10/19	1130	6/10/19	1150
Well Completion:	6/10/19	1150	6/10/19	1200
Grouting:	6/10/19	1200	6/10/19	1210

Depth to Water (Below TOC)

Depth: 11.19 Date: 6/10/19 Time: 1445

Well Construction Materials

	Grout	Seals	Filter
Quantity:		<u>50</u>	<u>50</u>
Type:		<u>bent</u>	<u>10/20</u>

	Screen	
Size:	<u>10'</u>	Config.: <u>10 Slot</u>
Area/Ft.:		Comp.: <u>PVC</u>
Inside Diam.:	<u>1"</u>	Outside Diam.: <u>Sch 40</u>

Comments

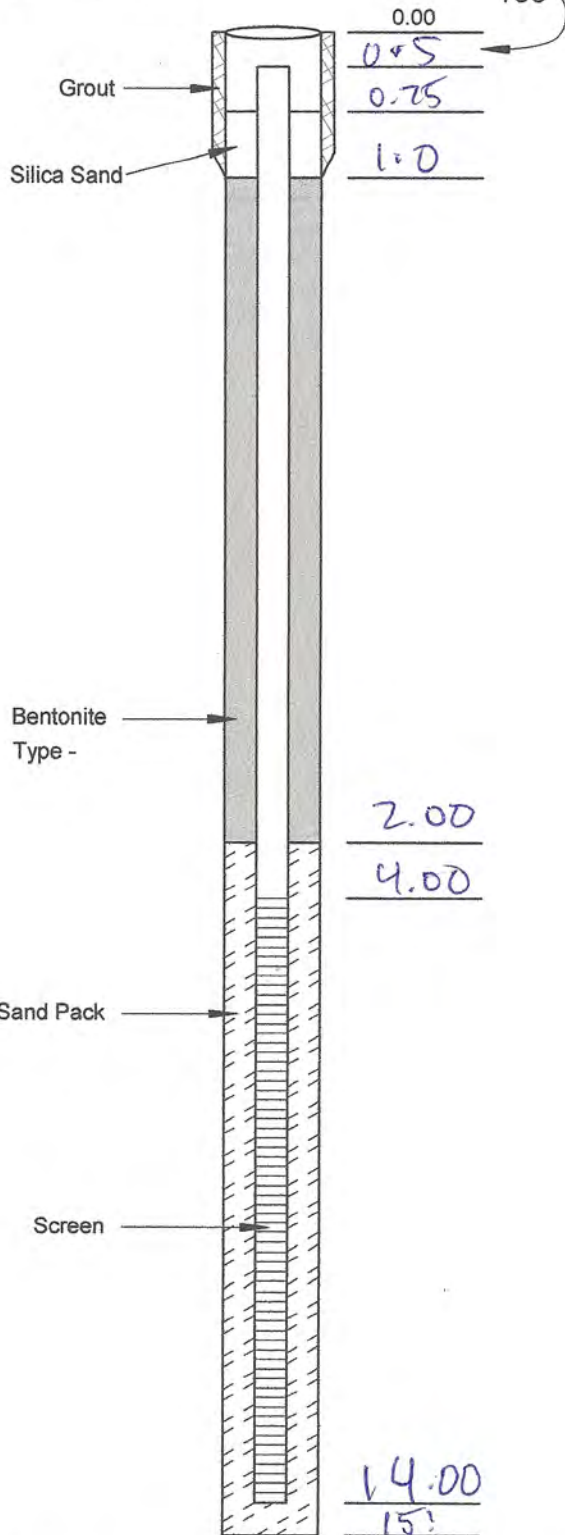
Total Depth from TOC = 15.0 17.91



Well Completion Detail

Street Box
Diam. = N/A

Surveyed Dif.
Btwn. GS and
TOC



* Measuring Point is Below Ground Surface (bgs)

Total Depth from TOC = 13.50

WELL CONSTRUCTION LOG

Project 744.1902.1
Number 446538

Well
Number BH02

Drilling Summary

Total Depth of Hole: 15'
Hole Diameter: 2.25
Drilling Company: Drill Pro
Driller: Ro
Rig Type: Direct Push
Bits: Solid Core
Geologist: D. Puchrik

