PROJECT NUMBER	BORING NUMBER	
678490	EW-1	SHEET 1 OF 1

SOIL BORING LOG and WELL CONSTRUCTION

PROJECT : UPRR Mosier Derailment | LOCATION : Mosier, OR | Date Drilled: 6/13/2016

DRILLING CONTRACTOR : Environmental West Explorations

DRILLING METHOD AND EQUIPMENT USED : Air Rotary B-90

WATER LEVELS : 22.85 feet | START : 14:00 | END : 16:10 | LOGGER :

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL (FT) / RECOVERY (FT)	USCS GROUP SYMBOL	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	WELL CONSTRUCTION DIAGRAM: CASING MATERIAL, SCREEN TYPE, SEAL TYPE, FILTER SAND TYPE	PID READING
0		GP	2-inch minus gravel fill	12" flush-mount vault and cement seal (to 1.0' bgs)	
		GP	Dry compacted clean gravel fill		0.1
5					
			As above		
		GP		17.0' to 2.0' Bentonite Chip Seal	0
10					
			Grayish-Brown silty sandy gravel - silt matrix with 3-4" rounded to subrounded poorly graded gravel, f-m sand, no odor, no sheen (fill?), moist		
15					
				17.0' to 36.0' Filter Pack	0.2
			As above		
20			Increase in moisture at 20'	20' Top Depth of Screen	
			Becomes saturated at 22'		
			no sheen observed		0.1
25		GM			
30			As Above		
					0
35			Increase in fines at 35'	35' Bottom Depth of Screen	
		GC	Grayish Brown clayey gravel - clay matrix with occasional f-c angular basalt fragments, no odor, no sheen, saturated. Drilling becomes hard at 39.5'		0
40					

<- 8" ->

Boring logged by drill cuttings from cyclone

Well Casing and Screen Materials Casing Material: Sch 40 PVC Casing Diameter: 4-in
Seal Type: 3/8" Bentonite Chips Pack Type: 10-20 Colorado Silica Sand Screen Length: 15 ft
Screen Type: Sch 40, 0.010" Milled Slots

PROJECT NUMBER	BORING NUMBER	
678490	EW-2	SHEET 1 OF 1

CH2MHILL

SOIL BORING LOG and WELL CONSTRUCTION

PROJECT : UPRR Mosier Derailment | LOCATION : Mosier, OR | Date Drilled: 6/15/2016

DRILLING CONTRACTOR : Environmental West Explorations

DRILLING METHOD AND EQUIPMENT USED : Air Rotary B-90

WATER LEVELS : 22.06 feet | START : 14:20 | END : 16:45 | LOGGER :

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL (FT) / RECOVERY (FT)	USCS GROUP SYMBOL	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	WELL CONSTRUCTION DIAGRAM: CASING MATERIAL, SCREEN TYPE, SEAL TYPE, FILTER SAND TYPE	PID READING
0		GP	2-inch minus gravel fill	12" flush-mount vault and cement seal (to 1.0' bgs)	
		GP	Dry compacted clean gravel fill		0.1
5		GM	Reddish-Brown silty gravel - silt matrix with angular basalt gravel, poorly graded, no odor, no sheen, moist, occasional f-m sand in matrix	13.0' to 2.0' Bentonite Chip Seal	0
10			Increase in f-m sand at 12'	13.0' to 36.0' Filter Pack	
15			Reddish-Brown silty sandy gravel - silt and f-m sand matrix with angular basalt gravel, poorly graded, no odor, no sheen, moist	15' Top Depth of Screen	0.2
20			Increase in moisture at 21'		
		GM	Becomes saturated at 22'		0.1
25			no sheen observed		
30			Increase of f-m sand at 31'		
35		GP	Brown to Reddish brown sandy gravel - f-c angular to subangular sand with f-m gravel. Gravel is subangular consisting of basalt with quartz (alluvium), poorly graded, no odor, no sheen, saturated	35' Bottom Depth of Screen	0

