

CONFIDENTIAL COMMUNICATION
PRIVILEGED ATTORNEY-CLIENT
COMMUNICATION AND
CONFIDENTIAL ATTORNEY WORK
PRODUCT



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

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW01		Project: State 30-16	
Date: 9/29/2021		Project Number:	
Logged By: D. Stenback, P. G.		Drilled By: Tosmon	
Drilling Method: Direct Push & Solid Stem		Sampling Method: Continuous	
Elevation:	Detector: PID	Seal: Bentonite	Grout: N/A
Gravel Pack: Silica Sand		Hole Diameter: 3"	
Casing Type: PVC	Diameter: 1"	Length: 37'	Depth to Liquid: -
Screen Type: PVC	Diameter: 1"	Length: 20'	Depth to Water: ~21'

Penetration Resistance	Moisture Content	CH ₄ % Vapor (approx)	Acid Reaction	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion Diagram
				0					
	0.1			1			CL	0-6' hand augered to clear potential utility hazards	
	0.6			2					
	0.2			3				0-6' clay, low-mud plasticity w/ trace fg sands throughout & trace small gravel 0-3'; no stain/dur	
				4					
				5				6-9' Same as above, moist, no stain/dur	
	0.0		No	6				7-9' Claystone, blocky, competent, iron mottling, few evaporites, trace iron concretions, acid reaction obs 7.5-8.5'	
	0.1		No	7			CLS		
	0.1		Yes	8				9-13' Claystone, hard, blocky, dry, few iron mottles throughout, trace evaporites, 3" Vfg sand lense @ 12.5'	
	0.0		No	9				13-16' Vfg silty sandstone, weathered, laminated, iron mottles throughout, trace - some evaporites, brittle, crumbles easily, 85-90% unconsolidated, d	
	0.0		N/A	10			SST		
	0.0			11				Direct push refusal @ 18' bgs, transition to 3" diameter Solid Stem auger to continue pursuing GW, will log Cuttings 18-TD	
	0.0			12				16-18' Same as above, dry, 2" evaporite lense @ 17.5'	
	0.0			13				18-20' Vfg sandstone, 60% unconsolidated, 40% consolidated, few-little iron concretions pieces	
	0.0			14				20-27' clay, low plasticity wet @ 21', trace Vfg sands, no stain/dur	
	0.0			15				Set as 1" temp stick-up	
	0.0			16					
	0.0			17					
	0.0			18					
	0.0			19					
	0.0			20					
	0.0			21			CL		
	0.0			22					
	0.0			23					
	0.0			24					
	0.0			25					

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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW02		Project: State 30-16	
Date: 9/29/21		Project Number:	
Logged By: P. Stainback, P. G.		Drilled By: Tosman	
Drilling Method: Solid Stem augers		Sampling Method: surface cuttings Continuous	
Elevation:	Detector: PID	Seal: Bentonite	Grout: N/A
Gravel Pack: Silica Sand	Casing Type: PVC	Diameter: 1"	Length: 10'
Screen Type: PVC	Diameter: 1"	Length: 20'	Hole Diameter: 3"
			Depth to Liquid: N/A
			Depth to Water: N/A

Penetration Resistance	Moisture Content	CH ₄ % Vapor (open)	Acid Reaction	Depth (ft. bgs.)	Sample Run Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion Diagram
				0			* Lagged surface cuttings only Hard augered 0-6' to nitrate pot. for strikes	
	moist 0.0	N/A		1		CL	0-9' clay, low plasticity, trc Fg Sands, trc small gravel 0-2', no stain/odor, brown	
	0.0			2			10-18' claystone, blocky, hard, moist, grey, no stain/odor	
				3			18-19' Sandstone, competent, tan-light brown, 40% consolidated hard pieces, 60% unconsolidated, no stain/odor	
	0.0			4			19-22' Same as above	
				5			22-30' clayey vFg Sands, moist, brown, no stain/odor	
	0.0			6				
				7				
	0.0			8				
				9				
				10				
	0.0			11			TD @ 30', Set as temp PVC	
				12			Stick-up	
				13		CLS		
				14				
				15				
	0.0			16				
				17				
				18				
				19		SST		
				20		SC		
	0.0			21				
				22				
				23				
				24				
				25				

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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW03		Project: State 30-16	
Date: 9/30/2021		Project Number: 31403177	
Logged By: Daniel Thomas		Drilled By: Tasman	
Elevation:	Detector: PID	Drilling Method: HSA / Solid Flight	Sampling Method: Continuous
Gravel Pack: Silica Sand		Seal: Bentonite	Grout:
Casing Type: PVC	Diameter: 1"	Length: 10'	Hole Diameter: 3"
Screen Type: PVC	Diameter: 1"	Length: 15'	Total Depth: 33'
			Depth to Liquid: N/D
			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				* Cuttings logged (1.6m inferences below)	
				1				0-6' - Hand Auger - Clay (mostly clay by volume)	
				2					
				3				6-15' - Clay / weathered clay - dominant lithology with trace iron-oxide staining brown	
				4					
				5				@ 15' Iron concretions	
				6				@ 16-16.5' Light brown sandstone	
	0.4			7					
				8				@ 17' Brown / Dark Brown clay - dominant lithology	
				9					
				10					
				11					
	0.9			12					
				13					
				14					
				15					
				16					
				17					
				18					
				19					
				20					
				21					
				22					
				23					
				24					
				25					

PVC set @ 23' BGS as temp. stickup

Slight Moisture
11.2
11.4
11.0

Gravel

Sand