Time Log

	Start		Finish	
	Date	Time	Date	Time
Drilling:	6/10/19	1100	6/10/19	1120
Well Completion:	6/16/19	1120	6/16/19	1130
Grouting:	6/16/19	1130	6/16/19	1140

Depth to Water (Below TOC)

Depth: 7.95 Date: 6/16/19 Time: 1415

Well Construction Materials

	Grout	Seals	Filter
Quantity:	<u>50 lbs</u>	<u>50 lbs</u>	<u>10/20 silica</u>
Type:	<u>bentonite</u>	<u>bentonite</u>	<u>50 lbs</u>

	Screen	
Size:	<u>10'</u>	Config.: <u>10 Slot</u>
Area/Ft.:		Comp.: <u>PVC</u>
Inside Diam.:	<u>1.1'</u>	Outside Diam.: <u>Sch 40</u>

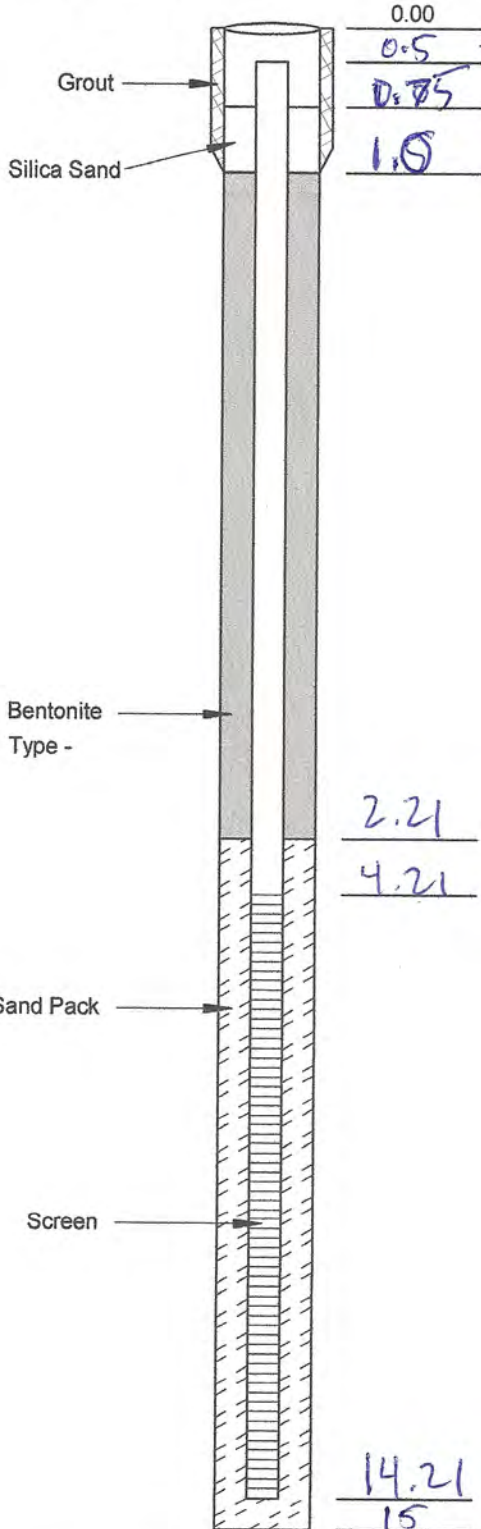
Comments



Well Completion Detail

Street Box
Diam. = N/A

Surveyed Dif.
Btwn. GS and
TOC



* Measuring Point is Below Ground Surface (bgs)

Total Depth from TOC = 13.71

WELL CONSTRUCTION LOG

Project 744.1902.1
Number 446538

Well
Number B403

Drilling Summary

Total Depth of Hole: 15'
Hole Diameter: 2.25
Drilling Company: Drill Pro
Driller: Ron
Rig Type: Direct Push
Bits: Solid Core
Geologist: D. Puchrik

Time Log

	Start		Finish	
	Date	Time	Date	Time
Drilling:	6/10/19	1215	6/10/19	1230
Well Completion:	6/10/19	1230	6/10/19	1240
Grouting:	6/10/19	1240	6/10/19	1250

Depth to Water (Below TOC)

