

received 03/07/2016  
Project 9549  
Spill 2232617  
Facility 103144  
Document 2525952

## Appendix A

### Boring Logs

Location Map:



Compliance, Engineering, Remediation  
 LT Environmental, Inc.  
 4400 West 46th Ave.  
 Denver, Colorado 80212

## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number:	SB01	Project:	Limited Phase II
Date:	3/13/13	Project Number:	0142-13053.003
Logged By:	Andy Verbonitz	Drilled By:	ACI
Drilling Method:	GeoProbe Direct Push	Sampling Method:	Continuous
Gravel Pack:	10-20 SILICA SAND	Seal:	Bentonite
Casing Type:	PVC - sch 40	Grout:	NA
Screen Type:	PVC - sch 40 Slot: 0.010	Hole Diameter:	2.25"
		Depth to Liquid:	—
		Total Depth:	23'
		Depth to Water:	—

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
Soft	Moist	0	none		0	not recovered		0'-2'	
		0			2			not recovered	
		0			4		CL	2'-6.5'	
		0			6			clay, w/ fine sand, tan to brown, moist, no stain/odor moderately cohesive	
		0			8			6.5'-11'	
		0			10			clay, minor silt, grey, moist, no stain/odor low cohesiveness, red Fe staining + CaCO <sub>3</sub> fishers	
		0			12		CL	11'-14.5'	
		0			14			Same as above w/ less cohesiveness, blocky, weathered	
		0			16		SM	14.5'-17'	
		0			18		SP	clayey silt, grey, moist, no stain/odor, grey w/ Fe stain	
		0			20			17'-23'	
		0			22	not recovered		sand, very fine, tan & brown with red Fe staining, minor silt, no stain/odor, moist refusal @ 23', can't sample from 20-23' (not recoverable)	
		0			24	refusal			
		0			26				
		0			28				
		0			30				

SB01 @ 20' - 8:30  
 SB01 GW - Ary - 11:50



Location Map:



Compliance, Engineering, Remediation  
LT Environmental, Inc.  
4400 West 46th Ave.  
Denver, Colorado 80212

see SBO1

Helgoth Heirs Unit #1

## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number:	SBO2	Project:	Limited Phase II
Date:	3/13/13	Project Number:	0142-13053.003
Logged By:	Andy Verbonitz	Drilled By:	ACI
Elevation:		Drilling Method:	GeoProbe Direct Push
Detector:	MiniRae 2000 PID	Sampling Method:	Continuous
Gravel Pack:	14-20 SILICA SAND	Seal:	Bentonite
Casing Type:	PVC - sch 40	Grout:	NA
Screen Type:	PVC - sch 40 Slot: 0.010	Hole Diameter:	2.25"
		Depth to Liquid:	---
		Diameter:	1"
		Length:	10'
		Total Depth:	24'
		Depth to Water:	22'

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
Soft	moist	0	none		0		SC	0'-2' fine sandy clay, moist, brown, no stain/odor, low cohesiveness	
↓	↓	0	↓		2		CL	2'-6' silty clay, moist, brownish grey, no stain/odor, moderate cohesiveness	
hard	↓	230	grey HC staining		4		CL		
↓	↓	628		SBO2@ 9:20	6	partial recovery	SC	6'-10.5' fine sandy clay, moist, grey w/ HC staining + odor, very hard, (crushed liners)	
very hard	↓	450		9:10	8		SC/SP		
↓	dry	320	none		10		SP	10.5'-15' fine sandy clay, slightly moist, no stain, HC odor, tan	
↓	↓	850	grey stain	SBO2@ 17:20	12		CL	15'-20' fine sand, tan to brown, HC odor, no staining, dry, hard,	
↓	↓	32.5		9:20	14		CL	20'-22' sand very fine, brown, wet, no stain, HC odor	
↓	↓	241	minor HC stain		16		CL	22'-24' clay brown to tan, moist, minor HC stain + odor	
↓	↓	206			18		refusal		
↓	↓				20				
↓	↓				22				
↓	↓				24				
↓	↓				26				
↓	↓				28				
↓	↓				30				

