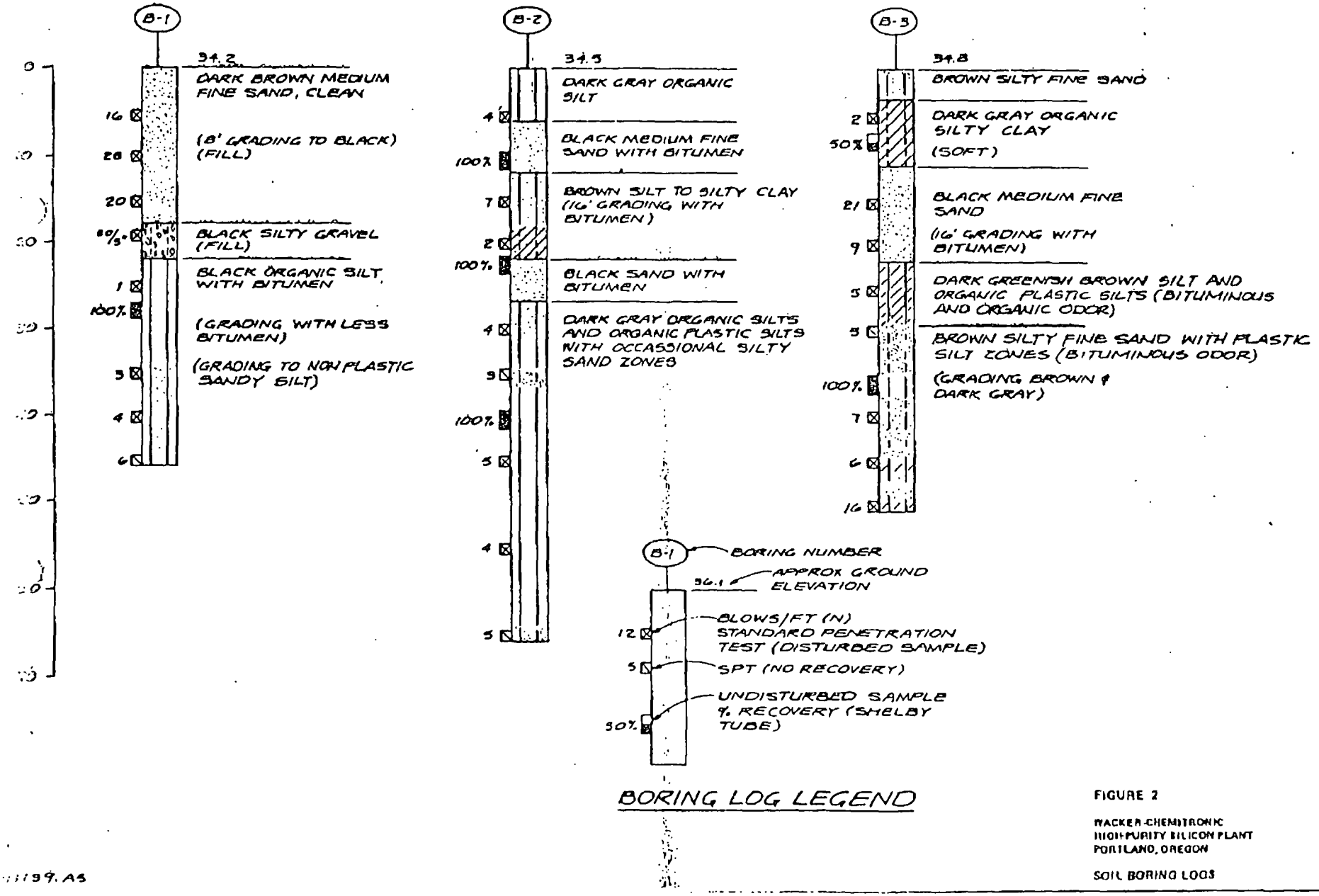
Received: 11/ 3/00 11:52AM; 1 503 229 6899 -> HAHN * ASSOCIATES; Page 5
11/03/00 FRI 12:44 FAX 1 503 229 6899 DEQ VCSAS 005



BORING LOG LEGEND

FIGURE 2

WACKER-CHEMITRONIC
HIGH-PURITY SILICON PLANT
PORTLAND, OREGON

SOIL BORING LOGS

11199.AS

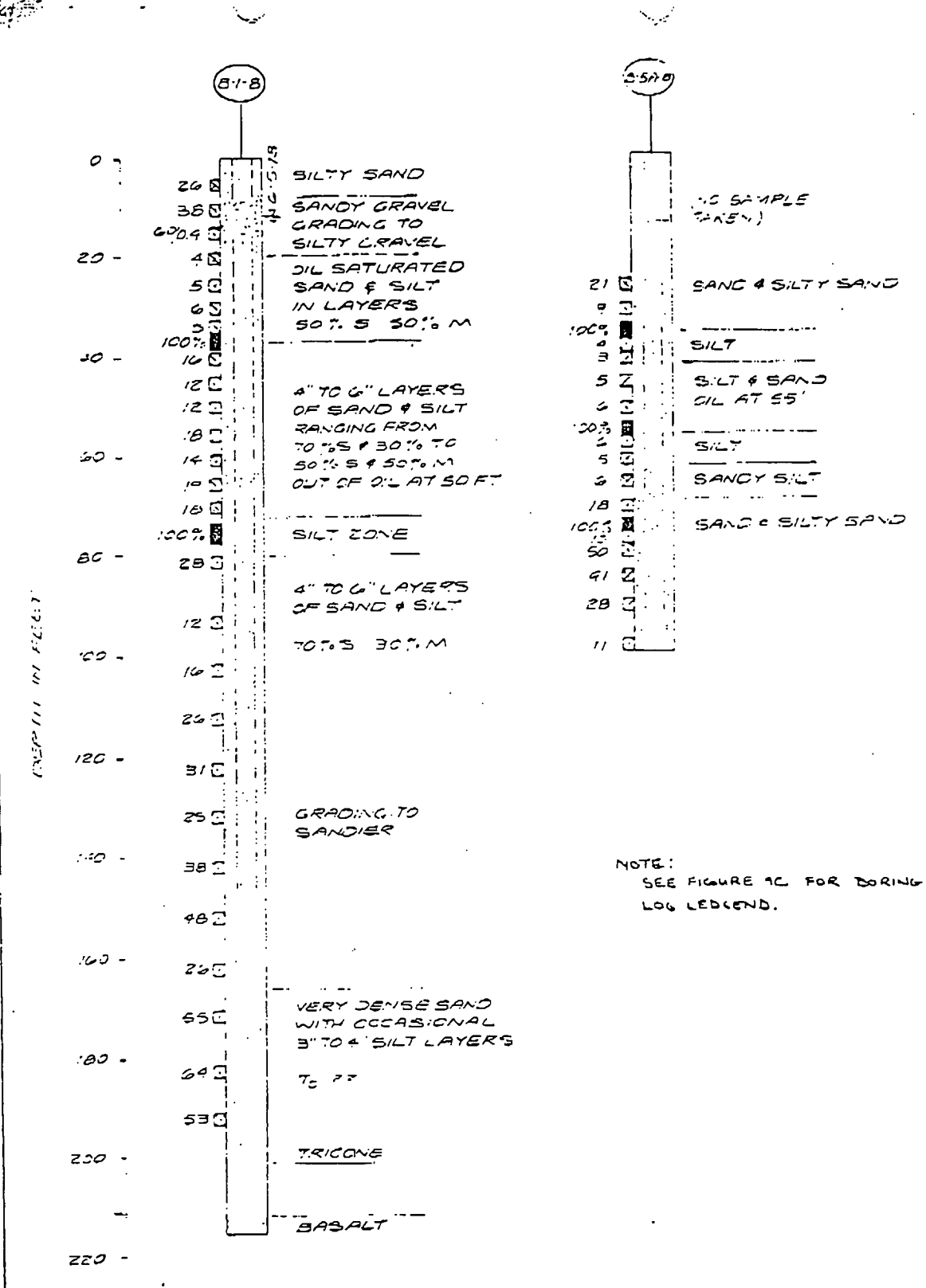


FIGURE 4D
WACKER SILTRONIC
PORTLAND, ORE.
PHASE II BORING LOGS

CH2M HILL

Received: 11/ 3/00 11:54AM; 1 503 229 6899 -> HAHN * ASSOCIATES; Page 11
11/03/00 FRI 12:46 FAX 1 503 229 6899 DEQ VCSAS 011

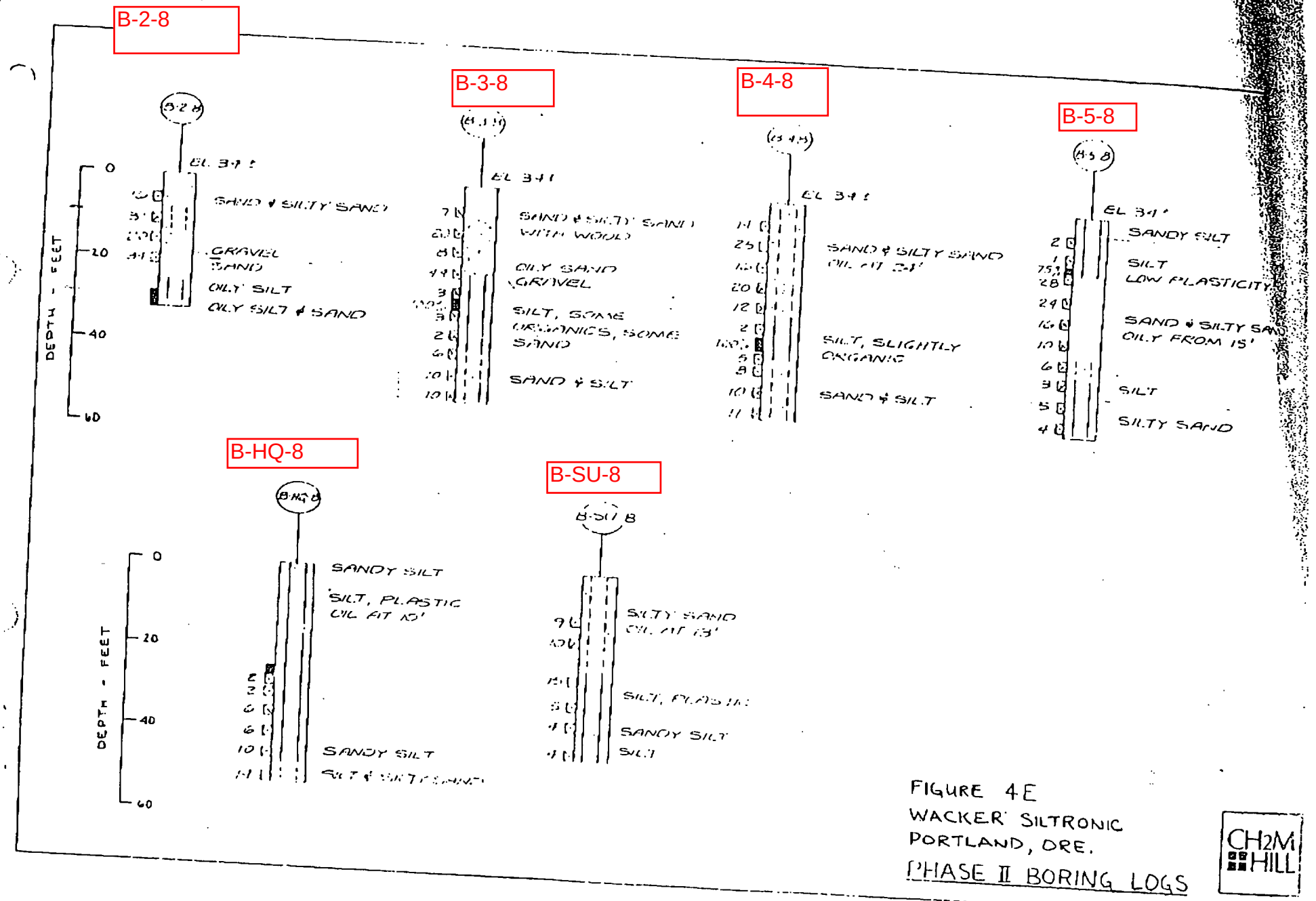


FIGURE 4E
WACKER SILTRONIC
PORTLAND, ORE.
PHASE II BORING LOGS

CH2M HILL

CH2M HILL

PROJECT NUMBER P16058.B0

SOIL BORING LOG

PROJECT Wacker Siltronics LOCATION

DRILLING METHOD Mud Rotary DRILLERS & EQUIPMENT D. Kenner of Oregon, Inc.; CME-55

ELEVATION 35.6 ft BORE HOLE: B-100

WATER LEVEL not measured DATE: -- START: 6/29/82 FINISH: 6/30/82 INSPECTOR CWHL

DEPTH BELOW SURFACE (ft)	SAMPLE: INTERVAL AND TYPE	SAMPLE: NUMBER	SAMPLE: RECOVERY (INCHES)	STANDARD PENETRATION TEST RESULTS: BLOWS 6"-6"-6"	STANDARD PENETRATION TEST RESULTS: BPF "N"	SOIL DESCRIPTION (COLOR, RELATIVE DENSITY OR CONSISTENCY, MOISTURE, GRAIN SHAPE AND TYPE, STRUCTURE, CEMENTATION, ORGANICS, MATERIAL)	GRAPHIC LOG	UNIFIED SOIL CLASSIFICATION SYMBOL	COMMENTS (DRILLING PROGRESS, LOST CIRCULATION, TYPE OF DEPOSIT, PROBLEMS, ETC.)
0									Start drilling at 11:00AM
									Begin drilling with drag bit
5	5.0								
	6.5	S-1	12	3-10-9	19	UPPER 3" SANDY SILT, SLIGHTLY PLASTIC, ABOUT 15% FINE SAND, GRAY, MOIST, LOOSE; FILL. LOWER 9" SILTY SAND, FINE SAND, 15-20% FINES, GRAY, WET, COMPACT, SOME PLANT FRAGMENTS; FILL.		ML SM	Driller notes strong petroleum odor at 5 to 10 ft
	10.0								Driller notes some gravel at 9 ft
10	11.5	S-2	7	12-11-18	29	SILTY SAND, 10-15% GRAVEL TO ABOUT 1¼" FINE SAND, 25-30% FINES, MOIST, BLACK, STRONG HYDROCARBON ODOR, SOME RUBBERY DEBRIS AND PLANT REMAINS; FILL.		SM	
	15.0								Rubbery debris and fine copper wire in cuttings from 10 to 15 ft.
15	16.5	S-3	2	12-24-11	35	SILTY SAND, SMALL RECOVERY BUT MATERIAL APPEARS SIMILAR TO S-2; FILL.		SM	Sampler rebounded during SPT for S-3 as if it were penetrating rubber (tires?)
	20.0								
20	21.5	S-4	14	1-1-1	2	UPPER 7" - SILT, SLIGHTLY TO MODERATELY PLASTIC, DARK GRAY, WET, VERY SOFT, WOOD DEBRIS, HYDROCARBON ODOR; FILL? LOWER 7" - SILT, SLIGHTLY PLASTIC, MEDIUM GRAY W/ORANGE BROWN MOTTLING, MOIST, VERY SOFT, SOME DECOMPOSED PLANT MATERIAL.		ML	
	25.0								
25	26.5	S-5	14	2-2-2	4	SILT, SIMILAR TO LOWER 7" OF S-4 EXCEPT CONSISTANCY IS SOFT.		ML	
	28.0								
		ST-6	24	---	—	SILT, MODERATELY TO HIGHLY PLASTIC, GRAY, MOIST, VERY SOFT.		MH	
30	30.0								

CH2M HILL

PROJECT NUMBER P16058.B0

SOIL BORING LOG

PROJECT Wacker Siltronics LOCATION Portland, Oregon

DRILLING METHOD Mud Rotary DRILLERS & EQUIPMENT D. Kenner of Oregon, Inc.; CME-5.

ELEVATION 35.6 ft BORE HOLE: B-100

WATER LEVEL not measured DATE: -- START: 6/29/82 FINISH: 6/30/82 INSPECTOR CW HL

DEPTH BELOW SURFACE (ft)	SAMPLE INTERVAL	SAMPLE NUMBER	SAMPLE RECOVERY (INCHES)	STANDARD PENETRATION TEST RESULTS BLOWS 6"-6"-6"	STANDARD PENETRATION TEST RESULTS BPF "N"	SOIL DESCRIPTION (COLOR, RELATIVE DENSITY OR CONSISTENCY, MOISTURE, GRAIN SHAPE AND TYPE, STRUCTURE, CEMENTATION, ORGANICS, MATERIAL)	GRAPHIC LOG	UNIFIED SOIL CLASSIFICATION SYMBOL	COMMENTS (DRILLING PROGRESS, LOST CIRCULATION, TYPE OF DEPOSIT, PROBLEMS, ETC.)
30	30.0								
	31.5	S-7	15	2-4-6	10	SILT, SLIGHTLY PLASTIC, LESS THAN 5% FINE SAND, GRAY, MOIST, FIRM TO STIFF.		ML	
	35.0								
35	36.5	S-8	18	1-1/12"	-1	SILT SIMILAR TO S-7 EXCEPT FOR WOOD DEBRIS IN LOWER 4" AND FRAGMENTS OF DECOMPOSED PLANT MATERIAL THROUGHOUT SAMPLE.		ML	
	38.0								
	40.0	ST-9	24	---		SILT SAME AS S-7 EXCEPT LENSES OF SAND AND GRAVEL		ML	
40	41.5	S-10	14	3-1-1	2	SANDY SILT, NON PLASTIC, ABOUT 15% FINE TO COARSE SAND, MEDIUM GRAY, VERY LOOSE DECOMPOSED WOOD FRAGMENTS THROUGH OUT SAMPLE, ABOUT 25% FINE SAND AND GRAVEL IN UPPER 3"; ORGANIC ODOR.		ML	
	45.0								
45	46.5	S-11	18	1-2-3	5	SILT, SLIGHTLY PLASTIC, BLUE-GREENISH GRAY, MOIST, FIRM.		ML	
	50.0								
50	51.5	S-12	18	3-3-3	6	SILT, SAME AS S-11.		ML	
	55.0								
55	56.5	S-13	16	2-5-10	15	SANDY SILT, NON PLASTIC, 15-20% FINE SAND, GRAY, MOIST, COMPACT.		ML	
60									

CH2M HILL

PROJECT NUMBER P16058.B0

SOIL BORING LOG

PROJECT Wacker Siltronics LOCATION Portland, Oregon

DRILLING METHOD Mud Rotary DRILLERS & EQUIPMENT D. Kenner of Oregon; CME-55

ELEVATION 35.6 ft BORE HOLE: B-100

WATER LEVEL Not measured DATE: -- START: 6/29/82 FINISH: 6/30/82 INSPECTOR CWHL

DEPTH BELOW SURFACE (ft)	SAMPLE INTERVAL	SAMPLE NUMBER	SAMPLE RECOVERY (INCHES)	STANDARD PENETRATION TEST RESULTS BLOWS 6"-6"-6"	STANDARD PENETRATION TEST RESULTS BPF "N"	SOIL DESCRIPTION (COLOR, RELATIVE DENSITY OR CONSISTENCY, MOISTURE, GRAIN SHAPE AND TYPE, STRUCTURE, CEMENTATION, ORGANICS, MATERIAL)	GRAPHIC LOG	UNIFIED SOIL CLASSIFICATION SYMBOL	COMMENTS (DRILLING PROGRESS, LOST CIRCULATION, TYPE OF DEPOSIT, PROBLEMS, ETC.)
60	60.0								
	61.5	S-14	8	6-11-12	23	SILTY SAND FINE SAND, 30-35% FINES, BROWN, WET, COMPACT.		SM	
	65.0								
65	66.5	S-15	10	7-12-18	30	UPPER 3" SILT, MODERATELY PLASTIC, ABOUT 3% FINE SAND, BROWN, MOIST, STIFF. LOWER 7" SILTY SAND, FINE SAND, 20-25% FINES, BROWN, WET, COMPACT.		ML SM	HOLE COLLAPSED FROM 65-85 FT ON NIGHT OF 6/29.
	70.0								
70	71.5	S-16	8	12-17-18	35	SAND, UNIFORMLY GRADED FINE SAND, 5-10% FINES, BROWN, WET, DENSE.		SP-SM	
	75.0								
75	76.5	S-17	8	9-16-17	33	SILTY SAND, FINE SAND, 12-15% FINES, BROWN, WET, DENSE.		SM	
	80.0								
80	81.5	S-18	8	10-17-17	34	SILTY SAND, SAME AS S-17, EXCEPT 20-25% FINES.		SM	
	85.0								END DRILLING @ 4:30 P.M. BEGIN DRILLING @ 7:30 AM CHANGE FROM DRAG BIT TO ROLLER BIT.
85	86.2	S-19	3	8-32-70/4"	102/14"	BASALT, HIGHLY WEATHERED TO SANDY GRAVEL, POORLY GRADED, GRAVEL TO AT LEAST 1 3/8", ABOUT 15% FINE TO COARSE SAND, 5-12% FINES, BROWN AND BLACK, MOIST, HARD.			
90									

CH2M HILL

PROJECT NUMBER P16058.B0

SOIL BORING LOG

PROJECT Wacker Siltronics LOCATION Portland, Oregon

DRILLING METHOD Mud Rotary DRILLERS & EQUIPMENT D. Kenner of Oregon, Inc.; CME-55

ELEVATION 35.6 ft BORE HOLE: B-100

WATER LEVEL Not Measured DATE: -- START: 6/29/82 FINISH: 6/30/82 INSPECTOR CWHL

DEPTH BELOW SURFACE (ft)	SAMPLE INTERVAL	SAMPLE NUMBER	SAMPLE RECOVERY (INCHES)	STANDARD PENETRATION TEST RESULTS BLOWS 6"-6"-6"	STANDARD PENETRATION TEST RESULTS BPF "N"	SOIL DESCRIPTION (COLOR, RELATIVE DENSITY OR CONSISTENCY, MOISTURE, GRAIN SHAPE AND TYPE, STRUCTURE, CEMENTATION, ORGANICS, MATERIAL)	GRAPHIC LOG	UNIFIED SOIL CLASSIFICATION SYMBOL	COMMENTS (DRILLING PROGRESS, LOST CIRCULATION, TYPE OF DEPOSIT, PROBLEMS, ETC.)
90	90.0 90.1	S-20	1.5	60/1.5	60/1.5	BASALT, WEATHERED, SAME AS S-19.	++++ ++++ ++++		DRILLER NOTES VERY HARD MATERIAL AT 90'
						END BORING AT 90.1 FEET			SAMPLER BOUNCES DURING 5' FOR S-20
95									FINISH DRILLING AT 8:45 A.M.

CH2M HILL

PROJECT NUMBER

SOIL BORING LOG

PROJECT Wacker Siltronics LOCATION Portland, Oregon

DRILLING METHOD Mud Rotary DRILLERS & EQUIPMENT D. Kenner of Oregon, Inc.; SME-55

ELEVATION 34.5 ft BORE HOLE: B-101

WATER LEVEL not measured DATE: -- START: 6/28/82 FINISH: 6/29/82 INSPECTOR CW HL

DEPTH BELOW SURFACE (ft)	SAMPLE INTERVAL	SAMPLE NUMBER	SAMPLE RECOVERY (INCHES)	STANDARD PENETRATION TEST RESULTS BLOWS 6"-6"-6"	STANDARD PENETRATION TEST RESULTS BPF "N"	SOIL DESCRIPTION (COLOR, RELATIVE DENSITY OR CONSISTENCY, MOISTURE, GRAIN SHAPE AND TYPE, STRUCTURE, CEMENTATION, ORGANICS, MATERIAL)	GRAPHIC LOG	UNIFIED SOIL CLASSIFICATION SYMBOL	COMMENTS (DRILLING PROGRESS, LOST CIRCULATION, TYPE OF DEPOSIT, PROBLEMS, ETC.)
0						SILTY SAND at SURFACE, BRICKS, WOOD DEBRIS, ETC, FILL.		SM	START DRILLING AT 1035 BEGIN DRILLING WITH A DRAG BIT.
5	5.0								
	6.5	S-1	0	2-1-1	3	NO RECOVERY.			DRILLER NOTES CHANGE FROM SILTY SAND TO SILT AT 6'.
10	10.0								
	11.5	S-2	3	5-4-5	9	SILTY SAND, FINE TO MEDIUM SAND, 20-30% FINES, BLACK, WET, LOOSE; FILL.		SM	
15	15.0								
	16.5	S-3	9	1-1-2	3	SANDY SILT, SLIGHTLY PLASTIC, FINE TO MEDIUM SAND, BLACK, WET, LOOSE, SOME ROUNDED GRAVELS TO ½" STRANDS OF COPPER WIRE IN SAMPLE, FILL, HYDROCARBON ODOR.		ML	RUBBER DEBRIS (TIRES) IN HOLE 15 TO 20'. DRILLER NOTES CLUMPS OF FINE COPPER WIRE IN CUTTINGS 15-20'.
20	20.0								
	21.5	S-4	13	3-3-3	6	LAYERED SILTY SAND AND SANDY SILT; SILTY SAND, FINE SAND, 25-35% FINES, DARK GRAY, WET, LOOSE, LAYERS 1-3" THICK		SM, ML	DRILLER SUSPECTS LOG(S) AT ABOUT 20'.
25	25.0					SANDY SILT, SLIGHTLY PLASTIC, DARK GRAY, MOIST, LOOSE, LOCAL CONCENTRATION OF DECOMPOSED PLANT MATERIAL.			
	26.5	S-5	18	1-4-5	9	SANDY SILT, SLIGHTLY PLASTIC, 10-15% FINE SAND, MOTTLED BROWN AND GRAY, MOIST, COMPACT, TRACES OF DECOMPOSED PLANT MATERIAL, HYDROCARBON ODOR.		ML	
30									

CH2M HILL

PROJECT NUMBER P16058.B0

SOIL BORING LOG

PROJECT Wacker Siltronics LOCATION Portland, Oregon

DRILLING METHOD Mud Rotary DRILLERS & EQUIPMENT D. Kuller of Oregon, Inc.; CME-55

ELEVATION 34.5 ft BORE HOLE: B-101

WATER LEVEL Not Measured DATE: -- START: 6/28/82 FINISH: 6/29/82 INSPECTOR CWHL

DEPTH BELOW SURFACE (ft)	SAMPLE INTERVAL	SAMPLE NUMBER	SAMPLE RECOVERY (INCHES)	STANDARD PENETRATION TEST RESULTS BLOWS 6"-6"-6"	STANDARD PENETRATION TEST RESULTS BPF "N"	SOIL DESCRIPTION (COLOR, RELATIVE DENSITY OR CONSISTENCY, MOISTURE, GRAIN SHAPE AND TYPE, STRUCTURE, CEMENTATION, ORGANICS, MATERIAL)	GRAPHIC LOG	UNIFIED SOIL CLASSIFICATION SYMBOL	COMMENTS (DRILLING PROGRESS, LOST CIRCULATION, TYPE OF DEPOSIT, PROBLEMS, ETC.)
30	30.0								
	31.5	S-6	16	1-1-1	2	SILT, SLIGHTLY PLASTIC, MEDIUM GRAY W/REDDISH BROWN MOTTLED, WET.		ML	
	33.0								
	35.0	ST-7	24	---	--	SILT, SIMILAR TO S-6 EXCEPT SLIGHTLY TO MODERATELY PLASTIC, BROWN COLOR.		ML	
35	36.5	S-8	18	4-5-9	14	SILT, SLIGHTLY TO MODERATELY PLASTIC, BROWN, MOIST, FIRM.		ML	
	40.0								
40	41.5	S-9	18	3-3-4	7	SILT, SIMILAR TO S-8, EXCEPT ABOUT 5% FINE SAND, SOFT TO FIRM.		ML	MIX MUD AT 41.5'
	45.0								
45	46.5	S-10	12	3-6-10	16	UPPER 6" SILT, SIMILAR TO S-8 EXCEPT 5-10% FINE TO MEDIUM SAND, BROWN AND GRAY, SOFT, LOWER 6" SILTY SAND, FINE SAND, 25-30% FINES, BROWN, WET LOOSE TO COMPACT.		ML SM	DRILLER NOTES SANDY MATERIAL AND SOFT DRILLING TO 50'.
	50.0								
50	51.5	S-11	18	3-8-13	21	SANDY SILT, NON PLASTIC, 12-15% FINE SAND, BROWN, WET, COMPACT.		ML	
	55.0								DRILLER NOTES HARDER DRILLING AT 45'.
55	56.5	S-12	6	11-23-28	51	SILTY SAND, FINE SAND, 10-15% FINES IN LOWER PART 30-40% FINES IN UPPER PART, BROWN, MOIST, DENSE, SEVERAL LENSES ≤ ½" OF SILT INTERBEDDED WITH THE SILTY SAND.		SM	
60									

CH2M HILL

PROJECT NUMBER P160058.80

SOIL BORING LOG

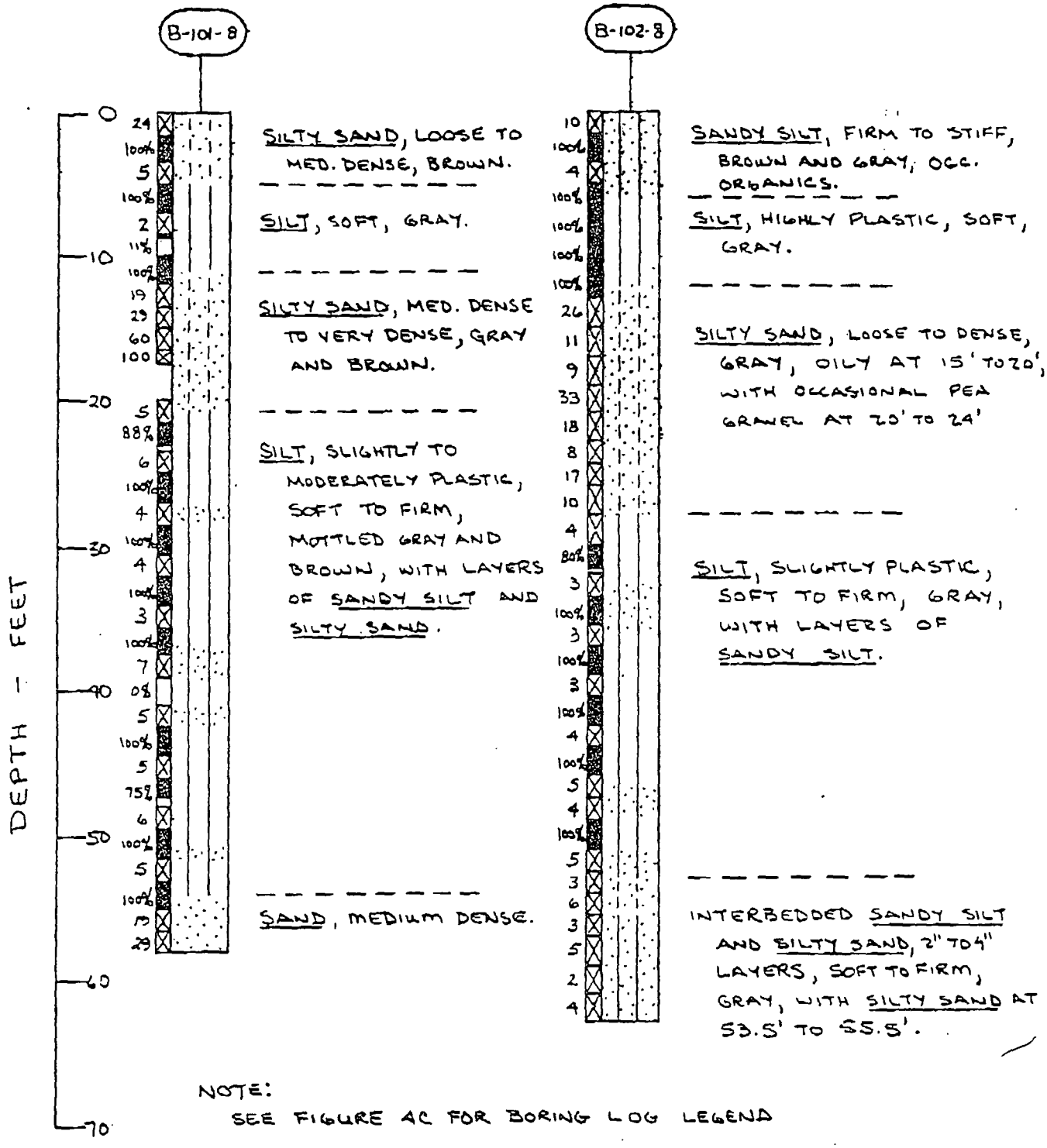
PROJECT Wacker Siltronics LOCATION Portland, Oregon

DRILLING METHOD Mud Rotary DRILLERS & EQUIPMENT D. Kenner of Oregon, Inc; CME-55

ELEVATION 34.5 ft BORE HOLE: B-101

WATER LEVEL Not Measured DATE: -- START: 6/28/82 FINISH: 6/29/82 INSPECTOR CWHL

DEPTH BELOW SURFACE (Ft)	SAMPLE INTERVAL	SAMPLE NUMBER	SAMPLE RECOVERY (INCHES)	STANDARD PENETRATION TEST RESULTS BLOWS 6"-6"-6"	STANDARD PENETRATION TEST RESULTS BPF "N"	SOIL DESCRIPTION (COLOR, RELATIVE DENSITY OR CONSISTENCY, MOISTURE, GRAIN SHAPE AND TYPE, STRUCTURE, CEMENTATION, ORGANICS, MATERIAL)	GRAPHIC LOG	UNIFIED SOIL CLASSIFICATION SYMBOL	COMMENTS (DRILLING PROGRESS, LOST CIRCULATION, TYPE OF DEPOSIT, PROBLEMS, ETC.)
60	60.0								
	61.5	S-13	10	10-13-17	30	SANDY SILT, NON PLASTIC, ABOUT 40% FINE SAND, BROWN, MOIST, COMPACT.		ML	
	65.0								
65	66.5	S-14	8	13-21-25	46	SILTY SAND, FINE SAND, ABOUT 30% FINE, BROWN, WET, COMPACT.		SM	
	70.0								
70	71.5	S-15	9	30-41-39	70	SAND, UNIFORMLY GRADED FINE SAND, 5-12% FINES, BROWN, WET, VERY DENSE.		SP-SM	
	75.0								
75	76.5	S-16	8	35-55-39	94	SAND, SAME AS S-15.		SP-SM	
	80.0								
80	81.5	S-17	8	13-24-30	54	SAND, UNIFORMLY GRADED FINE SAND, ABOUT 5% FINES, BROWN, WET, DENSE.		SP	DRILLER NOTES VERY HARD MATERIAL AT 84 FT, UNABLE TO PENETRATE W/DRAG BIT; STOP TO TAKE SAMPLE S-18
	84.0								END DRILLING @ 4:30 P.M.
	84.5	S-18	4	70/6"	70/6"	BASALT, WEATHERED TO SANDY GRAVEL, POORLY GRADED GRAVEL TO 1/4" 30-40% FINE TO COARSE SAND, MOSTLY COARSE, LESS THAN 5% FINES, BROWN AND BLACK, DENSE.			BEGIN DRILLING @ 8:00 AM CHANGE FROM DRAG BIT TO ROLLER BIT; MIX MUD.
85	87.0								VERY HARD DRILLING AT 86' DRILLS AT RATE OF 30 MIN/FT. ANGULAR BLACK BASALT CHIPS IN CUTTINGS
	87.5	S-19	5	78/6"	78/6"	BASALT, WEATHERED, SAME AS S-18.			END DRILLING @ 9:40 AM
90						END BORING @ 87.5 FT			



NOTE:
SEE FIGURE AC FOR BORING LOG LEGEND

FIGURE 4A
WACKER SILTRONIC
PORTLAND, OREGON

SUPPLEMENTAL BORING LOGS

CH2M HILL

PROJECT NUMBER P16058.B0

SOIL BORING LOG

PROJECT Wacker Siltronics LOCATION Portland, Oregon

DRILLING METHOD Mud Rotary DRILLERS & EQUIPMENT D Kenner of Oregon, Inc; CME-55

ELEVATION 32.2 ft. BORE HOLE: B-102

WATER LEVEL not measured DATE: -- START: 7/1/82 FINISH: 7/1/82 INSPECTOR CWHL

DEPTH BELOW SURFACE (ft)	SAMPLE INTERVAL	SAMPLE NUMBER	SAMPLE RECOVERY (INCHES)	STANDARD PENETRATION TEST RESULTS BLOWS 6"-6"-6"	STANDARD PENETRATION TEST RESULTS BPF "N"	SOIL DESCRIPTION (COLOR, RELATIVE DENSITY OR CONSISTENCY, MOISTURE, GRAIN SHAPE AND TYPE, STRUCTURE, CEMENTATION, ORGANICS, MATERIAL)	GRAPHIC LOG	UNIFIED SOIL CLASSIFICATION SYMBOL	COMMENTS (DRILLING PROGRESS, LOST CIRCULATION, TYPE OF DEPOSIT, PROBLEMS, ETC.)
0									START DRILLING AT 955. BEGIN DRILLING WITH DRAG BIT.
	5.0								
5	6.5	S-1	7	1-2-2	4	SILT, SLIGHTLY TO MODERATELY PLASTIC, ABOUT 5% FINE SAND, GRAY WITH REDDISH BROWN MOTTLING, MOIST SOFT, DISTINCT LAYERING 1/16-1/2" THICK.		ML	
	10.0								
10	11.5	S-2	9	4-8-9	17	SAND, UNIFORMLY GRADED FINE SAND, LESS THAN 5% FINES, DARK GRAY, WET, HYDROCARBON ODOR.		SP	
	15.0								
15	16.5	S-3	0	2-1-3	4	NO RECOVERY.			
	20.0								AT 19 FT CUTTINGS ARE SATURATED WITH OILY MATERIAL AND HAVE A STRONG HYDROCARBON ODOR.
20	21.5	S-4	1	2-3-3	6	SILT, NONPLASTIC, BLACK, WET, SOFT, STRONG HYDROCARBON ODOR.		ML	
	25.0								
25	26.5	S-5	10	1-1-1	2	SILT, NONPLASTIC, LESS THAN 5%, FINE SAND, MEDIUM GRAY, WET, LOOSE.		ML	
30									

CH2M HILL

PROJECT NUMBER P16058.B0

SOIL BORING LOG

PROJECT Wacker Siltronics LOCATION Portland, Oregon

DRILLING METHOD Mud Rotary DRILLERS & EQUIPMENT D. Kenner of Oregon, Inc.; CME-55

ELEVATION 32.2 ft. BORE HOLE: B-102

WATER LEVEL not measured DATE: -- START: 7/1/82 FINISH: 7/1/82 INSPECTOR CW HL

DEPTH BELOW SURFACE (ft)	SAMPLE INTERVAL	SAMPLE NUMBER	SAMPLE RECOVERY (INCHES)	STANDARD PENETRATION TEST RESULTS BLOWS 6"-6"-6"	STANDARD PENETRATION TEST RESULTS BPF "N"	SOIL DESCRIPTION (COLOR, RELATIVE DENSITY OR CONSISTENCY, MOISTURE, GRAIN SHAPE AND TYPE, STRUCTURE, CEMENTATION, ORGANICS, MATERIAL)	GRAPHIC LOG	UNIFIED SOIL CLASSIFICATION SYMBOL	COMMENTS (DRILLING PROGRESS, LOST CIRCULATION, TYPE OF DEPOSIT, PROBLEMS, ETC.)
30	30.0								MIX MUD AT 30'.
	31.5	S-6	10	1-2-2	4	SILT, NON PLASTIC, ABOUT 5% FINE SAND, MEDIUM GRAY, WET, SOFT, FRAGMENTS OF DECOMPOSED PLANT MATERIAL		ML	
	33.0								
	35.0	ST-7	24	---	—	SILT SIMILAR TO S-6 EXCEPT MODERATELY TO HIGHLY PLASTIC AND ORGANIC.		MH-OH	
35	36.5	S-8	18	1-2-2	4	SILT SIMILAR TO S-6 EXCEPT NO SAND AND MODERATELY TO HIGHLY PLASTIC AND ORGANIC		MH-OH	
	40.0								
40	41.5	S-9	18	4-7-8	15	SILT SIMILAR TO S-6, EXCEPT FOR LACK OF SAND, BLUE-GREEN COLOR AND STIFF.		ML	
	45.0								
45	46.5	S-10	18	2-2-2	4	SILT SIMILAR TO S-6, EXCEPT SLIGHTLY PLASTIC AND ABSENCE OF SAND AND FRAGMENTS OF PLANTS		ML	
	48.0								
	50.0	ST-11	24	---	—	UPPER 18"-SILT, SAME AS S-10 LOWER 6"-SILTY SAND, SAME AS S-12.		ML, SM	LAST 6" OF ST-11 PUSHED VERY HARD
50	51.5	S-12	10	4-6-10	16	SILTY SAND, FINE SAND, 20-25% FINES, BROWN, WET, COMPACT.		SM	
	55.0								
55	56.5	S-13	18	2-5-6	11	SILT, NON PLASTIC, BROWN, WET, STIFF.		ML	
60									

CH2M HILL

PROJECT NUMBER P16058.B0

SOIL BORING LOG

PROJECT Wacker Siltronics LOCATION Portland, Oregon

DRILLING METHOD Mud Rotary DRILLERS & EQUIPMENT D. Kenner of Oregon, Inc.; CME-55

ELEVATION 32.2 ft BORE HOLE: B-102

WATER LEVEL Not Measured DATE: -- START: 7/1/82 FINISH: 7/1/82 INSPECTOR CWHL

DEPTH BELOW SURFACE (ft)	SAMPLE INTERVAL	SAMPLE NUMBER	SAMPLE RECOVERY (INCHES)	STANDARD PENETRATION TEST RESULTS BLOWS 6"-6"-6"	STANDARD PENETRATION TEST RESULTS BPF "N"	SOIL DESCRIPTION (COLOR, RELATIVE DENSITY OR CONSISTENCY, MOISTURE, GRAIN SHAPE AND TYPE, STRUCTURE, CEMENTATION, ORGANICS, MATERIAL)	GRAPHIC LOG	UNIFIED SOIL CLASSIFICATION SYMBOL	COMMENTS (DRILLING PROGRESS, LOST CIRCULATION, TYPE OF DEPOSIT, PROBLEMS, ETC.)
60	60.0								
	61.5	S-14	18	3-11-20	31	SILTY SAND, FINE SAND, 20-25% FINES, BROWN, WET, COMPACT TO DENSE.		SM	
65	65.0								
	66.5	S-15	15	6-14-22	36	SILT, SLIGHT PLASTICITY, 5-10% FINE SAND, LOCAL CONCENTRATION OF FINE SAND WITHIN THE SILT, BROWN, MOIST, STIFF.		ML	
70	70.0								
	71.5	S-16	18	12-25-25	50	SILT, SIMILAR TO S-15, EXCEPT VERY STIFF.		ML	
75	75.0								
	76.5	S-17	9	11-28-29	57	SILTY SAND, FINE SAND, 15-20% FINES, BROWN, WET, VERY DENSE.		SM	DRILLER NOTES VERY HARD MATERIAL AT 79.5'
	79.5								
80	80.0	S-18	4	60/6"	60/6"	BASALT, WEATHERED TO SANDY GRAVEL, POORLY GRADED, ANGULAR GRAVEL TO ABOUT 1", 30-40% FINE TO COARSE SAND, 5-12% FINES, BROWN AND BLACK, WET, DENSE.			SAMPLER BOUNCES DURING SPT FOR
85						END BORING AT 80.0 Feet.			FINISH DRILLING AT 2:10 P.M.

FORM D 1586 5/78

CH2M HILL

PROJECT NUMBER P1605B.B0

SOIL BORING LOG

PROJECT Wacker Siltronics LOCATION Portland, Oregon

DRILLING METHOD Mud Rotary DRILLERS & EQUIPMENT D. Kenner & Oregon Inc.; CME-55

ELEVATION 35.8 ft BORE HOLE: B-103

WATER LEVEL not measured DATE: — — START: 6/30/82 FINISH: 7/1/82 INSPECTOR CWHL

DEPTH BELOW SURFACE (ft)	SAMPLE INTERVAL	SAMPLE NUMBER	SAMPLE RECOVERY (INCHES)	STANDARD PENETRATION TEST RESULTS BLOWS 6"-6"-6"	STANDARD PENETRATION TEST RESULTS BPF "N"	SOIL DESCRIPTION (COLOR, RELATIVE DENSITY OR CONSISTENCY, MOISTURE, GRAIN SHAPE AND TYPE, STRUCTURE, CEMENTATION, ORGANICS, MATERIAL)	GRAPHIC LOG	UNIFIED SOIL CLASSIFICATION SYMBOL	COMMENTS (DRILLING PROGRESS, LOST CIRCULATION, TYPE OF DEPOSIT, PROBLEMS, ETC.)
0									START DRILLING AT 10:20 BEGIN DRILLING WITH A DRAG BIT.
5	5.0								
	6.5	S-1	7	1-3-3	6	SILT, SLIGHTLY PLASTIC, ABOUT 5% FINE SAND, DARK GRAY, MOIST, FIRM; FILL?		ML	
10	10.0								
	11.5	S-2	7	14-19-30	49	SAND, POORLY GRADED FINE TO MEDIUM SAND, 5-12% FINES, BROWN, WET, DENSE; FILL.		SP-SM	ROUGH DRILLING AT ABOUT 11.5'; CHANGE FROM DRAG BIT TO ROLLER BIT, DRILLER NOTES GRAVELLY MATERIAL TO 15'.
15	15.0								
	16.5	S-3	4	6-7-6	13	GRAVELLY SAND, POORLY GRADED, 10-15% GRAVEL TO 1" FINE TO COARSE SAND, 5-12% FINES, BROWN, WET, COMPACT, FILL?		SP-SM	ROUGH DRILLING TO 19'; THEN SOFTER MATERIAL
20	20.0								
	21.5	S-4	1	3-4-3	7	SILT SLIGHTLY PLASTIC, DARK GRAY, WET, SOFT TO FIRM.		ML	REMOVE ROLLER BIT, ATTACH DRAG BIT.
	23.0								
25	25.0	ST-5	0	— — —	—	NO RECOVERY; TUBE SMEARED WITH BROWN SILT			ST-6 WAS PUSHED VERY SLOWLY; STIFF MATERIAL
	26.5	S-6	18	3-7-8	15	SILT, SLIGHTLY TO MODERATELY PLASTIC, BROWN, MOIST, STIFF TO VERY STIFF.		ML	
	28.0								
30	30.0	ST-7	18	— — —	—	SILT, SAME AS S-6		ML	

CH2M HILL

PROJECT NUMBER P160058.B0

SOIL BORING LOG

PROJECT Wacker Siltronics LOCATION Portland, Oregon

DRILLING METHOD Mud Rotary DRILLERS & EQUIPMENT D. Kenner of Oregon, Inc.; CME-55

ELEVATION 35.8 ft. BORE HOLE: B-103

WATER LEVEL DRY not measured DATE: -- START: 6/30/82 FINISH: 7/1/82 INSPECTOR CWHL

DEPTH BELOW SURFACE (ft)	SAMPLE INTERVAL	SAMPLE NUMBER	SAMPLE RECOVERY (INCHES)	STANDARD PENETRATION TEST RESULTS BLOWS 6"-6"-6"	STANDARD PENETRATION TEST RESULTS BPF "N"	SOIL DESCRIPTION (COLOR, RELATIVE DENSITY OR CONSISTENCY, MOISTURE, GRAIN SHAPE AND TYPE, STRUCTURE, CEMENTATION, ORGANICS, MATERIAL)	GRAPHIC LOG	UNIFIED SOIL CLASSIFICATION SYMBOL	COMMENTS (DRILLING PROGRESS, LOST CIRCULATION, TYPE OF DEPOSIT, PROBLEMS, ETC.)
30	30.0								
	31.5	S-8	18	2-2-3	5	SILT, SLIGHTLY PLASTIC, BROWN, MOIST, SOFT TO FIRM.		ML	
	35.0								
35	36.5	S-9	10	3-7-9	16	SILTY SAND, FINE SAND, 25-30% FINES, BROWN, WET, COMPACT.		SM	
	40.0								
40	41.5	S-10	18	2-2-3	5	SILT, NON PLASTIC, LESS THAN 5% FINE SAND, BROWN, MOIST, SOFT TO FIRM.		ML	
	43.0								
	45.0	ST-11	24	- - -	-	SILT, SAME as S-10		ML	LAST 6" OF S-11 WERE VERY STIFF.
45	46.5	S-12	18	3-5-8	13	SILT, SAME AS S-10		ML	
	50.0								
50	51.5	S-13	24	4-9-9	18	SILT, SIMILAR TO S-10 EXCEPT 5-10% FINE SAND.		ML	
	53.0								
	54.5	ST-14	18	- - -	-	SILT, SAME AS S-10		ML	ST-14 WAS PUSHED FOR ONLY AN 18" DRIVE, MATERIAL WAS TOO HARD FOR 24" PUSH.
55	56.0	S-15	10	4-6-20	26	SAND, FINE SAND, 5-10% FINES BROWN, WET COMPACT		SP-SM	
60									

CH2M HILL

PROJECT NUMBER P16058.B0

SOIL BORING LOG

PROJECT Wacker Siltronics LOCATION Portland, Oregon

DRILLING METHOD Mud Rotary DRILLERS & EQUIPMENT D. Kenner of Oregon Inc.; CME-55

ELEVATION 35.8 ft BORE HOLE: B-103

WATER LEVEL Not Measured DATE: -- START: 6/30/82 FINISH: 7/1/82 INSPECTOR CW HL

DEPTH BELOW SURFACE (ft)	SAMPLE INTERVAL	SAMPLE NUMBER	SAMPLE RECOVERY (INCHES)	STANDARD PENETRATION TEST RESULTS BLOWS 6"-6"-6"	STANDARD PENETRATION TEST RESULTS BPF "N"	SOIL DESCRIPTION (COLOR, RELATIVE DENSITY OR CONSISTENCY, MOISTURE, GRAIN SHAPE AND TYPE, STRUCTURE, CEMENTATION, ORGANICS, MATERIAL)	GRAPHIC LOG	UNIFIED SOIL CLASSIFICATION SYMBOL	COMMENTS (DRILLING PROGRESS, LOST CIRCULATION, TYPE OF DEPOSIT, PROBLEMS, ETC.)
60	60.0								
	61.5	S-16	13	8-15-23	38	SILT, NON PLASTIC, LESS THAN 5% FINE SAND, BROWN, WET, DENSE		ML	
65	65.0								
	66.5	S-17	8	11-21-22	43	SAND, UNIFORMLY GRADED, FINE SAND, LESS THAN 5% FINES, BROWN, WET, DENSE.		SP	
70	70.0								
	71.5	S-18	8	16-28-26	54	SAND, SAME AS S-17		SP	
75	75.0								
	76.5	S-19	8	20-42-45	87	SAND SIMILAR TO S-17, EXCEPT 5-10% FINES		SP-SM	DRILLER NOTES VERY HARD MATERIAL AT 76.5'
	77.0								END DRILLING @ 3:40 P.M. BEGIN DRILLING @ 7:30 A.M. SLOW, ROUGH DRILLING TO 77.0 FT. END DRILLING @ 8:45 A.M.
	77.0	S-20	0	60/0.5"	60"/0.5"	NO RECOVERY; PROBABLY WEATHERED BASALT			
80						END BORING AT 77.0 FEET			

CH2M HILL

PROJECT NUMBER P160588.80.00

SOIL BORING LOG

PROJECT WACKER SILTRONIC LOCATION PORTLAND, OR

DRILLING METHOD REVERT ROTARY; DRAG BIT DRILLERS & EQUIPMENT D. KENNER OF OR CME-75

ELEVATION 31.7 FEET BORE HOLE: B-104

WATER LEVEL 16.1 ft DATE: 7/23/82 START: 6/30/82 FINISH: 6/30/82 INSPECTOR DLKI

DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE NUMBER	SAMPLE RECOVERY (INCHES)	STANDARD PENETRATION TEST RESULTS BLOWS 6"-6"-6"	STANDARD PENETRATION TEST RESULTS BPF "N"	SOIL DESCRIPTION (COLOR, RELATIVE DENSITY OR CONSISTENCY, MOISTURE, GRAIN SHAPE AND TYPE, STRUCTURE, CEMENTATION, ORGANICS, MATERIAL)	GRAPHIC LOG	UNIFIED SOIL CLASSIFICATION SYMBOL	COMMENTS (DRILLING PROGRESS, LOST CIRCULATION, TYPE OF DEPOSIT, PROBLEMS, ETC.)
0									START DRILLING @ 7:55 A.M. BEGAN DRILLING WITH A DRAG BIT
5	5.0								
	6.5	S-1	11	1-2-2	4	SILT, SLIGHTLY TO MODERATELY PLASTIC, LESS THAN 5% VERY FINE SAND AND ORGANICS, MOTTLED GRAY AND BROWN, DAMP, FILL?, SOFT; OCCASSIONAL ROOTS.		ML	
10	10.0								
	11.5	S-2	11	1-1/12"	1	SANDY SILT, NONPLASTIC, 20-30% VERY FINE SAND, 5-10% ORGANICS, BLUE, WET, VERY LOOSE; FILL?		ML	
15	15.0								
	16.5	S-3	11	0-2-1	3	SANDY SILT, NONPLASTIC, 20-30% VERY FINE SAND, BLUE, MOIST, VERY LOOSE; OIL, OCCASSIONAL WOOD FRAGMENTS, HYDROCARBON ODOR, FILL?		ML	DRILLER NOTES FIRMER MATERIAL @ 17.5 FEET.
20	20.0								
	21.5	S-4	17	2-2-2	4	SANDY SILT, NONPLASTIC, 15-20% VERY FINE SAND, 5-10% ORGANICS, BLUE, MOIST, VERY LOOSE.		ML	
25	25.0								
	26.5	S-5	18	1-2-2	4	SILT, NONPLASTIC, LESS THAN 5% VERY FINE SAND, LESS THAN 5% ORGANICS, BLUE, WET, SOFT. OCCASSIONAL WOOD FRAGMENTS.		ML	DRILLER NOTES FIRMER AND SOFTER DRILLING (POSSIBLE LENSES).
30									

CH2M HILL

PROJECT NUMBER P160058.B0.00

SOIL BORING LOG

PROJECT WACKER SILTRONIC LOCATION PORTLAND, OR

DRILLING METHOD REVERT ROTARY; DRAG BIT DRILLERS & EQUIPMENT D. KENNER OF OR, CME-75

ELEVATION 31.7 FEET BORE HOLE: B-104

WATER LEVEL 16.1 ft DATE: 7/23/82 START: 6/30/82 FINISH: 6/30/82 INSPECTOR DLKI

DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE NUMBER	SAMPLE RECOVERY (INCHES)	STANDARD PENETRATION TEST RESULTS BLOWS 6"-6"-6"	STANDARD PENETRATION TEST RESULTS BPF "N"	SOIL DESCRIPTION (COLOR, RELATIVE DENSITY OR CONSISTENCY, MOISTURE, GRAIN SHAPE AND TYPE, STRUCTURE, CEMENTATION, ORGANICS, MATERIAL)	GRAPHIC LOG	UNIFIED SOIL CLASSIFICATION SYMBOL	COMMENTS (DRILLING PROGRESS, LOST CIRCULATION, TYPE OF DEPOSIT, PROBLEMS, ETC.)
30	30.0								
	31.5	S-6	16	1-1-2	3	SANDY SILT, NONPLASTIC, 15-20% VERY FINE SAND, 5-10% ORGANICS, BROWN, MOIST, VERY LOOSE; OCCASSIONAL WOOD FRAGMENTS.		ML	
	35.0								
35	37.0	ST-7	0	---	—	NO RECOVERY.			
	38.5	S-8	18	2-3-3	6	SANDY SILT, NONPLASTIC, 15-20% VERY FINE SAND, 5-10% ORGANICS, BLUE, WET, LOOSE; OCCASSIONAL WOOD FRAGMENTS.		ML	
	40.0								
40	41.5	S-9	18	1-1-2	3	SILT, SLIGHTLY TO MODERATELY PLASTIC, 5-10% ORGANICS, LESS THAN 5% VERY FINE SAND, GRAY, MOIST, SOFT; OCCASSIONAL WOOD FRAGMENTS		ML	
	45.0								
45	47.0	ST-10	0	---	—	NO RECOVERY.			MATERIAL SLIPPED OUT OF TUBE.
	48.5	S-11	14	2-3-4	7	SANDY SILT, NONPLASTIC, 20-30% VERY FINE SAND, 5-10% ORGANICS, BLUE, MOIST, LOOSE; OCCASSIONAL WOOD FRAGMENTS.		ML	
	50.0								
50	52.0	ST-12	24	---	—	SANDY SILT, SAME AS ABOVE		ML	
	53.5	S-13	18	4-7-8	15	SILT, NONPLASTIC, BLUE, MOIST, STIFF.		ML	
	55.0								
55	57.0	ST-14	24	---	—	SILT, SAME AS S-15.		ML	
	58.5	S-15	18	3-4-6	14	SILT, NONPLASTIC, 5-12% VERY FINE SAND, BROWN, WET, STIFF.		ML	
60									

CH2M HILL

PROJECT NUMBER P16058.B0

SOIL BORING LOG

PROJECT WACKER SILTRONIC LOCATION PORTLAND, OR

DRILLING METHOD REVERT ROTARY; DRAG BIT DRILLERS & EQUIPMENT D. KENNER OF DR; CME-75

ELEVATION 31.7 FEET BORE HOLE: B-104

WATER LEVEL 16.1 ft DATE: 7/23/82 START: 6/30/82 FINISH: 6/30/82 INSPECTOR DL KI

DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE NUMBER	SAMPLE RECOVERY (INCHES)	STANDARD PENETRATION TEST RESULTS BLOWS 6"-6"-6"	STANDARD PENETRATION TEST RESULTS BPF "N"	SOIL DESCRIPTION (COLOR, RELATIVE DENSITY OR CONSISTENCY, MOISTURE, GRAIN SHAPE AND TYPE, STRUCTURE, CEMENTATION, ORGANICS, MATERIAL)	GRAPHIC LOG	UNIFIED SOIL CLASSIFICATION SYMBOL	COMMENTS (DRILLING PROGRESS, LOST CIRCULATION, TYPE OF DEPOSIT, PROBLEMS, ETC.)
60	60.0								
	61.5	S-16	18	4-6-8	14	SANDY SILT, NONPLASTIC, 15-20% VERY FINE SAND, BROWN, WET, COMPACT.		ML	
	65.0								
65	66.5	S-17	14	5-8-17	25	SANDY SILT, NONPLASTIC, 20-30% VERY FINE SAND, BROWN, WET, COMPACT.		ML	
	70.0								
70	71.5	S-18	18	3-9-15	24	SILT, NONPLASTIC, LESS THAN 5% VERY FINE SAND, BROWN, WET, VERY STIFF.		ML	
	75.0								
75	76.5	S-19	18	6-14-26	40	SILT, SAME AS S-18, EXCEPT CONISTENCY IS HARD.		ML	
	80.0								
80	81.5	S-20	17	5-11-16	27	SILT, SAME AS S-18.		ML	
	85.0								
85	86.5	S-21	17	6-11-13	24	SILT, SAME AS S-18.		ML	
90									

CH2M HILL

PROJECT NUMBER P160058.B0

SOIL BORING LOG

PROJECT WACKER SILTRONIC LOCATION PORTLAND, OR

DRILLING METHOD REVERT ROTARY; DRAG BIT DRILLERS & EQUIPMENT D. KENNER OF OR; CME-75

ELEVATION 31.7 FEET BORE HOLE: B-104

WATER LEVEL 16.1 ft DATE: 7/23/82 START: 6/30/82 FINISH: 6/30/82 INSPECTOR DLK1

DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE NUMBER	SAMPLE RECOVERY (INCHES)	STANDARD PENETRATION TEST RESULTS BLOWS 6"-6"-6"	STANDARD PENETRATION TEST RESULTS BPF "N"	SOIL DESCRIPTION (COLOR, RELATIVE DENSITY OR CONSISTENCY, MOISTURE, GRAIN SHAPE AND TYPE, STRUCTURE, CEMENTATION, ORGANICS, MATERIAL)	GRAPHIC LOG	UNIFIED SOIL CLASSIFICATION SYMBOL	COMMENTS (DRILLING PROGRESS, LOST CIRCULATION, TYPE OF DEPOSIT, PROBLEMS, ETC.)
90	92.0								DRILLED TO 90 FEET, INSERTED SPLIT SPOON, SPLIT SPOON DROPPED TO 92 FEET. DRIVE SAMPLE @ 92 FEET
	93.5	S-22	8	2-2-3	5	SANDY SILT, NON PLASTIC, 20-30 % VERY FINE SAND, GRAY AND ORANGE, WET, LOOSE		ML	END DRILLING @ 1:20 P.M.
95	95.0								
	96.1	S-23	12	6-22-60/1"	82/1"	BASALT, UNWEATHERED, FRACTURED, BLACK, HARD			
						END BORING @ 96.1 ft			

NOTE: PIEZOMETER INSTALLED WITH 1.9-FT, 1½-INCH DIAMETER SLOTTED TIP 89.1 TO 91.0 FT; GRAVEL PACK, CONSISTING OF 3/8-INCH PEA GRAVEL FROM 96 TO 85 FT, FOLLOWED BY A 2-FOOT BENTONITE SEAL FROM 85 TO 83 FT; 3/4-INCH RISER PIPE INSTALLED FROM SLOTTED TIP TO ABOVE THE SURFACE; BORING WAS BACKFILLED FROM 83 FEET TO SURFACE WITH CUTTINGS AND PEA GRAVEL.

CH2M HILL

PROJECT NUMBER P16058.B0

SOIL BORING LOG

PROJECT WACKER SILTRONIC LOCATION PORTLAND, OR

DRILLING METHOD MUD ROTARY; DRAGBIT DRILLERS & EQUIPMENT D. KENNER DF DR; CME-75

ELEVATION 32.8 FEET BORE HOLE: B-105

WATER LEVEL NOT MEASURED DATE: - - - START: 7/1/82 FINISH: 7/2/82 INSPECTOR DLK1

DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE NUMBER	SAMPLE RECOVERY (INCHES)	STANDARD PENETRATION TEST RESULTS BLOWS 6"-6"-6"	STANDARD PENETRATION TEST RESULTS BPF "N"	SOIL DESCRIPTION (COLOR, RELATIVE DENSITY OR CONSISTENCY, MOISTURE, GRAIN SHAPE AND TYPE, STRUCTURE, CEMENTATION, ORGANICS, MATERIAL)	GRAPHIC LOG	UNIFIED SOIL CLASSIFICATION SYMBOL	COMMENTS (DRILLING PROGRESS, LOST CIRCULATION, TYPE OF DEPOSIT, PROBLEMS, ETC.)
0									BEGAN DRILLING @ 3:05 P.M.
5	5.0								
	6.5	S-1	13	1-1-1	2	SANDY SILT, NON PLASTIC, 12-20% VERY FINE SAND, 5-10% ORGANICS, ORANGE AND GRAY MOTTLING, WET, VERY LOOSE; OCCASSIONAL ROOTS; AT BOTTOM; FILL?		ML	
10	10.0								
	11.5	S-2	8	3-6-6	12	SAND, MEDIUM TO FINE, LESS THAN 5% FINES, BLACK, WET, LOOSE; HYDROCARBON ODOR, FILL?		SP	
15	15.0								
	16.5	S-3	11	3-2-3	5	SAND, SAME AS S-2, EXCEPT WITH OIL AT BOTTOM; FILL?		SP	
20	20.0								
	21.5	S-4	16	2-1-2	3	SILT, NON PLASTIC, 5-12% VERY FINE SAND, LESS THAN 5% ORGANICS, GRAY AND ORANGE MOTTLING, WET, SOFT; OCCASSIONAL WOOD FRAGMENTS.		ML	DRILLER NOTES WOOD AT BOTTOM OF SAMPLER.
25	25.0								
	26.5	S-5	18	1-1-2	3	SILT, NON PLASTIC, 5-10% FINE SAND, GRAY, MOIST, SOFT; FRAGMENTS OF DECOMPOSED PLANT MATERIAL IN LOWER 9 INCHES OF SAMPLER		ML	
30									END DRILLING @ 3:40 P.M.

CH2M HILL

PROJECT NUMBER P160058.80

SOIL BORING LOG

PROJECT WACKER SILTRONIC LOCATION PORTLAND, OR

DRILLING METHOD MUD ROTARY; DRAGBIT DRILLERS & EQUIPMENT D. KENNER OF OR; CME-75

ELEVATION 32.8 FEET BORE HOLE: B-105

WATER LEVEL NOT MEASURED DATE: --- START: 7/1/82 FINISH: 7/2/82 INSPECTOR CWHL

DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE NUMBER	SAMPLE RECOVERY (INCHES)	STANDARD PENETRATION TEST RESULTS BLOWS 6"-6"-6"	STANDARD PENETRATION TEST RESULTS BPF "N"	SOIL DESCRIPTION (COLOR, RELATIVE DENSITY OR CONSISTENCY, MOISTURE, GRAIN SHAPE AND TYPE, STRUCTURE, CEMENTATION, ORGANICS, MATERIAL)	GRAPHIC LOG	UNIFIED SOIL CLASSIFICATION SYMBOL	COMMENTS* (DRILLING PROGRESS, LOST CIRCULATION, TYPE OF DEPOSIT, PROBLEMS, ETC.)
30	30.0 31.5	S-6	18	1-1-2	3	SILT, NONPLASTIC, LESS THAN 5% FINE SAND, GRAY, WET, SOFT; LENSE OF DECOMPOSED PLANT MATERIAL 3 INCHES FROM TOP, HYDROCARBON ODOR		ML	BEGAN DRILLING, @ 7:45 A.M.
35	35.0 36.5	S-7	18	1-2-2	4	SILT, SLIGHTLY PLASTIC, GRAY, WET, SOFT.		ML	
40	40.0 41.5	S-8	18	3-6-8	14	SILT, SLIGHTLY TO MODERATELY PLASTIC, GREENISH GRAY, STIFF.		ML	
45	45.0 46.5	S-9	18	4-4-6	10	SILT, SLIGHTLY TO MODERATELY PLASTIC, 5-10% FINE SAND IN LOWER 9 INCHES, GREENISH GRAY IN UPPER PART, GRAY IN LOWER PART, MOIST, STIFF.		ML	
50	50.0 51.5	S-10	18	2-4-9	13	SILT, NONPLASTIC, LESS THAN 5% FINE SAND, BROWN, WET, COMPACT		ML	
55	55.0 56.5	S-11	18	2-4-8	12	SILT, SAME AS S-10		ML	
60									

CH2M HILL

PROJECT NUMBER P16058.B0

SOIL BORING LOG

PROJECT WACKER SILTRONIC LOCATION PORTLAND, OR

DRILLING METHOD MUD ROTARY; DRAG BIT DRILLERS & EQUIPMENT D. KENNER OF OR; CME-75

ELEVATION 32.8 FEET BORE HOLE: B-165

WATER LEVEL NOT MEASURED DATE: - - - START: 7/1/82 FINISH: 7/2/82 INSPECTOR CWHL

DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE NUMBER	SAMPLE RECOVERY (INCHES)	STANDARD PENETRATION TEST RESULTS BLOWS 6"-6"-6"	STANDARD PENETRATION TEST RESULTS BPF "N"	SOIL DESCRIPTION (COLOR, RELATIVE DENSITY OR CONSISTENCY, MOISTURE, GRAIN SHAPE AND TYPE, STRUCTURE, CEMENTATION, ORGANICS, MATERIAL)	GRAPHIC LOG	UNIFIED SOIL CLASSIFICATION SYMBOL	COMMENTS (DRILLING PROGRESS, LOST CIRCULATION, TYPE OF DEPOSIT, PROBLEMS, ETC.)
60	60.0								
	61.5	S-12	18	4-11-18	29	UPPER 12 INCHES SILT, SLIGHTLY PLASTIC, 5-10% FINE SAND, BROWN, MOIST, STIFF. LOWER 6 INCHES SILTY SAND, FINE SAND, 15-20% FINES, BROWN, WET, COMPACT.		ML SM	MIX MUD
65	65.0								
	66.5	S-13	18	6-10-14	24	SILTY SAND, FINE SAND, 20-25% FINES, BROWN, WET COMPACT.		SM	
70	70.0								
	71.5	S-14	15	9-23-22	45	UPPER 9 INCHES: SILTY SAND, SIMILAR TO S-13, EXCEPT 15-20% FINE SAND. LOWER 6 INCHES: SILT, SLIGHTLY PLASTIC, 10-15% FINE SAND, BROWN, MOIST, STIFF.		SM ML	
75	75.0								
	76.8	S-15	12	13-21-60/3"	81/9"	SILTY SAND WITH 1-2 INCH LAYERS OF SAND: SILTY SAND, FINE SAND, 20-25% FINES, BROWN, WET, COMPACT. SAND, UNIFORMLY GRADED, FINE SAND, 5-12% FINES, BROWN, WET, COMPACT.		SM SP-SM	DRILLER NOTES VERY HARD DRILLING @ 765 FEET; CHANGE TO TRICONE BIT; SAMPLER BOUNCED DURING SPT FOR S-16
	76.5 76.7	S-16	2	60/2"	60/2"	SAND, UNIFORMLY GRADED, FINE SAND, 5-12% FINES, WET, DENSE; PROBABLY CAVINGS ABOVE BASALT			FINISH DRILLING @ 9:55 A.M.
						END BORING @ 76.7 ft			

FORM D 1586 5/78

CH2M HILL

PROJECT NUMBER P160581.80

SOIL BORING LOG

PROJECT WACKER SILTRONIC LOCATION PORTLAND, OR

DRILLING METHOD MUD ROTARY; DRAG BIT DRILLERS & EQUIPMENT D. KENNER OF OR; CME-75

ELEVATION 32.2 FEET BORE HOLE: B-106

WATER LEVEL NOT MEASURED DATE: --- START: 6/29/82 FINISH: 6/29/82 INSPECTOR DLKI

DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE NUMBER	SAMPLE RECOVERY (INCHES)	STANDARD PENETRATION TEST RESULTS BLOWS 6"-6"-6"	STANDARD PENETRATION TEST RESULTS BPF "N"	SOIL DESCRIPTION (COLOR, RELATIVE DENSITY OR CONSISTENCY, MOISTURE, GRAIN SHAPE AND TYPE, STRUCTURE, CEMENTATION, ORGANICS, MATERIAL)	GRAPHIC LOG	UNIFIED SOIL CLASSIFICATION SYMBOL	COMMENTS (DRILLING PROGRESS, LOST CIRCULATION, TYPE OF DEPOSIT, PROBLEMS, ETC.)
0									BEGIN DRILLING @ 10:00 A.M.
5	5.0								
	6.4	S-1	17	1-1-1	2	SILT, SLIGHTLY TO MODERATELY PLASTIC, BROWN AND ORANGE MOTTLED, MOIST, FILL?, SOFT; OCCASSIONAL ROOTS AND WOOD; FILL?		ML	
	8.0								
	10.0	ST-2	22	---	-	SILT, SAME AS S-1. NO RECOVERY.		ML	
10	11.5	S-3	0	1-1-2	3				SILT SMEARED ON SPLIT SPOON
	15.0								DRILLER NOTES WOOD IN CUTTINGS FROM 13-15 FEET; COULD BE REASON FOR NO RECOVERY OF S-3.
15	16.5	S-4	14	0/12"-2	2	SILT, NONPLASTIC, 10-15% VERY FINE SAND, GRAY, MOIST, SOFT; OCCASSIONAL WOOD FRAGMENTS, HYDROCARBON ODOR; FILL?		ML	
	20.0								DRILLER NOTES OIL FROM 18-20 FEET.
20	21.5	S-5	16	3-4-6	10	SILT, NONPLASTIC, LESS THAN 5% VERY FINE SAND AND ORGANICS, GRAY, MOIST, STIFF; OCCASSIONAL ROOTS.		ML	
	25.0								
25	26.5	S-6	13	5-6-3	9	SAND, MEDIUM TO FINE, BLACK, WET, LOOSE.		SP	DRILLER NOTES FIRM DRILLING @ 26.5 FEET.
30									

CH2M HILL

PROJECT NUMBER P16058.B0

SOIL BORING LOG

PROJECT WACKER SILTRONIC LOCATION PORTLAND, OR

DRILLING METHOD MUD ROTARY; DRAG BIT DRILLERS & EQUIPMENT D. KEINER OF OR; CME-75

ELEVATION 32.2 FEET BORE HOLE: B-106

WATER LEVEL NOT MEASURED DATE: --- START: 6/29/82 FINISH: 6/29/82 INSPECTOR DLKI

DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE NUMBER	SAMPLE RECOVERY (INCHES)	STANDARD PENETRATION TEST RESULTS BLOWS 6"-6"-6"	STANDARD PENETRATION TEST RESULTS BPF "N"	SOIL DESCRIPTION (COLOR, RELATIVE DENSITY OR CONSISTENCY, MOISTURE, GRAIN SHAPE AND TYPE, STRUCTURE, CEMENTATION, ORGANICS, MATERIAL)	GRAPHIC LOG	UNIFIED SOIL CLASSIFICATION SYMBOL	COMMENTS (DRILLING PROGRESS, LOST CIRCULATION, TYPE OF DEPOSIT, PROBLEMS, ETC.)
30	30.0	ST-7	18	---	-	SILT, SAME AS S-8.		ML	DRILLER NOTES LAYERS OF FIRM AND SOFT DRILLING.
	32.0								
	33.5	S-8	18	2-2-5	7	SILT, NONPLASTIC, 5-12% VERY FINE SAND, 10-15% ORGANICS, BROWN, MOIST, FIRM; OCCASSIONAL WOOD FRAGMENTS.		ML	
35	35.0								
	36.5	S-9	18	1-1-2	3	SILT, SLIGHTLY TO MODERATELY PLASTIC, GRAY, MOIST, SOFT.		ML	
	38.0								
	40.0	ST-10	0	---	-	NO RECOVERY.			
40									
	42.0	ST-11	18	---	-	SILT, SAME AS S-12.		ML	
	43.5	S-12	18	3-3-5	8	SILT, NONPLASTIC, 5-12% VERY FINE SAND, 20-25% ORGANICS, GRAY, DAMP, FIRM; OCCASSIONAL WOOD.		ML	
45	45.0								
	47.0	ST-13	24	---	-	SILT, SAME AS S-14.		ML	WOODCHIP @ BOTTOM OF SHELBY TUBE.
	48.5	S-14	18	2-2-3	5	SILT, MODERATELY PLASTIC, GRAY, MOIST, FIRM; OCCASSIONAL WOOD FRAGMENTS.		ML	
50	50.0								
	51.5	S-15	18	2-2-6	8	SANDY SILT, 30-40% VERY FINE SAND, BLACK, WET, LOOSE.		ML	
55	55.0								
	56.0	S-16	11	7-9-8	17	SAND, LESS THAN 5% FINES, BLACK, MOIST, FIRM, GRADES TO SILT, MODERATELY PLASTIC, BROWN, MOIST, COMPACT; OCCASSIONAL ORGANICS.		SP ML	
60									

CH2M HILL

PROJECT NUMBER P16058.B0

SOIL BORING LOG

PROJECT WACKER SILTRONIC LOCATION PORTLAND, OR

DRILLING METHOD MUD ROTARY; DRAG BIT DRILLERS & EQUIPMENT D. KENNER OF OR; CME-75

ELEVATION 32.2 FEET BORE HOLE: B-106

WATER LEVEL NOT MEASURED DATE: --- START: 6/29/82 FINISH: 6/29/82 INSPECTOR DLKI

DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE NUMBER	SAMPLE RECOVERY (INCHES)	STANDARD PENETRATION TEST RESULTS BLOWS 6"-6"-6"	STANDARD PENETRATION TEST RESULTS BPF "N"	SOIL DESCRIPTION (COLOR, RELATIVE DENSITY OR CONSISTENCY, MOISTURE, GRAIN SHAPE AND TYPE, STRUCTURE, CEMENTATION, ORGANICS, MATERIAL)	GRAPHIC LOG	UNIFIED SOIL CLASSIFICATION SYMBOL	COMMENTS (DRILLING PROGRESS, LOST CIRCULATION, TYPE OF DEPOSIT, PROBLEMS, ETC.)
60	60.0								
	61.5	S-17	18	3-9-11	20	SILT, SLIGHTLY TO MODERATELY PLASTIC, BLUE, DAMP, VERY STIFF, GRADES TO SILT, NON-PLASTIC, 5-12% VERY FINE SAND, BLUE, DAMP, VERY STIFF.		ML	
65	65.0								
	66.5	S-18	18	6-14-22	36	SANDY SILT, NON PLASTIC, 15-20% VERY FINE SAND, BLUE, WET, DENSE.		ML	
70	70.0								
	71.5	S-19	18	4-6-15	21	SILT, NON PLASTIC, BROWN, WET, VERY STIFF. GRADES TO BLUE.		ML	
75	75.0								
	76.5	S-20	18	5-10-21	31	SILT, NON PLASTIC, 5-12% VERY FINE SAND, LIGHT BROWN, WET, HARD.		ML	
80	80.0								
	81.5	S-21	13	9-18-29	47	SILTY SAND, VERY FINE SAND, 20-30% FINES, LIGHT BROWN, WET, DENSE.		SM	
85	85.0								
	86.5	S-22	18	14-22-32	54	SILT, NON PLASTIC, 5-12% VERY FINE SAND, LIGHT BROWN, WET, HARD.		ML	
90									

CH2M HILL

PROJECT NUMBER P160581.30

SOIL BORING LOG

PROJECT WACKER SILTRONIC LOCATION PORTLAND, OR

DRILLING METHOD MUD ROTARY; DRAG BIT DRILLERS & EQUIPMENT D. KENNER OF OR; CME-75

ELEVATION 32.2 FEET BORE HOLE: B-106

WATER LEVEL NOT MEASURED DATE: --- START: 6/29/82 FINISH: 6/29/82 INSPECTOR DLK1

DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE NUMBER	SAMPLE RECOVERY (INCHES)	STANDARD PENETRATION TEST RESULTS BLOWS 6"-6"-6"	STANDARD PENETRATION TEST RESULTS BPF "N"	SOIL DESCRIPTION (COLOR, RELATIVE DENSITY OR CONSISTENCY, MOISTURE, GRAIN SHAPE AND TYPE, STRUCTURE, CEMENTATION, ORGANICS, MATERIAL)	GRAPHIC LOG	UNIFIED SOIL CLASSIFICATION SYMBOL	COMMENTS (DRILLING PROGRESS, LOST CIRCULATION, TYPE OF DEPOSIT, PROBLEMS, ETC.)
90	90.0								
	91.5	S-23	18	5-9-12	21	SILT, NON PLASTIC, 5-12% VERY FINE SAND, LIGHT BROWN, WET, VERY STIFF.		ML	
95	95.0								
	96.5	S-24	2	7-10-11	21	SILT, SAME AS S-23.		ML	
	98.0								
	98.4	S-25	4.5	60/4.5"	60/4.5"	BASALT, UNWEATHERED, FRACTURED, BLACK, VERY HARD			DRILLER NOTES HARD DRILLING @ 98 FEET. CHANGED TO TRICONE BIT (4 7/8 INCHES). END DRILLING @ 3:50 P.M.
100	100.0								
	100.0	S-26	0	60/0.5"	60/.05"	NO RECOVERY			
						END BORING @ 100.0 ft			

CH2M HILL

PROJECT NUMBER P160581.80

SOIL BORING LOG

PROJECT WACKER SILTRONIC LOCATION PORTLAND, OR

DRILLING METHOD MUD ROTARY; DRAG BIT DRILLERS & EQUIPMENT D. KENNER OF OR; CME-75

ELEVATION 34.6 FEET BORE HOLE: B-107

WATER LEVEL NOT MEASURED DATE: --- START: 7/1/82 FINISH: 7/1/82 INSPECTOR DLK1

DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE NUMBER	SAMPLE RECOVERY (INCHES)	STANDARD PENETRATION TEST RESULTS BLOWS 6"-6"-6"	STANDARD PENETRATION TEST RESULTS BPF "N"	SOIL DESCRIPTION (COLOR, RELATIVE DENSITY OR CONSISTENCY, MOISTURE, GRAIN SHAPE AND TYPE, STRUCTURE, CEMENTATION, ORGANICS, MATERIAL)	GRAPHIC LOG	UNIFIED SOIL CLASSIFICATION SYMBOL	COMMENTS (DRILLING PROGRESS, LOST CIRCULATION, TYPE OF DEPOSIT, PROBLEMS, ETC.)
0									BEGIN DRILLING @ 11:10 A.M.
	5.0								
5	6.5	S-1	7	3-3-3	6	SAND, MEDIUM TO FINE, LESS THAN 5% FINES, ORANGE, MOIST, LOOSE; FILL?		SP	
	10.0								
10	11.5	S-2	14	6-7-9	16	SAND, MEDIUM TO FINE, LESS THAN 5% FINES, BLACK, MOIST, COMPACT; HYDROCARBON ODOR; FILL?		SP	DRILLER NOTES OIL @ 12 OR 13 FEET
	15.0								
15	16.5	S-3	8	3-3-7	10	SAND, SAME AS S-2; WOOD CHUNK AT BOTTOM OF SPLIT SPOON; FILL?		SP	DRILLER NOTES WOOD IN CUTTINGS.
	20.0								
20	21.5	S-4	14	1-2-3	5	SILT, MODERATELY PLASTIC, BLUE, MOIST, FIRM; OCCASSIONAL WOOD FRAGMENTS, HYDROCARBON ODOR.		ML	
	25.0								DRILLER NOTES OUT OF OIL @ 22 OR 23 FEET, BUT STILL IN WOOD.
25	26.5	S-5	18	1-1-1	2	SILT, NONPLASTIC, BLUE, WET, SOFT.		ML	
30									

CH2M HILL

PROJECT NUMBER P/6058.80

SOIL BORING LOG

PROJECT WACKER SILTRONIC LOCATION PORTLAND, OR

DRILLING METHOD MUD ROTARY; DRAG BIT DRILLERS & EQUIPMENT D. KENNER OF OR; CME-75

ELEVATION 34.6 FEET BORE HOLE: B-107

WATER LEVEL NOT MEASURED DATE: --- START: 7/1/82 FINISH: 7/1/82 INSPECTOR DLK1

DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE NUMBER	SAMPLE RECOVERY (INCHES)	STANDARD PENETRATION TEST RESULTS BLOWS 6"-6"-6"	STANDARD PENETRATION TEST RESULTS BPF "N"	SOIL DESCRIPTION (COLOR, RELATIVE DENSITY OR CONSISTENCY, MOISTURE, GRAIN SHAPE AND TYPE, STRUCTURE, CEMENTATION, ORGANICS, MATERIAL)	GRAPHIC LOG	UNIFIED SOIL CLASSIFICATION SYMBOL	COMMENTS (DRILLING PROGRESS, LOST CIRCULATION, TYPE OF DEPOSIT, PROBLEMS, ETC.)
30	30.0								
	32.0	ST-6	24	---	-	SILT, SAME AS S-7.		ML	
	33.5	S-7	18	1-2-4	6	SILT, NON PLASTIC, LESS THAN 5% VERY FINE SAND AND ORGANICS, BROWN, MOIST, FIRM; OCCASSIONAL WOOD FRAGMENTS		ML	
35	35.0								
	37.0	ST-8	22	---	-	SILT, SAME AS S-9.		ML	
	38.5	S-9	18	3-4-5	9	SILT, SLIGHTLY TO MODERATELY PLASTIC, 5-12% VERY FINE SAND, BLUE AND ORANGE MOTTLED, WET, STIFF.		ML	
40	40.0								
	41.5	S-10	18	2-3-4	7	SILT, SLIGHTLY TO MODERATELY PLASTIC, 5-12% VERY FINE SAND, BROWN, WET, FIRM.		ML	
45	45.0								
	46.5	S-11	18	2-4-7	11	SILT, SLIGHTLY PLASTIC, BROWN, MOIST, STIFF.		ML	
50	50.0								
	51.5	S-12	18	5-9-10	19	SANDY SILT, NON PLASTIC, 20-30% VERY FINE SAND, BROWN, WET, COMPACT.		ML	
55	55.0								
	56.5	S-13	18	6-10-13	23	SANDY SILT, SAME AS S-12.		ML	
60									

CH2M HILL

PROJECT NUMBER P160581.80

SOIL BORING LOG

PROJECT WACKER SILTRONIC LOCATION PORTLAND, OR

DRILLING METHOD MUD ROTARY; DRAG BIT DRILLERS & EQUIPMENT D. KENNER OF DR; CME-75

ELEVATION 346 FEET BORE HOLE: B-107

WATER LEVEL NOT MEASURED DATE: --- START: 7/1/82 FINISH: 7/1/82 INSPECTOR DLK1

DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE NUMBER	SAMPLE RECOVERY (INCHES)	STANDARD PENETRATION TEST RESULTS BLOWS 6"-6"-6"	STANDARD PENETRATION TEST RESULTS BPF "N"	SOIL DESCRIPTION (COLOR, RELATIVE DENSITY OR CONSISTENCY, MOISTURE, GRAIN SHAPE AND TYPE, STRUCTURE, CEMENTATION, ORGANICS, MATERIAL)	GRAPHIC LOG	UNIFIED SOIL CLASSIFICATION SYMBOL	COMMENTS (DRILLING PROGRESS, LOST CIRCULATION, TYPE OF DEPOSIT, PROBLEMS, ETC.)
60	60.0								
	61.5	S-14	18	8-15-20	35	SILT, NONPLASTIC, 12-15% VERY FINE SAND, BROWN, WET, HARD.		ML	
65									
70	70.0								
	71.5	S-15	13	19-19-21	40	SAND, VERY FINE, LESS THAN 5% FINES, BROWN, WET, DENSE.		SP	
	71.5	S-16	0	30-43-60/3"	103/6"	NO RECOVERY; probably basalt			END DRILLING @ 2:30 P.M.
						END BORING @ 71.5 ft			

FORM D 1586 5/78

CH2M HILL

PROJECT NUMBER P16058.B0

SOIL BORING LOG

PROJECT WACKER SILTRONIC LOCATION PORTLAND, OR

DRILLING METHOD REVERT ROTARY; DRAG BIT DRILLERS & EQUIPMENT D. KENNER OF OR; CME-75

ELEVATION 35.9 FEET BORE HOLE: B-108

WATER LEVEL 18.8 ft DATE: 7/23/82 START: 6/30/82 FINISH: 7/1/82 INSPECTOR DLK1

DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE NUMBER	SAMPLE RECOVERY (INCHES)	STANDARD PENETRATION TEST RESULTS BLOWS 6"-6"-6"	STANDARD PENETRATION TEST RESULTS BPF "N"	SOIL DESCRIPTION (COLOR, RELATIVE DENSITY OR CONSISTENCY, MOISTURE, GRAIN SHAPE AND TYPE, STRUCTURE, CEMENTATION, ORGANICS, MATERIAL)	GRAPHIC LOG	UNIFIED SOIL CLASSIFICATION SYMBOL	COMMENTS (DRILLING PROGRESS, LOST CIRCULATION, TYPE OF DEPOSIT, PROBLEMS, ETC.)
0									BEGIN DRILLING @ 3:20 P.M.
5	5.0								
	6.5	S-1 A B	12	1-4-12	16	TOP: SILT, NONPLASTIC, LESS THAN 5% VERY FINE SAND, GRAY AND ORANGE MOTTLED, DRY, VERY STIFF. BOTTOM: SAND, MEDIUM TO FINE, LESS THAN 5% FINES, ORANGE, DRY, COMPACT; FILL?		ML SP	
10	10.0								
	11.5	S-2	12	3-8-9	17	SAND, MEDIUM TO FINE, LESS THAN 5% FINES, OCCASSIONAL GRAVEL TO 1 INCH MAX, BLACK, MOIST, COMPACT; FILL?		SP	
15	15.0								
	16.5	S-3	7	3-4-4	8	SAND, SAME AS S-2, EXCEPT WET, AND RELATIVE DENSITY IS LOOSE; FILL?		SP	
20	20.0								DRILLER NOTES CHANGE @ 18 FEET, WOOD CHUNKS.
	21.5	S-4	16	3-4-5	9	SILT, NONPLASTIC, ORANGE AND GRAY MOTTLING, MOIST, STIFF, OCCASSIONAL ROOTS.		ML	
25	25.0								
	27.0	ST-5	24	- - -	-	SILT, SAME AS S-6.		ML	
	28.5	S-6	18	2-2-3	5	SILT, SLIGHTLY PLASTIC, BROWN AND GRAY MOTTLING, MOIST, FIRM.		ML	END DRILLING @ 4:20 P.M.
30									

CH2M HILL

PROJECT NUMBER P160581.80

SOIL BORING LOG

PROJECT WACKER SILTRONIC LOCATION PORTLAND, OR

DRILLING METHOD REVERT ROTARY; DRAG BIT DRILLERS & EQUIPMENT D. KENNER OF OR; CME-75

ELEVATION 35.9 FEET BORE HOLE: B-108

WATER LEVEL 18.8 ft DATE: 7/23/82 START: 6/30/82 FINISH: 7/1/82 INSPECTOR DLKI

DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE NUMBER	SAMPLE RECOVERY (INCHES)	STANDARD PENETRATION TEST RESULTS BLOWS 6"-6"-6"	STANDARD PENETRATION TEST RESULTS BPF "N"	SOIL DESCRIPTION (COLOR, RELATIVE DENSITY OR CONSISTENCY, MOISTURE, GRAIN SHAPE AND TYPE, STRUCTURE, CEMENTATION, ORGANICS, MATERIAL)	GRAPHIC LOG	UNIFIED SOIL CLASSIFICATION SYMBOL	COMMENTS (DRILLING PROGRESS, LOST CIRCULATION, TYPE OF DEPOSIT, PROBLEMS, ETC.)
30	30.0								BEGAN DRILLING @ 7:45 A.M.
	32.0	ST-7	24	- - -	—	SILT, SAME AS S-8.		ML	
	33.5	S-8	18	1-2-2	4	SILT, NONPLASTIC, 5-12% VERY FINE SAND, BROWN, MOIST, SOFT.		ML	
35	35.0								
	36.5	S-9	18	3-3-2	5	SILT, NONPLASTIC, LESS THAN 5% VERY FINE SAND, BROWN, WET, FIRM.		ML	
	40.0								
40	41.5	S-10	18	2-5-8	14	SILT, SAME AS S-9.		ML	
	45.0								
45	46.5	S-11	18	6-7-10	17	SANDY SILT, NONPLASTIC, 15-20% VERY FINE SAND, BROWN, WET, COMPACT.		ML	
	50.0								
50	51.5	S-12	14	7-15-14	29	SAND, MEDIUM TO FINE, LESS THAN 5% FINES, BROWN, WET, COMPACT.		SP	
	55.0								
55	56.5	S-13	14	6-8-16	24	SILTY SAND, FINE SAND, 10-15% FINES, BROWN, WET, COMPACT.		SM	
60									

CH2M HILL

PROJECT NUMBER P160581.80

SOIL BORING LOG

PROJECT WACKER SILTRONIC LOCATION PORTLAND, OR

DRILLING METHOD REVERT ROTARY; DRAG BIT DRILLERS & EQUIPMENT D. KENNER OF OR; CME-75

ELEVATION 35.9 FEET BORE HOLE: B-108

WATER LEVEL 18.8 ft DATE: 7/23/82 START: 6/30/82 FINISH: 7/1/82 INSPECTOR DLKI

DEPTH BELOW SURFACE	SAMPLE INTERVAL	SAMPLE NUMBER	SAMPLE RECOVERY (INCHES)	STANDARD PENETRATION TEST RESULTS BLOWS 6"-6"-6"	STANDARD PENETRATION TEST RESULTS BPF "N"	SOIL DESCRIPTION (COLOR, RELATIVE DENSITY OR CONSISTENCY, MOISTURE, GRAIN SHAPE AND TYPE, STRUCTURE, CEMENTATION, ORGANICS, MATERIAL)	GRAPHIC LOG	UNIFIED SOIL CLASSIFICATION SYMBOL	COMMENTS (DRILLING PROGRESS, LOST CIRCULATION, TYPE OF DEPOSIT, PROBLEMS, ETC.)
60	60.0	S-14	14	12-24-25	49	SAND, MEDIUM TO FINE, LESS THAN 5 % FINES, BLACK, WET, DENSE,		SP	
	61.5								
65									
	68.0								
		S-15	12	16-14-24	38	BASALT, SLIGHTLY WEATHERED, FRACTURED, HARD, BASALTIC			END DRILLING @ 9:30 A.M.
	69.5								
70	69.5	S-16	0	60/1"	60/1"	NO RECOVERY			

END BORING @ 69.5 ft

NOTE: PIEZOMETER INSTALLED WITH A 1.9-FOOT, 1½-INCH DIAMETER SLOTTED TIP FROM 65.6 TO 67.5 FT; GRAVEL PACK, CONSISTING OF 3/8-INCH PEA GRAVEL FROM 70 FEET TO 64 FEET; FOLLOWED BY A 2-FOOT BENTONITE SEAL FROM 64 TO 62 FEET; ¾-INCH RISER PIPE INSTALLED FROM SLOTTED TIP TO ABOUT 1.5 FEET ABOVE THE GROUND SURFACE; BORING WAS THEN BACKFILLED FROM 62 FEET TO SURFACE WITH CUTTINGS AND PEA GRAVEL.

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: CN-1		Date(s): **1/27/09**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **Not Surveyed**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing:	Easting:
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **15.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/4" Bentonite Chips (Cetco Pure Gold) 0-15 feet		Remarks: **Location is adjacent to P-12.**	
Sample No. Prefix: 5237-090127-			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	1–4								**0.0 - 5.0 Feet:** No Recovery, closed point sampler pushed directly to 5.0 feet.		
	5							ML	**5.0 - 6.5 Feet:** gravelly SILT with some sand, dark gray, moist, soft, non-plastic. Odor and sheen present. Possible hard black solid tar and carbon pitch present at 6.0 feet.		
	6							SP	**6.5 - 7.0 Feet:** SAND with some gravel, moist, fine grained, loose, poorly graded. Oily sheen present and minor small wood fragments in the sandy matrix.		
	7			3.0 (5-10)	+	12.3		ML	**7.0 - 8.0 Feet:** gravelly SILT, dark gray and olive gray, moist, soft, low plasticity. Two inch sand lens present at 7.5 feet. Brick fragments encountered, odor present, and sheen observed during sheen testing.		
	8–9								**8.0 - 10.0 Feet:** No Recovery.		
	10							ML	**10.0 - 10.5 Feet:** gravelly SILT, dark gray, moist, soft, low plasticity.		
	11	⊠	010 (10.5-11.3) 010G (10.7')					OH	**10.5 - 11.3 Feet:** WOOD CHIPS with some silt, moist, highly decompossed with bluish coloration.		
	12			4.0 (10-15)				ML	**11.3 - 13.0 Feet:** gravelly SILT, dark gray, moist, soft, with brick fragements present. Gravel is coarse grained, sub-angular.		
	13							SP	**13.0 - 13.5 Feet:** SAND with some gravel, gray, wet, fine grained, poorly graded, with odor and a minor sheen present. Gravel is fine grained.	▽	
	14								**13.5 - 15.0 Feet:** No Recovery.		
	15								End of boring at 15.0 Feet below ground surface.		

NOTE:

Sample 010G is a grab sample (2 oz. container) collected in a zone of blue colored wood chips. Sample 010 is a homogenized sample (16 oz., 8 oz., 4 oz. containers) from the 10.5 to 11.3 foot interval from 3 co-located borings.

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface

▽ First encountered ground water

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: CN-2		Date(s): **1/26/09**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Corey Raspone**		Checked By: **Rob Ede**	
Driller: **Not applicable**			
Drilling Method: **Hand Auger**		GS Elevation: **Not Surveyed**	TOC: Not Applicable
Sampling Method: **Hand Auger**		Northing: **---**	Easting: **---**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **2.5 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: Backfill	0-2.5 feet	Remarks: **Location is adjacent to P-8.**	
Sample No. Prefix: 5237-090126-			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	1							SP	**0.0 - 1.9 Feet:** SAND, brown, moist, fine grained, loose, poorly graded, no odor or sheen present. No blue or grayish blue coloring observed.		
	2	☒	014G (2.0') 014 (2-2.2')						**1.9 - 2.1 Feet:** SAND, brown with blue-gray patches, moist, fine grained, loose, poorly graded, no odor or sheen observed. **2.1 - 2.5 Feet:** SAND, brown, moist, fine grained, loose, poorly graded, no odor or sheen present. No blue or grayish blue coloring observed.		
									End of hand auger boring at 2.5 feet below ground surface. NOTE: Sample 014G is a grab sample (2 oz. container) obtained from 2.0 feet and targeting the observed blue/grayish blue patches. Sample 014 is a homogenized sample (16 oz., 8 oz. 4 oz. containers) from the 2.0 to 2.2 interval obtained from 6 co-located hand auger borings.		

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: CN-5		Date(s): **1/28/09**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **Not Surveyed**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing:	Easting:
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **20.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/4" Bentonite Chips (Cetco Pure Gold) 0-20 feet		Remarks: **Location is adjacent to P-15.**	
Sample No. Prefix: 5237-090128-			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	1–4								**0.0 - 5.0 Feet:** No Recovery. Close point sampler pushed directly to 5.0 feet below ground surface.		
	5–6							ML	**5.0 - 7.0 Feet:** gravelly SILT, dark brown, moist, soft, non-plastic, with brick fragments present at 6.0 feet. Mild odor present, but no sheen observed during sheen testing, no visible oil or tar.		
	7–9			4.5 (5-10)	+	18.7		OH	**7.0 - 9.5:** silty WOOD CHIPS, gray with bluish tint, moist, soft, highly decompossed. Viscous black oil smears observed within interval. Odor present and sheen observed during sheen testing. UV screen identifies patch zones of fluorescence.		
	10								**9.5 - 10.0 Feet:** No Recovery		
	10–12		012 (10-12.5') 012G (12')					OH	**10.0 - 12.5 Feet:** silty WOOD CHIPS as above, gray with bluish coloring. Black viscous oil content increasing with depth, strong odor present and heavy sheen observed during sheen testing.		
	13–14			2.5 (10-15)					**12.5 - 15.0 Feet:** No Recovery		
	15–16							OH	**15.0 - 17.0 Feet:** silty WOOD CHIPS with some sand and gravels, gray with bluish tint, moist, soft. Black viscous oil with strong odor present and heavy sheen observed during sheen testing.		
	17–18			3.5 (15-20)	+	0.8		ML	**17.0 - 18.5 Feet:** sandy SILT, gray, moist, very soft, with strong odor and heavy sheen present during sheen testing, no visible oil or tar. UV screen identifies patchy zones of fluorescence.		
	19								**18.5 - 20.0 Feet:** No Recovery.		
	20								End of boring at 20.0 feet below ground surface NOTE: Sample 012G is a grab sample (2 oz. container) collected from a zone of wood chips with black oil. Sample 012 is a homogenized sample (16 oz., 8 oz., 4 oz. containers) from the 10 to 12.5 foot interval.		

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface

Report: SILTRONIC; File: 5237 (4_08).GPJ; 2/17/09

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: CN-6		Date(s): **1/27/09**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **Not Surveyed**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing:	Easting:
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **30.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/4" Bentonite Chips (Cetco Pure Gold) 0-30 feet		Remarks: **Location is adjacent to P-15.**	
Sample No. Prefix: 5237-090127-			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	1–14								**0.0 - 15.0 Feet:** No Recovery. Closed point sampler pushed directly to 15.0. feet.		
	15–19			4.0 (15-20)	+	0.0		SP	**15.0 - 19.0 Feet:** SAND, brown until 18.0 feet then gray, moist, medium grained, poorly graded, no odor, no discoloration, no sheen present. UV Screen identifies minor small speckled areas of fluorescence.		
	19								**19.0 - 20.0 Feet: No Recovery.**		

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface

▽ First encountered ground water

Report: SILTRONIC; File: 5237 (4_08).GPJ; 2/17/09

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: CN-6
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	21		011G (22.0')					ML	**20.0 - 20.4 Feet:** sandy SILT, gray, wet, soft, non-plastic, no odor, no discoloration, no sheen present.	▽	
								SP	**20.4 - 21.0 Feet:** SAND, gray, wet, fine grained, loose, poorly graded, no odor, no discoloration, no sheen present.		
	22		011 (22-22.2')	4.0 (20-25)				ML	**21.0 - 22.0 Feet:** SILT, brown and gray, moist, soft, non-plastic. No odor present, but minor sheen observed during sheen testing.		
	23							ML	**22.0 - 22.2 Feet:** SILT, black, moist, non-plastic. Strong odor and discoloration present with heavy sheen observed during sheen testing.		
	24								**22.2 - 24.0 Feet:** SILT, gray becoming brown by 24.0 feet with red and gray mottling present, moist, rootlets present, soft becoming stiff by 24.0 feet. Minor amounts of oil observed in rootlet partings near bottom of interval, and a mild odor present.		
	25							ML	**24.0 - 25.0 Feet:** No Recovery.		
	26								**25.0 - 29.7 Feet:** SILT, brown, moist, hard, low plasticity. Mild oil odor present, with minor amount of (patchy) oil with coincident sheen observed. UV screen does not indicate fluorescence at depth screened (27.5 feet)		
	27										
	28			5.0 (25-30)	-	22.7					
	29										
	30							ML	**29.7 - 30.0 Feet:** SILT as above with some sand.		
									End of boring at 30.0 feet below ground surface.		

NOTE: Sample 011G is a grab sample (2 oz. container) collected from a zone showing black discoloring and observed sheen. Sample 011 is a homogenized sample (16 oz., 8 oz., 4 oz. containers) from the 22 to 22.2 foot interval from two borings.

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface

▽ First encountered ground water

LTI Environmental Engineering
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501 Avis Drive, Ann Arbor, MI 48108

LOG OF BORING GP02-01

Wacker Siltronic Corporation

Date Started	: 3/19/02	Total Depth	: 100'
Date Completed	: 3/19/02	Depth to water	: 34.5'
Drilling Method	: Geoprobe		
Drilling Contractor	:		
Logged By	: JSD		

Depth in Feet	Recovery (in.)	Sample Type	Moisture Content	USCS	GRAPHIC	DESCRIPTION	Water Levels
0	48"/60"	Soil Sample (3' to 5')	Moist	SP		Gray fill SAND (36")	
3				SM		Dark gray fine sandy SILT (12")	
4				SP		Gray loamy fine SAND (48")	
7	60"/60"		Moist				
9				SP		Dark gray fine to medium SAND (12")	
10				ML		Dark gray SILT (6")	
11				SP		Fine to medium SAND (3")	
				ML		Gray SILT (5")	
12	42"/60"	Soil Sample (11' to 14')	Moist	SP		Gray to dark gray (stained) loamy medium sand (24")	
13				SP		Dark brown loamy medium SAND (4")	
14						No Recovery	
15				ML		Gray plastic SILT (6")	
16				SM		Fine to medium brown silty SAND (7")	
				ML		Plastic SILT (3")	
17	36"/60"		Moist	SP		Brown silty fine to medium SAND (3")	
18						Gray to black fine to medium SAND with some gravel (17")	
19						No Recovery	
20				ML		Dark gray plastic SILT (6")	
21				SP		Dark gray fine to medium SAND with some gravel, silt and wood (24")	
22	54"/60"						
				ML		Dark gray plasic SILT (4")	
23		Soil Sample (23' to 24')		SP		Fine SAND, tar above silt (18")	
24				ML		Stiff dark gray SILT (2")	
25				ML			

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LOG OF BORING GP02-01

Wacker Siltronic Corporation

Date Started	: 3/19/02	Total Depth	: 100'
Date Completed	: 3/19/02	Depth to water	: 34.5'
Drilling Method	: Geoprobe		
Drilling Contractor	:		
Logged By	: JSD		

Depth in Feet	Recovery (in.)	Sample Type	Moisture Content	USCS	GRAPHIC	DESCRIPTION	Water Levels
25							
26	24"/24"			ML		Plastic dark gray/olive SILT (odor) (24")	
27				ML		Plastic gray SILT with orange staining (12")	
28	30"/36"		Moist	ML		Protective casing set at 28'	
29							
30							
31	24"/24"		Moist	ML		Plastic medium brown clayey SILT with orange staining (24")	
32							
33	24"/24"		Moist	CL-ML		Plastic medium brown clayey SILT with orange staining (18")	
34				SP		Gray very fine silty SAND (12")	▽
35	18"/24"		Moist	ML-SP		Dark gray silty very fine to fine SAND (no odor) (12")	
36		Water Sample (35'-38')				No Recovery	
37	0"/24"						
38							
39							
40							
41							
42							
43							
44							
45							
46							
47							
48				SP		Dark olive/gray silty fine SAND (6")	
49	24"/24"		Wet	ML		Stiff dark olive/gray sandy SILT (6")	
50				SP		Medium dense dark olive/gray silty fine SAND (12")	

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LOG OF BORING GP02-01

Wacker Siltronic Corporation

Date Started	: 3/19/02	Total Depth	: 100'
Date Completed	: 3/19/02	Depth to water	: 34.5'
Drilling Method	: Geoprobe		
Drilling Contractor	:		
Logged By	: JSD		

Depth in Feet	Recovery (in.)	Sample Type	Moisture Content	USCS	GRAPHIC	DESCRIPTION	Water Levels
50							
51							
52							
53							
54							
55							
56							
57							
58				SP		Very dark gray silty fine SAND (3")	
59	14"/24"		Wet	ML		Stiff very dark gray very fine sandy SILT (11")	
60						No Recovery	
61							
62							
63							
64							
65							
66							
67							
68				SP		Loose dark olive/gray fine SAND, some silt, some medium sand (3")	
69	3"/24"		Wet			No Recovery	
70							
71							
72							
73							
74							
75							

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LOG OF BORING GP02-01

Wacker Siltronic Corporation

Date Started	: 3/19/02	Total Depth	: 100'
Date Completed	: 3/19/02	Depth to water	: 3-4.5'
Drilling Method	: Geoprobe		
Drilling Contractor	:		
Logged By	: JSD		

Depth in Feet	Recovery (in.)	Sample Type	Moisture Content	USCS	GRAPHIC	DESCRIPTION	Water Levels
75							
76							
77							
78				SP		Loose dark olive/gray fine SAND (12")	
79	18"/24"		Wet	SP		Medium dense dark olive/gray silty fine SAND (1")	
80						Very dense dark olive/gray silty fine SAND (6")	
81						No Recovery	
82							
83							
84							
85							
86							
87							
88				SP		Very loose dark gray fine SAND, some silt (6")	
89	18"/24"		Wet	ML-SP		Dark gray fine to medium silty SAND (12")	
90						No Recovery	
91							
92							
93							
94							
95							
96							
97							
98				SP-ML		Dark gray fine SAND, some silt (2")	
99	22"/24"		Wet	ML-SP		Plastic dark gray SILT, some sand (6")	
100				SP-ML		Dark gray fine SAND, some silt (14")	
						End Of Boring	

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LOG OF BORING GP02-02

Wacker Siltronic Corporation

Date Started	: 3/20/02	Total Depth	: 100'
Date Completed	: 3/20/02	Depth to water	: 20.5'
Drilling Method	: Geoprobe		
Drilling Contractor	:		
Logged By	: JSD		

Depth in Feet	Recovery (in.)	Sample Type	Moisture Content	USCS	GRAPHIC	DESCRIPTION	Water Levels
0						Asphalt (5")	
1				ML		Stiff dark gray SILT, rootlets, friable (30")	
2		Soil Sample (2' to 4')					
3	42"/60"		Dry	SP		Loose orange and brown layered loamy fine to medium SAND, some silt (11")	
4				ML		SILT (1")	
5						No Recovery	
6				SP		Loose orange and brown layered, loamy, fine to medium SAND (24")	
7				ML		Plastic dark olive/gray clayey SILT (5")	
8	30"/60"		Dry	SP		Loose orange and brown layered loamy fine to medium SAND (1")	
9						No Recovery	
10				SP		Orange/brown loamy fine to medium SAND. Silt lenses present in upper 5". (39")	
11							
12	39"60"		Dry				
13						No Recovery	
14							
15				SP		Orange/brown loamy fine to medium SAND with 3" zone of plastic clayey silt and wood (12")	
16		Soil Sample (18' to 20')		SP		Orange/brown loamy fine to medium SAND (21")	
17	39"/60"		Dry to 18'				
18				ML		Dark gray plastic SILT (6")	
19			Moist			No Recovery	
20	0	Soil Sample (20.5' to 23')		SP		Orange/brown fine to medium SAND with 1" - 2" zone of dark sheen/odor. (9")	▽
21			Dry	SP			
22			Moist	ML		Orange/brown fine to medium SAND with black tar, sheen and odor (6")	
23	35"/60"			ML		Very plastic olive brown clayey SILT (12")	
24						Plastic olive/brown clayey SILT with roots and wood (8")	
25						No Recovery	

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LOG OF BORING GP02-02

Wacker Siltronic Corporation

Date Started	: 3/20/02	Total Depth	: 100'
Date Completed	: 3/20/02	Depth to water	: 20.5'
Drilling Method	: Geoprobe		
Drilling Contractor	:		
Logged By	: JSD		

Depth in Feet	Recovery (in.)	Sample Type	Moisture Content	USCS	GRAPHIC	DESCRIPTION	Water Levels
25							
26	24"/24"	Water Sample (23' to 27')	Moist	ML		Very plastic olive brown clayey SILT, odor (24")	
27							
28						No Recovery Protective casing set to 28'	
29							
30							
31							
32							
33							
34							
35							
36							
37							
38				SP		Loose, uniform, olive/brown silty fine SAND with vertical rootlets and rust staining (18")	
39	18"/24"		Wet				
40						No Recovery	
41							
42							
43							
44							
45							
46							
47							
48				SP		Loose, uniform, dark gray fine silty SAND (13")	
49	16"/24"		Wet	ML		Dark gray fine sandy SILT (3")	
50							

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LOG OF BORING GP02-02

Wacker Siltronic Corporation

Date Started	: 3/20/02	Total Depth	: 100'
Date Completed	: 3/20/02	Depth to water	: 20.5'
Drilling Method	: Geoprobe		
Drilling Contractor	:		
Logged By	: JSD		

Depth in Feet	Recovery (in.)	Sample Type	Moisture Content	USCS	GRAPHIC	DESCRIPTION	Water Levels
50							
51							
52							
53							
54							
55							
56							
57							
58		Water Sample (56' to 60')		SP		Loose, uniform, dark gray silty SAND (6")	
59	12"/24"		Wet	ML		Stiff, dark gray sandy SILT (6")	
						No Recovery	
60							
61							
62							
63							
64							
65							
66							
67							
68				ML		Dark gray fine sandy SILT (5")	
69	24"/24"		Wet	SP		Loose dark gray very fine to fine SAND (16")	
70				ML		Stiff dark gray sandy SILT (3")	
71							
72							
73							
74							
75							

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LOG OF BORING GP02-02

Wacker Siltronic Corporation

Date Started	: 3/20/02	Total Depth	: 100'
Date Completed	: 3/20/02	Depth to water	: 20.5'
Drilling Method	: Geoprobe		
Drilling Contractor	:		
Logged By	: JSD		

Depth in Feet	Recovery (in.)	Sample Type	Moisture Content	USCS	GRAPHIC	DESCRIPTION	Water Levels
75							
76							
77							
78				SP		Loose dark gray silty very fine to fine SAND (10")	
79	10"/24"		Moist			No Recovery	
80							
81							
82							
83							
84							
85							
86							
87							
88				SP		Loose dark gray fine SAND some silt (14")	
89	20"/24"		Wet	ML		Dark gray very fine sandy SILT (6")	
90						No Recovery	
91							
92							
93							
94							
95							
96							
97							
98				SP		Loose dark gray fine SAND some silt (14")	
99	20"/24"		Wet	ML		Stiff dark gray very fine sandy SILT (6")	
100							

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LOG OF BORING GP02-03

Wacker Siltronic Corporation

Date Started	: 3/21/02	Total Depth	: 100'
Date Completed	: 3/21/02	Depth to water	: 26'
Drilling Method	: Geoprobe		
Drilling Contractor	:		
Logged By	: JSD		

Depth in Feet	Recovery (in.)	Sample Type	Moisture Content	USCS	GRAPHIC	DESCRIPTION	Water Levels
0				FL		Gravel and sand FILL (14")	
1				SP		Dense silty fine SAND and stiff sandy silt (12")	
2	54"/60"		Dry	SP		Loose orange/brown loamy fine to medium SAND (10")	
3				ML		Brown sandy SILT (6")	
4		Soil Sample (3' to 5')		SP		Loose orange/brown loamy fine to medium SAND (12")	
5				SP		No Recovery Orange/brown fine to medium silty SAND (1")	
6						Loose orange/brown loamy fine to medium SAND (56")	
7	57"/60"		Dry	SP			
8							
9							
10				SP		No Recovery Loose orange/brown loamy fine to medium SAND (12")	
11				SP		Gravel (1")	
12	42"/60"		Dry	SP		Loose orange/brown loamy fine to medium SAND with layers of dark organic woody material/cinders at bottom (29")	
13							
14						No Recovery	
15				SP		Loose orange/brown loamy fine to medium SAND (31")	
16							
17							
18	36"/60"		Dry to Moist	ML		Black very dense very fine SAND and stiff silt with layer of barklike material at top and layer of gravel in middle (5")	
19						No Recovery	
20	48"/60"		Dry to Moist				

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LOG OF BORING GP02-03

Wacker Siltronic Corporation

Date Started	: 3/21/02	Total Depth	: 100'
Date Completed	: 3/21/02	Depth to water	: 26'
Drilling Method	: Geoprobe		
Drilling Contractor	:		
Logged By	: JSD		

Depth in Feet	Recovery (in.)	Sample Type	Moisture Content	USCS	GRAPHIC	DESCRIPTION	Water Levels
20			Moist	SP			
21				ML		Brown sandy SILT (6")	
				GP		Loose, friable white GRAVEL (4")	
22	48"/60"		Dry to Moist	GP		Dry white gravel with brown stiff silt and SAND (4")	
				ML		Very stiff black sandy SILT (8")	
23				SP		Black fine to medium SAND with silt lenses and red brick (5")	
				ML			
				SP		Moist stiff black SILT (3")	
24				ML		Black fine to medium SAND (5")	
		Soil Sample (22' to 24')				Black SILT (1")	
25		Soil Sample (24' to 26')	Moist	ML		No Recovery	
26			Wet	SP		Stiff dark gray sandy SILT (7")	
						Orange/brown fine to medium SAND (13")	
27				SP		Dark gray fine SAND (16")	
	60"/60"						
28				ML		Plastic dark gray SILT with rootlets (24")	
29							
30						No Recovery	
31							
32							
	0"/60"		Wet				
33		Water Sample (31' to 35')					
34							
35				ML		Cohesive, soft brown sandy SILT with rust colored spots (3")	
				SP		Brown silty fine to medium SAND (2")	
36				ML		Cohesive, soft brown sandy SILT with rust colored spots (4")	
37						Brown silty fine to medium SAND (6")	
	24"/60"					Cohesive, soft brown sandy SILT with rust colored spots (9")	
38						No Recovery	
39							
40							

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501 Avis Drive, Ann Arbor, MI 48108

LOG OF BORING GP02-03

Wacker Siltronic Corporation

Date Started	: 3/21/02	Total Depth	: 100'
Date Completed	: 3/21/02	Depth to water	: 26'
Drilling Method	: Geoprobe		
Drilling Contractor	:		
Logged By	: JSD		

Depth in Feet	Recovery (in.)	Sample Type	Moisture Content	USCS	GRAPHIC	DESCRIPTION	Water Levels
40							
41							
42	54"/60"		Wet	SP			
43							
44				ML		Medium stiff rusty brown sandy SILT/silty sand (4")	
45						No Recovery	
46				ML		Dark olive gray fine sandy SILT (18")	
47	60"/60"		Wet	SP		Medium loose dark olive gray silty fine SAND (3")	
48				ML		Dark olive gray fine sandy SILT with wood frag. at 47' (14")	
49				SP		Dark olive gray silty fine SAND (2")	
50				ML		Dark olive gray fine sandy SILT (3")	
51				SP		Dark olive gray silty fine SAND (14")	
52	54"/60"		Wet	ML		Firm plastic dark olive gray SILT (6")	
53				SP		Dark olive gray fine to medium silty SAND (4")	
54				ML		Firm, plastic dark olive gray SILT, some sand (10")	
55				SP		Dark olive gray silty fine SAND, trace medium sand (40")	
56				ML		No Recovery	
57	60"/60"		Wet	SP		Dark olive gray silty fine SAND (2")	
58		Water Sample (56' to 60')				Firm plastic dark olive gray SILT, some sand and layers of woody material (18")	
59						Dark olive gray silty fine SAND (40")	
60							

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LTI Environmental Engineering
A Division of Limno-Tech, Inc.
501 Avis Drive, Ann Arbor, MI 48108

LOG OF BORING GP02-03

Wacker Siltronic Corporation

Date Started	: 3/21/02	Total Depth	: 100'
Date Completed	: 3/21/02	Depth to water	: 26'
Drilling Method	: Geoprobe		
Drilling Contractor	:		
Logged By	: JSD		

Depth in Feet	Recovery (in.)	Sample Type	Moisture Content	USCS	GRAPHIC	DESCRIPTION	Water Levels
60							
61							
62							
63							
64							
65				SP		Dark olive gray silty fine SAND (30")	
66							
67	54"/60"		Wet				
68				SP		Dark olive gray silty fine SAND with two stiffer silt lenses (24")	
69							
70						No Recovery	
71							
72							
73							
74							
75							
76						Dark olive gray silty fine SAND (60")	
77							
78	60"/60"		Wet	SP			
79							
80							

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LTI Environmental Engineering
A Division of Limno-Tech, Inc.
501 Avis Drive, Ann Arbor, MI 48108

LOG OF BORING GP02-03

Wacker Siltronic Corporation

Date Started	: 3/21/02	Total Depth	: 100'
Date Completed	: 3/21/02	Depth to water	: 26'
Drilling Method	: Geoprobe		
Drilling Contractor	:		
Logged By	: JSD		

Depth in Feet	Recovery (in.)	Sample Type	Moisture Content	USCS	GRAPHIC	DESCRIPTION	Water Levels
80							
81							
82							
83							
84							
85				ML		Very firm dark olive gray fine sandy SILT (12")	
86				ML		Very firm dark olive gray sandy SILT (5")	
87	59"/60"		Wet	SP		Very firm dark olive gray silty fine SAND (15")	
88				ML		Very firm dark olive gray sandy SILT (5")	
89				SP		Very firm dark olive gray silty fine SAND (10")	
90				ML		Plastic dark olive gray SILT, some sand (12")	
91				SP		Very firm dark olive gray silty fine SAND (1")	
92							
93							
94							
95				ML		Dark olive gray fine sandy SILT (9")	
96		Water Sample (96' to 100')		SP		Dark olive gray silty fine SAND (45")	
97	54"/60"		Wet				
98							
99							
100						End of Boring	

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.04	GP4	1 of 5

Project Name	Wacker Siltronic Corporation	TOC Elevation (feet above MSL)	N/A
Project Location	7200 NW Front Avenue, Portland Oregon 97210	Surface Elevation (feet above MSL)	N/A
Start/End Date	9/26/02 to 9/30/02	Northing	
Driller/Equipment	Geo-Tech Explorations, Inc./Geo-Probe	Easting	
Geologist/Engineer	Tony J. Silva/Anthony C. Bharwada	Hole Depth	100.0-feet
Sample Method	Geo-Probe	Outer Hole Diam	3.25 / 2.0-inch

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1			75%	GP					0.0 to 0.2 feet: GRAVEL (GP); light brown; 100% gravel, medium, subangular; dry to moist. Trace organic debris.
2									0.2 to 20.0 feet: GRAVELLY SAND (SW); brown; 75-80% sand, fine to coarse; 15-20% gravel, fine to coarse, subrounded; 5% fines; moist.
3									
4						PID = 1.9 ppm			
			90%	GP					
5									
6									
7									
8						GP4-S-7.5			@ 7.5 feet: Collected soil sample GP4-S-7.5.
			90%	GP		PID = >2 ppm			@ 7.7 feet: 3.5-inch layer of agglutinated sand, black.
9									
10									
11									
12						PID = 4.7 ppm			
			100%	GP					
13									
14						PID = 0.0 ppm			
15									
16									
			100%	GP					
17									
18									
19									
						GP4-S-19.0			@ 19.0 feet: Collected soil sample GP4-S-19.0.
20						PID = 5.0 ppm			

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval.

▽ **Water level observed after collecting water sample at 68 feet bgs.**

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.04	GP4	2 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			70%	GP		PID = 1.0 ppm			19.7 to 20.0 feet: Foreign piece of rubber material. 20.0 to 28.0 feet: GRAVELLY SAND (SW); dark grey; 55% sand, fine to coarse; 40% gravel, fine to coarse, subrounded; 5% fines; moist.
22									
23									
24			100%	GP					
25									
26						GP4-S-26.0 PID = 0.0 ppm			@ 26.0 feet: Collected soil sample GP4-S-26.0.
27									
28									@ 28.0 feet: Softer drilling noted by driller.
			100%	GP					28.0 to 29.5 feet: SANDY SILT (ML); dark grey; 60% fines, low plasticity; 40% sand, fine to coarse; moist to very moist.
29									
30									29.5 to 37.5 feet: SILT (ML); dark grey; 85-95% fines, high plasticity; 5-15% sand, fine; moist to wet.
31	▽								contact with native
32			100%	GP					32.0 to 36.0 feet: Dark grey with light brown mottling.
33									
34									
35									
36			100%	GP					36.0 to 37.5 feet: Dark grey with orangish brown mottling.
37									
38						PID = 0.0 ppm			37.5 to 37.8 feet: SILTY SAND (SM); dark grey with light brown mottling; 70% sand, fine to medium; 30% fines, low plasticity; wet. 37.8 to 39.0 feet: SILT (ML); dark grey with orangish brown mottling; 85% fines, medium to high plasticity; 15% sand, fine; wet.
39									39.0 to 40.0 feet: SILTY SAND (SM); dark grey; 85% sand, fine to medium; 15% fines, non plastic; wet.
40			100%	GP					40.0 to 44.0 feet: SILT (ML); dark grey; 80 to 90% fines, high plasticity; 10 to 20% sand, fine to medium; wet.
41									
42									

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval.

▽ **Water level observed after collecting water sample at 68 feet bgs.**

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.04	GP4	3 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43						PID = 0.0 ppm			
44									44.0 to 45.0 feet: SILTY SAND (SM); dark grey; 60% sand, fine to medium; 40% fines, medium plasticity; wet.
45			90%	GP					45.0 to 48.5 feet: SAND (SW); light brown; 95% sand, fine to coarse, poorly sorted, 5% fines; wet.
46									
47						PID = 0.0 ppm			
48									
49									48.5 to 53.0 feet: SILT (ML); dark grey; 90-95% fines, high plasticity; 5-10% sand, fine; wet.
50			90%	GP					
51									
52						PID = 0.0 ppm			
53									53.0 to 54.0 feet: SANDY SILT (ML); dark grey; 60% fines, medium plasticity; 40% sand, fine; wet.
54									54.0 to 55.0 feet: SILT (ML); dark grey; 90% fines, medium to high plasticity; 10% sand, fine; wet. Trace organic debris, leaves.
55			80%	GP					55.0 to 57.0 feet: SILTY SAND (SM); dark grey with light brown mottling; 85% sand, fine to coarse; 15% fines, low plasticity; wet.
56									
57						PID = 0.0 ppm			57.0 to 58.0 feet: SANDY SILT (ML); dark grey; 70% fines, medium plasticity; 30% sand, fine; wet.
58									58.0 to 60.0 feet: SILTY SAND (SM); dark grey with light brown mottling; 85% sand, fine to coarse; 15% fines, low plasticity; wet.
59									
60			100%	GP					60.0 to 75.0 feet: SAND (SW); dark grey; 95% sand, fine to coarse, poorly sorted; 5% fines; micaceous; wet.
61									
62									
63						PID = 0.0 ppm			
64									
65									

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval.

▽ **Water level observed after collecting water sample at 68 feet bgs.**

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.04	GP4	4 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66			80%	GP					
				GW					
67						PID = 0.0 ppm			
68						GP4-W-68.0			@ 68.0 feet: Collected water sample GP4-W-68.0. Screened from 66.0 to 70.0 feet bgs.
69									
70			100%	GP					
71									
72									
73						PID = 0.0 ppm			
74									
75			90%	GP					75.0 to 77.0 feet: SAND (SP); dark grey; 95% sand, fine, angular, well sorted; 5% fines; wet.
76									
77						PID = 0.0 ppm			77.0 to 79.0 feet: SANDY SILT (ML); dark grey; 75 to 85% fines, medium plasticity; 15 to 25% sand, fine; wet.
78									
79									79.0 to 80.0 feet: SILTY SAND (SM); dark grey; 85% sand, fine, subangular; 15% fines, medium plasticity; wet.
80			90%	GP					80.0 to 85.0 feet: SAND (SP); dark grey; 95% sand, fine, subrounded, well sorted; 5% fines; wet.
81									
82									
83						PID = 0.0 ppm			
84									
85			90%	GP					85.0 to 88.0 feet: SILTY SAND (SM); dark grey; 85% sand, fine to medium, subangular; 15% fines, non plastic; micaceous; wet.
86									
87									

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval.

▽ **Water level observed after collecting water sample at 68 feet bgs.**

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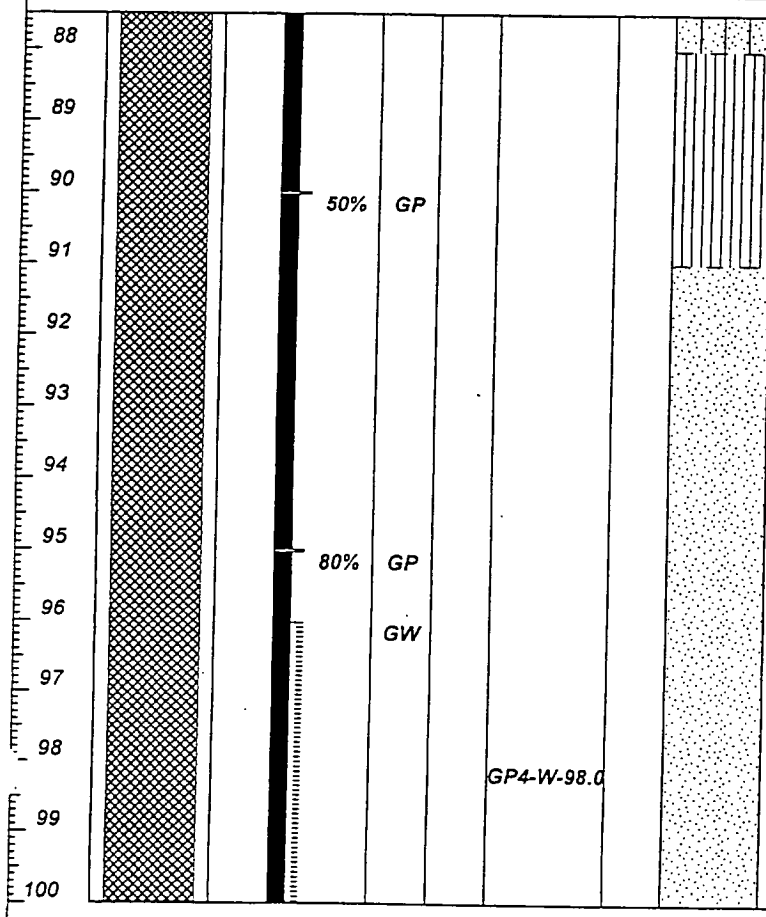
Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.04	GP4	5 of 5



Soil Description

88.0 to 91.0 feet: SILT (ML); dark grey; 90% fines, medium to high plasticity; 10% sand, fine; micaceous; wet.

91.0 to 100.0 feet: SAND (SP); dark grey; 95% sand, fine to medium, subangular, moderately sorted; 5% fines; micaceous; wet.

@ 98.0 feet: Collected water sample GP4-W-98.0. Screened from 96.0 to 100.0 feet bgs.

Total Depth = 100.0 feet below ground surface.

Borehole Completion Details
0.0 to 36.0 feet bgs: dual tube sampling system.
0.0 to 36.0 feet bgs: drive 3.25-inch temporary casing fitted with large drive shoe.
36.0 feet bgs: tremied in grout to set a seal on the 3.25-inch casing.
36.0 to 100.0 feet bgs: 2-inch by 5-foot long macro core soil sampler.
0.0 to 15.0 feet bgs: abandoned with 3/4-inch bentonite chips hydrated with potable water.
15.0 to 100.0 feet bgs: tremied in grout.

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval.

▽ Water level observed after collecting water sample at 68 feet bgs.

\PROJECTS\8128-01\GP4-7.GPJ 11/14/02
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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.04	GP5	1 of 5

Project Name	Wacker Siltronic Corporation	TOC Elevation (feet above MSL)	N/A
Project Location	7200 NW Front Avenue, Portland Oregon 97210	Surface Elevation (feet above MSL)	N/A
Start/End Date	10/7/02 to 10/8/02	Northing	
Driller/Equipment	Geo-Tech Explorations, Inc./Geo-Probe	Easting	
Geologist/Engineer	Anthony C. Bharwada	Hole Depth	100.0-feet
Sample Method	Geo-Probe	Outer Hole Diam	3.25 / 2.0-inch

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1			90%	GP					0.0 to 2.0 feet: SANDY GRAVEL (GW); light brown; 75% gravel, fine to coarse, subangular to subrounded; 20% sand, fine to coarse, subrounded; 5% fines; moist.
2						PID = 0.0 ppm			
3									2.0 to 4.0 feet: GRAVELLY SAND (SW); light brown; 85% sand, fine to course, subrounded to rounded; 10% gravel, fine to medium, rounded; 5% fines; moist.
4			95%	GP					4.0 to 9.0 feet: SAND (SP); dark brown; 95% sand, fine to medium, subrounded to rounded, moderately sorted; 5% fines; moist.
5									
6						PID = 0.0 ppm			
7									
8			90%	GP					@ 8.0 feet: One 2-inch diameter clast found.
9									9.0 to 11.0 feet: GRAVELLY SAND (SW); brown; 60% sand, fine to coarse, subrounded; 40% gravel, fine to medium, subangular to subrounded; micaceous; moist.
10						PID = 0.0 ppm			
11									11.0 to 22.0 feet: SAND (SP); brown; 95% sand, fine to medium, subrounded, moderately sorted; 5% fines; micaceous; moist.
12			80%	GP					
13						GP5-S-13.0			@ 13.0 feet: Collected soil sample GP5-S-13.0.
14						PID = 0.6 ppm			
15									
16			75%	GP					
17									
18									
19						PID = 0.0 ppm			
20									19.5 to 22.0 feet: Grey; moderately sorted. Trace organic debris.

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval.

▽ Water level observed while drilling by wetness on drilling equipment.

APROJECTS\8128-01\GP4-7.GPJ 11/14/02

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Geologic Borehole Log/Well Construction

Maul Foster & Alongi, Inc.

Project Number	Well Number	Sheet
8128.01.04	GP5	2 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			75%	GP		GP5-S-21.0 PID = 3.1 ppm			@ 21.0 feet: Collected soil sample GP5-S-21.0.
22									22.0 to 24.0 feet: GRAVELLY SAND (SW); grey; 65% sand, fine to medium, subrounded; 30% gravel, fine to medium, subrounded; 5% fines; micaceous; moist.
23									
24			100%	GP					24.0 to 28.0 feet: SILT (ML); olive grey with orange-brown mottling; 85-95% fines, medium to high plasticity; 5-15% sand, fine; micaceous; moist.
25									
26						GP5-S-26.0 PID = 0.0 ppm			@ 25.5 feet: 1 1/2-inch by 1/16-inch plant root. @ 26.0 feet: Collected soil sample GP5-S-26.0.
27									
28			100%	GP					28.0 to 29.0 feet: SILTY SAND (SM); brown; 80% sand, fine to coarse, rounded; 20% fines, low plasticity; moist to wet.
29									29.0 to 32.0 feet: SILT (ML); brown with orange-brown mottling; 85% fines, high plasticity; 15% sand, fine; moist to very moist. Trace rootlets.
30			100%	GP					
31									
32									32.0 to 37.5 feet: SILTY SAND (SM); brown; 80-90% sand, fine, subrounded; 10-20% fines, non to low plasticity; micaceous; wet.
33									
34	▽								
35			80%	GP					35.0 to 37.5 feet: Brown with reddish brown oxidized zones.
36									
37									
38									37.5 to 38.0 feet: SILT (ML); brown with reddish orange oxidizing zones; 85% fines, high plasticity; 15% sand, fine, subrounded; micaceous; wet.
39									38.0 to 40.0 feet: SILTY SAND (SM); brown with reddish brown oxidizing zones; 90% sand, fine, subrounded; 10% fines, non plastic; micaceous; wet.
40			80%	GP					40.0 to 42.5 feet: SAND (SP); brown; 95% sand, fine to medium, rounded, moderately sorted; 5% fines; micaceous; wet.
41									
42									

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval.

▽ **Water level observed while drilling by wetness on drilling equipment.**

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Geologic Borehole Log/Well Construction

Maul Foster & Alongi, Inc.

Project Number	Well Number	Sheet
8128.01.04	GP5	3 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43									42.5 to 46.0 feet: SILT (ML); grey; 85% fines, high plasticity; 15% sand, fine, rounded; micaceous; wet.
44									
45			100%	GP					45.0 to 46.0 feet: Olive grey. Trace shell fragments.
46									46.0 to 47.2 feet: SILTY SAND (SM); olive grey; 80% sand, fine, subrounded; 20% fines, low plasticity; micaceous; wet. Trace organic debris and shell fragments.
47									47.2 to 52.5 feet: SAND (SP); dark grey; 95% sand, fine, subrounded to rounded, well sorted; 5% fines; micaceous; wet. Trace organic debris and shell fragments.
48									
49									
50			100%	GP					
51									
52									
53									52.5 to 53.0 feet: SILTY SAND (SM); dark grey; 85% sand, fine to medium, subrounded; 15% fines, low plasticity; wet. Trace organic debris.
54									53.0 to 54.5 feet: SILT (ML); grey; 90% fines, high plasticity; 10% sand, fine; wet. Trace organic debris.
55			100%	GP					54.5 to 58.0 feet: SILTY SAND (SM); dark grey; 75-85% sand, fine to medium, subrounded; 15-25% fines, low plasticity; micaceous; wet. Trace organic debris.
56									
57									
58						PID = 3.9 ppm			58.0 to 59.0 feet: SILT (ML); grey; 90% fines, high plasticity; 10% sand, fine; micaceous; wet.
59									59.0 to 60.0 feet: SAND (SP); dark grey; 95% sand, fine, subrounded, well sorted; 5% fines; micaceous; wet.
60			100%	GP					60.0 to 61.0 feet: SILTY SAND (SM); dark grey; 75% sand, fine, subrounded; 25% fines, low plasticity; micaceous; wet.
61									61.0 to 62.0 feet: SILT (ML); grey; 90% fines, high plasticity; 10% sand, fine; micaceous; wet.
62									62.0 to 62.5 feet: SILTY SAND (SM); dark grey; 75% sand, fine, subrounded; 25% fines, low plasticity; micaceous; wet.
63									62.5 to 70.0 feet: SAND (SP); dark grey; 95% sand, fine to medium, subrounded, moderately sorted; 5% fines; micaceous; wet. Trace organic debris.
64									
65									

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval.

▽ **Water level observed while drilling by wetness on drilling equipment.**

PROJECTS\8128-01\GP4-7.GPJ 11/14/02

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.04	GP5	4 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66			80%	GP					
67				GW					
68						PID = 3.1 ppm GP5-W-68.0			@ 68.0 feet: Collected water sample GP5-W-68.0. Screened from 66.0 to 70.0 feet bgs.
69									
70			100%	GP					70.0 to 71.0 feet: SILTY SAND (SM); dark grey; 65 to 75% sand, fine, subrounded to rounded; 25 to 35% fines, low to medium plasticity; micaceous; wet.
71									71.0 to 74.0 feet: SILT (ML); dark grey with brownish orange mottling; 85-95% fines, high plasticity; 5-15% sand, fine; micaceous; wet. Trace shell fragments.
72									
73						PID = 2.3 ppm			
74									74.0 to 76.0 feet: SAND (SP); dark grey; 95% sand, fine to medium, subrounded, moderately sorted; 5% fines; micaceous; wet.
75			90%	GP					
76									76.0 to 76.5 feet: SILT (ML); dark grey; 85% fines, high plasticity; 15% sand, fine; micaceous; wet.
77									76.5 to 81.0 feet: SAND (SP); dark grey; 95% sand, fine to medium, subrounded, moderately sorted; 5% fines; micaceous; wet.
78						PID = 2.3 ppm			
79									
80			80%	GP					
81									81.0 to 84.0 feet: SILT (ML); dark grey; 85% fines, medium to high plasticity; 15% sand, fine; micaceous; wet. Trace organic debris and shell fragments.
82									
83									
84									84.0 to 95.0 feet: SAND (SP); dark grey; 95% sand, fine to medium, subangular to subrounded, moderately sorted; 5% fines; micaceous; wet. Trace organic debris.
85			90%	GP					
86									
87									

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval.

▽ **Water level observed while drilling by wetness on drilling equipment.**

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.04	GP5	5 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88									
89									
90			80%	GP					
91									
92									
93				GW		PID = 125.4 ppm			@ 92.6 feet: 2-inch lens of SILT (ML); dark grey; 90% fines, high plasticity; 10% sand, fine; micaceous; wet.
94									
95			90%	GP		GP5-W-95			95.0 to 96.0 feet: SILTY SAND (SM); dark grey; 85% sand, fine to medium, subrounded; 15% fines, low plasticity; micaceous; wet.
96									@ 95.0 feet: Collected water sample GP5-W-95.0. Screened from 93.0 to 97.0 feet bgs.
97									96.0 to 99.0 feet: SAND (SP); dark grey; 95% sand, fine, subrounded, well sorted; 5% fines; micaceous; wet.
98						PID = 111.8 ppm			@ 97.5 feet: 2-inch lens of SILT (ML); dark grey; 90% fines, high plasticity; 10% sand, fine; micaceous; wet.
99									99.0 to 99.5 feet: SILT (ML); dark grey: 90% fines, high plasticity; 10% sand, fine; micaceous; wet.
100									99.5 to 100.0 feet: SAND (SP); dark grey; 95% sand, fine, subrounded, well sorted; 5% fines; micaceous; wet.
									Total Depth = 100.0 feet below ground surface.

Borehole Completion Details

0.0 to 28.0 feet bgs: dual tube sampling system.
0.0 to 28.0 feet bgs: drive 3.25-inch temporary casing fitted with large drive shoe.
28.0 feet bgs: tremied in grout to set a seal on the 3.25-inch casing.
28.0 to 100.0 feet bgs: 2-inch by 5-foot long macro core soil sampler.
0.0 to 15.0 feet bgs: abandoned with 3/4-inch bentonite chips hydrated with potable water.
15.0 to 100.0 feet bgs: tremied in grout.

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval.

▽ Water level observed while drilling by wetness on drilling equipment.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.04	GP6	1 of 5

Project Name	Wacker Siltronic Corporation	TOC Elevation (feet above MSL)	N/A
Project Location	7200 NW Front Avenue, Portland Oregon 97210	Surface Elevation (feet above MSL)	N/A
Start/End Date	9/30/02 to 10/2/02	Northing	
Driller/Equipment	Geo-Tech Explorations, Inc./Geo-Probe	Easting	
Geologist/Engineer	Tony J. Silva/Anthony C. Bharwada	Hole Depth	100.0-feet
Sample Method	Geo-Probe	Outer Hole Diam	3.25 / 2.0-inch

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1			90%	GP					0.0 to 1.0 feet: SILTY GRAVEL (GM); dark brown; 50% gravel, fine to coarse, subrounded; 50% fines, low to medium plasticity; moist. Trace sand.
2									1.0 to 4.0 feet: SAND (SW); light brown; 95% sand, fine to coarse, subrounded to subangular, poorly sorted; 5% fines; moist.
3									
4			75%	GP					4.0 to 16.0 feet: GRAVELLY SAND (SW); light brown; 75% sand, fine to coarse, subrounded; 20% gravel, fine to medium, subangular to subrounded; 5% fines; moist.
5									
6									
7						PID = 0.0 ppm			
8			75%	GP					
9						PID = 1.0 ppm			
10									
11									
12			75%	GP					
13									
14									
15						GP6-S-15.0			@ 15.0 feet: Collected soil sample GP6-S-15.0.
16			75%	GP		PID = 1.2 ppm			16.0 to 22.0 feet: SAND (SW); light brown; 95% sand, fine to coarse, subangular, poorly sorted; 5% fines; moist.
17									@ 17.0 feet: 1/8-inch layer of agglutinated sand, black.
18									@ 18.0 feet: 1/8-inch layer of agglutinated sand, black.
19						PID = 0.0 ppm			@ 19.0 feet: 1/2-inch layer of agglutinated sand, black.
20									@ 19.5 feet: woody debris

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval. 7.) DUP = duplicate sample.

▽ Water level observed while drilling by wetness on drilling equipment.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.04	GP6	2 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			75%	GP					
22									22.0 to 23.0 feet: SAND (SP); grey; 95% sand fine to medium, subangular, moderately sorted; 5% fines; micaceous; moist.
23						GP6-S-23.0 PID = 1.5 ppm			23.0 to 24.5 feet: SILTY SAND (SM); dark grey; 80% sand, fine; 20% fines, low plasticity; moist. @ 23.0 feet: Collected soil sample GP6-S-23.0. @ 23.5 feet: 6-inch layer with woody debris.
24			75%	GP					
25						PID = 1.2 ppm			24.5 to 27.7 feet: GRAVELLY SAND (SW); grey; 80% sand, fine to medium, subangular; 15% gravel, fine to medium, rounded, light brown clasts; 5% fines; micaceous; moist.
26									
27									
28			100%	GP					27.7 to 28.0 feet: SILT (ML); grey; 80% fines, medium plasticity; 20% sand, fine; micaceous; moist.
29									28.0 to 29.0 feet: GRAVELLY SAND (SW); grey; 60% sand, fine to medium, subangular; 30% gravel, fine to medium, rounded; 10% fines; moist.
30									29.0 to 32.0 feet: CLAYEY SILT to SILTY CLAY (ML); light brown with reddish brown mottling; 100% fines, high plasticity; moist to very moist.
31						GP6-S-30.0 PID = 0.0 ppm			@ 30.0 feet: Collected soil sample GP6-S-30.0.
32			0%	GP					32.0 to 35.0 feet: NO RECOVERY; heave material in sampler suggests; SILTY SAND (SM); dark brown; 75% sand, fine to medium, subrounded; 25% fines, low to medium plasticity; moist to wet.
33									
34	▽								
35			100%	GP					35.0 to 40.0 feet: SANDY SILT (ML); reddish brown with dark reddish brown mottling; 80% fines, high plasticity; 20% sand, fine; micaceous; wet.
36									
37									37.0 to 40.0 feet: Light grey with reddish brown mottling.
38						PID = 2.1 ppm			
39									
40			100%	GP					
41									40.0 to 44.5 feet: SANDY SILT to SILT (ML); grey; 65 to 85% fines, medium to high plasticity; 15 to 35% sand, fine, rounded; micaceous; wet.
42									

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval. 7.) DUP = duplicate sample.

▽ Water level observed while drilling by wetness on drilling equipment.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.04	GP6	3 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43						PID = 1.1 ppm			
44									
45			100%	GP					44.5 to 45.0 feet: SILTY SAND (SM); grey; 70-80% sand, fine to medium, subrounded; 20-30% fines, low to medium plasticity; micaceous; wet.
46									45.0 to 46.0 feet: SILTY SAND to SAND (SM-SP); dark grey; 90% sand, fine to medium, subrounded to rounded; 10% fines, low to medium plasticity; micaceous; wet. Heave material?
47									46.0 to 47.0 feet: SILT (ML); grey; 85% fines, high plasticity; 15% sand, fine; micaceous; wet. Trace organic debris.
48						PID = 0.2 ppm			47.0 to 50.0 feet: SILTY SAND (SM); light brown with reddish brown mottling; 80% sand, fine to medium, subrounded; 20% fines, low plasticity; micaceous; wet.
49									
50			100%	GP					50.0 to 54.0 feet: SILTY SAND to SAND (SM-SP); grey; 85-90% sand, fine to medium, subrounded to rounded; 10% non plastic fines; 5% organic debris; micaceous; wet. Heaving sands.
51									51.0 to 54.0 feet: Light brown.
52									
53						PID = 0.2 ppm			
54									54.0 to 55.0 feet: SILTY SAND (SM); light grey to grey; 50-75% sand, fine, rounded; 25-50% fines, low to medium plasticity; micaceous; wet.
55			90%	GP					
56									56.0 to 57.0 feet: SILT (ML); grey; 90% fines, high plasticity; 10% sand, fine; wet.
57									57.0 to 58.0 feet: SILTY SAND (SM); grey; 80% sand, fine, subrounded; 20% fines, low plasticity; wet. Trace organic debris.
58						PID = 0.2 ppm			58.0 to 60.0 feet: SILTY SAND to SAND (SM-SP); dark grey; 85% sand, fine to medium, subrounded; 15% fines, low to medium plasticity; wet.
59									
60			50%	GP					60.0 to 65.0 feet: SAND (SP); dark grey; 95% sand, fine to medium, rounded, moderately sorted; 5% fines; micaceous; wet.
61									
62									
63						PID = 0.0 ppm			
64									
65									

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval. 7.) DUP = duplicate sample.

▽ Water level observed while drilling by wetness on drilling equipment.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.04	GP6	4 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66			100%	GP					65.0 to 67.0 feet: SILT (ML); dark grey; 90% fines, high plasticity; 10% sand, fine, rounded; micaceous; wet.
67									
68						PID = 2.1 ppm			67.0 to 68.0 feet: SANDY SILT (ML); dark grey; 60% fines, medium plasticity; 40% sand, fine, subrounded to rounded; micaceous; wet.
69									68.0 to 70.0 feet: SILT (ML); dark grey; 90% fines, high plasticity; 10% sand, fine, rounded; micaceous; wet. Trace organic debris.
70			75%	GP					70.0 to 77.0 feet: SAND (SP); dark grey; 95% sand, fine to medium, subangular, moderately sorted; 5% fines; micaceous; wet.
71									
72				GW					
73						PID = 1.1 ppm			
74						GP6-W-74.0			@ 74.0 feet: Collected water sample GP6-W-74.0. Screened from 72.0 to 76.0 feet bgs.
75			90%	GP					
76									
77									77.0 to 79.0 feet: SILTY SAND (SM); dark grey; 50% sand, fine to medium, subrounded; 50% fines, high plasticity; micaceous; wet.
78						PID = 2.1 ppm			
79									79.0 to 80 feet: SANDY SILT (ML); grey; 85% fines, high plasticity; 15% sand, fine; micaceous; wet. Trace organic debris.
80			80%	GP					80.0 to 85.0 feet: SAND (SP); 95% sand, fine to medium, subrounded, moderately sorted; 5% fines; micaceous; wet.
81									
82									
83						PID = 4.0 ppm			
84									
85			80%	GP					85.0 to 87.0 feet: SILTY SAND (SM); dark grey; 85% sand, fine to medium, subrounded; 15% fines, low to medium plasticity; micaceous; wet.
86									
87									87.0 to 89.0 feet: SAND (SP); 95% sand, fine to medium, rounded,

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval. 7.) DUP = duplicate sample.

▽ **Water level observed while drilling by wetness on drilling equipment.**

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.04	GP6	5 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88						PID = 8.2 ppm			moderately sorted; 5% fines; micaceous; wet.
89									89.0 to 89.5 feet: SANDY SILT (ML); dark grey; 60% fines, medium to high plasticity; 40% sand, fine to medium; micaceous; wet. Silt nodules 1/2-inch diameter.
90			90%	GP					89.5 to 90.0 feet: SILT (ML); dark grey; 90% fines, high plasticity; 10% sand, fine; micaceous; wet.
91									90.0 to 100.0 feet: SAND (SP); 95% sand, fine to medium, subrounded, moderately sorted; 5% fines; micaceous; wet. Silt nodules 1/2-inch diameter.
92									
93						PID = 54.0 ppm			
94									
95			90%	GP					
96				GW					
97									
98						PID = 43.0 ppm GP-W-98.0 GP-DUP			@ 98.0 feet: Collected water sample GP5-W-98.0 and duplicate GP-DUP. Screened from 96.0 to 100.0 feet bgs.
99									
100									

Total Depth = 100.0 feet below ground surface.

Borehole Completion Details

0.0 to 32.0 feet bgs: dual tube sampling system.
0.0 to 32.0 feet bgs: drive 3.25-inch temporary casing fitted with large drive shoe.
32.0 feet bgs: tremied in grout to set a seal on the 3.25-inch casing.
32.0 to 100.0 feet bgs: 2-inch by 5-foot long macro core soil sampler.
0.0 to 15.0 feet bgs: abandoned with 3/4-inch bentonite chips hydrated with potable water.
15.0 to 100.0 feet bgs: tremied in grout.

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NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval. 7.) DUP = duplicate sample.

▽ Water level observed while drilling by wetness on drilling equipment.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.04	GP7	1 of 5

Project Name	Wacker Siltronic Corporation	TOC Elevation (feet above MSL)	N/A
Project Location	7200 NW Front Avenue, Portland Oregon 97210	Surface Elevation (feet above MSL)	N/A
Start/End Date	10/2/02 to 10/4/02	Northing	
Driller/Equipment	Geo-Tech Explorations, Inc./Geo-Probe	Easting	
Geologist/Engineer	Tony J. Silva/Anthony C. Bharwada	Hole Depth	100.0-feet
Sample Method	Geo-Probe	Outer Hole Diam	3.25 / 2.0-inch

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1			90%	GP		PID = 5.6 ppm			0.0 to 2.0 feet: SANDY GRAVEL (GW); dark brown to light brown; 80% gravel, fine to coarse, angular to rounded; 20% sand, fine to coarse; moist. Plant roots to 3 inches. Three larger clasts 2-inch diameter.
2									
3									2.0 to 13.0 feet: SAND (SW); brown, 90% sand, fine to coarse, subrounded, poorly sorted; 5% gravel, fine to medium, subrounded to rounded; 5% fines; micaceous; moist.
4			90%	GP					
5									
6									
7						PID = 3.5 ppm			
8			75%	GP					
9						GP7-S-9.0 PID = 5.6 ppm			@ 9.0 feet: Collected soil sample GP7-S-9.0.
10									
11									
12			90%	GP					
13						PID = 7.0 ppm			13.0 to 13.5 feet: SILTY SAND (SM); dark grey; 75% sand, fine; 25% fines, medium plasticity; moist. One larger 2-inch diameter clast found at 13.5 feet.
14									13.5 to 20.0 feet: SAND (SW); brown, 90% sand, fine to coarse, subrounded, poorly sorted; 5% gravel, fine to medium, subrounded to rounded; 5% fines; micaceous; moist.
15									
16			90%	GP		GP7-S-15.5 PID = 5.6 ppm			@ 15.5 feet: Collected soil sample GP7-S-15.5.
17						PID = 7.7 ppm			@ 16.0 feet: 1.5 feet layer of agglutinated sand, black.
18									@ 18.0 feet: 2-inch layer of agglutinated sand, black.
19									@ 18.8 feet: 1-inch layer of agglutinated sand, black.
20									@ 19.2 feet; 1-inch layer of agglutinated sand, black.

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval.

▽ Water level observed while drilling by wetness on drilling equipment.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.04	GP7	2 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			90%	GP					20.0 to 26.0 feet: GRAVELLY SAND (SW); brown; 75% sand, fine to coarse, subrounded; 20% gravel, fine to medium, subangular to subrounded; 5% fines; micaceous; moist.
22						PID = 2.8 ppm			
23									
24			75%	GP					
25						PID = 3.5 ppm			
26									26.0 to 29.0 feet: SAND (SW); grey; 95% sand, fine to coarse, subrounded, poorly sorted; 5% fines; micaceous; moist to wet. Trace gravel.
27									
28			100%	GP					
29									29.0 to 30.5 feet: SILT (ML); 85% fines, high plasticity; 15% sand, fine; micaceous; moist to very moist.
30						GP7-S-30.0			@ 30.0 feet: Collected soil sample GP7-S-30.0.
31						PID = 0.7 ppm			30.5 to 36.0 feet: SILTY SAND (SM); grey; 70-80% sand, fine to medium, subrounded; 20-30% fines, medium plasticity; micaceous; moist to very moist.
32			10%	GP					
33									
34		▽				PID = 0.0 ppm			
35									
36			100%	GP					36.0 to 37.0 feet: SANDY SILT (ML); grey; 70-80% fines, high plasticity; 20-30% sand, fine; micaceous; wet.
37									37.0 to 39.5 feet: SILTY SAND (SM); grey; 75% sand, fine to medium, subangular to subrounded; 25% fines, low plasticity; micaceous; wet.
38						PID = 0.0 ppm			
39									
40			80%	GP					39.5 to 40.0 feet: SILT (ML); grey; 85% fines, high plasticity; 15% sand, fine; micaceous; wet.
41									40.0 to 45.0 feet: SAND (SP); dark grey; 95% sand, fine to medium, subangular, moderately sorted; 5% fines; micaceous; wet.
42									

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval.

▽ **Water level observed while drilling by wetness on drilling equipment.**

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.04	GP7	3 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43						PID = 0.7 ppm			
44									
45			100%	GP					45.0 to 46.0 feet: SILT (ML); dark grey; 85% fines, high plasticity; 15% sand, fine; micaceous; wet. Trace organic debris.
46									46.0 to 47.5 feet: SILTY SAND (SM); dark grey; 80% sand, fine to medium, subrounded; 20% fines, low to medium plasticity; micaceous; wet. Trace organic debris.
47									
48						PID = 0.7 ppm			47.5 to 49.0 feet: SANDY SILT (ML); dark grey; 80% fines, high plasticity; 20% sand, fine; micaceous; wet.
49									
50			75%	GP					49.0 to 49.4 feet: SILTY SAND (SM); dark grey; 80% sand, fine to medium, subrounded; 20% fines, low to medium plasticity; micaceous; wet. Trace organic debris.
51									49.4 to 49.8 feet: SILT (ML); dark grey; 85% fines, high plasticity; 15% sand, fine; micaceous; wet.
52									49.8 to 50.0 feet: SILTY SAND (SM); dark grey; 85% sand, fine, subrounded; 15% fines, low plasticity; micaceous; wet.
53						PID = 0.0 ppm			50.0 to 60.0 feet: SAND (SP); dark grey; 95% sand, fine to medium, subrounded to rounded, moderately sorted; 5% fines; micaceous; wet.
54									
55			80%	GP					
56									
57									
58									
59									
60			75%	GP					60.0 to 61.0 feet: SILT (ML); grey; 90% fines, high plasticity; 10% sand, fine; micaceous; wet.
61									61.0 to 67.5 feet: SILTY SAND (SM); dark grey; 80% sand, fine to medium, subrounded; 20% fines, low plasticity; micaceous; wet.
62									
63									
64									
65									

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval.

▽ **Water level observed while drilling by wetness on drilling equipment.**

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.04	GP7	4 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66									
67									
68			100%	GP		PID = 0.0 ppm			67.5 to 68.5 feet: SILT (ML); grey; 85% fines, high plasticity; 15% sand, fine; micaceous; wet.
69									68.5 to 69.0 feet: SILTY SAND (SM); dark grey; 80% sand, fine to medium, subrounded; 20% fines, low plasticity; micaceous; wet.
70			100%	GP					69.0 to 71.0 feet: SAND WITH SILT (SP-SM); dark grey; 85% sand, fine to medium, subrounded; 15% fines, low plasticity; micaceous; wet.
71									
72									71.0 to 79.5 feet: SAND (SP); dark grey; 95% sand, fine to medium, subrounded, moderately sorted; 5% fines; micaceous; wet.
73						PID = 0.0 ppm			
74									
75			100%	GP					
76				GW					
77									
78						PID = 0.7 ppm GP7-W-78.0			@ 78.0 feet: Collected water sample GP7-W-78.0. Screened from 76.0 to 80.0 feet bgs.
79									
80			90%	GP					79.5 to 80.0 feet: SILTY SAND (SM); dark grey; 80% sand, fine to medium, subrounded; 20% fines, low plasticity; micaceous; wet.
81									80.0 to 85.0 feet: SAND (SP); dark grey; 95% sand, fine to medium, subrounded, moderately sorted; 5% fines; micaceous; wet.
82									
83						PID = 0.7 ppm			
84									
85			100%	GP					85.0 to 87.0 feet: SANDY SILT (ML); dark grey; 75 to 85% fines, medium to high plasticity; 15 to 25% sand, fine; micaceous; wet.
86									
87									87.0 to 88.0 feet: SILT (ML); grey; 90% fines, high plasticity; 10%

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval.

▽ **Water level observed while drilling by wetness on drilling equipment.**

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.04	GP7	5 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88						PID = 3.1 ppm			sand, fine; micaceous; wet.
89									88.0 to 89.0 feet: SANDY SILT (ML); grey; 80% fines, low to medium plasticity; 20% sand, fine; micaceous; wet. Silt nodules 1/4-inch diameter.
90			100%	GP					89.0 to 91.5 feet: SAND (SP); dark grey; 95% sand, fine to medium, subangular, moderately sorted; 5% fines; micaceous; wet.
91									
92									91.5 to 92.5 feet: SANDY SILT (ML); dark grey; 75% fines, high plasticity; 25% sand, fine to medium, subangular; micaceous; wet.
93						PID = 6.2 ppm			92.5 to 94.5 feet: SAND (SP); dark grey; 95% sand, fine to medium, subrounded, moderately sorted; 5% fines; micaceous; wet.
94									
95			90%	GP					94.5 to 96.0 feet: SILT (ML); grey; 90% fines, high plasticity; 10% sand, fine; micaceous; wet.
96				GW					96.0 to 100.0 feet: SILTY SAND (SM); dark grey; 90% sand, fine to medium, subrounded; 10% fines, medium plasticity; micaceous; wet.
97									
98						PID = 7.8 ppm GP7-W-98.0			@ 97.4 feet: 1-inch silt lens @ 98.0 feet: 2-inch silt lens @ 98.0 feet: Collect water sample GP7-W-98.0. Screened from 96.0 to 100.0 feet bgs.
99									
100									Total Depth = 100.0 feet below ground surface.

Borehole Completion Details

0.0 to 36.0 feet bgs: dual tube sampling system.
0.0 to 36.0 feet bgs: drive 3.25-inch temporary casing fitted with large drive shoe.
36.0 feet bgs: tremied in grout to set a seal on the 3.25-inch casing.
36.0 to 100.0 feet bgs: 2-inch by 5-foot long macro core soil sampler.
0.0 to 15.0 feet bgs: abandoned with 3/4-inch bentonite chips hydrated with potable water.
15.0 to 100.0 feet bgs: tremied in grout.

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval.

▽ Water level observed while drilling by wetness on drilling equipment.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	**GP8**	**1 of 2**

Project Name	**Wacker Siltronic Corporation**	TOC Elevation (feet NGVD)	**N/A**
Project Location	**7200 NW Front Avenue, Portland Oregon 97210**	Surface Elevation (feet NGVD)	**33.1020**
Start/End Date	**7/16/03 to 7/16/03**	Northing	**7624560.5**
Driller/Equipment	**Geo-Tech Explorations, Inc./Geo-Probe**	Easting	**704640.2**
Geologist/Engineer	**Eric Roth / Tony Silva**	Hole Depth	**25.0-feet**
Sample Method	**Geo-Probe**	Outer Hole Diam	**3.25/2.0-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
0			60%	GP	1				0.0 to 0.4 feet: Asphalt.
1									0.4 to 5.0 feet: SAND with GRAVEL (SP); light brown; 10% fines, non plastic; 70% sand, fine to medium; 20% gravel, fine, well rounded; dry to moist. (Fill)
2									
3									
4						PID = 0.0 ppm			
5			20%	GP	2				5.0 to 19.0 feet: GRAVEL (GP); black; trace fines; 10% sand, fine; 90% gravel, fine, well rounded; dry to most. (Fill)
6									
7									
8									
9						PID = 0.0 ppm			
10			40%	GP	3				
11									
12									
13									
14						PID = 0.0 ppm			
15	▽		50%	GP	4				
16									16.0 feet: Wet.
17									
18									
19									
20						PID = 5.0 ppm			19.0 to 20.0 feet: SAND (SP); dark gray grading to black; 10% fines, non plastic; 70% sand, fine to medium; 20% gravel, medium, subrounded; wet. (Fill)

NOTES: 1.) NA = not available. 2.) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3.) PID = Photo ionization detector, soil head space reading. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = groundwater sample, dashed graphic indicates screened interval.

▽ **Water level observed after collecting water sample at 24 feet bgs.**

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	**GP8**	**2 of 2**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			**85%**	**GP GW**	**5**				*20.0 to 23.0 feet: SAND (SP); grayish black; 10% fines, non plastic; 85% sand, fine to medium; 5% gravel, fine, well rounded; wet. (Fill)*
22									*20.0 feet: Thick layer of black plastic observed in sampler.*
23						**GP8-S-22.0 PID = 11.8 ppm GP8-W-24.0**			
24									*23.0 to 25.0 feet: CLAYEY SILT (ML); grayish brown; 95% fines, medium plasticity; 5% sand, fine to coarse; organic debris, roots; wet.*
25						**PID = 5.0 ppm GP8-S-25.0**			

Total Depth = 25.0 feet below ground surface.

Borehole Completion Details

0.0 to 15.0 feet bgs: 3.25-inch temporary casing.
0.0 to 25.0 feet bgs: 2-inch by 5-foot long macro core soil sampler.
0.0 to 2.0 feet bgs: abandoned with 3/4-inch bentonite chips hydrated with potable water.
2.0 to 25.0 feet bgs: abandoned with grout slurry pumped through drilling rods.

NOTES: *1.) NA = not available. 2.) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3.) PID = Photo ionization detector, soil head space reading. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = groundwater sample, dashed graphic indicates screened interval.*

▽ ***Water level observed after collecting water sample at 24 feet bgs.***

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	**GP9**	**1 of 2**

Project Name	**Wacker Siltronic Corporation**	TOC Elevation (feet NGVD)	**N/A**
Project Location	**7200 NW Front Avenue, Portland Oregon 97210**	Surface Elevation (feet NGVD)	**33.4620**
Start/End Date	**7/17/03 to 7/17/03**	Northing	**7624569.4**
Driller/Equipment	**Geo-Tech Explorations, Inc./Geo-Probe**	Easting	**704636.0**
Geologist/Engineer	**Tony Silva**	Hole Depth	**25.0-feet**
Sample Method	**Geo-Probe**	Outer Hole Diam	**2.0-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
0			80%	GP	1				0.0 to 0.2 feet: Asphalt.
1									0.2 to 5.0 feet: SAND (SP); light brown; 10% fines, non plastic; 80% sand, fine; 20% gravel, fine to medium, subrounded; moist. (Fill)
2						PID = 0.0 ppm			
3									
4									
5			50%	GP	2	PID = 0.0 ppm			5.0 to 10.0 feet: SAND (SP); dark brown to light gray; 10% fines, non plastic; 80% sand, fine; 20% gravel, fine to medium, subrounded; moist. (Fill)
6									
7									
8									
9						PID = 0.0 ppm			
10			50%	GP	3				10.0 to 15.0 feet: GRAVEL (GP); light gray; trace fines; 10% sand, fine; 90% gravel, fine, well rounded; most. (Fill)
11									
12									
13									
14									
15	▽		50%	GP	4	PID = 0.0 ppm			15.0 to 24.0 feet: SAND (SP); dark gray grading to black; 10% fines, non plastic; 90% sand, fine; 10% gravel, fine, subrounded; organic debris, roots; wet. (Fill)
16									
17									
18									
19						PID = 0.0 ppm			
20									

NOTES: 1.) NA = not available. 2.) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3.) PID = Photo ionization detector, soil head space reading. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = groundwater sample, dashed graphic indicates screened interval.

▽ **Water level observed after collecting water sample at 24 feet bgs.**

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	**GP9**	**2 of 2**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			**80%**	**GP GW**	**5**	**GP9-S-20.0**			
						PID = 0.0 ppm			
22						**GP9-W-24**			
						GP-W-DUP			
23									
24						**PID = 0.0 ppm**			
						GP9-S-25.0			
25						**GP9-S-Dup**			*24.0 to 25.0 feet: SILT (ML); dark gray; 100% fines, medium plasticity; organic debris, roots; moist.*

Total Depth = 25.0 feet below ground surface.

Borehole Completion Details

0.0 to 25.0 feet bgs: 2-inch by 5-foot long macro core soil sampler.

0.0 to 2.0 feet bgs: abandoned with 3/4-inch bentonite chips hydrated with potable water.

2.0 to 25.0 feet bgs: abandoned with grout slurry pumped through drilling rods.

NOTES: *1.) NA = not available. 2.) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3.) PID = Photo ionization detector, soil head space reading. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = groundwater sample, dashed graphic indicates screened interval.*

▽ ***Water level observed after collecting water sample at 24 feet bgs.***

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	**GP10**	**1 of 2**

Project Name	**Wacker Siltronic Corporation**	TOC Elevation (feet NGVD)	**N/A**
Project Location	**7200 NW Front Avenue, Portland Oregon 97210**	Surface Elevation (feet NGVD)	**33.4420**
Start/End Date	**7/16/03 to 7/16/03**	Northing	**7624580.1**
Driller/Equipment	**Geo-Tech Explorations, Inc./Geo-Probe**	Easting	**704632.0**
Geologist/Engineer	**Eric Roth / Tony Silva**	Hole Depth	**25.0-feet**
Sample Method	**Geo-Probe**	Outer Hole Diam	**3.25/2.0-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
0			75%	GP	1				0.0 to 0.4 feet: Asphalt.
1									0.4 to 5.0 feet: GRAVELY SAND (SP); brownish gray; 10% fines, non plastic; 70% sand, fine; 20% gravel, fine to medium, subrounded; moist. (Fill)
2									
3									
4						PID = 0.0 ppm			
5			50%	GP	2				5.0 to 9.0 feet: SAND with GRAVEL (SP); tan brown; 10% fines, non plastic; 80% sand, fine to medium; 10% gravel; fine, rounded; most. (Fill)
6									
7									
8						PID = 0.0 ppm			
9									9.0 to 15.0 feet: SANDY GRAVEL (GP); black gray; trace fines; 30-40% sand, fine to medium; 60-70% gravel, fine, well rounded; dry to moist. (Fill)
10			60%	GP	3	PID = 0.0 ppm			
11									
12									
13									
14						PID = 0.0 ppm			
15	▽		80%	GP	4				15.0 to 19.0 feet: SAND (SP); grayish brown; 10% fines, non plastic; 90% sand, fine to coarse; moist to wet.
16									16.0 feet: Wet.
17									
18									
19						PID = 38.0 ppm			19.0 to 20.0 feet: SAND (SP); same as above; black. Strong olfactory and visual impacts. Apparent non-aqueous phase liquid observed with naphthalene-like odor.
20									

NOTES: 1.) NA = not available. 2.) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3.) PID = Photo ionization detector, soil head space reading. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = groundwater sample, dashed graphic indicates screened interval.

▽ **Water level observed after collecting water sample at 24 feet bgs.**

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	**GP10**	**2 of 2**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			**60%**	**GP GW**	**5**	**GP10-S-20.0**			*20.0 to 24.5 feet: SAND (SP); same as above; black. (Fill) Apparent non-aqueous phase liquid observed with naphthalene-like odor.*
22						**PID = 150.0 ppm**			
23						**GP10-W-24.0**			
24									
25						**PID = 5.0 ppm**			*24.5 to 25.0 feet: SILT (ML); brownish black; 95% fines, low plasticity, tight; 5% sand, fine; wet. Slight naphthalene-like odor noted.*

Total Depth = 25.0 feet below ground surface.

Borehole Completion Details

0.0 to 20.0 feet bgs: 3.25-inch temporary casing.

0.0 to 25.0 feet bgs: 2-inch by 5-foot long macro core soil sampler.

0.0 to 2.0 feet bgs: abandoned with 3/4-inch bentonite chips hydrated with potable water.

2.0 to 25.0 feet bgs: abandoned with grout slurry pumped through drilling rods.

NOTES: *1.) NA = not available. 2.) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3.) PID = Photo ionization detector, soil head space reading. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = groundwater sample, dashed graphic indicates screened interval.*

▽ ***Water level observed after collecting water sample at 24 feet bgs.***

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	GP11	1 of 5

Project Name	Wacker Siltronic Corporation	TOC Elevation (feet NGVD)	N/A
Project Location	7200 NW Front Avenue, Portland Oregon 97210	Surface Elevation (feet NGVD)	31.6590
Start/End Date	7/14/03 to 7/16/03	Northing	7624834.1
Driller/Equipment	Geo-Tech Explorations, Inc./Geo-Probe	Easting	703461.0
Geologist/Engineer	Eric Roth / Tony Silva	Hole Depth	96.5-feet
Sample Method	Geo-Probe	Outer Hole Diam	3.25/2.0-inch

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
0			90%	GP	1				0.0 to 0.4 feet: SILTY CLAY (CL) with ORGANICS; light brown with orange brown mottling; 100% fines; dry. (Fill)
1									0.4 to 6.0 feet: SILTY CLAY (CL); reddish brown with orangish brown mottling; 100% fines, low plasticity; dry. (Fill)
2						PID = 0.0 ppm			
3									
4									
5						PID = 0.0 ppm			
6			80%	GP	2				
7						PID = 0.0 ppm			6.0 to 9.5 feet: CLAYEY SAND (SC); yellowish brown; 15% fines, low plasticity; 85% sand, fine; slightly micaceous; dry to most. (Fill)
8						PID = 0.0 ppm			
9									
10			90%	GP	3				9.5 to 12.5 feet: SAND (SP); blackish gray; 10% fines, non plastic; 90% sand, fine to medium; slightly micaceous; damp to wet. Strong petroleum hydrocarbon-like odor. (Fill)
11						PID = 0.0 ppm			
12						PID = 0.0 ppm			
13									12.5 to 14.0 feet: CLAYEY SILT (ML); brownish black; 90% fines, medium plasticity, tight; 10% sand, fine; moist to wet. Strong petroleum hydrocarbon-like odor. (Fill)
14									14.0 to 15.0 feet: SAND (SP); grayish black; 15% fines, low plasticity; 85% sand, fine to medium; slightly micaceous; wet. Strong petroleum hydrocarbon-like odor. (Fill)
15			90%	GP	4	GP11-S-15.0 PID = 19.1 ppm			15.0 to 16.5 feet: SANDY SILT (ML); grayish black; 70% fines, low to medium plasticity; 20% sand, fine; 10% organic debris; slightly micaceous; damp to wet. Strong petroleum hydrocarbon-like odor. (Fill)
16									
17						PID = 54.7 ppm GP11-S-17.0			16.5 to 18.5 feet: CLAYEY SILT (ML); brownish black; 90% fines, medium plasticity; 5% sand, fine; 5% organic debris, roots; wet. Strong petroleum hydrocarbon-like odor. (Fill)
18									
19									18.5 to 19.0 feet: SAND with SILT (SP-SM); grayish brown to black; 15% fines, low plasticity; 70% sand, fine; 15% woody debris; slightly micaceous; dry. (Fill)
20									19.0 to 20.0 feet: SAND (SP); greenish gray; 5% fines, non plastic; 95%

NOTES: 1.) NA = not available. 2.) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3.) PID = Photo ionization detector, soil head space reading. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = groundwater sample, dashed graphic indicates screened interval.

▽ **Water level observed after collecting water sample at 40.0 feet bgs**

▼ **Water level Water level observed after collecting water sample at 70.0 feet bgs.**

▼ **Water level Water level observed after collecting water sample at 96.0 feet bgs.**

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	GP11	2 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
20			95%	GP	5	PID = 0.0 ppm			sand, fine; slightly micaceous; dry to moist. Slight petroleum hydrocarbon-like odor. (Fill)
21						PID = 0.0 ppm			20.0 to 23.0 feet: SILTY SAND (SM); greenish gray; 20% fines, low plasticity; 80% sand, very fine; slightly micaceous; wet. (Fill)
22									
23									23.0 to 23.8 feet: SILTY SAND (SM); blackish brown; 20% fines, low to medium plasticity; 60% sand, fine; 20% woody debris; moist. (Fill)
24						PID = 0.0 ppm			23.8 to 25.0 feet: SANDY SILT (ML); grayish brown; 90% fines, low plasticity; 10% sand, fine; slightly micaceous; moist. (Fill)
25			100%	GP	6				25.0 to 28.0 feet: SILTY SAND (SM); greenish gray; 15% fines, non to low plasticity; 80% sand, fine; 5% woody debris, snail shells; micaceous; moist. (Fill)
26						PID = 0.0 ppm			
27						GP11-S-27.0			
28									28.0 to 33.5 feet: CLAYEY SILT (ML); grayish brown; 90-95% fines, non to low plasticity; 5-10% sand, fine; slightly micaceous; dry to moist.
29						PID = 0.0 ppm			
30			90%	GP	7				
31						PID = 0.0 ppm			
32									
33									
34						PID = 0.0 ppm			33.5 to 35.0 feet: SILT (ML); gray; 95% fines, low plasticity; 5% sand, fine; slightly micaceous; moist.
35			100%	GP	8				35.0 to 40.0 feet: SANDY SILT (ML); greenish gray to grayish black; 80-85% fines, low plasticity; 15-20% sand, fine; slightly micaceous; damp to wet.
36				GW					
37						PID = 0.0 ppm			
38	▽					GP11-W-40.0			
39						PID = 0.0 ppm			
40			100%	GP	9				40.0 to 45.0 feet: SILT (ML); brownish gray; 85% fines, low plasticity; 10% sand, fine; 5% woody debris, snail shells, gastropods; slightly micaceous; moist to damp.
41						PID = 0.0 ppm			
42									

NOTES: 1.) NA = not available. 2.) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3.) PID = Photo ionization detector, soil head space reading. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = groundwater sample, dashed graphic indicates screened interval.

▽ **Water level observed after collecting water sample at 40.0 feet bgs**

▼ **Water level Water level observed after collecting water sample at 70.0 feet bgs.**

▼ **Water level Water level observed after collecting water sample at 96.0 feet bgs.**

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	GP11	3 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43									
44						PID = 0.0 ppm			
45			100%	GP	10				45.0 to 50.0 feet: SILT (ML); brownish gray to greenish gray; 95% fines, non plastic; 5% sand, fine; woody debris; slightly micaceous; dry to moist.
46						PID = 0.0 ppm			
47									
48									
49						PID = 0.0 ppm			
50			100%	GP	11				50.0 to 52.0 feet: SILTY SAND (SM); brownish gray; 30% fines, medium plasticity; 70% sand, fine to medium; slightly micaceous; wet.
51						PID = 0.0 ppm			
52									52.0 to 58.5 feet: CLAYEY SILT (ML); greenish gray; 95% fines, low plasticity; 5% sand, fine; tight; slightly micaceous; dry to moist.
53									
54						PID = 0.0 ppm			
55			100%	GP	12				
56						PID = 0.0 ppm			
57									
58									
59						PID = 0.0 ppm			58.5 to 60.0 feet: SILT (ML); grayish brown; 90% fines, non to low plasticity; 10% sand, fine; moist.
60			100%	GP	13				60.0 to 60.5 feet: SILTY SAND (SM); greenish gray; 20% fines, non plastic; 80% sand, fine; slightly micaceous; wet.
61						PID = 0.0 ppm			60.5 to 61.0 feet: SILT (ML); greenish gray; 95% fines, low plasticity; 5% sand, fine; moist.
62									61.0 to 63.0 feet: SAND (SP); greenish gray; 15% fines, non to low plasticity; 85% sand, fine; wet.
63									
64									63.0 to 64.0 feet: SANDY SILT (ML); brownish gray; 60% fines, low plasticity; 40% sand, fine; moist to damp.
65						PID = 0.0 ppm			64.0 to 65.5 feet: SILT (ML); light brown; 90% fines, medium plasticity; 10% sand, fine; damp to wet.

NOTES: 1.) NA = not available. 2.) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3.) PID = Photo ionization detector, soil head space reading. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = groundwater sample, dashed graphic indicates screened interval.

▽ **Water level observed after collecting water sample at 40.0 feet bgs**

▼ **Water level Water level observed after collecting water sample at 70.0 feet bgs.**

▼ **Water level Water level observed after collecting water sample at 96.0 feet bgs.**

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	GP11	4 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66			100%	GP	14				65.0 to 71.0 feet: SILTY SAND (SM); light brown to golden brown; 20-30% fines, non to low plasticity; 70-80% sand, fine; micaceous; dense; wet. Heaving sands.
67				GW		PID = 0.0 ppm			
68						GP11-W-70.0			
69						PID = 0.0 ppm			
70			100%	GP	15				
71						PID = 0.0 ppm			71.0 to 73.2 feet: SAND (SP); light brown to golden brown; 15% fines, non plastic; 85% sand, fine; micaceous; wet.
72									
73									73.2 to 75.0 feet: SILTY SAND (SM); light brown; 40% fines, low plasticity; 60% sand, fine; slightly micaceous; wet.
74						PID = 0.0 ppm			
75			100%	GP	16				75.0 to 80.0 feet: SANDY SILT (ML); light brown; 80% fines, low plasticity; 20% sand, fine; micaceous; wet.
76									
77									
78									
79									
80			95%	GP	17				80.0 to 94.0 feet: SAND (SP); light brown to golden brown; 10-15% fines, non plastic; 85-90% sand, very fine; micaceous; wet. Flowing sands.
81									
82									
83									
84									
85			0%	GP	18				85.0 feet: Flowing sands.
86									
87									

NOTES: 1.) NA = not available. 2.) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3.) PID = Photo ionization detector, soil head space reading. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = groundwater sample, dashed graphic indicates screened interval.

▽ **Water level observed after collecting water sample at 40.0 feet bgs**

▼ **Water level Water level observed after collecting water sample at 70.0 feet bgs.**

▼ **Water level Water level observed after collecting water sample at 96.0 feet bgs.**

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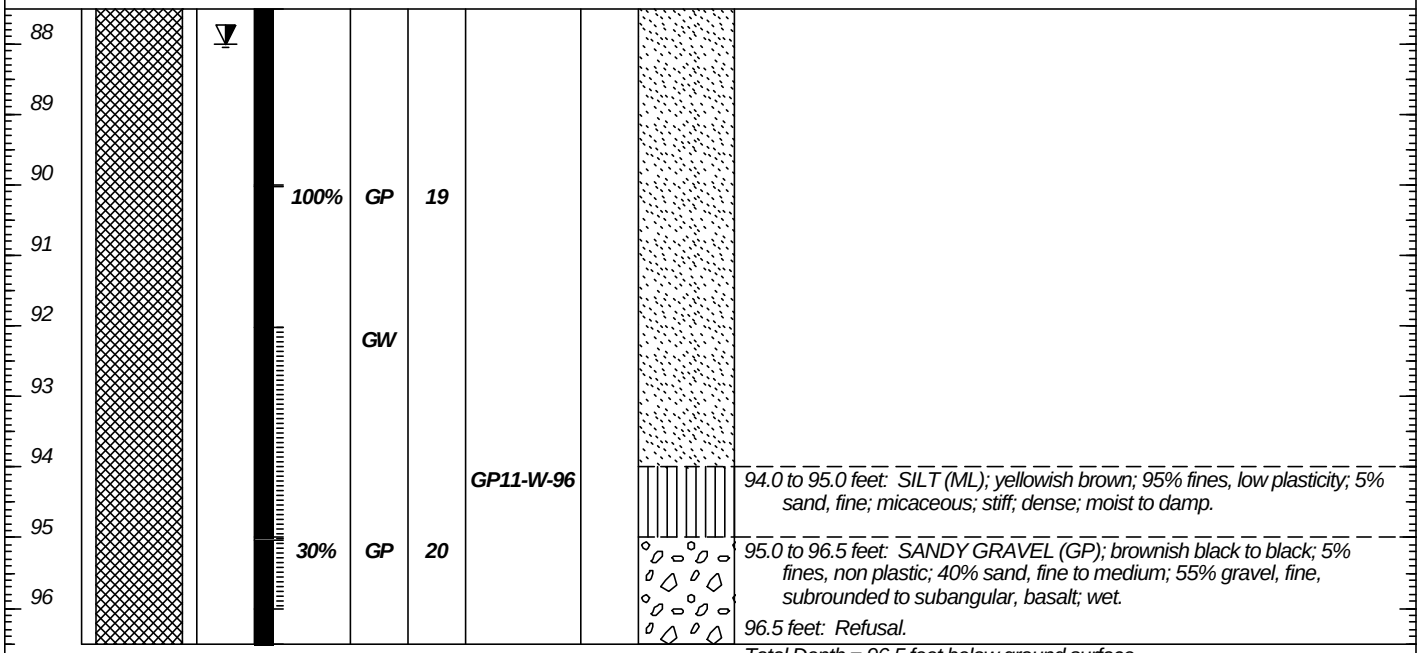
Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	GP11	5 of 5



Borehole Completion Details

0.0 to 32.0 feet bgs: 3.25-inch temporary casing.
0.0 to 96.0 feet bgs: 2-inch by 5-foot long macro core soil sampler.
0.0 to 10.0 feet bgs: abandoned with 3/4-inch bentonite chips hydrated with potable water.
10.0 to 96.0 feet bgs: abandoned with grout slurry pumped through drilling rods.

NOTES: *1.) NA = not available. 2.) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3.) PID = Photo ionization detector, soil head space reading. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = groundwater sample, dashed graphic indicates screened interval.*

Water level observed after collecting water sample at 40.0 feet bgs

Water level Water level observed after collecting water sample at 70.0 feet bgs.

Water level Water level observed after collecting water sample at 96.0 feet bgs.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**GP-12**	**1 of 1**

Project Name	**Siltronic Corporation**	TOC Elevation (feet NGVD)	**NA**
Project Location	**7200 NW Front Avenue, Portland, Oregon**	Surface Elevation (feet NGVD)	**33.1**
Start/End Date	**6/29/2004 to 6/29/2004**	Northing	**704604.7**
Driller/Equipment	**Geo-Tech Explorations, Inc./Geo-Probe**	Easting	**7624568.0**
Geologist/Engineer	**Anthony Chavez**	Hole Depth	**20.0-feet**
Sample Method	**Geo-Probe**	Outer Hole Diam	**2-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1			**0**	**NR**					*0.0 to 10.0 feet: NO RECOVERY; Air knife to 10 feet bgs. to clear for possible utilities. Soil observed from cuttings mainly light brown to gray; fine sand to silty sand; dry to damp.*
2									
3									
4									
5									
6									
7									
8									
9									
10			**60**	**GP**					*10.0 to 11.0 feet: SAND (SP); grayish-brown; 100% sand, fine to medium; trace fines; moist.*
11									*11.0 to 12.5 feet: SILTY SAND (SM); dark brownish-gray; 30% fines, non to low plasticity; 70% sand, fine; micaceous; slight odor; damp.*
12						**PID = 0ppm.**			
13						**PID = 0ppm.**			*12.5 to 13.0 feet: SAND (SP); grayish-brown; 100% sand, fine to medium; trace fines; moist.*
14									*13.0 to 15.0 feet: NO RECOVERY.*
15			**60**	**GP**					*15.0 to 18.0 feet: SAND (SP); dark brownish-gray; 100% sand, fine; trace fines; micaceous; moist to wet.*
16				**GW**					
17						**PID = 0ppm.**			
18						**GP12-W-17** **PID = 0ppm.**			*@ 17.5 feet: sand becomes black and tarry with strong odor.*
19									*18.0 to 20.0 feet: NO RECOVERY.*
20									*Total Depth = 20.0 feet bgs.*

NOTES: *1.) NA = not available. 2.) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3.) PID = Photo ionization detector, soil head space reading. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = groundwater sample, dashed graphic indicates screened interval. 7.) Odor characteristic of manufactured gas plant waste.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**GP-13**	**1 of 1**

Project Name	**Siltronic Corporation**	TOC Elevation (feet NGVD)	**NA**
Project Location	**7200 NW Front Avenue, Portland, Oregon**	Surface Elevation (feet NGVD)	**33.0**
Start/End Date	**6/29/2004 to 6/29/2004**	Northing	**704629.5**
Driller/Equipment	**Geo-Tech Explorations, Inc./Geo-Probe**	Easting	**7624531.9**
Geologist/Engineer	**Anthony Chavez**	Hole Depth	**20.0-feet**
Sample Method	**Geo-Probe**	Outer Hole Diam	**2-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1			**0**	**NR**					*0.0 to 10.0 feet: NO RECOVERY; Air knife to 10 feet bgs. to clear for possible utilities. Soil observed from cuttings mainly light brown to gray; fine sand to silty sand; dry to damp.*
2									
3									
4									
5									
6									
7									
8									
9									
10			**70**	**GP**					*10.0 to 10.5 feet: SAND (SP); dark yellowish-brown; 100% sand, fine to coarse; trace gravels, fines and organic debris; dry.*
11									*10.5 to 13.0 feet: SILTY SAND (SM); dark grayish-brown; 25% fines, non to low plasticity; 75% sand, fine; micaceous; slight odor; damp.*
12						**PID = 0ppm.**			
13									*13.0 to 15.0 feet: NO RECOVERY.*
14									
15			**80**	**GP**					*15.0 to 16.0 feet: SILTY SAND (SM); dark grayish-brown; 25% fines, non to low plasticity; 75% sand, fine; micaceous; slight odor; damp.*
16				**GW**					
17						**PID = 0ppm.**			*16.0 to 19.0 feet: SAND (SP); dark brownish-gray; 100% sand, fine; micaceous; trace fines; wet. Odor and sheen at 17.5 feet.*
18						**GP13-W-17** **PID = 0ppm.**			
19						**PID = 13.6ppm.**			*@ 18.5 feet: sand becomes black and tarry with strong odor and sheen.*
20									*19.0 to 20.0 feet: NO RECOVERY.*
									Total Depth = 20.0 feet.

NOTES: *1.) NA = not available. 2.) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3.) PID = Photo ionization detector, soil head space reading. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = groundwater sample, dashed graphic indicates screened interval. 7.) Odor characteristic of manufactured gas plant waste.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**GP-14**	**1 of 1**

Project Name	**Siltronic Corporation**	TOC Elevation (feet NGVD)	**NA**
Project Location	**7200 NW Front Avenue, Portland, Oregon**	Surface Elevation (feet NGVD)	**33.0**
Start/End Date	**6/30/2004 to 6/30/2004**	Northing	**704665.3**
Driller/Equipment	**Geo-Tech Explorations, Inc./Geo-Probe**	Easting	**7624482.5**
Geologist/Engineer	**Anthony Chavez**	Hole Depth	**20.0-feet**
Sample Method	**Geo-Probe**	Outer Hole Diam	**2-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–10			**0**	**NR**					*0.0 to 10.0 feet: NO RECOVERY; Air knife to 10 feet bgs. to clear for possible utilities. Soil observed from cuttings mainly light brown to gray; fine sand to silty sand; dry to damp.*
10–13			**70**	**GP**					*10.0 to 13.5 feet: SAND (SP); dark yellowish-brown; 100% sand, fine; trace fines; damp to moist.*
13–14									*13.5 to 15.0 feet: NO RECOVERY.*
15–16			**100**	**GP GW**		**PID = 0ppm.**			*15.0 to 17.0 feet: SAND (SP); dark yellowish-brown; 100% sand, fine; trace fines; moist to wet.*
17–18						**GP14-W-17 PID = 0ppm.**			*17.0 to 20.0 feet: SAND (SP); black to dark brownish-gray; 100% sand, fine; trace fines, non plastic; wet.*
19–20						**PID = 13.6ppm.**			*@ 18.5 feet: color change to dark brownish-gray and increased odor with sheen.*

Total Depth = 20.0 feet.