Depth: 8.71 Date: 6/10/19 Time: 1350

Well Construction Materials

	Grout	Seals	Filter
Quantity:		<u>50</u>	<u>50</u>
Type:		<u>bent</u>	<u>10/20</u>

	Screen	
Size:	<u>10'</u>	Config.: <u>10 Slot</u>
Area/Ft.:		Comp.: <u>PVC</u>
Inside Diam.:	<u>1 1/4</u>	Outside Diam.: <u>Sch 40</u>

Comments

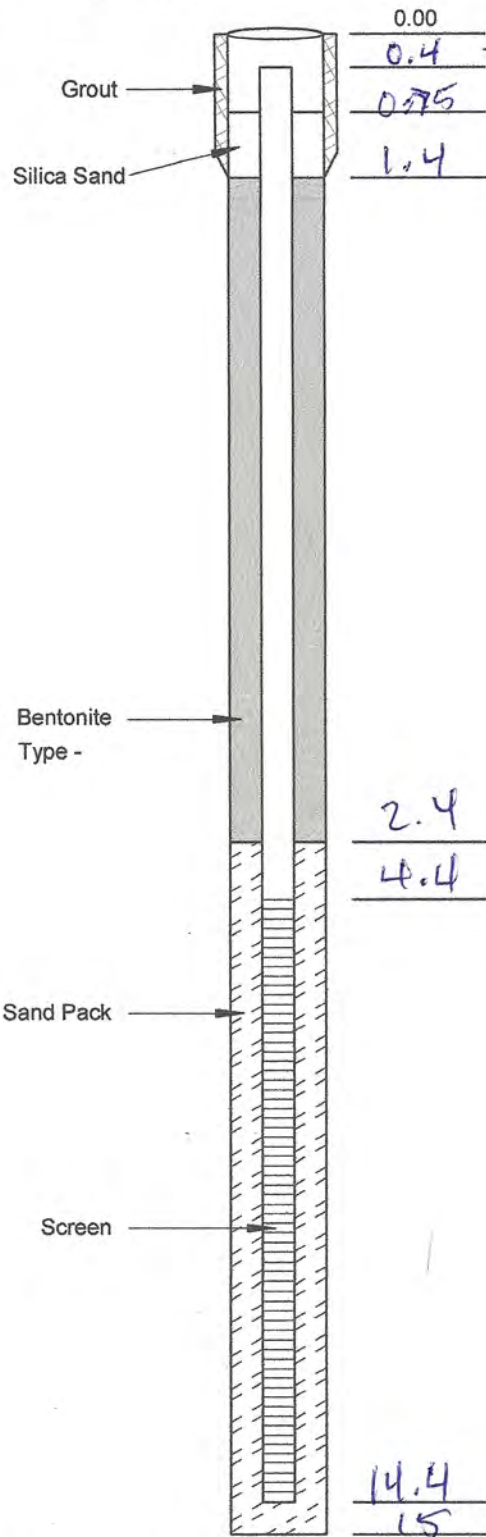


WELL CONSTRUCTION LOG

Well Completion Detail

Street Box
Diam. = N/A

Surveyed Dif.
Btwn. GS and
TOC



* Measuring Point is Below Ground Surface (bgs)

Project 744.1902.1
Number 446538

Well
Number B404

Drilling Summary

Total Depth of Hole: 15
Hole Diameter: 2.25
Drilling Company: Drill Pro
Driller: Ron
Rig Type: Direct Push
Bits: Solid Core
Geologist: D. Puchrik

Time Log

	Start		Finish	
	Date	Time	Date	Time
Drilling:	6/10/19	1200	6/10/19	1245
Well Completion:	6/10/19	1215	6/10/19	1230
Grouting:	6/10/19	1230	6/10/19	1245

Depth to Water (Below TOC)

Depth: 8.26 Date: 6/10/19 Time: 1430

Well Construction Materials

	Grout	Seals	Filter
Quantity:		<u>50</u>	<u>50</u>
Type:		<u>bent</u>	<u>10/20</u>

	Screen	
Size:	<u>10</u>	Config.: <u>10 Slot</u>
Area/Ft.:		Comp.: <u>PVC</u>
Inside Diam.:	<u>4.1</u>	Outside Diam.: <u>Sch 40</u>