SBO2 GW - 12:05



Location Map:

see SBO1



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Denver, Colorado 80212

**BORING LOG/MONITORING WELL COMPLETION DIAGRAM**

Boring/Well Number: **SBO3** Project: **Limited Phase II**

Date: **3/13/13** Project Number: **0142-13053.003**

Logged By: **Andy Verbonitz** Drilled By: **ACI**

Elevation: Helgoth Heirs Unit #1  
Detector: MiniRae 2000 PID

Drilling Method: GeoProbe Direct Push  
Sampling Method: Continuous

Gravel Pack: **10-20 SILICA SAND**

Seal: **Bentonite**

Grout: **NA**

Casing Type: **PVC - sch 40**

Diameter: **1"** Length: **10'**

Hole Diameter: **2.25"**

Depth to Liquid: **-**

Screen Type: **PVC - sch 40 0.010**

Diameter: **1"** Length: **15'**

Total Depth: **23'**

Depth to Water: **~ 21'**

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
soft	Moist	0	none		0			0'-4.5'	
↓	↓	0	↓		2		SC	clayey silt w/ fine sand in top 1.5', light brown, dry, no stain/odor, low cohesiveness	
hard	dry	0			4		CL		
↓	↓	0			6			4.5'-9'	
↓	moist	0			8			silty clay, grey, dry, CaCO <sub>3</sub> fishers and red Fe staining starting 8', low cohesiveness, no stain/odor	
↓	↓	0			10				
very hard		no recovery			12	not recovered / crushed liner		14'-18'	
↓					14			clay, tan w/ red Fe staining, moist, interbedded fine sands 1-2" thick, no stain, no odor	
hard		0.15			16		CL/SP		
↓			minor		18			18'-19'	
↓		10.5			20			same but w/ minor staining and HC odor	
↓		518		SBO3, @19	22		SP	19'-23'	
↓	wet			10:30 GW	22			fine sand, tan to brown w/ red Fe stain, HC odor, minor HC staining	
very hard		619			24	refusal		refusal @ 23'	
					26				
					28				
					30				

SBO3GW - Product  
18:45



Location Map:



Compliance | Engineering | Remediation  
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See S801

Helgoth Heirs Unit #1

## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number:	S804	Project:	Limited Phase II
Date:	3/13/13	Project Number:	0142-13053.003
Logged By:	Andy Verbonitz	Drilled By:	ACI
Elevation:	—	Drilling Method:	GeoProbe Direct Push
Detector:	MiniRae 2000 PID	Sampling Method:	Continuous
Gravel Pack:	10-20 SILICA SAND	Seal:	Benite
Casing Type:	PVC	Grout:	NA
Screen Type:	PVC	Diameter:	1"
Slot:	0.010	Length:	15'
		Hole Diameter:	2.25"
		Depth to Liquid:	—
		Total Depth:	24'
		Depth to Water:	22'

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
firm	moist	0	none		0		CL	0-2'	
		0			2		SC	clay, dark brown, moist, no stain/odor, moderate cohesiveness.	
		0			4		CL	2'-4.5'	
hard		0.11			6			clayey silt, tan, dry, no stain, no odor	
		0.23			8			4.5'-11'	
		0			10			clay, grey, dry, CaCO <sub>3</sub> fishers, no cohesiveness, no stain/odor	
		0			12			11'-18'	
		0			14			same but w/ no CaCO <sub>3</sub> and abundant Fe	
		0			16			18'-21'	
		0			18			same but w/ fine sand layers 1-2" thick	
		375			20			21-24'	
		485			22		CL/SP	same clay as above with fine sand layers 0.75" thick, sands have HC stain + odor	
					24			24' TD	
					26				
					28				
					30				

S804 GW - Product  
 19:00



Location Map:



Compliance Engineering Remediation  
LT Environmental, Inc.  
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Denver, Colorado 80212

see 5801

Helgoth Heirs Unit #1

## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number:	SB05	Project:	Limited Phase II
Date:	3/13/13	Project Number:	6142-13053.003
Logged By:	Andy Verbonitz	Drilled By:	ACI
Drilling Method:	GeoProbe Direct Push	Sampling Method:	Continuous
Gravel Pack:	10-20 SILICA SAND	Seal:	Benlate
Casing Type:	PVC - sch 40	Hole Diameter:	2.25"
Screen Type:	PVC - sch 40	Length:	15'
Slot:	0.010	Total Depth:	24'
		Depth to Liquid:	—
		Depth to Water:	22'

