

CONFIDENTIAL COMMUNICATION
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COMMUNICATION AND
CONFIDENTIAL ATTORNEY WORK
PRODUCT



WSP USA
4600 W. 60th Avenue
Arvada, Colorado 80003

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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: SVE01		Project: State 30-16	
Date: 9/30/21		Project Number: 31403077	
Logged By: Daniel Thomas		Drilled By: Tasman	
Elevation: 2	Detector: PID	Drilling Method: Direct Push	Sampling Method: Continuous
Gravel Pack: Silica Sand		Seal: Bentonite (+ 6" grout)	
Casing Type: PVC	Diameter: 1"	Length: 6'	Hole Diameter: 3"
Screen Type: PVC	Diameter: 1"	Length: 8'	Total Depth: 13'
			Depth to Liquid: N/A
			Depth to Water: N/A

Penetration Resistance	Moisture Content	Vapor (ppm) T.C.Hy	Acid Reaction	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion Diagram
				0				0-6' Hand Augered	
				1				0'-6.5' Clay, trace silt, trace vfg. sand, low-med. plasticity, cohesive, brown/dark brown, moist, black mottled stain (organic), no odor @ 11.5' trace gravels.	
				2					
				3			CL		
				4				6.5'-9.5' weathered clay/claystone, grey, moist, low plasticity, cohesive, increased competency with depth, intermittent gypsum mineralization and iron-oxide staining (mottled).	
				5				- From 6.5'-7.5' Black mottled staining.	
				6				- From 9'-10' Mostly Dry.	
				7			4' 5'	9.5'-13' Sandy claystone little silt, brownish grey	
				8			CLS	light brown, dry, low plasticity, slight cohesion, trace - intermittent iron-oxide staining + gypsum mineralization, no stain/odor.	
				9				11'-12' vfg. weathered sandstone some clay + silt content, light brown/grey, dry, poorly graded, low competency, low platy, mottled trace iron-oxide stain.	
				10			CLS		
				11			3' 4'		
				12			SPS		
				13			CLS		
				14					
				15					
				16					
				17					
				18					
				19					
				20					
				21					
				22					
				23					
				24					
				25					

Set as PVC SU @ 13' BGS

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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: SVE02		Project: State 30-16	
Date: 9/30/2021		Project Number: 31403177	
Logged By: Daniel Thomas		Drilled By: Tasman	
Elevation:	Detector: PID	Drilling Method: Direct Push	Sampling Method: Continuous
Gravel Pack: Silica Sand		Seal: Bentonite	Grout:
Casing Type: PVC	Diameter: 1"	Length: 6'	Hole Diameter: 3"
Screen Type: PVC	Diameter: 1"	Length: 8'	Total Depth: 13'
			Depth to Liquid: N/A
			Depth to Water: N/A

Penetration Resistance	Moisture Content	Vapor (ppm)	Acid Reaction	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion Diagram
				0					
	Moist			1				0-6' Hand Augered	
	0.21		mod.	2				0-6' Clay, trace silt, trace vfgs, sand, trace gravels, brown/dark brown, moist, no stain or odor, trace iron-oxide mottling and gypsum mineralization after 1'.	
	0			3			CL		
	0.11		mod.	4					
	0			5				6'-9.75' Weathered Claystone, trace vfgs, sands after 9', grey, slightly moist → dry, low plasticity, cohesive, intermittent trace gypsum mineralization, trace iron-oxide staining, e 9.5' - ore angular (60°) fracture (~1mm, 101%), no odor	
	0.01		NONE	6					
	0			7			CLS		
	0.01		NONE	8	4'	4'			
	0			9					
	0.21		NONE	10				9.75'-13' Alternating sandy (vfgs) Claystone and weathered sandstone, greyish-brown and light brown, low plasticity + cohesive (CLS), poorly-graded (SPS) CLS - moderate competency, SPS - low competency, platy, crumbly, trace gypsum mineralization and mottled iron-oxide staining	
	0		LOW	11			CLS/SPS		
	0.11		NONE	12	3'	4.5'			
	0			13					
				14					
				15					
				16					
				17					
				18					
				19					
				20					
				21					
				22					
				23					
				24					
				25					

Set as PVC SUE 13' 86"

Bentonite Grout (Coh.)

Sand

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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: 50E03		Project: State 30-16	
Date: 9/30/2021		Project Number: 31403172	
Logged By: Daniel Thomas		Drilled By: Tajman	
Elevation:	Detector: PID	Drilling Method: Direct Push	Sampling Method: Continuous
Gravel Pack: Silica Sand		Seal: Bentonite	Grout:
Casing Type: PVC	Diameter: 1"	Length: 6'	Hole Diameter: 3"
Screen Type: PVC	Diameter: 1"	Length: 8'	Total Depth: 13'
			Depth to Liquid: PID
			Depth to Water:

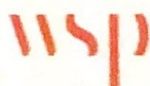
Penetration Resistance	Moisture Content	Vapor (ppm)	Acid Reaction	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion Diagram
				0					
				1				0-6' Hand Auger	
				2				6'-9' clay track silt trace vfg. Sand, Brown → grey, moist, low plasticity, cohesive, moderate gypsum mineralization trace - intermittent iron-oxide staining	
				3					
				4				9'-11.5' weathered Claystone, trace vfg. Sand, grey, Dry, low plasticity, cohesive, trace intermittent gypsum mineralization and iron-oxide staining, no odor.	
				5					
				6					
				7					
				8			4' 5' CL	11.5'-13' Sandy (vfg.) weathered Claystone, grey, light brown, dry, low plasticity, cohesive, low → moderate competency, trace - intermittent iron-oxide stain, no odor. trace gypsum mineralization	
				9					
				10			CLS		
				11			3' 4' CLS		
				12			CLS		
				13					
				14					
				15					
				16					
				17					
				18					
				19					
				20					
				21					
				22					
				23					
				24					
				25					

Set as PVC 54 @ 13' BGS

Bentonite Grout (Schlumberger)

Sand

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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

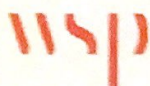
Spring/Well Number: SV-E04	Project: State 30-16
Date: 9-30-2021	Project Number: 31403177
Logged By: Daniel Thomas	Drilled By: Tasman
Elevation: 2113	Drilling Method: Direct Push
Gravel Pack: Silica Sand	Sampling Method: Continuous
Casing Type: PVC	Seal: Bentonite
Screen Type: PVC	Grout: NID
Diameter: 1"	Length: 6'
Diameter: 1"	Length: 8'
Total Depth: 13'	Depth to Liquid: NID

Penetration Resistance	Moisture Content	Vapor (ppm)	Acid Reaction	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion Diagram
				0				0-6' Hand Auger	
	Moist	0.6	Mod.	1					
		0		2				0-6.5' clay, trace silt, trace vfg. sand, trace gravel, low plasticity, cohesive, moist, trace gypsum mineralization and iron-oxide staining, no odor.	
		0.4		3			CL		
		0	Mod.	4					
				5				6.5' - 12.25' weathered claystone trace vfg. sand, grey, dry, low plasticity, cohesive, low to moderately competent, trace intermittent gypsum mineralization and iron-oxide staining (mottled), no odor.	
		0.3		6					
	Dry	0	Mod.	7			CLS		
				8					
		0.3		9					
		0	Mod.	10				12.25' - 13' weathered vfg. sandstone, light-brown, dry, poorly-graded, trace mottled iron-oxide staining, no odor.	
			Mod.	11					
		0.3		12					
		0	Mod.	13			SPS		
				14					
				15					
				16					
				17					
				18					
				19					
				20					
				21					
				22					
				23					
				24					
				25					

Set as PVC sue 13' BG

Bentonite Grout
Sand

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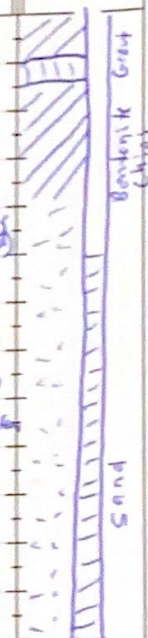
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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: SVES		Project: State 30-16	
Date: 9-30-21		Project Number: 31403177,	
Logged By: Daniel Thomas		Drilled By: Tasman	
Elevation:	Detector: PID	Drilling Method: Direct Push	Sampling Method: Continuous
Casing Type: pvc	Seal: Bentonite	Grout:	
Screen Type: pvc	Diameter: 1"	Length: 8'	Depth to Liquid: NID
	Diameter: 1"	Length: 8'	Depth to Water: NID

Penetration Resistance	Moisture Content	Vapor (ppm)	Acid Reaction	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Uthology/Remarks	Well Completion Diagram
				0				0-6 Hand Augered	
				1				0-5.5' Clay trace silt trace vfg. Sand trace	
				2				gravelly, brown, moist, low-moderate	
				3				plasticity, cohesive, trace gypsum	
				4				mineralization and iron-oxide staining	
				5				(mottled) no odor	
				6				5.5'-9.75' weathered Claystone trace vfg. Sandy	
				7				gray, dry → slightly moist, low plasticity,	
				8				cohesive, intermittent gypsum mineralization	
				9				and iron-oxide staining (mottled),	
				10				no odor	
				11				9.75'-13' weathered vfg. Sandstone, light-	
				12				brown/orangeish brown, slightly-	
				13				moist → dry, poorly-sorted,	
				14				mottled iron-oxide staining,	
				15				trace clay V. @ 11-12'; no odor	
				16					
				17					
				18					
				19					
				20					
				21					
				22					
				23					
				24					
				25					

Set as PVC SEC @ 13' BGJ



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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: SUE06		Project: State 30-16	
Date: 9-30-2021		Project Number: 31403177	
Logged By: Daniel Thomas		Drilled By: Tasman	
Elevation:	Detector: PID	Drilling Method: Direct Push	Sampling Method: Continuous
Gravel Pack: Silica Sand		Seal: Bentonite	
Casing Type: PVC	Diameter: 1"	Length: 6'	Hole Diameter: 3"
Screen Type: PVC	Diameter: 1"	Length: 8'	Total Depth: 13'
			Depth to Liquid: -
			Depth to Water: N/D

