

Appendix I

Monitoring Well Construction Logs

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Boring and Well Construction Log

Client: Camp Hero	Area: Background	Logged By: A Borden
Location ID: CH-MW001	Northing: 335505.8 Easting: 1569044.6	Drilling Company: Cascade
Project #: 60443903	Ground & TOC Elevations (FT NAVD88): 38.9	Depth to Bedrock (ft bgs): NA
Start Date: 12-06-16	Drilling Method: Sonic	Well Screen Interval (ft bgs): 5-20
Finish Date: 12-06-16	Borehole Diameter (in): 7	Total Depth (ft): 25.0

Depth (ft bgs)	Recovery Length	PID (ppm)	Percent Recovery	USCS Code	Geo Unit Code	Soil and Rock Description Classification Scheme: USCS	Well Information
0							Stickup →
2	2.1/5.0	1.7, 0.7	43%	OH	0.5	ORGANICS, moist, dark brown, decaying roots and leaves, trace gravel	
4				SM		SILTY SAND, moist, slightly compacted, yellowish brown with minor orange oxidation, medium to fine sand with silt, well sorted, cohesive, not plastic, some small gravel (pea size) at 5.5' bgs	
6							
8	1.6/5.0	0.5, 1.2	30%	SM	7.0	SILTY SAND, wet, loose, dark brown, medium sand, coarser than above, trace gravel (0.5-1"), subangular, poorly sorted	
10							
12							
14	4.0/5.0	1.1, 0.7	81%	CL	11.0	LEAN CLAY, moist, dense, dark brown/ gray, fine sand, silt, some organics, cohesive and plastic	
16							
18							
20	5.0/5.0	1.1, 3.4	98%	CH	18.0	FAT CLAY, moist to dry, dense and pliable, light gray, clay with trace silt, cohesive and highly plastic, TD = 20'. Borehole backfilled to have screen in waterbearing zone	
22							
24							
					25.0		End Cap/Base Backfill →

Remarks:

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Boring and Well Construction Log

Client: Camp Hero	Area: Background	Logged By: A Borden
Location ID: CH-MW002	Northing: 335054.1 Easting: 1569043.9	Drilling Company: Cascade
Project #: 60443903	Ground & TOC Elevations (FT NAVD88): 38.7	Depth to Bedrock (ft bgs): NA
Start Date: 12-05-16	Drilling Method: Sonic	Well Screen Interval (ft bgs): 15-30
Finish Date: 12-06-16	Borehole Diameter (in): 7	Total Depth (ft): 30.0

Depth (ft bgs)	Recovery Length	PID (ppm)	Percent Recovery	USCS Code	Geo Unit Code	Soil and Rock Description Classification Scheme: USCS	Well Information
0							Stickup
2	2.4/5.0	1.0, 1.7	50%	OH	1.0	ORGANIC MATERIAL, dry, soft, dark brown, leaves, roots, and decaying organic material	Annular Backfill
4				SM	2.0	SILTY SAND, dry, compacted, yellowish brown, fine to medium sand with some silt, poorly sorted	
6				ML	4.5	SANDY SILT, dry, compacted, grayish brown, fine sand with silt and trace clay, poorly sorted, cohesive and slightly plastic	
8	2.5/5.0	0.8, 0.4	50%	SW		SAND, moist, loose, yellowish brown with orange oxidation staining, medium sand with trace gravel (pea sized), poorly sorted, color change to gray brown, sand becomes medium to coarse, return to fine to medium sand at 15' bgs	Riser
10							
12							
14	2.5/5.0	0.8, 0.4	50%	SW		SAND, moist, loose, yellowish brown with orange oxidation staining, medium sand with trace gravel (pea sized), poorly sorted, color change to gray brown, sand becomes medium to coarse, return to fine to medium sand at 15' bgs	Seal
16							
18							
20	2.5/5.0	1.0, 1.1	50%	ML	15.5	SANDY SILT, dry, compacted, brownish gray, medium sand with silt and gravel (till material), material cemented	Filter Pack
22				SW	18.0	SANDY GRAVEL, dry, loose, medium sand with cobbles (0.5-1"), highly heterogenous	
24				SW	20.0	SANDY GRAVEL, dry, loose, medium sand with cobbles (0.5-1"), highly heterogenous	
26	2.0/5.0	1.2, 0.7	3%	SM		SILTY SAND, moist to wet, compacted, medium sand and silt, trace clay, trace fine gravel (pea size), poorly sorted, heterogeneous, large cobbles, poorly sorted, TD = 30' bgs, reach desired aquifer material	Screen
28							
30							

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Boring and Well Construction Log

Client: Camp Hero	Area: Background	Logged By: A Borden
Location ID: CH-MW003	Northing: 334839.0 Easting: 1569050.0	Drilling Company: Cascade
Project #: 60443903	Ground & TOC Elevations (FT NAVD88): 34.4	Depth to Bedrock (ft bgs): NA
Start Date: 12-05-16	Drilling Method: Sonic	Well Screen Interval (ft bgs): 15-20
Finish Date: 12-05-16	Borehole Diameter (in): 7	Total Depth (ft): 30.0

Depth (ft bgs)	Recovery Length	PID (ppm)	Percent Recovery	USCS Code	Geo Unit Code	Soil and Rock Description Classification Scheme: USCS	Well Information
0							Stickup
2	1.2/5.0	1.8, 0.9	25%	OH	1.0	Organics, dark brown/black, roots and root structures	Annular Backfill
4				SM		SILTY SAND, dry, loose, yellowish brown with orange oxidation staining along roots and other pathways, medium sand with some silt, gravel (0.5-2"), very heterogeneous, poorly sorted, Same as above, color change to light gray, very heterogeneous, very poorly sorted	
6							
8	3.8/5.0	1.1, 0.5	76%	ML	7.5	SANDY SILT, moist, dark brown, fine to medium sand with some silt, less gravel, slightly cohesive, not plastic	Riser
10				SM	8.5	SILTY SAND, moist to slightly wet, yellowish brown, medium sand with silt, trace gravel (0.5-2 inches), poorly sorted	
12							
14	1.4/5.0	1.7, 0.8	28%	SM			Seal
16							
18							
20	2.0/5.0	0.8	42%	SM			Filter Pack
22							
24							
26	3.3/5.0	1.0, 0.4	67%	SM	20.0	SILTY SAND, wet/very moist, light gray, medium to fine sand with silt, trace gravel, poorly sorted	Screen
28				SC	24.5	CLAYEY SAND, moist to wet, light gray, medium to fine sand with clay, trace gravel, poorly sorted sand, cohesive and slightly plastic. TD = 30' bgs, reached desired aquifer material	
30					30.0		

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Boring and Well Construction Log

Client: Camp Hero	Area: Background	Logged By: A Borden
Location ID: CH-MW004	Northing: 334385.3 Easting: 1569185.1	Drilling Company: Cascade
Project #: 60443903	Ground & TOC Elevations (FT NAVD88): 54.4	Depth to Bedrock (ft bgs): NA
Start Date: 12-06-16	Drilling Method: Sonic	Well Screen Interval (ft bgs): 17-32
Finish Date: 12-06-16	Borehole Diameter (in): 7	Total Depth (ft): 35.0

Depth (ft bgs)	Recovery Length	PID (ppm)	Percent Recovery	USCS Code	Geo Unit Code	Soil and Rock Description Classification Scheme: USCS	Well Information
0							Stickup
2	1.4/5.0	1.1, 14.7	28%	OH	1.0	ORGANICS, wet, cohesive, dark brown to black, grass, roots and decaying material	Annular Backfill
4				SM		SILTY SAND, dry to slightly moist, loose, yellowish brown, fine to medium sand with some silt, trace gravel (0.5"-1"), heterogeneous, poorly sorted	
6	1.6/5.0	0.7, 1.1	33%	SC	4.5	CLAYEY SAND, moist, yellowish brown, fine sand with clay, cohesive and slightly plastic, very heterogeneous	Riser
8				SM	6.5	SILTY SAND WITH GRAVEL, moist to dry, cemented, yellow brown, medium sand with silt and clay, gravel, subangular to rounded, poorly sorted	
10				SC	9.0	CLAYEY SAND, lens, same as above	
12				SM	11.0	SILTY SAND WITH GRAVEL, same as above, hit boulder during run, limited recovery	
14	1.5/5.0	2.1, 1.7	30%		15.0	SAND, dry, loose, yellow brown, medium to coarse sand, trace silt, well sorted and rounded, wet at 20' bgs, becoming more silty	Seal
16				SP			Filter Pack
18							
20							Screen
22	4.0/5.0	14.7, 7.8	80%		24.0	SILTY SAND, wet, compacted, yellowish brown, sand with some silt, trace clay, rounded to subangular, well sorted	
24							
26	4.2/5.0	8.8, 5.7	85%	SM			
28					29.5	CLAYEY SAND WITH GRAVEL, dry to moist, cemented, yellow brown, medium sand with some silt and clay, cemented gravel (0.5-2" diameter), poorly sorted and sub angular, TD = 32' bgs: Well screen moved up to put within waterbearing material	End Cap/Base Backfill
30	5.0/5.0	1.8, 1.7	100%				
32				SC			
34					35.0		