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
firm	Moist	0.12	none		0		CL	0'-4'	
					2			clay, tan to brown, moist, no stain/odor, moderate cohesiveness	
	dry	0			4			4'-11'	
hard					6			clay, grey w/ CaCO <sub>3</sub> spherules, dry, low cohesiveness, no stain, no odor	
		0.20			8				
	moist	0			10			11'-13'	
		0			12		SP	sand, very fine, red Fe stain, no HC stain/odor, brown, moist	
		0			14		CL	13'-15'	
			black in spots		16		SP	clay, reddish brown, moist, low cohesiveness, no stain/odor	
	wet to moist	79.4			18	partial recovery	CL	15'-16'	
	moist	22.6			20		SP	sand, very fine, brown w/ black HC stain and odor, moist to wet	
		22.4		SB05 @ 21'	22			16'-19'	
		23.7		12:00	24			clay, reddish brown, moist, HC odor, minor stain, low cohesiveness	
	wet	23.2			26			19'-24'	
					28			sand very fine, brown with grey HC stain and odor, wet at 22'	
					30				

SB05 GW - 12:40



Location Map:



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see SB01

Helgoth Heirs Unit #1

## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: SB06

Project: phase II

Date: 3/13/13

Project Number: 6142-13053.003

Logged By: Andy Verbonitz

Drilled By: ACI

Elevation:

Detector:

MiniRae 2000 PID

Drilling Method:

GeoProbe Direct Push

Sampling Method:

Continuous

Gravel Pack:

10-20 SILICA SAND

Seal:

Bentonite

Grout:

NA

Casing Type:

PVC

Diameter: 1"

Length: 10'

Hole Diameter:

2.25"

Depth to Liquid:

Screen Type:

PVC

Slot:

0.010

Diameter: 1"

Length: 15'

Total Depth:

24

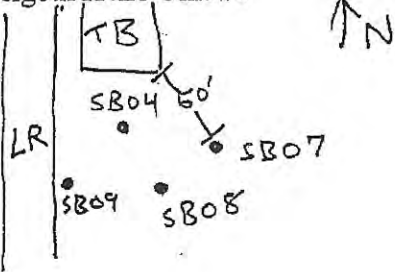
Depth to Water:

22'

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
Soft	Moist	0	none		0			0'-6'	
	↓	0			2		CL	clay, tan, dry below 2', no stain/odor, low cohesion	
	↓	0			4			6'-11'	
hard	↓	0			6			clay, grey w/ CaCO <sub>3</sub> fishers and Fe red, no HC stain/odor	
	↓	0			8			11'-12.5'	
	↓	0			10			clay, reddish brown, dry, moderately cohesive, no HC stain/odor	
	↓	0			12			12.5'-17'	
	↓	0			14		SP	sand, very fine, moist @ 15', reddish brown, no HC stain/odor	
	↓	0			16			17'-18.5'	
	↓	0			18		SM	clay w/ fine sand, tan to reddish brown, moist,	
	↓	0			20		SP	18.5'-24'	
	↓	76.35		SB06 @ 21'	22			fine sand, tan, moist, no HC stain/odor, units 11	
	↓	10.53		13105	24			20'-HC odor	
	↓				26		ref	TD=24' refusal	
	↓				28				
	↓				30				



Location Map: Helgoth Heirs Unit #1



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**LT Environmental, Inc.**  
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 Denver, Colorado 80212

**BORING LOG/MONITORING WELL COMPLETION DIAGRAM**

Boring/Well Number: <b>SB07</b>	Project: <b>Limited Phase II</b>
Date: <b>3/15/2013</b>	Project Number: <b>14213053.003</b>
Logged By: <b>Andy Verbonitz</b>	Drilled By: <b>ACI</b>
Drilling Method: <b>GeoProbe Direct Push</b>	Sampling Method: <b>Continuous</b>
Seal: <b>Bentonite</b>	Grout: <b>NA</b>

Elevation:	Detector: <b>MiniRae 2000 PID</b>	Diameter: <b>1"</b>	Length: <b>13'</b>	Hole Diameter: <b>2.25"</b>	Depth to Liquid: <b>-</b>
Gravel Pack: <b>10-20 SILICA SAND</b>	Screen Type: <b>PVC</b>	Slot: <b>0.010</b>	Diameter: <b>1"</b>	Length: <b>15'</b>	Total Depth: <b>27'</b>
Casing Type: <b>PVC</b>					Depth to Water: <b>25'</b>