NOTES: *1.) NA = not available. 2.) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3.) PID = Photo ionization detector, soil head space reading. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = groundwater sample, dashed graphic indicates screened interval. 7.) Odor characteristic of manufactured gas plant waste.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**GP-15**	**1 of 1**

Project Name	**Siltronic Corporation**	TOC Elevation (feet NGVD)	**NA**
Project Location	**7200 NW Front Avenue, Portland, Oregon**	Surface Elevation (feet NGVD)	**33.3**
Start/End Date	**6/29/2004 to 6/29/2004**	Northing	**704565.4**
Driller/Equipment	**Geo-Tech Explorations, Inc./Geo-Probe**	Easting	**7624555.8**
Geologist/Engineer	**Anthony Chavez**	Hole Depth	**20.0-feet**
Sample Method	**Geo-Probe**	Outer Hole Diam	**2-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–10			**0**	**NR**					*0.0 to 10.0 feet: NO RECOVERY; Air knife to 10 feet bgs. to clear for possible utilities. Soil observed from cuttings mainly light brown to gray; fine sand to silty sand; dry to damp.*
10–13			**60**	**GP**		**PID = 0ppm.**			*10.0 to 13.0 feet: SAND (SP); dark brownish-gray; 100% sand, fines; trace fines, non plastic; micaceous; slight odor; damp.*
13–15									*13.0 to 15.0 feet: NO RECOVERY.*
15–19			**80**	**GP GW**		**PID = 0ppm.** **GP15-W-17** **PID = 0ppm.**			*15.0 to 19.0 feet: SAND (SP); dark brownish-gray; 100% sand, fines; trace fines, non plastic; micaceous; slight odor; damp to wet.* *@ 16.0 feet: 2-inch silt layer with trace gravel, medium, subangular.*
19–20						**PID = 14.0ppm.**			*19.0 to 20.0 feet: NO RECOVERY.*
									Total Depth = 20.0 feet.

NOTES: *1.) NA = not available. 2.) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3.) PID = Photo ionization detector, soil head space reading. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = groundwater sample, dashed graphic indicates screened interval. 7.) Odor characteristic of manufactured gas plant waste.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**GP-16**	**1 of 1**

Project Name	**Siltronic Corporation**	TOC Elevation (feet NGVD)	**NA**
Project Location	**7200 NW Front Avenue, Portland, Oregon**	Surface Elevation (feet NGVD)	**33.3**
Start/End Date	**6/29/2004 to 6/29/2004**	Northing	**704539.9**
Driller/Equipment	**Geo-Tech Explorations, Inc./Geo-Probe**	Easting	**7624588.3**
Geologist/Engineer	**Anthony Chavez**	Hole Depth	**25.0-feet**
Sample Method	**Geo-Probe**	Outer Hole Diam	**2-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1			**0**	**NR**					*0.0 to 10.0 feet: NO RECOVERY; Air knife to 10 feet bgs. to clear for possible utilities. Soil observed from cuttings mainly light brown to gray; fine sand to silty sand; dry to damp.*
2									
3									
4									
5									
6									
7									
8									
9									
10			**90**	**GP**					*10.0 to 10.5 feet: SILTY SAND (SM); dark grayish-brown; 25% fines, non plastic; 75% sand, fine; micaceous; trace organics; damp.*
11									*10.5 to 14.5 feet: SAND (SP); dark grayish-brown; 100% sand, fine; trace fines, non plastic; micaceous; moist.*
12						**PID = 0 ppm.**			
13									
14									
15									*14.5 to 15.0 feet: NO RECOVERY.*
16			**80**	**GP**		**PID = 0 ppm.**			*15.0 to 19.0 feet: SAND (SP); dark grayish-brown; 100% sand, fine; trace fines, non plastic; micaceous; wet. Soil in shoe was tar-like and black with sheen.*
17									*@ 16.0 feet: 2-inch silt layer.*
18									
19						**PID = 14.0 ppm.**			*19.0 to 20.0 feet: NO RECOVERY.*
20			**80**	**GP**					*20.0 to 24.0 feet: SAND (SP); dark grayish-brown; 100% sand, fine; trace fines, non plastic; micaceous; wet.*
21				**GW**					
22						**GP16-W-22**			
23						**PID = 0ppm.**			*@ 23.0 feet: Strong odor and sheen.*
24									*24.0 to 25.0 feet: NO RECOVERY.*
25									*Total Depth = 25.0 feet.*

NOTES: *1.) NA = not available. 2.) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3.) PID = Photo ionization detector, soil head space reading. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = groundwater sample, dashed graphic indicates screened interval. 7.) Odor characteristic of manufactured gas plant waste.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**GP-17**	**1 of 1**

Project Name	**Siltronic Corporation**	TOC Elevation (feet NGVD)	**NA**
Project Location	**7200 NW Front Avenue, Portland, Oregon**	Surface Elevation (feet NGVD)	**33.8**
Start/End Date	**6/29/2004 to 6/29/2004**	Northing	**704475.2**
Driller/Equipment	**Geo-Tech Explorations, Inc./Geo-Probe**	Easting	**7624595.8**
Geologist/Engineer	**Anthony Chavez**	Hole Depth	**20.0-feet**
Sample Method	**Geo-Probe**	Outer Hole Diam	**2-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–10			**0**	**NR**					*0.0 to 10.0 feet: NO RECOVERY; Air knife to 10 feet bgs. to clear for possible utilities. Soil observed from cuttings mainly light brown to gray; fine sand to silty sand; dry to damp.*
10–13			**60**	**GP**					*10.0 to 13.0 feet: SAND (SP); black to dark brown; 95% sand, fine; 5% fines, non plastic; moist to wet. Black and tar-like with sheen from 10.0 to 12.0 feet; dark brown with strong odor and sheen from 12.0 to 13.0 feet.*
13–20			**0**	**GP GW**		**PID = 0ppm.** **GP17-W-17 PID = 186ppm.**			*13.0 to 20.0 feet: NO RECOVERY. Soil from the 15 to 20 foot interval appeared to be sand with visual impacts and wet.*

Total Depth = 20.0 feet.

NOTES: *1.) NA = not available. 2.) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3.) PID = Photo ionization detector, soil head space reading. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = groundwater sample, dashed graphic indicates screened interval. 7.) Odor characteristic of manufactured gas plant waste.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**GP-18**	**1 of 1**

Project Name	**Siltronic Corporation**	TOC Elevation (feet NGVD)	**NA**
Project Location	**7200 NW Front Avenue, Portland, Oregon**	Surface Elevation (feet NGVD)	**33.8**
Start/End Date	**6/30/2004 to 6/30/2004**	Northing	**704411.0**
Driller/Equipment	**Geo-Tech Explorations, Inc./Geo-Probe**	Easting	**7624553.9**
Geologist/Engineer	**Anthony Chavez**	Hole Depth	**24.0-feet**
Sample Method	**Geo-Probe**	Outer Hole Diam	**2-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–10			**0**	**NR**					*0.0 to 10.0 feet: NO RECOVERY; Air knife to 10 feet bgs. to clear for possible utilities. Soil observed from cuttings mainly light brown to gray; fine sand to silty sand; dry to damp.*
10–12			**100**	**GP**					*10.0 to 12.5 feet: SILT (ML); dark brownish-gray; 95% fines, low plasticity; 5% organic debris; trace gravels, fine; moist.*
13						**PID = 140.8ppm**			*12.5 to 18.5 feet: SAND (SP); dark grayish-brown; 100% sand, fine; trace fines; trace gravels, fine, subrounded; strong odor and sheen; moist to wet.*
15–16			**70**	**GP**		**PID = 13.6ppm.**			
17						**PID = 13.6ppm.**			
19						**PID = 0ppm.**			*18.5 to 24.0 feet: NO RECOVERY.*
20–21			**0**	**GW**					
22–23						**GP18-W-22 PID = 0ppm.**			
24									*Total Depth = 24.0 feet.*

NOTES: *1.) NA = not available. 2.) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3.) PID = Photo ionization detector, soil head space reading. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = groundwater sample, dashed graphic indicates screened interval. 7.) Odor characteristic of manufactured gas plant waste.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**GP-19**	**1 of 1**

Project Name	**Siltronic Corporation**	TOC Elevation (feet NGVD)	**NA**
Project Location	**7200 NW Front Avenue, Portland, Oregon**	Surface Elevation (feet NGVD)	**33.6**
Start/End Date	**6/30/2004 to 6/30/2004**	Northing	**704514.4**
Driller/Equipment	**Geo-Tech Explorations, Inc./Geo-Probe**	Easting	**7624625.0**
Geologist/Engineer	**Anthony Chavez**	Hole Depth	**20.0-feet**
Sample Method	**Geo-Probe**	Outer Hole Diam	**2-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–10			**0**	**NR**					*0.0 to 10.0 feet: NO RECOVERY; Air knife to 10 feet bgs. to clear for possible utilities. Soil observed from cuttings mainly light brown to gray; fine sand to silty sand; dry to damp.*
10–13			**60**	**GP**					*10.0 to 13.0 feet: SAND (SP); dark brownish-gray; 100% sand, fine; trace, fines; strong odor; damp to moist.*
13						**PID = 0ppm.**			*13.0 to 15.0 feet: NO RECOVERY.*
15–18			**60**	**GP GW**		**PID = 0ppm.**			*15.0 to 18.0 feet: SAND (SP); dark brownish-gray; 100% sand, fine; trace, fines; strong odor; damp to moist to wet.*
17						**GP19-W-17 PID = 113ppm.**			
18–20						**PID = 0ppm.**			*18.0 to 20.0 feet: NO RECOVERY.*

Total Depth = 20.0 feet.

NOTES: *1.) NA = not available. 2.) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3.) PID = Photo ionization detector, soil head space reading. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = groundwater sample, dashed graphic indicates screened interval. 7.) Odor characteristic of manufactured gas plant waste.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	GP-20	1 of 2

Project Name	Siltronic Corporation	TOC Elevation (feet NGVD)	NA
Project Location	7200 NW Front Avenue, Portland, Oregon	Surface Elevation (feet NGVD)	33.9
Start/End Date	7/19/04 to 7/19/04	Northing	704449.3
Driller/Equipment	Geo-Tech Explorations, Inc./Geo-Probe	Easting	7624537.7
Geologist/Engineer	Tony Silva	Hole Depth	30.0-feet
Sample Method	Geo-Probe	Outer Hole Diam	2-inch

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–10			0	NR					0.0 to 10.0 feet: NO RECOVERY; Air knife to 10 feet bgs. to clear for possible utilities. Soil observed from cuttings mainly light brown to gray; fine sand to silty sand; dry to damp.
10–11			80	GP					10.0 to 11.0 feet: SILT (ML); dark gray; 90% fines, non plastic; 10% sand, fine; slight odor; moist.
11–12									11.0 to 12.0 feet: SAND with SILT (SP-SM); dark gray to metallic blue; 10% fines; non plastic; 90% sand, fine to medium; strong odor with staining and sheen; moist.
12–13						PID = 118ppm.			12.0 to 14.0 feet: SAND (SP); dark brownish-gray; 100% sand, fine to medium; red, yellow and green lithics; trace fines; trace gravels, fine, well rounded; slight odor; moist.
13–14									
14–15									14.0 to 15.0 feet: NO RECOVERY.
15–16			80	GP GW		PID = 45.3ppm.			15.0 to 19.0 feet: SAND (SP); dark brownish-gray; 100% sand, fine to medium; red, yellow and green lithics; trace fines; trace gravels, fine, well rounded; slight odor; wet.
16–17									
17–18									
18–19						GP20-W-18 GP20-W-DUP PID = 0ppm.			
19–20									19.0 to 20.0 feet: NO RECOVERY.
20–21			80	GP					20.0 to 21.5 feet: SAND with SILT (SP-SM); dark bluish-gray to black; 10% fines; non plastic; 90% sand, fine to medium; trace gravels, fine, subrounded; strong odor with staining and sheen; wet.
21–22									21.5 to 24.5 feet: SAND (SP); brownish-gray to gray; 100% sand, fine to medium; red and green lithics; trace fines; trace gravels, fine, subrounded; slight odor; wet.
22–23									
23–24									
24–25									24.5 to 25.0 feet: NO RECOVERY.
25			100	GP		PID = 4.0ppm			25.0 to 29.7 feet: SAND (SP); brownish-gray to gray; 100% sand, fine to

NOTES: 1.) NA = not available. 2.) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3.) PID = Photo ionization detector, soil head space reading. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = groundwater sample, dashed graphic indicates screened interval. 7.) Odor characteristic of manufactured gas plant waste.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**GP-20**	**2 of 2**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Sample Data: Percent Recovery	Sample Data: Collection Method	Sample Data: Number	Sample Data: Name (Type)	Sample Data: Blows/6"	Lithologic Column	Soil Description
26				GW					medium; red and green lithics; micaceous; trace fines; trace gravels, fine, subrounded; slight odor; wet.
27									
28						GP20-W-28 PID = 9.0ppm			
29									
30						PID = 4.0ppm			29.7 to 30.0 feet: SILT with SAND (ML); dark gray; 70% fines, non plastic; 30% sand, fine; micaceous; wet.

Total Depth = 30.0 feet.

NOTES: 1.) NA = not available. 2.) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3.) PID = Photo ionization detector, soil head space reading. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = groundwater sample, dashed graphic indicates screened interval. 7.) Odor characteristic of manufactured gas plant waste.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**GP-21**	**1 of 2**

Project Name	**Siltronic Corporation**	TOC Elevation (feet NGVD)	**NA**
Project Location	**7200 NW Front Avenue, Portland, Oregon**	Surface Elevation (feet NGVD)	**32.7**
Start/End Date	**7/19/04 to 7/19/04**	Northing	**704372.8**
Driller/Equipment	**Geo-Tech Explorations, Inc./Geo-Probe**	Easting	**7624487.2**
Geologist/Engineer	**Tony Silva**	Hole Depth	**30.0-feet**
Sample Method	**Geo-Probe**	Outer Hole Diam	**2-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–10			0	NR					0.0 to 10.0 feet: NO RECOVERY; Air knife to 10 feet bgs. to clear for possible utilities. Soil observed from cuttings mainly light brown to gray; fine sand to silty sand; dry to damp.
10–11			80	GP					10.0 to 11.0 feet: SILT (ML); dark gray; 95% fines, non plastic; 5% sand, fine; faint to strong odor; moist.
11–13						PID = 13ppm.			11.0 to 13.5 feet: SAND (SP); light to dark gray; 100% sand, fine to medium; red, green and yellow lithics; alternating layers of staining; strong odor; moist.
13–15									13.5 to 15.0 feet: NO RECOVERY.
15–16			50	GP		PID = 13.0ppm.			15.0 to 17.5 feet: SAND (SP); dark gray to black; 5% fines, non plastic; 95% sand, fine to medium; strong odor with staining and sheen; tar-like feel; moist to wet.
16–17				GW					
17–18									17.5 to 20.0 feet: NO RECOVERY.
18–19						GP21-W-18 PID = 9.0ppm.			
19–20									
20–21			10	GP					20.0 to 20.5 feet: SAND (SP); dark gray to black; 100% sand, fine; strong odor with staining and sheen; wet.
21–25									20.5 to 25.0 feet: NO RECOVERY.
25			100	GP		PID = 190ppm			25.0 to 29.8 feet: SAND (SP); dark gray to black; 5% fines, non plastic;

NOTES: 1.) NA = not available. 2.) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3.) PID = Photo ionization detector, soil head space reading. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = groundwater sample, dashed graphic indicates screened interval. 7.) Odor characteristic of manufactured gas plant waste.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**GP-21**	**2 of 2**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Sample Data: Percent Recovery	Sample Data: Collection Method	Sample Data: Number	Sample Data: Name (Type)	Sample Data: Blows/6"	Lithologic Column	Soil Description
26				**GW**					*95% sand, fine to medium; strong odor with staining and sheen; wet.*
27									
28						**GP21-W-28**			
29						**PID = 18.0ppm.**			
30						**PID = 18.0ppm.**			*29.8 to 30.0 feet: SILT (ML); dark gray; 95% fines, non plastic; 5% sand, fine; odor; moist.*

Total Depth = 30.0 feet.

NOTES: *1.) NA = not available. 2.) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3.) PID = Photo ionization detector, soil head space reading. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = groundwater sample, dashed graphic indicates screened interval. 7.) Odor characteristic of manufactured gas plant waste.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**GP-22**	**1 of 2**

Project Name	**Siltronic Corporation**	TOC Elevation (feet NGVD)	**NA**
Project Location	**7200 NW Front Avenue, Portland, Oregon**	Surface Elevation (feet NGVD)	**33.0**
Start/End Date	**7/19/04 to 7/19/04**	Northing	**704656.9**
Driller/Equipment	**Geo-Tech Explorations, Inc./Geo-Probe**	Easting	**7624408.2**
Geologist/Engineer	**Tony Silva**	Hole Depth	**30.0-feet**
Sample Method	**Geo-Probe**	Outer Hole Diam	**2-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–10			0	NR					0.0 to 10.0 feet: NO RECOVERY; Air knife to 10 feet bgs. to clear for possible utilities. Soil observed from cuttings mainly light brown to gray; fine sand to silty sand; dry to damp.
10–14			80	GP					10.0 to 14.0 feet: SAND (SP); light gray; 100% sand, fine to medium; red, white and green lithics; trace fines; trace gravels; moist.
14–15									14.0 to 15.0 feet: NO RECOVERY.
15–17.5			80	GP					15.0 to 17.5 feet: SAND (SP); light brown to dark gray; 100% sand, fine to coarse; red, white and green lithics; trace fines; trace gravels; wet.
17.5–19									17.5 to 19.0 feet: SILT (ML); dark gray to brownish gray with dark red mottling; 90% fines, non plastic; 10% sand, fine to medium; trace gravels, fine, subangular; slight staining; moist.
19–20									19.0 to 20.0 feet: NO RECOVERY.
20–22			70	GP					20.0 to 22.0 feet: GRAVELLY SILT (ML); dark gray to greenish gray;70% fines, low plasticity; 30% gravel, fine, subrounded to subangular; trace sand; moist to wet.
22–24									22.0 to 24.0 feet: SAND (SP); black; 10% fines, non plastic; 90% sand, fine to medium; tar-like feel with odor and staining; wet.
24–25									24.0 to 25.0 feet: NO RECOVERY.
25–30			100	GP					25.0 to 30.0 feet: SAND (SP); black; 10% fines, non plastic; 90% sand,

NOTES: 1.) NA = not available. 2.) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3.) PID = Photo ionization detector, soil head space reading. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = groundwater sample, dashed graphic indicates screened interval. 7.) Odor characteristic of manufactured gas plant waste.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**GP-22**	**2 of 2**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Sample Data: Percent Recovery	Sample Data: Collection Method	Sample Data: Number	Sample Data: Name (Type)	Sample Data: Blows/6"	Lithologic Column	Soil Description
26				**GW**					*fine to medium; tar-like feel with strong odor, staining and rainbow-colored sheen; wet.*
27									
28						**GP22-W-28**			
29						**PID = 295ppm.**			
30									

Total Depth = 30.0 feet.

NOTES: *1.) NA = not available. 2.) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3.) PID = Photo ionization detector, soil head space reading. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = groundwater sample, dashed graphic indicates screened interval. 7.) Odor characteristic of manufactured gas plant waste.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**GP-23**	**1 of 2**

Project Name	**Siltronic Corporation**	TOC Elevation (feet NGVD)	**NA**
Project Location	**7200 NW Front Avenue, Portland, Oregon**	Surface Elevation (feet NGVD)	**33.5**
Start/End Date	**7/19/04 to 7/19/04**	Northing	**704562.1**
Driller/Equipment	**Geo-Tech Explorations, Inc./Geo-Probe**	Easting	**7624296.2**
Geologist/Engineer	**Tony Silva**	Hole Depth	**30.0-feet**
Sample Method	**Geo-Probe**	Outer Hole Diam	**2-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1			0	NR					0.0 to 10.0 feet: NO RECOVERY; Air knife to 10 feet bgs. to clear for possible utilities. Soil observed from cuttings mainly light brown to gray; fine sand to silty sand; dry to damp.
10			50	GP		PID = 0ppm.			10.0 to 12.5 feet: SILT with GRAVEL (ML); dark gray to greenish gray; 70% fines, low plasticity; 25% gravel, fine to medium, subangular to subrounded; 5% sand, fine to medium; moist.
13									12.5 to 15.0 feet: NO RECOVERY.
15			80	GP		PID = 0ppm.			15.0 to 19.0 feet: SILT with GRAVEL (ML); dark reddish-brown to brownish gray; 70% fines, low plasticity; 25% gravel, fine to medium, subangular to subrounded; 5% sand, fine to medium; moist.
18						PID = 0ppm.			@ 17.5 feet: 4-inch long wood fragment.
19									19.0 to 20.0 feet: NO RECOVERY.
20			60	GP					20.0 to 21.0 feet: GRAVELLY SILT (ML); black; 60% fines, non plastic; 35% gravel, fine to medium, subangular to subrounded; 5% sand, fine to medium; strong odor with sheen and staining; wet. [7]
22									21.0 to 23.0 feet: SILT with GRAVEL (ML); dark gray to black; 80% fines, non to low plasticity; 20% gravel, fine to medium, subangular to subrounded; 5% sand, fine to medium; trace organic debris; moist to wet. Sand in shoe visibly impacted.
23									23.0 to 25.0 feet: NO RECOVERY.
25			90	GP		PID = 438ppm			25.0 to 28.0 feet: SAND (SP); black; 5% fines, non plastic; 95% sand, fine

NOTES: 1.) NA = not available. 2.) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3.) PID = Photo ionization detector, soil head space reading. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = groundwater sample, dashed graphic indicates screened interval. 7.) Odor characteristic of manufactured gas plant waste.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**GP-23**	**2 of 2**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Sample Data: Percent Recovery	Sample Data: Collection Method	Sample Data: Number	Sample Data: Name (Type)	Sample Data: Blows/6"	Lithologic Column	Soil Description
26									to medium; strong odor with sheen and staining; wet.
27				**GW**					
28						**GP23-W-28**			28.0 to 29.5 feet: SILT (ML); greenish gray; 95% fines, non to low plasticity; 5% sand, fine; slight staining; moist.
29									
30						**PID = 9.0ppm.**			29.5 to 30.0 feet: NO RECOVERY.

Total Depth = 30.0 feet.

NOTES: *1.) NA = not available. 2.) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3.) PID = Photo ionization detector, soil head space reading. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = groundwater sample, dashed graphic indicates screened interval. 7.) Odor characteristic of manufactured gas plant waste.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**GP-24**	**1 of 2**

Project Name	**Siltronic Corporation**	TOC Elevation (feet NGVD)	**NA**
Project Location	**7200 NW Front Avenue, Portland, Oregon**	Surface Elevation (feet NGVD)	**34.3**
Start/End Date	**7/19/04 to 7/19/04**	Northing	**704410.8**
Driller/Equipment	**Geo-Tech Explorations, Inc./Geo-Probe**	Easting	**7624232.8**
Geologist/Engineer	**Tony Silva**	Hole Depth	**30.0-feet**
Sample Method	**Geo-Probe**	Outer Hole Diam	**2-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–10			0	NR					0.0 to 10.0 feet: NO RECOVERY; Air knife to 10 feet bgs. to clear for possible utilities. Soil observed from cuttings mainly light brown to gray; fine sand to silty sand; dry to damp.
10–12			60	GP					10.0 to 12.0 feet: SANDY SILT (ML); light brown to light gray; 70% fines, non plastic; 30% sand, fine; wet.
12–13						PID = 0ppm.			12.0 to 13.0 feet: SILT (ML); dark gray to bluish gray with dark red mottling; 90% fines, non plastic; 10% organic debris, roots and wood fragments; trace sand, fine; faint odor; wet.
13–15									13.0 to 15.0 feet: NO RECOVERY.
15–16			80	GP		PID = 4.5ppm.			15.0 to 16.0 feet: SILT (ML); dark gray to bluish gray with dark red mottling; 90% fines, non plastic; 10% organic debris, roots and wood fragments; trace sand, fine; faint odor; wet.
16–18									16.0 to 18.5 feet: SILT (ML); dark gray to greenish gray with dark green mottling; 90% fines, low plasticity; 5% sand, fine to medium; 5% gravel, fine, subangular; moist to wet. Sand and gravel in packets.
18						PID = 4.0ppm.			
19									18.5 to 20.0 feet: NO RECOVERY.
20–22			90	GP					20.0 to 22.5 feet: SILT (ML); dark gray to black; 90% fines, non plastic; 10% sand, fine to medium; trace organic debris; micaceous; loose; wet.
23									22.5 to 22.7 feet: WOODY DEBRIS (OH); dark bluish gray to black; 90% organics; 10% fines, non plastic; strong odor and staining; moist.
24									22.7 to 24.0 feet: SILT (ML); dark gray to greenish gray; 95% fines, non to low plasticity; 5% sand, fine; trace organic debris; micaceous; stiff; faint odor with staining; wet.
25			90	GP		PID = 4.5ppm			24.0 to 24.5 feet: SAND (SP); dark gray to black; 5% fines, non plastic; 95% sand, fine to medium; red, green and white lithics; odor and

NOTES: 1.) NA = not available. 2.) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3.) PID = Photo ionization detector, soil head space reading. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = groundwater sample, dashed graphic indicates screened interval. 7.) Odor characteristic of manufactured gas plant waste.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**GP-24**	**2 of 2**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
26				**GW**					staining; wet.
									24.5 to 25.0 feet: NO RECOVERY.
27									25.0 to 25.5 feet: SAND (SP); dark gray to black; 5% fines, non plastic; 95% sand, fine to medium; red, green and white lithics; odor and staining; wet.
28						**GP24-W-28**			25.5 to 29.5 feet: SILT (ML); dark gray to light brown with red mottling; 100% fines, low plasticity; trace sand, fine; micaceous; stiff; moist to wet.
29						**PID = 122ppm.**			
30									29.5 to 30.0 feet: NO RECOVERY.
						PID = 327ppm.			Total Depth = 30.0 feet.

NOTES: 1.) NA = not available. 2.) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3.) PID = Photo ionization detector, soil head space reading. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = groundwater sample, dashed graphic indicates screened interval. 7.) Odor characteristic of manufactured gas plant waste.

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Project: Rhone Poulenc RI / FS
Project Location: Portland, Oregon
Project Number: 5292C0804A.00 00045

Log of Boring GP-025

Sheet 1 of 2

Date(s) Drilled	10/11/99	Logged By	J. Peale	Reviewed By	
Drilling Method	Direct Push	Drilling Contractor	TEG Northwest	Total Depth of Borehole	50.0 feet
Drill Rig Type	Strataprobe	Drill Bit Size/Type	2-1/4-inch-dia. steel probe	Ground Surface Elevation	Not available
Groundwater Level(s)	Not measured	Sampling Method	1-inch-dia. dual tube	Hammer Data	Hydraulic hammer
Borehole Backfill	Bentonite grout to ground surface	Comments	Refer to site plan for boring location.		

Downhole Depth, feet	SAMPLES Type	Number	Recovery, inches	Headspace PID (FID), ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
0							[No recovery in upper 2 feet]	
		01	26			SP	Gravelly SAND; dark gray, coarse, dry	
						ML	SILT; medium brown, some fine sand, dry	
						SP-SM	SAND; medium gray, fine, trace silt, damp	
5		02	30					
						SM	Silty SAND; medium gray, fine, damp	
10		03	42				← Becomes wet, slight fuel odor	
		04	48	1.7 [10-15]		ML/MH	Clayey SILT; medium gray, trace fine sand, wet, fuel odor	
15						SP	SAND; reddish brown, coarse, loose, wet	
		05	48			SW	SAND; reddish brown, fine to coarse, moist to wet	
							} With alternating layers of silty clay ← Dark gray, clayey silt layer	
20						SM	Silty SAND; dark gray, trace clay, wet	
		06	48	25-35 [-]			} Clay layer with some silt } Coarse sand layers, wet, fuel odor	
							} Greenish gray clay layer	
25		07	48					
						CL/ML	Silty CLAY; brownish gray, very stiff, wet	
		08	NA			MH/CH	Layered CLAY and SILT; greenish gray, some sand, soft, wet	
30								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RPACRI45.GPJ; 12/19/99

URS Greiner Woodward Clyde

Project: Rhone Poulenc RI / FS
Project Location: Portland, Oregon
Project Number: 5292C0804A.00 00045

Log of Boring GP-025

Sheet 2 of 2

Downhole Depth, feet	SAMPLES Type	Number	Recovery, inches	Headspace PID (FID), ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
30		08	NA			MH/CH	Layered CLAY and SILT; greenish gray, some sand, soft, wet (continued)	
		09	48			SM	Silty SAND; greenish gray, fine, wet	
						ML/CL	Clayey SILT; greenish gray, wet	
35						ML	Sandy SILT; greenish gray, wet	
		10	48				Becomes light grayish brown, trace clay	
40						SM	Silty SAND; light grayish brown, fine, wet	
		11	48					
45		12	48					
		13	24			ML/MH	Clayey SILT; light grayish brown, trace fine sand, wet	
50							Boring terminated at 50.0 feet bgs due to refusal.	Refusal, but no gravel in end of sampler.
55								
60								
65								

Report: ENV_12x3_CLEVELAND+USCS; File: RPACRI45.GPJ; 12/19/99

URS Greiner Woodward Clyde

Project: Rhone Poulenc RI / FS Project Location: Portland, Oregon Project Number: 5292C0804A.00 00045	Log of Boring GP-026 Sheet 1 of 2

Date(s) Drilled	10/11/99	Logged By	J. Peale	Reviewed By	
Drilling Method	Direct Push	Drilling Contractor	TEG Northwest	Total Depth of Borehole	50.0 feet
Drill Rig Type	Strataprobe	Drill Bit Size/Type	2-1/4-inch-dia. steel probe	Ground Surface Elevation	Not available
Groundwater Level(s)	Not measured	Sampling Method	1-inch-dia. dual tube	Hammer Data	Hydraulic hammer
Borehole Backfill	Bentonite grout to ground surface	Comments	Refer to site plan for boring location.		

Downhole Depth, feet	SAMPLES Type	Number	Recovery, inches	Headspace FID, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
0							[No recovery in upper 0.8 foot]	
		01	36			MH/CH	Clayey SILT; brown, stiff, dry	
						CH/MH	Silty CLAY; light gray, dry	
5		02	48	50+			Becomes dark gray, fuel odor	
						CH	CLAY; dark brownish red, dry Becomes light brown	
						SM	Silty SAND; light brown, fine, dry	
10		03	48				Becomes damp	
							Becomes moist	
		04	48					
15								
		05	48				Clayey silt layer	
20		06	48				Clay layer	
							Clay layer	
25		07	48					
		08	48					
30								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RPACRI45.GPJ; 12/19/99

Project: Rhone Poulenc RI / FS
Project Location: Portland, Oregon
Project Number: 5292C0804A.00 00045

Log of Boring GP-026

Downhole Depth, feet	SAMPLES Type	Number	Recovery, inches	Headspace FID, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
30		08	48			SM	Silty SAND; light brown, fine, moist (continued)	
		09	48			CH/MH	Silty CLAY; light brown, sticky, soft, wet Becomes stiff, with trace fine sand	
35		10	48			ML/CL	Clayey SILT; light brown, trace fine sand, wet	
						ML	SILT; light brown, some fine sand and clay, wet	
40		11	48			SM	Silty SAND; light brown, fine, trace clay, wet	
						ML/CL	Clayey SILT; light brown, trace fine sand, wet	
45		12	48			SM	Silty SAND; light brown, fine, trace clay, wet	
		13	24				Coarse, angular, dark brown to red basalt fragments	
50							**Boring terminated at 50.0 feet bgs due to refusal.**	
55								
60								
65								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RPACR145.GPJ; 12/19/99

Project: Rhone Poulenc RI / FS Project Location: Portland, Oregon Project Number: 5292C0804A.00 00045	Log of Boring GP-027 Sheet 1 of 3

Date(s) Drilled	10/12/99	Logged By	G. Lukert	Reviewed By	
Drilling Method	Direct Push	Drilling Contractor	TEG Northwest	Total Depth of Borehole	74.5 feet
Drill Rig Type	Strataprobe	Drill Bit Size/Type	2-1/4-inch-dia. steel probe	Ground Surface Elevation	Not available
Groundwater Level(s)	Not measured	Sampling Method	1-inch-dia. dual tube	Hammer Data	Hydraulic hammer
Borehole Backfill	Cement grout to ground surface	Comments	Refer to site plan for boring location.		

Downhole Depth, feet	SAMPLES Type	Number	Recovery, inches	Headspace PID [FID], ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
0		01	30			SM	Silty SAND; dark grayish brown (10YR 4/2), ~30% silt, dry(?)	
						ML	SILT; dark gray (2.5Y 4/1), medium plasticity, trace clay, damp	
5		02	36	0.0 [36.2]		SM	Silty SAND; dark gray (2.5Y 4/1), fine, ~15-20% silt, damp	
10		03	36	0.0 [0.0]		ML/CL	Clayey SILT; dark gray (2.5Y 4/1), medium plasticity, ~10% fine sand, moist	
		04	36	0.0 [86.3]				
15						GM	Silty GRAVEL with sand; dark gray (2.5Y 4/1), ~40% well-graded angular basalt gravel, ~40% sand, ~20% silt, wet	
		05	24	0.0 [5.8]		SP	SAND; very dark grayish brown (10YR 3/2), poorly graded, rounded to subrounded medium grains, very little fines, wet	
20		06	30	0.0 [0.0]				
25		07	18	0.0 [12.6]		CL/CH	CLAY; dark gray (2.5Y 4/1), medium to high plasticity, trace silt, wet	
						CL/ML	Silty CLAY; dark gray (2.5Y 4/1), medium plasticity, wet [description from cuttings]	
30		08	0	–				

Report: ENV_12AS_CLEVELAND+/-USCS; File: RPACR145.GPJ; 12/19/99

URS Greiner Woodward Clyde

Project: Rhone Poulenc RI / FS
Project Location: Portland, Oregon
Project Number: 5292C0804A.00 00045

Log of Boring GP-027

Downhole Depth, feet	SAMPLES Type	Number	Recovery, inches	Headspace PID [FID], ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
30		08	0	–		CL/ML	Silty CLAY; dark gray (2.5Y 4/1), medium plasticity, wet (continued)	
		09	48	0.0 [2.6]		ML	SILT; dark gray (2.5Y 4/1), medium plasticity, trace clay, moist	
35		10	24	0.5 [2.9]				
40		11	24	0.0 [10.8]				
		12	48	0.0 [48.7]			▼ Becomes low to medium plasticity, damp to moist	
45							▼ Becomes medium plasticity, moist	
50		13	48	0.0 [53.5]				
		14	48	0.0 [103]		ML	Sandy SILT; dark gray (2.5Y 4/1), low plasticity, very fine sand, damp	
55		15	48	0.0 [123]		SM	Silty SAND; dark gray (2.5Y 4/1), ~60% fine sand, ~40% low plasticity fines, slightly micaceous, damp	
60		16	48	0.0 [102]		SP-SM	SAND with silt; dark gray (2.5Y 4/1), very fine sand, ~10% silt, slightly micaceous, damp	
							} Silt layer, trace sand	
65		17	36	NA		ML	SILT; dark gray (2.5Y 4/1), low to medium plasticity, ~30% very fine sand, wet	No PID/FID reading.

Report: ENV_12/99_CLEVELAND+/-USCS; File: RPACRI45.GPJ; 12/19/99

Project: Rhone Poulenc RI / FS
Project Location: Portland, Oregon
Project Number: 5292C0804A.00 00045

Log of Boring GP-027

Sheet 3 of 3

Downhole Depth, feet	SAMPLES Type	Number	Recovery, inches	Headspace PID [FID], ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
65		17	36	NA		ML	SILT; dark gray (2.5Y 4/1), low to medium plasticity, ~30% very fine sand, wet (continued)	No PID/FID reading.
		18	36	NA		ML	SILT; dark gray (2.5Y 4/1), medium plasticity, trace very fine sand, dry to damp	No PID/FID reading.
70		19	30	NA		SP-SM	SAND with silt; dark grayish brown (2.5Y 4/2), fine sand, ~10% silt, micaceous, moist	No PID/FID reading.
							Boring terminated at 74.5 feet bgs due to refusal.	
75								
80								
85								
90								
95								
100								

Report: ENV_12AS_CLEVELAND+.USCS; File: RPACRH45.GPJ; 12/19/99

URS Greiner Woodward Clyde

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**GP33**	**1 of 10**

Project Name	**Siltronic Corporation**	TOC Elevation (feet)	
Project Location	**7200 NW Front Avenue, Portland, Oregon**	Surface Elevation (feet)	
Start/End Date	**4/25/05 to 4/28/05**	Northing	
Driller/Equipment	**Geo-Tech Explorations, Inc./Geo-Probe**	Easting	
Geologist/Engineer	**Meri Gibson**	Hole Depth	**205.0-feet**
Sample Method	**Geo-Probe**	Outer Hole Diam	**3 1/4-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1			74%	GP	1				0.0 to 0.5 feet: FILL.
									0.5 to 12.5 feet: SAND (SP); dark brown; 5% fines; 95% sand, fine to medium; black lenses observed between 5 to 12.5 feet; slight odor; moist.
2						PID= 0 ppm			
3						GP33-S-2.5			
4									
5			80%	GP	2				
6						PID= 0 ppm			
7						GP33-S-6.5			
8									
9									
10			84%	GP	3				
11									
12									
13						PID= 0 ppm			12.5 to 15.3 feet: SAND (SP); dark brown; 5% fines; 95% sand, fine to medium; trace gravels; strong odor; heavy staining; moist.
14						GP33-S-14			
15			76%	GP	4				
16									15.3 to 16.5 feet: SAND WITH SILT (SP-SM); dark brown with black; 30% fines, low plasticity; 70% sand, fine to medium; moist.
17						GP33-S-17			16.5 to 25.5 feet: SAND (SP); dark brown; 5% fines, low plasticity; 95% sand, fine to medium; trace gravels; strong odor; heavy staining; moist.
18						PID= 0 ppm			
19									
20									

NOTES: *1) Sample depths are relative to feet below ground surface (bgs). 2) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3) PID = Photo ionization detector, soil head space reading. 4) ppm = parts per million. 5)GW = groundwater sample, dashed graphic indicates screened interval. 6) NA = not available. 7) Odor characteristic of manufactured gas plant waste.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	GP33	2 of 10

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			86%	GP	5				
22						PID= 0 ppm			
23						GP33-S-23			
24									
25			78%	GP	6				
26									25.5 to 25.7 feet: SAND WITH SILT (SP-SM); dark brown with black; 30% fines, nonplastic; 70% sand, fine to medium; odor; some staining; moist.
27						PID= 0 ppm			25.7 to 28.5 feet: SAND (SP); dark gray; 5% fines; 95% sand, fine to medium; trace wood debris; strong odor; damp to wet.
28						GP33-S-28			
29									28.5 to 28.9 feet: SILT (ML); dark gray; 100% fines, low plasticity; trace sand; odor; damp.
30			88%	GP	7				28.9 to 30.4 feet: SAND (SP); dark gray; 5% fines, nonplastic; 95% sand, fine to medium; trace wood debris; slight odor; damp to wet.
31									30.4 to 34.0 feet: SILT (ML); dark reddish brown; 90% fines, nonplastic; 10% sand, fine; wet.
32						PID= 0 ppm			
33						GP33-S-33			
34									34.0 to 36.5 feet: SAND WITH SILT (SP-SM); brownish gray with iron staining; 30% fines, nonplastic; 70% sand, fine to medium; odor; some staining; moist.
35			86%	GP	8				
36				GW					
37						PID= 0 ppm			36.5 to 37.5 feet: SILT WITH SAND (ML); dark gray; 70% fines, nonplastic; 30% sand, fine; moist.
38						GP33-S-38 GP33-W-38			37.5 to 40.0 feet: SAND WITH SILT (SP-SM); dark gray; 30% fines, nonplastic; 70% sand, fine; wet.
39									
40			92%	GP	9				40.0 to 41.0 feet: SILTY SAND (SM); dark gray; 30% fines, nonplastic; 70% sand, fine; wet.
41									41.0 to 42.5 feet: SILT WITH SAND (ML); dark gray; 70% fines, nonplastic; 30% sand, fine; damp.
42									

NOTES: 1) Sample depths are relative to feet below ground surface (bgs). 2) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3) PID = Photo ionization detector, soil head space reading. 4) ppm = parts per million. 5)GW = groundwater sample, dashed graphic indicates screened interval. 6) NA = not available. 7) Odor characteristic of manufactured gas plant waste.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	GP33	3 of 10

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43						GP33-S-43			42.5 to 43.0 feet: SILTY SAND (SM); dark gray; 30% fines, nonplastic; 70% sand, fine; wet.
44						PID= 0 ppm			43.0 to 44.6 feet: SILT WITH SAND (ML); dark gray; 70% fines, nonplastic; 30% sand, fine; damp.
45			100%	GP	10				44.6 to 46.5 feet: SAND WITH SILT (SP-SM); dark gray; 15% fines, nonplastic; 85% sand, fine; wet.
46						GP33-S-46			
47						PID= 0 ppm			46.5 to 47.2 feet: SILT WITH SAND (ML); dark gray; 85% fines, nonplastic; 15% sand, fine; damp.
48									47.2 to 48.0 feet: SAND WITH SILT (SP-SM); dark gray; 15% fines, nonplastic; 85% sand, fine; wet.
49									48.0 to 49.2 feet: SILT WITH SAND (ML); dark gray; 85% fines, nonplastic; 15% sand, fine; damp.
50			60%	GP	11				49.2 to 58.8 feet: SAND WITH SILT (SP-SM); dark gray; 15% fines, nonplastic; 85% sand, fine; damp to wet.
51									
52						GP33-S-52			
53						PID= 0 ppm			
54									
55			80%	GP	12				
56									
57						GP33-S-57			
58				GW		PID= 0 ppm			
59									58.8 to 60.5 feet: SANDY SILT (SM); dark gray; 70% fines, nonplastic; 30% sand, fine; wet.
60			86%	GP	13	GP33-W-60			
61									60.5 to 70.0 feet: SAND WITH SILT (SP-SM); dark gray; 10% fines, nonplastic; 90% sand, fine; damp.
62						PID= 0 ppm			
63						GP33-S-63			
64									
65									

NOTES: 1) Sample depths are relative to feet below ground surface (bgs). 2) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3) PID = Photo ionization detector, soil head space reading. 4) ppm = parts per million. 5)GW = groundwater sample, dashed graphic indicates screened interval. 6) NA = not available. 7) Odor characteristic of manufactured gas plant waste.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**GP33**	**4 of 10**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66			**80%**	**GP**	**14**				
67									
68						**GP33-S-68**			
69						**PID= 0 ppm**			
70			**100%**	**GP**	**15**				*70.0 to 70.8 feet: SILT WITH SAND (ML); dark gray; 85% fines, nonplastic; 15% sand, fine; wet.*
71									*70.8 to 72.5 feet: SAND (SP); dark gray; trace fines; 100% sand, fine; wet.*
72						**GP33-S-72**			
73									*72.5 to 73.5 feet: SANDY SILT (SM); dark gray; 70% fines, nonplastic; 30% sand, fine; wet.*
74						**PID= 0 ppm**			*73.5 to 80.0 feet: SAND (SP); dark gray; trace fines; 100% sand, fine; wet.*
75			**90%**	**GP**	**16**				
76									
77									
78						**GP33-S-78**			
79						**PID= 0 ppm**			
80			**100%**	**GP**	**17**				*80.0 to 80.2 feet: SILT (ML); dark brownish gray; 95% fines, low plasticity; 5% sand, fine; moist.*
81									*80.2 to 82.5 feet: SAND WITH SILT (SP-SM); dark gray; 15% fines, low plasticity; 85% sand, fine; wet.*
82						**GP33-S-82**			
83									*82.5 to 83.0 feet: SILT (ML); dark brownish gray; 100% fines, medium to high plasticity; trace sand; moist.*
84						**PID= 0 ppm**			*83.0 to 84.5 feet: SAND (SP); dark gray; 10% fines, low plasticity; 90% sand, fine; wet.*
85			**70%**	**GP**	**18**				*84.5 to 85.0 feet: SILT (ML); dark brownish gray; 100% fines, medium to high plasticity; trace sand; moist.*
86									*85.0 to 88.0 feet: SAND (SP); dark gray; 10% fines, low plasticity; 90% sand, fine; wet.*
87						**GP33-S-87**			

NOTES: *1) Sample depths are relative to feet below ground surface (bgs). 2) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3) PID = Photo ionization detector, soil head space reading. 4) ppm = parts per million. 5)GW = groundwater sample, dashed graphic indicates screened interval. 6) NA = not available. 7) Odor characteristic of manufactured gas plant waste.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	GP33	5 of 10

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88						PID= 0 ppm			88.0 to 88.5 feet: SILT (ML); dark brownish gray; 100% fines, medium to high plasticity; trace sand; moist.
89									88.5 to 95.0 feet: No Recovery.
90			0%	GP GW	19				
91									
92						GP33-W-92			
93									
94									
95			70%	GP	20				95.0 to 115.0 feet: SAND (SP); dark gray; trace fines; 100% sand, fine; wet.
96									
97									
98						GP33-S-98			
99						PID= 0 ppm			
100			90%	GP	21				
101									
102						GP33-S-102			
103						PID= 0 ppm			
104									
105			80%	GP	22				
106									
107						GP33-S-107			
108						PID= 0 ppm			
109									
110									

NOTES: 1) Sample depths are relative to feet below ground surface (bgs). 2) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3) PID = Photo ionization detector, soil head space reading. 4) ppm = parts per million. 5)GW = groundwater sample, dashed graphic indicates screened interval. 6) NA = not available. 7) Odor characteristic of manufactured gas plant waste.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	GP33	6 of 10

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
111			70%	GP GW	23				
112						GP33-S-112 GP33-S-DUP GP33-W-112 PID= 0 ppm			
113									
114									
115			100%	GP	24				115.0 to 129.0 feet: STRATIFIED LAYERS OF SAND (SP) AND SILT (ML); moist to wet.
116									
117									SAND (SP) LAYERS; dark gray; trace fines; 100% sand, fine; wet.
118						PID= 0 ppm			SILT (ML) LAYERS; dark gray; 95% fines, medium plasticity; 5% sand, fine; moist.
119						GP33-S-119			
120			90%	GP	25				
121									
122									
123						GP33-S-123 PID= 0 ppm			
124									
125			80%	GP	26				
126									
127									
128						GP33-S-128 PID= 0 ppm			
129									129.0 to 140.0 feet: SAND (SP); dark gray; trace fines; 100% sand, fine; silt nodules; wet.
130			70%	GP	27				
131									
132									

NOTES: *1) Sample depths are relative to feet below ground surface (bgs). 2) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3) PID = Photo ionization detector, soil head space reading. 4) ppm = parts per million. 5)GW = groundwater sample, dashed graphic indicates screened interval. 6) NA = not available. 7) Odor characteristic of manufactured gas plant waste.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	GP33	7 of 10

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
133						GP33-S-133 PID= 0 ppm			
134									
135			74%	GP	28				@ 135.0 feet: Increase in fines; 5% fines, nonplastic; 95% sand, fine; wet.
136									
137									
138						GP33-S-138 PID= 0 ppm			
139									
140			84%	GP	29				140.0 to 140.5 feet: SILT (ML); dark gray; 90% fines, low plasticity; 10% sand, fine; moist.
141									140.0 to 140.5 feet: SAND (SP); dark gray; 5% fines, nonplastic; 95% sand, fine; trace organics; wet.
142									
143						GP33-S-143 PID= 0 ppm			143.2 to 144.0 feet: SILT (ML); dark gray; 100% fines, low to medium plasticity; trace sand; moist.
144									144.0 to 148.2 feet: SAND (SP); dark gray; 5% fines, nonplastic; 95% sand, fine; wet.
145			100%	GP	30				
146									
147									
148						GP33-S-148 PID= 0 ppm			148.2 to 150.6 feet: SILT (ML); dark gray; 100% fines, low to medium plasticity; trace sand; moist.
149									
150			78%	GP GW	31				150.6 to 155.0 feet: SAND (SP); dark gray; 5% fines, nonplastic; 95% sand, fine; wet.
151									
152						GP33-W-152			
153						GP33-S-153 PID= 0 ppm			
154									
155									

NOTES: 1) Sample depths are relative to feet below ground surface (bgs). 2) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3) PID = Photo ionization detector, soil head space reading. 4) ppm = parts per million. 5)GW = groundwater sample, dashed graphic indicates screened interval. 6) NA = not available. 7) Odor characteristic of manufactured gas plant waste.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**GP33**	**8 of 10**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
156			**60%**	**GP**	**32**				*155.0 to 155.3 feet: SILT (ML); dark gray; 100% fines, low to medium plasticity; trace sand; moist.*
									155.3 to 160.0 feet: SAND (SP); dark gray; 5% fines, nonplastic; 95% sand, fine; wet.
157									
158						**GP33-S-158 PID= 0 ppm**			
159									
160			**70%**	**GP**	**33**				*160.0 to 165.0 feet: SILT (ML); dark gray; 100% fines, low to medium plasticity; trace sand; moist.*
161									
162									
163						**GP33-S-163 PID= 0 ppm**			
164									
165			**70%**	**GP**	**34**				*165.0 to 167.7 feet: SAND (SP); dark gray; 5% fines, nonplastic; 95% sand, fine; wet.*
166									
167									
168						**GP33-S-168 PID= 0 ppm**			*167.7 to 172.5 feet: SILT (ML); dark gray; 100% fines, low to medium plasticity; trace sand; moist.*
169									
170			**80%**	**GP**	**35**				
171									
172									
173						**GP33-S-173 PID= 0 ppm**			*172.5 to 175.3 feet: SAND (SP); dark gray; 5% fines, nonplastic; 95% sand, fine; silt nodules; wet.*
174									
175			**100%**	**GP**	**36**				
176									*175.3 to 175.8 feet: SILT (ML); dark gray; 100% fines, low to medium plasticity; moist.*
									175.8 to 178.0 feet: SAND (SP); dark gray; trace fines; 100% sand, fine; silt nodules; wet.
177									

NOTES: *1) Sample depths are relative to feet below ground surface (bgs). 2) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3) PID = Photo ionization detector, soil head space reading. 4) ppm = parts per million. 5)GW = groundwater sample, dashed graphic indicates screened interval. 6) NA = not available. 7) Odor characteristic of manufactured gas plant waste.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	GP33	9 of 10

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
178						GP33-S-178 PID= 0 ppm			178.0 to 179.0 feet: SILT (ML); dark gray; 100% fines, low to medium plasticity; moist.
179									179.0 to 180.0 feet: SAND (SP); dark gray; trace fines; 100% sand, fine; silt nodules; wet.
180			90%	GP	37				180.0 to 182.0 feet: SILT (ML); dark gray; 100% fines, low to medium plasticity; moist.
181									
182									182.0 to 195.0 feet: SAND (SP); dark gray; trace fines; 100% sand, fine; trace gravels; silt nodules; wet.
183						GP33-S-183 PID= 0 ppm			
184									
185			100%	GP	38				
186									
187									
188						GP33-S-188 PID= 0 ppm			
189									
190			60%	GP	39				
191									
192									
193						GP33-S-193 PID= 0 ppm			
194									
195			90%	GP	40				195.0 to 204.9 feet: SAND (SP); grayish brown; trace fines; 100% sand, fine to medium; wet.
196									
197									
198						GP33-S-198 PID= 0 ppm			
199									
200									

NOTES: *1) Sample depths are relative to feet below ground surface (bgs). 2) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3) PID = Photo ionization detector, soil head space reading. 4) ppm = parts per million. 5)GW = groundwater sample, dashed graphic indicates screened interval. 6) NA = not available. 7) Odor characteristic of manufactured gas plant waste.*

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**GP33**	**10 of 10**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
201			**90%**	**GP**	**41**				
				GW					
202						**PID= 0 ppm**			
203						**GP33-W-203**			
204						**GP33-S-204**			
205									*204.9 to 205.0 feet: GRAVEL WITH SAND (GP); light gray to brown; 10% sand, fine; 90% gravels, fine to medium, subrounded to subangular; moist to wet.*

Total Depth: 205.0 feet bgs.

Borehole Completion Details:

0 to 15.0 feet bgs: 3/8-inch bentonite chips hydrated with potable water.
0 to 35.0 feet bgs: 3 1/4-inch temporary steel isolation casing.
15.0 to 205.0 feet bgs: Bentonite grout.
35.0 to 205.0 feet bgs: 1 1/2-inch borehole.

NOTES: *1) Sample depths are relative to feet below ground surface (bgs). 2) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3) PID = Photo ionization detector, soil head space reading. 4) ppm = parts per million. 5)GW = groundwater sample, dashed graphic indicates screened interval. 6) NA = not available. 7) Odor characteristic of manufactured gas plant waste.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**GP36**	**1 of 10**

Project Name	**Siltronic Corporation**	TOC Elevation (feet NGVD)	
Project Location	**7200 NW Front Avenue, Portland, Oregon**	Surface Elevation (feet NGVD)	
Start/End Date	**04/29/05 to 5/03/05**	Northing	
Driller/Equipment	**Geo-Tech Explorations, Inc./Geo-Probe**	Easting	
Geologist/Engineer	**Meri Gibson / Madi Novak**	Hole Depth	**210.0-feet**
Sample Method	**Geo-Probe**	Outer Hole Diam	**3 1/4-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1			**72%**	**GP**	**1**				*0.0 to 0.5 feet: TOP SOIL AND GRASS.*
									0.5 to 4.0 feet: SILTY SAND (SM); orangish brown; 40% fines, nonplastic; 60% sand, fine; dry to moist.
3						**GP36-S-3 PID= 0 ppm**			
5			**80%**	**GP**	**2**				*4.0 to 29.8 feet: SAND (SP); orangish brown; trace fines; 100% sand, fine; dry to moist;*
									@ 5.0 feet: Trace gravels; globules of black material.
8						**GP36-S-8 PID= 0 ppm**			
10			**72%**	**GP**	**3**				
13						**GP36-S-13 PID= 0 ppm**			
15			**90%**	**GP**	**4**				*@ 14.5 feet: Color change to black and moisture content changes to moist. Strong odor.*
17									*25.5 to 25.7 feet: SAND WITH SILT (SP-SM); dark brown with black; 30% fines, nonplastic; 70% sand, fine to medium; odor; some staining; moist.*
18						**GP36-S-18 PID= 0 ppm**			
20									

NOTES: *1) Sample depths are relative to feet below ground surface (bgs). 2) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3) PID = Photo ionization detector, soil head space reading. 4) ppm = parts per million. 6) GW = groundwater sample, dashed graphic indicates screened interval. 7) NA = not available. 8) Odor characteristic of manufactured gas plant waste.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	GP36	2 of 10

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			90%	GP	5				
22									
23						GP36-S-23 PID= 0 ppm			
24									@ 24.0 feet: Staining and sheen no longer visible.
25			90%	GP	6				@ 25.0 feet: Moisture content changes to wet.
26									
27									
28						GP36-S-28 PID= 0 ppm			
29									
30			100%	GP	7				29.8 to 30.0 feet: SILTY SAND (SM); dark gray; 30% fines, low plasticity; 70% sand, fine; wet.
31									30.0 to 30.5 feet: SAND WITH SILT (SP-SM); dark gray; 15% fines, nonplastic; 85% sand, fine; slight odor; moist.
32									34.0 to 36.5 feet: SAND WITH SILT (SP-SM); brownish gray with iron staining; 30% fines, nonplastic; 70% sand, fine to medium; odor; some staining; moist. @ 31.0 feet: Color change to brownish gray with iron staining and change in plasticity to medium.
33						GP36-S-33 PID= 0 ppm			
34									
35			100%	GP	8				
36									
37									36.5 to 37.0 feet: SAND (SP); dark gray; trace fines, nonplastic; 100% sand, fine; trace woody debris; wet.
38						GP36-S-37 GP36-S-DUP PID= 0 ppm GP36-W-38			37.0 to 40.8 feet: SILT (ML); dark gray; 95% fines, low plasticity; 5% sand, fine; damp.
39									
40			100%	GP	9				
41									40.8 to 41.5 feet: SAND WITH SILT (SP-SM); dark gray; 15% fines, nonplastic; trace sand, fine; moist.
42									41.5 to 42.0 feet: SILT (ML); dark gray; 95% fines, low plasticity; 5% sand, fine; damp. 42.0 to 45.0 feet: SILTY SAND (SM); dark gray; 40% fines, nonplastic; 60%

NOTES: 1) Sample depths are relative to feet below ground surface (bgs). 2) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3) PID = Photo ionization detector, soil head space reading. 4) ppm = parts per million. 6) GW = groundwater sample, dashed graphic indicates screened interval. 7) NA = not available. 8) Odor characteristic of manufactured gas plant waste.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**GP36**	**3 of 10**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43						GP36-S-43 PID= 0 ppm			sand, fine; moist.
44									
45			100%	GP	10				45.0 to 50.0 feet: SILT WITH SAND (ML); dark gray; 70% fines, low to medium plasticity; 30% sand, fine; trace woody debris; damp to wet.
46									
47									
48						GP36-S-48 PID= 0 ppm			
49									
50			100%	GP	11				50.0 to 52.0 feet: SAND WITH SILT (SP-SM); dark gray; 15% fines, nonplastic; 85% sand, fine; wet.
51									
52						GP36-S-52 PID= 0 ppm			52.0 to 55.0 feet: SILTY SAND (SM); dark gray; 40% fines, nonplastic; 60% sand, fine; damp.
53									
54									
55			100%	GP	12				55.0 to 56.0 feet: SILT WITH SAND (ML); dark gray; 85% fines, low plasticity; 15% sand, fine; wet.
56									56.0 to 57.0 feet: SAND (SP); dark gray; 5% fines, nonplastic; 95% sand, fine; wet.
57									57.0 to 59.0 feet: SILT WITH SAND (ML); dark gray; 85% fines, low plasticity; 15% sand, fine; wet.
58						GP36-S-58 PID= 0 ppm			
59									59.0 to 60.5 feet: SAND (SP); orangish brown; 5% fines, nonplastic; 95% sand, fine; wet.
60			90%	GP	13	GP36-W-60			
61									60.5 to 61.0 feet: SAND WITH SILT (SP-SM); dark gray; 10% fines, nonplastic; 90% sand, fine; wet.
62									61.0 to 63.0 feet: SILT (ML); dark gray; 95% fines, low plasticity; 5% sand, fine; damp.
63						GP36-S-63 PID= 0 ppm			
64									63.0 to 65.0 feet: SAND WITH SILT (SP-SM); dark gray; 10% fines, nonplastic; 90% sand, fine; wet.
65									

NOTES: *1) Sample depths are relative to feet below ground surface (bgs). 2) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3) PID = Photo ionization detector, soil head space reading. 4) ppm = parts per million. 6) GW = groundwater sample, dashed graphic indicates screened interval. 7) NA = not available. 8) Odor characteristic of manufactured gas plant waste.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	GP36	4 of 10

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66			90%	GP	14				65.0 to 65.5 feet: SILT (ML); dark gray; 95% fines, low plasticity; 5% sand, fine; damp. 65.5 to 70.8 feet: SAND WITH SILT (SP-SM); dark gray; 10% fines, nonplastic; 90% sand, fine; wet.
67									
68						GP36-S-68			
69									
70			100%	GP	15				@ 70.0 feet: Increase in fines to 15%; low plasticity.
71									70.8 to 71.5 feet: SILT (ML); dark gray; 95% fines, low plasticity; 5% sand, fine; damp.
72									71.5 to 72.0 feet: SAND (SP); dark gray; 5% fines, nonplastic; 95% sand, fine; wet.
73						GP36-S-73 PID= 0 ppm			72.0 to 72.5 feet: SILT (ML); dark gray; 95% fines, low plasticity; 5% sand, fine; damp. 72.5 to 75.0 feet: SAND (SP); dark gray; 5% fines, nonplastic; 95% sand, fine; wet.
74									
75			100%	GP	16				75.0 to 76.5 feet: SAND WITH SILT (SP-SM); dark gray; 15% fines, nonplastic; 85% sand, fine; wet.
76									
77									76.5 to 77.0 feet: SILT (ML); dark gray; 95% fines, low plasticity; 5% sand, fine; damp.
78						GP36-S-78 PID= 0 ppm			77.0 to 80.0 feet: SAND WITH SILT (SP-SM); dark gray; 20% fines, low plasticity; 85% sand, fine; trace organics; wet.
79									
80			80%	GP	17				80.0 to 115.5 feet: STRATIFIED LAYERS OF SILT (ML) AND SAND (SP); damp to wet.
81									
82									
83						GP36-S-83 PID= 0 ppm			
84									
85			100%	GP	18				SILT LAYERS (ML); dark gray; 95% fines, low plasticity; 5% sand, fine; damp.
86									SAND LAYERS (SP); dark gray; 5% fines, nonplastic; 95% sand, fine; wet.
87									

NOTES: 1) Sample depths are relative to feet below ground surface (bgs). 2) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3) PID = Photo ionization detector, soil head space reading. 4) ppm = parts per million. 6) GW = groundwater sample, dashed graphic indicates screened interval. 7) NA = not available. 8) Odor characteristic of manufactured gas plant waste.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	GP36	5 of 10

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88						GP36-S-88 PID= 0 ppm			
89									
90			70%	GP	19				
91									
92						GP36-W-92			
93						GP36-S-93 PID= 0 ppm			
94									
95			60%	GP	20				
96									
97									96.5 to 105.0 feet: SILT NODULES in sand layers
98						GP36-S-98 PID= 0 ppm			
99									
100			100%	GP	21				
101									
102									
103						GP36-S-103 PID= 0 ppm			
104									
105			100%	GP	22				
106									
107									
108						GP36-S-108 PID= 0 ppm			
109									
110									

NOTES: 1) Sample depths are relative to feet below ground surface (bgs). 2) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3) PID = Photo ionization detector, soil head space reading. 4) ppm = parts per million. 6) GW = groundwater sample, dashed graphic indicates screened interval. 7) NA = not available. 8) Odor characteristic of manufactured gas plant waste.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	GP36	6 of 10

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
111			100%	GP	23	GP36-W-110			
112									
113						GP36-S-113 PID= 0 ppm			
114									
115			90%	GP	24				
116									115.5 to 116.0 feet: SILT WITH SAND (ML); dark gray; 85% fines, low plasticity; 15% sand, fine; wet.
117									116.0 to 117.5 feet: SAND (SP); dark gray; 5% fines, nonplastic; 95% sand, fine; silt nodules; wet.
118						GP36-S-118 PID= 0 ppm			117.5 to 117.8 feet: SILT WITH SAND (ML); dark gray; 95% fines, medium plasticity; 5% sand, fine; wet.
119									117.8 to 120.0 feet: SAND (SP); dark gray; 5% fines, nonplastic; 95% sand, fine; wet.
120			90%	GP	25				120.0 to 121.5 feet: SILT (ML); dark gray; 95% fines, medium plasticity; 5% sand, fine; wet.
121									
122									121.5 to 125.0 feet: SAND (SP); dark gray; 5% fines, nonplastic; 95% sand, fine; wet.
123						GP36-S-123 PID= 0 ppm			
124									
125			100%	GP	26				125.0 to 127.0 feet: SILT WITH SAND (ML); dark gray; 85% fines, nonplastic; 15% sand, fine; wet.
126									
127									127.0 to 128.5 feet: SAND (SP); dark gray; 5% fines, nonplastic; 95% sand, fine; silt nodules; wet.
128						GP36-S-128 PID= 0 ppm			
129									128.5 to 130.0 feet: SILT WITH SAND (ML); dark gray; 85% fines, nonplastic; 15% sand, fine; damp to wet.
130			100%	GP	27				130.0 to 134.0 feet: SILT (ML); dark brownish gray; 100% fines, low plasticity; trace sand, fine; wet.
131									
132									

NOTES: 1) Sample depths are relative to feet below ground surface (bgs). 2) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3) PID = Photo ionization detector, soil head space reading. 4) ppm = parts per million. 6) GW = groundwater sample, dashed graphic indicates screened interval. 7) NA = not available. 8) Odor characteristic of manufactured gas plant waste.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	GP36	7 of 10

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
133						GP36-S-133 PID= 0 ppm			
134									134.0 to 135.0 feet: SAND WITH SILT (SP-SM); dark gray; 15% fines, nonplastic; 85% sand, fine; wet.
135			100%	GP	28				135.0 to 136.5 feet: SILT (ML); dark brownish gray; 100% fines, medium plasticity; trace sand, fine; wet.
136									
137									136.5 to 136.7 feet: SAND WITH SILT (SP-SM); dark gray; 5% fines, nonplastic; 95% sand, fine; wet.
									136.7 to 140.0 feet: SILT (ML); dark brownish gray; 100% fines, medium plasticity; trace sand, fine; wet.
138						GP36-S-138 PID= 0 ppm			
139									
140			100%	GP	29				140.0 to 140.5 feet: SAND WITH SILT (SP-SM); dark gray; 15% fines, nonplastic; 85% sand, fine; wet.
141									140.5 to 141.0 feet: SILT (ML); dark brownish gray; 100% fines, medium plasticity; trace sand, fine; wet.
142									141.0 to 142.0 feet: SAND WITH SILT (SP-SM); dark gray; 15% fines, nonplastic; 85% sand, fine; wet.
									142.0 to 145.0 feet: SILT (ML); dark brownish gray; 100% fines, medium plasticity; trace sand, fine; wet.
143						GP36-S-143 PID= 0 ppm			
144									
145			100%	GP	30				145.0 to 145.5 feet: SAND WITH SILT (SP-SM); dark gray; 15% fines, nonplastic; 85% sand, fine; wet.
146									145.5 to 150.5 feet: SILT WITH SAND (ML); dark gray; 95% fines, medium plasticity; 5% sand, fine; wet.
									@ 146.0 feet: Decrease in fines to 85%.
147									
148				GW		GP36-S-148 PID= 0 ppm			
149									
150			100%	GP	31	GP36-W-150			@ 150.0 feet: Increase in fines to 90%.
151									150.5 to 151.0 feet: SAND WITH SILT (SP-SM); dark gray; 10% fines; 90% sand, fine; wet.
									151.0 to 151.5 feet: SILT (ML); dark gray; 100% fines, medium plasticity; trace sand; wet.
152									151.5 to 152.5 feet: SAND WITH SILT (SP-SM); dark gray; 10% fines, medium plasticity; 90% sand, fine; wet.
153									152.5 to 155.0 feet: SILT (ML); dark gray; 100% fines, medium plasticity; trace sand; wet.
						GP36-S-153 PID= 0 ppm			
154									
155									

NOTES: 1) Sample depths are relative to feet below ground surface (bgs). 2) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3) PID = Photo ionization detector, soil head space reading. 4) ppm = parts per million. 6) GW = groundwater sample, dashed graphic indicates screened interval. 7) NA = not available. 8) Odor characteristic of manufactured gas plant waste.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	GP36	8 of 10

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
156			100%	GP	32				155.0 to 156.0 feet: SILT WITH SAND (ML); dark gray; 85% fines, medium plasticity; 15% sand, fine; wet.
									156.0 to 157.0 feet: SILT WITH SAND (ML); dark gray; 100% fines, medium plasticity; trace sand, fine; wet.
157									157.0 to 158.5 feet: SILT WITH SAND (ML); dark gray; 85% fines, medium plasticity; 15% sand, fine; wet.
158						GP36-S-158 PID= 0 ppm			
159									158.5 to 160.0 feet: SILT (ML); dark gray; 100% fines, medium plasticity; trace sand; wet.
160			100%	GP	33				160.0 to 160.5 feet: SAND WITH SILT (SP-SM); dark gray; 15% fines; 85% sand, fine; wet.
161									160.5 to 165.0 feet: SILT WITH SAND (ML); dark gray; 85% fines, medium plasticity; 15% sand, fine; wet.
162									
163						GP36-S-163 PID= 0 ppm			
164									
165			100%	GP	34				165.0 to 167.0 feet: SAND WITH SILT (SP-SM); dark gray; 5% fines; 95% sand, fine; wet.
166									
167									167.0 to 167.5 feet: SILT WITH SAND (ML); dark gray; 85% fines, low plasticity; 15% sand, fine; wet.
168						GP36-S-168 PID= 0 ppm			167.5 to 170.0 feet: SAND WITH SILT (SP-SM); dark gray; 5% fines; 95% sand, fine; wet.
169									
170			100%	GP	35				170.0 to 173.5 feet: SAND WITH SILT (SP-SM); dark gray; 10% fines; 90% sand, fine; wet.
171									
172									
173						GP36-S-173 PID= 0 ppm			
174									173.5 to 176.5 feet: SILT (ML); dark gray; 100% fines, medium plasticity; trace sand; wet.
175			100%	GP	36				
176									
177									176.5 to 180.0 feet: SILT WITH SAND (ML); dark gray; 90% fines, medium plasticity; 10% sand, fine; wet.

NOTES: 1) Sample depths are relative to feet below ground surface (bgs). 2) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3) PID = Photo ionization detector, soil head space reading. 4) ppm = parts per million. 6) GW = groundwater sample, dashed graphic indicates screened interval. 7) NA = not available. 8) Odor characteristic of manufactured gas plant waste.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**GP36**	**9 of 10**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
178						**GP36-S-178 PID= 0 ppm**			
179									
180									
			100%	**GP**	**37**				*180.0 to 181.0 feet: SILT WITH SAND (ML); dark gray; 95% fines, low plasticity; 5% sand, fine; wet.*
181									*181.0 to 184.0 feet: SAND (SP); dark gray; trace fines; 100% sand, fine; wet.*
182									
183						**GP36-S-183 PID= 0 ppm**			
184									
									184.0 to 185.0 feet: SILT WITH SAND (ML); dark gray; 95% fines, low plasticity; 5% sand, fine; wet.
185			**100%**	**GP**	**38**				*185.0 to 194.0 feet: SILT WITH SAND (ML); dark gray; 90% fines, medium plasticity; 10% sand, fine; wet.*
186									
187									
188						**GP36-S-188 PID= 0 ppm**			
189									
190									
			100%	**GP**	**39**				
191									
192									
193						**GP36-S-193**			
194									
									194.0 to 195.0 feet: SAND WITH SILT (SP-SM); dark gray; 5% fines; 95% sand, fine; wet.
195			**80%**	**GP**	**40**				*195.0 to 204.0 feet: SAND (SP); dark gray; trace fines, medium plasticity; 100% sand, fine; wet.*
196									
197									
198						**GP36-S-198**			
199									
200									

NOTES: *1) Sample depths are relative to feet below ground surface (bgs). 2) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3) PID = Photo ionization detector, soil head space reading. 4) ppm = parts per million. 6) GW = groundwater sample, dashed graphic indicates screened interval. 7) NA = not available. 8) Odor characteristic of manufactured gas plant waste.*

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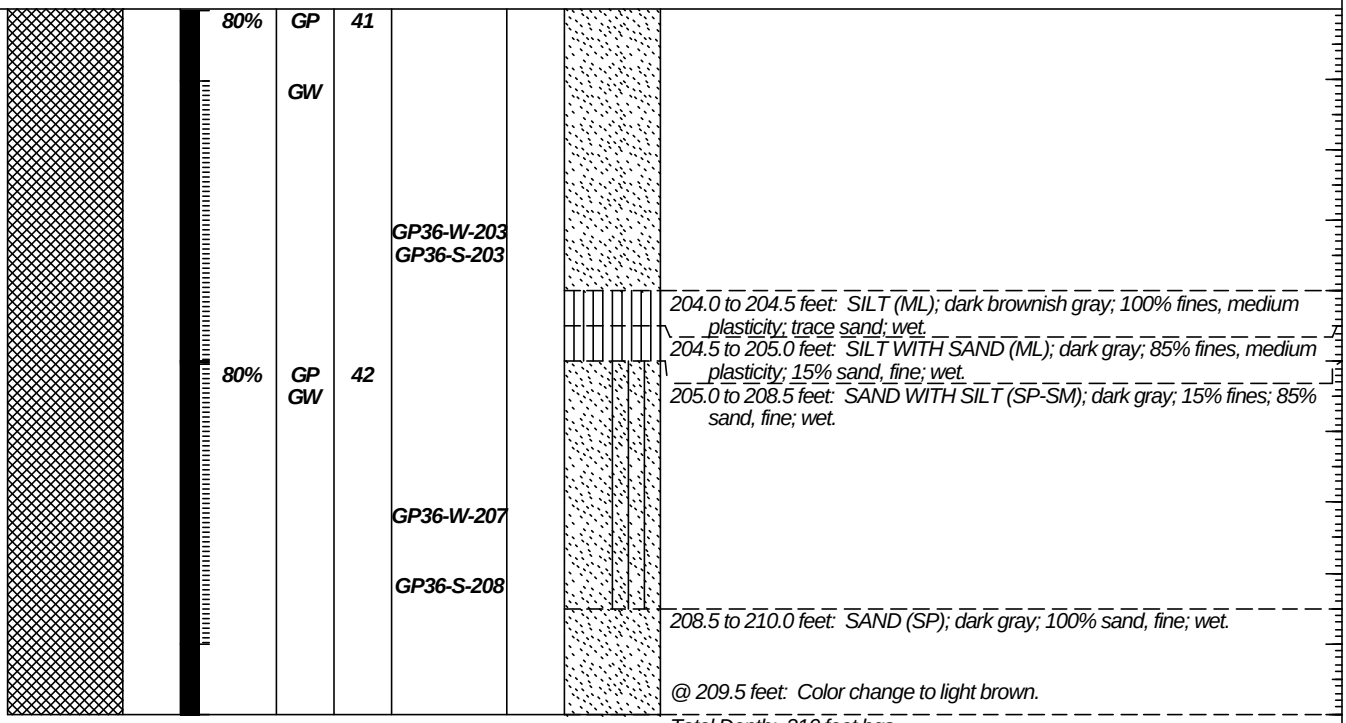
Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**GP36**	**10 of 10**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
201			**80%**	**GP**	**41**				
				GW					
202									
203						**GP36-W-203**			
						GP36-S-203			
204									
									204.0 to 204.5 feet: SILT (ML); dark brownish gray; 100% fines, medium plasticity; trace sand; wet.
205									*204.5 to 205.0 feet: SILT WITH SAND (ML); dark gray; 85% fines, medium plasticity; 15% sand, fine; wet.*
			80%	**GP**	**42**				
				GW					*205.0 to 208.5 feet: SAND WITH SILT (SP-SM); dark gray; 15% fines; 85% sand, fine; wet.*
206									
207						**GP36-W-207**			
208						**GP36-S-208**			
209									*208.5 to 210.0 feet: SAND (SP); dark gray; 100% sand, fine; wet.*
									@ 209.5 feet: Color change to light brown.
210									*Totel Depth: 210 feet bgs.*



Borehole Completion Details
0 to 15.0 feet: 3/8-inch bentonite chips hydrated with potable water.
0 to 35.0 feet: 3 1/4-inch temporary steel isolation casing.
15.0 to 210.0 feet: Bentonite grout.
35.0 to 210.0 feet: 1 1/2-inch borehole.

NOTES: *1) Sample depths are relative to feet below ground surface (bgs). 2) GP = Geo-Probe, 2-inch Macro Core soil sampler. 3) PID = Photo ionization detector, soil head space reading. 4) ppm = parts per million. 6) GW = groundwater sample, dashed graphic indicates screened interval. 7) NA = not available. 8) Odor characteristic of manufactured gas plant waste.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.10	**GP86**	**1 of 5**

Project Name	**Siltronic Corporation**	TOC Elevation (feet)	
Project Location	**7200 NW Front Avenue, Portland, Oregon**	Surface Elevation (feet)	
Start/End Date	**05/03/06 to 05/04/06**	Northing	
Driller/Equipment	**Geo-Tech Explorations, Inc./Geoprobe**	Easting	
Geologist/Engineer	**Scout Mauldin**	Hole Depth	**105.0-feet**
Sample Method	**Geoprobe**	Outer Hole Diam	**3 1/4-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1									0.0 to 0.5 feet: Asphalt surface.
									0.5 to 8.5 feet: No recovery. Used air knife to remove soil and check for underground utilities.
9				GP	1				8.5 to 15.0 feet: SAND (SP); light to dark brown; trace gravel, fine to medium; 80% sand, fine to medium; 10% fines, nonplastic; moist.
10			100%	GP	2				
12						PID = 0.0 ppm			
15			100%	GP	3				15.0 to 20.0 feet: SAND (SP); dark grey; 5% gravel; 80% sand; 10% fines, nonplastic; organic debris; wet.
16						PID = 0.0 ppm			
18									@ 18.0 feet: Slight odor.
19						PID = 3.1 ppm			
20									@ 19.7 feet: Sheen.

NOTES: *1.) Sample depths are relative to feet below ground surface (bgs). 2.) Gp = Geoprobe, 2-inch Macro Core soil sampler. 3.) PID = photoionization detector, head space readings in parts per million (ppm). 4.) Kit = Oil n Soil Sudan IV test kit, negative or positive result. 5.) GW = groundwater sample, dashed graphic indicates screened interval. 6.) NA = not available. 7.) Odor characteristic of manufactured gas plant waste.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.10	GP86	2 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			80%	GP	4				20 to 21.0 feet: SAND (SP); dark gray to dark black; 90% sand, fine; 10% fines, nonplastic; wet; odor; sheen. Plant waste.
						PID = 517 ppm			21.0 to 25.0 feet: SAND (SP); dark brown; sand, fine to medium; wet; odor.
25						PID = 0.0 ppm			
			100%	GP	5				25.0 to 30.0 feet: SAND (SP); dark gray to dark black; 90% sand; 10% fines, nonplastic; micaceous; wet
						PID = 5.2 ppm			
29									@ 29.0 feet: Sheen and odor.
30			100%	GP	6	Kit = neg			30.0 to 35.0 feet: SILTY CLAY to CLAYEY SILT (CL-ML); medium to high plasticity; micaceous; moist.
						Kit = neg			
						PID = 9.3 ppm			
35									@ 35.0 feet: Set 3 1/4-inch temporary isolation casing in place. Use bentonite chips to create a seal. Boring continued with the 2-inch macro core sampler.
			100%	GP	7				35.0 to 38.0 feet: CLAYEY SILT (ML); gray; high plasticity; moist to wet.
38						PID = 123.9 ppm			
									38.0 to 40.0 feet: SANDY SILT (ML); wet; 70% sand; 30% fines, low to medium plasticity; wet; odor.
40			100%	GP	8	Kit = neg			40.0 to 43.0 feet: SANDY SILT (ML); dark gray; 20% sand; 80% fines; wet; odor.
42									

NOTES: 1.) Sample depths are relative to feet below ground surface (bgs). 2.) Gp = Geoprobe, 2-inch Macro Core soil sampler. 3.) PID = photoionization detector, head space readings in parts per million (ppm). 4.) Kit = Oil n Soil Sudan IV test kit, negative or positive result. 5.) GW = groundwater sample, dashed graphic indicates screened interval. 6.) NA = not available. 7.) Odor characteristic of manufactured gas plant waste.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.10	GP86	3 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43						PID = 377 ppm			43.0 to 45.0 feet: SILT with SAND (ML); dark gray with orange mottling; 10% sand; 90% fines, low to medium plasticity; moist.
44									
45			100%	GP	9				45.0 to 48.0 feet: SILTY SAND (SM); dark gray; 60% sand; 40% fines, low plasticity; wet.
46						PID = 4.3 ppm			
47						Kit = neg			
48									48.0 to 50.0 feet: SILT (ML); gray; 10% sand; 90% fines, medium plasticity; wet; odor.
49						PID = 169.7 ppm			
50			100%	GP	10				50.0 to 51.0 feet: SANDY SILT (ML); dark gray; micaceous; wet.
51									51.0 to 52.5 feet: SAND (SP); gray; 90% sand; 10% fines; wet.
52						PID = 59.3 ppm Kit = neg			
53									52.5 to 53.0 feet: SANDY SILT (ML); light gray; low plasticity; wet.
				GW					53.0 to 58.0 feet: Not sampled.
54									
55						GP86-55.0			
56									
57									
58			5%	GP	11				58.0 to 63.0 feet: SILT (ML); dark gray; 10% sand; 90% fines, medium plasticity; wet.
59									
60									
61						PID = 0.0 ppm			
62									
63			100%	GP	12				63.0 to 65.5 feet: SAND (SP); dark gray; 80% sand, fine to medium; 20% fines; wet.
64						PID = 13.5 ppm			
65						Kit = neg			

NOTES: 1.) Sample depths are relative to feet below ground surface (bgs). 2.) Gp = Geoprobe, 2-inch Macro Core soil sampler. 3.) PID = photoionization detector, head space readings in parts per million (ppm). 4.) Kit = Oil n Soil Sudan IV test kit, negative or positive result. 5.) GW = groundwater sample, dashed graphic indicates screened interval. 6.) NA = not available. 7.) Odor characteristic of manufactured gas plant waste.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.10	GP86	4 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66						GP86-65 (grain size)			65.5 to 67.0 feet: SILTY SAND (SM); gray; moist.
67						PID = 9.3 ppm			67.0 to 69.0 feet: SILT (ML); gray; 20% sand, fine; 80% fines, low plasticity; moist to wet.
68			100%	GP	13	Kit = neg			
69				GW					69.0 to 73.0 feet: Not sampled.
70									
71						GP86-71.0			
72									
73			100%	GP	14				73.0 to 74.5 feet: SAND with SILT (SP-SM); gray; 80% sand; 20% fines, nonplastic; wet.
74						PID = 0.0 ppm			
75									74.5 to 78.0 feet: SILT (ML); dark gray; 10% sand; 90% fines, medium plasticity; moist to wet.
76						PID = 0.0 ppm			
77									
78									78.0 to 79.0 feet: No recovery.
79			100%	GP	15				79.0 to 79.5 feet: SAND (SP); 85% sand, fine; 15% fines; micaceous; wet.
80				GW					79.5 to 81.0 feet: SILT with SAND (ML); gray; low to medium plasticity; moist to wet.
81						PID = 0.0 ppm Kit = neg			81.0 to 82.5 feet: SAND (SP); gray; 90% sand; 10% fines; wet.
82						GP86-82.0			
83						Kit = neg PID = 0.0 ppm			82.5 to 83.0 feet: SILT with SAND (ML); gray; 30% sand; 70% fines, low plasticity. 83.0 to 85.0 feet: SILT (ML); 10% sand; 90% fines, medium to high plasticity; moist.
84									
85			100%	GP	16				
86						PID = 0.0 ppm			85.0 to 88.0 feet: SILTY SAND (SM); gray; 60% sand; 40% fines; wet.
87									

NOTES: 1.) Sample depths are relative to feet below ground surface (bgs). 2.) Gp = Geoprobe, 2-inch Macro Core soil sampler. 3.) PID = photoionization detector, head space readings in parts per million (ppm). 4.) Kit = Oil n Soil Sudan IV test kit, negative or positive result. 5.) GW = groundwater sample, dashed graphic indicates screened interval. 6.) NA = not available. 7.) Odor characteristic of manufactured gas plant waste.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.10	GP86	5 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88						PID = 0.0 ppm			88.0 to 89.5 feet: SANDY SILT (ML); gray; 40% sand; 60% fines; moist to wet.
89									
90			0%	GP	17				89.5 to 90.0 feet: SILT (ML); 20% sand; 80% fines, medium to high plasticity; micaceous. 90.0 to 95.0 feet: No recovery.
91									
92									
93									
94									
95			100%	GP GW	18				95.0 to 98.0 feet: SAND (SP); gray; 80% sand, fine; 20% fines, nonplastic; wet.
96									
97						PID = 0.0 ppm			
98						GP86-97.5 Kit = neg			98.0 to 99.5 feet: SILT (ML); dark gray; 30% sand; 70% fines, medium to high plasticity; moist to wet.
99						PID = 0.0 ppm			
100			80%	GP	19				99.5 to 100 feet: SILTY SAND (SM); gray; 70% sand; 30% fines; micaceous; damp. 100.0 to 101.0 feet: No recovery.
101						PID = 0.0 ppm			101.0 to 102.5 feet: SAND (SP); dark gray; 85% sand; 15% fines; micaceous; wet.
102						GP86-102 (grain size) Kit = neg			
103									102.5 to 104.0 feet: SILT with SAND (ML); gray; medium plasticity; micaceous; moist to wet.
104						PID = 0.0 ppm Kit = neg			104.0 to 105.0 feet: SAND (SP); dark gray; 75% sand; 25% fines; micaceous; moist.
105									Total Depth: 105.0 feet below ground surface.

Borehole Completion Details:

0.0 to 15.0 feet bgs: 3/8-inch bentonite chips hydrated with potable water.
0.0 to 35.0 feet bgs: 3 1/4-inch temporary steel isolation casing.
15.0 to 105.0 feet bgs: Bentonite grout slurry.
35.0 to 105.0 feet bgs: 2-inch borehole.

NOTES: *1.) Sample depths are relative to feet below ground surface (bgs). 2.) Gp = Geoprobe, 2-inch Macro Core soil sampler. 3.) PID = photoionization detector, head space readings in parts per million (ppm). 4.) Kit = Oil n Soil Sudan IV test kit, negative or positive result. 5.) GW = groundwater sample, dashed graphic indicates screened interval. 6.) NA = not available. 7.) Odor characteristic of manufactured gas plant waste.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.10	**GP87**	**1 of 6**

Project Name	**Siltronic Corporation**	TOC Elevation (feet)	
Project Location	**7200 NW Front Avenue, Portland, Oregon**	Surface Elevation (feet)	
Start/End Date	**05/04/06 to 5/09/06**	Northing	
Driller/Equipment	**Geo-Tech Explorations, Inc./Geoprobe**	Easting	
Geologist/Engineer	**Scout Mauldin**	Hole Depth	**115.0-feet**
Sample Method	**Geoprobe**	Outer Hole Diam	**3 1/4-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1									0.0 to 0.5 feet: Asphalt surface.
									0.5 to 10.0 feet: No recovery. Used air knife to remove soil and check for underground utilities.
10			**80%**	**GP**	**1**				10.0 to 12.0 feet: SAND (SP); brown; 90% sand, fine to medium; 10% fines; micaceous; damp.
11						**PID = 0.0 ppm**			
12									12.0 to 15.0 feet: SAND (SP); dark gray; 90% sand; 10% fines; micaceous; moist.
13									
14									
15						**PID = 0.0 ppm**			
			100%	**GP**	**2**				15.0 to 18.0 feet: SAND (SP); dark brown; 100% sand, fine to medium; micaceous; moist to wet.
16						**PID = 0.0 ppm**			
17									
18									18.0 to 20.0 feet: SAND (SP); dark gray; 100% sand, fine to medium; odor; moist to wet.
19						**PID = 0.0 ppm**			
20									

NOTES: 1.) Sample depths are relative to feet below ground surface (bgs). 2.) Gp = Geoprobe, 2-inch Macro Core soil sampler. 3.) PID = photoionization detector, head space readings in parts per million (ppm). 4.) Kit = Oil n Soil Sudan IV test kit, negative or positive result. 5.) GW = groundwater sample, dashed graphic indicates screened interval. 6.) NA = not available. 7.) Odor characteristic of manufactured gas plant waste.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.10	GP87	2 of 6

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			40%	GP	3				20.0 to 22.5 feet: No recovery.
22						Kit = neg			
23									22.5 to 25.0 feet: SAND (SP); dark gray; 90% sand, fine to medium; 10% fines; sheen and strong odor. Plant waste.
24						PID = 273 ppm			
25									@ 24.5 feet: Color change to dark brown; no sheen; moist to wet.
26			100%	GP	4				25.0 to 27.5 feet: SILT (ML); dark gray; medium plasticity; odor; moist to wet.
27						PID = 5.2 ppm			
28									27.5 to 30.0 feet: CLAYEY SILT (CL-ML); gray with orange mottling; medium to high plasticity; slight odor.
29						PID = 32.2 ppm			
30									30.0 to 40.0 feet: Not sampled.
31									@ 30.0 feet: Set 3 1/4-inch temporary isolation casing in place. Use bentonite chips to create a seal. Boring continued with the 2-inch macro core sampler.
32									
33									
34									
35									
36									
37									
38									
39									
40			100%	GP	5				40.0 to 44.5 feet: SAND (SP); dark brown; odor; wet.
41									
42						PID = 17.7 ppm			

NOTES: 1.) Sample depths are relative to feet below ground surface (bgs). 2.) Gp = Geoprobe, 2-inch Macro Core soil sampler. 3.) PID = photoionization detector, head space readings in parts per million (ppm). 4.) Kit = Oil n Soil Sudan IV test kit, negative or positive result. 5.) GW = groundwater sample, dashed graphic indicates screened interval. 6.) NA = not available. 7.) Odor characteristic of manufactured gas plant waste.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.10	GP87	3 of 6

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43									
44									
45						PID = 0.0 ppm			44.5 to 45.0 feet: SAND (SP); dark brown; 90% sand; 10% fines; moist.
			100%	GP	6				45.0 to 45.5 feet: SAND (SP); gray; moist.
46									45.5 to 46.5 feet: SANDY SILT (ML); gray; moist.
						PID = 0.0 ppm			
47									46.5 to 47.5 feet: SAND (SP); gray; moist to wet.
48									47.5 to 49.0 feet: CLAYEY SILT (CL-ML); gray; moist.
49									
						PID = 11.4 ppm			49.0 to 49.4 feet: SANDY SILT (ML); gray; wet.
50									49.4 to 50.0 feet: SAND (SP); gray; moist.
			100%	GP GW	7				50.0 to 50.5 feet: SANDY SILT (ML); gray; micaceous; odor.
51									50.5 to 52.0 feet: SAND (SP); strong odor; moist to wet.
52						PID = 5.2 ppm			
						GP87-52.0			52.0 to 53.0 feet: SILT with SAND (ML); micaceous; odor.
53									53.0 to 55.0 feet: SANDY SILT (ML); gray; micaceous.
54									@ 53.5 feet: Sand lens.
						PID = 3.2 ppm Kit = neg			
55									
			100%	GP	8				55.0 to 59.5 feet: No recovery.
56									
57									
58									
59									
60									59.5 to 60.0 feet: SILT (ML); gray; micaceous; moist.
			100%	GP	9				60.0 to 61.5 feet: SILT (ML); gray; micaceous; odor; moist.
61						PID = 13.2 ppm			
62						GP87-61.5 (grain size)			61.5 to 62.0 feet: SAND (SP); gray; 90% sand; 10% fines; odor; wet.
						PID = 38.2 ppm Kit = neg			62.0 to 64.5 feet: SILT (ML); gray; low to medium plasticity; odor; moist.
63									
						PID = 48.6 ppm Kit = neg			
64									
65									64.5 to 65.0 feet: SILTY SAND (SM); gray; odor; moist to wet.

NOTES: 1.) Sample depths are relative to feet below ground surface (bgs). 2.) Gp = Geoprobe, 2-inch Macro Core soil sampler. 3.) PID = photoionization detector, head space readings in parts per million (ppm). 4.) Kit = Oil n Soil Sudan IV test kit, negative or positive result. 5.) GW = groundwater sample, dashed graphic indicates screened interval. 6.) NA = not available. 7.) Odor characteristic of manufactured gas plant waste.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.10	GP87	4 of 6

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66			100%	GP	10	PID = 69.6 ppm Kit = neg			65.0 to 66.0 feet: SILT (ML); gray; medium plasticity; moist.
				GW					66.0 to 67.5 feet: SAND (SP); gray; 85-90% sand; 10-15% fines; wet.
67						PID = 30.2 ppm			
68									67.5 to 68.0 feet: SILT (ML); low plasticity; moist to wet.
						GP87-68.0			68.0 to 70.0 feet: SILTY SAND (SM); gray; 70% sand; 30% fines; wet.
69						PID = 32.2 ppm Kit = neg			
70			100%	GP	11				70.0 to 70.5 feet: SILT with SAND (ML); gray; low plasticity; wet.
71						PID = 5.2 ppm			70.5 to 72.5 feet: SAND (SP); gray; 90% sand; 10% fines; slight odor; wet.
72									
73						Kit = neg			72.5 to 73.5 feet: SILT (ML); gray; medium plasticity; moist to wet.
74						PID = 3.2 ppm			73.5 to 75.0 feet: SILTY SAND (SM); gray; 65% sand; 35% fines; micaceous.
75			100%	GP	12				75.0 to 75.4 feet: SANDY SILT (ML); gray; low plasticity; wet.
76									75.4 to 78.0 feet: SILT (ML); dark gray; 20% sand; 80% fines, medium plasticity; moist to wet.
77						PID = 134.0 ppm Kit = neg			
78									78.0 to 78.2 feet: SAND (SP); gray; wet.
79						PID = 0.0 ppm Kit = neg			78.2 to 80.0 feet: SILTY SAND (SM); gray; micaceous; moist.
80			100%	GP	13				80.0 to 80.5 feet: SILTY SAND (SM); gray; moist to wet.
81				GW		PID = 3.2 ppm			80.5 to 81.5 feet: SAND (SP); gray; 85% sand, fine to medium; 15% fines; wet.
82						PID = 0.0 ppm			81.5 to 81.7 feet: SILTY SAND (SM); 75% sand; 25% fines; moist.
						GP87-82.0 Kit = neg			81.7 to 82.1 feet: SAND (SP); gray; 85% sand; 15% fines; slight odor; wet.
83									82.1 to 83.0 feet: SILT with SAND (ML); gray; 30% sand; 70% fines; slight odor; moist.
84									83.0 to 83.5 feet: SAND (SP); gray; 90% sand; 10% fines; slight odor; wet.
						PID = 0.0 ppm Kit = neg			83.5 to 85.0 feet: SILT (ML); gray; 20% sand; 80% fines; moist.
85			100%	GP	14				85.0 to 87.8 feet: SAND (SP); dark gray; 95% sand, fine to medium; 5% fines; micaceous; wet.
86						GP87-86.0 (grain size)			
87						PID = 0.0 ppm			

NOTES: 1.) Sample depths are relative to feet below ground surface (bgs). 2.) Gp = Geoprobe, 2-inch Macro Core soil sampler. 3.) PID = photoionization detector, head space readings in parts per million (ppm). 4.) Kit = Oil n Soil Sudan IV test kit, negative or positive result. 5.) GW = groundwater sample, dashed graphic indicates screened interval. 6.) NA = not available. 7.) Odor characteristic of manufactured gas plant waste.

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.10	GP87	5 of 6

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88									87.8 to 90.0 feet: SILT (ML); dark gray; 15% sand; 85% fines, medium to high plasticity; micaceous; moist to wet.
89						PID = 0.0 ppm Kit = neg			
90			100%	GP	15				90.0 to 90.5 feet: SILT (ML); same as above with odor.
91				GW					90.5 to 91.0 feet: SILTY SAND (SM); dark gray; 80% sand; 20% fines; odor; wet.
92						PID = 416 ppm			91.0 to 93.7 feet: SILT (ML); dark gray; medium plasticity; micaceous; wet.
93						GP87-93.0			
94						PID = 159.3 ppm Kit = neg			93.7 to 94.5 feet: SAND (SP); gray; 85% sand; 15% fines; micaceous; wet.
95			100%	GP	16				94.5 to 95.0 feet: SILT (ML); gray; 30% sand; 70% fines, medium plasticity; micaceous; wet. 95.0 to 98.0 feet: SILT (ML); dark gray; 15% sand; 85% fines; medium to high plasticity; moist.
96				GW		PID = 15.6 ppm			
97									
98						GP87-98.0 Kit = neg			98.0 to 98.2 feet: SILT with SAND (ML); dark gray; 30% sand, fine; 70% fines; moist to wet.
99						PID = 42.7 ppm			98.2 to 100.0 feet: SILT (ML); gray; medium to high plasticity; moist.
100			0%	GP	17				100.0 to 104.0 feet: No recovery.
101									
102									
103									
104			100%	GP GW	18				104.0 to 104.4 feet: SILT with SAND (ML); dark gray; moist to wet. 104.4 to 104.9 feet: SILT (ML); gray; medium plasticity; moist.
105									104.9 to 105.5 feet: SILTY SAND (SM); gray; wet.
106						GP87-106.0			105.5 to 105.9 feet: SANDY SILT (ML): gray; wet. 105.9 to 106.4 feet: SILT (ML); gray; wet.
107									106.4 to 106.7 feet: SAND with SILT (SP-SM); gray; wet. 106.7 to 109.0 feet: SANDY SILT (ML); gray; 30% sand; 70% fines; wet.
108									@ 108.0 feet: Sand lens.
109									109.0 to 110.0 feet: Not sampled.
110									

NOTES: 1.) Sample depths are relative to feet below ground surface (bgs). 2.) Gp = Geoprobe, 2-inch Macro Core soil sampler. 3.) PID = photoionization detector, head space readings in parts per million (ppm). 4.) Kit = Oil n Soil Sudan IV test kit, negative or positive result. 5.) GW = groundwater sample, dashed graphic indicates screened interval. 6.) NA = not available. 7.) Odor characteristic of manufactured gas plant waste.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.10	**GP87**	**6 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
111				GP	19	PID = 0.0 ppm			110.0 to 110.5 feet: SILT with SAND (ML); gray; 10% sand, fine; 90% fines, nonplastic; moist to wet. 110.5 to 113.0 feet: SILT (ML); gray; trace sand, fine; nonplastic; moist to wet.
112									
113						PID = 0.0 ppm			113.0 to 114.5 feet: SILT (ML); gray; medium to high plasticity; moist to wet.
114									
115						PID = 0.0 ppm			114.5 to 115.0 feet: SILT with SAND (ML); nonplastic.

Total Depth: 115.0 feet below ground surface.

Borehole Completion Details:
0.0 to 15.0 feet bgs: 3/8-inch bentonite chips hydrated with potable water.
0.0 to 30.0 feet bgs: 3 1/4-inch temporary steel isolation casing.
15.0 to 115.0 feet bgs: Bentonite grout slurry.
30.0 to 115.0 feet bgs: 2-inch borehole.

NOTES: *1.) Sample depths are relative to feet below ground surface (bgs). 2.) Gp = Geoprobe, 2-inch Macro Core soil sampler. 3.) PID = photoionization detector, head space readings in parts per million (ppm). 4.) Kit = Oil n Soil Sudan IV test kit, negative or positive result. 5.) GW = groundwater sample, dashed graphic indicates screened interval. 6.) NA = not available. 7.) Odor characteristic of manufactured gas plant waste.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.10	**GP88**	**1 of 7**

Project Name	**Siltronic Corporation**	TOC Elevation (feet)	
Project Location	**7200 NW Front Avenue, Portland, Oregon**	Surface Elevation (feet)	
Start/End Date	**05/08/06 to 05/09/06**	Northing	
Driller/Equipment	**Geo-Tech Explorations, Inc./Geoprobe**	Easting	
Geologist/Engineer	**Scout Mauldin**	Hole Depth	**135.0-feet**
Sample Method	**Geoprobe**	Outer Hole Diam	**3 1/4-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1									0.0 to 0.5 feet: Topsoil.
2									
3									
4									
5									
6									
7									
8									
9									0.5 to 85.0 feet: No soil samples collected until 85.0 feet below ground surface.
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

NOTES: *1.) Sample depths are relative to feet below ground surface (bgs). 2.) Gp = Geoprobe, 2-inch Macro Core soil sampler. 3.) PID = photoionization detector, head space readings in parts per million (ppm). 4.) Kit = Oil n Soil Sudan IV test kit, negative or positive result. 5.) GW = groundwater sample, dashed graphic indicates screened interval. 6.) NA = not available. 7.) Odor characteristic of manufactured gas plant waste.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.10	**GP88**	**2 of 7**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Sample Data: Percent Recovery	Sample Data: Collection Method	Sample Data: Number	Sample Data: Name (Type)	Sample Data: Blows/6"	Lithologic Column	Soil Description
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									*No soil samples collected until 85.0 feet below ground surface.*
32									
33									
34									
35									*@ 35.0 feet: Set 3 1/4-inch temporary isolation casing in place. Use bentonite chips to create a seal. Boring continued with the 2-inch macro core sampler.*
36									
37									
38									
39									
40									
41									
42									

NOTES: *1.) Sample depths are relative to feet below ground surface (bgs). 2.) Gp = Geoprobe, 2-inch Macro Core soil sampler. 3.) PID = photoionization detector, head space readings in parts per million (ppm). 4.) Kit = Oil n Soil Sudan IV test kit, negative or positive result. 5.) GW = groundwater sample, dashed graphic indicates screened interval. 6.) NA = not available. 7.) Odor characteristic of manufactured gas plant waste.*

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.10	**GP88**	**3 of 7**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Sample Data: Percent Recovery	Sample Data: Collection Method	Sample Data: Number	Sample Data: Name (Type)	Sample Data: Blows/6"	Lithologic Column	Soil Description
43									
44									
45									
46									
47									
48									
49									
50									
51									
52									
53									
54									*No soil samples collected until 85.0 feet below ground surface.*
55									
56									
57									
58									
59									
60									
61									
62									
63									
64									
65									

NOTES: *1.) Sample depths are relative to feet below ground surface (bgs). 2.) Gp = Geoprobe, 2-inch Macro Core soil sampler. 3.) PID = photoionization detector, head space readings in parts per million (ppm). 4.) Kit = Oil n Soil Sudan IV test kit, negative or positive result. 5.) GW = groundwater sample, dashed graphic indicates screened interval. 6.) NA = not available. 7.) Odor characteristic of manufactured gas plant waste.*

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.10	GP88	4 of 7

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66									
67									
68									
69									
70									
71									
72									
73									
74									
75									
76									No soil samples collected until 85.0 feet below ground surface.
77									
78									
79									
80									
81									
82									
83									
84									
85			**100%**	**GP**	**1**	**PID = 0.0 ppm**			85.0 to 89.5 feet: SAND (SP); dark gray; 100% sand, fine to medium; wet.
86									
87									

NOTES: 1.) Sample depths are relative to feet below ground surface (bgs). 2.) Gp = Geoprobe, 2-inch Macro Core soil sampler. 3.) PID = photoionization detector, head space readings in parts per million (ppm). 4.) Kit = Oil n Soil Sudan IV test kit, negative or positive result. 5.) GW = groundwater sample, dashed graphic indicates screened interval. 6.) NA = not available. 7.) Odor characteristic of manufactured gas plant waste.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.10	GP88	5 of 7

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88									
89						PID = 0.0 ppm			
90			100%	GP	2	PID = 0.0 ppm			89.5 to 90.0 feet: SAND (SP); dark gray; 95% sand, fine to medium; 5% fines, nonplastic; dense; wet.
91									90.0 to 91.5 feet: ORGANICS (OL); 10% fines; 90% woody debris; wet.
92									91.5 to 95.0 feet: SAND (SP); dark gray; 100% sand, fine to medium; micaceous; wet.
93						PID = 3.5 ppm			
94									@ 94 feet: Trace organics, sticks and wood pieces.
95			100%	GP GW	3				95.0 to 100.0 feet: SAND (SP); dark gray; 95% sand, fine to medium; 5% fines; micaceous; wet.
96									
97						Kit = neg			
98						GP88-97.0 GP88-DUP-97.0 PID = 3.5 ppm			
99									
100			100%	GP	4				100.0 to 105.0 feet: SAND (SP); dark gray; micaceous; wet. Pieces of polyethylene sample liner in sample.
101									
102									
103									
104				GW					
105			100%	GP	5				105.0 to 107.5 feet: SAND (SP); dark gray; 95% sand, red lithics; 5% fines; wet.
106						PID = 5.3 ppm GP88-106.0			
107									
108						Kit = neg PID = 3.2 ppm Kit = neg			107.5 to 107.6 feet: SILT (ML); dark brown; 20% sand; 80% fines, low to medium plasticity. 107.6 to 108.0 feet: SAND (SP); dark gray; 95% sand, red lithics; 5% fines; wet.
109									108.0 to 108.2 feet: SILT (ML); dark brown; 20% sand; 80% fines, low to medium plasticity.
110									108.2 to 110.0 feet: SAND (SP); dark gray; 95% sand, red lithics; 5%

NOTES: *1.) Sample depths are relative to feet below ground surface (bgs). 2.) Gp = Geoprobe, 2-inch Macro Core soil sampler. 3.) PID = photoionization detector, head space readings in parts per million (ppm). 4.) Kit = Oil n Soil Sudan IV test kit, negative or positive result. 5.) GW = groundwater sample, dashed graphic indicates screened interval. 6.) NA = not available. 7.) Odor characteristic of manufactured gas plant waste.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.10	GP88	6 of 7

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
									fines; wet.
									110.0 to 115.0 feet: No sample.
111									
112									
113									
114									
115			80%	GP GW	6				115.0 to 120.0 feet: SAND (SP); dark gray; 95% sand, fine to medium, red lithics; 5% fines; micaceous; odor; wet.
116									
117						GP88-117			
118						PID = 3.5 ppm			
119									
120			90%	GP GW	7	PID = 0.0 ppm			120.0 to 120.2 feet: SANDY SILT (ML); 20% sand, fine; 85% fines, medium plasticity; micaceous; slight odor; wet.
121						Kit = neg PID = 0.0 ppm Kit = neg			120.2 to 120.5 feet: SILT (ML); dark gray; 100% fines, medium plasticity; slight odor; moist. 120.5 to 125.0 feet: SAND (SP); dark gray; 95% sand, fine to medium; 5% fines, nonplastic; wet.
122						GP88-122.0			
123						PID = 0.0 ppm Kit = neg			
124									
125			90%	GP GW	8				125.0 to 129.5 feet: SAND (SP); dark gray; 100% sand, fine to medium; wet.
126									
127						PID = 0.0 ppm GP88-127.0			
128									
129						PID = 0.0 ppm			
130			100%	GP	9				129.5 to 130.0 feet: SAND (SP); dark gray; 95% sand, fine to medium; 5% fines; wet. 130.0 to 135.0 feet: SAND (SP); dark gray; 95% sand, fine to medium; 5% fines; micaceous; wet.
131									
132						PID = 0.0 ppm			

NOTES: 1.) Sample depths are relative to feet below ground surface (bgs). 2.) Gp = Geoprobe, 2-inch Macro Core soil sampler. 3.) PID = photoionization detector, head space readings in parts per million (ppm). 4.) Kit = Oil n Soil Sudan IV test kit, negative or positive result. 5.) GW = groundwater sample, dashed graphic indicates screened interval. 6.) NA = not available. 7.) Odor characteristic of manufactured gas plant waste.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.10	**GP88**	**7 of 7**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
133									
134									
135						**PID = 0.0 ppm**			

Total Depth: 135.0 feet below ground surface.

Borehole Completion Details:

0.0 to 15.0 feet bgs: 3/8-inch bentonite chips hydrated with potable water.

0.0 to 35.0 feet bgs: 3 1/4-inch temporary steel isolation casing.

15.0 to 135.0 feet bgs: Bentonite grout slurry.

35.0 to 135.0 feet bgs: 2-inch borehole.

NOTES: *1.) Sample depths are relative to feet below ground surface (bgs). 2.) Gp = Geoprobe, 2-inch Macro Core soil sampler. 3.) PID = photoionization detector, head space readings in parts per million (ppm). 4.) Kit = Oil n Soil Sudan IV test kit, negative or positive result. 5.) GW = groundwater sample, dashed graphic indicates screened interval. 6.) NA = not available. 7.) Odor characteristic of manufactured gas plant waste.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.10	**GP89**	**1 of 6**

Project Name	**Siltronic Corporation**	TOC Elevation (feet)	
Project Location	**7200 NW Front Avenue, Portland, Oregon**	Surface Elevation (feet)	
Start/End Date	**5/11/06 to 5/11/06**	Northing	
Driller/Equipment	**Geo-Tech Explorations, Inc./Geoprobe**	Easting	
Geologist/Engineer	**Scout Mauldin**	Hole Depth	**110.0-feet**
Sample Method	**Geoprobe**	Outer Hole Diam	**3 1/4-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1									0.0 to 0.5 feet: Topsoil.
2									
3									
4									
5									
6									
7									
8									
9									0.5 to 95.0 feet: No soil samples collected until 95.0 feet below ground surface.
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

NOTES: *1.) Sample depths are relative to feet below ground surface (bgs). 2.) Gp = Geoprobe, 2-inch Macro Core soil sampler. 3.) PID = photoionization detector, head space readings in parts per million (ppm). 4.) Kit = Oil n Soil Sudan IV test kit, negative or positive result. 5.) GW = groundwater sample, dashed graphic indicates screened interval. 6.) NA = not available.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.10	**GP89**	**2 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									@ 30.0 feet: Set 3 1/4-inch temporary isolation casing in place. Use bentonite chips to create a seal. Boring continued with the 2-inch macro core sampler.
31									
32									
33									No soil samples collected until 95.0 feet below ground surface.
34									
35									
36									
37									
38									
39									
40									
41									
42									

NOTES: *1.) Sample depths are relative to feet below ground surface (bgs). 2.) Gp = Geoprobe, 2-inch Macro Core soil sampler. 3.) PID = photoionization detector, head space readings in parts per million (ppm). 4.) Kit = Oil n Soil Sudan IV test kit, negative or positive result. 5.) GW = groundwater sample, dashed graphic indicates screened interval. 6.) NA = not available.*

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.10	**GP89**	**3 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Sample Data: Percent Recovery	Sample Data: Collection Method	Sample Data: Number	Sample Data: Name (Type)	Sample Data: Blows/6"	Lithologic Column	Soil Description
43									
44									
45									
46									
47									
48									
49									
50									
51									
52									
53									
54									*No soil samples collected until 95.0 feet below ground surface.*
55									
56									
57									
58									
59									
60									
61									
62									
63									
64									
65									

NOTES: *1.) Sample depths are relative to feet below ground surface (bgs). 2.) Gp = Geoprobe, 2-inch Macro Core soil sampler. 3.) PID = photoionization detector, head space readings in parts per million (ppm). 4.) Kit = Oil n Soil Sudan IV test kit, negative or positive result. 5.) GW = groundwater sample, dashed graphic indicates screened interval. 6.) NA = not available.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.10	**GP89**	**4 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Sample Data: Percent Recovery	Sample Data: Collection Method	Sample Data: Number	Sample Data: Name (Type)	Sample Data: Blows/6"	Lithologic Column	Soil Description
66									
67									
68									
69									
70									
71									
72									
73									
74									
75									
76									*No soil samples collected until 95.0 feet below ground surface.*
77									
78									
79									
80									
81									
82									
83									
84									
85									
86									
87									

NOTES: *1.) Sample depths are relative to feet below ground surface (bgs). 2.) Gp = Geoprobe, 2-inch Macro Core soil sampler. 3.) PID = photoionization detector, head space readings in parts per million (ppm). 4.) Kit = Oil n Soil Sudan IV test kit, negative or positive result. 5.) GW = groundwater sample, dashed graphic indicates screened interval. 6.) NA = not available.*

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.10	GP89	5 of 6

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88–94									No soil samples collected until 95.0 feet below ground surface.
95			100%	GP GW	1	PID = 3.0 Kit = neg			95.0 to 96.0 feet: SILTY SAND (SM); dark gray; 60% sand; 40% fines; micaceous.
96						Kit = neg			96.0 to 97.0 feet: SAND (SP); dark gray, 100% sand; micaceous; wet.
97						GP89-96.0 (grain size) PID = 32.1			97.0 to 100.0 feet: SILT (ML) dark gray; 10% sand; 90% fines, medium plasticity; moist.
98						GP89-97.0 Kit = neg			@ 97.5 feet: Silt with sand lense.
99						for soil and water Kit = neg			@ 97.7 feet: Becomes dry.
100			100%	GP	2	PID = 22.6 PID = 0.0			100.0 to 102.5 feet: SILT (ML); dark gray; 5% sand; 95% fines; medium plasticity; damp to moist.
101–102				GW					
103						PID = 0.0 Kit = neg			102.5 to 105.0 feet: SAND (SP); gray; 100% sand; micaceous; wet. @ 102.8 feet: Sandy silt lense.
104						Kit = neg GP89-104.0			
105			100%	GP	3				105.0 to 108.5 feet: SILT (ML); dark gray; 10% sand; 90% fines, low to medium plasticity; damp to moist.
106–108									
109						Kit = neg			108.5 to 108.8 feet: SILT with SAND (ML); dark gray; wet. 108.8 to 110.0 feet: SILT (ML); dark gray; 10% sand; 90% fines, low to medium plasticity; damp to dry.
110									

NOTES: 1.) Sample depths are relative to feet below ground surface (bgs). 2.) Gp = Geoprobe, 2-inch Macro Core soil sampler. 3.) PID = photoionization detector, head space readings in parts per million (ppm). 4.) Kit = Oil n Soil Sudan IV test kit, negative or positive result. 5.) GW = groundwater sample, dashed graphic indicates screened interval. 6.) NA = not available.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.10	**GP89**	**6 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Sample Data: Percent Recovery	Sample Data: Collection Method	Sample Data: Number	Sample Data: Name (Type)	Sample Data: Blows/6"	Lithologic Column	Soil Description

Total Depth: 110.0 feet below ground surface.

Borehole Completion Details:
0.0 to 15.0 feet bgs: 3/8-inch bentonite chips hydrated with potable water.
0.0 to 30.0 feet bgs: 3 1/4-inch temporary steel isolation casing.
15.0 to 110.0 feet bgs: Bentonite grout slurry.
30.0 to 110.0 feet bgs: 2-inch borehole.

NOTES: *1.) Sample depths are relative to feet below ground surface (bgs). 2.) Gp = Geoprobe, 2-inch Macro Core soil sampler. 3.) PID = photoionization detector, head space readings in parts per million (ppm). 4.) Kit = Oil n Soil Sudan IV test kit, negative or positive result. 5.) GW = groundwater sample, dashed graphic indicates screened interval. 6.) NA = not available.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.10	**GP97**	**1 of 2**

Project Name	**Siltronic Corporation**	TOC Elevation (feet)	
Project Location	**7200 NW Front Avenue, Portland, Oregon**	Surface Elevation (feet)	**NA**
Start/End Date	**06/11/07 to 06/11/07**	Northing	
Driller/Equipment	**Geo-Tech - Boart Longyear/Geoprobe**	Easting	
Geologist/Engineer	**Scout Mauldin**	Hole Depth	**40.0-feet**
Sample Method	**Geoprobe**	Outer Hole Diam	**2-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–9									0.0 to 10.0 feet: Air knife by vacuum truck. No observation.
10				GP					10.0 to 12.0 feet: No recovery.
12–13						PID = 0.0 ppm			12.0 to 18.0 feet: SAND (SP); dark grayish brown; 100% sand; trace fines; no odor; wet.
15				GP					
17–18						PID = 0.0 ppm			
18–19									18.0 to 19.0 feet: GRAVELLY SAND (SP); dark gray; angular to subrounded; no odor; wet.
19				GW		GP97-W-21.0			19.0 to 20.0 feet: SAND (SP); dark gray; no odor; wet.
20									

NOTES: 1.) Depths are relative to feet below ground surface (bgs). 2.) GP = Geoprobe, 2-inch Macro Core soil sampler. 3.) PID = photoionization detector, head space readings in parts per million (ppm). 4.) GW = groundwater sample, dashed graphic indicates screened interval. 5.) NA = not available. 6.) MGP = manufactured gas product.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.10	**GP97**	**2 of 2**

Depth (feet, BGS)	Well Details	Sample Data: Interval / Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
20			GP					20.0 to 22.5 feet: SAND with GRAVEL (SP); dark brown; fine to medium; wet.
21								
22								
23								22.5 to 25.0 feet: Sample was capped in macro core. Sample appears to be SAND (SP); dark gray; wet; MGP waste. Sheen observed at the end of the macro core.
24								
25			GP		PID = 11.6 ppm			25.0 to 30.0 feet: Sample was capped in macro core. Sample appears to be SILT (ML); gray; trace sand; odor; wet; MGP waste.
26								
27								
28								
29								
30			GP		PID = 12.9 ppm			30.0 to 35.0 feet: Sample was capped in macro core. Sample appears to be SILT (ML); gray; odor; wet; MGP waste.
31								
32								
33			GW		GP97-W-35.0			
34								
35			GP					@ 35.0 feet: Trace sand. 35.0 to 36.5 feet: SILT with SAND (ML); gray; odor.
36					GP97-S-36.0			
37								@ 36.5 feet and 36.9 feet: SAND (SP); sheen; odor; MGP waste. 36.9 to 38.3 feet: SILT with SAND (ML); grayish brown; sheen; odor; MGP waste.
38					PID = 9.8 ppm			
39								@ 38.3 feet: SAND (SP); odor; sheen.
40								Total Depth: 40.0 feet below ground surface.

Borehole Completion Details:
0.0 to 40.0 feet bgs: 2-inch borehole.
0.0 to 4.0 feet bgs: Gravel backfill.
4.0 to 40.0 feet bgs: Cement grout slurry with 2% Bentonite content.

NOTES: 1.) Depths are relative to feet below ground surface (bgs). 2.) GP = Geoprobe, 2-inch Macro Core soil sampler. 3.) PID = photoionization detector, head space readings in parts per million (ppm). 4.) GW = groundwater sample, dashed graphic indicates screened interval. 5.) NA = not available. 6.) MGP = manufactured gas product.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.10	**GP98**	**1 of 2**

Project Name	**Siltronic Corporation**	TOC Elevation (feet)	
Project Location	**7200 NW Front Avenue, Portland, Oregon**	Surface Elevation (feet)	**NA**
Start/End Date	**06/11/07 to 06/11/07**	Northing	
Driller/Equipment	**Geo-Tech - Boart Longyear/Geoprobe**	Easting	
Geologist/Engineer	**Scout Mauldin**	Hole Depth	**40.0-feet**
Sample Method	**Geoprobe**	Outer Hole Diam	**2-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–9									0.0 to 10.0 feet: Air knife by vacuum truck. No observation.
10				GP					10.0 to 12.0 feet: No recovery.
12–13						PID = 0.0 ppm			12.0 to 15.0 feet: SAND (SP); dark grayish brown; 100% sand, fine to medium; trace fines; no odor; moist to wet.
15				GP					15.0 to 17.7 feet: No recovery.
17–18						PID = 0.0 ppm			17.7 to 20.0 feet: SAND (SP); dark grayish brown; 100% sand, fine to medium; trace fines; no odor; moist to wet.
19–20									@ 19.4 feet and 20.0 feet: Angular to subangular gravel.

NOTES: 1.) Depths are relative to feet below ground surface (bgs). 2.) GP = Geoprobe, 2-inch Macro Core soil sampler. 3.) PID = photoionization detector, head space readings in parts per million (ppm). 4.) GW = groundwater sample, dashed graphic indicates screened interval. 5.) NA = not available. 6.) MGP = manufactured gas product.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.10	**GP98**	**2 of 2**

Depth (feet, BGS)	Well Details	Sample Data: Interval / Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
20			GP					20.0 to 23.0 feet: No recovery.
21								
22			GW		GP98-W-23.5			
23					PID = 0.0 ppm			
24								23.0 to 24.5 feet: SAND (SP); dark gray; 100% sand, fine to medium; no odor; wet.
25								24.5 to 25.0 feet: SILTY SANDY GRAVEL (GP); gray; angular to subangular; no odor; wet.
			GP					25.0 to 27.4 feet: No recovery.
26								
27								
28					PID = 0.0 ppm			27.4 to 27.8 feet: SAND (SP); dark gray; slight odor; wet. 27.8 to 28.8 feet: SILT (ML); dark gray; trace sand; wet.
29								28.8 to 30.0 feet: SILT (ML); grayish brown, mottling; petroleum-like odor.
30								@ 29.0 feet: Sand lense.
			GP					30.0 to 35.0 feet: No recovery.
31								
32								
33								
34								
35			GP					35.0 to 40.0 feet: SILTY SAND (SM); dark gray; sheen; odor; wet; MGP waste.
36					GP98-W-38.0			
37								
38					GP98-S-37.5			
39								
40								Total Depth: 40.0 feet below ground surface.

<u>Borehole Completion Details:</u>
0.0 to 40.0 feet bgs: 2-inch borehole.
0.0 to 4.0 feet bgs: Gravel backfill.
4.0 to 40.0 feet bgs: Cement grout slurry with 2% Bentonite content.

NOTES: 1.) Depths are relative to feet below ground surface (bgs). 2.) GP = Geoprobe, 2-inch Macro Core soil sampler. 3.) PID = photoionization detector, head space readings in parts per million (ppm). 4.) GW = groundwater sample, dashed graphic indicates screened interval. 5.) NA = not available. 6.) MGP = manufactured gas product.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.10	**GP99**	**1 of 2**

Project Name	**Siltronic Corporation**	TOC Elevation (feet)	
Project Location	**7200 NW Front Avenue, Portland, Oregon**	Surface Elevation (feet)	**NA**
Start/End Date	**06/07/07 to 06/07/07**	Northing	
Driller/Equipment	**Geo-Tech - Boart Longyear/Geoprobe**	Easting	
Geologist/Engineer	**Scout Mauldin**	Hole Depth	**40.0-feet**
Sample Method	**Geoprobe**	Outer Hole Diam	**2-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–9									0.0 to 10.0 feet: Air knife by vacuum truck. No observation.
10				GP					10.0 to 11.5 feet: No recovery.
11									
12									11.5 to 12.6 feet: SANDY SILT (ML); dark gray; wet.
13						PID = 0.0 ppm			12.6 to 13.1 feet: SILT (ML); dark gray; sand lenses; moist.
14									13.1 to 15.0 feet: SILTY SAND (SM); wet.
15			100%	GP					15.0 to 18.5 feet: SILT with SAND (ML); dark gray; slight odor; damp.
16									
17									@ 17.5 feet: 1-inch subangular gravel.
18						PID = 0.0 ppm			@ 18.5 feet: 1/2-inch subangular gravel.
19									18.5 to 19.2 feet: SAND (SP); orangish brown; no odor; damp.
20									19.2 to 19.4 feet: GRAVEL (GP); gray; dry. 19.4 to 20.0 feet: SAND (SP); orangish brown; no odor; damp.

NOTES: 1.) Depths are relative to feet below ground surface (bgs). 2.) GP = Geoprobe, 2-inch Macro Core soil sampler. 3.) PID = photoionization detector, head space readings in parts per million (ppm). 4.) GW = groundwater sample, dashed graphic indicates screened interval. 5.) NA = not available. 6.) MGP = manufactured gas product.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.10	**GP99**	**2 of 2**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21				GP					20.0 to 22.0 feet: No recovery.
22									
23						PID = 0.0 ppm			22.0 to 25.0 feet: SAND (SP); orangish brown; trace silt; no odor; moist to damp.
24				GW		GP99-W-25.5			
25									@ 24.5 feet: 3/4-inch subangular gravel.
26				GP					25.0 to 27.3 feet: No recovery.
27									
28						PID = 17.1 ppm			27.3 to 30.0 feet: SILT (ML); black; some sand; clayey consistency in some areas; sheen, odor; MGP waste.
29									
30			0%	GP					30.0 to 30.7 feet: No recovery.
31						PID = 3.2 ppm			30.7 to 31.0 feet: SILT (ML); dark gray; some sand; sheen; odor; MGP waste.
32									31.0 to 33.3 feet: SILT with SAND (ML); olive gray with orange mottling; odor; moist; small fingers of MGP waste.
33									
34									33.3 to 35.0 feet: SAND with SILT (SM); gray; wet. @ 34.2 feet and 34.6 feet: Silt with olive gray mottling.
35				GP					35.0 to 40.0 feet: SAND (SP); gray; fine; no odor; wet.
36									
37									
38						PID = 0.0 ppm			
39									
40									

Total Depth: 40.0 feet below ground surface.

Borehole Completion Details:
0.0 to 40.0 feet bgs: 2-inch borehole.
0.0 to 4.0 feet bgs: Gravel backfill.
4.0 to 40.0 feet bgs: Cement grout slurry with 2% Bentonite content.

NOTES: 1.) Depths are relative to feet below ground surface (bgs). 2.) GP = Geoprobe, 2-inch Macro Core soil sampler. 3.) PID = photoionization detector, head space readings in parts per million (ppm). 4.) GW = groundwater sample, dashed graphic indicates screened interval. 5.) NA = not available. 6.) MGP = manufactured gas product.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20/07	**GP111**	**1 of 5**

Project Name	**Siltronic Corporation**	TOC Elevation (feet)	
Project Location	**7200 NW Front Avenue, Portland, Oregon**	Surface Elevation (feet)	**NA**
Start/End Date	**5/15/08 to 5/19/08**	Northing	
Driller/Equipment	**Cascade Drilling, Inc./Geoprobe**	Easting	
Geologist/Engineer	**Scout Mauldin**	Hole Depth	**110.0-feet**
Sample Method	**Geoprobe**	Outer Hole Diam	**2-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1			**0**	**GP**					0.0 to 10.0 feet: Air knife by vacuum truck. No observations.
5			**0**	**GP**					
10			**54**	**GP**					10.0 to 12.7 feet: SAND (SP); gray; fine sand; loose; no odor; moist.
13									12.7 to 15.0 feet: NO RECOVERY.
15			**70**	**GP**					15.0 to 18.5 feet: SAND (SP); black; fine sand; loose; wet.
17									@ 17.4 feet: 0.3-foot silt lens.
18									@ 17.9 feet: 0.1-foot wood fragment.
19									@ 17.9 to 18.5 feet: Dark black; sheen; odor. Strong odor and heavy sheen in shoe.
									@ 18.2 feet: 0.1-foot silt lens.
20									18.5 to 20.0 feet: NO RECOVERY.

NOTES: 1.) Depths are relative to feet below ground surface (bgs). 2.) GP = Geoprobe, 2-inch Macro Core soil sampler. 3.) NA = not available. 4) Boring backfilled with bentonite grout.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20/07	**GP111**	**2 of 5**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			**50**	**GP**					20.0 to 21.5 feet: SAND (SP); black; fine sand; loose; odor; sheen; wet. @ 20.2 feet: 0.1-foot silt lens.
22									21.5 to 22.5 feet: SILT (ML); gray; low plasticity fines; no odor. @ 22.0 feet: Grades to brown; no odor.
23									22.5 to 25.0 feet: NO RECOVERY.
24									
25			**72**	**GP**					25.0 to 26.5 feet: SILT WITH SAND (ML); brown; soft; no odor; moist.
26									
27									26.5 to 28.6 feet: SILT (ML); brown with orange mottling; medium soft; moist.
28									@ 28.0 feet: Three 1-millimeter NAPL blebs.
29									28.6 to 30.0 feet: NO RECOVERY.
30			**100**	**GP**					30.0 to 30.5 feet: SILTY SAND (SM); brown; no odor; moist to wet.
31									30.5 to 30.9 feet: SAND (SP); brown; fine sand; loose; no odor; wet. 30.9 to 31.5 feet: SILT WITH SAND (ML); brown; no odor; moist.
32									31.5 to 33.0 feet: SILTY SAND (SM); brown; no odor; moist to wet.
33									
34									33.0 to 35.0 feet: SILT (ML); brown with orange mottling; low to medium plasticity fines; medium-hard; moist. @ 33.4 feet: NAPL staining (one 1-millimeter bleb). @ 34.3 feet: Grades to orange-gray.
35			**80**	**GP**					35.0 to 36.0 feet: SILT (ML); gray with orange mottling; medium-hard; no odor; moist.
36									36.0 to 39.0 feet: SAND (SP); gray; fine sand; trace low plasticity fines; no odor; wet.
37									
38									@ 37.5 to 37.8 feet: SILT (ML); gray; medium-hard; no odor; moist.
39									39.0 to 40.0 feet: NO RECOVERY.
40			**100**	**GP**					40.0 to 41.0 feet: SAND (SP); brownish-gray with iron-orange staining; loose; wet.
41									41.0 to 41.5 feet: SAND (SP); gray; trace low plasticity fines; moist.
42									41.5 to 42.0 feet: SAND (SP); gray; fine sand; loose; no odor; wet. 42.0 to 42.5 feet: SILT WITH SAND (ML); gray; medium soft; no odor;

NOTES: *1.) Depths are relative to feet below ground surface (bgs). 2.) GP = Geoprobe, 2-inch Macro Core soil sampler. 3.) NA = not available. 4) Boring backfilled with bentonite grout.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20/07	**GP111**	**3 of 5**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43									moist.
									42.5 to 43.0 feet: SAND (SP); gray; fine sand; loose; slight odor.
44									43.0 to 45.4 feet: SILT (ML); gray; medium plasticity fines; trace to some sand; no odor; moist. Stiffens near the shoe.
45			**80**	**GP**					
46									45.4 to 47.0 feet: SAND WITH SILT (SP); gray; fine sand; slight odor; wet.
47									@ 46.5 feet: Grades to trace silt.
									47.0 to 48.0 feet: SAND (SP); gray; fine to medium sand; loose; wet.
48									48.0 to 49.0 feet: SILTY SAND (SM); gray; slight odor; moist.
49									49.0 to 50.0 feet: NO RECOVERY.
50			**100**	**GP**					50.0 to 53.0 feet: SAND (SP); gray; fine sand; loose; slight odor; wet.
51									@ 50.0 to 51.6 feet: 5-10% fines.
52									@ 52.0 to 53.0 feet: 5-10% fines.
53									53.0 to 55.0 feet: SAND (SP); gray; fine sand; loose; odor; wet.
54									@ 53.5 feet: Silty lens. @ 53.5 to 55.0 feet: Trace fines.
55			**0**	**GP**					55.0 to 60.0 feet: NO RECOVERY. In shoe: Gray-brown; loose sand and fine gravel; wet.
56									
57									
58									
59									
60			**100**	**GP**					60.0 to 61.0 feet: SILT WITH SAND (ML); gray; non to low plasticity fines; stiff; no odor; moist.
61									61.0 to 62.0 feet: SAND (SP); gray; trace fines; fine sand; loose; no odor; wet.
62									62.0 to 62.9 feet: SAND WITH SILT (SP); gray; fine sand; no odor; moist.
63									62.9 to 63.8 feet: SILT (ML); gray; medium plasticity fines; stiff; no odor; moist.
64									63.8 to 65.0 feet: SAND (SP); gray; trace fines; loose; no odor; wet.
65									@ 65.0 feet: In shoe: SILT (ML); gray; moist.

NOTES: *1.) Depths are relative to feet below ground surface (bgs). 2.) GP = Geoprobe, 2-inch Macro Core soil sampler. 3.) NA = not available. 4) Boring backfilled with bentonite grout.*

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20/07	**GP111**	**4 of 5**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66			**100**	**GP**					65.0 to 67.7 feet: SILTY SAND (SM); gray; 50% fines; 50% sand; looser; no odor; wet.
67									@ 66.2 to 67.3 feet: Siltier; very dense; hard-packed in Macro Core; moist.
68									67.7 to 70.0 feet: SAND WITH SILT (SP); gray; 10% fines; 90% sand; dense; hard-packed; no odor; wet.
69									
70			**100**	**GP**					70.0 to 74.0 feet: SAND (SP); gray; fine sand; loose; wet.
71									
72									
73									@ 72.4 feet: 0.1-foot silty sand lens.
74									74.0 to 75.0 feet: SILTY SAND (SM); gray; 20% fines; 80% sand; medium loose; no odor; wet.
75			**100**	**GP**					75.0 to 76.3 feet: SAND (SP); gray; fine sand; loose; no odor; wet.
76									
77									76.3 to 77.0 feet: SILT (ML); gray; low plasticity fines; trace sand; medium stiffness; moist.
78									77.0 to 78.2 feet: SAND (SP); gray; fine sand; loose; no odor; wet.
79									78.2 to 80.0 feet: SAND (SP); gray; fine sand; dense; no odor; moist.
80			**100**	**GP**					80.0 to 82.7 feet: SAND (SP); gray; trace fines; fine sand; no odor; loose; wet.
81									
82									
83									82.7 to 83.3 feet: SILTY SAND (SM); gray; 20% fines; 80% sand; no odor; wet.
84									83.3 to 85.0 feet: SAND (SP); gray; trace fines; fine sand; dense; moist.
85			**100**	**GP**					85.0 to 89.0 feet: SILTY SAND (SM); gray; 25% fines; 75% sand, fine to medium, grading to fine; loose; no odor; wet.
86									@ 85.0 to 86.0 feet: White ashy material and small wood slivers.
87									

NOTES: *1.) Depths are relative to feet below ground surface (bgs). 2.) GP = Geoprobe, 2-inch Macro Core soil sampler. 3.) NA = not available. 4) Boring backfilled with bentonite grout.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20/07	**GP111**	**5 of 5**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88									
89									89.0 to 90.0 feet: SAND (SP); gray; trace fines; fine sand; medium density; no odor; moist.
90			**100**	**GP**					90.0 to 91.8 feet: SANDY SILT (ML); gray; low plasticity fines; soft; no odor; moist.
91									
92									91.8 to 92.3 feet: SAND (SP); gray; trace fines; loose; wet; soupy. Ashy material throughout.
93									92.3 to 95.0 feet: SANDY SILT (ML); gray; low plasticity fines; soft; no odor; moist.
94									
95			**100**	**GP**					95.0 to 98.2 feet: SILT WITH SAND (ML); gray; medium plasticity fines; soft; moist.
96									
97									
98									98.2 to 98.5 feet: SILTY SAND (SM); gray; fine sand; loose; no odor.
99									98.5 to 100.0 feet: SILT (ML); gray; medium plasticity fines; trace sand; no odor; moist.
100			**100**	**GP**					100.0 to 105.0 feet: SAND (SP); gray; fine sand; loose; no odor; wet; soupy.
101									
102									
103									
104									
105			**100**	**GP**					105.0 to 107.0 feet: SAND WITH SILT (SP); gray; soft; no odor; moist to wet.
106									
107									107.0 to 110.0 feet: SAND (SP); trace fines; fine sand; loose; wet; soupy.
108									@ 108.4 feet: Silt lens.
109				**GP**		**GP111-S-110.0 (Soil)**			@ 109.6 feet: Silt lens.
110									End of boring at 110.0 feet.

NOTES: *1.) Depths are relative to feet below ground surface (bgs). 2.) GP = Geoprobe, 2-inch Macro Core soil sampler. 3.) NA = not available. 4) Boring backfilled with bentonite grout.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20/07	**GP112**	**1 of 6**

Project Name	**Siltronic Corporation**	TOC Elevation (feet)	
Project Location	**7200 NW Front Avenue, Portland, Oregon**	Surface Elevation (feet)	**NA**
Start/End Date	**5/19/08 to 5/20/08**	Northing	
Driller/Equipment	**Cascade Drilling, Inc./Geoprobe**	Easting	
Geologist/Engineer	**Scout Mauldin**	Hole Depth	**125.0-feet**
Sample Method	**Geoprobe**	Outer Hole Diam	**2-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
0			**0**	**GP**					0.0 to 0.5 feet: Concrete.
1									0.5 to 10.0 feet: Air knife by vacuum truck. No observations.
2									
3									
4									
5			**0**	**GP**					
6									
7									
8									
9									
10			**70**	**GP**					10.0 to 13.5 feet: SAND (SP); dark gray; fine sand; loose; no odor; moist.
11									
12									
13									
14									13.5 to 15.0 feet: NO RECOVERY.
15			**80**	**GP**					15.0 to 18.0 feet: SAND (SP); dark gray; fine sand; loose; odor; moist.
16									
17									@ 16.5 feet: Wet.
18									@ 17.8 to 18.0 feet: Dark gray to black; odor.
19									18.0 to 19.0 feet: SILT WITH GRAVEL (ML); gray; 80% fines, medium plasticity; 20% gravel, coarse, subangular to subrounded; hard; hydrocarbon odor; moist.
20									19.0 to 20.0 feet: NO RECOVERY.

NOTES: *1.) Depths are relative to feet below ground surface (bgs). 2.) GP = Geoprobe, 2-inch Macro Core soil sampler. 3.) NA = not available. 4) Boring backfilled with bentonite grout.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20/07	GP112	2 of 6

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			34	GP					20.0 to 21.3 feet: SILTY SAND WITH GRAVEL (SM); dark gray to black, grading to brown; coarse, subrounded gravel, green tint; medium density; strong odor; sheen; moist. @ 21.0 feet: Wood fragments. @ 21.3 feet: 1-millimeter silt lens.
22									21.3 to 21.7 feet: SAND (SP); black; fine sand; loose; strong odor; sheen; wet.
23									21.7 to 25.0 feet: NO RECOVERY.
24									
25			94	GP					25.0 to 25.5 feet: SILTY SAND (SM); black; loose; strong odor; heavy sheen; wet; soupy.
26									25.5 to 27.0 feet: SILT WITH SAND (ML); dark gray; 75% fines, low plasticity; 25% sand; soft; strong odor; heavy sheen; wet.
27									27.0 to 29.7 feet: SILT (ML); dark gray; low to medium plasticity; soft; strong odor; sheen; moist.
28									
29									
30			74	GP					29.7 to 30.0 feet: NO RECOVERY. 30.0 to 31.0 feet: SILT WITH SAND (ML); grayish-brown; low plasticity fines; soft; strong odor; heavy sheen; moist to wet.
31									31.0 to 32.0 feet: SILT (ML); grayish-brown with orange mottling and black staining; medium plasticity fines; soft; strong odor; moist.
32									32.0 to 33.7 feet: SILT (ML); brown with orange mottling; medium plasticity fines; soft; strong odor. @ 32.1 feet: Sand lens; staining; strong sheen. @ 32.5 feet: 1-millimeter NAPL blebs. @ 33.2 feet: Sand lens; staining; strong sheen. @ 33.6 feet: 1-millimeter NAPL blebs.
33									
34									33.7 to 35.0 feet: NO RECOVERY.
35			100	GP					35.0 to 37.5 feet: SILT (ML); brownish-gray with orange mottling and black staining; medium plasticity; soft; strong odor; moist.
36									
37									
38									37.5 to 38.5 feet: SAND (SP); grayish-black with black staining; trace fines; strong odor; heavy sheen; wet.
39									38.5 to 40.0 feet: SAND WITH SILT (SP); gray; very fine sand; medium density; 10 % fines; 90% sand; odor; sheen when placed in water; moist. @ 39.4 feet: 1-inch silt lens.
40			100	GP					40.0 to 43.0 feet: SAND (SP); gray; fine sand; loose; strong odor; rainbow sheen; wet; soupy.
41									
42									

NOTES: *1.) Depths are relative to feet below ground surface (bgs). 2.) GP = Geoprobe, 2-inch Macro Core soil sampler. 3.) NA = not available. 4) Boring backfilled with bentonite grout.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20/07	**GP112**	**3 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43									43.0 to 45.0 feet: SILTY SAND (SM); gray; 20% fines; 80% sand, fine, medium density; odor; slight sheen when placed in water; moist.
44									
45			**100**	**GP**					45.0 to 46.0 feet: SILTY SAND (SM); gray; strong odor; wet.
46									46.0 to 49.0 feet: SANDY SILT (ML); gray; 60% fines; 40% sand; soft; strong hydrocarbon odor; rainbow sheen when placed in water; wet; soupy.
47									
48									
49									49.0 to 50.0 feet: SAND (SP); gray; fine sand; medium density; strong odor; moist to wet.
50			**100**	**GP**					50.0 to 55.0 feet: SAND (SP); gray; fine sand; loose; odor.
51									
52									
53									
54									@ 54.0 to 55.0 feet: Slight increase in density.
55			**100**	**GP**					55.0 to 58.5 feet: SILTY SAND (SM); gray; 40% fines; 60% sand; soft; wet.
56									
57									@ 56.6 feet: Wood fragments. @ 57.0 feet: Wood fragments.
58									@ 58.0 feet: Sand lens.
59									58.5 to 63.0 feet: SANDY SILT (ML); gray; 60% fines, low plasticity; 40% sand; soft; moist.
60			**100**	**GP**					
61									
62									
63									63.0 to 63.5 feet: SAND WITH SILT (SP); gray; 10% fines; 90% sand; no odor; wet.
64									63.5 to 65.0 feet: SAND (SP); gray; fine sand; medium; non odor.
65									

NOTES: *1.) Depths are relative to feet below ground surface (bgs). 2.) GP = Geoprobe, 2-inch Macro Core soil sampler. 3.) NA = not available. 4) Boring backfilled with bentonite grout.*

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20/07	**GP112**	**4 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66			**100**	**GP**					65.0 to 66.0 feet: SANDY SILT (ML); gray; 70% fines, low plasticity; 30% sand, fine; medium hardness; wet.
									66.0 to 66.3 feet: SAND (SP); gray; fine sand; loose; wet; soupy.
67									66.3 to 66.6 feet: SAND WITH SILT (SP); gray; 10% fines; 90% sand; medium density; wet.
									66.6 to 67.5 feet: SAND (SP); fine sand; medium density; wet.
68									67.5 to 68.3 feet: SILTY SAND (SM); gray; 40% fines; 60% sand; medium density; wet.
69									68.3 to 68.6 feet: SANDY SILT (ML); gray; low to medium plasticity fines; soft; wet.
									68.6 to 70.0 feet: SAND (SP); gray; fine sand; medium density; moist. Hard-packed in macro core.
70			**100**	**GP**					70.0 to 71.0 feet: SAND (SP); gray; fine sand; loose; wet; soupy.
71									71.0 to 75.0 feet: SAND WITH SILT (SP); gray; 10% fines; 90% sand, fine; loose to medium density; no odor; wet.
72									
73									
74									@ 74.0 to 74.5 feet: Sand lenses.
75			**100**	**GP**					75.0 to 76.4 feet: SANDY SILT (ML); gray; 35% fines; 65% sand; soft; no odor; moist.
76									
77									76.4 to 77.8 feet: SAND (SP); gray; fine sand; loose; wet; soupy.
78									77.8 to 78.8 feet: SAND WITH SILT (SP); loose; no odor; wet.
79									78.8 to 79.5 feet: SAND (SP); gray; fine sand; loose; wet; soupy.
80			**100**	**GP**					79.5 to 80.0 feet: SAND WITH SILT (SP); gray; 10% fines; 90% sand; loose; wet.
81									80.0 to 82.5 feet: SILT (ML); gray; low to medium plasticity; soft; no odor.
82									
83									82.5 to 83.0 feet: SAND (SP); gray; fine sand; loose; wet; soupy.
									83.0 to 83.7 feet: SANDY SILT (ML); gray; low plasticity; soft; wet.
84									83.7 to 84.0 feet: SAND (SP); gray; fine sand; loose; wet; soupy.
									84.0 to 85.0 feet: SAND WITH SILT (SP); gray; 10% fines; 90% sand; medium loose; wet.
85			**100**	**GP**					85.0 to 88.8 feet: SAND (SP); gray; fine sand; loose; wet; soupy.
86									
87									

NOTES: *1.) Depths are relative to feet below ground surface (bgs). 2.) GP = Geoprobe, 2-inch Macro Core soil sampler. 3.) NA = not available. 4) Boring backfilled with bentonite grout.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20/07	**GP112**	**5 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88									
89									88.8 to 90.0 feet: SILTY SAND (SM); gray; 25% fines; 75% sand; loose; wet. @ 89.2 feet: 0.3-foot sand lens.
90			**100**	**GP**					90.0 to 92.5 feet: SAND (SP); gray; loose; wet.
91									
92									
93									92.5 to 94.0 feet: SILT (ML); gray; medium plasticity fines; soft; moist.
94									94.0 to 95.0 feet: SAND WITH SILT (SP); gray; 10% fines; 90% sand; medium density; wet.
95			**100**	**GP**					95.0 to 100.0 feet: SAND (SP); gray; fine sand; loose; wet; soupy. @ 95.0 to 96.0 feet: Ashy material throughout.
96									
97									
98									
99									
100			**100**	**GP**					100.0 to 102.5 feet: SILT (ML); gray; medium plasticity; medium soft; moist.
101									
102									
103									102.5 to 105.0 feet: SAND (SP); gray; fine to medium sand; loose; wet. Ashy material throughout.
104									
105			**100**	**GP**					105.0 to 105.6 feet: SILTY SAND (SM); gray; loose; wet.
106									105.6 to 105.9 feet: SILT WITH SAND (ML); gray; 85% fines; 15% sand; wet.
107				**GP**		**GP112-S-105.9-107.8 (Geotech)**			105.9 to 107.8 feet: This section of core was cut and capped for geotechnical analysis. No observations.
108									107.8 to 109.6 feet: SILT WITH SAND (ML); gray; soft; wet.
109									
110									109.6 to 120.0 feet: SAND (SP); gray; trace fines; loose; wet.

NOTES: 1.) Depths are relative to feet below ground surface (bgs). 2.) GP = Geoprobe, 2-inch Macro Core soil sampler. 3.) NA = not available. 4) Boring backfilled with bentonite grout.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20/07	**GP112**	**6 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
111			**100**	**GP**		**GP112-S-110.0 (Soil)**			
112									
113									
114									
115			**100**	**GP**					
116									
117									
118									
119									
120			**100**	**GP**					*120.0 to 125.0 feet: SILTY SAND (SM); brownish gray; 35% fines; soft; wet.*
121									
122									
123									
124									
125									*End of boring at 125.0 feet.*

NOTES: *1.) Depths are relative to feet below ground surface (bgs). 2.) GP = Geoprobe, 2-inch Macro Core soil sampler. 3.) NA = not available. 4) Boring backfilled with bentonite grout.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20/07	**GP113**	**1 of 6**

Project Name	**Siltronic Corporation**	TOC Elevation (feet)	
Project Location	**7200 NW Front Avenue, Portland, Oregon**	Surface Elevation (feet)	**NA**
Start/End Date	**5/21/08 to 5/22/08**	Northing	
Driller/Equipment	**Cascade Drilling, Inc./Geoprobe**	Easting	
Geologist/Engineer	**Scout Mauldin**	Hole Depth	**115.0-feet**
Sample Method	**Geoprobe**	Outer Hole Diam	**2-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
0			**0**	**GP**					*0.0 to 0.3 feet: ASPHALT.*
									0.3 to 10.0 feet: Air knife by vacuum truck. No observations.
5			**0**	**GP**					
10			**60**	**GP**					*10.0 to 10.5 feet: SAND (SP); grayish-brown; fine to medium sand; loose; moist.*
									10.5 to 11.3 feet: SILTY SAND (SM); brown; 25% fines; 75% sand; moist.
									@ 11.0 to 11.3 feet: Grades to gray; wood chips.
									11.3 to 15.0 feet: SAND (SP); grayish-brown; fine to medium sand, micaceous; loose; moist.
									@ 14.2 feet: WET.
15			**100**	**GP**					*15.0 to 20.0 feet: SAND (SP); dark gray; fine to medium sand; micaceous; loose; wet.*
									@ 18.0 to 20.0 feet: Sheen; odor.
									@ 18.7 feet: 0.3-foot silt lens.
20									

NOTES: *1.) Depths are relative to feet below ground surface (bgs). 2.) GP = Geoprobe, 2-inch Macro Core soil sampler. 3.) NA = not available. 4) Boring backfilled with bentonite grout.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20/07	**GP113**	**2 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			**100**	**GP**					20.0 to 25.0 feet: SAND (SP); dark gray to black; fine to medium sand, micaceous; loose; strong odor; heavy rainbow sheen; wet. Macro Core liner stained.
22									
23									
24									
25			**70**	**GP**					@ 25.0 feet: 0.1-foot wood chunk.
26									25.0 to 26.0 feet: SAND (SP); black; fine sand; loose; strong odor; heavy sheen; wet; soupy.
27									26.0 to 28.5 feet: SILT (ML); gray; medium plasticity; medium soft; visible staining (1-millimeter "tar blebs") throughout; strong odor; moist.
28									
29									28.5 to 30.0 feet: NO RECOVERY.
30			**60**	**GP**					30.0 to 33.0 feet: SILT (ML); greenish-gray; high plasticity; stiff; visible staining ("tar blebs") throughout; moist.
31									
32									
33									@ 32.5 to 32.6 feet: SILT (ML); orangish-grayish-green; very stiff.
									@ 32.5 to 33.0 feet: 1-millimeter interbedded sand lenses; green.
34									33.0 to 35.0 feet: NO RECOVERY.
35			**100**	**GP**					35.0 to 38.2 feet: SILT (ML); greenish-gray; medium plasticity; medium soft; odor; moist.
36									
37									
38									
39									38.2 to 40.0 feet: SAND (SP); dark gray; fine sand; medium density; odor; sheen; wet.
									@ 38.2 feet: Silty sand lens.
40			**100**	**GP**					40.0 to 45.0 feet: SILT (ML); gray; medium to high plasticity; slight odor; moist.
41									@ 41.0 feet: Sand lens.
42									

NOTES: *1.) Depths are relative to feet below ground surface (bgs). 2.) GP = Geoprobe, 2-inch Macro Core soil sampler. 3.) NA = not available. 4) Boring backfilled with bentonite grout.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20/07	**GP113**	**3 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43									@ 42.3 feet: Sand lens.
44									@ 43.4 feet: Sand lens. @ 43.4 to 45.0 feet: Stiffer.
45									
			100	**GP**					45.0 to 47.0 feet: SILT WITH SAND (ML); gray; 80% fines, low plasticity; 20% sand; moist.
46									
47									47.0 to 50.0 feet: SAND WITH SILT (SP); gray; 10 % fines; 90% sand, fine; medium density; moist to wet.
48									
49									
50									
			100	**GP**					50.0 to 51.7 feet: SILT WITH SAND (ML); gray; 75% fines; 25% sand; moist.
51									
52									51.7 to 53.8 feet: SAND (SP); gray; loose; wet; soupy.
53									@ 53.1 to 53.8 feet: More dense.
54									53.8 to 55.0 feet: SILT WITH SAND (ML); gray; 85% fines, low plasticity; 15% sand; medium stiffness; moist.
55									
			100	**GP**					55.0 to 56.0 feet: SILTY SAND (SM); gray; 40% fines; 60% sand, fine; loose; wet.
56									56.0 to 58.3 feet: SAND (SP); gray; fine sand; loose; wet.
57									@ 56.6 to 58.0 feet: Soupy.
58									
59									58.3 to 60.0 feet: SANDY SILT (ML); gray; 55% fines, non- to low plasticity; moist.
60									
			100	**GP**					60.0 to 61.0 feet: SILTY SAND (SM); gray; 25% fines; 75% sand, fine; loose.
61									61.0 to 62.7 feet: SILT WITH SAND (ML); gray; 75% fines, low plasticity; 25% sand; medium stiffness; moist.
62									
63									62.7 to 64.0 feet: SAND WITH SILT (SP); gray; 10% fines; 90% sand, fine; medium density; wet.
64									64.0 to 65.8 feet: SAND (SP); gray; fine sand; medium density; wet.
65									

NOTES: *1.) Depths are relative to feet below ground surface (bgs). 2.) GP = Geoprobe, 2-inch Macro Core soil sampler. 3.) NA = not available. 4) Boring backfilled with bentonite grout.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20/07	**GP113**	**4 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66			**100**	**GP**					*@ 65.0 to 65.8 feet: Less dense.*
									65.8 to 67.0 feet: SILTY SAND (SM); gray; 40% fines; 60% sand; soft; wet.
67									*67.0 to 70.0 feet: SAND (SP); gray; fine sand; loose; slight odor; wet. Ashy material throughout.*
68									
69									
70			**100**	**GP**					*70.0 to 75.0 feet: SAND (SP); gray; fine sand; loose; wet; soupy.*
71									
72									
73									
74									
75			**100**	**GP**					*75.0 to 80.0 feet: SAND (SP); gray; 5% fines; 95% sand, fine; loose; wet; soupy.*
76									
77									
78									
79									
80			**100**	**GP**					*80.0 to 80.9 feet: SILTY SAND (SM); gray; 40% fines; 60% sand; soft; wet.*
81									*80.9 to 81.1 feet: SAND (SP); gray; fine sand; loose; wet.*
									81.1 to 82.2 feet: SILT (ML); gray; medium plasticity; medium stiffness; moist.
82									*82.2 to 82.9 feet: SAND (SP); gray; fine sand; loose; wet; soupy. Ashy material throughout.*
83									*82.9 to 85.0 feet: SILTY SAND (SM); gray; 20% fines; 80% sand; medium density; wet.*
84									
85			**100**	**GP**					*85.0 to 87.3 feet: SANDY SILT (ML); gray; 60% fines, non to low plasticity; 40% sand; soft; moist.*
86									
87									

NOTES: *1.) Depths are relative to feet below ground surface (bgs). 2.) GP = Geoprobe, 2-inch Macro Core soil sampler. 3.) NA = not available. 4) Boring backfilled with bentonite grout.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20/07	**GP113**	**5 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88									87.3 to 89.0 feet: SAND (SP); gray; fine sand; loose; wet.
89									89.0 to 90.0 feet: SILTY SAND (SM); gray; 40% fines; 60% sand, fine; medium density; moist.
90			**100**	**GP**					90.0 to 91.0 feet: SAND (SP); gray; fine sand; loose; wet; soupy.
91									91.0 to 93.2 feet: SANDY SILT (ML); gray; 70% fines, non-plastic; 30% sand; moist.
92									
93									@ 92.9 feet: Silt lens. @ 93.1 feet: Silt lens.
94									93.2 to 96.5 feet: SAND (SP); gray; fine sand; loose; wet.
95			**100**	**GP**					
96									
97									96.5 to 100.0 feet: SILT WITH SAND (ML); gray; 85% fines, low to medium plasticity; 15% sand; moist.
98									@ 97.5 to 98.0 feet: Sand lens.
99									@ 98.5 to 98.6 feet: Sand lens.
100									@ 99.5 to 99.6 feet: Sand lens.
101			**100**	**GP**					100.0 to 110.0 feet: SAND (SP); gray; fine sand; loose; wet. @ 100.0 to 102.0 feet: Soupy.
102									
103									
104									
105			**100**	**GP**					@ 105.0 to 107.5 feet: Soupy.
106									
107									
108									
109									
110									

NOTES: *1.) Depths are relative to feet below ground surface (bgs). 2.) GP = Geoprobe, 2-inch Macro Core soil sampler. 3.) NA = not available. 4) Boring backfilled with bentonite grout.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20/07	**GP113**	**6 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
111			**100**	**GP**					*110.0 to 115.0 feet: This section of core was cut and capped for geotechnical analysis. No observations.*
112									
113				**GP**		**GP113-S-110-115 (Geotech)**			
114				**GP**		**GP113-S-115.0 (Soil)**			
115									*End of boring at 115.0 feet.*

NOTES: *1.) Depths are relative to feet below ground surface (bgs). 2.) GP = Geoprobe, 2-inch Macro Core soil sampler. 3.) NA = not available. 4) Boring backfilled with bentonite grout.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
	GP125	**1 of 6**

Project Name	**Siltronic Corporation**	TOC Elevation (feet)	
Project Location	**7200 NW Front Avenue, Portland, Oregon 97210**	Surface Elevation (feet)	
Start/End Date	**10/6/08 to 10/7/08**	Northing	
Driller/Equipment	**Marc Chalona, Cascade Drilling/Geoprobe 7720 DT**	Easting	
Geologist/Engineer	**Scout Mauldin**	Hole Depth	**110.0-feet**
Sample Method	**Geoprobe**	Outer Hole Diam	**3 1/4-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–20									*0.0 to 30.0 feet: Soil samples not collected.*

NOTES: *1. bgs = below ground surface. 2. PID = photo ionization detector, soil head space reading in parts per million. 3. ppm = parts per million. 4. Depths are relative to feet below ground surface.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
	GP125	**2 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval / Percent Recovery	Sample Data: Collection Method	Sample Data: Number	Sample Data: Name (Type)	Sample Data: Blows/6"	Lithologic Column	Soil Description
21								
22								
23								
24								
25								
26								
27								
28								
29								
30			**GP**					*30.0 to 35.0 feet: SILT (ML); brownish-gray with orange mottling; high plasticity fines; strong odor; staining and "blebs" throughout; dry to moist.*
31								*@ 31.4 feet: 0.1-inch SAND (SP) lens; black; moist.*
32								*@ 31.7 feet: 0.2-inch SAND (SP) lens; black; moist.*
33								
34								
35								*35.0 to 110.0 feet: Soil samples not collected.*
36								
37								
38								
39								
40								
41			**GW**		**GP125-W-41.0 (water)**			
42								

NOTES: *1. bgs = below ground surface. 2. PID = photo ionization detector, soil head space reading in parts per million. 3. ppm = parts per million. 4. Depths are relative to feet below ground surface.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
	GP125	**3 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Sample Data: Percent Recovery	Sample Data: Collection Method	Sample Data: Number	Sample Data: Name (Type)	Sample Data: Blows/6"	Lithologic Column	Soil Description
43									
44									
45									
46									
47									
48									
49									
50									
51									
52									
53									
54				**GW**		**GP125-W-54.0 (water)**			
55									
56									
57									
58									
59									
60									
61									
62									
63									
64									
65									

NOTES: *1. bgs = below ground surface. 2. PID = photo ionization detector, soil head space reading in parts per million. 3. ppm = parts per million. 4. Depths are relative to feet below ground surface.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
	GP125	**4 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Sample Data: Percent Recovery	Sample Data: Collection Method	Sample Data: Number	Sample Data: Name (Type)	Sample Data: Blows/6"	Lithologic Column	Soil Description
66									
67									
68									
69									
70									
71									
72									
73									
74				**GW**		**GP125-W-74.0 (water)**			
75									
76									
77									
78									
79									
80									
81									
82									
83									
84									
85									
86									
87									

NOTES: *1. bgs = below ground surface. 2. PID = photo ionization detector, soil head space reading in parts per million. 3. ppm = parts per million. 4. Depths are relative to feet below ground surface.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
	GP125	**5 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Sample Data: Percent Recovery	Sample Data: Collection Method	Sample Data: Number	Sample Data: Name (Type)	Sample Data: Blows/6"	Lithologic Column	Soil Description
88									
89									
90									
91				**GW**		**GP125-W-91.0 (water)**			
92									
93									
94									
95									
96									
97									
98									
99									
100									
101									
102									
103									
104									
105									
106									
107									
108									
109									
110									

NOTES: *1. bgs = below ground surface. 2. PID = photo ionization detector, soil head space reading in parts per million. 3. ppm = parts per million. 4. Depths are relative to feet below ground surface.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
	GP125	**6 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
					GW	**GP125-W-110.0 (water)**			*Total Depth = 110.0 feet below ground surface.*

Borehole Completion Details

0.0 to 31.0 feet bgs: 3 1/4-inch temporary, threaded steel, isolation casing.
0.0 to 110.0 feet bgs: 2 1/4-inch macrocore sampler.

0.0 to 7.0 feet bgs: 3/8'inch Baroid bentonite chips hydrated with potable water.
7.0 to 110.0 feet bgs: bentonite grout slurry.

NOTES: *1. bgs = below ground surface. 2. PID = photo ionization detector, soil head space reading in parts per million. 3. ppm = parts per million. 4. Depths are relative to feet below ground surface.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
	GP126	**1 of 2**

Project Name	**Siltronic Corporation**	TOC Elevation (feet)	
Project Location	**7200 NW Front Avenue, Portland, Oregon 97210**	Surface Elevation (feet)	
Start/End Date	**10/8/08 to 10/8/08**	Northing	
Driller/Equipment	**Marc Chalona, Cascade Drilling/Geoprobe 7720 DT**	Easting	
Geologist/Engineer	**Scout Mauldin**	Hole Depth	**38.0-feet**
Sample Method	**Geoprobe**	Outer Hole Diam	**2 1/4-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–17									0.0 to 18.0 feet: Pushed closed-point to 18.0 feet.
18			**62%**	**GP**					18.0 to 23.0 feet: SAND (SP); dark gray to black; fine to medium sand; trace fine rounded gravel; strong odor; loose; wet.
19				**GP**		**GP126-S-19.0 (soil)**			
20									

NOTES: 1. bgs = below ground surface. 2. PID = photo ionization detector, soil head space reading in parts per million. 3. ppm = parts per million. 4. Depths are relative to feet below ground surface.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
	GP126	**2 of 2**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21				GP	GP126-S-20.0 (soil)				@ 19.9 to 21.1 feet: SAND (SP); dark brown; fine to medium sand; micaceous; odor; loose; wet.
22									
23									
24			100%	GP GP	GP126-S-23.0 (soil)				23.0 to 28.0 feet: SAND (SP); dark gray; fine to medium sand; micaceous; odor; loose; wet.
25									
26									
27									@ 26.3 feet: Strong odor and rainbow sheen.
28									@ 28.0 feet: Strong odor; macrocore liner stained.
29			100%	GP GP	GP126-S-28.0 (soil)				28.0 to 29.2 feet: SAND (SP); black; fine to medium sand; strong odor; sheen; staining; loose; wet. Macrocore liner is stained.
30									29.2 to 38.0 feet: SILT (ML); brownish-gray; medium plasticity fines; odor; soft; moist. Grading to greenish-gray at 31.5 feet.
31				GW GW	GP126-W-30.0-NAPL (NAPL) GP126-W-30.0 (water)				
32									@ 31.5 to 38.0 feet: Color change to greenish-gray.
33				GP	GP126-S-32.0 (soil)				
34			100%	GP					
35									@ 34.0 feet: SAND (SP) lens.
36									@ 35.3 feet: SAND (SP) lens; staining.
37									
38									

Total Depth = 38.0 feet below ground surface.

Borehole Completion Details

0.0 to 2.0 feet bgs: concrete seal.
2.0 to 4.0 feet bgs: 3/8'inch Baroid bentonite chips hydrated with potable water.
4.0 to 38.0 feet bgs: bentonite grout slurry.

NOTES: *1. bgs = below ground surface. 2. PID = photo ionization detector, soil head space reading in parts per million. 3. ppm = parts per million. 4. Depths are relative to feet below ground surface.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
	GP127	**1 of 2**

Project Name	**Siltronic Corporation**	TOC Elevation (feet)	
Project Location	**7200 NW Front Avenue, Portland, Oregon 97210**	Surface Elevation (feet)	
Start/End Date	**10/9/08 to 10/9/08**	Northing	
Driller/Equipment	**Marc Chalona, Cascade Drilling/Geoprobe 7720 DT**	Easting	
Geologist/Engineer	**Scout Mauldin**	Hole Depth	**35.0-feet**
Sample Method	**Geoprobe**	Outer Hole Diam	**2 1/4-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–17									0.0 to 18.0 feet: Pushed closed-point to 18.0 feet.
18			**71%**	**GP**					18.0 to 19.5 feet: SAND (SP); dark gray to black; fine to medium sand; trace fine rounded gravel; strong odor; loose; wet.
19				**GP**		**GP127-S-18.5 (soil)**			@ 18.5 to 19.5 feet: Staining; black sheen; tacky; 5% fine rounded gravel.
20									19.5 to 23.0 feet: SAND (SP); dark brown; fine to medium sand;

NOTES: 1. bgs = below ground surface. 2. PID = photo ionization detector, soil head space reading in parts per million. 3. ppm = parts per million. 4. Depths are relative to feet below ground surface.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
	GP127	**2 of 2**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21				**GP**	**GP127-S-20.0 (soil)**				*micaceous; trace red lithics and rounded gravel; odor; loose; wet.*
22									
23									
24									*23.0 to 25.0 feet: NO RECOVERY.*
25			**100%**	**GP**					*25.0 to 30.0 feet: SAND (SP); dark gray; fine to medium sand; micaceous; odor; loose; wet.*
26									
27									
28									
29				**GP**	**GP127-S-28.5 (soil)**				*@ 29.0 to 30.0 feet: Rainbow sheen; macrocore is stained.*
30			**100%**	**GP**	**GP127-S-30.0 (soil)**				*30.0 to 35.0 feet: SILT (ML); brownish-gray; low to medium plasticity fines; odor; soft; moist.*
31				**GP** / **GW**	**GP127-W-30-NAPL (NAPL)**				
32				**GP**	**GP127-S-32.0 (soil)**				
33				**GP**	**GP127-S-33.0 (soil)**				*@ 32.8 feet: SAND (SP) lens; sheen.* *@ 33.0 feet: SAND (SP) lens; sheen.*
34									*@ 34.0 to 35.0 feet: Color change to greenish-gray; medium plasticity.*
35				**GP**	**GP127-S-35.0 (soil)**				*Total Depth = 35.0 feet below ground surface.*

Borehole Completion Details

0.0 to 2.0 feet bgs: concrete seal.
2.0 to 4.0 feet bgs: 3/8'inch Baroid bentonite chips hydrated with potable water.
4.0 to 35.0 feet bgs: bentonite grout slurry.

NOTES: *1. bgs = below ground surface. 2. PID = photo ionization detector, soil head space reading in parts per million. 3. ppm = parts per million. 4. Depths are relative to feet below ground surface.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
	GP128	**1 of 2**

Project Name	**Siltronic Corporation**	TOC Elevation (feet)	
Project Location	**7200 NW Front Avenue, Portland, Oregon 97210**	Surface Elevation (feet)	
Start/End Date	**10/9/08 to 10/9/08**	Northing	
Driller/Equipment	**Marc Chalona, Cascade Drilling/Geoprobe 7720 DT**	Easting	
Geologist/Engineer	**Scout Mauldin**	Hole Depth	**35.0-feet**
Sample Method	**Geoprobe**	Outer Hole Diam	**2 1/4-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–17									0.0 to 18.0 feet: Pushed closed-point to 18.0 feet.
18			**75%**	**GP**					18.0 to 20.0 feet: SAND (SP); dark gray to black; fine to medium sand; strong odor; loose; wet.
19				**GP**		**GP128-S-19.2 (soil)**			@ 19.0 feet: Wood chips. @ 19.1 feet: 0.25-inch SILT (ML) lens.
20									

NOTES: 1. bgs = below ground surface. 2. PID = photo ionization detector, soil head space reading in parts per million. 3. ppm = parts per million. 4. Depths are relative to feet below ground surface.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
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Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			**70%**	**GP**					@ 20.0 feet: In shoe: SAND (SP); black; staining; tacky.
				GP		**GP128-S-20.4 (soil)**			20.0 to 20.5 feet: SAND (SP); black; fine to medium sand; strong odor; tacky; tarry; wet.
22									20.5 to 24.0 feet: SAND (SP); dark brown; fine to medium sand; odor; loose; wet.
23				**GP**		**GP128-S-23.0 (soil)**			
24									24.0 to 25.0 feet: NO RECOVERY.
25			**100%**	**GP**					25.0 to 30.0 feet: SAND (SP); dark grayish-brown; fine to medium sand; micaceous; trace red lithics; strong odor; wet.
26									
27				**GP**		**GP128-S-26.25 (soil)**			@ 26.25 to 26.55 feet: Sheen on sand.
28									
29									
30			**100%**	**GP**		**GP128-W-30-NAPL (NAPL)**			30.0 to 35.0 feet: SILT (ML); brownish-gray; low to medium plasticity fines; micaceous; odor; moist.
31				**GW**		**GP128-W-30.0 (water)**			@ 30.0 to 31.05 feet: Color grading to grayish-brown. Non- to low plasticity fines.
32									@ 30.75 feet: Trace subrounded gravel.
33									@ 31.05 to 35.0 feet: Grading to light to medium gray with black mottling. Low to medium plasticity fines; moist.
34									
35									

Total Depth = 35.0 feet below ground surface.

Borehole Completion Details

0.0 3.0 feet bgs: concrete seal, gravel, and 3/8'inch Baroid bentonite chips hydrated with potable water.
3.0 to 35.0 feet bgs: bentonite grout slurry.

NOTES: *1. bgs = below ground surface. 2. PID = photo ionization detector, soil head space reading in parts per million. 3. ppm = parts per million. 4. Depths are relative to feet below ground surface.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
	GP129	**1 of 2**

Project Name	**Siltronic Corporation**	TOC Elevation (feet)	
Project Location	**7200 NW Front Avenue, Portland, Oregon 97210**	Surface Elevation (feet)	
Start/End Date	**10/10/08 to 10/10/08**	Northing	
Driller/Equipment	**Marc Chalona, Cascade Drilling/Geoprobe 7720 DT**	Easting	
Geologist/Engineer	**Scout Mauldin**	Hole Depth	**35.0-feet**
Sample Method	**Geoprobe**	Outer Hole Diam	**2 1/4-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–17									*0.0 to 18.0 feet: Pushed closed-point to 18.0 feet.*
18			**50%**	**GP**					*18.0 to 20.0 feet: SAND (SP); dark gray; fine to medium sand; micaceous; trace red lithics; some odor; loose; wet.*
19									*@ 18.5 feet: Wood chunks.*
20									*@ 18.8 feet: SILT (ML) lens.*

NOTES: *1. bgs = below ground surface. 2. PID = photo ionization detector, soil head space reading in parts per million. 3. ppm = parts per million. 4. Depths are relative to feet below ground surface.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
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Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			**66%**	**GP**					*20.0 to 25.0 feet: SAND (SP); dark gray to black; fine to medium sand; micaceous; trace fine rounded gravel; odor; loose; wet.*
				GP		**GP129-S-21.0 (soil)**			*@ 20.0 to 21.8 feet: Black; sheen; tacky; tarry.*
22									
23									
				GP		**GP129-S-23.0 (soil)**			
24									
25			**100%**	**GP**					*25.0 to 30.0 feet: SAND (SP); dark gray to black; fine to medium sand; micaceous; trace red lithics; odor; loose; wet.*
26									*@ 26.0 feet: Wood chunks.*
27									
28									
29									
30			**100%**	**GP**		**GP129-S-30.0 (soil)**			*30.0 to 35.0 feet: SILT (ML); brownish-gray with black mottling; low to medium plasticity; micaceous; odor.*
				GP					
31				**GP**		**GP129-W-30.0 (water)**			
				GP					
32						**GP129-S-30.5 (soil)**			*@ 32.0 feet: Wood chunk.*
33									
34									
35									

Total Depth = 35.0 feet below ground surface.

Borehole Completion Details

0.0 to 0.5 feet bgs: concrete seal
0.5 to 3.0 feet bgs: 3/8'inch Baroid bentonite chips hydrated with potable water.
3.0 to 35.0 feet bgs: bentonite grout slurry.

NOTES: *1. bgs = below ground surface. 2. PID = photo ionization detector, soil head space reading in parts per million. 3. ppm = parts per million. 4. Depths are relative to feet below ground surface.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
	GP130	**1 of 2**

Project Name	**Siltronic Corporation**	TOC Elevation (feet)	
Project Location	**7200 NW Front Avenue, Portland, Oregon 97210**	Surface Elevation (feet)	
Start/End Date	**10/14/08 to 10/14/08**	Northing	
Driller/Equipment	**Marc Chalona, Cascade Drilling/Geoprobe 7720 DT**	Easting	
Geologist/Engineer	**Kelly Titkemeier**	Hole Depth	**35.0-feet**
Sample Method	**Geoprobe**	Outer Hole Diam	**2 1/4-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–17									0.0 to 18.0 feet: Pushed closed-point to 18.0 feet.
18			**50%**	**GP**					18.0 to 19.0 feet: SAND (SP); dark grayish-brown; fine to medium sand; trace wood fragments and fine rounded gravel; dry to damp.
19									@ 18.25 to 18.45 feet: SILT (ML) lens. @ 18.5 to 19.0 feet: Black; hydrocarbon-like odor; tacky.
20									19.0 to 20.0 feet: NO RECOVERY.

NOTES: 1. bgs = below ground surface. 2. PID = photo ionization detector, soil head space reading in parts per million. 3. ppm = parts per million. 4. Depths are relative to feet below ground surface.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
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Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			**62%**	**GP**		**GP130-S-20.0**			*20.0 to 20.7 feet: SAND (SP); black; fine to medium sand; trace fine to medium, subrounded to rounded gravel; hydrocarbon-like odor; sheen; tacky; wet.*
				GP		**(soil)**			*20.7 to 22.35 SAND (SP); dark grayish-brown; fine to medium sand; trace wood fragments; hydrocarbon-like odor; sheen; damp to moist.*
22				**GP**		**GP130-S-21.5**			*@ 21.1 to 22.2 feet: No sheen.*
						(soil)			*@ 21.1 to 22.35 Trace red lithics, coarse sand, and mica.*
23				**GP**		**GP130-S-22.4**			*22.35 to 22.65 feet: SILT (ML).*
						(soil)			*22.65 to 23.1 feet: SAND (SP); dark grayish-brown; fine to medium (mostly medium) sand; moist.*
24									*23.1 to 25.0 feet: NO RECOVERY.*
25			**76%**	**GP**					*25.0 to 28.8 feet: SAND (SP); dark grayish-brown; fine to medium sand; trace red lithics and mica; mild hydrocarbon-like odor; wet.*
26				**GP**		**GP130-S-25.8**			
						(soil)			
27				**GP**		**GP130-S-26.7**			*@ 26.65 to 26.8 feet: Sheen.*
						(soil)			
28				**GP**		**GP130-S-28.0**			
						(soil)			
29									*28.8 to 30.0 feet: NO RECOVERY.*
30			**74%**	**GP**		**GP130-W-30.0**			*30.0 to 33.7 feet: SILT (ML); dark grayish-brown to brownish-gray; 90% non-plastic fines; 10% very fine sand; mild organic odor; moist.*
				GW		**(water)**			
31									
32				**GP**		**GP130-S-32.0**			
						(soil)			
33									
34									*33.7 to 35.0 feet: NO RECOVERY.*
35									

Total Depth = 35.0 feet below ground surface.

Borehole Completion Details

0.0 to 4.0 feet bgs: 3/8'inch Baroid bentonite chips hydrated with potable water.

4.0 to 35.0 feet bgs: bentonite grout slurry.

NOTES: *1. bgs = below ground surface. 2. PID = photo ionization detector, soil head space reading in parts per million. 3. ppm = parts per million. 4. Depths are relative to feet below ground surface.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
	GP131	**1 of 2**

Project Name	**Siltronic Corporation**	TOC Elevation (feet)	
Project Location	**7200 NW Front Avenue, Portland, Oregon 97210**	Surface Elevation (feet)	
Start/End Date	**10/14/08 to 10/14/08**	Northing	
Driller/Equipment	**Marc Chalona, Cascade Drilling/Geoprobe 7720 DT**	Easting	
Geologist/Engineer	**Kelly Titkemeier**	Hole Depth	**35.0-feet**
Sample Method	**Geoprobe**	Outer Hole Diam	**2 1/4-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–18									0.0 to 18.0 feet: Pushed closed-point to 18.0 feet.
18			**75%**	**GP**					18.0 to 19.5 feet: SAND (SP); very dark gray to black; fine to medium sand; trace roots and fine sub-angular gravel; strong hydrocarbon-like odor; wet.
19				**GP**		**GP131-S-19.0 (soil)**			@ 18.9 feet: Tacky.
20									19.5 to 20.0 feet: NO RECOVERY.

NOTES: 1. bgs = below ground surface. 2. PID = photo ionization detector, soil head space reading in parts per million. 3. ppm = parts per million. 4. Depths are relative to feet below ground surface.

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Project Number	Well Number	Sheet
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Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			**74%**	**GP**					*20.0 to 23.7 feet: SAND (SP); very dark gray to black; fine to medium sand; trace roots and coarse sand; strong hydrocarbon-like odor; wet. Grading to dark gray with depth.*
22									*@ 20.3 to 20.7 feet: SILT (ML); dark gray; non- to low plasticity fines; trace roots and mica; strong hydrocarbon-like odor; wet.*
23									
				GP	**GP131-S-23.3 (soil)**				
24									*23.7 to 25.0 feet: NO RECOVERY.*
25			**100%**	**GP**					*25.0 to 29.6 feet: SAND (SP); fine to medium sand; strong hydrocarbon-like odor; wet. Macrocore liner is stained.*
26									*@ 25.0 to 26.2 feet: Black; tacky.*
									@ 26.2 to 27.4 feet: Silver rainbow sheen.
27				**GP**	**GP131-S-27.0 (soil)**				
28									*@ 28.0 to 29.6 feet: Heavy black staining; tacky. Saturated with black liquid.*
29				**GP**	**GP131-S-29.0 (soil)**				
30									*29.6 to 30.0 feet: NO RECOVERY.*
			100%	**GP**	**GP131-W-30.0-NAPL (NAPL)**				*30.0 to 32.6 feet: SILT (ML); medium gray; low to medium plasticity; strong hydrocarbon-like odor; moist. Fingers of NAPL throughout.*
31				**GW**	**GP131-W-30.0 (water)**				
32									
33				**GP**	**GP131-S-32.6 (soil)**				*32.6 to 33.0 feet: SILTY SAND (SM); medium gray; strong hydrocarbon-like odor; moist. Grading to SANDY SILT (ML) with depth.*
34									*33.0 to 35.0 feet: SILT (ML); greenish-gray; medium plasticity; trace mica; strong hydrocarbon-like odor; moist.*
									@ 33.3 feet: Some staining/fingers of NAPL.
35				**GP**	**GP131-S-34.5 (soil)**				

Total Depth = 35.0 feet below ground surface.

Borehole Completion Details

0.0 to 1.0 feet bgs: concrete seal.
1.0 to 6.0 feet bgs: 3/8'inch Baroid bentonite chips hydrated with potable water.
6.0 to 35.0 feet bgs: bentonite grout slurry.

NOTES: *1. bgs = below ground surface. 2. PID = photo ionization detector, soil head space reading in parts per million. 3. ppm = parts per million. 4. Depths are relative to feet below ground surface.*

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Geologic Borehole Log/Well Construction

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Project Name	**Siltronic Corporation**	TOC Elevation (feet)	
Project Location	**7200 NW Front Avenue, Portland, Oregon 97210**	Surface Elevation (feet)	
Start/End Date	**10/15/08 to 10/15/08**	Northing	
Driller/Equipment	**Marc Chalona, Cascade Drilling/Geoprobe 7720 DT**	Easting	
Geologist/Engineer	**Kelly Titkemeier**	Hole Depth	**35.0-feet**
Sample Method	**Geoprobe**	Outer Hole Diam	**2 1/4-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–18									0.0 to 18.0 feet: Pushed closed-point to 18.0 feet.
18–19			**75%**	**GP**					18.0 to 19.5 feet: SAND (SP); very dark gray to black; fine to medium sand; trace coarse sand and fine sub-angular to sub-rounded gravel; strong hydrocarbon-like odor; tacky; wet. @ 18.4 feet: SILT (ML) lens.
19–20				**GP**		**GP132-S-18.5 (soil)**			19.5 to 20.0 feet: NO RECOVERY.

NOTES: 1. bgs = below ground surface. 2. PID = photo ionization detector, soil head space reading in parts per million. 3. ppm = parts per million. 4. Depths are relative to feet below ground surface.

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Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			**78%**	**GP**					*20.0 to 23.9 feet: SAND (SP); very dark gray to black; fine to medium sand; trace coarse sand and fine subangular gravel; strong hydrocarbon-like odor; trace rainbow sheen; tacky; wet. Coarse sand and fine gravel decreasing with depth. Grading to dark gray with depth.*
22									
23									
24				**GP**		**GP132-S-23.3 (soil)**			*23.9 to 25.0 feet: NO RECOVERY.*
25			**100%**	**GP**					*25.0 to 30.0 feet: SAND (SP); very dark gray to black; fine to medium sand; trace coarse sand; strong hydrocarbon-like odor; rainbow sheen; tacky; wet. Soupy. Outside of macrocore liner is stained.*
26									
27									
28									
29									
30				**GP**		**GP132-S-29.3 (soil)**			
31			**92%**	**GP**		**GP132-W-30.0-NAPL (NAPL)**			*30.0 to 34.6 feet: SILT (ML); greenish-gray; low to medium plasticity fines; trace mica; strong hydrocarbon-like odor; moist. Fingers of NAPL throughout. Outside of macrocore liner is stained.*
				GW		**GP132-W-30.0 (water)**			*@ 31.05 to 31.15 feet: SILTY SAND (SM) lens.*
32									*@ 31.3 to 31.4 feet: SILTY SAND (SM) lens.*
33				**GP**		**GP132-S-32.0 (soil)**			
34									
35									*@ 34.35 to 34.4 feet: SILTY SAND (SM) lens.*
									34.6 to 35.0 feet: NO RECOVERY.
									Total Depth = 35.0 feet below ground surface.

Borehole Completion Details

0.0 to 1.0 feet bgs: concrete seal.
1.0 to 4.0 feet bgs: 3/8'inch Baroid bentonite chips hydrated with potable water.
4.0 to 35.0 feet bgs: bentonite grout slurry.

NOTES: *1. bgs = below ground surface. 2. PID = photo ionization detector, soil head space reading in parts per million. 3. ppm = parts per million. 4. Depths are relative to feet below ground surface.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
	GP133	**1 of 2**

Project Name	**Siltronic Corporation**	TOC Elevation (feet)	
Project Location	**7200 NW Front Avenue, Portland, Oregon 97210**	Surface Elevation (feet)	
Start/End Date	**10/16/08 to 10/16/08**	Northing	
Driller/Equipment	**Marc Chalona, Cascade Drilling/Geoprobe 7720 DT**	Easting	
Geologist/Engineer	**Kelly Titkemeier**	Hole Depth	**35.0-feet**
Sample Method	**Geoprobe**	Outer Hole Diam	**2 1/4-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–17									0.0 to 18.0 feet: Pushed closed-point to 18.0 feet.
18			**90%**	**GP**		**PID = 121 ppm**			18.0 to 18.55 feet: SAND (SP); dark brownish-gray; fine to medium sand; trace red lithics and coarse sand; mild hydrocarbon-like odor; wet.
19				**GP**		**GP133-S-18.2 (soil)**			@ 18.0 to 18.2 feet: Abundant wood fragments.
				GP		**GP133-S-18.8 (soil)**			@ 18.1 to 18.15 feet: Silver-blue rainbow sheen.
20									18.55 to 18.8 feet: SILT (ML); dark grayish-brown; non-plastic to low

NOTES: 1. bgs = below ground surface. 2. PID = photo ionization detector, soil head space reading in parts per million. 3. ppm = parts per million. 4. Depths are relative to feet below ground surface.

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Project Number	Well Number	Sheet
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Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
			84%	**GP**	**PID = 82.6 ppm**				plasticity fines; trace mica; moderate hydrocarbon-like odor; soft; wet.
21									18.8 to 19.2 feet: SILT (ML); dark gray to black; low plasticity fines; strong hydrocarbon-like odor; tacky; moist.
									@ 19.2 feet: Trace medium sub-rounded gravel.
22				**GP**	**GP133-S-21.6 (soil)**				19.2 to 19.45 feet: SAND (SP); dark gray to black; fine to medium sand; trace wood fragments and coarse sand; strong hydrocarbon-like odor; tacky; wet.
23									19.45 to 19.8: Large wood fragment (single piece).
									19.8 to 20.0 feet: NO RECOVERY.
24				**GP**	**GP133-S-23.55 (soil)**				20.0 to 20.2 feet: Wood fragments.
									@ 20.0 to 20.7 feet: Tacky.
25									20.2 to 24.2 feet: SAND (SP); dark brownish-gray to dark gray; fine to medium sand; trace red lithics and mica; strong hydrocarbon-like odor; wet.
				GP					@ 20.7 to 23.55 feet: Silver-blue rainbow sheen.
26									24.2 to 25.0 feet: NO RECOVERY.
									25.0 to 30.0 feet: SAND (SP); dark gray; fine to medium sand; trace red lithics; strong hydrocarbon-like odor; heavy silver-blue rainbow sheen and rust-gold sheen; wet. Soupy.
27									
28				**GP**	**GP133-S-25-30 (soil)**				
29									
30									
			92%	**GP**	**GP133-W-30.0-NAPL (NAPL)**				30.0 to 34.35 feet: SILT (ML); greenish-gray; 90% low plasticity fines; 10% very fine to fine sand; trace mica; strong hydrocarbon-like odor; moist. Fingers of NAPL throughout.
31				**GW**	**GP133-W-30.0 (water)**				
32									
				GP	**GP133-S-32.1 (soil)**				
33									
34									
35									34.35 to 34.6 feet: SAND (SP); dark gray to black; fine to medium sand; strong hydrocarbon-like odor; sheen; wet.
									34.6 to 35.0 feet: NO RECOVERY.

Total Depth = 35.0 feet below ground surface.

Borehole Completion Details

0.0 to 1.0 feet bgs: concrete seal.
1.0 to 8.0 feet bgs: 3/8'inch Baroid bentonite chips hydrated with potable water.
8.0 to 35.0 feet bgs: bentonite grout slurry.

NOTES: *1. bgs = below ground surface. 2. PID = photo ionization detector, soil head space reading in parts per million. 3. ppm = parts per million. 4. Depths are relative to feet below ground surface.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
	GP134	**1 of 6**

Project Name	**Siltronic Corporation**	TOC Elevation (feet)	
Project Location	**7200 NW Front Avenue, Portland, Oregon 97210**	Surface Elevation (feet)	
Start/End Date	**10/17/08 to 10/17/08**	Northing	
Driller/Equipment	**Marc Chalona, Cascade Drilling/Geoprobe 7720 DT**	Easting	
Geologist/Engineer	**Kelly Titkemeier**	Hole Depth	**110.0-feet**
Sample Method	**Geoprobe**	Outer Hole Diam	**3 1/4-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

NOTES: *1. bgs = below ground surface. 2. PID = photo ionization detector, soil head space reading in parts per million. 3. ppm = parts per million. 4. Depths are relative to feet below ground surface.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
	GP134	**2 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Sample Data: Percent Recovery	Sample Data: Collection Method	Sample Data: Number	Sample Data: Name (Type)	Sample Data: Blows/6"	Lithologic Column	Soil Description
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

NOTES: *1. bgs = below ground surface. 2. PID = photo ionization detector, soil head space reading in parts per million. 3. ppm = parts per million. 4. Depths are relative to feet below ground surface.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
	GP134	**3 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Sample Data: Percent Recovery	Sample Data: Collection Method	Sample Data: Number	Sample Data: Name (Type)	Sample Data: Blows/6"	Lithologic Column	Soil Description
43									
44									
45									
46									
47									
48									
49									
50									
51									
52									
53									
54									
55									
56									
57									
58									
59									
60									
61									
62									
63									
64									
65									

NOTES: *1. bgs = below ground surface. 2. PID = photo ionization detector, soil head space reading in parts per million. 3. ppm = parts per million. 4. Depths are relative to feet below ground surface.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
	GP134	**4 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Sample Data: Percent Recovery	Sample Data: Collection Method	Sample Data: Number	Sample Data: Name (Type)	Sample Data: Blows/6"	Lithologic Column	Soil Description
66									
67									
68									
69									
70									
71									
72									
73									
74				**GW**		**GP134-W-74.0 (water)**			
75									
76									
77									
78									
79									
80									
81									
82									
83									
84									
85									
86									
87									

NOTES: *1. bgs = below ground surface. 2. PID = photo ionization detector, soil head space reading in parts per million. 3. ppm = parts per million. 4. Depths are relative to feet below ground surface.*

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
	GP134	**5 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Sample Data: Percent Recovery	Sample Data: Collection Method	Sample Data: Number	Sample Data: Name (Type)	Sample Data: Blows/6"	Lithologic Column	Soil Description
88									
89									
90									
91				**GW**		**GP134-W-91.0 (water)**			
92									
93									
94									
95									
96									
97									
98									
99									
100									
101									
102									
103									
104									
105									
106									
107									
108									
109									
110									

NOTES: *1. bgs = below ground surface. 2. PID = photo ionization detector, soil head space reading in parts per million. 3. ppm = parts per million. 4. Depths are relative to feet below ground surface.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
	GP134	**6 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description

Total Depth = 110.0 feet below ground surface.