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Boring and Well Construction Log

Client: Camp Hero	Area: Background	Logged By: M Glinski
Location ID: CH-MW005	Northing: 336287.5 Easting: 1571273.4	Drilling Company: Cascade
Project #: 60443903	Ground & TOC Elevations (FT NAVD88): 67.0	Depth to Bedrock (ft bgs): NA
Start Date: 12-06-16	Drilling Method: Sonic	Well Screen Interval (ft bgs): 17.9-32.9
Finish Date: 12-06-16	Borehole Diameter (in): 7	Total Depth (ft): 33.0

Depth (ft bgs)	Recovery Length	PID (ppm)	Percent Recovery	USCS Code	Geo Unit Code	Soil and Rock Description Classification Scheme: USCS	Well Information
0							Stickup →
2	3.5/5.0	0.3, 0.8, 0.5, 0.0	70%	ML	XXXXXX	10% fine sand, 7.5YR 4/6 strong brown, soft, dry	Annular Backfill →
4					XXXXXX	3.0	
6				ML	XXXXXX	25% fine gravel, 25% fine sand, 7.5YR 4/6 strong brown, soft, dry, slightly cohesive, trace subangular gravel	
8	3.8/5.0	1.0, 1.7, 0.6, 2.8	NA		XXXXXX	8.0	Riser →
10					XXXXXX	10% fine sand, 7.5YR 4/6 strong brown, medium stiff, moist	
12				ML	XXXXXX		
14	3.5/5.0	0.4, 0.0, 1.6, 2.8	NA		XXXXXX	14.0	Seal →
16					XXXXXX	35% fine sand, 7.5YR 4/6 strong brown, loose, moist, trace coarse sand and fine gravel	
18				ML	XXXXXX	17.0	
20	3.9/5.0	0.6, 1.2, 0.4, 0.1	NA	SPSM	XXXXXX	18.5	Filter Pack →
22					XXXXXX	fine to medium sand, 7.5YR 4/6 strong brown, loose, moist, slightly cohesive	
24					XXXXXX	35% fine sand, 7.5YR 4/6 strong brown, loose, moist, trace coarse sand, pulverized boulder at 19 ft bgs	
26	4/5.0	0.0, 0.3, 0.4, 0.1	NA	ML	XXXXXX		Screen →
28					XXXXXX		
30					XXXXXX		
32	4.3/5.0	0.0, 0.0, 0.0, 0.0	NA		XXXXXX		End Cap/Base Backfill →
33.0					XXXXXX		

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Boring and Well Construction Log

Client: Camp Hero	Area: Background	Logged By: A Borden
Location ID: CH-MW007	Northing: 335781.7 Easting: 1573852.4	Drilling Company: Cascade
Project #: 60443903	Ground & TOC Elevations (FT NAVD88): 60.8	Depth to Bedrock (ft bgs): NA
Start Date: 12-06-16	Drilling Method: Sonic	Well Screen Interval (ft bgs): 20-35
Finish Date: 12-06-16	Borehole Diameter (in): 7	Total Depth (ft): 40.0

Depth (ft bgs)	Recovery Length	PID (ppm)	Percent Recovery	USCS Code	Geo Unit Code	Soil and Rock Description Classification Scheme: USCS	Well Information
0							
2	3.0/5.0	24.1, 11.7	60%	SWSC	1.0	Fill material, sand, silt, clay, and gravel, heterogenous	Stickup Annular Backfill
4				SP		SAND, dry, loose, yellow brown, medium sand with small gravel (pea size), gravel at 2' bgs, well sorted, slightly cohesive	
6					6.0	boulder, no recovery	
8	3.6/5.0	25.3, 15.7	71%	SM		SILTY SAND, dry, compacted, yellowish brown, sand with silt, trace amounts of clay, trace gravel, very heterogenous, poorly sorted, grains rounded to subrounded, highly cemented at 8' bgs	Riser
10							
12	3.8/5.0	1.6, 3.2	75%	SM	13.0	SILTY SAND, dry to moist, loose, yellowish brown, sand with silt, poorly sorted, rounded to subrounded, trace small gravel	
14							
16	4.2/5.0	3.4, 5.7, 3.0	85%	SM	17.0	SILTY SAND WITH GRAVEL, dry to moist, dense and compact, sand with silt, trace clay, some small gravel in cemented matrix, poorly sorted, subangular, oxidation staining throughout 25-30' bgs, moist	Seal
18							Filter Pack
20	5.0/5.0	1.3, 2.1, 1.7	100%	SM			
22							
24							
26							
28	4.3/5.0	0.7, 0.3, 0.4	86%	SM			Screen
30							
32	5.0/5.0	0.4, 0.2	100%	CLML	32.0	SILTY CLAY, moist, loose, medium sand with some silt, poorly sorted, cohesive, not plastic	
34					35.0	SILTY SAND WITH GRAVEL, same as above, dry, highly compacted, TD = 35' bgs: moved screen to target waterbearing units	End Cap/Base Backfill
36	3.9/5.0	0.3, 0.4	78%	SM			
38							
40							
					40.0		

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Boring and Well Construction Log

Client: Camp Hero	Area: Background	Logged By: M Glinski
Location ID: CH-MW008	Northing: 335891.3 Easting: 1571897.8	Drilling Company: Cascade
Project #: 60443903	Ground & TOC Elevations (FT NAVD88): 56.5	Depth to Bedrock (ft bgs): NA
Start Date: 12-07-16	Drilling Method: Sonic	Well Screen Interval (ft bgs): 9.85-19.85
Finish Date: 12-07-16	Borehole Diameter (in): 7	Total Depth (ft): 20.0


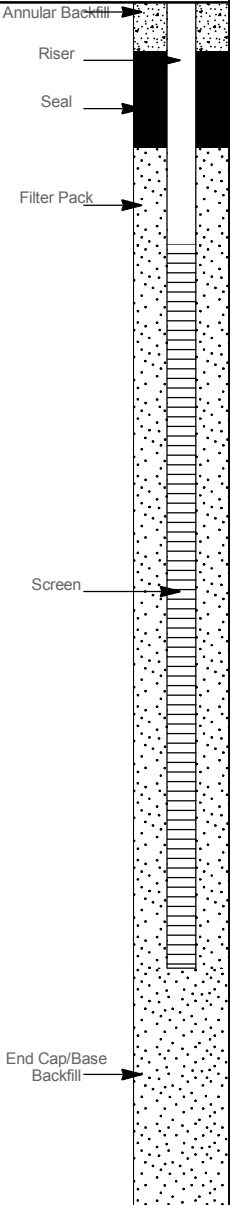





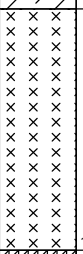
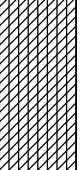

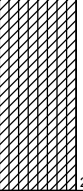

Depth (ft bgs)	Recovery Length	PID (ppm)	Percent Recovery	USCS Code	Geo Unit Code	Soil and Rock Description Classification Scheme: USCS	Well Information
0							
2	2.7/5	0.1, 0.1	55%	OH	0.5	ORGANIC MATERIAL, dry, soft, dark brown, leaves, roots, and decaying organic material	Riser
4						10YR 4/4 dark yellowish brown, soft, dry, cohesive, rare subangular gravel (20mm), increase in gravel size at 7.5 ft bgs, grading to yellowish brown (10YR 5/4) at 7.5 ft bgs	Annular Backfill
6							
8	3.7/5	1.0, 0.5, 0.7, 0.1	74%	ML			Seal
10							Filter Pack
12							
14	4.5/5	0.9, 1.4, 0.0, 0.0	90%		13.0	10YR 4/3 brown, medium plasticity stiff, dry, 5% fine to medium sand at 16 ft bgs	Screen
16							
18	5/5	0.0, 0.0, 0.0, 2.8	100%	CL			End Cap/Base Backfill
20					20.0		

Remarks:

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Boring and Well Construction Log

Client: Camp Hero	Area: Background	Logged By: A Borden
Location ID: CH-MW009	Northing: 335088.5 Easting: 1572872.1	Drilling Company: Cascade
Project #: 60443903	Ground & TOC Elevations (FT NAVD88): 55.4	Depth to Bedrock (ft bgs): NA
Start Date: 12-07-16	Drilling Method: Sonic	Well Screen Interval (ft bgs): 5-20
Finish Date: 12-07-16	Borehole Diameter (in): 7	Total Depth (ft): 25.0


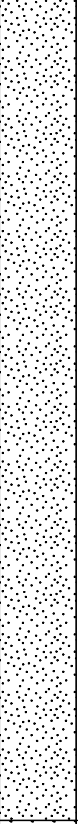
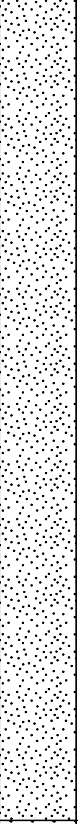
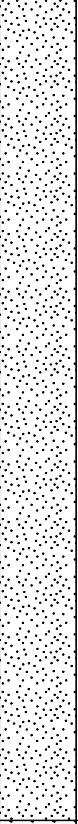