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
Soft	moist	0	none		0		SC	0'-4'	
		0			2			clayey silt, light brown, low cohesiveness, moist, no stain/odor	
		0			4		CL	4'-11'	
Firm	dry	0			6			fine sandy clay, light brown to grey w/ CaCO <sub>3</sub> + red Fe staining, dry, no HC stain/odor, low cohesiveness	
		0			8				
hard		0			10			11'-15'	
	moist	0			12			same but w/ silts + moist	
		0			14			15'-19'	
very hard		0			16		SP	sand f-fine w/ silt, light brown, red Fe staining, moist, no stain/odor	
		0			18			19'-21'	
		0			20		CL	clay, grey w/ red Fe stain, slightly moist, moderate cohesiveness, no stain/odor	
		0			22		SP	21'-25'	
		0			24			same as 15-19'	
	wet	0			26		CL	25'-TD	
refuse		0			28			clay, reddish grey, moist, no stain/odor, moderate cohesiveness	
					30				

SB07 @ 23' 11:30

GW

ref use

SB07GW - silty, no odor  
 1 uoa 15:15



Location Map: Helgoth Heirs Unit #1



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see  
 SB 07

**BORING LOG/MONITORING WELL COMPLETION DIAGRAM**

Boring/Well Number: <b>SB08</b>	Project: <b>Limited Phase II</b>
Date: <b>3/15/2013</b>	Project Number: <b>14213053.003</b>
Logged By: <b>Andy Verbonitz</b>	Drilled By: <b>ACI</b>
Drilling Method: <b>GeoProbe Direct Push</b>	Sampling Method: <b>Continuous</b>
Seal: <b>Bentonite</b>	Grout: <b>NA</b>
Gravel Pack: <b>10-20 SILICA SAND</b>	
Casing Type: <b>PVC</b>	Diameter: <b>1"</b> Length: <b>15'</b> Hole Diameter: <b>2.25"</b> Depth to Liquid: <b>-</b>
Screen Type: <b>PVC</b> Slot: <b>0.010</b>	Diameter: <b>1"</b> Length: <b>10'</b> Total Depth: <b>22'</b> Depth to Water: <b>-</b>

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
soft	moist	0	none		0		SC	0'-6'	
		0			2			clayey silt, tan to light brown	
		0			4			dry @ 4', low cohesiveness,	
		0			6		CL	no stain/odor	
		0			8			6'-11'	
		0			10			clay w/ sand vf, reddish	
		0			12			grey, dry, low cohesiveness,	
		0			14			no stain/odor	
		0			16			11'-15'	
		0			18			clay, grey w/ red Fe stain,	
		0			20		SP	slightly moist, low cohesiveness,	
		0			22		CL	no stain/odor, CaCO <sub>3</sub> fishers	
		0			24		SP	15'-18'	
		0			26		CLS	same but w/ out CaCO <sub>3</sub>	
		0			28			fishers, 1-2 cm thick silty	
		0			30			zones	
		0						18'-19'	
		0						sand vf-f, light brown, moist,	
		0						19'-20', no stain/odor	
		0						clay - same as 15-18'	
		0						20'-21.5'	
		0						sand vf-f, light brown, moist,	
		0						no stain/odor	
		0						21.5'-22'	
		0						clay stone	



Location Map: Helgoth Heirs Unit #1



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see  
SB09

# BORING LOG/MONITORING WELL COMPLETION DIAGRAM

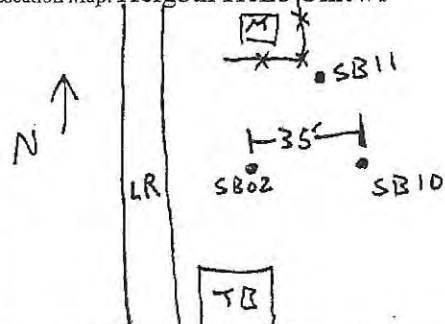
Boring/Well Number:	SB09	Project:	Limited Phase II
Date:	3/15/2013	Project Number:	14213053.003
Logged By:	Andy Verbonitz	Drilled By:	ACI
Elevation:	—	Drilling Method:	GeoProbe Direct Push
Detector:	MiniRae 2000 PID	Sampling Method:	Continuous
Gravel Pack:	10-20 SAND	Seal:	Bentonite
Casing Type:	PVC	Grout:	NA
Screen Type:	PVC	Diameter:	1"
Slot:	0.010	Length:	15'
		Hole Diameter:	2.25"
		Depth to Liquid:	—
		Total Depth:	29'
		Depth to Water:	26'