Borehole Completion Details

0.0 to 31.0 feet bgs: 3 1/4-inch temporary, threaded steel, isolation casing.
0.0 to 110.0 feet bgs: 2 1/4-inch macrocore sampler.

Surface: pea gravel.
0.0 to 10.0 feet bgs: 3/8'inch Baroid bentonite chips hydrated with potable water.
10.0 to 110.0 feet bgs: bentonite grout slurry.

NOTES: *1. bgs = below ground surface. 2. PID = photo ionization detector, soil head space reading in parts per million. 3. ppm = parts per million. 4. Depths are relative to feet below ground surface.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	**GP-138**	**1 of 5**

Project Name	**Siltronic Corp.**	TOC Elevation (feet)	
Project Location	**7200 NW Front Avenue, Portland, Oregon**	Surface Elevation (feet)	
Start/End Date	**11/10/10 to 11/15/10**	Northing	
Driller/Equipment	**Marc Chalona/Geoprobe 7720 DT**	Easting	
Geologist/Engineer	**Scout Mauldin**	Hole Depth	**110.0-feet**
Sample Method	**Geoprobe**	Outer Hole Diam	**-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–10			**0**						*0.0 to 10.0 feet: Air knife by vacuum truck. No observations.*
5			**0**						
10			**60**	**GP**					*10.0 to 13.0 feet: SAND (SP); black, fine to medium, loose, micaceous, odor, moist.*
13									*13.0 to 15.0 feet: NO RECOVERY.*
15			**80**	**GP**		**PID = 6.0 ppm**			*15.0 to 18.0 feet: SAND (SP); black, fine to medium, micaceous, red lithics, moist.*
18									*18.0 to 19.0 feet: SAND WITH INTERBEDDED SILT LENSES (SP); black; fined to medium; micaceous; staining; trace well rounded gravels; wet.*
19									*19.0 to 20.0 feet: NO RECOVERY.*
20									

NOTES: *1) Unless otherwise specified, odor staining, and NAPL observations characteristic of MGP impacts.*
2) No TCE NAPL observed.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	**GP-138**	**2 of 5**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			**60**	**GP**		**PID = 10.0 ppm**			20.0 to 22.0 feet: SAND (SP); dark black, fine to medium, micaceous; tacky; <5% well rounded gravels; staining; strong odor; sheen; wet.
22									22.0 to 23.0 feet: SAND (SP); dark black, fine to medium, micaceous; <5% well rounded gravels; staining; strong odor; moist.
23									23.0 to 25.0 feet: NO RECOVERY.
24									
25			**100**	**GP**		**PID = 2.0 ppm**			25.0 to 30.0 feet: SAND (SP); dark gray/black; fine to medium; loose; micaceous; red lithics; odor; sheen; wet.
26									
27									@ 27.0 feet: SILT LENS.
28									
29									
30			**100**	**GP**		**PID = 16.0 ppm**			30.0 to 35.0 feet: SILT (ML): medium to dark grayish brown; trace mica; low plasticity; strong odor; NAPL blobs; moist.
31				**GW**		**GP138-W-30**			
32									
33									
34									
35			**90**	**GP**		**PID = 83.0 ppm**			35.0 to 35.5 feet: SAND (SP); black; fine to medium; stained; sheen; loose; strong odor.
36									35.5 to 39.5 feet: SILT (ML); greenish gray; low to medium plasticity; staining; strong odor; moist.
37									
38									
39									
40									39.5 to 40.0 feet: NO RECOVERY.
41			**90**	**GP**		**PID = 43.0 ppm**			40.0 to 44.3 feet: SILT (ML); greenish gray; low to medium plasticity; strong odor; moist.
42									

NOTES: *1) Unless otherwise specified, odor staining, and NAPL observations characteristic of MGP impacts.*
2) No TCE NAPL observed.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	GP-138	3 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43									
44									
45									44.3 to 44.5 feet: SILT (ML); odor; staining; sheen; wet. 44.5 to 45.0 feet: NO RECOVERY.
			100	GP		PID = 0.0 ppm			45.0 to 46.5 feet: SILTY SAND (SM); dark gray; 20% fines; 80% sand, fine; trace organics/roots; sheen; strong odor; trace mica; wet.
46									
47				GW		GP138-W-47			46.5 to 47.1 feet: SILT (ML); brownish gray; low plasticity; trace mica; trace organic material; odor; moist. 47.1 to 47.5 feet: SILTY SAND (SM); dark gray; 20% fines; 80% sand, fine; trace organics; sheen; strong odor; trace mica; wet.
48									47.5 to 50.0 feet: SILT (ML); brownish gray; orange mottling throughout; odor; moist.
49									@ 49.0 feet: SILT LENS.
50			100	GP		PID = 4.0 ppm			50.0 to 55.0 feet: SANDY SILT (ML); dark gray; fine; 80% fines, low to medium plasticity; 20% sand; odor; organic debris; moist.
51									
52									
53									
54									
55									
			100	GP		PID = 2.0 ppm			55.0 to 55.5 feet: SAND WITH SILT (SP); dark gray; 10% fines; 90% sand; odor; wet.
56									55.5 to 58.5 feet: SANDY SILT (ML); dark gray; fine; 80% fines, low to medium plasticity; 20% sand; odor; organic debris; moist.
57									
58									
59									58.5 to 60.0 feet: SILT WITH SAND (ML); dark gray; 90% fines; 10% sand, fine; trace organics; odor; moist.
60			0	GP					60.0 to 65.0 feet: NO RECOVERY.
61									
62									
63									
64									
65									

NOTES: 1) Unless otherwise specified, odor staining, and NAPL observations characteristic of MGP impacts.
2) No TCE NAPL observed.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	GP-138	4 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66			100	GP		PID = 0.0 ppm			65.0 to 68.0 feet: SILT WITH SAND (ML); dark gray; 90% fines; 10% sand; trace mica; trace organics; odor; moist.
67									@ 67.7 feet: SAND WITH SILT LENS.
68									68.0 to 72.5 feet: SANDY SILT; dark gray; 60% fines, low plasticity; 40% sand, fine; trace mica; trace organics; odor; wet.
69									
70			50	GP		PID = 0.0 ppm			
71									
72									
73									72.5 to 75.0 feet: NO RECOVERY.
74									
75			90	GP		PID = 0.0 ppm			75.0 to 77.5 feet: SILTY SAND (SP); dark gray; 10% silt; 90% sand; medium plasticity; interbedded lense of silt and sand; odor; moist.
76									
77									
78									77.5 to 79.5 feet: SANDY SILT (ML); dark gray; 90% fines; low plasticity; 10% sand; odor; moist.
79									
80									79.5 to 80.0 feet: NO RECOVERY.
81			90	GP		PID = 0.0 ppm			80 to 84.5 feet: SAND (SP); dark gray; odor; speckles of white and black sand; wet.
82									
83									
84				GW		GP138-W-84			
85									84.5 to 85.0 feet: NO RECOVERY.
86			100	GP		PID = 5.0 ppm			85.0 to 87.0 feet: SAND (SP); dark gray; fine; speckles of white and black sand; wet.
87									87.0 to 87.5 feet: SILTY SAND (SP); dark gray; odor; moist.

NOTES: 1) Unless otherwise specified, odor staining, and NAPL observations characteristic of MGP impacts.
2) No TCE NAPL observed.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	GP-138	5 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88									87.5 to 90.0 feet: SAND (SP); dark gray; fine; speckles of white and black sand; wet.
89									
90			100	GP		PID = 2.0 ppm			90.0 to 105 feet: SAND (SP); dark gray; fine; speckled white and black sand; odor; moist/wet.
91									
92									
93									
94									
95				GW		GP138-W-95			
			100	GP		PID = 1.0 ppm			
96									
97									
98									
99									
100			100	GP		PID = 0.0 ppm			
101									
102									
103									
104									
105			100	GP		PID = 0.0 ppm			105.0 to 107.5 feet: SANDY SILT; dark gray; odor; moist to wet.
106									
107									
108									107.5 to 108.5 feet: SAND (SP); dark gray; fine; trace silt; odor; moist.
109									108.5 to 110.0 feet: SANDY SILT; dark gray; odor; moist.
110									

NOTES: 1) Unless otherwise specified, odor staining, and NAPL observations characteristic of MGP impacts.
2) No TCE NAPL observed.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	**GP143**	**1 of 5**

Project Name	**Siltronic Corp.**	TOC Elevation (feet)	
Project Location	**7200 NW Front Avenue, Portland, Oregon**	Surface Elevation (feet)	
Start/End Date	**11/22/10 to 11/24/10**	Northing	
Driller/Equipment	**Marc Chalona/Geoprobe 7720 DT**	Easting	
Geologist/Engineer	**Kerry Gallagher**	Hole Depth	**110.0-feet**
Sample Method	**Geoprobe**	Outer Hole Diam	**-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1			**0**						*0.0 to 10.0 feet: Air knife by vacuum truck. No observations.*
5			**0**						
10			**50**	**GP**		**PID = 4.0 ppm**			*10.0 to 11.5 feet: SAND (SP); brown to grayish brown; fine to medium; trace rounded gravel; moist.*
12									*11.5 to 12.0 feet: SANDY SILT (ML); brownish gray; moist.*
									12.0 to 12.5 feet: SAND (SP); dark gray; medium; red lithics; moist.
13									*12.5 to 15.0 feet: NO RECOVERY.*
15			**100**	**GP**		**PID = 28.0 ppm**			*15.0 to 17.0 feet: SAND (SP); dark gray; trace well rounded gravel; red lithics; moist;*
17									*17.0 to 17.5 feet: SANDY SILT (ML); dark brownish gray; wet.*
18									*17.5 to 20.0 feet: SAND (SP); dark gray to black; sheen; interbedded silt lense; odor; moist.*
20									

NOTES: *1) Unless otherwise specified, odor staining, and NAPL observations characteristic of MGP impacts.*
2) No TCE NAPL observed.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	GP143	2 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			60	GP		PID = 282.0 ppm			20.0 to 23.0 feet: SAND (SP); dark brownish gray to black; staining; sheen; odor; moist to wet.
23									23.0 to 30.0 feet: NO RECOVERY.
25			0	GP					
30			80	GP		PID = 431.0 ppm			30.0 to 31.0 feet: SILT (ML); dark grayish brown; hydrocarbon like odor; sheen; black mottling; plastic; NAPL; moist.
31									31.0 to 34.0 feet: SILT (ML); dark grayish brown; hydrocarbon like odor; sheen; black mottling; moist.
34									34.0 to 35.0 feet: NO RECOVERY.
35			100	GP		PID = 679.0 ppm			35.0 to 40.0 feet: SILT (ML); grayish brown; organic-like odor; medium plasticity; hard; dry.
40			100	GP		PID = 257.0 ppm			40.0 to 41.5 feet: SILT (ML); dark brownish gray; trace sand; sheen; odor; dry.
42									41.5 to 43.0 feet: SAND (SP); grayish brown; trace silt; wet.

NOTES: 1) Unless otherwise specified, odor staining, and NAPL observations characteristic of MGP impacts.
2) No TCE NAPL observed.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	GP143	3 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43									43.0 to 47.0 feet: SILT (ML); dark brownish gray; trace sand; trace organics; sheen; odor; moist.
44									
45				GW		GP143-W-45			
			100	GP		PID = >1,000 ppm			
46									
47									47.0 to 50.0 feet: SANDY SILT (ML); dark gray; trace sheen; trace organics; moist.
48									
49									
50			80	GP		PID = 716.0 ppm			50.0 to 52.0 feet: SANDY SILT (ML); dark brownish gray; trace organics; plastic.
51									
52									52.0 to 52.5 feet: SAND (SP); black; NAPL; sheen; strong odor; wet.
53									52.5 to 54.0 feet: SANDY SILT (ML); dark grayish brown; trace organics; moist.
54									54.0 to 55.0 feet: NO RECOVERY.
55				GW		GP143-W-55			
			100	GP		PID = 261.0 ppm			55.0 to 55.5 feet: SANDY SILT (ML); brownish gray; sheen; odor; moist.
56									55.5 to 56.5 feet: SAND (SP); dark grayish brown; wet.
57									56.5 to 57.0 feet: SANDY SILT (ML); brownish gray; moist.
58									57.0 to 58.0 feet: SAND (SP); dark grayish brown; moist.
59									58.0 to 60.0 feet: SANDY SILT (ML); brownish gray; moist.
60			100	GP		PID = 270.0 ppm			60.0 to 64.0 feet: SANDY SILT (ML); dark brownish gray; plastic; odor; interbedded silty sand; moist.
61									
62									
63									
64									64.0 to 65.0 feet: SAND (SP); dark gray; trace silt; wet.
65									

NOTES: 1) Unless otherwise specified, odor staining, and NAPL observations characteristic of MGP impacts.
2) No TCE NAPL observed.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	GP143	4 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66			100	GP		PID = 58.0 ppm			65.0 to 66.0 feet: SANDY SILT (ML); dark brownish gray; moist.
									66.0 to 69.5 feet; SAND (SP); dark gray; fine to medium; odor; mottled with white ash; wet.
67									
68									
69									
70									69.5 to 70.0 feet: SAND (SP); dark gray; medium; dense; mottled with black and white sand.
			100	GP		PID = 126.0 ppm			70.0 to 71.5 feet: SANDY SILT (ML); dark brownish gray; moist.
71									
									71.5 to 74.5 feet; SAND (SP); dark gray; fine to medium; odor; mottled with white ash; wet.
72									
73									
74									
75									74.5 to 75.0 feet: SAND (SP); dark gray; medium; dense; mottled with black and white sand.
			80	GP		PID = >1,000 ppm			75.0 to 75.5 feet: SAND (SP); black; medium; trace silt; odor; staining; wet.
76									75.5 to 78.5 feet: SANDY SILT (ML); dark gray to black; odor; staining; moist.
77									
78									
79									78.5 to 79.0 feet: SAND (SP); black; medium; trace silt; odor; staining; wet.
									79.0 to 80 feet: NO RECOVERY.
80			100	GP		PID = >1,000 ppm			80.0 to 82.0 feet: SANDY SILT (ML); dark gray; odor; staining; wet.
81									
82									82.0 to 84.0 feet: SAND (SP); dark gray to black; fine to medium; staining; trace silt; odor; NAPL; wet.
83									
84									84.0 to 85.0 feet: SILTY SAND (SP); dark gray; fine to medium; odor; staining; wet.
85			100	GW GP		GP143-W-85 PID = >1,000 ppm			85.0 to 86.5 feet: SANDY SILT; dark brownish gray; sheen; odor; moist.
86									
									86.5 to 89.0 feet: SILTY SAND (SP); dark gray; medium; trace white and black sand; odor; wet.
87									

NOTES: 1) Unless otherwise specified, odor staining, and NAPL observations characteristic of MGP impacts.
2) No TCE NAPL observed.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	**GP143**	**5 of 5**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88									
89									89.0 to 90.0 feet: SANDY SILT (ML); dark brownish gray; odor; moist.
90			**100**	**GP**		**PID = 672.0 ppm**			90.0 to 95.0 feet: SAND (SP); white and black; trace silt; odor; wet.
91									
92									
93									
94									
95			**100**	**GP**		**PID = 419.0 ppm**			95.0 to 99.5 feet: SILTY SAND (SP); dark gray to brownish gray; odor; wet.
96									
97									
98									
99									
100									99.5 to 100.0 feet: SAND (SP); dark gray; dense; moist.
100			**100**	**GP GW**		**PID = 212.0 ppm GP143-W-100**			100.0 to 105.0 feet: SAND (SP); dark gray to black; fine to medium; trace silt; odor; moist.
101									
102									
103									
104									
105			**100**	**GP**					105.0 to 106.0 feet: SILTY SAND (SP); dark gray to black; moist.
106									106.0 to 110.0 feet: SAND (SP); dark gray to black; fine to medium; trace black and white sand; trace silt; odor; moist to wet.
107									
108									
109									
110									

NOTES: *1) Unless otherwise specified, odor staining, and NAPL observations characteristic of MGP impacts.*
2) No TCE NAPL observed.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	**GP144**	**1 of 6**

Project Name	**Siltronic Corp.**	TOC Elevation (feet)	
Project Location	**7200 NW Front Avenue, Portland, Oregon**	Surface Elevation (feet)	
Start/End Date	**11/29/10 to 11/30/10**	Northing	
Driller/Equipment	**Marc Chalona/Geoprobe 7720 DT**	Easting	
Geologist/Engineer	**Kelly Titkemeier**	Hole Depth	**110.0-feet**
Sample Method	**Geoprobe**	Outer Hole Diam	**-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–9			**0**						*0.0 to 10.0 feet: Air knife by vacuum truck. No observations.*
5			**0**						
10			**34**	**GP**					*10.0 to 11.7 feet: SAND (SP); dark gray; fine to medium; trace fines; trace sub-rounded gravel; trace red lithics; micaceous; dry to moist.*
12									*11.7 to 15.0 feet: NO RECOVERY.*
15			**28**	**GP**					*15.0 to 16.4 feet: SAND (SP); dark gray; fine to medium; trace fines; trace sub-rounded gravel; trace red lithics; micaceous; dry to moist.*
17									*16.4 to 20.0 feet: NO RECOVERY.*

NOTES: *1) Unless otherwise specified, odor staining, and NAPL observations characteristic of MGP impacts.*
2) No TCE NAPL observed.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	GP144	2 of 6

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			76	GP					20.0 to 23.8 feet: SAND (SP); dark gray to black; fine to medium; trace fines; organics; subrounded to rounded medium gravel; sheen; hydrocarbon-like odor; trace coarse sand; trace mica; wet.
22									@ 22.0 feet: wood fragment.
23									@ 22.8 to 22.9 feet: SILT LENS.
24									23.8 to 25.0 feet: NO RECOVERY.
25			90	GP					25.0 to 29.5 feet: SAND (SP); dark gray to black; fine to medium; trace fines; trace mica; staining; sheen; hydrocarbon-like odor; wet.
26									
27									
28									
29									
30									29.5 to 30.0 feet: NO RECOVERY.
			92	GW GP		GP144-W-30			30.0 to 34.6 feet: SILT (ML); dark gray; medium plasticity; trace mica; trace fine sand; NAPL; sheen; hydrocarbon-like odor; moist.
31									
32									
33									@ 32.9 feet: SILT LENS; dark gray; sheen; trace mica; moist.
34									
35									34.6 to 35.0 feet: NO RECOVERY.
			84	GP					35.0 to 36.8 feet: SILT (ML); dark gray; medium plasticity; trace mica; trace fine sand; NAPL; sheen; hydrocarbon-like odor; moist.
36									
37									36.8 to 39.2 feet: SILT (ML); dark gray; 90% fines, medium plasticity; 10% sand, fine; trace mica; hydrocarbon-like odor; sheen; moist.
38									
39									
40									39.2 to 40.0 feet: NO RECOVERY.
			80	GP					40.0 to 42.7 feet: SILT (ML); dark gray; medium plasticity; trace mica; trace fine sand; NAPL; sheen; hydrocarbon-like odor; moist.
41									
42									

NOTES: 1) Unless otherwise specified, odor staining, and NAPL observations characteristic of MGP impacts.
2) No TCE NAPL observed.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	GP144	3 of 6

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43									42.7 to 44.0 feet: SILTY SAND (SM); dark gray; 20% fines; 80% sand; sheen; hydrocarbon-like odor; wet.
44									44.0 to 45.0 feet: NO RECOVERY.
45			74	GP					45.0 to 48.7 feet: INTERBEDDED SILTY SAND AND SILT (SM/ML); SILTY SAND (SM), dark gray, 20% fines, 80% sand, fine, trace mica, wet; SILT (ML); dark gray, low to medium plasticity; trace white friable fragments; moist.
46									
47									
48									
49									48.7 to 50.0 feet: NO RECOVERY.
50			94	GP					50.0 to 54.7 feet: INTERBEDDED SILTY SAND AND SILT (SM/ML); SILTY SAND (SM), dark gray, 20% fines, 80% sand, fine, trace mica, wet; SILT (ML); dark gray, low to medium plasticity; trace organics; trace white friable fragments; moist.
51									
52									
53									
54									
55									54.7 to 55.0 feet: NO RECOVERY.
56			96	GP					55.0 to 56.4 feet: SILTY SAND (SM); dark gray; 30% fines; 70% sand; wet.
57									56.4 to 57.7 feet: SILTY SAND; dark gray to black; 30% fines; 70% sand; sheen; NAPL ; hydrocarbon-like odor; wet.
58									57.7 to 59.8 feet: INTERBEDDED SILTY SAND AND SANDY SILT (SM/ML); dark gray; moist.
59				GW		GP144-W-59			
60			92	GP					59.8 to 60.0 feet: NO RECOVERY.
61									60.0 to 64.6 feet: INTERBEDDED SILTY SAND AND SANDY SILT (SM/ML); dark gray; moist.
62									@ 61.8 feet: trace organics.
63									@ 62.3 feet: trace friable white fragments.
64									
65									64.6 to 65.0 feet: NO RECOVERY.

NOTES: 1) Unless otherwise specified, odor staining, and NAPL observations characteristic of MGP impacts.
2) No TCE NAPL observed.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	GP144	4 of 6

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66			96	GP					65.0 to 65.5 feet: SANDY SILT (ML); dark gray; 60% fines, low plasticity; 40% sand, fine; moist. 65.5 to 68.1 feet: SILTY SAND (SM); dark gray; 40% fines; 60% sand, fine; wet.
67									
68									
69									68.1 to 69.4 feet: SANDY SILT (SM); dark gray; 60% fines, low plasticity; 40% sand, fine; moist.
70									69.4 to 69.8 feet: SILTY SAND (SM); dark gray; 30% fines; 70% sand, fine; wet.
71			100	GP					69.8 to 70.0 feet: NO RECOVERY. 70.0 to 75.0 feet: SILTY SAND (SM); dark gray; sheen; wet.
72									
73									
74									
75			80	GP					75.0 to 76.2 feet: SILTY SAND (SM); dark gray; 35% fines; 65% sand, fine; wet.
76									76.2 to 78.3 feet: SANDY SILT (ML); dark gray; 70% fines, low plasticity; 30% sand, fine; wet.
77									
78									
79									78.3 to 79.0 feet: SILTY SAND (SM); dark gray; 45% fines, low plasticity; 55% sand, fine; wet.
80			94	GP					79.0 to 80.0 feet: NO RECOVERY. 80.0 to 80.3 feet: SANDY SILT (ML); dark gray; 60% fines, low plasticity; 40% sand, fine; moist.
81									80.3 to 80.6 feet: SILTY SAND (SM); dark gray; 30% fines; 70% sand, fine; wet.
82									80.6 to 82.3 feet: SANDY SILT (ML); dark gray; 60% fines, low plasticity; 40% sand, fine; moist.
83									82.3 to 84.7 feet: SAND WITH SILT (SP/SM); dark gray; 10% fines; 90% sand, fine; trace coarse white sand; trace mica; wet.
84									
85				GW		GP144-W-85			84.7 to 85.0 feet: NO RECOVERY.
86			92	GP					85.0 to 89.6 feet: SAND WITH SILT (SP/SM); dark gray; 10% fines; 90% sand, fine; trace coarse white sand; trace mica; wet.
87									

NOTES: 1) Unless otherwise specified, odor staining, and NAPL observations characteristic of MGP impacts.
2) No TCE NAPL observed.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	GP144	5 of 6

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88									
89									
90									89.6 to 90.0 feet: NO RECOVERY.
			90	GP					90.0 to 91.0 feet: SAND WITH SILT (SP/SM); dark gray; 10% fines; 90% sand, fine; trace coarse white sand; trace mica; wet.
91									91.0 to 91.7 feet: SANDY SILT (ML); dark gray; 60% fines, low plasticity; 40% sand, fine; trace mica; moist to wet.
92									91.7 to 94.5 feet: SAND WITH SILT (SP/SM); dark gray; 10% fines; 90% sand, fine; trace coarse white sand; trace mica; wet.
93									
94									
95									94.5 to 95.0 feet: NO RECOVERY.
			100	GP					95.0 to 100 feet: INTERBEDDED SILTY SAND AND SANDY SILT (SM/ML); dark gray; fine sand; low plasticity fines; trace mica; moist to wet.
96									
97									
98									@ 98.0 feet: trace organics.
99									
100									
			0	GP					100.0 to 105.0 feet: NO RECOVERY.
101									
102									
103									
104									
105									
			92	GP					105.0 to 109.3 feet: SAND WITH SILT (SP-SM); dark gray; 10% fines; 90% sand, fine; trace mica; wet.
106									
107									
108									
109									@ 109.0 feet: silt lens.
110				GW		GP144-W-110			109.3 to 109.6 feet: SANDY SILT (ML); dark gray; 55% fines, low plasticity; 45% sand, fine; trace mica; moist to wet.

NOTES: 1) Unless otherwise specified, odor staining, and NAPL observations characteristic of MGP impacts.
2) No TCE NAPL observed.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	**GP144**	**6 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
									109.6 to 110.0 feet: NO RECOVERY.

NOTES: *1) Unless otherwise specified, odor staining, and NAPL observations characteristic of MGP impacts.*
2) No TCE NAPL observed.

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08/28	**GP145**	**1 of 5**

Project Name	**Siltronic Corp.**	TOC Elevation (feet)	
Project Location	**7200 NW Front Ave., Portland, Oregon**	Surface Elevation (feet)	
Start/End Date	**9/12/2013 to 9/17/2013**	Northing	
Driller/Equipment	**Cascade Drilling, L.P./Geoprobe 6620 DT**	Easting	
Geologist/Engineer	**K. Titkemeier and A. Vidourek**	Hole Depth	**100.0-feet**
Sample Method	**Geoprobe**	Outer Hole Diam	**3.75 to 2.25-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1			**0**						*0 to 10.0 feet: Soil removed using air knife and hand auger to check for underground utilities; no observation.*
10			**60**	**GP**					*10.0 to 12.0 feet: Reconnaissance soil vapor sample collected using a Post Run Tubing system; no recovery.*
12						**GP145-SV-11.5**			
13						**GP145-SO-13.0** **PID = 60.2 ppm**			*12.0 to 15.0 feet: SAND (SP); dark gray; 95% sand; 5% fines; black staining; dry.* *@ 13.0 feet: Heavy black staining.*
15			**80**	**GP**					*15.0 to 24.0 feet: SAND WITH SILT (SP-SM); very dark gray; 85% sand; 15% fines; black staining; dry.*
16				**GW**		**GP145-GW-16-21**			*@ 15.0 to 20.0 feet: Trace gravel.*
18						**PID = 7.9 ppm**			*@ 18.0 feet: Wet.*
19						**GP145-SO-19.0**			
20									

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Borehole was advanced to 33.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 31.0 feet bgs and then pulled back to 29.0 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 33.0 feet to 100.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08/28	GP145	2 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			100	GP					
22									
23						GP145-SO-23.0			
24									24.0 to 31.0 feet: SAND (SP); very dark gray; 95% sand; 5% fines; slight organic-like odor; wet.
25			100	GP					
26				GW		GP145-GW-26-31			
27									
28						PID = 2.4 ppm			
29									
30			100	GP					
31									31.0 to 33.0 feet: SILT (ML); dark gray; 100% fines; trace wood debris and mica; trace black staining; slight organic-like odor; moist.
32						PID = 1.1 ppm GP145-SO-32.0			
33			100	GP		PID = 38.2 ppm			33.0 to 35.0 feet: INTERBEDDED SAND (SP); dark gray; trace mica, mild hydrocarbon-like odor; wet; and SILT (ML); grayish-brown; mild hydrocarbon-like odor; wet.
34									
35			100	GP		PID = 18.9 ppm GP145-SO-35-38			35.0 to 38.0 feet: SANDY SILT (ML); grayish-brown; 80% low to medium plasticity fines; 20% fine sand; trace mica; moist.
36									
37									
38						GP145-SO-38-40			38.0 to 40.0 feet: SILT (ML); gray; 100% low to medium plasticity fines; moist.
39									
40									@ 39.5 feet: Trace flecks of white, friable material.
41			60	GP		PID = 20.8 ppm PID = 22.9 ppm			40.0 to 45.0 feet: SILT grading to SANDY SILT (ML); gray; 60-80% medium plasticity fines; 20-40% fine sand; trace mica; increase in sand content with depth; moist.
42									

NOTES: 1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Borehole was advanced to 33.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 31.0 feet bgs and then pulled back to 29.0 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 33.0 feet to 100.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08/28	GP145	3 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43									
44									
45									@ 44.5 feet: Wood fragment.
			90	GP		PID = 15.2 ppm			45.0 to 48.0 feet: INTERBEDDED SAND (SP); gray; wet; and SILT (ML); gray; low to medium plasticity fines; layers are 3 to 6 inches thick; moist to wet.
46									
47									
48									48.0 to 50.0 feet: SILT (ML); gray; 60-70% low to medium plasticity fines; 30-40% fine sand; trace mica; moist.
49									
50			100	GP		PID = 16.1 ppm			50.0 to 55.0 feet: SILT (ML); gray; 70-80% low plasticity fines; 20-30% sand; stiff; trace mica and wood fragments; moist.
51									@ 50.4 feet: SANDY SILT (ML) lens. @ 50.7 to 51.0 feet: SANDY SILT (ML) lens.
52									@ 52.0 to 52.5 feet: SANDY SILT (ML) lens.
53									
54									
55									@ 54.5 to 54.7 feet: SANDY SILT (ML) lens. @ 54.6 to 54.9 feet: SILTY SAND (SM); gray; wet.
			100	GP		PID = 15.8 ppm			55.0 to 57.0 feet: SILTY SAND to SANDY SILT (SM/ML); gray; 50% fine sand; 50% fines; soupy; wet.
56				GW		GP145-SO-56-60 GP145-GW-56-60			
57									57.0 to 57.5 feet: SILTY SAND (SM); gray; 55% fine sand; 45% fines; trace mica; wet.
58									57.5 to 58.3 feet: SILT (ML); gray; 90-95% low plasticity fines; 5-10% very fine sand; stiff; trace mica; moist.
59									58.3 to 60.0 feet: SAND WITH SILT (SP-SM); gray; 85% fine sand; 15% fines; trace mica; wet.
60			0	GP					60.0 to 65.0 feet: No recovery; drillers indicate very soft.
61									
62									
63									
64									
65									

NOTES: 1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Borehole was advanced to 33.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 31.0 feet bgs and then pulled back to 29.0 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 33.0 feet to 100.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08/28	GP145	4 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66			100	GP		PID = 11.3 ppm			65.0 to 69.0 feet: INTERBEDDED SANDY SILT (ML); gray; 60-80% fines; 20-40% fine sand; stiff; trace mica and decayed wood fragments; moist to wet; and SILTY SAND (SM); gray; 60% fine sand; 40% fines; loose; trace mica and decayed wood fragments; soupy; wet. Layers are 0.2 to 0.8 feet thick.
67									
68									
69									
70									69.0 to 70.5 feet: SANDY SILT (ML); gray; 60-70% low to medium plasticity fines; 30-40% very fine sand; stiff; trace mica; moist to wet.
			100	GP		PID = 32.6 ppm			
71									70.5 to 72.5 feet: SILTY SAND (SM); gray; 70% very fine to fine sand; 30% fines; trace mica; wet; soupy.
72									
73									72.5 to 75.0 feet: SANDY SILT(ML); gray; 60-70% low to medium plasticity fines; 30-40% very fine sand; trace mica; moist.
74									@ 74.0 feet: Driller indicates harder drilling.
75			100	GP		PID = 34.2 ppm			75.0 to 80.0 feet: SAND WITH SILT (SP-SM); gray; 80-85% very fine to fine sand; 15-20% fines; loose to medium density; trace mica; wet.
76				GW		GP145-GW-76-80			@ 75.0 to 78.5 feet: Soupy.
77									
78									
79									@ 78.5 feet: Dense; decrease in fines to 5-10%.
80			0	GP					80.0 to 85.0 feet: No recovery.
81									
82									
83									
84									
85			90	GP					85.0 to 94.5 feet: SAND (SP); dark gray; 95% fine to medium sand; 5% fines; dense to medium density; trace mica; wet.
86									@ 86.0 feet: SILT (ML) nodule.
87									

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Borehole was advanced to 33.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 31.0 feet bgs and then pulled back to 29.0 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 33.0 feet to 100.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08/28	**GP145**	**5 of 5**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88									
89									
90			**90**	**GP**		**PID = 213.2 ppm**			
91									
92									
93									
94									
95			**100**	**GP**		**PID = 375.9 ppm**			*94.5 to 95.5 feet: SANDY SILT (ML); gray; 55% non- to low-plasticity fines; 45% fine sand; stiff; trace mica; wet.*
96				**GW**		**GP145-GW-96-100**			*95.5 to 96.5 feet: SILTY SAND (SM); gray; 80% fine sand; 20% fines; trace mica; wet.*
97									*96.5 to 98.0 feet: SANDY SILT(ML); gray; 60-70% low to medium plasticity fines; 30-40% fine sand; trace mica; moist to wet.*
98									*@ 98.0 feet: Trace wood fragments.*
99									*98.0 to 100.0 feet: SAND WITH SILT (SP-SM); gray; 90% fine sand; 10% fines; trace mica; wet.*
100									

Total Depth = 100.0 feet bgs.

Completion Details

0.0 to 31.0 feet bgs: 3.75-inch borehole.
31.0 to 100.0 feet bgs: 2.25-inch borehole.

0.0 to 35.0 feet bgs: Bentonite grout with 10% Organoclay by volume.
35.0 to 100.0 feet bgs: Bentonite grout.

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Borehole was advanced to 33.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 31.0 feet bgs and then pulled back to 29.0 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 33.0 feet to 100.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08/28	**GP146**	**1 of 5**

Project Name	**Siltronic Corp.**	TOC Elevation (feet)	
Project Location	**7200 NW Front Ave., Portland, Oregon**	Surface Elevation (feet)	
Start/End Date	**9/18/13 to 9/23/13**	Northing	
Driller/Equipment	**Cascade Drilling, L.P./Geoprobe 6620 DT and 7720 DT**	Easting	
Geologist/Engineer	**K. Titkemeier**	Hole Depth	**105.0-feet**
Sample Method	**Geoprobe**	Outer Hole Diam	**3.75 to 2.25-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
0			**0**						*0 to 10.0 feet: Soil removed using air knife and hand auger to check for underground utilities; no observation.*
10			**0**	**GP**					*10.0 to 12.0 feet: Reconnaissance soil vapor sample collected using a Post Run Tubing system; no recovery.*
12						**GP146-SV-11.5**			
12			**100**	**GP**		**PID = 31.5 ppm**			*12.0 to 15.0 feet: SAND (SP); dark brown; 95% fine to medium sand; 5% fines; trace fine gravel and mica; dry to moist.*
13									*@13.0 to 13.5 feet: SILT (ML); dark gray; mild hydrocarbon-like odor.*
14						**GP146-SO-13.5-15**			*@ 13.5 feet: Color change to dark gray; mild hydrocarbon-like odor.*
15			**70**	**GP**		**PID = 100.7 ppm**			*15.0 to 20.0 feet: SAND WITH SILT (SP-SM); dark gray; 90% fine to medium sand; 10% fines; trace coarse sand, fine gravel, wood fragments, and mica; mild hydrocarbon-like odor; moist to wet.*
16				**GW**		**GP146-GW-15-20**			
18									*@ 18.0 feet: Large wood fragment.*
19						**GP146-SO-19-20**			*@ 19.0 feet: Heavy black staining; tacky; strong hydrocarbon-like odor; rainbow sheen when wet.*
20									

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Borehole was advanced to 33.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 33.0 feet bgs and pulled back to 31.0 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 33.0 feet to 105.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08/28	GP146	2 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			100	GP	PID = 367.7 ppm	GP146-SO-20-23			20.0 to 25.0 feet: SAND WITH SILT (SP-SM); black; 90% fine to medium sand; 10% fines; trace mica; hydrocarbon-like odor; heavy black staining; tacky; wet. @ 20.0 to 23.0 feet: Trace roots; rainbow sheen.
22									
23					PID = 29.1 ppm				@ 23 feet: Color change to dark gray; visual impacts (sheen, staining) end; mild hydrocarbon-like odor.
24									
25			100	GP	PID = 39.1 ppm				25.0 to 30.0 feet: SAND WITH SILT (SP-SM); dark gray; 90-95% fine to medium sand; 5-10% fines; trace mica; mild hydrocarbon-like odor; wet.
26				GW	PID = 14.1 ppm	GP146-GW-26-30			@ 25.0 feet: Trace sheen.
27									
28						GP146-SO-28-30			
29									@ 29.0 feet: SILT (ML) lamination.
30			100	GP	PID = 14.9 ppm				@ 29.8 feet: Increase in fines to 20%. 30.0 to 30.2 feet: SILTY SAND (SM); very dark gray; 80% fine to medium sand; 20% fines; trace mica; mild hydrocarbon-like odor; wet.
31						GP146-SO-30.5-33			30.2 to 33.0 feet: SILT (ML); very dark gray; 80% low plasticity fines; 20% very fine sand; firm to stiff; trace rootlets and mica; mild organic odor; moist.
32									
33			50	GP	PID = 24.5 ppm				33.0 to 35.0 feet: SILT (ML); very dark gray; 80-90% low to medium plasticity fines; 10-20% very fine sand; firm to stiff; trace mica; mild organic odor; moist.
34									
35			60	GP	PID = 10.4 ppm				35.0 to 40.0 feet: SILT (ML); very dark gray; 65-80% low to medium plasticity fines; 20-35% very fine sand; firm to stiff; trace mica; mild organic odor decreasing with depth; moist.
36									
37									
38									
39									
40			100	GP	PID = 5.0 ppm	GP146-SO-40-41			40.0 to 41.0 feet: SILT (ML); very dark gray; 65-80% low to medium plasticity fines; 20-35% very fine sand; firm; trace mica; moist.
41									41.0 to 42.6 feet: SILTY SAND (SM); 60% very fine to fine sand; 40% fines; trace mica; soupy; wet.
42									

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Borehole was advanced to 33.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 33.0 feet bgs and pulled back to 31.0 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 33.0 feet to 105.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed.*

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Project Number	Well Number	Sheet
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Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43									42.6 to 45.0 feet: SILT (ML); very dark gray; 70-80% low to medium plasticity fines; 20-30% very fine sand; firm to stiff; trace mica; moist.
44									@ 43.4 to 43.8 feet: SANDY SILT (ML); moist to wet.
45			**100**	**GP**		**PID = 5.4 ppm**			45.0 to 47.8 feet: SILT (ML); very dark gray; 70-80% low to medium plasticity fines; 20-30% very fine sand; firm to stiff; trace mica; moist.
46									
47									@ 46.8 to 47.0 feet: SANDY SILT (ML); moist to wet.
48									47.8 to 49.0 feet: SILTY SAND (SM); very dark gray; 85% fine sand; 15% fines; trace mica; wet.
49									49.0 to 49.5 feet: SILT (ML); very dark gray; 70% low plasticity fines; 30% sand; firm to stiff; trace mica; moist.
50			**100**	**GP**		**PID = 3.7 ppm**			49.5 to 50.0 feet: SILTY SAND (SM); very dark gray; 85-90% fine sand; 10-15% fines; trace mica; wet.
51				**GW**		**GP146-SO-51-55 GP146-GW-51-55**			50.0 to 51.5 feet: SILTY SAND (SM); very dark gray; 80-85% fine sand; 15-20% fines; trace mica; soupy; wet.
52									51.5 to 52.3 feet: SILT (ML); very dark gray; 70% low plasticity fines; 30% very fine sand; trace mica; moist.
53									52.3 to 55.0 feet: SILTY SAND (SM); very dark gray; 80-85% fine sand; 15-20% fines; trace mica; soupy; wet.
54									
55			**90**	**GP**		**PID = 5.1 ppm**			55.0 to 60.3 feet: SAND WITH SILT (SP-SM); very dark gray; 90% fine sand; 10% fines; loose, becoming medium density with depth; trace mica; wet.
56									
57									@ 57.2 feet: SILT (ML) lens.
58									
59									
60			**100**	**GP**		**PID = 9.6 ppm**			60.3 to 62.5 feet: INTERBEDDED SANDY SILT (ML), 60% low plasticity fines, 40% fine sand, wet; and SILTY SAND (SM), 60% fine sand, 40% fines, wet. Layers are 0.2 to 1.0 foot thick.
61									
62									
63									62.5 to 65.0 feet: SILTY SAND (SM); very dark gray; 60-70% fine sand; 30-40% fines; trace mica; wet.
64									
65									

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Borehole was advanced to 33.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 33.0 feet bgs and pulled back to 31.0 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 33.0 feet to 105.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed.*

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Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66			100	GP	PID = 6.5 ppm	GP146-SO-65.3-65.6			65.0 to 70.0: SILTY SAND (SM); very dark gray; 80-90% fine sand; 10-20% fines; loose to medium density; trace medium sand and mica; soupy; wet. @ 65.0 to 65.3 feet: Dense; moist. @ 65.3 to 65.6 feet: White, medium to coarse sand-sized material mixed approximately 50:50 with sand. Material has low density and breaks/"crunches" when force is applied. Resembles pumice or perlite.
67									
68									
69									
70			100	GP	PID = 6.7 ppm				70.0 to 75.0 feet: SAND WITH SILT (SP-SM); very dark gray; 90% fine sand; 10% fines, increasing with depth to 20%; medium density, becoming loose to medium density with depth; trace mica; wet; becoming soupy with depth.
71									
72									
73									
74									
75									@ 74.3 feet: SILT (ML) lens.
76			100	GP	PID = 6.2 ppm				75.0 to 75.3 feet: SAND WITH SILT (SP-SM); very dark gray; 90% fine sand; 10% fines; very dense; trace mica; moist. 75.3 to 77.7 feet: SILT (ML); very dark gray; 70-80% medium to low plasticity fines; 20-30% very fine sand; firm to stiff; trace mica; moist to wet.
77									@ 76.3 to 76.4 feet SILTY SAND (SM); wet. @ 77.2 to 77.4 feet: SILTY SAND (SM); wet.
78									77.7 to 78.9 feet: SILTY SAND (SM); very dark gray; 75% fine sand; 25% fines; loose; trace mica; soupy; wet.
79									78.9 to 80.0 feet: SILT (ML); very dark gray; 70-80% low to medium plasticity fines; 20-30% very fine sand; firm to stiff; trace mica; moist to wet.
80			100	GP GW	PID = 19.3 ppm	GP146-GW-80-84			@ 79.9 to 80.0 feet: SILTY SAND (SM); wet. 80.0 to 80.7 feet: SILT (ML); very dark gray; 60-70% low to medium plasticity fines; 30-40% sand; firm to stiff; trace mica; moist.
81						GP146-SO-81.5-83.5			@ 80.0 to 80.1 feet: SAND WITH SILT (SP-SM); dense; moist. 80.7 to 83.6 feet: SILTY SAND (SM); very dark gray; 75% fine sand; 25% fines; loose; trace mica; soupy; wet.
82									
83									
84									83.6 to 85.0 feet: SANDY SILT (ML); very dark gray; 55-65% low to medium plasticity fines; 35-45% very fine sand; firm to stiff; trace mica; trace small wood fragments; moist.
85			100	GP	PID = 9.1 ppm				85.0 to 90.0 feet: SAND WITH SILT (SP-SM); very dark gray; 90% fine sand; 10% fines; loose to medium density; trace mica; wet.
86									@ 85.9 to 86.0 feet: SILTY SAND (SM); very dense.
87									

NOTES: 1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Borehole was advanced to 33.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 33.0 feet bgs and pulled back to 31.0 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 33.0 feet to 105.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed.

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Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88									
89									@ 89.0 feet: SILT (ML) lens, 1 inch thick. @ 89.0 to 90.0 feet: Increase in fines to 20%; very dense.
90			**100**	**GP**		**PID = 6.4 ppm**			90.0 to 92.0 feet: SILTY SAND (SM); very dark gray; 20-25% fines, loose; 75-80% fine sand; soupy; wet. @ 90.0 to 90.2 feet: Very dense; moist.
91									
92									92.0 to 93.0 feet: INTERBEDDED SANDY SILT (ML) and SILTY SAND (SM); trace mica; wet.
93									93.0 to 95.0 feet: SILTY SAND (SM); very dark gray; 75% fine sand; 25% fines; trace mica; wet.
94									@ 94.1 feet: SILT (ML) lens.
95			**0**	**GP**					95.0 to 100.0 feet: No recovery; shoe came off.
96									
97									
98									
99									
100			**100**	**GP**		**PID = 9.2 ppm**			100.0 to 100.6 feet: SILTY SAND (SM); very dark gray; 75% fine sand; 25% fines; loose; trace mica; soupy; wet.
101				**GW**		**GP146-SO-101-105** **GP146-GW-101-105**			100.6 to 101.0 feet: SANDY SILT (ML); very dark gray; 55% low plasticity fines; 45% sand; soft; trace mica; wet. Nodules of very dense SANDY SILT (SM).
102									101.0 to 105.0 feet: SAND WITH SILT (SP-SM); very dark gray; 85-90% fine sand; 10-15% fines; trace mica; wet.
103									
104									@ 104.1 to 104.3 feet: SANDY SILT (ML); low plasticity; moist.
105									

Total Depth = 105.0 feet bgs.

Completion Details

0.0 to 33.0 feet bgs: 3.75-inch borehole.
33.0 to 105.0 feet bgs: 2.25-inch borehole.

0.0 to 35.0 feet bgs: Bentonite grout with 10% Organoclay by volume.
35.0 to 105.0 feet bgs: Bentonite grout.

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Borehole was advanced to 33.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 33.0 feet bgs and pulled back to 31.0 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 33.0 feet to 105.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
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Project Name	**Siltronic Corp.**	TOC Elevation (feet)	
Project Location	**7200 NW Front Ave., Portland, OR**	Surface Elevation (feet)	
Start/End Date	**10/31/2013 to 11/7/2013**	Northing	
Driller/Equipment	**Cascade Drilling, L.P./Geoprobe 7720 DT**	Easting	
Geologist/Engineer	**K. Titkemeier**	Hole Depth	**105.0-feet**
Sample Method	**Geoprobe**	Outer Hole Diam	**3.75 to 2.25-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–20			**0**						*0 to 10.0 feet: Soil removed using air knife and hand auger to check for underground utilities; no observation.*
10			**60**	**GP**		**PID = 56.7 ppm** **GP147-SO-10-15**			*10.0 to 12.0 feet: SILTY SAND (SM); very dark gray; 55% very fine to fine sand; 45% fines; loose to medium density; trace mica and wood fragments; mild hydrocarbon-like odor; trace blue sheen; moist to wet.*
12						**GP147-SV-11.5**			*12.0 to 13.5 feet: SANDY SILT (ML); very dark gray; 55% fines; 45% very fine to fine sand; firm; trace mica; mild hydrocarbon-like odor; trace blue sheen; moist to wet.*
14									*13.5 to 20.0 feet: SAND (SW); very dark gray; 90-100% fine to coarse sand; 5-10% fines; trace mica; mild hydrocarbon-like odor. Decrease in coarse sand with depth.* *@ 13.5 to 15.0 feet: Loose; trace fine gravel.*
15			**70**	**GP** **GW**		**PID = 116.8 ppm** **GP147-SO-15-20** **GP147-GW-15-20**			*@ 15.0 to 20.0 feet: Trace silt laminations and lenses of wood fragments.*

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Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			70	GP GW	PID = 193.3 ppm GP147-SO-20-22 GP147-GW-20-25				@ 20.0 feet: SILT (ML); very dark gray to black; tacky; hydrocarbon-like odor. 20.0 to 25.5 feet: SAND (SW); black; 90-95% fine to coarse sand; 5-10% fines; trace wood fragments; strong hydrocarbon-like odor; rainbow sheen when wet; tacky; staining; wet. @ 20.0 to 22.0 feet: Heavy staining.
22									
23									
24									@ 24.0 to 24.5 feet: Heavy staining; large wood fragments; coarse sand decreasing with depth.
25			90	GP					
26					PID = 196 ppm GP147-SO-26-30				25.5 to 35.0 feet: SILT (ML); very dark with brown and rust orange mottling; 70-80% low to medium plasticity fines; 20-30% very fine sand; firm to stiff; trace fine sand, mica, and rootlets; mild hydrocarbon-like odor decreasing with depth; moist. @ 25.5 to 26.0 feet: Very dark gray.
27									
28									
29									
30			50	GP	PID = 13.6 ppm GP147-SO-30-35				@ 30.0 to 35.0 feet: Hydrocarbon-like odor; trace blebs of black viscous fluid; blebs produce rainbow sheen when wet. Increase in sand with depth to 40%.
31									
32									
33									
34									@ 34.0 feet: SILTY SAND (SM); very dark gray; silver sheen. Lens is approximately 1/2-inch thick.
35			90	GP	PID = 247 ppm GP147-SO-35-40				35.0 to 36.0 feet: SANDY SILT (ML); very dark gray with brown and rust orange mottling; 60% low plasticity fines; 40% very fine to fine sand; firm; trace mica; hydrocarbon-like odor and non-hydrocarbon-like odor; moist.
36									36.0 to 40.0 feet: SILTY SAND (SM); very dark gray; 60% very fine to fine sand; 40% fines; trace medium sand and mica; hydrocarbon-like odor and non-hydrocarbon-like odor; wet. @ 36.0 to 37.0 feet: Very dark gray with brown mottling; mottling is faint. @ 37.0 feet: Trace blue/silver sheen.
37									
38									
39				GW	GP147-GW-39-43				@ 38.8 to 39.2 feet: SANDY SILT (ML); very dark gray with brown mottling; low to medium plasticity. @ 39.2 to 40.0 feet: Very dark gray with brown mottling; mottling is faint.
40			80	GP	PID = 1,020 ppm GP147-SO-40-45				40.0 to 43.0 feet: SILTY SAND (SM); very dark gray with faint brown mottling; 50-60% very fine to fine sand; 40-50% fines; trace mica; non-hydrocarbon-like odor; moist.
41									
42									

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Borehole was advanced to 30.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 30.0 feet bgs and then pulled back to 27.0 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 30.0 feet to 105.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed. 9. Soil vapor sample GP147-SV-11.5 was collected from a borehole approximately 30 feet plant-Southeast of GP147.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
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Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43									*43.0 to 45.0 feet: SILT (ML); very dark gray; 70-80% low to medium plasticity fines; 20-30% very fine sand; stiff; trace mica; non-hydrocarbon-like odor; moist.*
44									
45			**100**	**GP**		**PID = 804 ppm GP147-SO-45-50**			*45.0 to 55.0 feet: INTERBEDDED SANDY SILT (ML), very dark gray, 60% fines, 40% very fine to fine sand, firm to stiff, moist; and SILTY SAND (SM), very dark gray, 60% very fine to fine sand, 40% fines, medium density increasing to dense with depth, wet. Layers are 0.4 to 0.8 feet thick; trace mica; non-hydrocarbon-like odor.*
46									
47									*@ 45.0 feet: Trace silver/blue sheen.*
48									
49									
50			**100**	**GP**		**PID = 158 ppm**			
51									
52									
53									
54									
55			**100**	**GP**		**PID = 2.9 ppm**			*55.0 to 60.0 feet: SILTY SAND (SM); very dark gray; 70% very fine to fine sand; 30% fines; medium density; trace mica; mild hydrocarbon-like odor; wet.*
56									
57									
58									*@ 57.4 to 58.0 feet: SANDY SILT (ML); very dark gray; 60% fines; 40% very fine to fine sand; firm; trace mica; moist to wet.*
59									
60			**100**	**GP**		**PID = 3.3 ppm**			*60.0 to 65.0 feet: SANDY SILT (ML); very dark gray; 60% low to medium plasticity fines; 40% very fine to fine sand; firm to stiff; trace mica; moist.*
61									*@ 60.6 to 61.5 feet: SILTY SAND (SM); very dark gray; 50-55% very fine to fine sand; 45-50% fines; trace mica; wet.*
62									
63									*@ 62.7 to 63.0 feet: SILTY SAND (SM); very dark gray; 50-55% very fine to fine sand; 45-50% fines; trace mica; wet.*
64									*@ 64.0 to 65.0 feet: SILTY SAND (SM); very dark gray; 50-55% very fine to fine sand; 45-50% fines; trace mica; wet.*
65									

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Borehole was advanced to 30.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 30.0 feet bgs and then pulled back to 27.0 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 30.0 feet to 105.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed. 9. Soil vapor sample GP147-SV-11.5 was collected from a borehole approximately 30 feet plant-Southeast of GP147.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
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Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66			100	GP		PID = 1.2 ppm			65.0 to 80.0 feet: SILTY SAND (SM); very dark gray; 60-80% very fine to fine sand; 20-40% fines; medium density; trace mica and medium sand; wet.
67									
68									
69									
70			100	GP		PID = 1.0 ppm			@ 69.6 to 70.0 feet: SANDY SILT (ML); very dark gray; 60% fines; 40% very fine to fine sand; moist to wet.
71									@ 70.0 to 70.7 feet: SANDY SILT (ML); very dark gray; 60% low to medium plasticity fines; 40% very fine to fine sand; firm to stiff; trace wood fragments; moist.
72									@ 71.6 to 72.7 feet: SANDY SILT (ML); very dark gray; 60% low to medium plasticity fines; 40% very fine to fine sand; firm to stiff; trace wood fragments; moist.
73									
74									
75			100	GP		PID = 0.3 ppm GP147-SO-75-80			@ 75.0 to 80.0 feet: Trace white, fine to coarse sand-size material; low density; resembles pumice or perlite; decreasing with depth.
76				GW		GP147-GW-76-80			
77									
78									
79									
80			100	GP		PID = 6.2 ppm			80.0 to 95.0 feet: INTERBEDDED SILTY SAND (SM), SANDY SILT (ML), and SILT (ML); very dark gray; trace mica; moist to wet. Layers are 0.1 to 0.8 feet thick.
81									@ 80.0 to 83.2 feet: Trace friable wood fragments. Wood fragments appear decayed.
82									
83									@ 83.2 to 84.0 feet: SILTY SAND (SM); trace white, fine to coarse sand-sized material; low density; resembles pumice or perlite.
84									
85			100	GP		PID = 1.1 ppm GP147-SO-85-90			@ 85.0 to 90.0 feet: Drillers note potential methane-like odor when pulling up sample.
86									
87									

NOTES: 1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Borehole was advanced to 30.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 30.0 feet bgs and then pulled back to 27.0 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 30.0 feet to 105.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed. 9. Soil vapor sample GP147-SV-11.5 was collected from a borehole approximately 30 feet plant-Southeast of GP147.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08/28	**GP147**	**5 of 5**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88									
89									
90									
			100	**GP**	**PID = 63.8 ppm**	**GP147-SO-90-95**			*@ 90.0 to 95.0 feet: Trace white friable material.*
91									
92									
93									
94									
95									
			100	**GP**	**PID = 57 ppm**	**GP147-SO-95-100**			*95.0 to 100.0 feet: SANDY SILT (ML); very dark gray; 60-70% low to medium plasticity fines; 30-40% very fine to fine sand; firm to stiff; trace mica; moist.*
96									
									@ 96.3 to 96.8 feet: SILTY SAND (SM) lens; very dark gray; 50-60% fine sand; 40-50% fines; wet.
97									
98									
									@ 98.5 to 98.7 feet: SILTY SAND (SM) lens; very dark gray; 50-60% fine sand; 40-50% fines; wet.
99									
100									
			10	**GP**	**PID = 1.2 ppm**	**GP147-SO-100-105**			*100.0 to 105.0 feet: SILTY SAND (SM); very dark gray; 70-80% very fine to fine sand; 20-30% fines; very dense; trace mica; trace white friable material; moist to wet.*
101				**GW**	**GP147-GW-101-105**				
102									
103									
104									
105									

Total Depth = 105.0 feet bgs.

Completion Details

0.0 to 30.0 feet bgs: 3.75-inch borehole.
30.0 to 105.0 feet bgs: 2.25-inch borehole.

0.0 to 40.0 feet bgs: Bentonite grout with 10% Organoclay by volume.
40.0 to 105.0 feet bgs: Bentonite grout.

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Borehole was advanced to 30.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 30.0 feet bgs and then pulled back to 27.0 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 30.0 feet to 105.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed. 9. Soil vapor sample GP147-SV-11.5 was collected from a borehole approximately 30 feet plant-Southeast of GP147.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08/28	**GP148**	**1 of 5**

Project Name	**Siltronic Corp.**	TOC Elevation (feet)	
Project Location	**7200 NW Front Avenue, Portland, OR**	Surface Elevation (feet)	
Start/End Date	**10/16/2013 to 10/18/2013**	Northing	
Driller/Equipment	**Cascade Drilling, L.P./Geoprobe 7720 DT**	Easting	
Geologist/Engineer	**K. Titkemeier**	Hole Depth	**105.0-feet**
Sample Method		Outer Hole Diam	**3.75 to 2.25-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1			**0**						*0 to 10.0 feet: Soil removed using air knife and hand auger to check for underground utilities; no observation.*
10			**0**	**GP**					*10.0 to 12.0 feet: Reconnaissance soil vapor sample collected using a Post Run Tubing system; no recovery.*
12			**100**	**GP**	**GP148-SV-11.5**	**PID = 5.8 ppm GP148-SO-12.0-13.5**			*12.0 to 15.0 feet: SAND (SP); very dark grayish brown; 95-100% fine to medium sand; 0 - 5% fines; loose; trace mica; mild hydrocarbon-like odor; dry to moist.* *@ 13.0 to 13.5 feet: Dark gray/black; hydrocarbon-like odor; moist.* *@ 13.0 to 15.0 feet: Trace fine gravel.* *@ 13.5 to 15.0 feet: Color change to very dark gray.*
14				**GW**	**GP148-SO-13.5-15 PID = 0.9 ppm GP148-GW-14-19**				
15			**50**	**GP**	**PID = 9.4 ppm GP148-SO-15-20**				*15.0 to 20.0 feet: SAND (SP); very dark gray; 95-100% fine to medium sand; 0-5% fines; trace mica and fine gravel; medium density; moist to wet.*

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Borehole was advanced to 30.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 28.0 feet bgs and then pulled back to 25.0 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 30.0 feet to 105.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed. 9. Soil vapor sample GP148-SW-11.5 was collected approximately 5 feet northeast of GP148.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08/28	GP148	2 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			70	GP GW	PID = 170.0 ppm GP148-SO-20-22.5 GP148-GW-20-25				20.0 to 22.5 feet: INTERBEDDED SAND (SP), black; 95% fine to medium sand; 5% fines; hydrocarbon-like odor, tacky, blue sheen when wet; moist; and SILT (ML), dark gray; 80% low to medium plasticity fines; 20% fine sand; hydrocarbon-like odor; moist. Layers are 0.5 to 2 inches thick.
22									
23					GP148-SO-22.6-24.4				22.5 to 24.4 feet: SILT (ML); very dark gray; 80% low to medium plasticity fines; 20% very fine sand; stiff; moist; trace mica; trace roots and wood fragments; hydrocarbon-like odor.
24									
25			80	GP	PID = 14.3 ppm				24.4 to 25.0 feet: SILTY SAND (SM); very dark gray; 50-55% very fine to fine sand; 45-50% low plasticity fines; trace mica; hydrocarbon-like odor; moist to wet.
26									25.0 to 30.0 feet: INTERBEDDED SANDY SILT (ML); very dark gray; 60% low to medium plasticity fines; 40% very fine to fine sand; trace mica and rootlets; hydrocarbon-like odor; moist; and SILT (ML); very dark gray; 80% low to medium plasticity fines; 20% very fine sand; trace mica and rootlets; hydrocarbon-like odor; stiff; moist. Layers are 2 inches to 1 foot thick, decreasing with depth.
27									
28									@ 27.5 feet: Color change to grayish brown with dark brown mottling and some rust-orange mottling.
29									
30			90	GP	PID = 1.0 ppm				30.0 to 34.3 feet: SANDY SILT (ML); grayish brown with brown and some rust orange mottling; 60-70% low to medium plasticity fines; 30-40% very fine sand; stiff; trace mica; moist.
31									
32					GP148-SO-32-33.5				
33									
34					GP148-SO-33.8-35				@ 33.8 to 34.0 feet: SILTY SAND (SM) lens; very dark gray; 75% fine sand; 25% fines; mild non-hydrocarbon-like odor; moist to wet.
35			100	GP	PID = 4.2 ppm GP148-SO-35-40				34.3 to 35.0 feet: SILTY SAND (SM); very dark gray; 75-85% fine sand; 15-25% fines; trace mica; mild/faint non-hydrocarbon odor; moist to wet. Decrease in fines with depth.
36									35.0 to 40.0 feet: SILTY SAND (SM); very dark gray; 70% fine sand; 30% fines; trace mica; non-hydrocarbon-like odor; wet.
37									
38									@ 38.0 to 39.0 feet: SANDY SILT; grayish brown with brown mottling; trace mica; moist. Increasing sand with depth; becoming very dark gray with depth.
39				GW	GP148-GW-39-43				
40			80	GP	PID = 2.4 ppm GP148-SO-40-45				40.0 to 43.4 feet: SILTY SAND (SM); very dark gray; 70-75% fine sand; 25-30% fines; trace mica; non-hydrocarbon-like odor, decreasing with depth; moist.
41									
42									@ 42.2 to 42.6 feet: SANDY SILT (ML); very dark gray; moist;

NOTES: 1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Borehole was advanced to 30.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 28.0 feet bgs and then pulled back to 25.0 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 30.0 feet to 105.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed. 9. Soil vapor sample GP148-SW-11.5 was collected approximately 5 feet northeast of GP148.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
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Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43									increasing fines with depth. Faint mottling.
44									
45			100	GP	PID = 4.5 ppm				43.4 to 45.0 feet: SANDY SILT (ML); very dark gray; 60-80% medium plasticity fines; 20-40% very fine sand; stiff; trace mica; non-hydrocarbon-like odor, decreasing with depth; moist. Increasing fines with depth grading to SILT (ML).
46									
47					GP148-SO-46.5-50				45.0 to 65.0 feet: INTERBEDDED SILTY SAND (SM); dark gray; 50-55% fine sand; 45-50% fines; trace mica; non-hydrocarbon-like odor; wet; and SANDY SILT (ML) very dark gray; 50-55% fines; 45-50% fine sand; trace mica; non-hydrocarbon-like odor; moist.
48									@ 45.0 to 47.5 feet: Soupy.
49									@ 46.5 feet: Lamination of white, friable material.
50			100	GP	PID = 2.5 ppm				@ 48.3 feet: Charred wood fragment.
51					GP148-SO-50-55				@ 49.0 to 50.0 feet: Dense; moist.
52									@ 50.0 to 51.6 feet: SILT (ML) layers are dark gray with brown mottling.
53									
54									
55			100	GP	PID = 0.6 ppm				
56									
57									
58									
59									
60			100	GP	PID = 0.7 ppm				@ 60.0 to 65.0 feet: Odor not observed.
61									
62									
63									
64									
65									@ 64.2 to 64.4 feet: trace fine to medium sand-sized, white material; low density; resembles pumice/perlite.

NOTES: 1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Borehole was advanced to 30.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 28.0 feet bgs and then pulled back to 25.0 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 30.0 feet to 105.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed. 9. Soil vapor sample GP148-SW-11.5 was collected approximately 5 feet northeast of GP148.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
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Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
65			**100**	**GP**		**PID = 0.8 ppm**			65.0 to 65.7 feet: SILTY SAND (SM); very dark gray; 60% very fine to fine sand; 40% fines; trace mica; wet to moist.
66									65.7 to 67.2 feet: SANDY SILT (ML); very dark gray; 60% low to medium plasticity fines; 40% very fine sand; trace mica; moist.
67									
68									67.2 to 68.8 feet: SILTY SAND (SM); very dark gray; 60% very fine sand; 40% fines; trace mica; wet.
69									68.8 to 70.0 feet: INTERBEDDED SILTY SAND (SM); very dark gray; trace mica; moist to wet; and SANDY SILT (ML); very dark gray; trace mica; moist to wet.
70			**100**	**GP**		**PID = 0.7 ppm**			70.0 to 75.0 feet: SILTY SAND (SM); very dark gray; 75% fine to medium sand; 25% fines; trace mica; wet.
71									@ 70.0 feet: Soupy.
72									
73									@ 72.6 to 73.0 feet: SANDY SILT (ML); very dark gray; 70% low to medium plasticity fines; 30% very fine sand; trace mica.
74									
75									@ 74.4 to 75.0 feet: SANDY SILT (ML); very dark gray; 70% low to medium plasticity fines; 30% very fine sand; moist; trace mica.
			100	**GP**		**PID = 0.3 ppm**			75.0 to 80.0 feet: SILTY SAND (SM); very dark gray; 75 - 80% fine to medium sand; 20-25% fines; trace mica; wet. Decrease in fines with depth and increase in density with depth.
76						**GP148-SO-75-80**			
				GW		**GP148-GW-76-80**			@ 75.0 feet: Soupy.
77									@ 76.5 to 76.8 feet: SANDY SILT (ML); very dark gray; 70% low to medium plasticity fines; 30% fine sand; trace mica; moist.
78									
79									
80			**100**	**GP**		**PID = 0.4 ppm**			80.0 to 80.5 feet: SANDY SILT (ML); 60% low plasticity fines; 40% very fine to fine sand; moist.
81									80.5 to 81.4 feet: SILTY SAND (SM); 60% very fine to fine sand; 40% fines; trace mica and roots; wet.
82									81.4 to 81.9 feet: SANDY SILT (ML); 60% low plasticity fines; 40% very fine to fine sand; trace mica and roots; moist.
83									81.9 to 82.5 feet: SILTY SAND (SM); 60% very fine to fine sand; 40% fines; trace mica and roots; soupy; wet.
									82.5 to 83.0 feet: SANDY SILT (ML); 60% low plasticity fines; 40% very fine to fine sand; trace mica and roots; moist.
84									83.0 to 84.5 feet: SILTY SAND (SM); 60% very fine to fine sand; 40% fines; trace mica and roots; wet.
85									@ 83.0 to 84.0 feet: Trace fine to medium sand-sized material; low density; resembles pumice/perlite.
			100	**GP**		**PID = 0.6 ppm**			84.5 to 85.0 feet: SANDY SILT (ML); 60% low plasticity fines; 40% very fine to fine sand; trace mica and roots; moist.
86									85.0 to 90.0 feet: INTERBEDDED SILTY SAND (SM); very dark gray; trace mica; moist to wet; and SANDY SILT (ML); very dark gray; trace mica; moist to wet.
87									@ 86.2 to 86.9 feet: trace fine to medium sand-sized material; low density; resembles pumice/perlite.

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Borehole was advanced to 30.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 28.0 feet bgs and then pulled back to 25.0 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 30.0 feet to 105.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed. 9. Soil vapor sample GP148-SW-11.5 was collected approximately 5 feet northeast of GP148.*

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08/28	**GP148**	**5 of 5**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88									
89									
90									@ 89.3 to 89.4 feet: trace fine to medium sand-sized material; low density; resembles pumice/perlite.
			100	**GP**		**PID = 0.7 ppm**			90.0 to 91.0 feet: SILTY SAND (SM); very dark gray; 70-75% fine sand; 25-30% fines; trace mica; soupy; wet.
91									91.0 to 92.6 feet: INTERBEDDED SILTY SAND (SM); very dark gray; trace mica; moist to wet; and SANDY SILT (ML); very dark gray; trace mica; moist to wet. Layers are up to 0.3 feet thick.
92									
93									92.6 to 93.1 feet: SILTY SAND (SM); very dark gray; 85% fine sand; 15% fines; medium density; trace mica; wet.
94									93.1 to 95.0 feet: SILT (ML); very dark gray; 70% low to medium plasticity fines; 30% very fine sand; stiff; trace mica; trace white friable material; moist.
95									@ 93.5 feet: SILTY SAND (SM) lens; 1/2-inch thick.
			100	**GP**		**PID = 0.8 ppm**			95.0 to 98.0 feet: SILTY SAND (SM); very dark gray; 70% fine sand; 30% fines; trace mica; wet.
96									@ 95.0 feet: Soupy.
97									
98									98.0 to 100.0 feet: INTERBEDDED SILTY SAND (SM); very dark gray; trace mica; moist to wet; and SANDY SILT (ML); very dark gray; trace mica; moist to wet. Layers are 0.3 feet to 0.6 feet thick.
99									@ 98.4 to 100.0 feet: trace white friable material.
100									
			100	**GP**		**PID = 0.9 ppm**			100.0 to 105.0 SILTY SAND (SM); very dark gray; 70-85% fine to medium sand; 15-30% fines; medium density; trace mica; wet. Decreasing in fines with depth.
101						**GP148-SO-100-105**			
				GW		**GP148-GW-101-105**			@ 100.0 feet: Soupy.
102									
103									@ 103.2 to 103.3 feet: SANDY SILT (ML) lens.
104									@ 104.0 to 104.5 feet: SANDY SILT (ML) lens.
105									@ 104.5 to 105.0 feet: Dense.

Total Depth = 105.0 feet below ground surface.

Completion Details

0.0 to 28.0 feet bgs: 3.75-inch borehole.
28.0 to 105.0 feet bgs: 2.25-inch borehole.

0.0 to 30.0 feet bgs: Bentonite grout with 10% Organoclay by volume.
30.0 to 105.0 feet bgs: Bentonite grout.

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Borehole was advanced to 30.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 28.0 feet bgs and then pulled back to 25.0 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 30.0 feet to 105.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed. 9. Soil vapor sample GP148-SW-11.5 was collected approximately 5 feet northeast of GP148.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08/28	**GP149**	**1 of 5**

Project Name	**Siltronic Corp.**	TOC Elevation (feet)	
Project Location	**7200 NW Front Ave., Portland, OR**	Surface Elevation (feet)	
Start/End Date	**9/23/2013 to 9/26/2013**	Northing	
Driller/Equipment	**Cascade Drilling, L.P./Geoprobe 7720DT**	Easting	
Geologist/Engineer	**K. Titkemeier**	Hole Depth	**105.0-feet**
Sample Method	**Geoprobe**	Outer Hole Diam	**3.75 to 2.25-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1			**0**						*0 to 10.0 feet: Soil removed using air knife and hand auger to check for underground utilities; no observation.*
10			**0**	**GP**					*10.0 to 12.0 feet: Reconnaissance soil vapor sample collected using a Post Run Tubing system; no recovery.*
12						**GP149-SV-11.5**			
12			**100**	**GP**		**PID = 16.1 ppm**			*12.0 to 12.5 feet: SILTY SAND (SM); brown; 75% fine to medium sand; 25% fines; trace fine to medium gravel; trace mica; dry to moist.*
13									*12.5 to 15.0 feet: SAND WITH SILT (SP-SM); brown grading to very dark gray; 90% fine to medium sand; 10% fines; trace mica, coarse sand, fine to medium gravel; dry to moist. Decrease in fines with depth.*
14						**GP149-SO-14-15**			
15			**50**	**GP**		**PID = 22.1 ppm**			*15.0 to 20.0 feet: SAND (SP); very dark gray; 95% fine to medium sand; 5% fines; trace mica; moist.*
16				**GW**		**GP149-GW-16-20**			
19									*@ 19.4 to 19.8 feet: Wood fragments mixed, approximately 50:50, with sand.*
20									

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Borehole was advanced to 35.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 35.0 feet bgs and then pulled back to 33.0 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 35.0 feet to 105.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08/28	GP149	2 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			50	GP	PID = 301.5 ppm				@ 19.8 feet: SILT (ML) lens; gray; low to medium plasticity; moist. @ 19.8 - 20.0 feet: Black; tacky; strong hydrocarbon-like odor; organic material.
22									20.0 to 22.5 feet: No recovery.
23					GP149-SO-22.5-23.5				22.5 to 23.0 feet: SILTY SAND (SM); black; 75% sand; 25% fines; trace mica; tacky; strong hydrocarbon-like odor: wet to moist.
24									23.0 to 23.5 feet: SANDY SILT (ML); black; 60-70% low to medium plasticity fines; 30-40% sand; strong hydrocarbon-like odor; moist.
25									23.5 to 25.0 feet: SAND WITH SILT (SP-SM); very dark gray; 90% fine to medium sand; 10% fines; trace mica; strong hydrocarbon-like odor; moist to wet.
26			100	GP GW	PID = 47.8 ppm GP149-GW-25-30				@ 24.3 to 24.4 feet: Dark brown staining. 25.0 to 30.0 feet: SAND WITH SILT (SP-SM); black; 90% fine to medium sand; 10% fines; trace wood fragments; strong hydrocarbon-like odor; heavy rainbow sheen; blue silver sheen; soupy; wet.
27									@ 25.5 to 27.0 feet: 10 - 20% wood fragments mixed with soil.
28					GP149-SO-27.5-30				
29									
30			100	GP	PID = 30.2 ppm				30.0 to 32.0 feet: INTERBEDDED SAND WITH SILT (SP-SM); black; strong hydrocarbon-like odor, rainbow sheen, staining; wet; and SANDY SILT (ML); very dark gray with rust brown mottling; strong hydrocarbon-like odor; sand stringers (strong hydrocarbon-like odor, rainbow sheen, staining); moist to wet.
31									
32					GP149-SO-32-33				32.0 to 33.0 feet: SILT (ML); very dark gray with rust brown mottling; 80-90% low to medium plasticity fines; 10-20% sand; trace mica; blebs of black viscous fluid; trace lenses of black sand; strong hydrocarbon-like odor; moist.
33			0	GP	PID = 24.7 ppm				33.0 to 35.0 feet: No recovery.
34									
35			50	GP	PID = 18.7 ppm				35.0 to 41.0 feet: SILTY SAND (SM); very dark gray; trace mica; hydrocarbon-like odor, moderate sheen; wet. Trace lenses of SANDY SILT (ML). @ 35.0 feet: Soupy.
36									
37									
38									
39									
40									
41									41.0 to 43.0 feet: SANDY SILT (ML); very dark gray with trace brown mottling; low plasticity fines; trace mica; hydrocarbon-like odor; moist.
42									

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Borehole was advanced to 35.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 35.0 feet bgs and then pulled back to 33.0 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 35.0 feet to 105.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08/28	**GP149**	**3 of 5**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43									43.0 to 45.0 feet: SILTY SAND (SM); very dark gray; trace mica; hydrocarbon-like odor; wet.
44									
45			**80**	**GP**		**PID = 8.2 ppm**			45.0 to 46.0 feet: No recovery.
46									46.0 to 46.3 feet: SILTY SAND (SM); very dark gray; 75% fine sand; 25% fines; trace mica; wet
47									@ 46.0 feet: Trace sheen.
									46.3 to 49.0 feet: SILT (ML); very dark gray; 80-90% low plasticity fines; 10-20% very fine sand; trace mica; organic-like odor; moist.
48									@ 47.7 to 48.0 feet: SILTY SAND (SM); organic-like odor.
49									49.0 to 60.0 feet: SILTY SAND (SM); very dark gray; 75-85% fine sand; 15-25% fines; trace mica; moist to wet.
50			**100**	**GP**		**PID = 5.2 ppm**			
51				**GW**	**GP149-GW-51-55**				@ 50.9 to 51.2 feet: SILT (ML) lens.
52					**GP149-SO-51-55**				
53									@ 52.6 to 52.7 feet: SILT (ML) lens.
									@ 53.2 to 53.4 feet: SILT (ML) lens.
54									
55			**100**	**GP**		**PID = 5.9 ppm**			
56									@ 55.3 to 55.5 feet: SILT (ML) lens.
									@ 55.7 to 56.0 feet: SANDY SILT (ML) lens.
									@ 56.2 to 57.0 feet: SANDY SILT (ML) lens.
57									
58									@ 57.3 to 57.5 feet: SANDY SILT (ML) lens.
									@ 57.8 to 58.1 feet: SILT (ML) lens.
59									
60									@ 59.1 to 59.6 feet: SILT (ML) lens.
			100	**GP**		**PID = 6.0 ppm**			60.0 to 70.3 feet: INTERBEDDED SILTY SAND (SM), very dark gray; 75% fine sand; 25% fines; trace mica; wet; SANDY SILT (ML), 55-60% low plasticity fines; 40-45% sand; trace mica; moist; and SILT (ML); very dark gray; 70% low plasticity fines; 30% sand; trace mica; moist. Layers 0.2 to 1 foot thick.
61									
62									
63									
64									
65									

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Borehole was advanced to 35.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 35.0 feet bgs and then pulled back to 33.0 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 35.0 feet to 105.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
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Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66			**100**	**GP**		**PID = 5.1 ppm**			
67									
68									
69									
70			**100**	**GP**		**PID = 4.1 ppm**			
71									*70.3 to 72.0 feet: SILT (ML); very dark gray; 70% fines; 30% very fine to fine sand; trace wood fragments and mica; moist. Sheen observed on shoe and on water at top of core. No sheen observed in soil.*
72									*72.0 to 75.0 feet: INTERBEDDED SILTY SAND (SM), very dark gray; 75% fine sand; 25% fines; trace mica; wet; SANDY SILT (ML), 55-60% low plasticity fines; 40-45% sand; trace mica; moist; and SILT (ML); very dark gray; 70% low plasticity fines; 30% sand; trace mica; moist. Layers 0.2 to 1 foot thick.*
73									
74									
75			**100**	**GP**		**PID = 3.4 ppm**			*75.0 to 76.0 feet: SILTY SAND (SM); very dark gray; 75% sand; 25% fines; trace mica; mild organic-like odor; wet.*
76				**GW**		**GP149-GW-76-80** **GP149-SO-76-80**			*76.0 to 77.5 feet: SILT (ML); very dark gray; 80% low to medium plasticity fines; 20% sand; trace mica and wood fragments; mild organic-like odor; moist to wet.* *@ 76.8 feet: SILTY SAND (SM) lens.*
77									
78									*77.5 to 85.0 feet: SILTY SAND (SM); very dark gray; 75-85% fine sand; 15-25% fines; trace mica; mild organic-like odor; wet.*
79									
80			**100**	**GP**		**PID = 2.9 ppm**			*@ 80.0 to 85.0 feet: Sample was dropped, then retrieved using a sandcatcher. Sheen observed on outside of macrocore liner. Sheen not observed in soil.* *@ 80.0 feet: Medium to coarse sand-sized pieces of white material, resembles pumic/perlite. Soupy.*
81									
82									
83									
84									
85			**90**	**GP**		**PID = 1.8 ppm**			*85.0 to 87.6 feet: SANDY SILT (ML); very dark gray; 55-70% non- to low plasticity fines; 30-45% very fine to fine sand; trace mica; wet. Sheen observed on outside of macrocore liner and outside of core, but no sheen observed inside soil.*
86									
87									

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Borehole was advanced to 35.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 35.0 feet bgs and then pulled back to 33.0 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 35.0 feet to 105.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed.*

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
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Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88									87.6 to 90.0 feet: SILTY SAND (SM); very dark gray; 75% fine sand; 25% fines.
89									@ 87.6 to 89.2 feet: Trace medium sand-sized white material resembling pumice/perlite; sheen noted on water in soil core; soupy.
90			**100**	**GP**	**GP149-SO-89.9-90**	**PID = 2.4 ppm**			@ 89.9 to 90.0 feet: Moderate sheen on outside of soil core.
91									90.0 to 95.0 feet: SANDY SILT (ML); very dark gray; 60% low plasticity fines; 40% very fine to fine sand; trace mica; moist to wet.
92									
93									
94									@ 93.8 to 94.2 feet: SILTY SAND; very dark gray; 55% fine sand; 45% fines; wet.
95			**80**	**GP**		**PID = 2.6 ppm**			95.0 to 96.0 feet: No recovery.
96									96.0 to 96.5 feet: SANDY SILT (ML); very dark gray; 60% low plasticity fines; 40% very fine to fine sand; trace mica; moist to wet.
97									96.5 to 97.2 feet: SILTY SAND (SM); very dark gray; 55% fine sand; 45% fines; trace mica; wet.
98									97.2 to 97.9 feet: SANDY SILT (ML); very dark gray; 60% low plasticity fines; 40% very fine to fine sand; trace mica; moist to wet.
99									97.9 to 100.0 feet: SAND (SP); very dark gray; 95% fine sand; 5% fines; trace mica; wet.
100									@ 98.2 to 98.4 feet: SANDY SILT (ML) lens.
101			**100**	**GP**		**PID = 3.3 ppm**			100.0 to 101.0 feet: SANDY SILT (ML); very dark gray; 60-70% low plasticity fines; 30-40% very fine to fine sand; trace white friable material; moist.
102				**GW**	**GP149-GW-101-105**				101.0 to 105.0 feet: SAND (SP); very dark gray; 95% fine sand; 5% fines; trace mica; wet.
103					**GP149-SO-101-105**				
104									
105									

Total Depth = 105.0 feet below ground surface.

Completion Details
0.0 to 35.0 feet bgs: 3.75-inch borehole.
35.0 to 105.0 feet bgs: 2.25-inch borehole.

0.0 to 90.0 feet bgs: Bentonite grout with 10% Organoclay by volume.
90.0 to 105.0 feet bgs: Bentonite grout.

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Borehole was advanced to 35.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 35.0 feet bgs and then pulled back to 33.0 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 35.0 feet to 105.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08/28	**GP150**	**1 of 7**

Project Name	**Siltronic Corp.**	TOC Elevation (feet)	
Project Location	**7200 NW Front Ave., Portland, OR**	Surface Elevation (feet)	
Start/End Date	**10/21/2013 to 10/24/2013**	Northing	
Driller/Equipment	**Cascade Drilling, L.P./Geoprobe 77220DT**	Easting	
Geologist/Engineer	**K. Titkemeier**	Hole Depth	**135.0-feet**
Sample Method	**Geoprobe**	Outer Hole Diam	**3.75 to 2.25-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1			**0**						*0 to 10.0 feet: Soil removed using air knife and hand auger to check for underground utilities; no observation.*
2									
3									
4									
5									
6									
7									
8									
9									
10			**70**	**GP**		**PID = 36 ppm**			*10.0 to 20.0 feet: SAND (SP); very dark grayish-brown; 90-100% fine to medium sand; 0-10% fines; loose to medium density; trace mica and coarse sand; dry to moist.*
11									*@ 10.0 to 15.0 feet: Trace fine gravel.*
12						**GP150-SV-11.5**			
13						**GP150-SO-13-15**			
14				**GW**		**GP150-GW-14-19**			*@ 14.0 feet: Color change to very dark gray; damp to moist.*
15			**50**	**GP**		**PID = 24 ppm**			*@ 15.0 feet: Wet.*
16									
17									
18									
19									*@ 18.7 feet: SILT (ML) lamination.*
20									

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Refusal at 125.0 feet. Advanced water sampler to 135.0 feet. Borehole was advanced to 27.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 27.0 feet bgs and then pulled back to 24.0 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 27.0 feet to 125.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed. 9. Soil vapor sample GP150-SV-11.5 was collected from a borehole approximately 5 feet plant-north of GP150.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
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Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			60	GP GW	PID = 223 ppm GP150-SO-20-23.5 GP150-GW-20-25				20.0 to 23.5 feet: SAND WITH SILT (SP-SM); black; 90% fine to medium sand; 10% fines; trace coarse sand and fine gravel; hydrocarbon-like odor; rainbow sheen when wet; tacky; wet.
24					GP150-SO-23.5-25				23.5 to 25.0 feet: SILT (ML); very dark gray; 70-80% low to medium plasticity fines, stiff; 20-30% very fine sand; trace mica, roots, and twigs; hydrocarbon-like odor; moist.
26			100	GP					25.0 to 27.0 feet: INTERBEDDED SANDY SILT (ML); very dark gray; 60% low to medium plasticity fines; 40% very fine sand; trace mica and roots; moist; and SILT (ML); very dark gray; 80% low to medium plasticity fines; 20% very fine sand; trace roots and mica; moist.
28			73	GP	PID = 2.6 ppm				27.0 to 28.5 feet: SILT(ML); very dark gray; 70-80% low to medium plasticity fines, stiff; 20-30% very fine sand; trace mica and roots; moist.
29					GP150-SO-28.5-30				28.5 to 30.0 feet: SANDY SILT (ML); very dark gray with brown mottling; 55% low plasticity fines; 45% sand; trace mica; mild non-hydrocarbon-like odor; moist.
31			80	GP	PID = 2.9 ppm GP150-SO-30-35				30.0 to 40.0 feet: INTERBEDDED SANDY SILT (ML), gray with brown and some rust orange mottling; 50-55% low plasticity fines, 45-50% very fine to fine sand; mild non-hydrocarbon-like odor, decreasing with depth; moist; and SILT (ML), gray with brown and some rust orange mottling; 80% low to medium plasticity fines, 20% very fine sand; mild non-hydrocarbon-like odor, decreasing with depth; moist.
36			90	GP	PID = 9.1 ppm GP150-SO-35-40				
41			100	GP	PID = 332 ppm GP150-SO-40-45				40.0 to 60.0 feet: INTERBEDDED SAND WITH SILT (SP-SM), very dark gray; trace mica; wet; and SILTY SAND (SM); very dark gray; trace mica; wet; and SANDY SILT (ML); very dark gray; trace mica; moist. Layers are up to 1 foot in thickness. @ 40.0 to 45.0 feet: SANDY SILT (ML) and SILT (ML) layers are gray with brown and some rust orange mottling. Trace charred wood. @ 40.0 to 55.0 feet: Mild non-hydrocarbon-like odor.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08/28	**GP150**	**3 of 7**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43									
44									
45									
			10	**GP**		**PID = 254 ppm GP150-SO-45-50**			
46									
47									
48									
49									
50									
			100	**GP**		**PID = 131 ppm GP150-SO-50-55**			*@ 50.0 to 60.0 feet: Trace roots and wood fragments.*
51									
52									
53									
54									
55									
			100	**GP**		**PID = 122 ppm**			*@55.0 to 60.0 feet: Trace rust orange mottling in SILT (ML) layers. Chlorine-like odors.*
56									
57									
58									
59									
60									
			100	**GP GW**		**PID = 39 ppm GP150-SO-60-64 GP150-GW-60-64**			*60.0 to 70.0 feet: SILTY SAND (SM); very dark gray; 60-80% fine to medium sand; 20-40% fines; wet; trace mica; chlorine-like odor; wet.*
61									*@ 60.0 to 60.5 feet: SANDY SILT (ML) lens.*
62									*@ 61.5 to 61.8 feet: SANDY SILT (ML) lens.*
									@ 62.0 to 63.5 feet: Soupy; higher percentage of sand.
63									
64									*@ 63.8 to 64.4 feet: SANDY SILT (ML) lens; trace roots.*
65									

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Refusal at 125.0 feet. Advanced water sampler to 135.0 feet. Borehole was advanced to 27.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 27.0 feet bgs and then pulled back to 24.0 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 27.0 feet to 125.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed. 9. Soil vapor sample GP150-SV-11.5 was collected from a borehole approximately 5 feet plant-north of GP150.*

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08/28	GP150	4 of 7

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66			100	GP	PID = 35.9 ppm	GP150-SO-65-70			@ 65.8 to 66.1 feet: SANDY SILT (ML) lens.
67									@ 67.5 to 67.6 feet: SANDY SILT (ML) lens.
68									@ 69.2 to 69.6 feet: SANDY SILT (ML) lens.
69									@ 69.6 to 70.0 feet: SAND (SP); very dark gray; 95% fine to medium sand; 5% fines; trace mica; wet.
70			100	GP	PID = 22 ppm	GP150-SO-70-75			70.0 to 72.5 feet: INTERBEDDED SILTY SAND (SM); very dark gray; trace mica; chlorine-like odor; wet; and SANDY SILT (ML) trace mica; moist.
71									
72									72.5 to 75.0 feet: SILTY SAND (SM); very dark gray; 75% fine sand; 25% fines; trace mica; chlorine-like odor; wet.
73									
74									@ 74.6 - 75.0 feet: SANDY SILT (ML); very dark gray; 60-70% low to medium plasticity fines; 30-40% very fine to fine sand; trace mica; moist.
75			100	GP	PID = 11.3 ppm	GP150-SO-75-80			75.0 to 80.0 feet: INTERBEDDED SILTY SAND (SM); very dark gray; trace mica; mild hydrocarbon-like odor; wet; and SANDY SILT (ML); very dark gray; trace mica; mild hydrocarbon-like odor; moist.
76									@ 77.0 to 78.0 feet: Trace blue sheen.
77									
78									
79				GW	GP150-GW-79-83				@ 79.5 to 80.0: Trace blue sheen.
80			100	GP	PID = 77 ppm	GP150-SO-80-85			80.0 to 86.5 feet: SILTY SAND (SM); very dark gray; 70-80% fine to medium sand; 20-30% fines, medium density; trace mica; wet.
81									@ 80.0 feet: Soupy.
82									@ 81.0 to 81.1 feet: SANDY SILT (ML) lens.
83									@ 81.6 to 81.9 feet: SANDY SILT (ML) lens.
84									@ 82.2 to 82.4 feet: SANDY SILT (ML) lens.
85			100	GP	PID = 0.6 ppm				
86									
87									86.5 to 90.0 feet: INTERBEDDED SANDY SILT (ML), very dark gray, 50-70% low plasticity fines; 30-50% very fine to fine sand; trace mica and rootlets; moist; and SILTY SAND (SM), very dark gray;

NOTES: 1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Refusal at 125.0 feet. Advanced water sampler to 135.0 feet. Borehole was advanced to 27.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 27.0 feet bgs and then pulled back to 24.0 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 27.0 feet to 125.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed. 9. Soil vapor sample GP150-SV-11.5 was collected from a borehole approximately 5 feet plant-north of GP150.

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08/28	**GP150**	**5 of 7**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88									50-60% very fine to fine sand, 40-50% fines; trace mica and rootlets; wet.
89									
90									
91			**100**	**GP**		**PID = 0.7 ppm**			90.0 to 95.0 feet: SILTY SAND (SM); very dark gray; 80-85% fine to medium sand; 15-20% fines; medium density; trace mica; trace white, low density, medium sand-sized material resembling perlite/pumice; wet.
92									@ 90.0 to 90.3 feet: SANDY SILT (ML); very dark gray; 50-55% fines; 45-50% very fine to fine sand; trace mica; wet.
93									@ 90.3 to 90.8 feet: Abundant white, low density, medium sand-sized material resembling perlite/pumice.
94									@90.8 to 91.5 feet: SILT (ML), very dark gray; 80% low to medium plasticity fines; 20% very fine sand; trace mica and roots; moist.
95									@ 91.5 to 91.7 feet: Abundant white, low density medium sand-sized material resembling perlite/pumice.
96			**100**	**GP**		**PID = 412 ppm**			95.0 to 100.0 feet: INTERBEDDED SILTY SAND (SM); very dark gray; trace mica; wet; and SANDY SILT (ML) very dark gray; trace mica; moist.
97									
98									
99									
100									
101			**100**	**GP**		**PID = 113 ppm**			100.0 to 102.0 feet: SANDY SILT (ML); very dark gray; 60-70% low plasticity fines; 30-40% very fine to fine sand; firm; trace mica; moist.
102				**GW**		**GP150-SO-101-105** **GP150-GW-101-105**			102.0 to 105.0 feet: SILTY SAND (SM); very dark gray; 70-80% very fine to fine sand; 20-30% fines; up to 10% fine to medium-sand-sized white material, low density, resembling perlite/pumice; wet.
103									@ 102.9 to 103.1 feet: SANDY SILT (ML) lens.
104									
105									@ 104.4 to 104.5 feet: SANDY SILT (ML) lens.
106			**100**	**GP**		**PID = 117.1 ppm** **GP150-SO-105-110**			105.0 to 110.0 feet: SANDY SILT (ML); very dark gray; 55-60% low plasticity fines; 40-45% very fine to fine sand; firm; trace mica and rootlets; moist to wet.
107									
108									
109									
110									@ 109.3 to 109.8 feet: SILTY SAND (SM); very dark gray; 50-55% very fine to fine sand; 45-50% fines; moist to wet.

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Refusal at 125.0 feet. Advanced water sampler to 135.0 feet. Borehole was advanced to 27.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 27.0 feet bgs and then pulled back to 24.0 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 27.0 feet to 125.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed. 9. Soil vapor sample GP150-SV-11.5 was collected from a borehole approximately 5 feet plant-north of GP150.*

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08/28	**GP150**	**6 of 7**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
111			**100**	**GP**	**PID = 51.9 ppm**				*@ 109.8 feet: Lamination of fine to medium-sand-sized white material; low density; resembles perlite/pumice.*
									110.0 to 115.0 feet: INTERBEDDED SAND WITH SILT (SP-SM), very dark gray; 90% fine sand; 10% fines; trace mica; wet; SILTY SAND (SM), very dark gray; 70-80% fine sand; 20-30% fines; trace mica; wet; and SANDY SILT (ML); very dark gray; 50-60% low plasticity fines; 40-50% fine sand; trace mica; moist to wet.
112									*@ 110.0 feet: Soupy.*
113									*@ 111.2 to 112.9 feet: Trace white friable material, fine to medium-sand-sized.*
114									
115			**100**	**GP**	**PID = 5.0 ppm**				*115.0 to 117.1 feet: SAND WITH SILT (SP-SM); very dark gray; 90% very fine to fine sand; 10% fines; medium density; trace mica; wet.*
116									*@ 115.0 feet: Soupy.*
117									*117.1 to 117.7 feet: SILT(ML); very dark gray; 80-90% low to medium plasticity fines; 10-20% very fine sand; firm to stiff; trace mica; trace white, friable, sand-sized material; moist.*
118									*117.7 to 118.6 feet: SAND (SP): very dark gray; 95% fine to medium sand; 5% fines; medium density; trace mica; moist to wet.*
119									*118.6 to 120.0 feet: SILTY SAND (SM); very dark gray; 50-55% very fine to fine sand; 45-50% fines; dense to very dense; trace mica; trace white friable sand-sized material; moist.*
120			**100**	**GP**	**PID = 1.0 ppm**				*@ 119.7 to 120.0 feet: Trace laminations of white friable material.*
					GP150-SO-120-125				*120.0 to 122.0 feet: SILTY SAND (SM); very dark gray; 50-55% very fine to fine sand; 45-50% fines; trace mica; soupy; wet.*
121									
122									*122.0 to 123.7 feet: SILT (ML); very dark gray; 70-80% low plasticity fines; 20-30% very fine sand; soft; moist to wet; trace mica.*
123									
124									*123.7 to 125.0 feet: SILTY SAND (SM); very dark gray; 75-80% very fine to fine sand; 20-25% fines; medium density; trace mica; wet.*
125									*@ 124.2 to 125.0 feet: Dense to very dense; moist.*
			0	**GP**					*125.0 to 135.0 feet: Push to 135 feet for groundwater sample, no recovery.*
126									*@ 125.0 feet: Refusal.*
127									
128									
129									
130									
131				**GW**	**GP150-GW-131-135**				
132									

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Refusal at 125.0 feet. Advanced water sampler to 135.0 feet. Borehole was advanced to 27.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 27.0 feet bgs and then pulled back to 24.0 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 27.0 feet to 125.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed. 9. Soil vapor sample GP150-SV-11.5 was collected from a borehole approximately 5 feet plant-north of GP150.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08/28	**GP150**	**7 of 7**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
133									
134									
135									

Total Depth = 135.0 feet below ground surface.

Completion Details

0.0 to 27.0 feet: 3.75-inch borehole.
27.0 to 135.0 feet: 2.25-inch borehole.

0.0 to 30.0 feet: Bentonite grout with 10% Organoclay by volume.
30.0 to 135.0 feet: Bentonite grout.

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Refusal at 125.0 feet. Advanced water sampler to 135.0 feet. Borehole was advanced to 27.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 27.0 feet bgs and then pulled back to 24.0 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 27.0 feet to 125.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed. 9. Soil vapor sample GP150-SV-11.5 was collected from a borehole approximately 5 feet plant-north of GP150.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08/28	**GP151**	**1 of 7**

Project Name	**Siltronic Corp.**	TOC Elevation (feet)	
Project Location	**7200 NW Front Ave., Portland, OR**	Surface Elevation (feet)	
Start/End Date	**9/27/2013 to 10/3/2013**	Northing	
Driller/Equipment	**Cascade Drilling, L.P./Geoprobe 7720DT**	Easting	
Geologist/Engineer	**K. Titkemeier and A. Vidourek**	Hole Depth	**135.0-feet**
Sample Method	**Geoprobe**	Outer Hole Diam	**3.75 to 2.25-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1			**0**						*0 to 10.0 feet: Soil removed using air knife and hand auger to check for underground utilities; no observation.*
10			**0**	**GP**					*10.0 to 12.0 feet: Reconnaissance soil vapor sample collected using a Post Run Tubing system; no recovery.*
12			**100**	**GP**		**GP151-SV-11.5 PID = 8.7 ppm**			*12.0 to 15.0 feet: SAND (SP); dark grayish brown becoming very dark gray; 95% fine to medium sand; 5% fines; trace mica; non-hydrocarbon-like odor; moist.*
14				**GW**		**GP151-SO-14-15 GP151-GW-14-19**			*@ 14.0 feet: Wet.*
15			**70**	**GP**		**PID = 12.4 ppm**			*15.0 to 18.5 feet: SAND (SP); very dark gray; 95% fine to medium sand; 5% fines; trace mica; wet.*
18									*@ 18.1 to 18.5 feet: Abundant large wood fragments.*
19									*18.5 to 19.0 feet: GRAVELLY SANDY SILT (ML); very dark gray; 45% fines; 35% sand; 20% fine gravel; trace mica; moist.*
									@ 18.7 to 18.9 feet: Coarse gravel or cobble.
20									*19.0 to 20.0 feet: CLAYEY GRAVEL (GC); brown; 50% fine to*

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Refusal at 120.0 feet below ground surface. Borehole was advanced to 33.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 33.0 feet bgs and then pulled back to 30.0 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 33.0 feet to 120.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed. Advanced water sampler to 135.0 feet bgs.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08/28	GP151	2 of 7

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			80	GP	PID = 63.0 ppm				medium angular to subangular gravel; 35% medium to high plasticity fines; 15% very fine to fine sand; stiff to very stiff; sticky; trace mica; moist.
				GW	GP151-GW-21-26				
22									
23									
24					GP151-SO-24-25				
25			70	GP	PID = 322.0 ppm				
					GP151-SO-25-26				
26					GP151-SO-26-30				
27									
28									
29									20.0 to 24.0 feet: CLAYEY GRAVEL (GC); brown with trace red-orange mottling; 45% fine to medium, angular to subangular gravel; 40% medium to high plasticity fines; 15% very fine to fine sand; stiff to very stiff; trace roots, mica; moist.
30			0	GP					@ 23.0 feet: Color change to very dark gray with very dark greenish-gray mottling.
31									24.0 to 25.0 feet: SAND (SP); black; 95% fine to medium sand; 5% fines; trace fine gravel; strong hydrocarbon-like odor; rainbow sheen; heavy staining; wet.
32									25.0 to 26.0 feet: SAND (SP); black; 95% fine to medium sand; 5% fines; strong hydrocarbon-like odor; rainbow sheen; heavy staining; wet.
33			75	GP	PID = 112.9 ppm				26.0 to 30.0 feet: SILT (ML); very dark gray to black with brownish gray mottling; 70-80% low to medium plasticity fines; 20-30% fine sand; trace rootlets; strong hydrocarbon-like odor; blebs and stringers of black viscous fluid; rainbow sheen; staining; moist. Lenses of SANDY SILT (ML)/SILTY SAND (SM).
34					GP151-SO-33-35				
35									30.0 to 33.0 feet: No recovery.
36			80	GP	PID = 294.0 ppm				33.0 to 35.0 feet: SILT (ML); very dark gray with rust-orange mottling; 70% fines; 30% very fine to fine sand; trace mica; strong hydrocarbon-like odor; blebs of black viscous fluid; rainbow sheen; staining; moist to wet. Lenses of SILTY SAND (SM).
37									35.0 to 45.0 feet: INTERBEDDED SAND (SP), black, 95% fine to medium sand; 5% fines; trace mica; strong hydrocarbon-like odor; staining; rainbow sheen; wet; SILT (ML), very dark gray with rust orange mottling; 70% low plasticity fines; 30% fine sand; trace mica; strong hydrocarbon-like odor; blebs of black viscous fluid; subvertical stringers of black viscous fluid; moist; and SILTY SAND (SM); black; 75% fine sand; 25% fines; trace mica; strong hydrocarbon-like odor; staining; rainbow sheen; blebs of black viscous fluid; wet. Layers are 0.2 to 1 foot thick.
38									
39									
40			90	GP	PID = 387.0 ppm				
41									
42									

NOTES: 1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Refusal at 120.0 feet below ground surface. Borehole was advanced to 33.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 33.0 feet bgs and then pulled back to 30.0 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 33.0 feet to 120.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed. Advanced water sampler to 135.0 feet bgs.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08/28	**GP151**	**3 of 7**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43									
44									
45									
			100	**GP**	**PID = 380.9 ppm**				*45.0 to 55.0 feet: INTERBEDDED SAND (SP); black, 95% fine to medium sand, 5% fines; trace mica; strong hydrocarbon-like odor; staining; rainbow sheen; wet; SILT (ML): very dark gray, 70% low plasticity fines, 30% fine sand, trace rootlets and mica; strong hydrocarbon-like odor; moist; and SILTY SAND (SM); black; 75% fine sand; 25% fines; trace mica; strong hydrocarbon-like odor; staining; rainbow sheen; wet. Layers are 0.2 to 1 foot thick.*
46									
47									
48									
49									
50									
			100	**GP**	**PID = 304.7 ppm**				*@ 50.0 to 55.0 feet: Heavy staining in sand layers.*
51									
52									
53									
54									
				GW	**GP151-GW-54-59**				
					GP151-SO-54.5-55				
55									
			100	**GP**	**PID = 32.1 ppm**				*55.0 to 58.3 feet: INTERBEDDED SILTY SAND (SM); 60% sand; 40% fines; wet; and SANDY SILT (ML); 60% fines; 40% sand; hydrocarbon-like odor; moist to wet.*
56									*@ 55.0 feet: Slight sheen.*
57									
58									
59					**GP151-SO-58.5-60**				*58.3 to 60.0 feet: SANDY SILTY (ML); very dark gray; 60-70% low plasticity fines; 30-40% very fine to fine sand; trace mica; hydrocarbon-like odor, decreasing with depth; moist.*
60									
			100	**GP**	**PID = 10.8 ppm**				*@ 60.0 feet: Slight sheen on outside of soil core.*
61									*60.0 to 62.5 feet: SILTY SAND (SM); very dark gray; 75-80% fine sand; 20-25% fines; trace mica; mild organic odor; sheen observed on the outside of macrocore liner and soil core; wet.*
62									*@ 60.5 to 61.0 feet: SANDY SILT (ML); very dark gray; 60% low plasticity fines; 40% fine sand; moist to wet.*
63									*62.5 to 65.0 feet: INTERBEDDED SANDY SILT (ML), very dark gray, 55% low plasticity fines, 45% fine sand; trace mica and rootlets; wet; and SILTY SAND (SM), very dark gray, 55% fine sand, 45% fines; trace mica and rootlets; wet. Sheen observed on outside of macrocore liner.*
64									
65									

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Refusal at 120.0 feet below ground surface. Borehole was advanced to 33.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 33.0 feet bgs and then pulled back to 30.0 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 33.0 feet to 120.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed. Advanced water sampler to 135.0 feet bgs.*

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08/28	**GP151**	**4 of 7**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66			**90**	**GP**	**PID = 10.0 ppm**				65.0 to 70.0 feet: SAND WITH SILT (SP-SM); very dark gray; 90% fine sand; 10% fines; trace mica; mild organic-like odor; wet. Sheen observed on outside of macrocore liner.
67									
68									
69									@ 68.2 feet: Trace sheen in core.
70									
71			**100**	**GP**	**PID = 15.8 ppm**				70.0 to 78.0 feet: INTERBEDDED SANDY SILT (ML), very dark gray, 55% low plasticity fines, 45% fine sand; trace mica and rootlets; hydrocarbon-like odor; moist; and SILTY SAND (SM), very dark gray, 55% fine sand, 45% fines; hydrocarbon-like odor; wet. Sheen observed on outside of core, outside of macrocore liner, and in soil; when wet with water trace brown sheen is observed, increasing with depth.
72									
73									
74									
75									
76			**100**	**GP**	**PID = 17.4 ppm**				@ 75.0 to 78.0 feet: Mild organic-like odor; sheen not observed in soil.
77				**GW**	**GP151-SO-76-80** **GP151-GW-76-80**				
78									
79									78.0 to 80.0 feet: SAND WITH SILT (SP-SM); very dark gray; 90% fine sand; 10% fines; trace mica; mild organic-like odor; wet. Sheen observed on outside of macrocore liner.
80									
81			**100**	**GP**	**PID = 41.3 ppm**				80.0 to 82.8 feet: INTERBEDDED SANDY SILT (ML); very dark gray; trace mica; moist; SILT (ML); very dark gray; 80% low to medium plasticity fines; 20% fine sand; trace mica; moist; SILTY SAND (SM), very dark gray; trace mica; wet; and SAND WITH SILT (SP-SM); very dark gray; trace mica; wet. Sheen observed on outside of macrocore liner and on outside of soil core.
82									@ 80.0 feet: Brown sheen.
83									82.8 to 85.0 feet: SAND WITH SILT (SP-SM); very dark gray; 90% fine sand; 10% fines; trace mica; blue and silver sheen; wet. Sheen observed on outside of macrocore liner and on outside of soil core.
84									
85			**100**	**GP**	**PID = 189.7 ppm**				85.0 to 89.5 feet: SAND WITH SILT (SP-SM); very dark gray; 90% fine sand; 10% fines; wet.
86									@ 85.0 feet: Blue and silver sheen.
87									

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Refusal at 120.0 feet below ground surface. Borehole was advanced to 33.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 33.0 feet bgs and then pulled back to 30.0 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 33.0 feet to 120.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed. Advanced water sampler to 135.0 feet bgs.*

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08/28	**GP151**	**5 of 7**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88									
89									
90									89.5 to 94.5 feet: SAND (SP); very dark gray; 95% medium sand; 5% fines; wet.
			100	**GP**	**PID = 84.9 ppm**	**GP151-SO-90-95**			@ 90.0 to 94.0 feet: Blue and silver sheen.
91									
92									
93				**GW**	**GP151-GW-93-97**				
94									
95									94.5 to 97.5 feet: SILTY SAND (SM); very dark gray; 80% fine sand; 20% fines; wet.
			100	**GP**	**PID = 32.8 ppm**	**GP151-SO-95-97.5**			@ 95.0 to 97.5 feet: Blue and silver sheen.
96									
97									
98									97.5 to 100.0 feet: SAND WITH SILT (SP-SM); very dark gray; 90% fine sand; 10% fines; wet.
99									
100									
			100	**GP**	**PID = 2027 ppm**	**GP151-SO-100-105**			100.0 to 101.0 feet: GRAVEL (GP); white; fine, rounded pumice-like gravel; soft; wet.
101									101.0 to 115.0 feet: SAND WITH SILT (SP-SM); very dark gray; 90% sand; 10% fines; strong chemical-like odor; wet.
102									
103									
104									@ 104.0 to 105.0 feet: Trace white rounded gravel.
105									
			100	**GP**	**PID = 14.9 ppm**				
106									
107									
108									@ 108.0 feet: 2-inch lens of 100% SILT (ML); very dark gray; 100% fines.
109									
110									

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08/28	**GP151**	**6 of 7**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
111			**100**	**GP**	**PID = 67.4 ppm**	**GP151-SO-110-115**			@ 111.0 to 115.0 feet: Trace white rounded gravel.
112									
113									
114									
115			**100**	**GP**	**GP151-SO-115-120**				115.0 to 120.0 feet: SAND WITH SILT (SP-SM); very dark gray; 80% fine sand; 20% fines; trace white rounded gravel; wet.
116									
117									
118									
119									
120			**0**	**GP**					@ 119.5 feet: 3-inch lens of SILT (ML); gray; 100% fines; dry. @ 119.5 to 120.0 feet: No gravel observed. @ 120.0 feet: Refusal.
121									120.0 to 135.0 feet: Advanced casing to 135 feet to collect water sample. No soil recovery.
122									
123									
124									
125									
126									
127									
128									
129									
130									
131									
132									

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Refusal at 120.0 feet below ground surface. Borehole was advanced to 33.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 33.0 feet bgs and then pulled back to 30.0 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 33.0 feet to 120.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed. Advanced water sampler to 135.0 feet bgs.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08/28	**GP151**	**7 of 7**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
133									
134									
135									
				GW	GP151-GW-131-135				

Total Depth = 135.0 feet below ground surface.

Completion Details

0.0 to 33.0 feet bgs: 3.75-inch borehole.
33.0 to 135.0 feet bgs: 2.25-inch borehole.

0.0 to 135.0 feet bgs: Bentonite grout with 10% Organoclay by volume.

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Refusal at 120.0 feet below ground surface. Borehole was advanced to 33.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 33.0 feet bgs and then pulled back to 30.0 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 33.0 feet to 120.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed. Advanced water sampler to 135.0 feet bgs.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8123.01.08/28	**GP153**	**1 of 6**

Project Name	**Siltronic Corp.**	TOC Elevation (feet)	
Project Location	**7200 NW Front Ave., Portland, OR**	Surface Elevation (feet)	
Start/End Date	**10/11/2013 to 10/15/2013**	Northing	
Driller/Equipment	**Cascade Drilling, L.P./Geoprobe 7720DT**	Easting	
Geologist/Engineer	**K. Titkemeier**	Hole Depth	**110.0-feet**
Sample Method	**Geoprobe**	Outer Hole Diam	**3.75 to 2.25-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
0			**0**						*0 to 10.0 feet: Soil removed using air knife and hand auger to check for underground utilities; no observation.*
10			**0**	**GP**					*10.0 to 12.0 feet: Reconnaissance soil vapor sample collected using a Post Run Tubing system; no recovery.*
12			**100**	**GP**		**GP153-SV-11.5** **PID = 82.5 ppm** **GP153-SO-12-15**			*12.0 to 12.5 feet: SANDY SILT (ML); very dark grayish-brown; 60% non- to low plasticity fines; 40% very fine to fine sand; trace mica; moist.* *12.5 to 15.0 feet: SAND (SP); very dark gray to black; 90-95% fine to medium sand; 5-10% fines; loose; trace mica; hydrocarbon-like odor; rainbow sheen when wet; slight staining; moist to wet.* *@ 14.3 to 15.0 feet: dark gray; very loose; dry; no sheen; mild hydrocarbon-like odor.*
15			**60**	**GP**		**PID = 14.2 ppm**			*15.0 to 20.0 feet: SAND (SP); very dark gray; 95% fine to medium sand; 5% fines; loose to medium dense; trace mica; mild hydrocarbon-like odor; wet.*
19									*@ 19.0 to 19.1 feet: Wood fragments.* *@ 19.1 to 19.3 feet: SILT(ML) lens; very dark gray; soft; moist to wet.* *@ 19.3 to 20.0 feet: Black; slightly tacky; strong hydrocarbon-like*

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Borehole was advanced to 33.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 33.0 feet bgs and then pulled back to 30.5 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 33.0 feet to 110.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8123.01.08/28	GP153	2 of 6

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			2	GP	PID = 15.3 ppm				odor; abundant wood fragments.
22									20.0 to 25.0 feet: SILTY SAND (SM); very dark gray to black; 75% fine to medium sand; 25% fines; trace mica and wood fragments; strong hydrocarbon-like odor; wet.
23									
24									
25			80	GP GW	PID = 9.5 ppm GP153-SO-25-29.7 GP153-GW-25-30				25.0 to 29.7 feet: SAND WITH SILT (SP-SM); very dark gray; 90% fine to medium sand; 10% fines; wet; trace mica; trace gravel; hydrocarbon-like odor.
26									
27									
28									
29									
30			100	GP	PID = 11.2 ppm GP153-SO-30-31.5				29.7 to 30.0 feet: SILT (ML); very dark gray; 70-80% low plasticity fines; 20-30% very fine sand; trace mica and roots; moist. @ 29.7 feet: Fine gravel.
31									30.0 to 33.0 feet: SILT (ML); very dark gray; 70% low to medium plasticity; 30% very fine sand; trace mica and charred wood; mild hydrocarbon-like odor, decreasing with depth; moist.
32					GP153-SO-31.5-33 PID = 12.2 ppm				@ 31.5 feet: Very dark gray with brown mottling; organic-like odor.
33			25	GP	PID = 10.0 ppm				33.0 to 35.0 feet: SANDY SILT (ML); very dark gray; moist to wet.
34									
35			5	GP	PID = 8.4 ppm				35.0 to 40.0 feet: SILT (ML); very dark gray; 70% low to medium plasticity fines; 30% very fine sand; trace mica; trace white friable material, approximately 1-2 mm in diameter; moist.
36									
37									
38									
39									
40			90	GP	PID = 7.1 ppm				40.0 to 45.0 feet: SILT (ML); very dark gray; 80-90% low to medium plasticity fines; 10-20% very fine sand; stiff; trace mica and wood fragments; trace white friable material, approximately 1-2 mm in diameter; moist.
41									
42									

NOTES: 1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Borehole was advanced to 33.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 33.0 feet bgs and then pulled back to 30.5 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 33.0 feet to 110.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8123.01.08/28	**GP153**	**3 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43									
44									
45									
			90	**GP**		**PID = 9.7 ppm**			@ 45.0 feet: SILTY SAND (SM) lens; very dark gray; fine to coarse sand, coarse sand is rounded.
46									45.0 to 50.0 feet: SILT (ML); very dark gray; 80-90% low to medium plasticity fines; 10-20% very fine sand; stiff; trace mica and wood fragments (some charred); trace white friable material, approximately 1-2 mm in diameter; moist.
47									@ 45.0 to 45.2 feet: SILTY SAND (SM); very dark gray; fine to coarse sand; coarse sand is rounded.
48									@ 47.0 to 47.2 feet: SILTY SAND (SM); very dark gray; moist.
									@ 48.0 to 48.3 feet: SILTY SAND (SM); very dark gray; moist.
49									@ 48.3 to 49.0 feet: Abundant wood fragments; soil is very dark grayish brown.
50									
			100	**GP**		**PID = 11.2 ppm**			50.0 to 55.0 feet: SILT (ML); very dark gray; 80-90% low to medium plasticity fines; 10-20% very fine sand; stiff; trace mica and wood fragments (some charred); trace white friable material; moist.
51									@ 51.2 to 52.0 feet: Abundant wood fragments; soil is very dark grayish brown.
52									@ 52.0 to 52.1 feet: SILTY SAND (SM); very dark gray.
									@ 52.4 to 52.5 feet: SILTY SAND (SM); very dark gray.
53									@ 53.2 to 53.4 feet: SILTY SAND (SM); very dark gray.
54									@ 54.0 to 54.3 feet: SILTY SAND (SM); very dark gray.
55									
			100	**GP**		**PID = 12.4 ppm**			55.0 to 58.7 feet: SILT (ML); very dark gray; 80-90% low to medium plasticity fines; 10-20% very fine sand; stiff; trace mica and wood fragments; trace white friable material, approximately 1-2 mm in diameter; moist.
56									@ 55.7 to 55.8 feet: SILTY SAND (SM); very dark gray; wet.
57									@ 56.5 to 56.6 feet: SILTY SAND (SM); very dark gray; wet.
						GP153-SO-57.7-58.7			@ 57.3 to 57.7 feet: SILTY SAND (SM); very dark gray; wet.
58									
59									58.7 to 60.0 feet: SILTY SAND (SM); very dark gray; 70% very fine to fine sand; 30% fines; trace mica; wet.
60									
			100	**GP**					60.0 to 65.0 feet: SILT (ML); very dark gray; 80-90% low to medium plasticity fines; 10-20% very fine sand; trace mica and wood fragments; trace white friable material, 1-2 mm in diameter; moist.
61									@ 60.0 to 60.6 feet: SILTY SAND (SM); very dark gray; wet.
62									@ 61.5 to 62.0 feet: SILTY SAND (SM); very dark gray; wet.
63									
64									@ 63.6 to 63.7 feet: SILTY SAND (SM); very dark gray; wet.
65									

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Borehole was advanced to 33.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 33.0 feet bgs and then pulled back to 30.5 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 33.0 feet to 110.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8123.01.08/28	GP153	4 of 6

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66			100	GP		PID = 5.1 ppm			65.0 to 70.0 feet: SILT (ML); very dark gray; 80-90% low to medium plasticity fines; 10-20% very fine sand; trace mica and wood fragments; trace white friable material, approximately 1-2 mm in diameter; moist.
67									@ 66.1 to 66.7 feet: SILTY SAND (SM); very dark gray; wet.
68									@ 68.0 to 68.3 feet: SILTY SAND (SM); very dark gray; wet.
69									@ 68.7 to 69.5 feet: SILTY SAND (SM); very dark gray; wet.
70			100	GP		PID = 1.4 ppm			70.0 to 72.2 feet: SILTY SAND (SM); very dark gray; 55% very fine to fine sand; 45% low plasticity fines; trace mica; wet.
71									@ 70.6 to 70.8 feet: SILT (ML); very dark gray; stiff; moist.
72									72.2 to 74.1 feet: SILT (ML); very dark gray; 70% low to medium plasticity fines; 30% very fine sand; trace mica; moist.
73									@ 72.5 to 72.6 feet: SANDY SILT (ML).
74									@ 73.4 to 73.5 feet: SANDY SILT (ML).
75									@ 74.1 feet: Lamination of fine to medium sand-sized material; white; low-density; resembles perlite; SILT (ML) laminations underneath.
				GP		PID = 0.7 ppm			74.1 to 75.0 feet: SILTY SAND (SM); very dark gray; 75% fine to medium sand; 25% fines; trace mica; wet.
76						GP153-SO-75-80			75.0 to 80.0 feet: SAND (SP); very dark gray; 90-95% fine to medium sand; 5-10% fines; loose grading to medium density; trace mica; moist.
				GW		GP153-GW-76-80			@ 75.0 feet: Soupy.
77									
78									
79									
80			100	GP		PID = 1.7 ppm			80.0 to 81.0 feet: SILTY SAND/SANDY SILT (SM/ML); very dark gray; 50% very fine to fine sand; 50% low plasticity fines; trace mica; moist to wet.
81									81.0 to 85.0 feet: SAND (SP); very dark gray; 90-95% fine to medium sand; 5-10% fines; trace mica; wet.
82									@ 81.5 feet: Approximately 1-inch-thick SILT (ML) lens.
83									
84									
85			100	GP		PID = 1.0 ppm			@ 85.0 feet: Soupy.
86						GP153-SO-86-87.5			85.0 to 90.0 feet: SAND (SP); very dark gray; 90-95% sand; 5-10% fines; trace mica; wet.
87									@ 86.0 to 87.5 feet: Trace coarse sand to fine gravel-sized pieces of black material; often friable, appears to be charred wood.

NOTES: 1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Borehole was advanced to 33.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 33.0 feet bgs and then pulled back to 30.5 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 33.0 feet to 110.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8123.01.08/28	GP153	5 of 6

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88									
89									
90			100	GP	PID = 1.2 ppm				90.0 to 90.5 feet: SANDY SILT (ML); very dark gray; 60% low plasticity fines; 40% very fine to fine sand; trace mica; moist to wet.
91				GW	GP153-SO-91-95 GP153-GW-91-95				90.5 to 94.0 feet: SILTY SAND (SM); very dark gray; 75% fine to medium sand; 25% fines; trace mica; wet.
92									
93									
94									94.0 to 95.0 feet: SAND (SP); very dark gray; 90-95% fine to medium sand; 5-10% fines; trace mica; wet.
95				GP	PID = 2.0 ppm				95.0 to 96.0 feet: INTERBEDDED SILTY SAND (SM); very dark gray; trace mica; wet; SANDY SILT (ML): very dark gray; trace mica; moist; and SILT (ML); very dark gray; trace mica; moist.
96									96.0 to 100.0 feet: SILT (ML); very dark gray; 80-90% fines; 10-20% very fine sand; stiff grading to very stiff; trace fines; moist. Increase in fines with depth.
97									@ 96 feet: Trace wood fragments, some appear charred; rock fragment, angular, low density, resembles basalt, but less dense.
98					GP153-SO-98-100				@ 97.5 feet: Color change to brown with grayish brown mottling.
99									
100			100	GP	PID = 0.7 ppm				100.0 to 102.9 feet: SILT (ML); brown with dark grayish-brown mottling; 80-90% low to medium plasticity fines; 10-20% very fine sand; stiff; trace mica; coarse sand to fine gravel-sized nodules of hard SILT (ML); moist to wet.
101									
102									@ 102.3 to 102.6 feet: SILTY SAND; brown; 60% fine sand; 40% fines; wet.
103									102.9 to 105.0 feet: SILTY SAND (SM); brown; 60% very fine to fine sand; 40% low plasticity fines; medium density; trace mica; trace coarse sand to fine gravel-sized nodules of hard SILT (ML); wet.
104									
105			100	GP GW	PID = 0.8 ppm GP153-SO-105-109.5 GP153-GW-105-109				105.0 to 109.7 feet: SILTY SAND (SM); brown; 60-70% sand; 30-40% fines; trace mica; wet.
106									@ 105.0 to 108.0 feet: Soupy.
107									
108									
109									@ 108.8 feet: Increasing density (medium dense becoming very dense) with depth; moist.
110					GP153-SO-109.7-110				109.7 to 110.0 feet: WEATHERED BASALT; dark gray/black with rust

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Borehole was advanced to 33.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 33.0 feet bgs and then pulled back to 30.5 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 33.0 feet to 110.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed.*

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Maul Foster & Alongi, Inc.	Geologic Borehole Log/Well Construction		
	Project Number **8123.01.08/28**	Well Number **GP153**	Sheet **6 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
									orange; crumbles easily, can smear into silt to fine sand sized particles; dry.

Total Depth = 110.0 feet below ground surface.

Completion Details

0.0 to 33.0 feet bgs: 3.75-inch borehole.
33.0 to 110.0 feet bgs: 2.25-inch borehole.

0.0 to 35.0 feet bgs: Bentonite grout with 10% Organoclay by volume.
35.0 to 110.0 feet bgs: Bentonite grout.

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Borehole was advanced to 33.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 33.0 feet bgs and then pulled back to 30.5 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 33.0 feet to 110.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed.*

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08/28	**GP154**	**1 of 6**

Project Name	**Siltronic Corp.**	TOC Elevation (feet)	
Project Location	**7200 NW Front Ave., Portland, OR**	Surface Elevation (feet)	
Start/End Date	**10/7/2013 to 10/10/2013**	Northing	
Driller/Equipment	**Cascade Drilling, L.P./Geoprobe 7720**	Easting	
Geologist/Engineer	**K. Titkemeier**	Hole Depth	**109.0-feet**
Sample Method	**Geoprobe**	Outer Hole Diam	**3.75 to 2.25-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
0			**0**						*0 to 10.0 feet: Soil removed using air knife and hand auger to check for underground utilities; no observation.*
10			**0**	**GP**					*10.0 to 12.0 feet: Reconnaissance soil vapor sample collected using a Post Run Tubing system; no recovery.*
12			**67**	**GP**		**GP154-SV-11.5** **PID = 29 ppm** **GP154-SO-12-15**			*12.0 to 13.5 feet: SANDY SILT (ML); very dark gray; 60-70% low to medium plasticity fines; 30-40% very fine to fine sand; trace mica; hydrocarbon-like odor; moist.*
14									*13.5 to 15.0 feet: SAND (SP); dark gray; 100% fine to medium sand; trace coarse sand and mica; very loose; dry.*
15			**60**	**GP** **GW**		**PID = 50.4 ppm** **GP154-GW-15-20**			*15.0 to 19.0 feet: SAND (SP); very dark gray; 95% fine to medium sand; 5% fines; trace mica; hydrocarbon-like odor; trace rainbow sheen; wet.* *@ 15.0 feet: SILT (ML) lens.*
19						**GP154-SO-18.5-20**			
20									*19.0 to 20.0 feet: SAND (SW); black; 95% fine to coarse sand; 5% fines; trace fine gravel; strong hydrocarbon-like odor; sheen; tacky; moist to wet.*

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Borehole was advanced to 33.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 31.0 feet bgs and then pulled back to 29.5 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 33.0 feet to 100.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed. Advanced water sampler to 109.0 feet bgs. Refusal at 109.0 feet.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08/28	GP154	2 of 6

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			70	GP	PID = 100.7 ppm GP154-SO-20-25				@ 19.0 to 19.1 feet: SILT (ML); very dark gray; moist. @ 19.1 to 19.3 feet: Very dark brown; low density material, potentially wood; strong hydrocarbon-like odor. 20.0 to 25.0 feet: SAND WITH SILT (SP-SM); black; 90-95% fine to medium sand; 5-10% fines; trace fine gravel; trace coarse sand and roots; strong hydrocarbon-like odor; rainbow sheen; heavy staining; wet.
22									
23									
24									
25			70	GP GW	PID = 246 ppm GP154-SO-25-30 GP154-GW-25-30				25.0 to 30.1 feet: SAND WITH SILT (SP-SM); black; 90-95% fine to medium sand; 5-10% fines; strong hydrocarbon-like odor; rainbow sheen; heavy staining; wet. @ 25.0 to 29.5 feet: Heavy rainbow sheen.
26									
27									
28									
29									
30									@ 29.5 to 30.0 feet: Very heavy staining; tacky.
31			100	GP	PID = 23.5 ppm GP154-SO-30-32.5				30.1 to 33.0 feet: SILT (ML); very dark gray; 60-80% low to medium plasticity fines; 20-40% very fine to fine sand; trace rootlets and mica; hydrocarbon-like odor; moist. Increasing in sand content with depth. Inside of macrocore liner and outside of soil core stained brown; no staining observed inside soil core.
32									
33									
34			0	GP					33.0 to 35.0 feet: No recovery.
35									
36			70	GP	GP154-SO-35-39 PID = 11.5 ppm				35.0 to 40.0 feet: SANDY SILT (ML); very dark grayish brown; 60-70% low to medium plasticity fines; 30-40% very fine to fine sand; trace mica; mild hydrocarbon-like odor, decreasing with depth; moist. @ 36.0 feet: Color change to very dark gray.
37									
38									@ 37.9 feet: Wood.
39									@ 38.3 feet: Approximately 1/8-inch thick lamination of friable white material.
40			90	GP	PID = 3.5 ppm				40.0 to 45.0 feet: SILT (ML); very dark gray; 70-80% low to medium plasticity fines; 20-30% very fine sand; trace mica and rootlets; moist.
41									
42									@ 41.5 to 42.0 feet: Sand percentage is 45%.

NOTES: 1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Borehole was advanced to 33.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 31.0 feet bgs and then pulled back to 29.5 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 33.0 feet to 100.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed. Advanced water sampler to 109.0 feet bgs. Refusal at 109.0 feet.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08/28	**GP154**	**3 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43									
44									
45									
46			**100**	**GP**		**PID = 9.5 ppm**			*45.0 to 47.3 feet: SANDY SILT (ML); very dark gray; 60-70% low to medium plasticity fines; 30-40% very fine to fine sand; trace mica, roots and wood fragments; moist to wet.*
47						**GP154-SO-46.2-47.3**			*@ 45.0 to 46.5 feet: soft; wet.*
48									*@ 46.7 feet: 1-inch thick SILTY SAND (SM) lens; very dark gray; wet.*
49									*47.3 to 48.0 feet: SILTY SAND (SM); very dark gray; 60% fine sand; 40% fines; trace mica; wet.*
50									*48.0 to 50.0 feet: SILT (ML); very dark gray; 80% low to medium plasticity fines; 20% very fine sand; stiff; trace mica and wood fragments (appear charred); moist.*
51				**GP**		**PID = 18.6 ppm**			*50.0 to 55.0 feet: SILT (ML); very dark gray; 90-95% medium plasticity fines; 5-10% very fine sand; stiff; trace mica, wood fragments (some appear charred), and white friable material; moist.*
52									*@ 51.2 to 51.5 feet: Abundant wood fragments.*
53									*@ 52.2 to 52.3 feet: SILTY SAND (SM): very dark gray; trace mica; moist to wet.*
54									*@ 53.4 to 53.5 feet: SILTY SAND (SM): very dark gray; trace mica; moist to wet.*
55									*@ 54.4 to 54.6 feet: SILTY SAND (SM): very dark gray; trace mica; moist to wet.*
56			**100**	**GP**		**PID = 16.3 ppm**			*55.0 to 60.0 feet: SILT (ML); very dark gray; 70-80% low to medium plasticity fines; 20-30% very fine sand; soft grading to stiff with depth; trace mica, wood fragments, white friable material; moist.*
57				**GW**		**GP154-SO-56-60** **GP154-GW-56-60**			*@ 57.0 to 57.4 feet: SILTY SAND (SM): very dark gray; trace mica; wet.*
58									*@ 58.0 to 58.2 feet: SILTY SAND (SM): very dark gray; trace mica; wet.*
59									*@ 58.8 to 59.3 feet: SILTY SAND (SM): very dark gray; trace mica; wet.*
60			**100**	**GP**		**PID = 4.2 ppm**			*60.0 to 65.0 feet: SILT (ML); very dark gray; 90-95% medium plasticity fines; 5-10% very fine sand; stiff; trace mica, wood fragments (some wood fragments appear charred), and white friable material; moist.*
61									*@ 60.0 to 60.4 feet: SILTY SAND (SM): very dark gray; 60% fine sand; 40% low plasticity fines; trace mica; wet.*
62									*@ 61.5 to 62.1 feet: SILTY SAND (SM): very dark gray; 75% fine sand; 25% fines; trace mica; wet.*
63									
64									*@ 63.5 to 63.7 feet: SANDY SILT (ML) lens.*
65									

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Borehole was advanced to 33.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 31.0 feet bgs and then pulled back to 29.5 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 33.0 feet to 100.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed. Advanced water sampler to 109.0 feet bgs. Refusal at 109.0 feet.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08/28	**GP154**	**4 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66			**100**	**GP**	**PID = 4.2 ppm**				65.0 to 66.3 feet: INTERBEDDED SILTY SAND (SM), very dark gray; trace mica and wood fragments; SANDY SILT (ML), very dark gray; trace mica and wood fragments; and SILT (ML); very dark gray; trace mica and wood fragments. Layers are 0.1 to 0.5 feet thick.
67									66.3 to 68.0 feet: SILT (ML); very dark gray; 90-95% low to medium plasticity fines; 5-10% very fine sand; stiff; trace mica and wood fragments; white friable material; moist.
68									68.0 to 70.0 feet: INTERBEDDED SILTY SAND (SM), very dark gray; trace mica, wood fragments, and white friable material; SANDY SILT (ML), very dark gray; trace mica, wood fragments, and white friable material; and SILT (ML); very dark gray; trace mica, wood fragments, and white friable material. Layers are 0.2 to 0.6 feet thick.
69									
70			**100**	**GP**	**PID = 2.8 ppm**				70.0 to 71.5 feet: SILTY SAND (SM); very dark gray; 70% fine sand; 30% fines; trace mica and wood fragments; wet.
71									@ 70.2 to 70.3 feet: SILT (ML); very dark gray; stiff; moist.
72									71.5 to 72.0 feet: SILTY SAND (SM)/SANDY SILT (ML); very dark gray; 50% fine sand; 50% low to medium plasticity fines; trace mica; moist to wet.
73									72.0 to 73.5 feet: SILT (ML); very dark gray; 90-95% low to medium plasticity fines; 5-10% sand; stiff; trace mica and wood fragments; trace white friable material; moist. Trace lenses of SANDY SILT (ML).
74				**GW**	**GP154-SO-73.5-75 PID = 1.5 ppm GP154-GW-73.5-77.5**				73.5 to 75.0 feet: SILTY SAND (SM); very dark gray; 70% fine sand; 30% fines; trace mica and white friable material; wet.
75									@ 73.5 feet: very dark brown; loose; possible odor; wet.
76			**90**	**GP**	**PID = 0.8 ppm GP154-SO-75-77.5**				75.0 to 80.0 feet: SILTY SAND (SM); very dark gray; 70% fine sand; 30% fines; trace mica; wet; grading to SAND (SP); 95% fine to medium sand; 5% fines; loose grading to medium density with depth; trace mica; wet.
77									
78									@ 77.8 to 78.0 feet: SILT (ML) lens.
79									
80			**100**	**GP**	**PID = 2.2 ppm**				80.0 to 85.0 feet: SAND (SP); very dark gray; 95% fine to medium sand; 5% fines; medium density becoming dense with depth; trace mica; wet.
81									
82									
83									
84									
85			**100**	**GP**	**PID = 2.3 ppm**				85.0 to 90.0 feet: SAND WITH SILT (SP-SM); very dark gray; 85-90% fine to medium sand; 10-15% fines; medium density; trace mica; wet.
86									
87									

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Borehole was advanced to 33.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 31.0 feet bgs and then pulled back to 29.5 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 33.0 feet to 100.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed. Advanced water sampler to 109.0 feet bgs. Refusal at 109.0 feet.*

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08/28	**GP154**	**5 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88									@ 88.0 feet: SILT (ML) lens.
89									
90									
			100	**GP**		**PID = 0.0 ppm**			90.0 to 93.0 feet: SAND WITH SILT (SP-SM); very dark gray; 85-90% fine sand; 10-15% fines; medium density; trace mica; wet.
91									
92									
93									93.0 to 94.0 feet: SILTY SAND (SM); very dark gray; 51% sand; 49% fines; trace mica; wet.
94									94.0 to 95.0 feet: SANDY SILT (ML); very dark gray; 60-70% low plasticity fines; 30-40% very fine to fine sand; stiff; trace mica, roots, and small twigs; moist.
95			**100**	**GP**		**PID = 0.0 ppm**			@ 95.0 feet: SILTY SAND (SM) lens.
									95.0 to 95.5 feet: SILTY SAND (SM); very dark gray; 75% fine sand; 25% fines; medium density; trace mica; wet.
96									95.5 to 100.0 feet: SILT (ML); brown, grading to brown with grayish brown mottling; 90% medium plasticity fines; 10% very fine sand; stiff to very stiff; trace mica; moist.
97									
98					**GP154-SO-98-100**				
99									
100			**0**	**GP**					100.0 to 109.0 feet: Did not sample soil. Push to 109.0 feet for groundwater sample.
101									
102									
103									
104									
105				**GW**	**GP154-GW-105-109**				
106									
107									
108									
109									@ 109.0 feet: Refusal.
									Total Depth = 109.0 feet below ground surface.

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Borehole was advanced to 33.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 31.0 feet bgs and then pulled back to 29.5 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 33.0 feet to 100.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed. Advanced water sampler to 109.0 feet bgs. Refusal at 109.0 feet.*

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08/28	**GP154**	**6 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description

Completion Details

0.0 to 33.0 feet bgs: 3.75-inch borehole.
33.0 to 109.0 feet bgs: 2.25-inch borehole.

0.0 to 45.0 feet bgs: Bentonite grout with 10% Organoclay by volume.
45.0 to 109.0 feet bgs: Bentonite grout.

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. TOC = top of casing. 6. Depths are relative to feet below ground surface. 7. NAPL = Non-aqueous phase liquid. 8. Borehole was advanced to 33.0 feet bgs using 2.25-inch macrocore soil sampler. Next, 3.75-inch temporary, threaded steel casing was advanced using a closed tip to 31.0 feet bgs and then pulled back to 29.5 feet bgs to create a two-foot void to allow the installation of a seal using 3/8-inch bentonite chips hydrated with potable water. After the bentonite seal had set for a minimum of 30 minutes, the borehole was completed using a 2.25-inch macrocore soil sampler from 33.0 feet to 100.0 feet bgs. As the borehole was abandoned with grout, the temporary casing was removed. Advanced water sampler to 109.0 feet bgs. Refusal at 109.0 feet.*

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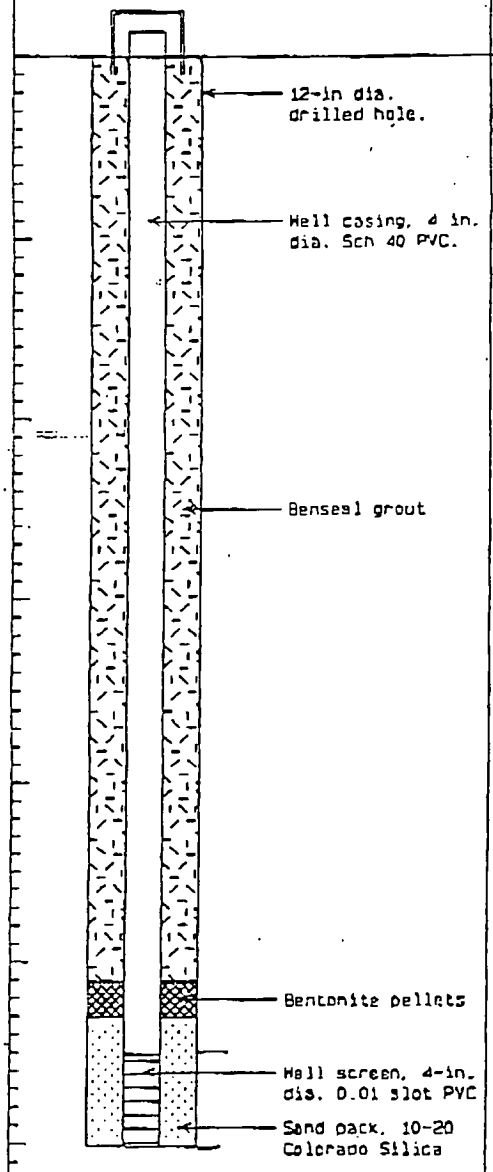
entered 12/9/94 KL

PROJECT NAME: DOANE LAKE HYDROGEOLOGICAL INVESTIGATION
PROJECT NO: WA103.01

LOG OF MW-3I

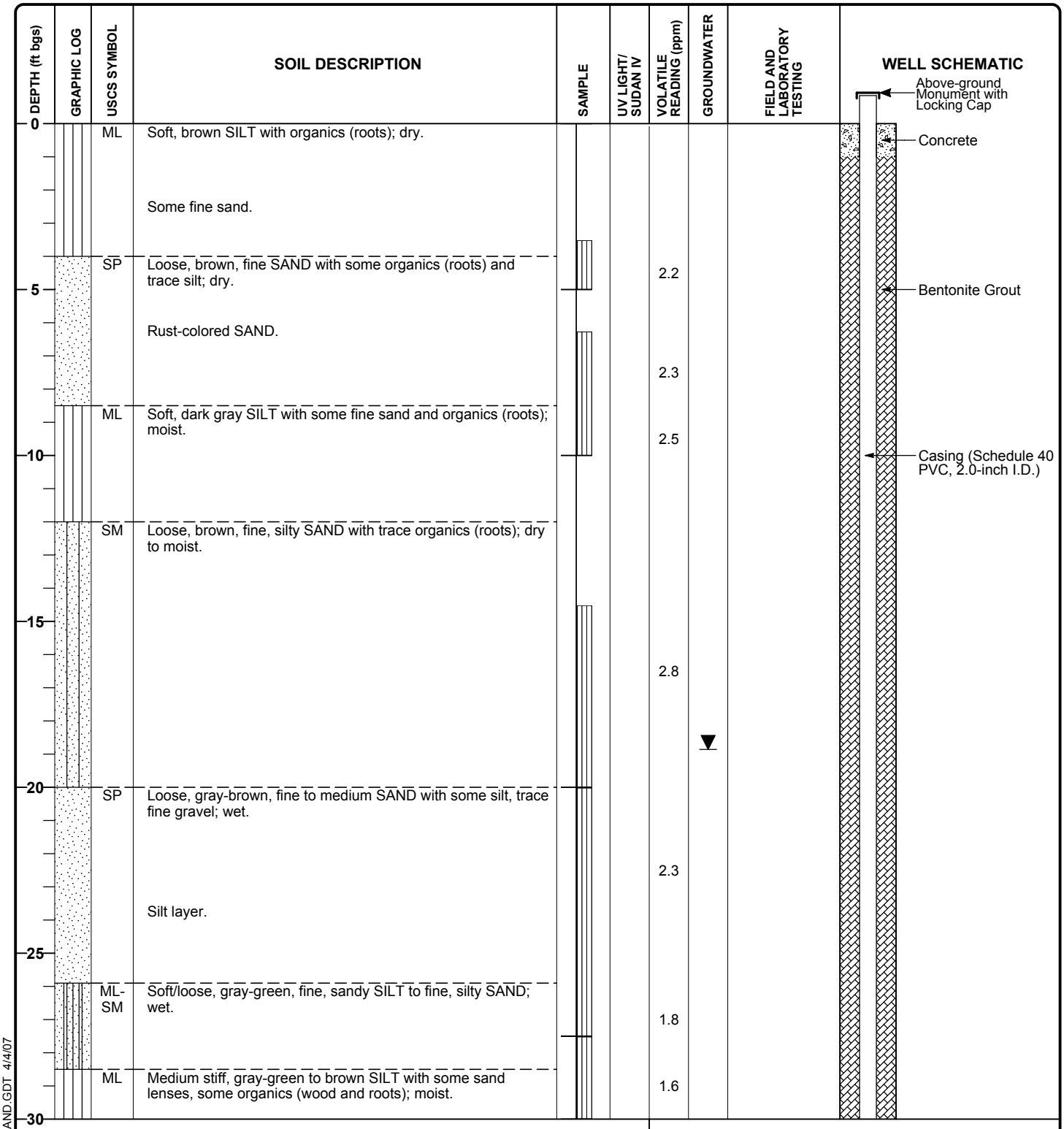
CLIENT NAME: INDUSTRIAL GROUP
PROJECT LOCATION: PORTLAND, OREGON
DATE STARTED: 25-JUNE-90
DATE COMPLETED: 25-JUNE-90
LOGGED BY: A. RIPLEY
CHECKED BY: A. RIPLEY

SURFACE ELEV.: 33.39 feet
DATUM: MEAN SEA LEVEL
DRILL COMPANY: GEO-TECH EXPLORATIONS
DRILLER: MIKE PETERSEN
DRILL METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: SPT SPLIT SPOON



DEPTH (feet)	BLOWS PER SIX IN.	MATERIALS DESCRIPTION
	6 5 8	Surface silty sand with gravel. -@surface... SILTY SAND with some clay - Dark brown, moist, medium dense, medium-grained sand, some organic fragments (roots), minor clay fraction. (SM) ①
		7
10	6 7 8	POORLY-GRADED SAND with silt - Brown, moist, medium dense, medium-grained sand, trace silt (<5%). (SP-SM)
		Water level taken 7/18/90 - 13.5ft (estimated) ②
	3 4 4	As above - Saturated.
		POORLY-GRADED SAND - Brown to grey, saturated, medium dense, medium to coarse-grained sand. (SP-SM)
20	5 4 11	SANDY SILT - Dark grey, wet, stiff to very stiff, ③ fine-grained sand, abundant organic fragments. (ML)
		24
		Heaving sands at 25 feet, no sample taken. ④
		POORLY-GRADED SAND with silt - Dark grey, saturated, very loose, medium-grained sand grades to SANDY SILT in bottom 6" of sampler (SP-SM) @
30	0/6" 1 1	31
	3 3 5	SANDY SILT - Grey, wet to moist, stiff, very fine-grained sand, some mica flakes and organic fragments. (ML) ⑤
		37
40	1 2 3	SILT with clay - Dark grey, moist, soft to medium stiff, plastic clay. (MH)
	6 2 3	As above - Large wood fragment in sampler, @45ft abundant organic fragments. (MH)
50	2 3 2	SILT with clay - As above. (MH) ⑥
60	1 2 3	SILT with clay - As above. (MH)
		61
		Borehole terminated at 61.5 feet.
70		

FIGURE A-11



BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 32.90 feet
CASING ELEVATION: 35.37 feet
START CARD/TAG ID: 186828/L83975
DRILLING DATES: 10/03/2006 - 10/04/2006

REMARKS:

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 4/4/07

RP - Portland
Stage 2 SCE

0-61M-107030 P69

AMEC
7376 SW Durham Road
Portland, Oregon
USA 97224
Tel (503) 639-3400
Fax (503) 620-7892

LOG OF BORING MW-03-137

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	UV LIGHT/ SUDAN IV	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
30		ML							Bentonite Grout
						1.3			Casing (Schedule 40 PVC, 2.0-inch I.D.)
35									
						2.5			
40									
						1.2			
45									
						2.4			
50									
						1.8			
		SP	Loose, gray, fine SAND with some silt; moist.						
						2.1			
55		ML	Medium stiff, gray-green SILT with some organics (wood), trace sand; moist to wet.						
						0.7			
60									

BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 32.90 feet
CASING ELEVATION: 35.37 feet
START CARD/TAG ID: 186828/L83975
DRILLING DATES: 10/03/2006 - 10/04/2006

REMARKS:

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 4/4/07

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LOG OF BORING MW-03-137

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	UV LIGHT/ SUDAN IV	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
60		ML							Bentonite Grout
						0.9			
			Slight decrease in organics (wood).						Casing (Schedule 40 PVC, 2.0-inch I.D.)
65									
						3.0			
70									
						2.5			
75									
						4.1			
			SILT intermixed with light gray ash from 79-82 ft bgs.						
80									
						4.4			
85									
						5.0			
90									

BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 32.90 feet
CASING ELEVATION: 35.37 feet
START CARD/TAG ID: 186828/L83975
DRILLING DATES: 10/03/2006 - 10/04/2006

REMARKS:

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 4/4/07

RP - Portland
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LOG OF BORING MW-03-137

DEPTH (ft bgs)	USCS SYMBOL	SOIL DESCRIPTION	VOLATILE READING (ppm)
90	ML	Organics (wood, approximately 4-inch layer).	
		Some sand.	5.8
95			6.7
100			4.5
105		Decrease to trace sand.	2.9
110			2.3
115	SM-ML	Loose/soft, gray-green, silty SAND to sandy SILT with some organics (wood); wet.	
		Organics (wood, approximately 6-inch layer).	3.1
120			

GRAPHIC LOG | SAMPLE | UV LIGHT/ SUDAN IV | GROUNDWATER | FIELD AND LABORATORY TESTING

WELL SCHEMATIC: Bentonite Grout; Casing (Schedule 40 PVC, 2.0-inch I.D.)

BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 32.90 feet
CASING ELEVATION: 35.37 feet
START CARD/TAG ID: 186828/L83975
DRILLING DATES: 10/03/2006 - 10/04/2006

REMARKS:

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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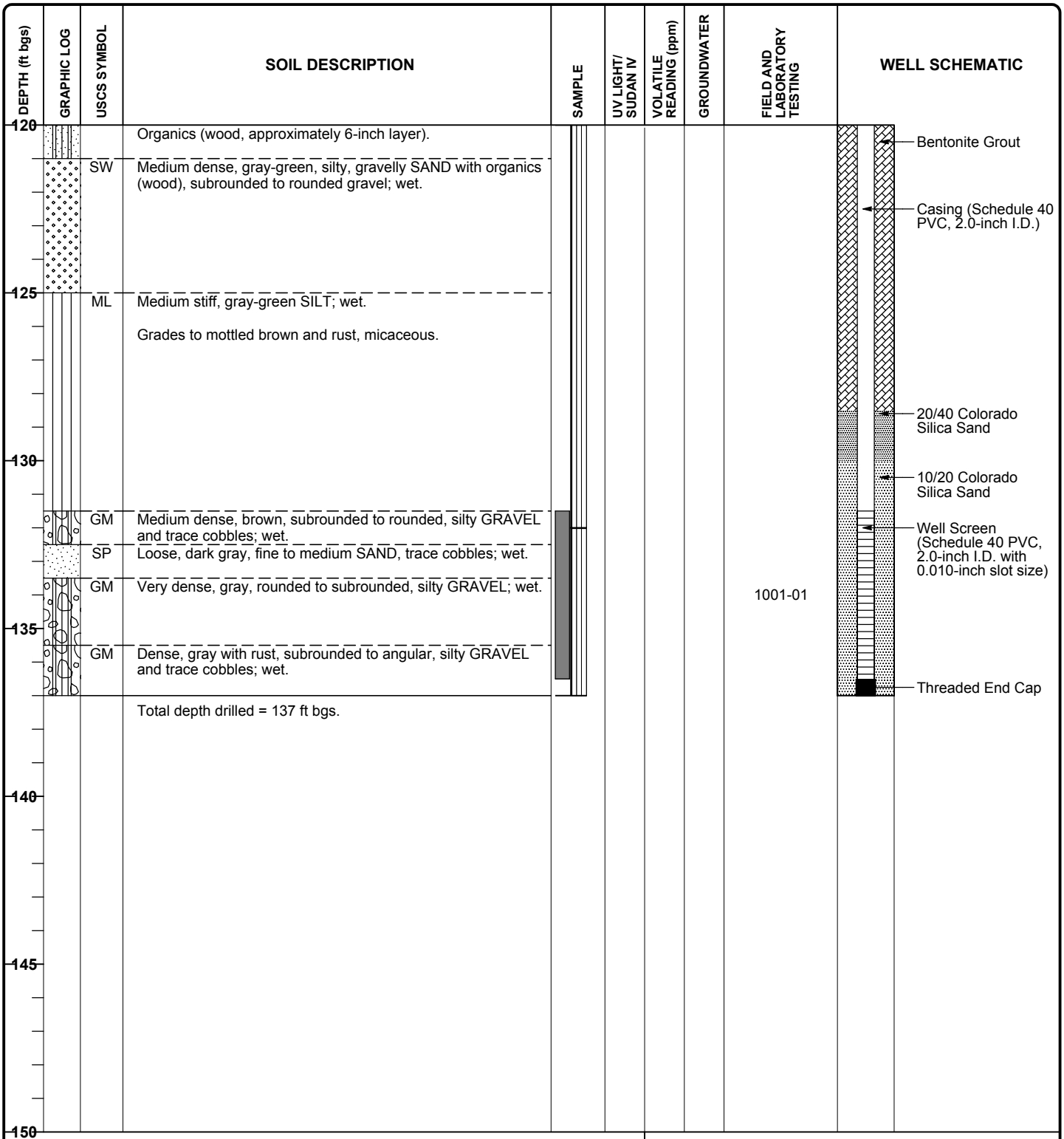
LOG OF BORING MW-03-137

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 4/4/07



BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 32.90 feet
CASING ELEVATION: 35.37 feet
START CARD/TAG ID: 186828/L83975
DRILLING DATES: 10/03/2006 - 10/04/2006

REMARKS:

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 4/4/07

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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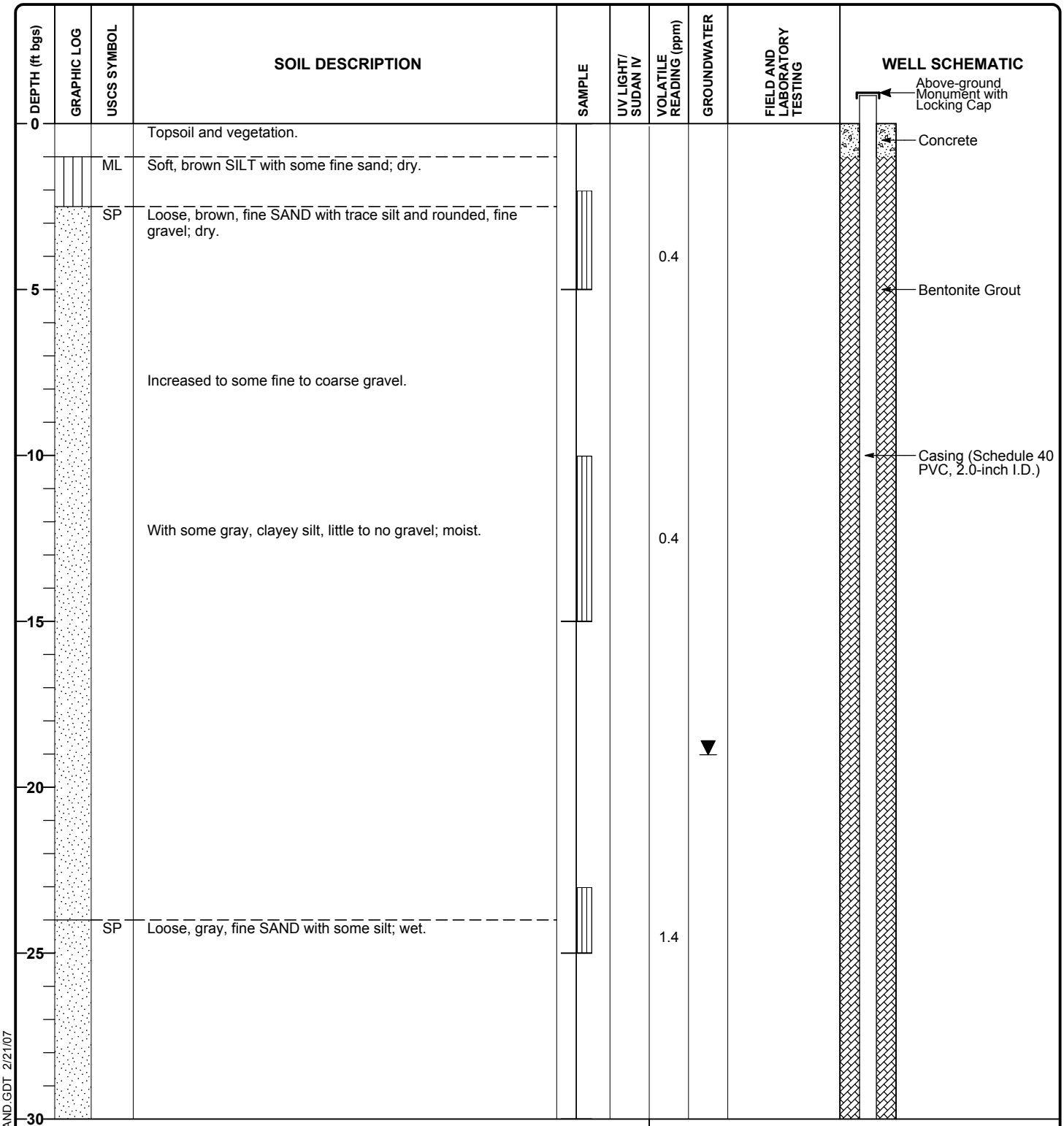
7376 SW Durham Road
Portland, Oregon
USA 97224
Tel (503) 639-3400
Fax (503) 620-7892

LOG OF BORING MW-03-137



BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 32.86 feet
CASING ELEVATION: 35.29 feet
START CARD/TAG ID: 186827/L83974
DRILLING DATES: 09/25/2006 - 10/03/2006

REMARKS:

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07

RP - Portland
Stage 2 SCE

0-61M-107030 P69

AMEC
7376 SW Durham Road
Portland, Oregon
USA 97224
Tel (503) 639-3400
Fax (503) 620-7892

LOG OF BORING MW-03-141

DEPTH (ft bgs)	USCS SYMBOL	SOIL DESCRIPTION	VOLATILE READING (ppm)
30	SP		
35	SM	Loose, gray-brown, silty SAND with trace organics (wood), micaceous; moist.	0.7
40	ML	Medium stiff, gray-brown, sandy SILT; moist.	0.3
		Grades to stiff, gray-green.	0.2
45	SM	Medium dense, gray-brown, silty SAND with some organics (wood); wet. Interbedded with thin sandy silt layers.	0.2
50		Coarse gravel.	0.2
55	SP	Loose, gray, fine SAND; wet.	
	SM-ML	Medium dense/medium stiff, gray-brown, silty SAND to sandy SILT, micaceous, trace organics (wood); moist.	0.2
60			

WELL SCHEMATIC: Bentonite Grout; Casing (Schedule 40 PVC, 2.0-inch I.D.)

BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 32.86 feet
CASING ELEVATION: 35.29 feet
START CARD/TAG ID: 186827/L83974
DRILLING DATES: 09/25/2006 - 10/03/2006

REMARKS:

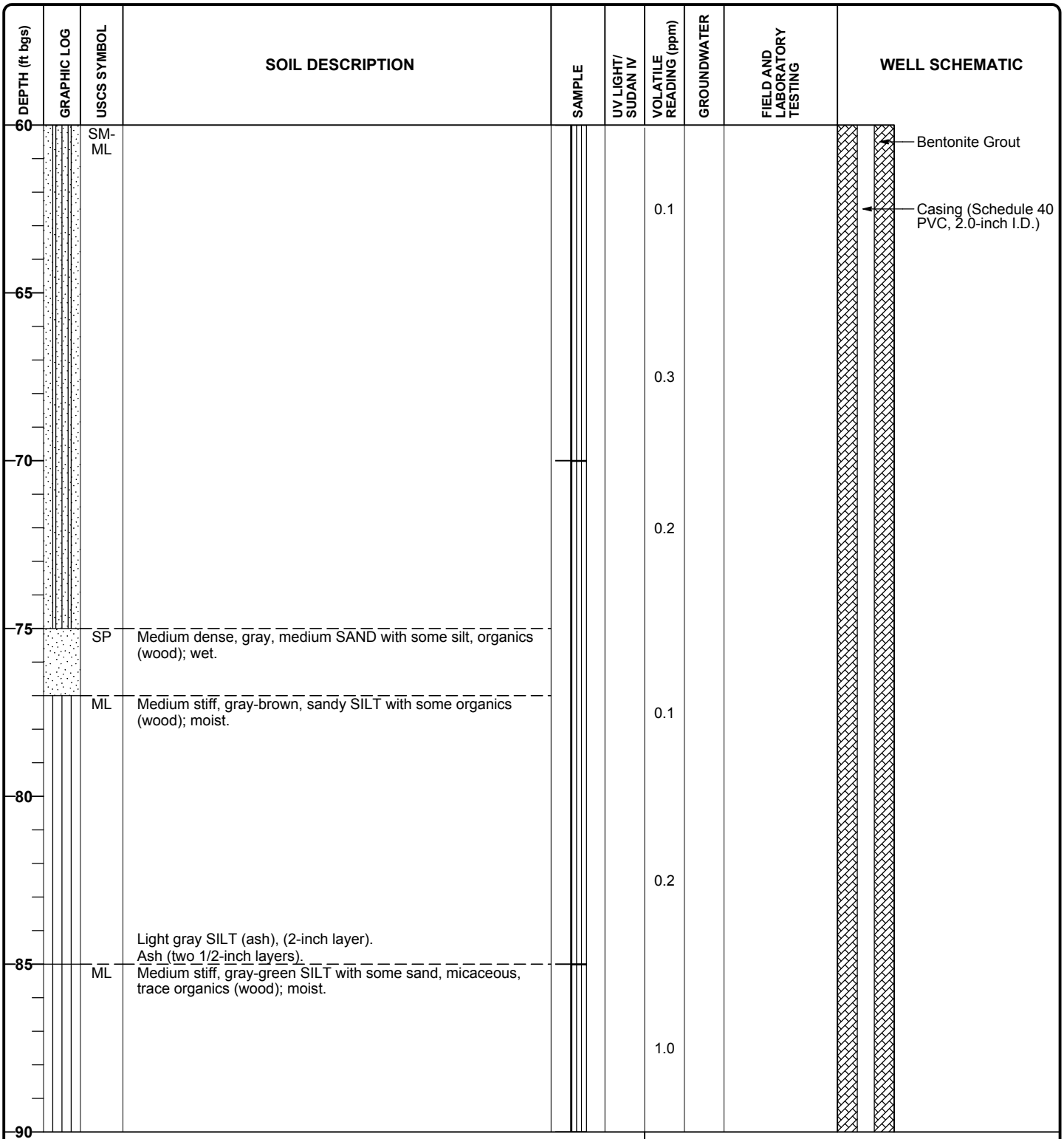
RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07

RP - Portland
Stage 2 SCE

0-61M-107030 P69

AMEC
7376 SW Durham Road
Portland, Oregon
USA 97224
Tel (503) 639-3400
Fax (503) 620-7892

LOG OF BORING MW-03-141



BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
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LOG OF BORING MW-03-141

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	UV LIGHT/ SUDAN IV	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
90		ML							Bentonite Grout
						1.9			Casing (Schedule 40 PVC, 2.0-inch I.D.)
95									
						2.3			
100									
						1.2			
105									
						0.9			
110									
						0.8			
115			Organics (wood, up to approximately 1 inch thick).						
						1.7			
120		GM	Medium dense, dark gray, subrounded to subangular, silty, sandy GRAVEL with some organics (wood); wet.						

BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 32.86 feet
CASING ELEVATION: 35.29 feet
START CARD/TAG ID: 186827/L83974
DRILLING DATES: 09/25/2006 - 10/03/2006

REMARKS:

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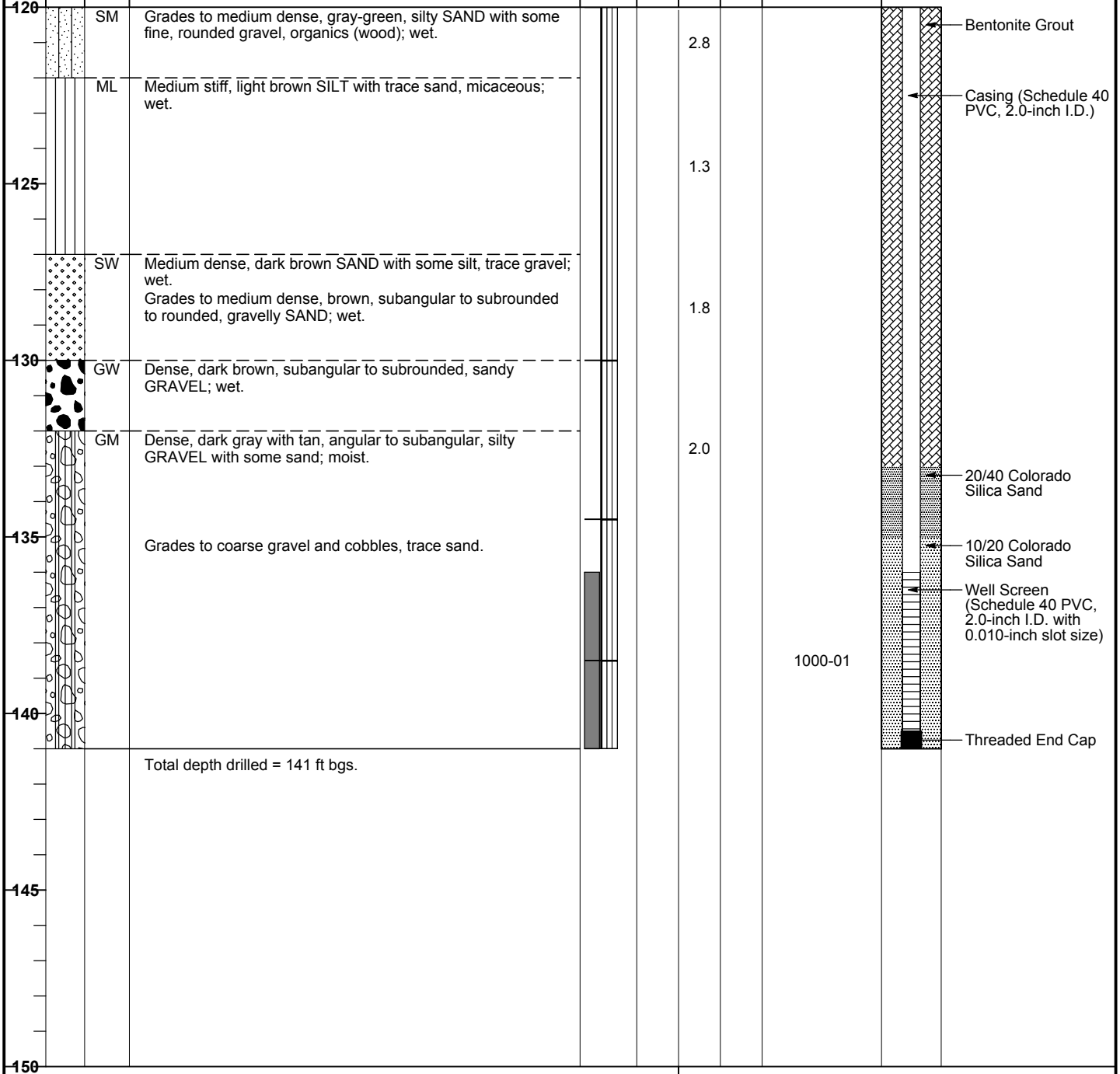
LOG OF BORING MW-03-141



BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 32.86 feet
CASING ELEVATION: 35.29 feet
START CARD/TAG ID: 186827/L83974
DRILLING DATES: 09/25/2006 - 10/03/2006

REMARKS:

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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7376 SW Durham Road
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LOG OF BORING MW-03-141

LOG OF EXPLORATORY BORING

PROJECT NAME	**Gasco - GW Source Control**	BORING NO.	**MW-35U**
LOCATION	**Portland, Oregon**	PAGE	**1 of 4**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**33.9 ft COP**
DRILL METHOD	**Rotosonic - AMS 17C**	TOTAL DEPTH	**70.0 ft.**
LOGGED BY	**Ben Johnson**	DATE COMPLETED	**9/28/12**
SAMPLING METHOD	**4-in. ID by 5-ft. core barrel (CB)**	PERMIT/STARTCARD NO.	**1017742**
BOREHOLE DIAMETER	**6-inches**	WATER RESOURCES WELL ID	**L109265**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
NA	NA				**0 to 10.0 feet: NO RECOVERY**, 0-10 foot interval air-knifed to clear for utilities.			
CB	5.0/5.0	10			**10.0 to 11.8 feet: SILT WITH SAND AND GRAVEL (MH)**, gray with some brown veins, stiff, moist, slight hydrocarbon-like odor, no sheen. (FILL) @ 11.5 feet: pieces of brick.	5	15	80
					11.8 to 22.9 feet: SAND (SP), brown, loose, damp, some rounded gravel, no odor, no sheen. (FILL)	10	90	0
CB	5.0/5.0	15			@ 16.0 to 16.3 feet: sandy silt (MH), gray with some organic debris.			
		20						

REMARKS
COP = City of Portland Datum.

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LOG OF EXPLORATORY BORING

PROJECT NAME	**Gasco - GW Source Control**	BORING NO.	**MW-35U**
LOCATION	**Portland, Oregon**	PAGE	**2 of 4**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**33.9 ft COP**
DRILL METHOD	**Rotosonic - AMS 17C**	TOTAL DEPTH	**70.0 ft.**
LOGGED BY	**Ben Johnson**	DATE COMPLETED	**9/28/12**
SAMPLING METHOD	**4-in. ID by 5-ft. core barrel (CB)**	PERMIT/STARTCARD NO.	**1017742**
BOREHOLE DIAMETER	**6-inches**	WATER RESOURCES WELL ID	**L109265**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
CB	5.0/5.0				**11.8 to 22.9 feet: SAND (SP)**, continued. @ 21.3 to 21.6 feet: sandy silt (MH), some gravel.	10	90	0
					22.9 to 27.6 feet: SANDY GRAVELLY SILT (MH), brown, firm, moist to wet, large pieces of rounded gravel, some black veins, pieces of pulverized brick, no odor, no sheen, some organic debris. (FILL)	30	50	20
CB	5.0/5.0	25			@ 25.0 to 25.9 feet: sand (SP), brown with some gravel and organic debris. @ 26.5 to 27.6 feet: wet.			
					27.6 to 28.3 feet: TAR, firm, some sand and organic debris, some moist spots.			
					28.3 to 33.0 feet: SILT WITH SAND (MH), gray with brown mottling, firm, damp, slight hydrocarbon-like odor, no sheen. (FILL)	0	10	90
CB	3.7/5.0	30			@ 30.0 to 30.5 feet: tar shavings, moist. @ 30.0 to 30.9 feet: brown silt swirls. @ 30.9 feet: contact with native. (ALLUVIUM) @ 31.8 feet: sand layer.			
					33.0 to 36.4 feet: SAND WITH SILT (SP-SM), gray, loose, wet, slight hydrocarbon-like odor, no sheen. (ALLUVIUM) @ 33.6 to 34.1 feet: silt with sand (MH). @ 34.4 to 34.5 feet: silt with sand (MH).	0	85	15
CB	4.0/5.0	35						
					36.4 to 37.5 feet: SILT WITH SAND (MH), gray, firm, moist, heavy brown mottling, no hydrocarbon-like odor, no sheen. (ALLUVIUM)	0	15	85
					37.5 to 40.0 feet: SILTY SAND (SM), brown with dark brown mottling, wet, no odor, no sheen. (ALLUVIUM)	0	55	45
		40						

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LOG OF EXPLORATORY BORING

PROJECT NAME	**Gasco - GW Source Control**	BORING NO.	**MW-35U**
LOCATION	**Portland, Oregon**	PAGE	**3 of 4**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**33.9 ft COP**
DRILL METHOD	**Rotosonic - AMS 17C**	TOTAL DEPTH	**70.0 ft.**
LOGGED BY	**Ben Johnson**	DATE COMPLETED	**9/28/12**
SAMPLING METHOD	**4-in. ID by 5-ft. core barrel (CB)**	PERMIT/STARTCARD NO.	**1017742**
BOREHOLE DIAMETER	**6-inches**	WATER RESOURCES WELL ID	**L109265**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
CB	3.6/5.0				**40.0 to 42.5 feet: SAND (SP)**, brown, loose, wet, no odor, no sheen. (ALLUVIUM)	0	95	5
					42.5 to 45.0 feet: SILTY SAND (SM), dark gray, medium density, wet, no odor, no sheen. (ALLUVIUM) @ 43.6 feet: organic debris. @ 44.1 to 44.6 feet: organic debris.	0	75	25
CB	4.0/5.0	45			**45.0 to 53.8 feet: SILT WITH SAND (ML)**, gray, firm, no plasticity, moist to wet, no odor, no sheen. (ALLUVIUM)	0	25	75
CB	4.0/5.0	50						
					53.8 to 61.0 feet: SAND WITH SILT (SP-SM), gray, loose, wet, no odor, no sheen. (ALLUVIUM)	0	90	10
CB	4.0/5.0	55			@ 56.1 to 56.5 feet: silt with sand (MH).			
					@ 58.7 to 59.7 feet: silt with sand (MH).			
		60						

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LOG OF EXPLORATORY BORING

PROJECT NAME	**Gasco - GW Source Control**	BORING NO.	**MW-35U**
LOCATION	**Portland, Oregon**	PAGE	**4 of 4**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**33.9 ft COP**
DRILL METHOD	**Rotosonic - AMS 17C**	TOTAL DEPTH	**70.0 ft.**
LOGGED BY	**Ben Johnson**	DATE COMPLETED	**9/28/12**
SAMPLING METHOD	**4-in. ID by 5-ft. core barrel (CB)**	PERMIT/STARTCARD NO.	**1017742**
BOREHOLE DIAMETER	**6-inches**	WATER RESOURCES WELL ID	**L109265**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
CB	5.0/5.0				**53.8 to 61.0 feet: SAND WITH SILT (SP-SM)**, continued.	0	90	10
					@ 60.7 feet: organic material.			
					61.0 to 61.6 feet: SILT WITH SAND (MH), gray, firm, moist, no odor, no sheen. (ALLUVIUM)	0	20	80
					61.6 to 67.0 feet: SAND WITH SILT (SP-SM), gray, loose, wet, no odor, no sheen. (ALLUVIUM)	0	85	15
					@ 63.4 to 65.0 feet: silt with sand (MH).			
CB	2.0/5.0	65			@ 65.0 to 67.0 feet: grayish green.			
					67.0 to 70.0 feet: SILTY SAND (SM), gray, soft, wet, very faint hydrocarbon-like odor, some grayish platy sheen. (ALLUVIUM)	0	60	40
		70			Total depth: 70.0 feet.			
					WELL COMPLETION DETAILS +2.9 to 54.0 feet: 2-inch-diameter, flush-threaded, Schedule 40 PVC blank riser pipe. 54.0 to 64.0 feet: 2-inch-diameter, flush-threaded, continuous wire-wrapped stainless steel screen with 0.020-inch slots. Rubber NAPL funnel attached at base of screen. 64.0 to 67.0 feet: 2-inch-diameter stainless steel sump.			
		75			0 to 2.0 feet: Concrete. 2.0 to 49.0 feet: Bentonite grout with 10% organoclay by volume. 49.0 to 52.0 feet: Bentonite chips. 52.0 to 64.0 feet: 10-20 Colorado silica sand. 64.0 to 70.0 feet: Coated bentonite pellets.			
		80						

REMARKS
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LOG OF EXPLORATORY BORING

PROJECT NAME	**Gasco - GW Source Control**	BORING NO.	**MW-36U**
LOCATION	**Portland, Oregon**	PAGE	**1 of 4**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**35.1 ft COP**
DRILL METHOD	**Rotosonic - AMS 17C**	TOTAL DEPTH	**60.0 ft.**
LOGGED BY	**Ben Johnson**	DATE COMPLETED	**9/27/12**
SAMPLING METHOD	**4-in. ID by 5-ft. core barrel (CB)**	PERMIT/STARTCARD NO.	**1017738**
BOREHOLE DIAMETER	**6-inches**	WATER RESOURCES WELL ID	**L109264**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
NA	NA				**0 to 10.0. feet: NO RECOVERY**, 0-10 foot interval air-knifed to clear for utilities.			
CB	3.0/3.0	10			**10.0 to 18.3 feet: TAR AND SAND (SP)**, slight plasticity, some gravel in matrix. (FILL)	5	95	0
CB	2.0/2.0				@ 14.2 to 18.3 feet: moist.			
CB	5.0/5.0	15						
					18.3 to 32.4 feet: SAND (SP), dark gray, loose, damp, slight hydrocarbon-like odor, no sheen, trace gravel. (FILL)	5	95	0
		20						

REMARKS

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LOG OF EXPLORATORY BORING

PROJECT NAME	**Gasco - GW Source Control**	BORING NO.	**MW-36U**
LOCATION	**Portland, Oregon**	PAGE	**2 of 4**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**35.1 ft COP**
DRILL METHOD	**Rotosonic - AMS 17C**	TOTAL DEPTH	**60.0 ft.**
LOGGED BY	**Ben Johnson**	DATE COMPLETED	**9/27/12**
SAMPLING METHOD	**4-in. ID by 5-ft. core barrel (CB)**	PERMIT/STARTCARD NO.	**1017738**
BOREHOLE DIAMETER	**6-inches**	WATER RESOURCES WELL ID	**L109264**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
CB	5.0/5.0				**18.3 to 32.4 feet: SAND (SP)**, continued. @ 20.0 to 20.6 feet: brown sand.			
CB	3.5/5.0	25			@ 25.7 to 27.4 feet: tar in matrix, moist. @ 27.4 to 27.7 brown sand.			
CB	2.5/5.0	30			@ 30.0 to 32.4 feet: wet, sheen visible on sample, but not colorful or platy.			
					32.4 to 35.0 feet: SILT (ML), dark gray, firm, low plasticity, moist, some fine roots, slight hydrocarbon-like odor, no sheen. (ALLUVIUM) @ 33.2 to 33.4 feet: sand (SP) with sheen, not colorful and platy.	0	5	95
CB	4.0/5.0	35			**35.0 to 36.3 feet: SILT WITH SAND (ML)**, brown, soft, wet, low to no plasticity, slight hydrocarbon-like odor, no sheen. (ALLUVIUM)	0	30	70
					36.3 to 39.9 feet: SILT WITH SAND (MH), gray, soft, moist, slight hydrocarbon-like odor, no sheen. (ALLUVIUM) @ 39.1 to 39.9 feet: silt (MH).	0	30	70
		40						

REMARKS

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LOG OF EXPLORATORY BORING

PROJECT NAME	**Gasco - GW Source Control**	BORING NO.	**MW-36U**
LOCATION	**Portland, Oregon**	PAGE	**3 of 4**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**35.1 ft COP**
DRILL METHOD	**Rotosonic - AMS 17C**	TOTAL DEPTH	**60.0 ft.**
LOGGED BY	**Ben Johnson**	DATE COMPLETED	**9/27/12**
SAMPLING METHOD	**4-in. ID by 5-ft. core barrel (CB)**	PERMIT/STARTCARD NO.	**1017738**
BOREHOLE DIAMETER	**6-inches**	WATER RESOURCES WELL ID	**L109264**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
CB	4.0/5.0				**39.9 to 45.0 feet: SAND WITH SILT (SP-SM)**, brown and gray swirled, loose, wet, no odor, no sheen. (ALLUVIUM)	0	85	15
					@ 41.8 to 42.8 feet: silt (MH).	0	15	85
						0	85	15
CB	3.5/5.0	45			**45.0 to 48.0 feet: SILT WITH SAND (ML)**, gray, wet, firm, low plasticity, slight hydrocarbon-like odor, no sheen. (ALLUVIUM)	0	25	75
					48.0 to 50.6 feet: SAND WITH SILT (SP-SM), gray, loose, wet, no odor, no sheen. (ALLUVIUM)	0	90	10
CB	4.0/5.0	50			@ 48.9 to 49.2 feet: silt with sand (MH).			
					50.6 to 58.6 feet: SILT WITH SAND (ML), gray, wet, firm, low plasticity, no odor, no sheen. (ALLUVIUM)	0	15	85
					@ 51.6 to 52.3 feet: sand with silt (SP-SM).			
CB	4.0/5.0	55			@ 54.6 to 56.8 feet: sandy silt.			
					58.6 to 60.0 feet: SAND WITH SILT (SP-SM), gray, loose, wet, no odor, no sheen. (ALLUVIUM)	0	90	10
		60						

REMARKS

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LOG OF EXPLORATORY BORING

PROJECT NAME	**Gasco - GW Source Control**	BORING NO.	**MW-36U**
LOCATION	**Portland, Oregon**	PAGE	**4 of 4**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**35.1 ft COP**
DRILL METHOD	**Rotosonic - AMS 17C**	TOTAL DEPTH	**60.0 ft.**
LOGGED BY	**Ben Johnson**	DATE COMPLETED	**9/27/12**
SAMPLING METHOD	**4-in. ID by 5-ft. core barrel (CB)**	PERMIT/STARTCARD NO.	**1017738**
BOREHOLE DIAMETER	**6-inches**	WATER RESOURCES WELL ID	**L109264**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
		65			Total depth: 60.0 feet. **WELL COMPLETION DETAILS** +3.0 to 44.0 feet: 2-inch-diameter, flush-threaded, Schedule 40 PVC blank riser pipe. 44.0 to 54.0 feet: 2-inch-diameter, flush-threaded, continuous wire-wrapped stainless steel screen with 0.020-inch slots. Rubber NAPL funnel attached at base of screen. 54.0 to 57.0 feet: 2-inch-diameter stainless steel sump. 0 to 2.0 feet: Concrete. 2.0 to 39.0 feet: Bentonite grout with 10% organoclay by volume. 39.0 to 42.0 feet: 20-40 Colorado silica sand. 42.0 to 54.0 feet: 10-20 Colorado silica sand. 54.0 to 60.0 feet: Coated bentonite pellets.			
		70						
		75						
		80						

REMARKS
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LOG OF EXPLORATORY BORING

PROJECT NAME	**NW Natural GW Source Control**	BORING NO.	**MW-42F**
LOCATION	**Portland, Oregon**	PAGE	**1 of 3**
DRILLED BY	**Cascade Drilling, Inc., Zone S**	LOGGED BY	**Ben Johnson**
DRILL METHOD	**Rotosonic with SPT**	TOTAL DEPTH	**41.5 ft.**
BOREHOLE DIAMETER	**4" core barrel, 6" casing**	DATE COMPLETED	**11/21/14**
GROUND SURFACE ELEVATION	**33.48 ft C.O.P.**	PERMIT/STARTCARD NO.	**1025006**
TOP OF CASING ELEVATION	**36.84 ft C.O.P.**	WATER RESOURCES WELL ID	**L115799**

SAMPLING METHOD	SPT COUNT	RECOVERY (FEET)	*LAB RESULTS	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
CB	5 23 18	2.5/2.5	MC=7.8 LL=40 PL=30 PI=10				**0 to 2.3 feet: GRAVELLY SAND (SP)**, dark brown, fine sand, fine to coarse, angular to subrounded gravels, loose, damp to dry. (FILL) @ 0.0 to 0.5 foot: silt, sand content down. @ 1.1 to 2.3 feet: lighter brown.	30	65	5
CB	9 11 12	2.5/2.5	MC=5.8				**2.3 to 10.0 feet: SAND (SP)**, brown, medium grained, poorly graded, trace gravel, loose, damp. (FILL)	2	98	0
CB	9 11 11	2.5/2.5	MC=6.1	5						
CB	6 11 14	2.7/2.5	MC=9.8				@ 7.8 to 8.0 feet: large fragmented rock.			
CB	4 6 6	4.9/5.0	MC=10.1	10			**10.0 to 16.4 feet: GRAVELLY SILTY SAND (SW)**, brown with some black, medium sand, fine to coarse gravel, loose, damp. (FILL) @ 12.1 to 12.6 feet: sand (SP), brown, medium grains.	15	60	25
CB	6 7 11	5.0/5.0	MC=9.6	15			@ 13.8 to 16.4 feet: silt with sand (ML), silt content up, sand down, brown, no plasticity, trace gravel, loose, damp. (FILL)	5	25	70
							16.4 to 19.1 feet: SAND (SP), brown, medium grained, trace fine gravel, loose, damp. (FILL)	3	97	0
				20			**19.1 to 21.2 feet: GRAVELLY SILTY SAND (SM)**, description on following page.	10	51	49

REMARKS

MC = Moisture Content (%); LL = Liquid Limit (% MC); PL = (% MC); PI=Plasticity Index (% MC); DD = Dry Density (pounds per cubic foot).

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LOG OF EXPLORATORY BORING

PROJECT NAME	**NW Natural GW Source Control**	BORING NO.	**MW-42F**
LOCATION	**Portland, Oregon**	PAGE	**2 of 3**
DRILLED BY	**Cascade Drilling, Inc., Zone S**	LOGGED BY	**Ben Johnson**
DRILL METHOD	**Rotosonic with SPT**	TOTAL DEPTH	**41.5 ft.**
BOREHOLE DIAMETER	**4" core barrel, 6" casing**	DATE COMPLETED	**11/21/14**
GROUND SURFACE ELEVATION	**33.48 ft C.O.P.**	PERMIT/STARTCARD NO.	**1025006**
TOP OF CASING ELEVATION	**36.84 ft C.O.P.**	WATER RESOURCES WELL ID	**L115799**

SAMPLING METHOD	SPT COUNT	RECOVERY (FEET)	*LAB RESULTS	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
CB	6 11 21	5.3/5.0	MC=10.9				**19.1 to 21.2 feet: GRAVELLY SILTY SAND (SM)**, brown, medium grained, trace fine gravel, loose, damp. (FILL) @ 19.8 to 21.2 feet: black, hydrocarbon odor, soft, rod pieces in matrix, brick?	5	15	80
							21.2 to 21.9 feet: SILT WITH SAND (ML), black, no plasticity, trace subrounded gravel, loose, damp, hydrocarbon odor. (FILL)	5	80	15
							21.9 to 31.1 feet: SAND WITH SILT (SP-SM), brown, loose, medium grained sand, trace subrounded gravel, damp. (FILL)			
CB	10 14 11	4.8/5.0	MC=12.2	25			@ 22.4 to 22.8 feet: silt (ML), black, hydrocarbon odor. @ 26.4 to 26.7 feet: dry. @ 26.8 to 28.1 feet: black silt veins in matrix. @ 28.3 to 31.1 feet: dark gray sand with silt, medium gravels.			
CB	4 6 4	5.0/5.0	MC=39.6 MC=11.8 DD=100.3	30			**31.1 to 36.4 feet: SILT (ML)**, dark gray, low plasticity, soft, damp. (ALLUVIUM)	0	10	90
CB	2 2 1	4.6/5.0	MC=33.5	35			@ 34.8 to 34.9 feet: organic debris.			
							36.4 to 41.5 feet: SANDY SILT (ML), gray, no plasticity, fine grained sand, soft, moist. (ALLUVIUM) @ 37.9 to 38.7 feet: sand (SP), fine grained.	0	35	65
				40						

REMARKS

MC = Moisture Content (%); LL = Liquid Limit (% MC); PL = (% MC); PI=Plasticity Index (% MC); DD = Dry Density (pounds per cubic foot).