Depth (ft bgs)	Recovery Length	PID (ppm)	Percent Recovery	USCS Code	Geo Unit Code	Soil and Rock Description Classification Scheme: USCS	Well Information
0							
2	2.5/5.0	2.3, 1.7	51%	OH		Organics, moist, loose and soft, dark brown, grass, roots	
4				SP		SAND, dry, loose yellowish brown, medium sand with trace silt, well sorted, subrounded to rounded, slightly cohesive	
6				SM		SILTY SAND, dry, loose/brittle, dark brown with orange staining, medium sand with some silt, roots in sleeve, cohesive, not plastic	
8	3.2/5.0	3.2, 1.4	66%	SW		SAND, dry to moist, loose, dark brown, fine sand with trace silt, poorly sorted, compacted	
10				SM		SILTY SAND, dry, loose/brittle, dark brown with orange staining, medium sand with some silt, roots, cohesive, not plastic	
12				SW		GRAVELLY SAND, moist, loose, yellowish brown/tan, coarse to medium sand, gravel (0.5-1"), very poorly sorted, heterogeneous, wet at 11' bgs	
14	3.5/5.0	3.3, 1.7	71%	ML		SANDY SILT WITH GRAVEL, dry, compacted and dense, brownish yellow, silt and trace clay with some fine sand, very poorly sorted, color change: gray at 15' bgs, wet, very heterogeneous, poorly sorted	
16				CLML		SILTY CLAY WITH SAND, dry, compacted/cemented, light gray, silt and clay with fine sand, trace small gravel, cohesive, low plasticity, subangular	
18				ML		SANDY SILT, dry to moist, compacted/slightly loose, fine sand with silt and clay, trace gravel, poorly sorted, cohesive and slightly plastic. END OF BORING- reached target depth and water bearing zone	
20	4.3/5.0	1.7, 1.6, 4.2	86%	CLML			
22				ML			
24							

Remarks:

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Boring and Well Construction Log

Client: Camp Hero	Area: Background	Logged By: A Borden
Location ID: CH-MW010	Northing: 335687.7 Easting: 1571269.8	Drilling Company: Cascade
Project #: 60443903	Ground & TOC Elevations (FT NAVD88): 64.8	Depth to Bedrock (ft bgs): NA
Start Date: 12-07-16	Drilling Method: Sonic	Well Screen Interval (ft bgs): 10-25
Finish Date: 12-07-16	Borehole Diameter (in): 7	Total Depth (ft): 25.0

Depth (ft bgs)	Recovery Length	PID (ppm)	Percent Recovery	USCS Code	Geo Unit Code	Soil and Rock Description Classification Scheme: USCS	Well Information
0							Stickup
2	3.3/5.0	4.3, 1.7, 40.7	66%	MLCL		CLAYEY SILT, soft, moist, yellowish brown/tan, silt with clay, cohesive and low plasticity, low fine sand percentage	Riser
4				MLCL		CLAYEY SILT WITH SAND, dry, soft/loose, light brownish yellow, silt with trace clay, some fine sand and gravel (0.5-1"), poorly sorted	
6	3.1/5.0	3.4, 2.3, 1.3	61%	SP		SAND, soft, moist, brownish yellow, medium sand, rounded, well sorted, small gravel (0.5"), rounded	Seal
8						wet at 10' bgs	
10						silty seam at 12' bgs	
12	3.6/5.0	0.7, 2.2, 1.4	71%	SP		coarse to medium sand at 14' bgs, gravel is 0.5-1", rounded, not spherical	Filter Pack
14						sand becomes coarser at 16', well sorted, rounded, angular	
16	2.0/5.0	1.5, 1.0	40%	SP		finer sand at 20' bgs, some trace gravel	Screen
18							
20							
22	3.7/5.0	1.7, 2.5, 3.1	75%	SM		SILTY SAND, soft, moist, fine sand with silt	
24							

Remarks:

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Boring and Well Construction Log

Client: Camp Hero	Area: Background	Logged By: M Glinski
Location ID: CH-MW011	Northing: 333753.9 Easting: 1570930.0	Drilling Company: Cascade
Project #: 60443903	Ground & TOC Elevations (FT NAVD88): 82.4	Depth to Bedrock (ft bgs): NA
Start Date: 12-06-16	Drilling Method: Sonic	Well Screen Interval (ft bgs): 10-25
Finish Date: 12-06-16	Borehole Diameter (in): 7	Total Depth (ft): 27.0

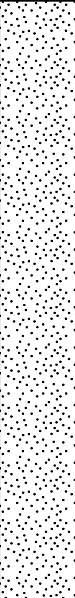
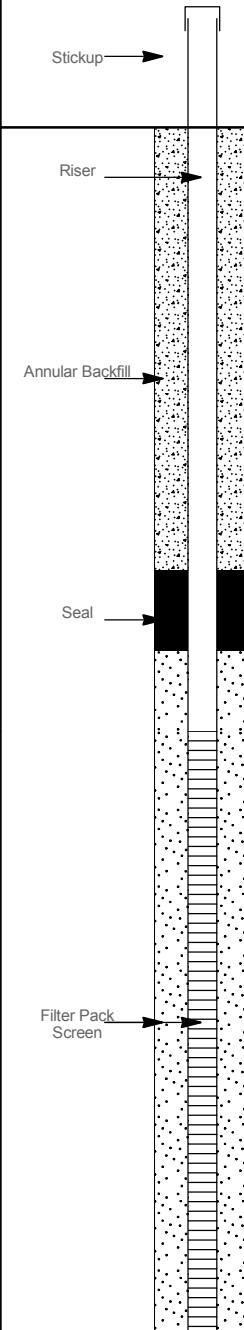

Depth (ft bgs)	Recovery Length	PID (ppm)	Percent Recovery	USCS Code	Geo Unit Code	Soil and Rock Description Classification Scheme: USCS	Well Information
0							
2	3.3/5.0	0.6, 0.0, 0.9, 0.8	66%	SM	1.0	5Y 2.5/1 black, angular, roots, organics from 0-2 inches bgs	Riser
4				ML	2.0	25% fine sand, 10YR 4/6 dark yellowish brown, soft, dry	Annular Backfill
6				ML	6.0	5% fine sand, 5Y 2.5/1 black, soft, dry	
8	3.5/5.0	1.1, 0.4, 1.0, 0.9	70%	SM	13.0	20% SILT, 5% gravel, 5Y 4/1 dark gray, loose, moist, cohesive, gravel is subrounded and 20mm in size	Seal
10					16.0	2.5Y 3/2 very dark grayish brown, non plastic, increasingly cohesive	Filter Pack Screen
12					22.0	25% fine sand, 7.5YR 4/6 strong brown, medium stiff, dry, trace gravel (up to 60 mm in size) at 20 ft bgs	
14	4/5.0	1.1, 0.8, 2.0, 3.4	80%	ML	24.0	20% SILT, 10YR 5/6 yellowish brown, loose, moist	
16				SM	27.0	5Y 5/1 gray, low plasticity stiff, dry, grading to olive grey (5Y 4/2) with brown (7.5YR 4/4) laminations (5mm in width) at 25 ft bgs	End Cap/Base Backfill
18				CL			
20	4.5/5.0	0.8, 0.7, 0.2, 0.0	90%	SM			
22							
24							
26	NA	0.0, 0.1					

Remarks:

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Boring and Well Construction Log

Client: Camp Hero	Area: Background	Logged By: A Borden
Location ID: CH-MW012	Northing: 335301.1 Easting: 1571415.8	Drilling Company: Cascade
Project #: 60443903	Ground & TOC Elevations (FT NAVD88): 70.2	Depth to Bedrock (ft bgs): NA
Start Date: 12-07-16	Drilling Method: Sonic	Well Screen Interval (ft bgs): 15-30
Finish Date: 12-07-16	Borehole Diameter (in): 7	Total Depth (ft): 30.0

Depth (ft bgs)	Recovery Length	PID (ppm)	Percent Recovery	USCS Code	Geo Unit Code	Soil and Rock Description Classification Scheme: USCS	Well Information						
0							Stickup						
2	2.1/5.0	8.2, 2.6	43%	SP		SAND, dry, loose, yellowish brown, medium sand, trace silt, well sorted, rounded, not cohesive, increasing gravel size (0.5")							
4						large piece of rock at 5' bgs, slight color change, more yellowish/tan							
6													
8	2.3/5.0	1.6, 2	46%			moist at 9' bgs							
10													
12													
14	No recovery		0%										
16													
18													
20	3.5/5.0	3.8, 2.2, 2.3	70%			SM			SILTY SAND, wet, loose/compact, light brown, medium to coarse sand, some silt with trace amounts of clay, poorly sorted, heterogenous, rounded to subrounded, subangular, TD = 30' bgs, reached water bearing unit				
22											No recovery	0%	
24													
26	No recovery	0%											
28													
30													

Remarks:

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Boring and Well Construction Log

Client: Camp Hero	Area: Background	Logged By: M Glinski
Location ID: CH-MW013	Northing: 334759.0 Easting: 1569949.4	Drilling Company: Cascade
Project #: 60443903	Ground & TOC Elevations (FT NAVD88): 58.0	Depth to Bedrock (ft bgs): NA
Start Date: 12-05-16	Drilling Method: Sonic	Well Screen Interval (ft bgs): 18-33
Finish Date: 12-05-16	Borehole Diameter (in): 7	Total Depth (ft): 33.0

Depth (ft bgs)	Recovery Length	PID (ppm)	Percent Recovery	USCS Code	Geo Unit Code	Soil and Rock Description Classification Scheme: USCS	Well Information
0							Stickup →
2	5.0/5.0	0.0, 0.0, 0.0, 0.1	100%	SM		poorly graded, 20% fine sand, 10YR 4/4 dark yellowish brown, loose, dry	Riser →
4						3.0 15% fine sand, 10YR 5/4 yellowish brown, medium stiff, dry, cohesive, pulverized concrete at 8-8.5 ft bgs, rare subrounded gravel at 12-13 ft bgs, grading to brown (7.5YR 4/4)	
6							
8	5.0/5.0	0.0, 0.0, 0.0, 0.0	100%				Annular Backfill →
10							
12							
14	5.0/5.0	0.2, 0.0, 0.2, 0.0	100%	ML			Seal →
16							
18							
20	5.0/5.0	0.0, 0.0, 0.0, 0.0	100%			19.0 20% SILT, 7.5YR 4/6 strong brown, loose, dry, yellowish red (5YR 4/6) from 17-18 ft bgs	
22							
24							
26	5.0/5.0	0.2, 0.4, 0.0, 0.0	100%	SM		23.0 7.5YR 4/2 brown, loose, dry, slightly cohesive	Filter Pack →
28						24.0 20% SILT, 7.5YR 4/6 strong brown, loose, dry, slightly cohesive	
30						25.0 10YR 4/6 dark yellowish brown, loose, moist, slightly cohesive, very fine to coarse grain sand, subangular sand, less than 5% gravel (40 mm)	Screen →
32	5.0/5.0	0.0, 0.0, 0.0, 0.0	100%	SWSM		27.5 20% silt, 7.5YR 4/6 strong brown, loose, dry, slightly cohesive	
33				SM			

Remarks:

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Boring and Well Construction Log

Client: Camp Hero	Area: Background	Logged By: M Glinski
Location ID: CH-MW014	Northing: 334249.2 Easting: 1570186.4	Drilling Company: Cascade
Project #: 60443903	Ground & TOC Elevations (FT NAVD88): 61.3	Depth to Bedrock (ft bgs): NA
Start Date: 12-05-16	Drilling Method: Sonic	Well Screen Interval (ft bgs): 15.07-30.07
Finish Date: 12-05-16	Borehole Diameter (in): 7	Total Depth (ft): 31.0

Depth (ft bgs)	Recovery Length	PID (ppm)	Percent Recovery	USCS Code	Geo Unit Code	Soil and Rock Description Classification Scheme: USCS	Well Information
0							
2	5.0/5.0	0.0, 0.0, 0.0, 0.0	100%	ML	XXXXXX	7.5YR 4/6 strong brown, soft, dry, cohesive	Riser
4						3.0	
6				3.0/5.0	0.2, 0.1, 0.1	60%	ML
8	25% fine sand, 10YR 3/6 dark yellowish brown, stiff, dry, less than 5% subrounded gravel at 14 ft bgs						
10	3.0/5.0	0.1, 0.0, 0.0	60%				ML
12							
14							
16	2.5/5.0	0.0, 0.0, 0.1	50%	ML	XXXXXX		
18							
20							
22	3.0/5.0	0.0, 0.0, 0.0	60%	ML	XXXXXX		Filter Pack
24							
26							
28	5.0/5.0	0.0, 0.0, 0.1, 0.2	100%	ML	XXXXXX	24.0	Screen
30						10YR 3/6 dark yellowish brown, soft, dry, grading to dark grey (2.5Y 4/1) at 24.5 ft bgs	
							ML
						31.0	End Cap/Base Backfill



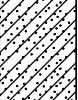


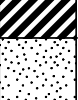
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Boring and Well Construction Log

Client: Camp Hero	Area: Background	Logged By: A Borden
Location ID: CH-MW016	Northing: 333368.4 Easting: 1570265.0	Drilling Company: Cascade
Project #: 60443903	Ground & TOC Elevations (FT NAVD88): 80.7	Depth to Bedrock (ft bgs): NA
Start Date: 12-08-16	Drilling Method: Sonic	Well Screen Interval (ft bgs): 15-30
Finish Date: 12-08-16	Borehole Diameter (in): 7	Total Depth (ft): 30.0

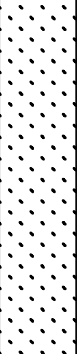


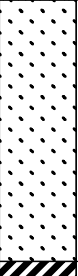

Depth (ft bgs)	Recovery Length	PID (ppm)	Percent Recovery	USCS Code	Geo Unit Code	Soil and Rock Description Classification Scheme: USCS	Well Information
0							Stickup
2	3.0/5.0	4.1, 9.2, 5.5, 3.7	60%	OH		0.5 ORGANIC MATERIAL, dry, soft, dark brown, leaves, roots, and decaying organic material	Riser
4						CLAYEY SAND, dense, dry, brownish yellow, fine to medium sand with clay, trace silt, cohesive and low plasticity, poorly sorted, subrounded, not spherical (till), becoming more medium sand, trace fine to medium gravel, less cohesive, very dense, lots of staining, becoming moderately dense at 14' bgs	
6							
8	3.6/5.0	173, 325, 321, 1447, 737	73%	SC			Annular Backfill Filter Pack
10							
12							
14	3.6/5.0	255, 195, 160, 117, 8.9	73%	SC			Seal
16							
18							
20	3.0/5.0	365, 440, 168, 72.1, 27.1	61%	SW		17.5 SAND, loose, moist, light gray, medium sand, trace silt, poorly sorted, sub rounded	Screen
22							
24							
26	3.3/5.0	3.1, 2.7, 3.4, 3.1, 1.1	66%	CH		20.0 FAT CLAY, soft, light brown to gray, clay and silt, trace fine sand, plastic and cohesive	
28							
30							
	3.4/5.0		68%	SP		26.5 SAND, loose, moist, light yellowish brown, medium to fine sand, trace silt, well sorted, sub rounded	

Remarks:

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Boring and Well Construction Log

Client: Camp Hero	Area: Background	Logged By: A Borden
Location ID: CH-MW017	Northing: 333325.0 Easting: 1570231.4	Drilling Company: Cascade
Project #: 60443903	Ground & TOC Elevations (FT NAVD88): 81.4	Depth to Bedrock (ft bgs): NA
Start Date: 12-08-16	Drilling Method: Sonic	Well Screen Interval (ft bgs): 15-30
Finish Date: 12-08-16	Borehole Diameter (in): 7	Total Depth (ft): 30.0

Depth (ft bgs)	Recovery Length	PID (ppm)	Percent Recovery	USCS Code	Geo Unit Code	Soil and Rock Description Classification Scheme: USCS	Well Information
0							Stickup →
2	3.5/5.0	2.2, 2	71%	SM		SILTY SAND, moist, moderate stiff, yellowish orange, fine sand with silt, cohesive, not plastic, well rounded, poorly sorted, rock in shoe, no recovery 5-10' bgs	Riser →
4							
6							
8	No recovery		0%			CLAYEY SAND, dry, stiff, yellowish orange to light gray, fine sand with clay, trace silt, cohesive, low plasticity, poorly sorted, sub rounded	Annular Backfill Filter Pack →
10							
12							
14	2.6/5.0	20.4, 21.6, 18.4, 24.5, 16.7	53%	SC		CLAYEY SAND to SAND, stiff, moist, light gray, fine to medium sand with trace silt and clay, poorly sorted, rounded, slightly cohesive, not plastic	Seal →
16							
18							
20	3.6/5.0	240, 210, 186, 88.4, 255	73%	SWSC		SILTY SAND, stiff, moist, light gray, medium sand with silt, trace clay and gravel, poorly sorted, rounded, slightly cohesive, not plastic	Screen →
22							
24							
26	2.0/5.0	370, 410, 360, 440, 382	40%	SM		FAT CLAY, soft, moist, brownish yellow, silt and clay, cohesive and plastic	
28							
30							

Remarks:

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Boring and Well Construction Log

Client: Camp Hero	Area: Background	Logged By: M Glinski
Location ID: CH-MW018	Northing: 333279.2 Easting: 1570144.4	Drilling Company: Cascade
Project #: 60443903	Ground & TOC Elevations (FT NAVD88): 61.1	Depth to Bedrock (ft bgs): NA
Start Date: 12-08-16	Drilling Method: Sonic	Well Screen Interval (ft bgs): 5-15
Finish Date: 12-08-16	Borehole Diameter (in): 7	Total Depth (ft): 15.0