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
firm	moist	0	none		0			0'-4.5'	
↓	↓	0	↓		2		SC	clayey silt, dark to light brown, dry at 3', no HC stain/odor	
↓	dry	0	↓		4				
hard	↓	0	↓		6		CL	4.5'-9.5' clay, grey w/ abundant CaCO <sub>3</sub> , low cohesiveness, dry, no stain/odor	
↓	↓	0	↓		8				
↓	↓	0	↓		10				
↓	↓	0	↓		12			9.5'-20.5' same but w/ less CaCO <sub>3</sub> and some Fe staining, moderately cohesive	
↓	↓	0	↓		14				
↓	↓	0	↓		16			20.5'-23' sand w/ f, reddish grey, moist HC odor + staining (black)	
↓	↓	0	↓		18				
↓	↓	0	↓		20			23'-24' clay w/ fine sand, light brown w/ HC stain + odor, moderately cohesive	
↓	↓	0	↓		22		SP		
↓	↓	0	↓		24		CL	24'-27' same as 20.5'-23'	
↓	↓	0	↓		26		SP		
↓	↓	0	↓		28		CLS	27'-29' clay stone, reddish grey, black staining + odor, very hard	
↓	↓	0	↓		30				

SB09GW-19:20  
1000 odor, sheen



Location Map: Helgoth Heirs Unit #1



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Denver, Colorado 80212

### BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number:	SB10	Project:	Limited Phase II				
Date:	3/15/2013	Project Number:	14213053.003				
Logged By:	Andy Verbonitz	Drilled By:	ACI				
Drilling Method:	GeoProbe Direct Push	Sampling Method:	Continuous				
Seal:	Bentonite	Grout:	NA				
Diameter:	1"	Length:	15'	Hole Diameter:	2.25"	Depth to Liquid:	-
Diameter:	1"	Length:	15'	Total Depth:	27'	Depth to Water:	25'

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
Soft	Moist	0	none		0		CL	0'-7'	
↓	↓	0			2			silty clay, tan to light brown, dry @ 2', low cohesiveness, no stain/odor	
Hard	dry	0			4				
↓	↓	0			6			7'-11'	
Very Hard	↓	0			8		SP/CL	Sand v-f-fine, tan to light brown with interbedded clay 1-4" thick, grey, dry, no stain or odor	
	moist	0			10				
		0			12		CL	11'-15.5'	
		0			14			clay, grey w/ red Fe staining, dry, interbedded w/ fine sands 0.5' thick - slightly moist, tan, no stain/odor	
		0			16		SA	15.5'-27'	
		0.40			18			Sand v-f-f, tan to light brown, minor Fe staining, moist, no stain/odor	
		0			20				
		0			22			TA - 27' - refusal	
		0			24				
		0			26			SB10 GW - 14:05	
		0			28			silty, no odor	
		0			30				



Location Map: Helgoth Heirs Unit #1



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see  
 SB10

**BORING LOG/MONITORING WELL COMPLETION DIAGRAM**

Boring/Well Number: <b>SB11</b>	Project: <b>Limited Phase II</b>
Date: <b>3/15/2013</b>	Project Number: <b>14213053.003</b>
Logged By: <b>Andy Verbonitz</b>	Drilled By: <b>ACI</b>
Drilling Method: <b>GeoProbe Direct Push</b>	Sampling Method: <b>Continuous</b>
Seal: <b>Bentonite</b>	Grout: <b>NA</b>
Gravel Pack: <b>10-20 SILICA SAND</b>	
Casing Type: <b>PVC</b>	Diameter: <b>1 1/4"</b> Length: <b>15'</b>
Screen Type: <b>PVC</b> Slot: <b>0.010</b>	Diameter: <b>1 1/4"</b> Length: <b>10'</b>
	Hole Diameter: <b>2.25"</b> Depth to Liquid: <b>-</b>
	Total Depth: <b>24'</b> Depth to Water: <b>-</b>