Boring logged by drill cuttings from cyclone

Well Casing and Screen Materials Casing Material: Sch 40 PVC Casing Diameter: 4-in
Seal Type: 3/8" Bentonite Chips Pack Type: 10-20 Colorado Silica Sand Screen Length: 15 ft
Screen Type: Sch 40, 0.010" Milled Slots

PROJECT NUMBER	BORING NUMBER	
678490	MW-1	SHEET 1 OF 1

SOIL BORING LOG and WELL CONSTRUCTION

PROJECT : UPRR Mosier Derailment | LOCATION : Mosier, OR | Date Drilled: 6/16/2016

DRILLING CONTRACTOR : Cascade Drilling

DRILLING METHOD AND EQUIPMENT USED : Sonic track mount

WATER LEVELS : 14.8 feet | START : 10:30 | END : 11:30 | LOGGER :

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL (FT)	RECOVERY (FT)	USCS GROUP SYMBOL	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	WELL CONSTRUCTION DIAGRAM: CASING MATERIAL, SCREEN TYPE, SEAL TYPE, FILTER SAND TYPE	PID READING
0			GM	Brown silty gravel - 3-4 inch rounded to subrounded gravel with occasional cobbles in a silt matrix, dry (fill?)	12" flush-mount vault and cement seal (to 1.0' bgs)	
				Grayish-Brown gravel - 1-inch subrounded gravel with silt and f-m sand matrix, poorly graded, loose, dry.	5.0' to 1.0' Bentonite Chip Seal	0.1
5					7' Top Depth of Screen	0
10			GP	Increase of moisture at 12'	5.0' to 23.0' Filter Pack	
15						0.2
20				Brown to Reddish brown sandy gravel - f-c angular to subangular sand with f-m gravel. Gravel is subangular consisting of basalt with quartz (alluvium), poorly graded, no odor, no sheen, saturated	22' Bottom Depth of Screen	

Well Casing and Screen Materials Casing Material: Sch 40 PVC Casing Diameter: 2-in
Seal Type: 3/8" Bentonite Chips Pack Type: 10-20 Colorado Silica Sand Screen Length: 15 ft
Screen Type: Sch 40, 0.010" Milled Slots

PROJECT NUMBER	BORING NUMBER	
678490	MW-2	SHEET 1 OF 1

SOIL BORING LOG and WELL CONSTRUCTION

PROJECT : UPRR Mosier Derailment LOCATION : Mosier, OR Date Drilled: 6/17/2016

DRILLING CONTRACTOR : Cascade Drilling

DRILLING METHOD AND EQUIPMENT USED : Sonic track mount

WATER LEVELS : 10.6 feet START : 10:30 END : 11:30 LOGGER :

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL (FT) / RECOVERY (FT)	USCS GROUP SYMBOL	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	WELL CONSTRUCTION DIAGRAM: CASING MATERIAL, SCREEN TYPE, SEAL TYPE, FILTER SAND TYPE	PID READING
0		GM	Brown silty gravel - 3-4 inch rounded to subrounded gravel with occassional cobbles in a silt matrix, dry	12" flush-mount vault and cement seal (to 1.0' bgs)	
			Grayish-Brown gravel - 1-inch subrounded gravel with silt and f-m sand matrix, poorly graded, loose, dry.	4.0' to 1.0' Bentonite Chip Seal	0.1
5				5' Top Depth of Screen	
			Increase of moisture at 9'		0
10		GP	Grades to Brown to Grayish Brown Gravel - f-c angular to subangular sand with silt. Gravel is angular to subrounded (1-3") alluvium, poorly graded, no odor, no sheen, satruated	4.0' to 21.0' Filter Pack	
15			Increase of f-m sand		0.2
			As Above - Brown to Grayish Brown Gravel - f-c angular to subangular sand with silt. Gravel is angular to subrounded (1-3") alluvium, poorly graded, no odor, no sheen, satruated		
20				20' Bottom Depth of Screen	

Well Casing and Screen Materials Casing Material: Sch 40 PVC Casing Diameter: 2-in
Seal Type: 3/8" Bentonite Chips Pack Type: 10-20 Colorado Silica Sand Screen Length: 15 ft
Screen Type: Sch 40, 0.010" Milled Slots