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LOG OF EXPLORATORY BORING

PROJECT NAME	**NW Natural GW Source Control**	BORING NO.	**MW-42F**
LOCATION	**Portland, Oregon**	PAGE	**3 of 3**
DRILLED BY	**Cascade Drilling, Inc., Zone S**	LOGGED BY	**Ben Johnson**
DRILL METHOD	**Rotosonic with SPT**	TOTAL DEPTH	**41.5 ft.**
BOREHOLE DIAMETER	**4" core barrel, 6" casing**	DATE COMPLETED	**11/21/14**
GROUND SURFACE ELEVATION	**33.48 ft C.O.P.**	PERMIT/STARTCARD NO.	**1025006**
TOP OF CASING ELEVATION	**36.84 ft C.O.P.**	WATER RESOURCES WELL ID	**L115799**

SAMPLING METHOD	SPT COUNT	RECOVERY (FEET)	*LAB RESULTS	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
CB	4 4 6	1.2/1.5					**36.4 to 41.5 feet: SANDY SILT (ML)**, continued.			
							Total depth: 41.5 feet. **WELL COMPLETION DETAILS** 0 to 25.95 feet: 2-inch-diameter, flush-threaded, Schedule 40 PVC blank riser pipe. 25.95 to 31.0 feet: 2-inch-diameter, flush-threaded, Schedule 40 PVC well screen with 0.020-inch machined slots. 31.0 to 31.4 feet: Sump. 0 to 3.0 feet: Concrete. 3.0 to 15.0 feet: Granular bentonite. 15.0 to 23.6 feet: Bentonite chips. 23.6 to 31.4 feet: 10-20 Colorado Silica Sand. 31.4 to 41.5 feet: Bentonite chips.			
				45						
				50						
				55						
				60						

REMARKS

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ANCHOR QEA

LOG OF EXPLORATORY BORING

PROJECT NAME	**Gasco - GW Source Control**	BORING NO.	**MW-PW2L**
LOCATION	**Portland, Oregon**	PAGE	**1 of 9**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**34.2 ft COP**
DRILL METHOD	**Rotosonic - SDC 390-14**	TOTAL DEPTH	**146.0 ft.**
LOGGED BY	**Matt Wilson**	DATE COMPLETED	**1/17/14**
SAMPLING METHOD	**6-in. ID by 10-ft. core barrel (CB)**	PERMIT/STARTCARD NO.	**1021185**
BOREHOLE DIAMETER	**12-in (0-40 ft)/10-in (40-146 ft)**	WATER RESOURCES WELL ID	**L105531**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
NA	NA	5			**0 to 10.3 feet: NO RECOVERY**; interval was air-knifed to clear for utilities.			
CB	3.0/5.0	10			**10.3 to 29.7 feet: SAND (SW)**, black, medium dense, dry, well graded, medium grained to coarse grained sand, trace fine to coarse angular gravel, moderate to strong hydrocarbon-like odor, sticky, tar in matrix from 10.3 to 16.0 feet, heavy rainbow sheen via sheen test. (FILL)	5	95	0
CB	5.0/5.0	15			@ 15.0 to 16.0 feet: slight hydrocarbon-like odor. @ 16.0 feet: trace spotty sheen via sheen test. @ 16.0 to 20.0 feet: color change to dark gray, trace to no hydrocarbon-like odor. @ 18.0 to 20.0 feet: no sheen via sheen test.			
		20						

REMARKS

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LOG OF EXPLORATORY BORING

PROJECT NAME	**Gasco - GW Source Control**	BORING NO.	**MW-PW2L**
LOCATION	**Portland, Oregon**	PAGE	**2 of 9**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**34.2 ft COP**
DRILL METHOD	**Rotosonic - SDC 390-14**	TOTAL DEPTH	**146.0 ft.**
LOGGED BY	**Matt Wilson**	DATE COMPLETED	**1/17/14**
SAMPLING METHOD	**6-in. ID by 10-ft. core barrel (CB)**	PERMIT/STARTCARD NO.	**1021185**
BOREHOLE DIAMETER	**12-in (0-40 ft)/10-in (40-146 ft)**	WATER RESOURCES WELL ID	**L105531**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
CB	7.4/8.0				**10.3 to 29.7 feet: SAND (SW)**, continued.	10-15	85-95	0
		25			@ 25.0 feet: wet, trace gravel.	5	95	0
CB	5.7/7.0				@ 28.0 to 29.7 feet: very wet, very loose, abundant, spotty sheen, moderate hydrocarbon-like odor, some oily blebs visible in standing water, but not saturated with oil.			
		30			**29.7 to 32.9 feet: SILTY SAND WITH GRAVEL (SM)**, dark brown, loose, very soft, wet, soupy, abundant spotty sheen, moderate hydrocarbon-like odor, trace oil, sample is very disturbed, fell out of core barrel. (FILL)	10	50	40
					32.9 to 35.0 feet: SILT WITH SAND (MH), dark grayish brown, soft, moist, high plasticity, trace fine and coarse sand, trace fine gravel, oily in intermittent sandy zones, sandy and silty zones are intermixed and not stratified. (FILL)	5	25	70
CB	5.0/5.0	35			**35.0 to 37.7 feet: SAND (SP)**, dark grayish brown, very loose, wet, poorly graded, fine grained, spotty sheen visible on sample, moderate hydrocarbon-like odor. (ALLUVIUM) @ 30.0 to 36.6 feet: spotty sheen.	0	100	0
					37.7 to 38.6 feet: SILT (MH), dark grayish brown, soft, grades from silty sand to sandy silt to silt, medium to high plasticity, trace fine sand, slight hydrocarbon-like odor, no sheen. (ALLUVIUM)	0	0-5	95-100
						0	60	40
		40			**38.6 to 41.2 feet: SILTY SAND (SM)**, as on following page.	0	20	80

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LOG OF EXPLORATORY BORING

PROJECT NAME	**Gasco - GW Source Control**	BORING NO.	**MW-PW2L**
LOCATION	**Portland, Oregon**	PAGE	**3 of 9**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**34.2 ft COP**
DRILL METHOD	**Rotosonic - SDC 390-14**	TOTAL DEPTH	**146.0 ft.**
LOGGED BY	**Matt Wilson**	DATE COMPLETED	**1/17/14**
SAMPLING METHOD	**6-in. ID by 10-ft. core barrel (CB)**	PERMIT/STARTCARD NO.	**1021185**
BOREHOLE DIAMETER	**12-in (0-40 ft)/10-in (40-146 ft)**	WATER RESOURCES WELL ID	**L105531**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
CB	5.0/5.0				**38.6 to 41.2 feet: SILTY SAND (SM)**, dark brownish gray, wet, fine sand, slight hydrocarbon-like odor, no sheen. (ALLUVIUM) @ 39.4 to 39.9 feet: sandy silt layer.	0	70	30
					41.2 to 42.0 feet: SILT (MH), dark grayish brown, moist, soft, highly plastic, no sheen, trace hydrocarbon-like odor. (ALLUVIUM)	0	0	100
					42.0 to 42.6 feet: SANDY SILT (MH), dark grayish brown, soft, wet, medium plasticity.	0	40	60
					42.6 to 46.1 feet: SAND (SP), dark grayish brown, wet, loose, poorly graded fine sand, no sheen , trace hydrocarbon-like odor, rust colored banding at 42.9 to 43.2 feet. (ALLUVIUM) @ 46.1 feet: grades to silty sand, increasing silt content with depth.	0	100	0
CB	5.0/5.0	45			**46.1 to 48.2 feet: SILTY SAND (SM)**, silt content increasing with depth. @ 48.1 to 48.2 feet: silt layer with rust red laminations.	0 0	80 70	20 30
					48.2 to 49.4 feet: SAND (SP), dark gray, medium dense, wet, fine grained, poorly graded sand, no sheen, no discernible odor, intermittent thin silt layers. (ALLUVIUM) @ 48.4 to 48.5 feet: silt layer. @ 49.1 to 49.2 feet: silt layer.	0 0	0 100	100 0
CB	3.4/5.0	50			**49.4 to 51.0 feet: SILT (MH)**, dark grayish brown, soft, moist, highly plastic, no discernible odor, no sheen. (ALLUVIUM)	0	55	45
					51.0 to 52.8 feet: SILTY SAND (SM), dark brownish gray, wet, soft, no sheen, no discernible odor.			
					52.8 to 53.2 feet: SILT LAYER (ML)			
					53.2 to 66.0 feet: SAND (SP), dark gray, loose, wet, poorly graded, fine grained. (ALLUVIUM)	0	100	0
CB	2.7/5.0	55			@ 55.6 to 55.8 feet: silt layer.			
					@ 57.2 to 57.3 feet: silt layer.			
		60						

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LOG OF EXPLORATORY BORING

PROJECT NAME	**Gasco - GW Source Control**	BORING NO.	**MW-PW2L**
LOCATION	**Portland, Oregon**	PAGE	**4 of 9**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**34.2 ft COP**
DRILL METHOD	**Rotosonic - SDC 390-14**	TOTAL DEPTH	**146.0 ft.**
LOGGED BY	**Matt Wilson**	DATE COMPLETED	**1/17/14**
SAMPLING METHOD	**6-in. ID by 10-ft. core barrel (CB)**	PERMIT/STARTCARD NO.	**1021185**
BOREHOLE DIAMETER	**12-in (0-40 ft)/10-in (40-146 ft)**	WATER RESOURCES WELL ID	**L105531**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
CB	5.0/5.0				**53.2 to 66.0 feet: SAND (SP)**, continued.	0	95-100	0-5
					@ 63.5 to 63.6 feet: silt layer. @ 63.7 to 63.8 feet: silt layer.			
CB	5.0/5.0	65			@ 65.3 to 66.0 feet: trace spotty sheen slight hydrocarbon-like odor.			
					66.0 to 68.5 feet: SAND WITH SILT (SP-SM), increasing silt content with depth. (ALLUVIUM) @ 66.0 to 68.5 feet: grades to sandy silt.	0	85-90	10-15
					68.5 to 69.0 feet: SANDY SILT (ML), low plasticity.	0	20	80
CB	5.0/5.0	70			**69.0 to 73.7 feet: SAND (SP)**, dark brownish gray, medium dense, moist, poorly graded, fine grained. (ALLUVIUM) @ 69.4 feet: 0.05-foot-thick silt layer. @ 72.7 to 72.8 feet: silt laminations. @ 73.1 feet: 0.05-foot silt layer.	0	100	0
					73.7 to 75.1 feet: SANDY SILT (MH), dark grayish brown, moist, firm, medium plasticity, trace hydrocarbon-like odor, no sheen. (ALLUVIUM)	0 0	30 0	70 100
CB	3.5/5.0	75			@ 74.3 to 75.1 feet: no sand - SILT.	0	100	0
					75.1 to 76.1 feet: SAND (SP), dark grayish brown, medium dense, wet, poorly graded fine sand, no sheen, no discernible odor. (ALLUVIUM)	0	30	70
					76.1 to 78.1 feet: SANDY SILT (MH), dark grayish brown, firm, moist, medium plasticity, increasing silt content with depth, no sheen, no discernible odor. (ALLUVIUM)			
					78.1 to 84.6 feet: SAND (SP), dark brownish gray, medium dense, wet, poorly graded, fine grained, no sheen, no discernible odor. (ALLUVIUM) @ 78.3 to 78.4 feet: layer of decayed wood & plant debris.	0	100	0
		80						

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LOG OF EXPLORATORY BORING

PROJECT NAME	**Gasco - GW Source Control**	BORING NO.	**MW-PW2L**
LOCATION	**Portland, Oregon**	PAGE	**5 of 9**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**34.2 ft COP**
DRILL METHOD	**Rotosonic - SDC 390-14**	TOTAL DEPTH	**146.0 ft.**
LOGGED BY	**Matt Wilson**	DATE COMPLETED	**1/17/14**
SAMPLING METHOD	**6-in. ID by 10-ft. core barrel (CB)**	PERMIT/STARTCARD NO.	**1021185**
BOREHOLE DIAMETER	**12-in (0-40 ft)/10-in (40-146 ft)**	WATER RESOURCES WELL ID	**L105531**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
CB	10.0/10.0				**78.1 to 84.6 feet: SAND (SP)**, continued. @ 78.4 to 78.6 feet: silt layer. @ 79.4 to 79.6 feet: silt layer. @ 80.0 to 84.6 feet: fine to medium grained, majority fine grained, variegated sand grain colors, trace fines. @ 80.0 to 81.3 feet: very strong hydrocarbon-like odor, abundant spotty sheen, abundant cobble-sized silt blebs. @ 81.3 to 82.3 feet: trace spotty sheen. @ 82.3 to 84.6 feet: saturated with clear brown oil, very strong hydrocarbon-like odor, increasing in saturation with depth.	0	95	5
		85			**84.6 to 86.6 feet: SILT (MH)**, dark grayish brown, moist, highly plastic, strong hydrocarbon-like odor, trace shell fragments, no sheen. (ALLUVIUM)	0	0	100
					86.6 to 101.6 feet: SAND (SP), dark gray with variegated sand grain colors, wet, loose, poorly graded, slight hydrocarbon-like odor, some gravel sized silt blebs, trace fines, majority fine sand. (ALLUVIUM) @ 88.2 to 88.8 feet: silt layer. @ 88.8 to 90.0 feet: trace dirty sock odor.	0	95	5
CB	10.0/10.0	90			@ 90.0 to 92.5 feet: spotty sheen, moderate hydrocarbon-like odor.			
					@ 92.5 to 93.8 feet: silt layer with some fine to medium sand pockets.			
					@ 93.8 to 99.1 feet: soil type change to sand with silt.			
		95				0	85-90	10-15
					@ 96.3 to 99.1 feet: abundant silt blebs, trace dirty sock odor.			
					@ 99.1 to 100.0 feet: silt layer, low to medium plasticity.			
		100						

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LOG OF EXPLORATORY BORING

PROJECT NAME	**Gasco - GW Source Control**	BORING NO.	**MW-PW2L**
LOCATION	**Portland, Oregon**	PAGE	**6 of 9**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**34.2 ft COP**
DRILL METHOD	**Rotosonic - SDC 390-14**	TOTAL DEPTH	**146.0 ft.**
LOGGED BY	**Matt Wilson**	DATE COMPLETED	**1/17/14**
SAMPLING METHOD	**6-in. ID by 10-ft. core barrel (CB)**	PERMIT/STARTCARD NO.	**1021185**
BOREHOLE DIAMETER	**12-in (0-40 ft)/10-in (40-146 ft)**	WATER RESOURCES WELL ID	**L105531**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
CB	10.0/10.0				**86.6 to 101.6 feet: SAND (SP)**, continued. @ 100.0 feet: sand with silt as previous page, majority fine grained, variegated sand grains, abundant silt blebs.	0	85-90	0-15
					101.6 to 103.0 feet: SILT (ML), low to medium plasticity, some sand pockets. (ALLUVIUM) @ 102.5 feet: 1-inch-thick light gray layer (volcanic ash?).	0	0	100
					103.0 to 113.4 feet: SAND (SP), dark gray, very loose, wet, fine to medium grained, majority medium grained, poorly graded, some silt blebs, no sheen, trace dirty sock odor, trace fines, silt blebs range from coarse gravel to cobble sized. (ALLUVIUM)	0	95	5
		105			@ 106.0 to 113.4 feet: abundant silt blebs, fine gravel to cobble size, 25 to 35 percent of sample.			
					@ 109.6 to 110.0 feet: silt layer or very large silt bleb.			
CB	4.5/5.0	110			@ 111.4 to 112.0 feet: heavy sheen on sample, strong hydrocarbon-like odor. @ 112.0 to 113.4 feet: saturated with brown oil, very strong hydrocarbon-like odor.			
					113.4 to 115.0 feet: SILT (ML), dark grayish brown, low to medium plasticity, firm, slight hydrocarbon-like odor.			
CB	6.0/5.0	115			**115.0 to 117.3 feet: SAND WITH SILT (SP-SM)**, dark brownish gray, loose, wet, poorly graded, fine grained. (ALLUVIUM) @ 116.1 to 117.3 feet: spotty rainbow sheen, strong hydrocarbon-like odor. @ 116.7 to 117.3 feet: saturated with brown oil.	0	80-85	15-20
					117.3 to 118.9 feet: SILT (ML), dark grayish brown, firm, moist, low to medium plasticity, trace hydrocarbon-like odor.			
		120			**118.9 to 120.0 feet: SAND (SP)**, dark gray, loose, moist, variegated sand grain colors, poorly graded, fine to medium			

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LOG OF EXPLORATORY BORING

PROJECT NAME	**Gasco - GW Source Control**	BORING NO.	**MW-PW2L**
LOCATION	**Portland, Oregon**	PAGE	**7 of 9**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**34.2 ft COP**
DRILL METHOD	**Rotosonic - SDC 390-14**	TOTAL DEPTH	**146.0 ft.**
LOGGED BY	**Matt Wilson**	DATE COMPLETED	**1/17/14**
SAMPLING METHOD	**6-in. ID by 10-ft. core barrel (CB)**	PERMIT/STARTCARD NO.	**1021185**
BOREHOLE DIAMETER	**12-in (0-40 ft)/10-in (40-146 ft)**	WATER RESOURCES WELL ID	**L105531**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
CB	5.0/5.0				grained, majority medium grained, trace spotty sheen, mild hydrocarbon-like odor.	0	95	5
					120.0 to 126.7 feet: SAND (SP), poorly graded sand, dark gray, wet, medium dense, fine to medium grained, majority fine grained, compacted. (ALLUVIUM) @ 120.0 to 121.0 feet: saturated with oil and sheen, strong hydrocarbon odor. @ 121.0 to 122.3 feet: spotty sheen, moderate hydrocarbon-odor, trace fines. @ 122.3 to 126.7 feet: trace spotty sheen, moderate hydrocarbon-like odor.			
CB	5.0/5.0	125			@ 125.5 to 125.8 feet: oily, sheen visible on sample. @ 126.4 to 126.7 feet: oily, sheen visible on sample.	0	95	5
					126.7 to 145.0 feet: SAND (SP), dark gray, loose, moist, poorly graded, fine to medium sand, majority medium grained, moderate hydrocarbon-like odor, trace fines. (ALLUVIUM) @ 129.0 to 129.2 feet: oily.			
CB	5.6/5.0	130			@ 130.0 to 135.0 feet: clean sand, little to no fines, mostly medium grained, small fraction fine grained sand. @ 130.7 to 130.8 feet: spotty sheen, moderate hydrocarbon-like odor. @ 131.4 to 131.6 feet: sheen, moderate hydrocarbon-like odor, trace oil. @ 132.7 to 134.4 feet: spotty sheen, moderate hydrocarbon-like odor.	0	100	0
CB	6.0/5.0	135			@ 134.4 to 137.5 feet: oily, heavy sheen, strong hydrocarbon-like odor. @ 135.0 to 140.0 feet: strong hydrocarbon-like odor. @ 137.5 to 140.0 feet: rainbow sheen when wetted, patches of brown oil. @ 139.5 feet: becoming siltier, patches of silty sand and silt blebs.	0	95	5
		140						

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LOG OF EXPLORATORY BORING

PROJECT NAME	**Gasco - GW Source Control**	BORING NO.	**MW-PW2L**
LOCATION	**Portland, Oregon**	PAGE	**8 of 9**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**34.2 ft COP**
DRILL METHOD	**Rotosonic - SDC 390-14**	TOTAL DEPTH	**146.0 ft.**
LOGGED BY	**Matt Wilson**	DATE COMPLETED	**1/17/14**
SAMPLING METHOD	**6-in. ID by 10-ft. core barrel (CB)**	PERMIT/STARTCARD NO.	**1021185**
BOREHOLE DIAMETER	**12-in (0-40 ft)/10-in (40-146 ft)**	WATER RESOURCES WELL ID	**L105531**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
CB	5.4/5.0	145			**126.7 to 145.0 feet: SAND (SP)**, continued. @ 140.0 to 145.0 feet: trace spotty sheen throughout. @ 141.0 to 143.5 feet: abundant coarse gravel to cobble sized silt blebs. @ 141.5 to 142.0 feet: moderate amounts of spotty rainbow sheen. @ 144.5 to 145.0 feet: moderate rainbow sheen, trace oil.	0	95	5
CB	NA				Boring advanced from 145.0 to 146.0 feet without sampling.			
		150			Total depth: 146.0 feet. NOTE: MW-PW2L is a 2-inch PVC monitoring well installed inside a preexisting 6-inch well. **WELL COMPLETION DETAILS (for 6-inch diameter well)** 0.0 to 119.8 feet: 6-inch-diameter, flush-threaded, mild steel blank riser pipe. 119.8 to 139.8 feet: 6-inch-diameter, flush-threaded, continuous wire-wrapped stainless steel screen with 0.035-inch slots. Rubber NAPL funnel attached at base of screen. 139.8 to 144.8 feet: 6-inch-diameter, flush-threaded stainless steel sump. 0 to 5.5 feet: Concrete. 5.5 to 112.0 feet: Bentonite grout with 10% organoclay by dry volume. 112.0 to 117.0 feet: 20-40 Colorado silica sand. 117.0 to 139.8 feet: 10-20 Colorado silica sand. 139.8 to 146.0 feet: Bentonite.			
		155						
		160			See Page 9 for **WELL COMPLETION DETAILS (for 2-inch diameter well)**.			

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LOG OF EXPLORATORY BORING

PROJECT NAME	**Gasco - GW Source Control**	BORING NO.	**MW-PW2L**
LOCATION	**Portland, Oregon**	PAGE	**9 of 9**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**34.2 ft COP**
DRILL METHOD	**Rotosonic - SDC 390-14**	TOTAL DEPTH	**146.0 ft.**
LOGGED BY	**Matt Wilson**	DATE COMPLETED	**1/17/14**
SAMPLING METHOD	**6-in. ID by 10-ft. core barrel (CB)**	PERMIT/STARTCARD NO.	**1021185**
BOREHOLE DIAMETER	**12-in (0-40 ft)/10-in (40-146 ft)**	WATER RESOURCES WELL ID	**L105531**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
		165			**WELL COMPLETION DETAILS (for 2-inch diameter well)** +1.9 to 122.4 feet: 2-inch-diameter, flush-threaded, Schedule 40 PVC blank casing. 122.4 to 142.4 feet: 2-inch-diameter, flush-threaded, Schedule 40 PVC screen with 0.010-inch slots. 142.4 to 145.4 feet: 2-inch-diameter, flush-threaded, Schedule 40 PVC sump. +0.3 to 2.0 feet: Concrete. 2.0 to 117.0 feet: Bentonite grout with 10% organoclay by dry volume. 117.0 to 120.0 feet: 20-40 Colorado silica sand. 120.0 to 145.4 feet: 10-20 Colorado silica sand.			
		170						
		175						
		180						

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ANCHOR QEA

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: NWN-1-20		Date(s): **6/26/2008**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E&I**		OWRD #: **L95808**	
Drilling Method: **Hollow Stem Auger**		GS Elevation: **37.9 feet**	TOC: **37.27 feet MSL**
Sampling Method: **5' Split Core Barrel**		Northing: **704240.40**	Easting: **7623946.70**
Well Construction:		Borehole Dia.: **6 inches**	Total Depth: **24.0 feet bgs**
Blank Casing: 2" schedule 40 PVC	0-10 feet bgs	Project Number: **5237**	
Screen: 2" SS wire wrap (0.02" slot)	10-20 feet bgs	Project Name: **Siltronic Corportation Property**	
2" SS threaded endcap	20-22 feet bgs	Remarks: **City of Portland Datum**	
Annular Fill: 3/4" bentonite chip	0-7 feet bgs		
10/20 Colorado Silica Sand	7-21 feet bgs		
3/4" bentonite chip	21-24 feet bgs		

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Well Construction
	1						ML	**0.0 to 15.0 Feet:** Soils not logged to 15.0 feet as purpose of boring was to install monitoring well. Lithology interpreted from previously adjacent boring (P-16).		
	2						SP			
35	3						ML			
	4									
	5						ML			
	6									
	7									
30	8									
	9									
	10						ML			
	11									
	12						SP			
25	13						ML			
	14									
	15						SP	**15.0 to 16.0 Feet:** gravelly SAND, fine grained, black, wet, loose, poorly graded. Black sticky tar fragments present. Strong tar-like odor present with heavy rainbow sheen present in water during sheen testing. Possible black oil blebbs mixed throughout interval.		
	16						ML			
	17									
20	18			4 (15-19)				**16.0 to 20.0 Feet:** gravelly SILT, black, wet, soft, low plasticity, tar and oil present. Strong tar-like odor continuing with heavy sheen present. From 19.0 to 20.0 feet tar is black, sticky, solid with strong tar-like odor and heavy sheen. Oil is black, thick, and highly viscous.		
	19									
	20						ML	**20.0 to 24.0 Feet:** SILT, dark brownish gray with some olive green, wet, stiff, low plasticity, root fragments present. Tar-like odor and sheen dimishing with depth, minor staining at the beginning of the interval.		
	21									
	22			5 (19-24)						
15	23				0.0					
	24							End of boring at 24.0 feet below ground surface. Stainless Steel Centralizer located at 10.0 feet below ground surface. Rubber DNAPL funnel located at 20.0 feet with stainless steel sump from 20.0 to 22.0 feet below ground surface.		
	25									
	26									

NOTES: bgs = below ground surface
PID=photoionization detector
ppm = parts per million
SS = Stainless Steel

Report: Monitoring Wells; File: 5237 (NWN SERIES).GPJ; 5/5/09

HAI
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Environmental Consultants

Site ID: NWN-2-20		Date(s): **6/13/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E&I**		OWRD #: **L95807**	
Drilling Method: **Hollow Stem Auger**		GS Elevation: **41.8 feet**	TOC: **41.39 feet MSL**
Sampling Method: **No samples collected**		Northing: **703958.00**	Easting: **7623940.10**
Well Construction:		Borehole Dia.: **6 inches**	Total Depth: **22.0 feet bgs**
Blank Casing: 2" schedule 40 PVC	0-10 feet bgs	Project Number: **5237**	
Screen: 2" SS wire wrap (0.02" slot)	10-20 feet bgs	Project Name: **Siltronic Corportation Property**	
2" SS threaded endcap	20-22 feet bgs	Remarks: **City of Portland Datum**	
Annular Fill: 3/4" bentonite chip	0-7 feet bgs		
10/20 Colorado Silica Sand	7-21 feet bgs		
3/4" bentonite chip	21-22 feet bgs		

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Well Construction
40	1						GM	**0.0 to 20.0 Feet:** Soils not logged as purpose of boring was to install monitoring well. Lithology interpreted from previously adjacent boring (P-12).		
	2						SM			
	3									
	4									
	5						SP			
	6									
35	7						ML			
	8						SP			
	9									
	10						ML			
	11									
30	12						ML			
	13						SM			
	14									
	15						GM			
	16						ML			
25	17									
	18									
	19									
	20						ML			
	21									
20	22							End of boring at 22.0 feet below ground surface. Stainless steel centralizer located at 10.0 feet below ground surface. Rubber DNAPL funnel located at 20.0 feet with stainless steel sump from 20.0 to 22.0 feet below ground surface.		
	23									

NOTES: bgs = below ground surface
PID=photoionization detector
ppm = parts per million
SS = Stainless Steel

Report: Monitoring Wells; File: 5237 (NWN SERIES).GPJ; 5/5/09

HAI
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Site ID: NWN-3-17	Date(s): **6/13/08**
Location: **7200 NW Front Avenue, Portland, Oregon**	
Logged By: **Ben Uhl**	Checked By: **Rob Ede**
Driller: **Boart Longyear E&I**	OWRD #: **L95806**
Drilling Method: **Hollow Stem Auger**	GS Elevation: **41.7 feet** / TOC: **41.47 feet MSL**
Sampling Method: **No samples collected**	Northing: **703613.00** / Easting: **7624165.60**
Borehole Dia.: **6 inches**	Total Depth: **19.0 feet bgs**
Project Number: **5237**	
Project Name: **Siltronic Corportation Property**	
Remarks: **City of Portland Datum**	

Well Construction:

Blank Casing:	2" schedule 40 PVC	0-7 feet bgs
Screen:	2" SS wire wrap (0.02" slot)	7-17 feet bgs
	2" SS threaded endcap	17-19 feet bgs
Annular Fill:	3/4" bentonite chip	0-5 feet bgs
	10/20 Colorado Silica Sand	5-18 feet bgs
	3/4" bentonite chip	18-19 feet bgs

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Well Construction
40	1						GM	**0.0 to 19.0 Feet:** Soils not logged to 19.0 feet as purpose of boring was to install monitoring well. Lithology interpreted from previously adjacent boring (P-13).		
	2									
	3									
	4									
	5						GM			
	6						SP			
35	7									
	8									
	9									
	10						SP			
	11									
30	12									
	13									
	14									
	15						SP			
	16									
25	17						ML			
	18									
	19							End of boring at 19.0 feet below ground surface. Stainless steel centralizer located at 7.0 feet below ground surface. Rubber DNAPL funnel located at 17.0 feet with stainless steel sump from 17.0 to 19.0 feet below ground surface.		
	20									

NOTES: bgs = below ground surface
PID=photoionization detector
ppm = parts per million
SS = Stainless Steel

Report: Monitoring Wells; File: 5237 (NWN SERIES).GPJ; 5/5/09

HAI
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Site ID: NWN-4-15	Date(s): **6/12/08**
Location: **7200 NW Front Avenue, Portland, Oregon**	
Logged By: **Ben Uhl**	Checked By: **Rob Ede**
Driller: **Boart Longyear E&I**	OWRD #: **L95803**
Drilling Method: **Hollow Stem Auger**	GS Elevation: **42.8 feet** / TOC: **42.69 feet MSL**
Sampling Method: **5' Split Core Barrel**	Northing: **703176.50** / Easting: **7624417.00**
Borehole Dia.: **6 inches**	Total Depth: **25.0 feet bgs**
Project Number: **5237**	
Project Name: **Siltronic Corportation Property**	
Remarks: **City of Portland Datum**	

Well Construction:

Blank Casing:	2" schedule 40 PVC	0-5 feet bgs
Screen:	2" SS wire wrap (0.02" slot)	5-15 feet bgs
	2" SS threaded endcap	15-17 feet bgs
Annular Fill:	3/4" bentonite chip	0-4 feet bgs
	10/20 Colorado Silica Sand	4-16 feet bgs
	3/4" bentonite chip	16-25 feet bgs

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Well Construction
40	1–6						ML / ML / ML	**0.0 to 15.0 Feet:** Soils not logged to 15.0 feet as purpose of boring was to install monitoring well. Lithology interpreted from previously adjacent boring (P-14).		
35	6–14						SP / SP			
30	15–18			5 (15-20)	0.0 / 0.0 / 0.0		ML	**15.0 to 20.0 Feet:** SILT with trace of sand, dark brown becoming olive at 16.0 feet and then grey at 18.0 feet, moist becoming wet at 18.0 feet, stiff becoming very stiff at 16.0 feet, low plasticity. Root fragments present throughout interval. Minor amounts of red oxidation present at 16.0 feet and increasing until 18.0 feet.		
25	20–21				0.0		ML	**20.0 to 21.5 Feet:** SILT, greenish brown, moist, stiff, low plasticity, root fragments present.		
20	22–25			5 (20-25)	0.0 / 0.0		ML	**21.5 to 25.0 Feet:** SILT with some sand, brown and gray, moist, stiff. Root fragments present and reddish-brown oxidation in areas. Sand is fine grained and increasing percentage with depth.		
	25–27							End of boring at 25.0 feet below ground surface. Stainless steel entralizer located at 5.0 feet below ground surface. Rubber DNAPL funnel located at 15.0 feet with stainless steel sump located at 15.0 to 17.0 feet below ground surface.		

NOTES: bgs = below ground surface
PID=photoionization detector
ppm = parts per million
SS = Stainless Steel

Report: Monitoring Wells; File: 5237 (NWN SERIES).GPJ; 5/5/09

HAI
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Site ID: NWN-5-20		Date(s): **6/12/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E&I**		OWRD #: **L95804**	
Drilling Method: **Hollow Stem Auger**		GS Elevation: **37.0 feet**	TOC: **36.87 feet MSL**
Sampling Method: **5' Split Core Barrel**		Northing: **702900.20**	Easting: **7624797.30**
Well Construction:		Borehole Dia.: **6 inches**	Total Depth: **29.0 feet bgs**
Blank Casing: 2" schedule 40 PVC	0-10 feet bgs	Project Number: **5237**	
Screen: 2" SS wire wrap (0.02" slot)	10-20 feet bgs	Project Name: **Siltronic Corportation Property**	
2" SS threaded endcap	20-22 feet bgs	Remarks: **City of Portland Datum**	
Annular Fill: 3/4" bentonite chip	0-7 feet bgs		
10/20 Colorado Silica Sand	7-21 feet bgs		
3/4" bentonite chip	21-29 feet bgs		

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Well Construction
35	1–2						SP	**0.0 to 24.0 Feet:** Soils not logged to 24.0 feet as purpose of boring was to install monitoring well. Lithology interpreted from previously adjacent boring (P-15).		
	2–5						ML			
	5–6						ML			
30	6–10						SP			
	10–15						SP			
25	15–20						SP			
	20–24						ML			
15	24				2.4		ML	**24.0 to 25.0 Feet:** SILT with some sand, dark brown with some gray, wet, soft, low plasticity. Sand is fine grained		
	25–29			5 (24-29)	43.8		ML	**25.0 to 29.0 Feet:** SILT with some sand pockets, brown, wet, very stiff to 26.0 feet then decreasing stiffness with depth. Sand is fine grained, gray, with small amounts of patchy black oil, odor present, sheen present, and discoloration in sand. Root fragments covered in oil present throughout interval.		
10	27–28				34.3					
	29							End of boring at 29.0 feet below ground surface. Stainless steel centralizer located at 10.0 feet bgs. Rubber DNAPL funnel located at 20.0 feet with stainless steel sump located from 20.0 to 22.0 feet bgs.		
	30–31									

NOTES: bgs = below ground surface
PID=photoionization detector
ppm = parts per million
SS = Stainless Steel

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Site ID: NWN-6-31		Date(s): **6/12/08 & 6/13/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E&I**		OWRD #: **L95805**	
Drilling Method: **Hollow Stem Auger**		GS Elevation: **33.4 feet**	TOC: **33.18 feet MSL**
Sampling Method: **Not Applicable**		Northing: **702865.20**	Easting: **7625094.40**
Well Construction:		Borehole Dia.: **6 inches**	Total Depth: **33.0 feet bgs**
Blank Casing: 2" schedule 40 PVC	0-21 feet bgs	Project Number: **5237**	
Screen: 2" SS wire wrap (0.02" slot)	21-31 feet bgs	Project Name: **Siltronic Corportation Property**	
2" SS threaded endcap	31-33 feet bgs	Remarks: **City of Portland Datum**	
Annular Fill: 3/4" bentonite chip	0-20 feet bgs		
10/20 Colorado Silica Sand	20-32 feet bgs		
3/4" bentonite chip	32-33 feet bgs		

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Well Construction
30	1–4						ML	**0.0 to 33.0 Feet:** Soils not logged to 33.0 feet as purpose of boring was to install monitoring well. Lithology interpreted from previously adjacent boring (P-20).		
25	5–12						ML			
20	13–14						SP			
	15–17						SP			
15	18–19						ML			
	20–24						SP			
10	25–27						SP			
5	28–29						ML			
	30–32						ML			
0	33							End of boring at 33.0 feet below ground surface. Stainless steel centralizer located at 21.0 feet below ground surface. Rubber DNAPL funnel located at 31.0 feet bgs with stainless steel sump located from 31.0 to 33.0 feet bgs.		
	34–35									

NOTES: bgs = below ground surface
PID=photoionization detector
ppm = parts per million
SS = Stainless Steel

Report: Monitoring Wells; File: 5237 (NWN SERIES).GPJ; 5/5/09

HAI
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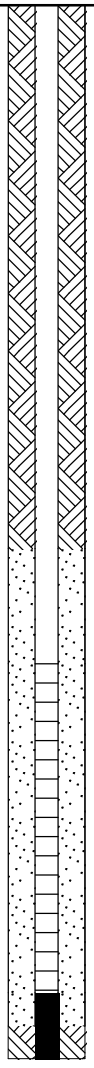
Site ID: NWN-7-30		Date(s): **6/13/08 & 6/16/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E&I**		OWRD #: **L95809**	
Drilling Method: **Hollow Stem Auger**		GS Elevation: **36.8 feet**	TOC: **36.10 feet MSL**
Sampling Method: **No samples collected**		Northing: **703893.50**	Easting: **7624543.00**
Well Construction:		Borehole Dia.: **6 inches**	Total Depth: **32.0 feet bgs**
Blank Casing: 2" schedule 40 PVC	0-20 feet bgs	Project Number: **5237**	
Screen: 2" SS wire wrap (0.02" slot)	20-30 feet bgs	Project Name: **Siltronic Corportation Property**	
2" SS threaded endcap	30-32 feet bgs	Remarks: **City of Portland Datum**	
Annular Fill: 3/4" bentonite chip	0-16.5 feet bgs		
10/20 Colorado Silica Sand	16.5-31 feet bgs		
3/4" bentonite chip	31-32 feet bgs		

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Well Construction
35	1						GM	**0.0 to 32.0 Feet:** Soils not logged to 33.0 feet as purpose of boring was to install monitoring well. Lithology interpreted from previously adjacent boring (P-24).		
	2						ML			
	3									
	4									
	5						ML			
30	6									
	7									
	8									
	9									
	10						ML			
	11									
25	12									
	13									
	14									
	15									
	16									
20	17									
	18									
	19									
	20						ML			
	21									
15	22						SP			
	23									
	24									
	25						SP			
	26									
10	27									
	28						ML			
	29									
	30						ML			
	31									
5	32							End of boring at 32.0 feet below ground surface. Stainless steel centralizer located at 20.0 feet below ground surface. Rubber DNAPL funnel located at 30.0 feet with stainless steel sump located from 30.0 to 32.0 feet bgs.		
	33									
	34									



NOTES: bgs = below ground surface
PID=photoionization detector
ppm = parts per million
SS = Stainless Steel

HAI
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Site ID: NWN-8-30		Date(s): **6/13/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E&I**		OWRD #: **L95810**	
Drilling Method: **Hollow Stem Auger**		GS Elevation: **34.2 feet**	TOC: **33.87 feet MSL**
Sampling Method: **No samples collected**		Northing: **703329.40**	Easting: **7625491.70**
Well Construction:		Borehole Dia.: **6 inches**	Total Depth: **32.0 feet bgs**
Blank Casing: 2" schedule 40 PVC	0-15 feet bgs	Project Number: **5237**	
Screen: 2" SS wire wrap (0.02" slot)	15-30 feet bgs	Project Name: **Siltronic Corportation Property**	
2" SS threaded endcap	30-32 feet bgs	Remarks: **City of Portland Datum**	
Annular Fill: 3/4" bentonite chip	0-12 feet bgs		
10/20 Colorado Silica Sand	12-31 feet bgs		
3/4" bentonite chip	31-32 feet bgs		

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Well Construction
	1–4						ML	**0.0 to 32.0 Feet:** Soils not logged to 33.0 feet as purpose of boring was to install monitoring well. Lithology interpreted from previously adjacent boring (P-28).		
30	5						ML			
	6						SP			
	7–8						ML			
25	9									
	10–13						SP			
20	14									
	15–16						SP			
	17–18						ML			
15	19									
	20–23						SP			
10	24						ML			
	25–29						SP			
5	30						ML			
	31–32							End of boring at 32.0 feet below ground surface. Stainless steel centralizer located at 15.0 feet bgs. Rubber DNAP funnel at 30.0 feet and stainless steel sump from 30.0 to 32.0 feet below ground surface.		
0	33–34									

NOTES: bgs = below ground surface
PID=photoionization detector
ppm = parts per million
SS = Stainless Steel

Report: Monitoring Wells; File: 5237 (NWN SERIES).GPJ; 5/5/09

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Site ID: NWN-9-31		Date(s): **6/17/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E&I**		OWRD #: **L95811**	
Drilling Method: **Hollow Stem Auger**		GS Elevation: **34.2 feet**	TOC: **33.79 feet MSL**
Sampling Method: **No samples collected**		Northing: **704896.30**	Easting: **7625000.80**
Well Construction:		Borehole Dia.: **6 inches**	Total Depth: **33.0 feet bgs**
Blank Casing: 2" schedule 40 PVC	0-16 feet bgs	Project Number: **5237**	
Screen: 2" SS wire wrap (0.02" slot)	16-31 feet bgs	Project Name: **Siltronic Corportation Property**	
2" SS threaded endcap	31-33 feet bgs	Remarks: **City of Portland Datum**	
Annular Fill: 3/4" bentonite chip	0-13 feet bgs		
10/20 Colorado Silica Sand	13-32 feet bgs		
3/4" bentonite chip	32-33 feet bgs		

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Well Construction
30	1–5						ML / SP	**0.0 to 33.0 Feet:** Soils not logged to 33.0 feet as purpose of boring was to install monitoring well. Lithology interpreted from previously adjacent boring (P-44).		
25	5–13						SP			
20	13–18						SP			
15	18–23						SP			
10	23–28						SP			
5	28–31						ML			
0	31–35							End of boring at 33.0 feet below ground surface. Stainless steel centralizer located at 16.0 feet below ground surface. Rubber DNAPL funnel located at 31.0 feet with stainless steel sump from 31.0 to 33.0 feet below ground surface.		

NOTES: bgs = below ground surface
PID=photoionization detector
ppm = parts per million
SS = Stainless Steel

Report: Monitoring Wells; File: 5237 (NWN SERIES).GPJ; 5/5/09

HAI
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Site ID: NWN-10-26	Date(s): **6/17/08**
Location: **7200 NW Front Avenue, Portland, Oregon**	
Logged By: **Ben Uhl**	Checked By: **Rob Ede**
Driller: **Boart Longyear E&I**	OWRD #: **L95812**
Drilling Method: **Hollow Stem Auger**	GS Elevation: **34.7 feet** / TOC: **34.37 feet MSL**
Sampling Method: **No samples collected**	Northing: **704369.30** / Easting: **7625813.70**
Borehole Dia.: **6 inches**	Total Depth: **28.0 feet bgs**
Project Number: **5237**	
Project Name: **Siltronic Corportation Property**	
Remarks: **City of Portland Datum**	

Well Construction:

Blank Casing:	2" schedule 40 PVC	0-11 feet bgs
Screen:	2" SS wire wrap (0.02" slot)	11-26 feet bgs
	2" SS threaded endcap	26-28 feet bgs
Annular Fill:	3/4" bentonite chip	0-8 feet bgs
	10/20 Colorado Silica Sand	8-27 feet bgs
	3/4" bentonite chip	27-28 feet bgs

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Well Construction
	1–30						SP	**0.0 to 28.0 Feet:** Soils not logged to 33.0 feet as purpose of boring was to install monitoring well. Lithology interpreted from previous adjacent boring location.		
	2–3						SM			
30	4–5						SM			
	6–7						ML			
25	8–10						ML			
	11–12						SP			
20	13–15						SP			
	16–18						SP			
15	19–20						SP			
	21–25						SP			
10	26–27						ML			
	28–30							End of boring at 28.0 feet below ground surface. Stainless steel centralizer located at 11.0 feet below ground surface. Rubber DNAPL funnel located at 26.0 feet with stainless steel sump from 26.0 to 28.0 feet below ground surface.		
5										

NOTES: bgs = below ground surface
PID=photoionization detector
ppm = parts per million
SS = Stainless Steel

Report: Monitoring Wells; File: 5237 (NWN SERIES).GPJ; 5/5/09

HAI
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Environmental Consultants

Site ID:	NWN-11-24	Date(s):	**April 8, 2014**
Location:	**7200 NW Front Avenue, Portland, Oregon**		
Logged By:	**Ben Uhl**	Checked By:	**Rob Ede**
Driller:	**Cascade Drilling LP**	OWRD #:	**L114034**
Drilling Method:	**Rotosonic - AMS Compact**	GS Elevation:	**35.06 feet*** TOC: **34.69 feet***
Sampling Method:	**No Samples Collected**	Northing:	**704323.49 feet**** Easting: **7625080.53 feet****
Borehole Dia.:	**6 inches**	Total Depth:	**25.0 feet bgs**
Project Number:	**5237**		
Project Name:	**Siltronic Corportation Property**		

Remarks: * City of Portland Datum
** ORGN Coordinates NAD83 (2011) Epoch 2010

Well Construction:

Blank Casing & Screen:	2-inch Schedule 40 PVC	0 to 14 feet bgs
	2-inch Stainless Steel 0.02-in Slot	14 to 24 feet bgs
	2-inch Stainless Steel Sump	24 to 25 feet bgs
Annular Fill:	3/8-in Bentonite Chips	1 to 11 feet bgs
	10/20 Colorado Silica Sand	11 to 25 feet bgs

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	UV Screen	Lithology	USCS Code	Lithologic Description	Groundwater	Well Construction
									0.0 to 10.0 Feet: Air Knife. No soils logged.		
30	5										
25	10			2.5 (10 - 15)	4.1	(+)		SP	**10.0 to 24.0 Feet:** SAND, black, moist becoming wet between 10.0 and 11.0 feet bgs and below 20.0 feet bgs, fine grained, poorly graded, petroleum hydrocarbon odor, and sheens by sheen test, zones with black oily blebs observed between 10.0 to 16.0 feet bgs; and 20.0 to 24.0 feet bgs. (No recovery from 12.5 to 15.0 feet bgs)	▽ ▼	
20	15							SP			
	18			5 (15 - 20)	82.4	(+)					

NOTES: bgs = below ground surface
PID=photoionization detector
ppm = parts per million
UV screen consisted of visual with ultraviolet light
(-) no indication of fluorescence
(+) fluorescence observed

▽ First encountered groundwater (wet soils observed)
▼ Measured static groundwater level

Report: HAI - MW W/ PID_UV; File: 5237 NWN 11 TO NWN 13 FILL.GPJ; 6/4/14

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: NWN-11-24
Project Name: **Siltronic Corportation Property**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	UV Screen	Lithology	USCS Code	Lithologic Description	Groundwater	Well Construction
	21			3 (20 - 23)				SP			
	22										
	23			2 (23 - 25)	16.4						
	24							ML	**24.0 to 25.0 Feet:** SILT, gray with brown mottling, moist, stiff, low plasticity, root fragments present. Minor petroleum-like hydrocarbon odor at 24.0 feet bgs and slight sheen by sheen test, no oil blebs observed.		
10	25								End boring at 25.0 feet bgs. Stainless steel centralizer loacted at 14.0 feet bgs. Rubber DNAPL funnel located at 24.0 feet bgs with stainless steel sump from 24.0 to 25.0 feet bgs. Silicon taped wrapped at PVC riser connections.		
5											
0											
-5											
-10											

NOTES: bgs = below ground surface
PID=photoionization detector
ppm = parts per million
UV screen consisted of visual with ultraviolet light
(-) no indication of fluorescence
(+) fluorescence observed

▽ First encountered groundwater (wet soils observed)
▼ Measured static groundwater level

Report: HAI - MW W/ PID_UV; File: 5237 NWN 11 TO NWN 13 FILL.GPJ; 6/4/14

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID:	NWN-12-20	Date(s):	**April 8, 2014**
Location:	**7200 NW Front Avenue, Portland, Oregon**		
Logged By:	**Ben Uhl**	Checked By:	**Rob Ede**
Driller:	**Cascade Drilling LP**	OWRD #:	**L114033**
Drilling Method:	**Rotosonic - AMS Compact**	GS Elevation:	**34.13 feet*** TOC: **33.88 feet***
Sampling Method:	**No Samples Collected**	Northing:	**704097.93 feet**** Easting: **7625552.26 feet****
Borehole Dia.:	**6 inches**	Total Depth:	**23.0 feet bgs**
Project Number:	**5237**		
Project Name:	**Siltronic Corportation Property**		

Remarks: * City of Portland Datum
** ORGN Coordinates NAD83 (2011) Epoch 2010

Well Construction:

Blank Casing & Screen:	2-inch Schedule 40 PVC	0 to 10 feet bgs
	2-inch Stainless Steel 0.02-in Slot	10 to 20 feet bgs
	2-inch Stainless Steel Sump	20 to 21 feet bgs
Annular Fill:	3/8-in Bentonite Chips	1 to 7 feet bgs
	10/20 Colorado Silica Sand	7 to 21 feet bgs
	3/8-in Bentonite Chips	21 to 23 feet bgs

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	UV Screen	Lithology	USCS Code	Lithologic Description	Groundwater	Well Construction
									0.0 to 10.0 Feet: Air Knife. No soils logged.		
30	1										
	2										
	3										
	4										
	5										
	6										
	7										
	8										
25	9										
	10			6 (10 - 20)	0.0	(-)		SM	**10.0 to 13.0 Feet:** silty SAND, gray, moist with wet interval between 11.0 and 12.0 feet bgs, loose, fine grained, poorly graded, no odor, no sheen by sheen test, and no discoloration.	▽	
	11										
	12				1.2	(-)				▼	
	13							SP	**13.0 to 14.0 Feet:** SAND, gray, moist, loose, fine grained, poorly graded, no odor, no sheen by sheen test, and no discoloration.		
20	14							SM	**14.0 to 16.0 Feet:** silty SAND, gray, moist, loose, fine grained, poorly graded, no odor, no sheen by sheen test, and no discoloration.		
	15				0.3	(-)					
	16				0.2	(+)					
	17										
	18										
15	19										

NOTES: bgs = below ground surface
PID=photoionization detector
ppm = parts per million
UV screen consisted of visual with ultraviolet light
(-) no indication of fluorescence
(+) fluorescence observed

▽ First encountered groundwater (wet soils observed)
▼ Measured static groundwater level

Report: HAI - MW W/ PID_UV; File: 5237 NWN 11 TO NWN 13 FILL.GPJ; 6/4/14

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: NWN-12-20
Project Name: **Siltronic Corportation Property**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	UV Screen	Lithology	USCS Code	Lithologic Description	Groundwater	Well Construction
	21			3 (20 - 23)				ML	**20.0 to 23.0 Feet:** SILT, gray, moist, medium soft, low to medium plasticity, no odor, no sheen by sheen test, and no discoloration.		
	22										
	23								End boring at 23.0 feet bgs. Stainless steel centralizer located at 10 feet bgs. Rubber DNAPL funnel located at 20 feet bgs with stainless steel sump from 20.0 to 21.0 feet bgs. Silicone tape wrapped at PVC riser connections.		
10											
5											
0											
-5											
-10											

NOTES: bgs = below ground surface
PID=photoionization detector
ppm = parts per million
UV screen consisted of visual with ultraviolet light
(-) no indication of fluorescence
(+) fluorescence observed

▽ First encountered groundwater (wet soils observed)
▼ Measured static groundwater level

Report: HAI - MW W/ PID_UV; File: 5237 NWN 11 TO NWN 13 FILL.GPJ; 6/4/14

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID:	NWN-13-23	Date(s):	**April 11, 2014**
Location:	**7200 NW Front Avenue, Portland, Oregon**		
Logged By:	**Jane-Clair Kerin**	Checked By:	**Rob Ede**
Driller:	**Cascade Drilling LP**	OWRD #:	**L114037**
Drilling Method:	**Rotosonic**	GS Elevation:	**37.82 feet*** TOC: **37.33 feet***
Sampling Method:	**No Samples Collected**	Northing:	**704353.40 feet**** Easting: **7624041.90 feet****
Borehole Dia.:	**6 inches**	Total Depth:	**24.0 feet bgs**
Project Number:	**5237**		
Project Name:	**Siltronic Corportation Property**		

Remarks: * City of Portland Datum
** ORGN Coordinates NAD83 (2011) Epoch 2010

Well Construction:

Blank Casing & Screen:	2-inch Schedule 40 PVC	0 to 13 feet bgs
	2-inch Stainless Steel 0.02-in Slot	13 to 23 feet bgs
	2-inch Stainless Steel Sump	23 to 24 feet bgs
Annular Fill:	3/8-in Bentonite Chips	1 to 10 feet bgs
	10/20 Colorado Silica Sand	10 to 24 feet bgs

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	UV Screen	Lithology	USCS Code	Lithologic Description	Groundwater	Well Construction
35	1–7								**0.0 to 8.0 Feet:** Air Knife. No soils logged.		
30	8			3 (8 - 11)				SM	**8.0 to 14.0 Feet:** silty SAND with some gravel, gray, wet, loose, fine grained, poorly graded, brick fragments above 11.0 feet bgs, wood fragments throughout, blebs of oil and tarry patches below 11.0 feet bgs.	▼	
	9–10				0.2	(-)			Note: Gravel or cobble at apparent 14.0 feet bgs closed off sampler - No recovery remainder of push.		
	11									▽	
25	12–13			3 (11 - 20)	31.4	(+)					
	14–19										
20											

NOTES: bgs = below ground surface
PID=photoionization detector
ppm = parts per million
UV screen consisted of visual with ultraviolet light
(-) no indication of fluorescence
(+) fluorescence observed

▽ First encountered groundwater (wet soils observed)
▼ Measured static groundwater level

Report: HAI - MW W/ PID_UV; File: 5237 NWN 11 TO NWN 13 FILL.GPJ; 6/4/14

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: NWN-13-23
Project Name: **Siltronic Corportation Property**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	UV Screen	Lithology	USCS Code	Lithologic Description	Groundwater	Well Construction
									20.0 to 22.0 Feet: Apparent slough from upper borehole.		
	21										
	22			3 (20 - 23)	3.6	(+)		SP	**22.0 to 22.5 Feet:** SAND, brown to black, wet, loose, fine to medium grained, poorly graded, hydrocarbon odor, and sheen by sheen test.		
15	23							ML	**22.5 to 23.0 Feet:** SILT, gray and brown with light brown mottling, moist, soft, low plasticitiy, no odor, no sheen by sheen test, and no discoloration.		
	24								End boring at 24.0 feet bgs. Stainless steel centralizer located at 13 feet bgs. Rubber DNAPL funnel located at 23 feet bgs with stainless steel sump from 23.0 to 24.0 feet bgs. Silicone tape wrapped at PVC riser connnections.		
10											
5											
0											
-5											

NOTES: bgs = below ground surface
PID=photoionization detector
ppm = parts per million
UV screen consisted of visual with ultraviolet light
(-) no indication of fluorescence
(+) fluorescence observed

▽ First encountered groundwater (wet soils observed)
▼ Measured static groundwater level

Report: HAI - MW W/ PID_UV; File: 5237 NWN 11 TO NWN 13 FILL.GPJ; 6/4/14

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID:	NWN-13-73	Date(s):	**April 10, 2014**
Location:	**7200 NW Front Avenue, Portland, Oregon**		
Logged By:	**Jane-Clair Kerin**	Checked By:	**Rob Ede**
Driller:	**Cascade Drilling LP**	OWRD #:	**L114036**
Drilling Method:	**Rotosonic - AMS Compact**	GS Elevation:	**37.79 feet*** TOC: **37.34 feet***
Sampling Method:	**No Samples Collected**	Northing:	**704361.46 feet**** Easting: **7624031.76 feet****
Borehole Dia.:	**9 & 6 inches**	Total Depth:	**73.5 feet bgs**
Project Number:	**5237**		
Project Name:	**Siltronic Corportation Property**		

Remarks: * City of Portland Datum.
** ORGN Coordinates NAD83 (2011) Epoch 2010

Well Construction:

Blank Casing & Screen:	2-inch Schedule 40 PVC	0 to 63 feet bgs
	2-inch Stainless Steel 0.02-in Slot	63 to 73 feet bgs
Annular Fill:	3/8-inch Bentonite Chips	0 to 10 feet bgs
	Organoclay Grout Mix - (20% solids, 9.8 lbs/gal average)	10 to 57 feet bgs
	3/8-inch Bentonite Chips	58 to 60 feet bgs
	10/20 Colorado Silica Sand	60 to 73 feet bgs

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	UV Screen	Lithology	USCS Code	Lithologic Description	Groundwater	Well Construction
									0.0 to 10.0 Feet: Air Knife. No soils logged.		
35	1–9										
30	10			10 (10 - 20)	1.1	(+)		SM	**10.0 to 17.0 Feet:** silty SAND with some gravel, gray, wet, loose, fine grained, poorly graded, woody debris and blebs of black oil and solid tar fragments present, brick fragments, hydrocarbon odor, and sheen by sheen test.		
25	11–16				11	(+)					
20	17							OM	**17.0 to 19.8 Feet:** ORGANIC wood chips, moist, "prussian-blue" discoloration after exposure to air, slight sheen by sheen test, and petroleum odor.	▽	
	18				358.1	(+)					
	19										

NOTES: bgs = below ground surface
PID=photoionization detector
ppm = parts per million
UV screen consisted of visual with ultraviolet light
(-) no indication of fluorescence
(+) fluorescence observed

▽ First encountered groundwater (wet soils observed)
▼ Measured static groundwater level

Report: HAI - MW W/ PID_UV; File: 5237 NWN 13S ALLUVIAL.GPJ; 6/4/14

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: NWN-13-73
Project Name: **Siltronic Corportation Property**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	UV Screen	Lithology	USCS Code	Lithologic Description	Groundwater	Well Construction
	21			1 (20 - 21)	24.8	(+)		SP	**19.8 to 21.0 Feet:** SAND, gray, wet, loose, fine grained, poorly graded, some wood fragments, sheen by sheen test, and hydrocarbon odor.		
	22							ML	**21.0 to 38.0 Feet:** SILT, gray and brown with some light brown and red mottling, moist, soft becoming very soft below 30.0 feet bgs, low plasticity, some rootlets, no odor, no sheen by sheen test, and no discoloration.		
15	23			5 (21 - 26)	0.5	(-)			**Note** Set 9-inch steel casing at 24.0 feet bgs with bentonite annular seal placed from 23.0 to 26.0 feet bgs. After hydrating bentonite, continued drilling by advancing 6-inch steel casing inside the 9-inch steel casing and through the middle of the hydrated bentonite seal.		
	24										
	25				0.2	(-)					
	26			4 (26 - 30)							
	27										
10	28										
	29				6.7	(+)					
	30			5 (30 - 35)							
	31										
	32										
5	33										
	34										
	35				0.2	(+)					
	36										
	37			5 (35 - 40)							
0	38							ML	**38.0 to 42.8 Feet:** SILT with some sand, gray and brown, wet, soft, non plastic, no odor, no sheen by sheen test, and no discoloration.		
	39										
	40				0.2	(-)					
	41										
	42										
-5	43			5 (40 - 45)	0.4	(-)		ML	**42.8 to 45.0 Feet:** SILT with trace of sand, gray with some olive green and blue mottling, moist, medium soft, non plastic, no odor, no sheen by sheen test, and no discoloration.		
	44										
	45							ML	**45.0 to 50.0 Feet:** SILT, gray with some olive green and blue, medium soft, moist, low plasticity, no OSD		
	46										

NOTES: bgs = below ground surface
PID=photoionization detector
ppm = parts per million
UV screen consisted of visual with ultraviolet light
(-) no indication of fluorescence
(+) fluorescence observed

▽ First encountered groundwater (wet soils observed)
▼ Measured static groundwater level

Report: HAI - MW W/ PID_UV; File: 5237 NWN 13S ALLUVIAL.GPJ; 6/4/14

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: NWN-13-73
Project Name: **Siltronic Corportation Property**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	UV Screen	Lithology	USCS Code	Lithologic Description	Groundwater	Well Construction
	47							ML			
				5 (45 - 50)	0.3	(-)					
-10	48										
	49										
	50							ML	**50.0 to 54.5 Feet:** SILT with some sand, brown and gray, moist, soft, non plastic, no odor, no sheen by sheen test, and no discoloration.		
	51										
				5 (50 - 55)	0.2	(-)					
	52										
-15	53										
					0.2	(+)					
	54										
	55							SP	**54.5 to 55.0 Feet:** SAND with some silt, brown, wet, loose, fine grained, poorly graded, no odor, no sheen by sheen test, and no discoloration.		
								SP	**55.0 to 60.0 Feet:** SAND, brown, wet, loose, fine grained, poorly graded, no odor, no sheen by sheen test, and no discoloration.		
	56										
				5 (55 - 60)	0.2	(-)					
-20	57										
	58				0.1	(-)					
	59										
	60							SM	**60.0 to 72.5 Feet:** silty SAND, brown, moist to 65.0 feet bgs then wet, loose, fine grained, poorly graded, no odor, no sheen by sheen test, and no discoloration.		
	61				0.2	(+)					
	62										
				5 (60 - 65)							
-25	63										
	64				0.1	(-)					
	65										
	66				0.1	(-)					
	67										
				5 (65 - 70)		(-)					
-30	68				0.1						
	69										
	70										
	71			3 (70 - 73)							
	72										
					0.3	(-)					
-35	73							ML	**72.5 to 73.0 Feet:** SILT, brown, hard, moist, low plasticity, no odor, no sheen by sheen test, and no discoloration.		

NOTES: bgs = below ground surface
PID=photoionization detector
ppm = parts per million
UV screen consisted of visual with ultraviolet light
(-) no indication of fluorescence
(+) fluorescence observed

▽ First encountered groundwater (wet soils observed)
▼ Measured static groundwater level

Report: HAI - MW W/ PID_UV; File: 5237 NWN 13S ALLUVIAL.GPJ; 6/4/14

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: NWN-13-73
Project Name: **Siltronic Corportation Property**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	UV Screen	Lithology	USCS Code	Lithologic Description	Groundwater	Well Construction
-40									End boring at 74.0 feet bgs. Stainless steel centalizers located at 13.0 and 63.0 feet bgs. Rubber DNAPL funnel located at 73.0 bgs with a stainless steel sump from 73.0 to 74.0 feet bgs. Silicon tape wrapped at PVC riser connections.		
-45											
-50											
-55											
-60											

NOTES: bgs = below ground surface
PID=photoionization detector
ppm = parts per million
UV screen consisted of visual with ultraviolet light
(-) no indication of fluorescence
(+) fluorescence observed

▽ First encountered groundwater (wet soils observed)
▼ Measured static groundwater level

Report: HAI - MW W/ PID_UV; File: 5237 NWN 13S ALLUVIAL.GPJ; 6/4/14

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID:	NWN-13-106	Date(s):	**April 9 and 10, 2014**
Location:	**7200 NW Front Avenue, Portland, Oregon**		
Logged By:	**Ben Uhl**	Checked By:	**Rob Ede**
Driller:	**Cascade Drilling LP**	OWRD #:	**L114035**
Drilling Method:	**Rotosonic - AMS Compact**	GS Elevation:	**37.65 feet*** TOC: **37.31 feet***
Sampling Method:	**No Samples Collected**	Northing:	**704367.99 feet**** Easting: **7624023.89 feet****
Borehole Dia.:	**9 & 6 inches**	Total Depth:	**110.0 feet bgs**
Project Number:	**5237**		
Project Name:	**Siltronic Corportation Property**		

Remarks: * City of Portland Datum.
** ORGN Coordinates NAD83 (2011) Epoch 2010

Well Construction:

Blank Casing & Screen:	2-inch Schedule 80 PVC	0 to 96 feet bgs
	2-inch Stainless Steel 0.02-in Slot	96 to 106 feet bgs
Annular Fill:	3/8-inch Bentonite Chips	0 to 10 feet bgs
	Organoclay Grout Mix - (20% solids, 9.8 lbs/gal average)	10 to 91 feet bgs
	3/8-inch Bentonite Chips	91 to 93 feet bgs
	10/20 Colorado Silica Sand	93 to 110 feet bgs

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	UV Screen	Lithology	USCS Code	Lithologic Description	Groundwater	Well Construction
									0.0 to 10.0 Feet: Air Knife. No soils logged.		
35	1										
	2										
	3										
	4										
	5										
	6										
	7										
30	8										
	9										
	10			10 (10 - 20)		(-)		SP	**10.0 to 12.5 Feet:** SAND with some gravel, gray, moist, loose, fine grained, poorly graded, no odor, no sheen by sheen test, and no discoloration. Gravel is subangular.		
	11										
	12										
25	13							SM	**12.5 to 16.0 Feet:** silty SAND, gray, wet from 12.5 to 13.5 feet bgs then moist, loose, fine grained, poorly graded, no odor, some gravel and wood fragments below 15.0 feet bgs, some black oil on wood chips.	▼	
	14										
	15					(-)					
	16							OM	**16.0 to 20.0 Feet:** ORGANIC wood chips, moist, "prussian-blue" discoloration when exposed to air, slight sheen by sheen test, petroleum hydrocarbon odor.		
	17										
20	18										
	19					(+)					

NOTES: bgs = below ground surface
PID=photoionization detector
ppm = parts per million

UV screen consisted of visual with ultraviolet light
(-) no indication of fluorescence
(+) fluorescence observed

▽ First encountered groundwater (wet soils observed)
▼ Measured static groundwater level

Report: HAI - MW W/ PID_UV; File: 5237 NWN 13S ALLUVIAL.GPJ; 6/4/14

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: NWN-13-106
Project Name: **Siltronic Corportation Property**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	UV Screen	Lithology	USCS Code	Lithologic Description	Groundwater	Well Construction
	20					(+)		SP	**20.0 - 22.0 Feet:** SAND with large wood fragments (4" long), gray, loose, very moist, fine grained, poorly graded, slight sheen by sheen test, no odor, and no discoloration.		
	21										
	22							ML	**22.0 - 35.0 Feet:** SILT, grayish brown with light brown mottling, moist, medium soft, low plasticity, no odor, no sheen by sheen test, and no discoloration.		
15	23			6 (20 - 26)		(-)			**Note** Set 9-inch steel casing at 24.0 feet bgs with bentonite annular seal placed from 23.0 to 26.0 feet bgs. After hydrating bentonite, continued drilling by advancing 6-inch steel casing inside the 9-inch steel casing and through the middle of the hydrated bentonite seal.		
	24										
	25										
	26										
	27			4 (26 - 30)		(+)					
10	28										
	29										
	30					(-)					
	31										
	32										
5	33			10 (30 - 40)		(-)					
	34										
	35							ML	**35.0 - 47.0 Feet:** SILT with some sand, grayish brown with light brown mottling, moist becoming wet from 40.0 to 41.5 feet bgs, medium soft, low plasticity, no odor, no sheen by sheen test, and no discoloration.		
	36					(-)					
	37										
0	38										
	39					(-)					
	40					(-)					
	41										
	42					(+)					
-5	43			10 (40 - 50)							
	44					(-)					
	45										
	46					(+)					

NOTES: bgs = below ground surface
PID=photoionization detector
ppm = parts per million

UV screen consisted of visual with ultraviolet light
(-) no indication of fluorescence
(+) fluorescence observed

▽ First encountered groundwater (wet soils observed)
▼ Measured static groundwater level

Report: HAI - MW W/ PID_UV; File: 5237 NWN 13S ALLUVIAL.GPJ; 6/4/14

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: NWN-13-106
Project Name: **Siltronic Corportation Property**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	UV Screen	Lithology	USCS Code	Lithologic Description	Groundwater	Well Construction
	47							ML	**47.0 - 50.0 Feet:** SILT, gray with slight olive green mottling, moist, stiff, medium plasticity, no odor, no sheen by sheen test, and no discoloration.		
-10	48					(-)					
	49										
	50					(-)		ML	**50.0 - 59.3 Feet:** SILT with some sand, gray to 53.5 feet bgs then brown, moist, soft, low plasticity, no odor, no sheen by sheen test, and no discoloration.		
	51										
	52					(-)					
-15	53			10 (50 - 60)							
	54					(-)					
	55										
	56					(-)					
	57										
-20	58					(-)					
	59										
	60					(-)		SP	**59.3 - 60.0 Feet:** SAND, brown, wet, loose, fine grained, poorly graded, no odor, no sheen by sheen test, and no discoloration.		
						(+)		SM	**60.0 - 72.5 Feet:** silty SAND, brown, moist to 65.0 feet bgs then wet, loose, fine grained, poorly graded, no odor, no sheen by sheen test, and no discoloration.		
	61										
	62					(-)					
-25	63			10 (60 - 70)							
	64					(+)					
	65										
	66					(-)					
	67										
-30	68					(-)					
	69										
	70					(-)					
	71										
	72					(-)					
-35	73			10				ML	**72.5 - 75.0 Feet:** SILT, brown, moist, stiff, low plasticity, no odor, no sheen by sheen test, and no discoloration.		

NOTES: bgs = below ground surface
PID=photoionization detector
ppm = parts per million

UV screen consisted of visual with ultraviolet light
(-) no indication of fluorescence
(+) fluorescence observed

▽ First encountered groundwater (wet soils observed)
▼ Measured static groundwater level

Report: HAI - MW W/ PID_UV; File: 5237 NWN 13S ALLUVIAL.GPJ; 6/4/14

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: NWN-13-106
Project Name: **Siltronic Corportation Property**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	UV Screen	Lithology	USCS Code	Lithologic Description	Groundwater	Well Construction
	74			(70 - 80)				ML			
	75					(-)		SP	**75.0 - 80.0 Feet:** SAND with some silt, brown, moist, medium dense, fine grained, poorly graded, no odor, no sheen by sheen test, and no discoloration.		
	76										
	77					(-)					
-40	78										
	79										
	80				1.0	(-)		SP	**80.0 - 91.0 Feet:** SAND, brown to 83.5 then increasing gray with depth, moist to 90.0 feet bgs then wet, dense, fine grained, poorly graded, "sweet odor" from 83.5 to 87.0 feet bgs coinciding with elevated PID headspace, no sheen by sheen test, no discoloration.		
	81										
	82										
-45	83			10							
	84			(80 - 90)	47.2	(-)					
	85										
	86										
	87				1,185	(+)					
-50	88										
	89										
	90				377	(-)					
	91							SP	**91.0 - 98.0 Feet:** SAND with some gravel, becoming dark gray at 92.0 feet bgs, wet, fine grained poorly graded, petroleum-like odor, no sheen by sheen test, no discoloration. Gravel - fine to coarse grain, subangular. Cobble present in 97.0 to 98.0 feet bgs interval.		
	92				349						
-55	93			8		(-)					
	94			(90 - 100)							
	95				257	(-)					
	96										
	97				38.7	(-)					
-60	98										
	99										

NOTES: bgs = below ground surface
PID=photoionization detector
ppm = parts per million
UV screen consisted of visual with ultraviolet light
(-) no indication of fluorescence
(+) fluorescence observed

▽ First encountered groundwater (wet soils observed)
▼ Measured static groundwater level

Report: HAI - MW W/ PID_UV; File: 5237 NWN 13S ALLUVIAL.GPJ; 6/4/14

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: NWN-13-106
Project Name: **Siltronic Corportation Property**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	UV Screen	Lithology	USCS Code	Lithologic Description	Groundwater	Well Construction
					14.1	(+)		GP	**100.0 - 106.0 Feet:** GRAVEL with some sand, gray, subrounded, poorly graded, wet, strong reducing-like odor, no sheen by sheen test, no discoloration.		
-65	101										
	102										
	103			7 (100 - 107)	2.6	(-)					
	104										
	105										
	106										
	107				1.5	(-)			**106.0 - 111.0 Feet:** weathered BEDROCK (basalt), dark gray and black, subrounded gravel and cobble sized fragments, some fine grained sand, no odor, no sheen by sheen test, and no discoloration.		
-70	108			4 (107 - 111)	0.5	(-)					
	109								End boring at 111.0 feet bgs. Stainless steel centalizers located at 46.0 and 96.0 feet bgs. Rubber DNAPL funnel located at 106.0 bgs with a stainless steel sump from 106.0 to 107.0 feet bgs. Silicon tape wrapped at PVC riser connections.		
	110				0.0	(+)			Headspace measurements not collected from 0.0 to 80.0 feet bgs. Refer to NWN-13-73 boring log for headspace measurements for this interval.		
-75											
-80											
-85											

NOTES: bgs = below ground surface
PID=photoionization detector
ppm = parts per million
UV screen consisted of visual with ultraviolet light
(-) no indication of fluorescence
(+) fluorescence observed

▽ First encountered groundwater (wet soils observed)
▼ Measured static groundwater level

Report: HAI - MW W/ PID_UV; File: 5237 NWN 13S ALLUVIAL.GPJ; 6/4/14

LOG OF EXPLORATORY BORING

PROJECT NAME	**NW Natural Gasco Site**	BORING NO.	**OW-1F**
LOCATION	**Portland, Oregon**	PAGE	**1 of 3**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**35.3 ft COP**
DRILL METHOD	**Rotosonic - AMS-17C**	TOTAL DEPTH	**40.0 ft.**
LOGGED BY	**Matt Wilson**	DATE COMPLETED	**3/23/12**
SAMPLING METHOD	**4-in. ID by 5-ft. core barrel (CB)**	PERMIT/STARTCARD NO.	**1016144**
BOREHOLE DIAMETER	**6-inch**	WATER RESOURCES WELL ID	**L99779**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
NA	NA	5			**0 to 10.0 feet: NO RECOVERY**, interval air knifed for utility clearance.			
CB	4.0	10			**10.0 to 19.5 feet: SAND (SW)**, dark brown, very loose, damp, well graded, fine to coarse grained, trace fine gravel, no sheen, no odor. (FILL) @ 13.6 to 13.7 feet: black, sooty, no sheen, no odor. @ 14.1 to 15.0 feet: black, sooty, slight hydrocarbon-like odor, light platy sheen via sheen test. @ 15.0 to 16.2 feet: dark brown and sooty black mixed. @ 16.2 to 19.5 feet: black, viscous tar in matrix, slightly sticky, slightly cohesive, light platy sheen via sheen test (tar is not fluid, does not appear to be mobile), strong hydrocarbon-like odor.	5	95	0
CB	5.0	15						
		20			**19.5 to 21.4 feet: SILTY SAND (SM)**	5	75-80	15-20

REMARKS

COP = City of Portland Datum.

End cap has three small diameter holes for drainage during dry season.

ANCHOR QEA

LOG OF EXPLORATORY BORING

PROJECT NAME	**NW Natural Gasco Site**	BORING NO.	**OW-1F**
LOCATION	**Portland, Oregon**	PAGE	**2 of 3**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**35.3 ft COP**
DRILL METHOD	**Rotosonic - AMS-17C**	TOTAL DEPTH	**40.0 ft.**
LOGGED BY	**Matt Wilson**	DATE COMPLETED	**3/23/12**
SAMPLING METHOD	**4-in. ID by 5-ft. core barrel (CB)**	PERMIT/STARTCARD NO.	**1016144**
BOREHOLE DIAMETER	**6-inch**	WATER RESOURCES WELL ID	**L99779**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
CB	4.6				**19.5 to 21.4 feet: SILTY SAND (SM)**, black, strong hydrocarbon-like odor, moist, trace gravel, slightly cohesive, medium density. (FILL)	5	75-80	15-20
					21.4 to 32.5 feet: SAND (SW), dark brown, very loose, damp, well graded, fine to coarse grained, trace fine gravel. (FILL) @ 21.4 to 23.7 feet: moist, black, viscous tar in matrix, very strong hydrocarbon-like odor, slightly sticky (not fluid, does not appear to be mobile), platy sheen via sheen test. @ 23.7 to 26.5 feet: dark grayish brown, wet, strong hydrocarbon-like odor, no sheen via sheen test.	5	95	0
CB	3.5	25			@ 26.2 to 26.5 feet: sheen visible on sample. @ 26.5 to 32.5 feet: color change to dark gray, slight hydrocarbon-like odor, trace fine to cobble-size gravel.			
CB	5.0	30			**32.5 to 35.0 feet: SILTY SAND (SM)**, dark brownish gray, loose, wet, fine to medium sand, low plasticity fines, abundant silt layers and silt blebs, trace fine gravel, slight hydrocarbon-like odor, no sheen. (FILL) @ 32.5 feet: piece of metal wire. @ 33.8 feet: piece of metal.	0-5	50-55	40-50
CB	4.0	35			**35.0 to 36.0 feet: SANDY SILT (ML)**, brown with gray mottling, soft, wet, low to medium plasticity (contact with native). (ALLUVIUM)	0	20	80
					36.0 to 38.1 feet: SAND WITH SILT (SP-SM), brown with faint gray mottling, loose, fine to medium grained, slightly cohesive, poorly graded, no sheen, no odor.	0	85-95	5-15
					38.1 to 40.0 feet: SAND (SP), brown grading to gray at 39.0 feet, loose, wet, fine grained, poorly graded, no sheen, no odor, clean sand.	0	100	0
		40						

REMARKS

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ANCHOR QEA

LOG OF EXPLORATORY BORING

PROJECT NAME	**NW Natural Gasco Site**	BORING NO.	**OW-1F**
LOCATION	**Portland, Oregon**	PAGE	**3 of 3**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**35.3 ft COP**
DRILL METHOD	**Rotosonic - AMS-17C**	TOTAL DEPTH	**40.0 ft.**
LOGGED BY	**Matt Wilson**	DATE COMPLETED	**3/23/12**
SAMPLING METHOD	**4-in. ID by 5-ft. core barrel (CB)**	PERMIT/STARTCARD NO.	**1016144**
BOREHOLE DIAMETER	**6-inch**	WATER RESOURCES WELL ID	**L99779**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
		45			Total depth: 40.0 feet. **WELL COMPLETION DETAILS** 0 to 30.0 feet: 2-inch-diameter, flush-threaded, Schedule 40 PVC blank riser pipe. 30.0 to 35.0 feet: 2-inch-diameter, flush-threaded, Schedule 40 PVC well screen with 0.010-inch slots. 35.0 to 35.3 feet: 2-inch-diameter threaded end cap. 0 to 1.0 foot: Concrete. 1.0 to 22.8 feet: Bentonite grout with 10% percent organoclay by volume. 22.8 to 28.0 feet: Bentonite. 28.0 to 35.8 feet: 10-20 Colorado silica sand. 35.8 to 40.0 feet: Bentonite.			
		50						
		55						
		60						

REMARKS

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End cap has three small diameter holes for drainage during dry season.

ANCHOR QEA

LOG OF EXPLORATORY BORING

PROJECT NAME	**NW Natural Gasco Site**	BORING NO.	**OW-2F**
LOCATION	**Portland, Oregon**	PAGE	**1 of 3**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**34.5 ft COP**
DRILL METHOD	**Rotosonic - AMS-17C**	TOTAL DEPTH	**35.0 ft.**
LOGGED BY	**Matt Wilson**	DATE COMPLETED	**3/22/12**
SAMPLING METHOD	**4-in. ID by 5-ft. core barrel (CB)**	PERMIT/STARTCARD NO.	**1016145**
BOREHOLE DIAMETER	**6-inch**	WATER RESOURCES WELL ID	**L99778**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
NA	NA				**0 to 10.0 feet: NO RECOVERY**, interval was air knifed for utility clearance.			
CB	4.0	10			**10.0 to 20.0 feet: SAND (SP)**, dark brown, density varies from loose to medium dense, moist, well graded, fine to coarse grained, trace gravel, trace fines. (FILL) @ 10.5 to 10.7 feet: black banding, viscous tar in matrix in bandings, moderate hydrocarbon-like odor. @ 12.0 to 13.0 feet: color changes to black, strong hydrocarbon-like odor. @ 13.0 to 15.8 feet: viscous tar in matrix, very strong hydrocarbon-like odor, black.	5	90	5
CB	1.0							
CB	3.7	15			@ 15.8 feet: black, very loose, slight hydrocarbon-like odor, increased gravel content to 10 percent, little to no fines. @ 17.0 feet: little to no hydrocarbon-like odor.	10	90	0
		20						

REMARKS

COP = City of Portland Datum.

End cap has three small diameter holes for drainage during dry season.

ANCHOR QEA

LOG OF EXPLORATORY BORING

PROJECT NAME	**NW Natural Gasco Site**	BORING NO.	**OW-2F**
LOCATION	**Portland, Oregon**	PAGE	**2 of 3**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**34.5 ft COP**
DRILL METHOD	**Rotosonic - AMS-17C**	TOTAL DEPTH	**35.0 ft.**
LOGGED BY	**Matt Wilson**	DATE COMPLETED	**3/22/12**
SAMPLING METHOD	**4-in. ID by 5-ft. core barrel (CB)**	PERMIT/STARTCARD NO.	**1016145**
BOREHOLE DIAMETER	**6-inch**	WATER RESOURCES WELL ID	**L99778**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
CB	5.0				**20.0 to 21.9 feet: SILTY SAND (SM)**, dark gray, cohesive, compacted, moist, fine to medium sand, nonplastic fines.	0	80	20
					@ 20.0 to 20.5 feet: black, strong hydrocarbon-like odor, tar in matrix, sheen via sheen test. (FILL)			
					@ 20.5 to 21.9 feet: slight hydrocarbon-like odor.	5	90	5
					21.9 to 30.2 feet: SAND (SW), dark gray, very loose, wet, well graded, fine to coarse grained, no sheen, no odor, trace fines, trace gravel. (FILL)			
CB	4.0	25						
					@ 28.3 to 28.5 feet: sandy silt layer, slight hydrocarbon-like odor.			
					@ 28.5 to 29.0 feet: large piece of wood. Wood blocked sampler. No recovery from 29.0 to 30.0 feet.			
CB	5.0	30			@ 30.0 to 30.2 feet: sandy gravel layer, strong hydrocarbon-like odor, tar in matrix.			
					30.2 to 30.6 feet: TAR, not fluid or mobile, rubbery.	0	5	95
					30.6 to 34.6 feet: SILT (ML), dark grayish brown with rust red mottling, moist, firm, low plasticity, trace fine sand, slight hydrocarbon-like odor, no sheen.			
					@ 33.6 to 34.0 feet: sandy silt layer.	0	60	40
						0	5	95
		35			**34.6 to 35.0 feet: SAND (SP)**, dark gray, loose, wet, poorly graded, fine grained, no sheen, slight hydrocarbon-like odor, clean sand, no fines.	0	100	0
					Total depth: 35.0 feet.			
		40						

REMARKS

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End cap has three small diameter holes for drainage during dry season.

ANCHOR QEA

LOG OF EXPLORATORY BORING

PROJECT NAME	**NW Natural Gasco Site**	BORING NO.	**OW-2F**
LOCATION	**Portland, Oregon**	PAGE	**3 of 3**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**34.5 ft COP**
DRILL METHOD	**Rotosonic - AMS-17C**	TOTAL DEPTH	**35.0 ft.**
LOGGED BY	**Matt Wilson**	DATE COMPLETED	**3/22/12**
SAMPLING METHOD	**4-in. ID by 5-ft. core barrel (CB)**	PERMIT/STARTCARD NO.	**1016145**
BOREHOLE DIAMETER	**6-inch**	WATER RESOURCES WELL ID	**L99778**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
		45			**WELL COMPLETION DETAILS** 0 to 25.6 feet: 2-inch-diameter, flush-threaded, Schedule 40 PVC blank riser pipe. 25.6 to 30.6 feet: 2-inch-diameter, flush-threaded, Schedule 40 PVC well screen with 0.010-inch slots. 30.6 to 30.9 feet: 2-inch-diameter threaded end cap. 0 to 1.0 foot: Concrete. 1.0 to 20.5 feet: Bentonite grout with 10% organoclay by volume. 20.5 to 23.5 feet: Bentonite. 23.5 to 31.5 feet: 10-20 Colorado silica sand. 31.5 to 35.0 feet: Bentonite.			
		50						
		55						
		60						

REMARKS

COP = City of Portland Datum.
End cap has three small diameter holes for drainage during dry season.

ANCHOR QEA

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-1**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 10:15	DRILL FINISH Time: 13:25
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Heriberto Ramirez	Date: 08/17/01	Date: 08/17/01
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 33.64 feet msl
TOP OF CASING ELEVATIC Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	DEPTH (feet)	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Chips					1	GP	Surface: Gravel, grey, dry, no petroleum odor, no sheen (0 to 0.5 foot below ground surface (bgs)).
					2		Sandy SILT with Gravel - brown and grey with minor orange mottling, dry, non-plastic, no petroleum odor, no sheen (0.5 to 4.0 feet bgs).
	135	10:20	1.9	-	3		
					4		
					5		Sandy SILT - grey, slightly moist, non-plastic, few wood fragments between 8 and 11 feet bgs, no petroleum odor, no sheen (4 to 12.5 feet bgs).
	136	10:25	2.9	-	6	ML	
					7		
					8		
					9		
					10		
Bentonite Grout	137	10:30	4.1	-	11		
					12		
					13	SP	Silty SAND with Gravel - grey, slightly moist, no petroleum odor, no sheen (12.5 to 13 feet bgs).
					14		Sandy SILT - grey, slightly moist, non-plastic, no petroleum odor, no sheen (13 to 16.0 feet bgs).
	138	10:40	1.2	-	15	ML	
					16		
					17		Silty SAND with Gravel - grey, moist, sand is fine grained, wood fragment at 17.5 feet bgs, brick fragments at 20 feet bgs, slight petroleum odor, no sheen (16 to 20.5 feet bgs).
	139	10:45	2.8	196.8	18	SM	
					19		
					20		

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-1**			
	HAI LOGGER:	Rob Ede	DRILL START	DRILL FINISH
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve	Time: 10:15	Time: 13:25
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Heriberto Ramirez	Date: 08/17/01	Date: 08/17/01
PROJECT #: 5237	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 33.64 feet msl
TOP OF CASING ELEVATIC Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							21		SM	SAND with Silt and Gravel - brown becoming grey below 26 feet bgs, moist, gravels are up to 2-inch diameter, several brick fragments, patchy dark grey discoloration below 26 feet bgs, no petroleum odor, no sheen (20.5 to 29 feet bgs).
	140	11:00	22.1	-			22			
							23			
							24		SP	
							25			
							26			
	141	11:09	27.2	-			27			
							28			
							29			
							30		GM	Gravely SILT - olive grey, moist, no odor, no sheen, becoming black and tarry below 30 feet bgs, tar appears weathered (not elastic), plant debris is mixed with tar, very stiff, petroleum odor, sheen, base of tar is at 30 feet 10 inches bgs (30.5 to 31 feet bgs).
	142	11:20	66.2	25,300			31		tar	
							32	▼	ML	SILT - olive grey, moist, slightly plastic, several sandy layers, slight sheen, no petroleum odor (31 to 32 feet bgs).
							33			Silty SAND - grey , wet, very fine grained, minor muscovite, petroleum odor and sheen in upper 2-inches of core only (36-39.0 feet bgs).
							34			
							35		SM	
	143	11:30	10.1	-			36			
							37			
							38			
							39			
	144	11:45	7.1	101			40		SP	SAND - grey, wet, fine grained, muscovite present, no petroleum odor, no sheen (39-42 feet bgs).

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-1**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 10:15 Date: 08/17/01	DRILL FINISH Time: 13:25 Date: 08/17/01
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Heriberto Ramirez		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 33.64 feet msl
TOP OF CASING ELEVATIC Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							41		SP	
							42		ML	SILT - grey, slightly moist, stiff, non-plastic, minor shell fragments, no petroleum odor, no sheen (42 - 42.5 feet bgs).
							43		SP	SAND - grey with orange staining (oxidation), wet, fine grained, no petroleum odor, no sheen (42.5-44.5 feet bgs).
	145	12:00	3.5	-			44			
							45		ML	SILT - olive grey, moist, stiff, non-plastic, no petroleum odor, no sheen (44.5 - 45 feet bgs).
							46			SAND - grey, wet, fine grained, minor muscovite, woody material at 45 and 57 feet bgs, several thin (<2-inch) grey silt layers between 53 and 56 feet bgs, no petroleum odor, no sheen (45-64 feet bgs).
							47			
	146	12:10	0.7	-			48		SP	
							49			
							50			
							51			
	147	12:30	0.7	-			52			
							53			
							54			
							55			
	148	12:45	0.4	-			56			
							57		SP	
							58			
	149	13:05	0.9	-			59			
							60			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-1**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 10:15	DRILL FINISH Time: 13:25
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Heriberto Ramirez	Date: 08/17/01	Date: 08/17/01
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 33.64 feet msl
TOP OF CASING ELEVATIC Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							61			
	150	13:25	0.6	-			62		SP	
							63			
							64			
							65			Boring terminated at 64.0 feet bgs.
							66			*Sample prefix is 5237-010817-
							67			
							68			
							69			
							70			
							71			
							72			
							73			
							74			
							75			
							76			
							77			
							78			
							79			
							80			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-1A**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 8:50	DRILL FINISH Time: 14:00
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Neil Kranz	Date: 03/18/02	Date: 03/18/02
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER: 2.0-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 33.64 feet msl
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	DEPTH (feet)	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Chips					1	GP	Surface: Gravel, grey, dry, no petroleum odor, no sheen (0 to 0.5 foot below ground surface (bgs)).
					2		
					3		Sandy SILT with Gravel - brown becoming orange mottled at 2.5 feet bgs, and grey below 3.0 feet bgs, moist, no petroleum odor, no sheen (0.5 to 5 feet bgs).
	001	8:55	-	-	4		
					5		
					6	ML	Sandy SILT with Gravel - gray, slightly moist, rootlets present, no petroleum odor, no sheen (5 to 12.5 feet bgs).
					7		
					8		
					9		
	002	8:55	-	-	10		
					11		
					12		
					13	SM	Silty SAND - gray, moist, fine grained, no petroleum odor, no sheen (12.5 to 13 feet bgs).
					14	ML	Sandy SILT with Gravel - grey, moist, non-plastic, woody zones, no petroleum odor, no sheen (13 to 15 feet bgs).
	003	9:00	-	-	15		
					16		Silty SAND with Gravel - light brown, increased moisture below 20 feet bgs, fine grained, woody material with large wood fragment at 18 feet bgs, no petroleum odor, no sheen (15 to 20 feet bgs).
					17		
					18	SM	
					19		
	004	9:05	-	-	20		

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-1A**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER: Rob Ede SAMPLING METHOD: Stainless Steel Soil Sampler with PVC Sleeve DRILLING METHOD: Hydraulic Push Probe EQUIPMENT TYPE Geo-Probe DRILLER: Neil Kranz DRILLING CONTRACTOR: Geo-Tech Explorations, Inc.		DRILL START Time: 8:50 Date: 03/18/02	DRILL FINISH Time: 14:00 Date: 03/18/02

BORING DIAMETER: 2.0-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 33.64 feet msl
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	DEPTH (feet)	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Chips					21		
					22	SP	SAND with Silt and Gravel - brown becoming rusty orange at depth, moist, well graded, loose, no petroleum odor, no sheen (20 to 25 feet bgs).
					23		
					24		
	005	9:15	-	-	25		SAND with Gravel - brown to gray, wet, no petroleum odor or sheen to 28 feet bgs. Tar with sheen identified at 28 feet bgs. Tar is stiff and plastic,with weathered, grainy texture in places, base of tar is at 30.5 feet bgs, (25 to 30.5 feet bgs).
					26		
					27		**GROUNDWATER SAMPLE** Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 24 to 28 feet bgs. Following the removal of approximately 1 liter of water, a groundwater sample (#5237-020318-331) was collected with disposable tubing/check valve at 10:20 hours, 3/18/02. Water level was measured at 25 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was advanced.
					28		
					29		
	006	9:30	-	-	30	tar	Base of Fill identified at 30.5 feet bgs
					31		
					32	ML	SILT - olive gray, moist, slightly plastic, several sandy layers, slight sheen, no petroleum odor (30.5 to 31.5 feet bgs).
					33		
Bentonite Grout					34		Note: No soil samples collected below 31.5 feet bgs. See boring log for probe P-1 for soil description.
					35		Note: Installed a 3.75-inch OD steel casing to 31.5 feet bgs, sealed base of casing with 3 feet of bentonite chips, then pushed well point directly to target groundwater sample depth of 54 to 58 feet bgs.
					36	SM	
					37		
					38		
					39		
					40	SP	

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-1A**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER: Rob Ede SAMPLING METHOD: Stainless Steel Soil Sampler with PVC Sleeve DRILLING METHOD: Hydraulic Push Probe EQUIPMENT TYPE Geo-Probe DRILLER: Neil Kranz DRILLING CONTRACTOR: Geo-Tech Explorations, Inc.	DRILL START Time: 8:50 Date: 03/18/02	DRILL FINISH Time: 14:00 Date: 03/18/02

BORING DIAMETER: 2.0-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 33.64 feet msl
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							41		SP	
							42		ML	
							43		SP	
							44			
							45		ML	
							46			
							47			
							48		SP	
							49			
							50			
							51			
							52			
							53			
							54			
							55			
							56		SP	
							57			
							58			
							59			
							60			

GROUNDWATER SAMPLE
Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 54 to 58 feet bgs. Following the removal of approximately 1 liter of water, groundwater samples (#5237-020318-333 and duplicate #5237-020318-334) were collected with disposable tubing/check valve at 10:20 hours, 3/18/02. Water level was measured at 50.95 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was terminated.

Boring terminated at 58 feet bgs and sealed from base to 30 feet bgs with bentonite grout, and from 30 feet bgs to ground surface with bentonite chips.

* Sample prefix is 5237-020318-

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-2**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER: Rob Ede SAMPLING METHOD: Stainless Steel Soil Sampler with PVC Sleeve DRILLING METHOD: Hydraulic Push Probe EQUIPMENT TYPE Geo-Probe DRILLER: Heriberto Ramirez DRILLING CONTRACTOR: Geo-Tech Explorations, Inc.	DRILL START Time: 8:45 Date: 08/14/01	DRILL FINISH Time: 14:30 Date: 08/14/01

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 33.86 feet msl
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	DEPTH (feet)	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout	109	8:52	1.6	-	1	SP	Surface: grass covered silty, SAND, brown with 1-inch thick zone of black coloration (organic?) at 6-inches bgs, dry, becoming gravelly at 2.5 feet bgs, no petroleum odor, no sheen (0 to 3 feet below ground surface (bgs)).
					2		
	110	8:53	2.2	-	3		SAND with Gravel - light brown, dry to slightly moist, fine-grained with minor Gravel (<1%), gravels are up to 1/4-inch diameter and are both rounded and angular, well graded, small piece of tar (fleck) at 4.25 feet bgs, no petroleum odor, slight sheen from tar fleck (3 to 4.25 feet bgs).
					4		
					5		
					6		SAND with Gravel - as above, several brick fragments at 10.5 feet bgs, no petroleum odor, no sheen, no tar (4.25 to 11 feet bgs).
	111	8:59	10.2	-	7		
					8		
					9		
					10	SP	
					11		
	112	9:02	2.7	-	12		SAND with Gravel - as above, small (1/8-inch diameter) dark grey to black zones of discoloration every few inches between 11 and 16 feet bgs, decreasing below, no petroleum odor, no sheen, no tar (11 to 21 feet bgs).
					13		
					14		
	113	9:10	7.0	77.3	15		
					16		
					17		
					18		
	114	9:20	8.5	-	19		
					20		

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-2**			
	HAI LOGGER:	Rob Ede	DRILL START	DRILL FINISH
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve	Time: 8:45	Time: 14:30
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Heriberto Ramirez	Date: 08/14/01	Date: 08/14/01
PROJECT #: 5237	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 33.86 feet msl
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	DEPTH (feet)	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout	115	9:40	4.8	1,170	21–25		SAND with Gravel - grey, moist, piece of cinder block or slag and brick fragments between 21 and 21.5 feet bgs, petroleum odor, no oil, no tar, no sheen (21 to 22.5 feet bgs). SAND with Gravel - grey-green, moist, becoming wet at 28 feet bgs, no petroleum odor, no sheen (22.5 to 32 feet bgs).
	116	9:55	8.6	-	26–28	SP	
	117	10:10	6.6	-	29–30		
	118	10:36	7.2	414	31–33		SAND with Gravel - grey to olive-grey, wet, mild to moderate petroleum odor, sheen, no oil or tar observed, brown glass fragment at base of sand, (30.5 to 32.5 feet bgs).
					34	ML	Sandy SILT - olive grey to tan with orange mottling, moist, slightly plastic, clear glass fragment in upper 3-inches of silt, no petroleum odor, no sheen (32.5 to 34 feet bgs).
	119	10:40	6.3	-	35–38	SM	Silty SAND - grey, wet, poorly graded, minor plant debris, no petroleum odor, no sheen (34-38 feet bgs).
	120	10:46	7.4	-	39–40	SP	SAND - grey, becoming light brown below 40 feet bgs, wet, fine grained, poorly graded, muscovite present, no petroleum odor, no sheen (38-44 feet bgs).

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-2**			
	HAI LOGGER:	Rob Ede	DRILL START	DRILL FINISH
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve	Time:	Time:
	DRILLING METHOD:	Hydraulic Push Probe	8:45	14:30
	EQUIPMENT TYPE	Geo-Probe	Date:	Date:
	DRILLER:	Heriberto Ramirez	08/14/01	08/14/01
PROJECT #: 5237	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 33.86 feet msl
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							41		SP	
							42			
	121	11:03	4.6	-			43			
							44			
							45		ML	SILT - light brown, slightly moist, stiff, slightly plastic, several small shell fragments, no petroleum odor, no sheen (44 - 45.5 feet bgs).
							46		SP	SAND - grey, wet, fine grained, no petroleum odor, no sheen (45.5-46.5 feet bgs).
							47		ML	Sandy SILT - tan, moist, slightly plastic, minor shell fragments, no petroleum odor. no sheen (46.5 - 48 feet bgs).
	122	11:21	7.8	-			48			
							49		SP	SAND - grey, wet, fine grained, no petroleum odor, no sheen (48-49 feet bgs).
							50		ML	SILT - grey, moist, several small shell fragments, no petroleum odor, no sheen (49 - 49.5 feet bgs).
							51		SP	SAND - grey, wet, fine grained, poorly graded, minor muscovite, no petroleum odor, no sheen (49.5-51.5 feet bgs).
	123	11:40	7.0	-			52			
							53		SM	Silty SAND - grey, wet, rootlets and minor plant debris, no petroleum odor, no sheen (51.5-53.5 feet bgs).
							54			
							55			SAND - grey, wet, fine grained, poorly graded, minor muscovite, no shell fragments, no petroleum odor, no sheen (49.5-62.5 feet bgs).
	124	11:58	4.1	-			56		SP	
							57			
							58			
	125	12:12	5.7	-			59			
							60			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-2**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 8:45	DRILL FINISH Time: 14:30
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Heriberto Ramirez	Date: 08/14/01	Date: 08/14/01
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 33.86 feet msl
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							61			
							62			
	126	12:34	5.7	-			63		SM	Silty SAND - grey, very moist, no petroleum odor, no sheen (62.5-63.5 feet bgs).
							64			SAND - grey, wet, fine grained, poorly graded, no petroleum odor, no sheen (63.5-76 feet bgs).
							65			
							66		SP	
							67			
							68			
							69			
							70			
							71			
							72			
							73			
							74			
							75			
							76			
							77		SP	SAND - as above, no petroleum odor, no sheen (76-80 feet bgs).
							78			
							79			
	127	13:24	3.9	-			80			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-2**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER: Rob Ede SAMPLING METHOD: Stainless Steel Soil Sampler with PVC Sleeve DRILLING METHOD: Hydraulic Push Probe EQUIPMENT TYPE Geo-Probe DRILLER: Heriberto Ramirez DRILLING CONTRACTOR: Geo-Tech Explorations, Inc.	DRILL START Time: 8:45 Date: 08/14/01	DRILL FINISH Time: 14:30 Date: 08/14/01

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 33.86 feet msl
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							81			
							82			
							83			
							84			
							85		SP	
							86			
							87			SAND - as above, no petroleum odor, no sheen (86-90 feet bgs).
							88			
	128	13:54	4.1	-			89			
							90			
							91			
							92			
							93			
							94			
							95			
							96			
							97			SAND - as above, no petroleum odor, no sheen (96-98.5 feet bgs).
							98			
	129	14:25	14.2	-			99			Boring terminated at 100.0 feet bgs.
							100			*Sample prefix is 5237-010814-

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**	**P-2A**		
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon	HAI LOGGER:	Rob Ede	DRILL START Time: 8:23	DRILL FINISH Time: 14:40
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Heriberto Ramirez	Date: 08/16/01	Date: 08/16/01
PROJECT #: 5237	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	1.5-inch
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Measured
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Chips							1			Note: No soil samples collected. Pushed with well point directly to groundwater sample depths. See boring log for probe P-2 for soil description
							2			
							3			
							4			
							5			
							6			
							7			
							8			
							9			
							10		SP	
Bentonite Grout							11			
							12			
							13			
							14			
							15			
							16			
							17			
							18			
							19			
							20			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**	**P-2A**		
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon	HAI LOGGER:	Rob Ede	DRILL START Time: 8:23	DRILL FINISH Time: 14:40
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Heriberto Ramirez	Date: 08/16/01	Date: 08/16/01
PROJECT #: 5237	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	1.5-inch
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Measured
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							21			
							22			
							23			
							24			
							25			
							26		SP	
							27			
	Water Level measured for 28' - 32' bgs screen						28	▽		
							29			
							30			
							31			
							32			
							33			
							34		ML	
							35			
							36		SM	
							37			
							38			
							39		SP	
							40			

GROUNDWATER SAMPLE
Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 28 to 32 feet bgs. Following the removal of approximately 1 quart of water, a groundwater sample (#5237-010816-316) was collected with disposable tubing/check valve at 9:55 hours, 8/16/01. Water level was measured at 28.0 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was advanced.

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**	**P-2A**		
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon	HAI LOGGER:	Rob Ede	DRILL START Time:	DRILL FINISH Time:
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve	8:23	14:40
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Heriberto Ramirez	Date:	Date:
PROJECT #: 5237	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	08/16/01	08/16/01

BORING DIAMETER:	1.5-inch
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Measured
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							41			
							42		SP	
							43			
	Water Level measured for 54' - 58' bgs screen						44	▽		
							45		ML	
							46		SP	
							47		ML	
							48			
							49		SP	
							50		ML	
							51		SP	
							52			
							53		SM	
							54			
							55			
							56		SP	
							57			
							58			
							59			
							60			

GROUNDWATER SAMPLE
Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen a t54 to 58 feet bgs. Following the removal of approximately 1 quart of water, a groundwater sample (#5237-010816-317) was collected with disposable tubing/check valve at 11:11 hours, 8/16/01. Water level was measured at 44 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was advanced.

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**	**P-2A**		
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time:	DRILL FINISH Time:
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve	8:23	14:40
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Heriberto Ramirez	Date:	Date:
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	08/16/01	08/16/01

BORING DIAMETER:	1.5-inch
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Measured
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							61			
							62			
							63		SM	
							64			
							65			
							66		SP	
							67			
							68			
							69			
							70			
							71			
							72			
							73			
							74			
							75			
							76			
							77		SP	
							78			
							79			
							80			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**	**P-2A**		
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon	HAI LOGGER:	Rob Ede	DRILL START Time: 8:23	DRILL FINISH Time: 14:40
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Heriberto Ramirez	Date: 08/16/01	Date: 08/16/01
PROJECT #: 5237	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	1.5-inch
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Measured
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							81			
							82			
							83			
							84			
							85		SP	
							86			
							87			
							88			
							89			
							90			
							91			
							92			
							93			
							94			
							95			
							96			**GROUNDWATER SAMPLE** Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 96 to 100 feet bgs. Following the removal of approximately 1 liter of water, a groundwater sample (#5237-010816-318) was collected with disposable tubing/check valve at 12:57 hours, 8/16/01. Water level was measured at 57.9 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was abandoned.
							97			
							98			
							99			Boring terminated at 100.0 feet bgs and sealed from base to 2 feet bgs with bentonite grout, and from 2 feet bgs to ground surface with bentonite chips.
							100			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-3**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon	HAI LOGGER:	Rob Ede	DRILL START Time:	DRILL FINISH Time:
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve	9:12	16:20
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Heriberto Ramirez	Date: 08/20/01	Date: 08/20/01
PROJECT #: 5237	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout	151	9:16	2.5	-			1 2 3 4 5		SP	Surface: grass covered silty, SAND with Gravel, light brown, dry, no petroleum odor, no sheen (0 to 1 foot below ground surface (bgs)). SAND with Gravel - light brown, dry, becoming slightly moist at 4 feet bgs, fine-grained with minor Gravel (<1%), gravels are up to 1/2-inch diameter and are both rounded and angular, well graded, thin (1/4-inch) silt layer at 5.5 feet bgs, no petroleum odor, no sheen (1 to 13 feet bgs).
	152	9:24	4.0	100			6 7 8 9 10			
	153	9:29	3.6	-			11 12 13			SAND with Gravel - 5-inch thick zone of grey discoloration with petroleum odor and slight to moderate sheen when wetted at 13 feet bgs, no oil or tar observed, a steel bolt is present within zone of impact (13 to 13.5 feet bgs).
	154	9:45	8.8	-			14 15		SP	SAND with Gravel - light brown, dry, no sheen, no petroleum odor, no oil or tar observed (13.5 to 16.5 feet bgs).
	155	9:55	102	1,733			16 17 18 19 20			SAND with Gravel - grey discoloration with petroleum (creosote) odor and sheen when wetted, a 1/2-inch diameter rubber hose fragment is present at 16.5 feet bgs, no oil product or tar observed (16.5 to 18 feet bgs). SAND with Gravel - light brown with patchy zones of grey discoloration extending to 23.5 feet bgs, petroleum odor, no sheen, no oil or tar observed (18 to 23.5 feet bgs).

BORING DIAMETER:	1.5-inch
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	34.74 feet msl
TOP OF CASING ELEVATION:	Not Applicable

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-3**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 9:12 Date: 08/20/01	DRILL FINISH Time: 16:20 Date: 08/20/01
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Heriberto Ramirez		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 34.74 feet msl
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	DEPTH (feet)	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout	156	10:02	53.1	-	21–25	SP	SAND with Gravel - grey (natural?), dry, petroleum odor, no sheen, no oil or tar observed (23.5 to 30.5 feet bgs).
	157	10:15	22.7	-	26–30		
	158	10:30	15	-	31		SAND with Gravel - grey, petroleum odor, slightly wet, sheen, no oil or tar observed (30.5 to 32.5 feet bgs).
					32–35	ML	SILT - grey with tan mottling, moist to very moist, slightly plastic, rootlets, several sandy silt layers (3 to 4-inches thick) in 33 to 35 foot depth interval, no petroleum odor, no sheen (32.5 to 36 feet bgs).
	159	10:45	12.5	106	36–38	SM	Silty SAND - grey and light brown, wet, very fine grained, no petroleum odor, no sheen (36-40.5 feet bgs).
	160	10:55	7.0	-	39–40		

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-3**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 9:12 Date: 08/20/01	DRILL FINISH Time: 16:20 Date: 08/20/01
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Heriberto Ramirez		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 34.74 feet msl
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
									SM	
							41		SP	SAND - grey, wet, very fine grained, muscovite present, no petroleum odor. no sheen (40.5-42 feet bgs).
							42			
							43		SM	Silty SAND - grey, moist, no sheen, no petroleum odor (42-43.5 feet bgs).
	161	11:10	-	-			44		ML	SILT - grey, slightly moist, stiff, non-plastic, rootlets, shell fragments. no petroleum odor. no sheen (43.5 - 44 feet bgs).
							45			SAND - grey, wet, fine grained, poorly graded, woody material in upper sand zone. no petroleum odor. no sheen (44-48 feet bgs).
							46		SP	
							47			
	162	11:40	10.1	-			48			
							49		ML	Sandy SILT - grey, moist, stiff, non-plastic, no petroleum odor, no sheen (48 - 51 feet bgs).
							50			
							51			
							52			SAND - grey, wet, fine grained, poorly graded, no petroleum odor, possible solvent odor (faint) from 59 feet to 64 feet bgs, no sheen (51-76 feet bgs).
	163	11:45	9.3	-			53			
							54			
Bentonite Grout							55			
	164	12:02	10.7	-			56			
							57		SP	
							58			
							59			
	-	12:20	9.5	-			60			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-3**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 9:12 Date: 08/20/01	DRILL FINISH Time: 16:20 Date: 08/20/01
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Heriberto Ramirez		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 34.74 feet msl
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							61			
							62			
							63			
	165	12:45	9.2	-			64			
							65			
							66		SP	
							67			
							68			
							69			
							70			
							71			
							72			
							73			
							74			
							75			
							76			
							77			SAND - as above, no petroleum or solvent odor, no sheen (76-80 feet bgs).
							78		SP	
	166	13:30	9.0	-			79			
							80			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-3**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 9:12 Date: 08/20/01	DRILL FINISH Time: 16:20 Date: 08/20/01
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Heriberto Ramirez		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)
Bentonite Grout							81		
							82		
							83		
							84		
							85		SP
							86		
Soil Sampler							87		
							88		
							89		
							90		
							91		
							92		
							93		
							94		
							95		
							96		
							97		
							98		
							99		
							100		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 34.74 feet msl
TOP OF CASING ELEVATION: Not Applicable

SOIL DESCRIPTION

NOTE: Soil Sampler (4-foot length) became stuck in hole (apparent sand heave / lock) during attempted push at 90 feet bgs. Sampler, with two feet of rod stem remain in hole. Pressure grouted hole with tremie tube from top of sampler (86 feet bgs) to ground surface.

Boring terminated at 90.0 feet bgs.

*Sample prefix is 5237-010820-

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-3A**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER: Jay Greifer SAMPLING METHOD: N/A DRILLING METHOD: Hydraulic Push Probe EQUIPMENT TYPE Geo-Probe DRILLER: Heriberto Ramirez DRILLING CONTRACTOR: Geo-Tech Explorations, Inc.	DRILL START Time: 8:38 Date: 08/21/01	DRILL FINISH Time: 13:36 Date: 08/21/01

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)
Bentonite Grout							1		
							2		
							3		SP
							4		
							5		
							6		
							7		
							8		
							9		
							10		SP
							11		
							12		
							13		
							14		
							15		
							16		
							17		
							18		
							19		
							20		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: Not Measured
TOP OF CASING ELEVATION: Not Applicable

SOIL DESCRIPTION

Note: No soil samples collected. Pushed with well point directly to groundwater sample depths. See boring log for probe P-3 for soil description

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-3A**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Jay Greifer	DRILL START Time: 8:38 Date: 08/21/01	DRILL FINISH Time: 13:36 Date: 08/21/01
	SAMPLING METHOD:	N/A		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Heriberto Ramirez		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: Not Measured
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							21			
	Water Level measured for 55' - 59' bgs screen						22	▽		
							23			
							24			
							25			
							26		SP	
							27			
							28			
	Water Level measured for 28.5' - 32.5' bgs screen interval						29	▽		
							30			
							31			
							32			
							33			
	Water Level measured for 96' - 100' bgs screen interval						34	▽	ML	
							35			
							36			
							37			
							38		SM	
							39			
							40			

GROUNDWATER SAMPLE
Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 28.5 to 32.5 feet bgs. Following the removal of approximately 1 quart of water, a groundwater sample (#5237-010821-321) was collected with disposable tubing/check valve at 9:41 hours, 8/21/01. Water level was measured at 28.5 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was advanced.

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-3A**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER: Jay Greifer SAMPLING METHOD: N/A DRILLING METHOD: Hydraulic Push Probe EQUIPMENT TYPE Geo-Probe DRILLER: Heriberto Ramirez DRILLING CONTRACTOR: Geo-Tech Explorations, Inc.	DRILL START Time: 8:38 Date: 08/21/01	DRILL FINISH Time: 13:36 Date: 08/21/01

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: Not Measured
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							41		SM	
							42		SP	
							43		SM	
							44		ML	
							45			
							46		SP	
							47			
							48			
							49			
							50		ML	
							51			
							52			
							53			
							54			
							55			
							56		SP	
							57			
							58			
							59			
							60			

GROUNDWATER SAMPLE
Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 55 to 59 feet bgs. Following the removal of approximately 1 quart of water, a groundwater sample (#5237-010821-323) was collected with disposable tubing/check valve at 10:57 hours, 8/21/01. Water Level was measured at 22 feet bgs immediately prior to sampling. After sampling, the well point was removed from the borehole and the borehole was advanced.

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-3A**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER: Jay Greifer SAMPLING METHOD: N/A DRILLING METHOD: Hydraulic Push Probe EQUIPMENT TYPE Geo-Probe DRILLER: Heriberto Ramirez DRILLING CONTRACTOR: Geo-Tech Explorations, Inc.	DRILL START Time: 8:38 Date: 08/21/01	DRILL FINISH Time: 13:36 Date: 08/21/01

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: Not Measured
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							61			
							62			
							63			
							64			
							65			
							66		SP	
							67			
							68			
							69			
							70			
							71			
							72			
							73			
							74			
							75			
							76			
							77			
							78		SP	
							79			
							80			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-3A**			
	HAI LOGGER:	Jay Greifer	DRILL START	DRILL FINISH
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon	SAMPLING METHOD:	N/A	Time:	Time:
	DRILLING METHOD:	Hydraulic Push Probe	8:38	13:36
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Heriberto Ramirez	Date:	Date:
PROJECT #: 5237	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	08/21/01	08/21/01

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: Not Measured
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							81		SP	
							82			
							83			
							84			
							85			
							86			
							87			
							88			
							89			
							90			
							91			
							92			
							93			
							94			
							95			
							96			
							97			
							98			
							99			
							100			

GROUNDWATER SAMPLE
Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 96 to 100 feet bgs. Following the removal of approximately 1 quart of water, a groundwater sample (#5237-010821-325) was collected with disposable tubing/check valve at 12:10 hours, 8/21/01. Water level was measured at 34 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was abandoned.

Boring terminated at 100.0 feet bgs and sealed from base to top with bentonite grout.

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-4**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 12:05 Date: 08/10/01	DRILL FINISH Time: 16:00 Date: 08/10/01
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Heriberto Ramirez		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 34.29 feet msl
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	DEPTH (feet)	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Chips					1		Surface: grass covered silty, SAND with Gravel, grey, dry, no hydrocarbon odor, no sheen (0 to 1 foot below ground surface (bgs)).
					2		
	076	12:10	2.5	-	3	SP	SAND with Gravel - light brown, dry, becoming slightly moist at 4 feet bgs, fine-grained with minor Gravel (<1%), gravels are up to 1/2-inch diameter and are both rounded and angular, well graded, no petroleum odor, no sheen (1 to 10 feet bgs).
					4		
					5		
					6		
	077	12:14	3.3	-	7		
					8		
					9		
					10		
Bentonite Grout	078	12:18	2.4	-	11		SAND with Gravel - as above except with thin (1/4-inch) dark brown to grey colored layers at 10 feet bgs, 14 feet bgs, and 16 feet bgs, no petroleum odor, no sheen (10 to 18 feet bgs).
					12		
					13		
					14		
	079	12:25	1.6	247.4	15	SP	
					16		
					17		
	080	12:32	5.2	313	18		
					19		SAND with Gravel - grey discoloration with petroleum (creosote) odor and sheen when wetted, no oil or tar present (18 to 20 feet bgs).
					20		

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-4**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 12:05 Date: 08/10/01	DRILL FINISH Time: 16:00 Date: 08/10/01
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Heriberto Ramirez		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 34.29 feet msl
TOP OF CASING ELEVATIC Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	DEPTH (feet)	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout	no sample	12:45	153	-	21		SAND with Gravel - grey discoloration with petroleum (creosote) odor and sheen, slightly oily, but pores are not saturated with oil (20 to 24 feet bgs).
					22		
					23		
					24		
					25		SAND with Gravel - grey (natural?), slightly moist, slight petroleum odor, no sheen, no oil or tar observed (24 to 28 feet bgs).
					26	SP	
	082	13:00	28.1	-	27		
					28		SAND - grey, wet, medium grained, no petroleum odor, no sheen, (28 to 29.5 feet bgs).
					29		
					30		Silty SAND - grey, slightly moist, very fine grained, moderate petroleum odor, no sheen (29.5-32 feet bgs).
	083	13:10	17.4	-	31	SM	
					32		
					33	ML	SILT - tan with orange mottling, moist, slightly plastic, no petroleum odor, no sheen (32 to 33 feet bgs).
					34		Silty SAND - brown, wet, very fine grained, poorly graded, no petroleum odor, no sheen (33-35.5 feet bgs).
					35	SM	
	084	13:25	8.5	ND	36		Sandy SILT - tan with orange mottling, moist, non-plastic, no petroleum odor, no sheen (35.5 - 39.5 feet bgs).
					37		
					38	ML	
	085	13:35	6.0	-	39		
					40	SP	SAND - grey, wet, very fine grained, no petroleum odor, no sheen (39.5-41 feet bgs).

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-4**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 12:05	DRILL FINISH Time: 16:00
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Heriberto Ramirez	Date: 08/10/01	Date: 08/10/01
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 34.29 feet msl
TOP OF CASING ELEVATIC Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	DEPTH (feet)	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout	086	13:50	3.7	-	41	SP	Silty SAND - grey, moist, several small shell fragments, no sheen, no petroleum odor (41-41.5 feet bgs).
					42	SM	SAND - grey, wet, very fine grained, poorly graded, no petroleum odor. no sheen (41.5-42.5 feet bgs).
					43	SP	SILT - grey, moist, stiff, non-plastic, rootlets, shell fragments, no petroleum odor. no sheen (42.5 - 43 feet bgs).
					44	ML	SAND - grey, wet, fine grained, poorly graded, minor muscovite, 2-inch thick sandy silt layer at 53.5 feet bgs, no petroleum odor, no sheen (43-64 feet bgs).
					45		
					46	SP	
					47		
	087	14:00	3.8	-	48		
					49		
					50		
					51		
	088	14:30	3.9	-	52		
					53		
					54		
	089	15:05	3.0	-	55		
					56		
					57	SP	
					58		
					59		
					60		

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-4**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon	HAI LOGGER: Rob Ede SAMPLING METHOD: Stainless Steel Soil Sampler with PVC Sleeve DRILLING METHOD: Hydraulic Push Probe EQUIPMENT TYPE Geo-Probe DRILLER: Heriberto Ramirez	DRILL START Time: 12:05 Date: 08/10/01	DRILL FINISH Time: 16:00 Date: 08/10/01
PROJECT #: 5237	DRILLING CONTRACTOR: Geo-Tech Explorations, Inc.		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 34.29 feet msl
TOP OF CASING ELEVATI(Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout	no sample			-			61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80		SP	Boring terminated at 64.0 feet bgs. *Sample prefix is 5237-010810-

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-4A**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 8:43	DRILL FINISH Time: 11:40
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Heriberto Ramirez	Date: 08/15/01	Date: 08/15/01
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)
Bentonite Chips							1		
							2		
							3		SP
							4		
							5		
							6		
							7		
							8		
							9		
Bentonite Grout							10		
							11		
							12		
							13		
							14		SP
							15		
							16		
							17		
							18		
							19		
							20		

BORING DIAMETER:	1.5-inch
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Measured
TOP OF CASING ELEVATION:	Not Applicable

SOIL DESCRIPTION

Note: No soil samples collected. Pushed with well point directly to groundwater sample depths. See boring log for probe P-4 for soil description

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-4A**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 8:43	DRILL FINISH Time: 11:40
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Heriberto Ramirez	Date: 08/15/01	Date: 08/15/01
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	1.5-inch
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Measured
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							21			
							22			
							23			
							24			
							25			
							26		SP	
	Water Level measured for 50' - 54' bgs screen						27	▽		
							28			
	Water Level measured for 28' - 32' bgs screen						29	▽		
							30			
							31		SM	
							32			
							33		ML	
							34		SM	
							35			
							36			
							37			
							38		ML	
							39			
							40		SP	

GROUNDWATER SAMPLE
Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 28 to 32 feet bgs. Following the removal of approximately 1 quart of water, a groundwater sample (#5237-010815-309) was collected with disposable tubing/check valve at 10:06 hours, 8/15/01. Water level was measured at 28.5 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was advanced.

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-4A**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 8:43 Date: 08/15/01	DRILL FINISH Time: 11:40 Date: 08/15/01
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Heriberto Ramirez		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: Not Measured
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							41		SP	
							42		SM	
							43		SP	
							44		ML	
							45			
							46		SP	
							47			
							48			
							49			
							50			
							51			
							52			
							53			
							54			
							55			
							56			
							57			
							58			
							59			
							60			

GROUNDWATER SAMPLE
Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 50 to 54 feet bgs. Following the removal of approximately 1 quart of water, a groundwater sample (#5237-010815-310) was collected with disposable tubing/check valve at 11:33 hours, 8/15/01. Water level was measured at 27.5 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was abandoned.

Boring terminated at 54.0 feet bgs and sealed from base to 2 feet bgs with bentonite grout, and from 2 feet bgs to ground surface with bentonite chips.

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-5**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 8:55	DRILL FINISH Time: 17:00
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Heriberto Ramirez	Date: 08/13/01	Date: 08/13/01
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	1.5-inch
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	34.22 feet msl
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	DEPTH (feet)	STRATA (USCS)	SOIL DESCRIPTION
BentoniteChips					1	GP	Surface: asphalt with 6-inch gravel base (0 to 0.5 foot below ground surface (bgs)).
					2		
	090	9:10	1.2	-	3	SP	SAND with Gravel - brown, dry, becoming slightly moist at 4 feet bgs, medium-grained with minor Gravel (<5%), gravels are up to 1.25-inch diameter and are both rounded and angular, well graded, no petroleum odor, no sheen (0.5 to 9.5 feet bgs).
					4		
					5		
					6		
	091	9:14	1.4	ND	7		
					8		
					9		
Bentonite Grout	092	9:25	13.6	20,000	10		SAND with Gravel - as above except with thin (4-inch) grey discolred layer at 9.5 feet bgs, discolored area is sharply defined and has sheen and is oily, several brick and tar fragments within this zone (9.5 to 10 feet bgs).
					11		
					12		SAND with Gravel - brown, moist, medium grained sand, slight sheen, slight petroleum odor, no oil or tar (10 to 13 feet bgs).
					13		
					14		SAND with Gravel - brown, moist, medium grained sand, no sheen, no hydrocarbon odor, no oil or tar, thin (2-inches thick), dark grey layer with petroleum odor and slight sheen at 14 feet bgs (13 to 14 feet bgs).
	093	9:35	2.4	ND	15	SP	SAND with Gravel - light grey, moist, medium grained sand, no sheen, no petroleum odor, no oil or tar (14 to 20 feet bgs).
					16		
					17		
					18		
	094	9:40	2.1	-	19		
					20		

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-5**			
	HAI LOGGER:	Rob Ede	DRILL START Time:	DRILL FINISH Time:
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve	8:55	17:00
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Heriberto Ramirez	Date:	Date:
PROJECT #: 5237	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	08/13/01	08/13/01

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 34.22 feet msl
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							21		SP	SAND with Gravel - grey, moist, petroleum odor?, no sheen (20 to 22 feet bgs).
	095	9:45	1.9	-			22			
							23			Silty SAND - grey, slightly moist, very fine grained, no petroleum odor. no sheen (22-25.5 feet bgs).
							24			
							25			
	096	9:58	1.6	-			26			Silty SAND with Gravel- grey, moist to very moist, very fine grained sand, large gravels (>2-inch diameter) present at 26.5 feet bgs and at 32 feet bgs, much plant debris (roots, stalks) in 2-inch zone below 27.5 feet bgs, and between 28 and 32 feet bgs, no petroleum odor, no sheen (22-33 feet bgs).
							27			
							28		SM	
							29	▼		
							30			
							31			
	097	10:03	1.8	-			32			
	098	10:14	2.0	ND			33			
							34			SILT - tan with orange mottling, moist, slightly plastic, no petroleum odor, no sheen (33 to 36 feet bgs).
							35		ML	
	099	10:15	1.3	-			36			
							37		SM	Silty SAND - brown, wet, very fine grained, poorly graded, no petroleum odor. no sheen (36-37 feet bgs).
							38		ML	SILT - olive grey with orange mottling, moist, non-plastic, several thin (<1-inch silty sand layers near 38 feet bgs, no petroleum odor, no sheen (37 - 40.5 feet bgs).
							39			
	100	10:25	1.3	-			40			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-5**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER: Rob Ede SAMPLING METHOD: Stainless Steel Soil Sampler with PVC Sleeve DRILLING METHOD: Hydraulic Push Probe EQUIPMENT TYPE Geo-Probe DRILLER: Heriberto Ramirez DRILLING CONTRACTOR: Geo-Tech Explorations, Inc.		DRILL START Time: 8:55 Date: 08/13/01	DRILL FINISH Time: 17:00 Date: 08/13/01

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 34.22 feet msl
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							41		ML SP	SAND - grey, wet, fine grained, no petroleum odor, no sheen (40.5-41 feet bgs).
							42			Silty SAND - grey, moist, becoming very moist to wet below 44 feet bgs, minor (<1%) small shell fragments, no sheen, no petroleum odor (41-46.5 feet bgs).
							43		SM	
	101	10:36	1.9	-			44			
							45			
							46			
	102	10:50	1.6	-			47			SILT - grey, moist,slightly plastic, minor small shell fragments, no petroleum odor, no sheen (46.5 - 49 feet bgs).
							48		ML	
							49			
							50		SP	SAND - grey, wet, very fine grained, poorly graded, no petroleum odor. no sheen (49-49.5 feet bgs).
	103	11:09	1.5	-			51		SM	Silty SAND - grey, moist, minor (<1%) small shell fragments, no sheen, no petroleum odor (49.5-52 feet bgs).
							52			
							53			SAND - grey, wet, fine grained, poorly graded, minor muscovite, no petroleum odor, no sheen (52-59 feet bgs).
							54			
							55			
							56			
							57		SP	
							58			
	104	11:55	2.9	-			59			SILT - grey, moist,slightly plastic, minor small shell fragments, no petroleum odor, no sheen (59 - 59.5 feet bgs).
							60		ML SP	

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-5**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 8:55	DRILL FINISH Time: 17:00
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Heriberto Ramirez	Date: 08/13/01	Date: 08/13/01
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)
Bentonite Grout							61		
							62		
							63		
	105	12:15	2.5	-			64		
							65		
							66		
							67		
							68		SP
							69		
							70		
							71		
							72		
							73		
							74		
							75		
							76		
							77		
							78		
	106	15:15	2.9	-			79		
							80		

BORING DIAMETER:	1.5-inch
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	34.22 feet msl
TOP OF CASING ELEVATION:	Not Applicable

SOIL DESCRIPTION

SAND - grey, wet, fine grained, poorly graded, minor muscovite, thin (2-inch thick) silty sand layer at 78 feet bgs, no petroleum odor, no sheen (59.5-100 feet bgs).

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-5**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 8:55 Date: 08/13/01	DRILL FINISH Time: 17:00 Date: 08/13/01
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Heriberto Ramirez		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 34.22 feet msl
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Heaved Formation Sand	107	13:45	2.3	-	↕	↕	81–90		SP	Boring terminated at 100.0 feet bgs. *Sample prefix is 5237-010813- NOTE: Formation Sand heaved into borehole and tremie tube to 80 feet bgs, preventing the placement of grout across this depth
	108	14:25	2.4	-	↕	↕	91–100			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-5A**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 12:06	DRILL FINISH Time: 17:48
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Heriberto Ramirez	Date: 08/15/01	Date: 08/15/01
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)
Bentonite Chips							1		GP
							2		
							3		SP
							4		
							5		
							6		
							7		
Bentonite Grout							8		
							9		
							10		
							11		
							12		
							13		
							14		
							15		SP
							16		
							17		
							18		
							19		
							20		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: Not Measured
TOP OF CASING ELEVATION: Not Applicable

SOIL DESCRIPTION

Note: No soil samples collected. Pushed with well point directly to groundwater sample depths. See boring log for probe P-5 for soil description

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-5A**			
	HAI LOGGER:	Rob Ede	DRILL START Time:	DRILL FINISH Time:
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve	12:06	17:48
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Heriberto Ramirez	Date:	Date:
PROJECT #: 5237	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	08/15/01	08/15/01

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: Not Measured
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							21		SP	
							22			
							23			
							24			
							25			
							26			
							27			
							28		SM	
	Water Level measured for 29' - 33' bgs screen						29	▽		
							30			
							31			
							32			
							33			
							34		ML	
							35			
							36			
							37		SM	
							38			
							39		ML	
							40			

GROUNDWATER SAMPLE
Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 29 to 33 feet bgs. Following the removal of approximately 1 quart of water, groundwater samples (#5237-010815-311 and -312) were collected with disposable tubing/check valve at 14:04 hours, 8/15/01. Water level was measured at 28.5 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was advanced.

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-5A**			
	HAI LOGGER:	Rob Ede	DRILL START Time:	DRILL FINISH Time:
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve	12:06	17:48
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Heriberto Ramirez	Date:	Date:
PROJECT #: 5237	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	08/15/01	08/15/01

BORING DIAMETER:	1.5-inch
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Measured
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							41	▽	ML SP	
	Water Level measured for 52' - 56' bgs screen						42			
							43		SM	
							44			
	Water Level measured for 96' - 100' bgs screen interval						45	▽		
							46			
							47			
							48		ML	
							49			
							50		SP	
							51		SM	
							52			
							53			
							54			
							55			
							56		SP	
							57			
							58			
							59			
							60		ML SP	

GROUNDWATER SAMPLE
Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 52 to 56 feet bgs. Following the removal of approximately 1 quart of water, a groundwater sample (#5237-010815-313) was collected with disposable tubing/check valve at 15:10 hours, 8/15/01. Water level was measured at 41.0 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was advanced.

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-5A**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon	HAI LOGGER:	Rob Ede	DRILL START Time: 12:06	DRILL FINISH Time: 17:48
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Heriberto Ramirez	Date: 08/15/01	Date: 08/15/01
PROJECT #: 5237	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							61			BORING DIAMETER: 1.5-inch CASING DIAMETER: Not Applicable SURFACE ELEVATION: Not Measured TOP OF CASING ELEVATION: Not Applicable
							62			
							63			
							64			
							65			
							66			
							67			
							68		SP	
							69			
							70			
							71			
							72			
							73			
							74			
							75			
							76			
							77			
							78			
							79			
							80			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-5A**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER: Rob Ede SAMPLING METHOD: Stainless Steel Soil Sampler with PVC Sleeve DRILLING METHOD: Hydraulic Push Probe EQUIPMENT TYPE Geo-Probe DRILLER: Heriberto Ramirez DRILLING CONTRACTOR: Geo-Tech Explorations, Inc.		DRILL START Time: 12:06 Date: 08/15/01	DRILL FINISH Time: 17:48 Date: 08/15/01

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: Not Measured
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Heaved Formation Sand							81		SP	
							82			
							83			
							84			
							85			
							86			
							87			
							88			
							89			
							90			
							91			
							92			
							93			
							94			
							95			
							96			
							97			
							98			
							99			
							100			

GROUNDWATER SAMPLE
Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 96 to 100 feet bgs. Following the removal of approximately 1 quart of water, a groundwater sample (#5237-010815-314) was collected with disposable tubing/check valve at 16:41 hours, 8/15/01. Water level was measured at 44.5 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was abandoned.

Boring terminated at 100.0 feet bgs and sealed from base to1 foot bgs with bentonite grout, and from 1 foot bgs to ground surface with bentonite chips.

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-5a		Date(s): **4/29/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **34.2**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **704730.00**	Easting: **7625280.00**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **10.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/8" Bentonite Chips	0-10 feet	Remarks: **City of Portland Datum**	
Sample Prefix: 5237-080429-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	1							SP	**0.0 - 4.0 Feet:** SAND, gray, moist, fine grained, loose, poorly graded, no odor, no sheen, no discoloration.		
	2										
	3			4 (0-5)							
30	4								**4.0 - 5.0 Feet:**No Recovery		
	5								**5.0 - 7.0 Feet:**Not Sampled - Closed Pin		
	6										
	7							SP	**7.0 - 10.0 Feet:** SAND, gray to 9.5 feet then black, moist, fine grained, loose, poorly graded. Tar-like odor present with sheen in water during sheen testing. Small black tar fragments mixed throughout core.		
	8		159 (7-10)	3 (7-10)							
25	9		159G (9.5')								
	10								End of Boring at 10.0 feet below ground surface.		
20											
15											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-6**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER: Rob Ede SAMPLING METHOD: Stainless Steel Soil Sampler with PVC Sleeve DRILLING METHOD: Hydraulic Push Probe EQUIPMENT TYPE Geo-Probe DRILLER: Marcus Johnson DRILLING CONTRACTOR: Geo-Tech Explorations, Inc.		DRILL START Time: 9:15 Date: 08/02/01	DRILL FINISH Time: 14:00 Date: 08/02/01

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 35.38 feet msl
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	DEPTH (feet)	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Chips					1	GP	Surface: asphalt with 6-inch gravel base (0 to 0.5 foot below ground surface (bgs)).
	01	9:21	1.6	-	2	SP	SAND - light brown with some orange oxidation, slightly moist, medium-grained, loose, no petroleum odor, no sheen (0.5 to 4 feet bgs).
					3		
					4		
					5		SAND with Gravel - light brown and grey, slightly moist, fine-grained, minor gravel (up to 1/2-inch diameter), no petroleum odor, no sheen (4 to 6.5 feet bgs).
Bentonite Grout	02	9:28	1.9	-	6		
					7	SM	Silty SAND - olive grey, slightly moist, reducing odor (organic), several coal-like and concrete fragments, no petroleum odor, no sheen (6.5-8 feet bgs).
					8		
	03	9:32	2.2	-	9		Silty SAND with Gravel - grey, moist, piece of concrete encountered at 10 feet bgs, no petroleum odor, no sheen (8 to 10 feet bgs).
					10		
	04	9:35	2.2	247.4	11	SP	Silty SAND with Gravel - brown and black, moist, coarse grained sand, slight petroleum odor?, no sheen (10 - 12 feet bgs).
					12		
					13		Silty SAND with Gravel - brown, moist, coarse grained sand, refusal at 15.5 feet bgs on concrete, thin wet zone immediately above concrete, no petroleum odor, no sheen (12 - 16 feet bgs).
					14		
					15		
					16	concrete	
	05	10:00	1.8	-	17	SP	SAND - light grey, wet, medium grained sand, slight sheen, no hydrocarbon odor, no oil or tar (14 to 20 feet bgs).
					18		Silty SAND with Gravel - grey, very moist, woody debris and brick fragments throughout, large, angular basalt fragment at 18 feet bgs, burned wood fragments at 19 feet bgs, no petroleum odor, no sheen (16.5-20 feet bgs).
					19	SM	
	06	10:03	1.6	-	20		

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-6**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 9:15 Date: 08/02/01	DRILL FINISH Time: 14:00 Date: 08/02/01
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Marcus Johnson		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 35.38 feet msl
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	DEPTH (feet)	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout					21	SP	SAND with Gravel - grey, wet, medium grained, no petroleum odor, possible sheen (20 to 23.5 feet bgs).
					22		
	07	10:10	2.1	ND	23		
					24	GP	Sandy GRAVEL - grey, wet, well rounded gravels, no petroleum odor. no sheen (23.5-24 feet bgs).
					25	ML	SILT - olive grey with minor brown and orange mottling near base, moist, non-plastic, rootlets, no petroleum odor, no sheen (24 to 26 feet bgs).
					26		
	08	10:20	2.2	-	27	SM	Silty SAND - olive grey, wet, very fine grained, poorly graded, no petroleum odor, no sheen (26-26.5 feet bgs).
					28	ML	SILT - grey with orange mottling, very moist, slightly plastic, several very thin (<1/4-inch thick) fine-grained sand layers. no petroleum odor, no sheen (26.5 to 32 feet bgs).
					29		
	09	10:35	2.2	-	30		
					31		
					32		
	10	10:55	2.4	-	33	SP	SAND - brown, wet, fine grained, minor muscovite, poorly graded, several thin (< 1-inch) silt layers below 36 feet bgs, no petroleum odor, no sheen (32-37.5 feet bgs).
					34		
					35		
					36		
					37		
	11	11:05	1.8	-	38	SM	Silty SAND - grey and brown, wet, fine-grained, no sheen, no petroleum odor (37.5-40 feet bgs).
					39		
					40		

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-6**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon	HAI LOGGER:	Rob Ede	DRILL START Time: 9:15	DRILL FINISH Time: 14:00
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Marcus Johnson	Date: 08/02/01	Date: 08/02/01
PROJECT #: 5237	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 35.38 feet msl
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							41			SAND - brown, wet, fine grained, several small shell fragments at 43 feet bgs. no petroleum odor. no sheen (40-44 feet bgs).
	12	11:25	2.5	-			42			
							43			
							44			SAND - grey, wet, several thin (< 1-inch thick) silt layers every 1 to 2 feet, minor muscovite, minor shell fragments at 54 feet bgs, no petroleum odor, no sheen (44-59 feet bgs).
							45			
							46			
	13	11:50	2.8	-			47		SP	
							48			
							49			
							50			
	14	12:20	1.5	-			51			
							52			
							53			
	15	12:50	2.6	-			54			
							55			
							56		SP	
							57			
							58			
	16	13:00	-	-			59			
							60		ML SP	SILT - grey, moist,slightly plastic, minor small shell fragments, no petroleum odor, no sheen (59 - 59.5 feet bgs).

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-6**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 9:15 Date: 08/02/01	DRILL FINISH Time: 14:00 Date: 08/02/01
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Marcus Johnson		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 35.38 feet msl
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							61		SP	SAND - grey, wet, fine grained, poorly graded, no petroleum odor, no sheen (59.5-64 feet bgs).
							62			
							63			
							64			
							65			Boring terminated at 64.0 feet bgs.
							66			*Sample prefix is 5237-010802-
							67			
							68			
							69			
							70			
							71			
							72			
							73			
							74			
							75			
							76			
							77			
							78			
							79			
							80			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-6A**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER: Rob Ede SAMPLING METHOD: Stainless Steel Soil Sampler with PVC Sleeve DRILLING METHOD: Hydraulic Push Probe EQUIPMENT TYPE Geo-Probe DRILLER: Marcus Johnson DRILLING CONTRACTOR: Geo-Tech Explorations, Inc.	DRILL START Time: 14:30 Date: 08/02/01	DRILL FINISH Time: 18:00 Date: 08/02/01

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)
Bentonite Chips							1		GP
							2		
							3		SP
							4		
							5		
							6		
							7		SM
							8		
							9		
							10		
Bentonite Grout							11		SP
							12		
							13		
							14		
							15		
							16		concrete
							17		SP
							18		
							19		SM
							20		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: Not Measured
TOP OF CASING ELEVATION: Not Applicable

SOIL DESCRIPTION

Note: No soil samples collected. Pushed with well point directly to groundwater sample depths. See boring log for probe P-6 for soil description

Note: Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 16 to 20 feet bgs. Well point was dry. No groundwater sample was collected. The well point was removed from the borehole and the borehole was advanced.

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-6A**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 14:30 Date: 08/02/01	DRILL FINISH Time: 18:00 Date: 08/02/01
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Marcus Johnson		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)
Bentonite Grout							21		SP
							22		
							23		
							24		GP
							25		ML
							26		SM
							27		
							28		ML
							29		
	— Water Level measured for 32' - 36' bgs and 46' - 50' screen interval						30	▽	
							31		
							32		
							33		SP
							34		
							35		
							36		
							37		
							38		SM
							39		
							40		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: Not Measured
TOP OF CASING ELEVATION: Not Applicable

SOIL DESCRIPTION

Note: Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 20 to 24 feet bgs. The well point was dry. No groundwater sample was collected. The well point was removed from the borehole and the borehole was advanced.

GROUNDWATER SAMPLE
Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 32 to 36 feet bgs. Following the removal of approximately 1 quart of water, a groundwater sample (#5237-010802-300) was collected with disposable tubing/check valve at 16:30 hours, 8/2/01. Water level was measured at 30.0 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was advanced.

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-6A**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER: Rob Ede SAMPLING METHOD: Stainless Steel Soil Sampler with PVC Sleeve DRILLING METHOD: Hydraulic Push Probe EQUIPMENT TYPE Geo-Probe DRILLER: Marcus Johnson DRILLING CONTRACTOR: Geo-Tech Explorations, Inc.		DRILL START Time: 14:30 Date: 08/02/01	DRILL FINISH Time: 18:00 Date: 08/02/01

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)
Bentonite Grout							41		
							42		
							43		
							44		
							45		SP
							46		
							47		
							48		
							49		
							50		
							51		
							52		
							53		
							54		
							55		
							56		
							57		
							58		
							59		
							60		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: Not Measured
TOP OF CASING ELEVATION: Not Applicable

SOIL DESCRIPTION

GROUNDWATER SAMPLE
Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 46 to 50 feet bgs. Following the removal of approximately 1 quart of water, a groundwater sample (#5237-010802-301) was collected with disposable tubing/check valve at 17:55 hours, 8/2/01. Water level was measured at 30.0 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was abandoned.

Boring terminated at 50.0 feet bgs and sealed from base to 2 feet bgs with bentonite grout, and from 2 feet bgs to ground surface with bentonite chips.

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-7**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 8:45 Date: 08/08/01	DRILL FINISH Time: 13:30 Date: 08/08/01
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Marcus Johnson		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 34.98 feet msl
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	DEPTH (feet)	STRATA (USCS)	SOIL DESCRIPTION
BentoniteChips					1	SM	Surface: grass covered silty SAND, brown, dry, no hydrocarbon odor, no sheen (0 to 2.5 feet below ground surface (bgs)).
					2		
	059	8:50	3.4	-	3	SP	SAND - brown, dry, medium-grained, loose, no petroleum odor, no sheen (2.5 to 4.5 feet bgs).
					4		
					5	ML	Sandy SILT - grey, moist, plant debris wan wood fragments, no petroleum odor, no sheen (4.5 to 6.5 feet bgs).
					6		
	060	9:00	4.1	-	7	GP	Sandy GRAVEL with concrete - grey, moist to wet immediately above concrete, no petroleum odor, no sheen (6.5 to 7 feet bgs).
					8	SP	SAND with Gravel - grey, moist, medium grained sand, gravels (<5%) are up to 1/4-inch diameter, no petroleum odor, no sheen (7 - 12.5 feet bgs).
					9		
					10		
					11		
	061	9:10	6.1	-	12		
					13		Sandy SILT - grey, moist, non-plastic, plant debris and wood fragments at 13 feet bgs, minor plant matterfrom 13 to 14 feet bgs, rounded gravel (up to 1/2-inch diameter) below 13 feet bgs, no petroleum odor, no sheen (12.5 to 20 feet bgs).
	062	9:15	8.5	-	14		
					15		
Bentonite Grout					16	ML	
					17		
	063	9:20	16.0	-	18		
					19		
					20		

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-7**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 8:45	DRILL FINISH Time: 13:30
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Marcus Johnson	Date: 08/08/01	Date: 08/08/01
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
							21		SM	Silty SAND - grey, moist, no petroleum odor, no sheen (20 to 22.5 feet bgs).
							22			
	064/065	9:30	56.5	11,420			23		GM	Sandy Silty GRAVEL - brown to grey, petroleum odor (diesel?), sheen, several small patches of oil (22.5-24 feet bgs).
							24			
							25			Sandy Silty GRAVEL - as above, slight petroleum odor, slight sheen, no oil (24-25 feet bgs).
	066	9:38	6.9	-			26			SILT - tan with orange mottling, moist, becoming very moist below 28 feet bgs, slightly plastic, stiff, no petroleum odor, no sheen (25 to 32 feet bgs).
							27			
							28			
	067	9:42	7.8	-			29			
							30			
Bentonite Grout							31			
							32		ML	
							33			Sandy SILT - grey with orange mottling, very moist to slightly wet, non-plastic, no sheen, no petroleum odor (32-36.5 feet bgs).
	068	9:55	4.7	-			34			
							35			
							36			
							37			
	069	10:10	3.4	-			38			Sandy SILT - grey, moist, slightly-plastic, minor rootlets, no sheen, no petroleum odor (36.5-42 feet bgs).
							39			
							40			

BORING DIAMETER:	1.5-inch
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	34.98 feet msl
TOP OF CASING ELEVATION:	Not Applicable

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-7**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon	HAI LOGGER:	Rob Ede	DRILL START Time: 8:45	DRILL FINISH Time: 13:30
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Marcus Johnson	Date: 08/08/01	Date: 08/08/01
PROJECT #: 5237	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
							41			SAND - brown, wet, fine grained, several small shell fragments at 43 feet bgs, no petroleum odor, no sheen (40-44 feet bgs).
							42			
	070	10:45	3.4	-			43			SILT - grey, moist, non-plastic, stiff, rootlets, minor shell fragments, no petroleum odor, no sheen (44-49 feet bgs).
							44		ML	
							45			
							46			
							47			
	071	11:00	3.5	-			48			
							49			
							50			Silty SAND - olive grey, wet, fine grained, no petroleum odor, no sheen (49 to 52 feet bgs).
							51		SM	
	072	11:18	3.7	-			52			
							53		SP	SAND - grey, wet, medium grained, poorly graded, no petroleum odor, no sheen (52-53 feet bgs).
							54		SM	Silty SAND - olive grey, moist, fine grained, no petroleum odor, no sheen (53 to 53.5 feet bgs).
							55		SP	SAND - grey, wet, fine grained, poorly graded, minor muscovite, no petroleum odor, no sheen (53.6-56 feet bgs).
	073	11:45	3.8	-			56			
							57		ML	Sandy SILT - grey, moist to wet, no petroleum odor, no sheen (56 - 56.5 feet bgs).
							58		SM	Silty SAND - grey, moist to wet, no petroleum odor, no sheen (56.5 - 57.5 feet bgs).
	074	13:00	4.3	-			59		SP	SAND - grey, wet, fine grained, poorly graded, no petroleum odor, no sheen (57.5-60 feet bgs).
							60			

Bentonite Grout

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 34.98 feet msl
TOP OF CASING ELEVATION: Not Applicable

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-7**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 8:45 Date: 08/08/01	DRILL FINISH Time: 13:30 Date: 08/08/01
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Marcus Johnson		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 34.98 feet msl
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							61		SM	Silty SAND - grey, wet, very fine grained, poorly graded, no petroleum odor, no sheen (60 to 63 feet bgs).
							62			
							63			
	075	13:20	5.0	-			64		SP	SAND - grey, wet, fine grained, poorly graded, no petroleum odor, no sheen (63-64 feet bgs).
							65			Boring terminated at 64.0 feet bgs.
							66			*Sample prefix is 5237-010802-
							67			
							68			
							69			
							70			
							71			
							72			
							73			
							74			
							75			
							76			
							77			
							78			
							79			
							80			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-7A**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER: Rob Ede SAMPLING METHOD: Stainless Steel Soil Sampler with PVC Sleeve DRILLING METHOD: Hydraulic Push Probe EQUIPMENT TYPE Geo-Probe DRILLER: Marcus Johnson DRILLING CONTRACTOR: Geo-Tech Explorations, Inc.	DRILL START Time: 14:14 Date: 08/09/01	DRILL FINISH Time: 17:10 Date: 08/09/01	

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)
Bentonite Chips							1		SM
							2		
							3		SP
							4		
							5		ML
							6		
							7		GP
							8		SP
							9		
Bentonite Grout							10		
							11		
							12		
							13		ML
							14		
							15		
							16		
							17		
							18		
							19		
							20		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: Not Measured
TOP OF CASING ELEVATION: Not Applicable

SOIL DESCRIPTION

Note: No soil samples collected. Pushed with well point directly to groundwater sample depths. See boring log for probe P-7 for soil description

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-7A**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 14:14 Date: 08/09/01	DRILL FINISH Time: 17:10 Date: 08/09/01
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Marcus Johnson		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: Not Measured
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							21		SM	**Note:** Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 21 to 25 feet bgs. Well point was dry. No groundwater sample was collected. The well point was removed from the borehole and the borehole was advanced.
							22			
							23			
							24		GM	
							25			
							26			
							27			
							28			
							29			
							30			
							31		ML	
							32			
							33			
							34			
							35			
							36			
							37			
							38			
							39			
							40			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-7A**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 14:14 Date: 08/09/01	DRILL FINISH Time: 17:10 Date: 08/09/01
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Marcus Johnson		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: Not Measured
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							41		ML	
							42			
							43			
							44			
							45			
							46			
							47			
							48			
							49			
							50			
							51		SM	
							52			
							53		SP	
							54		SM	
							55			
							56		SP	
				Water Level measured for 58' - 62' bgs screen			57	▽	ML	
							58		SM	
							59		SP	
							60			

GROUNDWATER SAMPLE
Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 58 to 62 feet bgs. Following the removal of approximately 1 quart of water, a groundwater sample (#5237-010809-307) was collected with disposable tubing/check valve at 16:46 hours, 8/9/01. Water level was measured at 56.0 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was advanced.

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-7A**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER: Rob Ede SAMPLING METHOD: Stainless Steel Soil Sampler with PVC Sleeve DRILLING METHOD: Hydraulic Push Probe EQUIPMENT TYPE Geo-Probe DRILLER: Marcus Johnson DRILLING CONTRACTOR: Geo-Tech Explorations, Inc.		DRILL START Time: 14:14 Date: 08/09/01	DRILL FINISH Time: 17:10 Date: 08/09/01

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)
Bentonite Grout							61		SM
							62		
							63		
							64		SP
							65		
							66		
							67		
							68		
							69		
							70		
							71		
							72		
							73		
							74		
							75		
							76		
							77		
							78		
							79		
							80		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: Not Measured
TOP OF CASING ELEVATION: Not Applicable

SOIL DESCRIPTION

Boring terminated at 64.0 feet bgs and sealed from base to 1 foot bgs with bentonite grout, and from 1 foot bgs to ground surface with bentonite chips.

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-8**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 8:30	DRILL FINISH Time: 18:30
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Marcus Johnson	Date: 08/06/01	Date: 08/07/01
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	1.5-inch
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	34.50 feet msl
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
BentoniteChips							1		SM	Surface: grass covered silty SAND, brown, dry, slight petroleum odor at 2 feet bgs?, no sheen (0 to 2 feet below ground surface (bgs))
							2			
	031	8:40	1.0				3			SAND with Gravel - brown, slightly moist, fine-grained, minor (<1%) rounded gravel (up to 1/2-inch diameter), 6-inch diameter log at 12.5 bgs, underlain by 1-inch diameter angular basalt fragment, no petroleum odor, no sheen (2 to 12.5 feet bgs).
							4			
							5			
	032	8:45	0.8				6			
							7		SP	
							8			
							9			
	033	8:50	1.6				10			
							11			
							12			
							13		ML	SILT - brown, moist, no petroleum odor, no sheen (12.5 to 13.5 feet bgs).
							14			SAND - grey, moist, fine-grained, no petroleum odor, no sheen (13.5 to 17 feet bgs).
							15			
							16		SP	
	034	8:58	2.2				17			
							18			SILT - olive grey, slightly moist, several thin (<1-inch) very fine grained sand layers, no petroleum odor, no sheen (17 to 23.5 feet bgs).
							19		ML	
							20			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-8**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER: Rob Ede SAMPLING METHOD: Stainless Steel Soil Sampler with PVC Sleeve DRILLING METHOD: Hydraulic Push Probe EQUIPMENT TYPE Geo-Probe DRILLER: Marcus Johnson DRILLING CONTRACTOR: Geo-Tech Explorations, Inc.		DRILL START Time: 8:30 Date: 08/06/01	DRILL FINISH Time: 18:30 Date: 08/07/01

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 34.50 feet msl
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout	035	9:00	2.2				21–40	▼	ML	SAND - grey, moist, fine-grained, no petroleum odor, no sheen (23.5 to 24 feet bgs).
									SP	Silty SAND - grey, very moist, no petroleum odor, no sheen (24 to 24.5 feet bgs).
									SM	SAND with Gravel - brown becoming grey below 25 feet bgs, moist becoming wet below 28.5 feet bgs, medium-grained, wood fragments, no petroleum odor, no sheen (24.5 to 31.5 feet bgs).
	036	9:10	2.6						SP	
	037	9:15	2.4							Silty SAND - grey, wet, minor wood fragments, slight sheen, slight reducing odor (31.5-36 feet bgs).
	038	9:30	1.8						SM	Silty SAND - brown, wet, minor plant matter, thin layers (<3-inches thick) of very fine-grained sand at 41.5 feet bgs and 43 feet bgs, no sheen, no petroleum odor (36-45 feet bgs).

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-8**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 8:30	DRILL FINISH Time: 18:30
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Marcus Johnson	Date: 08/06/01	Date: 08/07/01
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 34.50 feet msl
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							41		SM	
							42			
	039	10:20	2.9				43			
							44			
							45			
							46		SP	SAND - brown, wet, very fine grained, no petroleum odor, no sheen (45-46.5 feet bgs).
	040	10:45	2.6				47		ML	Sandy SILT - brown, moist, non-plastic, no petroleum odor, no sheen (46.5 to 47.5 feet bgs).
							48		SM	Silty SAND - brown, moist, no petroleum odor, no sheen (47.5 to 48 feet bgs).
							49			SAND - brown, wet, fine-grained, poorly graded, minor muscovite, no petroleum odor, no sheen (48-55 feet bgs).
							50			
Probe Rod	041	11:05	2.9				51			
							52			
							53		SP	
							54			
							55			
Bentonite Grout	042	11:30	2.7				56			SAND - as above, medium-grained, no petroleum odor, no sheen (48-59 feet bgs).
							57			
							58			
	043	12:35	2.1				59			
							60			SAND - as above, fine-grained, no petroleum odor, no sheen (59-63.5 feet bgs).

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-8**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 8:30 Date: 08/06/01	DRILL FINISH Time: 18:30 Date: 08/07/01
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Marcus Johnson		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							61		SP	
							62			
							63			
	044	13:12	1.8				64		ML	Sandy SILT - brown, moist, non-plastic, brown, fine-grained sand in botton of sampler, no petroleum odor, no sheen (63.5-64 feet bgs).
							65			
							66			
							67			
							68			
							69			
							70			
							71			
							72		SP	
Bentonite Grout							73			
							74			
							75			
							76			NOTE: At 13:45 try releasing pin for soil sampler. Pin will not release so trip out of hole, clean sampler, and back down hole for 76 to 80 foot sample at 14:10. No sample recovery at 76 to 80 feet bgs. Driller indicates likely presence of dense sands (a lot of hammering needed to advance soil sampler).
							77			
							78			
Probe Rod							79			
							80			

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 34.50 feet msl
TOP OF CASING ELEVATION: Not Applicable

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-8**			
	HAI LOGGER:	Rob Ede	DRILL START	DRILL FINISH
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve	Time: 8:30	Time: 18:30
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Marcus Johnson	Date: 08/06/01	Date: 08/07/01
PROJECT #: 5237	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)
Soil Sampler							81		SP
							82		
							83		
							84		
							85		
							86		bedrock?
							87		
							88		
							89		
							90		
							91		
							92		
							93		
							94		
							95		
							96		
							97		
							98		
							99		
							100		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 34.50 feet msl
TOP OF CASING ELEVATION: Not Applicable

SOIL DESCRIPTION

NOTE: At 15:40 8/6/01 had refusal at 86 feet bgs on very hard surface (bedrock?). Hammering caused threads on probe rod to shear and pulled the probe eqipment out of the tracking. Probe rig to shop for maintenance.

8/7/01 8:35 Recovered all but the lower 32 feet of probe rod and the 4-foot soil sampler from the bore hole. Soil sampler (4-foot length) and rod are stuck at base of hole. Cannot fish out. Pressure grouted hole with tremie tube from top of sampler (82 feet bgs) to 20 feet bgs, placed bentonite chips from top of grout seal (20 feet bgs) to ground surface.

Boring terminated at 86.0 feet bgs.

*Sample prefix is 5237-010806-

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-8A**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 8:30 Date: 08/06/01	DRILL FINISH Time: 18:30 Date: 08/07/01
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Marcus Johnson		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)
Bentonite Chips							1		SM
							2		
							3		SP
							4		
							5		
							6		
							7		
							8		
							9		
Bentonite Grout							10		
							11		
							12		
							13		ML
							14		
							15		SP
							16		
							17		
							18		ML
							19		
							20		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: Not Measured
TOP OF CASING ELEVATION: Not Applicable

SOIL DESCRIPTION

Note: No soil samples collected. Pushed with well point directly to groundwater sample depths. See boring log for probe P-8 for soil description

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-8A**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 8:30 Date: 08/06/01	DRILL FINISH Time: 18:30 Date: 08/07/01
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Marcus Johnson		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	1.5-inch
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Measured
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							21		ML	
							22			
							23			
							24		SP	
							25		SM	
							26			
							27			
							28		SP	**GROUNDWATER SAMPLE** Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 28 to 32 feet bgs. Following the removal of approximately 1 quart of water, a groundwater sample (#5237-010809-304) was collected with disposable tubing/check valve at 9:56 hours, 8/9/01. Water level was measured at 29.5 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was advanced.
							29			
	Water Level measured for 28' - 32' bgs screen						30			
							31			
							32			
							33			
							34			
							35			
							36		SM	
							37			
							38			
							39			
							40			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-8A**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER: Rob Ede SAMPLING METHOD: Stainless Steel Soil Sampler with PVC Sleeve DRILLING METHOD: Hydraulic Push Probe EQUIPMENT TYPE Geo-Probe DRILLER: Marcus Johnson DRILLING CONTRACTOR: Geo-Tech Explorations, Inc.		DRILL START Time: 8:30 Date: 08/06/01	DRILL FINISH Time: 18:30 Date: 08/07/01

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: Not Measured
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							41		SM	
							42			
							43			
	Water Level measured for 80' - 84' bgs screen						44	▽		
							45			
							46		SP	
							47		ML	
							48		SM	
							49			
	Water Level measured for 50' - 54' bgs screen						50	▽		
							51			
							52			
							53		SP	
							54			
							55			
							56			
							57			
							58			
							59			
							60			

GROUNDWATER SAMPLE
Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 50 to 54 feet bgs. Following the removal of approximately 1 quart of water, a groundwater sample (#5237-010809-305) was collected with disposable tubing/check valve at 11:03 hours, 8/9/01. Water level was measured at 29.5 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was advanced.

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-8A**			
	HAI LOGGER:	Rob Ede	DRILL START	DRILL FINISH
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve	Time: 8:30	Time: 18:30
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Marcus Johnson	Date: 08/06/01	Date: 08/07/01
PROJECT #: 5237	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)
Bentonite Grout							61		SP
							62		
							63		
							64		ML
							65		
							66		
							67		
							68		
							69		
							70		
							71		
							72		SP
							73		
							74		
							75		
							76		
							77		
							78		
							79		
							80		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: Not Measured
TOP OF CASING ELEVATION: Not Applicable

SOIL DESCRIPTION

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-8A**			
	HAI LOGGER:	Rob Ede	DRILL START	DRILL FINISH
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve	Time: 8:30	Time: 18:30
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Marcus Johnson	Date: 08/06/01	Date: 08/07/01
PROJECT #: 5237	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)
Bentonite Grout							81		
							82		
							83		SP
							84		
							85		
							86		
							87		bedrock?
							88		
							89		
							90		
							91		
							92		
							93		
							94		
							95		
							96		
							97		
							98		
							99		
							100		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: Not Measured
TOP OF CASING ELEVATION: Not Applicable

SOIL DESCRIPTION

GROUNDWATER SAMPLE
Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 80 to 84 feet bgs. Following the removal of approximately 1 quart of water, a groundwater sample (#5237-010809-306) was collected with disposable tubing/check valve at 12:36 hours, 8/9/01. Water level was measured at 44.0 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was abandoned.

Boring terminated at 84.0 feet bgs and sealed from base to 1 foot bgs with bentonite grout, and from 1 foot bgs to ground surface with bentonite chips.

HAI

Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-8a	Date(s): **4/29/08**
Location: **7200 NW Front Avenue, Portland, Oregon**	
Logged By: **Ben Uhl**	Checked By: **Rob Ede**
Driller: **Boart Longyear E & I Division**	
Drilling Method: **Geoprobe 6600 - direct push**	GS Elevation: **34.5** / TOC: Not Applicable
Sampling Method: **Macrocore**	Northing: **704360.00** / Easting: **7625900.00**
Well Construction:	Borehole Dia.: **2.5 inches** / Total Depth: **5.0 feet bgs**
Blank Casing: NA — NA	Project Number: **5237**
Screen: NA — NA	Project Name: **Remedial Investigation - Siltronic Corporation**
Annular Fill: 3/8" Bentonite Chips — 0-5 feet	Remarks: **City of Portland Datum**
Sample Prefix: 5237-080429-XXX	

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
30	1							SP	**0.0 - 0.5 Feet:** SAND, brown, wet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration.		
								ML	**0.5 - 1.8 Feet:** sandy SILT, gray, moist, soft, non-plastic, no odor, no sheen, no discoloration.		
	2		161 (0-3) 161G (2.0')	2.5 (0-5)				SP	**1.8 - 2.0 Feet:** SAND with small black soft ductile tar fragments and hard brittle tar fragments mixed throughout interval, no odor, no sheen, no discoloration.		
	3								**2.0 - 2.5 Feet:** SAND, gray, moist, fine grained, loose, poorly graded, no odor, no sheen, no discoloration.		
	4								**2.5 - 5.0 Feet:** No Recovery.		
	5								End of Boring at 5.0 feet below ground surface.		
25											
20											
15											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-9**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 9:45 Date: 08/07/01	DRILL FINISH Time: 15:20 Date: 08/07/01
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Marcus Johnson		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 34.84 feet msl
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	DEPTH (feet)	STRATA (USCS)	SOIL DESCRIPTION
BentoniteChips					1	GP	Surface: asphalt with 6-inch gravel base (0 to 0.5 foot below ground surface (bgs)).
	145	9:55	0.6	-	2		SAND with Gravel - brown, dry, fine-grained, minor (<1%) rounded and angular gravel (up to 1-inch diameter), minor rootlets from 4 to 8 feet bgs, no petroleum odor, no sheen (0.5 to 8 feet bgs).
					3		
					4		
					5		
					6		
	046	9:58	0.7	-	7		
					8		
					9		SAND with Gravel - brown, slightly moist, fine-grained, minor (<1%) rounded and angular gravel (up to 2-inch diameter),no petroleum odor, slight sheen (8 to 12 feet bgs).
					10	SP	
	047	10:03	0.8	-	11		
					12		
					13		SAND with Gravel - as above,becoming fully moist at 18 feet bgs, no petroleum odor, no sheen (12 to 21 feet bgs).
					14		
	048	10:06	1.1	-	15		
					16		
					17		
					18		
	049	10:15	1.2	-	19		
					20		

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-9**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 9:45 Date: 08/07/01	DRILL FINISH Time: 15:20 Date: 08/07/01
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Marcus Johnson		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 34.84 feet msl
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	DEPTH (feet)	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout	050	10:25	1.5	ND	21	SP	
					22	GM	Sandy Silty GRAVEL - grey, moist, slight sheen, no petroleum odor (21-22.5 feet bgs).
					23	SP	SAND - grey, moist, fine-grained, wood fragments, no petroleum odor, no sheen (22.5 to 24 feet bgs).
					24	ML	Sandy SILT - grey, moist, no petroleum odor, no sheen (24 to 24.5 feet bgs).
					25	SP	SAND - grey, moist, fine-grained, no petroleum odor, no sheen (24.5 to 25.5 feet bgs).
	051	10:35	1.5	-	26	SM	Silty SAND - grey, moist, minor shell fragments, no petroleum odor, no sheen (25.5-28 feet bgs).
					27		
					28		
					29	ML	SILT - olive grey, moist, non-plastic, minor plant matter, no petroleum odor, no sheen (28-28.5 feet bgs).
					30	SP	SAND - grey, very moist, fine-grained, woody matter and shell fragments, no petroleum odor, no sheen (28.5 to 29 feet bgs).
	052	11:05	1.6	-	31	ML	SILT - olive grey, moist, non-plastic, minor plant matter, no petroleum odor, no sheen (29-30.5 feet bgs).
					32		SAND - grey, wet, fine-grained, no petroleum odor, no sheen (30.5 to 34.5 feet bgs).
					33	SP	
					34		
	053	11:15	1.2	-	35	ML	SILT - olive grey, very moist, slightly plastic, no petroleum odor, no sheen (34.5-36 feet bgs).
					36		
					37	SP	SAND - grey, wet, fine-grained, several thin (<2-inches thick) silt layers, several 1-inch diameter gravels from 40 to 42 feet bgs, no petroleum odor, no sheen (36 to 42 feet bgs).
					38		
	054	11:45	1.5	-	39		
					40		

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-9**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 9:45 Date: 08/07/01	DRILL FINISH Time: 15:20 Date: 08/07/01
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Marcus Johnson		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 34.84 feet msl
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							41		SP	
	055	12:15	1.7	-			42			Silty SAND - tan, wet, very fine-grained, minor muscovite, no sheen, no petroleum odor (42-50.5 feet bgs).
							43			
							44			Note: Driller accidentally pushed through the 44 to 48 feet bgs depth interval without collecting a soil sample.
							45			
							46		SM	
							47			
							48			
	056	13:30	1.3	-			49			
							50			
							51			SAND - brown, moist, fine-grained, poorly graded, minor muscovite, no petroleum odor, no sheen (50.5-53 feet bgs).
							52			
							53		SP	
	057	14:00	1.5	-			54			SAND - grey, wet, fine-grained, poorly graded, minor muscovite, woody material present, no petroleum odor, no sheen (53-56 feet bgs).
							55			
							56			
							57			Silty SAND - brown, very moist to wet, very fine-grained, no petroleum odor, no sheen (56-61 feet bgs).
							58			
							59		SM	
							60			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-9**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 9:45 Date: 08/07/01	DRILL FINISH Time: 15:20 Date: 08/07/01
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Marcus Johnson		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 34.84 feet msl
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							61		SM	SAND - brown, wet, fine-grained, poorly graded, no petroleum odor, no sheen (53-56 feet bgs).
							62			
	058	15:00	1.4	-			63		SP	
							64			
							65			Boring terminated at 64.0 feet bgs.
							66			*Sample prefix is 5237-010807-
							67			
							68			
							69			
							70			
							71			
							72			
							73			
							74			
							75			
							76			
							77			
							78			
							79			
							80			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-9A**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 15:41	DRILL FINISH Time: 17:00
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Heriberto Ramirez	Date: 08/16/01	Date: 08/16/01
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)
BentoniteChips							1		GP
							2		
							3		
							4		
							5		
							6		
							7		
							8		
							9		
							10		SP
							11		
							12		
							13		
							14		
							15		
							16		
							17		
							18		
							19		
							20		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: Not Measured
TOP OF CASING ELEVATION: Not Applicable

SOIL DESCRIPTION

Note: No soil samples collected. Pushed with well point directly to groundwater sample depths. See boring log for probe P-9 for soil description

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-9A**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 15:41 Date: 08/16/01	DRILL FINISH Time: 17:00 Date: 08/16/01
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Heriberto Ramirez		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: Not Measured
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							21		SP	
							22		GM	
							23		SP	
							24		ML	
							25		SP	
							26		SM	
							27			
							28		ML	
							29		SP	
							30		ML	
	Water Level measured for 31' - 35' bgs screen						31	▽		
							32		SP	
							33			
							34			
							35		ML	
							36			
							37		SP	
							38			
							39			
							40			

GROUNDWATER SAMPLE
Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 31 to 35 feet bgs. Following the removal of approximately 1 quart of water, a groundwater sample (#5237-010816-320) was collected with disposable tubing/check valve at 17:20 hours, 8/16/01. Water level was measured at 30.4 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was abandoned.

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-10**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 11:35	DRILL FINISH Time: 15:00
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Marcus Johnson	Date: 08/03/01	Date: 08/03/01
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	1.5-inch
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	34.92 feet msl
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	DEPTH (feet)	STRATA (USCS)	SOIL DESCRIPTION
BentoniteChips					1	GP	Surface: grass covered silty SAND with Gravel, brown, dry, no petroleum odor, no sheen (0 to 5 feet below ground surface (bgs)).
					2		
	017	11:40	2.0	-	3	SM	SAND with Gravel - brown, dry, fine-grained, minor (<1%) rounded and angular gravel (up to 1-inch diameter), minor rootlets from 4 to 8 feet bgs, no petroleum odor, no sheen (0.5 to 8 feet bgs).
					4		
					5		
					6		SAND - brown and grey, slightly moist, fine to medium grained, several thin silt layers, no petroleum odor, no sheen (8 to 10 feet bgs).
	018	11:45	1.8	-	7		
					8	SP	
					9		
					10		
	019	11:50	2.1	-	11		SILT - olive grey, very moist, soft, slightly plastic, small wood fragment at 14.5 feet bgs, no petroleum odor, no sheen (10 to 17 feet bgs).
					12		
					13		
					14	ML	
	020	12:00	2.4	-	15		
					16		
					17		
					18		Sandy SILT with Gravel - grey with brown mottling, moist, gravels up to 1/4-inch diameter, no petroleum odor, no sheen (17 to 19 feet bgs).
					19		
	021	12:05	3.0	-	20	SP	SAND - grey, moist, medium grained, several thin silt layers,no petroleum odor, no sheen (19 to 20 feet bgs).

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-10**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER: Rob Ede SAMPLING METHOD: Stainless Steel Soil Sampler with PVC Sleeve DRILLING METHOD: Hydraulic Push Probe EQUIPMENT TYPE Geo-Probe DRILLER: Marcus Johnson DRILLING CONTRACTOR: Geo-Tech Explorations, Inc.		DRILL START Time: 11:35 Date: 08/03/01	DRILL FINISH Time: 15:00 Date: 08/03/01

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 34.92 feet msl
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	DEPTH (feet)	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout	022	12:10	3.2	-	21–24	ML	Sandy SILT with Gravel and Cobble - grey, moist, few pieces of wood fragments, no sheen, no petroleum odor (20-24 feet bgs).
					25	SM	Silty SAND with Gravel- grey, moist, pieces of burned wood fragments, abrupt color change at 26.5 feet bgs, no petroleum odor, no sheen (24-26.5 feet bgs).
	023	12:15	3.2	ND	26–28	ML	SILT - tan with orange mottling, slightly moist, slightly plastic, stiff, minor wood fragments between 28 and 32 feet bgs, no petroleum odor, no sheen (26.5-35.5 feet bgs).
	024	12:20	2.3	ND	29–35		
	025	12:30	2.4	-	36	SM	Silty SAND -tan, very moist, no petroleum odor, no sheen (35.5-36 feet bgs).
					37	SP	SAND - brown, wet, fine-grained, minor muscovite, no petroleum odor, no sheen (36 to 37.5 feet bgs).
	026	12:45	2.8	-	38–40	SM	Silty SAND -brown, very moist to wet, several 2 to 4-inch thick fine-grained sand layers, no petroleum odor, no sheen (37.5-41 feet bgs).

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-10**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 11:35 Date: 08/03/01	DRILL FINISH Time: 15:00 Date: 08/03/01
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Marcus Johnson		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 34.92 feet msl
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)
Bentonite Grout							41		SM
							42		
							43		
	027	12:55	2.6	-			44		
							45		
							46		
							47		SP
							48		
							49		
							50		
	028	13:30	2.6	-			51		
							52		
							53		
							54		
							55		
	029	14:00	2.6	-			56		
							57		SP
							58		
							59		
							60		

SOIL DESCRIPTION

SAND - brown, wet, fine-grained, poorly graded, minor muscovite, several thin (2 to 4-inch thick) silt layers between 48 and 52 feet bgs, no petroleum odor, no sheen (41-64 feet bgs).

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-10**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER: Rob Ede SAMPLING METHOD: Stainless Steel Soil Sampler with PVC Sleeve DRILLING METHOD: Hydraulic Push Probe EQUIPMENT TYPE Geo-Probe DRILLER: Marcus Johnson DRILLING CONTRACTOR: Geo-Tech Explorations, Inc.		DRILL START Time: 11:35 Date: 08/03/01	DRILL FINISH Time: 15:00 Date: 08/03/01

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 34.92 feet msl
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							61		SP	
							62			
							63			
	030	14:55	-	-			64			
							65			Boring terminated at 64.0 feet bgs. *Sample prefix is 5237-010803-
							66			
							67			
							68			
							69			
							70			
							71			
							72			
							73			
							74			
							75			
							76			
							77			
							78			
							79			
							80			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER P-11**			
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT #: 5237	HAI LOGGER:	Rob Ede	DRILL START Time: 9:15 Date: 08/17/01	DRILL FINISH Time: 9:50 Date: 08/17/01
	SAMPLING METHOD:	Stainless Steel Soil Sampler with PVC Sleeve		
	DRILLING METHOD:	Hydraulic Push Probe		
	EQUIPMENT TYPE	Geo-Probe		
	DRILLER:	Marcus Johnson		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 35.05 feet msl
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	DEPTH (feet)	STRATA (USCS)	SOIL DESCRIPTION
BentoniteChips					1	GP	Surface: asphalt with 4-inch gravel base (0 to 0.5 foot below ground surface (bgs)).
					2		SAND with Gravel - brown, dry, minor (<1%) gravel, no petroleum odor, no sheen (0.5 to 7 feet bgs).
	130	9:20	0.3	-	3		
					4		
					5		
					6		
	131	9:25	1.0	-	7		
					8	SP	SAND with Gravel - brown, dry, 1-inch thick discolored zone at 7 feet bgs and 8.5 feet bgs, slight petroleum odor, slight sheen (7 to 13.5 feet bgs).
	132	9:28	1.6	-	9		
					10		
					11		
					12		
					13		
					14		Silty SAND with Gravel - grey, slightly moist, no petroleum odor, no sheen (13.5 16 feet bgs).
	133	9:36	1.6	-	15	SM	
					16		
					17		Sandy SILT - olive grey, moist, several thin (<1-inch) fine grained sand layers, non-plastic, no petroleum odor, no sheen (16 to 20 feet bgs).
					18		
	134	9:40	2.4	-	19	ML	Boring terminated at 20.0 feet bgs.
					20		*Sample prefix is 5237-010817-

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-12		Date(s): **4/14/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **41.7728**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **703957.97**	Easting: **7623940.07**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **25.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/8" Bentonite Chips	0-25 feet	Remarks: **City of Portland Datum**	
Sample Prefix: 5237-080414-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
40	1		001 (0-3)	3 (0-5)	(+)	14.2		GM	**0.0 - 1.5 Feet** gravelly SILT, brown and becoming black below 1.0 foot, moist, soft, non-plastic. Gravels are medium grained, sub-angular. Oil-like odor present with sheen on black portions and black staining from 1.0 to 1.5 feet, but no visible oil or tar.		
	2		001G (2.5')					SM	**1.5 - 3.0 Feet:** silty SAND with some Gravel, black, moist, fine grained, loose, non-plastic, poorly graded, sheen present in water during sheen test, but no visible oil or tar. Gravels are medium grained, sub-angular, with oil odor, and black staining. UV shows fluorescence.		
	3										
	4								**3.5 - 5 Feet:** No Recovery.		
	5							SP	**5.0 - 7.0 Feet:** SAND, gray turning black at 5.5 feet, moist, fine grained, loose, poorly graded. Oil-like odor and sheen present with small amounts of thick, black, viscous oil present from 5.5 to 7.0 feet. UV shows fluorescence.		
35	6		002 (5-7.5) 002G (6.5')		(+)	94					
	7							ML	**7.0 - 7.5 Feet:** SILT, gray, moist, soft, low plasticity. Oil-like odor present with sheen and black smearing.		
	8			3.5 (5-10)				SP	**7.5 - 8.5 Feet:** SAND, brown and black, fine grained, loose, poorly graded, oil-like odor and sheen present.		
	9								**8.5 - 10.0 Feet:** No Recovery.		
	10		003 (10-11)					ML	**10.0 - 12.0 Feet:** SILT with 1" diameter gravels present at 12.0 feet, black, moist, soft, brick fragments present, sheen present. Wood chips present with minor blue appearance.		
30	11										
	12							ML	**12.0 - 12.5 Feet:** gravelly SILT, brown with black mottling, moist, soft, non-plastic. Oil odor and sheen present. Gravel is coarse grained, sub-angular, approximately 1 inch diameter.		
	13		004 (12.5-13.5)	4 (10-15)	(-)	3.2		SM	**12.5 - 14.0 Feet:** silty SAND with some Gravel, brown and black, moist becoming wet below 13 feet, fine grained, moderate grading. Oil-like odor and sheen present. Gravel is coarse grained, sub-angular with some brick fragments. UV shows no fluorescence.	▽	
	14										
	15							GM	**14.0 - 15.0 Feet:** No Recovery.		
	16								**15.0 - 16.0 Feet:** GRAVEL with some Silt, wet, coarse grained, angular, flat		
25	17		005 (16.5-17)					ML	**16.0 - 17.0 Feet:** SILT with some Gravel, black, moist becoming wet with depth, non-plastic. Oil-like odor and sheen present. Wood chips (approximately 1" x 1/8" x 1/8") present throughout with dark brown to black coloration, non-viscous oil blebs coating wood chips from 16.8 to 17.0 feet.		
	18			2 (15-20)					**17.0 - 20.0 Feet:** No Recovery.		
	19										

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-12
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
20	21							OH	**20.0 - 20.2 Feet:** Wood chips/fragments as above, with coating of brown to black viscous oil, oil-like odor and sheen present.		
	22							ML	**20.2 - 24.0 Feet:** SILT, brown, wet, soft, low plasticity. Mild oil-like odor and sheen present, but no visible oil. UV shows no fluorescence.		
	23	X	006 (22.5-24)	4 (20-25)	(-)	0.0					
	24								**24.0 - 25.0 Feet:** No Recovery.		
	25								End of boring at 25.0 feet below ground surface.		
15											
10											
5											
0											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-13		Date(s): **4/14/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **41.7062**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **703612.56**	Easting: **7624164.56**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **20.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/8" Bentonite Chips	0-20 feet	Remarks: **City of Portland Datum**	
Sample Prefix: 5237-080414-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
40	1							GM	**0.0 - 3.5 Feet:** gravelly SILT, brown becoming gray at 1.5 feet, moist, soft, non-plastic. Gravel is coarse grained, sub-angular. No odor, sheen, or discoloration to 1.5 feet then mild oil-like odor and sheen present during sheen test from 1.5 to 3.5 feet.		
	2		007 (0-3) 007G (2.5)								
	3			3.5 (0-5)							
	4								**3.5 - 5.0 Feet:** No Recovery.		
	5							GM	**5.0 - 6.0 Feet:** gravelly SILT, as above. Mild oil-like odor and sheen present.		
	6				(-)	0.0		SP	**6.0 - 8.0 Feet:** SAND, brown, moist, fine grained, loose, poorly graded. No odor, but minor sheen present. Wood chips encountered at 7.8 feet. UV shows no fluorescence.		
35	7										
	8			3 (5-10)					**8.0 - 10.0 Feet:** No Recovery.		
	9										
	10							SP	**10.0 - 12.5 Feet:** SAND with some Gravel, gray, moist, fine grained, loose, poorly graded. Gravel is coarse grained and sub-angular. No odor, no sheen, no discoloration present. UV shows no fluorescence.		
	11		008 (10-12) 008G (11.5)		(-)	0.0					
30	12										
	13			2.5 (10-15)					**12.5 - 15.0 Feet:** No Recovery.		
	14										
	15							SP	**15.0 - 17.0 Feet:** SAND, gray, wet, coarse grained, loose, poorly graded, no odor, no sheen, no discoloration.	▽	
	16		009 (15-17)								
25	17							ML	**17.0 - 19.0 Feet:** SILT, gray, wet, soft, non-plastic, no odor, no sheen, no discoloration.		
	18			4 (15-20)							
	19								**19.0 - 20.0 Feet:** No Recovery.		
	20								End of boring at 20 feet below ground surface.		

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-14		Date(s): **4/14/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **42.8012**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **703176.73**	Easting: **7624418.29**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **20.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/8" Bentonite Chips	0-20 feet	Remarks: **City of Portland Datum**	
Sample Prefix: 5237-080414-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	1		010 (0-3) 010G (2.5)	4 (0-5)	(-)	0.0		ML	**0.0 - 3.0 Feet:** SILT with some Gravel, brown, moist, soft, non-plastic, no odor, no sheen, no discoloration. Gravel is medium grained, sub-angular.		
	2										
40	3							SM	**3.0 - 4.0 Feet:** silty SAND, gray, moist, fine-grained, loose, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	4								**4.0 - 5.0 Feet:** No Recovery.		
	5							ML	**5.0 - 6.0 Feet:** SILT with some Gravel and Sand, gray, moist, soft, no odor, no sheen, no discoloration. Gravel is coarse grained.		
	6							SP	**6.0 -9.0 Feet:** SAND, brown, moist, fine grained, poorly graded, with 1" diameter gravel at 8.0 feet. No odor, but sheen present when wetted. UV shows no fluorescence.		
	7										
35	8			4 (5-10)							
	9				(-)	0.0			**9.0 - 10.0 Feet:** No Recovery.		
	10							SP	**10.0 -13.5 Feet:** SAND, brown, moist, fine grained, poorly graded, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	11										
	12		011 (12-13.5) 011G (13)								
30	13			3.5 (10-15)	(-)	0.0					
	14								**13.5 - 15.0 Feet:** No Recovery.		
	15							ML	**15.0 - 18.5 Feet:** SILT, gray, moist, soft, non-plastic, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	16										
	17										
25	18			3.5 (15-20)	(-)	0.0					
	19								**18.5 - 20.0 Feet:** No Recovery.		
	20								End of boring at 20.0 feet below ground surface.		

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-15		Date(s): **4/14/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **36.7587**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **702897.65**	Easting: **7624792.98**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **25.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/8" Bentonite Chips	0-25 feet	Remarks: **City of Portland Datum**	
Sample Prefix: 5237-080414-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
35	1		012 (0-2.5) 012G (2)	2.5 (0-5)	(-)	0.0		ML	**0.0 - 0.5 Feet:** SILT with some Gravel, brown, moist, soft, non-plastic, no odor, no sheen, no discoloration.		
	2							SP	**0.5 - 2.0 Feet:** SAND, brown, moist, fine grained, loose, poorly graded, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	3							ML	**2.0 - 2.5 Feet:** SILT, gray, moist, soft, low plasticity, no odor, no sheen, no discoloration.		
	4								**2.5 - 5.0 Feet:** No Recovery.		
	5							ML	**5.0 - 5.5 Feet:** SILT, brown, moist, soft, low plasticity, no odor, no sheen, no discoloration.		
	6							SP	**5.5 - 8.0 Feet:** SAND, brown, moist, fine grained, loose, poorly graded, no odor, no sheen, no discoloration. UV shows no fluorescence.		
30	7			3 (5-10)	(-)	0.0					
	8								**8.0 - 10.0 Feet:** No Recovery.		
	9										
	10							SP	**10.0 - 13.0 Feet:** SAND, as above. UV shows some fluorescence.		
	11										
25	12			3 (10-15)	(-)	0.0					
	13								**13.0 - 15.0 Feet:** No Recovery.		
	14										
	15							SP	**15.0 - 19.0 Feet:** SAND, as above, becoming wet below 15.0 feet and gray below 18.0 feet. UV shows no fluorescence.	▽	
	16										
20	17			4 (15-20)	(-)	0.0					
	18		013 (17-19) 013G (18.5)								
	19								**19.0 - 20.0 Feet:** No Recovery.		

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-15
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
15	21							ML	**20.0 - 24.0 Feet:** SILT, brownish gray with increasing brown color with depth, wet, soft, low plasticity, tar-like smears and odor present, ductile from 22.0 to 23.0 feet, sheen present in water during sheen test, wood fragments present. UV shows no fluorescence.		
	22		014 (20-24)	4.5 (20-25)	(-) (-)	10.8					
	23										
	24								**24.0 - 25.0 Feet:** No Recovery.		
	25								End of boring at 25.0 feet below ground surface.		
10											
5											
0											
-5											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-16		Date(s): **4/30/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **37.8853**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **704243.18**	Easting: **7623947.30**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **25.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/8" Bentonite Chips	0-25 feet	Remarks: **City of Portland Datum**	
Sample Prefix: 5237-080430-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	1		176 (0-3) 176G (2)	4 (5-10)	(-)	1.9		ML	**0.0 - 1.0 Feet :** gravelly SILT, brown, moist, soft, non-plastic, no odor, no sheen, no discoloration. Gravel is coarse grained, sub-angular.		
	2							SP	**1.0 - 1.4 Feet :** SAND, moist, fine grained, loose. Tar present with heavy odor, sheen present in water during sheen test. Tar fragments are black, fine, non-ductile, dry.		
35	3							ML	**1.4 - 2.4 Feet:** SAND, brown, no tar, no odor, no sheen, no discoloration.		
	4								**2.4 - 3.4 Feet:** sandy SILT, gray, moist, soft, non-plastic, no odor, no sheen, no discoloration. UV shows mild patchy fluorescence.		
	5								**3.4 - 5.0 Feet:** No Recovery.		
	6							ML	**5.0 - 9.5 Feet:** SILT with some Gravel and tar, black, moist, soft, non-plastic. Gravel is coarse grained, sub-angular. Strong tar-like odor, heavy sheen present in water during sheen test, soils discolored black. Tar is a black, moist, plastic solid. UV shows heavy patchy fluorescence.		
	7			4.5 (5-10)							
30	8		177 (7.5-9.5) 177G (9.5)		(+)	37.8					
	9								**9.5 - 10.0 Feet:** No Recovery.	▽	
	10		178 (10-12) 178G (12)					ML	**10.0 - 12.0 Feet:** gravelly SILT with tar and splintered wood fragments, black, wet, non-plastic. Gravel is coarse grained, sub-angular. Tar is solid to semi-solid with viscous oil component.		
	11				(+)	45.9					
	12							SP	**12.0 - 12.5 Feet:** SAND, wet, fine grained, loose, poorly graded. Tar and black viscous oil present throughout. UV shows heavy patchy fluorescence.		
25	13			3 (10-15)				ML	**12.5 - 13.0 Feet:** SILT with tar, gray, moist, soft, odor present, sheen present, discolored. Tar is sticky, black, and solid.		
	14								**13.0 - 15.0 Feet:** No Recovery.		
	15							SP	**15.0 - 16.0 Feet:** SAND with gravel and tar, black, wet, fine grained, loose, poorly graded, odor present, sheen present, discolored. Tar is solid, black, sticky, with some pitch incorporated (granular, coal-like).		
	16							ML	**16.0 - 20.0 Feet:** SILT, gray, wet, soft, low plasticity, no odor, no sheen, no discoloration below 16.4 feet. black solid sticky tar mixed in to silt to 16.4 feet. UV shows no fluorescence.		
	17										
20	18			5 (15-20)	(-)	0.0					
	19		179 (18-20)								

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-16
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	21							ML	**20.0 - 21.0 Feet:** gravelly SILT with some Sand, dark brown, wet, soft, non-plastic, odor present, sheen present in water during sheen test. Gravel is coarse grained, sub-angular, coated with brown oil (non-viscous).		
	22		180 (21-23)	3 (20-25)	(-)	0.0		ML	**21.0 - 23.0 Feet:** SILT, brownish gray, moist, soft, non-plastic, root matter mixed throughout, no odor, no sheen, no discoloration. UV shows no fluorescence.		
15	23								**23.0 - 25.0 Feet:** No Recovery.		
	24										
	25								End of boring at 25.0 feet below ground surface.		
10											
5											
0											
-5											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-17		Date(s): **4/25/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **35.6106**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **703842.03**	Easting: **7624287.71**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **35.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/8" Bentonite Chips	0-35 feet	Remarks: **City of Portland Datum**	
Sample Prefix: 5237-080425-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
35	1		121 (0-2) 121G (2)		(-)			SP	**0.0 - 1.0 Feet:** SAND, brown, fine grained, loose, poorly graded. Gravels present at 0.5 feet, coarse grained, sub-angular.		
	2			2 (0-5)				ML	**1.0 - 2.0 Feet:** SILT, brown and gray, moist, hard, no odor, no sheen, no discoloration. Sand found in cutting shoe, fine grained, loose, poorly graded.		
	3								**2.0 - 5.0 Feet:** No Recovery.		
	4										
	5							SP	**5.0 - 5.2 Feet:** SAND, wet, medium grained, loose, poorly graded, no odor, no sheen, no discoloration.		
30	6		122 (6-7)		(-)	0.0		ML	**5.2 - 8.0 Feet:** SILT with some Gravel, gray, moist, soft, medium plasticity, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	7										
	8			3 (5-10)					**8.0 - 10.0 Feet:** No Recovery.		
	9										
	10							ML	**10.0 - 13.0 Feet:** SILT with some Gravel, moist, soft. Heavy tar-like odor and sheen, with wood chips and tar mixed throughout interval. UV shows some fluorescence.		
25	11		123 (11-12)		(+)	14.2					
	12										
	13			3 (10-15)					**13.0 - 15.0 Feet:** No Recovery.		
	14										
	15							ML	**15.0 - 17.5 Feet:** SILT with some Gravel and Tar, gray and black, moist, and soft. Gravel is coarse grained, sub-angular to sub-rounded. Heavy tar-like odor and sheen present. UV shows some fluorescence.		
20	16		124 (15-17) 124G (16)		(+)	16.2					
	17										
	18			2.5 (15-20)					**17.5 - 20.0 Feet:** No Recovery.		
	19										

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-17
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
15	21	☒	125 (20-21)		(-)	0.0		ML	**20.0 - 24.0 Feet:** SILT, gray becoming brown at 22.0 feet, most, soft, no odor, no sheen, no discoloration, no visible tar or oil. UV shows no fluorescence.	▽	
	22			4 (20-25)							
	23										
	24								**24.0 - 25.0 Feet:** No Recovery.		
	25							ML	**25.0 - 35.0 Feet:** SILT, gray, wet, stiff, moderate to high plasticity, no odor, no sheen, no discoloration, no visible tar or oil. UV shows no fluorescence.		
10	26										
	27	☒	126 (27-28)	5 (25-30)	(-)	0.0					
	28										
	29										
	30										
5	31										
	32										
	33	☒	127 (33-34)	5 (30-35)	(-)	0.0					
	34										
	35								End of boring at 35.0 feet below ground surface.		
0											
-5											
-10											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-18		Date(s): **4/15/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **41.6186**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **703328.20**	Easting: **7624523.99**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **25.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/8" Bentonite Chips	0-25 feet	Remarks: **City of Portland Datum**	
Sample Prefix: 5237-080415-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
40	1–3		025 (0-3) 025G (3)	3.5 (0-5)	(-)	0.0		ML	**0.0 - 3.5 Feet:** gravelly SILT, brown to 2.5 feet then gray, moist, soft, non-plastic. Gravel is medium grained, sub-angular to angular. No odor, no sheen, no discoloration. UV shows no fluorescence.		
	3–5								**3.5 - 5.0 Feet:** No Recovery.		
	5–8			3.5 (5-10)				ML	**5.0 - 8.0 Feet:** SILT with some Gravel, gray, most, soft, non-plastic. Gravel is medium grained, sub-angular. No odor, no sheen, no discoloration. Shredded wood present at 6.1 feet and root material present from 6.1 to 8.0 feet. UV shows no fluorescence.		
35	8				(-)	0.0		SP	**8.0 - 8.5 Feet:** SAND, brownish gray, moist, fine grained, loose, poorly graded. Red and black sand lenses present at 8.1 and 8.3 feet. No odor, no sheen, no discoloration.		
	8–10								**8.5 - 10.0 Feet:** No Recovery.		
	10–12							SP	**10.0 - 13.5 Feet:** SAND, brown, moist, fine grained, loose, poorly graded, no odor, no sheen, no discoloration. UV shows no fluorescence.		
30	12–13		026 (11.5-13.5) 026G (13.5)	3.5 (10-15)	(-)	0.0					
	13–15								**13.5 - 15.0 Feet:** No Recovery.	▽	
	15–18							SP	**15.0 - 18.0 Feet:** SAND as above, wet below 15 feet, no odor, no sheen, no discoloration. UV shows no fluorescence.		
25	18–20			5 (15-20)					**18.0 - 20.0 Feet:** No Recovery		

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-18
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
20	21							SP	**20.0 - 23.0 Feet:** SAND, gray, moist, fine grained, loose, poorly graded, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	22		027 (21-23)	5 (20-25)	(-)	0.0					
	23							ML	**23.0 - 25.0 Feet:** SILT, gray, wet, soft, non-plastic. Frequent small black oily tar blebs present from 23.0 to 24.5 feet with heavy rainbow sheen.		
	24										
	25								End of boring at 25.0 feet below ground surface.		
15											
10											
5											
0											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-19		Date(s): **4/15 & 4/23/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **42.4848**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **703133.58**	Easting: **7624778.23**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **40.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/8" Bentonite Chips	0-40 feet	Remarks: **City of Portland Datum**	
Sample Prefix: 5237-080415-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
40	1–3		021/022 (0-3) 021G/022G (2)	3.5 (0-5)	(-)			ML	**0.0 - 3.5 Feet:** SILT with some Gravel, brown, moist, non-plastic. Gravel is medium grained, sub-angular. No odor, no sheen, no discoloration. UV shows no fluorescence.		
	3–4								**3.5 - 5.0 Feet:** No Recovery.		
	5–8			4 (5-10)	(-)	0.0		ML	**5.0 - 8.0 Feet:** SILT with some Gravel as above, gray, no odor, no sheen, no discoloration. UV shows no fluorescence.		
35	8							SP	**8.0 - 8.3 Feet:** SAND, moist, fine grained, loose, poorly graded, no odor, no sheen, no discoloration.		
	8–9							ML	**8.3 - 9.0 Feet:** SILT, gray, moist, non-plastic, with root material present. No odor, no sheen, no discoloration.		
	10							ML	**9.0 - 10.0 Feet:** No Recovery.		
	10–12		023 (10-12) 023G (12)					SP	**10.0 - 10.5 Feet:** SILT as above. No odor, no sheen, no discoloration.		
	10.5–12								**10.5 - 13.5 Feet:** SAND, gray, moist, fine grained, loose, poorly graded, no odor, no sheen, no discoloration. UV shows no fluorescence.		
30	12–13			3.5 (10-15)							
	13–14				(-)	0.0			**13.5 - 15.0 Feet:** No Recovery.		
	15–18			3.5 (15-20)	(-)	0.0		SP	**15.0 - 18.5 Feet:** SAND as above, becoming brown at 15.0 feet. No odor, no sheen, no discoloration. Coarse sub-angular gravel present at 17.9 feet. UV shows no fluorescence.		
25	18–19								**18.5 - 20.0 Feet:** No Recovery.		