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Boring and Well Construction Log

Client: Camp Hero	Area: Background	Logged By: A Borden
Location ID: CH-MW020	Northing: 333303.1 Easting: 1570356.8	Drilling Company: Cascade
Project #: 60443903	Ground & TOC Elevations (FT NAVD88): 93.7	Depth to Bedrock (ft bgs): NA
Start Date: 12-08-16	Drilling Method: Sonic	Well Screen Interval (ft bgs): 10-25
Finish Date: 12-08-16	Borehole Diameter (in): 7	Total Depth (ft): 25.0

Depth (ft bgs)	Recovery Length	PID (ppm)	Percent Recovery	USCS Code	Geo Unit Code	Soil and Rock Description Classification Scheme: USCS	Well Information
0							Stickup →
2	1.9/5.0	3.4, 1.5	38%	SP		SAND, dry, loose, light yellowish brown, medium sand, trace silt, trace small gravel, well sorted, slightly cohesive, rounded, sub-spherical, gravel is rounded, trace organics and roots, moist at 4' bgs, large gravel piece	Riser →
4							
6							
8	2.7/5.0	5.5, 37.2, 1330	55%	SP	6.0	Rock in shoe, no recovery	Annular Backfill →
10				SC	7.0	CLAYEY SAND, dense, dry to moist, grayish brown with minor staining (oxidation), fine sand with clay, trace silt, poorly sorted, sub rounded, cohesive and low plasticity, trace fine gravel	
12				SW	11.0	SAND, wet, loose, grayish brown, fine to medium sand (coarse to medium), trace clay and silt, slightly cohesive, poorly sorted, angular, not spherical	
14	3.0/5.0	16.2, 5.5	60%	SC	13.5	CLAYEY SAND, dense, dry, grayish orange, fine to medium sand with clay and trace silt, poorly sorted, rounded, not spherical, cohesive and slightly plastic	Seal →
16							
18							
20							
22							
24	2.8/5.0	1.5, 7.2	57%	CLML	23.0	SILTY CLAY, dense, dry to moist, brownish gray, fine to medium sand, poorly sorted, some silt, trace gravel	Filter Pack →
25.0					25.0		

Remarks:

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Boring and Well Construction Log

Client: Camp Hero	Area: Background	Logged By: A Borden
Location ID: CH-MW021	Northing: 333245.8 Easting: 1570329.5	Drilling Company: Cascade
Project #: 60443903	Ground & TOC Elevations (FT NAVD88): 92.2	Depth to Bedrock (ft bgs): NA
Start Date: 12-07-16	Drilling Method: Sonic	Well Screen Interval (ft bgs): 5-15
Finish Date: 12-07-16	Borehole Diameter (in): 7	Total Depth (ft): 25.0

Depth (ft bgs)	Recovery Length	PID (ppm)	Percent Recovery	USCS Code	Geo Unit Code	Soil and Rock Description Classification Scheme: USCS	Well Information
0							
2	2.9/5.0	1.0, 1.8	58%	OH	0.5	ORGANICS, silty clay, grass, roots	
4				CLML	3.3	SILTY CLAY, moist, dense, brown with orange staining, clay with fine sand, poorly sorted, cohesive and plastic, some trace gravel, subrounded	
6				SW	4.0	SAND lens, dry	
8	3.4/5.0	4.8, 3.2, 2.2	68%	SC		CLAYEY SAND, dry, soft, grayish brown, clay with fine sand, poorly sorted, cohesive and plastic, some trace gravel, impacted soil at 10' bgs to 12.5' bgs; high PID hits and staining	
10							
12							
14	4.3/5.0	336, 453, 382	86%		12.0	FAT CLAY, soft and dense, grayish brown, dry to moist in places, clay with silt, trace fine sand, cohesive and highly plastic, no staining or odor	
16					15.0		
18							
20	5.0/5.0	48.2, 16.1	100%	CH			
22				CL	21.0	LEAN CLAY, soft and dense, dry, grayish brown, fine sand, poorly sorted, slight odor, no staining	
24				SC	22.5	CLAYEY SAND, slight odor, no staining	
					24.0	LEAN CLAY, TD = 25' bgs, set well from 5-15' bgs to monitor impacted zone	

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Boring and Well Construction Log

Client: Camp Hero	Area: DU01	Logged By: M Glinski
Location ID: CH-MW023	Northing: 333370.5 Easting: 1570058.3	Drilling Company: Cascade
Project #: 60443903	Ground & TOC Elevations (FT NAVD88): 58.1	Depth to Bedrock (ft bgs): NA
Start Date: 06-08-17	Drilling Method: Sonic	Well Screen Interval (ft bgs): 10-24.5
Finish Date: 06-08-17	Borehole Diameter (in): 6 in	Total Depth (ft): 25.0

Depth (ft bgs)	Recovery Length	PID (ppm)	USCS Code	Geo Unit Code	Soil and Rock Description Classification Scheme: USCS	Well Information	
0						Stickup →	
2	3.3	0.1, 0.2, 0.1	ML	x x x x x	SILT WITH SAND, non-plastic soft {n=2-4}, dry, (10YR 4/4) dark yellowish brown, fine sand 15%, cohesive	<div>Riser →</div> <div>Bentonite chips →</div> <div>Seal →</div> <div>Annular Backfill Filter Pack →</div> <div>Screen →</div>	
4				x x x x x			
6				x x x x x			
8	4.1	0.1, 0.1, 0.1		x x x x x			
10				x x x x x			
12				x x x x x			
14	5	0.1, 0.1, 0.2, 0.1		x x x x x	10.5 SANDY SILT, increasing fine sand to SANDY SILT		
16				x x x x x			
18				x x x x x			
20				x x x x x			
22				x x x x x			
24	5	0.0, 0.1, 0.1, 0.1, 0.1	ML	x x x x x	20.0 SILT, non-plastic stiff {n=9-15}, dry, (5Y 4/1) dark gray, cohesive		
25.0			ML	x x x x x		22.0 SILT WITH SAND, stiff {n=9-15}, dry, (2.5Y 4/3) olive brown, 20% fine sand, micaceous	
						End Cap/Base Backfill →	

Remarks:

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Boring and Well Construction Log

Client: Camp Hero	Area: DU01	Logged By: A Borden
Location ID: CH-MW025	Northing: 333494.4 Easting: 1570092.4	Drilling Company: Cascade
Project #: 60443903	Ground & TOC Elevations (FT NAVD88): 71.6	Depth to Bedrock (ft bgs): NA
Start Date: 06-07-17	Drilling Method: Sonic	Well Screen Interval (ft bgs): 10-20
Finish Date: 06-07-17	Borehole Diameter (in): 6 in	Total Depth (ft): 22.5

Depth (ft bgs)	Recovery Length	PID (ppm)	USCS Code	Geo Unit Code	Soil and Rock Description Classification Scheme: USCS	Well Information
0						Stickup →
2	2	0.9, 1.3, 2.7, 3.2	OH		Organic soil, loamy, roots, grass	
4			SM		SILTY SAND, firm, dry, light reddish brown, fine to medium sand, poorly sorted, subrounded, silt, cohesive, trace gravel	Bentonite chips →
6						Riser →
8	3	0.7, 0.4, 0.2, 0.1	MLCL		SILTY SAND WITH CLAY, soft, dry, light gray, fine to medium sand, poorly sorted, subrounded, silt and clay, cohesive and slightly plastic becoming very soft with higher percentage of clay, less silt, moderate plasticity	Seal →
10						Annular Backfill Filter Pack →
12						
14	3	0.2, 0.3, 0.4, 0.1	SM		SILTY SAND, firm, dry, dark grayish brown, medium sand, poorly sorted, silt, cohesive, becoming light reddish brown, fine to medium sand with silt, moist	Screen →
16			SP		SAND, loose, wet, reddish brown, medium sand, very poorly sorted, subrounded, trace amount of silt and clay, not cohesive	
18						
20	3.5	0.4, 0.4, 0.6, 0.2	CL		CLAYEY SILT, dense to very dense, dry, light reddish brown to gray, silt and clay, massive, cohesive, non plastic, fine sand and trace small gravel	
22						End Cap/Base Backfill →
22.5						

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



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Boring and Well Construction Log

Client: Camp Hero	Area: Suspected Tank B	Logged By: M Glinski
Location ID: CH-MW028	Northing: 334647.6 Easting: 1570092.0	Drilling Company: Cascade
Project #: 60443903	Ground & TOC Elevations (FT NAVD88): 57.5	Depth to Bedrock (ft bgs): NA
Start Date: 06-05-17	Drilling Method: Sonic	Well Screen Interval (ft bgs): 20-29.5
Finish Date: 06-05-17	Borehole Diameter (in): 6 in	Total Depth (ft): 30.0