Penetration Resistance	Moisture Content	Vapor (ppm)	Acid Reaction	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion Diagram
				0				0-6' Hand Auger	
	Moist	0.7/0	Low	1					
		0.2/0		2				0'-6.5' Clay trace silt trace vfg. sand, trace gravel, grey/brown, moist, low-moderate plasticity, cohesive, trace iron-oxide staining (mottled), no odor	
		0.2/0	Low	3			CL		
		0.2/0		4					
		0.2/0		5				6.5'-9.5' weathered clay stone, trace vfg. sand, grey, dry, low plasticity, cohesive, intermittent trace gypsum mineralization and iron-oxide staining, no odor	
	Dry	0.5/0	Med.	6					
		0.5/0		7			CLS		
		0.2/0	None	8	4'	4'			
		0.2/0		9				9.5'-13' Alternating weathered clay stone and weathered sand stone, greyish-brown/light brown, dry, low plasticity and cohesive CLS, poorly-graded SPS, SPS is crumbly - test completed mottle iron-oxide staining, no odor	
		0.1/0	NOM	10			CLS/SPS		
				11	3'	4'			
				12					
				13					
				14					
				15					
				16					
				17					
				18					
				19					
				20					
				21					
				22					
				23					
				24					
				25					

Set as PVC SC @ 13' BGS

As-built to ground

Sand

Order = 7-8-9-10-11-12-13-14-15-16-17-18-19-20-21

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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: SVE07		Project: State 30-16	
Date: 11-3-2021		Project Number: 31403177.98	
Logged By: Daniel Thomas (WSP)		Drilled By: Site Service	
Elevation:	Detector: PID	Drilling Method: Direct Push	Sampling Method: Continuous
Gravel Pack: Silica Sand		Seal: Bentonite	Grout:
Casing Type: PVC	Diameter: 1"	Length: 6'	Hole Diameter: 3"
Screen Type: PVC	Diameter: 1"	Length: 8'	Total Depth: 13'
			Depth to Liquid:
			Depth to Water:

Penetration Resistance	Moisture Content	Vapor (ppm)	Acid Reaction	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion Diagram
				0				0-6' Hand Augered	
				1				0-6' Infer cuttings	
				2				0-7' clay, trace silt, trace vfg. sand, trace gravels, brown / dark brown, moist, low plasticity, cohesive, no stain, no odor	
				3					
				4					
				5			CL		
				6			CL		
				7				7'-11.5' weathered clay/claystone, grey, moist → slightly moist, low plasticity, cohesive, little competency, intermittent iron-oxide staining and gypsum mineralization, no odor	
				8	4' 4'		CL / CLS		
				9					
				10					
				11	3' 4'		CLS / SPS	11.5' - 13' vfg. sandy weathered claystone, brownish grey / light brown, slightly moist, low plasticity, low cohesion, little competency, platy, intermittent iron-oxide staining and gypsum mineralization, no odor	
				12					
				13					
				14					
				15					
				16					
				17					
				18					
				19					
				20					
				21					
				22					
				23					
				24					
				25					

Set as PVC stickup @ 13' BGS

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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: SUE 08		Project: State 30-16	
Date: 11-3-2021		Project Number: 31403177.98	
Logged By: Daniel Thomas (WSP)		Drilled By: Sik Services	
Drilling Method: Direct Push		Sampling Method: Continuous	
Elevation:	Detector: PID	Seal: Bentonite	Grout: -
Gravel Pack: Silica Sand		Hole Diameter: 3"	
Casing Type: PVC	Diameter: 1"	Length: 6'	Depth to Liquid: -
Screen Type: PVC	Diameter: 1"	Length: 8'	Depth to Water: -
		Total Depth: 13'	

Penetration Resistance	Moisture Content	Vapor (ppm) $\frac{X}{CH_4}$	Acid Reaction	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion Diagram
				0					
	Moist			1				0-6' Hand Auger	
		0.01	Mod	2				0'-6.5' clay, trace Silty, trace vFg/Fg, Sand, trace gravels, brown/dark brown, moist, low plasticity, cohesive,	
		0.1/0	Mod	3			CL		
		0.1/0	Mod	4					
		0.3/0	NONE	5					
		0.3/0	NONE	6			CL		
		0.1/0	Low	7				6.5'-11.5' weathered claystone/clay, brownish-grey/light brown, moist → slightly moist,	
	slightly moist	0.1/0	Low	8	4'4"		cl/CLS	low plasticity, cohesive, little competency, intermittent iron-oxide staining, and gypsum mineralization, no odor	
		0.1/0	NONE	9					
		0.1/0	NONE	10					
		0.1/0	NONE	11	3'				
		0.1/0	NONE	12			SPS/CLS		
		0.1/0	NONE	13				11.5'-13' vFg weathered sandstone interbedded w/ weathered claystone, light brown/brownish grey, slightly moist, SPS is poorly graded, CLS is low plasticity, little cohesion, little competency, platy, 12-13' friable, intermittent iron-oxide staining and gypsum-mineralization, no odor	
				14					
				15					
				16					
				17					
				18					
				19					
				20					
				21					
				22					
				23					
				24					
				25					