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-19
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	20							SP	**20.0 - 24.5 Feet:** SAND as above, with tar/oil-like odor and rainbow sheen present throughout interval. Mildly sticky tar mixed into soil matrix. Wood fragments present below 22.5 feet. UV shows no fluorescence.		
20	21				(-)	0.0					
	22			5 (20-25)							
	23	X	024 (22.5-24.5)								
	24	X									
	25							ML	**24.5 - 25.0 Feet:** SILT, gray, moist, non-plastic. tar/oil-like odor present and heavy sheen present in water during sheen testing. Small oily tar blebs throughout interval.		
								SP	**25.0 - 28.5 Feet:** SAND, black, wet, fine grained, loose, poorly graded. Very small oily tar blebs mixed throughout interval with heavy tar-like aroma and heavy rainbow sheen present.		
	26										
	27										
15				4.5							
	28			(25-30)							
	29				(-)	0.0		ML	**28.5 - 29.0 Feet:** SILT, moist, soft, with slightly sticky tar mixed into soil matrix. Heavy tar-like odor with heavy rainbow sheen present.		
								SP	**29.0 - 29.5 Feet:** SAND as above with tar blebs, tar-like odor, and rainbow sheen continuing.		
	30	X	074 (30-31)					ML	**29.5 - 30.0 Feet:** No Recovery.		
	31	X							**30.0 - 34.0 Feet:** SILT, black with tar blebs to 32.0 feet then becoming greenish gray, wet, soft, non-plastic. No odor, no sheen, and no discoloration below 32.0 feet.		
	32										
10				4	(-)						
	33			(30-35)							
	34								**34.0 - 35.0 Feet:** No Recovery.		
	35							ML	**35.0 - 40.0 Feet:** SILT, brown to 39.0 feet then greenish gray, moist, soft, medium plasticity, no odor, no sheen, no discoloration.		
	36										
	37										
5				5	(-)						
	38			(35-40)							
	39	X	075 (39-40)								
	40	X							End of boring at 40.0 feet below ground surface.		
0											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID:	P-19A	Date(s):	**6/30/2014**
Location:	**7200 NW Front Avenue, Portland, Oregon**		
Logged By:	**Ben Uhl**	Checked By:	**Rob Ede**
Driller:	**Pacific Soil and Water, LLC**	OWRD #:	**NA**
Drilling Method:	**AMS 9500-VTR (Direct Push)**	GS Elevation:	**42.7 feet**
TOC:	NA		
Sampling Method:	**Macrocore**	Northing:	**703133.49**
Easting:	**7624778.27**		
Boring Abandonment Details:		Borehole Dia.:	**2.25 inches**
Total Depth:	**32.0 feet bgs**		
Annular Fill:	3/4" Bentonite Chips: 0 - 32 feet bgs	Project Number:	**5237**
Project Name:	**Remedial Investigation - Siltronic Corp**		
Remarks:	Horizontal Datum - NAD 83/91 Vertical Datum - City of Protland (COP)		

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	UV	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
40	1								No soils were logged during this boring installation. Soil boring installed for undisturbed core sample collection only. See P-19 boring log for soil description.		
	2										
	3										
	4										
	5										
	6										
	7										
35	8										
	9										
	10										
	11										
	12										
30	13										
	14										
	15										
	16										
	17										
25	18										
	19										

bgs = below ground surface
ft = feet
PID=photoionization detector
ppm = parts per million

UV = ultraviolet
UV screen consisted of visual observation with ultraviolet light.
(-) no indication of fluorescence
(+) fluorescence observed (see lithology)

Report: 5237 BAU JAN 23; File: 5237-10H3 DNAPL CHAR LOGS.GPJ; 2/9/15

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-19A
Project Name: **Remedial Investigation - Siltronic Corp**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	UV	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	21		P-19A-A1								
	22										
20	23		P-19A-A2								
	24		P-19A-A3								
	25										
	26		P-19A-B1								
	27										
15	28		P-19A-B2								
	29		P-19A-B3								
	30										
	31		P-19A-C1								
	32								End boring at 32.0 feet bgs		
10											
5											
0											

bgs = below ground surface
ft = feet
PID=photoionization detector
ppm = parts per million

UV = ultraviolet
UV screen consisted of visual observation with ultraviolet light.
(-) no indication of fluorescence
(+) fluorescence observed (see lithology)

Report: 5237 BAU JAN 23; File: 5237-10H3 DNAPL CHAR LOGS.GPJ; 2/9/15

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-20		Date(s): **4/15/08 & 4/23/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**	Checked By: **Rob Ede**		
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**	GS Elevation: **33.3591**	TOC: Not Applicable	
Sampling Method: **Macrocore**	Northing: **702865.17**	Easting: **7625096.87**	
Well Construction:	Borehole Dia.: **2.5 inches**	Total Depth: **35.0 feet bgs**	
Blank Casing: NA NA	Project Number: **5237**		
Screen: NA NA	Project Name: **Remedial Investigation - Siltronic Corporation**		
Annular Fill: 3/8" Bentonite Chips 0-35 feet	Remarks: **City of Portland Datum**		
Sample Prefix: 5237-080415-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	1–2		015 (0-3) 015G (2)	3 (0-5)	(-)	0.0		ML	**0.0 - 3.0 Feet:** sandy SILT, brown, moist, soft, non-plastic, with root material present at 0.5 feet. No odor, no sheen, no discoloration. Sand is fine grained. UV shows no fluorescence.		
30	3								**3.0 - 5.0 Feet:** No Recovery.		
	4–7							ML	**5.0 - 13.0 Feet:** SILT, brownish gray, moist, soft, non-plastic, no odor, no sheen, no discoloration. UV shows no fluorescence.		
25	8			5 (5-10)	(-)	0.0					
	9–12										
	13			4 (10-15)	(-)	0.0		SP	**13.0 - 14.0 Feet:** SAND, gray, moist, medium grained, loose, poorly graded. Trace of fine grained gravels present at 14.0 feet. No odor, no sheen, no discoloration.		
20	14								**14.0 - 15.0 Feet:** No Recovery.		
	15							SP	**15.0 - 18.0 Feet:** SAND, as above.		
	16–17		016 (16-18) 016G (18)		(-)	0.0					
	18			5 (15-20)				ML	**18.0 - 20.0 Feet:** SILT, gray, moist becoming wet below 20.0 feet, soft, low plasticity. Very fine layers of black solid tar and shredded wood fragments present throughout core with heavy odor and a heavy sheen present in water during sheen test. UV shows no fluorescence on soils, with patches of fluorescence on solid tar.		
15	19		017 (18-20)		(+)	2.9				▽	

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-20
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	20							SP	**20.0 - 24.5 Feet:** SAND, gray, wet, fine grained, loose, poorly graded. Small black oil smears/blebs present throughout with heavy oil/tar-like odor and heavy sheen present in water during sheen test. Tar and oil smeared on macrocore.		
	21										
	22			4.5 (20-25)	(-)						
10	23										
	24										
	25								**24.5 - 25.0 Feet:** No Recovery.		
	26							SP	**25.0 - 28.0 Feet:** SAND, as above. Oil/tar-like odor diminished to very mild and mild sheen present in water during sheen test.		
	27		078 (27-28)	3.5 (25-30)	(-)						
5	28							ML	**28.0 - 28.5 Feet:** SILT, gray, wet, soft, non-plastic, no odor, no sheen, no discoloration.		
	29								**28.5 - 30.0 Feet:** No Recovery.		
	30							ML	**30.0 - 35.0 Feet:** SILT, brown, moist, soft, medium plasticity, no odor, no sheen, no discoloration.		
	31										
	32		079 (32-33)	5 (30-35)	(-)						
0	33										
	34										
	35								End of boring at 35 feet below ground surface.		
-5											
-10											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID:	P-20A	Date(s):	**6/30/2014**
Location:	**7200 NW Front Avenue, Portland, Oregon**		
Logged By:	**Ben Uhl**	Checked By:	**Rob Ede**
Driller:	**Pacific Soil and Water, LLC**	OWRD #:	**NA**
Drilling Method:	**AMS 9500-VTR (Direct Push)**	GS Elevation:	**33.5 feet**
TOC:	NA		
Sampling Method:	**Macrocore**	Northing:	**702864.15**
Easting:	**7625092.84**		
Boring Abandonment Details:		Borehole Dia.:	**2.25 inches**
Total Depth:	**34.0 feet bgs**		
Annular Fill:	3/4" Bentonite Chips 0 - 34 feet bgs	Project Number:	**5237**
Project Name:	**Remedial Investigation - Siltronic Corp**		
Remarks:	Horizontal Datum - NAD 83/91 Vertical Datum - City of Protland (COP)		

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	UV	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
30	1								No soils were logged during this boring installation. Soil boring installed for undisturbed core sample collection only. See P-20 boring log for soil description.		
	2										
	3										
	4										
	5										
	6										
	7										
25	8										
	9										
	10										
	11										
	12										
	13										
20	14										
	15		P-20A-A1								
	16		P-20A-A2								
	17										
	18		P-20A-A3								
15	19		P-20A-B1								

bgs = below ground surface
ft = feet
PID=photoionization detector
ppm = parts per million

UV = ultraviolet
UV screen consisted of visual observation with ultraviolet light.
(-) no indication of fluorescence
(+) fluorescence observed (see lithology)

Report: 5237 BAU JAN 23; File: 5237-10H3 DNAPL CHAR LOGS.GPJ; 2/9/15

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-20A
Project Name: **Remedial Investigation - Siltronic Corp**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	UV	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
10	21		P-20A-B2								
	22		P-20A-B3								
	23										
	24		P-20A-C1								
	25										
	26		P-20A-C2								
	27										
5	28		P-20A-C3								
	29		P-20A-D1								
	30										
	31										
	32										
	33										
0	34								End boring at 34.0 feet bgs.		
-5											
-10											

bgs = below ground surface
ft = feet
PID=photoionization detector
ppm = parts per million

UV = ultraviolet
UV screen consisted of visual observation with ultraviolet light.
(-) no indication of fluorescence
(+) fluorescence observed (see lithology)

Report: 5237 BAU JAN 23; File: 5237-10H3 DNAPL CHAR LOGS.GPJ; 2/9/15

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-22		Date(s): **4/15 & 4/23/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**	Checked By: **Rob Ede**		
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**	GS Elevation: **39.992**	TOC: Not Applicable	
Sampling Method: **Macrocore**	Northing: **703479.47**	Easting: **7624604.86**	
Well Construction:	Borehole Dia.: **2.5 inches**	Total Depth: **40.0 feet bgs**	
Blank Casing: NA NA	Project Number: **5237**		
Screen: NA NA	Project Name: **Remedial Investigation - Siltronic Corporation**		
Annular Fill: 3/8" Bentonite Chips 0-40 feet	Remarks: **City of Portland Datum**		
Sample Prefix: 5237-080415-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	1–3		028 (0-3) 028G (3)	4 (0-5)				ML	**0.0 - 4.0 Feet:** gravelly SILT, brownish gray, moist, soft, no odor, no sheen, no discoloration. Gravel is coarse grained and sub-angular.		
	4								**4.0 - 5.0 Feet:** No Recovery.		
35	5							ML	**5.0 - 6.0 Feet:** gravelly SILT as above		
	6							SP	**6.0 - 6.3 Feet:** SAND, gray, moist, fine grained, loose, poorly graded, no odor, no sheen, no discoloration.		
	7			3 (5-10)	(-)	0.0		ML	**6.3 - 8.0 Feet:** SILT, gray, soft, moist, non-plastic, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	8								**8.0 - 10.0 Feet:** No Recovery.		
30	9–10		029 (10-11.5) 029G (11)					ML	**10.0 - 11.5 Feet:** SILT, gray, moist, soft, low plasticity, with some wood fragments at 11.5 feet. No odor, no sheen, no discoloration.		
	11									▽	
	12							SP	**11.5 - 14.0 Feet:** SAND, gray, wet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	13			4 (10-15)							
	14				(-)	0.0			**14.0 - 15.0 Feet:** No Recovery.		
25	15							SP	**15.0 - 19.0 Feet:** SAND as above. No odor, no sheen, no discoloration. UV shows no fluorescence.		
	16–17										
	18			4 (15-20)	(-)	0.0					
	19								**19.0 - 20.0 Feet:** No Recovery.		

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-22
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	21							SP	**20.0 - 24.0 Feet:** SAND as above with small black tar fragments and heavy sheen in water during sheen tests. UV shows no fluorescence.		
	22										
	23		030 (22-24)	5 (20-25)	(-)	0.0					
	24							ML	**24.0 - 25.0 Feet:** SILT with some Sand, gray, moist, soft, with small blebs of black non-viscous oil and small black tar blebs, heavy sheen in water during sheen test and on the core. Wood fragments encountered from 24.0 to 24.1 feet bgs.		
15	25								**25.0 - 30.0 Feet:** No Recovery.		
	26										
	27										
	28			0 (25-30)							
	29										
10	30							ML	**30.0 - 35.0 Feet:** SILT, greenish gray, wet, soft, non-plastic, heavy tar-like aroma, heavy sheen in water. Minor black-gray tar blebs from 33 to 35 feet.		
	31										
	32										
	33		076 (33-34)	5 (30-35)							
	34										
5	35								**35.0 - 40.0 Feet:** SILT, greenish gray, moist, soft, medium plasticity, no odor, no sheen, no discoloration.		
	36										
	37										
	38			5 (35-40)							
	39		077 (39-40)								
0	40								End of boring at 40 feet below ground surface.		
-5											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID:	P-22A	Date(s):	**7/1/2014**
Location:	**7200 NW Front Avenue, Portland, Oregon**		
Logged By:	**Ben Uhl**	Checked By:	**Rob Ede**
Driller:	**Pacific Soil and Water, LLC**	OWRD #:	**NA**
Drilling Method:	**AMS 9500-VTR (Direct Push)**	GS Elevation:	**39.9 feet**
TOC:	NA		
Sampling Method:	**Macrcore**	Northing:	**703479.47**
Easting:	**7624604.86**		
Boring Abandonment Details:		Borehole Dia.:	**2.25 inches**
Total Depth:	**35.0 feet bgs**		
Annular Fill:	3/4" Bentonite Chips 0 - 35 feet bgs	Project Number:	**5237**
Project Name:	**Remedial Investigation - Siltronic Corp**		
Remarks:	Horizontal Datum - NAD 83/91 Vertical Datum - City of Protland (COP)		

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	UV	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
35	1								No soils were logged during this boring installation. Soil boring installed for undisturbed core sample collection only. See P-22 boring log for soil description.		
	2										
	3										
	4										
	5										
	6										
	7										
	8										
	9										
30	10										
	11										
	12										
	13										
	14										
25	15										
	16										
	17										
	18										
	19										

bgs = below ground surface
ft = feet
PID=photoionization detector
ppm = parts per million

UV = ultraviolet
UV screen consisted of visual observation with ultraviolet light.
(-) no indication of fluorescence
(+) fluorescence observed (see lithology)

Report: 5237 BAU JAN 23; File: 5237-10H3 DNAPL CHAR LOGS.GPJ; 2/9/15

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-22A
Project Name: **Remedial Investigation - Siltronic Corp**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	UV	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
15	21		P-22A-A1								
	22										
	23		P-22A-A2								
	24		P-22A-A3								
	25										
	26		P-22A-B1								
	27										
	28		P-22A-B2								
	29		P-22A-B3								
10	30										
	31		P-22A-C1								
	32										
	33		P-22A-C2								
	34		P-22A-C3								
5	35								End boring at 35.0 feet bgs.		
0											
-5											

bgs = below ground surface
ft = feet
PID=photoionization detector
ppm = parts per million

UV = ultraviolet
UV screen consisted of visual observation with ultraviolet light.
(-) no indication of fluorescence
(+) fluorescence observed (see lithology)

Report: 5237 BAU JAN 23; File: 5237-10H3 DNAPL CHAR LOGS.GPJ; 2/9/15

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-23		Date(s): **4/15/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **32.3458**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **703023.09**	Easting: **7625260.15**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **20.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/8" Bentonite Chips	0-20 feet	Remarks: **City of Portland Datum**	
Sample Prefix: 5237-080415-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	0							SP	**0.0 - 1.0 Feet:** SAND, brown, moist, fine grained, loose, poorly graded, no odor, no sheen, no discoloration. Coarse 1" diameter sub-rounded gravel encountered at 0.5 feet.		
	1	X	018 (0-2.5) 018G (1)	2.5 (0-5)	(-)	0.0		ML	**1.0 - 2.0 Feet:** SILT, brown with red mottling, moist, soft, non-plastic, no odor, no sheen, no discoloration. UV shows no fluorescence.		
30	2	X							**2.0 - 5.0 Feet:** No Recovery.		
	3	X									
	4	X									
	5	X						ML	**5.0 - 8.0 Feet:** SILT as above, no odor, no sheen, no discoloration.		
	6	X									
	7	X									
25	8	X		4 (5-10)				SP	**8.0 - 9.0 Feet:** SAND, brown, moist, fine grained, loose, poorly graded, no odor, no sheen, no discoloration.		
	9	X							**9.0 - 10.0 Feet:** No Recovery.		
	10	X						SP	**10.0 - 12.0 Feet:** SAND, brown, moist becoming wet below 10.5 feet, medium grained, loose, poorly graded, no odor, no sheen, no discoloration. UV shows no fluorescence.	▽	
	11	X	019 (10-12) 019G (10)		(-)	0.0					
	12	X						ML	**12.0 - 12.4 Feet:** SILT with some wood fragments, gray, no odor, no sheen, no discoloration. Wood fragments are soft and shredded.		
20	13	X		4 (10-15)				SP	**12.4 - 14.0 Feet:** SAND, brown becoming gray at 13.0 feet, moist, medium grained, loose, poorly graded with 0.1 inch silt lens at 12.5 feet. No odor, no sheen, no discoloration.		
	14	X							**13.0 - 14.0 Feet:** No Recovery.		
	15	X						SP	**15.0 - 18.0 Feet:** SAND as above, becoming wet below 18.0 feet, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	16	X									
15	17	X	020 (16-18)		(-)	0.0					
	18	X		5 (15-20)				ML	**18.0 - 20.0 Feet:** sandy SILT, brown, wet, no odor, no sheen, no discoloration. Wood fragments encountered at 18.0 to 18.1 feet.		
	19	X									
	20								End of boring at 20.0 feet below ground surface.		

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-24		Date(s): **4/25/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **36.7**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **703891.10**	Easting: **7624548.50**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **35.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/8" Bentonite Chips	0-35 feet	Remarks: **City of Portland Datum**	
Sample Prefix: 5237-080425-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
35	1	X	114(0-2.5) 114G (2.5)	2.5 (0-5)				GM	**0.0 - 1.5 Feet:** silty GRAVEL, coarse grained, sub-angular. Silt is brown, moist, non-plastic, no odor, no sheen, no discoloration.		
	2	X						ML	**1.5 - 2.5 Feet:** SILT, gray, moist, low plasticity. No odor or discoloration, very mild sheen in water during sheen test.		
	3								**2.5 - 5.0 Feet:** No Recovery		
	4										
	5							ML	**5.0 - 8.0 Feet:** SILT with some Gravel, gray, moist, soft, low plasticity. Gravels are fine grained, sub-angular. No odor, no sheen, no discoloration.		
30	6										
	7			3 (5-10)							
	8								**8.0 - 10.0 Feet:** No Recovery		
	9										
	10	X	115 (10-12) 115G (11)		(+)	14.5		ML	**10.0 - 19.5 Feet:** SILT with some Gravel as above with tar present to 13.0 feet. Tar-like odor and heavy sheen present in water during sheen test to 13.0 feet. Tar is evidenced by black, ductile patches with heavy odor and heavy sheen. Root matter present throughout. Mild odor, no sheen, and no visible tar below 13.0 feet. Silt becomes very stiff below 17.0 feet. UV shows some fluorescence.		
25	11	X									
	12	X									
	13			5 (10-15)							
	14										
	15										
	16										
20	17										
	18	X	116 (17-18)	4.5 (15-20)	(-)	1.4					
	19										
									19.5 - 20.0 Feet: No Recovery		

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-24
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
15	21		118 (20-22')					ML	**20.0 - 20.1 Feet:** Tar with minor silt and brick fragments. Tar is black, sticky, ductile, with a heavy odor and heavy sheen.		
								OH	**20.1 - 21.0 Feet:** SILT with some Gravel, black, moist, soft. Gravel is medium grained, sub-angular. Tar present with tar-like odor, sheen in water during sheen test.		
	22		117 (21-21.5')					SP		▽	
	23			4.5 (20-25)					**21.0 - 21.3 Feet:** Wood chips with Silt and Tar. Tar is black, sticky, ductile, with heavy odor and heavy sheen.		
									21.3 - 21.4 Feet: Tar with some Silt and wood fragments.		
	24				(+)	10.6			**21.4 - 24.5 Feet:** SAND, brown, wet, fine grained, loose, poorly graded. Strong tar-like odor with sheen present in water during sheen test. UV shows some patchy fluorescence.		
	25							SP	**24.5 - 25.0 Feet:** No Recovery		
	26								**25.0 - 28.0 Feet:** SAND, brown, wet, medium to coarse grained, loose, poorly graded. Mild tar-like odor, no sheen or discoloration. UV shows no fluorescence.		
10	27				(-)	4.7					
	28			5 (25-30)				ML	**28.0 - 30.0 Feet:** sandy SILT, gray, moist, soft, low plasticity, no odor, no sheen, no discoloration.		
	29		119 (29-30)		(-)						
	30							ML	**30.0 - 35.0 Feet:** SILT, gray, moist, very stiff, high plasticity, no odor, no sheen, no discoloration. UV shows no fluorescence.		
5	31										
	32		120 (32-33)	5 (30-35)	(-)	0.0					
	33										
	34										
	35								End of boring at 35 feet below ground surface.		
0											
-5											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-25		Date(s): **4/25/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **34.0**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **703697.50**	Easting: **7624935.70**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **35.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/8" Bentonite Chips	0-35 feet	Remarks: **City of Portland Datum**	
Sample Prefix: 5237-080425-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	1		107 (0-3) 107G (2)	3 (0-5)	(-)	0.0		ML	**0.0 - 3.0 Feet:** SILT, brown, moist, soft, non-plastic, no odor, no sheen, no discoloration. Some root matter present. UV shows no fluorescence.		
	2										
	3								**3.0 - 5.0 Feet:** No Recovery.		
30	4										
	5							ML	**5.0 - 7.0 Feet:** SILT with some Sand, gray, moist, soft, low plasticity, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	6		108 (6-7)		(-)	0.0					
	7							SP	**7.0 - 9.0 Feet:** SAND with some Silt, gray, moist, fine grained, loose, poorly graded, no odor, no sheen, no discoloration.		
	8			4 (5-10)							
25	9								**9.0 - 10.0 Feet:** No Recovery.		
	10							ML	**10.0 - 14.0 Feet:** SILT with some Sand, dark gray, moist, soft, medium plasticity, heavy tar-like aroma, heavy rainbow sheen in water, with oily tar blebs. Wood chips coated with oily black tar blebs with heavy tar-like odor and heavy sheen in water during sheen testing present from 10.3 to 10.8 feet and again at 13.8 feet. UV shows some fluorescence.		
	11										
	12		109 (12-14) 109G (13.5)	4 (10-15)	(-)	10.0					
	13										
20	14								**14.0 - 15.0 Feet:** No Recovery.		
	15		110 (15-16)		(-)	0.0		SP	**15.0 - 15.3 Feet:** SAND, moist, medium grained, loose, poorly graded, no odor, no sheen, no discoloration. UV shows no fluorescence.	▽	
	16							ML			
	17							SP	**15.3 - 16.0 Feet:** SILT, gray, most, soft, non-plastic, no odor, no sheen, no discoloration.		
	18			5 (15-20)					**16.0 - 20.0 Feet:** SAND with some Gravel and wood chips, wet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration. Gravel is fine grained, sub-angular.		
15	19										

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-25
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	21							ML	**20.0 - 21.5 Feet:** sandy SILT, gray, moist, soft, low plasticity, mild tar-like aroma, minor sheen in water.		
	22							SP	**21.5 - 24.0 Feet:** SAND, gray to 22.0 feet then brown, wet, medium grained, poorly graded. No odor, no discoloration, but minor sheen present in water during sheen testing.		
	23	X	111 (23-24)	4 (20-25)		0.0					
-10	24								**24.0 - 25.0 Feet:** No Recovery.		
	25							SP	**25.0 - 30.0 Feet:** SAND as above with minor tar-like odor, minor sheen present in water during sheen testing. Gravels present at 29.0 to 30.0 feet, fine grained, sub-angular.		
	26										
	27										
	28	X	112 (28-30)	5 (25-30)		0.0					
-5	29										
	30							ML	**30.0 - 35.0 Feet:** SILT, dark brown, moist, stiff, moderate plasticity, no odor, no sheen, no discoloration.		
	31										
	32										
	33	X	113 (33-34)	4 (30-35)							
0	34										
	35								End of boring at 35.0 feet below ground surface.		
-5											
-10											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-26		Date(s): **4/25/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **33.2494**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **703462.25**	Easting: **7625137.05**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **35.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/8" Bentonite Chips	0-35 feet	Remarks: **City of Portland Datum**	
Sample Prefix: 5237-080425-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	1–3	☒	101 (0-3) 101G (2)	5 (0-5)				ML	**0.0 - 5.0 Feet:** SILT, brown, moist, soft, low plasticity, no odor, no sheen, no discoloration.		
30	4										
	5							ML	**5.0 - 10.0 Feet:** SILT with some Sand, brown from 5.0 to 5.5 feet then becoming black from 5.5 to 10.0 feet, moist, soft, heavy tar-like aroma, heavy sheen present in water during sheen test. Fine black tar smears/blebs mixed throughout core. UV shows some fluorescence.		
	6										
	7–8	☒	102 (7-8)	5 (5-10)	(+)	20.4					
25	9										
	10							ML	**10.0 - 15.0 Feet:** sandy SILT, dark gray, moist, soft, non-plastic, tar-like aroma present, no visible tar or sheen in water. Wood chips present below 14.5 feet bgs. UV shows no fluorescence.		
	11										
	12			5 (10-15)							
20	13–14	☒	103 (13-15) 103G (15)		(-)	1.4					
	15							SP	**15.0 - 19.0 Feet:** SAND, black discoloration, wet, fine grained, poorly graded, tar-like aroma, no visible tar or oil. UV shows no fluorescence.	▽	
	16										
	17–18	☒	104 (17-18)	4 (15-20)	(-)	0.0					
15	19								**19.0 - 20.0 Feet:** No Recovery.		

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-26
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	21							SM	**20.0 - 30.0 Feet:** silty SAND, gray, wet, fine grained, loose, poorly graded, tar-like aroma present becoming minor below 25 feet, minor sheen in water, no visible tar/oil in core. UV shows no fluorescence.		
	22			5 (20-25)	(-)	0.0					
10	23										
	24										
	25										
	26										
	27			5 (25-30)							
5	28		105 (28-30) 105G (30)		(-)	0.0					
	29										
	30							ML	**30.0 - 35.0 Feet:** SILT with trace of sand from 30 to 32 feet bgs, dark brown, moist, soft, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	31										
	32										
0	33			5 (30-35)							
	34		106 (34-35)		(-)	0.0					
	35								End of boring at 35.0 feet below ground surface.		
-5											
-10											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-28		Date(s): **4/28/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **34.0**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **703329.60**	Easting: **7625491.40**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **35.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/8" Bentonite Chips	0-35 feet	Remarks: **City of Portland Datum**	
Sample Prefix: 5237-080425-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	1–3		151 (0-3) 151G(3)	3.5 (0-5)	(-)	0.0		ML	**0.0 - 3.5 Feet:** sandy SILT with some Gravel, brown, damp, soft, non-plastic, no odor, no sheen, no discoloration. Gravel is coarse grained, sub-angular. Wood fragments present below 3.0 feet. UV shows no fluorescence.		
30	4								**3.5 -5.0 Feet:** No Recovery.		
	5							ML	**5.0 - 5.5 Feet:** sandy SILT with some Gravel, as above.		
	6							SP	**5.5 - 7.5 Feet:** SAND with some Gravel, brown, damp, fine grained, loose, poorly graded. Gravel is medium grained, sub-rounded. No odor, no sheen, no discoloration.		
	7–8		152 (7-8)	3 (5-10)	(-)	0.0			**7.5 - 8.0 Feet:** SILT with some Sand and Gravel, brown, moist, soft, non-plastic, no odor, no sheen, no discoloration. Gravels are medium grained, sub-rounded. UV shows no fluorescence.		
25	9								**8.0 - 10.0 Feet:** No Recovery.		
	10–12		153 (10-12) 153G (12)	4 (10-15)	(-)	0.0		SP	**10.0 - 14.0 Feet:** SAND, moist becoming wet below 12.0 feet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration. UV shows no fluorescence.	▽	
20	14								**14.0 - 15.0 Feet:** No Recovery.		
	15–17		154 (15-17) 154G (17)			0.0		SP	**15.0 - 17.0 Feet:** SAND with some Gravel and wood fragments, dark gray, moist, fine grained, loose, poorly graded. Tar odor present with patches of black, stiff, plastic tar incorporated into sand, sheen present in water during sheen test.		
	18			3 (15-20)				ML	**17.0 - 18.0 Feet:** sandy SILT, gray, no odor, no sheen, no discoloration. UV shows no fluorescence.		
15	19								**18.0 - 20.0 Feet:** No Recovery		

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-28
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	21							SP	**20.0 - 24.0 Feet:** SAND, brown, wet, fine grained, poorly graded, no odor, no sheen, no discoloration.		
	22										
	23		155 (22-24)	5 (20-25)	(-)	0.0					
10	24							ML	**24.0 - 24.7 Feet:** SILT, gray, moist, soft, non-plastic, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	25							SP	**24.7 - 30.0 Feet:** SAND, gray, moist becoming wet below 25.0 feet, medium grained becoming fine grained below 25.0 feet, very loose, poorly graded, no odor, no sheen, no discoloration. Wood fragments present throughout (<5%). UV shows no fluorescence.		
	26										
	27			5 (25-30)							
	28										
5	29		156 (28-30)		(-)	0.0					
	30							ML	**30.0 - 35.0 Feet:** SILT with trace of Sand, brown, moist, hard, low plasticity, no odor, no sheen, no discoloration. Sand is fine grained. UV shows no fluorescence.		
	31										
	32										
	33			5 (30-35)							
0	34		157 (34-35)		(-)	0.0					
	35								End of boring at 35 feet below ground surface.		
-5											
-10											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-29		Date(s): **5/1/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **34.9**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **704450.20**	Easting: **7624301.50**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **15.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/8" Bentonite Chips	0-15 feet	Remarks: **City of Portland Datum**	
Sample Prefix: 5237-080501-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	1	X	197/197G (0-1)					ML	**0.0 - 1.1 Feet:** SILT with some Gravel, brown, moist, soft, non-plastic, no odor, no sheen, no discoloration. Gravel is medium grained, sub-angular.		
	2								**1.1 - 10.0 Feet:** No Recovery due to air knifing of location.		
	3										
	4										
30	5			1.1 (0-10)							
	6										
	7										
	8										
	9										
25	10							ML	**10.0 - 13.0 Feet:** SILT with some Gravel, gray, moist, soft, low plasticity, no odor, mild sheen present in water during sheen test, no discoloration. Gravel is coarse grained, sub-angular. Wood chips (approx. 1/2") mixed throughout with noticable oil-like aroma, sheen and discoloration. Brick fragments encountered at 12.0 feet.		
	11										
	12	X	204 (12-14)	5 (10-15)							
	13	X	204G (13)					SP	**13.0 - 14.0 Feet:** SAND, black, moist, fine grained, loose, poorly graded, strong aroma, heavy sheen present, with tar fragments mixed throughout.	▽	
	14	X	205 (14-15)			0.0		ML	**14.0 - 15.0 Feet:** sandy SILT, wet, soft, low plasticity, no odor, no sheen, no discoloration.		
20	15								End of boring at 15.0 feet below ground surface due to refusal on hard substrate.		

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-30		Date(s): **4/28/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **36.6303**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **703885.88**	Easting: **7625115.44**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **40.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/8" Bentonite Chips	0-40 feet	Remarks: **City of Portland Datum**	
Sample Prefix: 5237-080428-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
35	1		135 (0-3) 135G (1)	3 (0-5)				SP	**0.0 - 1.0 Feet:** silty SAND with some Gravel, brown, moist, fine grained, loose, poorly graded. Gravel is coarse grained, sub-angular. No odor, no sheen, no discoloration.		
	2							SP	**1.0 - 3.0 Feet:** SAND with some Gravel, as above. No odor, no sheen, no discoloration.		
	3								**3.0 - 5.0 Feet:** No Recovery.		
	4										
	5							SP	**5.0 - 7.0 Feet:** SAND with some Gravel, as above. No odor, no sheen, no discoloration.		
30	6										
	7		136 (7-8)	3 (5-10)	(-)	0.0		MH	**7.0 - 8.0 Feet:** SILT, gray, moist, stiff, high plasticity, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	8								**8.0 - 10.0 Feet:** No Recovery.		
	9										
	10							ML	**10.0 - 10.5 Feet:** sandy SILT, gray, moist, non-plastic, no odor, no sheen, no discoloration.		
	11							SP ML	**10.5 - 11.0 Feet:** SAND, gray, moist, fine grained, loose, poorly graded, no odor, no sheen, no discoloration.		
25	12		137 (12-14) 137G (14)	4 (10-15)	(-)	0.0			**11.0 - 14.0 Feet:** SILT with some Sand, gray, moist, low plasticity, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	13										
	14								**14.0 - 15.0 Feet:** No Recovery.		
	15							ML	**15.0 - 17.5 Feet:** sandy SILT, brown, wet, soft, non-plastic, no odor, no sheen, no discoloration.	▽	
	16										
20	17										
	18		139 (18-19)	5 (15-20)	(-)	0.0		ML	**17.5 - 20.0 Feet:** SILT, gray, moist, soft, low plasticity, no odor, no sheen, no discoloration, root material mixed throughout. UV shows no fluorescence.		
	19										

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-30
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	21							SP	**20.0 - 34.5 Feet:** SAND, gray, wet, fine grained, loose, poorly graded. No visible tar/oil or odor throughout interval. Wood chips encountered at 28.5 to 29.5 feet which produced sheen in water during sheen testing, no sheen at other intervals. UV shows no fluorescence.		
15	22										
	23			5 (20-25)							
	24	X	140 (24-25)		(-)	0.0					
	25										
	26										
10	27										
	28			5 (25-30)							
	29	X	141 (28.5-29.5)		(-)	0.0					
	30										
	31										
5	32										
	33	X	142 (32.5-34.5)	5 (30-35)	(-)	0.0					
	34										
	35							ML	**34.5 - 39.0 Feet:** SILT, gray to 34.5 feet then brownish gray, moist, hard, high plasticity, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	36										
0	37										
	38	X	143 (38-39)	4 (35-40)	(-)	0.0					
	39								**39.0 - 40.0 Feet:** No Recovery.		
	40								End of boring at 40.0 feet below ground surface.		
-5											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-31		Date(s): **4/28/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **36.6303**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **703885.88**	Easting: **7625115.44**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **35.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/8" Bentonite Chips	0-35 feet	Remarks: **City of Portland Datum**	
Sample Prefix: 5237-080428-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	0							ML	**0.0 - 1.0 Feet** sandy SILT, brown, moist, non-plastic, no odor, no sheen, no discoloration.		
	1		144 (0-3)					SP	**1.0 - 1.5 Feet** SAND, brown, wet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration.		
35	2		144G (2)	3 (0-5)	(-)	0.0		SP	**1.5 - 3.0 Feet:** silty SAND, brown, moist, fine grained, loose, poorly graded, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	3								**3.0 - 5.0 Feet:** No Recovery.		
	4										
	5							SP	**5.0 - 7.0 Feet:** SAND, brown, moist, fine grained, loose, poorly graded, no odor, no sheen, no discoloration.		
	6										
30	7		145 (7-8)	3 (5-10)	(-)	0.0		ML	**7.0 - 8.0 Feet:** SILT with some Sand, gray, moist, stiff non-plastic, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	8								**8.0 - 10.0 Feet:** No Recovery.		
	9										
	10							ML	**10.0 - 13.0 Feet:** SILT with some Sand, brown, moist, very stiff, non-plastic, no odor, no sheen, no discoloration.		
	11										
25	12		146 (11-13) 146G (13)	5 (10-15)	(-)	0.0					
	13							SP	**13.0 - 20.0 Feet:** SAND, gray, wet, fine grained, poorly graded, no odor, no sheen, no discoloration. Wood fragments present at 12.5 feet and then again at 19.0 feet. Wood chips at 19.5 to 20.0 feet exhibit a minor tar-like aroma, but with no visible tar/oil. Soils in cutting shoe at 20.0 feet show small tar blebs, black in color. UV shows no fluorescence.	▽	
	14										
	15										
	16										
20	17										
	18			5 (15-20)							
	19		147 (18-20)		(-)	0.0					

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-31
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	21							SP	**20.0 - 22.0 Feet:** silty SAND, brown, wet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration.		
15	22							ML	**22.0 - 24.0 Feet:** sandy SILT, gray, moist, soft, tar-like aroma present, minor sheen in water, but no visible tar/oil. Wood framents present throughout interval. UV shows no fluorescence.		
	23	X	148 (22-24)	4 (20-25)	(-)	0.0					
	24								**24.0 - 25.0 Feet:** No Recovery.		
	25							SP	**25.0 - 30.0 Feet:** SAND, wet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	26										
10	27	X		5 (25-30)							
	28		149 (27-30)		(-)	0.0					
	29										
	30							ML	**30.0 - 35.0 Feet:** SILT, brown, moist, dense, medium plasticity, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	31										
5	32										
	33			5 (30-35)							
	34	X	150 (33-34)		(-)	0.0					
	35								End of boring at 35 feet below ground surface.		
0											
-5											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-32		Date(s): **4/24/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **35.4**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **703471.20**	Easting: **7625665.20**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **45.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/8" Bentonite Chips	0-45 feet	Remarks: **City of Portland Datum**	
Sample Prefix: 5237-080424-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
35	1		094 (0-3) 094G (2.5)	2.5 (0-5)				ML	**0.0 - 1.0 Feet:** gravelly SILT, brown, moist, soft, non-plastic, no odor, mild sheen present in water during sheen test, no discoloration. Gravel is coarse grained, sub-angular.		
	2							ML	**1.0 - 2.5 Feet:** sandy SILT, brown to 2.5 feet then gray, moist, non-plastic. Sand is fine grained, poorly graded. No odor, no sheen, no discoloration.		
	3								**2.5 - 5.0 Feet:** No Recovery.		
	4										
30	5							ML	**5.0 - 8.0 Feet:** sandy SILT as above, no odor, no sheen, no discoloration.		
	6										
	7										
	8		095 (8-9)	4 (5-10)	(-)	0.0		ML	**8.0 - 9.0 Feet:** SILT, gray, moist, soft, non-plastic. No odor or discoloration, but minor sheen in water during sheen tests. UV shows no fluorescence.		
	9								**9.0 - 10.0 Feet:** No Recovery.		
25	10								**10.0 - 12.5 Feet:** SILT with some Sand, gray, moist, soft, non-plastic, no odor, no sheen, no discoloration.		
	11										
	12										
	13		096 (13-14)	4 (10-15)	(-)	0.0		SP	**12.5 - 14.0 Feet:** silty SAND with 1-inch bands of Sand alternating through the interval, gray, moist, fine grained, poorly graded, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	14								**14.0 - 15.0 Feet:** No Recovery.		
	15									▽	
20	16							SP	**15.0 - 19.0 Feet:** SAND with some Gravel, brown, wet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration. Wood fragments present at 15.5 and 17.0 feet. Gravels are fine grained, sub-rounded. UV shows no fluorescence.		
	17										
	18			4 (15-20)	(-)	0.0					
	19								**19.0 - 20.0 Feet:** No Recovery.		

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-32
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
15	21				(-)	0.0			**20.0 - 20.5 Feet:** SAND, brown, wet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	22								**20.5 - 25.0 Feet:** No Recovery.		
	23			0.5 (20-25)							
	24										
10	25							SP	**25.0 - 29.0 Feet:** SAND, gray, wet, fine grained, loose, poorly graded, with splinters of wood mixed throughout. No odor, no sheen, no discoloration. UV shows no fluorescence.		
	26										
	27	X									
	28	X	097 (27-29)	5 (25-30)	(-)	0.0					
	29	X							**29.0 - 30.0 Feet:** No Recovery.		
5	30							ML	**30.0 - 34.0 Feet:** sandy SILT, gray, wet, soft, non-plastic, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	31	X									
	32	X	098 (31-33)		(-)	0.0					
	33	X		5 (30-35)							
	34							SP	**34.0 - 39.5 Feet:** SAND, gray, wet, fine grained, poorly graded, no odor, no sheen, no discoloration. UV shows no fluorescence.		
0	35										
	36										
	37										
	38	X		5 (35-40)							
	39	X	099 (37.5-39.5)		(-)	0.0					
	40							ML	**39.5 - 40.0 Feet:** SILT, gray, moist, soft, medium plasticity, no odor, no sheen, no discoloration.		
-5	41							ML	**40.0 - 45.0 Feet:** SILT, greenish gray and brown mottled, moist, very stiff, no odor, no sheen, no discoloration.		
	42										
	43			5 (40-45)							
	44	X									
	45	X	100 (44-45)								
-10									End of boring at 45.0 feet below ground surface.		

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-33		Date(s): **8/10/09**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Cascade Drilling**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **34.8004**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **704580.01**	Easting: **7624598.16**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **35.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: Concrete	0.0-2.0 Feet	Remarks: **City of Portland Datum**	
3/8" Bentonite Chips	2-35 Feet		
Sample Prefix: 5237-090810-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	1							SP	**0.0 - 10.0 Feet:** Location air knifed to 13.0 feet with intermitten hand auger soil sampling at 1.0 and 8.0 feet.		
	1	X	001 (1-2') 001G (1.5')		(-)	2.0			**0.0 - 0.2 Feet:** Asphalt		
	2	X							**0.2 - 3.0 Feet:** SAND with some gravel, brown, damp, fine grained, loose, poorly graded, no odor, no discoloration, no sheen during sheen testing. Gravels are coarse grained, sub-angular. UV shows no fluorescence.		
	3										
	4								**3.0 - 13.0 Feet:** SAND with some gravel, as above, with some silt present at 8.0 to 8.5 feet and wood fragments observed at 8.0 feet, no odor, no discoloration, no sheen during testing. UV shows no fluorescence.		
30	5										
	6										
	7										
	8	X	002 (8-9') 002G (8')								
	9	X									
25	10				(-)	0.0					
	11				(-)	56					
	12										
	13			3 (10-15)					**13.0 to 15.0 Feet:** No recovery.		
	14										
20	15							SP	**15.0 - 18.0 Feet:** SAND with some silt, black, wet, fine grained, loose, poorly graded. Moderately viscous black oil mixed throughout interval with a strong hydrocarbon-like odor and heavy sheen produced on water during sheen testing. UV shows mild patches of fluorescence.	▽	
	16	X	003 (15-17') 003G (17')		(+)	0.0					
	17	X									
	18			3 (15-20)					**18.0 to 20.0 Feet:** No recovery.		
	19										
15											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-33
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	21				(+)	24		SP	**20.0 - 23.0 Feet:** SAND with some silt and gravel, black, wet from 20.0 to 21.5 feet, then moist from 21.5 to 23.5 feet, fine grained, loose, poorly graded. Gravels are fine grained, sub-angular. Moderately viscous black oil present at 20.0 to 21.0 feet, then again at 23.0 to 23.2 feet. Strong hydrocarbon-like odor observed and heavy sheen produced on water during sheen testing. UV shows strong patches of fluorescence.		
	22			3.5							
	23			(20-25)							
	24								**23.5 - 25.0 Feet:** No recovery.		
-10	25							SP	**25.0 - 30.0 Feet:** SAND, gray, wet, fine grained, loose, poorly graded. No visible black oil observed, hydrocarbon-like odor noticable, and sheen produced on water during sheen testing. UV shows strong patches of fluorescence.		
	26										
	27				(+)	3.6					
	28			5 (25-30)							
	29										
-5	30							ML	**30.0 - 35.0 Feet:** SILT, brown to 32.0 feet then grayish olive-green to 35.0 feet, moist, hard, low plasticity. Rootlets observed, no discoloration, no sheen during sheen testing, and a very miild organic musky odor observed. UV shows no fluorescence.		
	31										
	32				(-)	0.0					
	33			5 (30-35)							
	34										
0	35								End of boring at 35.0 feet below ground surface.		
-5											
-10											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-34		Date(s): **4/30/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **35.4**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **704256.90**	Easting: **7624822.90**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **40.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/8" Bentonite Chips	0-40 feet	Remarks: **City of Portland Datum**	
Sample Prefix: 5237-080430-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
35	1		188 (0-3) 188G (2.5)	4 (0-5)				ML	**0.0 - 0.1 Feet:** Asphalt **0.1 - 2.0 Feet:** gravelly SILT, brown, moist, soft, non-plastic, no odor, no sheen, no discoloration. Gravel is coarse grained and sub-angular.		
	2							ML	**2.0 - 4.0 Feet:** SILT, gray, moist, stiff, low plasticity, no odor, no sheen, no discoloration.		
	3										
	4								**4.0 - 5.0 Feet:** No Recovery.		
30	5		189 (5-6)					ML	**2.0 - 9.0 Feet:** SILT as above with alternating moderately graded sand lenses present from 6.0 to 7.5 feet. No odor, no sheen, no discoloration.		
	6										
	7										
	8			4 (5-10)							
	9								**9.0 - 10.0 Feet:** No Recovery.		
	10							ML	**10.0 - 11.0 Feet:** SILT as above with no odor, no sheen, no discoloration.		
25	11		190G/191G (11) 190/191 (11-13)					SP	**11.0 - 13.5 Feet:** SAND, discolored black, moist, fine grained, loose, poorly graded, with black oily tar fragments present between 11.0 and 11.3 feet. Strong tar-like aroma present, heavy sheen present in water during sheen test. UV shows heavy patches of fluorescence.		
	12										
	13			3.5 (10-15)	(+)	172					
	14								**13.5 - 15.0 Feet:** No Recovery.		
	15									▽	
20	16							SP	**15.0 - 19.0 Feet:** SAND, gray, wet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration.		
	17		192 (17-18)								
	18			4 (15-20)							
	19								**19.0 - 20.0 Feet:** No Recovery.		

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-34
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
15	21							SP	**20.0 - 23.5 Feet:** SAND with some Tar, moist, fine grained, poorly graded, high plasticity due to presence of tar. Tar is black, solid, ductile, forming a sheath/coating around soils from push probe casing. Strong aroma, heavy sheen in water, with approximately 1/8 inch tar layers from 22.5 to 23.5 feet. Dark brown oil present in a thin zone at 22.0 feet. UV shows heavy patches of fluorescence.		
	22	X	193G (22) 193 (22-23.5)	3.5 (20-25)	(+)	375					
	23								**23.5 - 25.0 Feet:** No Recovery.		
	24										
10	25							SP	**25.0 - 30.0 Feet:** SAND with some Tar as above, black, moist, strong odor, heavy sheen present during sheen tests. UV shows heavy patches of fluorescence.		
	26										
	27			5 (25-30)							
	28	X	194 (28-29)		(+)	250					
	29										
	30							SP	**30.0 - 32.0 Feet:** SAND, gray, moist, fine grained, poorly graded, with no odor, no sheen, no discoloration.		
5	31	X	195 (31-32)		(-)	0.0					
	32								**32.0 - 35.0 Feet:** No Recovery.		
	33			2 (30-35)							
	34										
	35							ML	**35.0 - 40.0 Feet:** SILT, gray, moist, stiff, high plasticity, no odor, no sheen, no discoloration.		
0	36										
	37										
	38			5 (35-40)							
	39	X	196 (39-40)		(-)	0.0					
	40								End of boring at 40.0 feet below ground surface.		
-5											
-10											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-36		Date(s): **5/1/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **35.6**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **704327.40**	Easting: **7624966.30**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **40.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/8" Bentonite Chips	0-40 feet	Remarks: **City of Portland Datum**	
Sample Prefix: 5237-080501-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
35	1								**0.0 - 10.0 Feet:** Location air knifed with no soil sampling.		
	2										
	3										
	4										
	5										
30	6										
	7										
	8										
	9										
	10							ML	**10.0 - 11.0 Feet:** gravelly SILT with some Tar, brown with black mottling due to presence of tar, soft, non-plastic, with tar-like odor, sheen present in water during sheen test. Tar is black, granular, and sticky.		
25	11		198G (11) 198 (11-13)	4 (10-15)	(+)	32.5		SP	**11.0 - 14.0 Feet:** SAND, moist, fine grained, loose, poorly graded, with some tar fragments present between 11.0 and 11.8 feet and again between 13.5 and 14.0 feet. Strong tar aroma with heavy sheen present in water during sheen test. UV shows bright speckles of fluorescence.		
	12										
	13										
	14								**14.0 - 15.0 Feet:** No Recovery.		
	15									▽	
20	16							SP	**15.0 - 19.5 Feet:** SAND, brown to 18.0 feet then becoming black from 18 to 19.5 feet, wet, fine grained, loose. Tar/oil-like odor present, sheen present in water during sheen test. Oily tar between 18.5 and 19.5 feet bgs. Tar is black, sticky, and viscous. Oil is black, mildly viscous, and sticky. UV shows bright speckles of fluorescence.		
	17										
	18		199G (18) 199 (18-20)	4.5 (15-20)	(+)	186					
	19										
									19.5 - 20.0 Feet: No Recovery.		

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-36
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
15	21							SP	**20.0 - 20.5 Feet:** TAR, black, very sticky, ductile, high plasticity, strong odor, heavy sheen, solid, with some black viscous oil present throughout.		
	22	☒	200 (21.5-22.5)	2.5 (20-25)	(+)	187			**20.5 - 22.5 Feet:** SAND, black, moist, fine grained, loose, poorly graded. Interbedded tar layers (approximately 1/8 inch thick) present, tar is black, granular, sticky. 1/2 inch silt lens present at 22.0 feet. Strong tar-like aroma, and sheen present during sheen testing. UV shows heavy patches of fluorescence.		
	23								**22.5 - 25.0 Feet:** No Recovery.		
	24										
10	25	☒	201 (25-26)		(+)	13.7		SP	**25.0 - 26.5 Feet:** SAND, gray, moist, fine grained, loose, poorly graded with black granular tar fragments present. Heavy tar-like odor and heavy sheen present in water during sheen test. Tar is black, granular, solid. UV shows mild speckles of fluorescence.		
	26							SP	**26.5 - 27.5 Feet:** SAND as above, brown, with no visible tar.		
	27			2.5 (25-30)					**27.5 - 30.0 Feet:** No Recovery.		
	28										
	29										
5	30	☒	202 (30-31)		(-)	0.0		SP	**30.0 - 30.2 Feet:** SAND as above with some tar fragments, tar-like odor, and sheen present during sheen tests. UV shows very mild speckles of fluorescence.		
	31							ML	**30.2 - 34.0 Feet:** SILT with some Sand, gray, moist, soft, no odor, no sheen, no discoloration.		
	32										
	33			5(30-35)							
	34							ML	**34.0 - 40.0 Feet:** SILT, gray, moist, very stiff, high plasticity, no odor, no sheen, no discoloration. UV shows no fluorescence.		
0	35	☒	203 (35-36)		(-)	0.0					
	36										
	37										
	38			5 (35-40)							
	39										
	40								End of boring at 40.0 feet below ground surface.		
-5											
-10											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-37		Date(s): **4/30/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **35.0**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **704141.60**	Easting: **7625240.00**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **40.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/8" Bentonite Chips	0-40 feet	Remarks: **City of Portland Datum**	
Sample Prefix: 5237-080430-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	1–2		181 (0-3) 181G (2.5)	4 (0-5)	(-)	0.0		ML	**0.0 - 0.1 Feet:** Asphalt **0.1 - 2.5 Feet:** sandy SILT, gray, moist, soft, non-plastic, no odor, no discoloration, mild sheen in water during sheen testing. UV shows no fluorescence.		
	3							SP	**2.5 - 4.0 Feet:** SAND, gray, moist, fine grained, loose, poorly graded, no odor, no discoloration, mild sheen in water.		
	4								**4.0 - 5.0 Feet:** No Recovery.		
30	5–6							ML	**5.0 - 8.0 Feet:** sandy SILT, gray, moist, soft, non-plastic, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	7		182 (7-8)	4 (5-10)	(-)	0.0				▽	
	8							SM	**8.0 - 9.0 Feet:** silty SAND, gray, wet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration.		
	9								**9.0 - 10.0 Feet:** No Recovery.		
25	10							SP	**10.0 - 10.5 Feet:** SAND, gray, wet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration.		
	11							ML	**10.5 - 14.0 Feet:** SILT with trace of Sand, moist, soft, low plasticity, no odor, no sheen, no discoloration. Minor coarse grained sub-angular gravel present at 13.5 feet. UV shows no fluorescence.		
	12–13		183 (12-13)	4 (10-15)	(-)	0.0					
	14								**14.0 - 15.0 Feet:** No Recovery.		
20	15							SP	**15.0 - 18.0 Feet:** SAND, gray, moist, medium grained, loose, with tar-like aroma present, and sheen present in water during sheen test. UV shows speckles of fluorescence.		
	16–17		184 (16-18) 184G (18)		(+)	6.5					
	18			5 (15-20)				SP	**18.0 - 19.0 Feet:** SAND with some Tar, gray to black, moist, loose, low plasticity. Tar is present as small fargements, fine grained, with heavy odor, and heavy sheen in water during sheen test.		
	19								**19.0 - 20.0 Feet:** No Recovery.		

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-37
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	21							SP	**20.0 - 27.0 Feet:** SAND, brown becoming gray below 25.0 feet, moist, fine grained, loose, poorly graded, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	22	X	185 (22-23)	5 (20-25)	(-)	0.0					
	23										
	24										
10	25										
	26										
	27				(-)	0.0			**27.0 - 30.0 Feet:** No Recovery.		
	28			2 (25-30)							
	29										
5	30							ML	**30.0 - 35.0 Feet:** SILT with some Sand, gray, moist, stiff, medium plasticity, no odor, no sheen, no discoloration.		
	31										
	32										
	33			5 (30-35)							
	34	X	186 (34-35)		(-)	0.0					
0	35							SP	**35.0 - 37.0 Feet:** SAND, gray, wet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	36										
	37							ML	**37.0 - 40.0 Feet:** SILT, gray, moist, stiff, medium plasticity, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	38			5 (35-40)							
	39	X	187 (39-40)		(-)	0.0					
-5	40								End of boring at 40 feet below ground surface.		
-10											

NOTES: UV screen consisted of visual with ultraviolet light.
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(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-38		Date(s): **5/1/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **34.7**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **705004.40**	Easting: **7624389.20**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **45.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/8" Bentonite Chips	0-45 feet	Remarks: **City of Portland Datum**	
Sample Prefix: 5237-080501-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
									0.0 - 10.0 Feet: Location air knifed with no soil sampling.		
30	1–5										
25	6–9										
	10							SP	**10.0 - 14.5 Feet:** SAND, brown, moist, fine grained, poorly graded. No odor, no discoloration, mild sheen present in water during sheen tests. Gravels of approximately 2" diameter encountered at 12.0 feet. UV shows no fluorescence.		
	11–13	X	206 (11.5-13.5) 206G (13.5)	4.5 (10-15)	(-)	0.0					
20	14										
	15								**14.5 - 15.0 Feet:** No Recovery	▽	
								SP	**15.0 - 15.7 Feet:** SAND as above, wet, no odor, no sheen, no discoloration. Wood fragments present at 15.3 feet.		
	16							ML	**15.7 - 17.5 Feet:** gravelly SILT, brown, wet, soft, low plasticity, no odor, no sheen, no discoloration. Gravel is coarse grained and sub-angular.		
	17–18	X	207 (16-17)	3.5 (15-20)	(-)	0.0		GP	**17.5 - 18.0 Feet:** GRAVEL, coarse grained, rounded to sub-angular. UV shows no fluorescence.		
								ML	**18.0 - 18.5 Feet:** gravelly SILT as above, no odor, no sheen, no discoloration.		
15	19								**18.5 - 20.0 Feet:** No Recovery.		

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-38
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	21		208 (20-22)					ML	**20.0 - 22.0 Feet:** gravelly SILT, gray with olive gray mottling, moist, soft, non-plastic, with tar-like aroma and heavy rainbow sheen present in water during sheen test. Gravel is coarse grained and sub-angular.		
	22			2 (20-25)					**22.0 - 25.0 Feet:** No Recovery		
	23										
	24										
-10	25		209 (25-26)		(+)	119		ML	**25.0 - 28.5 Feet:** SILT with some Sand and Tar fragments, dark brown to black, moist, soft, medium plasticity, with heavy tar aroma, and heavy rainbow sheen in water. Tar is oily, solid, and black. UV shows heavy patches of fluorescence.		
	26										
	27										
	28			5 (25-30)							
	29		210 (29-30)		(+)	815		SP	**28.5 - 30.0 Feet:** SAND, black, wet, fine grained, loose, poorly graded. Granular, black, solid, sticky tar is present in this interval. UV shows heavy patches of fluorescence.		
-5	30								**30.0 - 35.0 Feet:** SILT with some Sand, gray with black mottling, moist, soft, low plasticity. Solid to semi-solid tar present througout interval as black patchy zones, with strong aroma, and strong rainbow sheen present in water during sheen test. UV shows heavy patches of fluorescence.		
	31										
	32										
	33			5 (30-35)							
	34		211 (34-35)		(+)	452					
0	35							ML	**35.0 - 40.0 Feet:** SILT with some Tar, gray with black patches, wet, soft, low plasticity. Heavy tar-like odor with strong rainbow sheen present in water during sheen testing. Non-viscous black oil mixed with soil matrix encountered at 35.0 to 35.2 feet. UV shows heavy patches of fluorescence.		
	36										
	37										
	38			5 (35-40)							
	39		212G (38) 212 (38-40)		(+)	720					
-5	40							SP	**40.0 - 44.5 Feet:** SAND with some Tar, brown with black patches, moist, fine grained, loose, poorly graded. Tar is black, solid, granular, with heavy aroma, and heavy sheen present in water during sheen test. UV shows heavy patches of fluorescence.		
	41										
	42										
	43			4.5 (40-45)							
	44		213 (44-45)		(+)	224					
-10	45								**44.5 - 45.0 Feet:** No Recovery.		
									End of boring at 45 feet below ground surface.		

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-39		Date(s): **4/29/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **34.4**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **704247.90**	Easting: **7625371.60**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **30.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/8" Bentonite Chips	0-30 feet	Remarks: **City of Portland Datum**	
Sample Prefix: 5237-080429-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	1		162 (0-3) 162G (3)	3.5 (0-5)				ML	**0.0 - 0.1 Feet:** Asphalt		
								SP	**0.1 - 0.5 Feet:** gravelly SILT, dark brown, soft, non-plastic, no odor, no sheen, no discoloration. Gravel is coarse grained, sub-angular.		
	2								**0.5 - 2.0 Feet:** SAND, gray, moist, fine grained, loose, poorly graded, no odor, no sheen, no discoloration.		
								ML	**2.0 - 2.3 Feet:** SILT, gray, moist, soft, low plasticity.		
	3							SP	**2.3 - 3.5 Feet:** SAND with some Silt, gray, moist, fine grained, loose, poorly graded, no odor, no sheen, no discoloration. Wood chip fragments present at 3.3 feet.		
	4								**3.5 - 5.0 Feet:** No Recovery.		
30											
	5							SP	**5.0 - 5.5 Feet:** SAND, gray, moist, medium grained, loose, poorly graded, no odor, no sheen, no discoloration.		
	6		163 (6-7)	4.5 (5-10)	(-)	0.0		ML	**5.5 - 9.5 Feet:** SILT with some Sand, gray, wet (perched) becoming moist with depth, soft, non-plastic, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	7										
	8										
	9										
25											
	10		164 (10-11)		(-)	0.0			**9.5 - 10.0 Feet:** No Recovery.		
								ML	**10.0 - 11.5 Feet:** SILT, gray, moist, soft, low plasticity, no odor, no discoloration, mild sheen present in water during sheen testing. UV shows no fluorescence.		
	11										
	12			3 (10-15)				SP	**11.5 -13.0 Feet:** SAND, gray, moist, fine grained, loose, poorly graded, no odor, no sheen, no discoloration.		
	13								**13.0 - 15.0 Feet:** No Recovery.		
	14										
20											
	15		165 (15-17) 165G (17)		(-)	0.0		SP	**15.0 - 18.0 Feet:** SAND, gray, wet below 17.0 feet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration. UV shows no fluorescence.	▽	
	16										
	17										
	18			3 (15-20)					**18.0 - 20.0 Feet:** No Recovery.		
	19										
15											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-39
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	21	X	166 (20-21.5)		(-)	0.0		SP	**20.0 - 21.5 Feet:** SAND as above, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	22			4.5 (20-25)				ML	**21.5 - 24.5 Feet:** SILT, gray turning brown below 24.0 feet, moist, very stiff, medium plasticity, no odor, no sheen, no discoloration.		
10	24										
	25								**24.5 - 25.0 Feet:** No Recovery.		
	26							ML	**25.0 - 30.0 Feet:** SILT, brown, moist, soft, low plasticity, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	27	X	167 (27-28)	5 (25-30)	(-)	0.0					
5	29										
	30								End of boring at 30 feet below ground surface.		
0											
-5											
-10											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-40		Date(s): **4/28/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **35.677**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **704004.95**	Easting: **7625676.55**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **35.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/8" Bentonite Chips	0-35 feet	Remarks: **City of Portland Datum**	
Sample Prefix: 5237-080428-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
35	1		128 (0-3) 128G (2)					ML	**0.0 - 2.0 Feet:** SILT with some Gravel, gray, moist, low plasticity, no odor, no sheen, no discoloration.		
	2			3 (0-5)				SP	**2.0 - 3.0 Feet:** SAND, gray, moist, fine grained, loose, poorly graded, no odor, no sheen, no discoloration.		
	3								**3.0 - 5.0 Feet:** No Recovery		
	4										
	5							SP	**5.0 - 6.0 Feet:** SAND as above, no odor, no sheen, no discoloration.		
30	6							MH	**6.0 - 9.0 Feet:** sandy SILT with some Gravel, gray, moist, soft, non-plastic, no odor, no sheen, no discoloration. Gravel is coarse grained, sub-angular. Sand is fine grained, sub-angular. UV shows no fluorescence.		
	7		129 (7-8)	4 (5-10)	(-)	0.0					
	8										
	9								**9.0 - 10.0 Feet:** No Recovery		
	10							ML	**10.0 - 13.0 Feet:** SILT, gray, moist, soft, low plasticity, no odor, no sheen, no discoloration. UV shows no fluorescence.		
25	11		130 (11-12)		(-)	0.0					
	12										
	13			3 (10-15)					**13.0 - 15.0 Feet:** No Recovery		
	14										
	15							ML	**15.0 - 18.5 Feet:** sandy SILT becoming SILT at 15.5 feet, gray, moist, soft, non-plastic, no odor, no sheen, no discoloration. Wood chips of less than 0.5 inch thickness present at 17.0 feet. UV shows no fluorescence.		
20	16										
	17		131 (16-18) 131G (18)		(-)	0.0					
	18			4.5 (15-20)						▽	
	19								**18.5 - 20.0 Feet:** No Recovery		

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-40
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
15	21							SM	**20.0 - 23.0 Feet:** silty SAND, gray, wet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration.		
	22										
	23			4.5 (20-25)							
	24	X	132 (23-24)		(-)	0.0		ML	**23.0 - 24.5 Feet:** SILT with some Sand, gray, stiff, medium plasticity, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	25								**24.5 - 25.0 Feet:** No Recovery		
10	26	X	133 (25-57)		(-)	0.0		ML	**25.0 - 27.5 Feet:** sandy SILT, brownish gray, wet, stiff, medium plasticity, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	27										
	28			5 (25-30)					**27.5 - 33.0 Feet:** SILT, brown, moist, stiff, medium plasticity, no odor, no sheen, no discoloration.		
	29										
	30										
5	31										
	32										
	33			4.5 (30-35)							
	34	X	134 (33.5-34.5)		(-)	0.0			**33.0 - 34.5 Feet:** SILT with trace of Sand, gray, moist, stiff, medium plasticity, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	35								**34.5 - 35.0 Feet:** No Recovery		
0									End of boring at 35.0 feet below ground surface.		
-5											
-10											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-41		Date(s): **4/24/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **36.6**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **703787.93**	Easting: **7625936.80**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **30.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/8" Bentonite Chips	0-30 feet	Remarks: **City of Portland Datum**	
Sample Prefix: 5237-080424-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
35	1		089 (0-3) 89G (3)	3.5 (0-5)	(-)	0.0		ML	**0.0 - 1.5 Feet:** SILT with some Gravel, brown, moist, soft, non-plastic, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	2							SP	**1.5 - 3.5 Feet:** SAND, brown to 3.4 feet then gray, moist, fine grained, loose, poorly graded, no odor, no sheen, no discoloration.		
	3								**3.5 - 5.0 Feet:** No Recovery		
	4										
	5							SM	**5.0 - 6.5 Feet:** silty SAND, brown, wet (perched), fine grained, loose, poorly graded, no odor, no sheen, no discoloration.		
30	6										
	7			3.5 (5-10)	(-)	0.0		SP	**6.5 - 8.5 Feet:** SAND, brown becoming gray at 8.0 feet, wet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	8										
	9								**8.5 - 10.0 Feet:** No Recovery		
	10							SP	**10.0 - 13.0 Feet:** SAND, dark gray, moist, fine grained, loose, poorly graded, tar-like aroma present, heavy sheen present in water during sheen test, no visible tar or oil. Wood chips present at 11.0 feet. UV shows no fluorescence.		
	11										
25	12		090 (11.5-12.5)		(-)	0.0					
	13			3.5 (10-15)					**13.0 - 15.0 Feet:** No Recovery		
	14										
	15							SP	**15.0 - 16.0 Feet:** SAND, gray, wet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration. UV shows no fluorescence.	▽	
	16		091 (15-17) 091G (17)		(-)	0.0		ML	**16.0 - 17.0 Feet:** SILT, gray, wet, soft, non-plastic, no odor, no sheen, no discoloration.		
20	17							SP	**17.0 - 19.0 Feet:** SAND, gray, wet, medium grained, loose, poortly graded, no odor, no sheen, no discoloration.		
	18			4 (15-20)							
	19								**19.0 - 20.0 Feet:** No Recovery		

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-41
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
15	21							SP	**20.0 - 25.0 Feet:** SAND, gray, wet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration. Wood fragments mixed throughout from 23.0 to 25.0 feet. UV shows no fluorescence.		
	22										
	23				(-)	0.0					
	24		092 (23-25)	5 (20-25)							
	25							ML	**25.0 - 30.0 Feet:** SILT, dark brown becoming greenish gray with depth, stiff, wet, medium plasticity, no odor, no sheen, no discoloration. UV shows no fluorescence.		
10	26										
	27			5 (25-30)							
	28										
	29		093 (29-30)		(-)	0.0					
	30								End of boring at 30.0 feet below ground surface.		
5											
0											
-5											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-42		Date(s): **4/16/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **34.0722**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **705191.01**	Easting: **7624541.35**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **35.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/8" Bentonite Chips	0-35 feet	Remarks: **City of Portland Datum**	
Sample Prefix: 5237-080416-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	1		031 (0-3) 031G (2)	4.5 (0-5)				ML	**0.0 - 4.5 Feet:** SILT with some Gravel, brown, moist, soft, non-plastic, no odor, no sheen, no discoloration. Gravel is medium grained, sub-angular.		
	2										
	3										
30	4										
	5								**4.5 - 5.0 Feet:** No Recovery.		
	6							ML	**5.0 - 7.0 Feet:** SILT as above, no odor, no sheen, no discoloration.		
	7			4 (5-10)	(-)	0.0		SP	**7.0 - 9.0 Feet:** SAND, brown, moist, fine grained, loose, poorly graded, no odor, no sheen, no discoloration, silt lens present from 8.7 to 8.9 feet. UV shows no fluorescence.		
	8										
25	9								**9.0 - 10.0 Feet:** No Recovery.		
	10							SP	**10.0 - 13.0 Feet:** SAND as above, no odor, no sheen, no discoloration, with exception of black discolored layer from 11.4 to 11.7 feet. UV shows no fluorescence.		
	11										
	12		032G (11.5) 032 (11.5-13)	3 (10-15)	(-)	7.7					
	13								**13.0 - 15.0 Feet:** No Recovery.		
20	14										
	15							SP	**15.0 - 18.0 Feet:** SAND as above, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	16										
	17										
	18			3 (15-20)	(-)	0.0			**18.0 - 20.0 Feet:** No Recovery.		
15	19										

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-42
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	21				(+)	0.0		SP	**20.0 - 24.0 Feet:** SAND as above, no odor, no sheen, no discoloration. UV shows some fluorescence.		
	22			4 (20-25)							
	23										
10	24								**24.0 - 25.0 Feet:** No Recovery.		
	25							SP	**25.0 - 28.0 Feet:** SAND, gray, becoming wet below 26 feet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration. UV shows some fluorescence.	▽	
	26										
	27				(+)	0.0					
	28			3.5 (25-30)							
5	29								**28.0 - 30.0 Feet:** No Recovery.		
	30							ML	**30.0 - 33.5 Feet:** SILT, gray, wet, soft, non-plastic. At 31.0 to 32.0 feet is a layer of patchy black solid sticky tar wth black viscous oil. Heavy sheen on macrocore and in water, with strong tar-like odor. UV shows some fluorescence.		
	31										
	32				(+)	0.0					
	33			5 (30-35)							
0	34		033 (33-35)					ML	**33.5 - 35.0 Feet:** sandy SILT, gray, wet, soft, with mild odor, and mild sheen during water test.		
	35								End of boring at 35.0 feet below ground surface.		
-5											
-10											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-43		Date(s): **4/16/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **34.8244**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **705001.01**	Easting: **7624849.95**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **40.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/8" Bentonite Chips	0-40 feet	Remarks: **City of Portland Datum**	
Sample Prefix: 5237-080416-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	1		034 (0-3) 034G (2.5)		(+)	0.0		ML	**0.0 - 1.5 Feet:** gravelly SILT, brown, moist, soft, non-plastic, no odor, no sheen, no discoloration.		
	2							SP	**1.5 - 4.0 Feet:** SAND, brown, moist, fine grained, loose, poorly graded, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	3			4 (0-5)							
	4								**4.0 - 5.0 Feet:** No Recovery.		
30	5							SP	**5.0 - 8.5 Feet:** SAND as above, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	6										
	7										
	8			3.5 (5-10)	(-)	3.3					
	9								**8.5 - 10.0 Feet:** No Recovery.		
25	10							SP	**10.0 - 13.0 Feet:** SAND, brown, moist, fine grained, loose, poorly graded, no odor, no sheen, no discoloration, UV screen shows speckled fluorescence at 12.5 feet. UV shows some fluorescence.		
	11										
	12										
	13			3 (10-15)	(+)	2.8					
	14								**13.0 - 15.0 Feet:** No Recovery.		
20	15							SP	**15.0 - 18.0 Feet:** SAND as above, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	16										
	17		035 (16-18) 035G (18)		(-)	4.2					
	18			3 (15-20)					**18.0 - 20.0 Feet:** No Recovery.		
	19										
15											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-43
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	21							SP	**20.0 - 24.0 Feet:** SAND as above, no odor, no sheen, no discoloration, UV screen shows speckled fluorescence. UV shows some speckled fluorescence.		
	22				(+)	0.0					
	23			4 (20-25)							
	24								**24.0 - 25.0 Feet:** No Recovery.		
10	25							SP	**25.0 - 28.5 Feet:** SAND as above, becoming gray below 26.0 feet. Tar-like odor present with heavy sheen present during sheen testing, no visible oil or tar, UV screen shows patchy zones of fluorescence. UV shows some fluorescence.		
	26										
	27										
	28			3.5 (25-30)	(+)	25.6					
	29								**28.5 - 30.0 Feet:** No Recovery.		
5	30							SP	**30.0 - 33.0 Feet:** SAND as above, gray, tar-like odor present, rainbow sheen present during sheen testing, no visible tar/oil.		
	31										
	32										
	33			3 (30-35)					**33.0 - 35.0 Feet:** No Recovery.		
	34										
0	35							SP	**35.0 - 37.0 Feet:** SAND as above, tar-like odor and sheen continuing. UV shows some fluorescence.		
	36		036 (35-37)		(+)	58.9					
	37							ML	**37.0 - 38.0 Feet:** SILT with some Sand, containing small patches of tar fragments with black non-viscous oil.		
	38			5 (35-40)				ML	**38.0 - 40.0 Feet:** sandy SILT, brown, wet, stiff, no visual evidence of tar or oil.	▽	
-5	39										
	40								End of boring at 40.0 feet below ground surface.		
-10											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-44		Date(s): **4/16/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **33.9014**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **704893.79**	Easting: **7625005.80**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **35.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/8" Bentonite Chips	0-35 feet	Remarks: **City of Portland Datum**	
Sample Prefix: 5237-080416-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	1		037 (0-3) 037G (2.5)	3.5 (0-5)				ML	**0.0 - 0.5 Feet:** gravelly SILT, brown, moist, soft, no odor, no sheen, no discoloration. Gravel is coarse grained (approximately 2" diameter).		
	2							SP	**0.5 - 3.5 Feet:** SAND, brown, moist, fine grained, loose, poorly graded, no odor, no sheen, no discoloration.		
	3										
30	4								**3.5 - 5.0 Feet:** No Recovery.		
	5							SP	**5.0 - 13.0 Feet:** SAND, as above to 10.0 feet. Below 10.0 feet are small patches of solid, black, plastic tar fragments mixed into sand, with odor and sheen present during sheen test. UV shows no fluorescence.		
	6										
	7										
	8			4 (5-10)	(-)	3.8					
25	9										
	10										
	11										
	12				(-)	4.6					
	13			3 (10-15)					**13.0 - 15.0 Feet:** No Recovery.		
20	14										
	15							SP	**15.0 - 18.0 Feet:** SAND as above becoming black below 16.0 feet, with black plastic tar fragments and heavy rainbow sheen present during sheen test. UV shows no fluorescence.		
	16										
	17		038G (16) 038 (16-18)		(-)	32.8					
	18			3 (15-20)					**18.0 - 20.0 Feet:** No Recovery.		
15	19										

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-44
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	20							SP	**20.0 - 23.5 Feet:** SAND, gray, moist, fine grained, loose, poorly graded. Minor speckles of black tar fragments present throughout with heavy tar-like odor and heavy rainbow sheen in water during sheen test. UV shows no fluorescence.		
	21										
	22										
	23			3.5 (20-25)	(-)	6.2					
10	24								**23.5 - 25.0 Feet:** No Recovery.		
	25							SP	**25.0 - 28.5 Feet:** SAND, as above with tar-like odor diminishing with depth, no sheen or visible tar/oil. UV shows no fluorescence.		
	26										
	27	X	039 (26.5-28.5)		(-)	3.6					
	28	X		3.5 (25-30)							
5	29								**28.5 - 30.0 Feet:** No Recovery.		
	30									▽	
	31							ML	**30.0 - 34.5 Feet:** SILT, gray becoming brown with gray mottling below 31.0 feet, wet from 30.0 to 31.0 feet, moist below 31.0 feet, soft, low plasticity, tar-like odor present, no visible tar or oil.		
	32										
	33			4.5 (30-35)							
0	34										
	35								**34.5 - 35.0 Feet:** No Recovery.		
									End of boring at 35 feet below ground surface.		
-5											
-10											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-45		Date(s): **4/21/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **36.1208**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **704597.70**	Easting: **7625135.03**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **30.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/8" Bentonite Chips	0-30 feet	Remarks: **City of Portland Datum**	
Sample Prefix: 5237-080421-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
35	1		040 (0-3) 040G (3)	3.5 (0-5)	(-)	0.8		ML	**0.0 - 0.5 Feet:** gravelly SILT, brown, moist, soft, non-plastic, no odor, no sheen, no discoloration. Gravel is coarse grained, sub-angular.		
								SP			
	2							ML	**0.5 - 1.0 Feet:** SAND with some Gravel, brown, moist, loose, no odor, no sheen, no discoloration. Gravel is coarse grained, sub-angular.		
	3								**1.0 - 3.5 Feet:** SILT, gray, moist, soft, non-plastic, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	4								**3.5 - 5.0 Feet:** No Recovery.		
	5							ML	**5.0 - 6.5 Feet:** SILT as above. There is a 0.5 inch sand layer between 5.2 and 5.3 feet, with fine grained, loose, poorly graded sand, no odor, no sheen, no discoloration.		
30	6										
	7		041 (6.5-7.5)	4 (5-10)	(-)	0.0		SP	**6.5 - 7.5 Feet:** SAND, gray, moist, medium grained, loose, poorly graded, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	8							ML	**7.5 - 9.0 Feet:** SILT, gray, moist, soft, non-plastic, no odor, no discoloration, mild sheen in water during sheen test.		
	9								**9.0 - 10.0 Feet:** No Recovery.		
	10							ML	**10.0 - 10.5 Feet:** SILT as above, no odor, no sheen, no discoloration.		
25	11		042 (10-12) 042G (12)					SP	**10.5 - 12.0 Feet:** SAND, gray, moist, medium grained, loose, poorly graded, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	12				(-)	0.0		ML	**12.0 - 12.5 Feet:** SILT, gray, moist, soft, non-plastic, no odor, no sheen, no discoloration.		
	13			3 (10-15)				SP	**12.5 - 13.0 Feet:** SAND, gray, moist, medium grained, loose, poorly graded, no odor, no sheen, no discoloration.		
	14								**13.0 - 15.0 Feet:** No Recovery.		
	15							SP	**15.0 - 18.0 Feet:** SAND as above, no odor, no sheen, no discoloration. UV shows no fluorescence.		
20	16										
	17										
	18			3 (15-20)	(-)	0.0			**18.0 - 20.0 Feet:** No Recovery.	▽	
	19										

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-45
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
15	21		043 (20-23)	4 (20-25)	(-)	0.0		SP	**20.0 - 23.0 Feet:** SAND, gray, wet, medium grained, loose, poorly graded, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	22										
	23							ML	**23.0 - 24.0 Feet:** SILT, gray, moist, soft, non-plastic, no odor, no sheen, no discoloration.		
	24								**24.0 - 25.0 Feet:** No Recovery.		
	25							ML	**25.0 - 30.0 Feet:** SILT as above, wet, no odor, no sheen, no discoloration. UV shows no fluorescence.		
10	26										
	27			5 (25-30)							
	28										
	29				(-)	0.0					
	30								End of boring at 30.0 feet below ground surface.		
5											
0											
-5											
-10											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-45A		Date(s): **8/10/09**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Cascade Drilling**		Depth to Groundwater (in well point): 19 Feet bgs	
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **36.1208**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **704597.70**	Easting: **7625135.03**
Annular Fill: 3/8" Bentonite Chips 0-35 feet		Borehole Dia.: **2.5 inches**	Total Depth: **35.0 feet bgs**
		Project Number: **5237**	
		Project Name: **Remedial Investigation - Siltronic Corporation**	
		Remarks: **City of Portland Datum**	

Elevation (ft)	Depth (ft)	Recovery (ft) (core interval)	Sample Information Prefix: 5237-090810- Soil Interval	Soil Number	Soil PID (ppm)	Soil UV Screen	Water Interval	Water Number	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
35	1									ML	**NOTE:** Lithology from 0.0 to 5.0 feet logged based on immediately adjacent boring (P-45).		
	2	0 (0-5)			0.0	(-)				SP	**0.0 - 0.5 Feet:** gravelly SILT, brown, moist, soft, non-plastic, no odor, no sheen, no discoloration. Gravel is coarse grained, sub-angular.		
	3									ML	**0.5 - 1.0 Feet:** SAND with some Gravel, brown, moist, loose, no odor, no sheen, no discoloration. Gravel is coarse grained, sub-angular.		
	4										**1.0 - 3.5 Feet:** SILT, gray, moist, soft, non-plastic, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	5										**3.5 - 5.0 Feet:** No Recovery.		
	6									ML	**5.0 - 6.0 Feet:** SILT with some sand, gray, moist, soft, non-plastic, no odor, no discoloration, no sheen during testing.		
30	7	2.5 (5-10)			0.0	(-)				SP	**6.0 - 7.5 Feet:** SAND with silt lense at 7.1 to 7.2 feet, gray, moist, fine grained, loose, poorly graded, no odor, no discoloration, no sheen during testing. UV shows no fluorescence.		
	8										**7.5 - 10.0 Feet:** No Recovery.		
	9												
	10									SP	**10.0 - 12.0 Feet:** SAND, gray, moist, fine grained, loose, poorly graded, no odor, no discoloration, no sheen during testing. UV shows no fluorescence.		
25	11				56	(-)							
	12	2 (10-15)									**12.0 - 15.0 Feet:** No Recovery.		
	13												
	14												
	15									SP	**15.0 - 19.5 Feet:** SAND, gray, moist, fine grained, loose, poorly graded, no odor, no discoloration, no sheen during testing. UV shows no fluorescence.		
20	16												
	17												
	18	4.5 (15-20)			10.9	(-)							
	19											▽	
											19.5 - 20.0 Feet: No Recovery.		

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence
(+) = fluorescence observed.

bgs = below ground surface
PID = photoionization detector

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-45A
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Recovery (ft) (core interval)	Sample Information Prefix: 5237-090810- Soil Interval	Soil Number	Soil PID (ppm)	Soil UV Screen	Water Interval	Water Number	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
											Depth to Groundwater (in well point):		
-15	21									SP	**20.0 - 22.8 Feet:** SAND, gray, moist, fine grained, loose, poorly graded, no odor, no discoloration, no sheen during testing. UV shows no fluorescence.		
	22	3 (20-25)			1.8	(-)							
	23							101		ML	**22.8 - 23.0 Feet:** SILT, gray, moist, soft, non-plastic, no odor, no discoloration, no sheen during testing.		
	24							102			**23.0 - 25.0 Feet:** No Recovery.		
	25									ML	**25.0 - 30.0 Feet:** sandy SILT, gray, wet, soft, non-plastic, no odor, no discoloration, no sheen during testing.		
-10	26												
	27	5 (25-30)			39	(-)							
	28												
	29												
	30									ML	**30.0 - 35.0 Feet:** SILT, gray with red mottling, wet, hard, non-plastic, root fragment present, no odor, no discoloration, no sheen during testing.		
-5	31				1.8	(-)							
	32	5 (30-35)											
	33												
	34												
	35										End of boring at 35.0 feet below ground surface.		
0													
-5													

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence
(+) = fluorescence observed.

bgs = below ground surface
PID = photoionization detector

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-46		Date(s): **4/21/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **33.7648**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **704761.88**	Easting: **7625237.15**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **40.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/8" Bentonite Chips	0-40 feet	Remarks: **City of Portland Datum**	
Sample Prefix: 5237-080421-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	1		044 (0-3) 044G (3)	3.5 (0-5)	(-)	0.0		SP	**0.0 - 3.5 Feet:** SAND, brown, moist, medium grained, loose, poorly graded, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	2										
	3										
30	4								**3.5 - 5.0 Feet:** No Recovery.		
	5							SP	**5.0 - 8.5 Feet:** SAND as above with minor sheen in water during sheen test. Black fine grained pitch-like material with wood fragments from 8.3 to 8.4 feet. UV shows no fluorescence.		
	6										
	7		045 (6.5-8.5)	3.5 (5-10)	(-)	0.0					
	8										
25	9								**8.5 - 10.0 Feet:** No Recovery.		
	10							SP	**10.0 - 14.0 Feet:** SAND as above with no odor, no discoloration, minor sheen in water during sheen testing. UV shows no fluorescence.		
	11										
	12										
	13			4 (10-15)	(-)	0.0					
20	14								**14.0 - 15.0 Feet:** No Recovery.		
	15								**15.0 - 15.8 Feet:** SAND as above with no odor, no sheen, no discoloration. UV shows no fluorescence.		
	16		046 (15.8)		(-)	0.0		SP	**15.8 - 16.8 Feet:** tarry SAND with root/wood fragments, moist, soft, heavy tar-like aroma, heavy sheen in water during sheen test, tar is solid/granular.		
	17		047 (16.8-18) 047G (17.5)	3 (15-20)					**16.8 - 18.0 Feet:** SAND, gray, moist, medium grained, loose, poorly graded, very light sheen in water during sheen test, no tar or oil observed.		
	18										
15	19								**18.0 - 20.0 Feet:** No Recovery.		

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-46
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	20							SP	**20.0 - 24.0 Feet:** SAND, brown, moist, medium grained, loose, poorly graded, no odor, no sheen, no discoloration. Layer of wood chips present between 22.5 to 22.6 feet. UV shows no fluorescence.		
	21				(-)	0.0					
	22										
	23	☒	048 (22.5)	4 (20-25)							
10	24								**24.0 - 25.0 Feet:** No Recovery.		
	25	☒	049 (25-25.2)		(-)	0.0		SP	**25.0 - 26.0 Feet:** SAND, brown, moist, medium grained, loose, poorly graded, no odor, no sheen, no discoloration. Layer of wood chips present between 25.0 to 25.2 feet.	▽	
	26								**26.0 - 27.0 Feet:** SAND, gray, wet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	27										
	28			2 (25-30)					**27.0 - 30.0 Feet:** No Recovery.		
5	29										
	30							ML	**30.0 - 30.5 Feet:** SILT with some Sand, gray, moist, soft, non-plastic, no odor, no sheen, no discoloration.		
	31							SP	**30.5 - 32.5 Feet:** SAND, gray, wet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration.		
	32										
	33	☒	050/051 (32.5-33)	5 (30-35)	(-)	0.0		OL	**32.5 - 33.0 Feet:** Wood chips with some Sand and Tar fragments, black staining covering wood chips, heavy tar-like aroma, heavy rainbow sheen in water during sheen test. UV shows no fluorescence.		
0	34							ML	**33.0 - 35.0 Feet:** SILT, gray becoming brown at 34.0 feet, moist, soft, non-plastic, no odor, no sheen, no discoloration.		
	35										
	36								**35.0 - 40.0 Feet:** SILT with some Sand, gray, moist, soft, non-plastic, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	37										
	38	☒		5 (35-40)	(-)	0.0					
-5	39	☒	052 (38-40)								
	40								End of boring at 40.0 feet below ground surface.		
-10											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-47		Date(s): **4/21/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **34.565**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **704542.23**	Easting: **7625520.79**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **25.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/8" Bentonite Chips	0-25 feet	Remarks: **City of Portland Datum**	
Sample Prefix: 5237-080421-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	1		053 (0-3) 053G (3)		(-)	0.0		ML	**0.0 - 2.5 Feet:** sandy SILT, brown, moist, soft, non-plastic, no odor, no sheen, no discoloration. Possible brick fragments.		
	2			3.5 (0-5)							
	3							SP	**2.5 - 3.5 Feet:** SAND, brown, moist, medium grained, poorly graded, no odor, mild sheen in water during sheen test, no discoloration. UV shows no fluorescence.		
	4								**3.5 - 5.0 Feet:** No Recovery.		
30	5							ML	**5.0 - 7.5 Feet:** SILT with some Sand, brown, moist, soft, non-plastic, no odor, no sheen, no discoloration.		
	6										
	7		054G (7.5')								
	8		054G (7.5)	4.5 (5-10)	(+)	35.9		SP	**7.5 - 8.5 Feet:** SAND, black, moist, fine grained, loose, poorly graded, with black tar fragments present. Strong tar-like aroma, heavy rainbowsheen in water during sheen test. UV shows heavy patches of fluorescence.		
	9		054 (7.5-8.5)						**8.5 - 9.5 Feet:** SAND, medium grained, brown, moist, loose, poorly graded, no odor, no sheen, no discoloration.		
25	10							ML	**9.5 - 10.0 Feet:** No Recovery.		
	11								**10.0 - 14.0 Feet:** sandy SILT, gray, soft, non-plastic. Mild tar-like odor with mild rainbow sheen present in water during sheen testing, no visible tar/oil. UV shows patches of fluorescence.		
	12										
	13		055 (12-14)	4 (10-15)	(+)	0.4					
	14								**14.0 - 15.0 Feet:** No Recovery.		
20	15									▽	
	16							ML	**15.0 - 19.0 Feet:** sandy SILT, gray, wet to 17.0 feet then moist to 19.0 feet, soft, non-plastic, no odor, no sheen, no discoloration.		
	17										
	18			4 (15-20)	(-)						
	19								**19.0 - 20.0 Feet:** No Recovery.		
15											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-47
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
10	21							ML	**20.0 - 22.0 Feet:** sandy SILT, gray, wet, soft, non-plastic, no odor, no sheen, no discoloration. Sand is fine grained.		
	22										
	23			5 (20-25)					**22.0 - 25.0 Feet:** SILT, gray, moist, soft, non-plastic, no odor, no sheen, no discoloration. Wood fragments present at 24.0 feet.		
	24		056 (23-25)								
	25								End of boring at 25.0 feet below ground surface.		
5											
0											
-5											
-10											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-48		Date(s): **4/22/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **34.9891**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **704407.21**	Easting: **7625579.84**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **25.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/8" Bentonite Chips	0-25 feet	Remarks: **City of Portland Datum**	
Sample Prefix: 5237-080422-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	1		057 (0-3) 057G (3)					ML	**0.0 - 2.0 Feet:** SILT with some Gravel, brown, moist, soft, no odor, no discoloration, light sheen in water during sheen test. Gravel is coarse grained, sub-angular.		
	2			4 (0-5)	(-)			SP	**2.0 - 3.5 Feet:** SAND, brown, moist, fine grained, poorly graded, no odor, no discoloration, light sheen in water during sheen test.		
	3							ML	**3.5 - 4.0 Feet:** sandy SILT, gray, moist, soft, non-plastic, no odor, no sheen, no discoloration.		
	4								**4.0 - 5.0 Feet:** No Recovery.		
30	5							ML	**5.0 - 8.0 Feet:** sandy SILT as above, no odor, no sheen, no discoloration.		
	6										
	7			4.5							
	8			(5-10)	(-)	0.0		SP	**8.0 - 9.5 Feet:** SAND, gray, moist, medium grained, loose, poorly graded, no odor, no sheen, no discoloration.		
	9								**9.5 - 10.0 Feet:** No Recovery.		
25	10							SP	**10.0 - 12.5 Feet:** SAND as above, fine grained, no odor, no sheen, no discoloration.		
	11		058 (10-12.5) 058G (12)		(-)	0.0					
	12										
	13			2.5 (10-15)					**12.5 - 15.0 Feet:** No Recovery.		
	14										
20	15							SM	**15.0 - 19.0 Feet:** silty SAND, gray, wet to 17.0 feet then moist to 19.0 feet, fine grained, loose, poorly graded. No odor, no discoloration, but mild sheen present in water during sheen testing.	▽	
	16		059 (15-17) 059G (17)		(-)	0.0					
	17										
	18			4 (15-20)							
	19								**19.0 - 20.0 Feet:** No Recovery.		

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-48
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	21							ML	**20.0 - 21.0 Feet:** sandy SILT, dark brown, moist, soft, non-plastic, no odor, no sheen, no discoloration.		
	22								**21.0 - 25.0 Feet:** SILT, dark brown becoming brown with depth, moist, soft, non-plastic, no odor, no sheen, no discoloration.		
	23			5 (20-25)							
	24	X	060 (24-25)		(-)	0.0					
10	25								End of boring at 25.0 feet below ground surface.		
5											
0											
-5											
-10											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-49		Date(s): **4/22/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **34.7296**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **704396.92**	Easting: **7625718.48**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **35.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/8" Bentonite Chips	0-35 feet	Remarks: **City of Portland Datum**	
Sample Prefix: 5237-080422-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	1		061 (0-3) 061G (2)	3.5 (0-5)				SP	**0.0 - 3.0 Feet:** SAND, brown, moist, fine grained, loose, poorly graded, no odor, no discoloration, minor sheen in water during sheen test.		
	2										
	3				(-)	0.0		ML	**3.0 - 3.5 Feet:** sandy SILT, gray, moist, soft, non-plastic, no odor, no sheen, no discoloration.		
	4								**3.5 - 5.0 Feet:** No Recovery.		
30	5							SP	**5.0 - 5.2 Feet:** SAND, brown, moist, fine grained, loose, poorly graded, no odor, no sheen, no discoloration.		
	6							ML	**5.2 - 9.0 Feet:** sandy SILT, gray, moist, soft, non-plastic, no odor, no sheen, no discoloration. Sand is fine grained.		
	7										
	8			4 (5-10)	(-)	0.0					
	9								**9.0 - 10.0 Feet:** No Recovery.		
25	10							SP	**10.0 - 10.2 Feet:** SAND, gray, moist, fine grained, loose, poorly graded, no odor, no sheen, no discoloration.		
	11		062 (10.2-12.5) 062G (12.5)					ML	**10.2 - 13.5 Feet:** SILT with some Sand, gray, moist, soft, non-plastic, no odor, no sheen, no discoloration.		
	12										
	13			4 (10-15)	(-)	3.8					
	14							SP	**13.5 - 13.6 Feet:** SAND, gray, moist, medium grained, loose, no odor, no sheen, no discoloration.		
								ML	**13.6 - 14.0 Feet:** sandy SILT, gray, moist, soft, non-plastic, no odor, no sheen, no discoloration.		
20	15							SP	**14.0 - 15.0 Feet:** No Recovery.		
	16							ML	**15.0 - 15.2 Feet:** SAND, gray, wet, medium grained, loose, poorly graded, no odor, no sheen, no discoloration.		
	17		063 (16.18)		(-)	0.2			**15.2 - 18.0 Feet:** SILT with some Sand and Gravel becoming sandy SILT at 17.2 feet, gray, moist, soft, non-plastic, no odor, no sheen, no discoloration. Gravel is fine to coarse grained, sub-angular. Sand is fine grained. Flat wood fragments present at 16.5 feet and 17.8 feet.		
	18			3 (15-20)					**18.0 - 20.0 Feet:** No Recovery.		
	19										
15											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-49
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	21							SP ML	**20.0 - 20.1 Feet:** SAND, brown, moist, fine grained, loose, poorly graded, no odor, no sheen, no discoloration. **20.1 - 22.0 Feet:** sandy SILT, gray, moist, soft, non-plastic, no odor, no discoloration, minor sheen in water during sheen test.		
	22			3				SP ML	**22.0 - 22.1 Feet:** SAND, gray, moist, fine grained, loose, poorly graded, no odor, no discoloration, minor sheen in water during sheen test.		
	23			(20-25)	(-)	0.0			**22.1 - 23.0 Feet:** sandy SILT, gray, moist, soft, non-plastic, no odor, no discoloration, minor sheen in water during sheen testing.		
	24								**23.0 - 25.0 Feet:** No Recovery.		
10	25									▽	
	26							ML	**25.0 - 26.0 Feet:** sandy SILT, brownish gray, wet, soft, non-plastic, no odor, no sheen, no discoloration. **26.0 - 29.0 Feet:** SILT, dark brown becoming brown with depth, moist, soft, non-plastic, red/brown mottling present, no odor, no sheen, no discoloration.		
	27										
	28		064 (28.29)	4 (25-30)	(-)	2.8					
	29								**29.0 - 30.0 Feet:** No Recovery.		
5	30							ML	**30.0 - 34.0 Feet:** SILT, brown, wet to 31.0 feet then moist, soft, medium plasticity, no odor, no sheen, no discoloration.		
	31										
	32										
	33			4 (30-35)							
	34				(-)	0.0			**34.0 - 35.0 Feet:** No Recovery.		
0	35								End of boring at 35.0 feet below ground surface.		
-5											
-10											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-50		Date(s): **4/22/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **35.2314**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **704270.59**	Easting: **7625745.38**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **40.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/8" Bentonite Chips	0-40 feet	Remarks: **City of Portland Datum**	
Sample Prefix: 5237-080422-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
35								SP	**0.0 - 2.5 Feet:** SAND with some Silt, brown, moist, fine grained, loose, poorly graded, no odor, no sheen, no discoloration.		
	1		069 (0-3) 069G (3)		(-)	0.0					
	2			3.5 (0-5)							
	3								**2.5 - 3.0 Feet:** SAND, brown, moist, fine grained, loose, poorly graded, no odor, no discoloration, with minor sheen in water during sheen testing.		
	4								**3.0 - 5.0 Feet:** No Recovery.		
30	5							SP	**5.0 - 6.0 Feet:** SAND as above, no odor, no sheen, no discoloration.		
	6							ML	**6.0 - 9.0 Feet:** sandy SILT, gray, moist, soft, non-plastic, no odor, no sheen, no discoloration.		
	7										
	8			4 (5-10)		0.0					
	9								**9.0 - 10.0 Feet:** No Recovery.		
25	10							ML	**10.0 - 14.0 Feet:** SILT, gray, moist, soft, non-plastic, no odor, no sheen, no discoloration.		
	11										
	12		070/071 (11-14) 070G/071G (14)								
	13			4.5 (10-15)	(-)	0.0					
	14							SP	**14.0 - 14.5 Feet:** SAND, gray, moist, medium grained, loose, poorly graded, no odor, no sheen, no discoloration.		
20	15							SP	**14.5 - 15.0 Feet:** No Recovery.		
	16								**15.0 - 18.0 Feet:** SAND as above, wet, no odor, no sheen, no discoloration.		
	17				(-)	0.0					
	18			3 (15-20)					**18.0 - 20.0 Feet:** No Recovery.		
	19										

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-50
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
15	21							ML	**20.0 - 25.0 Feet:** SILT, gray, moist, soft, low plasticity, no odor, no sheen, no discoloration.		
	22										
	23			5 (20-25)							
	24		072 (23-25)		(-)	0.0					
10	25							SM	**25.0 - 30.0 Feet:** silty SAND, brown, wet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration.	▽	
	26										
	27										
	28			5 (25-30)		0.0					
	29										
5	30										
	31										
	32										
	33			5 (30-35)							
	34		073 (33-34)		(-)	0.0					
0	35							ML	**34.0 - 35.0 Feet:** SILT, brown becoming gray at 35.0 feet then brown again with depth, wet, soft, non-plastic to 35.0 feet then medium plasticity, no odor, no sheen, no discoloration.		
	36										
	37										
	38			5 (35-40)	(-)	0.0					
	39										
-5	40								End of boring at 40.0 feet below ground surface.		
-10											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-51		Date(s): **4/22/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **34.751**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **704373.39**	Easting: **7625811.15**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **35.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/8" Bentonite Chips	0-35 feet	Remarks: **City of Portland Datum**	
Sample Prefix: 5237-080422-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	1		065 (0-3) 065G (3)	3.5 (0-5)	(-)	0.1		SP	**0.0 - 2.0 Feet:** SAND, brown, moist, fine grained, loose, poorly graded, some rootlets present, no odor, no sheen, no discoloration.		
	2							SM	**2.0 - 3.5 Feet:** silty SAND, gray, moist, fine grained, loose, poorly graded, with wood chips present at 2.0 feet. no odor, no sheen, no discoloration.		
	3										
	4								**3.5 - 5.0 Feet:** No Recovery.		
30	5							SM	**5.0 - 6.2 Feet:** SAND becoming silty SAND below 5.2 feet, brown becoming gray at 5.2 feet, moist, fine grained, loose, poorly graded. No odor, no sheen, and no discoloration.		
	6										
	7		066 (6-8)	3 (5-10)	(-)	4.0		ML	**6.2 - 8.0 Feet:** sandy SILT, gray, moist, soft, low plasticity, no odor, no sheen, no discoloration.		
	8								**8.0 - 10.0 Feet:** No Recovery.		
	9										
25	10							ML	**10.0 - 11.0 Feet:** sandy SILT, as above.		
	11							SP	**11.0 - 13.0 Feet:** SAND with some Silt and Gravel, gray, moist, fine grained, loose, moderate grading. Gravel is coarse grained, sub-rounded. No odor, no sheen, and no discoloration present. Wood chips encountered at 11.5 feet.		
	12		067 (11-13) 067G (13)	3 (10-15)	(-)	0.0					
	13								**13.0 - 15.0 Feet:** No Recovery.		
	14										
20	15							SP	**15.0 - 18.5 Feet:** SAND, gray, wet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration.	▽	
	16										
	17										
	18			3.5 (15-20)	(-)	0.0			**18.5 - 20.0 Feet:** No Recovery.		
	19										
15											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-51
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	20				(-)	0.0		SP	**20.0 - 20.5 Feet:** SAND, as above **20.5 - 25.0 Feet:** No Recovery.		
	21										
	22										
	23			0.5 (20-25)							
	24										
10	25							SP	**25.0 - 26.0 Feet:** SAND, as above.		
	26							ML	**26.0 - 27.5 Feet:** SILT with some Sand, gray, moist, soft, non-plastic, no odor, no sheen, no discoloration. Wood chips present at 26.0 and at 27.0 feet.		
	27			2.5 (25-30)	(-)	0.0			**27.5 - 30.0 Feet:** No Recovery.		
	28										
	29										
5	30							ML	**30.0 - 31.5 Feet:** SILT, brown, moist, soft, low plasticity, no odor, no sheen, no discoloration.		
	31										
	32			5 (30-35)				SP	**31.5 - 35.0 Feet:** SAND with some Silt, brown, wet becoming moist below 33.0 feet, fine grained, loose, low plasticity, poorly graded, no odor, no sheen, no discoloration.		
	33										
	34		068 (34-35)		(-)	0.0					
0	35								End of boring at 35 feet below ground surface.		
-5											
-10											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-52		Date(s): **4/24/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **35.9969**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **704109.69**	Easting: **7626110.77**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **31.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/8" Bentonite Chips	0-31 feet	Remarks: **City of Portland Datum**	
Sample Prefix: 5237-080424-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
35	1		080 (0-3) 080G (1)					ML	**0.0 - 1.0 Feet:** SILT, brown, moist, soft, low plasticity, no odor, no sheen, no discoloration. Root material present throughout interval		
	2							SP	**1.0 - 3.0 Feet:** SAND, brown, moist, fine grained, loose, poorly graded. No odor, no discoloration, but minor sheen present in water during sheen testing. UV shows no fluorescence.		
	3			3 (0-5)	(-)	0.0			**3.0 - 5.0 Feet:** No Recovery.		
	4										
	5							SP	**5.0 - 7.5 Feet:** SAND as above with some Silt, brown to 7.0 feet then gray. Occasional coarse grained gravels present. UV shows no fluorescence.		
30	6										
	7		081 (6.5-7.5)		(-)	0.0					
	8			2.5 (5-10)					**7.5 - 10.0 Feet:** No Recovery.		
	9										
	10							SP	**10.0 - 10.1 Feet** SAND as above with trace of silt, no odor, no sheen, no discoloration.		
25	11		082 (11-12)					ML	**10.1 - 11.1 Feet:** SILT, gray, moist, soft, medium plasticity, no odor, no sheen, no discoloration.		
	12		083 (12-13)					ML	**11.1 - 13.0 Feet:** sandy SILT with some Gravel, gray, moist, soft, no odor, no sheen, no discoloration. Gravels are coarse grained, sub-angular. Wood chips present at 11.0 and 12.0 feet. UV shows no fluorescence.		
	13			3 (10-15)	(-)	0.0			**13.0 - 15.0 Feet:** No Recovery.		
	14										
	15		085G (15) 085 (15-17)					SP	**15.0 - 17.0 Feet:** SAND with some Silt, gray, moist, fine grained, loose, poorly graded, no odor, no sheen, no discoloration. UV shows no fluorescence.		
20	16										
	17		084 (17-18)					SM	**17.0 - 18.0 Feet:** silty SAND as above with trace of gravel from 17.5 to 18.0 feet. Gravel is fine grained, sub-rounded. UV shows no fluorescence.		
	18			3 (15-20)	(-)	0.0			**18.0 - 20.0 Feet:** No Recovery.		
	19										

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-52
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
15	21							SM	**20.0 - 23.5 Feet:** silty SAND as above. No odor, no discoloration, but minor sheen present in water during sheen testing. UV shows no fluorescence.		
	22										
	23	☒	086 (22.5-23.5)	2.5 (20-25)	(-)	0.0					
	24								**23.5 - 25.0 Feet:** No Recovery.		
	25							SP	**25.0 - 30.0 Feet:** SAND with trace of Silt, gray, wet, fine grained, loose, no odor, no sheen, no discoloration. UV shows no fluorescence.	▽	
10	26										
	27										
	28	☒	087 (27.5-28.5)	5 (25-30)	(-)	0.0					
	29										
	30										
		☒	088 (30-31)	1 (30-31)				SM	**30.0 - 31.0 Feet:** silty SAND, gray, wet, fine grained, loose, poorly graded, with small black oil bleb at 30.5 feet.		
5	31								End of boring at 31.0 feet below ground surface due to refusal.		
0											
-5											
-10											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-54		Date(s): **4/29/08**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **37.2028**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing: **704150.24**	Easting: **7625028.22**
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **40.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/8" Bentonite Chips	0-40 feet	Remarks: **City of Portland Datum**	
Sample Prefix: 5237-080429-XXX			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	0							ML	**0.0 - 0.1 Feet:** Asphalt.		
	1		168 (0-3) 168G (3)						**0.1 - 1.5 Feet:** gravelly SILT with some Sand, gray, moist, soft, non-plastic, no odor, no sheen, no discoloration. Gravel is coarse, sub-angular.		
35	2							SM	**1.5 - 2.5 Feet:** silty SAND, gray, moist, fine grained, loose, poorly graded. No odor, no discoloration, but mild sheen present in water during sheen testing. UV shows no fluorescence.		
	3			2.5 (0-5)					**2.5 - 5.0 Feet:** No Recovery.		
	4										
	5							SM	**5.0 - 5.5 Feet:** silty SAND as above.		
	6							SP	**5.5 - 6.0 Feet:** SAND, gray, moist, fine grained, loose, poorly graded. No odor, no discoloration, but sheen present in water during sheen testing.		
	7							ML	**6.0 - 8.7 Feet:** sandy SILT, gray, moist, soft, non-plastic. No odor, no discoloration, but sheen present in water during sheen testing. UV shows no fluorescence.		
30	8		169 (7-9) 169G (9)	4 (5-10)	(-)	0.0					
	9							ML	**8.7 - 9.0 Feet:** SILT, gray, moist, soft, non-plastic, no odor, no discoloration, sheen present in water during sheen testing.		
	10								**9.0 - 10.0 Feet:** No Recovery.		
	11		170 (11-12)		(-)	0.0		ML	**10.0 - 12.0 Feet:** SILT as above, no odor, no sheen, no discoloration.		
25	12							SP	**12.0 - 13.5 Feet:** SAND, moist, fine grained, loose, poorly graded, no odor, no sheen, no discoloration. UV shows no fluorescence.		
	13			3.5 (10-15)							
	14								**13.5 - 15.0 Feet:** No Recovery.		
	15							SP	**15.0 - 19.0 Feet:** SAND as above, wet below 17.0 feet, no odor, no sheen, no discoloration. Wood chips present at 16.5 feet. Possible tar (black, solid) encountered at end of macrocore (19.0 feet). UV shows no fluorescence.	▽	
	16		171 (15-17)		(-)	0.0					
20	17										
	18			4 (15-20)							
	19		172 (19)		(-)	0.0			**19.0 - 20.0 Feet:** No Recovery.		

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-54
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	21	X	173 (20-22) 173G (21)		(+)	0.0		SP	**20.0 - 22.0 Feet:** SAND as above with small black oily tar fragments and a heavy sheen. UV shows some fluorescence.		
15	22			5 (20-25)					**22.0 - 30.0 Feet:** SAND as above, brown, wet, mild tar-like odor present, no sheen, no visible tar/oil present. UV shows no fluorescence.		
	23										
	24										
	25										
	26										
10	27	X	174 (27-28)	5 (25-30)	(-)	0.0					
	28										
	29										
	30								**30.0 - 35.0 Feet:** No Recovery.		
	31										
5	32										
	33			0 (30-35)							
	34										
	35	X	175 (35-36)		(-)	0.0		ML	**35.0 - 40.0 Feet:** SILT, brown, moist, stiff, high plasticity, no odor, no sheen, no discoloration. UV shows no fluorescence.		
0	36										
	37										
	38			5 (35-40)							
	39										
	40								End of boring at 40.0 feet below ground surface.		
-5											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface
City of Portland Datum

▽ First encountered groundwater

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID:	P-55	Date(s):	**7/8/2014**
Location:	**7200 NW Front Avenue, Portland, Oregon**		
Logged By:	**Ben Uhl**	Checked By:	**Rob Ede**
Driller:	**Pacific Soil and Water, LLC**	OWRD #:	**NA**
Drilling Method:	**AMS 9500-VTR (Direct Push)**	GS Elevation:	**34.9 feet**
TOC:	NA		
Sampling Method:	**Macrocore**	Northing:	**704410.82**
Easting:	**7625148.44**		
Borehole Dia.:	**2.25 inches**	Total Depth:	**30.0 feet bgs**
Project Number:	**5237**		
Project Name:	**Remedial Investigation - Siltronic Corp**		
Remarks:	Horizontal Datum - NAD 83/91 Vertical Datum - City of Protland (COP)		

Boring Abandonment Details:

Annular Fill: Asphalt Patch: 0 - 0.5 feet bgs
3/4" Bentonite Chips: 0.5 - 30 feet bgs

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	UV	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	1			3.2 (0 - 5)	0.3	(-)		GP	**(0.0 - 0.5 feet bgs)** GRAVEL with some Asphalt, gray, moist, loose, fine grained, poorly graded, no odor, no sheen, no discoloration.		
								ML			
								ML	**(0.5 - 1.0 feet bgs)** Gravelly SILT, gray, moist, soft, non-plastic, no odor, no sheen, no discoloration.		
	2							SP			
								SM	**(1.0 - 1.7 feet bgs)** sandy SILT, gray, moist, soft, non-plastic, no odor, no sheen, no discoloration.		
	3				0.2	(-)		SP	**(1.7 - 2.1 feet bgs)** SAND with some Silt, gray, moist, loose, fine grained, poorly graded, no odor, no sheen, no discoloration.		
	4								**(2.1 - 3.1 feet bgs)** silty SAND, gray, moist, loose, fine grained, poorly graded, no odor, no sheen, no discoloration.		
30	5			2.5 (5 - 10)	0.1	(-)		SP	**(3.1 - 3.2 feet bgs)** SAND, gray, moist, medium grained, poorly graded, no odor, no sheen, no discoloration.		
	6							ML	**(3.2 - 5.0 feet bgs)** NO RECOVERY		
	7				0.1	(-)		SP	**(5.0 - 5.7 feet bgs)** SAND, gray, moist, medium grained, poorly graded, no odor, no sheen, no discoloration.		
	8								**(5.7 - 7.1 feet bgs)** sandy SILT, gray, moist, soft, non-plastic, no odor, no sheen, no discoloration.		
	9								**(7.1 - 7.5 feet bgs)** SAND, gray, moist, loose, medium grained, poorly graded, no odor, light sheen, no discoloration.		
25	10								**(7.5 - 10.0 feet bgs)** NO RECOVERY		
				4.3	50.4	(-)		SP	**(10.0 - 10.7 feet bgs)** SAND with some fine grained Gravel, black, moist, loose, fine grained, poorly graded, petroleum odor, rainbow sheen, black discoloration, no visible oil.		
	11		P-55-A1	(10 - 15)				SP			
	12								**(10.7 - 14.3 feet bgs)** SAND, dark gray and black, moist, loose, fine grained, poorly graded, petroleum odor, rainbow sheen, black discoloration, no visible oil.		
	13		P-55-A2		1	(-)					
	14								**(14.3 - 15.0 feet bgs)** NO RECOVERY		
20			P-55-B1								
	15							SP	**(15.0 - 18.0 feet bgs)** SAND, gray to black, very moist, loose, fine to medium grained, poorly graded, rootlets at 15.5 feet bgs, petroleum odor, no sheen, some black discoloration, no visible oil.		
	16		P-55-B2	3 (15 - 20)	0.8	(-)					
	17										
	18				0.6	(-)			**(18.0 - 20.0 feet bgs)** NO RECOVERY		
	19										

bgs = below ground surface
ft = feet
PID=photoionization detector
ppm = parts per million

UV = ultraviolet
UV screen consisted of visual observation with ultraviolet light.
(-) no indication of fluorescence
(+) fluorescence observed (see lithology)

▽ First encountered groundwater (wet soils observed)

Report: 5237 BAU JAN 23; File: 5237-10H3 DNAPL CHAR LOGS.GPJ; 2/9/15

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-55
Project Name: **Remedial Investigation - Siltronic Corp**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (Prefix:)	Recovery (ft) (core interval)	PID (ppm)	UV	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	21			4.7 (20 - 25)	0.3	(-)		SP	**(20.0 - 24.1 feet bgs)** SAND, gray, wet, loose, fine to medium grained, poorly graded, mild petroleum odor, no sheen, and no discoloration.		
	22										
	23		P-55-C1								
	24				0.1	(-)		ML	**(24.1 - 24.7 feet bgs)** SILT, gray, moist, soft, non plastic, no odor, no sheen, no discoloration.		
10	25		P-55-C2	3.8 (25 - 30)				ML	**(25.0 - 28.8 feet bgs)** SILT with some Sand, brown, moist, soft, non-plastic, no odor, no sheen, no discoloration.		
	26										
	27				0.1	(-)					
	28										
	29								**(28.8 - 30.0 feet bgs)** NO RECOVERY		
5	30								End boring at 30.0 feet bgs.		
0											
-5											
-10											

bgs = below ground surface
ft = feet
PID=photoionization detector
ppm = parts per million

UV = ultraviolet
UV screen consisted of visual observation with ultraviolet light.
(-) no indication of fluorescence
(+) fluorescence observed (see lithology)

▽ First encountered groundwater (wet soils observed)

Report: 5237 BAU JAN 23; File: 5237-10H3 DNAPL CHAR LOGS.GPJ; 2/9/15

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID:	P-56	Date(s):	**7/7/2014**
Location:	**7200 NW Front Avenue, Portland, Oregon**		
Logged By:	**Ben Uhl**	Checked By:	**Rob Ede**
Driller:	**Pacific Soil and Water, LLC**	OWRD #:	**NA**
Drilling Method:	**AMS 9500-VTR (Direct Push)**	GS Elevation: **40.9 feet**	TOC: NA
Sampling Method:	**Macrocore**	Northing: **703778.91**	Easting: **7624024.29**
Boring Abandonment Details:		Borehole Dia.: **2.25 inches**	Total Depth: **25.0 feet bgs**
Annular Fill: 3/4" Bentonite Chips: 0 - 25 feet bgs		Project Number: **5237**	
		Project Name:	**Remedial Investigation - Siltronic Corp**
		Remarks:	Horizontal Datum - NAD 83/91 Vertical Datum - City of Protland (COP)

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	UV	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
40	1			3.7 (0 - 5)				ML	**(0.0 - 1.2 feet bgs)** gravelly SILT, brown, moist, soft, non-plastic, no odor, no sheen, no discoloration, filter fabric at 1.2 feet bgs. Gravels are fine to medium grained and subangular.		
	2				1.6	(-)		ML	**(1.2 - 3.2 feet bgs)** SILT with some Sand, gray, moist, soft, low plasticity, no odor, no sheen, no discoloration.		
	3				0.1	(-)		SP	**(3.2 - 3.7 feet bgs)** SAND with some Silt and subangular Gravel, gray, moist, loose, fine grained, poorly graded, no odor, no sheen, no discoloration.		
	4								**(3.7 - 5.0 feet bgs)** NO RECOVERY		
	5			4 (5 - 10)				SP	**(5.0 - 8.0 feet bgs)** SAND, gray, moist, loose, fine grained, poorly graded, mild petroleum odor, no sheen, no discoloration.		
35	6				0.1	(-)					
	7										
	8				0.2	(-)		ML	**(8.0 - 8.3 feet bgs)** SILT, gray, moist, soft, non-plastic, mild petroleum odor, no sheen, no discoloration.		
	9							SP	**(8.3 - 9.0 feet bgs)** SAND, gray, wet, loose, fine grained, poorly graded, mild petroleum odor, no sheen, no discoloration.		
	10								**(9.0 - 10.0 feet bgs)** NO RECOVERY		
30	11		P-56-A1	3.8 (10 - 15)	4.4	(-)		ML	**(10.0 - 11.7 feet bgs)** gravelly SILT, dark gray, moist, soft, non-plastic, mild petroleum odor, no sheen, no discoloration, wire fragments at 10.0 feet bgs and rubber fragments at 10.7 feet bgs. Gravels are coarse grained and subangular.		
	12		P-56-A2					ML	**(11.7 - 13.8 feet bgs)** SILT with some Gravel, brown and olive green to 13.4 feet bgs, then black and dark brown mottled, moist, soft, low plasticity, roots and wood fragments present, mild petroleum odor, no sheen.		
	13										
	14		P-56-A3		0.4	(-)			**(13.8 - 15.0 feet bgs)** NO RECOVERY		
	15							ML	**(15.0 - 18.3 feet bgs)** SILT, dark gray with black smears, moist, soft, non-plastic, concrete fragments from 17.4 to 17.5 feet bgs, mild petroleum odor, no sheen.		
25	16		P-56-B1	3.3 (15 - 20)							
	17		P-56-B2		0.4	(-)					
	18								**(18.3 - 20.0 feet bgs)** NO RECOVERY	▽	
	19		P-56-C1								

bgs = below ground surface
ft = feet
PID=photoionization detector
ppm = parts per million

UV = ultraviolet
UV screen consisted of visual observation with ultraviolet light.
(-) no indication of fluorescence
(+) fluorescence observed (see lithology)

▽ First encountered groundwater (wet soils observed)

Report: 5237 BAU JAN 23; File: 5237-10H3 DNAPL CHAR LOGS.GPJ; 2/9/15

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-56
Project Name: **Remedial Investigation - Siltronic Corp**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (Prefix: P-56-C2)	Recovery (ft) (core interval)	PID (ppm)	UV	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
20	21		P-56-C2	4.2 (20 - 25)	0.8	(-)		SP	**(20.0 - 20.7 feet bgs)** gravelly SAND with some Silt, dark gray, wet, loose, medium grained, poorly graded, Gravels are medium to coarse grained, subangular, mild petroleum odor, no sheen, no discoloration.		
								ML			
	22				0.3	(-)			**(20.7 - 24.2 feet bgs)** SILT with some Sand, dark brown, moist to 23.3 feet bgs then wet, soft, non-plastic, rootlets present, no odor, no sheen, no discoloration.		
	23										
	24										
	25								**(24.2 - 25.0 feet bgs)** NO RECOVERY		
15									End boring at 25.0 feet bgs.		
10											
5											
0											
-5											

bgs = below ground surface
ft = feet
PID=photoionization detector
ppm = parts per million

UV = ultraviolet
UV screen consisted of visual observation with ultraviolet light.
(-) no indication of fluorescence
(+) fluorescence observed (see lithology)

▽ First encountered groundwater (wet soils observed)

Report: 5237 BAU JAN 23; File: 5237-10H3 DNAPL CHAR LOGS.GPJ; 2/9/15

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID:	P-57	Date(s):	**7/1/2014**
Location:	**7200 NW Front Avenue, Portland, Oregon**		
Logged By:	**Ben Uhl**	Checked By:	**Rob Ede**
Driller:	**Pacific Soil and Water, LLC**	OWRD #:	**NA**
Drilling Method:	**AMS 9500-VTR (Direct Push)**	GS Elevation:	**42.6 feet**
TOC:	NA		
Sampling Method:	**Macrocore**	Northing:	**702975.93**
Easting:	**7624584.86**		
Boring Abandonment Details:		Borehole Dia.:	**2.25 inches**
Total Depth:	**20.0 feet bgs**		
Annular Fill:	3/4" Bentonite Chips 0 - 20 feet bgs	Project Number:	**5237**
Project Name:	**Remedial Investigation - Siltronic Corp**		
Remarks:	Horizontal Datum - NAD 83/91 Vertical Datum - City of Protland (COP)		

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	UV	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	0			4.3 (0 - 5)				ML	**(0.0 - 2.2 feet bgs)** gravelly SILT, dark brown, soft, moist, non-plastic. Gravels are fine to medium grained, subangular, no odor, no sheen, no discoloration.		
	1										
	2				0.6	(-)		SP	**(2.2 - 3.0 feet bgs)** SAND, gray, moist, loose, fine grained, poorly graded, no odor, light sheen, no discoloration.		
40	3							ML	**(3.0 - 3.1 feet bgs)** SILT, gray, moist, soft, no odor, light sheen, no discoloration.		
	4							SP	**(3.1 - 3.4 feet bgs)** SAND, gray, moist, loose, fine grained, poorly graded, no odor, light sheen, no discoloration.		
	5		P-57-A1	3.4 (5 - 10)	0.7	(-)		ML	**(3.4 - 3.5 feet bgs)** SILT, gray, moist, soft, no odor, light sheen, no discoloration.		
	6		P-57-A2					SP	**(3.5 - 4.3 feet bgs)** SAND, gray, moist, loose, fine grained, poorly graded, no odor, light sheen, no discoloration.		
	7								**(4.3 - 5.0 feet bgs)** NO RECOVERY		
35	8		P-57-B1		0.1	(-)			**(5.0 - 8.4 feet bgs)** SAND with some Gravel becoming light brown at 7.6 feet bgs, moist, loose, fine grained, poorly graded, no odor, light sheen, no discoloration.		
	9		P-57-B2		0.4	(-)			**(8.4 - 10.0 feet bgs)** NO RECOVERY		
	10							SP	**(10.0 - 13.5 feet bgs)** SAND, dark brown, moist to 12.5 feet bgs then wet, loose, fine grained, poorly graded, no odor, light sheen, no discoloration.	▽	
	11		P-57-C1	3.6 (10 - 15)							
	12		P-57-C2		0.2	(-)					
30	13		P-57-C3		0.1	(-)		ML	**(13.5 - 13.6 feet bgs)** SILT, dark gray, moist, hard, no odor, light sheen, no discoloration.		
	14								**(13.6 - 15.0 feet bgs)** NO RECOVERY		
	15			4.1 (15 - 20)				ML	**(15.0 - 19.1 feet bgs)** SILT, dark gray, moist, hard, rootlets, no odor, light sheen, no discoloration.		
	16										
	17				0.1	(-)					
25	18										
	19				0.2	(-)					
									(19.1 - 20.0 feet bgs) NO RECOVERY End boring at 20.0 feet bgs.		

bgs = below ground surface
ft = feet
PID=photoionization detector
ppm = parts per million

UV = ultraviolet
UV screen consisted of visual observation with ultraviolet light.
(-) no indication of fluorescence
(+) fluorescence observed (see lithology)

▽ First encountered groundwater (wet soils observed)

Report: 5237 BAU JAN 23; File: 5237-10H3 DNAPL CHAR LOGS.GPJ; 2/9/15

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID:	P-58	Date(s):	**6-30-14**
Location:	**7200 NW Front Avenue, Portland, Oregon**		
Logged By:	**Ben Uhl**	Checked By:	**Rob Ede**
Driller:	**Pacific Soil and Water, LLC**	OWRD #:	**NA**
Drilling Method:	**AMS 9500-VTR (Direct Push)**	GS Elevation:	**35.8 feet**
TOC:	NA		
Sampling Method:	**Macrocore**	Northing:	**702820.37**
Easting:	**7624832.51**		
Boring Abandonment Details:		Borehole Dia.:	**2.25 inches**
Total Depth:	**25.0 feet bgs**		
Annular Fill:	3/4" Bentonite Chips 0 - 25 feet bgs	Project Number:	**5237**
Project Name:	**Remedial Investigation - Siltronic Corp**		
Remarks:	Horizontal Datum - NAD 83/91 Vertical Datum - City of Protland (COP)		

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	UV	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
35	1			4.3 (0 - 5)	0.0	(-)		ML	**(0.0 - 3.3 feet bgs)** sandy SILT with some Gravel from 0.7 to 1.0 foot bgs, brown, moist, soft, non- plastic, coarse grained, subrounded, no odor, no sheen, no discoloration.		
	2										
	3				0.0	(-)					
	4				0.0	(-)		SP	**(3.3 - 4.3 feet bgs)** SAND, brown, moist, loose, medium grained, poorly graded, no odor, no sheen, no discoloration.		
	5			2.8 (5 - 10)					**(4.3 - 5.0 feet bgs)** NO RECOVERY		
30	6				0.0	(-)		SP	**(5.0 - 7.8 feet bgs)** SAND, brown, moist, loose, medium grained, poorly graded, silt lens from 7.0 to 7.1 feet bgs, no odor, no sheen, no discoloration.		
	7				0.0	(-)					
	8								**(7.8 - 10.0 feet bgs)** NO RECOVERY		
	9										
	10			2.5 (10 - 15)				SP	**(10.0 - 12.5 feet bgs)** SAND, brown, moist with wet interval from 12.3 to 12.5 feet bgs, loose, medium grained, poorly graded, silt lenses at 10.5 to 10.6 feet bgs and 11.9 to 12.0 feet bgs, no odor, no sheen, no discoloration.		
25	11				0.0	(-)					
	12				0.1	(-)				▽	
	13								**(12.5 - 15.0 feet bgs)** NO RECOVERY		
	14										
	15							SP	**(15.0 - 16.0 feet bgs)** SAND, brown, moist, loose, medium grained, poorly graded, no odor, no sheen, no discoloration.		
20	16		P-58-A1	5 (15 - 20)	0.2	(-)		SP	**(16.0 - 21.0 feet bgs)** SAND with some Silt and Gravel, gray becoming black at 20.0 feet bgs, wet, loose, medium grained, poorly gaded, brick fragments at 19.0 feet bgs, and metal debris at 20.0 feet bgs. Gravels are fine to coarse grained, subangular, mild petroleum odor, no sheen, no discoloration.		
	17		P-58-A2								
	18				0.1	(-)					
	19										

bgs = below ground surface
ft = feet
PID=photoionization detector
ppm = parts per million

UV = ultraviolet
UV screen consisted of visual observation with ultraviolet light.
(-) no indication of fluorescence
(+) fluorescence observed (see lithology)

▽ First encountered groundwater (wet soils observed)

Report: 5237 BAU JAN 23; File: 5237-10H3 DNAPL CHAR LOGS.GPJ; 2/9/15

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-58
Project Name: **Remedial Investigation - Siltronic Corp**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (Prefix:)	Recovery (ft) (core interval)	PID (ppm)	UV	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
15	21		P-58-B1	5 (20 - 25)	0.0 0.1	(-) (-)		SP ML	**(21.0 - 25.0 feet bgs)** SILT, brown and gray, moist, stiff, low to medium plasticity, rootlets present (<1%), wet sand lens from 23.8 to 24.2 feet bgs, no odor, no sheen, no discoloration.		
	22										
	23		P-58-B2		0.0	(-)					
	24		P-58-B3								
	25								End boring at 25.0 feet bgs.		
10											
5											
0											
-5											
-10											

bgs = below ground surface
ft = feet
PID=photoionization detector
ppm = parts per million

UV = ultraviolet
UV screen consisted of visual observation with ultraviolet light.
(-) no indication of fluorescence
(+) fluorescence observed (see lithology)

▽ First encountered groundwater (wet soils observed)

Report: 5237 BAU JAN 23; File: 5237-10H3 DNAPL CHAR LOGS.GPJ; 2/9/15

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID:	P-59	Date(s):	**7/7/2014**
Location:	**7200 NW Front Avenue, Portland, Oregon**		
Logged By:	**Ben Uhl**	Checked By:	**Rob Ede**
Driller:	**Pacific Soil and Water, LLC**	OWRD #:	**NA**
Drilling Method:	**AMS 9500-VTR (Direct Push)**	GS Elevation:	**36.3 feet**
TOC:	NA		
Sampling Method:	**Macrocore**	Northing:	**703961.02**
Easting:	**7624300.29**		
Boring Abandonment Details:		Borehole Dia.:	**2.25 inches**
Total Depth:	**30.0 feet bgs**		
Annular Fill:	3/4" Bentonite Chips 0 - 30 feet bgs	Project Number:	**5237**
Project Name:	**Remedial Investigation - Siltronic Corp**		
Remarks:	Horizontal Datum - NAD 83/91 Vertical Datum - City of Protland (COP)		

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	UV	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
35	1			4.4 (0 - 5)	0.1	(-)		SP	**(0.0 - 2.2 feet bgs)** SAND with some Silt and trace of Gravel, brown, moist, loose, fine grained, poorly graded, no odor, light sheen, no discoloration.		
	2							ML	**(2.2 - 4.4 feet bgs)** SILT, brown becoming gray at 4.1 feet bgs, moist, medium soft, non-plastic, fine grainded sand in "shoe" with wood fragment at silt/sand contact, no odor, no sheen, no discoloration.		
	3				0.1	(-)					
	4								**(4.4 - 5.0 feet bgs)** NO RECOVERY		
	5			3.8 (5 -10)				SP	**(5.0 - 6.1 feet bgs)** SAND, gray, wet, loose, fine grained, poorly graded, no odor, no sheen, no discoloration.		
30	6				0.2	(-)		ML	**(6.1 - 7.6 feet bgs)** SILT, gray, moist, soft, low plasticity, no odor, no sheen, no discoloration.		
	7										
	8							SP	**(7.6 - 8.8 feet bgs)** SAND, dark gray and black, moist, loose, fine grained, poorly graded, wood fragments at 7.8 feet bgs, flat 1/2-inch diamter metal fragment at 8.7 feet bgs, light petroleum odor, no sheen, discoloration.		
	9				0.2	(-)					
	10								**(8.8 - 10.0 feet bgs)** NO RECOVERY		
25	11		P-59-A1	3.3 (10 - 15)	3.1	(-)		GM	**(10.0 - 10.9 feet bgs)** SAND, dark gray and black, moist, loose, fine grained, poorly graded, black carbon pitch present (<1%), rubber fragments, petroleum odor, sheen, discoloration.		
	12		P-59-A2		2.9	(-)		ML	**(10.9 - 11.1 feet bgs)** CRUSHED ROCK (slag?) with some Brick Fragments, no odor, no sheen, no discoloration.		
	13								**(11.1 - 13.3 feet bgs)** SILT with trace of Sand, gray, moist, soft, slightly plastic, metal and rubber fragments, wires, red brick fragments at 12.0 feet bgs, glass debris, petroleum odor, rainbow sheen, no visible oil.		
	14								**(13.3 - 15.0 feet bgs)** NO RECOVERY		
	15							SP	**(15.0 - 15.5 feet bgs)** SAND with some Gravel, gray, wet, loose, fine grained, poorly graded, metal fragments, coal-like fragments, slag debris. Gravels are coarse grained, subangular, mild petroleum odor, slight sheen.	▽	
20	16		P-59-B1	2.2 (15 - 20)	0.6	(-)		ML			
	17				8.9	(-)		ML	**(15.5 - 16.5 feet bgs)** SILT, dark brown, moist, soft, medium plasticity, mild petroleum odor, light sheen, no discoloration.		
	18		P-59-B2						**(16.5 - 17.2 feet bgs)** SILT with some Sand, dark brown, soft, moist, low plasticity, petroleum odor, light sheen, no discoloration.		
	19		P-59-B3						**(17.2 - 20.0 feet bgs)** NO RECOVERY		

bgs = below ground surface
ft = feet
PID=photoionization detector
ppm = parts per million

UV = ultraviolet
UV screen consisted of visual observation with ultraviolet light.
(-) no indication of fluorescence
(+) fluorescence observed (see lithology)

▽ First encountered groundwater (wet soils observed)

Report: 5237 BAU JAN 23; File: 5237-10H3 DNAPL CHAR LOGS.GPJ; 2/9/15

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-59
Project Name: **Remedial Investigation - Siltronic Corp**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (Prefix:)	Recovery (ft) (core interval)	PID (ppm)	UV	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
15	21		P-59-C1	4.8 (20 - 25)	211.4	(+)		SP	**(20.0 - 20.2 feet bgs)** SAND with trace Gravel, black, wet, loose, fine grained, poorly graded, viscous black oil blebs.		
								ML			
	22		P-59-C2					SM	**(20.2 - 20.8 feet bgs)** SILT, brown, moist, soft, low plasticity, no odor, no sheen, no discoloration.		
									(20.8 - 22.6 feet bgs) silty SAND, gray, wet, loose, fine grained, poorly graded, no odor, no sheen, no discoloration.		
	23		P-59-C3		8.8	(+)		SP	**(22.6 - 23.2 feet bgs)** SAND, black, wet, loose, medium grained, poorly graded, no odor, no sheen.		
								ML			
	24								**(23.2 - 24.8 feet bgs)** SILT, dark brown, moist, soft, medium plasticity, rootlets present (<1%), mild petroleum odor, no sheen, no discoloration.		
	25			4 (25 - 29)				ML	**(25.0 - 29.0 feet bgs)** SILT, gray to 27 feet bgs then brown with red mottling, moist with wet interval from 27.0 to 27.3 feet bgs, soft, low plastcity, mild petroleum odor to 27.0 feet bgs, then no odor, no sheen, no discoloration.		
10	26										
	27				0.4	(-)					
	28				0.3	(-)					
	29								**(29.0 - 30.0 feet bgs)** NO RECOVERY		
	30								End boring at 30.0 feet bgs.		
5											
0											
-5											
-10											

bgs = below ground surface
ft = feet
PID=photoionization detector
ppm = parts per million

UV = ultraviolet
UV screen consisted of visual observation with ultraviolet light.
(-) no indication of fluorescence
(+) fluorescence observed (see lithology)

▽ First encountered groundwater (wet soils observed)

Report: 5237 BAU JAN 23; File: 5237-10H3 DNAPL CHAR LOGS.GPJ; 2/9/15

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID:	P-60	Date(s):	**7-1-2014**
Location:	**7200 NW Front Avenue, Portland, Oregon**		
Logged By:	**Ben Uhl**	Checked By:	**Rob Ede**
Driller:	**Pacific Soil and Water, LLC**	OWRD #:	**NA**
Drilling Method:	**AMS 9500-VTR (Direct Push)**	GS Elevation:	**36.8 feet**
TOC:	NA		
Sampling Method:	**Macrocore**	Northing:	**703601.81**
Easting:	**7624729.94**		
Borehole Dia.:	**2.25 inches**	Total Depth:	**35.0 feet bgs**
Project Number:	**5237**		
Project Name:	**Remedial Investigation - Siltronic Corp**		
Remarks:	Horizontal Datum - NAD 83/91 Vertical Datum - City of Protland (COP)		

Boring Abandonment Details:

Annular Fill: 3/4" Bentonite Chips 0 - 35 feet bgs

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	UV	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
35	1			4.3 (0 - 5)	0.3			ML	**(0.0 - 4.3 feet bgs)** SILT with some Gravel, brown with some red mottling, moist, soft, non-plastic, minor rootlets present, no odor, no sheen, no discoloration. Gravels are fine to coarse grained and subangular, no odor, no sheen, no discoloration.		
	2										
	3				0.1	(-)					
	4				0.3	(-)					
	5			2.7 (5 - 10)					**(4.3 - 5.0 feet bgs)** NO RECOVERY		
	6							SP	**(5.0 - 5.4 feet bgs)** SAND, gray, moist, loose, medium grained, poorly graded, no odor, no sheen, no discoloration.		
30	7				0.1	(-)		ML	**(5.4 - 7.7 feet bgs)** SILT, gray, moist, soft, slightly plastic, no odor, no sheen, no discoloration.		
	8				0.1	(-)			**(7.7 - 10.0 feet bgs)** NO RECOVERY		
	9										
	10			4.2 (10 - 15)				ML	**(10.0 - 11.2 feet bgs)** SILT, gray, moist, soft, slightly plastic, no odor, no sheen, no discoloration.	▽	
	11										
25	12				0.1	(-)		SM	**(11.2 - 12.5 feet bgs)** silty SAND, gray, wet, medium dense, fine grained, poorly graded, no odor, no sheen, no discoloration.		
	13							SP	**(12.5 - 13.4 feet bgs)** SAND, gray, wet, loose, fine grained, poorly graded, no odor, no sheen, no discoloration.		
	14				0.1	(-)		SM SP	**(13.4 - 13.6 feet bgs)** silty SAND, gray, wet, medium dense, fine grained, poorly graded, no odor, no sheen, no discoloration.		
	15			4.7 (15 - 20)				SP	**(13.6 - 14.2 feet bgs)** SAND, gray, wet, loose, fine grained, poorly graded, no odor, no sheen, no discoloration.		
	16		P-60-A1						**(14.2 - 15.0 feet bgs)** NO RECOVERY		
20	17								**(15.0 - 19.2 feet bgs)** SAND, gray, wet, loose, fine to medium grained, poorly graded, silt lens from 18.4 to 18.5 feet bgs, mild petroleum odor, light sheen, no discoloration.		
	18				0.4	(-)					
	19										
					0.1	(-)		SM	**(19.2 - 19.7 feet bgs)** silty SAND, gray, wet, medium loose, fine grained, poorly graded, no odor, no sheen, no		

bgs = below ground surface
ft = feet
PID=photoionization detector
ppm = parts per million

UV = ultraviolet
UV screen consisted of visual observation with ultraviolet light.
(-) no indication of fluorescence
(+) fluorescence observed (see lithology)

▽ First encountered groundwater (wet soils observed)

Report: 5237 BAU JAN 23; File: 5237-10H3 DNAPL CHAR LOGS.GPJ; 2/9/15

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-60
Project Name: **Remedial Investigation - Siltronic Corp**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	UV	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	21		P-60-B1	4.9 (20 - 25)				SM	discoloration.		
								ML	**(19.7 - 20.0 feet bgs)** NO RECOVERY		
15	22							SP	**(20.0 - 20.2 feet bgs)** silty SAND, gray, wet, medium loose, fine grained, poorly graded, rainbow sheen, no discoloration, no visible oil.		
	23		P-60-B2		0.7	(-)		ML	**(20.2 - 21.4 feet bgs)** SILT, dark gray becoming black with depth, moist, soft, low plasticity, wood fragments from 21.1 to 21.2 feet bgs, mild petroleum odor and rainbow sheen.		
	24		P-60-B3						**(21.4 - 23.0 feet bgs)** SAND, dark gray, wet, loose, fine grained, poorly graded, mild petroleum odor and rainbow sheen, no visible oil.		
	25				0.3	(-)		SP			
								ML	**(23.0 - 24.6 feet bgs)** SILT with some Sand, dark gray, very moist, soft, non plastic, sand increasing with depth, mild petroleum odor, rainbow sheen, no visible oil.		
	26			4.9 (25 - 30)					**(24.6 - 24.9 feet bgs)** SAND, dark gray, wet, loose, fine grained, poorly graded, mild petroleum odor and rainbow sheen, no visible oil.		
10	27							SP			
	28		P-60-C1		0.1	(-)			**(25.0 - 27.0 feet bgs)** SILT with some sand, dark gray, very moist, soft, non plastic, mild "gym bag" odor, no sheen, no discoloration.		
	29								**(27.0 - 31.0 feet bgs)** SILT with some Sand, dark gray, very moist, soft, non-plastic, sand content increasing with depth, mild petroleum odor, rainbow sheen, no visible oil.		
	30		P-60-C2		0.1	(-)					
	31		P-60-C3	4 (30 - 35)				ML	**(31.0- 33.0 feet bgs)** SILT with some Sand, gray, moist, hard, low plasticity, rootlets present (<1%), no odor, no sheen, no discoloration.		
5	32				0.3	(-)					
	33				1.1	(-)		SP	**(33.0 - 34.0 feet bgs)** SAND, gray, moist, loose, fine grained, poorly graded, no odor, no sheen, no discoloration.		
	34								**(34.0 - 35.0 feet bgs)** NO RECOVERY		
	35								End Boring at 35.0 feet bgs		
0											
-5											

bgs = below ground surface
ft = feet
PID=photoionization detector
ppm = parts per million

UV = ultraviolet
UV screen consisted of visual observation with ultraviolet light.
(-) no indication of fluorescence
(+) fluorescence observed (see lithology)

▽ First encountered groundwater (wet soils observed)

Report: 5237 BAU JAN 23; File: 5237-10H3 DNAPL CHAR LOGS.GPJ; 2/9/15

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID:	P-61	Date(s):	**7/7/2014**
Location:	**7200 NW Front Avenue, Portland, Oregon**		
Logged By:	**Ben Uhl**	Checked By:	**Rob Ede**
Driller:	**Pacific Soil and Water, LLC**	OWRD #:	**NA**
Drilling Method:	**AMS 9500-VTR (Direct Push)**	GS Elevation:	**33.9 feet**
TOC:	NA		
Sampling Method:	**Macrocore**	Northing:	**703403.86**
Easting:	**7625008.99**		
Boring Abandonment Details:		Borehole Dia.:	**2.25 inches**
Total Depth:	**35.0 feet bgs**		
Annular Fill:	3/4" Bentonite Chips 0 - 35 feet bgs	Project Number:	**5237**
Project Name:	**Remedial Investigation - Siltronic Corp**		
Remarks:	Horizontal Datum - NAD 83/91 Vertical Datum - City of Protland (COP)		

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	UV	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	0			4 (0 - 5)				ML	**(0.0 - 2.2 feet bgs)** SILT, brown, moist, soft, non-plastic, minor rootlets present, no odor, no sheen, no discoloration.		
	1				0.1	(-)					
	2							SP	**(2.2 - 4.0 feet bgs)** SAND with some Silt, brown, moist, loose, fine grained, poorly graded, no odor, no sheen, no discoloration.		
30	3										
	4				0.2	(-)			**(4.0 - 5.0 feet bgs)** NO RECOVERY		
	5			3.2 (5 - 10)				ML	**(5.0 - 7.1 feet bgs)** SILT, dark brown with light brown mottling, moist, soft, low to medium plasticity, no odor, no sheen, no discoloration.		
	6										
	7				0.1	(-)				▽	
	8				0.1	(-)		SP	**(7.1 - 8.2 feet bgs)** SAND, light brown to 7.7 feet bgs, then becoming dark gray, wet, loose, fine grained, poorly graded, no odor, no sheen, no discoloration.		
25	9								**(8.2 - 10.0 feet bgs)** NO RECOVERY		
	10			4.9 (10 - 15)				SP	**(10.0 - 14.9 feet bgs)** SAND, black, wet, loose, fine grained, poorly graded, silt lenses from 10.9 to 11.3 feet bgs and 12.7 to 12.9 feet bgs, mild petroleum odor, rainbow sheen, no visible oil.		
	11		P-61-A1								
	12		P-61-A2		0.1	(-)					
	13		P-61-A3								
20	14		P-61-A4								
	15				1.6	(+)					
	16		P-61-B1	3.9 (15 - 20)	12.3	(+)		SP	**(15.0 - 17.5 feet bgs)** SAND with some Silt, black, wet, loose, fine grained, poorly graded, petroleum odor, rainbow sheen, minor amounts of low viscosity black oil from 16.5 to 17.5 feet bgs, brittle tar flakes from 16.8 to 16.9 feet bgs.		
	17		P-61-B2								
	18				16.3	(-)		ML	**(17.5 - 18.9 feet bgs)** sandy SILT, dark gray, moist, soft, non-plastic, no odor, no sheen, no discoloration.		
15	19								**(18.9 - 20.0 feet bgs)** NO RECOVERY		

bgs = below ground surface
ft = feet
PID=photoionization detector
ppm = parts per million

UV = ultraviolet
UV screen consisted of visual observation with ultraviolet light.
(-) no indication of fluorescence
(+) fluorescence observed (see lithology)

▽ First encountered groundwater (wet soils observed)

Report: 5237 BAU JAN 23; File: 5237-10H3 DNAPL CHAR LOGS.GPJ; 2/9/15

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-61
Project Name: **Remedial Investigation - Siltronic Corp**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (Prefix:)	Recovery (ft) (core interval)	PID (ppm)	UV	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	20			0.3 (20 - 25)				SP	**(20.0 - 20.3 feet bgs)** SAND with some Silt, dark gray, wet, loose, fine grained, poorly graded, mild petroleum odor, no sheen, no discoloration.		
	21								**(20.3 - 25.0 feet bgs)** NO RECOVERY		
	22										
	23										
10	24										
	25			4.8 (25 - 30)				SP	**(25.0 - 29.8 feet bgs)** SAND, gray, wet, loose, fine grained, poorly graded, mica flakes, wood fragments, no odor, no sheen, no discoloration.		
	26				0.3	(-)					
	27										
	28		P-61-C1								
5	29				0.3	(-)					
	30		P-61-C2	4.8 (30 - 35)				ML	**(30.0 - 34.8 feet bgs)** SILT, dark brown, moist, soft, low plasticity, fine grained, poorly graded sand lens from 33.7 to 33.8 feet bgs, no odor, no sheen, no discoloration.		
	31		P-61-C3								
	32										
	33										
0	34										
	35								End Boring at 35.0 feet bgs.		
-5											
-10											

bgs = below ground surface
ft = feet
PID=photoionization detector
ppm = parts per million

UV = ultraviolet
UV screen consisted of visual observation with ultraviolet light.
(-) no indication of fluorescence
(+) fluorescence observed (see lithology)

▽ First encountered groundwater (wet soils observed)

Report: 5237 BAU JAN 23; File: 5237-10H3 DNAPL CHAR LOGS.GPJ; 2/9/15

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID:	P-62	Date(s):	**7/15/2014**
Location:	**7200 NW Front Avenue, Portland, Oregon**		
Logged By:	**Ben Uhl**	Checked By:	**Rob Ede**
Driller:	**Pacific Soil and Water, LLC**	OWRD #:	**NA**
Drilling Method:	**AMS 9500-VTR (Direct Push)**	GS Elevation:	**34.3 feet**
TOC:	NA		
Sampling Method:	**Macrocore**	Northing:	**703512.10**
Easting:	**7625420.37**		
Boring Abandonment Details:		Borehole Dia.:	**2.25 inches**
Total Depth:	**35.0 feet bgs**		
Annular Fill:	3/4" Bentonite Chips 0 - 35 feet bgs	Project Number:	**5237**
Project Name:	**Remedial Investigation - Siltronic Corp**		
Remarks:	Horizontal Datum - NAD 83/91 Vertical Datum - City of Protland (COP)		

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	UV	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	0			4	0.0	(-)		ML	**(0.0 - 3.1 feet bgs)** SILT with some Sand, brown, moist, soft, low plasticity, no odor, no sheen, no discoloration.		
	1										
	2			(0 - 5)	0.1	(-)					
	3				0.0	(-)		SP	**(3.1 - 4.0 feet bgs)** SAND, brown, moist, loose, fine to medium grained, no odor, no sheen, no discoloration.		
30	4								**(4.0 - 5.0 feet bgs)** NO RECOVERY		
	5			4.3	0.0	(+)		SP	**(5.0 - 5.2 feet bgs)** SAND, brown, moist, loose, fine to medium grained, no odor, no sheen, no discoloration.		
				(5 - 10)				ML	**(5.2 - 7.9 feet bgs)** sandy SILT, gray, moist, soft, non-plastic, no odor, no sheen, no discoloration.		
	6										
	7				0.0	(+)					
	8							SP	**(7.9 - 9.3 feet bgs)** SAND, brown, moist, loose, fine grained, poorly graded, no odor, no sheen, no discoloration.		
25	9				1.0	(-)			**(9.3 - 10.0 feet bgs)** NO RECOVERY		
	10			2.7	0.2	(+)		SP	**(10.0 - 12.7 feet bgs)** SAND, brown to 10.8 feet bgs then becoming gray, moist to 12.0 feet bgs then becoming wet, loose, fine to medium grained, poorly graded, no odor, light sheen from 10.0 to 10.8 feet bgs, no discoloration.	▽	
				(10 - 15)							
	11										
	12				0.4	(+)					
	13								**(12.7 - 15.0 feet bgs)** NO RECOVERY		
20	14										
	15			4.8				SP	**(15.0 - 16.3 feet bgs)** SAND, dark brown, wet, loose, fine grained, poorly graded, minor rootlets, petroleum odor, rainbow sheen, blebs of viscous black oil present.		
	16		P-62-A1	(15 - 20)	11.8	(+)		ML	**(16.3 - 17 feet bgs)** sandy SILT, brown, moist, soft, low plasticity, petroleum odor, light rainbow sheen, no discoloration.		
	17							SP			
	18		P-62-A2		4.1	(+)			**(17.0 - 19.8 feet bgs)** SAND, dark brown, wet to 18.8 feet bgs then moist, loose, fine grained, poorly graded, rootlets present (<1%), petroleum odor, rainbow sheen, blebs of low viscosity black oil present.		
	19		P-62-A3								
15											

bgs = below ground surface
ft = feet
PID=photoionization detector
ppm = parts per million

UV = ultraviolet
UV screen consisted of visual observation with ultraviolet light.
(-) no indication of fluorescence
(+) fluorescence observed (see lithology)

▽ First encountered groundwater (wet soils observed)

Report: 5237 BAU JAN 23; File: 5237-10H3 DNAPL CHAR LOGS.GPJ; 2/9/15

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-62
Project Name: **Remedial Investigation - Siltronic Corp**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (Prefix:)	Recovery (ft) (core interval)	PID (ppm)	UV	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	21			4.8 (20 - 25)	0.2	(+)		SP	**(20.0 - 24.9 feet bgs)** SAND, gray, wet to 24.6 feet bgs then very moist, loose, fine grained, poorly graded, rootlest at 24.8 feet bgs, mild petroeum odor, no sheen, no discoloration.		
	22				0.1	(+)					
	23										
10	24				0.1	(-)					
	25			4.6 (25 - 30)				SP	**(25.0 - 27.3 feet bgs)** SAND, gray, wet, loose, fine grained, poorly graded, no odor, no sheen, no discoloration.		
	26				0.1	(-)					
	27										
	28				0.1	(-)		ML	**(27.3 - 28.3 feet bgs)** SILT with some Sand, dark brown, moist, soft, rootlets, no odor, no sheen, no discoloration.		
5	29		P-68-B1		0.2	(-)		SP	**(28.3 - 30.3 feet bgs)** SAND, gray, wet, loose, fine grained, poorly graded, no odor, no sheen, no discoloration.		
	30										
	31		P-68-B2	4.2 (30 - 35)	0.4	(-)		ML	**(30.3 - 34.2 feet bgs)** SILT with some Sand, dark brown, moist, hard, low plasticity, rootlets, no odor, no sheen, no discoloration.		
	32										
	33										
	34				1.1.	(-)					
0									**(34.2 - 35.0 feet bgs)** NO RECOVERY		
	35								End boring at 35.0 feet bgs.		
-5											
-10											

bgs = below ground surface
ft = feet
PID=photoionization detector
ppm = parts per million

UV = ultraviolet
UV screen consisted of visual observation with ultraviolet light.
(-) no indication of fluorescence
(+) fluorescence observed (see lithology)

▽ First encountered groundwater (wet soils observed)

Report: 5237 BAU JAN 23; File: 5237-10H3 DNAPL CHAR LOGS.GPJ; 2/9/15

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID:	P-63	Date(s):	**7/9/2014**
Location:	**7200 NW Front Avenue, Portland, Oregon**		
Logged By:	**Ben Uhl**	Checked By:	**Rob Ede**
Driller:	**Pacific Soil and Water, LLC**	OWRD #:	**NA**
Drilling Method:	**AMS 9500-VTR (Direct Push)**	GS Elevation:	**37 feet**
TOC:	NA		
Sampling Method:	**Macrocore**	Northing:	**704106.91**
Easting:	**7624711.48**		
Boring Abandonment Details:		Borehole Dia.:	**2.25 inches**
Total Depth:	**35.0 feet bgs**		
Annular Fill:	3/4" Bentonite Chips: 0 - 35 feet bgs	Project Number:	**5237**
		Project Name:	**Remedial Investigation - Siltronic Corp**
		Remarks:	Horizontal Datum - NAD 83/91 Vertical Datum - City of Protland (COP)

Elevation (ft)	Depth (ft)	Recovery (ft) (core interval)	PID (ppm)	UV	USCS Code	Lithologic Description
	1	3.7 (0 - 5)	0.1	(-)	ML	**(0.0 - 1.7 feet bgs)** gravelly SILT, brown, moist, soft, non-plastic. Gravels are fine to coarse grained, subangular, no odor, no sheen, no discoloration.
35	2				SP	**(1.7 - 1.9 feet bgs)** gravelly SAND, brown, moist, loose, fine grained, poorly graded, no odor, no sheen, no discoloration.
	3				ML	**(1.9 - 2.9 feet bgs)** gravelly SILT, brown, moist, soft, non plastic, no odor, no sheen, no discoloration.
	4		0.2	(-)	SP	**(2.9 - 3.2 feet bgs)** SILT, gray, moist, hard, non plastic, no odor, no sheen, no discoloration.
	5	4.9 (5 - 10)			ML	**(3.2 - 3.5 feet bgs)** SAND, with trace of Gravel, gray, very moist-wet, fine grained, poorly graded, no odor, no sheen, no discoloration.
	6				ML	**(3.5 - 3.7 feet bgs)** SILT, gray, moist, hard, non-plastic, no odor, no sheen, no discoloration.
30	7		0.2	(-)	SP	**(3.7 - 5.0 feet bgs)** NO RECOVERY
	8				ML	**(5.0 - 5.1 feet bgs)** SILT, gray, moist, hard, non-plastic, no odor, no sheen, no discoloration.
	9		0.3	(-)		**(5.1 - 6.1 feet bgs)** gravelly SILT, light brown, moist with wet interval from 5.9 to 6.1 feet bgs, soft, non plastic. Gravels are fine to coarse grained, subangular, no odor, no sheen, no discoloration.
	10	4.1 (10 - 15)			ML	**(6.1 - 7.0 feet bgs)** silty SAND with trace of Gravel, gray, moist, tight, no odor, no sheen, no discoloration.
	11		0.4	(-)		**(7.0 - 9.9 feet bgs)** sandy SILT with trace of Gravel, gray, moist, hard, non-plastic, no odor, no sheen, no discoloration.
25	12					**(10.0 - 13.9 feet bgs)** SILT with some Sand, gray to 13.6 feet bgs then becoming dark gray and black, moist, hard, non-plastic, no odor to 13.6 feet bgs then mild petroleum odor, no sheen.
	13					
	14		0.6	(-)	SP	**(13.9- 14.1 feet bgs)** SAND, gray, moist, loose, fine to medim grained, poorly graded, no odor, no sheen, no discoloration.
	15	4.1 (15 - 20)			SP	**(14.1 - 15.0 feet bgs)** NO RECOVERY
	16					**(15.0- 19.1 feet bgs)** SAND, dark gray, moist, loose, medim grained poorly graded, no odor, no sheen, no discoloration.
20	17		0.4	(-)		
	18					
	19		0.3	(-)		**(19.1 - 20.0 feet bgs)** NO RECOVERY

Groundwater ▽

Boring Abandonment Details

bgs = below ground surface
ft = feet
PID=photoionization detector
ppm = parts per million

UV = ultraviolet
UV screen consisted of visual observation with ultraviolet light.
(-) no indication of fluorescence
(+) fluorescence observed (see lithology)

▽ First encountered groundwater (wet soils observed)

Report: 5237 BAU JAN 23; File: 5237-10H3 DNAPL CHAR LOGS.GPJ; 2/9/15

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-63
Project Name: **Remedial Investigation - Siltronic Corp**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	UV	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	21			4.7 (20 - 25)	0.8	(-)		SP	**(20.0 - 24.2 feet bgs)** SAND, light black, wet, loose, fine to medium grained, wood fragments from 22.4 to 22.5 feet bgs and 23.9 to 24.0 feet bgs, mild petroleum odor, no sheen.		
15	22										
	23										
	24		P-63-A1		1.8	(-)		ML			
	25							SP	**(24.2 - 24.3 feet bgs)** SILT, gray, moist, soft, low plasticity, petroleum odor, rainbow sheen, minor amounts of black oil blebs present.		
	26		P-63-A2	3 (25 - 30)	11.8	(-)		SP	**(24.3 - 24.7 feet bgs)** SAND with some Gravel, black, wet, loose, fine grained, poorly graded, black viscous oil blebs from 24.5 to 24.7 feet bgs, strong petroleum odor, rainbow sheen.		
10	27		P-63-A3		0.2	(-)			**(24.7 - 25.0 feet bgs)** NO RECOVERY		
	28								**(25.0 - 28.0 feet bgs)** SAND, black, wet to 27.5 feet bgs then moist, medium grained, poorly graded, black viscous oil blebs from 25.0 to 26.8 feet bgs, petroleum odor, rainbow sheen.		
	29		P-63-B1								
	30			4.7 (30 - 35)					**(28.0 - 30.0 feet bgs)** NO RECOVERY		
	31							SP	**(30.0 - 33.9 feet bgs)** SAND, dark gray, medium grained, poorly graded. Soil core logged through macrocore acetate sleeve.		
5	32										
	33		P-63-C1								
	34		P-63-C2					ML	**(33.9 - 34.7 feet bgs)** SILT, gray and dark brown increasing with depth. Soil logged through macrocore acetate sleeve. Soil in "shoe" - SILT, brown, moist, medium soft, non plastic, no odor, no sheen, no discoloration.		
	35								**(34.7 - 35.0 feet bgs)** NO RECOVERY		
0									End boring at 35.0 feet bgs.		
-5											

bgs = below ground surface
ft = feet
PID=photoionization detector
ppm = parts per million

UV = ultraviolet
UV screen consisted of visual observation with ultraviolet light.
(-) no indication of fluorescence
(+) fluorescence observed (see lithology)

▽ First encountered groundwater (wet soils observed)

Report: 5237 BAU JAN 23; File: 5237-10H3 DNAPL CHAR LOGS.GPJ; 2/9/15

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID:	P-64	Date(s):	**7/8/2014**
Location:	**7200 NW Front Avenue, Portland, Oregon**		
Logged By:	**Ben Uhl**	Checked By:	**Rob Ede**
Driller:	**Pacific Soil and Water, LLC**	OWRD #:	**NA**
Drilling Method:	**AMS 9500-VTR (Direct Push)**	GS Elevation:	**36 feet**
TOC:	NA		
Sampling Method:	**Macrocore**	Northing:	**704233.82**
Easting:	**7624781.63**		
Boring Abandonment Details:		Borehole Dia.:	**2.25 inches**
Total Depth:	**35.0 feet bgs**		
Annular Fill:	3/4" Bentonite Chips 0 - 35 feet bgs	Project Number:	**5237**
Project Name:	**Remedial Investigation - Siltronic Corp**		
Remarks:	Horizontal Datum - NAD 83/91 Vertical Datum - City of Protland (COP)		

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	UV	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
35	1			3.7 (0 - 5)	0.0	(-)		ML	**(0.0 - 1.8 feet bgs)** gravelly SILT, brown, moist, soft, non-plastic, no odor, no sheen, no discoloration.		
	2							SP	**(1.8 - 3.7 feet bgs)** SAND with some Silt, gray, moist, dense, fine to medium grained, moderately graded, no odor, no sheen, no discoloration.		
	3				0.4	(-)					
	4								**(3.7 - 5.0 feet bgs)** NO RECOVERY		
	5			4.7 (5 - 10)				ML	**(5.0 - 5.6 feet bgs)** SILT with some Gravel, dark gray, moist, hard, non-plastic, no odor, no sheen, no discoloration.		
30	6							ML			
	7				0.2	(-)		ML	**(5.6 - 6.2 feet bgs)** gravelly SILT, light brown, moist, soft, non-plastic, no odor, no sheen, no discoloration. Gravels are fine to medim grained and subangular.		
	8							SP	**(6.2 - 7.8 feet bgs)** SILT, gray, moist, very stiff, non plastic, no odor, no sheen, no discoloration.		
	9				0.1	(-)		SM	**(7.8 - 8.3 feet bgs)** SAND, gray, moist, loose, fine to medium grained, moderately graded, no odor, no sheen, no discoloration.		
	10			4.6 (10 - 15)					**(8.3 - 13.4 feet bgs)** silty SAND, gray, moist, loose, fine grained, poorly graded, no odor, no sheen, no discoloration.		
25	11				0.1	(-)					
	12										
	13										
	14							SP	**(13.4 - 14.6 feet bgs)** SAND, gray, moist, loose, medium grained, poorly graded, mild petroleum odor, no sheen, no discoloration, no visible oil.		
	15			3.4 (15 - 20)	0.2	(-)			**(14.6 - 15.0 feet bgs)** NO RECOVERY		
20	16				9.2	(-)		SP	**(15.0 - 17.5 feet bgs)** SAND, gray, moist, loose, medium grained, poorly graded, mild petroleum odor, no sheen, no discoloration, no visible oil.		
	17										
	18		P-64-A1		128.6	(+)		SP	**(17.5 - 18.0 feet bgs)** TAR (black,soft) with some visocous black oil blebs, strong petroleum odor, heavy rainbow sheen.		
	19								**(18.0 - 18.4 feet bgs)** SAND, dark gray, moist, loose, medium grained, poorly graded, petroleum odor, rainbow sheen, no discoloration, no visible oil.		

bgs = below ground surface
ft = feet
PID=photoionization detector
ppm = parts per million

UV = ultraviolet
UV screen consisted of visual observation with ultraviolet light.
(-) no indication of fluorescence
(+) fluorescence observed (see lithology)

▽ First encountered groundwater (wet soils observed)

Report: 5237 BAU JAN 23; File: 5237-10H3 DNAPL CHAR LOGS.GPJ; 2/9/15

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-64
Project Name: **Remedial Investigation - Siltronic Corp**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (Prefix:)	Recovery (ft) (core interval)	PID (ppm)	UV	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
								SP	**(18.4 - 20.0 feet bgs)** NO RECOVERY		
15	21		P-64-B1	4.9 (20 - 25)	25.6	(-)			**(20.0 - 23.3 feet bgs)** SAND, black, moist, loose, medium grained, poorly graded, minor black viscous oil blebs from 21.7 to 23.3 feet bgs, petroleum odor, no sheen to 21.7 feet bgs, then rainbow sheen to 23.3 feet bgs.		
	22										
	23		P-64-B2								
					435.2	(+)		ML	**(23.3 - 23.5 feet bgs)** SILT, gray and black, moist, soft, low plastciity, black viscous oil blebs, petroleum odor, rainbow sheen, discoloration.		
	24							SP			
	25							SP	**(23.5 - 24.9 feet bgs)** SAND, black, moist, loose, medium grained, poorly graded, petroleum odor, rainbow sheen, discoloration, some black viscous oil blebs.	▽	
10	26		P-64-D1	4.8 (25 - 30)	78.6	(+)			**(24.9 - 25.0 feet bgs)** NO RECOVERY		
	27								**(25.0 - 29.8 feet bgs)** SAND with a trace of Gravel, black, wet, loose, medium grained, poorly graded, black viscous oil, oil stained acetate macrocore liner, strong petroleum odor, heavy rainbow sheen. Gravels are coated with black viscous oil.		
	28		P-64-D2								
	29		P-64-D3		554.1	(+)					
	30			(30 - 35)				SP	**(29.8 - 30.0 feet bgs)** NO RECOVERY		
5	31		P-64-C1	4.9					**(30.0 - 34.9 feet bgs)** SAND, black, wet, loose, medium grained, poorly graded, minor amounts of black viscous oil decreasing with depth, mild petroleum odor, mild rainbow sheen from 30.0 to 32.0 feet bgs. Soil logged through acetate macrocore liner obtained for sample collection. SILT observed in driller's "shoe".		
	32										
	33		P-64-C2								
	34										
	35							ML	End boring at 35.0 feet bgs.		
0											
-5											
-10											

bgs = below ground surface
ft = feet
PID=photoionization detector
ppm = parts per million

UV = ultraviolet
UV screen consisted of visual observation with ultraviolet light.
(-) no indication of fluorescence
(+) fluorescence observed (see lithology)

▽ First encountered groundwater (wet soils observed)

Report: 5237 BAU JAN 23; File: 5237-10H3 DNAPL CHAR LOGS.GPJ; 2/9/15

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID:	P-65	Date(s):	**7/16/2014**
Location:	**7200 NW Front Avenue, Portland, Oregon**		
Logged By:	**Ben Uhl**	Checked By:	**Rob Ede**
Driller:	**Pacific Soil and Water, LLC**	OWRD #:	**NA**
Drilling Method:	**AMS 9500-VTR (Direct Push)**	GS Elevation:	**42.1 feet**
TOC:	NA		
Sampling Method:	**Macrocore**	Northing:	**703383.57**
Easting:	**7624330.36**		
Boring Abandonment Details:		Borehole Dia.:	**2.25 inches**
Total Depth:	**20.0 feet bgs**		
Annular Fill:	3/4" Bentonite Chips 0 - 20 feet bgs	Project Number:	**5237**
Project Name:	**Remedial Investigation - Siltronic Corp**		
Remarks:	Horizontal Datum - NAD 83/91 Vertical Datum - City of Protland (COP)		

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	UV	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	1			3.9 (0 - 5)	0.3	(-)		ML	**(0.0 - 3.9 feet bgs)** SILT with some Sand and Gravel, gray and brown to 2.2 feet bgs then becoming gray, petroleum odor, light sheen, no visible oil.		
40	2										
	3				0.2	(-)					
	4								**(3.9 - 5.0 feet bgs)** NO RECOVERY		
	5							ML	**(5.0 - 6.9 feet bgs)** Silt with some intermittent Sand lenses (~1 to 2 inches thick), dark brown, moist, soft. Sand lenses fine grained, poorly graded, loose, moist, no odor, no sheen, no discoloration.		
	6			2.5 (5 - 10)	0.1	(-)					
35	7				0.2	(-)		ML	**(6.9 - 7.5 feet bgs)** Silt with some Sand and Gravel, brown, moist, no odor, no sheen, no discoloration.		
	8								**(7.5 - 10.0 feet bgs)** NO RECOVERY		
	9										
	10							ML	**(10.0 - 10.6 feet bgs)** Silt with some Sand and Gravel, black, moist, brick fragments at 10.6 feet bgs, petroleum odor, rainbow sheen , no visible oil,		
	11		P-65-A1	3 (10 - 15)	16.8	(+)		SP	**(10.6 - 13.0 feet bgs)** Sand, black to 11.9 feet bgs then gray and dark brown, moist, fine to medium grained, moderately graded, petroleum odor, rainbow sheen, minor amounts of high viscosity black oil blebs to 12.8 feet bgs.		
30	12				4.5	(+)					
	13		P-65-A2						**(13.0 - 15.0 feet bgs)** NO RECOVERY		
	14										
	15							SP	**(15.0 - 16.4 feet bgs)** Sand, black and dark gray, wet, medium grained, poorly graded, no odor, no sheen.	▽	
	16		P-65-B1	3.5 (15 - 20)	0.4	(+)					
25	17							ML	**(16.4 - 18.5 feet bgs)** SILT, dark gray getting lighter with depth, moist, hard, medium plasticity, rootlets (<1%), no odor, no sheen, no discoloration.		
	18				0.5	(-)					
	19								**(18.5 - 20.0 feet bgs)** NO RECOVERY End boring at 20.0 feet bgs.		

bgs = below ground surface
ft = feet
PID=photoionization detector
ppm = parts per million

UV = ultraviolet
UV screen consisted of visual observation with ultraviolet light.
(-) no indication of fluorescence
(+) fluorescence observed (see lithology)

▽ First encountered groundwater (wet soils observed)

Report: 5237 BAU JAN 23; File: 5237-10H3 DNAPL CHAR LOGS.GPJ; 2/9/15

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID:	P-66	Date(s):	**7/16/2014**
Location:	**7200 NW Front Avenue, Portland, Oregon**		
Logged By:	**Ben Uhl**	Checked By:	**Rob Ede**
Driller:	**Pacific Soil and Water, LLC**	OWRD #:	**NA**
Drilling Method:	**AMS 9500-VTR (Direct Push)**	GS Elevation:	**34 feet**
TOC:	NA		
Sampling Method:	**Macrocore**	Northing:	**703113.36**
Easting:	**7624995.94**		
Boring Abandonment Details:		Borehole Dia.:	**2.25 inches**
Total Depth:	**35.0 feet bgs**		
Annular Fill:	3/4" Bentonite Chips 0 - 35 feet bgs	Project Number:	**5237**
Project Name:	**Remedial Investigation - Siltronic Corp**		
Remarks:	Horizontal Datum - NAD 83/91 Vertical Datum - City of Protland (COP)		

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	UV	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	1			3 (0 - 5)	0.1	(-)		ML	**(0.0 - 1.3 feet bgs)** SILT with some Sand and roots, brown, moist, soft, non-plastic, no odor, light sheen, no discoloration.		
	2							SP	**(1.3 - 3.0 feet bgs)** SAND, brown, moist, loose, fine to medium grained, no odor, light sheen, no discoloration.		
	3				0.2	(-)			**(3.0 - 5.0 feet bgs)** NO RECOVERY		
30	4										
	5							ML	**(5.0 - 9.3 feet bgs)** SILT, brown to 7.6 feet bgs then gray, moist, hard, low plasticity, no odor, no sheen, no discoloration.		
	6			4.8 (5 - 10)							
	7				0.1	(-)					
	8										
25	9										
	10				0.1	(-)		SP	**(9.3 - 14.5 feet bgs)** SAND, brown and dark brown to 11.4 feet bgs then becoming black, moist, loose, fine to medium grained, viscous black oil blebs (~1mm) visible from 12.8 to 14.5 feet bgs with wood fragments coated in thick black viscous oil from 13.9 to 14.5 feet bgs, petroleum odor, light sheen from 9.3 to 9.8 feet bgs then rainbow sheen from 9.8 to 14.5 feet bgs.		
	11		P-66-A1	4.5 (10 - 15)							
	12		P-66-A2		2.3	(-)					
	13										
20	14				12.4	(+)					
	15								**(14.5 - 15.0 feet bgs)** NO RECOVERY		
	16		P-66-B1	4.6 (15 - 20)	14.8	(+)		ML ML SP	**(15.0 - 15.2 feet bgs)** sandy SILT, black, moist, soft, petroleum odor, rainbow sheen, minor amounts of black viscous oil blebs present. **(15.2 - 16.0 feet bgs)** SILT with some Sand, black, moist, non-plastic, wood fragments present, petroleum odor, rainbow sheen, no visible oil.	▽	
	17		P-66-B2								
	18		P-66-B3		5.5	(+)		ML SM	**(16.0 - 18.2 feet bgs)** SAND, black, wet, fine grained, poorly graded, appears to be saturated with high viscosity black oil to 17.2 feet bgs then minor black oil blebs to 18.2 feet bgs, petroleum odor, rainbow sheen, discoloration.		
15	19								**(18.2 - 18.5 feet bgs)** SILT, gray, moist, soft, low plasticity, petroleum odor, rainbow sheen, no discoloration.		

bgs = below ground surface
ft = feet
PID=photoionization detector
ppm = parts per million

UV = ultraviolet
UV screen consisted of visual observation with ultraviolet light.
(-) no indication of fluorescence
(+) fluorescence observed (see lithology)

▽ First encountered groundwater (wet soils observed)

Report: 5237 BAU JAN 23; File: 5237-10H3 DNAPL CHAR LOGS.GPJ; 2/9/15

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-66
Project Name: **Remedial Investigation - Siltronic Corp**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (Prefix:)	Recovery (ft) (core interval)	PID (ppm)	UV	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	21			4.6 (20 - 25)	0.5	(+)		SM	**(18.5 - 19.6 feet bgs)** silty SAND, gray, moist, loose, fine grained, poorly graded, wood fragments at 18.8 feet bgs, petroleum odor, rainbow sheen, no discoloration.		
									(19.6 - 20.0 feet bgs) NO RECOVERY		
	22							SP	**(20.0 - 21.7 feet bgs)** silty SAND, gray, wet, loose, fine grained, poorly graded, very mild petroleum odor, no sheen, no discoloration, no visible oil.		
	23								**(21.7 - 24.6 feet bgs)** SAND, black, moist, loose, fine to medium grained, poorly graded, no odor, no sheen, no discoloration.		
10	24				0.1	(-)					
	25								**(24.6 - 25.0 feet bgs)** NO RECOVERY		
								SP	**(25.0 - 29.7 feet bgs)** SAND, black, moist, loose, fine to medium grained, poorly graded, no odor, no sheen, no discoloration.		
	26			4.7 (25 - 30)							
	27				0.2	(-)					
	28										
5	29		P-66-C1		0.2	(-)					
	30								**(29.7 - 30.0 feet bgs)** NO RECOVERY		
								SP	**(30.0 - 30.5 feet bgs)** SAND, black, wet to 30.2 feet bgs then moist, loose, fine to medium grained, poorly graded, no odor, no sheen, no discoloration.		
	31			4.8 (30 - 35)	0.1	(-)		ML			
	32								**(30.5 - 34.8 feet bgs)** SILT, gray, moist, hard, low plasticity, no odor, no sheen, no discoloration.		
	33										
0	34				0.2	(-)					
	35								**(34.8 - 35.0 feet bgs)** NO RECOVERY		
									End boring at 35.0 feet bgs.		
-5											
-10											

bgs = below ground surface
ft = feet
PID=photoionization detector
ppm = parts per million

UV = ultraviolet
UV screen consisted of visual observation with ultraviolet light.
(-) no indication of fluorescence
(+) fluorescence observed (see lithology)

▽ First encountered groundwater (wet soils observed)

Report: 5237 BAU JAN 23; File: 5237-10H3 DNAPL CHAR LOGS.GPJ; 2/9/15

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID:	P-67	Date(s):	**7/15/2014**
Location:	**7200 NW Front Avenue, Portland, Oregon**		
Logged By:	**Ben Uhl**	Checked By:	**Rob Ede**
Driller:	**Pacific Soil and Water, LLC**	OWRD #:	**NA**
Drilling Method:	**AMS 9500-VTR (Direct Push)**	GS Elevation:	**34.1 feet**
TOC:	NA		
Sampling Method:	**Macrocore**	Northing:	**703295.00**
Easting:	**7625293.33**		
Boring Abandonment Details:		Borehole Dia.:	**2.25 inches**
Total Depth:	**30.0 feet bgs**		
Annular Fill:	3/4" Bentonite Chips 0 - 30 feet bgs	Project Number:	**5237**
Project Name:	**Remedial Investigation - Siltronic Corp**		
Remarks:	Horizontal Datum - NAD 83/91 Vertical Datum - City of Protland (COP)		

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	UV	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	1			4.7 (0 - 5)	0.5	(-)		ML	**(0.0 - 1.9 feet bgs)** SILT, brown, dry, soft, non-plastic, no odor, no sheen, no discoloration.		
	2							SP	**(1.9 - 4.7 feet bgs)** SAND, brown, moist, loose, fine grained, poorly graded, no odor, no sheen, no discoloration.		
	3										
30	4				0.9	(-)					
	5			2.7 (5 - 10)				SP	**(4.7 - 5.0 feet bgs)** NO RECOVERY		
								SP	**(5.0 - 5.6 feet bgs)** SAND, brown, moist, loose, fine grained, poorly graded, no odor, no sheen, no discoloration.		
	6				0.4	(-)		ML	**(5.6 - 6.6 feet bgs)** SILT, gray, moist, soft, medium plasticity, no odor, no sheen, no discoloration.		
	7							SP	**(6.6 - 7.7 feet bgs)** SAND, brown, moist, loose, fine grained, poorly graded, no odor, no sheen, no discoloration.		
	8				0.3	(-)			**(7.7 - 10.0 feet bgs)** NO RECOVERY		
25	9										
	10			4 (10 - 15)	0.2	(-)		SP	**(10.0 - 14.0 feet bgs)** SAND, light brown to 10.2, brown to 13.3 feet bgs, and gray to 14.0 feet bgs, wet, loose, fine grained, poorly graded, no odor, no sheen, no discoloration.	▽	
	11										
	12				0.7	(-)					
	13				0.6	(-)					
20	14								**(14.0 - 15.0 feet bgs)** NO RECOVERY		
	15			3.4 (15 - 20)	9.1	(+)		SP	**(15.0 - 18.4 feet bgs)** SAND, black, wet, loose, fine grained, poorly graded, minor amounts of black low viscosity oil (<1mm diameter blebs), petroleum odor and rainbow sheen.		
	16		P-67-A1								
	17										
	18		P-67-A2		4.2	(+)					
15	19		P-67-A3						**(18.4 - 20.0 feet bgs)** NO RECOVERY		

bgs = below ground surface
ft = feet
PID=photoionization detector
ppm = parts per million

UV = ultraviolet
UV screen consisted of visual observation with ultraviolet light.
(-) no indication of fluorescence
(+) fluorescence observed (see lithology)

▽ First encountered groundwater (wet soils observed)

Report: 5237 BAU JAN 23; File: 5237-10H3 DNAPL CHAR LOGS.GPJ; 2/9/15

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-67
Project Name: **Remedial Investigation - Siltronic Corp**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (Prefix:)	Recovery (ft) (core interval)	PID (ppm)	UV	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	21		P-67-B1	4.2 (20 - 25)	2.1	(-)		SP	**(20.0 - 22.0 feet bgs)** SAND, black, wet, loose, fine grained, poorly graded, minor amounts of black low viscosity oil (<1mm diameter blebs), petroleum odor and rainbow sheen.		
	22		P-67-B2		2.5	(-)		ML	**(22.0 - 22.9 feet bgs)** SILT, black, moist, soft, low plasticity, wood fragments, minor amounts of black viscous oil, petroleum odor and rainbow sheen to 22.3 feet bgs, then no odor and no sheen, no discoloration.		
	23				0.2	(-)		SP	**(22.9 - 24.2 feet bgs)** SAND, black, wet, loose, fine grained, poorly graded, some wood fragments, no odor, no sheen, discoloration.		
10	24										
	25			4.6 (25 - 30)				SP	**(24.2 - 25.0 feet bgs)** NO RECOVERY		
	26								**(25.0 - 28.2 feet bgs)** SAND, black, wet, loose, fine grained, poorly graded, some wood fragments, no odor, no sheen, discoloration.		
	27				0.5	(-)					
	28		P-67-C1					ML	**(28.2 - 29.6 feet bgs)** SILT with trace of sand, dark gray to 29.4 feet bgs then very dark gray, soft, moist, low plasticity, no odor, no sheen, no discoloration.		
5	29				1.1	(-)					
	30								**(29.6 - 30.0 feet bgs)** NO RECOVERY End boring at 30.0 feet bgs.		
0											
-5											
-10											

bgs = below ground surface
ft = feet
PID=photoionization detector
ppm = parts per million

UV = ultraviolet
UV screen consisted of visual observation with ultraviolet light.
(-) no indication of fluorescence
(+) fluorescence observed (see lithology)

▽ First encountered groundwater (wet soils observed)

Report: 5237 BAU JAN 23; File: 5237-10H3 DNAPL CHAR LOGS.GPJ; 2/9/15

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID:	P-68	Date(s):	**7/15/2014**
Location:	**7200 NW Front Avenue, Portland, Oregon**		
Logged By:	**Ben Uhl**	Checked By:	**Rob Ede**
Driller:	**Pacific Soil and Water, LLC**	OWRD #:	**NA**
Drilling Method:	**AMS 9500-VTR (Direct Push)**	GS Elevation:	**36.1 feet**
TOC:	NA		
Sampling Method:	**Macrocore**	Northing:	**704465.80**
Easting:	**7625309.93**		
Boring Abandonment Details:		Borehole Dia.:	**2.25 inches**
Total Depth:	**25.0 feet bgs**		
Annular Fill:	3/4" Bentonite Chips: 0 - 25 feet bgs	Project Number:	**5237**
		Project Name:	**Remedial Investigation - Siltronic Corp**
		Remarks:	Horizontal Datum - NAD 83/91 Vertical Datum - City of Protland (COP)

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number Prefix:	Recovery (ft) (core interval)	PID (ppm)	UV	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
35	1			4.6 (0 - 5)	0.0	(-)		SM	**(0.0 - 4.1 feet bgs)** silty SAND, brown, moist, loose, fine grained, poorly graded, no odor, light sheen below 2.0 feet bgs, no discoloration.		
	2				0.0	(-)					
	3										
	4				0.0	(-)		SP	**(4.1 - 4.6 feet bgs)** SAND with a trace of Gravel, brown, moist, loose, medium grained, poorly graded, no odor, no sheen, no discoloration.		
	5							SP	**(4.6 - 5.0 feet bgs)** NO RECOVERY		
30	6			3.7 (5 - 10)	0.0	(-)		SM	**(5.0 - 5.8 feet bgs)** SAND with a trace of Gravel, brown, moist, loose, medium grained, poorly graded, no odor, light sheen, no discoloration.	▽	
	7							SP			
								ML	**(5.8 - 6.7 feet bgs)** silty SAND, gray, moist to 6.4 feet bgs then wet, loose, fine grained, poorly graded, no odor, no sheen, no discoloration.		
	8		P-68-A1		0.1	(-)		SP			
	9				0.0				**(6.7 - 7.2 feet bgs)** SAND, gray, wet, loose, fine grained, poorly graded, no odor, no sheen, no discoloration.		
	10		P-68-A2						**(7.2 - 7.8 feet bgs)** SILT with some Sand, gray, moist, soft, low plasticity, no odor, no sheen, no discoloration.		
				4.3				SP	**(7.8 - 8.7 feet bgs)** SAND, brown, moist, loose, medium grained, poorly graded, no odor, light sheen, no discoloration.		
25	11		P-68-C1	(10 - 15)	0.0	(-)		ML			
								SP	**(8.7 - 10.0 feet bgs)** NO RECOVERY		
	12				0.0	(-)			**(10.0 - 10.2 feet bgs)** SAND, gray, moist, loose, medium grained, poorly graded, no odor, rainbow sheen, no discoloration, no visible oil.		
	13								**(10.2 - 11.1 feet bgs)** SILT with some Sand, gray, moist, soft, low plasticity, no odor, rainbow sheen, no discoloration.		
	14				0.0	(-)					
	15			4.1				SP	**(11.1 - 14.3 feet bgs)** SAND, gray, moist, loose, fine to medium grained, poorly graded, no odor, light sheen, no discoloration.		
20	16			(15 - 20)	0.0	(-)			**(14.3 - 15.0 feet bgs)** NO RECOVERY		
	17				0.0	(+)			**(15.0 - 18.0 feet bgs)** SAND, gray, wet, loose, fine to medium grained, poorly graded, no odor, no sheen, no discoloration.		
	18							SM	**(18.0 - 18.3 feet bgs)** silty SAND, gray, moist, loose, fine grained, poorly graded, no odor, no sheen, no discoloration.		
	19				0.1	(-)		SP	**(18.3 - 19.1 feet bgs)** SAND, gray, wet, loose, fine to medium grained, poorly graded, no odor, no sheen, no		

bgs = below ground surface
ft = feet
PID=photoionization detector
ppm = parts per million

UV = ultraviolet
UV screen consisted of visual observation with ultraviolet light.
(-) no indication of fluorescence
(+) fluorescence observed (see lithology)

▽ First encountered groundwater (wet soils observed)

Report: 5237 BAU JAN 23; File: 5237-10H3 DNAPL CHAR LOGS.GPJ; 2/9/15

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: P-68
Project Name: **Remedial Investigation - Siltronic Corp**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (Prefix:)	Recovery (ft) (core interval)	PID (ppm)	UV	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
15	21			4.7	0.0	(+)		SP	discoloration. **(19.1 - 20.0 feet bgs)** NO RECOVERY **(20.0 - 22.5 feet bgs)** SAND, gray, wet, loose, fine grained, poorly graded, no odor, no sheen, no discoloration.		
	22		P-68-B1	(20 - 25)	0.0	(-)		ML	**(22.5 - 24.7 feet bgs)** SILT, gray, moist, soft, low plasticity, some sand from 24.0 to 24.7 feet bgs, no odor, no sheen, no discoloration.		
	23		P-68-B2								
	24				0.0	(-)					
	25								End boring at 25.0 feet bgs.		
10											
5											
0											
-5											
-10											

bgs = below ground surface
ft = feet
PID=photoionization detector
ppm = parts per million

UV = ultraviolet
UV screen consisted of visual observation with ultraviolet light.
(-) no indication of fluorescence
(+) fluorescence observed (see lithology)

▽ First encountered groundwater (wet soils observed)

Report: 5237 BAU JAN 23; File: 5237-10H3 DNAPL CHAR LOGS.GPJ; 2/9/15

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

PROJECT:
Northwest Natural - Gasco Facility
Gas Pipeline Excavation Pre-Drill
Portland, Oregon
PROJECT: 2708

PUSH PROBE NUMBER P-A

		DRILL START	DRILL FINISH
HAI LOGGER:	Rob Ede		
SAMPLING METHOD:	Macrocore-Grab		
DRILLING METHOD:	Direct Push-GeoProbe	Time:	Time:
EQUIPMENT TYPE	6,600	1200	1215
DRILLER:	Marcus Johnson	Date:	Date:
DRILLING CONTRACTOR:	Boart Longyear	4-May-07	4-May-07

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

BORING ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	DNAPL Screen Results	CORE INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
										Ground surface
3/4-inch bentonite chips							1		SP	SAND, fine grained, brown, loose, several brick fragments, no odor, no sheen, no discoloration, no oil or tar observed, no ultraviolet fluorescence (0-10' bgs).
							2			
	17	12:11	0.0	-			3			
							4			
							5			
							6			
							7			
							8			
	18	12:15	0	-			9			
							10			
							11			Boring terminated at 10 feet bgs
							12			
							13			
							14			
							15			
							16			
							17			
							18			
							19			
							20			

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Portland, Oregon
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PROJECT:
Northwest Natural - Gasco Facility
Gas Pipeline Excavation Pre-Drill
Portland, Oregon
PROJECT: 2708

PUSH PROBE NUMBER P-B

		DRILL START	DRILL FINISH
HAI LOGGER:	Rob Ede		
SAMPLING METHOD:	Macrocore-Grab		
DRILLING METHOD:	Direct Push-GeoProbe	Time:	Time:
EQUIPMENT TYPE	6,600	1135	1144
DRILLER:	Marcus Johnson	Date:	Date:
DRILLING CONTRACTOR:	Boart Longyear	4-May-07	4-May-07

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

BORING ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	DNAPL Screen Results	CORE INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
										Ground surface
3/4-inch bentonite chips							1		GM	Sandy SILT with gravel, brown becoming discolored black (carbon pitch material?) at 2.5 feet bgs, brick fragments throughout core, mild petroleum odor, no sheen, no ultraviolet fluorescence or visual oil or tar (0 - 6' bgs)
							2			
	13	11:41	0.0	-			3			
							4			
							5			
							6		SM	Silty SAND with minor gravels, very moist to wet, olive grey and dark grey with black (carbon pitch?) mottled, moderate petroleum odor, no visual oil or tar. Sample -14 has fleck of positive ultraviolet fluorescence suggesting possible NAPL (6 to 10 feet bgs).
							7			
	14	11:48	0.0	+			8			
							9			
							10			
							11			Boring terminated at 10 feet bgs
							12			
							13			
							14			
							15			
							16			
							17			
							18			
							19			
							20			

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PROJECT:
Northwest Natural - Gasco Facility
Gas Pipeline Excavation Pre-Drill
Portland, Oregon
PROJECT: 2708

PUSH PROBE NUMBER P-C

		DRILL START	DRILL FINISH
HAI LOGGER:	Rob Ede		
SAMPLING METHOD:	Macrocore-Grab		
DRILLING METHOD:	Direct Push-GeoProbe	Time:	Time:
EQUIPMENT TYPE	6,600	1058	1113
DRILLER:	Marcus Johnson	Date:	Date:
DRILLING CONTRACTOR:	Boart Longyear	4-May-07	4-May-07

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

BORING ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	DNAPL Screen Results	CORE INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
										Ground surface
3/4-inch bentonite chips							1			Sandy SILT with gravel, very moist (upper 6 inches), moist below, light brown and orange mottled, gravels (up to size of core, 2 inches) sporadic throughout, root matter and minor vegetation throughout, no odor, no sheen, no observed oil or tar, no ultraviolet fluorescence (0-6' bgs).
							2			
							3			
	09	11:05	0.0	-			4			
							5		ML	
							6			Sandy SILT becoming mottled gray and black below 6 feet bgs, moist, minor gravels (<5%) throughout, wood chips at 8 feet bgs, moderate petroleum odor, no visual oil or tar, no sheen, no ultraviolet fluorescence (6-10' bgs).
							7			
							8			
	10	11:10	0.0	-			9			
							10			
							11			Boring terminated at 10 feet bgs
							12			
							13			
							14			
							15			
							16			
							17			
							18			
							19			
							20			

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PROJECT:
Northwest Natural - Gasco Facility
Gas Pipeline Excavation Pre-Drill
Portland, Oregon
PROJECT: 2708

PUSH PROBE NUMBER P-D

		DRILL START	DRILL FINISH
HAI LOGGER:	Rob Ede		
SAMPLING METHOD:	Macrocore-Grab		
DRILLING METHOD:	Direct Push-GeoProbe	Time:	Time:
EQUIPMENT TYPE	6,600	1042	1052
DRILLER:	Marcus Johnson	Date:	Date:
DRILLING CONTRACTOR:	Boart Longyear	4-May-07	4-May-07

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

BORING ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	DNAPL Screen Results	CORE INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
										Ground surface
3/4-inch bentonite chips							1			Sandy SILT, very moist (upper 6 inches) to moist below, light brown and orange mottled, non-plastic, no odor, becoming grey with petroleum odor at 4 feet bgs, gravels in upper foot, fine to medium sands (<10%), no ultraviolet fluorescence, no sheen, no visual oil or tar (0-5' bgs).
							2			
	07	10:46	0.0	-			3			
							4			
							5		ML	
							6			SILT, moist, grey with some minor areas of discoloration (patchy black), slightly plastic, moderate stiff, moist, mild petroleum odor below 6 feet bgs, no ultraviolet fluorescence, no sheen, no visual oil or tar (5-10' bgs).
							7			
	08	10:51	0.0	-			8			
							9			
							10			
							11			Boring terminated at 10 feet bgs
							12			
							13			
							14			
							15			
							16			
							17			
							18			
							19			
							20			

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PROJECT:
Northwest Natural - Gasco Facility
Gas Pipeline Excavation Pre-Drill
Portland, Oregon
PROJECT: 2708

PUSH PROBE NUMBER P-E

		DRILL START	DRILL FINISH
HAI LOGGER:	Rob Ede		
SAMPLING METHOD:	Macrocore-Grab		
DRILLING METHOD:	Direct Push-GeoProbe	Time:	Time:
EQUIPMENT TYPE	6,600	1021	1040
DRILLER:	Marcus Johnson	Date:	Date:
DRILLING CONTRACTOR:	Boart Longyear	4-May-07	4-May-07

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

BORING ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	DNAPL Screen Results	CORE INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
										Ground surface
3/4-inch bentonite chips							1		SM	Silty SAND, brown, dry, 1 to 1.5-inch diameter gravels (<5%), rootlets and vegetation at surface and at 1.5 feet bgs, no sheen, no odor, no visual tar or oil, no ultraviolet fluorescence (0 - 2 feet bgs).
							2			
	05	10:30	0.0	-			3			Sandy SILT, brown, moist, approximately 0.25-inch layer of black granular material at 3 feet bgs, fine-grained sand layer (grey, moist) at 9 feet bgs, slight naphthalene odor, becoming mottled with black discoloration below 5 feet bgs with increasing naphthalene odor, no sheen, no visual tar or oil, no ultraviolet fluorescence (2 - 9 feet bgs).
							4			
							5			
							6			
							7		ML	
	06	10:33	0.0	+			8			
							9			
							10			SILT, grey, plastic, stiff, no visual tar or oil (5-10 feet bgs). Soil at Sample -06 location has flecks of ultraviolet fluorescence suggesting possible patchy oil (9 - 10 feet bgs).
							11			Boring terminated at 10 feet bgs
							12			
							13			
							14			
							15			
							16			
							17			
							18			
							19			
							20			

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PUSH PROBE NUMBER P-F

PROJECT:	HAI LOGGER:	Rob Ede	DRILL START Time: 1000 / Date: 4-May-07
Northwest Natural - Gasco Facility	SAMPLING METHOD:	Macrocore-Grab	DRILL FINISH Time: 1015 / Date: 4-May-07
Gas Pipeline Excavation Pre-Drill	DRILLING METHOD:	Direct Push-GeoProbe	
Portland, Oregon	EQUIPMENT TYPE	6,600	
PROJECT: 2708	DRILLER:	Marcus Johnson	
	DRILLING CONTRACTOR:	Boart Longyear	

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

BORING ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	DNAPL Screen Results	CORE INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
										Ground surface
3/4-inch bentonite chips							1		ML	Sandy SILT, light brown, slightly moist, zones of dark discoloration below 1 foot bgs, mottled brown and black, several gravels present, no ultraviolet fluorescence, no sheen, no visual oil or tar (0-5.5'bgs).
	03	10:07	0.0	-			2			
							3			
							4			
							5			
							6		SM	Silty SAND with gravel, very moist, strong odor, mottled with black material, strong petroleum or naphthalene odor, no sheen, no visual oil or tar, no ultraviolet fluorescence (5.5-8' bgs)
							7			
	04	10:13	0.7	-			8	▼		.
				-			9		SP	SAND, gray, wet at 8 feet bgs, petroleum odor, no discoloration, no sheen, no visual oil or tar, no ultraviolet fluorescence (8-10' bgs).
							10			
							11			Boring terminated at 10 feet bgs
							12			
							13			
							14			
							15			
							16			
							17			
							18			
							19			
							20			

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PUSH PROBE NUMBER P-G

PROJECT:	HAI LOGGER:	Rob Ede	DRILL START Time: 0940 / DRILL FINISH Time: 0955
Northwest Natural - Gasco Facility	SAMPLING METHOD:	Macrocore-Grab	
Gas Pipeline Excavation Pre-Drill	DRILLING METHOD:	Direct Push-GeoProbe	
Portland, Oregon	EQUIPMENT TYPE	6,600	
PROJECT: 2708	DRILLER:	Marcus Johnson	Date: 4-May-07 / Date: 4-May-07
	DRILLING CONTRACTOR:	Boart Longyear	

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

BORING ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	DNAPL Screen Results	CORE INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
										Ground surface
3/4-inch bentonite chips							1			Sandy SILT, light brown, damp, vegetation and roots in upper 2 feet, non-plastic, several black patchy areas of discoloration at approximately 4 feet bgs, no odor, no sheen, no ultraviolet fluorescence or visual oil or tar (0 - 5.5' bgs). .
							2			
	01	9:45	0.0	-			3			
							4		ML	
							5			
							6			Sandy SILT as above to 5.5 feet bgs, becoming very moist and black discolored at 5.5 feet bgs with naphthalene odor, increasing sand content with depth, minor sheen, no visual tar or oil, no ultraviolet fluorescence (5.5 - 8' bgs).
							7			
							8			
	02	9:55	0.0	-			9		SM	Silty SAND, very moist and black discolored with naphthalene odor, no visual tar or oil, no ultraviolet fluorescence (8-10' bgs).
							10			
							11			Boring terminated at 10 feet bgs
							12			
							13			
							14			
							15			
							16			
							17			
							18			
							19			
							20			

LOG OF EXPLORATORY BORING

PROJECT NAME	**Gasco Groundwater Source Control**	BORING NO.	**PW-1L**
LOCATION	**Portland, Oregon**	PAGE	**1 of 8**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**34.9 ft COP**
DRILL METHOD	**Rotosonic - SDC 390-14**	TOTAL DEPTH	**141.5 ft.**
LOGGED BY	**Matt Wilson/Ben Johnson**	DATE COMPLETED	**1/8/13**
SAMPLING METHOD	**See Remarks**	PERMIT/STARTCARD NO.	**1017830**
BOREHOLE DIAMETER	**17.5-inch (0-37 ft)/10-inch (37-141.5 ft)**	WATER RESOURCES WELL ID	**L109299**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
NA	NA	5			**0 to 10.0 feet: No Recovery**. Interval Air-Knifed to clear for utilities.			
CB	4.5/5.0	10			@ 10.0 feet: hard drilling. **10.0 to 20.0 feet: SAND (SW)**, black, sticky, loose, well graded, medium to coarse sand, trace fine gravel. (FILL) @ 10.0 to 11.2 feet: tar in matrix, sticky, moderate hydrocarbon-like odor, platy sheen via sheen test. @ 11.2 feet: color change to dark brown, hydrocarbon-like odor. @ 12.7 feet: color change to black, slight hydrocarbon-like odor. @ 13.5 to 13.6 feet: color change to dark brown. @ 13.6 to 14.2 feet: color change to dark orange-red. @ 14.2 feet: color change to dark gray.	5	95-100	0
CB	4.2/5.0	15			@ 16.5 to 17.6 feet: moderate hydrocarbon-like odor. @ 17.6 to 17.7 feet: sheen on wetted sample, moderate hydrocarbon-like odor. @ 18.0 to 18.1 feet: sheen on wetted sample, moderate hydrocarbon-like odor. @ 18.5 to 20.0 feet: intermittent bands of sheen on wetted sample, moderate hydrocarbon-like odor.			
		20						

REMARKS

COP = City of Portland Vertical Datum.