Comments

Total Depth from TOC = 14.00



SOIL BORING LOG

Project Number 744.1902.1
446538

Boring Number BH05

Sheet 1 of 1

← Boring Location Sketch

Project Hiner 36 Pad Location N 16th Ave., N 23rd Ave Greeley, CO

Drilling Method & Equipment Direct Push Drilling Contractor Drill Pro

Date 7/9/19 Water Level ~14' Start 1400 Finish 1415 Logger David Puchrik

Depth Below Surface	Sample			Standard Penetration Test Results 6"/6"/6"/6"	Soil Description USCS Group Symbol, Name, Gradation or Plasticity, Particle Size Distribution, Color, Moisture Content Relative Density or Consistency, Soil Structure, Mineralogy, Stain or Odor	Symbol of USCS Log	Staining	PID Readings (ppm)	PID Reading Depths (bgs)
	Interval	Depth/Time	Recovery						
5				N/A	Pothole to 6'			N/A	
					0-3.5' pebbles, cobbles	5m		0.8	5
					No recovery with hand auger.				
10					4'-6.5' brown silty sand with Fe/CaCO ₃ , slightly moist, no stain/no odor			2.1	
					6.5'-11' dark brown clay with CaCO ₃ , moist stiff, no stain/odor			1.3	10
15					11'-12' poorly graded gravels with sand.			2.4	15
					12'-14' same as			1.1	
20					14'-20' same as except saturated, limited staining at 14'				20
25									25
30									30
35									35
Total Depth(s) = <u>20'</u>				Soil Sample(s): <u>BH05 @ 13.5-14.0</u> Rationale <u>staining High PID</u>			Additional Information:		



SOIL BORING LOG

← Boring Location Sketch

Project Number
744.1902.1
446538

Boring Number
BH06

Sheet
1 of 1

Project Hiner 36 Pad Location N 16th Ave., N 23rd Ave Greeley, CO

Drilling Method & Equipment Direct Push Drilling Contractor Drill Pro

Date 7/9/19 Water Level ~8.5 Start 1335 Finish 1355 Logger David Puchrik

Depth Below Surface	Sample			Standard Penetration Test Results 6"/6"/6"/6"	Soil Description USCS Group Symbol, Name, Gradation or Plasticity, Particle Size Distribution, Color, Moisture Content Relative Density or Consistency, Soil Structure, Mineralogy, Stain or Odor	Symbol of USCS Log	Staining	PID Readings (ppm)	PID Reading Depths (bgs)
	Interval	Depth/Time	Recovery						
5	1236			N/A	Pothole to 6' 2' brown silty sand, slightly moist, FE/CACO ₃ pockets, no stain, no odor 4' cobbles. Punch through with geoprobe. 4.5' Dark gray (moist from pitholing) clayey sand and gravel, 6-7' same as above 8-11 poorly graded sands no stain, no odor, loose, saturated at 10' 11-16 poorly graded gravels with sands - med to coarse no stain/no odor. Sands coarsens with depth.	SM GC SP GP		3.1 @ 2' 2.1 @ 4' 2.1 @ 10' 2.2 @ 15' 2.2 @ 20'	5

Total Depth(s) =

16'

Soil Sample(s):

BH06 @ 2'
1230

Rationale

High PIP

Additional Information:



SOIL BORING LOG

Project Number
744.1902.1
446538

Boring Number
BH07

Sheet
1 of 1

← Boring Location Sketch

Project Hiner 36 Pad Location N 16th Ave., N 23rd Ave Greeley, CO

Drilling Method & Equipment Direct Push Drilling Contractor Drill Pro

Date 7/19/19 Water Level 28.5 Start 1315 Finish 1330 Logger David Puchrik

Depth Below Surface	Sample			Standard Penetration Test Results	Soil Description USCS Group Symbol, Name, Gradation or Plasticity, Particle Size Distribution, Color, Moisture Content Relative Density or Consistency, Soil Structure, Mineralogy, Stain or Odor	Symbol of USCS Log	Staining	PID Readings (ppm)	PID Reading Depths (bgs)
	Interval	Depth/Time	Recovery						
				6"/6"/6"/6"					
5				N/A	Pothole to 6'	GC		6.7C	
					2' - Clay with gravel and sand, brown to grey. No odor or stain. Gravel angular to 1", moist from potholing	SM		5.1C	5
10		1325			4' silty sand, brown, slightly moist, trace gravels to 2.5", no stain or odor	SP		2.5C	
					6-7 same as above			2.1C	10
15					7-11 Dark/black stained poorly sorted sands - moist	GP		2.1C	
					At 8' no staining and saturated, loose.			2.3C	15
20					11-16' poorly graded gravel with sands - med to coarse, gravels to 3", no stain				
25									25
30									30
35									35
Total Depth(s) = <u>16'</u>				Soil Sample(s): <u>BH07 @ 2.5-8.0' 1325</u>		Rationale: <u>Staining</u>		Additional Information:	

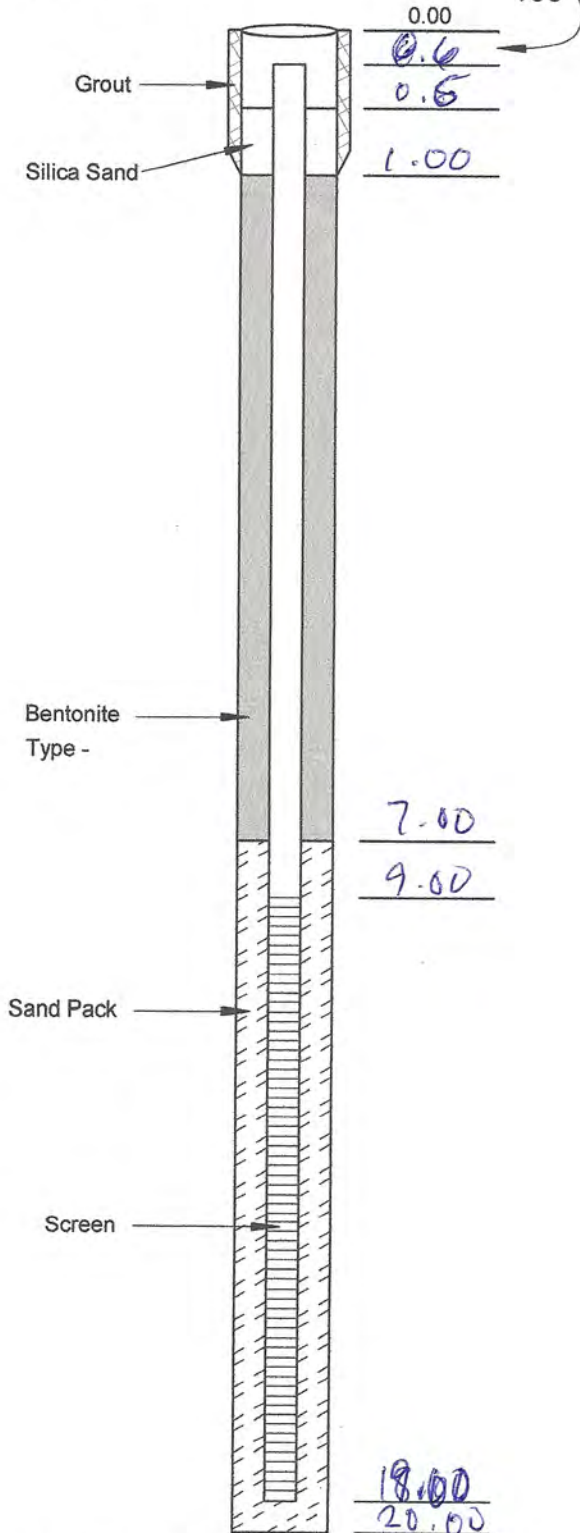


WELL CONSTRUCTION LOG

Well Completion Detail

Street Box
Diam. = N/A

Surveyed Dif.
Btwn. GS and
TOC



Project 744.1902.1
Number 446538

Well
Number BH05

Drilling Summary

Total Depth of Hole: 20.0
Hole Diameter: 2-25
Drilling Company: Drill Pro
Driller: Terrance
Rig Type: Direct Push
Bits: Solid Core
Geologist: D. Puchrik

Time Log

	Start		Finish	
	Date	Time	Date	Time
Drilling:	7/6/19	1400	7/6/19	1415
Well Completion:	7/6/19	1400	7/6/19	1425
Grouting:	7/6/19	1445	7/6/19	1500