Depth (ft bgs)	Recovery Length	PID (ppm)	USCS Code	Geo Unit Code	Soil and Rock Description Classification Scheme: USCS	Well Information			
0									
2	4	0.0, 0.0, 0.0, 0.0	SC		CLAYEY SAND, soft {n=2-4}, dry, (10YR 4/3) brown	Capped Riser			
4			ML		2.0	SILT WITH SAND, soft {n=2-4}, dry, (7.5YR 4/3) brown, 15% fine sand trace gravel			
6									
8	5	0.0, 0.0, 0.0, 0.0					Bentonite chips		
10									
12			5	0.0, 0.0, 0.0, 0.0	SC		11.0	CLAYEY SAND, soft {n=2-4}, dry, (7.5YR 4/3) brown, fine SAND, trace gravel	
14									
16	5	0.0, 0.0, 0.0, 0.0							
18							Annular Backfill Filter Pack		
20							Screen		
22	5	0.0, 0.0, 0.0, 0.0	SC						
24									
26					3	0.0, 0.0, 0.0			
28									
30				30.0			End Cap/Base Backfill		

Remarks: No Stickup

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Boring and Well Construction Log

Client: Camp Hero	Area: DU17	Logged By: M Glinski
Location ID: CH-MW029	Northing: 335299.4 Easting: 1571864.5	Drilling Company: Cascade
Project #: 60443903	Ground & TOC Elevations (FT NAVD88): 50.0	Depth to Bedrock (ft bgs): NA
Start Date: 06-06-17	Drilling Method: Sonic	Well Screen Interval (ft bgs): 10-19.5
Finish Date: 06-06-17	Borehole Diameter (in): 6.0 in	Total Depth (ft): 20.0


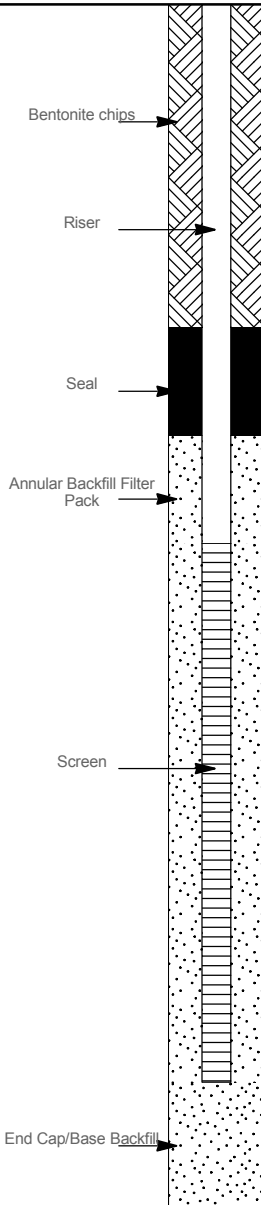
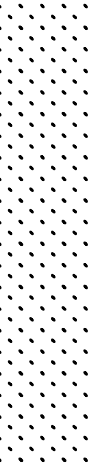

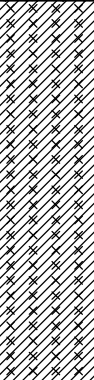
Depth (ft bgs)	Recovery Length	PID (ppm)	USCS Code	Geo Unit Code	Soil and Rock Description Classification Scheme: USCS	Well Information
0						Stickup →
2			SPSM		POORLY GRADED SAND WITH SILT, loose {n=5-10}, moist, (7.5YR 3/2) dark brown, 5% gravel	Bentonite chips →
4	2.7	0.1, 0.1, 0.1			SILTY SAND, non-plastic loose {n=5-10}, moist, (7.5YR 5/3) brown, 20% fines	Riser →
6			SM			Seal →
8	3.4	0.0, 0.0, 0.0				Annular Backfill Filter Pack →
10						Screen →
12					POORLY GRADED SAND WITH SILT, cohesive loose {n=5-10}, moist, (2.5Y 5/2) grayish brown, fine SAND	
14	3	0.1, 0.0, 0.1				
16			SPSM			
18	3	0.0, 0.0, 0.0				
20						End Cap/Base Backfill →

Remarks:

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Boring and Well Construction Log

Client: Camp Hero	Area: DU12	Logged By: A Borden
Location ID: CH-MW030	Northing: 335186.5 Easting: 1572152.3	Drilling Company: Cascade
Project #: 60443903	Ground & TOC Elevations (FT NAVD88): 49.2	Depth to Bedrock (ft bgs): NA
Start Date: 06-06-17	Drilling Method: Sonic	Well Screen Interval (ft bgs): 10-20
Finish Date: 06-06-17	Borehole Diameter (in): 6 in	Total Depth (ft): 22.5

Depth (ft bgs)	Recovery Length	PID (ppm)	USCS Code	Geo Unit Code	Soil and Rock Description Classification Scheme: USCS	Well Information	
0							
	2.5	0.4, 1.7, 2.3, 4.3, 2.1	OH		Organic soil, grass, roots		
2			SM		SILTY SAND, loose, moist, brown, medium sand, poorly sorted, subrounded, some silt, slightly cohesive, trace gravel, non spherical, medium to fine sand, moist to wet		
4							
6							
8							
	0	NA					
10							
	3	0.3, 0.7, 0.2, 2.4	SC		CLAYEY SAND, soft, moist to wet, light grayish brown, medium to coarse sand, rounded to subrounded, poorly sorted, clay, cohesive and low to moderate plasticity		Screen
12							
14							
	4.2	0.4, 0.5, 0.9, 1.3, 0.2	MLCL		SILTY SAND WITH CLAY AND GRAVEL, dense, moist, light reddish brown, medium sand, poorly sorted, subrounded, silt and clay matrix, cohesive, slightly plastic, some gravel, sub rounded, very heterogeneous		End Cap/Base Backfill
16							
18							
20							
22							

Remarks: No Stickup

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Boring and Well Construction Log

Client: Camp Hero	Area: DU14	Logged By: A Borden
Location ID: CH-MW031	Northing: 335162.2 Easting: 1572582.1	Drilling Company: Cascade
Project #: 60443903	Ground & TOC Elevations (FT NAVD88): 44.1	Depth to Bedrock (ft bgs): NA
Start Date: 06-07-17	Drilling Method: Sonic	Well Screen Interval (ft bgs): 8-18
Finish Date: 06-07-17	Borehole Diameter (in): 6 in	Total Depth (ft): 20.0

Depth (ft bgs)	Recovery Length	PID (ppm)	USCS Code	Geo Unit Code	Soil and Rock Description Classification Scheme: USCS	Well Information
0						Stickup →
2	3.4	0.4, 0.7, 1.4, 2.3	OH	1.5	Organic soil, loamy, roots, fine sand	Bentonite chips →
4			SP	4.5	SAND, soft, moist, light grayish brown, fine sand, well sorted, rounded, trace silt, slightly cohesive	Riser →
6			MLCL	5.5	CLAYEY SILT, lens, organics, root structures	Seal →
8	3.1	1.1, 2.4, 3.3, 0.7			SAND, soft, moist to wet, fine sand, well sorted, rounded, coarse sand seam, very poorly sorted, wet to saturated, subrounded	Annular Backfill Filter Pack →
10			SP		SAND, SAA, trace gravel, becoming moist to wet, higher silt content	
12						
14	3.3	0.3, 0.5, 0.1, 0.7				Screen →
16						
18	4	0.1, 0.5, 0.6, 0.3	SM	15.0	SILTY SAND, loose, moist to wet, light grayish brown, fine sand, poorly sorted, subrounded, trace amount of fine gravel	
20				20.0		End Cap/Base Backfill →

Remarks:

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Boring and Well Construction Log

Client: Camp Hero	Area: DU11	Logged By: M Glinski
Location ID: CH-MW033	Northing: 335094.6 Easting: 1572040.4	Drilling Company: Cascade
Project #: 60443903	Ground & TOC Elevations (FT NAVD88): 48.1	Depth to Bedrock (ft bgs): NA
Start Date: 06-06-17	Drilling Method: Sonic	Well Screen Interval (ft bgs): 15-29.9
Finish Date: 06-06-17	Borehole Diameter (in): 6.0 in	Total Depth (ft): 30.0




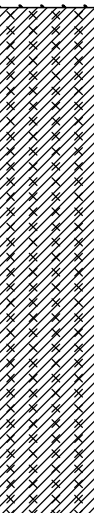




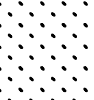
Depth (ft bgs)	Recovery Length	PID (ppm)	USCS Code	Geo Unit Code	Soil and Rock Description Classification Scheme: USCS	Well Information
0						Stickup →
2	3	0.0, 0.0, 0.0	ML	X X X X X	0.5 SILT, soft {n=2-4}, moist, (10YR 2/1) black, with roots	
4			ML	X X X X X	SILT WITH SAND, soft {n=2-4}, moist, (10YR 4/4) dark yellowish brown, 20% fine sand 5% gravel	Bentonite chips →
6			ML	X X X X X		Riser →
8	3	0.0, 0.0, 0.0	SW	X X X X X	7.0 WELL GRADED SAND, loose {n=5-10}, moist, (7.5YR 4/4) brown, fine to coarse SAND	
10			SW	X X X X X		
12	4	0.0, 0.0, 0.0, 0.0	ML	X X X X X	11.0 SILT WITH SAND, soft {n=2-4}, moist, (10YR 4/3) brown, 15% fine sand	Seal →
14			ML	X X X X X		
16			SPSM	X X X X X	14.0 POORLY GRADED SAND WITH SILT	Annular Backfill Filter Pack →
18	3	0.0, 0.5, 0.3	SP	X X X X X	15.5 POORLY GRADED SAND, loose {n=5-10}, dry, (10YR 5/4) yellowish brown, 5% gravel	Screen →
20			SP	X X X X X		
22	2.6	0.1, 0.3, 0.4	SPSM	X X X X X	24.0 POORLY GRADED SAND WITH SILT, loose {n=5-10}, moist, (10YR 4/3) brown, trace fine to medium gravel	
24			SPSM	X X X X X	25.5 WELL GRADED SAND, loose {n=5-10}, wet	
26			SW	X X X X X		
28	1.6	0.0, 0.0, 0.0	SW	X X X X X		
30			SW	X X X X X	30.0	End Cap/Base Backfill →