Set as PVC stickup at 13' BGS

Bentonite
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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: SVF09		Project: State 30-16	
Date: 11-3-2021		Project Number: 31403177.98	
Logged By: Daniel Thomas (WSP)		Drilled By: Site Services	
Elevation:	Detector: PID	Drilling Method: Direct Push	Sampling Method: Continuous
Gravel Pack: Silica Sand		Seal: Bentonite	Grout:
Casing Type: PVC	Diameter: 1"	Length: 6'	Hole Diameter: 3"
Screen Type: PVC	Diameter: 1"	Length: 8'	Total Depth: 13'
			Depth to Liquid:
			Depth to Water:

Penetration Resistance	Moisture Content	Vapor (ppm) x CH ₄	Acid Reaction	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion Diagram
				0					
				1				0'-6' Hand Auger	
				2					
				3				0'-7.5' clay, trace silt, trace vfg. sand, trace granules, brown/dark brown, moist, low plasticity, cohesive, no stain, no odor	
				4					
				5					
				6					
				7			CL	7.5'-9.75' weathered clay/claystone, grey/greyish brown, moist → dry, low plasticity, cohesive, little competency, intermittent iron-oxide staining, and gypsum mineralization, no odor	
				8	4'	4'	CL		
				9			CLS		
				10					
				11	3'	4'	SPS/CLS	9.75'-13' vfg. weathered sandstone and interbedded weathered claystone, light brownish grey/grey, dry, SPS is poorly-graded, CLS is low plasticity, little cohesion, little competency, platy, intermittent iron-oxide staining and gypsum mineralization, no odor	
				12					
				13					
				14					
				15					
				16					
				17					
				18					
				19					
				20					
				21					
				22					
				23					
				24					
				25					

Set as PVC stickup @ 13' BGS

Bentonite

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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: SVE10		Project: State 30-76	
Date: 11-3-2021		Project Number: 31403177.98	
Logged By: Daniel Thomas (WSP)		Drilled By: Site Services	
Elevation:	Detector: PID	Drilling Method: Direct Push	Sampling Method: Continuous
Gravel Pack: Silica Sand	Seal: Bentonite	Grout: -	
Casing Type: PVC	Diameter: 1"	Length: 6'	Hole Diameter: 3"
Screen Type: PVC	Diameter: 1"	Length: 8'	Total Depth: 12.75'
			Depth to Liquid: -
			Depth to Water: -

Penetration Resistance	Moisture Content	Vapor (ppm)	Acid Reaction	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion Diagram
				0					
	Moist			1				0-6' Hand auger	
		0.1/0	Mod.	2					
		0.0/0	Mod.	3				0-6' clay, trace silt, trace vfg. Sands, trace gravels, brown/dark brown, moist, low plasticity, cohesive, no stain, no odor	
		0.0/0	Low	4			CL		
		0.0/0	Low	5					
		0.0/0	Low	6					
		0.1/0	Low	7			CL/CLS	6'-8.5' weathered claystone/clay, grey, moist → dry, low plasticity, cohesive, little competency, Intermittent Iron-oxide staining, and gypsum mineralization, no odor	
		0.1/0	None	8	4' 4'				
		0.1/0	None	9					
		0.1/0	None	10			SPS/CLS		
		0.1/0	None	11					
		0.1/0	None	12	4' 4'			8.5'-13' vfg. weathered sandstone w/ interbedded weathered claystone, light brown/greyish brown, SPS is poorly-graded, CLS is low plasticity, little cohesion, little competency, platy, increased friability w/ depth, increased iron-oxide staining from 12'-13', no odor	
				13					
				14					
				15					
				16					
				17					
				18					
				19					
				20					
				21					
				22					
				23					
				24					
				25					

Set as PVC stickup
e 12.75'
Refusal 12.75'

Bentonite
Sand

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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: SUE 11		Project: State 30-16	
Date: 11-3-2021		Project Number: 31403177.98	
Logged By: Daniel Thomas (CWSP)		Drilled By: Site Services	
Elevation:	Detector: PID	Drilling Method: Direct Push	Sampling Method: Continuous
Gravel Pack: Silica Sand		Seal: Bentonite	Grout:
Casing Type: PVC	Diameter: 1"	Length: 6'	Hole Diameter: 3"
Screen Type: PVC	Diameter: 1"	Length: 8'	Total Depth: 13'
			Depth to Liquid:
			Depth to Water:

Penetration Resistance	Moisture Content	Vapor (ppm)	Acid Reaction	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion Diagram
				0					
	Moist	0.11	mod.	1				0-6' Hand Auger	
		0		2					
		0.11	mod.	3			CL	0'-5.5' clay, trace vfg. sands, trace silt, trace gravels, brown/dark brown, moist, low plasticity, cohesive, no odor	
		0		4					
		0.01	low	5					
		0		6			CLS		
		0		7			CLS		
	Dry	0.21	NONE	8	4'	4'	SPS/CLS	5.5'-6.5' weathered claystone/clay, grey, moist, low plasticity, cohesive, little competency, intermittent iron-oxide staining and gypsum mineralization, no odor	
		0		9					
		0.11	NONE	10				6.5'-11' weathered vfg. sandstone and interbedded weathered claystone, light brown/grey, moist → dry, poorly-graded, low-plasticity, little cohesion, little competency, intermittent iron-oxide staining and gypsum mineralization, no odor	
		0		11					
		0.01	NONE	12	3'	4'	SPS		
		0		13					
				14					
				15				11-13' weathered vfg. sandstone, light-brownish grey / orangeish brown, dry, poorly-graded, intermittent iron-oxide staining along horizontal fractures (~1mm/1-2%), platy, (friable from 9-12'), increased competency w/ depth, no odor	
				16					
				17					
				18					
				19					
				20					
				21					
				22					
				23					
				24					
				25					