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
firm	moist		none		0			0'-2' not recovered	
					2			2'-7.5'	
					4		CL	clay grey is brown, moist, high cohesiveness, no stain/odor	
					6			7.5'-11'	
					8		SP	sand vf-f w/ minor clay, moist, grey to light brown w/ Fe staining, no stain or odor	
					10			11'-13.5'	
					12		CL	clay w/ fine sand, reddish brown interbedded with fine sands 2-4" thick, clays are dry, low cohesiveness, no HC stain/odor	
					14		SP	13.5'-20'	
					16			sand vf-f, w/ some clay, tan to light brown, no HC stain or odor, dry	
					18			20'-24' not recovered, jammed liner	
					20				
					22				
					24				
					26				
					28				
					30				



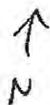
Location Map:



5812

5812

45'



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## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: 5812 Project: Helgata Water UT #1

Date: 4/3/03 Project Number: 0142 17057.001

Logged By: PH Drilled By: ACE

Elevation: N/A Detector: PID Drilling Method: Direct Push Sampling Method: Continuous

Gravel Pack: Silica Sand Seal: Bentonite Grout: N/A

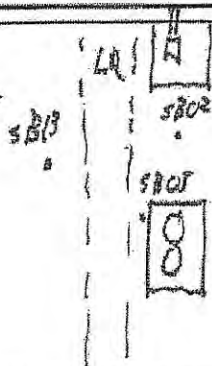
Casing Type: PVC Diameter: 1" Length: 7.5' Hole Diameter: 2" Depth to Liquid: 17.5'

Screen Type: PVC Slot: 0.010" Diameter: 1" Length: 10' Total Depth: 17.5' Depth to Water: 17.5'

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
low	low	0.0	No		0			0-3 No recovery	
	Dry	0.0			2			3-5 No recovery	
		0.0			4			5-10' grey silty clays w/iron	
		0.0			6			U.F. sand stringers & low	
		0.0			8		CL	grading into grey 1/4" silty	
		0.0			10			clay from 8-10' No flow/odor	
		0.0			12			Fe discoloration noted.	
		0.0			14			10-15' grey silty w/iron discoloration	
		0.0			16			Notes: See U.F. Sand stringers w/low	
		0.0			18			thickness @ 12', 12.5' + 14' thick.	
		0.0			20			15-17 "	
		0.0			22			@ 16' fine sand moist tan	
		0.0			24			+16.5' 16.5' to 17.5'	
		0.0			26			fine clay dark brown moist @ 17'	
		0.0			28			Reford @ 17.5'	
		0.0			30				



Location Map:



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## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number:	SB 13	Project:	Wetzel's Heirs. UT #1
Date:	4/17/18	Project Number:	QW2 18057.008
Logged By:	PH	Drilled By:	ACT
Elevation:	N/A	Drilling Method:	Direct Push
Gravel Pack:	Silica Sand	Sampling Method:	Continuous
G casing Type:	PVC	Seal:	Bentonite
Screen Type:	PVC Slot 0.010"	Group:	—
		Diameter:	1" Length: 15'
		Hole Diameter:	2" Depth to Liquid: —
		Total Depth:	30'
		Depth to Water:	~ 22'

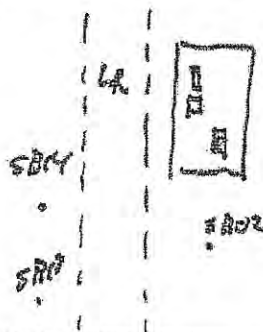
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
Low	Dry		NO		0			0-1.5 Dark brown sandy loam	
		0.0			2		CL	1.5-4' well brown silty clay	
					4			grading to grey silty clay	
		0.0			6			w/ white linear desiccation streaks @ 5'	
		0.0			8		CL	5'-10' grey silty clay	
		0.0			10			white lin. streaks silty	
		0.4			12			way to Fe thinning @ 7-10	
		1.1			14			10-15' grey silty clays with Fe dendritic	
		2.7			16			streaks throughout	
	moist	0.8			18			V. fine tan sands & silts @ 14-15'	
		152			20			V. fine tan sand @ 15-16'	
		4.6			22			14-15' grey silty clay	
		1250			24			15-17 grey silty clays	
		0.0			26			numerous V. fine sand stringers	
					28			@ 24-25' thick	
					30			17-20' " "	
								20-22' " "	
								w/ color & minor staining @	
								21-22'	
								22-25' "	
								streaks @ 21' & 2" thick	
								25-27'	