CH2MHILL

PROJECT NUMBER	BORING NUMBER	
678490	MW-3	SHEET 1 OF 1

SOIL BORING LOG and WELL CONSTRUCTION

PROJECT : UPRR Mosier Derailment LOCATION : Mosier, OR Date Drilled: 6/17/2016

DRILLING CONTRACTOR : Cascade Drilling

DRILLING METHOD AND EQUIPMENT USED : Sonic track mount

WATER LEVELS : 10.0 feet START : 08:00 END : 9:00 LOGGER :

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL (FT)	RECOVERY (FT)	USCS GROUP SYMBOL	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	WELL CONSTRUCTION DIAGRAM: CASING MATERIAL, SCREEN TYPE, SEAL TYPE, FILTER SAND TYPE	PID READING
0			GM	Brown silty gravel - 3-4 inch rounded to subrounded gravel with occassional cobbles in a silt matrix, dry	12" flush-mount vault and cement seal (to 1.0' bgs)	
				Grayish-Brown gravel - 1-inch subrounded gravel with silt and f-m sand matrix, poorly graded, loose, dry.	4.0' to 1.0' Bentonite Chip Seal	0.1
5					5' Top Depth of Screen	
				Increase of moisture at 9'		0
10			GP	Grades to Brown to Grayish Brown Gravel - f-c angular to subangular sand with silt. Gravel is angular to subrounded (1-3") alluvium, poorly graded, no odor, no sheen, satruated	4.0' to 21.0' Filter Pack	
15				Increase of fines at 18'		0.2
				Brown to Grayish Brown Gravel - f-c angular to subangular sand with silt. Higher fines content than above. Gravel is angular to subrounded (1-3") alluvium, poorly graded, no odor, no sheen, satruated		
20					20' Bottom Depth of Screen	

Well Casing and Screen Materials Casing Material: Sch 40 PVC Casing Diameter: 2-in
Seal Type: 3/8" Bentonite Chips Pack Type: 10-20 Colorado Silica Sand Screen Length: 15 ft
Screen Type: Sch 40, 0.010" Milled Slots

CH2MHILL

PROJECT NUMBER	BORING NUMBER	
678490	MW-4	SHEET 1 OF 1

SOIL BORING LOG and WELL CONSTRUCTION

PROJECT : UPRR Mosier Derailment | LOCATION : Mosier, OR | Date Drilled: 6/16/2016

DRILLING CONTRACTOR : Cascade Drilling

DRILLING METHOD AND EQUIPMENT USED : Sonic track mount

WATER LEVELS : 6.0 feet | START : 14:45 | END : 15:30 | LOGGER :

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL (FT) / RECOVERY (FT)	USCS GROUP SYMBOL	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	WELL CONSTRUCTION DIAGRAM: CASING MATERIAL, SCREEN TYPE, SEAL TYPE, FILTER SAND TYPE	PID READING
0		GM	Brown silty gravel - 3-4 inch rounded to subrounded gravel with occasional cobbles in a silt matrix, dry	12" flush-mount vault and cement seal (to 1.0' bgs)	
				4.0' to 1.0' Bentonite Chip Seal	0.1
			Grayish-Brown gravel - 1-inch subrounded gravel with silt and f-m sand matrix, poorly graded, loose, Increase of moisture at 5'		
5				5' Top Depth of Screen	
			Becomes saturated at 6'		
		GP			0
10					
				4.0' to 16.0' Filter Pack	
		ML	Grades to Brown Silt - Silt (soft) with occasional basalt gravel. Gravel is angular to subrounded (1") alluvium, poorly graded, no odor, no sheen, saturated		
15				15' Bottom Depth of Screen	
		GP	Grades to Grayish Brown Gravel - f-c angular to subangular sand with silt. Gravel is angular to subrounded (1-3") alluvium, poorly graded, no odor, no sheen, saturated		

Well Casing and Screen Materials Casing Material: Sch 40 PVC Casing Diameter: 2-in
Seal Type: 3/8" Bentonite Chips Pack Type: 10-20 Colorado Silica Sand Screen Length: 10 ft
Screen Type: Sch 40, 0.010" Milled Slots