Set as PVC stickup @ 13' BGS

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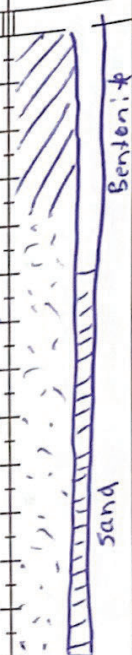
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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: SVE 12		Project: State 30-16	
Date: 11-3-2021		Project Number: 31403177.98	
Logged By: Daniel Thomas (WSP)		Drilled By: Site Services	
Elevation:	Detector: PID	Drilling Method: Direct Push	Sampling Method: Continuous
Gravel Pack: Silica Sand		Seal: Bentonite	Grout:
Casing Type: PVC	Diameter: 1"	Length: 6'	Hole Diameter: 3"
Screen Type: PVC	Diameter: 1"	Length: 8'	Total Depth: 13'
			Depth to Liquid: -
			Depth to Water: -

Penetration Resistance	Moisture Content	Vapor (ppm)	Acid Reaction	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion Diagram
				0					
	Moist		Mod	1				0-6' Hand Auger	
		0.0/0		2					
		0.1/0	Mod	3				0-6.5' clay, trace vfg. sands, trace silt, trace gravels, brown / dark brown, moist, low plasticity, cohesive, no stain, no odor	
		0.1/0		4			CL		
		0.1/0	Low	5					
		0.1/0		6			CL		
	Slightly moist	0.1/0	NONE	7			CLS	6.5'-8.5' weathered claystone, grey, moist → slightly moist, low plasticity, cohesive, little competency, intermittent iron-oxide staining and gypsum mineralization, no odor	
	Dry	0.1/0		8	4'	4'	SPS/CLS		
		0.1/0	NONE	9			CLS		
		0.1/0		10			CLS		
		0.1/0	NONE	11	3'	4'	CLS	8.5'-10.5' weathered vfg. sandstone and intermittent weathered claystone, light brownish grey, dry, poorly-graded, low plasticity, little cohesion, intermittent iron oxide stain/gypsum, no odor	
		0.1/0		12			SPS		
		0.1/0	NONE	13				10.5'-12.5' weathered claystone, grey, dry, low plasticity, cohesive, little competency, intermittent iron-oxide staining and gypsum mineralization, no odor	
				14					
				15					
				16					
				17					
				18					
				19				12.5'-13' weathered sandstone, light brown / greyish brown, dry, poorly-graded, intermittent iron-oxide staining, platy, friable, no odor	
				20				① 12.5'-13' Fe ₂ O ₃ stain along vertical fractures (1mm/1X)	
				21					
				22					
				23					
				24					
				25					

Set as PVC
stickup @ 13' bgs.



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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: SVE13		Project: State 30-16	
Date: 11-3-2021		Project Number: 31403177.98	
Logged By: Daniel Thomas (WSP)		Drilled By: Site Services	
Elevation:	Detector: PID	Drilling Method: Direct Push	Sampling Method: Continuous
Gravel Pack: Silica Sand	Seal: Bentonite	Grout:	
Casing Type: PVC	Diameter: 1" Length: 6'	Hole Diameter: 3"	Depth to Liquid:
Screen Type: PVC	Diameter: 1" Length: 8'	Total Depth: 13'	Depth to Water:

Penetration Resistance	Moisture Content	Vapor (ppm)	Acid Reaction	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion Diagram
				0				0-6' Hand Auger	
				1					
				2					
				3			CL	0-6' clay, trace silt, trace vfg. sands, trace gravels, brown/dark brown, moist, low plasticity, cohesive, no stain, no odor	
				4					
				5					
				6					
				7				6'-12' weathered claystone, trace vfg. -	
				8	4' 4"		CLS	Sands from 11-12', grey, moist → dry, low plasticity, cohesive (less w/ depth),	
				9				Intermittent Iron-oxide staining	
				10				and gypsum mineralization,	
				11				trace angular + vertical fractures	
				12	3' 4"		SPS	from 9'-12' (1mm, 1%), no odor	
				13				12'-13' weathered vfg. sandstone, light-	
				14				brown/grey, dry, poorly-graded,	
				15				friable, no stain/no odor	
				16					
				17					
				18					
				19					
				20					
				21					
				22					
				23					
				24					
				25					