Depth to Water (Below TOC)

Depth: 12.10 Date: 7/9/19 Time: 1445

Well Construction Materials

	Grout	Seals	Filter
Quantity:	<u>50</u>	<u>260</u>	<u>150</u>
Type:	<u>Quickcrete</u>	<u>bent</u>	<u>10/20</u>

	Screen	
Size:	<u>10'</u>	Config.: <u>10 Slot</u>
Area/Ft.:	<u>.04</u>	Comp.: <u>PVC</u>
Inside Diam.:	<u>1"</u>	Outside Diam.: <u>Sch 40</u>

Comments

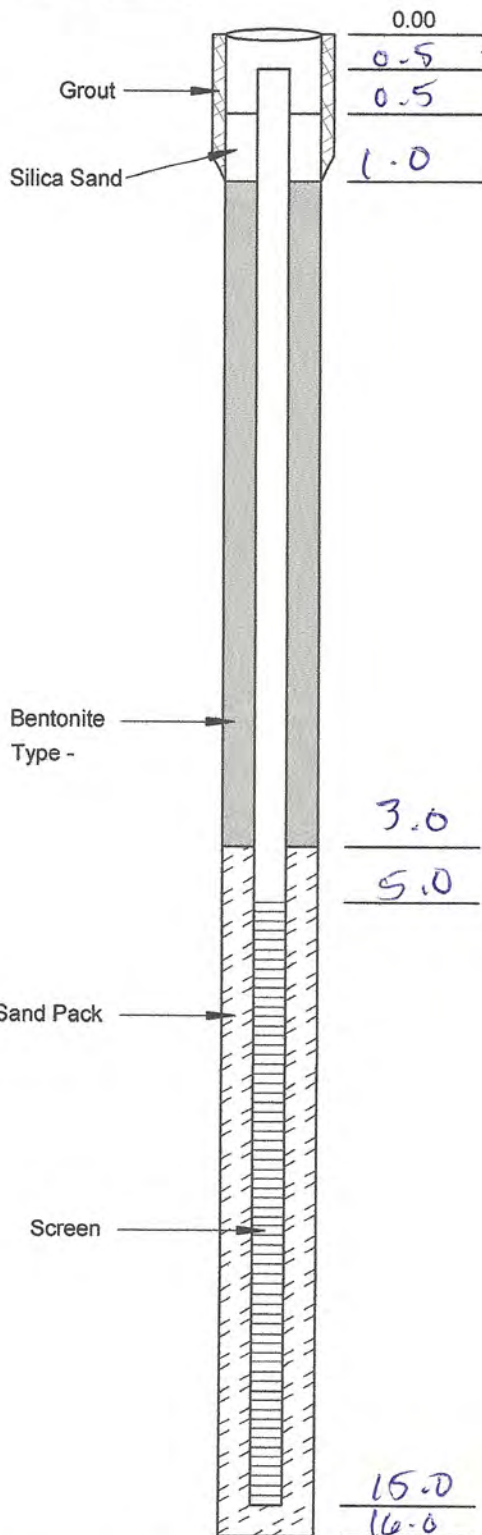
Total Depth from TOC = 18.60



Well Completion Detail

Street Box
Diam. = N/A

Surveyed Dif.
Btwn. GS and
TOC



* Measuring Point is Below Ground Surface (bgs)

Total Depth from TOC =

14.5

WELL CONSTRUCTION LOG

Project 744.1902.1
Number 446538

Well
Number BH06

Drilling Summary

Total Depth of Hole: 16.0

Hole Diameter: 2.25

Drilling Company: Drill Pro

Driller: Terraviva

Rig Type: Direct Push

Bits: Solid Core

Geologist: D. Puchrik

Time Log

	Start		Finish	
	Date	Time	Date	Time
Drilling:	7/9/19	1335	7/9/19	1355
Well Completion	7/9/19	1345	7/9/19	1400
Grouting:	7/9/19	1430	7/9/19	1445

Depth to Water (Below TOC)

Depth: 9.22 Date: 7/9/19 Time: 1440

Well Construction Materials

	Grout	Seals	Filter
Quantity:	<u>50</u>	<u>60</u>	<u>75</u>
Type:	<u>Acidcure</u>	<u>bent</u>	<u>10/20</u>