Sampling Method: 1.5-in. ID by 5-ft. core barrel (CB) (0-85 ft.); 6-in. by 10-ft. core barrel (85-140 ft.).

ANCHOR QEA

LOG OF EXPLORATORY BORING

PROJECT NAME	**Gasco Groundwater Source Control**	BORING NO.	**PW-1L**
LOCATION	**Portland, Oregon**	PAGE	**2 of 8**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**34.9 ft COP**
DRILL METHOD	**Rotosonic - SDC 390-14**	TOTAL DEPTH	**141.5 ft.**
LOGGED BY	**Matt Wilson/Ben Johnson**	DATE COMPLETED	**1/8/13**
SAMPLING METHOD	**See Remarks**	PERMIT/STARTCARD NO.	**1017830**
BOREHOLE DIAMETER	**17.5-inch (0-37 ft)/10-inch (37-141.5 ft)**	WATER RESOURCES WELL ID	**L109299**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
CB	4.6/5.0				**20.0 to 20.9 feet: SILTY SAND (SM))**, dry, slightly cohesive, sand is well graded, medium to coarse grained, slight hydrocarbon-like odor, trace fine gravel. (FILL)	5	80	15
					@ 20.0 feet: light sheen evident on wetted sample.	15	85	0
					20.9 to 30.4 feet: SAND (SW), dark gray, loose, dry, well graded, medium to coarse sand, fine gravel, no sheen, trace hydrocarbon-like odor. (FILL)			
					@ 22.4 to 22.9 feet: silty sand layer.			
CB	3.0/5.0	25						
					@ 28.5 to 30.0 feet: no recovery, piece of wood blocked sampler.			
CB	5.0/5.0	30			**30.4 to 30.5 feet: TAR**, strong hydrocarbon-like odor.	0	40	60
					@ 30.4 to 31.4 feet: trace spotty sheen.			
					30.5 to 32.4 feet: SANDY SILT (ML), dark gray with red mottling, very soft, wet, nonplastic, fine sand, slight hydrocarbon-like odor, intermittent thin (1-5 mm) fine sand seams. (ALLUVIUM)	0	70	30
					32.4 to 34.0 feet: SILTY SAND (SM), dark orange red, wet, loose, fine sand, no sheen, no odor. (ALLUVIUM)			
					@ 33.8 to 34.0 feet: silt layer.	0	100	0
					34.0 to 36.6 feet: SAND (SP), dark orange red, wet, loose, poorly graded, fine grained, no sheen, no odor. (ALLUVIUM)			
CB	5.0/5.0	35			@ 35.0 to 35.7 feet: silty sand layer.	0	70	30
					@ 36.0 to 36.6 feet: silty sand layer.	0	70	30
					36.6 to 38.0 feet: SAND (SP), dark gray, loose, wet, poorly graded, fine grained, trace fines, no sheen, no odor. (ALLUVIUM)	0	95-100	0-5
					38.0 to 38.8 feet: SILT (ML), dark grayish brown, moist, soft, low plasticity, trace fine sand. (ALLUVIUM)	0	0-5	95-100
					38.8 to 39.5 feet: SANDY SILT (ML), dark grayish brown, very soft, wet, low plasticity, fine sand. (ALLUVIUM)	0	20	80
		40				0	100	0

REMARKS

COP = City of Portland Vertical Datum.

Sampling Method: 1.5-in. ID by 5-ft. core barrel (CB) (0-85 ft.); 6-in. by 10-ft. core barrel (85-140 ft.).

ANCHOR QEA

LOG OF EXPLORATORY BORING

PROJECT NAME	**Gasco Groundwater Source Control**	BORING NO.	**PW-1L**
LOCATION	**Portland, Oregon**	PAGE	**3 of 8**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**34.9 ft COP**
DRILL METHOD	**Rotosonic - SDC 390-14**	TOTAL DEPTH	**141.5 ft.**
LOGGED BY	**Matt Wilson/Ben Johnson**	DATE COMPLETED	**1/8/13**
SAMPLING METHOD	**See Remarks**	PERMIT/STARTCARD NO.	**1017830**
BOREHOLE DIAMETER	**17.5-inch (0-37 ft)/10-inch (37-141.5 ft)**	WATER RESOURCES WELL ID	**L109299**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
CB	4.8/5.0				**39.5 to 41.1 feet: SAND (SP)**, dark brownish gray, loose, wet, poorly graded, fine grained, no sheen, no odor, gradual contact with silty sand unit below. (ALLUVIUM)	0	100	0
					41.1 to 42.3 feet: SILTY SAND (SM), dark brownish gray, loose, wet, slightly cohesive, fine sand, no sheen, no odor, trace plant and wood debris, gradational contact with silt unit below. (ALLUVIUM)	0	80	20
					42.3 to 42.9 feet: SILT (ML), dark grayish brown, soft, moist, moderately plastic, no sheen, no odor. (ALLUVIUM)	0	0	100
					42.9 to 47.7 feet: SAND (SP), dark brownish gray, medium dense, wet, poorly graded, fine grained, intermittent thin silt layers. (ALLUVIUM) @ 43.3 to 43.6 feet: silt layer. @ 43.9 to 44.2 feet: silt layer. @ 45.0 to 47.7 feet: trace fines.	0	95-100	0-5
CB	5.0/5.0	45						
					47.7 to 48.3 feet: SANDY SILT (ML), dark brownish gray, moist, soft, low plasticity, fine sand, no sheen, no odor. (ALLUVIUM)	0	20-30	60-70
					48.3 to 48.9 feet: SILT (ML), dark brownish gray, moist, firm, moderate plasticity, no sheen, no odor. (ALLUVIUM)	0	0	100
					48.9 to 50.6 feet: SAND (SP), dark brownish gray, loose, wet, poorly graded, fine grained, no sheen, no odor, intermittent very thin silt layers (1- to 5-mm). (ALLUVIUM)	0	95-100	0-5
CB	4.3/5.0	50						
					50.6 to 51.6 feet: SILT (ML), dark grayish brown, moist, soft moderate plasticity, no sheen, no odor. (ALLUVIUM) @ 50.6 to 51.1 feet: sandy silt, fine sand.	0 0	100 (in sand) 50 (overall)	0 50
					51.6 to 60.1 feet: SAND (SP), dark brownish gray, loose, wet, poorly graded fine grained, abundant intermittent silt layers, no sheen, no odor. @ 52.0 to 52.3 feet: silt layer. @ 52.5 to 52.6 feet: silt layer. @ 52.8 to 53.3 feet: silt layer. @ 53.5 to 54.0 feet: silt layer.	0	0	100
CB	4.1/5.0	55						
					@ 57.9 to 58.0 feet: silt layer. @ 58.2 to 58.3 feet: silt layer. @ 58.8 to 58.9 feet: silt layer.			
		60			@ 59.6 to 60.1 feet: silt layer.			

REMARKS

COP = City of Portland Vertical Datum.

Sampling Method: 1.5-in. ID by 5-ft. core barrel (CB) (0-85 ft.); 6-in. by 10-ft. core barrel (85-140 ft.).

ANCHOR QEA

LOG OF EXPLORATORY BORING

PROJECT NAME	**Gasco Groundwater Source Control**	BORING NO.	**PW-1L**
LOCATION	**Portland, Oregon**	PAGE	**4 of 8**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**34.9 ft COP**
DRILL METHOD	**Rotosonic - SDC 390-14**	TOTAL DEPTH	**141.5 ft.**
LOGGED BY	**Matt Wilson/Ben Johnson**	DATE COMPLETED	**1/8/13**
SAMPLING METHOD	**See Remarks**	PERMIT/STARTCARD NO.	**1017830**
BOREHOLE DIAMETER	**17.5-inch (0-37 ft)/10-inch (37-141.5 ft)**	WATER RESOURCES WELL ID	**L109299**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
CB	4.1/5.0				**51.6 to 60.1 feet: SAND (SP)**, continued.	0	80	20
					60.1 to 61.4 feet: SILTY SAND (SM), dark brownish gray, wet, loose, slightly cohesive. (ALLUVIUM)			
					61.4 to 82.4 feet: SAND (SP), dark brownish gray, medium dense, wet, poorly graded, fine grained, trace fines, no sheen, no odor. (ALLUVIUM)	0	95-100	0-5
					@ 62.1 to 62.2 feet: silt layer.			
					@ 62.3 to 62.9 feet: silt layer.			
					@ 63.9 to 64.1 feet: silt layer.			
CB	4.9/5.0	65						
					@ 67.7 to 68.4 feet: silt layer.			
					@ 68.7 to 69.1 feet: silt layer.			
CB	4.6/5.0	70						
					@ 70.5 to 71.4 feet: silty sand, dark grayish brown, wet, very loose, very soft, no sheen, no odor.	0	60	40
					@ 72.1 to 72.2 feet: silt layer.	0	95-100	0-5
					@ 72.3 to 72.6 feet: silt layer.			
					@ 73.1 feet: 0.05-foot thin wood plant debris layer.			
					@ 73.6 to 73.7 feet: wood and plant debris.			
					@ 73.8 to 74.2 feet: silt layer.			
CB	3.4/5.0	75			@ 74.8 to 75.8 feet: silt layer.			
					@ 75.9 to 82.4 feet: clean sand, no fines, sand seems slightly coarser grained than upper units, but not medium grained.	0	100	0
		80						

REMARKS

COP = City of Portland Vertical Datum.

Sampling Method: 1.5-in. ID by 5-ft. core barrel (CB) (0-85 ft.); 6-in. by 10-ft. core barrel (85-140 ft.).

ANCHOR QEA

LOG OF EXPLORATORY BORING

PROJECT NAME	**Gasco Groundwater Source Control**	BORING NO.	**PW-1L**
LOCATION	**Portland, Oregon**	PAGE	**5 of 8**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**34.9 ft COP**
DRILL METHOD	**Rotosonic - SDC 390-14**	TOTAL DEPTH	**141.5 ft.**
LOGGED BY	**Matt Wilson/Ben Johnson**	DATE COMPLETED	**1/8/13**
SAMPLING METHOD	**See Remarks**	PERMIT/STARTCARD NO.	**1017830**
BOREHOLE DIAMETER	**17.5-inch (0-37 ft)/10-inch (37-141.5 ft)**	WATER RESOURCES WELL ID	**L109299**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
CB	5.0/5.0				**61.4 to 82.4 feet: SAND (SP)**, continued. (ALLUVIUM)	0	100	0
					82.4 to 85.0 feet: SAND AND SILT (SP/ML), alternating layers of sand and silt, layers range from 1 mm to 3 inches, dark brownish gray, sand is poorly graded, loose, fine grained, low to moderate plasticity silt. (ALLUVIUM)	0	50	50
CB	5.0/5.0	85			**85.0 to 86.7 feet: SILT WITH SAND (ML)**, gray, no plasticity, soft, moist, slight hydrocarbon-like odor, no sheen, fine sand with red, white, and clear grains visible. (ALLUVIUM)	0	20	80
					86.7 to 88.1 feet: SILT (ML), gray, low plasticity, soft, moist, slight hydrocarbon-like odor, no sheen. (ALLUVIUM)	0	10	90
					88.1 to 95.0 feet: SILTY SAND (SM), gray, medium density, damp, slight hydrocarbon-like odor, no sheen, fine to medium grained sand with red, white, and clear grains visible. (ALLUVIUM)	0	70	30
CB	5.0/5.0	90			@ 91.6 to 92.6 feet: silt with sand (ML).			
					@ 92.3 feet: organic debris.			
					@ 94.2 to 94.5 feet: silt with sand (ML).			
CB	5.0/5.0	95			**95.0 to 97.5 feet: SAND WITH SILT (SP-SM)**, gray, loose, fine to medium grained with white, red, and clear grains, slight hydrocarbon-like odor, no sheen. (ALLUVIUM)	0	85	15
					97.5 to 110.0 feet: SAND (SP), gray, loose, white/red/clear grains, medium grained, damp, slight hydrocarbon-like odor, no sheen, trace fines. (ALLUVIUM)	0	95	5
		100			@ 99.5 to 99.7 feet: silt (ML).			

REMARKS

COP = City of Portland Vertical Datum.

Sampling Method: 1.5-in. ID by 5-ft. core barrel (CB) (0-85 ft.); 6-in. by 10-ft. core barrel (85-140 ft.).

ANCHOR QEA

LOG OF EXPLORATORY BORING

PROJECT NAME	**Gasco Groundwater Source Control**	BORING NO.	**PW-1L**
LOCATION	**Portland, Oregon**	PAGE	**6 of 8**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**34.9 ft COP**
DRILL METHOD	**Rotosonic - SDC 390-14**	TOTAL DEPTH	**141.5 ft.**
LOGGED BY	**Matt Wilson/Ben Johnson**	DATE COMPLETED	**1/8/13**
SAMPLING METHOD	**See Remarks**	PERMIT/STARTCARD NO.	**1017830**
BOREHOLE DIAMETER	**17.5-inch (0-37 ft)/10-inch (37-141.5 ft)**	WATER RESOURCES WELL ID	**L109299**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
CB	5.0/5.0	105			**97.5 to 110.0 feet: SAND (SP)**, continued. @ 102.1 to 102.3 feet: silt (ML).	0	95	5
CB	5.0/5.0	110			@ 106.0 to 109.6 feet: silt blebs. @ 109.2 to 110.0 feet: fine grained sand.			
CB	4.7/5.0	115			**110.0 to 115.0 feet: SILT (ML)**, gray, low plasticity, firm, damp, slight hydrocarbon-like odor, no sheen. (ALLUVIUM) @ 111.2 feet: organic debris. @ 111.5 to 113.0 feet: sand (SP).	0	7	93
CB	5.0/5.0				**115.0 to 117.0 feet: SAND WITH SILT (SP-SM)**, gray, fine grained with red, white, and clear grains visible, loose, damp, slight hydrocarbon-like odor, no sheen. (ALLUVIUM)	0	90	10
		120			**117.0 to 140.0 feet: SAND (SP)**, gray, fine grained with red, white, and clear grains visible, loose, damp, slight hydrocarbon-like odor, no sheen. (ALLUVIUM) @ 119.1 to 119.5 feet: silt (ML).	0	95	5

REMARKS

COP = City of Portland Vertical Datum.

Sampling Method: 1.5-in. ID by 5-ft. core barrel (CB) (0-85 ft.); 6-in. by 10-ft. core barrel (85-140 ft.).

ANCHOR QEA

LOG OF EXPLORATORY BORING

PROJECT NAME	**Gasco Groundwater Source Control**	BORING NO.	**PW-1L**
LOCATION	**Portland, Oregon**	PAGE	**7 of 8**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**34.9 ft COP**
DRILL METHOD	**Rotosonic - SDC 390-14**	TOTAL DEPTH	**141.5 ft.**
LOGGED BY	**Matt Wilson/Ben Johnson**	DATE COMPLETED	**1/8/13**
SAMPLING METHOD	**See Remarks**	PERMIT/STARTCARD NO.	**1017830**
BOREHOLE DIAMETER	**17.5-inch (0-37 ft)/10-inch (37-141.5 ft)**	WATER RESOURCES WELL ID	**L109299**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
CB	4.7/5.0				**117.0 to 140.0 feet: SAND (SP)**, continued. @ 120.0 to 120.5 feet: silt blebs. @ 123.3 to 123.5 feet: silty sand (SM). @ 123.9 to 124.2 feet: silty sand (SM).	0	95	5
CB	5.0/5.0	125			@ 127.0 to 127.4 feet: silt blebs. @ 128.0 to 129.1 feet: silty sand (SM).			
CB	5.0/5.0	130			@ 130.4 to 131.4 feet: silt with sand (ML). @ 131.4 to 140.0 feet: clean sand, no fines, medium grained sand.			
CB	NA	135						
		140						

REMARKS

COP = City of Portland Vertical Datum.

Sampling Method: 1.5-in. ID by 5-ft. core barrel (CB) (0-85 ft.); 6-in. by 10-ft. core barrel (85-140 ft.).

ANCHOR QEA

LOG OF EXPLORATORY BORING

PROJECT NAME	**Gasco Groundwater Source Control**	BORING NO.	**PW-1L**
LOCATION	**Portland, Oregon**	PAGE	**8 of 8**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**34.9 ft COP**
DRILL METHOD	**Rotosonic - SDC 390-14**	TOTAL DEPTH	**141.5 ft.**
LOGGED BY	**Matt Wilson/Ben Johnson**	DATE COMPLETED	**1/8/13**
SAMPLING METHOD	**See Remarks**	PERMIT/STARTCARD NO.	**1017830**
BOREHOLE DIAMETER	**17.5-inch (0-37 ft)/10-inch (37-141.5 ft)**	WATER RESOURCES WELL ID	**L109299**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
NA	NA				**140.0 to 141.5 feet: interval advanced without sampling**.			
		145			Total depth: 141.5 feet. **WELL COMPLETION DETAILS** +2.2 to 114.8 feet: 6-inch-diameter, flush-threaded, mild steel blank riser pipe. Riser pipe expands to 8-inch diameter at ground surface and terminates in a 14-inch diameter flange. 114.8 to 134.8 feet: 6-inch-diameter, flush-threaded, continuous wire-wrapped stainless steel screen with 0.035-inch slots. Rubber NAPL funnel attached at base of screen. 134.8 to 139.8 feet: 6-inch-diameter stainless steel sump. 0 to 6.0 feet: Concrete. 6.0 to 109.0 feet: Bentonite grout with 10% organoclay by dry volume. 109.0 to 112.8 feet: 20-40 Colorado silica sand. 112.8 to 134.8 feet: 10-20 Colorado silica sand. 134.8 to 141.5 feet: Coated bentonite pellets.			
		150						
		155						
		160						

REMARKS

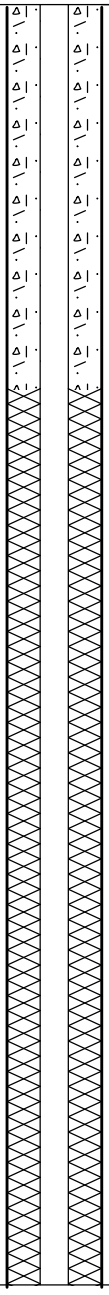
COP = City of Portland Vertical Datum.

Sampling Method: 1.5-in. ID by 5-ft. core barrel (CB) (0-85 ft.); 6-in. by 10-ft. core barrel (85-140 ft.).

ANCHOR QEA

LOG OF EXPLORATORY BORING

PROJECT NAME	**Gasco Groundwater Source Control**	BORING NO.	**PW-1U**
LOCATION	**Portland, Oregon**	PAGE	**1 of 5**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**35.0 ft COP**
DRILL METHOD	**Rotosonic - SDC 390-14**	TOTAL DEPTH	**85.0 ft.**
LOGGED BY	**Matt Wilson**	DATE COMPLETED	**1/9/13**
SAMPLING METHOD	**1.5-in. ID by 5-ft. core barrel (CB)**	PERMIT/STARTCARD NO.	**1017828**
BOREHOLE DIAMETER	**See remarks.**	WATER RESOURCES WELL ID	**L109298**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
		5			See boring log PW-1L for lithologic description.			
		10						
		15						
		20						

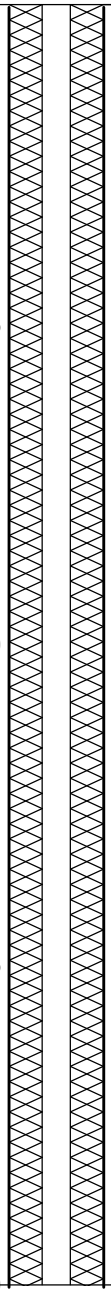
REMARKS

COP = City of Portland Vertical Datum. Borehole diameter: 17.5-inch (0-35 ft)/10-inch (35-75.5 ft)/2.25-in (75.5-85.0 ft)

ANCHOR QEA

LOG OF EXPLORATORY BORING

PROJECT NAME	**Gasco Groundwater Source Control**	BORING NO.	**PW-1U**
LOCATION	**Portland, Oregon**	PAGE	**2 of 5**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**35.0 ft COP**
DRILL METHOD	**Rotosonic - SDC 390-14**	TOTAL DEPTH	**85.0 ft.**
LOGGED BY	**Matt Wilson**	DATE COMPLETED	**1/9/13**
SAMPLING METHOD	**1.5-in. ID by 5-ft. core barrel (CB)**	PERMIT/STARTCARD NO.	**1017828**
BOREHOLE DIAMETER	**See remarks.**	WATER RESOURCES WELL ID	**L109298**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
		25			See boring log PW-1L for lithologic description.			
		30						
		35						
		40						

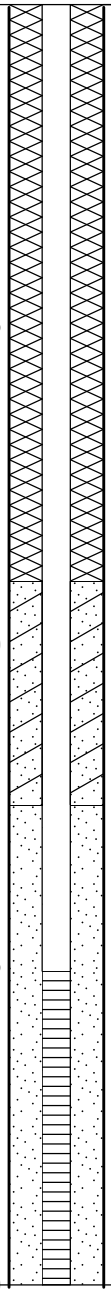
REMARKS

COP = City of Portland Vertical Datum. Borehole diameter: 17.5-inch (0-35 ft)/10-inch (35-75.5 ft)/2.25-in (75.5-85.0 ft)

ANCHOR QEA

LOG OF EXPLORATORY BORING

PROJECT NAME	**Gasco Groundwater Source Control**	BORING NO.	**PW-1U**
LOCATION	**Portland, Oregon**	PAGE	**3 of 5**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**35.0 ft COP**
DRILL METHOD	**Rotosonic - SDC 390-14**	TOTAL DEPTH	**85.0 ft.**
LOGGED BY	**Matt Wilson**	DATE COMPLETED	**1/9/13**
SAMPLING METHOD	**1.5-in. ID by 5-ft. core barrel (CB)**	PERMIT/STARTCARD NO.	**1017828**
BOREHOLE DIAMETER	**See remarks.**	WATER RESOURCES WELL ID	**L109298**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
		45			See boring log PW-1L for lithologic description.			
		50						
		55						
		60						

REMARKS

COP = City of Portland Vertical Datum. Borehole diameter: 17.5-inch (0-35 ft)/10-inch (35-75.5 ft)/2.25-in (75.5-85.0 ft)

ANCHOR QEA

LOG OF EXPLORATORY BORING

PROJECT NAME	**Gasco Groundwater Source Control**	BORING NO.	**PW-1U**
LOCATION	**Portland, Oregon**	PAGE	**4 of 5**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**35.0 ft COP**
DRILL METHOD	**Rotosonic - SDC 390-14**	TOTAL DEPTH	**85.0 ft.**
LOGGED BY	**Matt Wilson**	DATE COMPLETED	**1/9/13**
SAMPLING METHOD	**1.5-in. ID by 5-ft. core barrel (CB)**	PERMIT/STARTCARD NO.	**1017828**
BOREHOLE DIAMETER	**See remarks.**	WATER RESOURCES WELL ID	**L109298**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
		65			See boring log PW-1L for lithologic description.			
		70						
		75						
		80						

REMARKS

COP = City of Portland Vertical Datum. Borehole diameter: 17.5-inch (0-35 ft)/10-inch (35-75.5 ft)/2.25-in (75.5-85.0 ft)

ANCHOR QEA

LOG OF EXPLORATORY BORING

PROJECT NAME	**Gasco Groundwater Source Control**	BORING NO.	**PW-1U**
LOCATION	**Portland, Oregon**	PAGE	**5 of 5**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**35.0 ft COP**
DRILL METHOD	**Rotosonic - SDC 390-14**	TOTAL DEPTH	**85.0 ft.**
LOGGED BY	**Matt Wilson**	DATE COMPLETED	**1/9/13**
SAMPLING METHOD	**1.5-in. ID by 5-ft. core barrel (CB)**	PERMIT/STARTCARD NO.	**1017828**
BOREHOLE DIAMETER	**See remarks.**	WATER RESOURCES WELL ID	**L109298**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
		85			See boring log PW-1L for lithologic description.			
		90			Total depth: 85.0 feet. **WELL COMPLETION DETAILS** +2.4 to 55.1 feet: 6-inch-diameter, flush-threaded, mild steel blank riser pipe. Riser pipe expands to 8-inch diameter at ground surface and terminates in a 14-inch diameter flange. 55.1 to 70.1 feet: 6-inch-diameter, flush-threaded, continuous wire-wrapped stainless steel screen with 0.020-inch slots. Rubber NAPL funnel attached at base of screen. 70.1 to 75.1 feet: 6-inch-diameter stainless steel sump. 0 to 6.0 feet: Concrete. 6.0 to 49.0 feet: Bentonite grout with 10% organoclay by dry volume. 49.0 to 52.5 feet: 20-40 Colorado silica sand. 52.5 to 70.1 feet: 16-30 Colorado silica sand. 70.1 to 75.5 feet: Bentonite pellets. 75.5 to 85.0 feet: Bentonite grout with 10% organoclay by dry volume.			
		95						
		100						

REMARKS

COP = City of Portland Vertical Datum. Borehole diameter: 17.5-inch (0-35 ft)/10-inch (35-75.5 ft)/2.25-in (75.5-85.0 ft)

ANCHOR QEA

34.7 ft COP

LOG OF EXPLORATORY BORING

PROJECT NAME	**NW Natural - GW Source Control**	BORING NO.	**PW-1Ub**
LOCATION	**Portland, Oregon**	PAGE	**1 of 5**
DRILLED BY	**Westerberg**	GROUND SURFACE ELEVATION	
DRILL METHOD	**Cable Tool**	TOTAL DEPTH	**85.0 ft.**
LOGGED BY	**Matt Wilson/Ben Johnson**	DATE COMPLETED	**2/15/16**
BOREHOLE DIAMETER	**16-inch: 0'-9'; 12-inch: 9'-30'; 10-inch: 30'-85'.**	PERMIT/STARTCARD NO.	
		WATER RESOURCES WELL ID	**L118264**

SAMPLING METHOD	DEPTH SAMPLED (FEET)	BLOW COUNTS	DEPTH (FEET)	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
AK	0'-10'		5			**0 to 10.0 feet: SAND (SW)**, brown, medium to coarse grains, trace gravel, loose, moist, no odor, no sheen. (FILL)	5	95	0
bailer	10'-14.5'		10			**10.0 to 22.0 feet: SAND (SW)**, brown, fine to coarse grains, well graded, trace fine gravel, wet (water added), loose, no odor, no sheen. (FILL)	5	93	2
bailer	14.5'-20'		15			@ 14.5 to 17.5 feet: less gravel. @ 17.5 to 22.0 feet: hydrocarbon odor, monocolor sheen.			
			20						

REMARKS

1.) AK = Air Knife. 2.) SS = 2.5-inch x 2 ft.-diameter split spoon. 3.) SS2 = 2.0-inch x 1.5 ft. split-spoon.

ANCHOR QEA

LOG OF EXPLORATORY BORING

PROJECT NAME	**NW Natural - GW Source Control**	BORING NO.	**PW-1Ub**
LOCATION	**Portland, Oregon**	PAGE	**2 of 5**
DRILLED BY	**Westerberg**	GROUND SURFACE ELEVATION	
DRILL METHOD	**Cable Tool**	TOTAL DEPTH	**85.0 ft.**
LOGGED BY	**Matt Wilson/Ben Johnson**	DATE COMPLETED	**2/15/16**
BOREHOLE DIAMETER	**16-inch: 0'-9'; 12-inch: 9'-30'; 10-inch: 30'-85'.**	PERMIT/STARTCARD NO.	
		WATER RESOURCES WELL ID	**L118264**

SAMPLING METHOD	DEPTH SAMPLED (FEET)	BLOW COUNTS	DEPTH (FEET)	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
bailer	20'-22'					**10.0 to 22.0 feet: SAND (SW)**, continued.			
bailer	22'-25'					**22.0 to 26.0 feet: SILTY SAND (SM)**, black, fine to medium grained sand, trace fine gravel, loose, wet (from water addition), sheen, hydrocarbon odor. (FILL) @ 24.0 to 25.0 feet: approximately 10 percent less silt.	2	68	30
bailer	25'-30'		25			**26.0 to 28.0 feet: SANDY GRAVEL (SP)**, black, fine to medium gravel, medium to coarse sand, subrounded, wet, loose, hydrocarbon odor, sheen.	40	50	10
						28.0 to 29.0 feet: SAND (SP), black, fine to medium sand, loose, wet, wood pulp, hydrocarbon odor, sheen. (FILL)	2	95	3
bailer	30'-32'		30			**29.0 to 31.0 feet: SANDY SILT (ML)**, black/gray, fine to medium sand, loose/soft, wet, hydrocarbon odor, sheen. (FILL/UPPER ALLUVIUM CONTACT) @ 30.0 to 31.0 feet: SILT (ML).	5	40	55
bailer	32'-36'					**31.0 to 36.0 feet: SAND (SP)**, gray, loose, wet, poorly graded, fine grains, trace fines, no odor, no sheen. (ALLUVIUM) @ 32.0 to 33.0 feet: SILT (ML), brown/red mottled, some sand.	0	98	2
bailer	36'-40'		35			**36.0 to 42.0 feet: SILTY SAND (SM)**, orange, wet, loose, fine grains, no odor, no sheen. (ALLUVIUM) @ 39.0 feet: gray.	0	70	30
			40						

REMARKS

1.) AK = Air Knife. 2.) SS = 2.5-inch x 2 ft.-diameter split spoon. 3.) SS2 = 2.0-inch x 1.5 ft. split-spoon.

ANCHOR QEA

LOG OF EXPLORATORY BORING

PROJECT NAME	**NW Natural - GW Source Control**	BORING NO.	**PW-1Ub**
LOCATION	**Portland, Oregon**	PAGE	**3 of 5**
DRILLED BY	**Westerberg**	GROUND SURFACE ELEVATION	
DRILL METHOD	**Cable Tool**	TOTAL DEPTH	**85.0 ft.**
LOGGED BY	**Matt Wilson/Ben Johnson**	DATE COMPLETED	**2/15/16**
BOREHOLE DIAMETER	**16-inch: 0'-9'; 12-inch: 9'-30'; 10-inch: 30'-85'.**	PERMIT/STARTCARD NO.	
		WATER RESOURCES WELL ID	**L118264**

SAMPLING METHOD	DEPTH SAMPLED (FEET)	BLOW COUNTS	DEPTH (FEET)	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
bailer	40'-42'					**36.0 to 42.0 feet: SILTY SAND (SM)**, continued.	0	70	30
bailer	42'-48'					**42.0 to 44.0 feet: SILT (ML)**, gray, moist, soft, low plasticity, trace fine sand, no odor, no sheen. (ALLUVIUM)	0	5	95
			45			**44.0 to 60.9 feet: SAND (SP)**, gray, loose, wet, poorly graded, fine grains, trace silt. (ALLUVIUM)	0	95	5
bailer	48'-50'								
bailer	50'-51'		50			@ 50.0 to 58.0 feet: sand appears slightly coarser than above, light sheen observed in water when poured out of bailer.			
bailer	51'-53'								
bailer	53'-56'								
			55						
bailer	56'-58'								
NA	58'-60'								
			60						

REMARKS

1.) AK = Air Knife. 2.) SS = 2.5-inch x 2 ft.-diameter split spoon. 3.) SS2 = 2.0-inch x 1.5 ft. split-spoon.

ANCHOR QEA

LOG OF EXPLORATORY BORING

PROJECT NAME	**NW Natural - GW Source Control**	BORING NO.	**PW-1Ub**
LOCATION	**Portland, Oregon**	PAGE	**4 of 5**
DRILLED BY	**Westerberg**	GROUND SURFACE ELEVATION	
DRILL METHOD	**Cable Tool**	TOTAL DEPTH	**85.0 ft.**
LOGGED BY	**Matt Wilson/Ben Johnson**	DATE COMPLETED	**2/15/16**
BOREHOLE DIAMETER	**16-inch: 0'-9'; 12-inch: 9'-30'; 10-inch: 30'-85'.**	PERMIT/STARTCARD NO.	
		WATER RESOURCES WELL ID	**L118264**

SAMPLING METHOD	DEPTH SAMPLED (FEET)	BLOW COUNTS	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
SS	60'-62'	13 19	**44.0 to 60.9 feet: SAND (SP)**, continued.	0	95	5
			60.9 to 62.5 feet: SILT (MH), dark brownish gray, moist, firm, moderate plasticity, no sheen, no odor. (ALLUVIUM)	0	0	100
SS	62'-64'	18 34	**62.5 to 69.1 feet: SAND WITH SILT (SP-SM)**, dark gray, fine grained, poorly graded, medium dense, wet, no sheen, no odor. (ALLUVIUM)	0	90	10
SS	64'-66'	36 41	65			
SS	66'-68'	14 48	@ 66.5 to 67.1 feet: sandy silt layer.			
SS	68'-70'	13 61	@ 69.0 to 69.1 feet: silt layer.			
			69.1 to 76.4 feet: SAND (SP), dark gray, fine grained, poorly graded, dense, wet, no sheen, no odor. (ALLUVIUM)	0	95	5
SS	70'-72'	51 76	70			
SS	72'-74'	66 95				
SS	74'-76'	30 44	@ 74.0 feet: density change to medium dense.			
			75 @ 74.8 to 74.9 feet: sandy silt layer.			
SS	76'-80'	39 83	**76.4 to 78.0 feet: SANDY SILT (MH)**, dark brownish gray, moist, very stiff, medium plasticity, no sheen, no odor. (ALLUVIUM)	0	15	85
			@ 76.9 to 77.0 feet: sand layer. @ 77.1 feet: sand layer.			
SS	78'-79'	96	**78.0 to 82.9 feet: SAND (SP)**, dark gray, wet, poorly graded, fine grained, dense, no sheen, no odor, trace fines. (ALLUVIUM)	0	95	5
SS2	79'-80.5'	33 20	@ 79.0 feet: 2.5-inch SS refusal. @ 79.0 to 80.5 feet: used 2-inch x 1.5 ft. SS.	0	30	70
			80			

REMARKS

1.) AK = Air Knife. 2.) SS = 2.5-inch x 2 ft.-diameter split spoon. 3.) SS2 = 2.0-inch x 1.5 ft. split-spoon.

ANCHOR QEA

LOG OF EXPLORATORY BORING

PROJECT NAME	**NW Natural - GW Source Control**	BORING NO.	**PW-1Ub**
LOCATION	**Portland, Oregon**	PAGE	**5 of 5**
DRILLED BY	**Westerberg**	GROUND SURFACE ELEVATION	
DRILL METHOD	**Cable Tool**	TOTAL DEPTH	**85.0 ft.**
LOGGED BY	**Matt Wilson/Ben Johnson**	DATE COMPLETED	**2/15/16**
BOREHOLE DIAMETER	**16-inch: 0'-9'; 12-inch: 9'-30'; 10-inch: 30'-85'.**	PERMIT/STARTCARD NO.	
		WATER RESOURCES WELL ID	**L118264**

SAMPLING METHOD	DEPTH SAMPLED (FEET)	BLOW COUNTS	DEPTH (FEET)	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
SS2		32				**78.0 to 82.9 feet: SAND (SP)**, continued.	0	95	5
SS2	80.5'-82'	4				@ 79.1 to 79.2 feet: silt layer.			
		10				@ 80.0 to 82.0 feet: density change to medium dense, appears to be good water produced, appears slightly coarser than intervals higher up.			
		17							
SS	82'-84'	29				@ 81.0 to 81.2 feet: silt layer			
		76							
						82.9 to 84.0 feet: SANDY SILT (MH), dark grayish brown, stiff, moist, medium plasticity, no sheen, no odor. (ALLUVIUM)	0	30	70
SS	84'-85'	54				**84.0 to 85.0 feet: SAND (SP)**, dark gray, wet, poorly graded, fine grained, medium dense, no sheen, no odor, abundant fine to medium gravel-sized silt blebs. (ALLUVIUM)	0	95	5
			85			Total depth = 85.0 feet.			
						WELL COMPLETION DETAILS			
						Well Materials			
						+2.5 to 64.5 feet: 6-inch-diameter, flush-threaded, mild steel riser pipe. Expands to 8-inch diameter at ground surface and terminates in a 14-inch diameter flange.			
						64.5 to 79.5 feet: 6-inch-diameter, flush-threaded, continuous wire-wrapped stainless steel screen with 0.02-inch slots. DNAPL funnel attached at base of screen.			
			90			79.5 to 84.5 feet: 6-inch-diameter stainless steel sump.			
						Annular Materials			
						0 to 5.0 feet: Concrete.			
						5.0 to 60.0 feet: Bentonite grout with 10% organoclay by dry volume.			
						60.0 to 62.5 feet: 20-40 Colorado silica sand.			
						62.5 to 79.5 feet: 16-30 Colorado silica sand.			
			95			79.5 to 85.0 feet: Bentonite grout with 10% organoclay by dry volume.			
			100						

REMARKS

1.) AK = Air Knife. 2.) SS = 2.5-inch x 2 ft.-diameter split spoon. 3.) SS2 = 2.0-inch x 1.5 ft. split-spoon.

ANCHOR QEA

LOG OF EXPLORATORY BORING

PROJECT NAME	**Gasco - GW Source Control**	BORING NO.	**PW-2L**
LOCATION	**Portland, Oregon**	PAGE	**1 of 8**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**34.6 ft COP**
DRILL METHOD	**Rotosonic - SDC 390-14**	TOTAL DEPTH	**147.0 ft.**
LOGGED BY	**Matt Wilson**	DATE COMPLETED	**2/6/13**
SAMPLING METHOD	**See Remarks**	PERMIT/STARTCARD NO.	**1018904**
BOREHOLE DIAMETER	**17.5-in (0-40 ft)/10-in (40-147 ft)**	WATER RESOURCES WELL ID	**L110745**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
NA	NA	5			**0 to 10.3 feet: NO RECOVERY**; interval was air-knifed to clear for utilities.			
CB	3.0/5.0	10			**10.3 to 29.7 feet: SAND (SW)**, black, medium dense, dry, well graded, medium grained to coarse grained sand, trace fine to coarse angular gravel, moderate to strong hydrocarbon-like odor, sticky, tar in matrix from 10.3 to 16.0 feet, heavy rainbow sheen via sheen test. (FILL)	5	95	0
CB	5.0/5.0	15			@ 15.0 to 16.0 feet: slight hydrocarbon-like odor. @ 16.0 feet: trace spotty sheen via sheen test. @ 16.0 to 20.0 feet: color change to dark gray, trace to no hydrocarbon-like odor. @ 18.0 to 20.0 feet: no sheen via sheen test.			
		20						

REMARKS

COP = City of Portland Datum. Variegated = black, gray, white, red, tan, green, and clear. Sampling method: 1.5-in. by 5 ft. core barrel (0-80 ft.); 6-in. by 10-ft. core barrel (80-147 ft.) (CB).

ANCHOR QEA

LOG OF EXPLORATORY BORING

PROJECT NAME	**Gasco - GW Source Control**	BORING NO.	**PW-2L**
LOCATION	**Portland, Oregon**	PAGE	**2 of 8**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**34.6 ft COP**
DRILL METHOD	**Rotosonic - SDC 390-14**	TOTAL DEPTH	**147.0 ft.**
LOGGED BY	**Matt Wilson**	DATE COMPLETED	**2/6/13**
SAMPLING METHOD	**See Remarks**	PERMIT/STARTCARD NO.	**1018904**
BOREHOLE DIAMETER	**17.5-in (0-40 ft)/10-in (40-147 ft)**	WATER RESOURCES WELL ID	**L110745**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
CB	7.4/8.0				**10.3 to 29.7 feet: SAND (SW)**, continued.	10-15	85-95	0
		25			@ 25.0 feet: wet, trace gravel.	5	95	0
CB	5.7/7.0				@ 28.0 to 29.7 feet: very wet, very loose, abundant, spotty sheen, moderate hydrocarbon-like odor, some oily blebs visible in standing water, but not saturated with oil.			
		30			**29.7 to 32.9 feet: SILTY SAND WITH GRAVEL (SM)**, dark brown, loose, very soft, wet, soupy, abundant spotty sheen, moderate hydrocarbon-like odor, trace oil, sample is very disturbed, fell out of core barrel. (FILL)	10	50	40
					32.9 to 35.0 feet: SILT WITH SAND (MH), dark grayish brown, soft, moist, high plasticity, trace fine and coarse sand, trace fine gravel, oily in intermittent sandy zones, sandy and silty zones are intermixed and not stratified. (FILL)	5	25	70
CB	5.0/5.0	35			**35.0 to 37.7 feet: SAND (SP)**, dark grayish brown, very loose, wet, poorly graded, fine grained, spotty sheen visible on sample, moderate hydrocarbon-like odor. (ALLUVIUM)	0	100	0
					@ 30.0 to 36.6 feet: spotty sheen.			
					37.7 to 38.6 feet: SILT (MH), dark grayish brown, soft, grades from silty sand to sandy silt to silt, medium to high plasticity, trace fine sand, slight hydrocarbon-like odor, no sheen. (ALLUVIUM)	0	0-5	95-100
						0	60	40
		40			**38.6 to 41.2 feet: SILTY SAND (SM)**, as on following page.	0	20	80

REMARKS

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ANCHOR QEA

LOG OF EXPLORATORY BORING

PROJECT NAME	**Gasco - GW Source Control**	BORING NO.	**PW-2L**
LOCATION	**Portland, Oregon**	PAGE	**3 of 8**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**34.6 ft COP**
DRILL METHOD	**Rotosonic - SDC 390-14**	TOTAL DEPTH	**147.0 ft.**
LOGGED BY	**Matt Wilson**	DATE COMPLETED	**2/6/13**
SAMPLING METHOD	**See Remarks**	PERMIT/STARTCARD NO.	**1018904**
BOREHOLE DIAMETER	**17.5-in (0-40 ft)/10-in (40-147 ft)**	WATER RESOURCES WELL ID	**L110745**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
CB	5.0/5.0				**38.6 to 41.2 feet: SILTY SAND (SM)**, dark brownish gray, wet, fine sand, slight hydrocarbon-like odor, no sheen. (ALLUVIUM) @ 39.4 to 39.9 feet: sandy silt layer.	0	70	30
					41.2 to 42.0 feet: SILT (MH), dark grayish brown, moist, soft, highly plastic, no sheen, trace hydrocarbon-like odor. (ALLUVIUM)	0	0	100
					42.0 to 42.6 feet: SANDY SILT (MH), dark grayish brown, soft, wet, medium plasticity.	0	40	60
					42.6 to 46.1 feet: SAND (SP), dark grayish brown, wet, loose, poorly graded fine sand, no sheen , trace hydrocarbon-like odor, rust colored banding at 42.9 to 43.2 feet. (ALLUVIUM) @ 46.1 feet: grades to silty sand, increasing silt content with depth.	0	100	0
CB	5.0/5.0	45			**46.1 to 48.2 feet: SILTY SAND (SM)**, silt content increasing with depth. @ 48.1 to 48.2 feet: silt layer with rust red laminations.	0 0	80 70	20 30
					48.2 to 49.4 feet: SAND (SP), dark gray, medium dense, wet, fine grained, poorly graded sand, no sheen, no discernible odor, intermittent thin silt layers. (ALLUVIUM) @ 48.4 to 48.5 feet: silt layer. @ 49.1 to 49.2 feet: silt layer.	0	100	0
CB	3.4/5.0	50			**49.4 to 51.0 feet: SILT (MH)**, dark grayish brown, soft, moist, highly plastic, no discernible odor, no sheen. (ALLUVIUM)	0	55	45
					51.0 to 52.8 feet: SILTY SAND (SM), dark brownish gray, wet, soft, no sheen, no discernible odor.			
					52.8 to 53.2 feet: SILT LAYER (ML)			
					53.2 to 66.0 feet: SAND (SP), dark gray, loose, wet, poorly graded, fine grained. (ALLUVIUM) @ 55.6 to 55.8 feet: silt layer. @ 57.2 to 57.3 feet: silt layer.	0	100	0
CB	2.7/5.0	55						
		60						

REMARKS

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ANCHOR QEA

LOG OF EXPLORATORY BORING

PROJECT NAME	**Gasco - GW Source Control**	BORING NO.	**PW-2L**
LOCATION	**Portland, Oregon**	PAGE	**4 of 8**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**34.6 ft COP**
DRILL METHOD	**Rotosonic - SDC 390-14**	TOTAL DEPTH	**147.0 ft.**
LOGGED BY	**Matt Wilson**	DATE COMPLETED	**2/6/13**
SAMPLING METHOD	**See Remarks**	PERMIT/STARTCARD NO.	**1018904**
BOREHOLE DIAMETER	**17.5-in (0-40 ft)/10-in (40-147 ft)**	WATER RESOURCES WELL ID	**L110745**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
CB	5.0/5.0				**53.2 to 66.0 feet: SAND (SP)**, continued.	0	95-100	0-5
					@ 63.5 to 63.6 feet: silt layer. @ 63.7 to 63.8 feet: silt layer.			
CB	5.0/5.0	65			@ 65.3 to 66.0 feet: trace spotty sheen slight hydrocarbon-like odor.			
					66.0 to 68.5 feet: SAND WITH SILT (SP-SM), increasing silt content with depth. (ALLUVIUM) @ 66.0 to 68.5 feet: grades to sandy silt.	0	85-90	10-15
					68.5 to 69.0 feet: SANDY SILT (ML), low plasticity.	0	20	80
CB	5.0/5.0	70			**69.0 to 73.7 feet: SAND (SP)**, dark brownish gray, medium dense, moist, poorly graded, fine grained. (ALLUVIUM) @ 69.4 feet: 0.05-foot-thick silt layer. @ 72.7 to 72.8 feet: silt laminations. @ 73.1 feet: 0.05-foot silt layer.	0	100	0
					73.7 to 75.1 feet: SANDY SILT (MH), dark grayish brown, moist, firm, medium plasticity, trace hydrocarbon-like odor, no sheen. (ALLUVIUM)	0 0	30 0	70 100
CB	3.5/5.0	75			@ 74.3 to 75.1 feet: no sand - SILT.	0	100	0
					75.1 to 76.1 feet: SAND (SP), dark grayish brown, medium dense, wet, poorly graded fine sand, no sheen, no discernible odor. (ALLUVIUM)	0	30	70
					76.1 to 78.1 feet: SANDY SILT (MH), dark grayish brown, firm, moist, medium plasticity, increasing silt content with depth, no sheen, no discernible odor. (ALLUVIUM)			
					78.1 to 84.6 feet: SAND (SP), dark brownish gray, medium dense, wet, poorly graded, fine grained, no sheen, no discernible odor. (ALLUVIUM) @ 78.3 to 78.4 feet: layer of decayed wood & plant debris.	0	100	0
		80						

REMARKS

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ANCHOR QEA

LOG OF EXPLORATORY BORING

PROJECT NAME	**Gasco - GW Source Control**	BORING NO.	**PW-2L**
LOCATION	**Portland, Oregon**	PAGE	**5 of 8**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**34.6 ft COP**
DRILL METHOD	**Rotosonic - SDC 390-14**	TOTAL DEPTH	**147.0 ft.**
LOGGED BY	**Matt Wilson**	DATE COMPLETED	**2/6/13**
SAMPLING METHOD	**See Remarks**	PERMIT/STARTCARD NO.	**1018904**
BOREHOLE DIAMETER	**17.5-in (0-40 ft)/10-in (40-147 ft)**	WATER RESOURCES WELL ID	**L110745**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
CB	10.0/10.0				**78.1 to 84.6 feet: SAND (SP)**, continued. @ 78.4 to 78.6 feet: silt layer. @ 79.4 to 79.6 feet: silt layer. @ 80.0 to 84.6 feet: fine to medium grained, majority fine grained, variegated sand grain colors, trace fines. @ 80.0 to 81.3 feet: very strong hydrocarbon-like odor, abundant spotty sheen, abundant cobble-sized silt blebs. @ 81.3 to 82.3 feet: trace spotty sheen. @ 82.3 to 84.6 feet: saturated with clear brown oil, very strong hydrocarbon-like odor, increasing in saturation with depth.	0	95	5
		85			**84.6 to 86.6 feet: SILT (MH)**, dark grayish brown, moist, highly plastic, strong hydrocarbon-like odor, trace shell fragments, no sheen. (ALLUVIUM)	0	0	100
					86.6 to 101.6 feet: SAND (SP), dark gray with variegated sand grain colors, wet, loose, poorly graded, slight hydrocarbon-like odor, some gravel sized silt blebs, trace fines, majority fine sand. (ALLUVIUM) @ 88.2 to 88.8 feet: silt layer. @ 88.8 to 90.0 feet: trace dirty sock odor.	0	95	5
CB	10.0/10.0	90			@ 90.0 to 92.5 feet: spotty sheen, moderate hydrocarbon-like odor.			
					@ 92.5 to 93.8 feet: silt layer with some fine to medium sand pockets.			
					@ 93.8 to 99.1 feet: soil type change to sand with silt.			
		95				0	85-90	10-15
					@ 96.3 to 99.1 feet: abundant silt blebs, trace dirty sock odor.			
					@ 99.1 to 100.0 feet: silt layer, low to medium plasticity.			
		100						

REMARKS

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ANCHOR QEA

LOG OF EXPLORATORY BORING

PROJECT NAME	**Gasco - GW Source Control**	BORING NO.	**PW-2L**
LOCATION	**Portland, Oregon**	PAGE	**6 of 8**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**34.6 ft COP**
DRILL METHOD	**Rotosonic - SDC 390-14**	TOTAL DEPTH	**147.0 ft.**
LOGGED BY	**Matt Wilson**	DATE COMPLETED	**2/6/13**
SAMPLING METHOD	**See Remarks**	PERMIT/STARTCARD NO.	**1018904**
BOREHOLE DIAMETER	**17.5-in (0-40 ft)/10-in (40-147 ft)**	WATER RESOURCES WELL ID	**L110745**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
CB	10.0/10.0				**86.6 to 101.6 feet: SAND (SP)**, continued. @ 100.0 feet: sand with silt as previous page, majority fine grained, variegated sand grains, abundant silt blebs.	0	85-90	0-15
					101.6 to 103.0 feet: SILT (ML), low to medium plasticity, some sand pockets. (ALLUVIUM) @ 102.5 feet: 1-inch-thick light gray layer (volcanic ash?).	0	0	100
		105			**103.0 to 113.4 feet: SAND (SP)**, dark gray, very loose, wet, fine to medium grained, majority medium grained, poorly graded, some silt blebs, no sheen, trace dirty sock odor, trace fines, silt blebs range from coarse gravel to cobble sized. (ALLUVIUM) @ 106.0 to 113.4 feet: abundant silt blebs, fine gravel to cobble size, 25 to 35 percent of sample.	0	95	5
CB	4.5/5.0	110			@ 109.6 to 110.0 feet: silt layer or very large silt bleb. @ 111.4 to 112.0 feet: heavy sheen on sample, strong hydrocarbon-like odor. @ 112.0 to 113.4 feet: saturated with brown oil, very strong hydrocarbon-like odor.			
					113.4 to 115.0 feet: SILT (ML), dark grayish brown, low to medium plasticity, firm, slight hydrocarbon-like odor.			
CB	6.0/5.0	115			**115.0 to 117.3 feet: SAND WITH SILT (SP-SM)**, dark brownish gray, loose, wet, poorly graded, fine grained. (ALLUVIUM) @ 116.1 to 117.3 feet: spotty rainbow sheen, strong hydrocarbon-like odor. @ 116.7 to 117.3 feet: saturated with brown oil.	0	80-85	15-20
					117.3 to 118.9 feet: SILT (ML), dark grayish brown, firm, moist, low to medium plasticity, trace hydrocarbon-like odor.			
		120			**118.9 to 120.0 feet: SAND (SP)**, dark gray, loose, moist, variegated sand grain colors, poorly graded, fine to medium			

REMARKS

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ANCHOR QEA

LOG OF EXPLORATORY BORING

PROJECT NAME	**Gasco - GW Source Control**	BORING NO.	**PW-2L**
LOCATION	**Portland, Oregon**	PAGE	**7 of 8**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**34.6 ft COP**
DRILL METHOD	**Rotosonic - SDC 390-14**	TOTAL DEPTH	**147.0 ft.**
LOGGED BY	**Matt Wilson**	DATE COMPLETED	**2/6/13**
SAMPLING METHOD	**See Remarks**	PERMIT/STARTCARD NO.	**1018904**
BOREHOLE DIAMETER	**17.5-in (0-40 ft)/10-in (40-147 ft)**	WATER RESOURCES WELL ID	**L110745**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
CB	5.0/5.0				grained, majority medium grained, trace spotty sheen, mild hydrocarbon-like odor.	0	95	5
					120.0 to 126.7 feet: SAND (SP), poorly graded sand, dark gray, wet, medium dense, fine to medium grained, majority fine grained, compacted. (ALLUVIUM) @ 120.0 to 121.0 feet: saturated with oil and sheen, strong hydrocarbon odor. @ 121.0 to 122.3 feet: spotty sheen, moderate hydrocarbon-odor, trace fines. @ 122.3 to 126.7 feet: trace spotty sheen, moderate hydrocarbon-like odor.			
CB	5.0/5.0	125			@ 125.5 to 125.8 feet: oily, sheen visible on sample. @ 126.4 to 126.7 feet: oily, sheen visible on sample.	0	95	5
					126.7 to 145.0 feet: SAND (SP), dark gray, loose, moist, poorly graded, fine to medium sand, majority medium grained, moderate hydrocarbon-like odor, trace fines. (ALLUVIUM) @ 129.0 to 129.2 feet: oily.			
CB	5.6/5.0	130			@ 130.0 to 135.0 feet: clean sand, little to no fines, mostly medium grained, small fraction fine grained sand. @ 130.7 to 130.8 feet: spotty sheen, moderate hydrocarbon-like odor. @ 131.4 to 131.6 feet: sheen, moderate hydrocarbon-like odor, trace oil. @ 132.7 to 134.4 feet: spotty sheen, moderate hydrocarbon-like odor.	0	100	0
CB	6.0/5.0	135			@ 134.4 to 137.5 feet: oily, heavy sheen, strong hydrocarbon-like odor. @ 135.0 to 140.0 feet: strong hydrocarbon-like odor. @ 137.5 to 140.0 feet: rainbow sheen when wetted, patches of brown oil. @ 139.5 feet: becoming siltier, patches of silty sand and silt blebs.	0	95	5
		140						

REMARKS

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ANCHOR QEA

LOG OF EXPLORATORY BORING

PROJECT NAME	**Gasco - GW Source Control**	BORING NO.	**PW-2L**
LOCATION	**Portland, Oregon**	PAGE	**8 of 8**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**34.6 ft COP**
DRILL METHOD	**Rotosonic - SDC 390-14**	TOTAL DEPTH	**147.0 ft.**
LOGGED BY	**Matt Wilson**	DATE COMPLETED	**2/6/13**
SAMPLING METHOD	**See Remarks**	PERMIT/STARTCARD NO.	**1018904**
BOREHOLE DIAMETER	**17.5-in (0-40 ft)/10-in (40-147 ft)**	WATER RESOURCES WELL ID	**L110745**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
CB	5.4/5.0	145			**126.7 to 145.0 feet: SAND (SP)**, continued. @ 140.0 to 145.0 feet: trace spotty sheen throughout. @ 141.0 to 143.5 feet: abundant coarse gravel to cobble sized silt blebs. @ 141.5 to 142.0 feet: moderate amounts of spotty rainbow sheen. @ 144.5 to 145.0 feet: moderate rainbow sheen, trace oil.	0	95	5
NA	NA				Boring advanced from 145.0 to 147.0 feet without sampling.			
		150			Total depth: 147.0 feet. **WELL COMPLETION DETAILS** +2.6 to 120.1 feet: 6-inch-diameter, flush-threaded, mild steel blank riser pipe. Riser pipe expands to 8-inch diameter at ground surface and terminates in a 14-inch diameter flange. 120.1 to 140.1 feet: 6-inch-diameter, flush-threaded, continuous wire-wrapped stainless steel screen with 0.035-inch slots. Rubber NAPL funnel attached at base of screen. 140.1 to 145.1 feet: 6-inch-diameter stainless steel sump. 0 to 4.0 feet: Concrete. 4.0 to 115.0 feet: Bentonite grout with 10% organoclay by dry volume. 115.0 to 117.8 feet: 20-40 Colorado silica sand. 117.8 to 140.1 feet: 10-20 Colorado silica sand. 140.1 to 147.0 feet: Bentonite.			
		155						
		160						

REMARKS

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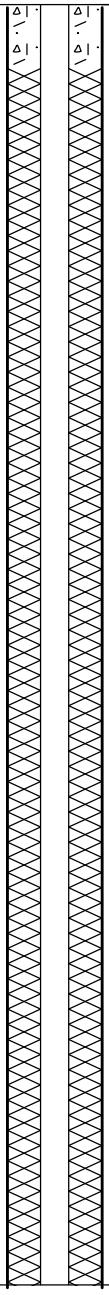
ANCHOR QEA

LOG OF EXPLORATORY BORING

PROJECT NAME	**NW Natural Gasco Site**	BORING NO.	**PW-2U**
LOCATION	**Portland, Oregon**	PAGE	**1 of 5**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**34.5 ft COP**
DRILL METHOD	**Rotosonic**	TOTAL DEPTH	**80.0 ft.**
LOGGED BY	**Matt Wilson**	DATE COMPLETED	**4/25/12**
SAMPLING METHOD	**1.5-in. ID by 5-ft. core barrel (CB)**	PERMIT/STARTCARD NO.	**1016221**
BOREHOLE DIAMETER	**12-in (0-40 ft)/10-in (40-79 ft)**	WATER RESOURCES WELL ID	**L104884**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
		5			See boring log PW-2L for lithologic description.			
		10						
		15						
		20						

REMARKS

COP = City of Portland Datum.

ANCHOR QEA

LOG OF EXPLORATORY BORING

PROJECT NAME	**NW Natural Gasco Site**	BORING NO.	**PW-2U**
LOCATION	**Portland, Oregon**	PAGE	**2 of 5**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**34.5 ft COP**
DRILL METHOD	**Rotosonic**	TOTAL DEPTH	**80.0 ft.**
LOGGED BY	**Matt Wilson**	DATE COMPLETED	**4/25/12**
SAMPLING METHOD	**1.5-in. ID by 5-ft. core barrel (CB)**	PERMIT/STARTCARD NO.	**1016221**
BOREHOLE DIAMETER	**12-in (0-40 ft)/10-in (40-79 ft)**	WATER RESOURCES WELL ID	**L104884**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
		25 30 35 40			See boring log PW-2L for lithologic description.			

REMARKS
COP = City of Portland Datum.

ANCHOR QEA

LOG OF EXPLORATORY BORING

PROJECT NAME	**NW Natural Gasco Site**	BORING NO.	**PW-2U**
LOCATION	**Portland, Oregon**	PAGE	**3 of 5**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**34.5 ft COP**
DRILL METHOD	**Rotosonic**	TOTAL DEPTH	**80.0 ft.**
LOGGED BY	**Matt Wilson**	DATE COMPLETED	**4/25/12**
SAMPLING METHOD	**1.5-in. ID by 5-ft. core barrel (CB)**	PERMIT/STARTCARD NO.	**1016221**
BOREHOLE DIAMETER	**12-in (0-40 ft)/10-in (40-79 ft)**	WATER RESOURCES WELL ID	**L104884**

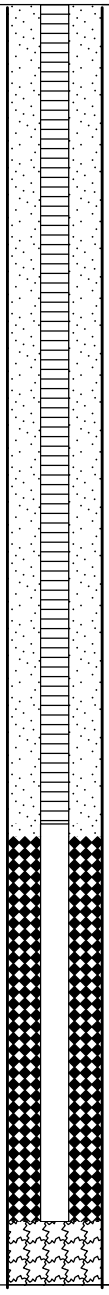
SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
		45			See boring log PW-2L for lithologic description.			
		50						
		55						
		60						

REMARKS
COP = City of Portland Datum.

ANCHOR QEA

LOG OF EXPLORATORY BORING

PROJECT NAME	**NW Natural Gasco Site**	BORING NO.	**PW-2U**
LOCATION	**Portland, Oregon**	PAGE	**4 of 5**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**34.5 ft COP**
DRILL METHOD	**Rotosonic**	TOTAL DEPTH	**80.0 ft.**
LOGGED BY	**Matt Wilson**	DATE COMPLETED	**4/25/12**
SAMPLING METHOD	**1.5-in. ID by 5-ft. core barrel (CB)**	PERMIT/STARTCARD NO.	**1016221**
BOREHOLE DIAMETER	**12-in (0-40 ft)/10-in (40-79 ft)**	WATER RESOURCES WELL ID	**L104884**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
		65			See boring log PW-2L for lithologic description.			
		70						
		75						
		80			Total depth = 80.0 feet.			

REMARKS

COP = City of Portland Datum.

ANCHOR QEA

LOG OF EXPLORATORY BORING

PROJECT NAME	**NW Natural Gasco Site**	BORING NO.	**PW-2U**
LOCATION	**Portland, Oregon**	PAGE	**5 of 5**
DRILLED BY	**Cascade Drilling, Inc.**	GROUND SURFACE ELEVATION	**34.5 ft COP**
DRILL METHOD	**Rotosonic**	TOTAL DEPTH	**80.0 ft.**
LOGGED BY	**Matt Wilson**	DATE COMPLETED	**4/25/12**
SAMPLING METHOD	**1.5-in. ID by 5-ft. core barrel (CB)**	PERMIT/STARTCARD NO.	**1016221**
BOREHOLE DIAMETER	**12-in (0-40 ft)/10-in (40-79 ft)**	WATER RESOURCES WELL ID	**L104884**

SAMPLING METHOD	RECOVERY (FEET)	DEPTH IN FEET	WELL DETAILS	LITHO-LOGIC COLUMN	LITHOLOGIC DESCRIPTION	GRA %	SAND %	FINES %
		85			**WELL COMPLETION DETAILS** +2.3 to 57.8 feet: 6-inch-diameter, flush-threaded, mild steel blank riser pipe. Riser pipe expands to 8-inch diameter at ground surface and terminates in a 14-inch diameter flange. 57.8 to 72.8 feet: 6-inch-diameter, flush-threaded, continuous wire-wrapped stainless steel screen with 0.020-inch slots. Rubber NAPL funnel attached at base of screen. 72.8 to 77.8 feet: 6-inch-diameter stainless steel sump. 0 to 1.0 foot: Concrete. 1.0 to 54.0 feet: Bentonite grout with 10% organoclay by volume. 54.0 to 56.0 feet: Bentonite. 56.0 to 73.0 feet: 16-30 Colorado silica sand. 73.0 to 79.0 feet: Bentonite. 79.0 to 80.0 feet: Native.			
		90						
		95						
		100						

REMARKS
COP = City of Portland Datum.

ANCHOR QEA

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

PROJECT:
Northwest Natural - Gasco Facility
Gas Pipeline Excavation Pre-Drill
Portland, Oregon
PROJECT: 2708

PUSH PROBE NUMBER P-Y

		DRILL START	DRILL FINISH
HAI LOGGER:	Rob Ede		
SAMPLING METHOD:	Macrocore-Grab		
DRILLING METHOD:	Direct Push-GeoProbe	Time:	Time:
EQUIPMENT TYPE	6,600	1148	1152
DRILLER:	Marcus Johnson	Date:	Date:
DRILLING CONTRACTOR:	Boart Longyear	4-May-07	4-May-07

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

BORING ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	DNAPL Screen Results	CORE INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
										Ground surface
3/4-inch bentonite chips	15	11:58	6.5	-			1–5		SM	Silty SAND with gravel, tan and gray, dry, no odor, no sheen, no discoloration to 2 feet bgs, below 2 feet bgs wood chips present sporadically, strong carbon pitch odor, black discoloration (patchy, mottled), brick fragments, pieces of plastic at 1.5 feet bgs (plastic shows positive ultraviolet fluorescence). Soil shows no ultraviolet fluorescence, no sheen. (0 to 5 feet bgs)
	16	12:00	14.9	+			6–10	▼ 7	GM	Sandy gravelly SILT, moist to wet, brick fragments, gray and black mottled, carbon pitch odor, slight sheen in wet zone at 7 feet bgs. Sample 16 shows 2 to 3 flecks of positive ultraviolet fluorescence suggesting possible NAPL presence.
							11–20			Boring terminated at 10 feet bgs

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

PROJECT:
Northwest Natural - Gasco Facility
Gas Pipeline Excavation Pre-Drill
Portland, Oregon
PROJECT: 2708

PUSH PROBE NUMBER P-Z

		DRILL START	DRILL FINISH
HAI LOGGER:	Rob Ede		
SAMPLING METHOD:	Macrocore-Grab		
DRILLING METHOD:	Direct Push-GeoProbe	Time:	Time:
EQUIPMENT TYPE	6,600	1118	1132
DRILLER:	Marcus Johnson	Date:	Date:
DRILLING CONTRACTOR:	Boart Longyear	4-May-07	4-May-07

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

BORING ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	DNAPL Screen Results	CORE INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
										Ground surface
3/4-inch bentonite chips							1		GP	Sandy GRAVEL, grey, dry, loose (0 to 2' bgs).
							2			
	11	11:24	2.2	-			3			Silty SAND with gravel, moist, grey with minor black mottling with mild petroleum odor, small flecks of ultraviolet fluorescence suggests possible NAPL or carbon pitch to 6 feet bgs.
							4		SM	
							5			
							6			
							7			Sandy SILT, grey with visual black coal-like content, becoming very moist below 6 feet bgs with patchy sheen and brown oil at 7 feet bgs becoming patchy oil presence with strong petroleum odor below, gravels (less than 0.25-inch diameter) throughout, copper wire at 8 feet bgs, positive ultraviolet fluorescence.
	12	11:31	12.6	+			8		ML	
							9			
							10			
							11			Boring terminated at 10 feet bgs
							12			
							13			
							14			
							15			
							16			
							17			
							18			
							19			
							20			

Project: Rhone Poulenc RI / FS Project Location: Portland, Oregon Project Number: 5292C0804A.00 00045	Log of Boring RP-01-31 Sheet 1 of 2

Date(s) Drilled and Installed	2/10/00	Geologist	G. Lukert	Reviewer	
Drilling Method	Air Rotary	Drilling Contractor	Cascade Drilling, Inc.	Total Depth of Borehole	31.5 feet
Sampling Method	Grab from cuttings, SPT split spoon	Hammer Data	140 lbs / 30-inch drop	Top of Casing Elevation	Not available
Size and Type of Well Casing	2-inch-dia. Schedule 40 PVC	Screen Perforation	0.010-inch slot (25-30 feet)	Approximete Surface Elevation	Not available
Seal or Backfill	Bentonite chips 2-23 feet	Groundwater Level(s)	23 feet bgs on 2/10/00 ATD; water equilibrium at 23.77 feet below TOC on 3/15/00		

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, blows / 6 in.	Recovery, inches	Headspace OVA, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
	0								Surface Conditions: crushed rock		6-inch-dia. steel protective casing Concrete (0-2 ft)
	5		01	NA	NA	0.0		ML	SILT with sand; olive (5Y 4/3), medium plasticity, ~15% sand, damp, no odor		7-3/8-in.-dia. borehole 2-in.-dia. Sch. 40 PVC riser (to 25 ft)
	10		02	NA	NA	0.0		ML	SILT; olive (5Y 4/3), medium plasticity, no sand, damp		Bentonite chips (2-23 ft)
	15		03	NA	NA	0.0			Becomes low to medium plasticity, dry		
	20		04	NA	NA	0.0					
	25		05	2-3-3	18	0.0		ML	SILT with sand; olive (5Y 4/3), medium plasticity, ~20% very fine sand, trace clay, loose, wet		20-40 silica sand (23-25 ft) Prepacked well screen, 20-40 silica sand (25-30 ft)
								SM	Silty SAND; olive (5Y 4/3), fine, low plasticity fines, loose, wet, no odor		2-in. dia. 0.010-in. slot Sch. 40 PVC screen (25-30 ft) 10-20 silica sand outside prepack (25-31.5 ft)
	30										

Report: ENV_12W_CLEVELAND+/-USCS; File: RPACRI45.GPJ; 4/5/2000 RP-01-31

URS Greiner Woodward Clyde

Project: Rhone Poulenc RI / FS
Project Location: Portland, Oregon
Project Number: 5292C0804A.00 00045

Log of Boring RP-01-31

Sheet 2 of 2

Elevation feet	Depth, feet	SAMPLES: Type Number	SAMPLES: Sampling Resistance, blows / 6 in.	SAMPLES: Recovery, inches	SAMPLES: Headspace OVA, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
	30	06	3-3-2	12	0.0		ML	Sandy SILT; olive (5Y 4/3), fine, loose, wet		Sump (30-31 ft)
							ML	SILT; olive (5Y 4/3), trace sand, loose, wet		
								Bottom of boring at 31.5 feet.		
	35									
	40									
	45									
	50									
	55									
	60									
	65									

Report: ENV_12W_[illegible]VELAND+/-USCS; File: RPACRI45.GPJ; 4/5/2000 RP-01-31

Project: Rhone Poulenc RI / FS Project Location: Portland, Oregon Project Number: 5292C0804A.00 00045	Log of Boring RP-01-51 Sheet 1 of 2

Date(s) Drilled and Installed	2/9/00	Geologist	G. Lukert	Reviewer	
Drilling Method	Air Rotary	Drilling Contractor	Cascade Drilling, Inc.	Total Depth of Borehole	51.0 feet
Sampling Method	Grab from cuttings, SPT split spoon	Hammer Data	140 lbs / 30-inch drop	Top of Casing Elevation	Not available
Size and Type of Well Casing	2-inch-dia. Schedule 40 PVC	Screen Perforation	0.010-inch slot (45-50 feet)	Approximete Surface Elevation	Not available
Seal or Backfill	Aquaguard bentonite grout 2-43 feet	Groundwater Level(s)	Not measured ATD; water equilibrium at 22.09 feet bgs on 2/10/00 at 0800		

Elevation feet	Depth, feet	SAMPLES: Type	SAMPLES: Number	Sampling Resistance, blows / 6 in.	SAMPLES: Recovery, inches	SAMPLES: Headspace OVA, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
	0								Surface Conditions: crushed rock		6-inch-dia. steel protective casing Concrete (0-2 ft)
	5		01	NA	NA	0.0		ML	Sandy SILT; olive (5Y 4/3), with angular gravel (crushed rock), damp, no odor [FILL]		7-3/8-in.-dia. borehole
	10		02	NA	NA	0.0		ML	SILT; olive brown (5Y 4/4), medium plasticity, trace sand, slightly micaceous, damp to moist, no odor		2-in.-dia. Sch. 40 PVC riser (to 45 ft) Aquaguard bentonite grout (2-43 ft)
	15		03	NA	NA	0.0			Becomes olive (5Y 4/3), damp, no sand		
	20							SP-SM	SAND with silt; medium, trace clay		
	25										
	30										

Report: ENV_12W_CLEVELAND+/-USCS; File: RPACRI45.GPJ; 4/5/2000 RP-01-51

URS Greiner Woodward Clyde

Project: Rhone Poulenc RI / FS
Project Location: Portland, Oregon
Project Number: 5292C0804A.00 00045

Log of Boring RP-01-51

Sheet 2 of 2

Elevation feet	Depth, feet	SAMPLES Type Number	Sampling Resistance, blows / 6 in.	Recovery, inches	Headspace OVA, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
	30						CH/MH	Silty CLAY to clayey SILT; high plasticity, trace sand		7-3/8-in.-dia. borehole
	35									2-in.-dia. Sch. 40 PVC riser (to 45 ft)
		04	2-2-3	18	0.0		SM	Silty SAND; gray, fine, loose, wet		Aquaguard bentonite grout (2-43 ft)
	40									
							SP-SM	SAND with silt; dark grayish brown (10YR 4/2), fine, low plasticity fines, micaceous, loose, wet, no odor		20-40 silica sand (43-45 ft)
	45	05	1-2-2	18	0.0					Prepacked well screen, 20-40 silica sand (45-50 ft)
										2-in. dia. 0.010-in. slot Sch. 40 PVC screen (45-50 ft)
	50									10-20 silica sand outside prepack (45-51 ft)
								BASALT		Sump (50-51 ft)
								Bottom of boring at 51.0 feet.		
	55									
	60									
	65									

Report: ENV_12W_ _VELAND+/-USCS; File: RPACRI45.GPJ; 4/5/2000 RP-01-51

Project: Rhone Poulenc RI / FS Project Location: Portland, Oregon Project Number: 5292C0804A.00 00045	Log of Boring RP-01-65 Sheet 1 of 3

Date(s) Drilled and Installed	2/8/00	Geologist	G. Lukert	Reviewer	
Drilling Method	Air Rotary	Drilling Contractor	Cascade Drilling, Inc.	Total Depth of Borehole	66.0 feet
Sampling Method	Grab from cuttings, SPT split spoon, piston-driven split spoon	Hammer Data	140 lbs / 30-inch drop	Top of Casing Elevation	Not available
Size and Type of Well Casing	7-3/8-inch-dia. steel casing to 52 feet; 2-inch-dia. Schedule 40 PVC	Screen Perforation	0.010-inch slot (59-64 feet)	Approximete Surface Elevation	Not available
Seal or Backfill	Aquaguard bentonite grout 2-53 feet, bentonite chips 53-56 feet	Groundwater Level(s)	Not measured ATD; water equilibrium at 20.55 feet bgs on 2/9/00 at 0813		

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, blows / 6 in.	Recovery, inches	Headspace OVA, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
	0								Surface Conditions: crushed rock		6-inch-dia. steel protective casing Concrete (0-2 ft)
	5		01	NA	NA	0.0		ML	Sandy SILT; olive (5Y 4/3), with angular gravel (crushed rock), moist, no odor [FILL]		9-5/8-in.-dia. steel outer casing (to 51 ft) 7-3/8-in.-dia. steel inner casing (to 52 ft)
	10		02	NA	NA	0.0		ML/CL	Clayey SILT; brown (10YR 4/3), medium plasticity, trace fine sand, moist		2-in.-dia. Sch. 40 PVC riser (to 59 ft)
	15		03	NA	NA	0.0		ML	Sandy SILT; brown (10YR 4/3), medium plasticity, trace clay, moist		Aquaguard bentonite grout (2-53 ft) Centralizers at 20-ft spacing to top of screen
	20							SM	Silty SAND; brown (10YR 4/3), fine, low to medium plasticity fines, wet [no sample collected; material same as at 25 feet]		
	25		04	NA	NA	0.0					
	30										

Report: ENV_12W_...VELAND+/-USCS; File: RPACRI45.GPJ; 4/5/2000 RP-01-65

URS Greiner Woodward Clyde

Project: Rhone Poulenc RI / FS
Project Location: Portland, Oregon
Project Number: 5292C0804A.00 00045

Log of Boring RP-01-65

Elevation feet	Depth, feet	SAMPLES: Type Number	Sampling Resistance, blows / 6 in.	Recovery, inches	Headspace OVA, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
	30	05	NA	NA	0.0		ML/CL	SILT with clay; olive gray (5Y 4/2), medium plasticity, trace sand		9-5/8-in.-dia. steel outer casing (to 51 ft)
	35	06	NA	NA	0.0		SC	Clayey SAND; olive gray (5Y 4/2), medium, trace silt		7-3/8-in.-dia. steel inner casing (to 52 ft)
	40	07	NA	NA	0.0		ML	SILT with sand and clay; olive gray (5Y 4/2), medium plasticity, ~15% sand, ~15% clay		2-in.-dia. Sch. 40 PVC riser (to 59 ft)
		08	NA	NA	0.0					Aquaguard bentonite grout (2-53 ft)
	45	09	1-4-4	18	0.0		ML	SILT with sand; olive gray (5Y 4/2), medium plasticity, loose		
								Fine sand		
	50	10	NA	NA	NA			Increasing sand		
								BASALT, slightly weathered, red-orange iron oxide staining, very little fracturing, all angular		
								Small, irregular fractures (indicated by drilling); black and red-stained fragments		Bentonite chips (53-56 ft)
	55									6-inch-dia. borehole below 52 ft
										10-20 silica sand (56-66 ft)
								Highly fractured (possibly interbedded)		Centralizer at top of screen
	60							Fractured		2-in. dia. 0.010-in. slot Sch. 40 PVC screen (59-64 ft)
	65									Sump (65-66 ft)

Report: ENV_12W_CLEVELAND+/-USCS; File: RPACRI45.GPJ; 4/5/2000 RP-01-65

Project: Rhone Poulenc RI / FS
Project Location: Portland, Oregon
Project Number: 5292C0804A.00 00045

Log of Boring RP-01-65

Sheet 3 of 3

Elevation feet / Depth, feet	SAMPLES: Type Number	SAMPLES: Sampling Resistance, blows / 6 in.	SAMPLES: Recovery, inches	SAMPLES: Headspace OVA, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
65							BASALT, black with red iron oxide staining, slightly weathered, fractured (continued)		10-20 silica sand (56-66 ft)
							Bottom of boring at 66.0 feet.		
70									
75									
80									
85									
90									
95									
100									

Report: ENV_12W:_ELAND+/-USCS; File: RPACRI45.GPJ; 4/5/2000 RP-01-65

URS Greiner Woodward Clyde

(Abandoned)

Project: Rhone Poulenc RI / FS
Project Location: Portland, Oregon
Project Number: 5292C0804A.00 00045

Log of Boring RP-03-26

Sheet 1 of 1

Date(s) Drilled and Installed	2/17/00	Geologist	G. Lukert	Reviewer	
Drilling Method	Air Rotary	Drilling Contractor	Cascade Drilling, Inc.	Total Depth of Borehole	26.5 feet
Sampling Method	Grab from cuttings, SPT split spoon	Hammer Data	140 lbs / 30-inch drop	Top of Casing Elevation	Not available
Size and Type of Well Casing	2-inch-dia. Schedule 40 PVC	Screen Perforation	0.010-inch slot (20-25 feet)	Approximate Surface Elevation	Not available
Seal or Backfill	Bentonite chips 2-18 feet	Groundwater Level(s)	13.5 feet bgs on 2/17/00 ATD; water equilibrium at 20.9 feet bgs on 2/17/99 at 1510		

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, blows / 6 in.	Recovery, inches	Headspace OVA, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
	0								Surface Conditions: gravel		6-inch-dia. steel protective casing; Concrete (0-2 ft)
	5		01	NA	NA	0.0		ML	SILT; dark brown (10YR 3/3), medium plasticity, 10% sand, organic debris (wood), damp		7-3/8-in.-dia. borehole
	10		02	NA	NA	0.0		SP-SM	SAND with silt and gravel; very dark brown (10YR 2/2), ~20% rounded gravel to 3 cm diameter, ~10% silt, damp		2-in.-dia. Sch. 40 PVC riser (to 20 ft)
								SP	SAND; very dark brown (10YR 2/2), medium, loose, wet		Bentonite chips (2-18 ft)
	15		03	2-4-3	18	0.0		ML	Sandy SILT; very dark brown (10YR 2/2), fine sand, loose, saturated		20-40 silica sand (18-20 ft)
	20		04	4-3-4	18	160.		ML	Sandy SILT; dark olive gray (5Y 3/2), medium plasticity, fine sand, loose, moist to wet, organic odor (creosote?)		Prepacked well screen, 20-40 silica sand (20-25 ft)
								SM/ML	Silty SAND to sandy SILT; dark olive gray (5Y 3/2), ~50% fine sand, ~50% medium plasticity silt, loose, odor (small NAPL blebs observed on bottom of drill stem)		2-in. dia. 0.010-in. slot Sch. 40 PVC screen (20-25 ft)
	25		05	3-3-2	18	180			Sand grades medium; saturated, odor, visible rainbow sheen		10-20 silica sand outside prepack (20-26.5 ft)
								ML	SILT; dark olive gray (5Y 3/2), loose, saturated		Sump (25-26 ft)
									Bottom of boring at 26.5 feet.		
	30										

Report: ENV_12W_...WELAN11.rpt (USCS); File: RPACR145.GPJ; 4/5/2000 RP-03-26

URS Greiner Woodward Clyde

LOG OF BORING NO. RP-03-30R

PROJECT: RPAC RI/FS
PROJECT NO: 52-92C0804A
PROJECT LOCATION: Portland, Oregon
CLIENT NAME: Rhone-Poulenc
DATE STARTED: September 13, 2000
DATE COMPLETED: September 13, 2000
DRILLING CONTRACTOR: Cascade
DRILLER: Jason, Jose, Charles
DRILLING METHOD: Air Rotary with Casing Hammer
SAMPLING METHOD: 2" Diameter, 3' Long Split Spoon

WATER LEVEL: ▼ 24.00 ft

TOTAL DEPTH : 30.00 ft
WEATHER: Clear
FIELD ENGINEER: Don Coberly
CHECKED BY: Chris Moody

SAMPLE TYPE KEY:
- Relatively undisturbed sample
- Disturbed sample
- Sample attempt with no recovery
- SPT split spoon sample
- B Bag Sample

SAMPLER DRIVEN (in)	FINES CONTENT (%)	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	BLOWS PER FOOT	SAMPLE TYPE	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
										CLEARED BRUSH ON SILTY GRAVEL FILL.	
							0	SP/ SM		**DARK BROWN TO BROWN SAND**, VF-M, trace fines, no stain or odor, loose, [slightly damp].	Logged Off Cuttings
							5				
							10				
							15				
							20	SM/ SC		**DARK GREY SILTY TO CLAYEY SAND**,creosote odor, [damp]. *PID on cuttings 0-0.4, BZ=0-0.1* *Grades to wet (adding water), strong creosote odor.*	
							▼ 25				

NOTES:

URS

LOG OF BORING RP-03-30R

LOB3 G:\1163\GINTPR-1062000\RHONEP.GPJ URSPDX1.GDT 10/10/00 port

PROJECT: RPAC RI/FS
PROJECT NO: 52-92C0804A
PROJECT LOCATION: Portland, Oregon

FIELD ENGINEER: Don Coberly
CHECKED BY: Chris Moody

SAMPLE TYPE KEY:
- Relatively undisturbed sample
- Disturbed sample
- Sample attempt with no recovery
- SPT split spoon sample
- B Bag sample

SAMPLER DRIVEN (in)	FINES CONTENT (%)	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	BLOWS PER FOOT	SAMPLE TYPE	ELEVATION(ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
							25				
24								SM/ SP		**BROWN AND GREY SILTY SAND**, very fine grained sand with some clay, dark brown stained areas, smell of creosote, [saturated].	S-1
								CL/ ML		*Grading to VFSD at 27' to 27.5'. NAPL both as LNAPL and within water.*	
							30			**BROWN AND GREY SILTY CLAY**, mottled, low toughness, moderate plasticity, [damp].	
										Borehole terminated at 30' bgs.	

NOTES:

URS

LOG OF BORING RP-03-30I

LOB3 G:\163\GINTPR-1\062000\RHONEP.GPJ URSPDX1.GDT 10/10/00 port

LOG OF BORING NO. RP-03-52R

PROJECT: RPAC RI/FS
PROJECT NO: 52-92C0804A
PROJECT LOCATION: Portland, Oregon
CLIENT NAME: Rhone-Poulenc
DATE STARTED: September 12, 2000
DATE COMPLETED: September 12, 2000
DRILLING CONTRACTOR: Cascade
DRILLER: Jason, Jose, Charles
DRILLING METHOD: Air Rotary with Casing Hammer
SAMPLING METHOD: 2" Diameter, 3' Long Split Spoon

WATER LEVEL: ▼ 24.00 ft

TOTAL DEPTH : 52.50 ft
WEATHER: Clear
FIELD ENGINEER: Don Coberly
CHECKED BY: Chris Moody

SAMPLE TYPE KEY:
- Relatively undisturbed sample
- Disturbed sample
- Sample attempt with no recovery
- SPT split spoon sample
- B Bag Sample

SAMPLER DRIVEN (in)	FINES CONTENT (%)	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	BLOWS PER FOOT	SAMPLE TYPE	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
										CLEARED BRUSH ON SILTY GRAVEL FILL.	
							0	SP		**LIGHT BROWN-BROWN SAND**, trace fines, no stain or odor, loose, [dry].	Logged Off Cuttings
							5			*Grades to black-brown, F-M grained, slighly damp with scattered granules and gravel to 1.5" diameter.*	
							10				
							15			*Grades to slightly more damp.*	
								ML/ CL		**GREY TO DARK GREY SILTY CLAY**, low toughness, slightly plastic, slight creosote odor.	
							20			*Grades to strong creosote odor, no NAPL or sheen. Driller adding trace water.*	
							▼				
							25				

NOTES:

URS

LOG OF BORING RP-03-52R

LOB3 G:\163\GINTPR~1\062000\RHONEP.GPJ URSPDX1.GDT 10/10/00 port

PROJECT: **RPAC RI/FS**
PROJECT NO: **52-92C0804A**
PROJECT LOCATION: **Portland, Oregon**

FIELD ENGINEER: **Don Coberly**
CHECKED BY: **Chris Moody**

SAMPLE TYPE KEY:
- Relatively undisturbed sample
- Disturbed sample
- Sample attempt with no recovery
- SPT split spoon sample
- B Bag sample

SAMPLER DRIVEN (in)	FINES CONTENT (%)	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	BLOWS PER FOOT	SAMPLE TYPE	ELEVATION(ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARK
							25			*Driller still adding water.*	
							30			*Added casing at 32', creosote odor decreased to undetetable level.*	
24							35	SP		**BLACK TO DARK BROWN SAND**, slight trace fines, well-sorted, VF-M grained, very slight odor creosote, no stain or sheen, loose-firm (adding water previously),	
							40			*Grades to black to brown sand with no creosote odor.*	
							45				
							50			Driller encountered bedrock at 51'.	
										Borehole terminated at 52.5' bgs, 1.5' below bedrock surface to provide depth for sump.	

NOTES:

LOG OF BORING RP-03-52P

URS

LOB3 G:\163\GINTPR~1\062000\RHONEP.GPJ URSPDX1.GDT 10/10/00 port

(Abandoned)

Project: Rhone Poulenc RI / FS
Project Location: Portland, Oregon
Project Number: 5292C0804A.00 00045

Log of Boring RP-03-63

Sheet 1 of 2

Date(s) Drilled and Installed	2/17/00	Geologist	G. Lukert	Reviewer	
Drilling Method	Air Rotary	Drilling Contractor	Cascade Drilling, Inc.	Total Depth of Borehole	64.0 feet
Sampling Method	Grab from cuttings, SPT split spoon	Hammer Data	140 lbs / 30-inch drop	Top of Casing Elevation	Not available
Size and Type of Well Casing	2-inch-dia. Schedule 40 PVC	Screen Perforation	0.010-inch slot (57.4-62.4 feet)	Approximate Surface Elevation	Not available
Seal or Backfill	Aquaguard bentonite grout 2.5-55.4 feet	Groundwater Level(s)	Not measured ATD; water equilibrium at 16.41 feet bgs on 2/17/00		

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, blows / 6 in.	Recovery, inches	Headspace OVA, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
	0								Surface Conditions: gravel		6-inch-dia. steel protective casing; Concrete (0-2.5 ft)
	5		01	NA	NA	0.0		ML	SILT; very dark grayish brown (10YR 3/2), medium plasticity, slightly micaceous, dry to damp, no odor		7-3/8-in.-dia. borehole
	10		02	NA	NA	0.0		ML	Sandy SILT; very dark gray (10YR 3/1), ~40% fine subrounded sand, moist to wet, no odor		2-in.-dia. Sch. 40 PVC riser (to 57.4 ft)
	15		03	NA	NA	0.0		SP	SAND; dark brown (10YR 3/3), fine to medium, poorly graded, moist, no odor		Aquaguard bentonite grout (2.5-55.4 ft)
	20		04	NA	NA	0.0		SM	Silty SAND; dark brown (10YR 3/3), ~30% silt, wet, no odor		
	25		05	NA	NA	42		ML	SILT with sand; olive (5Y 4/3), wet, some odor (creosote)		
	30										

Report: ENV_12W; ELAND+USCS; Fle: RPACRU45.GPJ; 4/5/2000 RP-03-63

URS Greiner Woodward Clyde

Project: Rhone Poulenc RI / FS
Project Location: Portland, Oregon
Project Number: 5292C0804A.00 00045

Log of Boring RP-03-63

Sheet 2 of 2

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, blows / 6 in.	Recovery, Inches	Headspace OVA, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
	30	08		NA	NA	0.0		ML	SILT; olive (5Y 4/3), medium plasticity, wet, no odor		7-3/8-in.-dia. borehole
	35	07		NA	NA	0.0					2-in.-dia. Sch. 40 PVC riser (to 57.4 ft)
	40	08		NA	NA	0.0			With trace clay		Aquagusrd bentonite grout (2.5-55.4 ft)
	45	09		NA	NA	0.0					
	50	10		NA	NA	0.0		CL/ML	Silty CLAY; olive (5Y 4/3), medium plasticity, wet, no odor		
	55	11		2-2-1	18	0.0		SP-SM	SAND with silt; dark brown (10YR 3/3), fine to medium, trace silt, micaceous, wet, very loose Silt layer Silt layer		20-40 silica sand (55.4-57.4 ft)
	60	12		1-3-2	18	0.0		SP	SAND; dark olive gray (5Y 3/2), medium, micaceous, with basalt fragments, loose, wet Silt layer		Prepacked well screen..20-40 silica sand (57.4-62.4 ft) 2-in. dia. 0.010-in. slot Sch. 40 PVC screen (57.4-62.4 ft) 10-20 silica sand outside prepack (57.4-64 ft) Sump (62.4-63.4 ft)
									BASALT		
	65								Boring terminated at 64.0 feet.		

Report ENV_12W_CLEVELAND+/-USCS; File: RPACRI45.GPJ; 4/5/2000 RP-03-63

Project: Rhone Poulenc RI / FS Project Location: Portland, Oregon Project Number: 5292C0804A.00 00045	Log of Boring RP-06-31 Sheet 1 of 2

Date(s) Drilled and Installed	2/7/00 and 2/8/00	Geologist	G. Lukert	Reviewer	
Drilling Method	Air Rotary	Drilling Contractor	Cascade Drilling, Inc.	Total Depth of Borehole	31.5 feet
Sampling Method	Grab from cuttings, SPT split spoon	Hammer Data	140 lbs / 30-inch drop	Top of Casing Elevation	Not available
Size and Type of Well Casing	2-inch-dia. Schedule 40 PVC	Screen Perforation	0.010-inch slot (24.5-29.5 feet)	Approximete Surface Elevation	Not available
Seal or Backfill	Bentonite chips 2-22.5 feet	Groundwater Level(s)	24 feet bgs on 2/7/00 ATD; water equilibrium at 17.04 feet below TOC on 3/15/00		

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, blows / 6 in.	Recovery, inches	Headspace OVA, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
	0								Surface Conditions: gravel		6-inch-dia. steel protective casing Concrete (0-2 ft)
	5		01	NA	NA	0.0		ML	SILT; dark gray (5Y 4/1), medium plasticity, dry to damp, no odor		7-3/8-in.-dia. borehole
	10		02	NA	NA	0.0			Becomes damp		2-in.-dia. Sch. 40 PVC riser (to 24.5 ft) Bentonite chips (2-22.5 ft)
	15		03	NA	NA	0.0		ML/MH	SILT with clay; dark gray (5Y 4/1), medium to high plasticity, wood debris, damp to wet, no odor		
	20		04	NA	NA	0.0		ML	SILT with gravel; dark gray (5Y 4/1), medium plasticity, ~15% angular gravel, trace clay, moist, no odor		20-40 silica sand (22.5-24.5 ft)
								ML	SILT; dark gray (5Y 4/1), some organics, loose, wet		Prepacked well screen, 20-40 silica sand (24.5-29.5 ft)
	25		05	3-4-3	18	0.0		SM	Silty SAND; dark gray (5Y 4/1), loose, wet		2-in. dia. 0.010-in. slot Sch. 40 PVC screen (24.5-29.5 ft) 10-20 silica sand outside prepack (24.5-31.5 ft)
	30										

Report: ENV_12W_...cVELAND+USCS; File: RPACRI45.GPJ; 4/5/2000 RP-06-31

URS Greiner Woodward Clyde

Project: Rhone Poulenc RI / FS
Project Location: Portland, Oregon
Project Number: 5292C0804A.00 00045

Log of Boring RP-06-31

Sheet 2 of 2

Elevation feet	Depth, feet	SAMPLES Type Number	Sampling Resistance, blows / 6 in.	Recovery, inches	Headspace OVA, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
	30	06	3-2-5	18	0.0		SM	Silty SAND; dark gray (5Y 4/1), ~30% fines, loose, saturated		Sump in 10-20 silica sand (29.5-30.5 ft)
							ML	SILT; dark gray (5Y 4/1), saturated		
								Bottom of boring at 31.5 feet.		
	35									
	40									
	45									
	50									
	55									
	60									
	65									

Report: ENV_12W_CLEVELAND+/-USCS; File: RPACR145.GPJ; 4/5/2000 RP-06-31

Project: Rhone Poulenc RI / FS Project Location: Portland, Oregon Project Number: 5292C0804A.00 00045	Log of Boring RP-06-87 Sheet 1 of 3

Date(s) Drilled and Installed	2/7/00	Geologist	G. Lukert	Reviewer	
Drilling Method	Air Rotary	Drilling Contractor	Cascade Drilling, Inc.	Total Depth of Borehole	88.0 feet
Sampling Method	Grab from cuttings, SPT split spoon	Hammer Data	140 lbs / 30-inch drop	Top of Casing Elevation	Not available
Size and Type of Well Casing	2-inch-dia. Schedule 40 PVC	Screen Perforation	0.010-inch slot (81-86 feet)	Approximete Surface Elevation	Not available
Seal or Backfill	Aquaguard bentonite grout 2-79 feet	Groundwater Level(s)	Not measured ATD; water equilibrium at 24.32 feet below TOC on 3/15/00		

Elevation feet	Depth, feet	SAMPLES: Type	SAMPLES: Number	Sampling Resistance, blows / 6 in.	Recovery, inches	Headspace OVA, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
	0								Surface Conditions: grass		6-inch-dia. steel protective casing Concrete (0-2 ft)
	5		01	NA	NA	0.0		ML	SILT; very dark gray (5Y 3/1), low to medium plasticity, trace very fine sand, slightly micaceous, damp, no odor		7-3/8-in.-dia. borehole
	10		02	NA	NA	0.0					2-in.-dia. Sch. 40 PVC riser (to 81 ft)
	15		03	NA	NA	0.0			Increasing moisture		Aquaguard bentonite grout (2-79 ft)
	20		04	NA	NA	0.0		GM	Silty GRAVEL; very dark gray (5Y 3/1), angular to subrounded basalt fragments with silt matrix, moist, no odor		
	25		05	NA	NA	0.0		ML	Sandy SILT; very dark gray (5Y 3/1), medium plasticity, ~20% sand, moist, no odor		
	30										

Report: ENV_12W_CLEVELAND+USCS; File: RPACRI45.GPJ; 4/5/2000 RP-06-87

URS Greiner Woodward Clyde

Project: Rhone Poulenc RI / FS
Project Location: Portland, Oregon
Project Number: 5292C0804A.00 00045

Log of Boring RP-06-87

Sheet 2 of 3

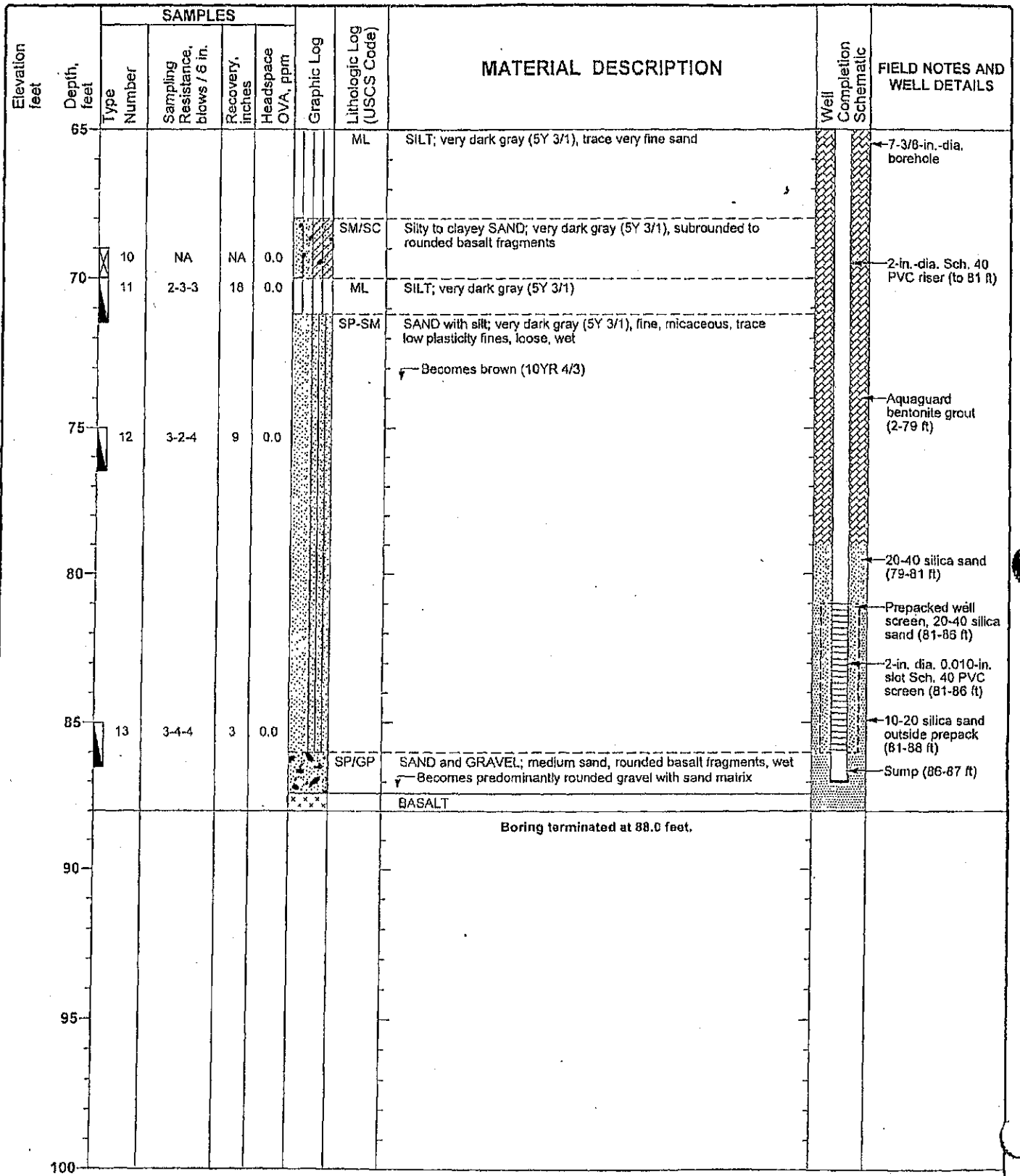
Elevation feet	Depth, feet	SAMPLES: Type Number	Sampling Resistance, blows / 6 in.	Recovery, inches	Headspace OVA, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
	30									7-3/8-in.-dia. borehole
	35	06	NA	NA	0.0		ML	Clayey SILT; very dark gray (5Y 3/1, medium plasticity, wet		2-in.-dia. Sch. 40 PVC riser (to 81 ft)
	40							(very soft drilling 35-45 feet]		Aquaguard bentonite grout (2-79 ft)
	45	07	NA	NA	0.0		ML	SILT; very dark gray (5Y 3/1), medium plasticity, ~10% fine sand, wet		
	50	08	NA	NA	0.0					
	55	09	NA	NA	0.0		ML	Sandy SILT; very dark gray (5Y 3/1), very fine sand		
	60									
	65									

Report: ENV_12Vs_...eVELAND+/-USCS; File: RPACR145.GPJ; 4/5/2000 RP-06-87

Project: Rhone Poulenc RI / FS
Project Location: Portland, Oregon
Project Number: 5292C0804A.00 00045

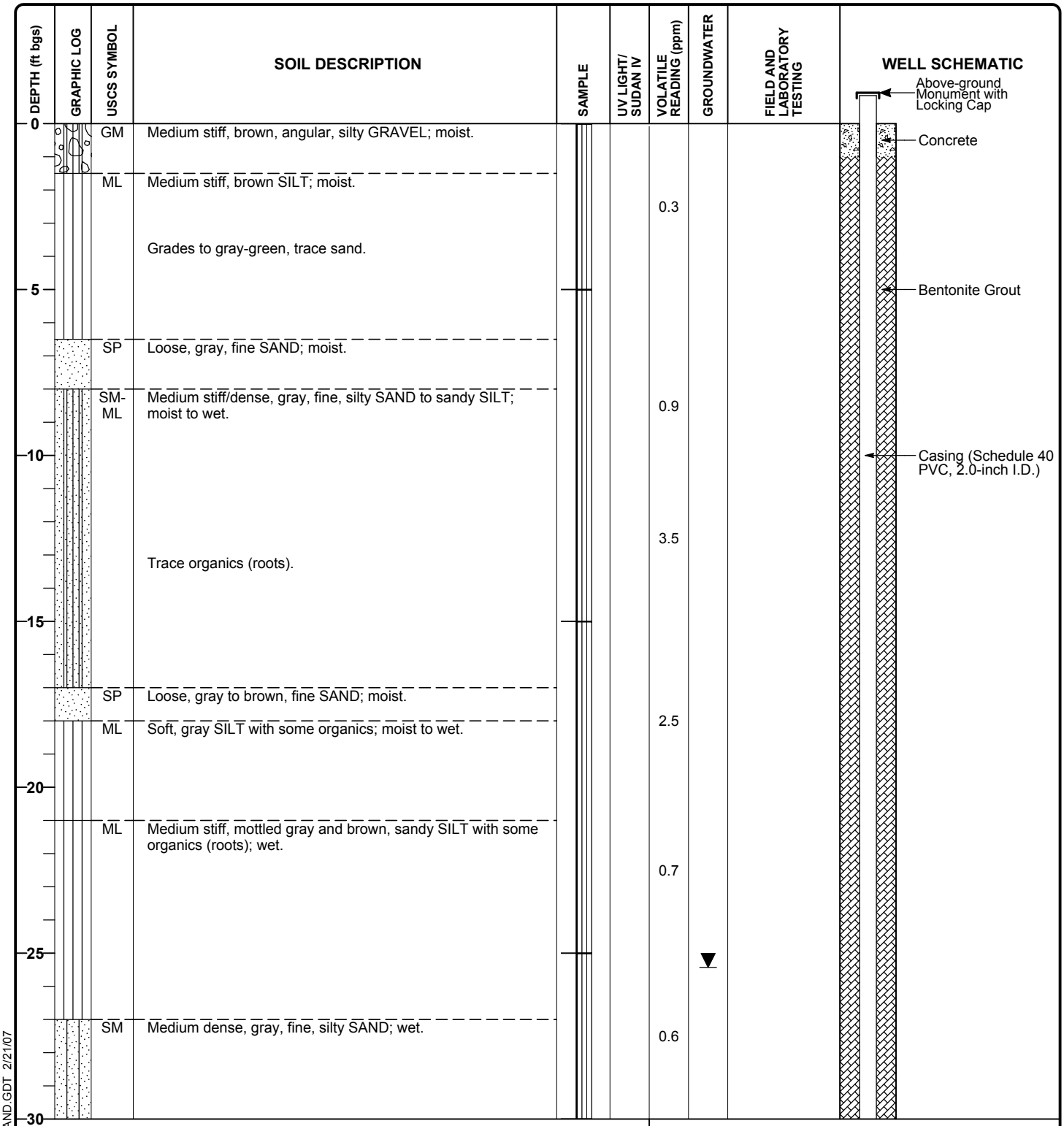
Log of Boring RP-06-87

Sheet 3 of 3



Report: ENV_12W_CLEVELAND+/-USCS; File: RPACRI45.GPJ; 4/5/2000 RP-06-87

URS Greiner Woodward Clyde



BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 34.84 feet
CASING ELEVATION: 37.26 feet
START CARD/TAG ID: 186843/L83990
DRILLING DATES: 10/27/2006 - 10/30/2006

REMARKS:

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07

RP - Portland
Stage 2 SCE

0-61M-107030 P69

AMEC
7376 SW Durham Road
Portland, Oregon
USA 97224
Tel (503) 639-3400
Fax (503) 620-7892

LOG OF BORING RP-06-95

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	UV LIGHT/ SUDAN IV	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
30		SM							Bentonite Grout
		ML	Medium stiff to stiff, gray-green SILT with trace fine sand; moist.			0.5			Casing (Schedule 40 PVC, 2.0-inch I.D.)
35						0.6			
40			Grades to interbedded, sand layers; moist to dry.			0.5			
45						0.4			
50		SM	Medium dense, gray, fine, silty SAND; wet.			0.0			
55		ML	Soft, gray-green, fine, sandy SILT with interbedded, silty sand layers, micaceous; wet.			0.0			
60									

BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 34.84 feet
CASING ELEVATION: 37.26 feet
START CARD/TAG ID: 186843/L83990
DRILLING DATES: 10/27/2006 - 10/30/2006

REMARKS:

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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7376 SW Durham Road
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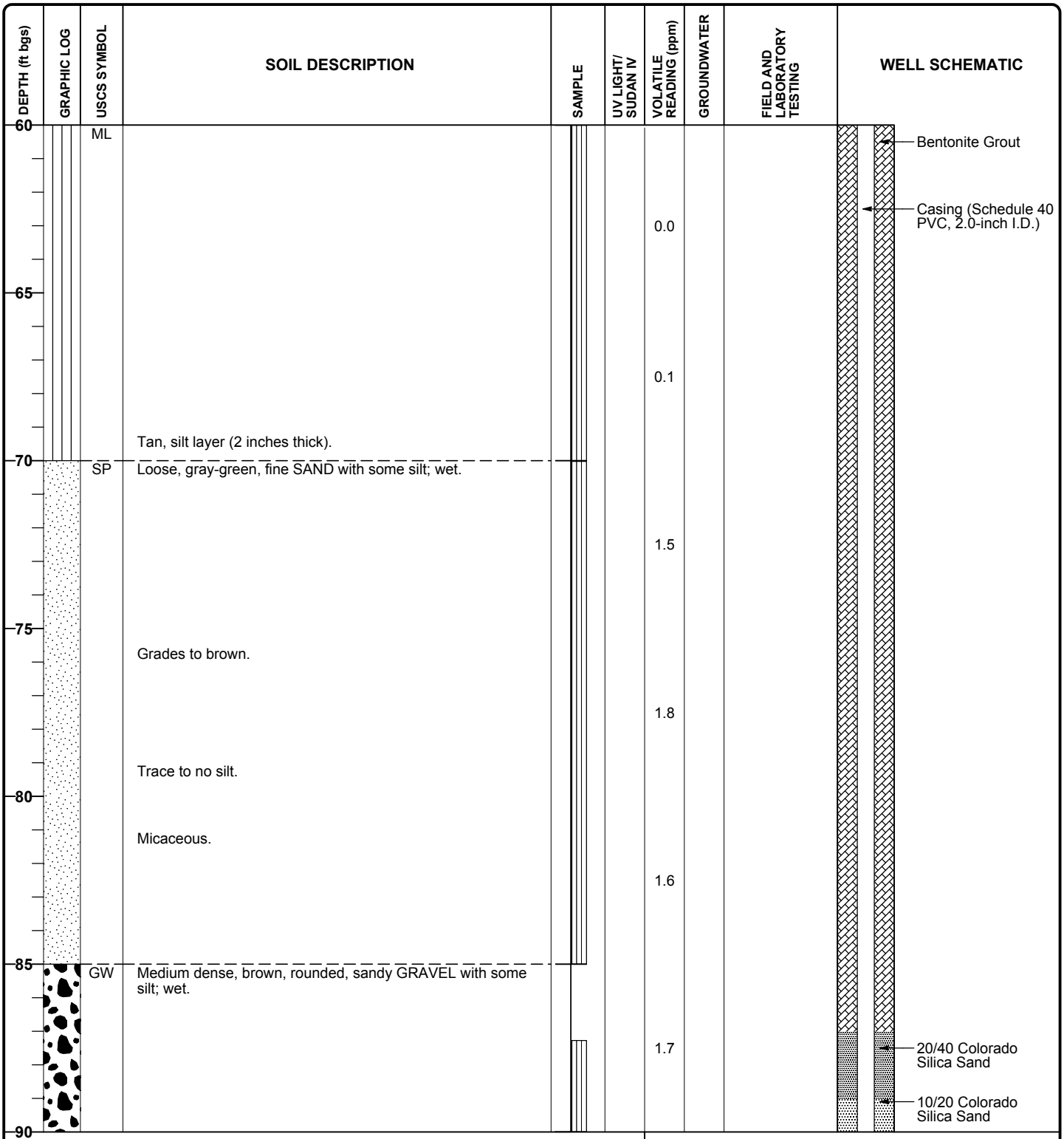
LOG OF BORING RP-06-95



BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 34.84 feet
CASING ELEVATION: 37.26 feet
START CARD/TAG ID: 186843/L83990
DRILLING DATES: 10/27/2006 - 10/30/2006

REMARKS:

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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LOG OF BORING RP-06-95

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	UV LIGHT/ SUDAN IV	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
90		GW				2.6		1017-01	10/20 Colorado Silica Sand; Well Screen (Schedule 40 PVC, 2.0-inch I.D. with 0.010-inch slot size); Threaded End Cap
95			Total depth drilled = 95 ft bgs.						
100									
105									
110									
115									
120									

BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 34.84 feet
CASING ELEVATION: 37.26 feet
START CARD/TAG ID: 186843/L83990
DRILLING DATES: 10/27/2006 - 10/30/2006

REMARKS:

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07

RP - Portland
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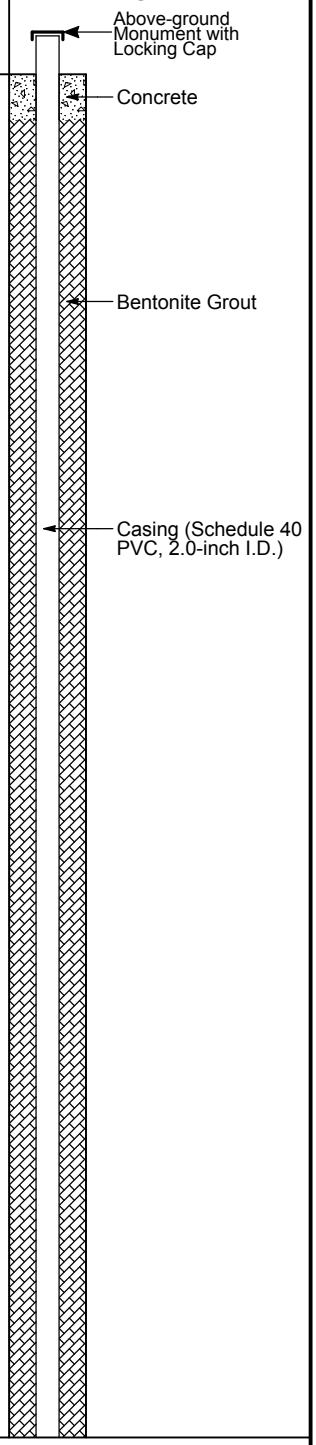
LOG OF BORING RP-06-95

DEPTH (ft bgs)	USCS SYMBOL	SOIL DESCRIPTION	VOLATILE READING (ppm)
0	GM	Medium dense, brown, angular, silty, sandy GRAVEL; moist.	
	ML	Medium stiff, gray, sandy SILT; moist.	0.4
5			
	SP	Loose, gray, fine SAND with some silt; moist to dry.	0.8
	ML	Medium stiff, gray, fine, sandy SILT with organics (roots) and some silty sand layers; moist.	
10			1.4
15		Grades to gray-brown.	1.1
20	SP	Loose, brown, medium SAND with trace rounded gravel; moist.	
	ML	Stiff, mottled green, brown and black SILT with trace fine sand and organics; moist.	0.3
25	ML	Medium stiff, gray-brown SILT with some fine sand, trace organics (wood and roots); moist. Sand (4-inch layer).	0.2
30			

GRAPHIC LOG | SAMPLE | UV LIGHT/ SUDAN IV | GROUNDWATER | FIELD AND LABORATORY TESTING

WELL SCHEMATIC



BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 34.79 feet
CASING ELEVATION: 37.13 feet
START CARD/TAG ID: 186842/L83989
DRILLING DATES: 10/26/2006 - 10/27/2006

REMARKS:

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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LOG OF BORING RP-06-105

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07

DEPTH (ft bgs)	USCS SYMBOL	SOIL DESCRIPTION	VOLATILE READING (ppm)
30	ML		
			0.3
35			0.3
40	SM	Medium dense, gray-green, fine, silty SAND with interbedded silt layers; moist.	
			0.1
45			
			0.2
		Sand content increases and becomes wet at 47.5 ft bgs.	
50			
			0.2
55			
		Grades to brown.	
			0.2
60			

GRAPHIC LOG; SAMPLE; UV LIGHT/ SUDAN IV; GROUNDWATER; FIELD AND LABORATORY TESTING

WELL SCHEMATIC: Bentonite Grout; Casing (Schedule 40 PVC, 2.0-inch I.D.)

BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 34.79 feet
CASING ELEVATION: 37.13 feet
START CARD/TAG ID: 186842/L83989
DRILLING DATES: 10/26/2006 - 10/27/2006

REMARKS:

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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7376 SW Durham Road
Portland, Oregon
USA 97224
Tel (503) 639-3400
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LOG OF BORING RP-06-105

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	UV LIGHT/ SUDAN IV	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
60		SM	Grades to gray.			0.3			Bentonite Grout Casing (Schedule 40 PVC, 2.0-inch I.D.)
65			Grades to brown.			0.3			
70		SP	Loose to medium dense, mottled gray and brown, fine SAND with some silt, micaceous; wet. Becomes brown.			0.2			
75			Trace to no silt.			0.6			
80						0.8			
85		GW-GM	Dense, brown, rounded to subrounded, sandy GRAVEL with some silt, trace cobbles; wet.			0.5			
90									

BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 34.79 feet
CASING ELEVATION: 37.13 feet
START CARD/TAG ID: 186842/L83989
DRILLING DATES: 10/26/2006 - 10/27/2006

REMARKS:

RP - Portland
Stage 2 SCE

0-61M-107030 P69

AMEC
7376 SW Durham Road
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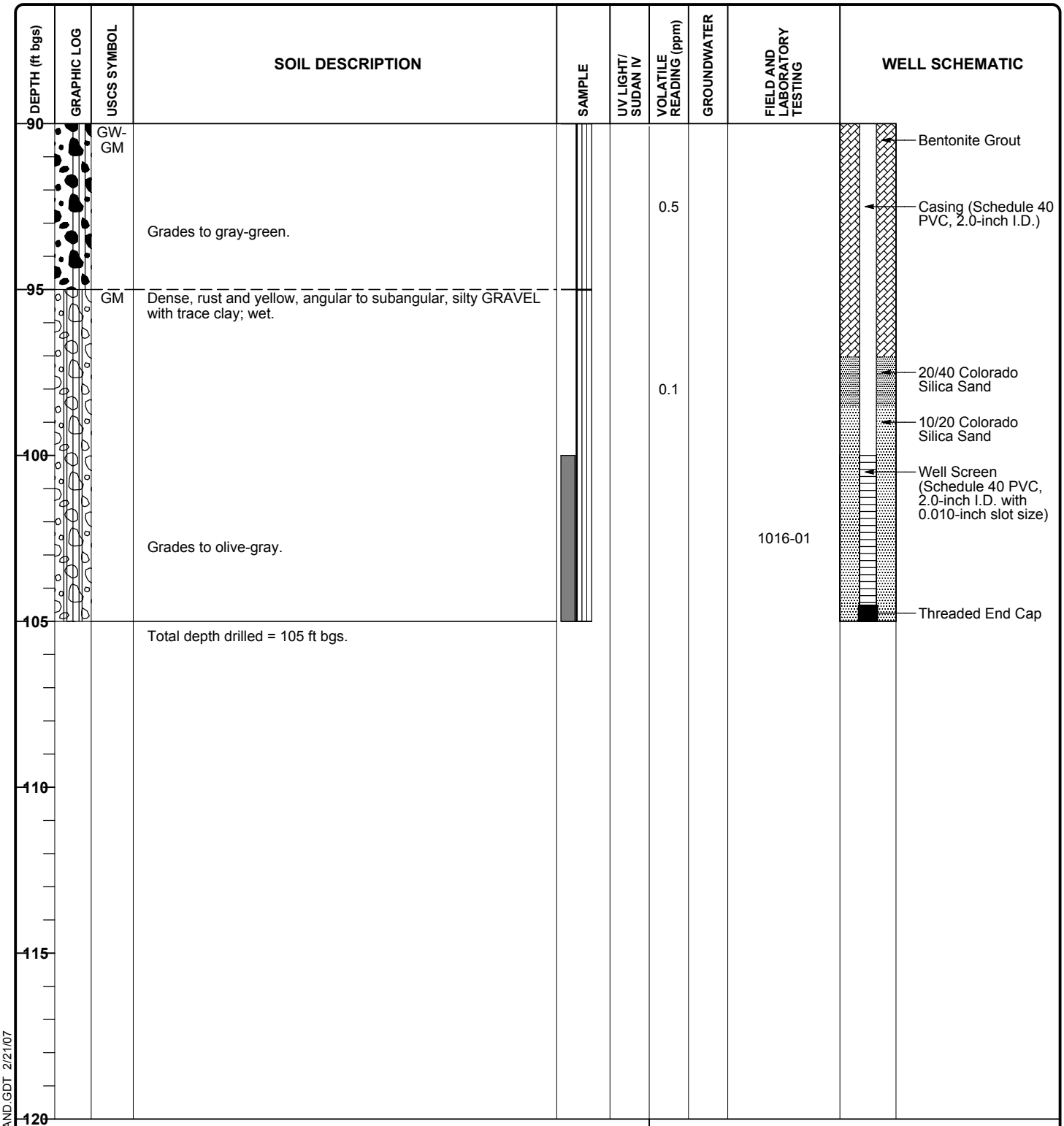
LOG OF BORING RP-06-105

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07



BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 34.79 feet
CASING ELEVATION: 37.13 feet
START CARD/TAG ID: 186842/L83989
DRILLING DATES: 10/26/2006 - 10/27/2006

REMARKS:

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07

RP - Portland
Stage 2 SCE

0-61M-107030 P69

AMEC
7376 SW Durham Road
Portland, Oregon
USA 97224
Tel (503) 639-3400
Fax (503) 620-7892

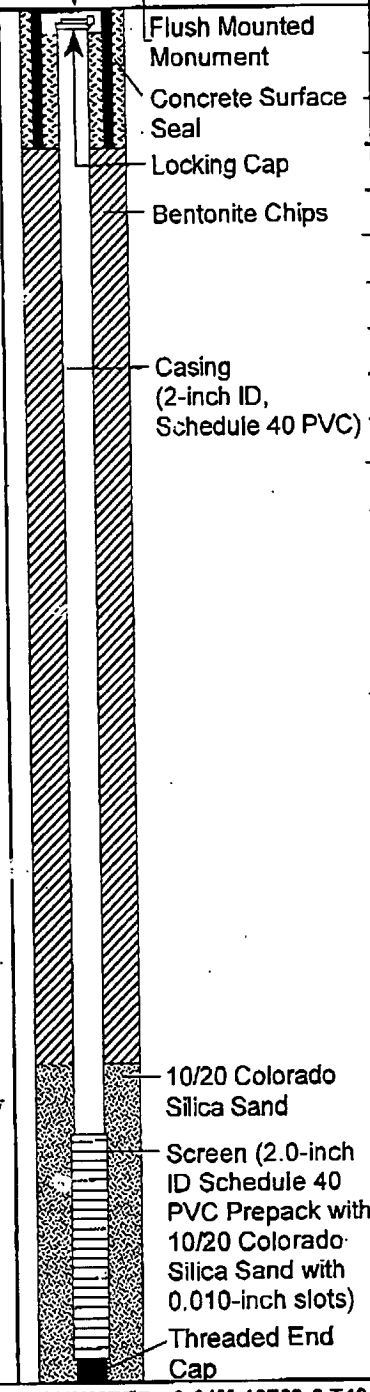
LOG OF BORING RP-06-105

PROJECT: RPAC - PDX START CARD/TAG NO.: 147580/L55513 BORING No.: RP-07-30 PAGE 1 OF 1

Elevation Reference: City of Portland Datum
Relative Ground Surface Elevation: Approximately 35.50 Feet
Well Completed: 4/22/02
Casing Elevation: 35.26 Feet
Boring Method: Hollow Stem Auger
Borehole Diameter: 11.75"

Depth (feet)	SOIL DESCRIPTION	Sample Number	Sample Type	Blow Counts	Volatile Readings (ppm)	Ground Water
0	Topsoil.					
10	SANDY SILT (ML), brown, some clay (possible FILL).					
20	SANDY SILT (ML), dark gray, some clay.					SW
30	SANDY SILT (ML), mottled dark gray and brown, some clay. Total depth = 30.0 feet.					

AS-BUILT DESIGN



ANALYSES: RPAC SUITE-I

PROJECT NUMBER: 0-61M-10703-0 T43

LEGEND

SW Static groundwater level measured on 5/3/02

RPAC SUITE-I Groundwater Analysis (8260B, 8041, 8151A, 8290, 6020 Total & Dissolved Metals, NAP) Groundwater sample collected on 5/3/02

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\10703\RP730.DRW

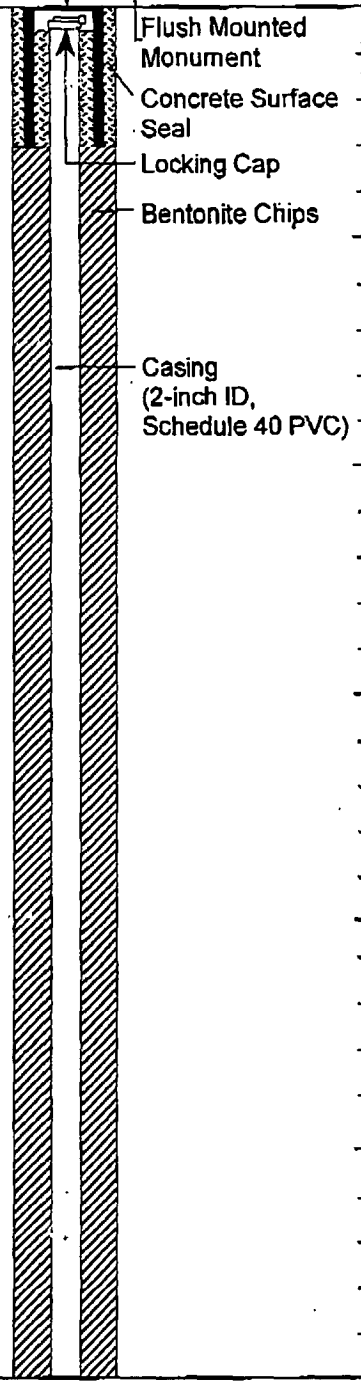
Drilling Started: 4/22/02 Drilling Completed: 4/22/02 Logged By: L. Janczak

PROJECT: RPAC - PDX START CARD/TAG NO.: 147581/L55512 BORING No.: RP-07-55 PAGE 1 OF 2

Elevation Reference: City of Portland Datum
Relative Ground Surface Elevation: Approximately 35.50 Feet
Well Completed: 4/22/02
Casing Elevation: 35.20 Feet
Boring Method: Hollow Stem Auger
Borehole Diameter: 11.75"

Depth (feet)	SOIL DESCRIPTION	Sample Number	Sample Type	Blow Counts	Volatile Readings (ppm)	Ground Water
0	Topsoil.					
5	SANDY SILT (ML), medium stiff, damp, brown to gray, some clay and roots, (possibly oxidized FILL material).			10	0.3	
10	SANDY SILT (ML), soft, damp to moist, gray to brown, some clay and roots, (clay content and moisture decreases).			5	0.1	
15	CLAYEY SILT (ML), soft, damp to moist, gray to brown, some sand, (clay content decreases and moisture increases).			4	0.5	
20	SILT (ML), medium stiff, moist, dark brown, some sand (<20%).			10	0.3	
25	SAND (SP), medium dense, moist, dark gray to black, fine-grained, some silt (<10%).			13	0.2	SW
30						

AS-BUILT DESIGN



ANALYSES

PROJECT NUMBER: 0-61M-10703-0 T43

LEGEND

- 2.0-inch OD split-spoon sample with % recovered
- SW Static groundwater level measured on 5/3/02
- RPAC SUITE-1 Groundwater Analysis (8260B, 8041, 8151A, 8290, 6020 Total & Dissolved Metals, NAP) Groundwater sample collected on 5/3/02

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Drilling Started: 4/22/02 Drilling Completed: 4/22/02 Logged By: L. Janczak

\10703\RP756.DRW

PROJECT: RPAC - PDX START CARD/TAG NO.: 147581/L55512 BORING No.: RP-07-55 PAGE 2 OF 2

Elevation Reference: City of Portland Datum
Relative Ground Surface Elevation: Approximately 35.50 Feet
Well Completed: 4/22/02
Casing Elevation: 35.20 Feet
Boring Method: Hollow Stem Auger
Borehole Diameter: 11.75"

Depth (feet)	SOIL DESCRIPTION	Sample Number	Sample Type	Blow Counts	Volatile Readings (ppm)	Ground Water	AS-BUILT DESIGN	ANALYSES
30	SAND (SP), medium dense, damp to moist, dark gray to black, fine- to medium- grained, some silt (<10%). Organic odor.			12	0.1		Bentonite Chips; Casing (2-inch ID, Schedule 40 PVC)	
35	SILT (ML), medium stiff, wet, gray to brown, some fine-grained sand (approximately 20%).			15	0.0			
40	SILTY SAND (SM), loose, wet, brown and gray mottled, fine-grained sand.			4	0.0			
45	SAND (SP), medium dense, wet, brown, fine-grained.			9	0.0		10/20 Colorado Silica Sand	
50	SAND (SP), loose, wet, brown, fine-grained.			5	0.0		Screen (2.0-inch ID Schedule 40 PVC Prepack with 10/20 Colorado Silica Sand with 0.010-inch slots)	RPAC SUITE-I
	SAND (SP), medium dense, moist, black and brown mottled, fine- to medium-grained.			16	0.1			
55	Total depth = 55.0 feet.						Threaded End Cap	
60								

LEGEND

- 2.0-inch OD split-spoon sample with % recovered
- SW Static groundwater level measured on 5/3/02
- RPAC SUITE-I Groundwater Analysis (8260B, 8041, 8151A, 8290, 6020 Total & Dissolved Metals, NAP) Groundwater sample collected on 5/3/02

PROJECT NUMBER: 0-61M-10703-0 T43

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Drilling Started: 4/22/02 Drilling Completed: 4/22/02 Logged By: L. Janczak \10703\RP75SP2.DRW

PROJECT: RPAC - PDX START CARD/TAG NO.: 147582/L55511 BORING No.: RP-07-84 PAGE 1 OF 4

Elevation Reference: City of Portland Datum
Relative Ground Surface Elevation: Approximately 35.50 Feet
Well Completed: 4/22/02
Casing Elevation: 35.22 Feet
Boring Method: Air Rotary
Borehole Diameter: 7.0"

Depth (feet)	SOIL DESCRIPTION	Sample Number	Sample Type	Blow Counts	Volatile Readings (ppm)	Ground Water	AS-BUILT DESIGN	ANALYSES
0	Topsoil.						Flush Mounted Monument; Concrete Surface Seal; Locking Cap; Bentonite Grout with 30% Solids; Casing (2-inch ID, Schedule 40 PVC)	
10	SAND (SP), dry, dark brown to gray.							
	SAND (SP), dry, dark gray, poorly sorted with some silt, approximately 10% gravel, grain-size increases.							
15	SANDY SILT (ML), dry, dark gray with some organics.							
	SILT (ML), dry to moist, dark gray with some clay.							
20								
25						SW		
	SAND (SP), dry, dark gray, poorly sorted with some silt, gravel, and wood debris.							
	Encountered large piece of wood - difficult drilling.					WD		
30								

LEGEND

WD Encountered groundwater level while drilling

SW Static groundwater level measured on 5/3/02

RPAC SUITE-I Groundwater Analysis (8260B, 8041, 8151A, 8290, 6020 Total & Dissolved Metals, NAP)
Groundwater sample collected on 5/3/02

PROJECT NUMBER: 0-61M-10703-0 T43

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Drilling Started: 4/15/02 Drilling Completed: 4/22/02 Logged By: J. Fassio/L. Janczak

\10703\RP784.DRW

PROJECT: RPAC - PDX START CARD/TAG NO.: 147582/L55511 BORING No.: RP-07-84 PAGE 2 OF 4

Elevation Reference: City of Portland Datum
Relative Ground Surface Elevation: Approximately 35.50 Feet
Well Completed: 4/22/02
Casing Elevation: 35.22 Feet
Boring Method: Air Rotary
Borehole Diameter: 7.0"

Depth (feet)	SOIL DESCRIPTION	Sample Number	Sample Type	Blow Counts	Volatile Readings (ppm)	Ground Water	AS-BUILT DESIGN	ANALYSES
30	SANDY SILT (ML), wet, dark gray, (approximately 20% sand).						Bentonite Grout with 30% Solids; Casing (2-inch ID, Schedule 40 PVC)	
35	SANDY SILT (ML), dense, wet, dark gray.							
40								
45								
50	SANDY SILT (ML), wet, dark brown.							
55								
60	SILTY SAND (SM), wet, dark brown, sand content increases.							

PROJECT NUMBER: 0-61M-10703-0 T43

LEGEND

WD Encountered groundwater level while drilling

SW Static groundwater level measured on 5/3/02

RPAC SUITE1 Groundwater Analysis (8260B, 8041, 8151A, 8290, 6020 Total & Dissolved Metals, NAP)
Groundwater sample collected on 5/3/02

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Drilling Started: 4/15/02 Drilling Completed: 4/22/02 Logged By: J. Fassio/L. Janczak

\10703\RP784P2.DRW

PROJECT: RPAC - PDX START CARD/TAG NO.: 147582/L55511 BORING No.: RP-07-84 PAGE 3 OF 4

Elevation Reference: City of Portland Datum
Relative Ground Surface Elevation: Approximately 35.50 Feet
Well Completed: 4/22/02
Casing Elevation: 35.22 Feet
Boring Method: Air Rotary
Borehole Diameter: 7.0"

Depth (feet)	SOIL DESCRIPTION	Sample Number	Sample Type	Blow Counts	Volatile Readings (ppm)	Ground Water	AS-BUILT DESIGN	ANALYSES
60								
65							Bentonite Grout with 30% Solids (Total Bentonite Grout used = 880 gallons)	
70	GRAVELLY SAND (SP), wet, dark brown and black.						Casing (2-inch ID, Schedule 40 PVC)	
	SANDY GRAVEL (GP), wet, dark brown and black, (approximately 80% basalt gravel, 20% mixture of chert, quartz, and scoria).							
	Producing large amounts of water.						20/40 Colorado Silica Sand (Transition Layer)	
75	SANDY GRAVEL (GP), dense, wet, mottled black and brown, mostly basalt gravel.						10/20 Colorado Silica Sand	
	SANDY GRAVEL (GP), medium dense, wet, mottled black and brown.							
	Producing large amounts of water.						Screen (2.0-inch ID Schedule 40 PVC Prepack with 10/20 Colorado Silica Sand with 0.010-inch slots)	RPAC SUITE-I
80							Threaded End Cap	
	GRAVELLY SAND (SP), wet, mottled black and brown, (gravel constists of approximately 80% basalt, 20% quartz, granite, and chert).						Coated Bentonite Pellets (55 gallons) used to seal boring from 85.0-112.0 feet BGS. (As casing pulled out due to sediment caving. Total depth =112.0 feet.)	
85	GRAVELLY SAND (SP), dense, wet, mottled black and brown, sand is approximately 90% basalt.							
90								

PROJECT NUMBER: 0-61M-10703-0 T43

LEGEND

WD Encountered groundwater level while drilling

SW Static groundwater level measured on 5/3/02

RPAC SUITE-I Groundwater Analysis (8260B, 8041, 8151A, 8290, 6020 Total & Dissolved Metals, NAP)
Groundwater sample collected on 5/3/02

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\10703\RP784P3.DRW

Drilling Started: 4/15/02 Drilling Completed: 4/22/02 Logged By: J. Fassio/L. Janczak

PROJECT: RPAC - PDX START CARD/TAG NO.: 147582/L55511 BORING No.: RP-07-84 PAGE 4 OF 4

Elevation Reference: City of Portland Datum
Relative Ground Surface Elevation: Approximately 35.50 Feet
Well Completed: 4/22/02
Casing Elevation: 35.22 Feet
Boring Method: Air Rotary
Borehole Diameter: 7.0"

Depth (feet)	SOIL DESCRIPTION	Sample Number	Sample Type	Blow Counts	Volatile Readings (ppm)	Ground Water	AS-BUILT DESIGN	ANALYSES
90	SILTY SAND (SM), dense, wet, dark brown to black, fine-grained with gravel (basalt, quartz, and chert). (Approximately 70% sand, 20% silt, 10% gravel.)						Coated Bentonite Pellets (55 gallons) used to seal boring from 85.0-112.0 feet BGS. (As casing pulled out due to sediment caving. Total depth =112.0 feet.)	
95	SANDY GRAVEL (GP), dense, wet, dark brown to black, with silt. (Approximately 70% basalt, quartz, and granite gravel, 25% sand, 5% silt). Sand content decreases below 97.0 feet.							
100								
105	GRAVEL (GW), very dense, dark brown to black, with some sand and silt. (Approximately 95% gravel, 5% sand and silt).							
110	SANDY GRAVEL (GP), very dense, wet, dark brown to black with sand and silt. (Approximately 70% gravel, 20% sand, 10% silt.) Total depth = 114.0 feet.						Bottom 2.0 feet of borehole caved/ heave from 112.0-114.0 feet	
115								
120								

LEGEND

WD Encountered groundwater level while drilling

SW Static groundwater level measured on 5/3/02

RPAC SUITE 1 Groundwater Analysis (8260B, 8041, 8151A, 8290, 6020 Total & Dissolved Metals, NAP) Groundwater sample collected on 5/3/02

PROJECT NUMBER: 0-61M-10703-0 T43

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Drilling Started: 4/15/02 Drilling Completed: 4/22/02 Logged By: J. Fasslo/L. Janczak \10703\RP784P4.DRW

PROJECT: RPAC - PDX START CARD/TAG NO.: 147583/L32082 BORING No.: RP-07-119 PAGE 1 OF 4

Elevation Reference: City of Portland Datum
Relative Ground Surface Elevation: Approximately 35.50 Feet
Well Completed: 5/1/02
Casing Elevation: 35.13 Feet
Boring Method: 5.0" Tri-cone Air Rotary from 0.0-101.0', 5.0" ODEX Percussion Button Bit w/Under-reamer from 101.0-119.4'
Borehole Diameter: 6.0"

Depth (feet)	SOIL DESCRIPTION	Sample Number	Sample Type	Blow Counts	Volatile Readings (ppm)	Ground Water	AS-BUILT DESIGN	ANALYSES
0	Grass and rooty topsoil.						Flush Mounted Monument; Concrete Surface Seal; Locking Cap; Bentonite Chips (3/8"), hydrated Total = 2,400 lbs Bentonite Chips; VOID at 7.0-8.0 feet BGS; Casing (2-inch ID, Schedule 40 PVC)	
	SILTY SAND (SM), loose, damp, gray, fine-grained, poorly graded.							
	NOTE: Subsurface lithology logged by visual inspection of drill cuttings return and drilling character (no discrete soil samples collected).							
5								
	Drilling soil column while injecting clean water.							
	CLAYEY SILT (ML), soft, moist, gray.							
10								
	Gradational contact.							
	SAND with gravel (SP), medium dense, moist, medium- to coarse- grained, poorly graded, some organic woody debris. (Poor cuttings return - displacing into formation).							
15								
20								
25	Return cuttings becoming wet - unconfined groundwater encountered while drilling.					WD SW		
	Gradational contact.							
30								

LEGEND

WD Encountered groundwater level while drilling

SW Static groundwater level measured on 5/3/02

RPAC SUITE-I Groundwater Analysis (8260B, 8041, 8151A, 8290, 6020 Total & Dissolved Metals, NAP) Groundwater sample collected on 5/3/02

RPAC SUITE-II Groundwater Analysis (8260B, 8041, 8151A, 8290, 6020 Total & Dissolved Metals, 8081A) Groundwater sample collected on 4/29/02

PROJECT NUMBER: 0-61M-10703-0 T43

RPAC
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Phone (503) 639-3400 FAX (503) 620-7892

\10703\RP7119.DRW

Drilling Started: 4/24/02 Drilling Completed: 5/1/02 Logged By: S. Bourcy

PROJECT: RPAC - PDX START CARD/TAG NO.: 147583/L32082 BORING No.: RP-07-119 PAGE 2 OF 4

Elevation Reference: City of Portland Datum
Relative Ground Surface Elevation: Approximately 35.50 Feet
Well Completed: 5/1/02
Casing Elevation: 35.13 Feet
Boring Method: 5.0" Tri-cone Air Rotary from 0.0-101.0', 5.0" ODEX Percussion Button Bit w/Under-reamer from 101.0-119.4'
Borehole Diameter: 6.0"

Depth (feet)	SOIL DESCRIPTION	Sample Number	Sample Type	Blow Counts	Volatile Readings (ppm)	Ground Water	AS-BUILT DESIGN	ANALYSES
30	SILTY SAND (SM), loose, wet to saturated, medium to dark gray, fine-grained, rounded to subrounded, poorly graded.						Bentonite Chips (3/8"), hydrated	
	Gradational change at approximately 34.5 feet.						VOID at 31.0 feet	
35	CLAYEY SILT (ML), soft, wet, mottled brown, low to medium plasticity, trace very fine-grained sand and mica. (Poor cuttings return - displacing into formation.)						Casing (2-inch ID, Schedule 40 PVC)	
	Very poor cuttings return.						Bentonite Grout with 30% Solids (Wt = 10.3 lbs/gal, Ratio - 50 gal water : 100 lbs grout per batch mixed)	
40								
45								
	Gradational change at 48.0-48.5 feet.							
50	SILTY SAND (SM), loose to medium dense, wet to saturated, gray-brown, fine-grained, rounded to subrounded, poorly graded. (Sand consists of primarily volcanic fragments.)							
	SILT content decreasing (<10-15%). Brown return water. Discharge water production increased to approximately 15 gpm below 54.0 feet.							
55	SAND (SP), loose to medium dense, saturated, gray-brown, fine-grained, poorly graded with trace silt (approximately 10%).							
60								

LEGEND

WD Encountered groundwater level while drilling

SW Static groundwater level measured on 5/3/02

RPAC SUITE-I Groundwater Analysis (8260B, 8041, 8151A, 8290, 6020 Total & Dissolved Metals, NAP) Groundwater sample collected on 5/3/02

RPAC SUITE-II Groundwater Analysis (8260B, 8041, 8151A, 8290, 6020 Total & Dissolved Metals, 8081A) Groundwater sample collected on 4/29/02

PROJECT NUMBER: 0-61M-10703-0 T43

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Drilling Started: 4/24/02 Drilling Completed: 5/1/02 Logged By: S. Bourcy

\10703\RP7119P2.DRW

PROJECT: RPAC - PDX START CARD/TAG NO.: 147583/L32082 BORING No.: RP-07-119 PAGE 3 OF 4

Elevation Reference: City of Portland Datum
Relative Ground Surface Elevation: Approximately 35.50 Feet
Well Completed: 5/1/02
Casing Elevation: 35.13 Feet
Boring Method: 5.0" Tri-cone Air Rotary from 0.0-101.0', 5.0" ODEX Percussion Button Bit w/Under-reamer from 101.0-119.4'
Borehole Diameter: 8.0"

Depth (feet)	SOIL DESCRIPTION	Sample Number	Sample Type	Blow Counts	Volatile Readings (ppm)	Ground Water	AS-BUILT DESIGN	ANALYSES
60	SAND with trace silt (SP), medium dense, saturated, gray-brown, fine-grained, rounded to subrounded, poorly graded.						Bentonite Grout with 30% Solids (Wt = 10.3 lbs/gal; Ratio - 50 gal water : 100 lbs grout per batch mixed)	
65	Discharge water production increased to approximately 50 gpm below 67.0 feet with little fines (cleaner discharge water). Contact at 67.0 feet.						Casing (2-inch ID, Schedule 40 PVC)	
	SANDY GRAVEL (GW), very dense, saturated, fine- to coarse-grained sand, fine gravel (<2.0 inch diameter), rounded to subrounded, well-graded, unconsolidated, 90% of sand/clasts volcanic.							
70	Discharge water production increased to approximately 75-100 gpm below 70.0 feet. Gravel becoming coarser - possible occasional cobbles (harder drilling).							
75	Large cobble or boulder encountered between 76.0 and 77.0 feet. Drill casing difficult to advance.							
80	SANDY GRAVEL with occasional cobbles (GW), very dense, saturated, coarse-grained, rounded to subrounded, some gravel elongated, well-graded, unconsolidated sand and gravel primarily volcanic fragments (approximately 90%).							
85	Possible thin, stratified GRAVELLY SAND (SP) interbeds. (Based on visual observation of cuttings return and drill character.)							
90								

LEGEND

WD Encountered groundwater level while drilling

SW Static groundwater level measured on 5/3/02

RPAC SUITE-I Groundwater Analysis (8260B, 8041, 8151A, 8290, 6020 Total & Dissolved Metals, NAP) Groundwater sample collected on 5/3/02

RPAC SUITE-II Groundwater Analysis (8260B, 8041, 8151A, 8290, 6020 Total & Dissolved Metals, 8081A) Groundwater sample collected on 4/29/02

PROJECT NUMBER: 0-61M-10703-0 T43

RPAC
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\10703\RP711P3.DRW

Drilling Started: 4/24/02 Drilling Completed: 5/1/02 Logged By: S. Bourcy

PROJECT: RPAC - PDX START CARD/TAG NO.: 147583/L32082 BORING No.: RP-07-119 PAGE 4 OF 4

Elevation Reference: City of Portland Datum
Relative Ground Surface Elevation: Approximately 35.50 Feet
Well Completed: 5/1/02
Casing Elevation: 35.13 Feet
Boring Method: 5.0" Tri-cone Air Rotary from 0.0-101.0', 6.0" ODEX Percussion Button Bit w/Under-reamer from 101.0-119.4'
Borehole Diameter: 6.0"

Depth (feet)	SOIL DESCRIPTION	Sample Number	Sample Type	Blow Counts	Volatile Readings (ppm)	Ground Water	AS-BUILT DESIGN	ANALYSES
90	GRAVELLY SAND (SP) interbedded with SANDY GRAVEL (GW); sand content increases below 90.5 feet. Discharge water gray-brown, approximately 75-100 gpm.						Bentonite Grout with 30% Solids (Wt = 10.3 lbs/gal, Ratio - 50 gal water : 100 lbs grout per batch mixed) Total Bentonite Grout used = 650 gallons	
95							Casing (2-inch ID, Schedule 40 PVC)	
100	Trip-out 5.0-inch tri-cone bit, replace with 5.0-inch ODEX under-reamer percussion button bit at 101.0 feet. Difficulty getting ODEX bit to "kick out" below bottom of 6.0-inch casing, sand and gravel binding bit.							
105	Resumed drilling on 4/29/02. Had 7.0 feet of SAND/GRAVEL heave up inside 6.0-inch casing - ream out. Discharge water changes to reddish brown at 108.0 feet.							
110	Contact into BASALT at 108.5-109.0 feet. BASALT, massive, hard to very hard, slightly to moderately weathered, reddish brown, fractured, some Fe/Mn oxidation coating fracture surfaces. Pumped approximately 100-125 gallons water prior to collecting discrete groundwater sample (060-01@1330 on 4/29/02) using inflatable packer/ submersible pump system. Bottom of pump at 108.0 feet below ground surface.						20/40 Colorado Silica Sand (Transition Layer)	RPAC SUITE-II
115	Discharge water production decreases below 112.0 feet. Basalt grades to dark gray and discharge water changes to gray-brown at 114.0-115.5 feet. Basalt grades to reddish brown and discharge water changes to reddish brown at 115.5 feet.						10/20 Colorado Silica Sand	
							Screen (2.0-inch ID Schedule 40 PVC Prepack with 10/20 Colorado Silica Sand with 0.010-inch slots)	RPAC SUITE-I
120	Total depth = 119.4 feet.						Threaded End Cap	

LEGEND

- WD — Encountered groundwater level while drilling
- SW — Static groundwater level measured on 5/3/02
- RPAC SUITE-I — Groundwater Analysis (8260B, 8041, 8151A, 8290, 6020 Total & Dissolved Metals, NAP) Groundwater sample collected on 5/3/02
- RPAC SUITE-II — Groundwater Analysis (8260B, 8041, 8151A, 8290, 6020 Total & Dissolved Metals, 8081A) Groundwater sample collected on 4/29/02

PROJECT NUMBER: 0-61M-10703-0 T43

RPAC
Portland, Oregon

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Portland, Oregon 97224
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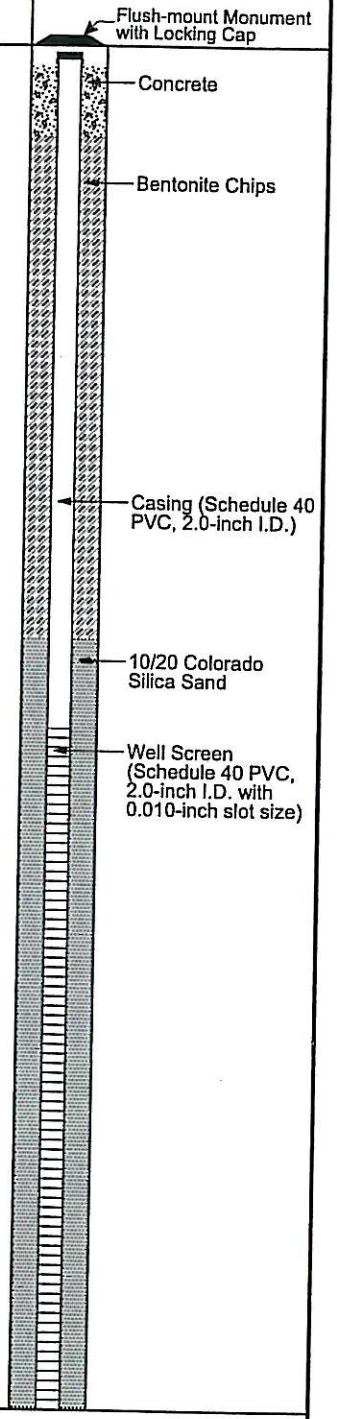
Drilling Started: 4/24/02 Drilling Completed: 5/1/02 Logged By: S. Bourcy \10703\RP7119P4.DRW

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING
0			Refer to boring RP-11-216 for lithology between 0 to 12 ft bgs.					
10		SM	Medium dense, gray, silty, fine SAND; wet. Strong petroleum-like odor.			1.3		
15			With wood debris from 17-18 ft bgs.			0.0		
20						0.0		
25			With slight sheen.			0.0		041-01
30						0.0		



WELL SCHEMATIC

BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Cascade Drilling
LOGGED BY: C. Johnson

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
START CARD/TAG ID: 183227/L76297
DRILLING DATES: 12/02/2005 - 12/02/2005

REMARKS:

ENVR+WELL BORING 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/7/06

RP - Portland
Stage 1 SCE

0-61M-107030 P69

AMEC
7376 SW Durham Road
Portland, Oregon
USA 97224
Tel (503) 639-3400
Fax (503) 620-7892

LOG OF BORING RP-11-30

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
30		ML	Medium stiff, brown mottled with orange and gray, fine, sandy SILT; wet.			0.0			Threaded End Cap
						0.0			Bentonite Chips
35						0.0			
						0.0			
						0.0			
40			Total depth drilled = 40 ft bgs.			0.0			
45									
50									
55									
60									

BORING METHOD: Sonic

BOREHOLE DIAMETER: 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Cascade Drilling

LOGGED BY: C. Johnson

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

START CARD/TAG ID: 183227/L76297

DRILLING DATES: 12/02/2005 - 12/02/2005

REMARKS:

RP - Portland
Stage 1 SCE

0-61M-107030 P69

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LOG OF BORING
RP-11-30

ENVR+WELL BORING 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/7/06

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
0			Refer to boring RP-11-216 for lithology between 0 to 25 ft bgs.						Flush-mount Monument with Locking Cap
									Concrete
									Bentonite Chips
5									
									Casing (Schedule 40 PVC, 2.0-inch I.D.)
10									
									Bentonite Grout
15									
20									
25		SM	Medium dense, dark gray, silty, fine SAND with wood debris; wet.			0.0			
		ML	Medium stiff, brown mottled with orange, fine, sandy SILT; wet.						Step Down to 6.0-inch
30									

BORING METHOD: Sonic

BOREHOLE DIAMETER: 8.0 & 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Cascade Drilling

LOGGED BY: C. Johnson

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

START CARD/TAG ID: 183228/L76296

DRILLING DATES: 11/30/2005 - 12/01/2005

REMARKS:

Borehole diameter: 8-inch - 0 to 29 ft bgs. 6-inch - 29 to 160 ft bgs.

ENVR+WELL BORING 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/7/06

RP - Portland
Stage 1 SCE

0-61M-107030 P69

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LOG OF BORING RP-11-160

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
30			Refer to boring RP-11-216 for lithology between 30 to 150 ft bgs.			0.0			Bentonite Grout; Casing (Schedule 40 PVC, 2.0-inch I.D.)
35									
40									
45									
50									
55									
60									

BORING METHOD: Sonic

BOREHOLE DIAMETER: 8.0 & 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Cascade Drilling

LOGGED BY: C. Johnson

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

START CARD/TAG ID: 183228/L76296

DRILLING DATES: 11/30/2005 - 12/01/2005

REMARKS:

Borehole diameter: 8-inch - 0 to 29 ft bgs. 6-inch - 29 to 160 ft bgs.

ENVR+WELL BORING 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/7/06

RP - Portland
Stage 1 SCE

0-61M-107030 P69

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LOG OF BORING
RP-11-160

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
60			Refer to boring RP-11-216 for lithology between 30 to 150 ft bgs.						Bentonite Grout Casing (Schedule 40 PVC, 2.0-inch I.D.)
65									
70									
75									
80									
85									
90									

BORING METHOD: Sonic

BOREHOLE DIAMETER: 8.0 & 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Cascade Drilling

LOGGED BY: C. Johnson

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

START CARD/TAG ID: 183228/L76296

DRILLING DATES: 11/30/2005 - 12/01/2005

REMARKS:

Borehole diameter: 8-inch - 0 to 29 ft bgs. 6-inch - 29 to 160 ft bgs.

ENVR+WELL BORING 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/7/06

RP - Portland
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LOG OF BORING
RP-11-160

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
90			Refer to boring RP-11-216 for lithology between 30 to 150 ft bgs.						Bentonite Grout Casing (Schedule 40 PVC, 2.0-inch I.D.)
95									
100									
105									
110									
115									
120									

BORING METHOD: Sonic

BOREHOLE DIAMETER: 8.0 & 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Cascade Drilling

LOGGED BY: C. Johnson

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

START CARD/TAG ID: 183228/L76296

DRILLING DATES: 11/30/2005 - 12/01/2005

REMARKS:

Borehole diameter: 8-inch - 0 to 29 ft bgs. 6-inch - 29 to 160 ft bgs.

ENVR+WELL BORING 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/7/06

RP - Portland
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LOG OF BORING
RP-11-160

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
120			Refer to boring RP-11-216 for lithology between 30 to 150 ft bgs.						Bentonite Grout Casing (Schedule 40 PVC, 2.0-inch I.D.) 20/40 Colorado Silica Sand 10/20 Colorado Silica Sand
125									
130									
135									
140									
145									
150									

BORING METHOD: Sonic

BOREHOLE DIAMETER: 8.0 & 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Cascade Drilling

LOGGED BY: C. Johnson

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

START CARD/TAG ID: 183228/L76296

DRILLING DATES: 11/30/2005 - 12/01/2005

REMARKS:

Borehole diameter: 8-inch - 0 to 29 ft bgs. 6-inch - 29 to 160 ft bgs.

ENVR+WELL BORING 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/7/06

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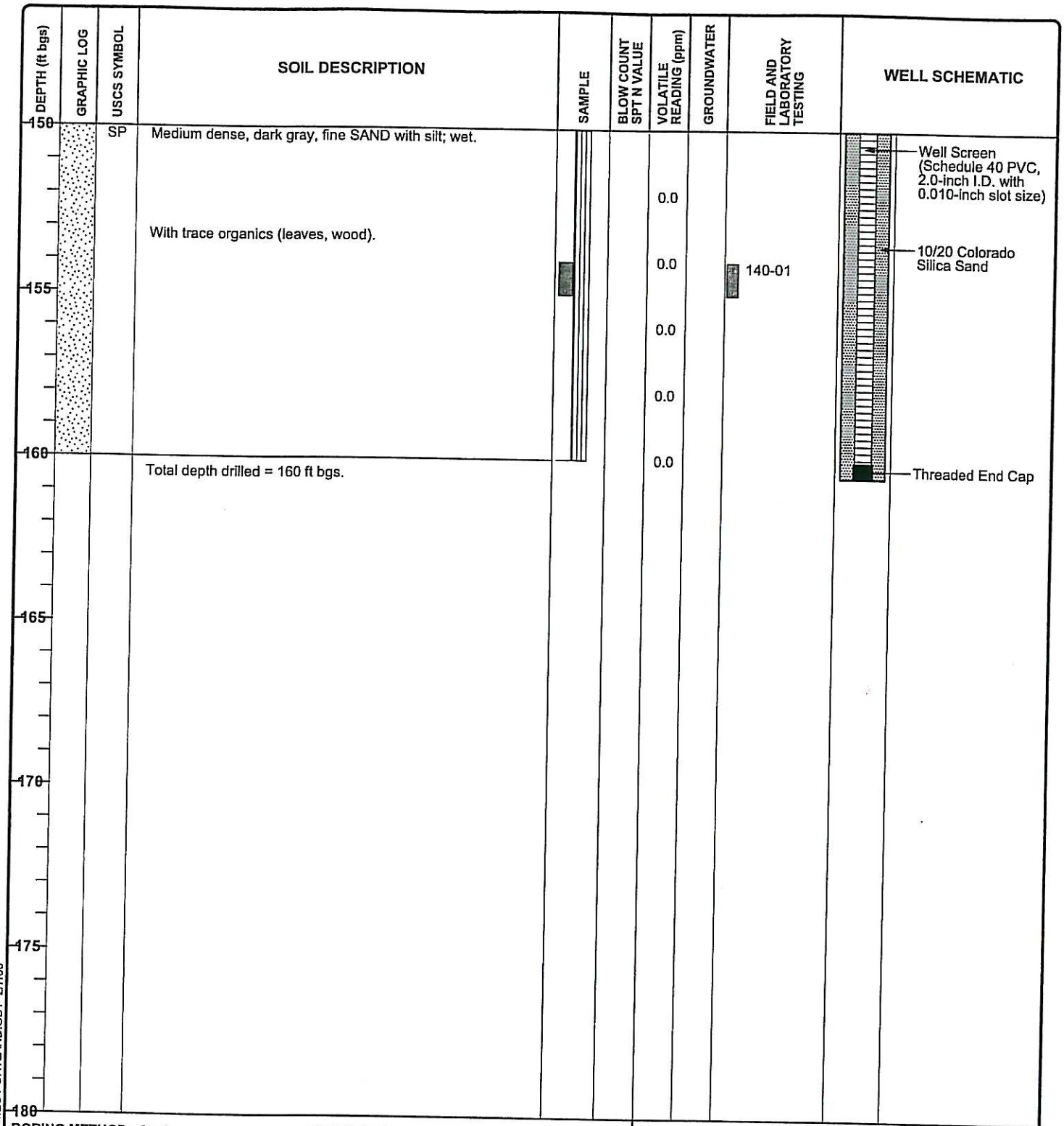
LOG OF BORING
RP-11-160



BORING METHOD: Sonic

BOREHOLE DIAMETER: 8.0 & 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Cascade Drilling

LOGGED BY: C. Johnson

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

START CARD/TAG ID: 183228/L76296

DRILLING DATES: 11/30/2005 - 12/01/2005

REMARKS:

Borehole diameter: 8-inch - 0 to 29 ft bgs. 6-inch - 29 to 160 ft bgs.

ENVR+WELL BORING 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/7/06

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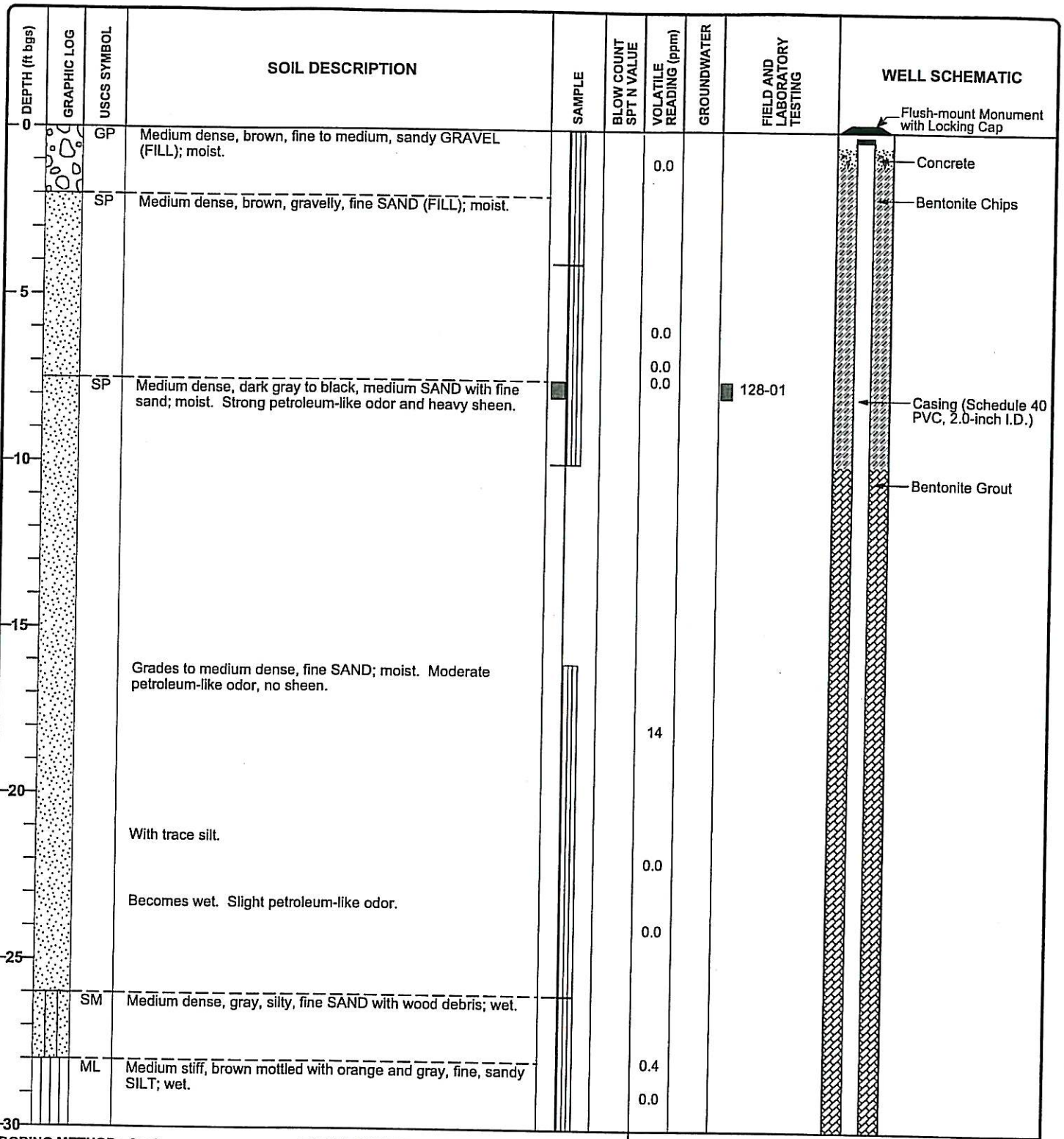
LOG OF BORING
RP-11-160



BORING METHOD: Sonic

BOREHOLE DIAMETER: 8.0 & 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Cascade Drilling

LOGGED BY: C. Johnson

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

START CARD/TAG ID: 183229/L76278

DRILLING DATES: 11/17/2005 - 11/29/2005

REMARKS:

Borehole diameter: 8-inch - 0 to 30 ft bgs. 6-inch - 30 to 216 ft bgs.

RP - Portland
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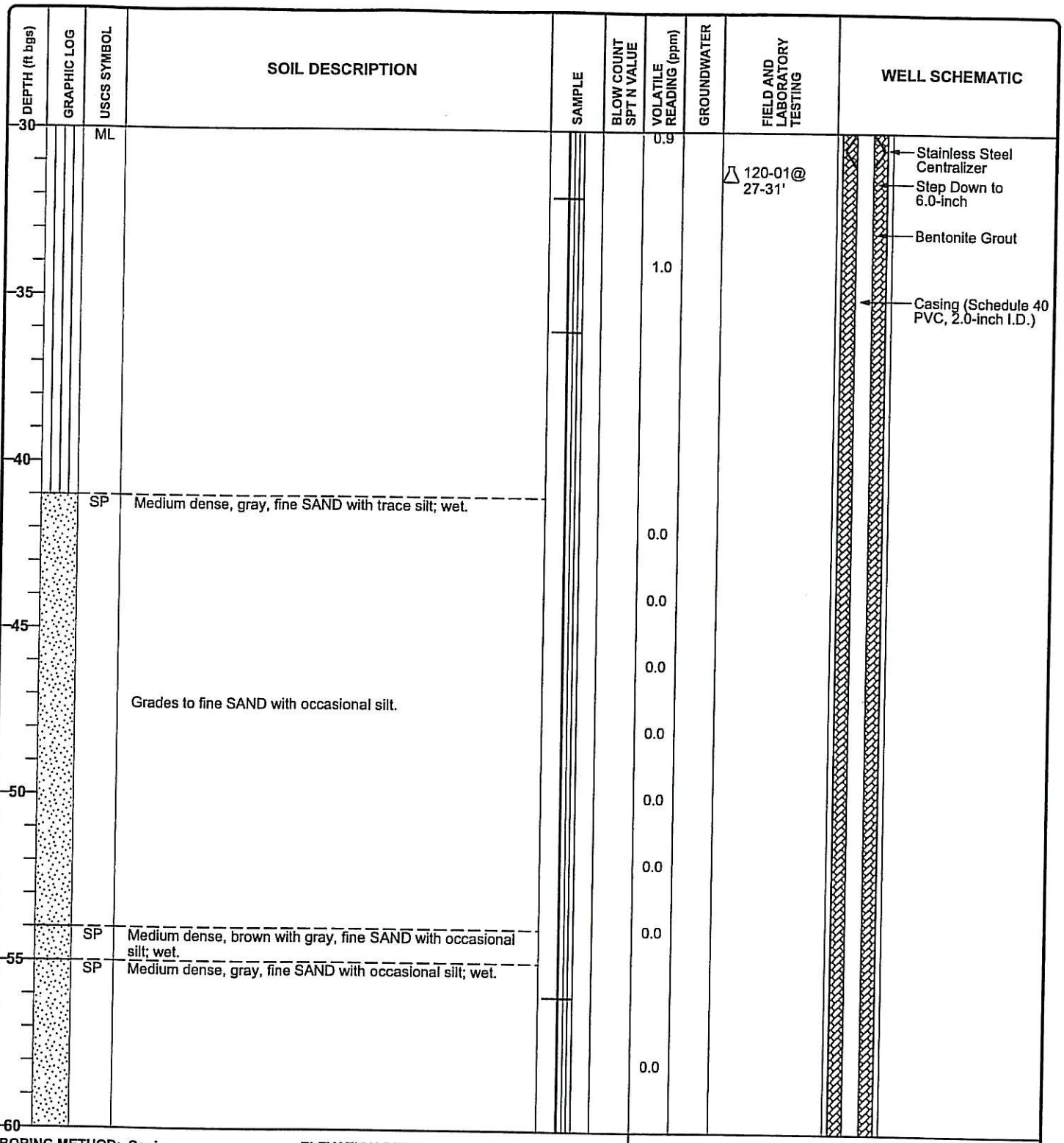
LOG OF BORING
RP-11-216

ENVR+WELL BORING 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/7/06



BORING METHOD: Sonic

BOREHOLE DIAMETER: 8.0 & 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Cascade Drilling

LOGGED BY: C. Johnson

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

START CARD/TAG ID: 183229/L76278

DRILLING DATES: 11/17/2005 - 11/29/2005

REMARKS:

Borehole diameter: 8-inch - 0 to 30 ft bgs. 6-inch - 30 to 216 ft bgs.

ENVR+WELL BORING 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/7/06

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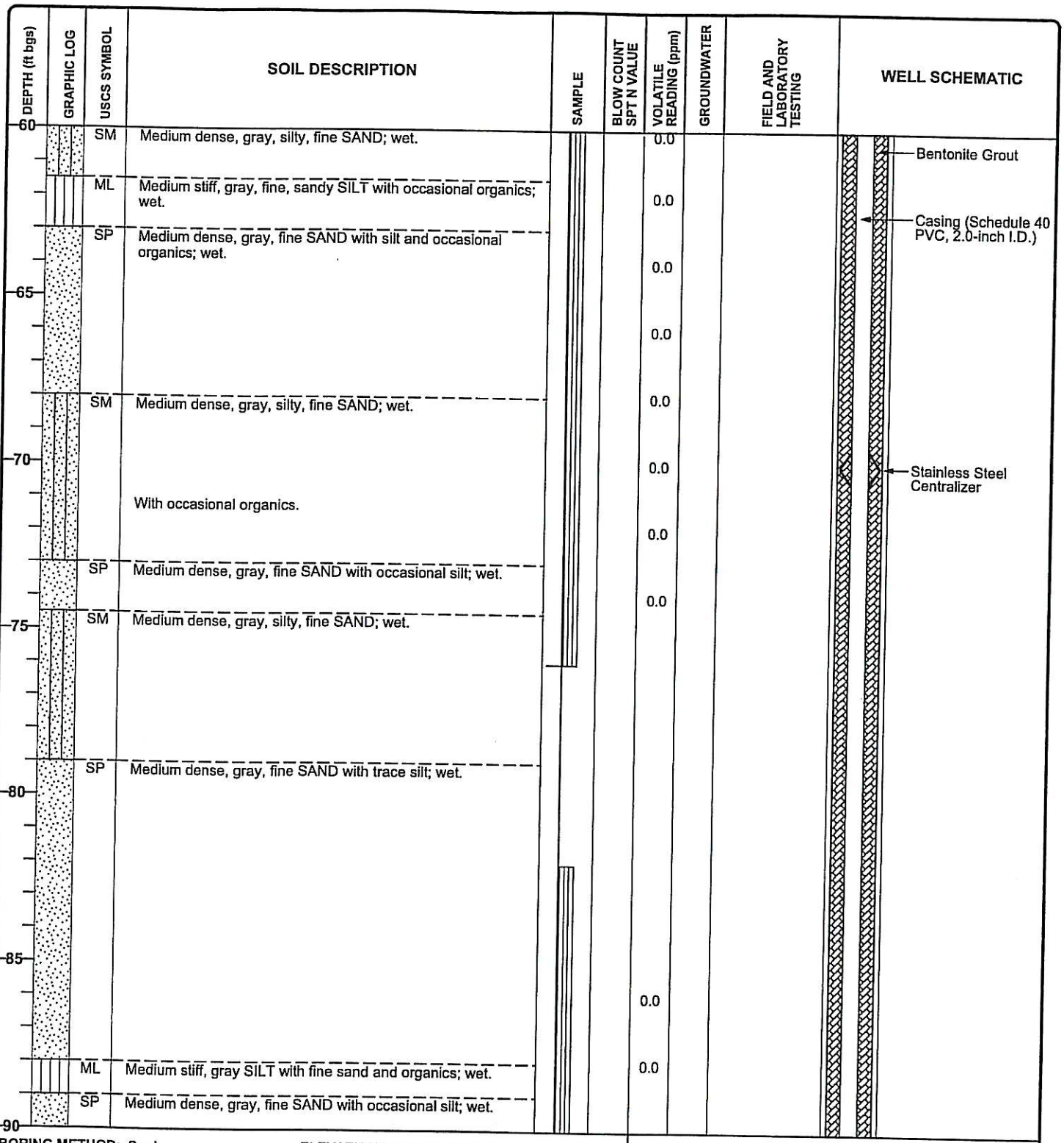

BORING METHOD: Sonic

BOREHOLE DIAMETER: 8.0 & 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Cascade Drilling

LOGGED BY: C. Johnson

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

START CARD/TAG ID: 183229/L76278

DRILLING DATES: 11/17/2005 - 11/29/2005

REMARKS:

Borehole diameter: 8-inch - 0 to 30 ft bgs. 6-inch - 30 to 216 ft bgs.

ENVR+WELL BORING 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/7/06

RP - Portland
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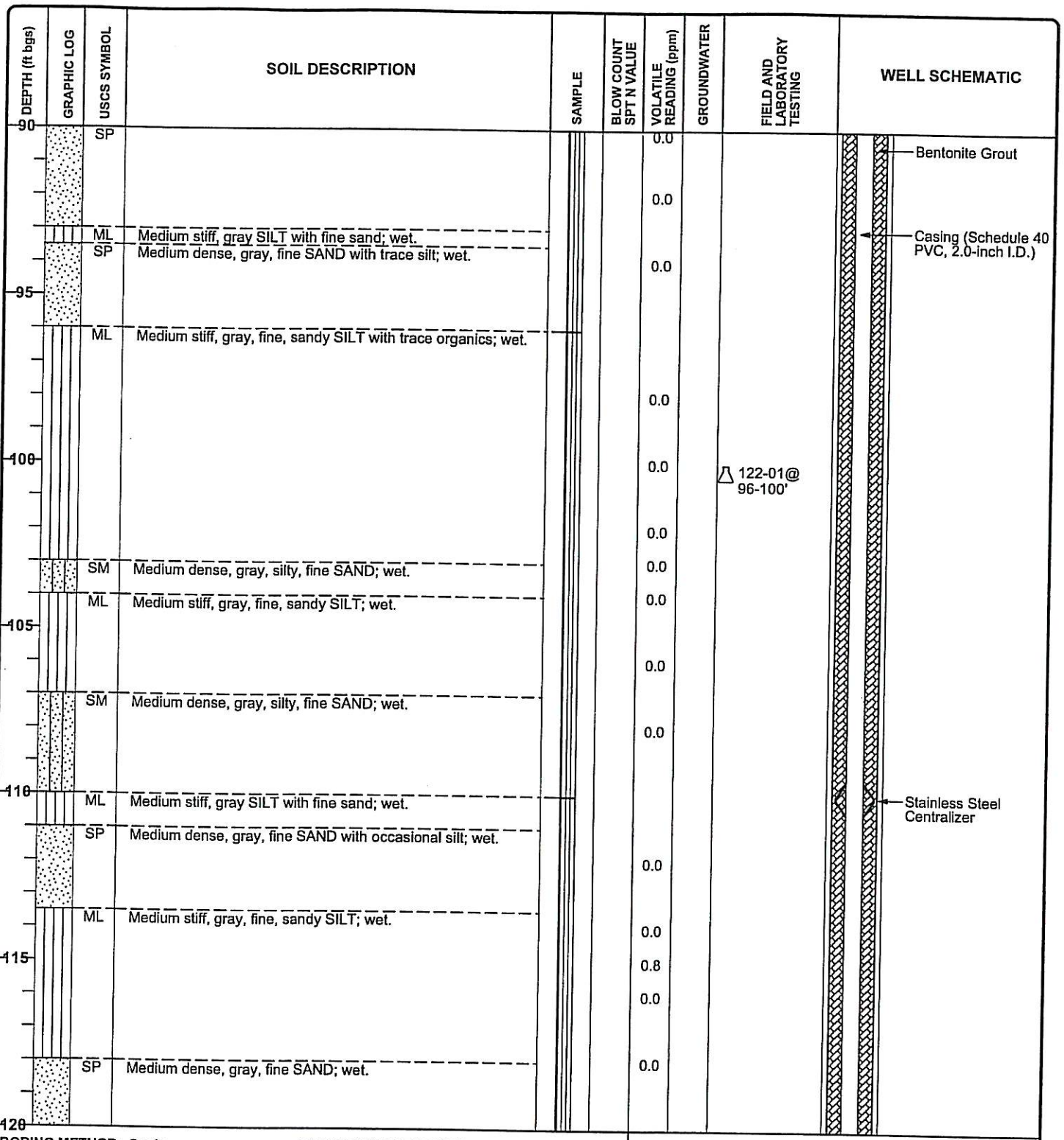
LOG OF BORING
RP-11-216



BORING METHOD: Sonic

BOREHOLE DIAMETER: 8.0 & 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Cascade Drilling

LOGGED BY: C. Johnson

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

START CARD/TAG ID: 183229/L76278

DRILLING DATES: 11/17/2005 - 11/29/2005

REMARKS:

Borehole diameter: 8-inch - 0 to 30 ft bgs. 6-inch - 30 to 216 ft bgs.