27-28 grey silty clay grading  
 to grey V. fine sand  
 27-28 NO Recovery



Location Map:

PH



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## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

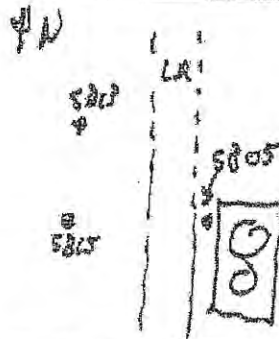
Boring/Well Number: **SB14** Project: **Holston Heins UT #1**  
 Date: **4/7/13** Project Number: **0142 17057.007**  
 Logged By: **PH** Drilled By: **ALL**

Elevation: **N/A** Detector: **PID** Drilling Method: **Direct Push** Sampling Method: **Continuous**  
 Gravel Pack: **Silica Sand** Seal: **Bentonite** Grout: **—**  
 Casing Type: **PVC** Diameter: **1"** Length: **10'** Hole Diameter: **2"** Depth to Liquid: **—**  
 Screen Type: **PVC** Slot: **0.010"** Diameter: **1"** Length: **20"** Total Depth: **70'** Depth to Water: **—**

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
mod	Dry	0.0	NO		0			0-1.5 sandy loam dark brown	
		0.0			2		CL	1.5-5' med brown sandy clay	
		0.0			4			grading to grey silty clay w/ white int. fragments	
		0.0			6		CL	5-10' grey silty clay w/ white	
		0.0			8		CL	Uniform structure throughout when Fe discoloration from 9-10	
		0.0			10		CL	10-12' " " " "	
		0.2			12		CL	Fe discoloration no int. fragments grey from 12-12.5'	
	moist	4.05	NO	SB14 014	14		SC	12-15' silty clay tan/med brown	
		1.0			16		CL	grading to U. fine sandy clay	
	moist	0.0			18		CL	10-15' upper silty clay @ 14'	
		0.0			20			13-18 inter bedded silty clays + sandy clays grey to med brown	
		0.1			22			18-21 " " " "	
		0.0			24			@ 20' 2" thick U. fine sandy tan sand	
		0.0			26			21-25 interbedded silty clays w/ tan U. fine sand shaly	
		0.0			28			in 0.5" grey w/ Fe discoloration	
		0.0			30			25-27' " " " "	
		0.0			32			27-30 " " " "	
		0.0			34			to light fat clay @ 29'	
		0.0			36			Refusal @ 30'	



Location Map:



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## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number:

S815

Project:

Helena Home UT#1

Date:

4/19/10

Project Number:

C162 13057.005

Logged By:

PH

Drilled By:

ACF

Elevation:

N/A

Detector:

PID

Drilling Method:

Direct Push

Sampling Method:

Continuous

Gravel Pack:

Silica Sand

Seal:

Bentonite

Grout:

—

Casing Type:

PVC

Diameter:

1"

Length:

10'

Hole Diameter:

2"

Depth to Liquid:

—

Screen Type:

PVC

Slot:

0.010"

Diameter:

1"

Length:

20'

Total Depth:

30'

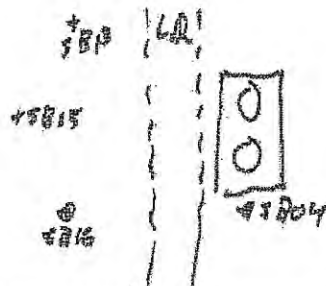
Depth to Water:

~22'

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
100	0.0	0.0	No		0		CL	1-1.8' sandy loam & dk brown	
	0.0	0.0			2		CL	1.5-8' silty clay with brn	
	0.0	0.0			4		CL	8-10' silty clays with brn	
	0.0	0.0			6		CL	greenish to grey interbedded	
	0.0	0.0			8		CL	sandy clay - silty clay with	
	0.0	0.0			10		CL	unimol/brown & tan clay	
	0.0	0.0			12		CL	10-12 " "	
	0.0	0.0			14		CL	12-17 U.F. grained sand tan	
	0.0	0.0			16		CL	brown clays	
	0.0	0.0			18		SM	18-19 interbedded grey	
	0.0	0.0			20		CL	silty clays & sandy clays	
	0.0	0.0			22		CL	Fe discoloration in various	
	0.0	0.0			24		CL	surfaces	
	0.0	0.0			26		CL	17-20 " "	
	0.0	0.0			28		CL	20-22' silty clay	
	0.0	0.0			30		CL	with grey staining 21-22'	
	10.1	578						22-25 silty clay 2" track	
	578	840						and staining @ 22' black	
	840							staining	
	?	?						25'-29' Not Recovered	
								Crushed Sample Steel	
								Rebar @ 24'	