	Screen	
Size:	<u>10'</u>	Config.: <u>10 Slot</u>
Area/Ft.:	<u>.04</u>	Comp.: <u>PVC</u>
Inside Diam.:	<u>1"</u>	Outside Diam.: <u>Sch 40</u>

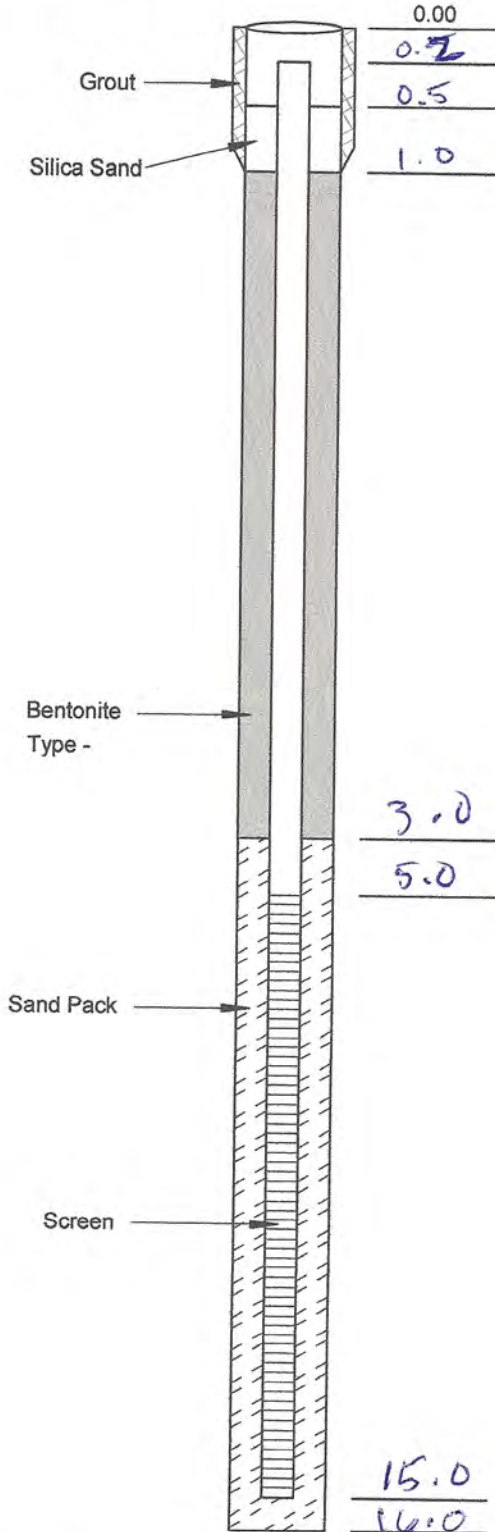
Comments



Well Completion Detail

Street Box
Diam. = N/A

Surveyed Dif.
Btwn. GS and
TOC



* Measuring Point is Below Ground Surface (bgs)

Total Depth from TOC = 14.20

WELL CONSTRUCTION LOG

Project 744.1902.1
Number 446538

Well
Number B-107

Drilling Summary

Total Depth of Hole: 16.0

Hole Diameter: 2.25

Drilling Company: Drill Pro

Driller: Terrance

Rig Type: Direct Push

Bits: Solid Core

Geologist: D. Puchrik

Time Log

	Start		Finish	
	Date	Time	Date	Time
Drilling:	7/6/19	1315	7/6/19	1330
Well Completion:	7/6/19	1330	7/6/19	1345
Grouting:	7/6/19	1415	7/6/19	1430

Depth to Water (Below TOC)

Depth: 7.60 Date: 7/9/19 Time: 1435

Well Construction Materials

	Grout	Seals	Filter
Quantity:	<u>50</u>	<u>60</u>	<u>75</u>
Type:	<u>Quickcrete</u>	<u>bent</u>	<u>10/20</u>

	Screen	
Size:	<u>10</u>	Config.: <u>10 Slot</u>
Area/Ft.:	<u>.04</u>	Comp.: <u>PVC</u>
Inside Diam.:	<u>1"</u>	Outside Diam.: <u>Sch 40</u>

Comments