ENVR+WELL BORING 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/7/06

RP - Portland
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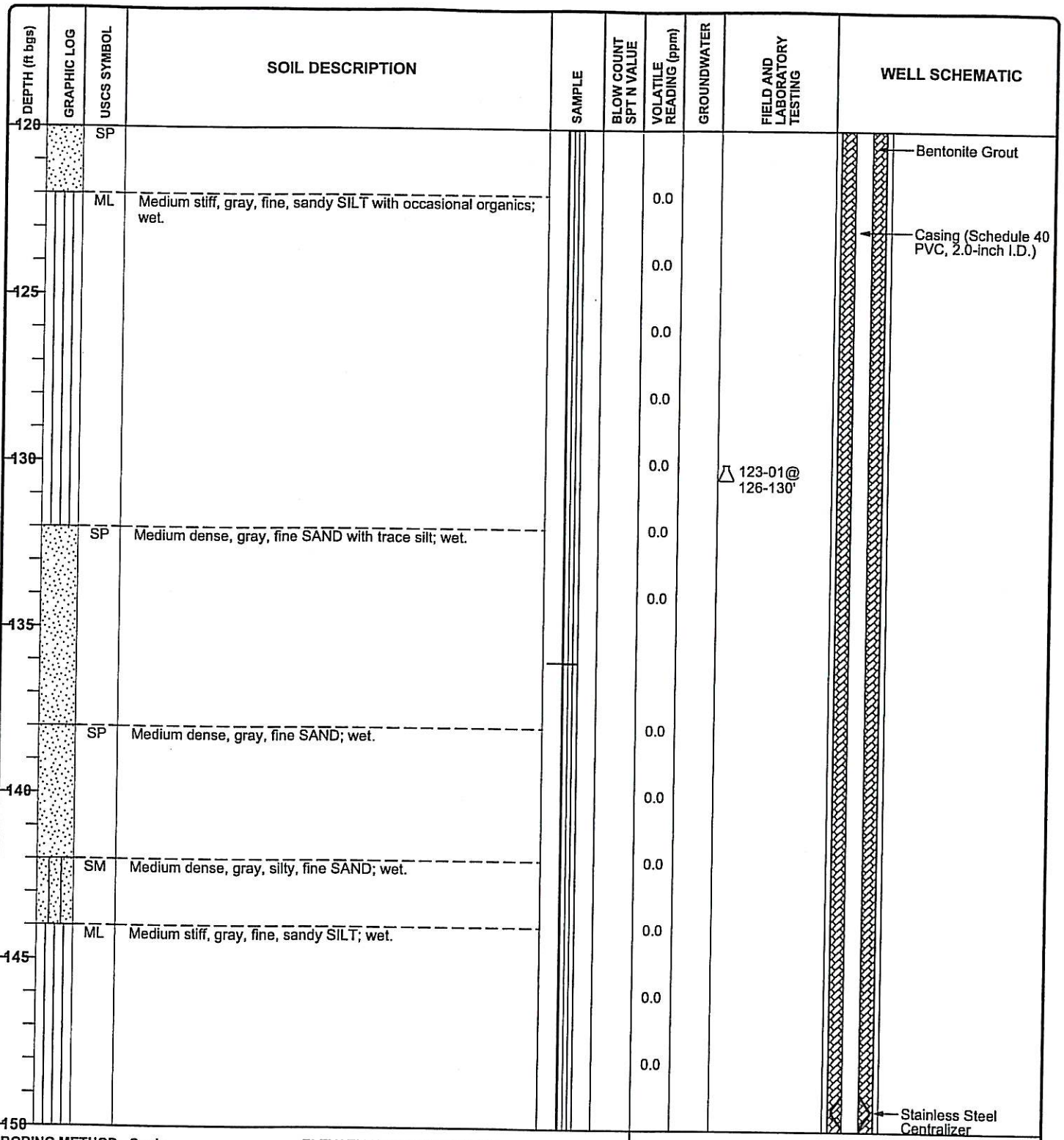
LOG OF BORING RP-11-216



BORING METHOD: Sonic

BOREHOLE DIAMETER: 8.0 & 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Cascade Drilling

LOGGED BY: C. Johnson

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

START CARD/TAG ID: 183229/L76278

DRILLING DATES: 11/17/2005 - 11/29/2005

REMARKS:

Borehole diameter: 8-inch - 0 to 30 ft bgs. 6-inch - 30 to 216 ft bgs.

ENVR+WELL BORING 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/7/06

RP - Portland
Stage 1 SCE

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LOG OF BORING
RP-11-216

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
150		ML				0.0			Bentonite Grout
						0.0		124-01@ 148-152'	
		SP	Medium dense, gray, fine SAND with trace silt; wet.			0.0			Casing (Schedule 40 PVC, 2.0-inch I.D.)
155		SM	Medium dense, gray, silty, fine SAND; wet.			0.0			
160		SP	Medium dense, gray, fine SAND with silt and organic debris (leaves, roots); wet.			0.0			
		ML	Medium stiff, gray SILT with fine sand; wet.			0.0			
		SP	Medium dense, gray, fine SAND with silt; wet.						
		SM	Dense, gray, silty, fine SAND with organics (roots, leaves, wood); wet.			0.0			
165						0.0			
170						0.0			
						0.0			
175		SP	Medium dense, gray, fine SAND with trace silt; wet.			0.0			
180									

BORING METHOD: Sonic

BOREHOLE DIAMETER: 8.0 & 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Cascade Drilling

LOGGED BY: C. Johnson

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

START CARD/TAG ID: 183229/L76278

DRILLING DATES: 11/17/2005 - 11/29/2005

REMARKS:

Borehole diameter: 8-inch - 0 to 30 ft bgs. 6-inch - 30 to 216 ft bgs.

ENVR+WELL BORING 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/7/06

RP - Portland
Stage 1 SCE

0-61M-107030 P69

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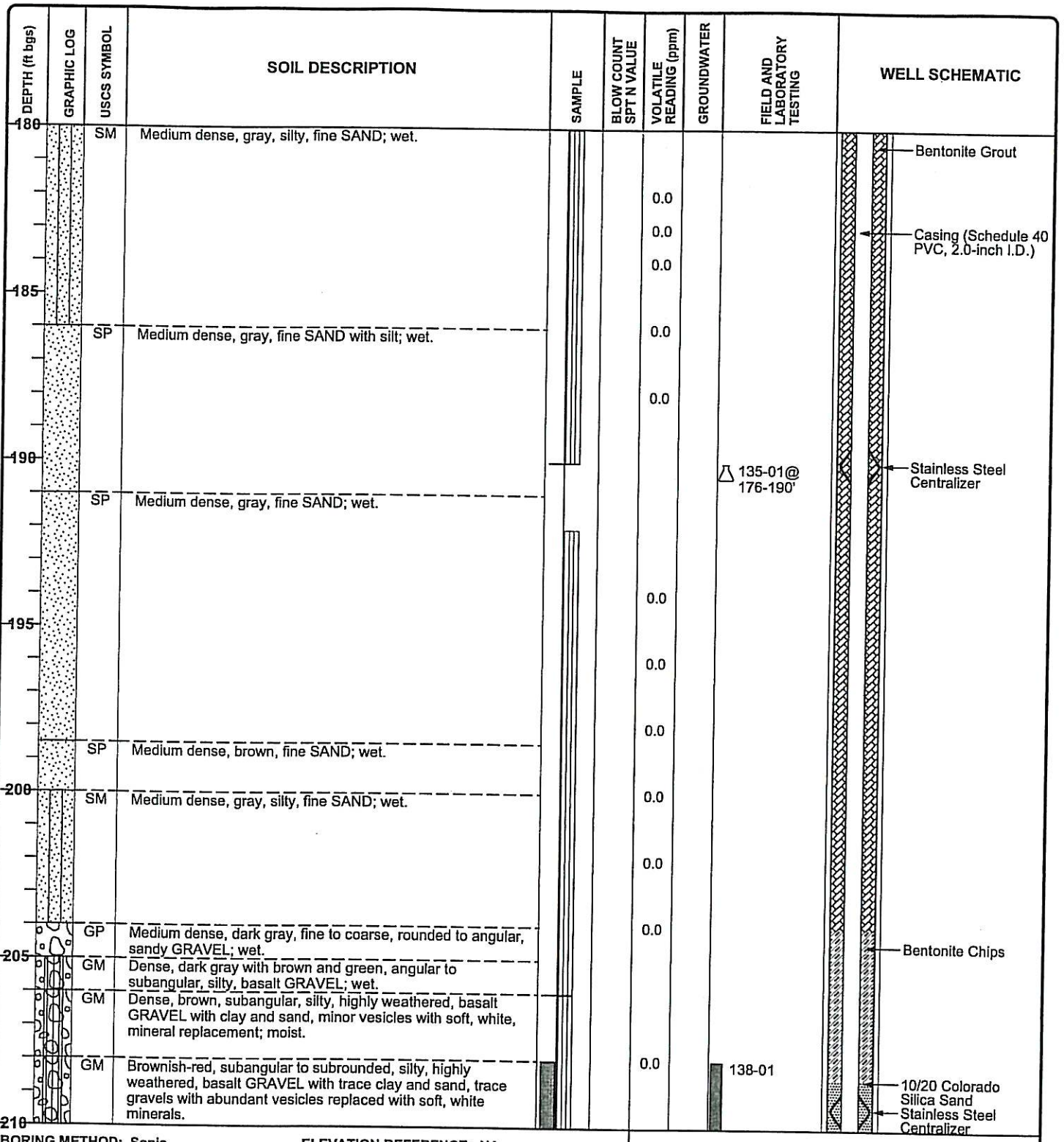
LOG OF BORING
RP-11-216



BORING METHOD: Sonic
BOREHOLE DIAMETER: 8.0 & 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Cascade Drilling
LOGGED BY: C. Johnson

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
START CARD/TAG ID: 183229/L76278
DRILLING DATES: 11/17/2005 - 11/29/2005

REMARKS:
Borehole diameter: 8-inch - 0 to 30 ft bgs. 6-inch - 30 to 216 ft bgs.

ENVR+WELL BORING 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/7/06

RP - Portland
Stage 1 SCE

0-61M-107030 P69

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LOG OF BORING RP-11-216

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
210		ML	Very stiff, grayish red, gravelly SILT with trace clay and sand, subrounded, highly weathered, basalt gravel; wet.			0.0			Well Screen (Schedule 40 PVC, 2.0-inch I.D. with 0.010-inch slot size)
						0.0			
		GM	Dense, gray, angular to subangular, silty, slightly weathered, basalt GRAVEL with fine sand and trace clay; wet.			0.0			
215									
			Total depth drilled = 216 ft bgs.			0.0		139-01@ 210-216'	Threaded End Cap
220									
225									
230									
235									
240									

BORING METHOD: Sonic

BOREHOLE DIAMETER: 8.0 & 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Cascade Drilling

LOGGED BY: C. Johnson

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

START CARD/TAG ID: 183229/L76278

DRILLING DATES: 11/17/2005 - 11/29/2005

REMARKS:

Borehole diameter: 8-inch - 0 to 30 ft bgs. 6-inch - 30 to 216 ft bgs.

ENVR+WELL BORING 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/7/06

RP - Portland
Stage 1 SCE

0-61M-107030 P69

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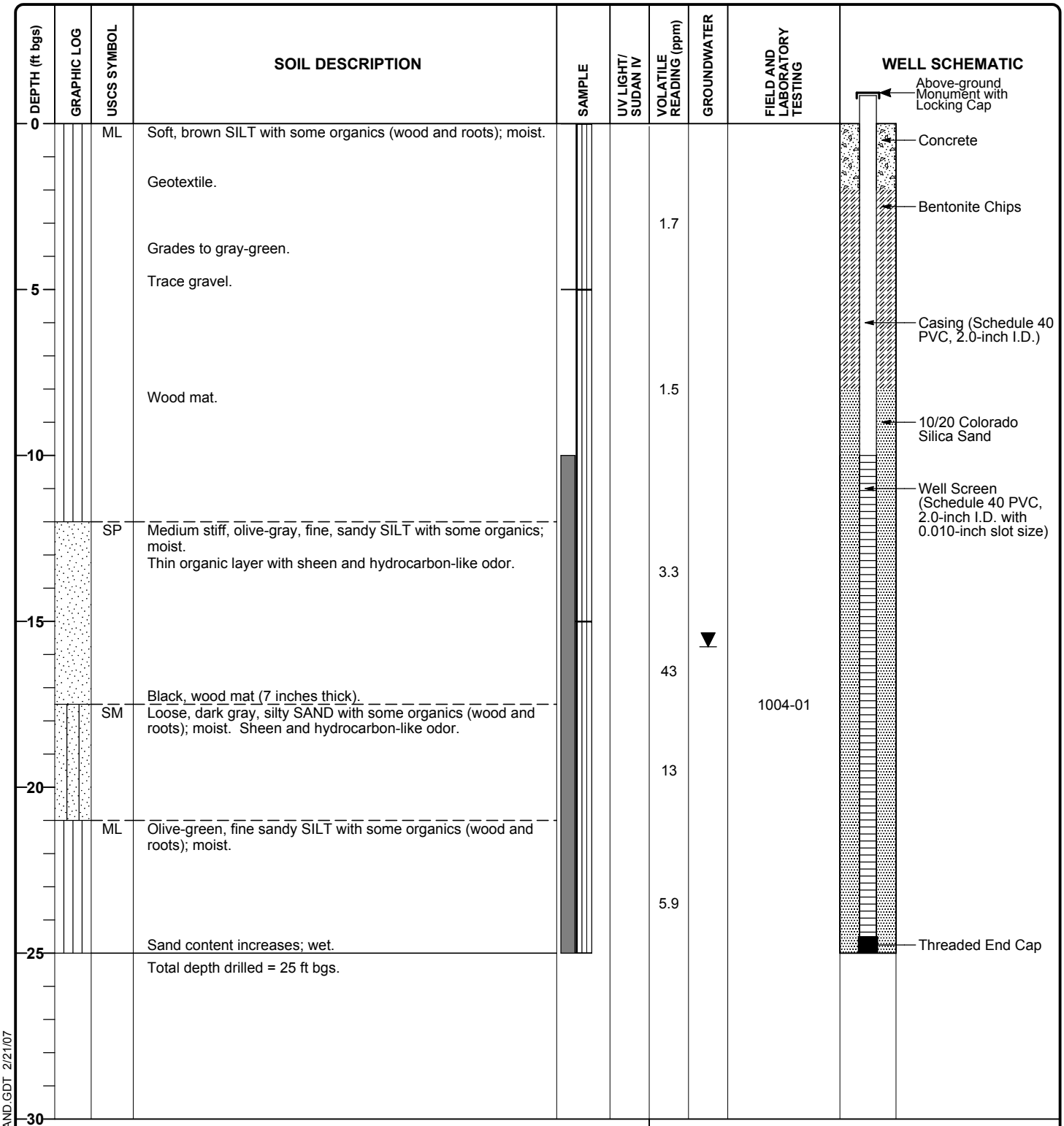
LOG OF BORING
RP-11-216



BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 37.11 feet
CASING ELEVATION: 39.70 feet
START CARD/TAG ID: 186831/L83978
DRILLING DATES: 10/10/2006 - 10/10/2006

REMARKS:

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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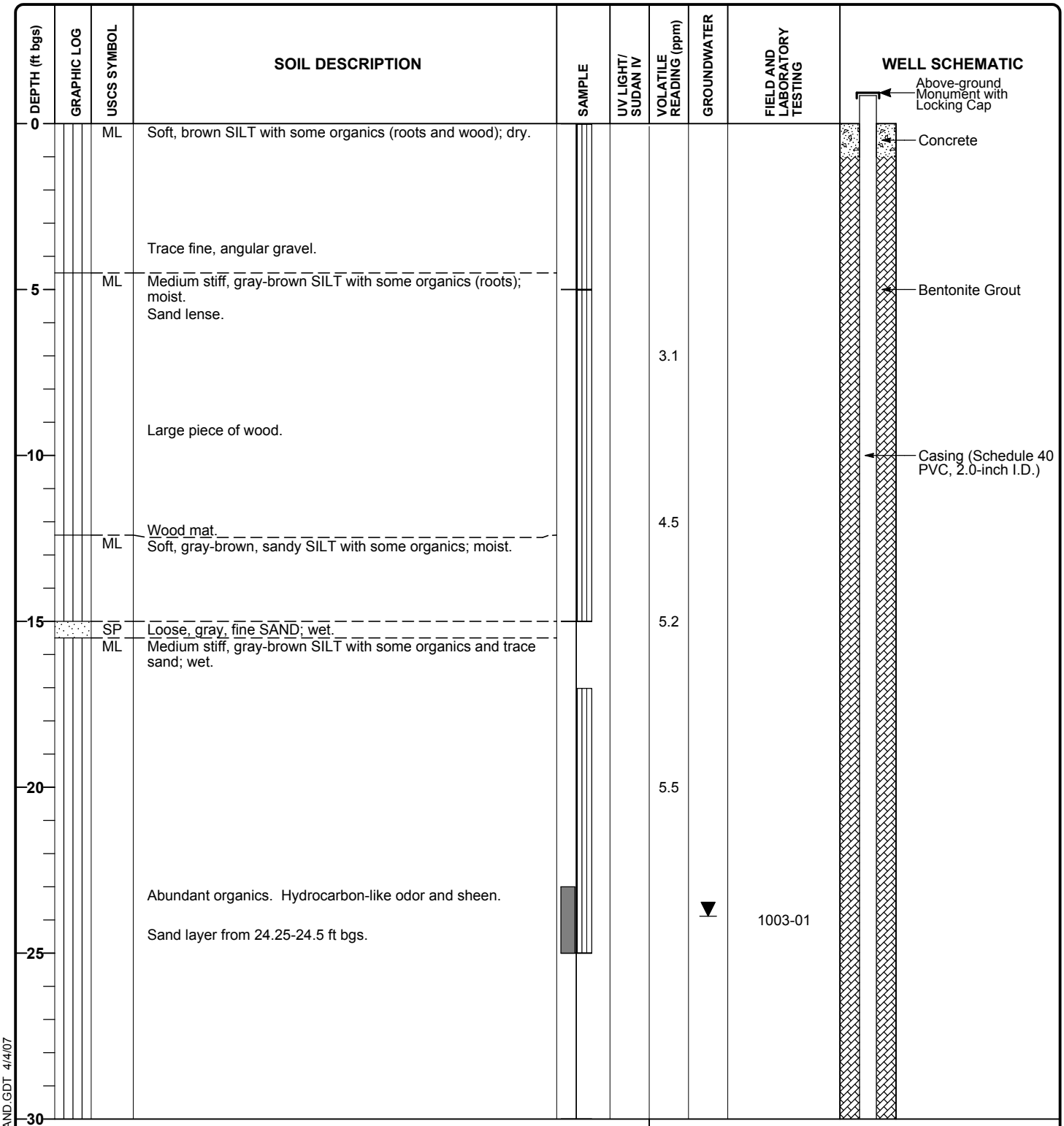
LOG OF BORING RP-20-25



BORING METHOD: Sonic
BOREHOLE DIAMETER: 8.0 & 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 37.25 feet
CASING ELEVATION: 39.30 feet
START CARD/TAG ID: 186830/L83977
DRILLING DATES: 10/06/2006 - 10/09/2006

REMARKS:
Borehole diameter: 8-inch - 0 to 30 ft bgs. 6-inch - 30 to 97 ft bgs.

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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LOG OF BORING RP-20-97

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 4/4/07

DEPTH (ft bgs)	USCS SYMBOL	SOIL DESCRIPTION	VOLATILE READING (ppm)
30	ML	Brown, no sand.	
			1.0
35		Grades to gray-green.	
		Trace fine sand; wet.	
			2.6
40		Moist.	
			3.1
45		Pieces of wood.	
	MH	Soft, gray-green, highly plastic SILT with trace clay, organics; wet.	3.8
50	ML	Stiff, green-gray SILT with trace clay, organics; moist to dry.	
			3.7
55			
		Slightly moist.	4.2
60			

WELL SCHEMATIC: Bentonite Grout; Casing (Schedule 40 PVC, 2.0-inch I.D.)

BORING METHOD: Sonic
BOREHOLE DIAMETER: 8.0 & 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 37.25 feet
CASING ELEVATION: 39.30 feet
START CARD/TAG ID: 186830/L83977
DRILLING DATES: 10/06/2006 - 10/09/2006

REMARKS:
Borehole diameter: 8-inch - 0 to 30 ft bgs. 6-inch - 30 to 97 ft bgs.

RP - Portland
Stage 2 SCE

0-61M-107030 P69

AMEC
7376 SW Durham Road
Portland, Oregon
USA 97224
Tel (503) 639-3400
Fax (503) 620-7892

LOG OF BORING RP-20-97

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 4/4/07

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	UV LIGHT/ SUDAN IV	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
60		SM	Medium dense, gray-green, fine, silty SAND, micaceous; wet.						Bentonite Grout
			Grades to brown.			4.2			Casing (Schedule 40 PVC, 2.0-inch I.D.)
65									
			Silt layer.			3.5			
70									
						4.5			
75			Interbedded silt layers.						
						4.0			
80									
						4.8			
85									20/40 Colorado Silica Sand
						4.5			10/20 Colorado Silica Sand
									Well Screen (Schedule 40 PVC, 2.0-inch I.D. with 0.010-inch slot size)
90								1038-01	

BORING METHOD: Sonic
BOREHOLE DIAMETER: 8.0 & 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 37.25 feet
CASING ELEVATION: 39.30 feet
START CARD/TAG ID: 186830/L83977
DRILLING DATES: 10/06/2006 - 10/09/2006

REMARKS:
Borehole diameter: 8-inch - 0 to 30 ft bgs. 6-inch - 30 to 97 ft bgs.

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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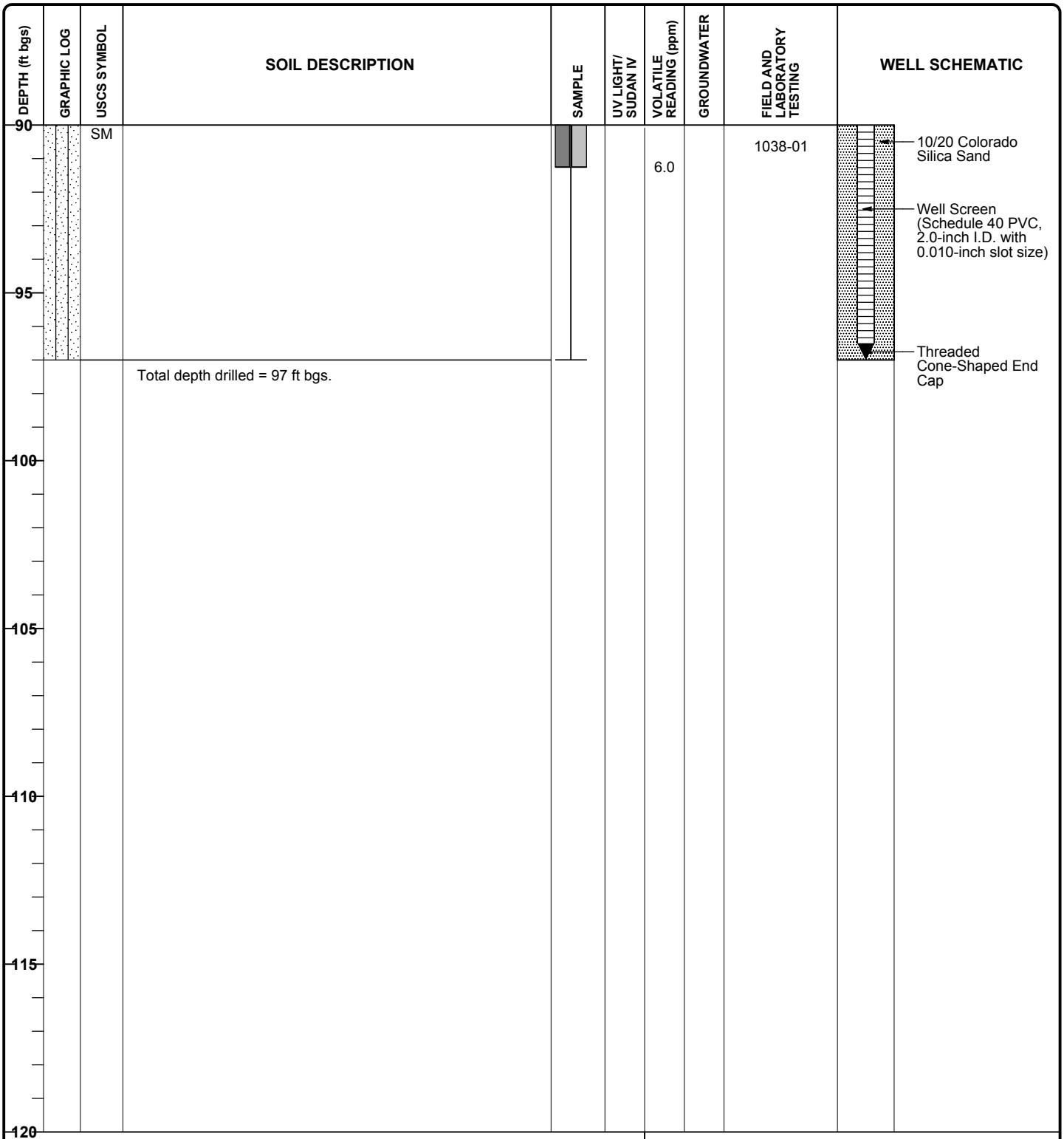
LOG OF BORING RP-20-97

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 4/4/07



BORING METHOD: Sonic

BOREHOLE DIAMETER: 8.0 & 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Boart Longyear

LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A

GROUND SURFACE ELEVATION: 37.25 feet

CASING ELEVATION: 39.30 feet

START CARD/TAG ID: 186830/L83977

DRILLING DATES: 10/06/2006 - 10/09/2006

REMARKS:

Borehole diameter: 8-inch - 0 to 30 ft bgs. 6-inch - 30 to 97 ft bgs.

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 4/4/07

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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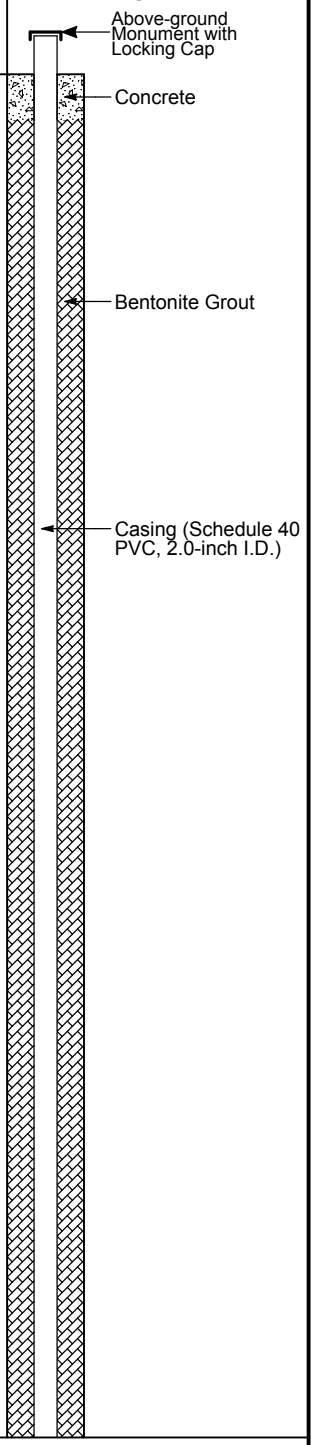
LOG OF BORING RP-20-97

DEPTH (ft bgs)	USCS SYMBOL	SOIL DESCRIPTION	VOLATILE READING (ppm)
0	ML	Soft, brown, sandy SILT with organics (roots); dry.	6.9
	ML	Soft, gray-green, sandy SILT with some organics (roots); moist.	
5		Rounded gravel with some silt (2-inch layer).	5.1
10			4.2
15	SP	Loose, gray, fine to medium SAND with silt lenses; moist.	
	ML	Medium stiff, gray SILT with some sand, organics (wood); moist.	11
20		Hydrocarbon-like odor and sheen.	48
		Abundant wood.	
	SP	Loose to medium dense, gray, fine SAND with some organics (wood).	7.1 ▼
25		Wood mat from 24.5-24.75 ft bgs.	
	ML	Medium stiff, brown to olive-gray SILT with trace sand, some organics (wood and roots); moist.	
30			

WELL SCHEMATIC



BORING METHOD: Sonic
BOREHOLE DIAMETER: 8.0 & 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 37.42 feet
CASING ELEVATION: 39.88 feet
START CARD/TAG ID: 186829/L83976
DRILLING DATES: 10/04/2006 - 10/06/2006

REMARKS:
Borehole diameter: 8-inch - 0 to 25 ft bgs. 6-inch - 25 to 110 ft bgs.

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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LOG OF BORING RP-20-110

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	UV LIGHT/ SUDAN IV	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
30		ML							Bentonite Grout
						2.3			Casing (Schedule 40 PVC, 2.0-inch I.D.)
35			Moist to wet.						
						3.2			
40			Hard SILT; moist (2-inch layer, almost rock-like).						
						2.7			
45									
						5.4			
			Rounded gravel (approximately 1.5-inch diameter).						
50			Grades to brown-gray, fine layers of wood mats.						
						4.1			
			Soft; wet.						
55									
						2.1			
		ML-SM	Medium stiff, brown, fine, sandy SILT, micaceous; wet.						
60									

BORING METHOD: Sonic
BOREHOLE DIAMETER: 8.0 & 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 37.42 feet
CASING ELEVATION: 39.88 feet
START CARD/TAG ID: 186829/L83976
DRILLING DATES: 10/04/2006 - 10/06/2006

REMARKS:
Borehole diameter: 8-inch - 0 to 25 ft bgs. 6-inch - 25 to 110 ft bgs.

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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LOG OF BORING RP-20-110

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	UV LIGHT/ SUDAN IV	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
60		ML-SM				2.4			Bentonite Grout; Casing (Schedule 40 PVC, 2.0-inch I.D.)
65						3.1			
70						3.7			
75									
		ML	Medium stiff, brown, sandy SILT with interbedded silt lenses, micaceous; wet.			1.8			
80						1.6			
85						5.4			
90									

BORING METHOD: Sonic

BOREHOLE DIAMETER: 8.0 & 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Boart Longyear

LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A

GROUND SURFACE ELEVATION: 37.42 feet

CASING ELEVATION: 39.88 feet

START CARD/TAG ID: 186829/L83976

DRILLING DATES: 10/04/2006 - 10/06/2006

REMARKS:

Borehole diameter: 8-inch - 0 to 25 ft bgs. 6-inch - 25 to 110 ft bgs.

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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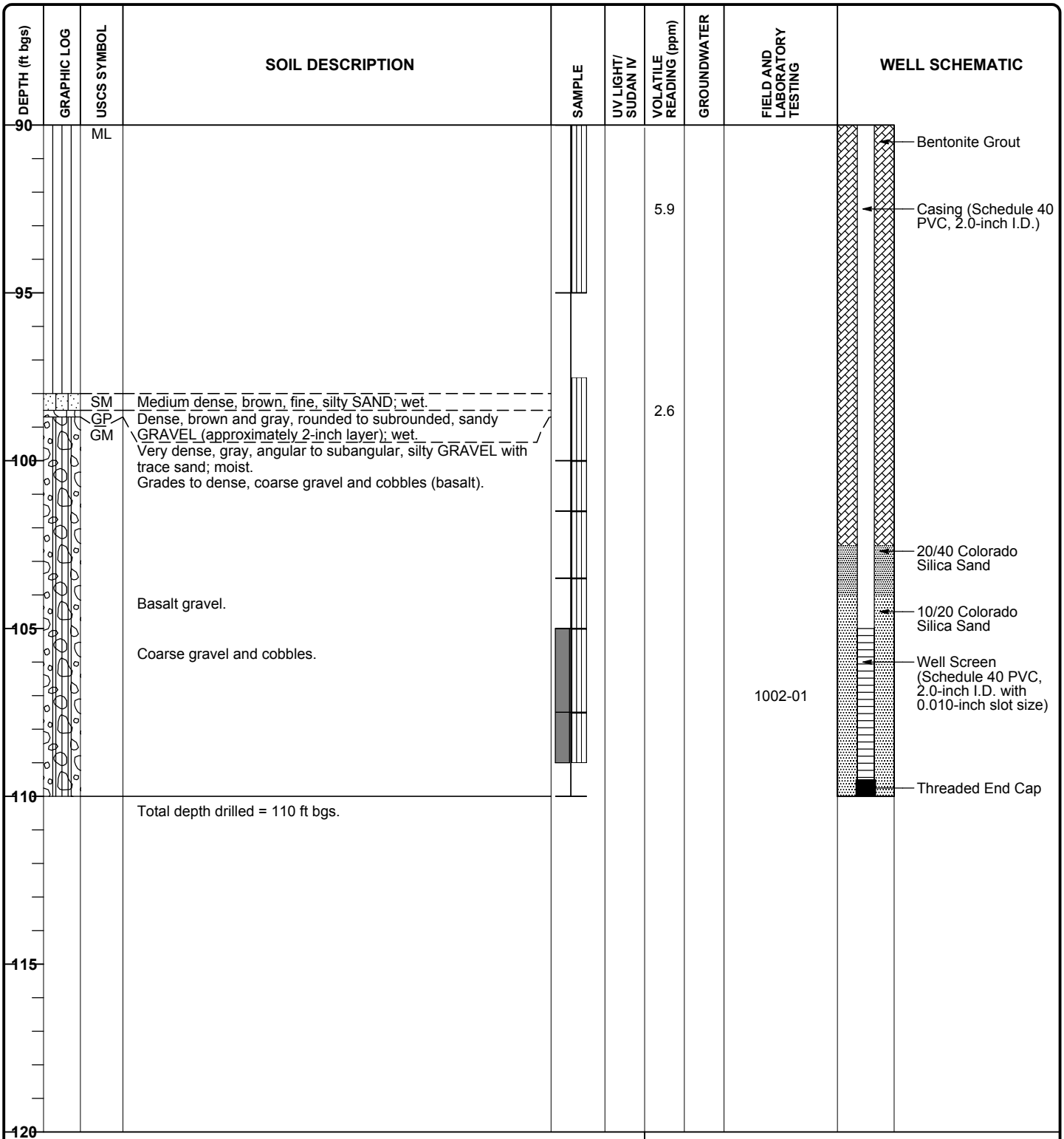
LOG OF BORING RP-20-110



BORING METHOD: Sonic
BOREHOLE DIAMETER: 8.0 & 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 37.42 feet
CASING ELEVATION: 39.88 feet
START CARD/TAG ID: 186829/L83976
DRILLING DATES: 10/04/2006 - 10/06/2006

REMARKS:
Borehole diameter: 8-inch - 0 to 25 ft bgs. 6-inch - 25 to 110 ft bgs.

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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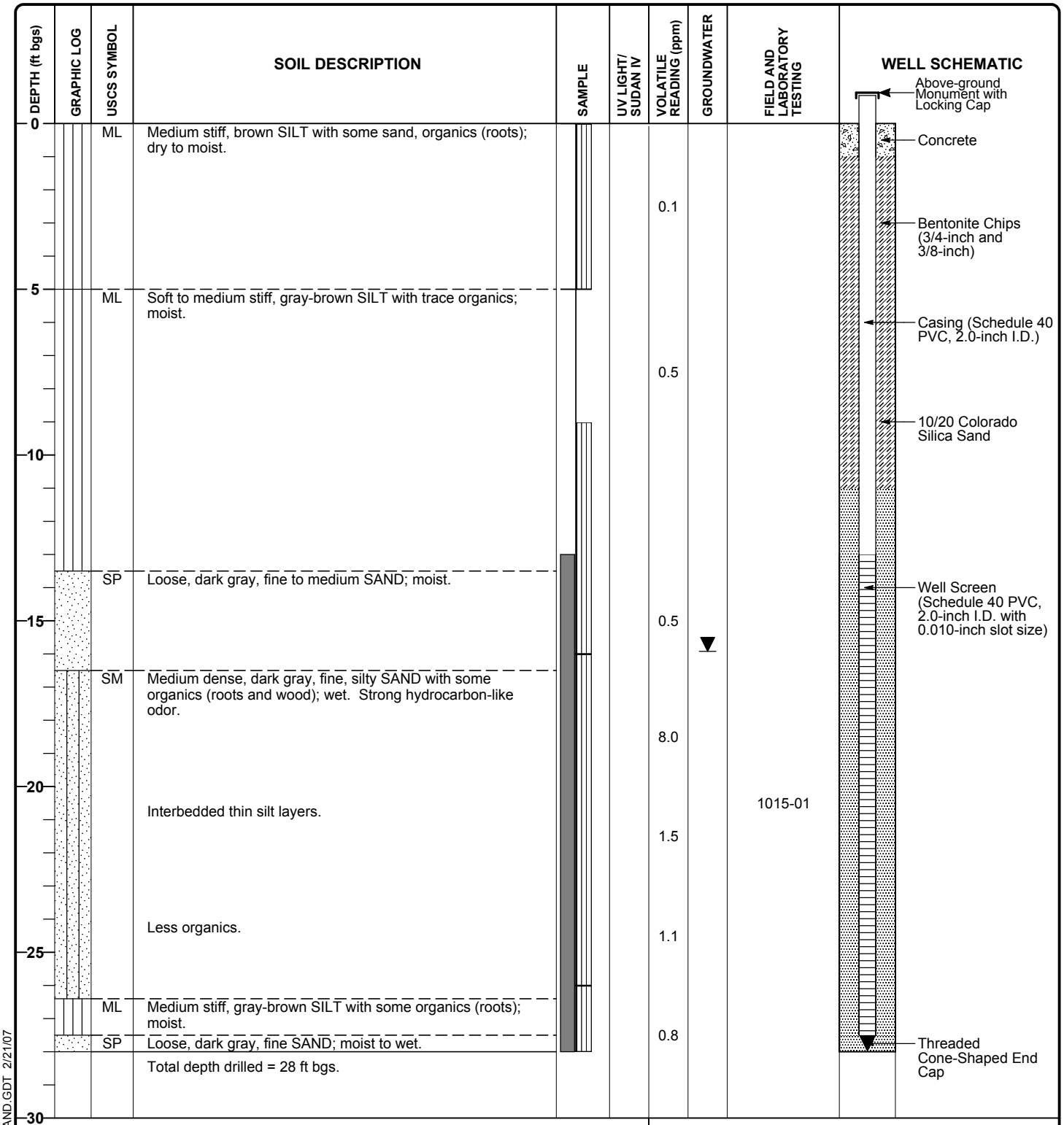
LOG OF BORING RP-20-110

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07



BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 34.47 feet
CASING ELEVATION: 37.14 feet
START CARD/TAG ID: 186841/L83988
DRILLING DATES: 10/25/2006 - 10/25/2006

REMARKS:

RP - Portland
Stage 2 SCE

0-61M-107030 P69

AMEC
7376 SW Durham Road
Portland, Oregon
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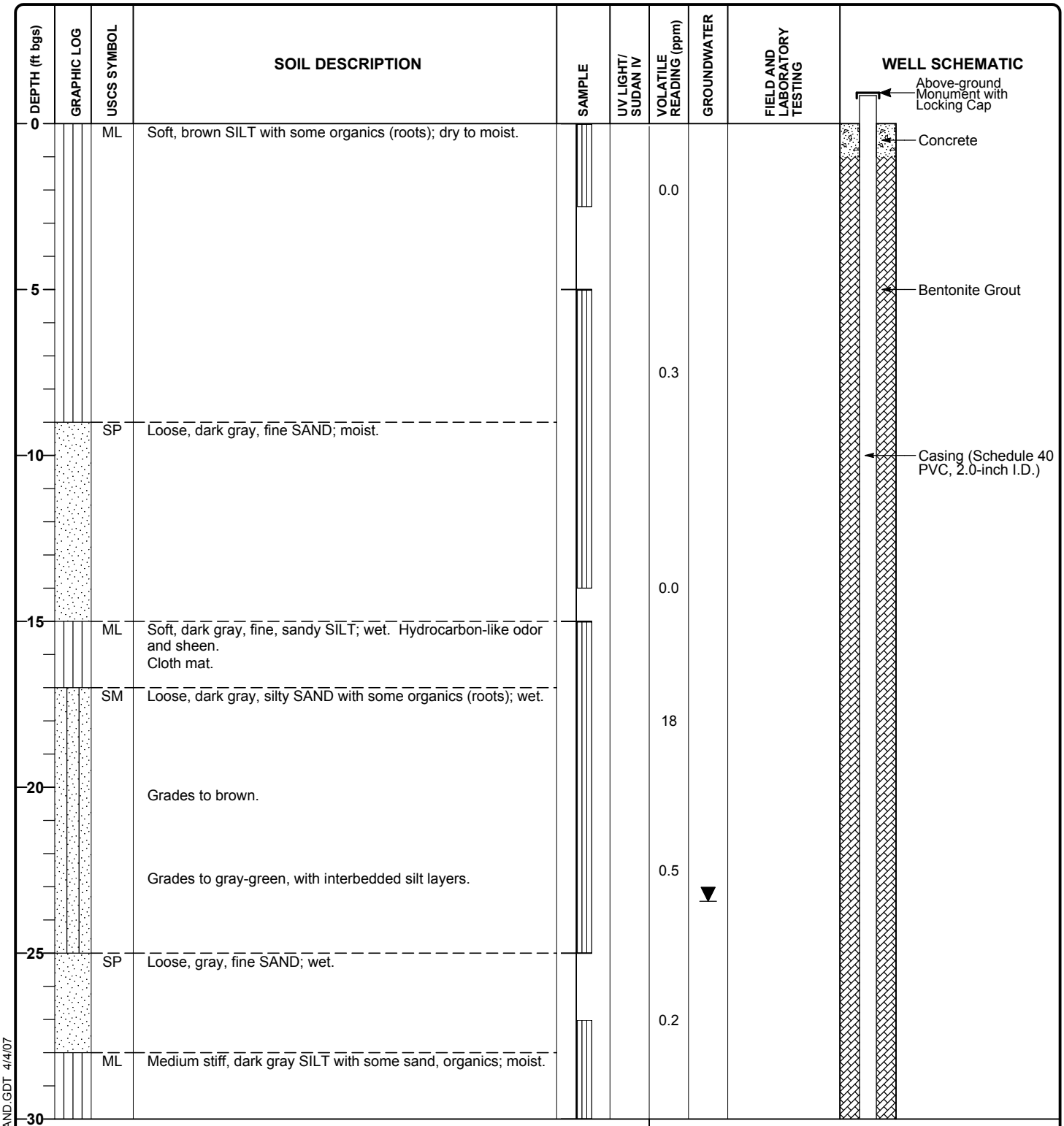
LOG OF BORING RP-21-28

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07



BORING METHOD: Sonic
BOREHOLE DIAMETER: 8.0 & 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 34.31 feet
CASING ELEVATION: 36.98 feet
START CARD/TAG ID: 186840/L83987
DRILLING DATES: 10/24/2006 - 10/24/2006

REMARKS:
Borehole diameter: 8-inch - 0 to 25 ft bgs. 6-inch - 25 to 125 ft bgs.

RP - Portland
Stage 2 SCE

0-61M-107030 P69

AMEC
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LOG OF BORING RP-21-125

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 4/4/07

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	UV LIGHT/ SUDAN IV	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
30		ML	Grades to brown.			0.4			Bentonite Grout Casing (Schedule 40 PVC, 2.0-inch I.D.)
35						0.1			
40			Trace organics.			0.1			
45		ML	Medium stiff to stiff, gray-brown SILT with some sand, organics (wood); moist to wet.			0.1			
			Interbedded silty sand layers.						
50						0.1			
55									
60		SM	Medium dense, dark gray, fine, silty SAND; wet.			0.2			

BORING METHOD: Sonic
BOREHOLE DIAMETER: 8.0 & 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 34.31 feet
CASING ELEVATION: 36.98 feet
START CARD/TAG ID: 186840/L83987
DRILLING DATES: 10/24/2006 - 10/24/2006

REMARKS:
Borehole diameter: 8-inch - 0 to 25 ft bgs. 6-inch - 25 to 125 ft bgs.

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 4/4/07

RP - Portland
Stage 2 SCE

0-61M-107030 P69

AMEC
7376 SW Durham Road
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LOG OF BORING RP-21-125

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	UV LIGHT/ SUDAN IV	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
60		ML	Medium stiff to stiff, gray-brown SILT with some interbedded sandy silt layers; moist.						Bentonite Grout
						0.5			Casing (Schedule 40 PVC, 2.0-inch I.D.)
65									
			Trace organics (wood).						
						0.5			
70									
						0.1			
75									
			Organics (wood mat, 4 inches thick).						
						0.2			
		SP	Loose, dark gray, fine to medium SAND with some silt and organics (wood); moist to wet.						
80									
		SM-ML	Medium stiff/dense, gray-brown, interbedded sandy SILT and silty SAND; moist to wet.						
			Light gray, sandy ash (6-inch layer) with piece of wood.			0.1			
85									
						0.2			
90									

BORING METHOD: Sonic
BOREHOLE DIAMETER: 8.0 & 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 34.31 feet
CASING ELEVATION: 36.98 feet
START CARD/TAG ID: 186840/L83987
DRILLING DATES: 10/24/2006 - 10/24/2006

REMARKS:
Borehole diameter: 8-inch - 0 to 25 ft bgs. 6-inch - 25 to 125 ft bgs.

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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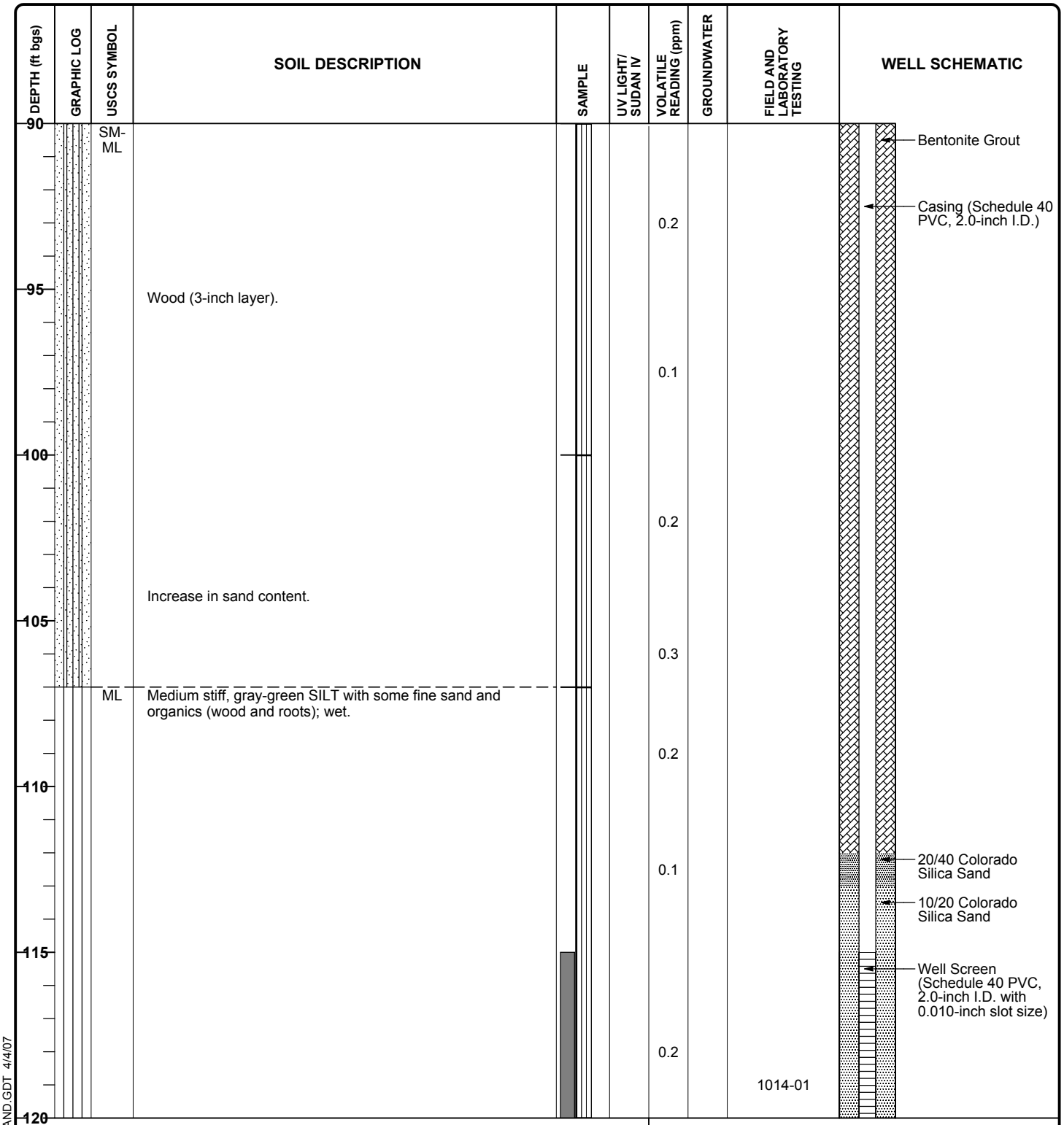
LOG OF BORING RP-21-125

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 4/4/07



BORING METHOD: Sonic

BOREHOLE DIAMETER: 8.0 & 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Boart Longyear

LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A

GROUND SURFACE ELEVATION: 34.31 feet

CASING ELEVATION: 36.98 feet

START CARD/TAG ID: 186840/L83987

DRILLING DATES: 10/24/2006 - 10/24/2006

REMARKS:

Borehole diameter: 8-inch - 0 to 25 ft bgs. 6-inch - 25 to 125 ft bgs.

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 4/4/07

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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LOG OF BORING RP-21-125

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	UV LIGHT/ SUDAN IV	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
120		ML				0.1		1040-01	10/20 Colorado Silica Sand; Well Screen (Schedule 40 PVC, 2.0-inch I.D. with 0.010-inch slot size); Threaded End Cap
125			Total depth drilled = 125 ft bgs.						
130									
135									
140									
145									
150									

BORING METHOD: Sonic

BOREHOLE DIAMETER: 8.0 & 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Boart Longyear

LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A

GROUND SURFACE ELEVATION: 34.31 feet

CASING ELEVATION: 36.98 feet

START CARD/TAG ID: 186840/L83987

DRILLING DATES: 10/24/2006 - 10/24/2006

REMARKS:

Borehole diameter: 8-inch - 0 to 25 ft bgs. 6-inch - 25 to 125 ft bgs.

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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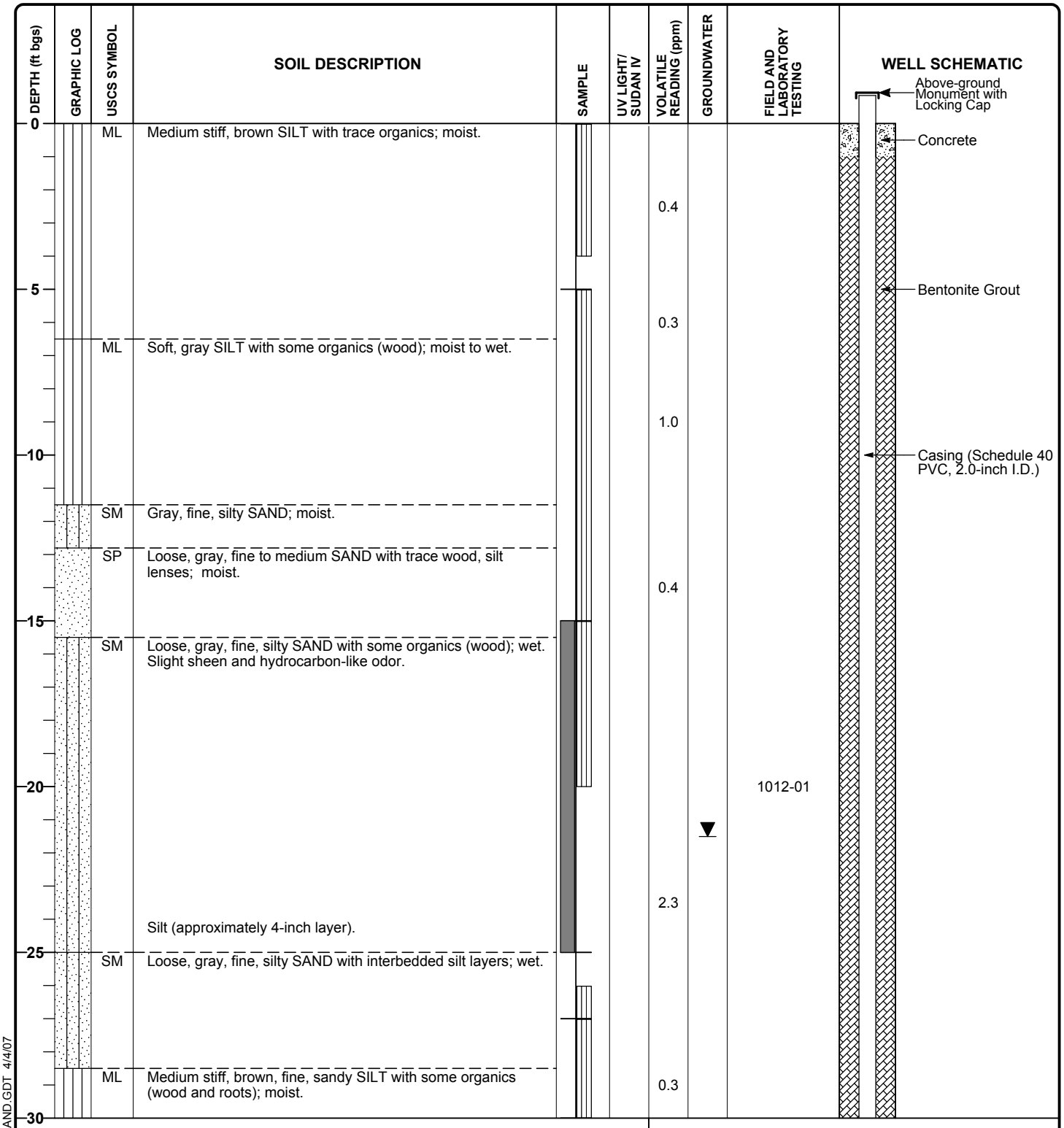
LOG OF BORING RP-21-125

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 4/4/07



BORING METHOD: Sonic
BOREHOLE DIAMETER: 8.0 & 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 34.30 feet
CASING ELEVATION: 36.78 feet
START CARD/TAG ID: 186839/L83986
DRILLING DATES: 10/20/2006 - 10/23/2006

REMARKS:
Borehole diameter: 8-inch - 0 to 25 ft bgs. 6-inch - 25 to 150 ft bgs.

RP - Portland
Stage 2 SCE

0-61M-107030 P69

AMEC
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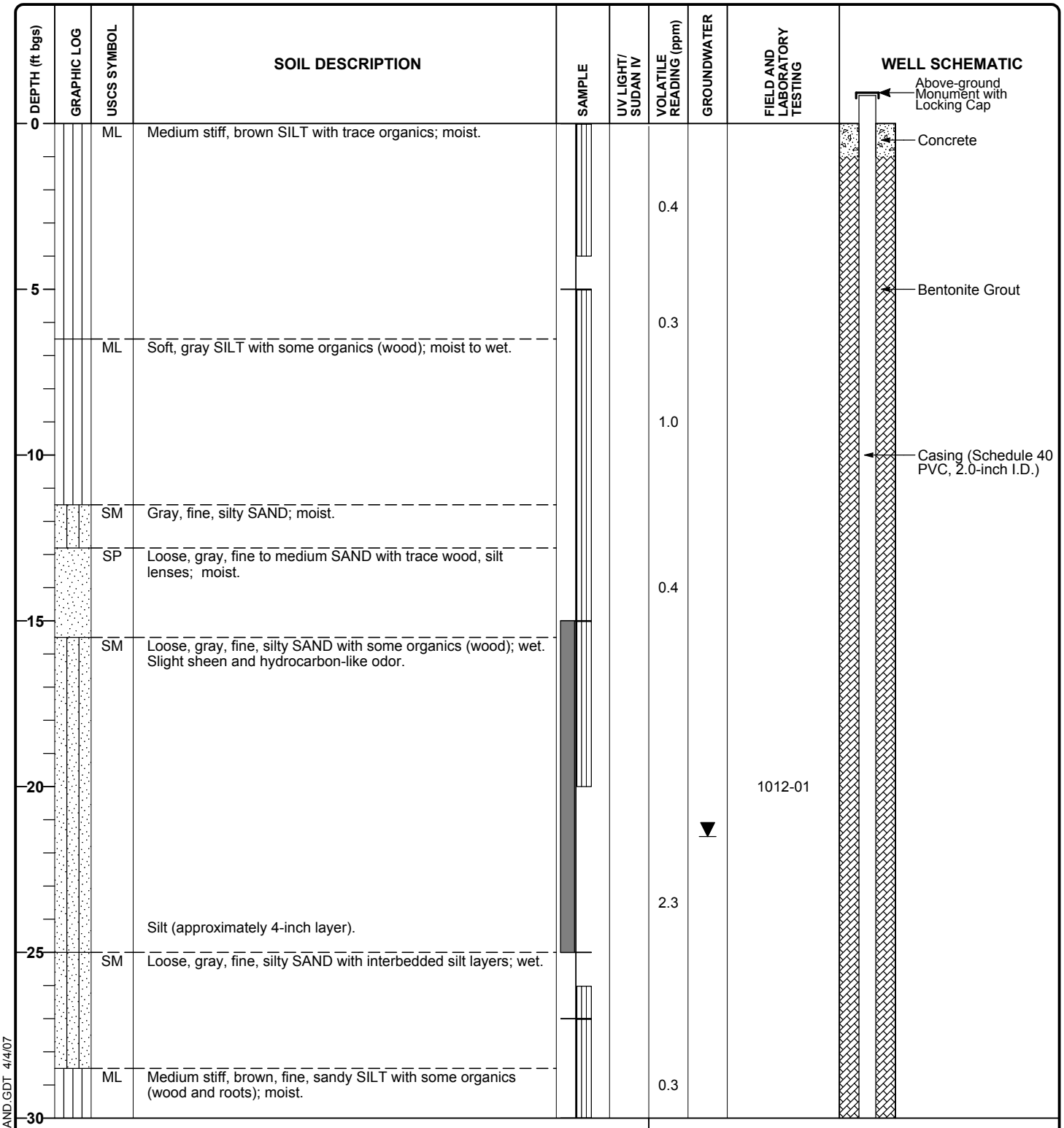
LOG OF BORING RP-21-150

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 4/4/07



BORING METHOD: Sonic
BOREHOLE DIAMETER: 8.0 & 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 34.30 feet
CASING ELEVATION: 36.78 feet
START CARD/TAG ID: 186839/L83986
DRILLING DATES: 10/20/2006 - 10/23/2006

REMARKS:
Borehole diameter: 8-inch - 0 to 25 ft bgs. 6-inch - 25 to 150 ft bgs.

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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LOG OF BORING RP-21-150

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 4/4/07

DEPTH (ft bgs)	USCS SYMBOL	SOIL DESCRIPTION	VOLATILE READING (ppm)
30	ML		
			0.4
35	ML-SM	Medium stiff, gray-brown, sandy SILT to fine, silty SAND with some organics (wood and roots); moist.	
			0.3
		Interbedded layers of green-gray SILT from 35-42 ft bgs.	
40			0.1
45			
			0.1
50	ML	Medium stiff, gray-brown, sandy SILT with trace organics (wood); moist.	
			0.2
55	SM	Medium dense, gray-brown, silty SAND with trace organics; wet.	
			0.0
60			

WELL SCHEMATIC: Bentonite Grout; Casing (Schedule 40 PVC, 2.0-inch I.D.)

BORING METHOD: Sonic
BOREHOLE DIAMETER: 8.0 & 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 34.30 feet
CASING ELEVATION: 36.78 feet
START CARD/TAG ID: 186839/L83986
DRILLING DATES: 10/20/2006 - 10/23/2006

REMARKS:
Borehole diameter: 8-inch - 0 to 25 ft bgs. 6-inch - 25 to 150 ft bgs.

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 4/4/07

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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LOG OF BORING RP-21-150

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	UV LIGHT/ SUDAN IV	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
60		SP	Medium dense, gray-brown, fine SAND with some silt, trace organics (wood); wet.						Bentonite Grout
						0.0			Casing (Schedule 40 PVC, 2.0-inch I.D.)
		ML	Medium stiff, gray-brown SILT with some fine sand; moist.						
65						0.1			
			Interbedded fine, silty SAND layers; wet.						
70						0.2			
75						0.1			
			Wood (6-inch layer).						
80		SM	Medium dense, gray-brown, fine, silty SAND with some light gray ash; wet.						
		ML	Medium stiff, gray-brown SILT with some fine sand, trace organics (wood); moist.			0.0			
85						0.1			
90									

BORING METHOD: Sonic
BOREHOLE DIAMETER: 8.0 & 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 34.30 feet
CASING ELEVATION: 36.78 feet
START CARD/TAG ID: 186839/L83986
DRILLING DATES: 10/20/2006 - 10/23/2006

REMARKS:
Borehole diameter: 8-inch - 0 to 25 ft bgs. 6-inch - 25 to 150 ft bgs.

RP - Portland
Stage 2 SCE

0-61M-107030 P69

AMEC
7376 SW Durham Road
Portland, Oregon
USA 97224
Tel (503) 639-3400
Fax (503) 620-7892

LOG OF BORING RP-21-150

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 4/4/07

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	UV LIGHT/ SUDAN IV	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
90		ML	Organics (1-inch thick wood mat).			0.0			Bentonite Grout; Casing (Schedule 40 PVC, 2.0-inch I.D.)
95			Soft; wet.			0.3			
100						0.3			
105						0.3			
110		SM	Medium dense, gray-brown, fine, silty SAND, interbedded silt layers; wet.			0.0			
115						0.0			
120									

BORING METHOD: Sonic
BOREHOLE DIAMETER: 8.0 & 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 34.30 feet
CASING ELEVATION: 36.78 feet
START CARD/TAG ID: 186839/L83986
DRILLING DATES: 10/20/2006 - 10/23/2006

REMARKS:
Borehole diameter: 8-inch - 0 to 25 ft bgs. 6-inch - 25 to 150 ft bgs.

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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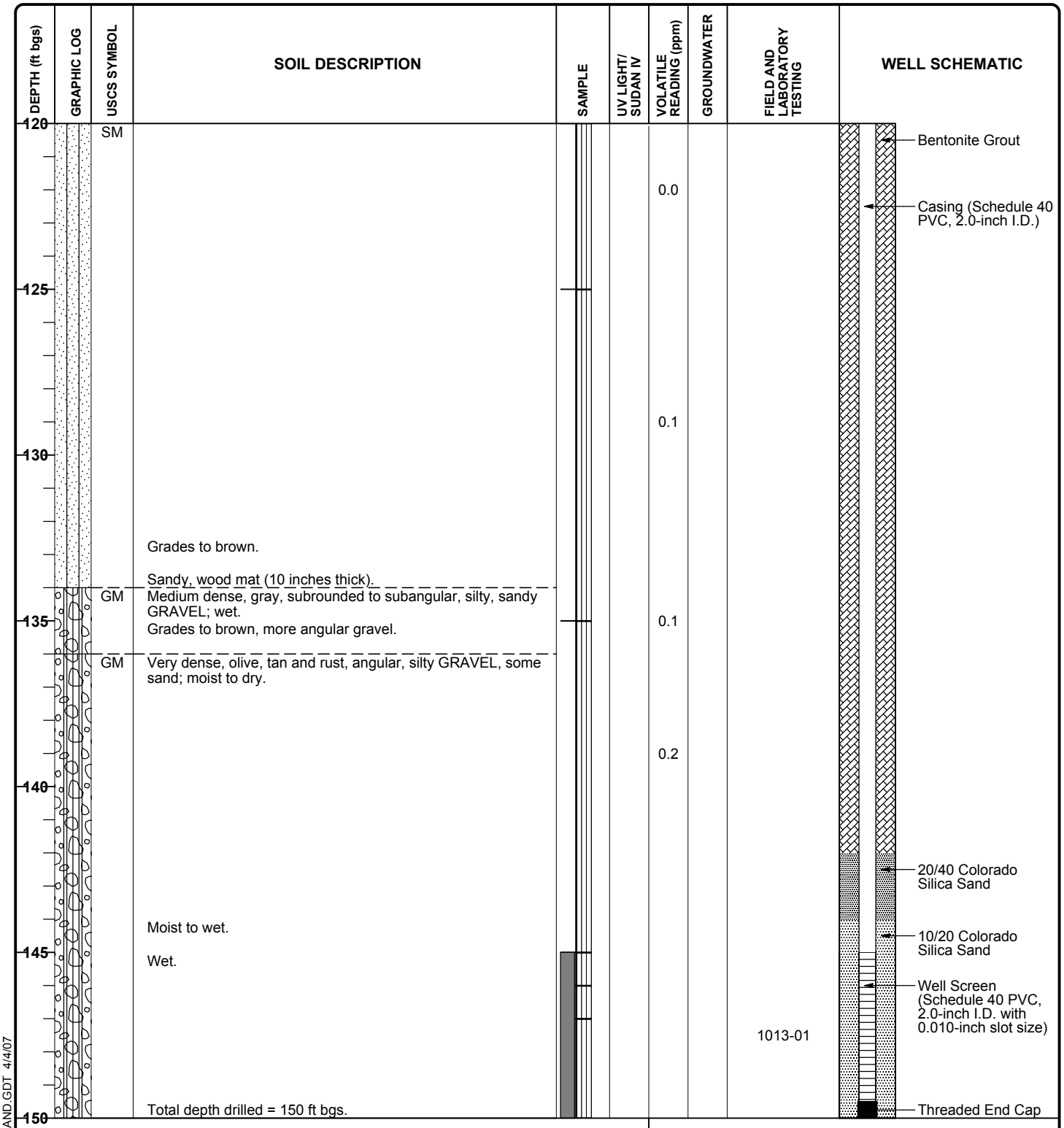
LOG OF BORING RP-21-150

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 4/4/07



BORING METHOD: Sonic
BOREHOLE DIAMETER: 8.0 & 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 34.30 feet
CASING ELEVATION: 36.78 feet
START CARD/TAG ID: 186839/L83986
DRILLING DATES: 10/20/2006 - 10/23/2006

REMARKS:
Borehole diameter: 8-inch - 0 to 25 ft bgs. 6-inch - 25 to 150 ft bgs.

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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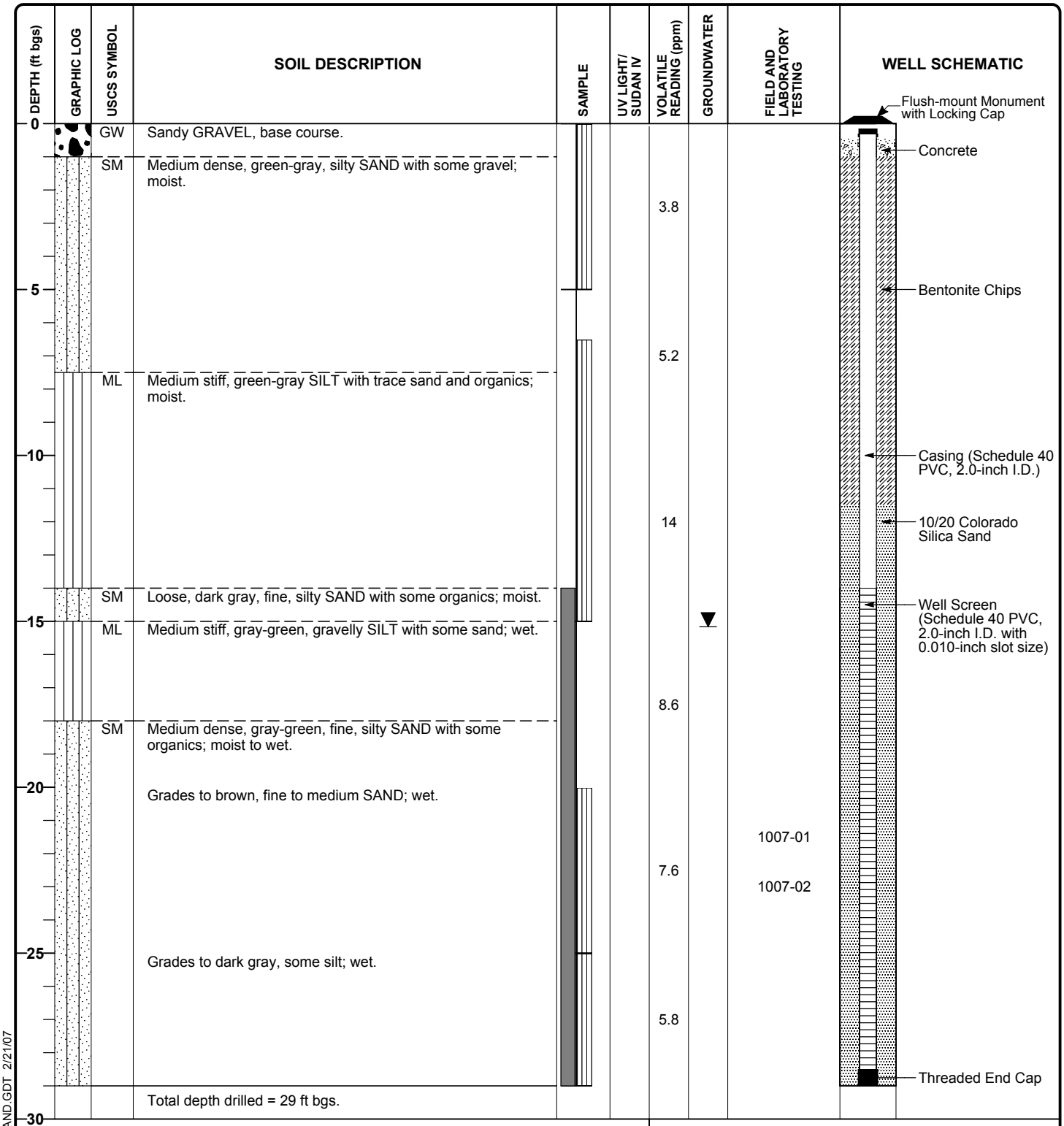
LOG OF BORING RP-21-150

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 4/4/07



BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 35.37 feet
CASING ELEVATION: 35.09 feet
START CARD/TAG ID: 186834/L83981
DRILLING DATES: 10/12/2006 - 10/12/2006

REMARKS:

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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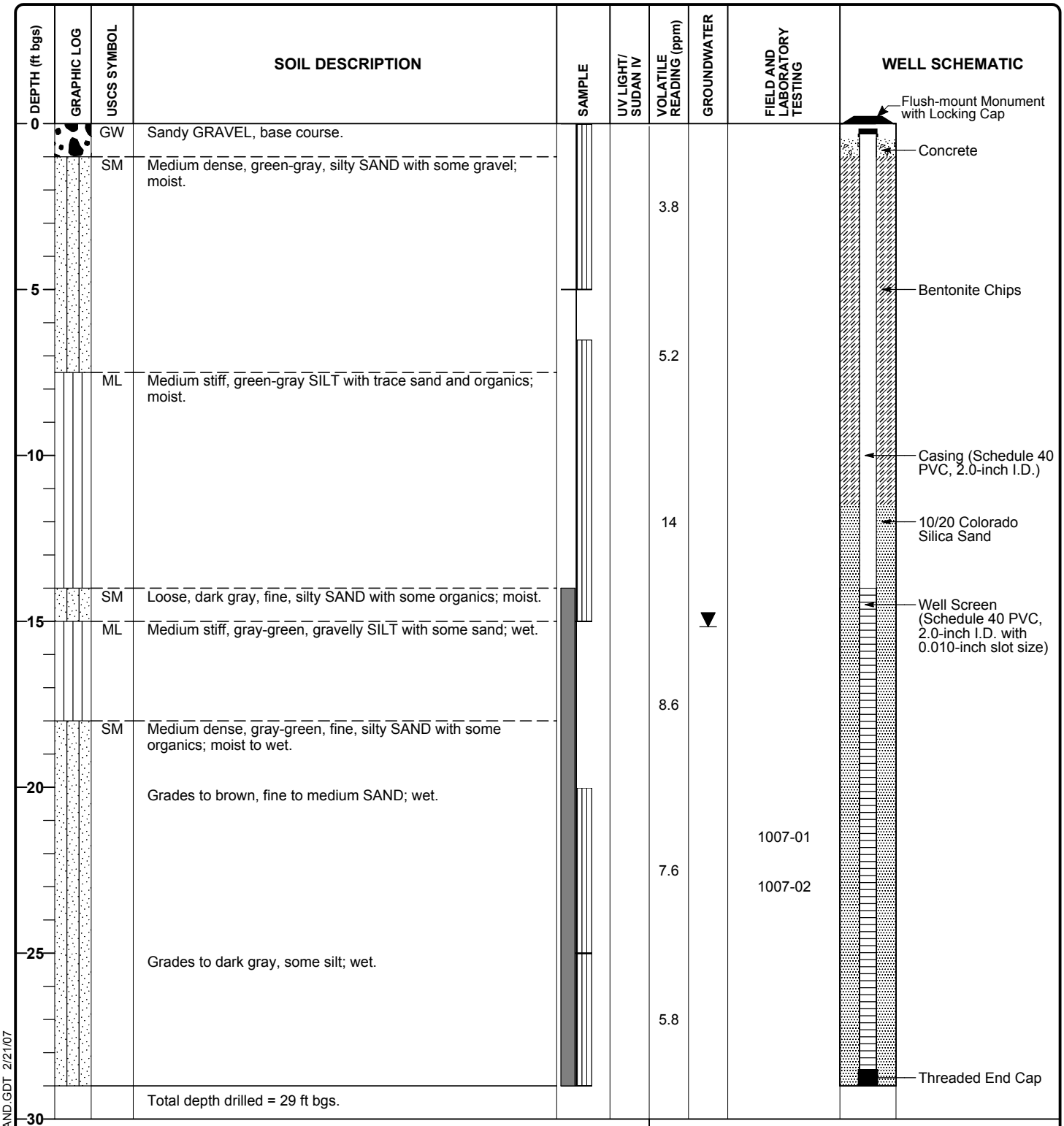
LOG OF BORING RP-22-29

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07



BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 35.37 feet
CASING ELEVATION: 35.09 feet
START CARD/TAG ID: 186834/L83981
DRILLING DATES: 10/12/2006 - 10/12/2006

REMARKS:

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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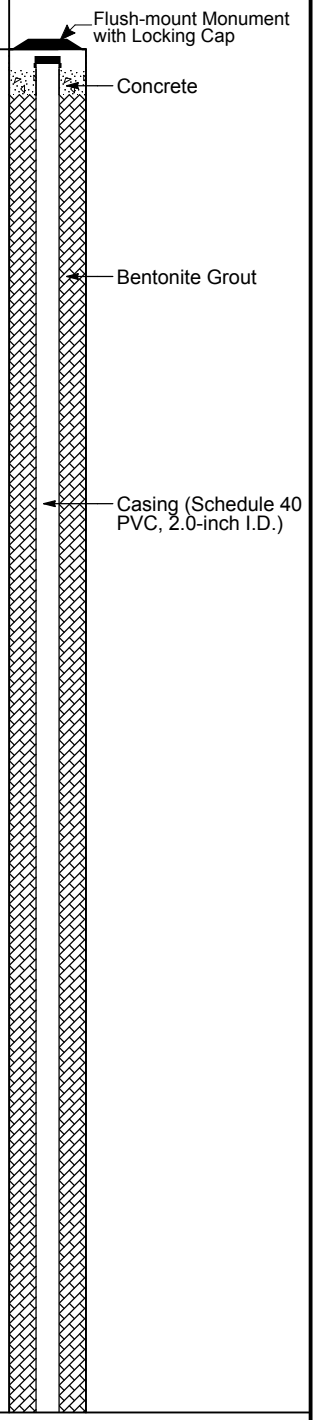
LOG OF BORING RP-22-29

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07

DEPTH (ft bgs)	USCS SYMBOL	SOIL DESCRIPTION	VOLATILE READING (ppm)
0	ML	Medium stiff, gray-green SILT with some sand, trace gravel; moist.	
			1.4
		Sandy SILT from 4-5 ft bgs.	
5			
			4.2
10			
		Organics (wood, approximately 1-inch layer). Hydrocarbon-like odor.	11
	SM	Loose, gray-green, silty SAND with some organics (wood); moist.	4.5
15	ML	Soft, gray-green SILT with some gravel; moist.	
	SP	Loose, gray-green, fine to medium SAND with trace silt and organics (wood and roots); moist. Slight hydrocarbon-like odor.	6.3
			6.6
20		With some rounded to subrounded gravel from 20-21 ft bgs.	
	SP	Loose, brown, fine to medium SAND with some organics; moist. Slight hydrocarbon-like odor.	6.7
25			
	ML	Medium stiff, brown SILT with trace sand and organics (wood and roots); moist.	5.3
30			

GRAPHIC LOG; SAMPLE; UV LIGHT/ SUDAN IV; GROUNDWATER; FIELD AND LABORATORY TESTING

WELL SCHEMATIC



BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 35.29 feet
CASING ELEVATION: 35.17 feet
START CARD/TAG ID: 186833/L83980
DRILLING DATES: 10/12/2006 - 10/12/2006

REMARKS:

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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LOG OF BORING RP-22-75

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 4/4/07

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	UV LIGHT/ SUDAN IV	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
30		ML							Bentonite Grout
						4.9			Casing (Schedule 40 PVC, 2.0-inch I.D.)
35			Grades to green-gray or olive-gray.						
						6.9			
40									
						5.1			
45		SM	Medium dense, green-gray, fine, silty SAND with some organics (wood); moist.						
						3.2			
50		ML	Medium stiff, green-gray SILT with trace fine sand and organics (wood); moist.						
						3.9			
55									
						3.1			
60									

BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 35.29 feet
CASING ELEVATION: 35.17 feet
START CARD/TAG ID: 186833/L83980
DRILLING DATES: 10/12/2006 - 10/12/2006

REMARKS:

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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LOG OF BORING RP-22-75

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 4/4/07

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	UV LIGHT/ SUDAN IV	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
60		SM	Loose, dark gray, fine, silty SAND with some organics (wood); wet.			4.3			Bentonite Grout; Casing (Schedule 40 PVC, 2.0-inch I.D.); 20/40 Colorado Silica Sand
		SP	Loose, dark gray, fine, silty SAND; wet.						10/20 Colorado Silica Sand
65			Grades to medium to fine SAND with some silt, organics (wood).						Well Screen (Schedule 40 PVC, 2.0-inch I.D. with 0.010-inch slot size)
						5.3		1006-01	
70			Organics (wood, approximately 1-inch layer).						
								1039-01	
75			Total depth drilled = 75 ft bgs.						Threaded End Cap
80									
85									
90									

BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 35.29 feet
CASING ELEVATION: 35.17 feet
START CARD/TAG ID: 186833/L83980
DRILLING DATES: 10/12/2006 - 10/12/2006

REMARKS:

RP - Portland
Stage 2 SCE

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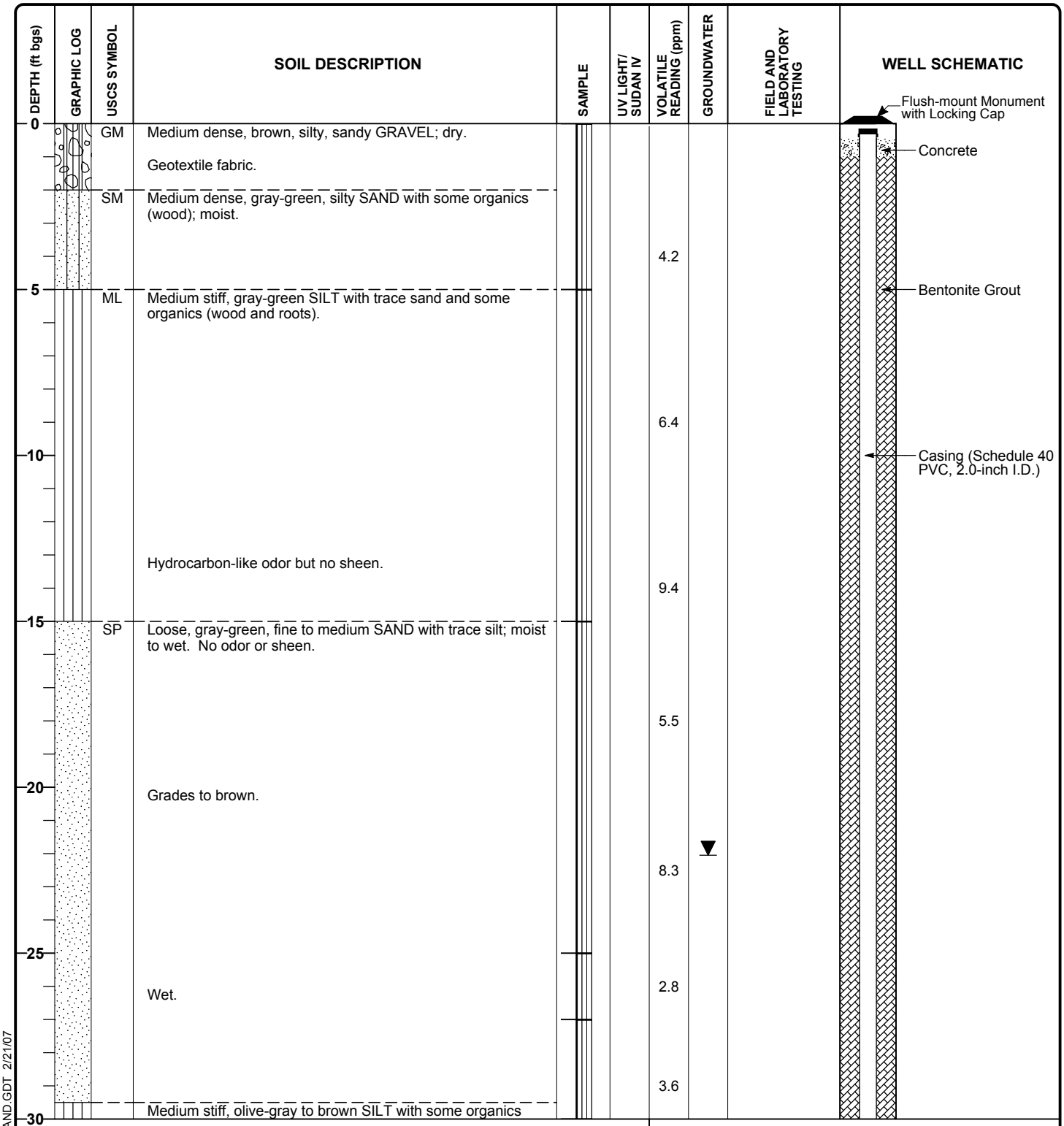
LOG OF BORING RP-22-75

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 4/4/07



BORING METHOD: Sonic
BOREHOLE DIAMETER: 8.0 & 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 35.45 feet
CASING ELEVATION: 35.28 feet
START CARD/TAG ID: 186832/L83979
DRILLING DATES: 10/10/2006 - 10/11/2006

REMARKS:
Borehole diameter: 8-inch - 0 to 25 ft bgs. 6-inch - 25 to 151 ft bgs.

RP - Portland
Stage 2 SCE

0-61M-107030 P69

AMEC
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LOG OF BORING RP-22-151

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	UV LIGHT/ SUDAN IV	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
30		ML	(roots); moist.			3.5			Bentonite Grout; Casing (Schedule 40 PVC, 2.0-inch I.D.)
35						5.7			
40						6.0			
45			Slightly softer.			6.0			
50		ML	Soft, green-gray, sandy SILT with some organics (wood); moist.			4.8			
		SM	Loose to medium dense, green-gray, fine, silty SAND; moist.						
55		ML	Medium stiff, brown SILT with some organics (wood); moist.			6.2			
60									

BORING METHOD: Sonic
BOREHOLE DIAMETER: 8.0 & 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 35.45 feet
CASING ELEVATION: 35.28 feet
START CARD/TAG ID: 186832/L83979
DRILLING DATES: 10/10/2006 - 10/11/2006

REMARKS:
Borehole diameter: 8-inch - 0 to 25 ft bgs. 6-inch - 25 to 151 ft bgs.

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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LOG OF BORING RP-22-151

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07

DEPTH (ft bgs)	USCS SYMBOL	SOIL DESCRIPTION	VOLATILE READING (ppm)
60	ML		
	SM	Loose, brown, silty SAND, some organics; moist.	6.7
65	SP	Loose, brown, fine SAND with trace silt; moist.	
			4.8
		Interbedded silt (approximately 4-inch layer).	
		Grades to fine to medium SAND.	
70		Organics (approximately 1-inch wood and root layer).	
			5.8
		Organics (2-inch wood mat).	
75	SM	Medium dense, green-gray to brown, fine, silty SAND with some organics (wood and roots); moist.	
			3.9
80	ML	Medium stiff, brown, sandy SILT with trace organics; moist.	
			3.9
		Light gray ash (approximately 10-inch layer).	
85	ML	Medium stiff, olive-gray SILT with trace sand, micaceous; moist.	
			3.5
90			

WELL SCHEMATIC: Bentonite Grout; Casing (Schedule 40 PVC, 2.0-inch I.D.)

BORING METHOD: Sonic
BOREHOLE DIAMETER: 8.0 & 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 35.45 feet
CASING ELEVATION: 35.28 feet
START CARD/TAG ID: 186832/L83979
DRILLING DATES: 10/10/2006 - 10/11/2006

REMARKS:
Borehole diameter: 8-inch - 0 to 25 ft bgs. 6-inch - 25 to 151 ft bgs.

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07

RP - Portland
Stage 2 SCE

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LOG OF BORING RP-22-151

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	UV LIGHT/ SUDAN IV	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
90		ML	Grades to brown.						Bentonite Grout
						6.0			Casing (Schedule 40 PVC, 2.0-inch I.D.)
95			Grades to olive-brown, trace organics (roots).						
						5.3			
100			Scattered organics (wood pieces).						
						4.6			
			Organics (1-inch wood layer).						
105									
						1.8			
110									
						3.9			
115									
						5.2			
120									

BORING METHOD: Sonic
BOREHOLE DIAMETER: 8.0 & 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 35.45 feet
CASING ELEVATION: 35.28 feet
START CARD/TAG ID: 186832/L83979
DRILLING DATES: 10/10/2006 - 10/11/2006

REMARKS:
Borehole diameter: 8-inch - 0 to 25 ft bgs. 6-inch - 25 to 151 ft bgs.

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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LOG OF BORING RP-22-151

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07

DEPTH (ft bgs)	USCS SYMBOL	SOIL DESCRIPTION	VOLATILE READING (ppm)	FIELD AND LABORATORY TESTING
120	SM-ML	Medium stiff/dense, gray-green, fine, silty SAND to fine, sandy SILT, micaceous, trace organics (wood); wet.	2.1	
125			3.8	
130			3.9	
		Rounded gravel (approximately 2-inch diameter).		
	SP	Medium dense, gray-green, fine SAND with some rounded to subrounded, fine to coarse gravel; wet.		
135	ML	Dense, brown, rust and dark gray, clayey SILT with some angular gravel; moist.	3.9	
140			2.9	
145	GM	Dense, greenish gray and brown, angular, silty GRAVEL; moist.		1005-01
		Grades to brown.		
150				

WELL SCHEMATIC: Bentonite Grout; Casing (Schedule 40 PVC, 2.0-inch I.D.); 20/40 Colorado Silica Sand; 10/20 Colorado Silica Sand; Well Screen (Schedule 40 PVC, 2.0-inch I.D. with 0.010-inch slot size)

BORING METHOD: Sonic
BOREHOLE DIAMETER: 8.0 & 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 35.45 feet
CASING ELEVATION: 35.28 feet
START CARD/TAG ID: 186832/L83979
DRILLING DATES: 10/10/2006 - 10/11/2006

REMARKS:
Borehole diameter: 8-inch - 0 to 25 ft bgs. 6-inch - 25 to 151 ft bgs.

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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LOG OF BORING RP-22-151

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	UV LIGHT/ SUDAN IV	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
150		GM	Total depth drilled = 151 ft bgs.						Threaded End Cap
155									
160									
165									
170									
175									
180									

BORING METHOD: Sonic

BOREHOLE DIAMETER: 8.0 & 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Boart Longyear

LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A

GROUND SURFACE ELEVATION: 35.45 feet

CASING ELEVATION: 35.28 feet

START CARD/TAG ID: 186832/L83979

DRILLING DATES: 10/10/2006 - 10/11/2006

REMARKS:

Borehole diameter: 8-inch - 0 to 25 ft bgs. 6-inch - 25 to 151 ft bgs.

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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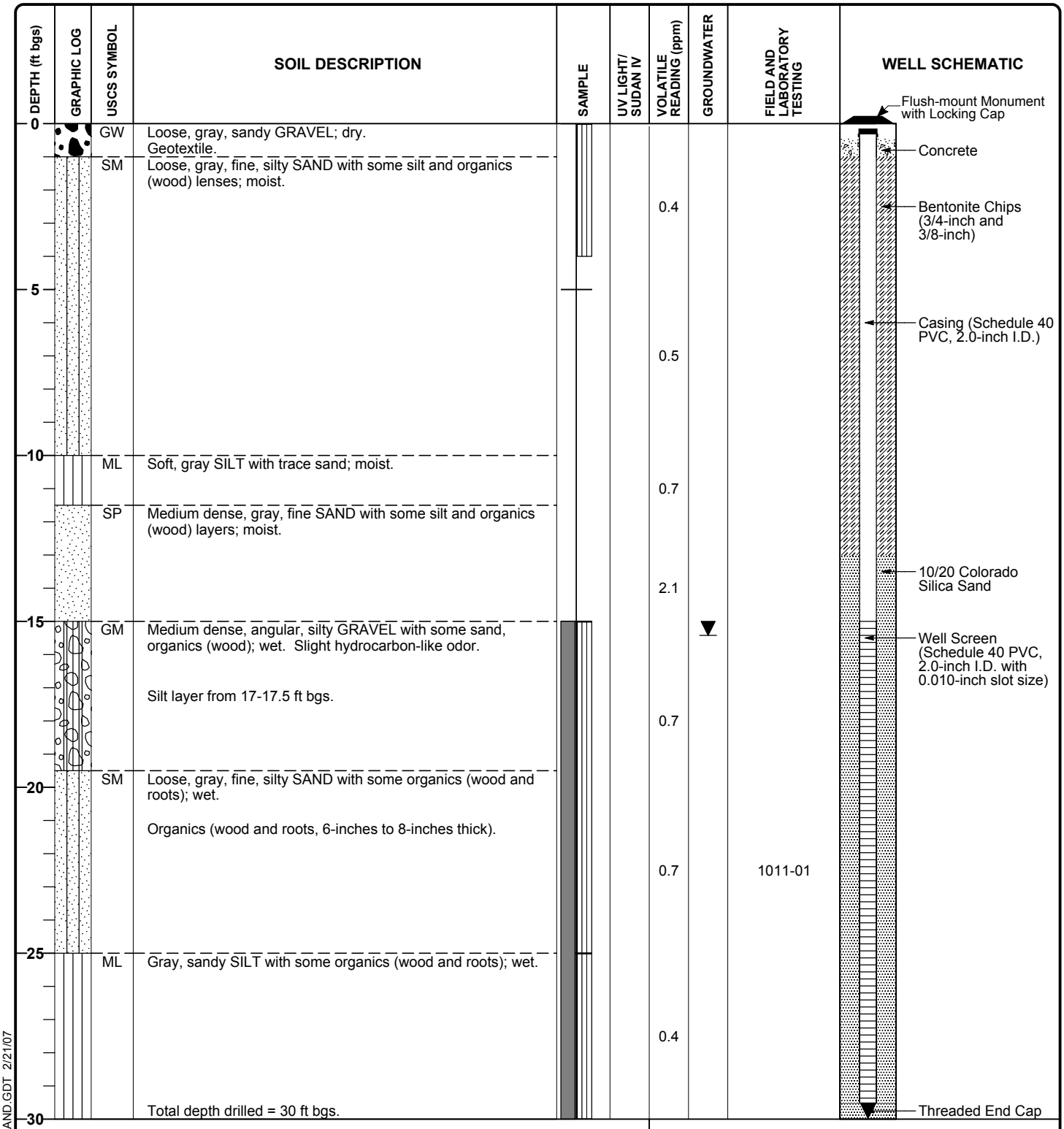
LOG OF BORING RP-22-151



BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 35.05 feet
CASING ELEVATION: 34.68 feet
START CARD/TAG ID: 186838/L83985
DRILLING DATES: 10/18/2006 - 10/18/2006

REMARKS:

RP - Portland
Stage 2 SCE

0-61M-107030 P69

AMEC
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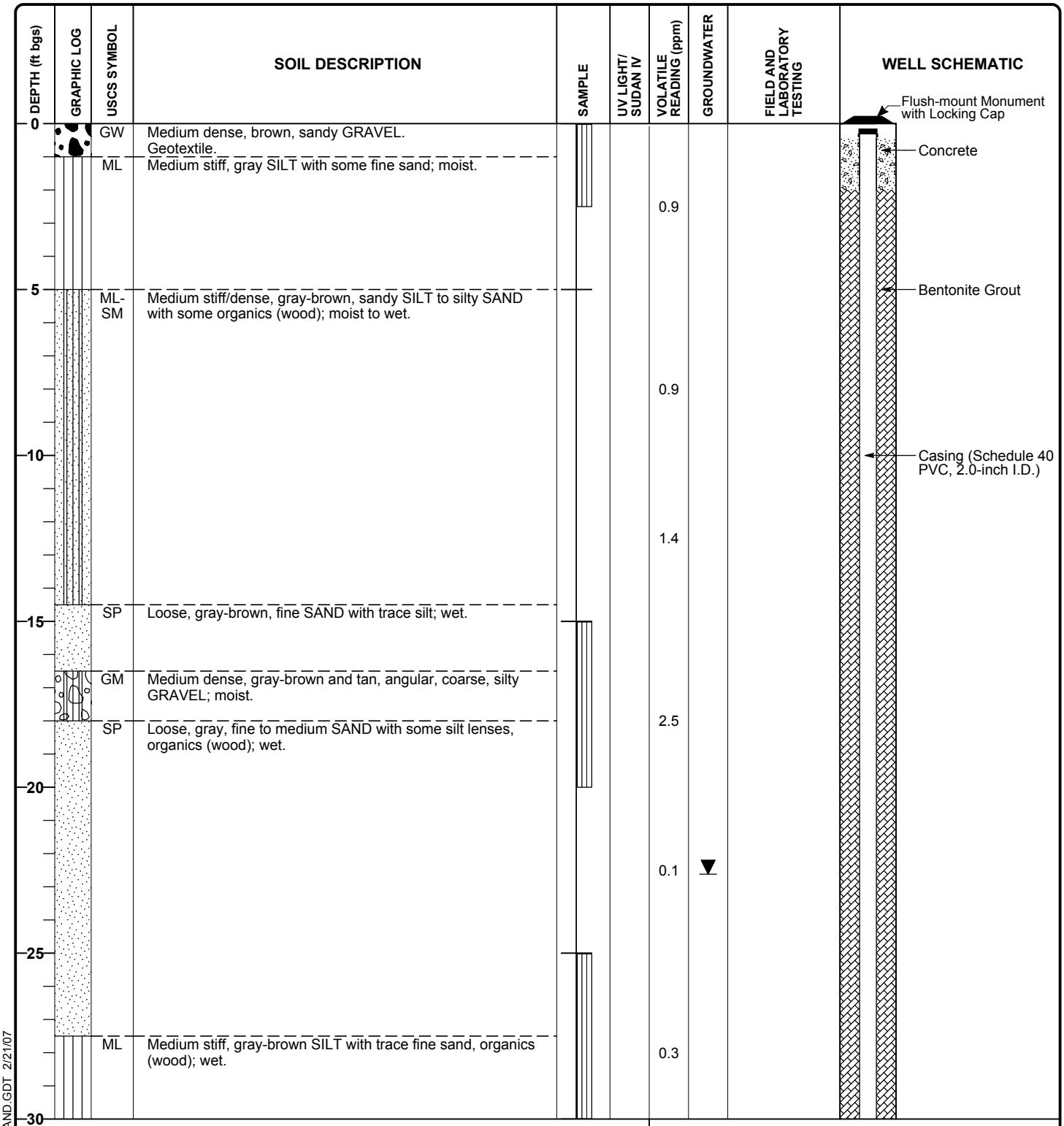
LOG OF BORING RP-23-30

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07



BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 35.10 feet
CASING ELEVATION: 34.46 feet
START CARD/TAG ID: 186837/L83984
DRILLING DATES: 10/18/2006 - 10/18/2006

REMARKS:

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07

RP - Portland
Stage 2 SCE

0-61M-107030 P69

AMEC
7376 SW Durham Road
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LOG OF BORING RP-23-85

DEPTH (ft bgs)	USCS SYMBOL	SOIL DESCRIPTION	VOLATILE READING (ppm)
30	ML		
			0.3
35		Grades to gray-green.	
			0.3
40	SM-ML	Medium dense/medium stiff, gray-brown, silty SAND to sandy SILT with trace organics (wood); moist.	
			0.4
45			
			0.4
	SP	Loose, gray-brown, fine SAND with trace silt and some organics (wood); wet.	
50		Fine to medium.	
			0.4
		Thin silt lenses.	
55	SM-ML	Medium dense/medium stiff, gray-brown, silty SAND to sandy SILT with trace organics (wood); moist.	
			0.5
60			

WELL SCHEMATIC: Bentonite Grout; Casing (Schedule 40 PVC, 2.0-inch I.D.)

BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 35.10 feet
CASING ELEVATION: 34.46 feet
START CARD/TAG ID: 186837/L83984
DRILLING DATES: 10/18/2006 - 10/18/2006

REMARKS:

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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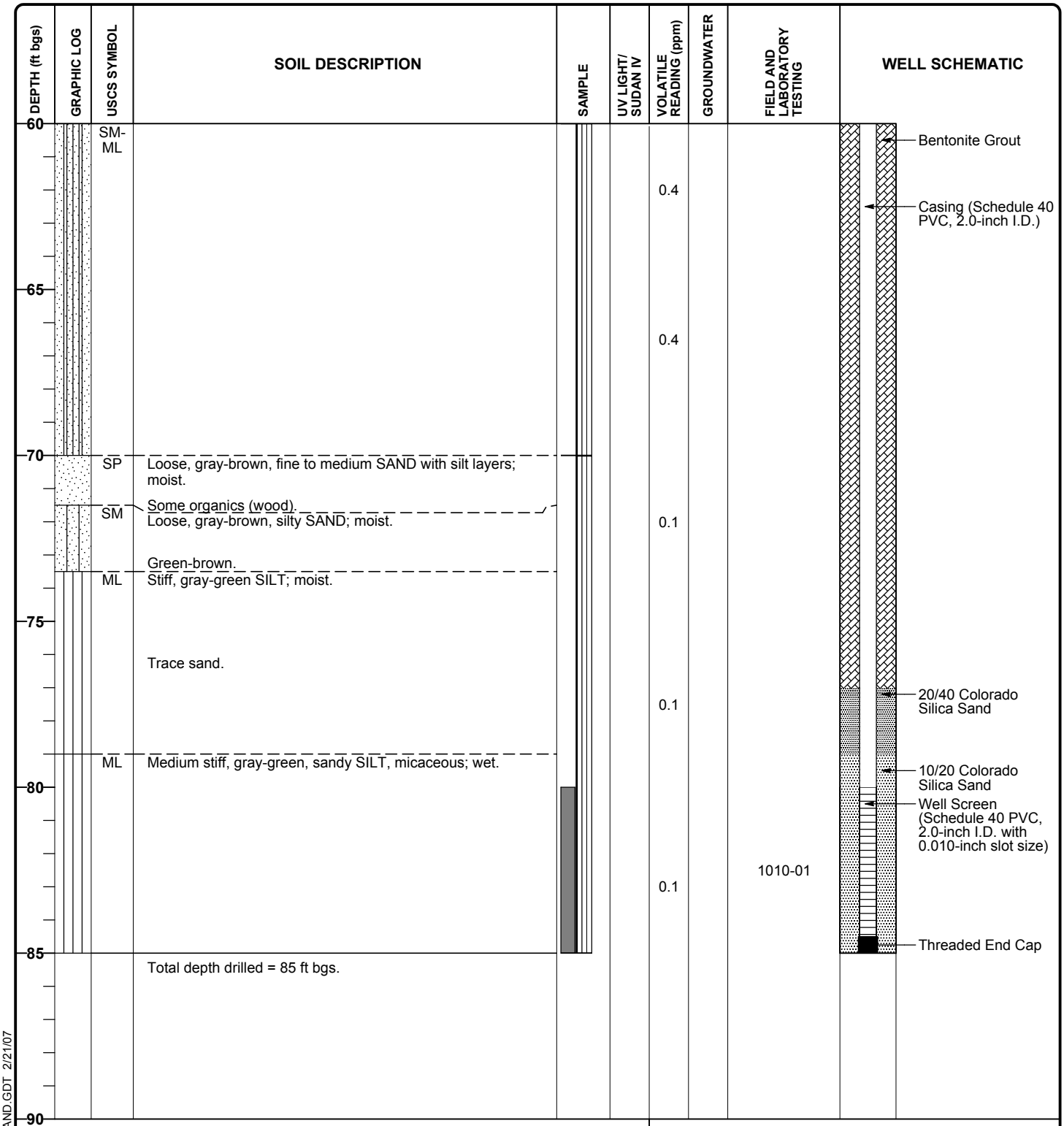
LOG OF BORING RP-23-85



BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 35.10 feet
CASING ELEVATION: 34.46 feet
START CARD/TAG ID: 186837/L83984
DRILLING DATES: 10/18/2006 - 10/18/2006

REMARKS:

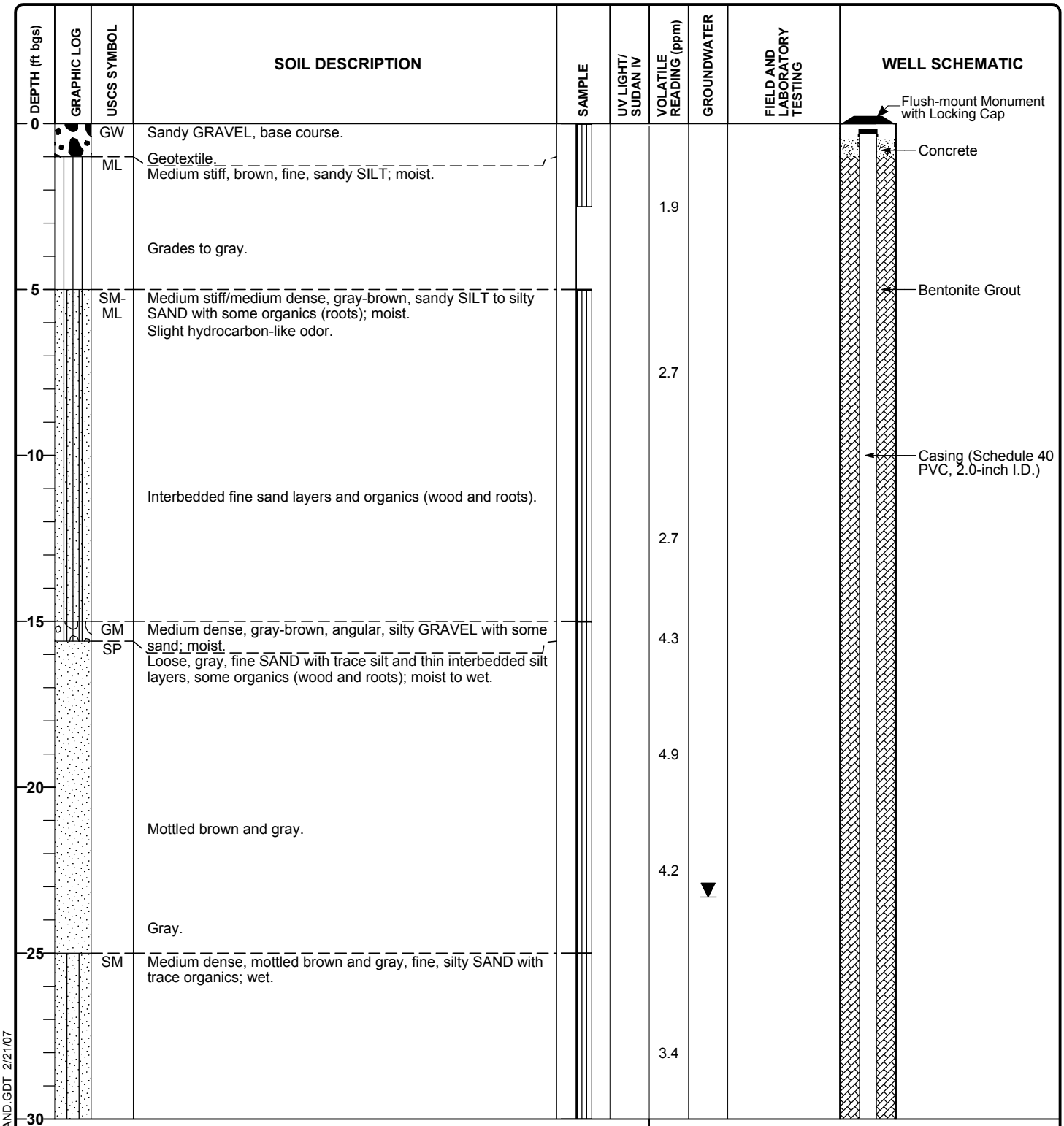
RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07

RP - Portland
Stage 2 SCE

0-61M-107030 P69

AMEC
7376 SW Durham Road
Portland, Oregon
USA 97224
Tel (503) 639-3400
Fax (503) 620-7892

LOG OF BORING RP-23-85



BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 35.14 feet
CASING ELEVATION: 34.84 feet
START CARD/TAG ID: 186836/L83983
DRILLING DATES: 10/17/2006 - 10/17/2006

REMARKS:

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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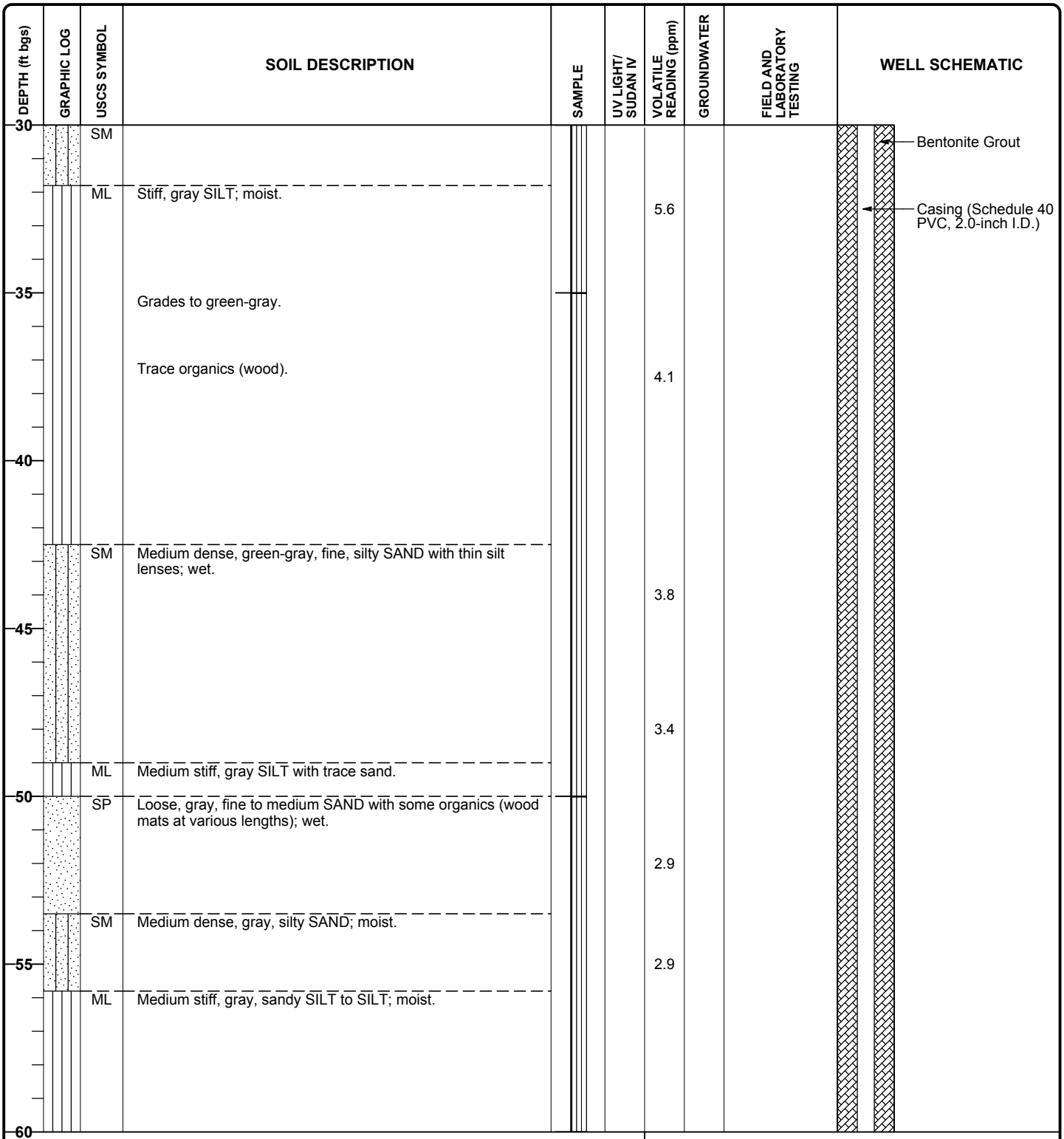
LOG OF BORING RP-23-100

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07



BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 35.14 feet
CASING ELEVATION: 34.84 feet
START CARD/TAG ID: 186836/L83983
DRILLING DATES: 10/17/2006 - 10/17/2006

REMARKS:

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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LOG OF BORING RP-23-100

DEPTH (ft bgs)	USCS SYMBOL	SOIL DESCRIPTION	VOLATILE READING (ppm)
60	ML		3.4
	SM	Medium dense, gray, silty SAND, trace organics; moist.	
65	SP	Medium dense, gray, fine to medium SAND with some organics (wood); moist.	3.4
			7.1
70		Interbedded silt layers from 73-74 ft bgs.	
	ML	Medium stiff, gray-brown, sandy SILT; moist.	5.1
75	ML	Stiff, gray-green SILT; moist.	
			5.8
	SM	Loose, green-brown, silty SAND; wet.	
80			4.0
		Silt lenses.	
85	GM	Medium dense, gray, rounded, silty, sandy GRAVEL with trace cobbles; wet.	
			3.3
90			

GRAPHIC LOG · SAMPLE · UV LIGHT/ SUDAN IV · GROUNDWATER · FIELD AND LABORATORY TESTING

WELL SCHEMATIC: Bentonite Grout; Casing (Schedule 40 PVC, 2.0-inch I.D.)

BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 35.14 feet
CASING ELEVATION: 34.84 feet
START CARD/TAG ID: 186836/L83983
DRILLING DATES: 10/17/2006 - 10/17/2006

REMARKS:

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07

RP - Portland
Stage 2 SCE

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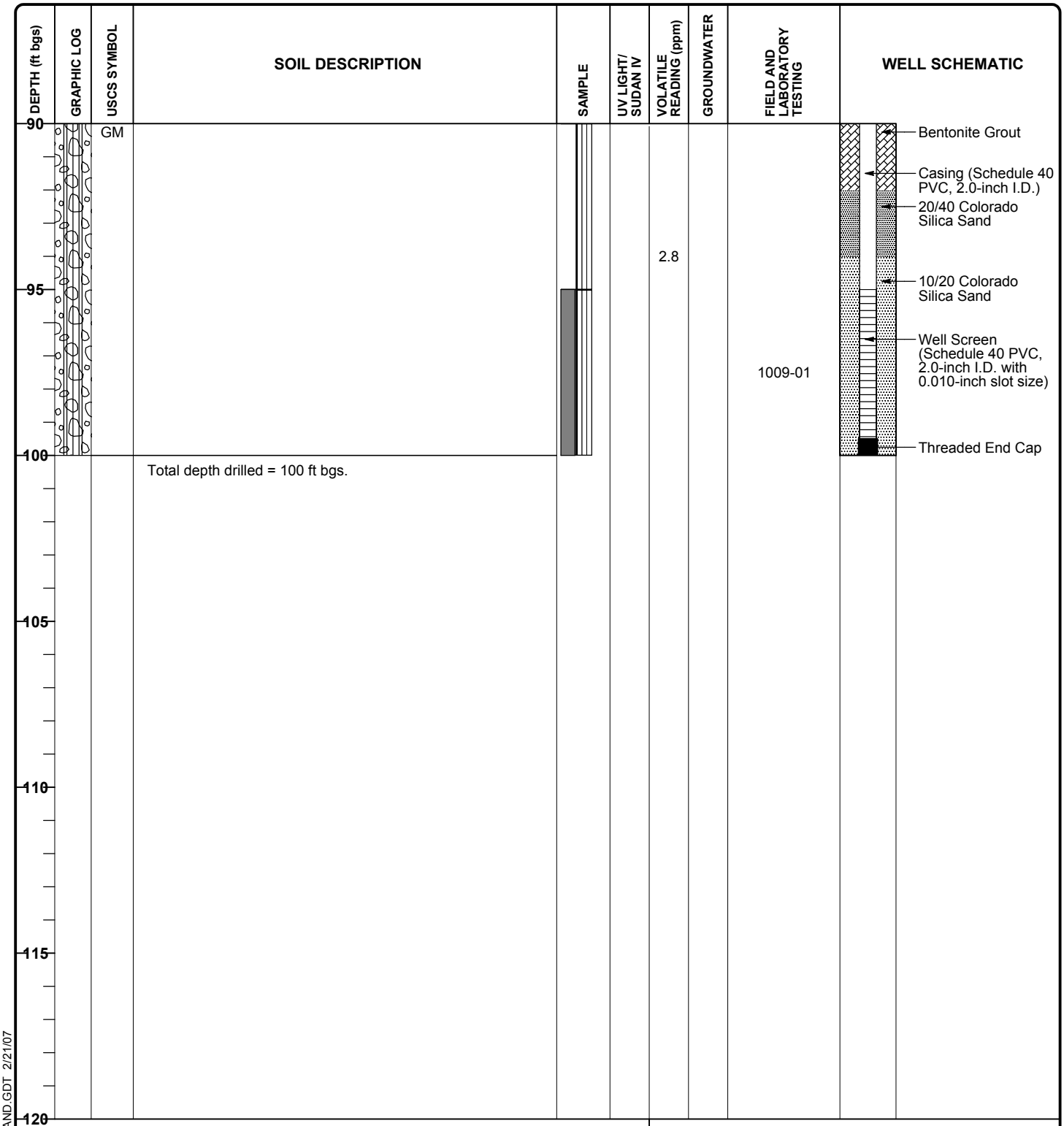
LOG OF BORING RP-23-100



BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 35.14 feet
CASING ELEVATION: 34.84 feet
START CARD/TAG ID: 186836/L83983
DRILLING DATES: 10/17/2006 - 10/17/2006

REMARKS:

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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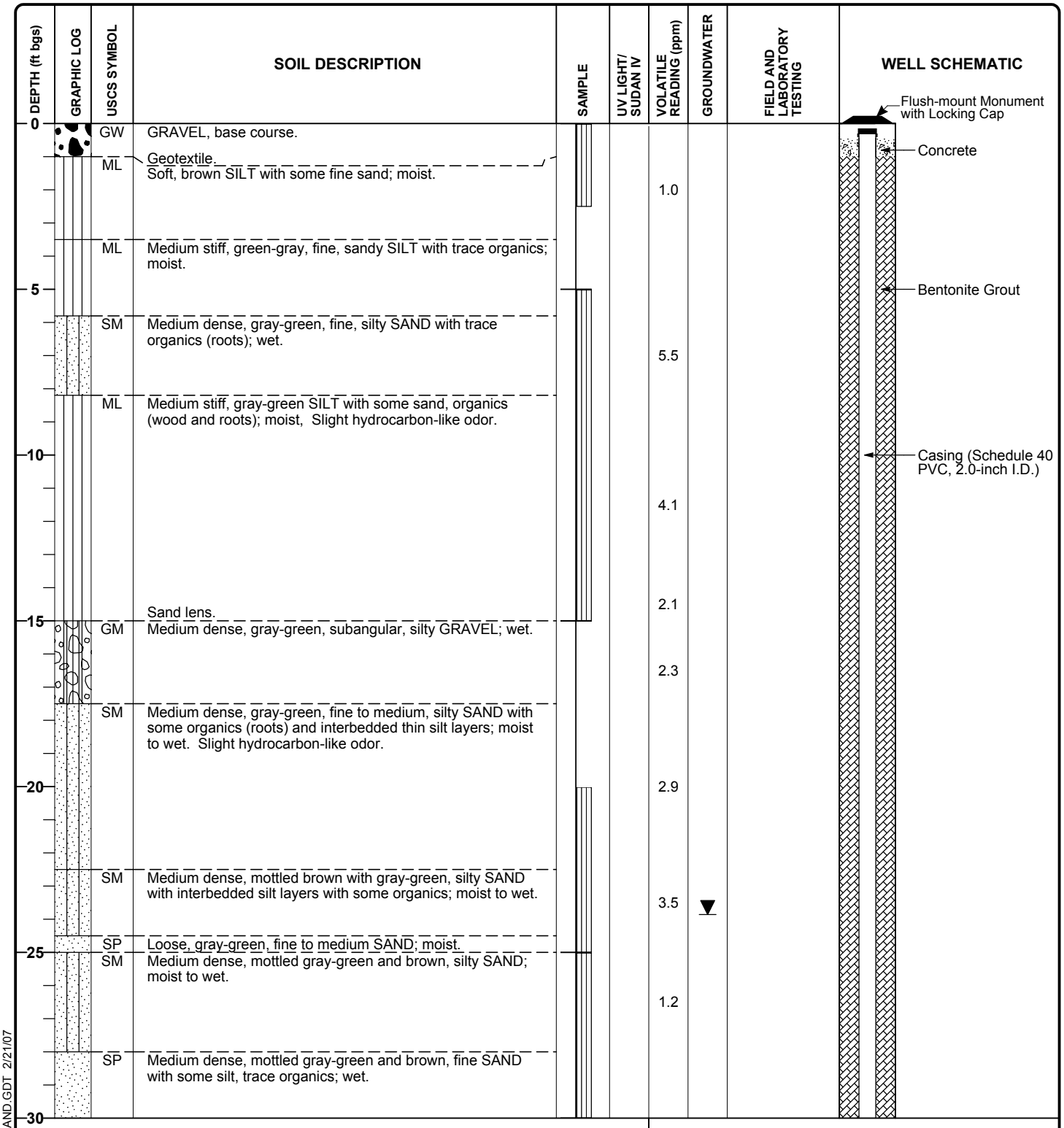
LOG OF BORING RP-23-100



BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 35.10 feet
CASING ELEVATION: 34.62 feet
START CARD/TAG ID: 186835/L83982
DRILLING DATES: 10/13/2006 - 10/16/2006

REMARKS:

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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7376 SW Durham Road
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Tel (503) 639-3400
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LOG OF BORING RP-23-125

DEPTH (ft bgs)	USCS SYMBOL	SOIL DESCRIPTION	VOLATILE READING (ppm)
30	SP	Grades to gray-green.	1.7
	ML	Medium stiff, gray-green SILT with some sand, trace organics; moist.	3.3
35	ML	Medium stiff, gray-green to gray-brown, sandy SILT with trace organics; moist to wet.	
40		Wood (20-inch layer).	3.2
45	ML	Medium stiff, gray-brown SILT with some fine sand, trace organics (roots); moist.	3.4
50	SM	Medium dense, gray-brown, fine, silty SAND with some organics (wood); moist.	4.9
55		Medium to fine SAND.	3.8
60	ML	Medium stiff, gray-brown SILT with some fine sand; moist.	

WELL SCHEMATIC: Bentonite Grout; Casing (Schedule 40 PVC, 2.0-inch I.D.)

BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 35.10 feet
CASING ELEVATION: 34.62 feet
START CARD/TAG ID: 186835/L83982
DRILLING DATES: 10/13/2006 - 10/16/2006

REMARKS:

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07

RP - Portland
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0-61M-107030 P69

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LOG OF BORING RP-23-125

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	UV LIGHT/ SUDAN IV	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
60		SM	Medium dense, gray-brown, fine, silty SAND with trace organics (wood and roots); moist.						Bentonite Grout
						2.1			Casing (Schedule 40 PVC, 2.0-inch I.D.)
65									
						1.9			
70		ML	Medium stiff, green-gray SILT with some sand; moist.						
						4.3			
75									
		SM	Medium dense, green-gray, fine, silty SAND, micaceous; wet.						
						4.9			
80									
85		SP	Loose, gray, fine SAND with trace silt; wet.						
						2.9			
		GM	Dense, gray, rounded, silty, sandy GRAVEL; wet.						
90									

BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 35.10 feet
CASING ELEVATION: 34.62 feet
START CARD/TAG ID: 186835/L83982
DRILLING DATES: 10/13/2006 - 10/16/2006

REMARKS:

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07

RP - Portland
Stage 2 SCE

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LOG OF BORING RP-23-125

DEPTH (ft bgs)	USCS SYMBOL	SOIL DESCRIPTION	VOLATILE READING (ppm)
90	GM		3.9
95		Some cobbles.	4.0
100	CL	Very stiff, gray-green to tan to rust, gravelly, silty CLAY; moist.	
105			2.4
	GM	Dense, dark gray, rounded to subangular, silty, sandy GRAVEL; moist.	2.3
	ML	Very stiff, bright orange, gravelly, clayey SILT; moist. Grades to brown, light yellow, tan and rust.	
110		Yellow-tan to brown.	
115		Moist.	
120			

WELL SCHEMATIC: Bentonite Grout; Casing (Schedule 40 PVC, 2.0-inch I.D.); 20/40 Colorado Silica Sand; 10/20 Colorado Silica Sand

BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 35.10 feet
CASING ELEVATION: 34.62 feet
START CARD/TAG ID: 186835/L83982
DRILLING DATES: 10/13/2006 - 10/16/2006

REMARKS:

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07

RP - Portland
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LOG OF BORING RP-23-125

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	UV LIGHT/ SUDAN IV	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
120		GM	Dense, gray, silty GRAVEL with some sand and cobbles; moist. Grades to tan, rust and brown, angular to subangular, clayey, silty GRAVEL; moist.					1008-01	Well Screen (Schedule 40 PVC, 2.0-inch I.D. with 0.010-inch slot size) 10/20 Colorado Silica Sand Threaded End Cap
125			Total depth drilled = 125 ft bgs.						
130									
135									
140									
145									
150									

BORING METHOD: Sonic
BOREHOLE DIAMETER: 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: B. Lary

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 35.10 feet
CASING ELEVATION: 34.62 feet
START CARD/TAG ID: 186835/L83982
DRILLING DATES: 10/13/2006 - 10/16/2006

REMARKS:

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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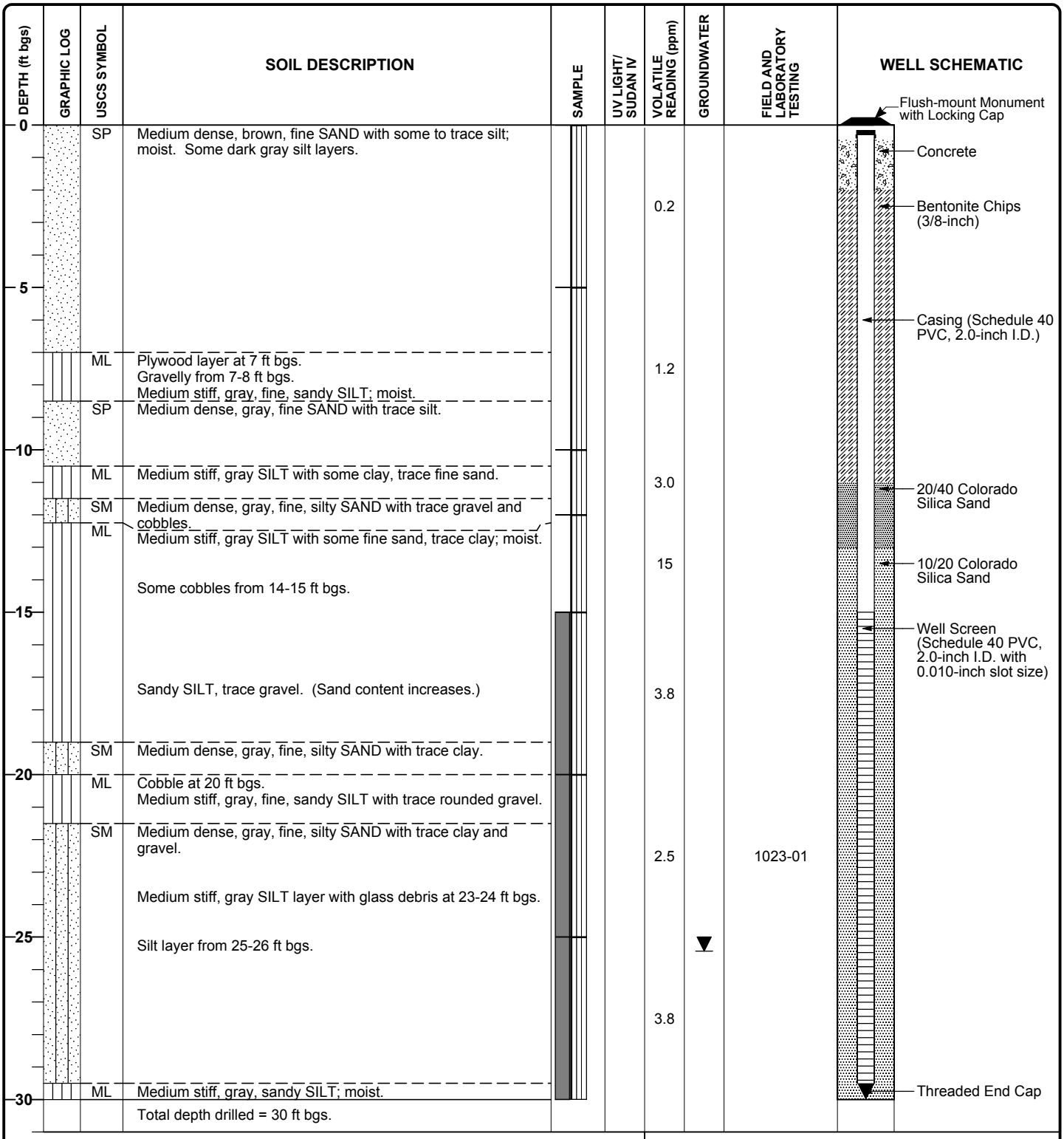
LOG OF BORING RP-23-125



BORING METHOD: Sonic
BOREHOLE DIAMETER: 8.0 & 6.0 (in)
DRILL RIG: Mini Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: J. Fassio

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 35.85 feet
CASING ELEVATION: 35.60 feet
START CARD/TAG ID: 186826/L83973
DRILLING DATES: 11/15/2006 - 11/15/2006

REMARKS:
Borehole diameter: 8-inch - 0 to 20 ft bgs. 6-inch - 20 to 30.5 ft bgs.

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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USA 97224
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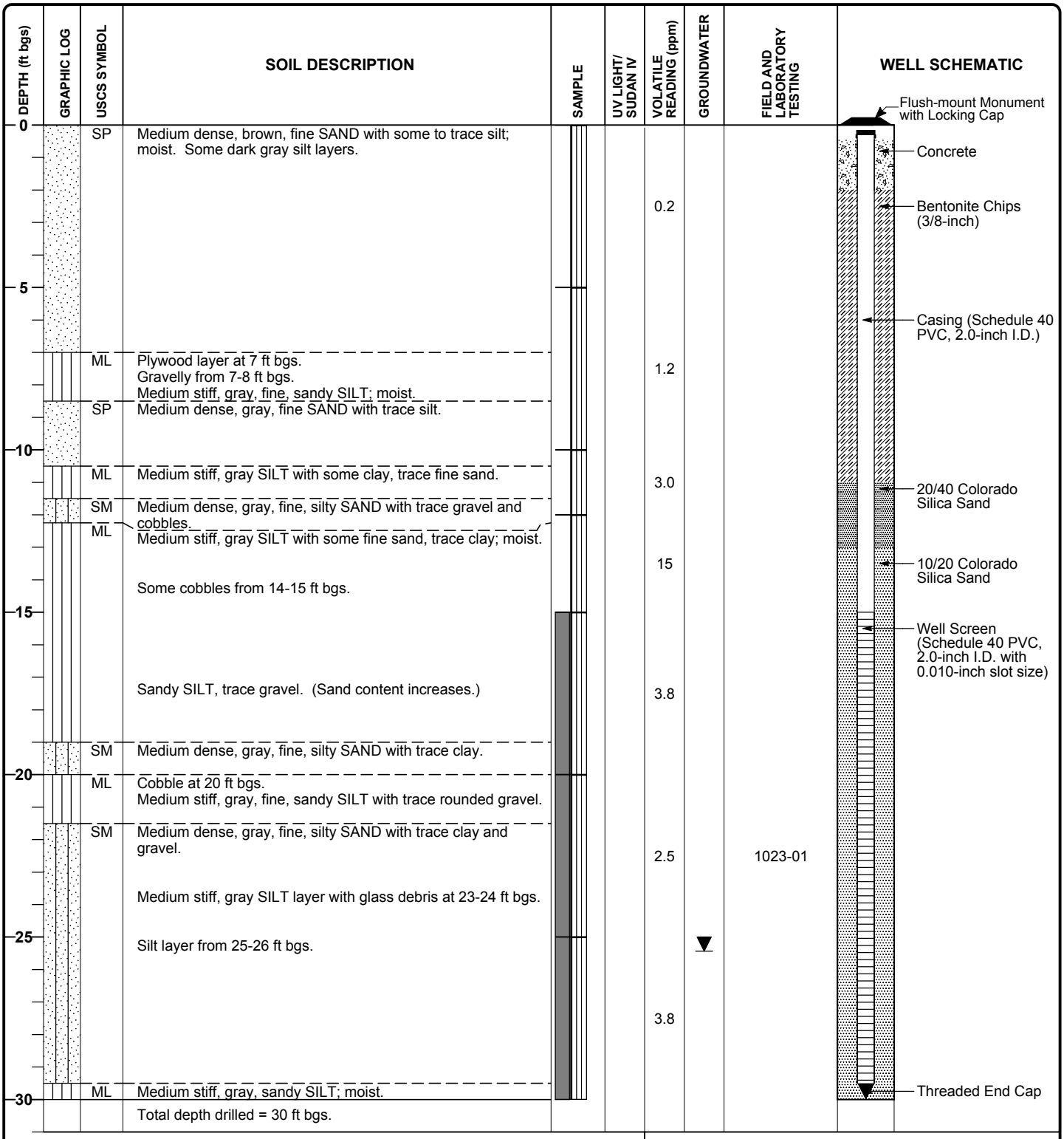
Fax (503) 620-7892

LOG OF BORING RP-24-30

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 4/4/07



BORING METHOD: Sonic
BOREHOLE DIAMETER: 8.0 & 6.0 (in)
DRILL RIG: Mini Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: J. Fassio

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 35.85 feet
CASING ELEVATION: 35.60 feet
START CARD/TAG ID: 186826/L83973
DRILLING DATES: 11/15/2006 - 11/15/2006

REMARKS:
Borehole diameter: 8-inch - 0 to 20 ft bgs. 6-inch - 20 to 30.5 ft bgs.

RP - Portland
Stage 2 SCE

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LOG OF BORING RP-24-30

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 4/4/07

DEPTH (ft bgs)	USCS SYMBOL	SOIL DESCRIPTION	VOLATILE READING (ppm)
0	ML	Stiff, brown SILT with some fine sand, trace organics (rootlets); moist.	
	SP	Medium dense, brown, fine SAND with some silt, trace organics (wood); moist.	
	ML	Medium stiff, gray, sandy SILT; moist.	
5			0.7
10	ML	Medium stiff, gray SILT with some clay, trace fine sand and gravel.	1.2
		Some fine sand, trace brick debris.	
15	SM	Medium dense, gray, fine, silty SAND with trace rounded gravel and clay; moist. Cobbles from 16-16.5 ft bgs.	3.0
	ML-SM	Medium stiff, gray, fine, sandy SILT interlayered with medium dense, fine, silty SAND.	3.3
20		Cobbles at 19 ft bgs.	
	SM	Medium dense, gray, fine, silty SAND with trace clay, rounded gravel (1-2%); moist.	2.5
25			1.9
	ML	Medium stiff, gray SILT with some fine sand; moist.	
30			

WELL SCHEMATIC: Flush-mount Monument with Locking Cap; Concrete; Bentonite Grout; Casing (Schedule 40 PVC, 2.0-inch I.D.)

BORING METHOD: Sonic
BOREHOLE DIAMETER: 8.0 & 6.0 (in)
DRILL RIG: Mini Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: J. Fassio

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 36.04 feet
CASING ELEVATION: 35.85 feet
START CARD/TAG ID: 186825/L83972
DRILLING DATES: 11/09/2006 - 11/13/2006

REMARKS:
Borehole diameter: 8-inch - 0 to 40 ft bgs. 6-inch - 40 to 60 ft bgs.

RP - Portland
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LOG OF BORING RP-24-60

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07

DEPTH (ft bgs)	USCS SYMBOL	SOIL DESCRIPTION	VOLATILE READING (ppm)	FIELD AND LABORATORY TESTING
30	ML			
	SM	Medium dense, gray, fine, silty SAND with trace gravel (1-2%); moist.	2.3	
35		Becomes wet at 35 ft bgs.		
		Thin, clayey silt layers from 35-40 ft bgs.	1.8	
40	ML	Soft, gray SILT with trace fine sand (10-15%); wet.	0.3	
45		Fine sand content increases to 20-25% from 44-45 ft bgs.		
		Color changes to brown.	0.3	
50	ML	Medium stiff, brown, sandy SILT; wet.		
55	SP	Medium dense, brown, fine SAND with some to trace silt.	0.2	1022-01
60		Total depth drilled = 60 ft bgs.		

WELL SCHEMATIC: Bentonite Grout; Casing (Schedule 40 PVC, 2.0-inch I.D.); 20/40 Colorado Silica Sand; 10/20 Colorado Silica Sand; Well Screen (Schedule 40 PVC, 2.0-inch I.D. with 0.010-inch slot size); Threaded End Cap

BORING METHOD: Sonic
BOREHOLE DIAMETER: 8.0 & 6.0 (in)
DRILL RIG: Mini Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: J. Fassio

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 36.04 feet
CASING ELEVATION: 35.85 feet
START CARD/TAG ID: 186825/L83972
DRILLING DATES: 11/09/2006 - 11/13/2006

REMARKS:
Borehole diameter: 8-inch - 0 to 40 ft bgs. 6-inch - 40 to 60 ft bgs.

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07

RP - Portland
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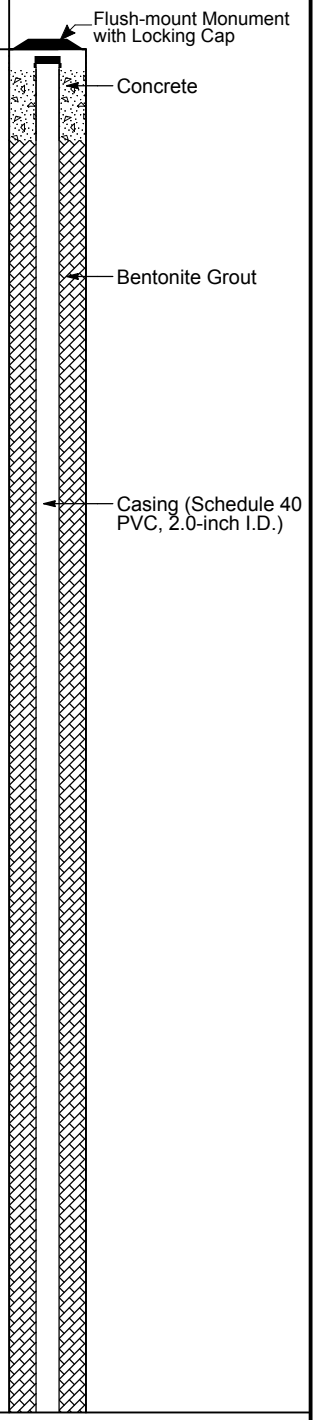
LOG OF BORING RP-24-60

DEPTH (ft bgs)	USCS SYMBOL	SOIL DESCRIPTION	VOLATILE READING (ppm)
0	ML	Stiff, brown, fine, sandy SILT with trace clay and organics (rootlets); moist.	
5	ML	Medium stiff, brown SILT with trace fine sand, clay and gravel; moist.	2.9
	ML	Medium stiff, gray SILT with some rounded to subrounded gravel, trace clay and fine sand. Gravel content decreases from 7-8 ft bgs.	
	ML	Stiff, gray, fine, sandy SILT with trace gravel; moist.	5.8
10			
			4.3
15			
20	ML	Medium stiff, gray, sandy SILT with trace clay and fibrous organics.	
			3.2
25	SM	Medium dense, gray, fine, silty SAND with trace clay and rounded gravel; moist.	
			3.9
	ML	Medium stiff, mottled gray and blue-gray SILT with some fine sand, trace clay; wet.	
30			



BORING METHOD: Sonic
BOREHOLE DIAMETER: 8.0 & 6.0 (in)
DRILL RIG: Mini Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: J. Fassio

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 35.99 feet
CASING ELEVATION: 35.74 feet
START CARD/TAG ID: 186824/L83971
DRILLING DATES: 11/01/2006 - 11/08/2006

REMARKS:
Borehole diameter: 8-inch - 0 to 40 ft bgs. 6-inch - 40 to 74 ft bgs.

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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LOG OF BORING RP-24-73

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 4/4/07

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	UV LIGHT/ SUDAN IV	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
30		ML							Bentonite Grout
		ML	Medium stiff, brown SILT with some clay; moist.			3.5			Casing (Schedule 40 PVC, 2.0-inch I.D.)
35		ML	Soft, brown SILT with trace fine sand and clay.			2.6			
40						2.1			
45			No recovery from 45 to 60 ft bgs.						
50									
55									
60									

BORING METHOD: Sonic
BOREHOLE DIAMETER: 8.0 & 6.0 (in)
DRILL RIG: Mini Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: J. Fassio

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 35.99 feet
CASING ELEVATION: 35.74 feet
START CARD/TAG ID: 186824/L83971
DRILLING DATES: 11/01/2006 - 11/08/2006

REMARKS:
Borehole diameter: 8-inch - 0 to 40 ft bgs. 6-inch - 40 to 74 ft bgs.

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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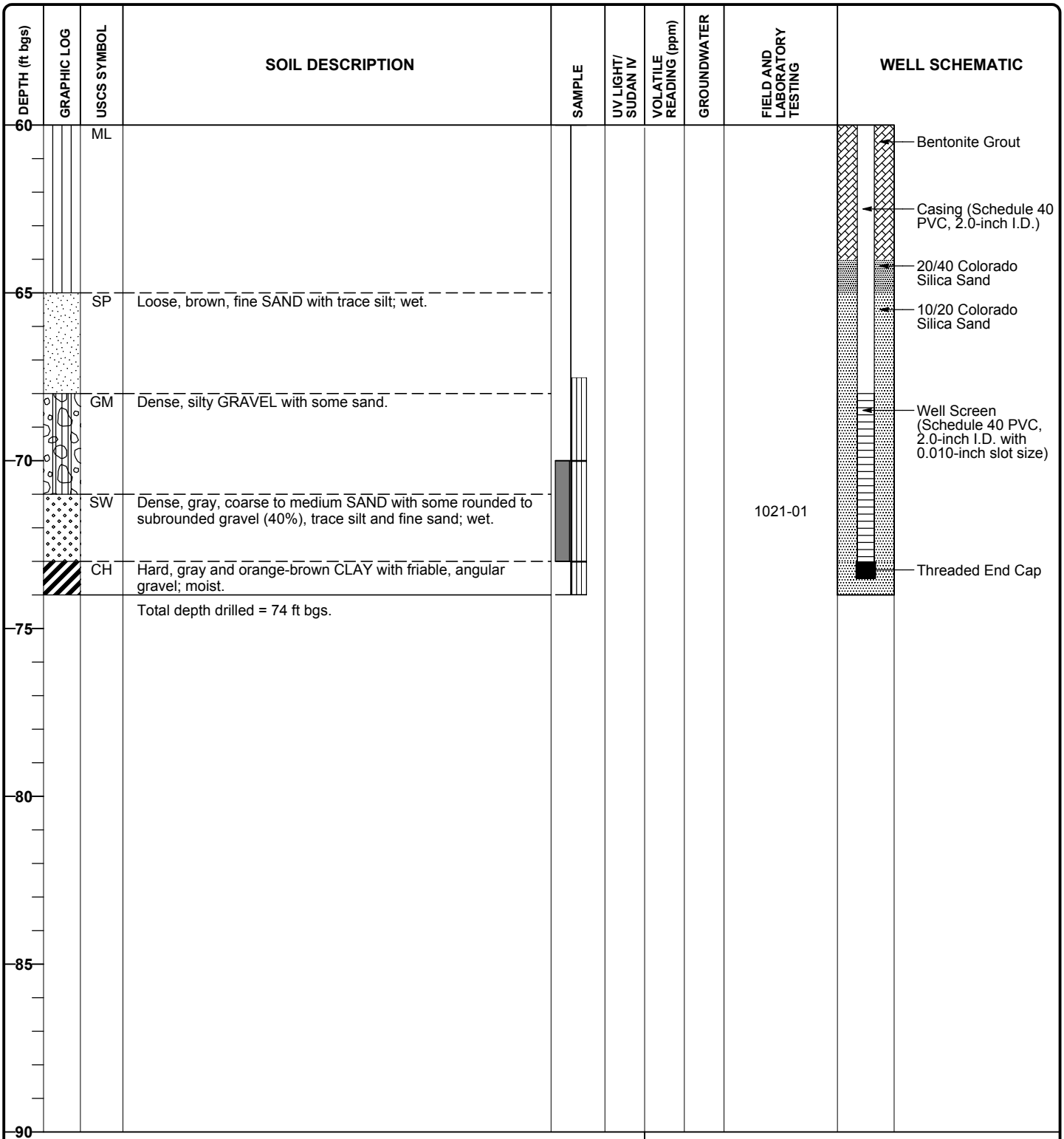
LOG OF BORING RP-24-73

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 4/4/07



BORING METHOD: Sonic
BOREHOLE DIAMETER: 8.0 & 6.0 (in)
DRILL RIG: Mini Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: J. Fassio

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 35.99 feet
CASING ELEVATION: 35.74 feet
START CARD/TAG ID: 186824/L83971
DRILLING DATES: 11/01/2006 - 11/08/2006

REMARKS:
Borehole diameter: 8-inch - 0 to 40 ft bgs. 6-inch - 40 to 74 ft bgs.

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 4/4/07

RP - Portland
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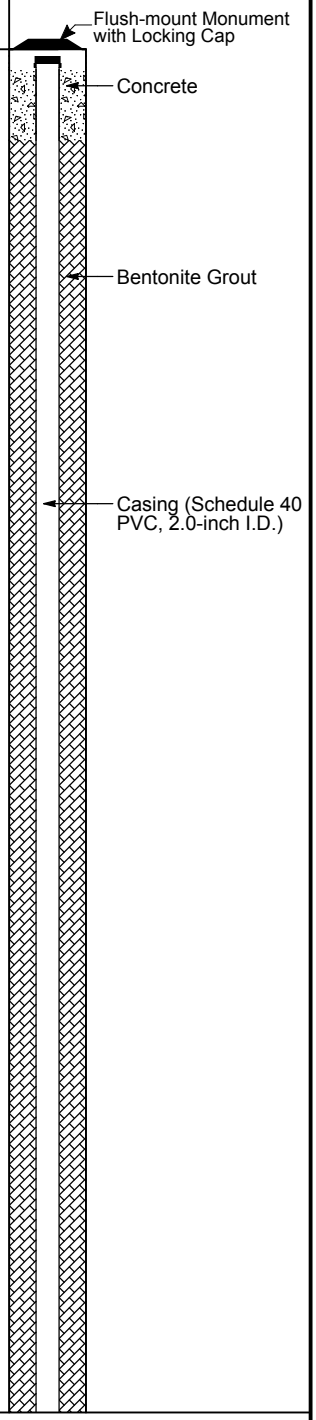
LOG OF BORING RP-24-73

DEPTH (ft bgs)	USCS SYMBOL	SOIL DESCRIPTION	VOLATILE READING (ppm)
0	ML	Stiff. light brown, sandy SILT with trace organics (rootlets); moist.	
	SP	Medium dense, brown, fine SAND, trace silt and organics (wood); moist.	1.7
5	SM-ML	Medium dense, brown, fine to medium, silty SAND with trace clay alternating with clayey silt layers; moist.	
		Color changes to gray and wood layer at 8 ft bgs.	2.7
10		Trace rounded gravel from 10-12 ft bgs.	
		Color changes to brown at 12 ft bgs.	2.5
		Trace organics (wood). Color changes to dark gray at 13.5 ft bgs.	
15			7.9
20	ML	Medium stiff, gray SILT with some clay, trace rounded gravel; moist.	
	SM	Medium dense, gray, fine, silty SAND with trace organics (wood); moist. Clayey silt layer from 22.5-23 ft bgs.	4.4
25	ML	Medium stiff, gray, rounded, coarse, gravelly SILT with some fine sand, trace clay; wet.	
	SM	Medium dense, gray, fine SAND with some silt, trace clay, coarse, rounded gravel, debris (wood and brick); wet.	3.5
	ML	Medium stiff, gray, sandy SILT.	
30			

GRAPHIC LOG | SAMPLE | UV LIGHT/ SUDAN IV | GROUNDWATER | FIELD AND LABORATORY TESTING

WELL SCHEMATIC



BORING METHOD: Sonic
BOREHOLE DIAMETER: 8.0 & 6.0 (in)
DRILL RIG: Mini Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: J. Fassio

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 36.00 feet
CASING ELEVATION: 35.80 feet
START CARD/TAG ID: 186823/L83970
DRILLING DATES: 10/27/2006 - 10/31/2006

REMARKS:
Borehole diameter: 8-inch - 0 to 40 ft bgs. 6-inch - 40 to 86 ft bgs.

RP - Portland
Stage 2 SCE

0-61M-107030 P69

AMEC
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Portland, Oregon
USA 97224
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Fax (503) 620-7892

LOG OF BORING RP-24-85

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07

DEPTH (ft bgs)	USCS SYMBOL	SOIL DESCRIPTION	VOLATILE READING (ppm)	FIELD AND LABORATORY TESTING
30	ML	Sheen and hydrocarbon-like odor noted from 30-32.5 ft bgs.	3.5	1018-01
	ML	Stiff, blue-gray SILT with some clay; moist.		
		Becomes wet at 34 ft bgs.		
35	SM-ML	Soft, gray, sandy SILT to fine, silty SAND; wet.		
		Color changes to brown.		
40				
45	SM	Soft, brown, fine, silty SAND; wet.	1.2	
50	ML	Medium stiff, mottled red-brown and brown SILT with trace clay; wet.		
	SP	Loose, brown, fine to medium SAND; wet.		
55		Fine SAND with trace silt.	1.1	1019-01
60				

WELL SCHEMATIC: Bentonite Grout; Casing (Schedule 40 PVC, 2.0-inch I.D.)

BORING METHOD: Sonic
BOREHOLE DIAMETER: 8.0 & 6.0 (in)
DRILL RIG: Mini Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: J. Fassio

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 36.00 feet
CASING ELEVATION: 35.80 feet
START CARD/TAG ID: 186823/L83970
DRILLING DATES: 10/27/2006 - 10/31/2006

REMARKS:
Borehole diameter: 8-inch - 0 to 40 ft bgs. 6-inch - 40 to 86 ft bgs.

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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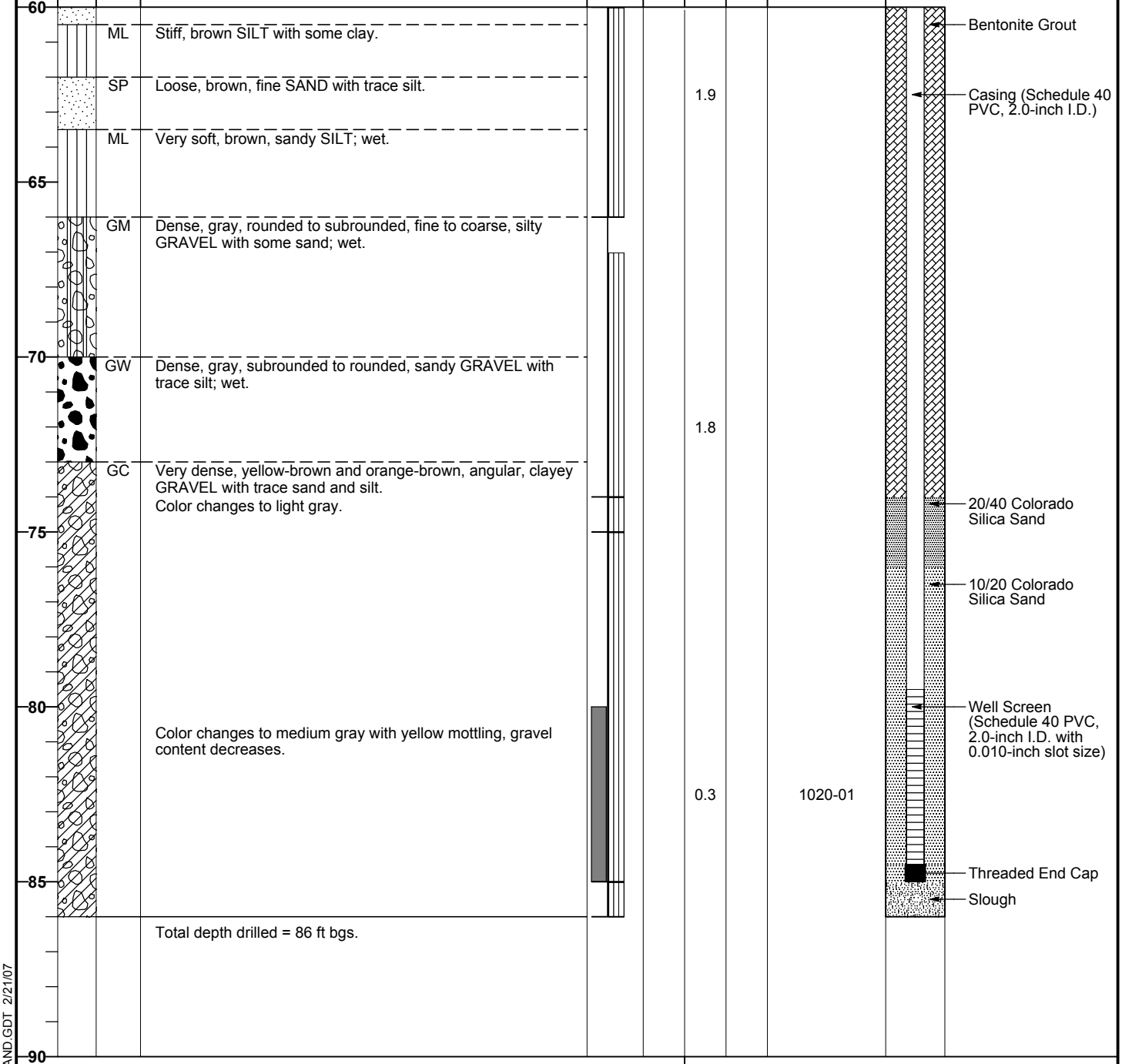
LOG OF BORING RP-24-85

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07



BORING METHOD: Sonic
BOREHOLE DIAMETER: 8.0 & 6.0 (in)
DRILL RIG: Mini Sonic
CONTRACTOR: Boart Longyear
LOGGED BY: J. Fassio

ELEVATION REFERENCE: N/A
GROUND SURFACE ELEVATION: 36.00 feet
CASING ELEVATION: 35.80 feet
START CARD/TAG ID: 186823/L83970
DRILLING DATES: 10/27/2006 - 10/31/2006

REMARKS:
Borehole diameter: 8-inch - 0 to 40 ft bgs. 6-inch - 40 to 86 ft bgs.

RP - Portland
Stage 2 SCE

0-61M-107030 P69

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LOG OF BORING RP-24-85

RP_WELL 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/21/07

PRIVILEGED AND CONFIDENTIAL
WORK PRODUCT PREPARED IN
ANTICIPATION OF LITIGATION

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
0		SP	Medium dense to loose, light brown (5 YR 5/6), fine, poorly graded, SAND, moist, (Fill).						Above Ground Monument (0.17 ft) with Dedicated Pump Cap; Cement; Bentonite Chips (3/8-inch)
						4.6			
5									Casing (Schedule 40 PVC, 2-inch I.D.)
		SM	Medium dense, moderate brown, (5 YR 4/4), silty, fine, SAND, moist, (Fill).						
						3.2			
10		SP-SM	Loose, medium dark gray (N4), fine to medium, poorly graded SAND, trace silt, moist, (Fill).						
		ML	Soft, brownish-gray (5 YR 4/1), SILT, with some clay, trace fine sand, moist, low plasticity, (Fill).						
						14			
15			Fine sand layers, 2 to 3 inches thick from 15-19 ft bgs.						
						4.6			
20									

DRAFT

BORING METHOD: Sonic
BOREHOLE DIAMETER: 8 & 6 (in)
DRILL RIG: Truck Mounted Sonic
CONTRACTOR: Boart Longyear/S. Adams
LOGGED BY: J. Fassio

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
START CARD/TAG ID: NA
DRILLING DATES: 06/16/2009 - 06/17/2009

REMARKS:
Borehole diameter: 8-inch 0-38 ft bgs, 6-inch 38-172 ft bgs.

ENVR+WELL BORING 0-61M-107030.502.002.GPJ AMEC PORTLAND.GDT 8/13/09

RP - Portland Site
NFA ISCM

0-61M-107030 P502 T002

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LOG OF BORING RP-24-172

DEPTH (ft bgs)	USCS SYMBOL	SOIL DESCRIPTION	VOLATILE READING (ppm)	FIELD AND LABORATORY TESTING
20	ML			
	SP	Loose, medium dark gray (N4), fine to medium, SAND, with trace silt, gravel and clay, moist, (Fill).		
25		Some silt layers from 25-25.5 ft bgs.	6.4	
	SM	Loose, medium dark gray (N4), fine, SAND, with some silt, trace clay, moist, (Fill).		
		Silt layer from 29-29.5 ft bgs.		
		Fine SAND, trace silt from 29.5-30.5 ft bgs.		
30			5.0	
	ML-SM	Interbedded, medium stiff, medium dark gray (N4), sandy, SILT, fine sand, with trace clay, low plasticity and loose, medium dark gray (N4), silty, SAND, moist, (Fill). Organics (wood debris layer - 1 foot thick), from 31-32 ft bgs.		
		Scattered, fine organics (wood fibers).		
35		Becomes wet, sheen noted at 35 ft bgs.	5.1	Sieve/ Hydrometer/ Atterberg Tests
	ML	Soft, pale brown (5 YR 3/4), SILT, with some fine sand, wet, nonplastic, (Alluvium).		
40				

WELL SCHEMATIC: Bentonite Grout; Casing (Schedule 40 PVC, 2-inch I.D.)

DRAFT

BORING METHOD: Sonic
BOREHOLE DIAMETER: 8 & 6 (in)
DRILL RIG: Truck Mounted Sonic
CONTRACTOR: Boart Longyear/S. Adams
LOGGED BY: J. Fassio

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
START CARD/TAG ID: NA
DRILLING DATES: 06/16/2009 - 06/17/2009

REMARKS:
Borehole diameter: 8-inch 0-38 ft bgs, 6-inch 38-172 ft bgs.

ENVR+WELL BORING 0-61M-107030.502.002.GPJ AMEC PORTLAND.GDT 8/13/09

RP - Portland Site
NFA ISCM

0-61M-107030 P502 T002

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LOG OF BORING RP-24-172

DEPTH (ft bgs)	USCS SYMBOL	SOIL DESCRIPTION	VOLATILE READING (ppm)	FIELD AND LABORATORY TESTING
40	ML		1.8	
	SM	Loose, pale brown (5 YR 5/2), silty, fine SAND, wet, micaceous, (Alluvium).		
	ML	Soft, pale brown (5 YR 5/2), SILT, with some clay and trace fine sand, wet, low plasticity, (Alluvium).		
45			2.0	Sieve/ Hydrometer/ Atterberg Tests
	SM	Loose, pale brown (5 YR 5/2), fine to medium, SAND, with some silt, wet, (Alluvium).		
50			2.0	
	ML	Soft, pale brown (5 YR 5/2), SILT, with some fine sand, trace clay, wet, nonplastic, (Alluvium).		
	SP	Loose, pale brown (5 YR 5/2), fine to medium, SAND, wet, (Alluvium).		
55			1.5	Sieve Test
	SM	Loose, pale brown (5 YR 5/2), silty, fine, SAND, wet, (Alluvium).		
60				

WELL SCHEMATIC: Bentonite Grout; Casing (Schedule 40 PVC, 2-inch I.D.)

DRAFT

BORING METHOD: Sonic
BOREHOLE DIAMETER: 8 & 6 (in)
DRILL RIG: Truck Mounted Sonic
CONTRACTOR: Boart Longyear/S. Adams
LOGGED BY: J. Fassio

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
START CARD/TAG ID: NA
DRILLING DATES: 06/16/2009 - 06/17/2009

REMARKS:
Borehole diameter: 8-inch 0-38 ft bgs, 6-inch 38-172 ft bgs.

RP - Portland Site
NFA ISCM

0-61M-107030 P502 T002

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LOG OF BORING RP-24-172

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
60		SM				1.3			Bentonite Grout; Casing (Schedule 40 PVC, 2-inch I.D.)
			Fine sand layers from 64-65 ft bgs.			1.6			
65									
70		GW	Dense, medium dark gray (N4), fine to coarse, rounded to subrounded, GRAVEL, with some sand, trace clay and silt, wet, (DAG).			4.6			
		CL	Hard, grayish-orange (10 YR 7/4), gravelly, CLAY, coarse to fine angular gravel, stained grayish-brown (5 YR 2/2) and most are friable, some silt and sand, (Decomposing CRBG).			3.1			
			Dark yellowish-orange (10 YR 6/6) and grayish-red (10 R 4/2).						
75		GM	Very dense, moderate yellowish-brown (10 YR 6/6), fine to coarse, angular to subangular, GRAVEL, with some sand, silt and clay (matrix), gravels are hard to friable with dusk-brown (5 YR 2/2) staining, wet, (Decomposing CRBG).						
		GC	Dense, grayish-brown (5 YR 3/2) with pale yellowish-orange (10 YR 5/6), clayey, GRAVEL with trace fine to coarse, sand, wet, (Decomposing CRBG).						
80									

DRAFT

BORING METHOD: Sonic
BOREHOLE DIAMETER: 8 & 6 (in)
DRILL RIG: Truck Mounted Sonic
CONTRACTOR: Boart Longyear/S. Adams
LOGGED BY: J. Fassio

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
START CARD/TAG ID: NA
DRILLING DATES: 06/16/2009 - 06/17/2009

REMARKS:
Borehole diameter: 8-inch 0-38 ft bgs, 6-inch 38-172 ft bgs.

ENVR+WELL BORING 0-61M-107030.502.002.GPJ AMEC PORTLAND.GDT 8/13/09

RP - Portland Site
NFA ISCM

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LOG OF BORING RP-24-172

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
80		GC	Some fine sand and silt, with minor vesicles.			3.6		Sieve/ Hydrometer Tests	Bentonite Grout; Casing (Schedule 40 PVC, 2-inch I.D.)
85			Light gray with pale reddish-brown mottling.			2.6			
		GC	Dense, moderate reddish-orange (10 R 6/6) and moderate reddish-brown (10 R 4/6), clayey, angular, well-graded, GRAVEL, some fine sand, wet. (Decomposing CRBG).			4.8			
90			BASALT, moderate light gray (N7), no vesicles, moderately weathered (some friable basalt), intensely fractured (0.2-0.5 ft), clay matrix between boulders, iron-oxide staining, (CRBG).						
95		GM	Dense, medium gray (N5), coarse to fine, subrounded to subangular, GRAVEL, with clay and silt, moist, wet, nonplastic, iron-oxide and manganese-oxide staining, (Decomposing CRBG).			5.5			
			Cobbles, fresh and friable from 98-102 ft bgs.			3.8			
100									

DRAFT

BORING METHOD: Sonic
BOREHOLE DIAMETER: 8 & 6 (in)
DRILL RIG: Truck Mounted Sonic
CONTRACTOR: Boart Longyear/S. Adams
LOGGED BY: J. Fassio

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
START CARD/TAG ID: NA
DRILLING DATES: 06/16/2009 - 06/17/2009

REMARKS:
Borehole diameter: 8-inch 0-38 ft bgs, 6-inch 38-172 ft bgs.

ENVR+WELL BORING 0-61M-107030.502.002.GPJ AMEC PORTLAND.GDT 8/13/09

RP - Portland Site
NFA ISCM

0-61M-107030 P502 T002

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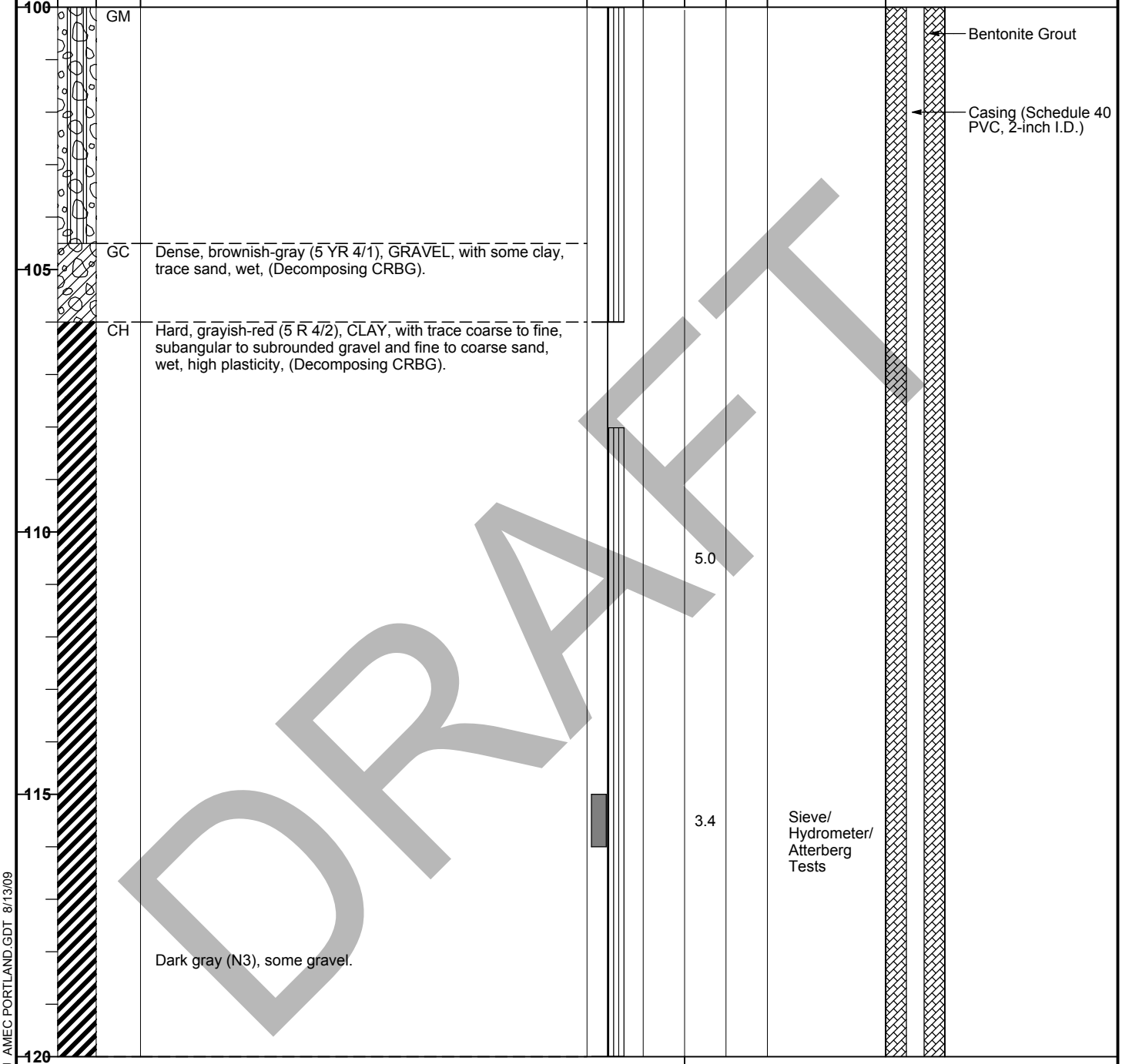
LOG OF BORING RP-24-172



DRAFT

BORING METHOD: Sonic
BOREHOLE DIAMETER: 8 & 6 (in)
DRILL RIG: Truck Mounted Sonic
CONTRACTOR: Boart Longyear/S. Adams
LOGGED BY: J. Fassio

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
START CARD/TAG ID: NA
DRILLING DATES: 06/16/2009 - 06/17/2009

REMARKS:
Borehole diameter: 8-inch 0-38 ft bgs, 6-inch 38-172 ft bgs.

RP - Portland Site
NFA ISCM

0-61M-107030 P502 T002

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LOG OF BORING RP-24-172

ENVR+WELL BORING 0-61M-107030.502.002.GPJ AMEC PORTLAND.GDT 8/13/09

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
120		GC	Dense, dark gray (N3), clayey, fine to coarse, subrounded to subangular, well-graded, GRAVEL, trace sand, wet, some gravel are friable and weathered, (Decomposing CRBG).			5.1			Bentonite Grout
			Moderate yellowish-brown (10 YR 5/4) and moderate brown (5 YR 3/4).						Casing (Schedule 40 PVC, 2-inch I.D.)
						4.4			
125									
						1.6			
130			Grayish-brown (5 YR 3/2).						
135						10			
		GW	Very dense, dark gray (N3), coarse to fine, subrounded, GRAVEL, with medium sand, trace clay and silt, cobbles, wet, (Decomposing CRBG).			0.8			
		GC	Very dense, medium dark gray (N4), subangular to angular, GRAVEL and cobbles, with some clay and trace sand, wet, (Decomposing CRBG).						
140									

DRAFT

BORING METHOD: Sonic
BOREHOLE DIAMETER: 8 & 6 (in)
DRILL RIG: Truck Mounted Sonic
CONTRACTOR: Boart Longyear/S. Adams
LOGGED BY: J. Fassio

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
START CARD/TAG ID: NA
DRILLING DATES: 06/16/2009 - 06/17/2009

REMARKS:
Borehole diameter: 8-inch 0-38 ft bgs, 6-inch 38-172 ft bgs.

RP - Portland Site
NFA ISCM

0-61M-107030 P502 T002

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LOG OF BORING RP-24-172

ENVR+WELL BORING 0-61M-107030.502.002.GPJ AMEC PORTLAND.GDT 8/13/09

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
140		GC	Trace clay, silt and sand.			6.1			Bentonite Grout Casing (Schedule 40 PVC, 2-inch I.D.)
145						4.6		Sieve Test	
			Coarse GRAVEL and cobbles, some clay (approximately 15%).						
150			BASALT, moderate light gray (N7), no vesicles, clay matrix between boulders, (CRBG).						Coated Bentonite Pellets
155		GM	Dense, brownish-gray (5 YR 4/1), coarse, angular to subangular, GRAVEL, with clay, sand and silt, gravels are vesicular (with large vesicles), wet, (Decomposing CRBG).						
			Gravel becomes highly vesicular (approximately 40%), some sand and silt.						Centralizer 20/40 Colorado Silica Sand
160									

DRAFT

BORING METHOD: Sonic
BOREHOLE DIAMETER: 8 & 6 (in)
DRILL RIG: Truck Mounted Sonic
CONTRACTOR: Boart Longyear/S. Adams
LOGGED BY: J. Fassio

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
START CARD/TAG ID: NA
DRILLING DATES: 06/16/2009 - 06/17/2009

REMARKS:
Borehole diameter: 8-inch 0-38 ft bgs, 6-inch 38-172 ft bgs.

ENVR+WELL BORING 0-61M-107030.502.002.GPJ AMEC PORTLAND.GDT 8/13/09

RP - Portland Site
NFA ISCM

0-61M-107030 P502 T002

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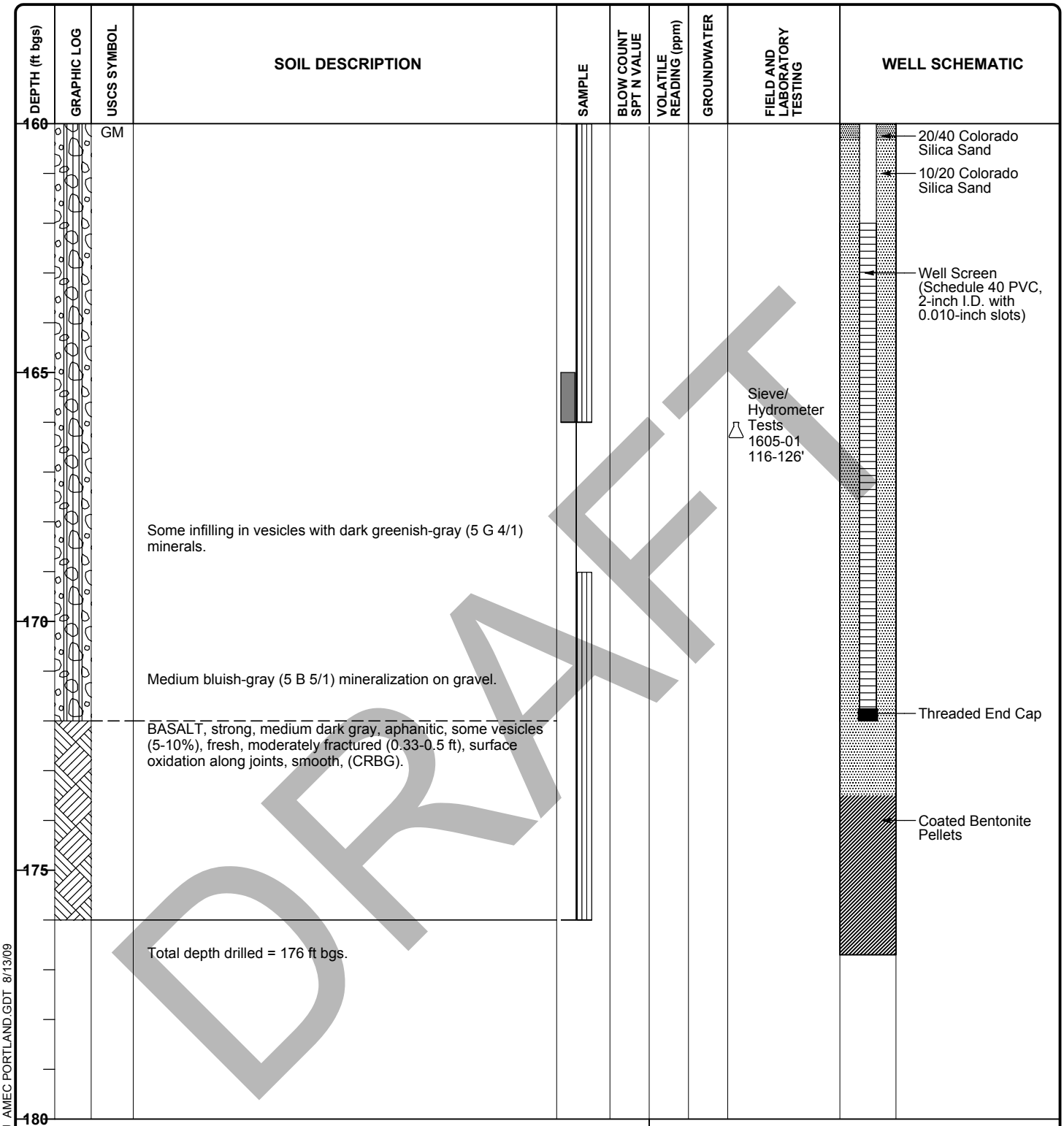
LOG OF BORING RP-24-172



DRAFT

BORING METHOD: Sonic
BOREHOLE DIAMETER: 8 & 6 (in)
DRILL RIG: Truck Mounted Sonic
CONTRACTOR: Boart Longyear/S. Adams
LOGGED BY: J. Fassio

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
START CARD/TAG ID: NA
DRILLING DATES: 06/16/2009 - 06/17/2009

REMARKS:
Borehole diameter: 8-inch 0-38 ft bgs, 6-inch 38-172 ft bgs.

RP - Portland Site
NFA ISCM

0-61M-107030 P502 T002

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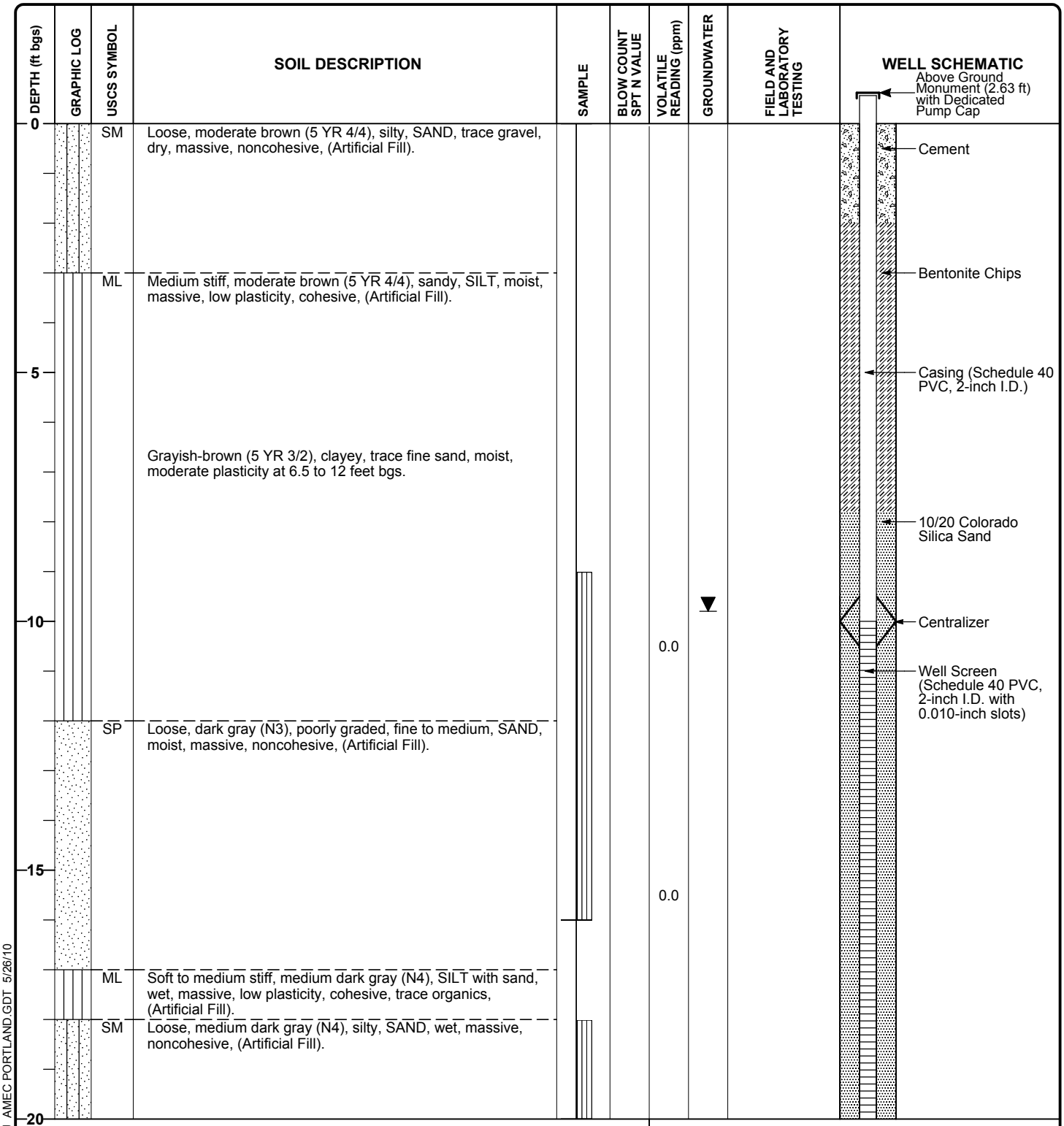
LOG OF BORING RP-24-172

ENVR+WELL BORING 0-61M-107030.502.002.GPJ AMEC PORTLAND.GDT 8/13/09



BORING METHOD: Sonic
BOREHOLE DIAMETER: 6 (in)
DRILL RIG: Truck Mounted Sonic
CONTRACTOR: Boart Longyear/S. Adams
LOGGED BY: J. Fassio

ELEVATION REFERENCE: City of Portland Datum
GROUND SURFACE ELEVATION: 32.53 feet
CASING ELEVATION: 35.12 feet
START CARD/TAG ID: 202071/L99196
DRILLING DATES: 06/15/2009 - 06/15/2009

REMARKS:
Airknife to 10 ft bgs. Borehole diameter: 6-inch 0-31 ft bgs.

ENVR+WELL BORING 0-61M-107030.502.002.GPJ AMEC PORTLAND.GDT 5/26/10

RP - Portland Site
NFA ISCM

0-61M-107030 P502 T002

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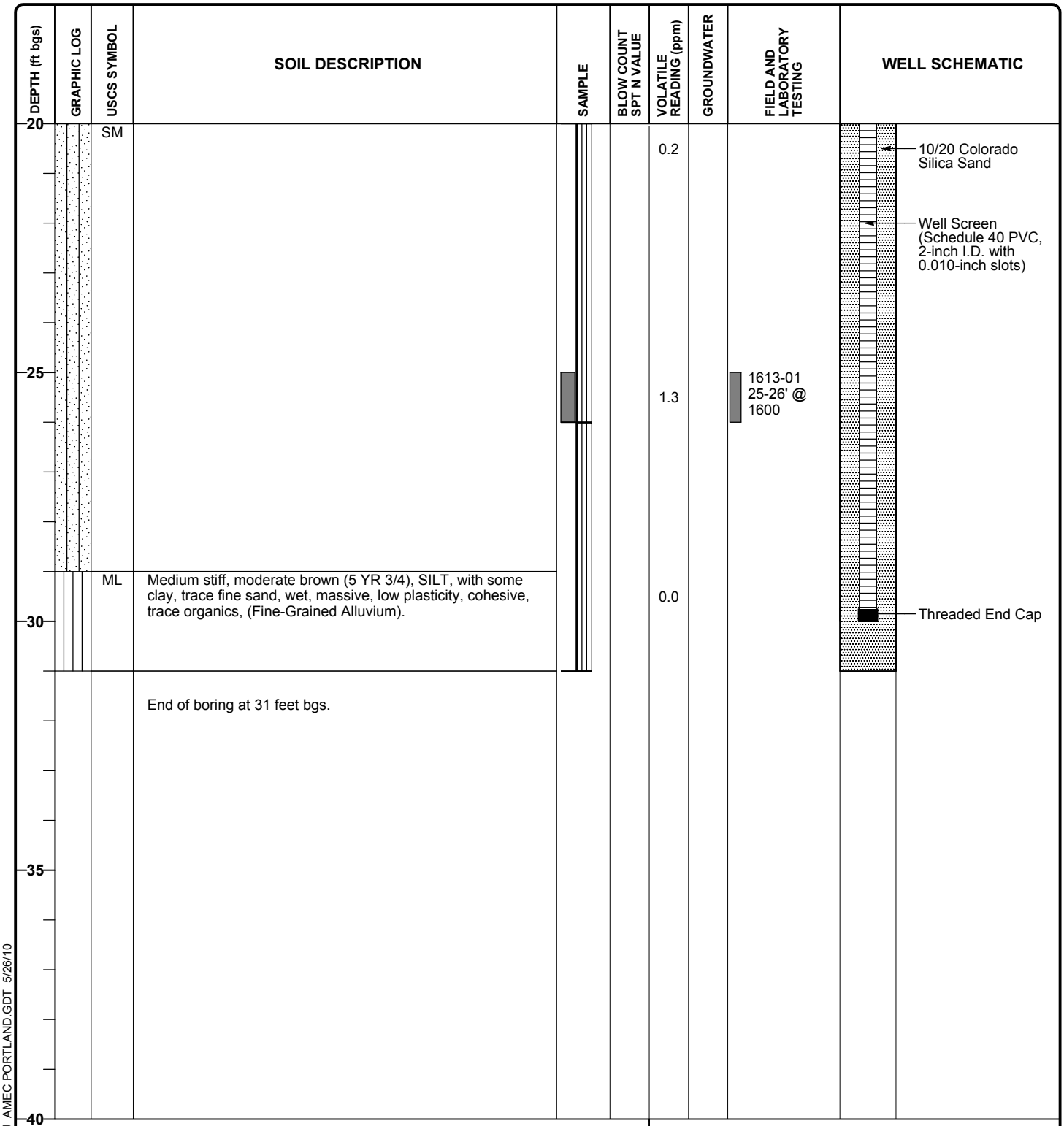
LOG OF BORING RP-25-30



BORING METHOD: Sonic
BOREHOLE DIAMETER: 6 (in)
DRILL RIG: Truck Mounted Sonic
CONTRACTOR: Boart Longyear/S. Adams
LOGGED BY: J. Fassio

ELEVATION REFERENCE: City of Portland Datum
GROUND SURFACE ELEVATION: 32.53 feet
CASING ELEVATION: 35.12 feet
START CARD/TAG ID: 202071/L99196
DRILLING DATES: 06/15/2009 - 06/15/2009

REMARKS:
Airknife to 10 ft bgs. Borehole diameter: 6-inch 0-31 ft bgs.

ENVR+WELL BORING 0-61M-107030.502.002.GPJ AMEC PORTLAND.GDT 5/26/10

RP - Portland Site
NFA ISCM

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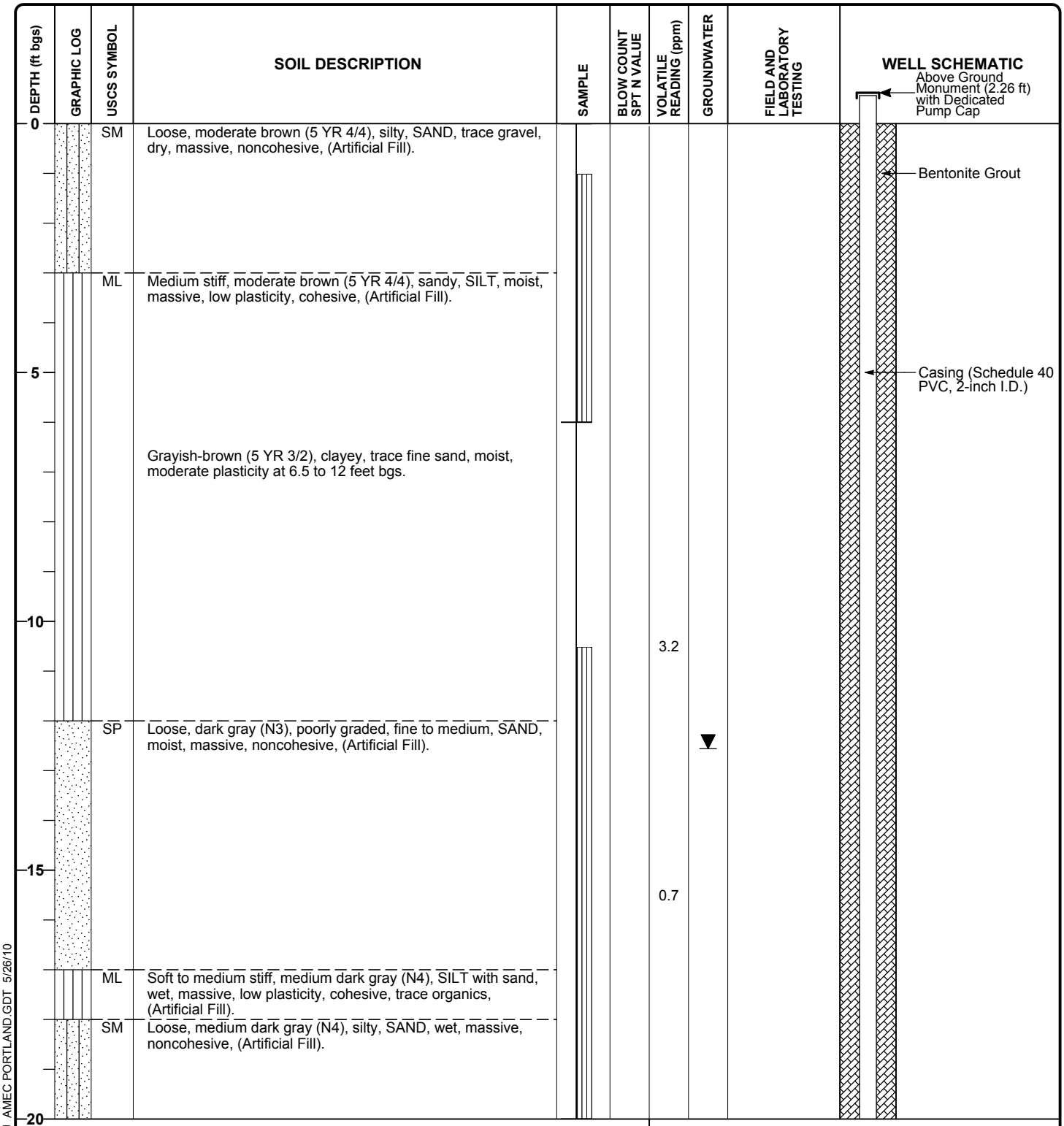
LOG OF BORING RP-25-30



BORING METHOD: Sonic
BOREHOLE DIAMETER: 8 & 6 (in)
DRILL RIG: Truck Mounted Sonic
CONTRACTOR: Boart Longyear/S. Adams
LOGGED BY: J. Fassio

ELEVATION REFERENCE: City of Portland Datum
GROUND SURFACE ELEVATION: 32.67 feet
CASING ELEVATION: 35.51 feet
START CARD/TAG ID: 202070/L99195
DRILLING DATES: 06/12/2009 - 06/15/2009

REMARKS:
Airknife to 10 ft bgs. Borehole diameter: 8-inch 0-36 ft bgs, 6-inch 36-86 ft bgs.

ENVR+WELL BORING 0-61M-107030.502.002.GPJ AMEC PORTLAND.GDT 5/26/10

RP - Portland Site
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LOG OF BORING RP-25-86

DEPTH (ft bgs)	USCS SYMBOL	SOIL DESCRIPTION	VOLATILE READING (ppm)
20	SM		0.9
25			1.5
30	ML	Medium stiff, moderate brown (5 YR 3/4), SILT, with some clay, trace fine sand, wet, massive, low plasticity, cohesive, (Fine-Grained Alluvium). Organics (woody layer 3 inches thick) at 29.5 feet bgs.	0.6
35	SM	Medium dense, moderate brown (5 YR 3/4), silty, SAND, wet, massive, noncohesive, (Fine-Grained Alluvium).	0.6
40			

GRAPHIC LOG | SAMPLE | BLOW COUNT SPT N VALUE | GROUNDWATER | FIELD AND LABORATORY TESTING

WELL SCHEMATIC

- Bentonite Grout
- Casing (Schedule 40 PVC, 2-inch I.D.)

BORING METHOD: Sonic
BOREHOLE DIAMETER: 8 & 6 (in)
DRILL RIG: Truck Mounted Sonic
CONTRACTOR: Boart Longyear/S. Adams
LOGGED BY: J. Fassio

ELEVATION REFERENCE: City of Portland Datum
GROUND SURFACE ELEVATION: 32.67 feet
CASING ELEVATION: 35.51 feet
START CARD/TAG ID: 202070/L99195
DRILLING DATES: 06/12/2009 - 06/15/2009

REMARKS:
Airknife to 10 ft bgs. Borehole diameter: 8-inch 0-36 ft bgs, 6-inch 36-86 ft bgs.