Location Map:

↑  
N

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## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number:	5816	Project:	Helgeth Home UT #1
Date:	4/9/10	Project Number:	0102 17057.003
Logged By:	PH	Drilled By:	ACZ
Elevation:	N/A	Drilling Method:	Direct Push
Detector:	PID	Sampling Method:	Continuous
Gravel Pack:	Silica Sand	Seal:	Bentonite
Casing Type:	PVC	Hole Diameter:	2"
Screen Type:	PVC	Length:	10'
Slot:	0.010"	Total Depth:	30'
Diameter:	20'	Depth to Liquid:	—
Length:	20'	Depth to Water:	~22'

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
100	Dry	0.0	NO		0			0-1.5 Sandy loam	
		0.0			2			1.5-5 ft. tan to brown silty clay grading to grey	
		0.0			4			5-10' grey silty clay w/ white vesicle mineralization Fe discoloration @ 9-10'	
		0.0			6			10-15' NO recovery	
		0.0			8			15-17' grey silty clay w/ Fe discoloration	
		0.0			10			17-20' Interbedded silty clays + sandy clays w/ Fe discoloration & white mineralization stringers	
		0.0			12			20-22' grey silty clays w/ Fe discoloration	
		0.0			14			22-25' grey silty clays	
		0.0			16			25-27' " " silty clay stringers	
		0.0			18			27-30' grey interbedded sandy & silty clay	
		0.0			20				
		0.0			22				
		0.0			24				
		0.0			26				
		0.0			28				
		0.0			30				

Refusal @ 30'



Location Map: 		<b>Compliance • Engineering • Remediation</b> <b>LT Environmental, Inc.</b> 4600 W. 60th Avenue Arvada, Colorado 80003	
<b>BORING LOG/MONITORING WELL COMPLETION DIAGRAM</b>			
Boring/Well Number: <b>SR17</b>		Project: <b>Helgoth Hills VT#1</b>	
Date: <b>4/4/13</b>		Project Number: <b>0142</b>	
Logged By: <b>PH</b>		Drilled By: <b>ACI</b>	
Elevation: <b>N/A</b>	Detector: <b>PID</b>	Drilling Method: <b>Direct Push</b>	Sampling Method: <b>Continuous</b>
Gravel Pack: <b>Silica Sand</b>		Seal: <b>Bentonite</b>	Grout: <b>—</b>
Casing Type: <b>PVC</b>	Diameter: <b>1"</b> Length: <b>15'</b>	Hole Diameter: <b>2"</b>	Depth to Liquid: <b>—</b>
Screen Type: <b>PVC</b> Slot: <b>0.010"</b>	Diameter: <b>1"</b> Length: <b>10'</b>	Total Depth: <b>22'</b>	Depth to Water: <b>—</b>

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
mod	Dry	0.0	NO		0		SC	0-1 Dk brn clayey sand	
		0.0			2		CL	1-3 ft. Dk silty clay	
		0.0			4		CL	5-10 Htan silty clay grading into grey silty clay with	
		0.0			6		CL	white (caliche) mineralizations	
		0.0			8		CL	veined @ 9.5' pebble bed	
		0.0			10		CL	10-14 " "	
		0.0			12		CL	14-17 " " w/ Fe discolorations	
		0.0			14		CL	16-16.5 tan V.F. grained sand	
		0.0			16		CL	17-20' V.F. grained sand	
		0.0			18		CL	minor Fe discolored veins	
		0.0			20		CL	20-22' " "	
		0.0			22		CL	cobble @ 20'	
		0.0			24		CL	21-22 moist V.F. grained sand	
		0.0			26		CL	Refusal @ 22'	
		0.0			28		CL		
		0.0			30		CL		