Set as per sticklog
e13' bgs

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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: SVE14		Project: State 30-16	
Date: 11-5-2021		Project Number: 31403177.98	
Logged By: Daniel Thomas (WSP)		Drilled By: Site Services	
Elevation:	Detector: PID	Drilling Method: Direct push	Sampling Method: Continuous
Gravel Pack: Silica Sand		Seal: Bentonite	Grout:
Casing Type: PVC	Diameter: 1"	Length: 6'	Hole Diameter: 3"
Screen Type: PVC	Diameter: 1"	Length: 8'	Total Depth: 13'
			Depth to Liquid: -
			Depth to Water: -

Penetration Resistance	Moisture Content	Vapor (ppm) XCH₄	Acid Reaction	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion Diagram
				0					
	Moist	0.1/0	mod	1				0-6' Hand Auger	
		0.0/0	mod	2					
		0.0/0	mod	3			CL	0'-7' Clay, trace silt, trace vfg. sand, trace gravel, brown/dark brown, moist, low plasticity, cohesive, no stain, no odor	
		0.1/0	NONE	4					
		0.1/0	NONE	5					
	Dry	0.0/0	NONE	6			CL		
		0.0/0	NONE	7					
		0.0/0	NONE	8	4' 4'		CL	7'-11' Weathered clay/claystone trace vfg. - sand, gray, dry, low plasticity, cohesive, little competency, intermittent iron-oxide staining and gypsum mineralization, no odor	
		0.0/0	NONE	9			CLS		
		0.0/0	NONE	10					
		0.1/0	NONE	11	3' 4'		SPS	11'-13' Weathered vfg. sandstone, trace clay, light brown/gray, dry, poorly-graded, trace iron-oxide staining, little competency, friable, no odor	
				12					
				13					
				14					
				15					
				16					
				17					
				18					
				19					
				20					
				21					
				22					
				23					
				24					
				25					

Set as PVC Stickup
@ 13' BGS

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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: SVE15		Project: State 30-16	
Date: 11-3-2021		Project Number: 31403177.98	
Logged By: Daniel Thomas (CWSP)		Drilled By: Site Services	
Elevation:	Detector: PID	Drilling Method: Direct Push	Sampling Method: Continuous
Gravel Pack:	Seal: Bentonite		Grout:
Silica Sand	Diameter: 1"	Length: 6'	Hole Diameter: 3"
Casing Type: PVC	Diameter: 1"	Length: 8'	Total Depth: 13'
Screen Type: PVC			Depth to Liquid:
			Depth to Water:

Penetration Resistance	Moisture Content	Vapor (ppm) % CH ₄	Acid Reaction	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion Diagram
				0				0'-6' Hand Auger	
	Moist	0.1/0	Mod.	1					
		0.1/0	Mod.	2					
		0.1/0	Mod.	3			CL	0'-6.5' Clay, trace silt, trace vfg. sand, trace gravels, brown / dark brown, moist, low plasticity, cohesive, no stain, no odor	
		0.01/0	Low	4					
		0.01/0	Low	5					
		0.01/0	Low	6			CL		
		0.21/0	None	7					
		0.21/0	None	8	4' 4'		CLS	6.5'-11' Weathered claystone, trace vfg. sands, grey, moist → dry, low plasticity, cohesive (less w/ depth), little competency, Intermittent Iron-oxide staining and gypsum mineralization, no odor	
		0.21/0	Low	9					
		0.21/0	Low	10					
		0.21/0	Low	11	3' 4'		SPS		
		0.31/0	None	12					
		0.31/0	None	13				11-13' Weathered vfg. sandstone, light-brown/grey, dry, poorly-graded, Intermittent Iron-oxide staining and gypsum mineralization, trace angular + vertical fractures (1mm/1 ft.), no odor	
				14					
				15					
				16					
				17					
				18					
				19					
				20					
				21					
				22					
				23					
				24					
				25					

Set as PVC string
@ 13' BGS

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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: SVE16		Project: State 30-16	
Date: 11-5-21		Project Number: 31403177, 98	
Logged By: Daniel Thomas (WSP)		Drilled By: Site Services	
Elevation:	Detector: PID	Drilling Method: Direct Push	Sampling Method: Continuous
Gravel Pack: Silica Sand		Seal: Bentonite	Grout:
Casing Type: PVC	Diameter: 1"	Length: 6'	Hole Diameter: 3"
Screen Type: PVC	Diameter: 1"	Length: 8'	Total Depth: 13'
			Depth to Liquid: -
			Depth to Water: -

Penetration Resistance	Moisture Content	Vapor (ppm) $\frac{V}{CH_4}$	Acid Reaction	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion Diagram
				0					
	moist	0.0/0	mod.	1				0-6' Hand Auger	
		0.1/0	mod.	2					
		0.1/0	mod.	3			CL	0-6' clay, trace silt, trace vfg. sand, trace gravels, brown / dark brown, moist, low plasticity, cohesive, no odor	
		0.2/0	mod.	4					
	dry	0.1/0	none	5					
		0.1/0	none	6					
		0.1/0	none	7			CL		
		0.1/0	none	8	4'	4'	CLS	6'-8' weathered clay / claystone, grey, dry, low plasticity, cohesive, little competency, intermittent iron-oxide staining and gypsum mineralization, trace vfg. sand from 7.5'-8', no odor	
	moist	0.1/0	low	9			CLS / SPS		
	dry	0.1/0	low	10			SPS		
		0.1/0	low	11			SPS		
		0.9/0	none	12	3'	4'	CLS	8'-10.5' weathered claystone w/ interbedded weathered sandstone, grey / light brown, dry → moist, low plasticity + cohesive CLS, poorly-graded SPS, trace iron-oxide staining and gypsum mineralization, no odor	
				13					
				14					
				15					
				16					
				17				10.5'-11.5' weathered vfg. sandstone, light brown, greyish brown, dry, poorly-graded, friable, no odor.	
				18					
				19					
				20					
				21					
				22					
				23					
				24					
				25				11.5'-13' weathered claystone, trace vfg. sand, grey / light brown, dry, low plasticity, cohesive, little competency, intermittent gypsum mineralization + iron-oxide staining along angular fractures (1mm, 1X), no odor.	