Remarks:

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Boring and Well Construction Log

Client: Camp Hero	Area: DU13	Logged By: A Borden
Location ID: CH-MW034	Northing: 334975.9 Easting: 1572442.8	Drilling Company: Cascade
Project #: 60443903	Ground & TOC Elevations (FT NAVD88): 48.9	Depth to Bedrock (ft bgs): NA
Start Date: 06-06-17	Drilling Method: Sonic	Well Screen Interval (ft bgs): 20-35
Finish Date: 06-06-17	Borehole Diameter (in): 6 in	Total Depth (ft): 37.5

Depth (ft bgs)	Recovery Length	PID (ppm)	USCS Code	Geo Unit Code	Soil and Rock Description Classification Scheme: USCS	Well Information		
0						Stickup →		
2	3.8	0.0, 0.0, 0.0, 0.0	OH		0.5 Organic soil, roots, grass			
			SM		2.5 SANDY SILT, loose, dry to moist, light reddish brown, silt, cohesive, slightly plastic, fine sand, well sorted			
4			SM		5.5 SILTY SAND, loose, dry, light grayish brown, medium sand, poorly sorted, subrounded, trace to some silt, trace gravel	Riser →		
6	5	0.0, 0.0, 0.0, 0.0, 0.0	MLCL		5.5 SILTY SAND WITH CLAY, dense and firm, light reddish brown, medium to fine sand, poorly sorted, silt and clay, cohesive, slightly plastic, trace amount of gravel,	Bentonite chips →		
8					5	0.0, 0.0, 0.0, 0.0, 0.0	some orange oxidation staining along preferential pathways at 17 feet bgs, not moist or wet	
10								
12								
14	3.1	0.0, 0.0, 0.0, 0.0, 0.0						
16								
18	5	0.0, 0.0, 0.0, 0.0, 0.0	CL		21.0 LEAN CLAY, lens, cohesive, plastic, very dense	Seal →		
20			SM		21.5 SILTY SAND, firm to moist, light grayish brown, fine to medium sand, poorly sorted, sub rounded, silt, slightly cohesive, trace gravel at 24' bgs, more moist than above	Annular Backfill Filter Pack →		
22			5	0.0, 0.0, 0.0, 0.0, 0.0	CL		27.0 SILTY SAND WITH CLAY, firm to dense, light grayish brown, dry to moist, fine to medium sand, poorly sorted, sub rounded, silt and clay, cohesive, not plastic	Screen →
24	5	0.0, 0.0, 0.0, 0.0, 0.0			SM		29.5 SILTY SAND, dense, moist to wet, light reddish gray, fine to medium sand, poorly sorted, sub rounded, silt, cohesive, trace gravel, sub rounded	
26								
28	5	0.0, 0.0, 0.0, 0.0, 0.0	SM					
30								
32								
34								
36					37.5	End Cap/Base Backfill →		

Remarks:

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Boring and Well Construction Log

Client: Camp Hero	Area: DU13	Logged By: A Borden
Location ID: CH-MW035	Northing: 335018.2 Easting: 1572552.8	Drilling Company: Cascade
Project #: 60443903	Ground & TOC Elevations (FT NAVD88): 42.0	Depth to Bedrock (ft bgs): NA
Start Date: 06-06-17	Drilling Method: Sonic	Well Screen Interval (ft bgs): 20-30
Finish Date: 06-06-17	Borehole Diameter (in): 6 in	Total Depth (ft): 32.5

Depth (ft bgs)	Recovery Length	PID (ppm)	USCS Code	Geo Unit Code	Soil and Rock Description Classification Scheme: USCS	Well Information
0						Stickup →
2	3.5	0.4, 0.6, 1.3, 0.5	OH		1.0 Organic soil, roots, loamy soil	
4			SM		SILTY SAND, loose to dense, dry, light reddish brown, fine to medium sand, poorly sorted, subrounded, silt, cohesive, non plastic fine sand at 4 feet bgs, trace gravel, broken rock fragment	Riser →
6	3.8	0.1, 0.4, 0.1, 0.8	MLCL		5.5 SILTY SAND WITH CLAY, dense, moist to dry, reddish brown, fine to medium sand, poorly sorted, sub rounded to rounded, silt and clay, cohesive, low plasticity, sticky, orange oxidation staining, bright orange to red, trace gravel and fragmented rock, becoming moist to dry, higher sand content at 14 feet bgs, moist, rock fragment	Bentonite chips →
8						
10						
12	4.1	0.1, 1.7, 2.3, 3.3, 2.4				
14						
16	4.5	0.3, 0.2, 1.3, 2.0, 0.7			16.0 SILTY SAND, firm/slightly dense, moist, light reddish brown, fine to medium sand, poorly sorted, rounded to subrounded, silt, slightly cohesive, trace to some gravel, rounded, non spherical, moisture limited to pore spaces	Seal →
18						
20	4.1	0.1, 0.2, 0.7, 1.1, 1.0,	SM		trace large diameter gravel ~1-2"	Annular Backfill Filter Pack →
22					till material, heterogenous sand, silt, and gravel	
24	4.3	0.4, 0.6, 0.2, 1.0, 1.5			SAA, tight to firm, less moisture in core material	Screen →
26						
28						
30						
32					32.5	End Cap/Base Backfill →

Remarks:

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Boring and Well Construction Log

Client: Camp Hero	Area: DU08	Logged By: M Glinski
Location ID: CH-MW036	Northing: 333730.5 Easting: 1572712.9	Drilling Company: Cascade
Project #: 60443903	Ground & TOC Elevations (FT NAVD88): 18.0	Depth to Bedrock (ft bgs): NA
Start Date: 06-09-17	Drilling Method: Sonic	Well Screen Interval (ft bgs): 5-14.5
Finish Date: 06-09-17	Borehole Diameter (in): 6 in	Total Depth (ft): 15.0

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Boring and Well Construction Log

Client: Camp Hero	Area: DU08	Logged By: A Borden
Location ID: CH-MW037	Northing: 333765.9 Easting: 1572787.9	Drilling Company: Cascade
Project #: 60443903	Ground & TOC Elevations (FT NAVD88): 18.8	Depth to Bedrock (ft bgs): NA
Start Date: 06-09-17	Drilling Method: Sonic	Well Screen Interval (ft bgs): 5-15
Finish Date: 06-09-17	Borehole Diameter (in): 6 in	Total Depth (ft): 17.5

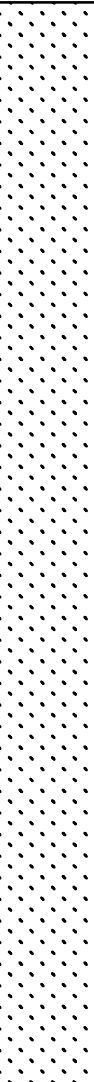
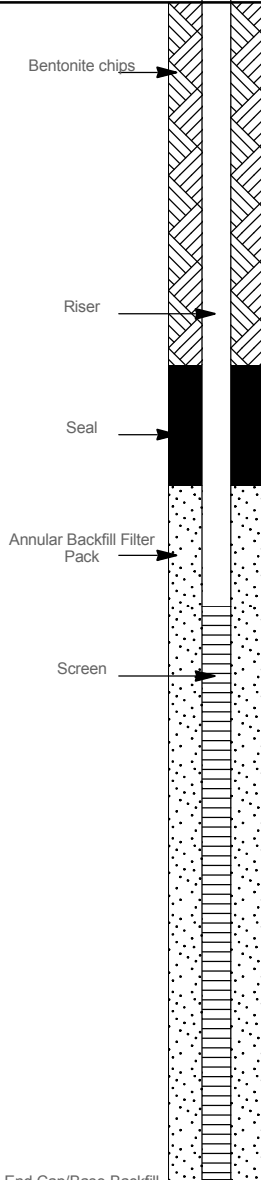
Depth (ft bgs)	Recovery Length	PID (ppm)	USCS Code	Geo Unit Code	Soil and Rock Description Classification Scheme: USCS	Well Information
0						
2	2	0.0, 0.1, 0.0	OH		0.5 Organic soil, tight, wet, roots, grass	
4			SP		SAND, lose, moist, grayish brown, medium sand, some coarse sand, subrounded, poorly sorted, rootsrock in shoe, crushedincreasing silt contentsand becomes coarse	Bentonite chips
6						Annular Backfill Filter Pack
8	3	0.2, 0.3, 0.2	SWGP		6.5 GRAVELLY SAND, very loose, wet, dark brownish gray, coarse sand, poorly sorted, subrounded, gravel, slightly spherical, rounded, 1" diameter	Riser
10			SM		9.5 SILTY SAND lens, firm, moist, dark brown, fine to medium sand, silt	Screen
12			SW		11.0 SAND, lose, wet, light brown, medium to coarse sand, well sorted, rounded, trace silt	
14	3.1	0.1, 0.1, 0.1	SPGP		12.5 GRAVELLY SAND, loose, wet, dark brown, poorly sorted, rounded gravel, sub spherical, 1" diameter	
16					17.5	End Cap/Base Backfill