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set as PVC stickup @ 15' BS

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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: SUE17		Project: State 30-16	
Date: 11-5-2021		Project Number: 31403177.98	
Logged By: Daniel Thomas (WSP)		Drilled By: Site Services	
Elevation:	Detector: PID	Drilling Method: Direct Push	Sampling Method: Continuous
Gravel Pack: Silica Sand	Seal: Bentonite	Grout: -	
Casing Type: PVC	Diameter: 1" Length: 6'	Hole Diameter: 3"	Depth to Liquid: -
Screen Type: PVC	Diameter: 1" Length: 8'	Total Depth: 13'	Depth to Water: -

Penetration Resistance	Moisture Content	Vapor (ppm) % CH ₄	Acid Reaction	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion Diagram
				0					
	Moist	0.0/0	Mod	1				0-6' Hand Auger	
		0.1/0	Low	2					
		0.1/0	Low	3			CL	0'-9' Clay, trace silt, trace vfg. Sand, trace gravels, brown / dark brown, moist, low plasticity, cohesive, no odor	
		0.1/0	Low	4					
		0.1/0	Low	5					
		0.2/0	Low	6					
		0.2/0	Low	7			CL		
		0.2/0	Low	8	4' 4'			9'-13' vfg. Weathered Sandstone, light-brown / gray, moist → slightly moist, poorly-graded, trace Iron-oxide staining (mottled), no odor, trace gypsum mineralization.	
	Slightly Moist	0.2/0	NONE	9					
		0.3/0	NONE	10					
				11	3' 4'		SPS		
				12					
				13					
				14					
				15					
				16					
				17					
				18					
				19					
				20					
				21					
				22					
				23					
				24					
				25					

Set as PVC Stickup @ 13' BGS

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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: 5VE18		Project: State 30-16	
Date: 11-5-2021		Project Number: 31403177.98	
Logged By: Daniel Thomas (WSP)		Drilled By: Site Services	
Elevation:	Detector: PID	Drilling Method: Direct Push	Sampling Method: Continuous
Gravel Pack: Silica Sand		Seal: Bentonite	Grout:
Casing Type: PVC	Diameter: 1"	Length: 6'	Hole Diameter: 3"
Screen Type: PVC	Diameter: 1"	Length: 8'	Total Depth: 13'
			Depth to Liquid: -
			Depth to Water: -

Penetration Resistance	Moisture Content	Vapor (ppm) Y-City	Acid Reaction	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion Diagram
				0					
	Moist	0.3/0	Mod	1				0-6' Hand Auger	
		0.3/0	Mod	2					
		0.1/0	Mod	3			CL	0'-7.5' Clay, trace silt, trace vfg. sands, trace gravels, brown/dark brown, moist, low plasticity, cohesive, no odor	
		0.1/0	Mod	4					
		0.1/0	Mod	5					
		0.1/0	Mod	6					
		0.1/0	Low	7			CL	7.5'-12' weathered claystone w/ interbedded weathered sandstone, gray/light brown, moist → dry, low plasticity, cohesive, little competency, sps is friable (increased competency w/ depth), intermittent iron-oxide staining + trace gypsum mineralization, no odor	
		0.1/0	Low	8	4' 4'				
		0.2/0	Low	9			CLS/SPS		
		0.2/0	None	10					
		0.1/0	Low	11	3' 4'				
		0.1/0	Low	12			SPS		
		0.1/0	Low	13					
				14				12'-13' weathered vfg. sandstone, light-brown, dry, poorly-graded, little competency, trace iron-oxide staining along angular fractures (1mm, 1%), no odor	
				15					
				16					
				17					
				18					
				19					
				20					
				21					
				22					
				23					
				24					
				25					

Set as PVC Stickup @ 13' bgs

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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: SVE19		Project: State 30-16	
Date: 11-5-2021		Project Number: 31403177.98	
Logged By: Daniel Thomas (WSP)		Drilled By: Sik Series	
Elevation:	Detector: PID	Drilling Method: Direct Push	Sampling Method: Continuous
Gravel Pack: Silica Sand		Seal: Bentonite	Grout:
Casing Type: PVC	Diameter: 1"	Length: 6'	Hole Diameter: 3"
Screen Type: PVC	Diameter: 1"	Length: 6.5'	Total Depth: 11.5'
			Depth to Liquid:
			Depth to Water:

Penetration Resistance	Moisture Content	Vapor (ppm) elasticity	Acid Reaction	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion Diagram
				0				0-6' Hand Auger	
				1					
				2					
				3			CL	0'-8' clay, trace silt, trace vfg, sand, trace gravels, moist, low plasticity, cohesive, no odor	
				4					
				5					
				6					
				7			CL		
				8	4'	4'		8'-10.75' weathered claystone, trace vfg, sand, grey, dry, low plasticity, cohesive, low-moderate competency, intermittent iron-oxide staining + trace gypsum mineralization, no odor	
				9			CLS		
				10					
				11	15'	25'	SPS		
				12				10.75'-11.5' weathered vfg, sandstone, brown, dry, poorly graded, friable, unconsolidated, no odor	
				13				Re-fused @ 11.5'	
				14				- very hard bedrock recovered @ 11.5' - inferred sandstone	
				15					
				16					
				17					
				18					
				19					
				20					
				21					
				22					
				23					
				24					
				25					

Set a PVC string @ 11.5' bgs

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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: SV E 20		Project: State 30-16	
Date: 11-5-2021		Project Number: 31403177.98	
Logged By: Daniel Thomas (WSP)		Drilled By: Site Services	
Elevation:	Detector: PID	Drilling Method: Direct Push	Sampling Method: Continuous
Gravel Pack: Silica Sand		Seal: Bentonite	Grout:
Casing Type: PVC	Diameter: 1"	Length: 6'	Hole Diameter: 3"
Screen Type: PVC	Diameter: 1"	Length: 8'	Total Depth: 13'
			Depth to Liquid:
			Depth to Water:

Penetration Resistance	Moisture Content	Vapor (ppm) x CH ₄	Acid Reaction	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion Diagram
				0					
	moist	0.2/0	low	1				0-6' Hand Auger	
		0.1/0	mod	2					
		0.2/0	mod	3			CL	0'-7' clay, trace silt, trace vfg. sands, trace gravels, brown / dark-brown, low plasticity, cohesive, no odor	
		0.2/0	mod	4					
	slightly moist	0.5/0	none	5			CL		
		0.5/0	none	6			CLS		
	dry	0.2/0	none	7	4'	4'	CLS	7'-8' weathered claystone, grey, slightly moist, low plasticity, cohesive, little-moderate compaction, intermittent iron-oxide staining (mottled) and gypsum mineralization, no odor	
		0.2/0	low	8			SPS		
		0.2/0	low	9					
		0.1/0	low	10			CLS		
		0.1/0	low	11	3'	4'	SPS	8'-13' weathered vfg. sandstone, trace clay, 4" CLS lens @ 11', light brown / grey, dry, poorly-graded, trace / mottled iron-oxide staining + gypsum mineralization, no odor	
				12					
				13					
				14					
				15					
				16					
				17					
				18					
				19					
				20					
				21					
				22					
				23					
				24					
				25					

set as PVC stuck
e 13' bgs

bentonite
sand

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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: SVEX1		Project: State 30-16	
Date: 11-5-2021		Project Number: 31403177.98	
Logged By: Daniel Thomas (CWSP)		Drilled By: Site Services	
Elevation:	Detector: PID	Drilling Method: Direct Push	Sampling Method: Continuous
Gravel Pack: Silica Sand		Seal: Bentonite	Grout:
Casing Type: PVC	Diameter: 1"	Length: 6'	Hole Diameter: 3"
Screen Type: PVC	Diameter: 1"	Length: 4.5'	Total Depth: 9.5'
			Depth to Liquid:
			Depth to Water:

Penetration Resistance	Moisture Content	Vapor (ppm) % CH ₄	Acid Reaction	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion Diagram
	Moist	0.2/0	Mod	0				0-6' Hand Auger	
		0.1/0	Low	1					
		0.1/0	Low	2					
		0.2/0	Mod	3				CL 0'-7.5' Clay, trace silt, trace vfg. sand, trace gravel, brown/dark brown, moist, low plasticity, cohesive, no odor	
		0.2/0	Mod	4					
		0.2/0	Mod	5					
		0.2/0	Mod	6					
		0.2/0	Mod	7					
		0.2/0	Mod	8	3.5'	3'	CL	7.5'-8' Iron Concretion, interbedded - weathered clay, reddish grey, dry	
		0.2/0	Mod	9					
		0.2/0	Mod	10					
		0.2/0	Mod	11				8'-9.5' weathered vfg. sandstone w/ interbedded weathered clays, grey/light brown/red (iron), dry, poorly-graded (SPS), low plasticity, cohesive, little competency, increased iron-oxide stain w/ depth.	
		0.2/0	Mod	12					
		0.2/0	Mod	13					
		0.2/0	Mod	14					
		0.2/0	Mod	15					
		0.2/0	Mod	16					
		0.2/0	Mod	17					
		0.2/0	Mod	18					
		0.2/0	Mod	19					
		0.2/0	Mod	20					
		0.2/0	Mod	21					
		0.2/0	Mod	22					
		0.2/0	Mod	23					
		0.2/0	Mod	24					
		0.2/0	Mod	25					

Set as PVC string @ 9.5' BGS