Remarks: No Stickup

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Boring and Well Construction Log

Client: Camp Hero	Area: DU07	Logged By: M Glinski
Location ID: CH-MW038	Northing: 335849.6 Easting: 1571322.0	Drilling Company: Cascade
Project #: 60443903	Ground & TOC Elevations (FT NAVD88): 63.7	Depth to Bedrock (ft bgs): NA
Start Date: 06-07-17	Drilling Method: Sonic	Well Screen Interval (ft bgs): 10-19.5
Finish Date: 06-07-17	Borehole Diameter (in): 6 in	Total Depth (ft): 20.0

Depth (ft bgs)	Recovery Length	PID (ppm)	USCS Code	Geo Unit Code	Soil and Rock Description Classification Scheme: USCS	Well Information
0						Stickup →
2	2.5	0.0, 0.0	SM		SILTY SAND, soft {n=2-4}, wet, (7.5YR 4/6) strong brown, fine SAND, 20% fines trace gravel	
4						
6						
8	3	0.0, 0.0, 0.0				
10						
12						
14	3.4	0.0, 0.0, 0.0				
16						
18						
20	3.6	0.0, 0.0, 0.0				

Remarks:

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Boring and Well Construction Log

Client: Camp Hero	Area: DU15	Logged By: M Glinski
Location ID: CH-MW039	Northing: 335245.2 Easting: 1571285.3	Drilling Company: Cascade
Project #: 60443903	Ground & TOC Elevations (FT NAVD88): 66.2	Depth to Bedrock (ft bgs): NA
Start Date: 06-07-17	Drilling Method: Sonic	Well Screen Interval (ft bgs): 5-14.5
Finish Date: 06-07-17	Borehole Diameter (in): 6 in	Total Depth (ft): 15.0

Depth (ft bgs)	Recovery Length	PID (ppm)	USCS Code	Geo Unit Code	Soil and Rock Description Classification Scheme: USCS	Well Information
0						Stickup →
2	2.9	0.0, 0.0, 0.0	SM		SILTY SAND, non-plastic medium dense (n=11-30), dry, (2.5Y 4/3) olive brown, fine to medium SAND, 20% fines	Cement →
4						Seal →
6						Riser →
8	2.5	0.0, 0.0				Annular Backfill Filter Pack →
10			SPSM		POORLY GRADED SAND WITH SILT, non-plastic loose (n=5-10), wet, (2.5Y 5/3) light olive brown, fine to medium SAND	Screen →
12	3		SPSM		POORLY GRADED SAND w SILT + GRAVEL, 15% gravel	
14			SPSM		POORLY GRADED SAND WITH SILT, non-plastic loose (n=5-10), wet, (2.5Y 5/3) light olive brown, fine to medium SAND	
15.0						End Cap/Base Backfill →

Remarks:








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Boring and Well Construction Log

Client: Camp Hero	Area: DU06	Logged By: A Borden
Location ID: CH-MW041	Northing: 334117.5 Easting: 1570083.1	Drilling Company: Cascade
Project #: 60443903	Ground & TOC Elevations (FT NAVD88): 59.6	Depth to Bedrock (ft bgs): NA
Start Date: 06-05-17	Drilling Method: Sonic	Well Screen Interval (ft bgs): 15-25
Finish Date: 06-05-17	Borehole Diameter (in): 6 in	Total Depth (ft): 30.0

Depth (ft bgs)	Recovery Length	PID (ppm)	USCS Code	Geo Unit Code	Soil and Rock Description Classification Scheme: USCS	Well Information
0						Stickup →
2	4.1	0.0, 0.0, 0.0, 0.0, 0.0	OH		Organic soil, grass, roots, coal fragments	
4			SM		SILTY SAND, loose, moist, light brown with orange staining, fine to medium sand, rounded, poorly sorted, trace silt, cohesive, gray at 3 feet bgs	Riser →
6			OH		Peat/organic layer, leaves, roots, woody fragments	Bentonite chips →
8	4	0.0, 0.0, 0.0, 0.0, 0.0	SM		SILTY SAND, loose to firm, moist, light brown, fine sand, poorly sorted, rounded, silt, cohesive	
10			SP		SAND, loose, wet, medium sand, well sorted	
12			SM		SILTY SAND, firm, dry, gray with orange staining, fine sand with silt, trace clay, cohesive, non plastic	
14	2.8	0.0, 0.0, 0.0, 0.0, 0.0	SW		SAND, loose, dry to moist, light brown, medium sand, trace silt, grading to coarse sand, wet, poorly sorted	Seal →
16					SILTY SAND, loose to firm, light gray, moist, fine to medium sand, poorly sorted, sub rounded, silt, cohesive, non plastic, trace gravel, rounded, non spherical	Annular Backfill Filter Pack →
18					denser at 18 feet bgs, higher percentage of clay	
20	3.8	0.0, 0.0, 0.0, 0.0, 0.0			SILTY SAND continued, loose to firm, moist to slightly wet, light/dark gray, medium sand, poorly sorted, subrounded, silt, cohesive, non plastic, trace gravel, rounded	
22					slight coarser grained, more firm	Screen →
24						
26	3	0.0, 0.0, 0.0, 0.0, 0.0				
28						End Cap/Base Backfill →
30						

Remarks:

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Boring and Well Construction Log

Client: Camp Hero	Area: DU06	Logged By: A Borden
Location ID: CH-MW042	Northing: 334148.3 Easting: 1570132.9	Drilling Company: Cascade
Project #: 60443903	Ground & TOC Elevations (FT NAVD88): 61.1	Depth to Bedrock (ft bgs): NA
Start Date: 06-05-17	Drilling Method: Sonic	Well Screen Interval (ft bgs): 22-32
Finish Date: 06-05-17	Borehole Diameter (in): 5.5 in	Total Depth (ft): 35.0

Depth (ft bgs)	Recovery Length	PID (ppm)	USCS Code	Geo Unit Code	Soil and Rock Description Classification Scheme: USCS	Well Information
0						
2	2	0.0, 0.0, 0.7	OH		0.5 Organic soil (loam), grass, roots	
4			SM		SILTY SAND, moist, loose, black to dark brown, fine to medium sand with some silt, poorly sorted	Bentonite chips
6			SM		3.0 SILTY SAND WITH GRAVEL, loose, moist, light reddish brown, fine to medium sand with trace gravel, poorly sorted, gravel is rounded and non-spherical, moist to wet at 5-6 feet bgs	
8	4.5	0.0, 0.0, 0.4, 0.0, 0.0	MLCL		6.5 SILTY CLAY, soft, moist to wet, light brown, fine sand with trace medium sand, cohesive, slightly plastic	
10			SM		8.0 SILTY SAND, soft, dry to moist, light brown with orange staining, fine sand with silt, trace clay, poorly sorted, cohesive becoming moist at 11 feet bgs, coarsening at 12 feet bgs, trace gravel, orange staining, medium to coarse sand at 14 feet bgs, poorly sorted	Riser
12	4	0.0, 0.0, 0.0, 0.0	SM			
14			MLCL		17.0 SILTY SAND WITH CLAY, dense, dry to moist, medium brown with orange staining, medium sand, trace gravel, poorly sorted, sand is rounded, non-spherical becoming stiff and dense, difficult to break open core	Seal
16	4.5	0.0, 0.0, 0.0	MLCL		21.0 SAND, loose, moist to wet, light gray, medium sand, poorly sorted, rounded, trace silt, slightly cohesive, trace amount of gravel	Annular Backfill Filter Pack
18			SW			
20			SW			
22	2.5	0.0, 0.0, 0.0	SW			
24			SW			
26			SW			
28	0	NA	SW			Screen
30			SM		30.0 SILTY SAND, stiff, moist to dry, light gray, medium to coarse sand, angular to sub rounded, poorly sorted, silt, stiff, cohesive, not plastic	
32	4.2	0.0, 0.0, 0.0, 0.0	SM		very coarse, wet, loose, poorly sorted at 35 feet bgs	
34			SM			End Cap/Base Backfill
35.0						

Remarks: No Stickup

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