ENVR+WELL BORING 0-61M-107030.502.002.GPJ AMEC PORTLAND.GDT 5/26/10

RP - Portland Site
NFA ISCM

0-61M-107030 P502 T002

AMEC
7376 SW Durham Road
Portland, Oregon
USA 97224
Tel (503) 639-3400
Fax (503) 620-7892

LOG OF BORING RP-25-86

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
40		SM							Bentonite Grout
									Casing (Schedule 40 PVC, 2-inch I.D.)
45			Becomes medium dark gray (N4) at 45 to 55 feet bgs.			0.0			
50						0.0			
55		ML	Medium stiff, grayish-brown (5 YR 3/2), SILT, with sand, wet, massive, low plasticity, cohesive, trace organics, (Fine-Grained Alluvium).			0.0			
60									

BORING METHOD: Sonic
BOREHOLE DIAMETER: 8 & 6 (in)
DRILL RIG: Truck Mounted Sonic
CONTRACTOR: Boart Longyear/S. Adams
LOGGED BY: J. Fassio

ELEVATION REFERENCE: City of Portland Datum
GROUND SURFACE ELEVATION: 32.67 feet
CASING ELEVATION: 35.51 feet
START CARD/TAG ID: 202070/L99195
DRILLING DATES: 06/12/2009 - 06/15/2009

REMARKS:
Airknife to 10 ft bgs. Borehole diameter: 8-inch 0-36 ft bgs, 6-inch 36-86 ft bgs.

ENVR+WELL BORING 0-61M-107030.502.002.GPJ AMEC PORTLAND.GDT 5/26/10

RP - Portland Site
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LOG OF BORING RP-25-86

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING
60		ML				0.0		
65						0.0		
70						0.0		
75		ML	Becomes stiff, dark greenish-gray (5 GY 4/1) with some clay at 74 to 75 feet bgs. Soft to medium stiff, pale brown (5 YR 5/2), SILT, with sand, wet, massive, noncohesive, (Fine-Grained Alluvium).			0.0		1612-01 75-76' @1100
80						0.0		

WELL SCHEMATIC

- Bentonite Grout
- Casing (Schedule 40 PVC, 2-inch I.D.)
- Bentonite Chips (3/8-inch)
- 20/40 Colorado Silica Sand
- 10/20 Colorado Silica Sand
- Centralizer
- Well Screen (Schedule 40 PVC, 2-inch I.D. with 0.010-inch slots)

BORING METHOD: Sonic
BOREHOLE DIAMETER: 8 & 6 (in)
DRILL RIG: Truck Mounted Sonic
CONTRACTOR: Boart Longyear/S. Adams
LOGGED BY: J. Fassio

ELEVATION REFERENCE: City of Portland Datum
GROUND SURFACE ELEVATION: 32.67 feet
CASING ELEVATION: 35.51 feet
START CARD/TAG ID: 202070/L99195
DRILLING DATES: 06/12/2009 - 06/15/2009

REMARKS:
Airknife to 10 ft bgs. Borehole diameter: 8-inch 0-36 ft bgs, 6-inch 36-86 ft bgs.

ENVR+WELL BORING 0-61M-107030.502.002.GPJ AMEC PORTLAND.GDT 5/26/10

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DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
80		ML				0.0			10/20 Colorado Silica Sand
									Well Screen (Schedule 40 PVC, 2-inch I.D. with 0.010-inch slots)
						0.6			
85						1.3			Threaded End Cap
			End of boring at 86 feet bgs.						
90									
95									
100									

BORING METHOD: Sonic
BOREHOLE DIAMETER: 8 & 6 (in)
DRILL RIG: Truck Mounted Sonic
CONTRACTOR: Boart Longyear/S. Adams
LOGGED BY: J. Fassio

ELEVATION REFERENCE: City of Portland Datum
GROUND SURFACE ELEVATION: 32.67 feet
CASING ELEVATION: 35.51 feet
START CARD/TAG ID: 202070/L99195
DRILLING DATES: 06/12/2009 - 06/15/2009

REMARKS:
Airknife to 10 ft bgs. Borehole diameter: 8-inch 0-36 ft bgs, 6-inch 36-86 ft bgs.

ENVR+WELL BORING 0-61M-107030.502.002.GPJ AMEC PORTLAND.GDT 5/26/10

RP - Portland Site
NFA ISCM

0-61M-107030 P502 T002

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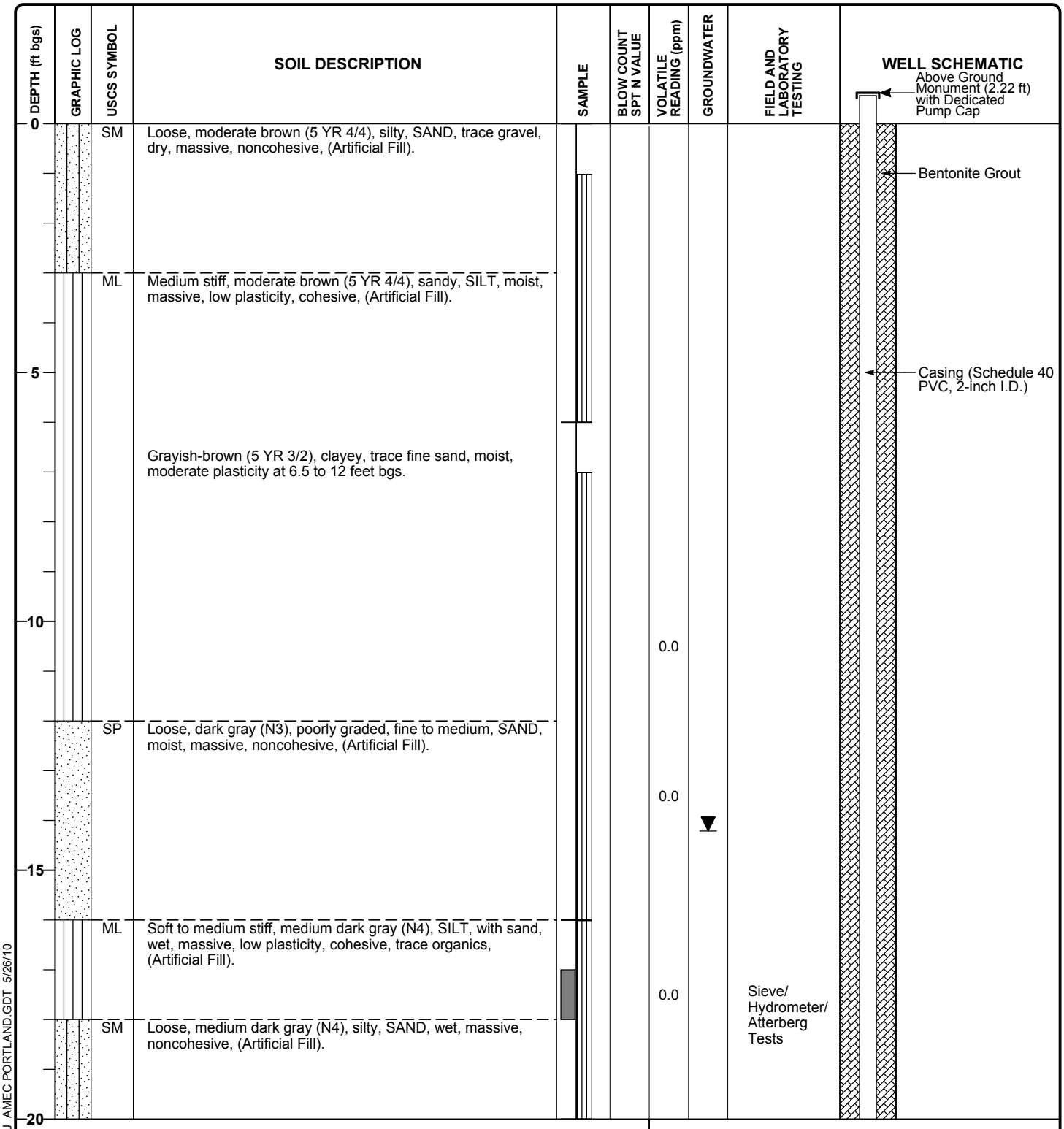
LOG OF BORING RP-25-86



BORING METHOD: Sonic
BOREHOLE DIAMETER: 8 & 6 (in)
DRILL RIG: Truck Mounted Sonic
CONTRACTOR: Boart Longyear/S. Adams
LOGGED BY: J. Fassio

ELEVATION REFERENCE: City of Portland Datum
GROUND SURFACE ELEVATION: 32.72 feet
CASING ELEVATION: 34.89 feet
START CARD/TAG ID: 202069/L99194
DRILLING DATES: 06/08/2009 - 06/12/2009

REMARKS:
Airknife to 10 ft bgs. Borehole diameter: 8-inch 0-36 ft bgs, 6-inch 36-122 ft bgs.

ENVR+WELL BORING 0-61M-107030.502.002.GPJ AMEC PORTLAND.GDT 5/26/10

RP - Portland Site
NFA ISCM

0-61M-107030 P502 T002

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LOG OF BORING RP-25-113

DEPTH (ft bgs)	USCS SYMBOL	SOIL DESCRIPTION	VOLATILE READING (ppm)	FIELD AND LABORATORY TESTING
20	SM			
25			0.0	Sieve/ Hydrometer/ Atterberg Tests
	ML	Medium stiff, moderate brown (5 YR 3/4), SILT, with some clay, trace fine sand, wet, massive, low plasticity, cohesive, (Fine-Grained Alluvium). Organics (woody layer 3 inches thick) at 29.5 feet bgs.	0.0	
30				
35	SM	Medium dense, moderate brown (5 YR 3/4), silty, SAND, wet, massive, noncohesive, (Fine-Grained Alluvium).	0.0	Sieve/ Hydrometer/ Atterberg Tests
40				

WELL SCHEMATIC: Bentonite Grout; Casing (Schedule 40 PVC, 2-inch I.D.)

BORING METHOD: Sonic
BOREHOLE DIAMETER: 8 & 6 (in)
DRILL RIG: Truck Mounted Sonic
CONTRACTOR: Boart Longyear/S. Adams
LOGGED BY: J. Fassio

ELEVATION REFERENCE: City of Portland Datum
GROUND SURFACE ELEVATION: 32.72 feet
CASING ELEVATION: 34.89 feet
START CARD/TAG ID: 202069/L99194
DRILLING DATES: 06/08/2009 - 06/12/2009

REMARKS:
Airknife to 10 ft bgs. Borehole diameter: 8-inch 0-36 ft bgs, 6-inch 36-122 ft bgs.

ENVR+WELL BORING 0-61M-107030.502.002.GPJ AMEC PORTLAND.GDT 5/26/10

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LOG OF BORING RP-25-113

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
40		SM				0.0			Bentonite Grout; Casing (Schedule 40 PVC, 2-inch I.D.)
45			Becomes medium dark gray (N4) at 45 to 55 feet bgs.			0.0			
50						0.0			
55		ML	Medium stiff, grayish-brown (5 YR 3/2), SILT, with sand, wet, massive, low plasticity, cohesive, trace organics, (Fine-Grained Alluvium).			0.0			
60									

BORING METHOD: Sonic
BOREHOLE DIAMETER: 8 & 6 (in)
DRILL RIG: Truck Mounted Sonic
CONTRACTOR: Boart Longyear/S. Adams
LOGGED BY: J. Fassio

ELEVATION REFERENCE: City of Portland Datum
GROUND SURFACE ELEVATION: 32.72 feet
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START CARD/TAG ID: 202069/L99194
DRILLING DATES: 06/08/2009 - 06/12/2009

REMARKS:
Airknife to 10 ft bgs. Borehole diameter: 8-inch 0-36 ft bgs, 6-inch 36-122 ft bgs.

ENVR+WELL BORING 0-61M-107030.502.002.GPJ AMEC PORTLAND.GDT 5/26/10

RP - Portland Site
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LOG OF BORING RP-25-113

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
60		ML				0.0			Bentonite Grout; Casing (Schedule 40 PVC, 2-inch I.D.)
65						0.0		Sieve/ Hydrometer/ Atterberg Tests	
70						0.0			
75		ML	Soft to medium stiff, pale brown (5 YR 5/2), SILT, with sand, wet, massive, noncohesive, (Fine-Grained Alluvium).			0.0		Sieve/ Hydrometer/ Atterberg Tests	
80									

BORING METHOD: Sonic
BOREHOLE DIAMETER: 8 & 6 (in)
DRILL RIG: Truck Mounted Sonic
CONTRACTOR: Boart Longyear/S. Adams
LOGGED BY: J. Fassio

ELEVATION REFERENCE: City of Portland Datum
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REMARKS:
Airknife to 10 ft bgs. Borehole diameter: 8-inch 0-36 ft bgs, 6-inch 36-122 ft bgs.

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DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
80		ML				0.8			Bentonite Grout; Casing (Schedule 40 PVC, 2-inch I.D.)
						2.7		Sieve/ Hydrometer/ Atterberg Tests	
85		ML	Soft, moderate brown (5 YR 4/4), SILT, wet, massive, low plasticity, cohesive, (Fine-Grained Alluvium).						
						1.2			
90									
95						1.7			
		SM	Loose, pale brown (5 YR 5/2), silty, fine, SAND, wet, massive, noncohesive, (Fine-Grained Alluvium).						
100									

BORING METHOD: Sonic
BOREHOLE DIAMETER: 8 & 6 (in)
DRILL RIG: Truck Mounted Sonic
CONTRACTOR: Boart Longyear/S. Adams
LOGGED BY: J. Fassio

ELEVATION REFERENCE: City of Portland Datum
GROUND SURFACE ELEVATION: 32.72 feet
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REMARKS:
Airknife to 10 ft bgs. Borehole diameter: 8-inch 0-36 ft bgs, 6-inch 36-122 ft bgs.

ENVR+WELL BORING 0-61M-107030.502.002.GPJ AMEC PORTLAND.GDT 5/26/10

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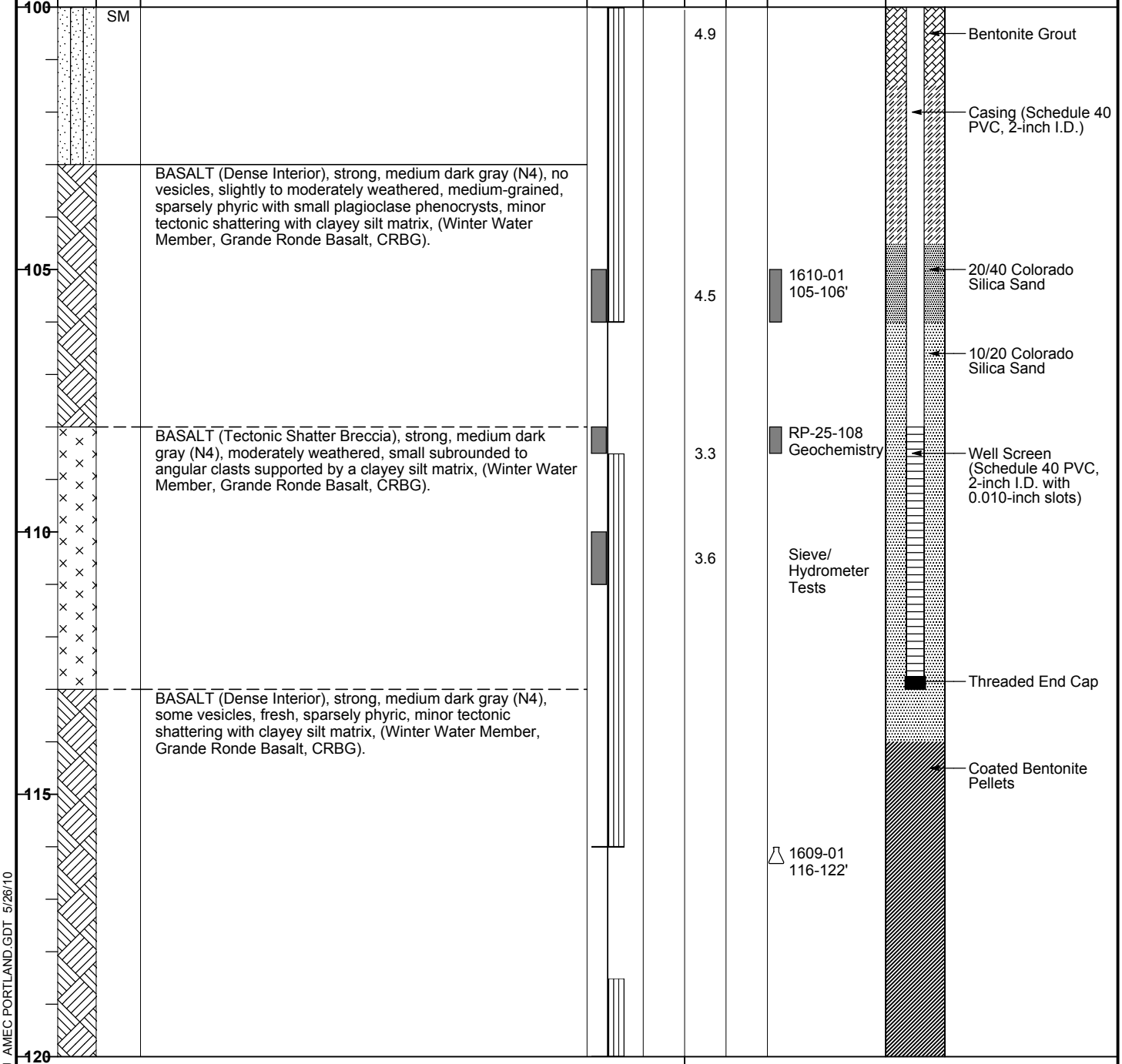
LOG OF BORING RP-25-113



BORING METHOD: Sonic
BOREHOLE DIAMETER: 8 & 6 (in)
DRILL RIG: Truck Mounted Sonic
CONTRACTOR: Boart Longyear/S. Adams
LOGGED BY: J. Fassio

ELEVATION REFERENCE: City of Portland Datum
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REMARKS:
Airknife to 10 ft bgs. Borehole diameter: 8-inch 0-36 ft bgs, 6-inch 36-122 ft bgs.

ENVR+WELL BORING 0-61M-107030.502.002.GPJ AMEC PORTLAND.GDT 5/26/10

RP - Portland Site
NFA ISCM

0-61M-107030 P502 T002

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LOG OF BORING RP-25-113

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
120			Total depth drilled = 122 ft bgs.						Coated Bentonite Pellets
125									
130									
135									
140									

BORING METHOD: Sonic
BOREHOLE DIAMETER: 8 & 6 (in)
DRILL RIG: Truck Mounted Sonic
CONTRACTOR: Boart Longyear/S. Adams
LOGGED BY: J. Fassio

ELEVATION REFERENCE: City of Portland Datum
GROUND SURFACE ELEVATION: 32.72 feet
CASING ELEVATION: 34.89 feet
START CARD/TAG ID: 202069/L99194
DRILLING DATES: 06/08/2009 - 06/12/2009

REMARKS:
Airknife to 10 ft bgs. Borehole diameter: 8-inch 0-36 ft bgs, 6-inch 36-122 ft bgs.

ENVR+WELL BORING 0-61M-107030.502.002.GPJ AMEC PORTLAND.GDT 5/26/10

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LOG OF BORING RP-25-113

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: SB-21	Date(s): **3/9/09 through 3/11/09**
Location: **7200 NW Front Avenue, Portland, Oregon**	
Project Name: **Remedial Investigation - Siltronic Corporation**	
Driller: **Boart Longyear E & I Division**	Project Number: **5237**
Drilling Method: **Rotosonic 600t**	GS Elevation: **37.6749** / TOC: Not Applicable
Sampling Method: **Rotosonic - Grab**	Northing: **704368.68** / Easting: **7624037.67**
Boring & Casing Details: 8 inch steel casing driven to 26.0 feet then pulled back to 23.0 feet bgs. Three foot hydrated bentonite annular seal set from 23 to 26 feet bgs. 6 inch steel casing subsequently placed to terminal depth of boring.	Borehole Dia.: **8 & 6 inches** / Total Depth: **108.0 feet bgs**
	Logged By: **Ben Uhl** / Checked By: **Rob Ede**
Annular Fill: 3/8" Bentonite Chips : 0-20 feet Grout Mix (20% Solids, 9.8 lbs/gal avg) : 20-108 feet Grout Mix Ratio of 35:10:100 (gallons water : lbs organoclay : lbs granular bentonite)	Remarks: City of Portland Datum Sample Numbers: 5237-0903XX-XXX

Elevation (ft)	Depth (ft)	Recovery (ft) (core interval)	Sample Information (Prefix: 5237-0903XX-XXX) Soil: Interval	Soil: Number	Soil: PID (ppm)	Soil: UV Screen	Water: Well Point Interval	Water: Number	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	1										**0.0 - 10.0 Feet:** Location air knifed with no soil sampling.		
	2												
35	3												
	4												
	5												
	6												
	7												
30	8												
	9												
	10			11-001GS (10')						SP	**10.0 - 11.0 Feet:** SAND with trace of gravel, brown, moist, loose, fine grained, poorly graded. Gravel is sub-rounded. No odor, no sheen, no discoloration, but UV screen shows speckled fluorescence.	1 ▼	
	11				2.4	+	(1)	09 -100		SM			
	12	3 (10-13)		09-001 (11-13') 09-001G (12')		+				ML	**11.0 - 11.5 Feet:** silty SAND, brown, moist, loose, fine grained, poorly graded, no odor, no sheen, no discoloration.		
25	13										**11.5 - 13.0 Feet:** SILT, brown which turns prussian blue when exposed to atmosphere, moist, soft, low plasticity. Blue wood chips and oily aroma present, no visible oil blebs, UV screen show speckeled fluorescence.	1 ▽	
	14									SM			
	15									OM	**13.0 - 14.0 Feet:** silty SAND, bluish brown, wet, loose, fine grained, poorly graded. Wood chips present with mild odor, and minor sheen present in water during sheen testing.		
	16										**14.0 - 20.0 Feet:** ORGANIC wood chips with some silt, prussian blue, wet, loose. Sticky plastic tar present from 19.0 - 20.0 feet, UV screen at 18.0 feet show small patches and speckles of fluorescence.		
	17												
20	18	13 (13-26)			4.6	+							
	19												

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

bgs = below ground surface
PID = photoionization detector

1 ▽ First encountered groundwater

1 ▼ Groundwater depth at time of sampling (numbers indicate corresponding well point interval)

Report: SONIC WITH SOIL_WATER_PID_UV SAMPLES; File: 5237 (4_08).GPJ; 11/22/10

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: SB-21
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Recovery (ft) (core interval)	Sample Information (Prefix: 5237-0903XX-XXX) Soil: Interval	Soil: Number	Soil: PID (ppm)	Soil: UV Screen	Water: Well Point Interval	Water: Number	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	21		11-002GS (20')							SP	**20.0 - 22.0 Feet:** SAND, brown, moist, loose, fine grained, poorly graded. Minor amounts of thick black viscous oil present with mild oil-like odor and minor sheen present in water during sheen testing. Black sticky tar present from 21.5 to 22.0 feet.		
	22									ML	**22.0 - 41.0 Feet:** SILT, brown and olive gray turning gray at 26.0 feet, red mottling present, moist, soft, non-plastic. No odor, no sheen, no discoloration, UV screening throughout interval shows patchy fluorescence.		
-15	23				0.7	+							
	24										Set 8-inch steel casing at 26.0 feet with bentonite annular seal placed from 23.0 to 26.0 feet. After hydrating bentonite, continue drilling by advancing 6-inch steel casing inside the 8-inch steel casing and through the middle of the hydrated bentonite seal.		
	25												
	26				0.8	+							
	27												
-10	28												
	29												
	30		11-003GS (30')										
	31				0.4	+							
	32												
-5	33	15 (26-41)											
	34												
	35												
	36				0.8	+							
	37												
0	38												
	39												
	40		11-004GS (40')		1.7	+						2	
	41									ML	**41.0 - 60.0 Feet:** SILT, gray with olive green, moist with wet area from 42.0 to 43.0 feet, soft, non-plastic, no odor, no sheen, no discoloration. UV screens at 42.0, 49.0, 54.0, 56.0, and 58.0 feet show mildly patchy to patch fluorescence.		
	42				0.4	+							
-5	43												
	44												
	45				0.0	-							
	46	10 (41-51)											

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

bgs = below ground surface
PID = photoionization detector

First encountered groundwater

Groundwater depth at time of sampling (numbers indicate corresponding well point interval)

Report: SONIC WITH SOIL_WATER_PID_UV SAMPLES; File: 5237 (4_08).GPJ; 11/22/10

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: SB-21
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Recovery (ft) (core interval)	Sample Information Prefix: 5237-0903XX-XXX Soil Interval	Soil Number	Soil PID (ppm)	Soil UV Screen	Water Well Point Interval	Water Number	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	47									ML			
-10	48												
	49				0.7	+							
	50			11-005GS (50')									
	51												
	52												
-15	53												
	54				0.5	+							
	55	10 (51-61)											
	56				0.9	+							
	57												
-20	58				1.2	+							
	59												
	60			11-006GS (60')						SP	**60.0 - 61.0 Feet:** silty SAND, brown, moist, fine grained, loose, poorly graded, no odor, no sheen, no discoloration.		
	61				1.4	-				SP	**61.0 - 71.0 Feet:** SAND with some silt, brown, wet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration.		
	62												
-25	63												
	64												
	65	10 (61-71)											
	66				0.8	-							
	67												
-30	68												
	69												
	70			11-007GS (70')									
	71				0.3	-				SM	**71.0 - 86.0 Feet:** SAND with some silt, brown, wet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration. UV screens at 76.0, 81.0 and 86.0 feet show		
	72												

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

bgs = below ground surface
PID = photoionization detector

First encountered groundwater

Groundwater depth at time of sampling (numbers indicate corresponding well point interval)

Report: SONIC WITH SOIL_WATER_PID_UV SAMPLES; File: 5237 (4_08).GPJ; 11/22/10

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: SB-21
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Recovery (ft) (core interval)	Sample Information Prefix: 5237-0903XX-XXX Soil Interval	Soil Number	Soil PID (ppm)	Soil UV Screen	Water Well Point Interval	Water Number	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
-35	73									SM	speckled and mildly patchy fluorescence.		
	74												
	75												
	76				0.6	+						2 ▽	
	77												
-40	78	15 (71-86)					(2)	10 -101					
	79												
	80		11-008GS (80')										
	81				0.4	+							
	82												
-45	83												
	84												
	85												
	86				4.0	+				SP	**86.0 - 91.0 Feet:** SAND, grayish brown, wet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration. UV screen shows patchy fluorescence.	3 ▼	
-50	87												
	88	5 (86-91)											
	89												
	90		11-009GS (90')										
	91				265	+					**91.0 - 97.0 Feet:** No recovery.		
	92												
-55	93												
	94	1 (91-98)											
	95												
	96												
	97		11-002 (97-98')							SP	**97.0 - 101.0 Feet:** SAND with some cobbles, gray, wet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration. Rounded cobbles up to 4" in diameter. UV	3 ▼	
-60	98		11-002G (98')		2100 225	+ +	(3)	11 -102					

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

bgs = below ground surface
PID = photoionization detector

▽ First encountered groundwater
▼ Groundwater depth at time of sampling (numbers indicate corresponding well point interval)

Report: SONIC WITH SOIL_WATER_PID_UV SAMPLES; File: 5237 (4_08).GPJ; 11/22/10

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: SB-21
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Recovery (ft) (core interval)	Sample Information Prefix: 5237-0903XX-XXX — Soil: Interval	Soil: Number	Soil: PID (ppm)	Soil: UV Screen	Water: Well Point Interval	Water: Number	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	99									SP	screen at 98.0 feet shows patchy fluorescence.		
	100	5 (98-103)		11-010GS (100')									
	101				5.8						**101.0 - 105.0 Feet:** weathered BEDROCK (basalt), reddish brown and orange (highly oxidized), moist, sub-rounded to angular gravel and cobble sized fragments, no odor, no sheen, no discoloration.		
-65	102												
	103												
	104												
	105	5 (103-108)									**105.0 - 108.0 Feet:** unweathered BEDROCK (basalt), gray and black, damp, cobble sized fragments, no odor, no sheen, no discoloration.		
	106												
	107			11-011GS (107')	1.1	-							
-70	108										End of boring upon confirming bedrock at 108.0 feet below ground surface.		
-75													
-80													
-85													

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

bgs = below ground surface
PID = photoionization detector

First encountered groundwater

Groundwater depth at time of sampling (numbers indicate corresponding well point interval)

Report: SONIC WITH SOIL_WATER_PID_UV SAMPLES; File: 5237 (4_08).GPJ; 11/22/10

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: SB-27		Date(s): **3/19/09 through 3/23/09**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Project Name: **Remedial Investigation - Siltronic Corporation**			
Driller: **Boart Longyear E & I Division**		Project Number: **5237**	
Drilling Method: **Rotosonic 600t**		GS Elevation: **34.2034**	TOC: Not Applicable
Sampling Method: **Rotosonic - Grab**		Northing: **703906.47**	Easting: **7624890.59**
Boring & Casing Details:	8 inch steel casing driven to 26.0 feet then pulled back to 23.0 feet bgs. Three foot hydrated bentonite annular seal set from 23 to 26 feet bgs. 6 inch steel casing subsequently placed to terminal depth of boring.	Borehole Dia.: **8 & 6 inches**	Total Depth: **110.0 feet bgs**
		Logged By: **Ben Uhl**	Checked By: **Rob Ede**
Annular Fill:	3/8" Bentonite Chips : 0-22 feet Grout Mix (20% Solids, 9.8 lbs/gal avg) : 22-110 feet Grout Mix Ratio of 35:10:100 (gallons water : lbs organoclay : lbs granular bentonite)	Remarks: City of Portland Datum Sample Numbers: 5237-0903XX-XXX	

Elevation (ft)	Depth (ft)	Recovery (ft) (core interval)	Sample Information Prefix: 5237-0903XX-XXX — Soil: Interval	Soil: Number	Soil: PID (ppm)	Soil: UV Screen	Water: Well Point Interval	Water: Number	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	0										**0.0 - 10.0 Feet:** Location air knifed with no soil sampling.		
30	1												
	2												
	3												
	4												
	5												
	6												
	7												
	8												
25	9												
	10			20-040GS (10')	0.0	+				ML	**10.0 - 11.0 Feet:** SILT with some sand, gray, wet, non-plastic. Mild tar-like odor, no sheen present on water during sheen testing. UV screen shows patchy fluorescence.		
	11									SP	**11.0 - 13.0 Feet:** SAND, grayish black, wet, fine grained, loose, poorly graded. Tar-like odor and sheen present, with no visible tar or oil. Wood fragments present.		
	12												
	13									ML	**13.0 - 15.0 Feet:** SILT with some sand, gray, wet, non-plastic, no odor, no sheen, no discoloration. UV screen shows patchy fluorescence.		
20	14												
	15	10 (10-20)			0.0	+				SP	**15.0 - 19.0 Feet:** SAND, brown, moist, fine grained, loose, poorly graded, no odor, no sheen, no discoloration.	1	
	16												
	17			19-005 (17-18') 19-005G (18')									
	18												
15	19									SM	**19.0 - 20.0 Feet:** SAND with some silt, gray, moist, fine grained, loose, no odor, no sheen, no discoloration.		
					0.0	-							

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

bgs = below ground surface
PID = photoionization detector

1 ▽ First encountered groundwater

1 ▼ Groundwater depth at time of sampling (numbers indicate corresponding well point interval)

Report: SONIC WITH SOIL_WATER_PID_UV SAMPLES; File: 5237 (4_08).GPJ; 11/22/10

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: SB-27
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Recovery (ft) (core interval)	Sample Information (Prefix: 5237-0903XX-XXX) Soil: Interval	Soil: Number	Soil: PID (ppm)	Soil: UV Screen	Water: Well Point Interval	Water: Number	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	21			20-041GS (20')	0.0	-				SP	**20.0 - 23.0 Feet:** SAND, brown, moist, medium grained, loose, poorly graded, no odor, no sheen, no discoloration.	4 ▼	
	21						(1)	19 -112					
	22											1 ▽	
	23	6 (20-26)								ML	**23.0 - 37.0 Feet:** SILT, grayish brown with some olive green at 36.5 feet, moist, soft, non-plastic, no odor, no sheen, no discoloration. (Native)		
10	24										Set 8-inch steel casing at 32.0 feet with bentonite annular seal placed from 29.0 to 32.0 feet. After hydrating bentonite, continue drilling by advancing 6-inch steel casing within the outer 8-inch steel casing and through the middle of the hydrated bentonite seal.		
	25				0.0	-							
	26												
	27												
	28	5 (26-31)											
5	29												
	30			20-042GS (30')	0.0	-							
	31												
	32												
	33	5 (31-36)											
0	34												
	35				0.0	-							
	36												
	37										**37.0 - 46.0 Feet:** SILT, grayish brown becoming gray at 40.0 feet, moist, soft, non-plastic, no odor, no sheen, no discoloration. Sparse small wood fragments present (native).		
	38												
-5	39												
	40			20-043GS (40')	0.0	-							
	41	10 (36-46)											
	42												
	43												
-10	44												
	45				0.0	-						2 ▼	
	46												

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

bgs = below ground surface
PID = photoionization detector

1 ▽ First encountered groundwater

1 ▼ Groundwater depth at time of sampling (numbers indicate corresponding well point interval)

Report: SONIC WITH SOIL_WATER_PID_UV SAMPLES; File: 5237 (4_08).GPJ; 11/22/10

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: SB-27
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Recovery (ft) (core interval)	Sample Information (Prefix: 5237-0903XX-XXX) Soil: Interval	Soil: Number	Soil: PID (ppm)	Soil: UV Screen	Water: Well Point Interval	Water: Number	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	47									ML	**46.0 - 49.0 Feet:** sandy SILT, gray, moist, soft, non-plastic, no odor, no sheen, no discoloration. Sands are fine grained, poorly graded.		
	48												
-15	49									SM	**49 - 59 Feet:** SAND with some silt, gray, wet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration.		
	50		20-044GS (50')		0.0	-							
	51	10 (46-56)											
	52												
	53												
-20	54												
	55				0.0	-							
	56												
	57												
	58												
-25	59									ML	**59.0 - 64.5 Feet:** SILT, gray, moist, soft, non-plastic, no odor, no sheen, no discoloration. Sparse rootlets present.		
	60		20-045GS (60')		0.0	-							
	61	10 (56-66)										2	
	62												
	63						(2)	20 -113					
-30	64												
	65				0.0	-				ML	**64.5 - 65.0 Feet:** SILT with some sand, gray, moist, soft, non-plastic, no odor, no sheen, no discoloration. Sands are fine grained, poorly graded.	3	
	66									ML	**65.0 - 73.0 Feet:** SILT, brownish gray becoming olive/greenish gray at 70.0 feet, moist, soft, non-plastic, no odor, no sheen, no discoloration.		
	67												
	68												
-35	69												
	70		23-046GS (70')		0.0	-							
	71	10 (66-76)											
	72												

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

bgs = below ground surface
PID = photoionization detector

1 First encountered groundwater

1 Groundwater depth at time of sampling
(numbers indicate corresponding well point interval)

Report: SONIC WITH SOIL_WATER_PID_UV SAMPLES; File: 5237 (4_08).GPJ; 11/22/10

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: SB-27
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Recovery (ft) (core interval)	Sample Information Prefix: 5237-0903XX-XXX — Soil: Interval	Soil: Number	Soil: PID (ppm)	Soil: UV Screen	Water: Well Point Interval	Water: Number	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	73									ML			
	74									SP	**73.0 - 75.0 Feet:** SAND, brown, wet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration.		
-40	75				0.0	-				ML	**75.0 - 80.0 Feet:** SILT, olive green, moist, soft, non-plastic, no odor, no sheen, no discoloration.	3 ▽	
	76												
	77												
	78	5 (76-81)					(3)	20 -114 &115					
-45	79												
	80		23-047GS (80')		0.0	-				SM	**80.0 - 90.0 Feet:** silty SAND, brown, wet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration.		
	81												
	82												
	83												
-50	84												
	85				0.0	-							
	86	10 (81-91)											
	87												
	88												
-55	89												
	90		23-048GS (90')		0.0	-				SP	**90.0 - 109.0 Feet:** SAND, brown, wet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration.		
	91												
	92												
	93												
-60	94												
	95				0.0	-							
	96	10 (91-101)										4 ▽	
	97												
	98						(4)	23 -116					

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

bgs = below ground surface
PID = photoionization detector

1 ▽ First encountered groundwater

1 ▼ Groundwater depth at time of sampling
(numbers indicate corresponding well point interval)

Report: SONIC WITH SOIL_WATER_PID_UV SAMPLES; File: 5237 (4_08).GPJ; 11/22/10

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: SB-27
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Recovery (ft) (core interval)	Sample Information Prefix: 5237-0903XX-XXX — Soil: Interval	Soil: Number	Soil: PID (ppm)	Soil: UV Screen	Water: Well Point Interval	Water: Number	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
-65	99									SP			
	100		23-049GS (100')		0.0	-							
	101												
	102												
	103												
-70	104												
	105	9 (101-110)			0.0	-							
	106												
	107												
	108												
	109										**109.0 - 110.0 Feet:** BEDROCK (basalt) with some silt, weathered, reddish brown, moist, large angular cobbles and gravel size particles. No odor, no sheen, no discoloration.		
-75			23-050GS (110')		0.0	–							
	110										End of boring upon confirming bedrock at 110.0 feet below ground surface.		
-80													
-85													
-90													

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

bgs = below ground surface
PID = photoionization detector

First encountered groundwater

Groundwater depth at time of sampling (numbers indicate corresponding well point interval)

Report: SONIC WITH SOIL_WATER_PID_UV SAMPLES; File: 5237 (4_08).GPJ; 11/22/10

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: SB-35	Date(s): **3/17/09 through 3/19/09**
Location: **7200 NW Front Avenue, Portland, Oregon**	
Project Name: **Remedial Investigation - Siltronic Corporation**	
Driller: **Boart Longyear E & I Division**	Project Number: **5237**
Drilling Method: **Rotosonic 600t**	GS Elevation: **35.1639** / TOC: Not Applicable
Sampling Method: **Rotosonic - Grab**	Northing: **704332.11** / Easting: **7625086.62**
Boring & Casing Details: 8 inch steel casing driven to 26.0 feet then pulled back to 23.0 feet bgs. Three foot hydrated bentonite annular seal set from 23 to 26 feet bgs. 6 inch steel casing subsequently placed to terminal depth of boring.	Borehole Dia.: **8 & 6 inches** / Total Depth: **116.0 feet bgs**
	Logged By: **Ben Uhl** / Checked By: **Rob Ede**
Annular Fill: 3/8" Bentonite Chips : 0-20 feet Grout Mix (20% Solids, 9.8 lbs/gal avg) : 20-116 feet Grout Mix Ratio of 35:10:100 (gallons water : lbs organoclay : lbs granular bentonite)	Remarks: City of Portland Datum Sample Numbers: 5237-0903XX-XXX

Elevation (ft)	Depth (ft)	Recovery (ft) (core interval)	Sample Information (Prefix: 5237-0903XX-XXX) Soil: Interval	Soil: Number	Soil: PID (ppm)	Soil: UV Screen	Water: Well Point Interval	Water: Number	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
35	1										**0.0 - 10.0 Feet:** Location air knifed with no soil sampling.		
	2												
	3												
	4												
30	5												
	6												
	7												
	8												
	9												
25	10		⊠	19-028GS (10')	0.0	-				SP	**10.0 - 15.0 Feet:** SAND, brown, moist, medium grained, loose, poorly graded, no odor, no sheen, no discoloration.		
	11												
	12												
	13	6 (10-16)											
	14												
20	15				0.0	+				SM	**15.0 - 16.0 Feet:** SAND with some silt, brown and black, moist, medium grained, loose, poorly graded. Oil-like odor present, sheen observed on water during sheen testing. No visible tar or oil. UV screen shows patchy fluorescence.	1 ▼	
	16									SP			
	17		⊠	17-004 (17-18') 17-004G (18')							**16.0 - 22.0 Feet:** SAND, black, moist, medium grained, loose, poorly graded. Small amounts of thick black viscous oil present, oil-like odor, and sheen observed on water during sheen testing. UV screen shows patchy fluorescence.		
	18												
	19												

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

bgs = below ground surface
PID = photoionization detector

1 ▽ First encountered groundwater

1 ▼ Groundwater depth at time of sampling (numbers indicate corresponding well point interval)

Report: SONIC WITH SOIL_WATER_PID_UV SAMPLES; File: 5237 (4_08).GPJ; 11/22/10

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: SB-35
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Recovery (ft) (core interval)	Sample Information (Prefix: 5237-0903XX-XXX) Soil: Interval	Soil: Number	Soil: PID (ppm)	Soil: UV Screen	Water: Well Point Interval	Water: Number	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
15	21	10 (16-26)	☒	19-029G (20')	0.0	+				SP		1 ▽	
	22						(1)	17 -108		ML	**22.0 - 26.0 Feet:** SILT, gray, moist, soft, non-plastic, rootlets present at 24.0 feet. Thick black viscous oil present on rootlets. Silt matrix has no oil-like odor, with mild sheen observed during sheen testing, and no discoloration.		
	23												
	24												
10	25				68.0	+							
	26										**26.0 - 28.0 Feet:** SILT, gray, moist, soft, non-plastic, no odor, no sheen, no discoloration.		
	27												
	28	5 (26-31)									**28.0 - 31.0 Feet:** SILT, brown with reddish mottling, moist, soft, low plasticity, no odor, no sheen, no discoloration.		
	29												
5	30		☒	19-030G (30')	0.0	-					Set 8-inch steel casing at 31.0 feet with bentonite annular seal placed from 28.0 to 31.0 feet. After hydrating bentonite, continue drilling by advancing 6-inch steel casing inside the 8-inch steel casing and through the middle of the hydrated bentonite seal.		
	31										**31.0 - 50.5 Feet:** SILT, gray with brown mottling becoming gray at 33.0 feet, moist, soft, low plasticity, no odor, no sheen, no discoloration. Rootlets present from 36.0 to 40.0 feet.		
	32												
	33	5 (31-36)											
	34												
0	35				0.0	+							
	36												
	37												
	38												
	39												
-5	40		☒	19-031G (40')	0.0	-							
	41	10 (36-46)											
	42												
	43												
	44											3 ▼	
-10	45				0.0	-							
	46												

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

bgs = below ground surface
PID = photoionization detector

1 ▽ First encountered groundwater

1 ▼ Groundwater depth at time of sampling (numbers indicate corresponding well point interval)

Report: SONIC WITH SOIL_WATER_PID_UV SAMPLES; File: 5237 (4_08).GPJ; 11/22/10

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: SB-35
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Recovery (ft) (core interval)	Sample Information Prefix: 5237-0903XX-XXX: Soil: Interval	Soil: Number	Soil: PID (ppm)	Soil: UV Screen	Water: Well Point Interval	Water: Number	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	47												
	48	5 (46-51)										2 ▼	
	49												
-15	50		⊠	19-032G (50')	0.0	-							
	51									SM	**50.5 - 51.0 Feet:** sandy SILT, gray, moist, soft, low plasticity, no odor, no sheen, no discoloration. **51.0 - 53.0 Feet:** silty SAND, gray, wet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration.		
	52												
	53	5 (51-56)									**53.0 - 62.5 Feet:** SAND with some silt, gray, moist with wet areas, fine grained, loose, poorly graded, no odor, no sheen, no discoloration. Large (4") wood fragment encountered at 62.5 feet.		
	54												
-20	55				0.0	+							
	56											3 ▽	
	57												
	58											2 ▽	
	59												
-25	60		⊠	19-033G (60')	0.0	-							
	61												
	62												
	63									ML	**62.5 - 76.0 Feet:** sandy SILT, gray, moist, soft, low plasticity, no odor, no sheen, no discoloration. Sparse amounts (<1%) of rootlets present throughout interval.		
	64						(2)	18 -109					
-30	65				0.0	-							
	66	20 (56-76)											
	67												
	68												
	69												
-35	70		⊠	19-034G (70')	0.0	-							
	71												
	72												

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

bgs = below ground surface
PID = photoionization detector

1 ▽ First encountered groundwater

1 ▼ Groundwater depth at time of sampling (numbers indicate corresponding well point interval)

Report: SONIC WITH SOIL_WATER_PID_UV SAMPLES; File: 5237 (4_08).GPJ; 11/22/10

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: SB-35
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Recovery (ft) (core interval)	Sample Information (Prefix: 5237-0903XX-XXX) Soil: Interval	Soil: Number	Soil: PID (ppm)	Soil: UV Screen	Water: Well Point Interval	Water: Number	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	73									ML			
	74												
-40	75				0.0	-							
	76									SM	**76.0 - 81.0 Feet:** SAND with some silt, gray, moist with wet areas, fine and medium grained, loose, moderate grading, no odor, no sheen, no discoloration.		
	77												
	78												
	79												
-45	80		☒	19-035G (80')	0.0	-							
	81									SM	**81.0 - 96.0 Feet:** No Recovery due to saturated sandy soils. Soils cuttings available for inspection to confirm soil type, but unable to associate depths or sample within this range.		
	82												
	83												
	84						(3)	18 -110				4 ▼	
-50	85				0.0	-							
	86	5 (76-96)											
	87												
	88												
	89												
-55	90												
	91												
	92											4 ▽	
	93												
	94												
-60	95				0.0	-	(4)	18 -111					
	96										**96.0 - 108.0 Feet:** weathered BEDROCK (basalt), brown and reddish brown with light gray areas, damp, loose, well graded gravel and cobble sized fragments, angular and sub-angular. No odor, no sheen, no discoloration.		
	97												
	98												

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

bgs = below ground surface
PID = photoionization detector

1 ▽ First encountered groundwater

1 ▼ Groundwater depth at time of sampling
(numbers indicate corresponding well point interval)

Report: SONIC WITH SOIL_WATER_PID_UV SAMPLES; File: 5237 (4_08).GPJ; 11/22/10

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: SB-35
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Recovery (ft) (core interval)	Sample Information Prefix: 5237-0903XX-XXX — Soil: Interval	Soil: Number	Soil: PID (ppm)	Soil: UV Screen	Water: Well Point Interval	Water: Number	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
-65	99												
	100		☒	19-037G (100')	0.0	-							
	101	10 (96-106)											
	102												
	103												
	104												
-70	105				0.0	-							
	106												
	107												
	108										**108.0 - 116.0 Feet:** consolidated BEDROCK (basalt), dark brown and light gray, damp, angular gravel and cobble sized fragments, several area solid core. No odor, no sheen, no discoloration.		
	109												
-75	110		☒	19-038G (110')	0.0	-							
	111	10 (106-116)											
	112												
	113												
	114												
-80	115												
	116		☒	19-039G (116')	0.0	-					End of boring upon confirming native bedrock to 116.0 feet below ground surface.		
-85													

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

bgs = below ground surface
PID = photoionization detector

First encountered groundwater

Groundwater depth at time of sampling (numbers indicate corresponding well point interval)

Report: SONIC WITH SOIL_WATER_PID_UV SAMPLES; File: 5237 (4_08).GPJ; 11/22/10

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: SB-53		Date(s): **3/11 through 3/16/09**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Project Name: **Remedial Investigation - Siltronic Corporation**			
Driller: **Boart Longyear E & I Division**		Project Number: **5237**	
Drilling Method: **Rotosonic 600t**		GS Elevation: **35.0858**	TOC: Not Applicable
Sampling Method: **Rotosonic - Grab**		Northing: **704821.34**	Easting: **7624228.44**
Boring & Casing Details: 8 inch steel casing driven to 26.0 feet then pulled back to 23.0 feet bgs. Three foot hydrated bentonite annular seal set from 23 to 26 feet bgs. 6 inch steel casing subsequently placed to terminal depth of boring.		Borehole Dia.: **8 & 6 inches**	Total Depth: **166.0 feet bgs**
		Logged By: **Ben Uhl**	Checked By: **Rob Ede**
Annular Fill: 3/8" Bentonite Chips : 0-20 feet Grout Mix (20% Solids, 9.8 lbs/gal avg) : 20-166 feet Grout Mix Ratio of 35:10:100 (gallons water : lbs organoclay : lbs granular bentonite)		Remarks: City of Portland Datum Sample Numbers: 5237-0903XX-XXX	

Elevation (ft)	Depth (ft)	Recovery (ft) (core interval)	Sample Information Prefix: 5237-0903XX-XXX — Soil: Interval	Soil: Number	Soil: PID (ppm)	Soil: UV Screen	Water: Well Point Interval	Water: Number	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
											0.0 - 10.0 Feet: Location air knifed with no soil sampling.		
-30	5												
-25	10	6 (10-16)		16-012GS (10')	0.0	+				SP	**10.0 - 12.0 Feet:** gravelly SAND with some silt, brown, moist, medium grained, loose, poorly graded. Gravels are medium grained, silts are soft and non-plastic. Mild odor present, no sheen produced during sheen testing, no discoloration observed. UV screen shows patches of fluorescence.		
										ML	**12.0 - 13.0 Feet:** cobbley SILT with some sand, gray, moist, soft, non-plastic. Cobbles up to 4 inches in diameter with brick fragments observed. Mild tar-like odor present, no sheen produced during sheen testing, no discoloration observed.	1	
										ML			
										SP			
-20	15				0.0	+				ML	**13.0 - 14.0 Feet:** gravelly SILT, brownish gray, moist, soft, non-plastic. Gravels are medium grained. Mild odor present, no sheen produced during sheen testing, no discolorations observed.		
											14.0 - 15.0 Feet: SAND with some gravel, brown, moist, fine grained, loose, poorly graded, no odor, no sheen, no discoloration. UV screen shows patches of fluorescence.		
				11-003 (18-19') 11-003G (19')							**15.0 - 16.0 Feet:** sandy SILT with some gravel, brown, moist, soft, non-plastic, no odor, no sheen, no discoloration.		
-15	20			16-013GS (20')	42.9	+				ML	**16.0 - 20.0 Feet:** gravelly SILT with some sand, cobbles present after 19.0 feet, brown and black, moist, soft, low plasticity. Thick black and brown viscous oil mixed throughout interval with strong hydrocarbon odor, heavy rainbow sheen, and blackish discoloration observed. UV screen shows large patches of fluorescence.		

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

bgs = below ground surface
PID = photoionization detector

1 First encountered groundwater

1 Groundwater depth at time of sampling (numbers indicate corresponding well point interval)

Report: SONIC WITH SOIL_WATER_PID_UV SAMPLES; File: 5237 (4_08).GPJ; 11/22/10

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: SB-53
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Recovery (ft) (core interval)	Sample Information Prefix: 5237-0903XX-XXX — Soil: Interval	Soil: Number	Soil: PID (ppm)	Soil: UV Screen	Water: Well Point Interval	Water: Number	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
		10 (16-26)					(1)	12 -103		ML	**20.0 - 28.0 Feet:** gravelly SILT, black, moist, soft, non-plastic. Gravels are coarse grained and sub-angular. Thick black viscous oil present with strong hydrocarbon odor and rainbow sheen. UV screen shows large patches of fluorescence.	1	
-10	25				120	+							
											28.0 - 31.0 Feet gravelly SILT, black becoming brown with depth, moist, soft, non-plastic. Viscous oil diminishing, odor becoming more mild, and sheen dimishing with depth. UV screen shows patches of fluorescence.	5	
-5	30			16-014GS (30')	26.5	+							
		10 (26-36)								ML	**31.0 - 36.0 Feet:** SILT, brownish gray, moist, soft, medium plasticity. Small black viscous oil patches present throughout interval with trace amounts of brown oil patches, oil-like odor present, and sheen observed during sheen testing. UV screen shows patches of fluorescence.	3	
0	35				32.1	+							
										ML	**36.0 - 40.0 Feet:** sandy SILT, gray, moist, soft, non-plastic. Thick black viscous oil smears present with some less viscous brown oil patches, strong oil-like odor present, and rainbow sheen observed during sheen testing.		
-5	40			16-015GS (40')	47.6	+							
											40.0 - 45.5 Feet: sandy SILT, gray, moist, soft, non-plastic. Intermittent patches of thick black viscous oil present, with oil-like odor, and sheen observed during sheen testing. UV screen shows patches of fluorescence.		
		15 (36-51)											
-10	45				60.7	+						2	
										SP	**45.5 - 46.0 Feet** SAND, gray, moist, fine grained, loose, poorly graded. Thick black viscous oil present throughout, less viscous brown oil blebs also present in a smaller amounts, oil-like odor, with sheen observed during sheen testing.		
										ML			

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

bgs = below ground surface
PID = photoionization detector

1▽ First encountered groundwater

1▼ Groundwater depth at time of sampling (numbers indicate corresponding well point interval)

Report: SONIC WITH SOIL_WATER_PID_UV SAMPLES; File: 5237 (4_08).GPJ; 11/22/10

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: SB-53
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Recovery (ft) (core interval)	Sample Information Prefix: 5237-0903XX-XXX — Soil: Interval	Soil: Number	Soil: PID (ppm)	Soil: UV Screen	Water: Well Point Interval	Water: Number	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
-15	50		☒	16-016GS (50')	28.1	+				ML	**46.0 - 53.0 Feet:** sandy SILT, gray, moist, soft, non-plastic with sand lens present at 49.5 to 50.0 feet. Sand is fine grained, poorly graded. Thick black viscous oil with smaller amount of less viscous brown oil blebs present, oil-like odor, with sheen observed during sheen testing. UV screen shows patches of fluorescence.		
		5 (51-56)								SP	**53.0 - 55.0 Feet:** SAND, gray, wet, fine grained, loose, poorly graded. Thick black viscous oil blebs present, oil-like odor, with sheen observed during sheen testing. UV screen shows larges patches of fluorescence.		
-20	55				88.8	+				ML	**55.0 - 60.0 Feet:** sandy SILT, gray, moist, soft, low plasticity. Small (2mm) flake-like patches of thick black oil present with oil-like odor. Sheen observed during sheen testing of oil patches, but no sheen observed when silt matrix tested. UV screen shows patches of fluorescence.		
		5 (56-61)											
-25	60		☒	16-017GS (60')	14.7	+					**60.0 - 67.0 Feet:** sandy SILT, gray, moist, soft, low plasticity. Small (2mm) patches of thick black oil present with oil-like odor. Sheen observed during sheen testing of oil patches, but no sheen observed when silt matrix tested. UV screen shows patches of fluorescence.	▽2	
		5 (61-66)					(2)	12 -104					
-30	65				8.9	+							
		5 (66-71)								SM	**67.0 - 70.0 Feet:** SAND with some silt, gray, moist, fine grained, loose, poorly graded, silt lens present from 67.7 to 68.0 feet. Brown oil smears present at 67.7 (top of silt lens). Odor noticable and oily areas produce sheen during testing.		
-35	70		☒	16-018GS (70')	0.0	+				SP	**70.0 - 70.5 Feet:** SAND, gray, wet, fine grained, loose, poorly graded. Small patches of thick black viscous oil present, with noticable odor, and sheen observed during sheen testing.		
										ML	**70.5 - 72.0 Feet:** sandy SILT becoming SILT at 71.8 feet, gray, moist, soft, low plasticity. No visible oil, but oil-like odor present, and sheen observed during sheen testing.		
										SP	**71.8 - 72.0 Feet:** SILT, gray, moist, soft, low-plasticity. No visible oil, but noticable odor present, and sheen observed during sheen testing.		
-40	75	10 (71-81)			0.0	+					**72.0 - 80.0 Feet:** SAND, gray, wet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration. UV screen shows patches of fluorescence.		

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

bgs = below ground surface
PID = photoionization detector

▽1 First encountered groundwater

▼1 Groundwater depth at time of sampling (numbers indicate corresponding well point interval)

Report: SONIC WITH SOIL_WATER_PID_UV SAMPLES; File: 5237 (4_08).GPJ; 11/22/10

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: SB-53
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Recovery (ft) (core interval)	Sample Information (Prefix: 5237-0903XX-XXX) Soil: Interval	Soil: Number	Soil: PID (ppm)	Soil: UV Screen	Water: Well Point Interval	Water: Number	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
-45	80			16-019GS (80')	0.0	+				SP	Set 8-inch steel casing at 80.0 feet with bentonite annular seal placed from 77.0 to 80.0 feet. After hydrating bentonite, continue drilling by advancing 6-inch steel casing inside the 8-inch steel casing and through the middle of the hydrated bentonite seal.		
											80.0 - 97.5 Feet: SAND, gray, moist with wet zone from 86.0 to 87.0 feet and becoming wet at 96.0 feet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration. UV screen below 85.0 feet shows no fluorescence.		
-50	85	10 (81-91)			0.0	+							
-55	90			16-020GS (90')	0.0	-							
		5 (91-96)											
-60	95				2.1	-						4	
										SM	**97.5 - 127.0 Feet:** silty SAND, gray, wet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration, and no UV fluorescence.		
-65	100			16-021GS (100')	0.0	-						3	
							(3)	13 -104					
-70	105				0.0	-							

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

bgs = below ground surface
PID = photoionization detector

1 First encountered groundwater

1 Groundwater depth at time of sampling
(numbers indicate corresponding well point interval)

Report: SONIC WITH SOIL_WATER_PID_UV SAMPLES; File: 5237 (4_08).GPJ; 11/22/10

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: SB-53
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Recovery (ft) (core interval)	Sample Information Prefix: 5237-0903XX-XXX Soil Interval	Soil Number	Soil PID (ppm)	Soil UV Screen	Water Well Point Interval	Water Number	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
		20 (96-116)								SM			
-75	110			16-022GS (110')	0.0	-							
-80	115				0.0	-							
-85	120	10 (116-126)		16-023GS (120')	0.0	-							
-90	125				0.0	-				SP	**127.0 - 128.0 Feet:** SAND, gray, wet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration.		
										SP	**128.0 - 140.0 Feet:** SAND with some silt, gray, wet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration.		
-95	130			16-024GS (130')	0.0	-						4	
							(4)	13 -105					

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

bgs = below ground surface
PID = photoionization detector

1 First encountered groundwater

1 Groundwater depth at time of sampling
(numbers indicate corresponding well point interval)

Report: SONIC WITH SOIL_WATER_PID_UV SAMPLES; File: 5237 (4_08).GPJ; 11/22/10

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: SB-53
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Recovery (ft) (core interval)	Sample Information Prefix: 5237-0903XX-XXX Soil Interval	Soil Number	Soil PID (ppm)	Soil UV Screen	Water Well Point Interval	Water Number	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
-100	135	20 (126-146)			0.0	-				SP			
-105	140			16-025GS (140')	0.0	-				SM	**140.0 - 146.0 Feet** silty SAND, gray, wet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration, and no UV fluorescence.		
-110	145				0.0	-				SP	**146.0 - 161.0 Feet:** SAND, gray becoming brown at 156.0 feet, wet, fine grained, loose, poorly graded, no odor, no sheen, no discoloration, and no UV fluorescence.		
-115	150			16-026GS (150')	0.0	-							
							(5)	16 -107					
-120	155	20 (146-166)			0.0	-							
-125	160			16-027GS (160')	0.0	-							

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

bgs = below ground surface
PID = photoionization detector

First encountered groundwater

Groundwater depth at time of sampling (numbers indicate corresponding well point interval)

Report: SONIC WITH SOIL_WATER_PID_UV SAMPLES; File: 5237 (4_08).GPJ; 11/22/10

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: SB-53
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Recovery (ft) (core interval)	Sample Information Prefix: 5237-0903XX-XXX Soil Interval	Soil Number	Soil PID (ppm)	Soil UV Screen	Water Well Point Interval	Water Number	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
-130	165				0.0	-					**161.0 - 166.0 Feet:** BEDROCK (basalt), unweathered solid cores, gray, damp, angular cobble sized fragments present with some fine grained sand.		
											End of boring upon confirming bedrock at 166.0 feet below ground surface.		
-135													
-140													
-145													
-150													
-155													

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

bgs = below ground surface
PID = photoionization detector

First encountered groundwater

Groundwater depth at time of sampling
(numbers indicate corresponding well point interval)

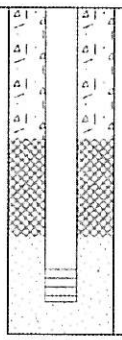
Report: SONIC WITH SOIL_WATER_PID_UV SAMPLES; File: 5237 (4_08).GPJ; 11/22/10

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	SG-1	1 of 1

Project Name	Siltronic Corporation - Soil Vapor Probe Installation	TOC Elevation (feet)	
Project Location	7200 NW Front Avenue, Portland, Oregon 97210	Surface Elevation (feet)	
Start/End Date	12/3/10 to 12/3/10	Northing	
Driller/Equipment	Cascade Drilling, L.P./Hand Auger	Easting	
Geologist/Engineer	J. Pounds	Hole Depth	5.0-feet
Sample Method	Hand Auger	Outer Hole Diam	3-inch

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1			100	HA					0.0 to 0.5 feet: ASPHALT.
2									0.5 to 5.0 feet: SANDY SILT (ML).
3									
4									
5									

Total Depth = 5.0 feet below ground surface.

Well Completion Details

Oregon Water Resources Department Geotechnical Hole Report: MULT 104676

Boring:

0.0 to 2.0 feet bgs: flush mount Morris vault and cement seal.
2.0 to 3.5 feet bgs: granular bentonite hydrated with potable water.
3.5 to 5.0 feet bgs: 10x20 Colorado silica sand.

Well:

Surface: 1/4-inch Teflon ball valve.
0.0 to 4.0 feet bgs: 1/4-inch diameter, Tygon tubing.
4.0 to 4.5 feet bgs: 1/2-inch diameter, AMS vapor implant, double woven stainless steel wire screen, pore size 0.0057-in.

NOTES: 1. bgs = below ground surface. 2. PVC = poly vinyl chloride. 3. TOC = top of casing. 4. Depths are relative to feet below ground surface.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	SG-2	1 of 1

Project Name	Siltronic Corporation - Soil Vapor Probe Installation	TOC Elevation (feet)	
Project Location	7200 NW Front Avenue, Portland, Oregon 97210	Surface Elevation (feet)	
Start/End Date	9/13/11 to 9/13/11	Northing	
Driller/Equipment	Terra Hydr, Inc./Hand Auger	Easting	
Geologist/Engineer	K. Titkemeier	Hole Depth	5.0-feet
Sample Method	Hand Auger	Outer Hole Diam	3-inch

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1		0		NR					0.0 to 0.5 feet: ASPHALT.
2									0.5 to 5.0 feet: SANDY SILT (ML).
3									
4		100		HA					
5									

Total Depth = 5.0 feet below ground surface.

Well Completion Details

Oregon Water Resources Department Geotechnical Hole Report: MULT 107868 (reconnaissance soil vapor sample on 12/3/2010: MULT 104678)

Boring:
0.0 to 2.0 feet bgs: flush mount Sherwood vault and cement seal.
2.0 to 3.3 feet bgs: granular bentonite hydrated with potable water.
3.3 to 5.0 feet bgs: 10x20 Colorado silica sand.

Well:
Surface: 1/4-inch Teflon ball valve.
0.0 to 3.3 feet bgs: 4-inch diameter, schedule 40 PVC blank riser pipe.
0.0 to 4.0 feet bgs: 1/4-inch diameter, Tygon tubing.
4.0 to 4.5 feet bgs: 1/2-inch diameter, AMS vapor implant, double woven stainless steel wire screen, pore size 0.0057-in.

NOTES: 1. bgs = below ground surface. 2. PVC = poly vinyl chloride. 3. TOC = top of casing. 4. Depths are relative to feet below ground surface. 5. SG-2 installation was performed in an open trench. The trench bottom was 3.3 feet bgs. Soil from 3.3 to 5.0 feet bgs was removed using a hand auger. 4-inch PVC was used for well construction between the trench bottom and the ground surface. The monument was installed after the trench was backfilled with 3/4-minus gravel. The gravel was compacted using a jumping jack. A 6-inch layer of asphalt was placed on top of the gravel and around the cement of the monument. 6. Lithology from 0.5 to 3.3 feet bgs was observed in the sidewalls of the trench.

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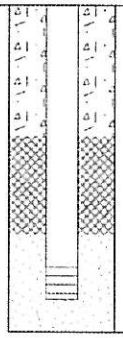
Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	SG-3	1 of 1

Project Name	Siltronic Corporation - Soil Vapor Probe Installation	TOC Elevation (feet)	
Project Location	7200 NW Front Avenue, Portland, Oregon 97210	Surface Elevation (feet)	
Start/End Date	12/3/10 to 12/3/10	Northing	
Driller/Equipment	Cascade Drilling, L.P./Hand Auger	Easting	
Geologist/Engineer	J. Pounds	Hole Depth	5.0-feet
Sample Method	Hand Auger	Outer Hole Diam	3-inch

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1			100	HA					0.0 to 0.5 feet: ASPHALT.
2									0.5 to 5.0 feet: SANDY SILT (ML).
3									
4									
5									

Total Depth = 5.0 feet below ground surface.

Well Completion Details

Oregon Water Resources Department Geotechnical Hole Report: MULT 104677

Boring:

0.0 to 2.0 feet bgs: flush mount Morris vault and cement seal.
2.0 to 3.5 feet bgs: granular bentonite hydrated with potable water.
3.5 to 5.0 feet bgs: 10x20 Colorado silica sand.

Well:

Surface: 1/4-inch Teflon ball valve.
0.0 to 4.0 feet bgs: 1/4-inch diameter, Tygon tubing.
4.0 to 4.5 feet bgs: 1/2-inch diameter, AMS vapor implant, double woven stainless steel wire screen, pore size 0.0057-in.

NOTES: 1. bgs = below ground surface. 2. PVC = poly vinyl chloride. 3. TOC = top of casing. 4. Depths are relative to feet below ground surface.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	SG-4	1 of 1

Project Name	Siltronic Corporation - Soil Vapor Probe Installation	TOC Elevation (feet)	
Project Location	7200 NW Front Avenue, Portland, Oregon 97210	Surface Elevation (feet)	
Start/End Date	9/13/11 to 9/13/11	Northing	
Driller/Equipment	Terra Hydr, Inc./Hand Auger	Easting	
Geologist/Engineer	K. Titkemeier	Hole Depth	5.3-feet
Sample Method	Hand Auger	Outer Hole Diam	3-inch

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1		0		NR					0.0 to 0.5 feet: ASPHALT.
2									0.5 to 5.3 feet: SANDY SILT (ML).
3									
4		100		HA					
5									

Total Depth = 5.3 feet below ground surface.

Well Completion Details

Oregon Water Resources Department Geotechnical Hole Report: MULT 107869 (reconnaissance soil vapor sample on 12/3/2010: MULT 104679)

Boring:
0.0 to 2.0 feet bgs: flush mount Sherwood vault and cement seal.
2.0 to 3.7 feet bgs: granular bentonite hydrated with potable water.
3.7 to 5.3 feet bgs: 10x20 Colorado silica sand.

Well:
Surface: 1/4-inch Teflon ball valve.
0.0 to 3.7 feet bgs: 4-inch diameter, schedule 40 PVC blank riser pipe.
0.0 to 4.0 feet bgs: 1/4-inch diameter, Tygon tubing.
4.0 to 4.5 feet bgs: 1/2-inch diameter, AMS vapor implant, double woven stainless steel wire screen, pore size 0.0057-in.

NOTES: 1. bgs = below ground surface. 2. PVC = poly vinyl chloride. 3. TOC = top of casing. 4. Depths are relative to feet below ground surface. 5. SG-4 installation was performed in an open trench. The trench bottom was 3.3 feet bgs. Soil from 3.7 to 5.3 feet bgs was removed using a hand auger. 4-inch PVC was used for well construction between the trench bottom and the ground surface. The monument was installed after the trench was backfilled with 3/4-minus gravel. The gravel was compacted using a jumping jack. A 6-inch layer of asphalt was placed on top of the gravel and around the cement of the monument. 6. Lithology from 0.5 to 3.7 feet bgs was observed in the sidewalls of the trench.

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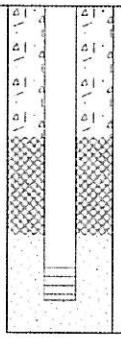
Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	SG-5	1 of 1

Project Name	Siltronic Corporation - Soil Vapor Probe Installation	TOC Elevation (feet)	
Project Location	7200 NW Front Avenue, Portland, Oregon 97210	Surface Elevation (feet)	
Start/End Date	12/3/10 to 12/3/10	Northing	
Driller/Equipment	Cascade Drilling, L.P./Hand Auger	Easting	
Geologist/Engineer	J. Pounds	Hole Depth	5.0-feet
Sample Method	Hand Auger	Outer Hole Diam	3-inch

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1			100	HA					0.0 to 0.5 feet: ASPHALT.
2									0.5 to 5.0 feet: SANDY SILT (ML).
3									
4									
5									

Total Depth = 5.0 feet below ground surface.

Well Completion Details

Oregon Water Resources Department Geotechnical Hole Report: MULT 104680

Boring:

0.0 to 2.0 feet bgs: flush mount Morris vault and cement seal.
2.0 to 3.5 feet bgs: granular bentonite hydrated with potable water.
3.5 to 5.0 feet bgs: 10x20 Colorado silica sand.

Well:

Surface: 1/4-inch Teflon ball valve.
0.0 to 4.0 feet bgs: 1/4-inch diameter, Tygon tubing.
4.0 to 4.5 feet bgs: 1/2-inch diameter, AMS vapor implant, double woven stainless steel wire screen, pore size 0.0057-in.

NOTES: 1. bgs = below ground surface. 2. PVC = poly vinyl chloride. 3. TOC = top of casing. 4. Depths are relative to feet below ground surface.

GBLWC W:\GINT\GINTW\PROJECTS\8128-01\SOIL VAPOR PROBES_SG-1 THROUGH SG-5.GPJ 2/3/12

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING	TESTING AND LABORATORY DATA
0		SP	Loose, brown, fine SAND (FILL) with trace gravel; moist.			0.0			
						0.0			
5			Gravel becomes rounded and coarser.						
10		SP	Medium dense, gray, fine SAND (FILL); moist. Strong petroleum-like odor.						
		SM	Medium dense, brown, silty SAND (FILL) with debris (rubber); moist.						
		SM	Medium dense, gray, silty SAND (FILL), debris, trace copper wire; moist. Slight petroleum-like odor.			0.0			
		SM	Stiff, gray, sandy SILT (FILL); moist. Slight petroleum-like odor.						
		SP	Medium dense, brown, fine SAND (FILL) with trace gravel; moist.			0.0			
15		SM	Stiff, gray, sandy SILT (FILL) with trace copper wire and glass debris; moist. Moderate petroleum-like odor.						
		SP	Medium dense, dark gray, fine SAND (FILL); moist. Strong petroleum-like odor.						
		ML	Stiff, gray SILT (FILL) with fine sand; moist. Strong petroleum-like odor.						
		SP	Medium dense, gray, fine SAND (FILL); moist. Strong petroleum-like odor and heavy sheen.			169			
20			With trace silt.			194			
						205			
		SP	Medium dense, gray, fine SAND (FILL); moist. Moderate petroleum-like odor.			262			
						3.0			
25			With trace organics (roots) and fine gravel.						
						3.8			
			With trace silt and brick debris. (FILL)						
		SP	Medium dense, brownish gray, fine SAND (FILL); moist. Slight petroleum-like odor.			5.1			
30									

BORING METHOD: Sonic

BOREHOLE DIAMETER: 10.0, 8.0, & 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Cascade Drilling

LOGGED BY: C Johnson & L. Glonek

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

DRILLING DATES: 10/31/2005 - 10/31/2005

REMARKS:
Borehole diameter: 10-inch - 0 to 27 ft bgs. 8-inch - 27 to 158 ft bgs. 6-inch - 158 to 218 ft bgs.

Bentonite seal at bottom of casing before stepping down.

ENVIRONMENTAL BORING (MULTIPLE SCREENS) 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/7/06

RP - Portland
Stage 1 SCE

0-61M-107030 P69

AMEC
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LOG OF BORING SIL-01

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING	TESTING AND LABORATORY DATA
30		SP	Loose, brown, fine SAND (FILL) with trace rounded gravel; moist. Strong petroleum-like odor.			18			101-01
		SM	Medium stiff, brown, sandy SILT (FILL) with trace organics; et.						
35						0.0			
		SM	Medium stiff, dark gray, sandy SILT (FILL), metal debris to 40 ft bgs; wet. Moderate petroleum-like odor.			7.9			
40						3.6			
45									
		SM	Medium dense, dark gray, silty SAND; wet. Slight petroleum-like odor, no sheen.						
		SM	Medium stiff, dark gray, sandy SILT; wet. Slight petroleum-like odor.			3.3			
		SM	Medium dense, dark gray, silty SAND; wet.						
50		SP	Medium dense, dark gray, fine SAND; wet.			2.1			
55			With trace organics.						
		ML	Stiff, brownish dark gray SILT with trace organics (roots); wet.						
		SP	Medium dense, dark gray, fine SAND with trace organics; wet.			2.3			
						3.3			
60		SM	Medium dense, dark gray, silty SAND, trace organics; wet.						

BORING METHOD: Sonic
BOREHOLE DIAMETER: 10.0, 8.0, & 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Cascade Drilling
LOGGED BY: C Johnson & L. Glonek

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
DRILLING DATES: 10/31/2005 - 10/31/2005

REMARKS:
Borehole diameter: 10-inch - 0 to 27 ft bgs. 8-inch - 27 to 158 ft bgs. 6-inch - 158 to 218 ft bgs.

Bentonite seal at bottom of casing before stepping down.

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LOG OF BORING SIL-01

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING	TESTING AND LABORATORY DATA
60		SP	Medium dense, dark gray, fine SAND with trace organics; wet.						
		ML	Medium stiff, brownish dark gray SILT with trace organics.						
		SP	Medium dense, dark gray, fine SAND with trace organics; wet.			5.3			
65		ML	Medium stiff, brownish dark gray SILT with occasional organics and fine sand laminae.						
		SP	Medium dense, dark gray, fine SAND; wet.			7.2			
		ML	Medium stiff, dark gray SILT with fine sand laminae and some organics; wet.						
70									
		SP	Medium dense, dark gray, fine SAND with occasional organics; wet. Slight petroleum-like odor.			15			
			No organics below 74 ft bgs.						
75									
		ML	Medium stiff, dark gray SILT with fine sand; wet.						
		SM	Medium dense, dark gray, fine SAND with trace silt; wet.			14			
			With silt nodules (to 1-inch diameter) from 79-79.5 ft bgs.						
80									
			With silt nodules (to 1.5-inch diameter) from 81-81.5 ft bgs.			0.0			
		ML	Medium stiff, dark gray, fine, sandy SILT with fine sand lense (1 inch thick at 82 ft bgs); wet.						
		SP	Medium dense, dark gray, fine SAND with abundant silt nodules from 83-84 ft bgs; wet.			0.0			
85		ML	Medium stiff, dark gray SILT with fine sand; wet.			3.9			
		SP	Medium dense, dark gray, fine SAND; wet.						
						0.0			
90									

BORING METHOD: Sonic

BOREHOLE DIAMETER: 10.0, 8.0, & 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Cascade Drilling

LOGGED BY: C Johnson & L. Glonek

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

DRILLING DATES: 10/31/2005 - 10/31/2005

REMARKS:
Borehole diameter: 10-inch - 0 to 27 ft bgs. 8-inch - 27 to 158 ft bgs. 6-inch - 158 to 218 ft bgs.

Bentonite seal at bottom of casing before stepping down.

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LOG OF BORING SIL-01

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING	TESTING AND LABORATORY DATA
90		SP				0.0			
95		ML	Medium stiff, dark gray, fine, sandy SILT; wet.						
		SP	Medium dense, dark gray, fine SAND; wet.			0.0			
100						0.0			115-01
105		SM	Medium dense, dark gray, fine SAND with abundant gray silt nodules; wet.			0.0			
110		ML	Medium stiff, gray SILT with trace organics; wet.			0.0			
115		SM	Medium dense, dark gray, fine SAND with abundant gray silt nodules (to 1/2-inch diameter); wet.			0.0			
120			With abundant silt nodules (to 1/2-inch to 3-inch diameter).						

BORING METHOD: Sonic

BOREHOLE DIAMETER: 10.0, 8.0, & 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Cascade Drilling

LOGGED BY: C Johnson & L. Glonek

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

DRILLING DATES: 10/31/2005 - 10/31/2005

REMARKS:
Borehole diameter: 10-inch - 0 to 27 ft bgs. 8-inch - 27 to 158 ft bgs. 6-inch - 158 to 218 ft bgs.

Bentonite seal at bottom of casing before stepping down.

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LOG OF BORING
SIL-01

DEPTH (ft bgs)	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING	TESTING AND LABORATORY DATA
120	SM	With trace silt nodules (to 3/4-inch diameter) and trace organics in nodules.			0.0			
125		Occasional silt nodules.			0.0			
	SP	Medium dense, gray, fine SAND; wet. (Heaving sand conditions encountered, resulting in 10 feet of disturbed material inside drill stem/casing.)						
130					0.0			116-01
135					0.0			
					0.0			
140	ML	Medium stiff, gray SILT with trace fine sand lenses; wet.						
	SP	Medium dense, gray, fine SAND; wet.			0.0			
145					0.0			
150								

BORING METHOD: Sonic

BOREHOLE DIAMETER: 10.0, 8.0, & 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Cascade Drilling

LOGGED BY: C Johnson & L. Glonek

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

DRILLING DATES: 10/31/2005 - 10/31/2005

REMARKS:
Borehole diameter: 10-inch - 0 to 27 ft bgs. 8-inch - 27 to 158 ft bgs. 6-inch - 158 to 218 ft bgs.

Bentonite seal at bottom of casing before stepping down.

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LOG OF BORING
SIL-01

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING	TESTING AND LABORATORY DATA
150		SP				0.0			
						0.0			
155			With trace gray silt nodules (to 1/2-inch diameter).						
						0.0			
		ML	Medium stiff, gray SILT with trace fine sand; wet.			0.0			
160		SP	Medium dense, gray, fine SAND; wet.						△ 117-01
						0.0			
						0.0			
165									
170						0.0			
						0.0			
175									
						0.0			
		SM	Medium dense, gray, fine SAND with trace silt nodules (to 1.5-inch diameter); wet.			0.0			
						0.0			
180									

BORING METHOD: Sonic

BOREHOLE DIAMETER: 10.0, 8.0, & 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Cascade Drilling

LOGGED BY: C Johnson & L. Glonek

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

DRILLING DATES: 10/31/2005 - 10/31/2005

REMARKS:
Borehole diameter: 10-inch - 0 to 27 ft bgs. 8-inch - 27 to 158 ft bgs. 6-inch - 158 to 218 ft bgs.

Bentonite seal at bottom of casing before stepping down.

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LOG OF BORING
SIL-01

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING	TESTING AND LABORATORY DATA
180		SM							
		SP	Medium dense, gray, fine SAND; wet.			0.0			
185									
						0.0			118-01
			With trace silt nodules from 189-191 ft bgs.			0.0			
190						0.0			
		SP	Medium dense, brown, fine SAND; wet.			0.0			
195						0.0			
						0.0			
200						0.0			
			With trace medium sand.			0.0			
205						0.0			
		GP	Dense, brown, subangular to rounded, sandy GRAVEL with trace silt, alluvium; wet.			0.0			
		GC	Dense, gray, red and greenish-brown, clayey, slightly weathered, basalt GRAVEL, trace vesicles; moist.			0.0			109-01
210									

BORING METHOD: Sonic

BOREHOLE DIAMETER: 10.0, 8.0, & 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Cascade Drilling

LOGGED BY: C Johnson & L. Glonek

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

DRILLING DATES: 10/31/2005 - 10/31/2005

REMARKS:
Borehole diameter: 10-inch - 0 to 27 ft bgs. 8-inch - 27 to 158 ft bgs. 6-inch - 158 to 218 ft bgs.

Bentonite seal at bottom of casing before stepping down.

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LOG OF BORING
SIL-01

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING	TESTING AND LABORATORY DATA
210		GC	Very dense, dark gray to red-brown, rounded, clayey GRAVEL with trace sand (10%), gravel lithology varies from basalt, chert, and quartzite; moist.						
		SP	Dense, gray, coarse SAND; wet.						
		GC	Very dense, light to dark gray, coarse, clayey, moderately weathered to decomposed basalt GRAVEL with some silt and sand; wet.						
215			Total depth drilled = 218 ft bgs.						△ 114-01
220									
225									
230									
235									
240									

BORING METHOD: Sonic

BOREHOLE DIAMETER: 10.0, 8.0, & 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Cascade Drilling

LOGGED BY: C Johnson & L. Glonek

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

DRILLING DATES: 10/31/2005 - 10/31/2005

REMARKS:
Borehole diameter: 10-inch - 0 to 27 ft bgs. 8-inch - 27 to 158 ft bgs. 6-inch - 158 to 218 ft bgs.

Bentonite seal at bottom of casing before stepping down.

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LOG OF BORING
SIL-01

ENVIRONMENTAL BORING (MULTIPLE SCREENS) 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/7/06

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING	TESTING AND LABORATORY DATA
0		SP	Medium dense, brown, fine SAND (FILL) with trace medium sand; moist.						
		SM	Medium dense, brown, silty, fine SAND (FILL); moist.						
		SP	Medium dense, brown, fine SAND (FILL) with occasional fine gravel and wood debris; moist.			1.9			
5						0.0			
		SP	Medium dense, brown with gray, fine SAND (FILL) with occasional gravel; moist.			0.0			
10		SP	Medium dense, dark gray to black, fine SAND (FILL) with occasional fine gravel and silt; moist. Strong petroleum-like odor, slight sheen.						
			Sheen becomes heavy.			67			
						0.0			
						47			
15			No sheen.						
			Petroleum-like odor becomes moderate.						
						9.4			
						0.0			
20			No silt and strong petroleum-like odor.						
						0.0			
25						0.0			
						1.4			
						0.0			
30			With heavy sheen.						

BORING METHOD: Sonic

BOREHOLE DIAMETER: 8.0 & 6.0 (In)

DRILL RIG: Sonic

CONTRACTOR: Cascade Drilling

LOGGED BY: C. Johnson

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

DRILLING DATES: 11/10/2005 - 11/15/2005

REMARKS:
Borehole diameter: 8-inch - 0 to 35 ft bgs. 6-inch - 35 to 235 ft bgs.

ENVIRONMENTAL BORING (MULTIPLE SCREENS) 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/7/06

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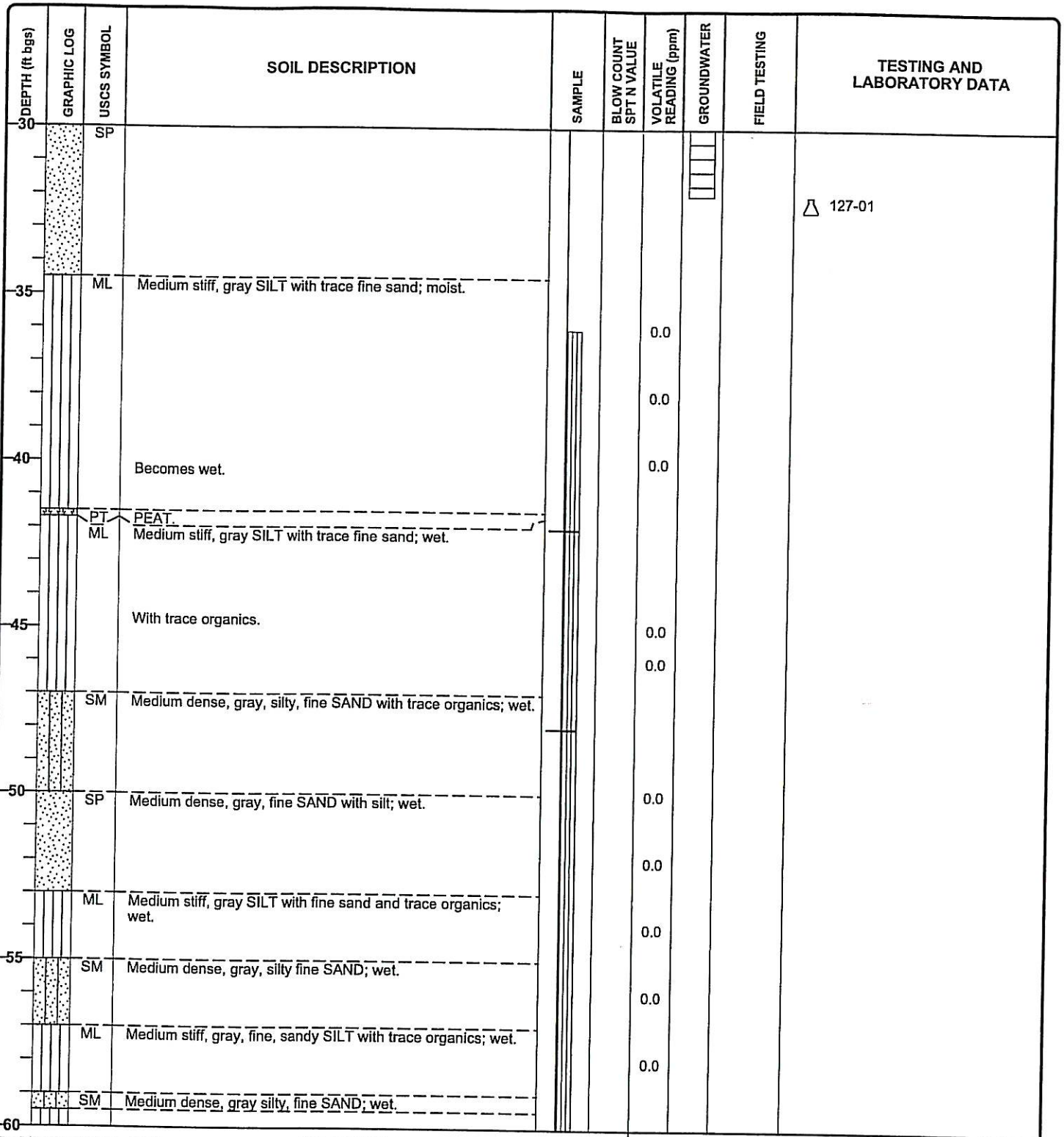
LOG OF BORING
SIL-02



BORING METHOD: Sonic

BOREHOLE DIAMETER: 8.0 & 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Cascade Drilling

LOGGED BY: C. Johnson

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

DRILLING DATES: 11/10/2005 - 11/15/2005

REMARKS:
Borehole diameter: 8-inch - 0 to 35 ft bgs. 6-inch - 35 to 235 ft bgs.

ENVIRONMENTAL BORING (MULTIPLE SCREENS) 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/7/06

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LOG OF BORING SIL-02

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING	TESTING AND LABORATORY DATA
60		ML	Medium stiff, gray SILT with fine sand and trace organics; wet.						
		SP	Medium dense, gray, fine SAND with occasional silt; wet.			0.0			
		SP	Medium dense, gray, fine SAND; wet.			0.0			
						0.0			
65		ML	Medium stiff, gray SILT with trace fine sand; wet.						
		SP	Medium dense, gray, fine SAND; wet.						
						0.0			
70						0.0			
						0.0			
						0.0			
75						0.0			
						0.0			
80		ML	Medium stiff, gray SILT with fine sand; wet.						
		SP	Medium dense, gray, fine SAND; wet.			0.0			
						0.0			
						0.0			
85			With trace organics from 84-85 ft bgs.						
			With trace silt.						
		ML	Medium stiff, gray SILT with trace sand and organics; wet.			0.0			
90									

BORING METHOD: Sonic

BOREHOLE DIAMETER: 8.0 & 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Cascade Drilling

LOGGED BY: C. Johnson

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

DRILLING DATES: 11/10/2005 - 11/15/2005

REMARKS:
Borehole diameter: 8-inch - 0 to 35 ft bgs. 6-inch - 35 to 235 ft bgs.

ENVIRONMENTAL BORING (MULTIPLE SCREENS) 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/7/06

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LOG OF BORING
SIL-02

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING	TESTING AND LABORATORY DATA
90		SP	Medium dense, gray, fine SAND; wet.			0.0			
						0.0			
						0.0			
		ML	Medium stiff, gray, fine, sandy SILT; wet.						
		SP	Medium dense, gray, fine SAND; wet.			0.0			
95									
						0.0			
100						0.0			△ 131-01
		ML	Medium stiff, gray SILT with fine sand; wet.			0.0			
		SP	Medium dense, gray, fine SAND; wet.			0.0			
			With trace organics from 104-105 ft bgs.			0.0			
105									
						0.0			
110		ML	Medium stiff, gray SILT; wet.						
		SP	Medium dense, gray, fine SAND; wet.			0.0			
		ML	Medium stiff, gray SILT with trace fine sand; wet.			0.0			
						0.0			
						0.0			
115			With trace organics and occasional fine sand.						
		SP	Medium dense, gray, fine SAND with trace silt nodules (to 1-inch diameter); wet.						
						0.0			
		SM	Medium dense, gray, silty, fine SAND; wet.						
120									

BORING METHOD: Sonic
BOREHOLE DIAMETER: 8.0 & 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Cascade Drilling
LOGGED BY: C. Johnson

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
DRILLING DATES: 11/10/2005 - 11/15/2005

REMARKS:
Borehole diameter: 8-inch - 0 to 35 ft bgs. 6-inch - 35 to 235 ft bgs.

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Portland, Oregon
USA 97224
Tel (503) 639-3400
Fax (503) 620-7892

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LOG OF BORING SIL-02

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING	TESTING AND LABORATORY DATA
120		SM				0.0			
						0.0			
						0.0			
		ML	Medium stiff, gray SILT with fine sand; wet.						
		SM	Medium dense, gray, silty, fine SAND; wet.			0.0			
125									
						0.0			
130		ML	Medium stiff, gray SILT with trace fine sand and occasional organics; wet.			0.0			△ 132-01
		SP	Medium dense, gray, fine SAND with occasional silt; wet.			0.0			
		ML	Medium stiff, gray SILT with trace fine sand; wet.			0.0			
		SP	Medium dense, gray, fine SAND; wet.						
			With trace silt nodules from 134-135 ft bgs.			0.0			
135									
		SM	Medium dense, gray, silty, fine SAND; wet.						
140						0.0			
		SP	Medium dense, gray, fine SAND; wet.						
						0.0			
						0.0			
145		SM	Medium dense, gray, fine SAND with silt nodules (to 2-inch diameter); wet.						
						0.0			
						0.0			
		ML	Medium stiff, gray, fine, sandy SILT; wet.						
150									

BORING METHOD: Sonic

BOREHOLE DIAMETER: 8.0 & 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Cascade Drilling

LOGGED BY: C. Johnson

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

DRILLING DATES: 11/10/2005 - 11/15/2005

REMARKS:
Borehole diameter: 8-inch - 0 to 35 ft bgs. 6-inch - 35 to 235 ft bgs.

ENVIRONMENTAL BORING (MULTIPLE SCREENS) 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/7/06

RP - Portland
Stage 1 SCE

0-61M-107030 P69

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LOG OF BORING
SIL-02

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING	TESTING AND LABORATORY DATA
150		ML				0.0			
						0.0			
						0.0			
155		SM	Medium dense, gray, silty, fine SAND with occasional organics; wet.						
						0.0			
160									133-01
						0.0			
						0.0			
165		ML	Medium stiff, gray SILT with fine sand; wet.			0.0			
		SM	Medium dense, gray, silty, fine SAND; wet.						
						0.0			
170						0.0			
						0.0			
			With trace organics from 174-175 ft bgs.			0.0			
175									
		ML	Medium stiff, gray SILT with organics (leaves, needles, bark) and trace fine sand; wet.						
180									

BORING METHOD: Sonic

BOREHOLE DIAMETER: 8.0 & 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Cascade Drilling

LOGGED BY: C. Johnson

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

DRILLING DATES: 11/10/2005 - 11/15/2005

REMARKS:
Borehole diameter: 8-inch - 0 to 35 ft bgs. 6-inch - 35 to 235 ft bgs.

ENVIRONMENTAL BORING (MULTIPLE SCREENS) 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/7/06

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LOG OF BORING
SIL-02

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING	TESTING AND LABORATORY DATA
180		ML				0.0			
						0.0			
185		SP	Medium dense, gray, fine SAND with organics; wet.						
		SM-ML	Medium dense, gray, silty, fine SAND to medium stiff, fine, sandy SILT; wet.			0.0			
						0.0			
190			With trace organics from 190-192 ft bgs.			0.0			△ 134-01
						0.0			
						0.0			
195		SM	Medium dense, gray, silty, fine SAND; wet.						
						0.0			
200						0.0			
						0.0			
						0.0			
		ML	Very stiff, dark gray to black with green, blue, and brown, fine, sandy SILT with angular to occasional subrounded, weathered, basalt gravel; wet.			0.0			
205		ML	Very stiff, brownish red with occasional yellow, fine, sandy SILT with angular to subangular, weathered, basalt gravel; wet.						
						0.0			
210									

BORING METHOD: Sonic
BOREHOLE DIAMETER: 8.0 & 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Cascade Drilling
LOGGED BY: C. Johnson

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
DRILLING DATES: 11/10/2005 - 11/15/2005

REMARKS:
Borehole diameter: 8-inch - 0 to 35 ft bgs. 6-inch - 35 to 235 ft bgs.

ENVIRONMENTAL BORING (MULTIPLE SCREENS) 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/7/06

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Stage 1 SCE

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LOG OF BORING SIL-02

DEPTH (ft bgs)	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING	TESTING AND LABORATORY DATA
210	ML				0.0			
	GM	Dense, reddish-gray, angular to subangular, silty GRAVEL with some sand and clay; wet.						
		Grades to brownish-gray.						
215	GM	Dense, gray, subangular to subrounded, silty, clayey, basalt GRAVEL with trace fine sand, fractured, orange oxidized surfaces, occasional gravel with oxidized rings (2-mm to 3-mm diameter); wet.						△ 119-01
220		With boulders.						
		Basalt boulders increase in size (6-inch to 8-inch long cores), fresh, aphanitic.						
225								
230								
235		Total depth drilled = 235 ft bgs.						
240								

BORING METHOD: Sonic

BOREHOLE DIAMETER: 8.0 & 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Cascade Drilling

LOGGED BY: C. Johnson

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

DRILLING DATES: 11/10/2005 - 11/15/2005

REMARKS:
Borehole diameter: 8-inch - 0 to 35 ft bgs. 6-inch - 35 to 235 ft bgs.

ENVIRONMENTAL BORING (MULTIPLE SCREENS) 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/7/06

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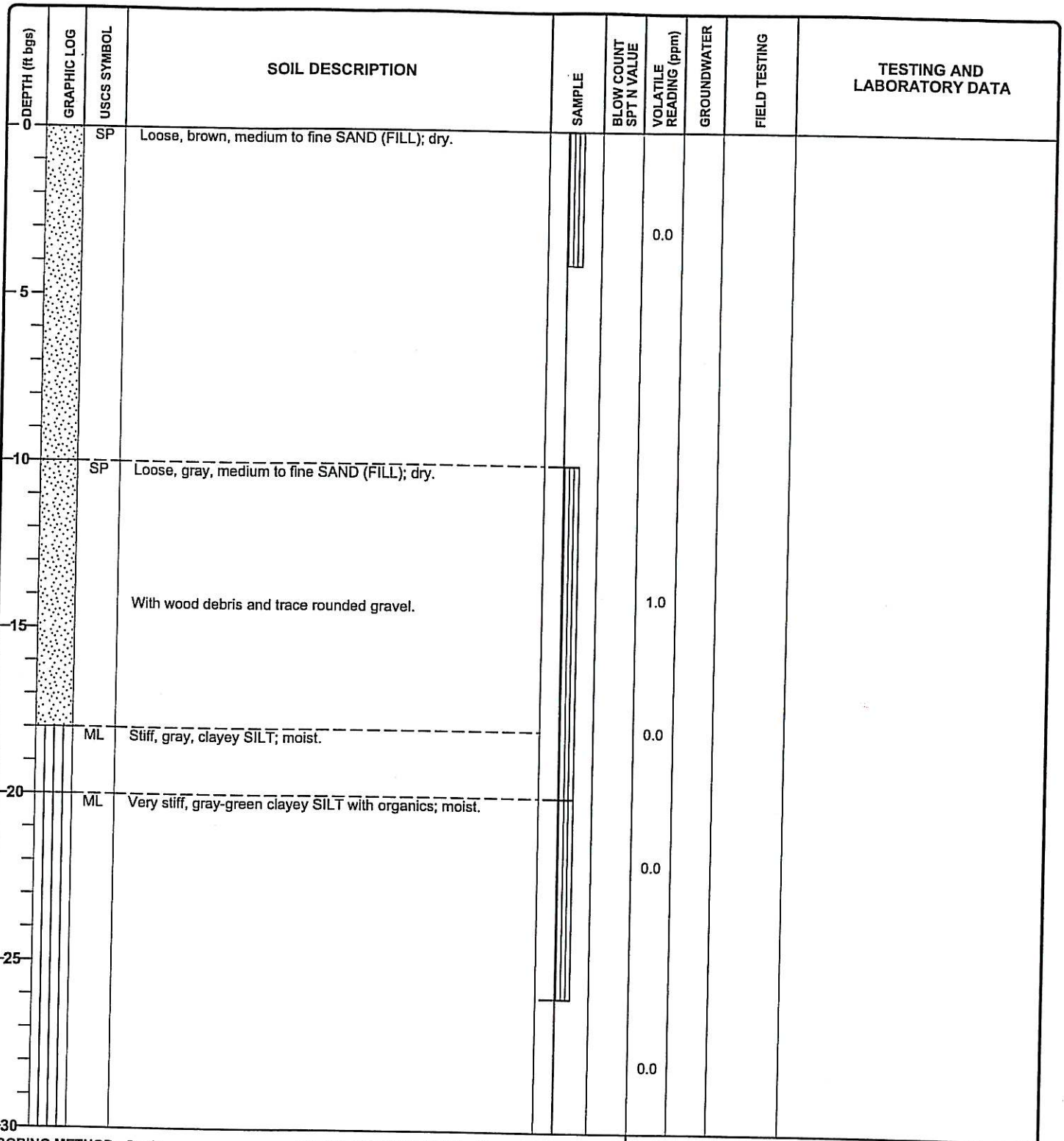
LOG OF BORING
SIL-02



BORING METHOD: Sonic

BOREHOLE DIAMETER: 8.0 & 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Cascade Drilling

LOGGED BY: B. Lary & C. Johnson

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

DRILLING DATES: 12/05/2005 - 12/06/2005

REMARKS:
Borehole diameter: 8-inch - 0 to 30 ft bgs. 6-inch - 30 to 130 ft bgs.

ENVIRONMENTAL BORING (MULTIPLE SCREENS) 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/7/06

RP - Portland
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LOG OF BORING
SIL-03

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING	TESTING AND LABORATORY DATA
30		SM	Medium dense, brown, silty SAND; moist to wet.						
35		SM-ML	Stiff, gray, sandy SILT/silty SAND with organics; wet.						125-01
40									
45			With wood debris.						
50									
55									
60									

BORING METHOD: Sonic

BOREHOLE DIAMETER: 8.0 & 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Cascade Drilling

LOGGED BY: B. Lary & C. Johnson

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

DRILLING DATES: 12/05/2005 - 12/06/2005

REMARKS:
Borehole diameter: 8-inch - 0 to 30 ft bgs. 6-inch - 30 to 130 ft bgs.

ENVIRONMENTAL BORING (MULTIPLE SCREENS) 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/7/06

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LOG OF BORING
SIL-03

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING	TESTING AND LABORATORY DATA
60		SM-ML							
65		ML	Stiff, gray-green sandy SILT; wet.						
		SM	Medium dense, brown, silty SAND; wet.						
		GP	Dense, brown and gray, subrounded, fine GRAVEL in silt matrix; wet.						
70		GM	Dense, gray, medium to coarse, subrounded to rounded, silty GRAVEL in silt and sand matrix; wet.						
75									
80		GP	Gray, fine GRAVEL with some silt; wet.						
		GP	Red, coarse GRAVEL, weathering rinds around some gravel; wet.						
		GM	Subrounded to subangular GRAVEL with yellowish weathering rinds on gravel (clast lithology: basalt, chert, quartz and granite).						
85		GP	Fine GRAVEL in silt matrix; wet.						
		GM	Very dense, dark gray, rounded, well-graded, fine GRAVEL in silty matrix, trace cobbles; wet.						
90									

BORING METHOD: Sonic

BOREHOLE DIAMETER: 8.0 & 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Cascade Drilling

LOGGED BY: B. Lary & C. Johnson

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

DRILLING DATES: 12/05/2005 - 12/06/2005

REMARKS:
Borehole diameter: 8-inch - 0 to 30 ft bgs. 6-inch - 30 to 130 ft bgs.

ENVIRONMENTAL BORING (MULTIPLE SCREENS) 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/7/06

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LOG OF BORING
SIL-03

DEPTH (ft bgs)	USCS SYMBOL	SOIL DESCRIPTION	TESTING AND LABORATORY DATA
90	GM	Matrix grades from silt to sand.	
		Grades to gray-brown.	
95		Grades to coarse GRAVEL.	
	GW	Gray-brown, fine, sandy GRAVEL; wet.	
	GW	Gray-brown, rounded, silty, sandy GRAVEL; wet.	
		Large cobble (4-inch plus diameter).	
		Grades to gray.	126-01
100	GP	BASALT (6-inch piece). Dense, dark brown to gray, coarse, highly weathered, porphyritic, basalt GRAVEL, with occasional cobble clasts (to 6-inch diameter), with trace silt.	
		BASALT cobble.	
		Silt content increases; moist to wet.	
105		BASALT fragments (3-inch to 5-inch diameter).	
	CL	Soft, red, gravelly CLAY with highly weathered basalt gravels.	
		Grades to reddish-brown to brown.	
110		Gravel becomes coarser, basalt gravels have moderate vesicles (to 4-mm).	
	GM	Medium dense, reddish-brown, angular to subangular, silty, slightly to moderately weathered, basalt GRAVEL and cobbles with clay and trace fine sand, trace vesicles (to 2-mm diameter); wet.	
115			
120			

SAMPLE | BLOW COUNT SPT N VALUE | VOLATILE READING (ppm) | GROUNDWATER | FIELD TESTING

BORING METHOD: Sonic

BOREHOLE DIAMETER: 8.0 & 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Cascade Drilling

LOGGED BY: B. Lary & C. Johnson

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

DRILLING DATES: 12/05/2005 - 12/06/2005

REMARKS:
Borehole diameter: 8-inch - 0 to 30 ft bgs. 6-inch - 30 to 130 ft bgs.

ENVIRONMENTAL BORING (MULTIPLE SCREENS) 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/7/06

RP - Portland
Stage 1 SCE

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LOG OF BORING
SIL-03

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING	TESTING AND LABORATORY DATA
120		CL	Soft, red, gravelly CLAY with highly weathered basalt gravels.						
			Grades to mottled brown and gray.						
125									
			Increase in gravel and cobble content; wet.						
130			Total depth drilled = 130 ft bgs.						△ 142-01
135									
140									
145									
150									

BORING METHOD: Sonic

BOREHOLE DIAMETER: 8.0 & 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Cascade Drilling

LOGGED BY: B. Lary & C. Johnson

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

DRILLING DATES: 12/05/2005 - 12/06/2005

REMARKS:
Borehole diameter: 8-inch - 0 to 30 ft bgs. 6-inch - 30 to 130 ft bgs.

ENVIRONMENTAL BORING (MULTIPLE SCREENS) 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/7/06

RP - Portland
Stage 1 SCE

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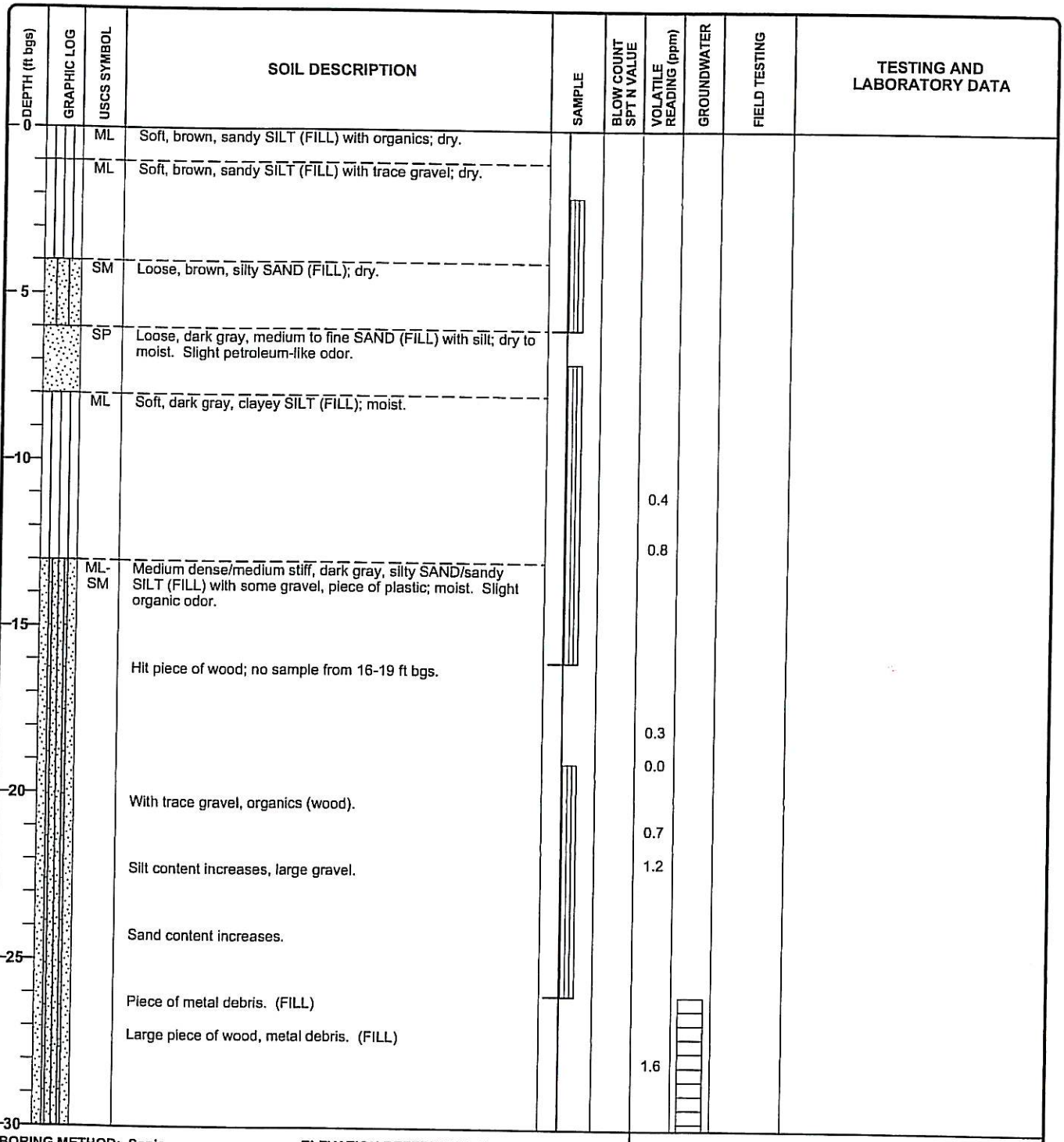
LOG OF BORING
SIL-03



ENVIRONMENTAL BORING (MULTIPLE SCREENS) 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/7/06

BORING METHOD: Sonic

BOREHOLE DIAMETER: 8.0 & 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Cascade Drilling

LOGGED BY: B. Lary

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

DRILLING DATES: 12/07/2005 - 12/09/2005

REMARKS:
Borehole diameter: 8-inch - 0 to 40 ft bgs. 6-inch - 40 to 120 ft bgs.

RP - Portland
Stage 1 SCE

0-61M-107030 P69

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LOG OF BORING SIL-04

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING	TESTING AND LABORATORY DATA
30		ML-SM							△ 136-01
35		ML	Soft, brown, fine, sandy SILT; wet.						
40			Encountered pieces of wood from approximately 41-42 ft bgs.			0.1			
45						0.2			
50			Sand content increases.						
		SP	Loose, dark brown, fine to medium SAND with some silt; wet.			0.3			
55						0.4			
60			Grades to fine SAND, micaceous, some silt.						

BORING METHOD: Sonic

BOREHOLE DIAMETER: 8.0 & 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Cascade Drilling

LOGGED BY: B. Lary

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

DRILLING DATES: 12/07/2005 - 12/09/2005

REMARKS:
Borehole diameter: 8-inch - 0 to 40 ft bgs. 6-inch - 40 to 120 ft bgs.

ENVIRONMENTAL BORING (MULTIPLE SCREENS) 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/7/06

RP - Portland
Stage 1 SCE

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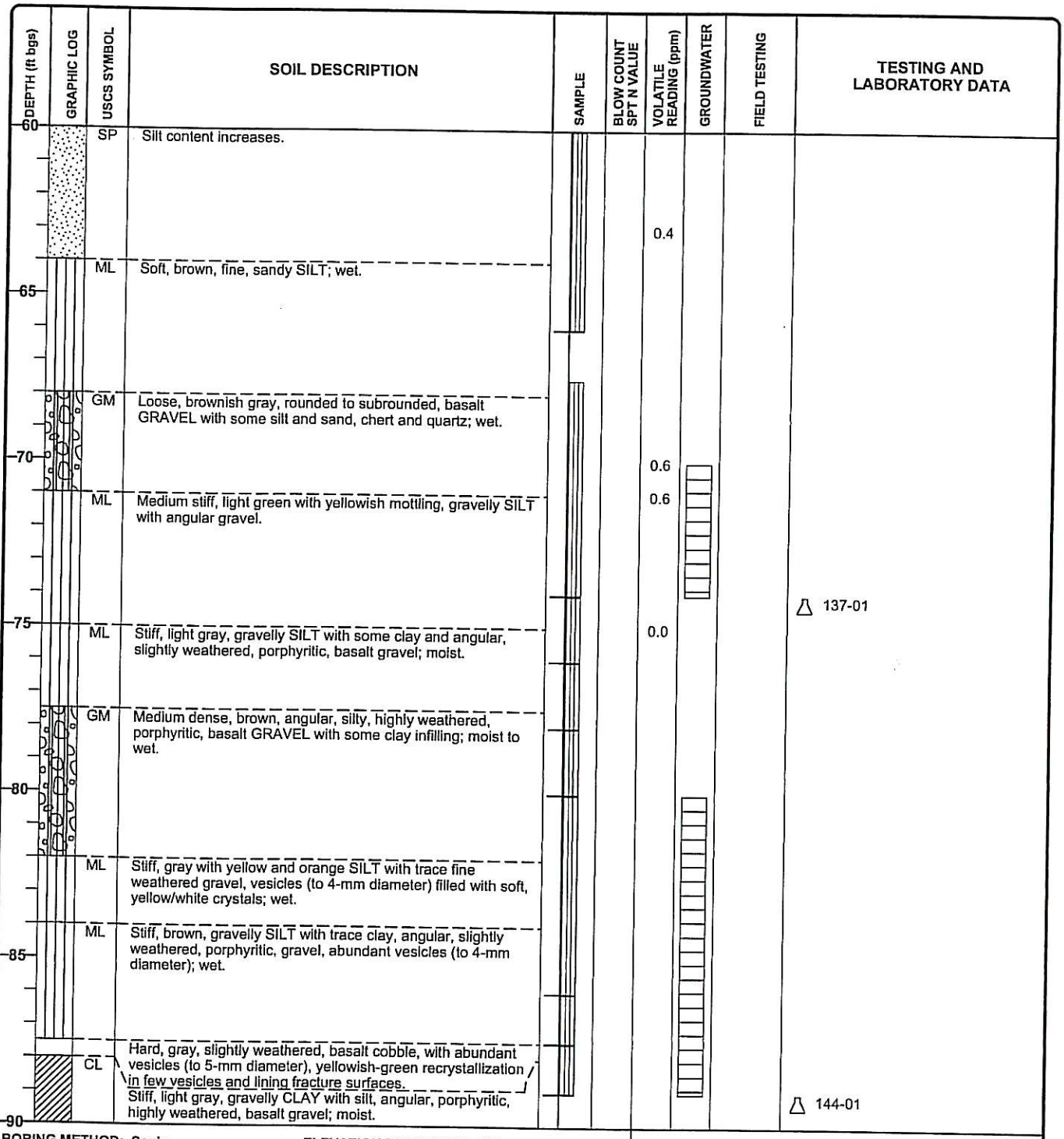
LOG OF BORING
SIL-04



DEPTH (ft bgs)	USCS SYMBOL	SOIL DESCRIPTION	VOLATILE READING (ppm)	TESTING AND LABORATORY DATA
60	SP	Silt content increases.		
			0.4	
	ML	Soft, brown, fine, sandy SILT; wet.		
65				
	GM	Loose, brownish gray, rounded to subrounded, basalt GRAVEL with some silt and sand, chert and quartz; wet.		
70			0.6	
	ML	Medium stiff, light green with yellowish mottling, gravelly SILT with angular gravel.	0.6	
				137-01
75	ML	Stiff, light gray, gravelly SILT with some clay and angular, slightly weathered, porphyritic, basalt gravel; moist.	0.0	
	GM	Medium dense, brown, angular, silty, highly weathered, porphyritic, basalt GRAVEL with some clay infilling; moist to wet.		
80				
	ML	Stiff, gray with yellow and orange SILT with trace fine weathered gravel, vesicles (to 4-mm diameter) filled with soft, yellow/white crystals; wet.		
	ML	Stiff, brown, gravelly SILT with trace clay, angular, slightly weathered, porphyritic, gravel, abundant vesicles (to 4-mm diameter); wet.		
85				
	CL	Hard, gray, slightly weathered, basalt cobble, with abundant vesicles (to 5-mm diameter), yellowish-green recrystallization in few vesicles and lining fracture surfaces.		
		Stiff, light gray, gravelly CLAY with silt, angular, porphyritic, highly weathered, basalt gravel; moist.		144-01
90				

BORING METHOD: Sonic
BOREHOLE DIAMETER: 8.0 & 6.0 (in)
DRILL RIG: Sonic
CONTRACTOR: Cascade Drilling
LOGGED BY: B. Lary

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
DRILLING DATES: 12/07/2005 - 12/09/2005

REMARKS:
Borehole diameter: 8-inch - 0 to 40 ft bgs. 6-inch - 40 to 120 ft bgs.

ENVIRONMENTAL BORING (MULTIPLE SCREENS) 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/7/06

RP - Portland
Stage 1 SCE

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LOG OF BORING SIL-04

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING	TESTING AND LABORATORY DATA
90		CL	Stiff, light gray, gravelly CLAY with silt, angular, porphyritic, highly weathered, basalt gravel; moist.						
95			Basalt cobble.						
		ML	Medium stiff, brown, gravelly SILT with some clay and fine sand, angular to subangular, highly weathered gravel, abundant vesicles (to 2-mm diameter), some with soft, yellow-white, recrystallization; wet.						
100		CL	Medium stiff, light gray with green, gravelly CLAY, angular, moderately weathered, porphyritic gravel, trace vesicles (to 2-mm); wet.						
		GM	Medium dense, dark grayish-brown with orange and yellow, angular to subangular, silty, highly weathered, porphyritic basalt GRAVEL with clay; wet.						
105		CL	Medium stiff, light greenish-gray CLAY with silt, decomposed basalt gravel or highly vesicular basalt with weathering rinds; wet.						
110									
115									
120			Grades to reddish-brown. Total depth drilled = 120 ft bgs.						

BORING METHOD: Sonic

BOREHOLE DIAMETER: 8.0 & 6.0 (in)

DRILL RIG: Sonic

CONTRACTOR: Cascade Drilling

LOGGED BY: B. Lary

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

DRILLING DATES: 12/07/2005 - 12/09/2005

REMARKS:
Borehole diameter: 8-inch - 0 to 40 ft bgs. 6-inch - 40 to 120 ft bgs.

ENVIRONMENTAL BORING (MULTIPLE SCREENS) 0-61M-107030-P69.GPJ AMEC PORTLAND.GDT 2/7/06

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Stage 1 SCE

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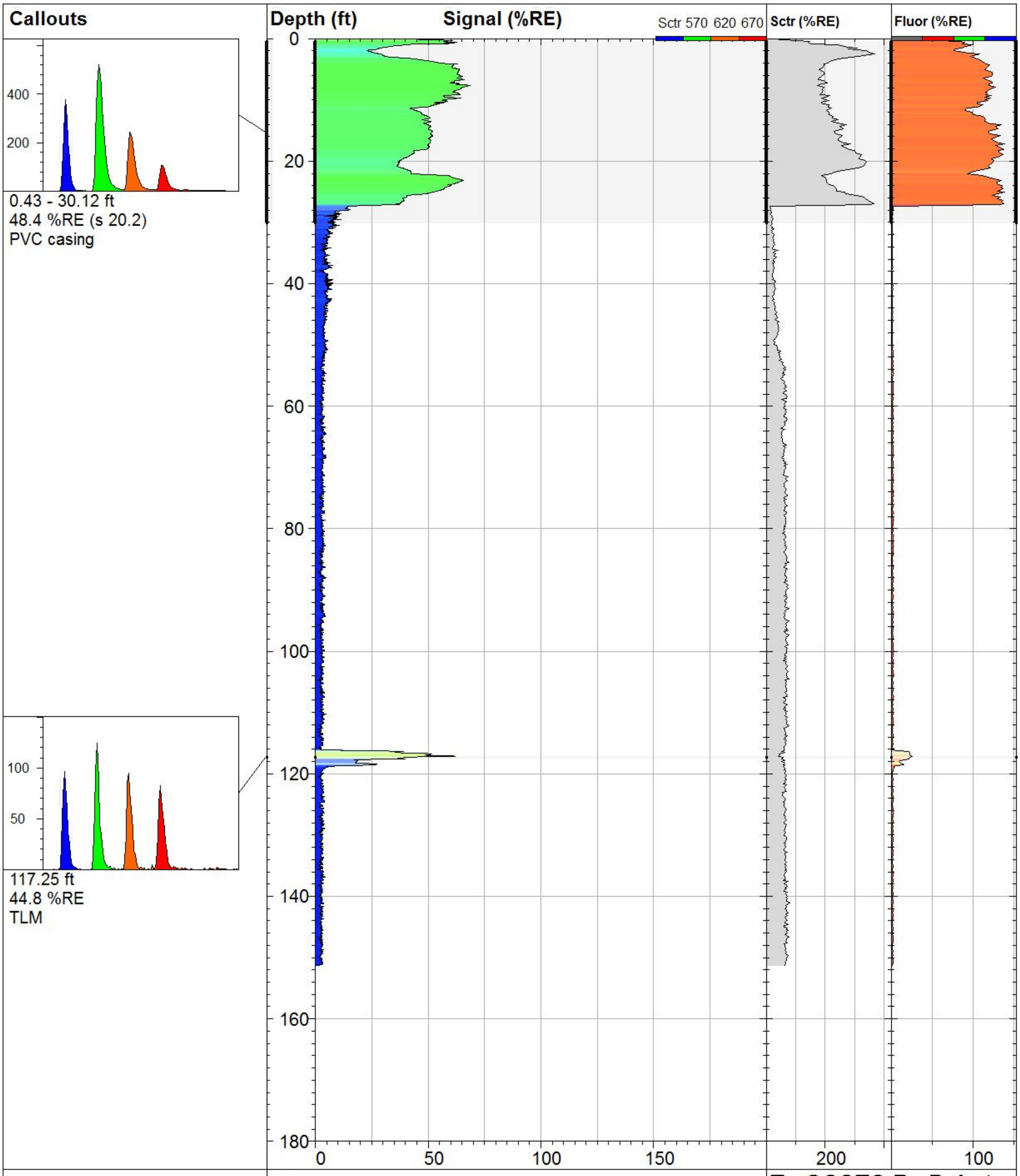
LOG OF BORING
SIL-04



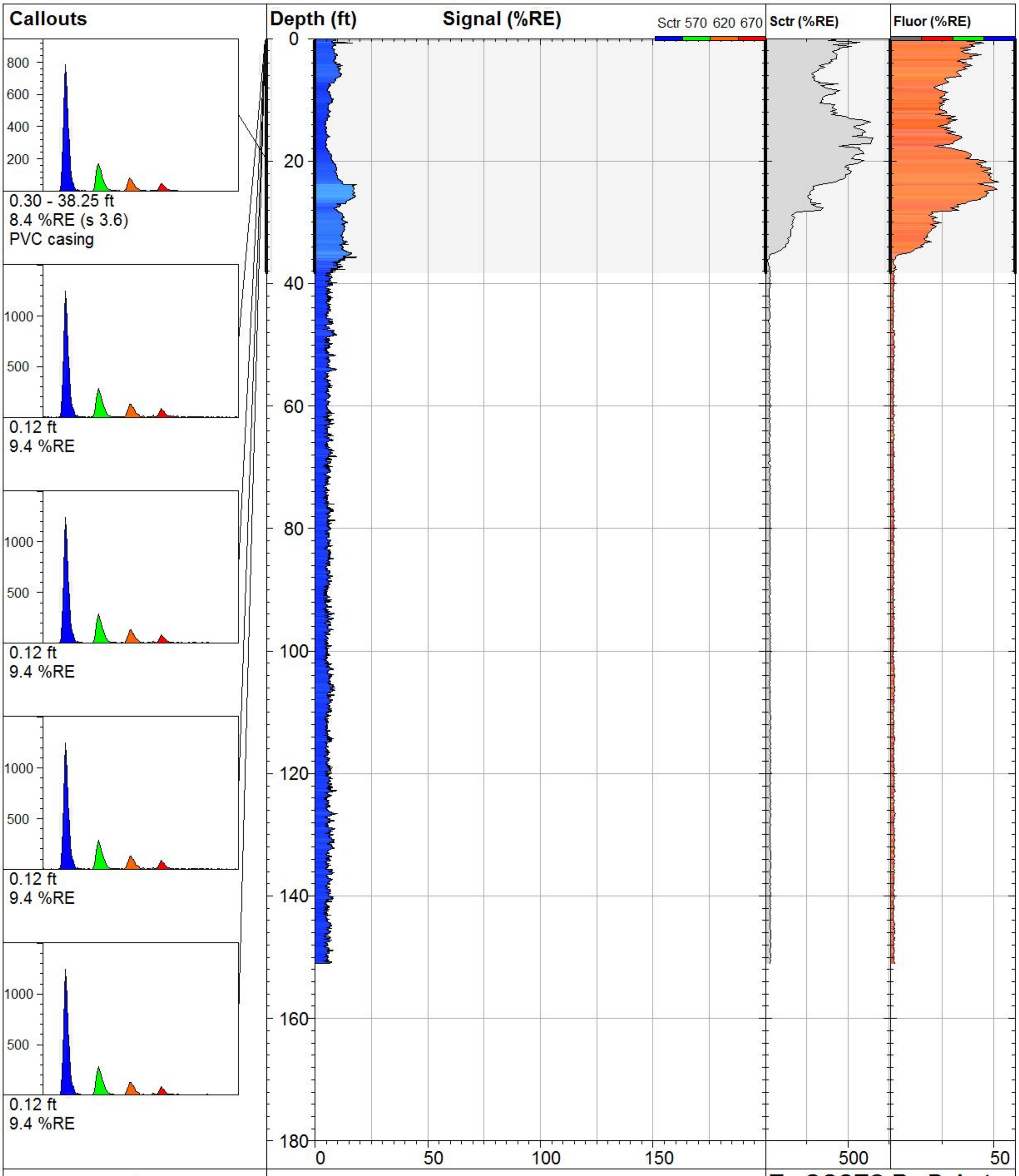
DAKOTA TECHNOLOGIES

www.DakotaTechnologies.com

TG01S

TarGOST® By Dakota
www.DakotaTechnologies.com

Site: **Portland, OR MGP**	*Y Coord.(Lat-N) / System:* **Unavailable /**	*Final depth:* **151.27 ft**
Client / Job: **Hahn & Associates, Inc. /**	*X Coord.(Lng-E) / Fix:* **Unavailable /**	*Max signal:* **68.8 %RE @ 7.64 ft**
Operator / Unit: **Steve Adamek / DTI01**	*Elevation:* **Unavailable**	*Date & Time:* **2007-09-05 14:43**



DAKOTA TECHNOLOGIES

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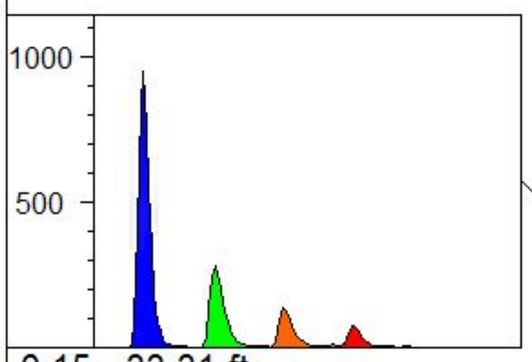
TG02Sc

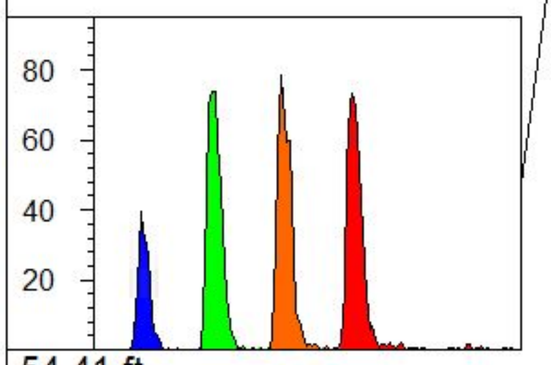
TarGOST® By Dakota
www.DakotaTechnologies.com

Site: **Portland, OR MGP**	*Y Coord.(Lat-N) / System:* **Unavailable /**	*Final depth:* **151.04 ft**
Client / Job: **Hahn & Associates, Inc. /**	*X Coord.(Lng-E) / Fix:* **Unavailable /**	*Max signal:* **19.6 %RE @ 35.72 ft**
Operator / Unit: **Steve Adamek / DTI01**	*Elevation:* **Unavailable**	*Date & Time:* **2007-09-07 10:14**

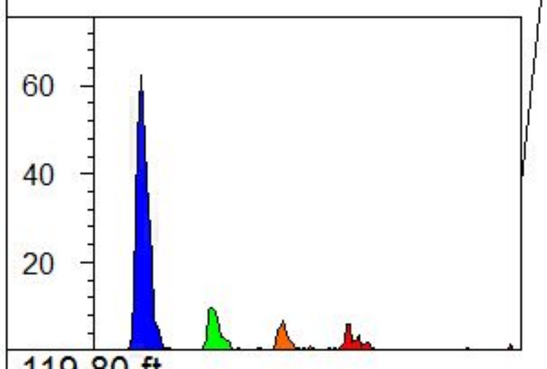
Callouts



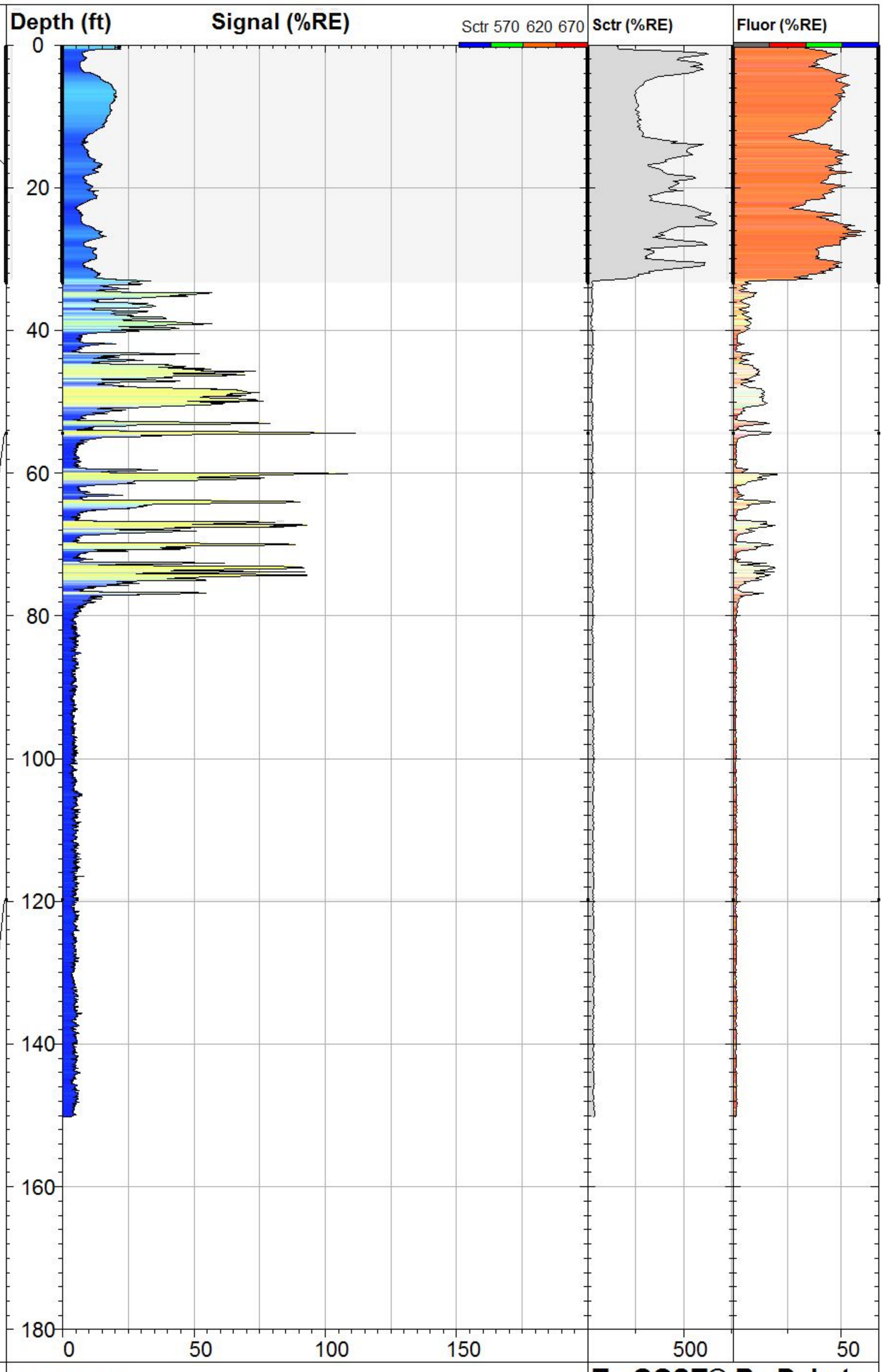
0.15 - 33.31 ft
10.9 %RE (s 4.8)
PVC casing



54.41 ft
112.1 %RE
TLM



119.80 ft
6.1 %RE
typical background



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TG03S

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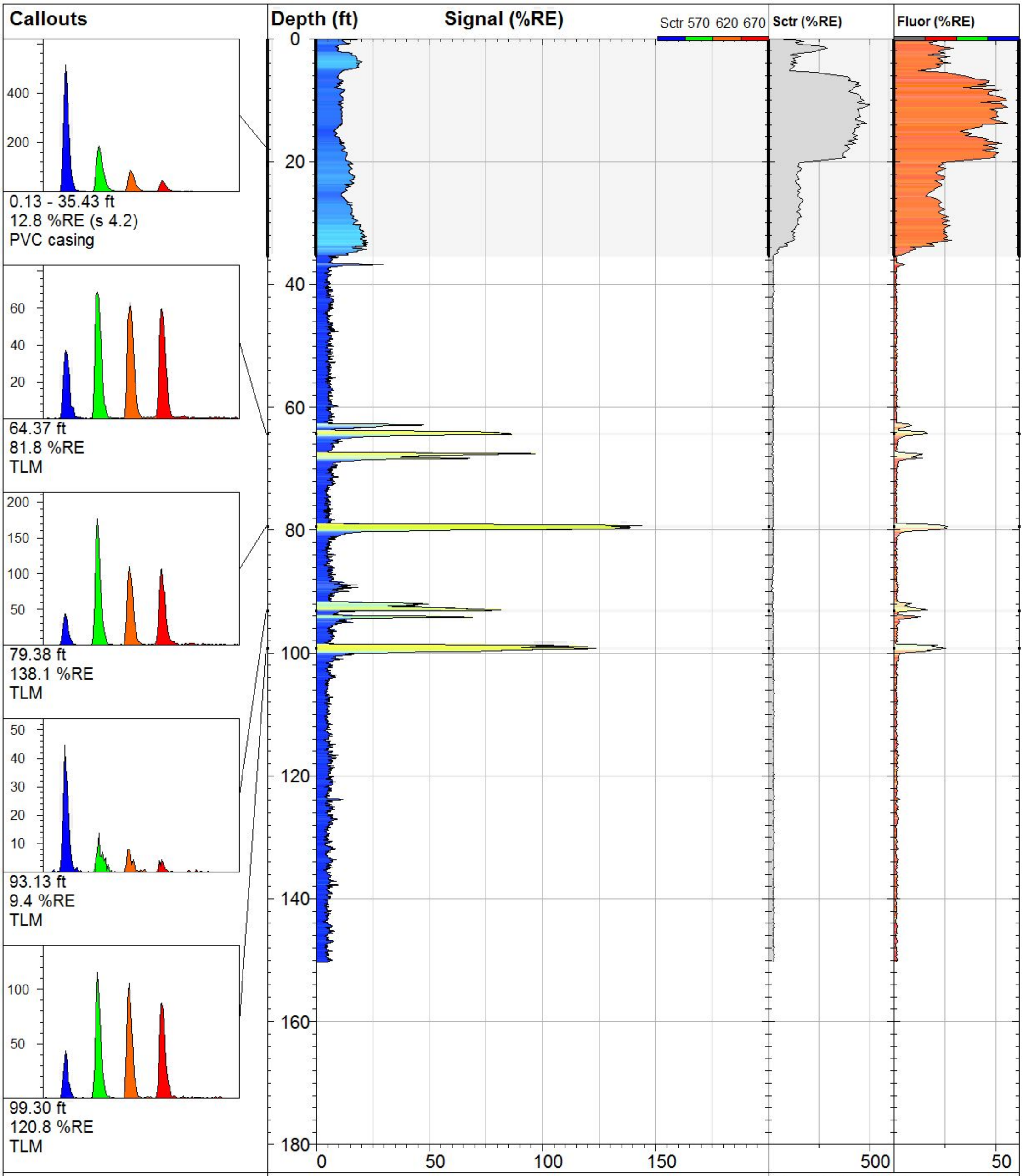
Site: **Portland, OR MGP**	*Y Coord.(Lat-N) / System:* **Unavailable /**	*Final depth:* **150.19 ft**
Client / Job: **Hahn & Associates, Inc. /**	*X Coord.(Lng-E) / Fix:* **Unavailable /**	*Max signal:* **112.1 %RE @ 54.41 ft**
Operator / Unit: **Steve Adamek / DTI01**	*Elevation:* **Unavailable**	*Date & Time:* **2007-09-08 13:29**



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TG04S

TarGOST® By Dakota
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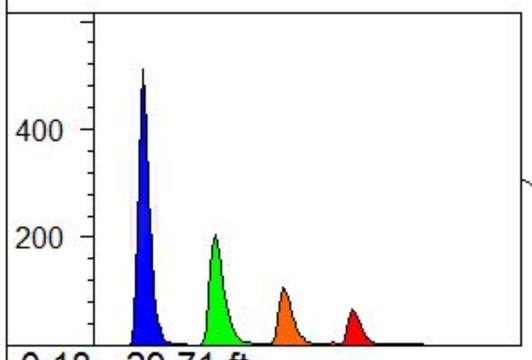
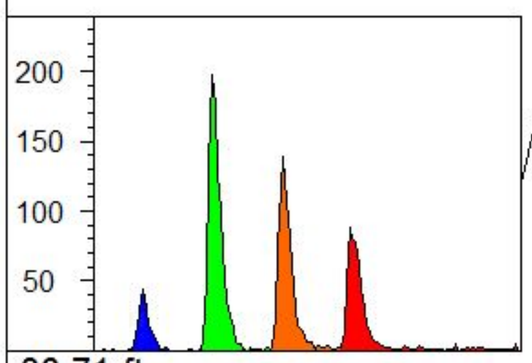
Site: **Portland, OR MGP**	*Y Coord.(Lat-N) / System:* **Unavailable /**	*Final depth:* **150.33 ft**
Client / Job: **Hahn & Associates, Inc. /**	*X Coord.(Lng-E) / Fix:* **Unavailable /**	*Max signal:* **146.1 %RE @ 79.23 ft**
Operator / Unit: **Steve Adamek / DTI01**	*Elevation:* **Unavailable**	*Date & Time:* **2007-09-07 14:37**

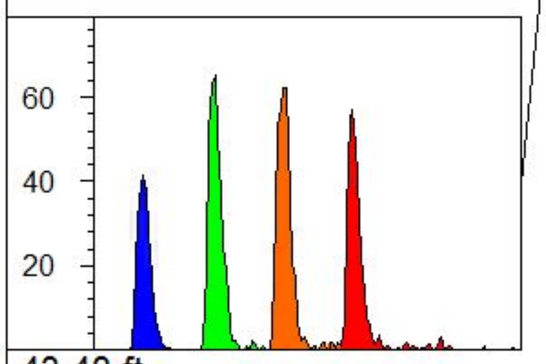
Callouts



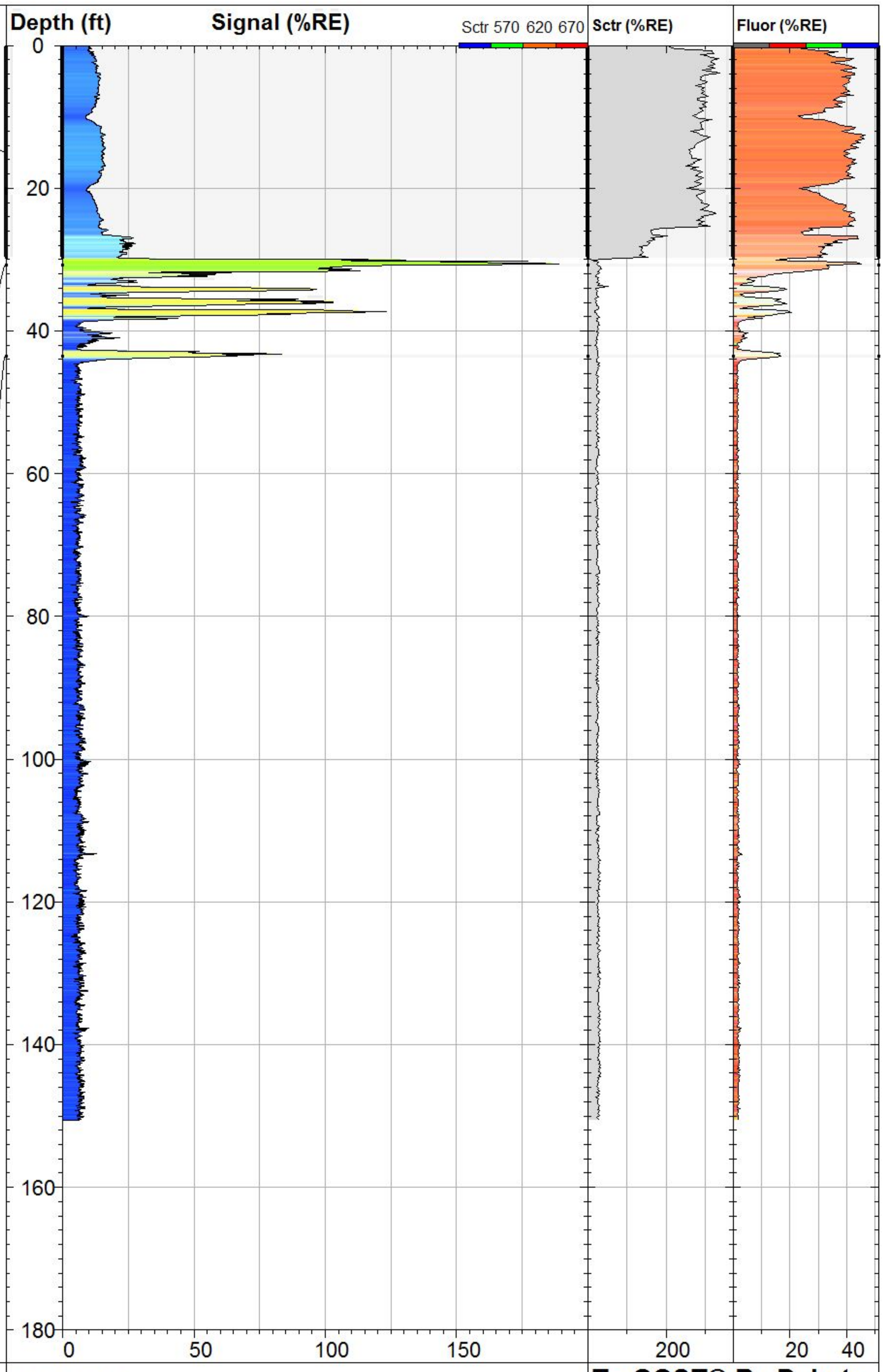
0.18 - 29.71 ft
14.1 %RE (s 4.8)
PVC casing



30.71 ft
163.3 %RE
TLM



43.48 ft
64.3 %RE
TLM



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TG05S

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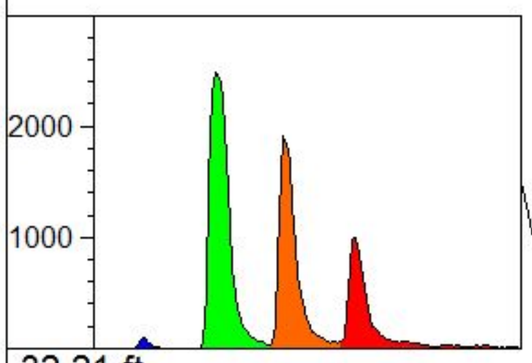
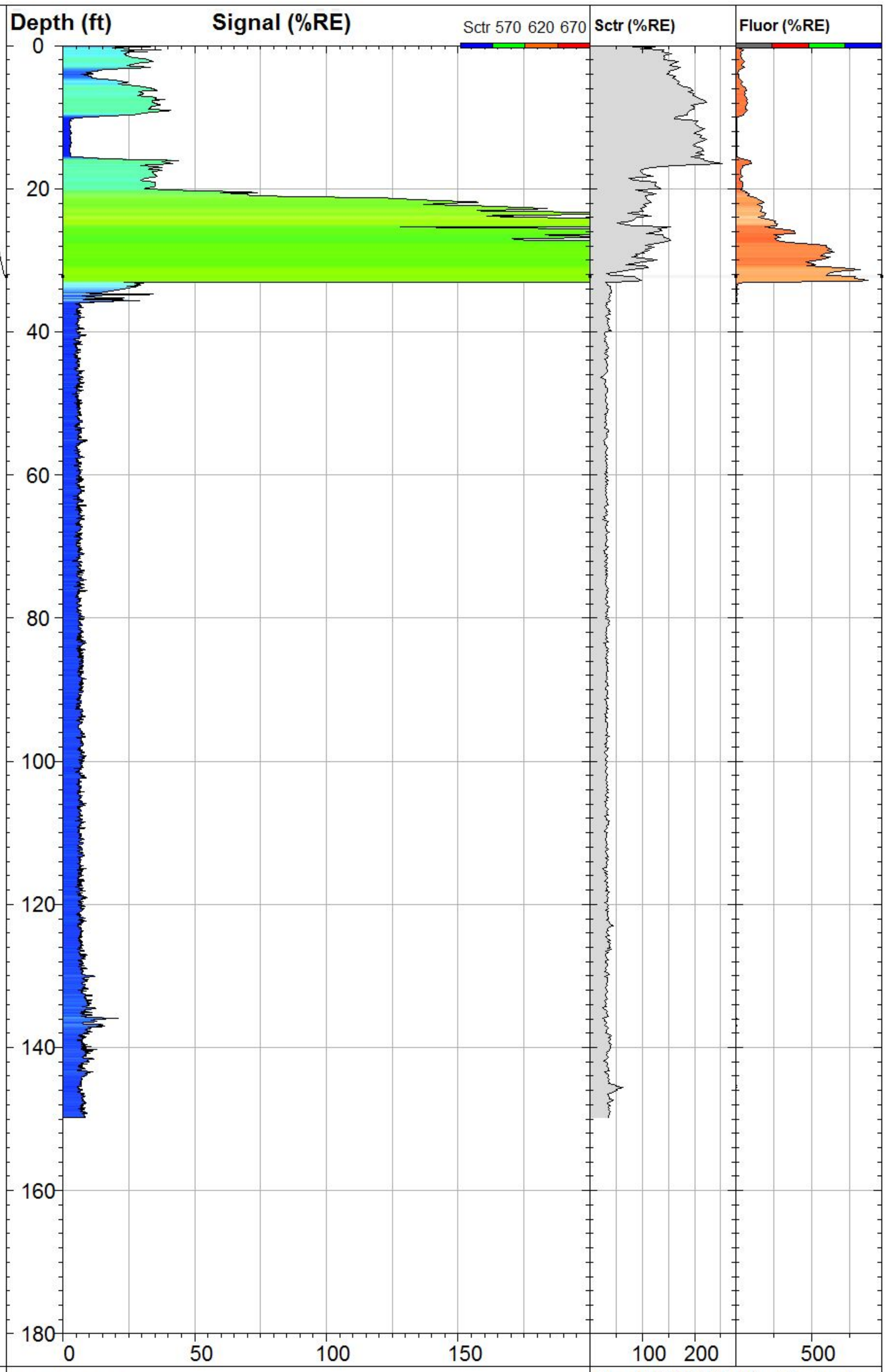
Site: **Portland, OR MGP**	*Y Coord.(Lat-N) / System:* **Unavailable /**	*Final depth:* **150.57 ft**
Client / Job: **Hahn & Associates, Inc. /**	*X Coord.(Lng-E) / Fix:* **Unavailable /**	*Max signal:* **205.7 %RE @ 30.24 ft**
Operator / Unit: **Steve Adamek / DTI01**	*Elevation:* **Unavailable**	*Date & Time:* **2007-09-06 13:41**

Callouts



32.21 ft
1378.9 %RE
Product in casing?

PVC casing to 35'



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TG06S

TarGOST® By Dakota
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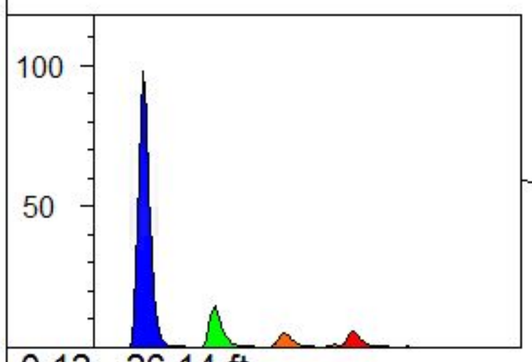
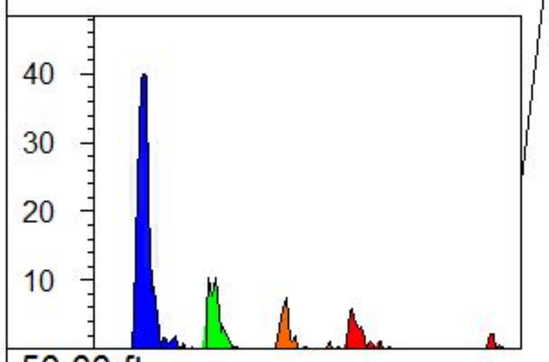
Site: **Portland, OR MGP**	*Y Coord.(Lat-N) / System:* **Unavailable /**	*Final depth:* **149.74 ft**
Client / Job: **Hahn & Associates, Inc. /**	*X Coord.(Lng-E) / Fix:* **Unavailable /**	*Max signal:* **1951.6 %RE @ 31.81 ft**
Operator / Unit: **Steve Adamek / DTI01**	*Elevation:* **Unavailable**	*Date & Time:* **2007-09-08 08:54**

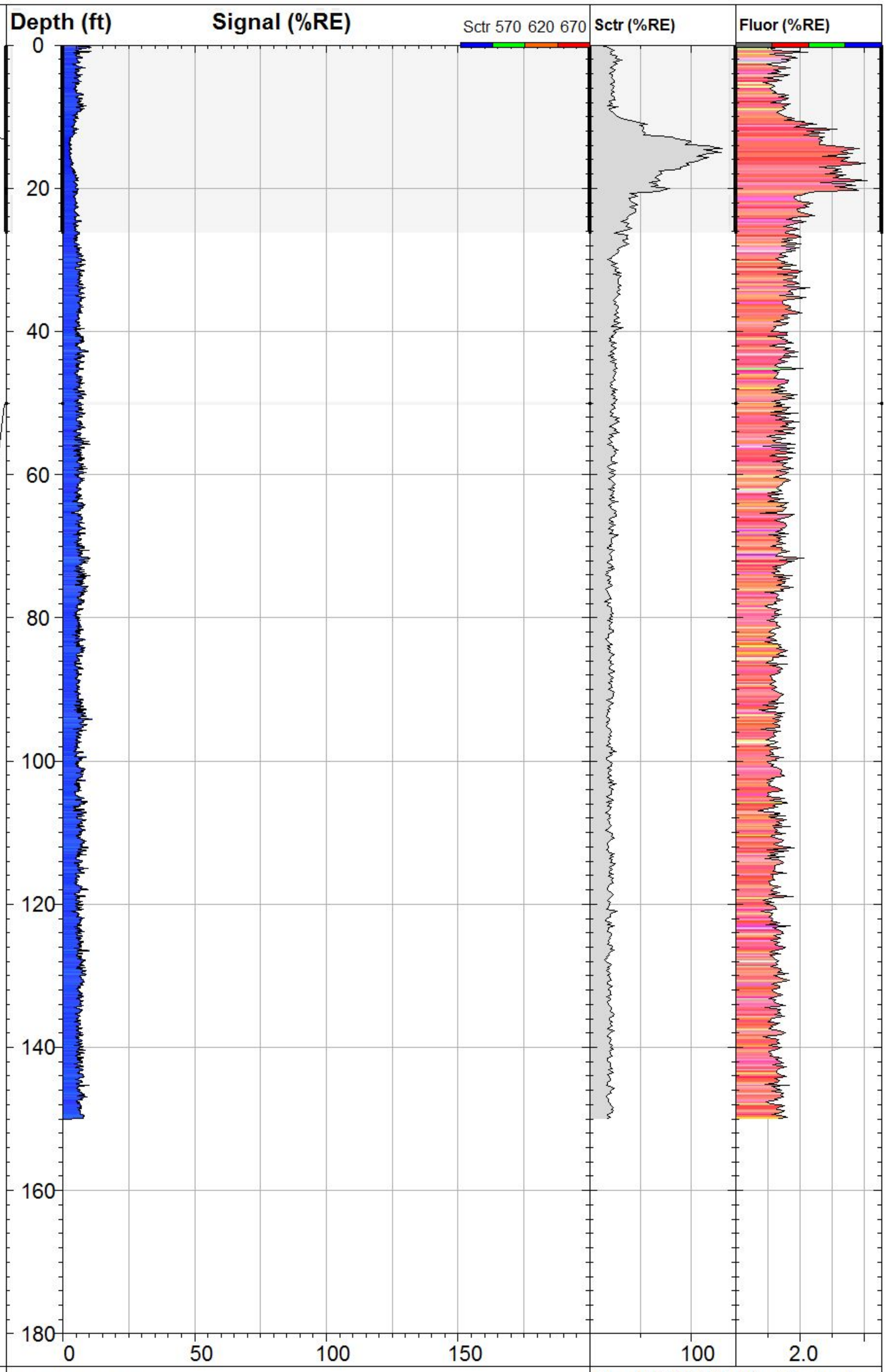
Callouts



0.12 - 26.14 ft
4.1 %RE (s 1.5)
Fill



50.00 ft
6.7 %RE
background



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TG-7Sb

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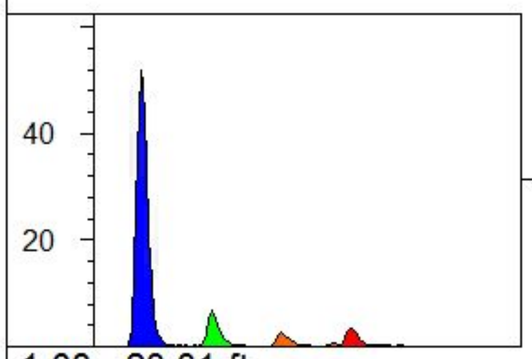
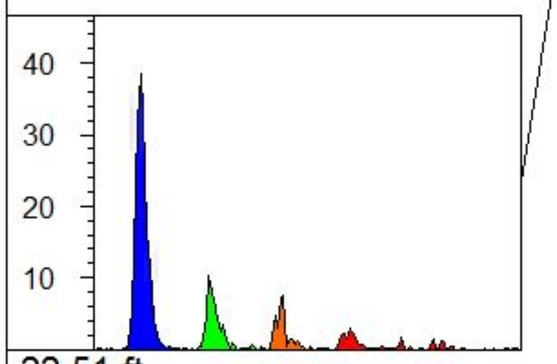
Site: **Portland, OR MGP**	*Y Coord.(Lat-N) / System:* **Unavailable /**	*Final depth:* **149.98 ft**
Client / Job: **Hahn & Associates, Inc. /**	*X Coord.(Lng-E) / Fix:* **Unavailable /**	*Max signal:* **12.5 %RE @ 0.00 ft**
Operator / Unit: **T.Rudolph / DTI01**	*Elevation:* **Unavailable**	*Date & Time:* **2008-03-26 09:36**

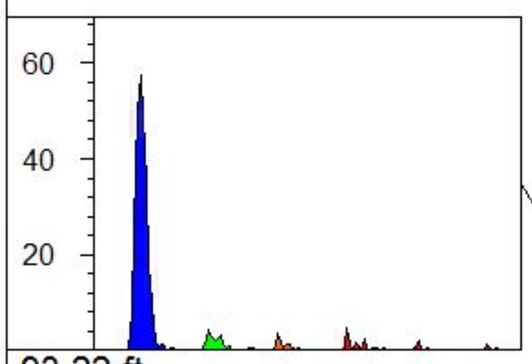
Callouts



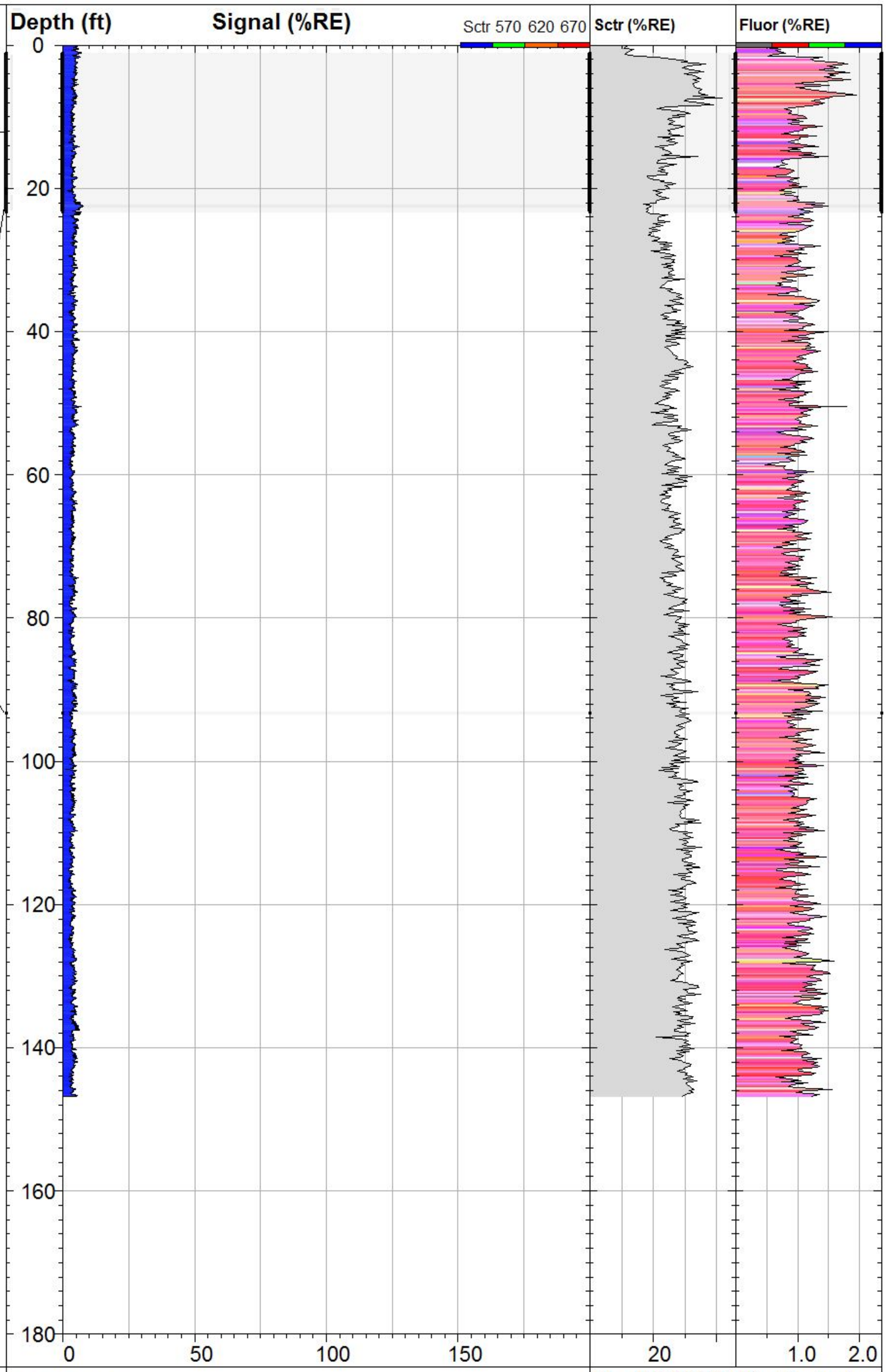
1.08 - 23.31 ft
4.2 %RE (s 1.0)
Fill



22.51 ft
7.7 %RE
solid tar in borin



93.22 ft
2.6 %RE
Background



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TG-8S

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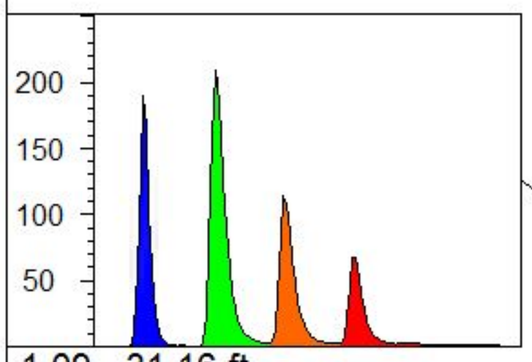
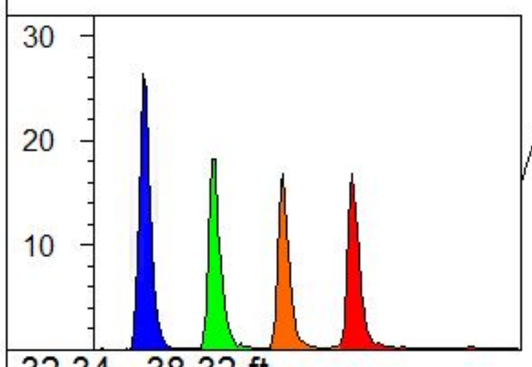
Site: **Portland, OR MGP**	*Y Coord.(Lat-N) / System:* **Unavailable /**	*Final depth:* **146.83 ft**
Client / Job: **Hahn & Associates, Inc. /**	*X Coord.(Lng-E) / Fix:* **Unavailable /**	*Max signal:* **15.0 %RE @ 0.00 ft**
Operator / Unit: **T.Rudolph / DTI01**	*Elevation:* **Unavailable**	*Date & Time:* **2007-08-31 04:38**

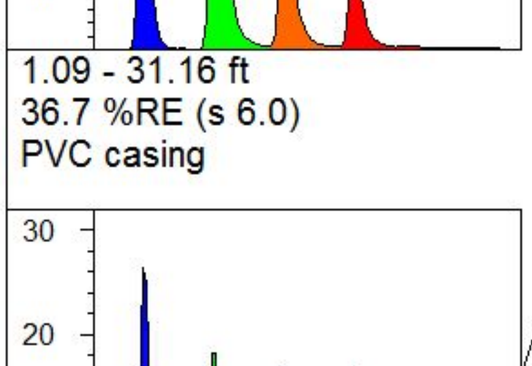
Callouts



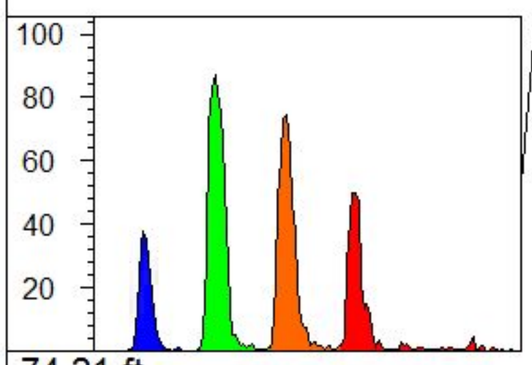
1.09 - 31.16 ft
36.7 %RE (s 6.0)
PVC casing



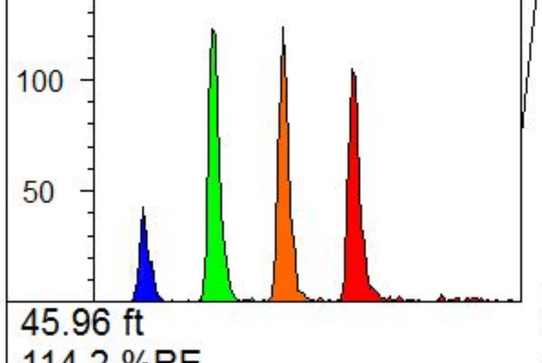
32.34 - 38.32 ft
24.4 %RE (s 3.9)
?



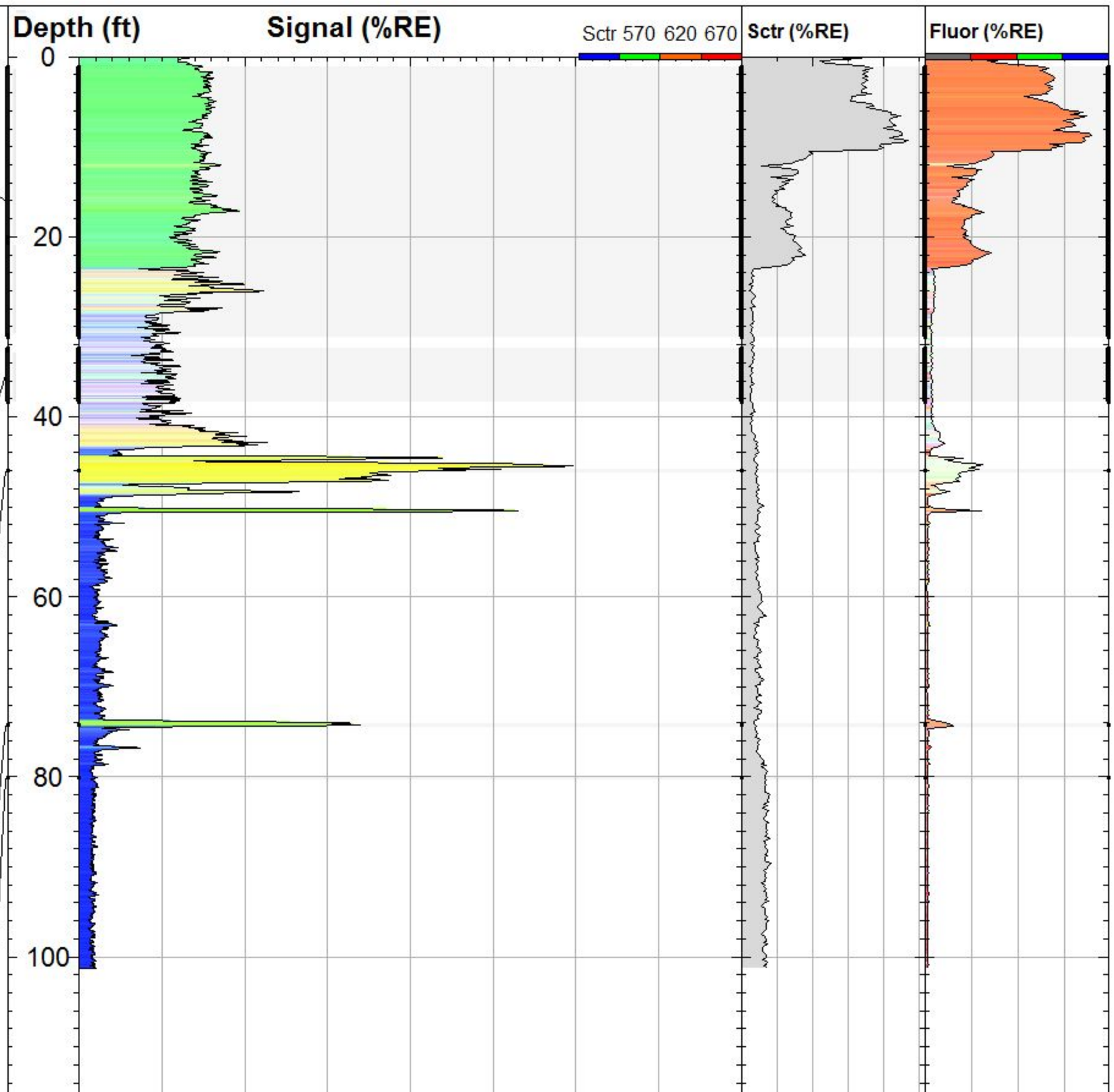
45.96 ft
114.2 %RE
TLM



74.21 ft
85.5 %RE
TLM



80.09 ft
5.7 %RE
Background



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TG-9S

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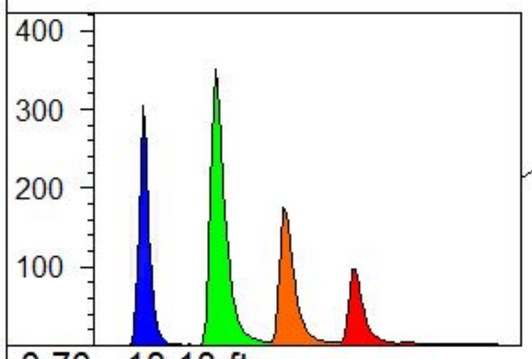
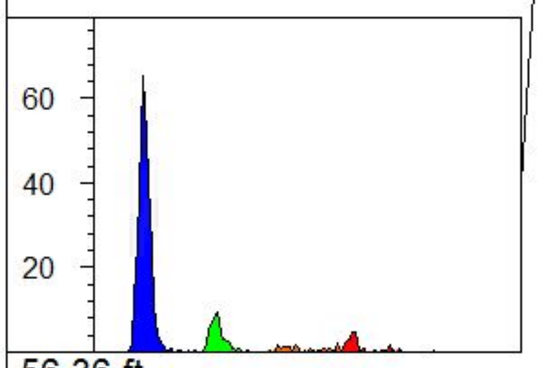
Site: **Portland, OR MGP**	*Y Coord.(Lat-N) / System:* **Unavailable /**	*Final depth:* **101.32 ft**
Client / Job: **Hahn & Associates, Inc. /**	*X Coord.(Lng-E) / Fix:* **Unavailable /**	*Max signal:* **150.2 %RE @ 45.48 ft**
Operator / Unit: **T.Rudolph / DTI01**	*Elevation:* **Unavailable**	*Date & Time:* **2008-03-26 11:59**

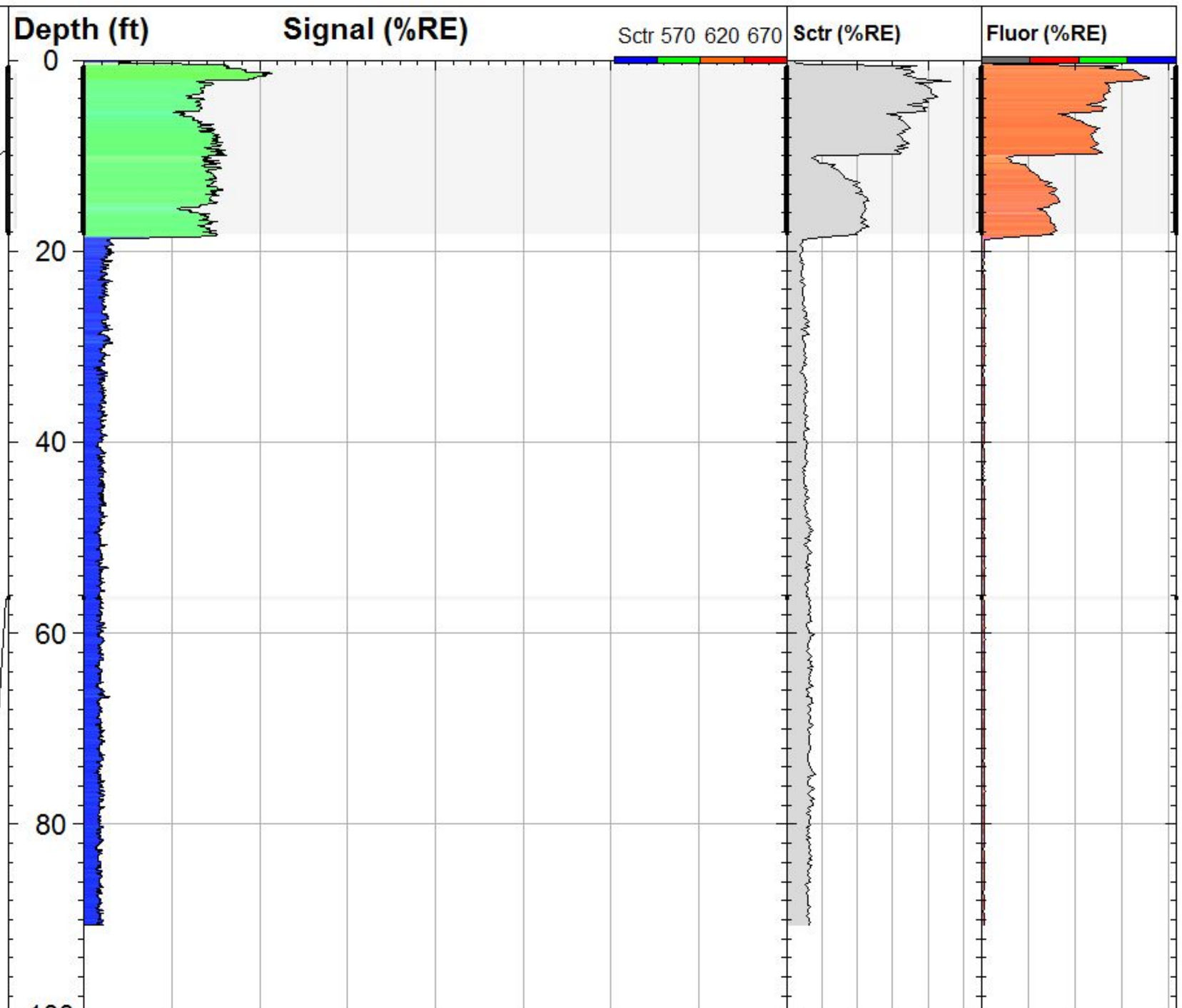
Callouts



0.70 - 18.13 ft
35.7 %RE (s 4.4)
PVC casing



56.36 ft
3.3 %RE
Background



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TG-10S

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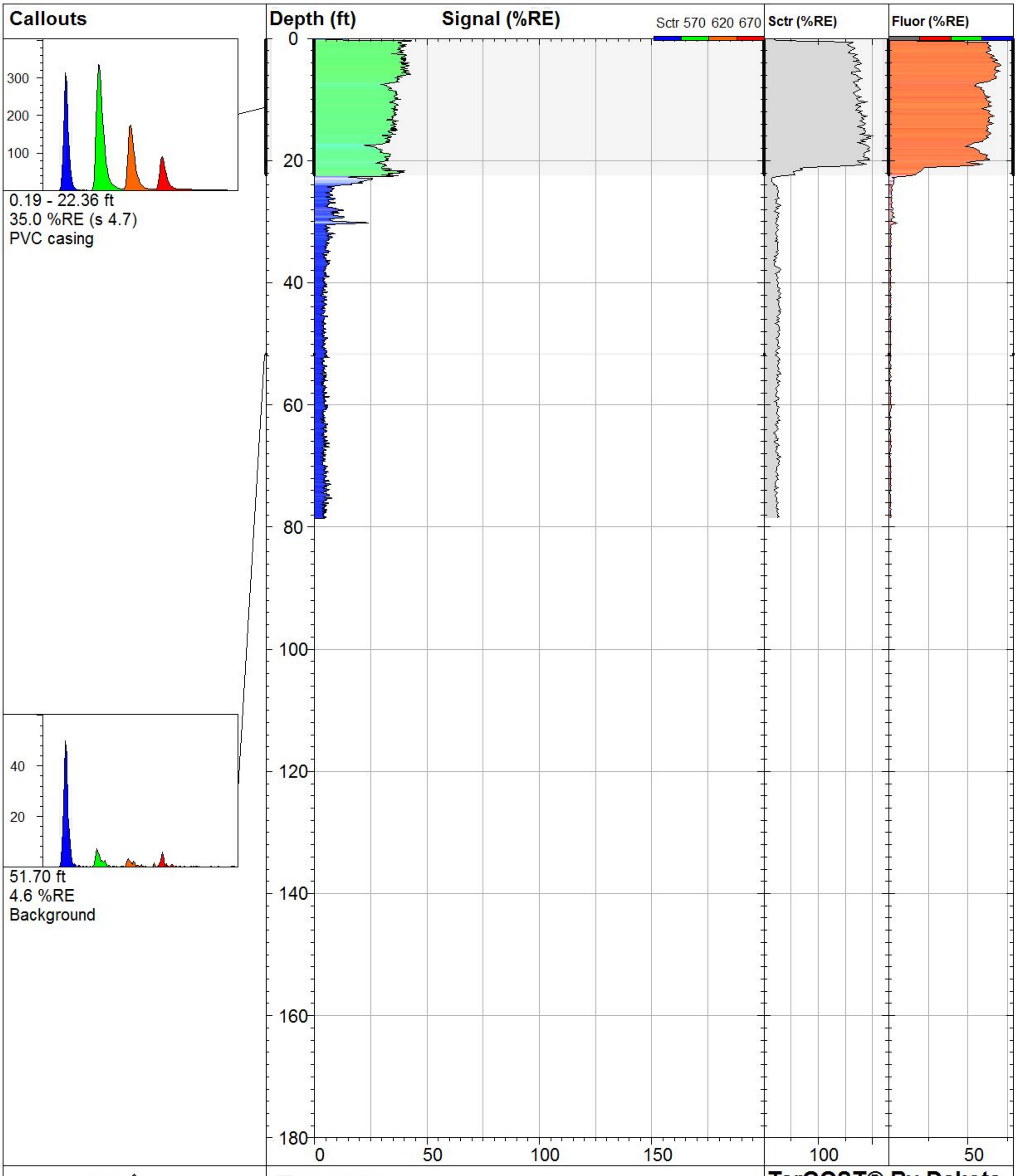
Site: **Portland, OR MGP**	*Y Coord.(Lat-N) / System:* **Unavailable /**	*Final depth:* **90.54 ft**
Client / Job: **Hahn & Associates, Inc. /**	*X Coord.(Lng-E) / Fix:* **Unavailable /**	*Max signal:* **53.5 %RE @ 1.36 ft**
Operator / Unit: **T.Rudolph / DTI01**	*Elevation:* **Unavailable**	*Date & Time:* **2008-03-26 15:07**



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TG-11S

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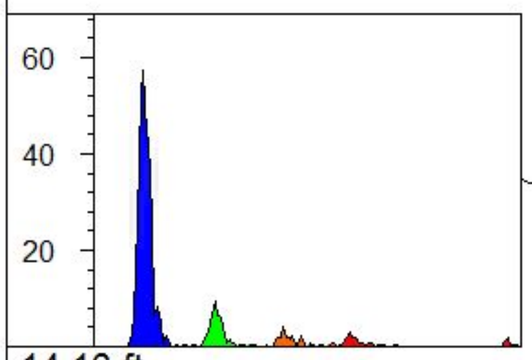
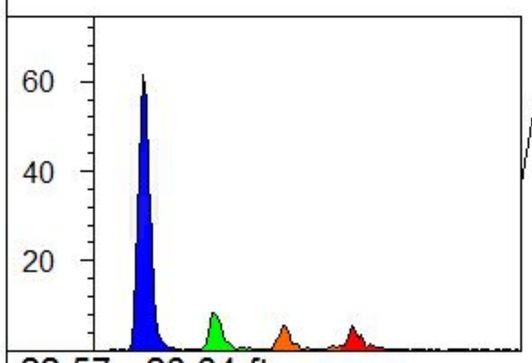
Site: **Portland, OR MGP**	*Y Coord.(Lat-N) / System:* **Unavailable /**	*Final depth:* **78.53 ft**
Client / Job: **Hahn & Associates, Inc. /**	*X Coord.(Lng-E) / Fix:* **Unavailable /**	*Max signal:* **43.6 %RE @ 0.39 ft**
Operator / Unit: **T.Rudolph / DTI01**	*Elevation:* **Unavailable**	*Date & Time:* **2008-03-26 16:59**

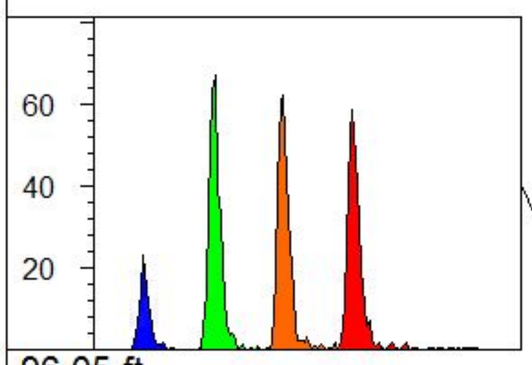
Callouts



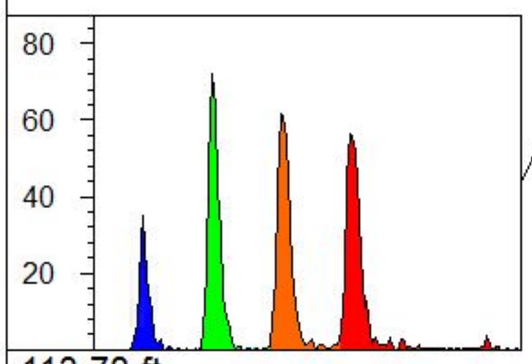
14.16 ft
4.1 %RE
background



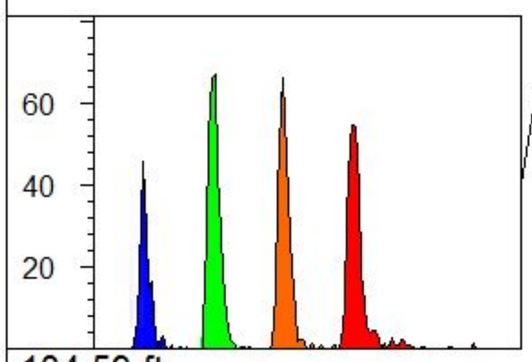
22.57 - 26.64 ft
5.3 %RE (s 1.0)



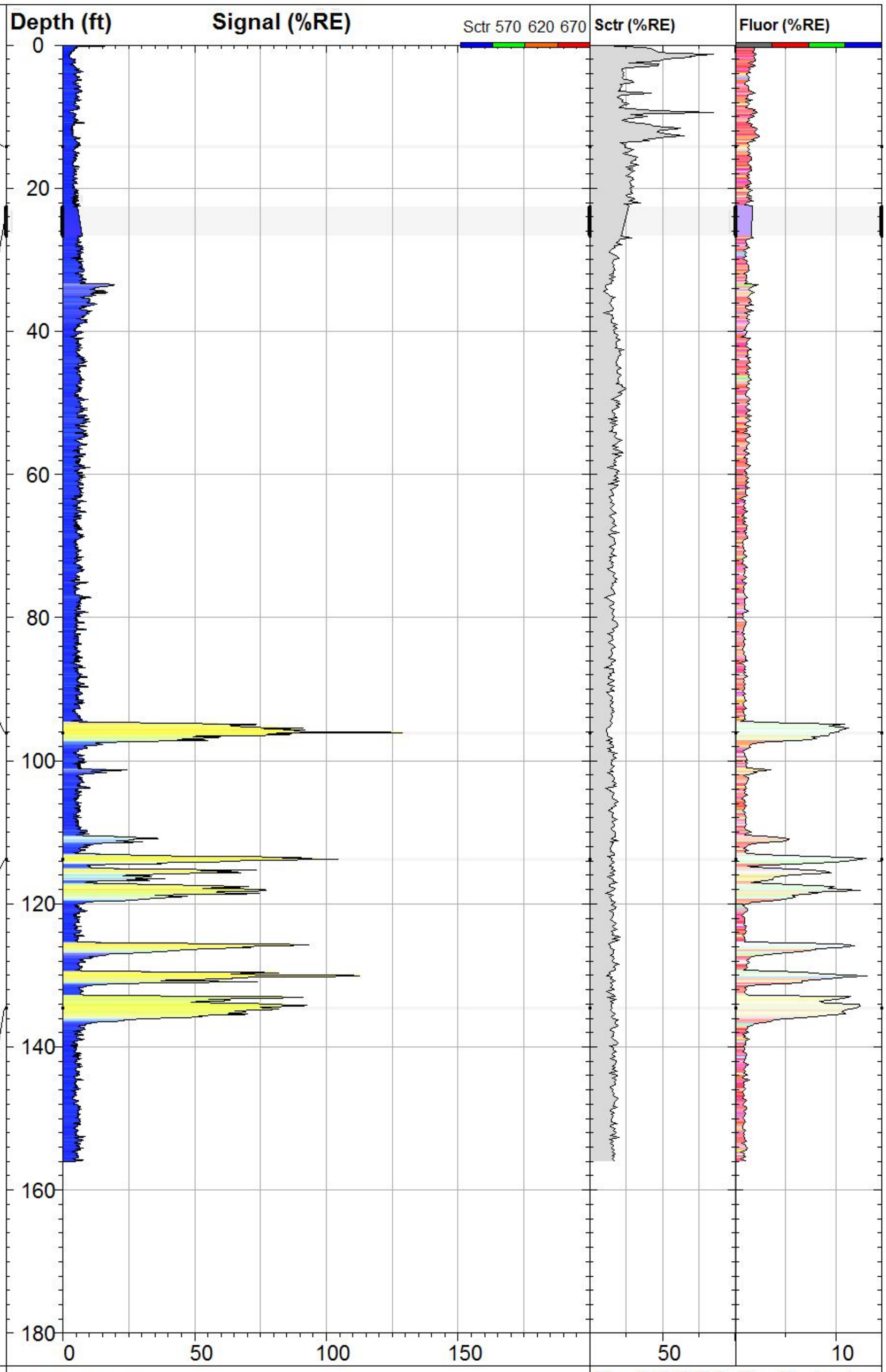
96.05 ft
131.5 %RE
TLM



113.78 ft
105.0 %RE
TLM



134.59 ft
77.2 %RE
TLM



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TG-12S

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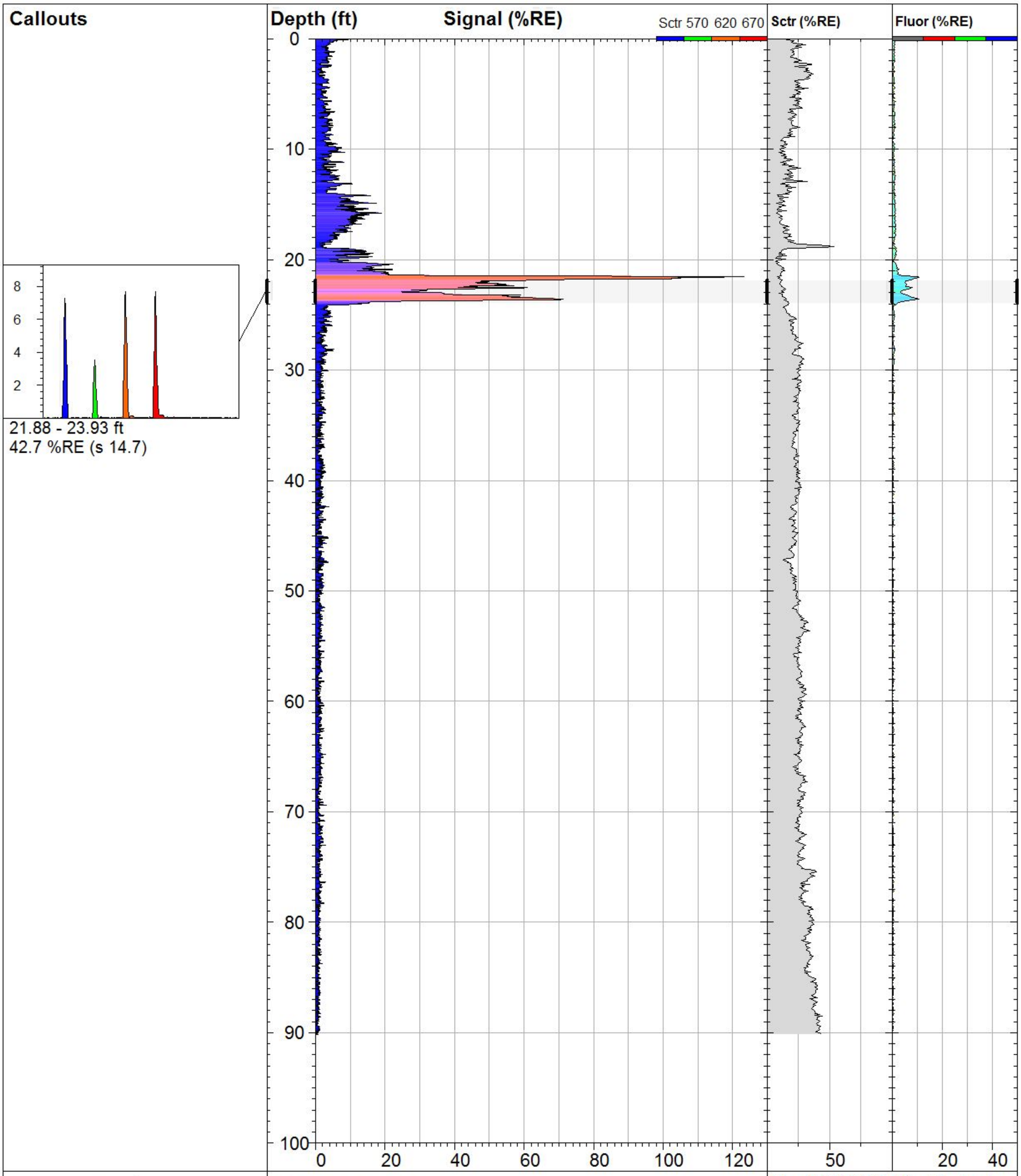
Site: **Portland, OR MGP**	*Y Coord.(Lat-N) / System:* **Unavailable /**	*Final depth:* **156.02 ft**
Client / Job: **Hahn & Associates, Inc. /**	*X Coord.(Lng-E) / Fix:* **Unavailable /**	*Max signal:* **131.5 %RE @ 96.05 ft**
Operator / Unit: **T.Rudolph / DTI01**	*Elevation:* **Unavailable**	*Date & Time:* **2008-03-27 10:38**



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TG-DG-20

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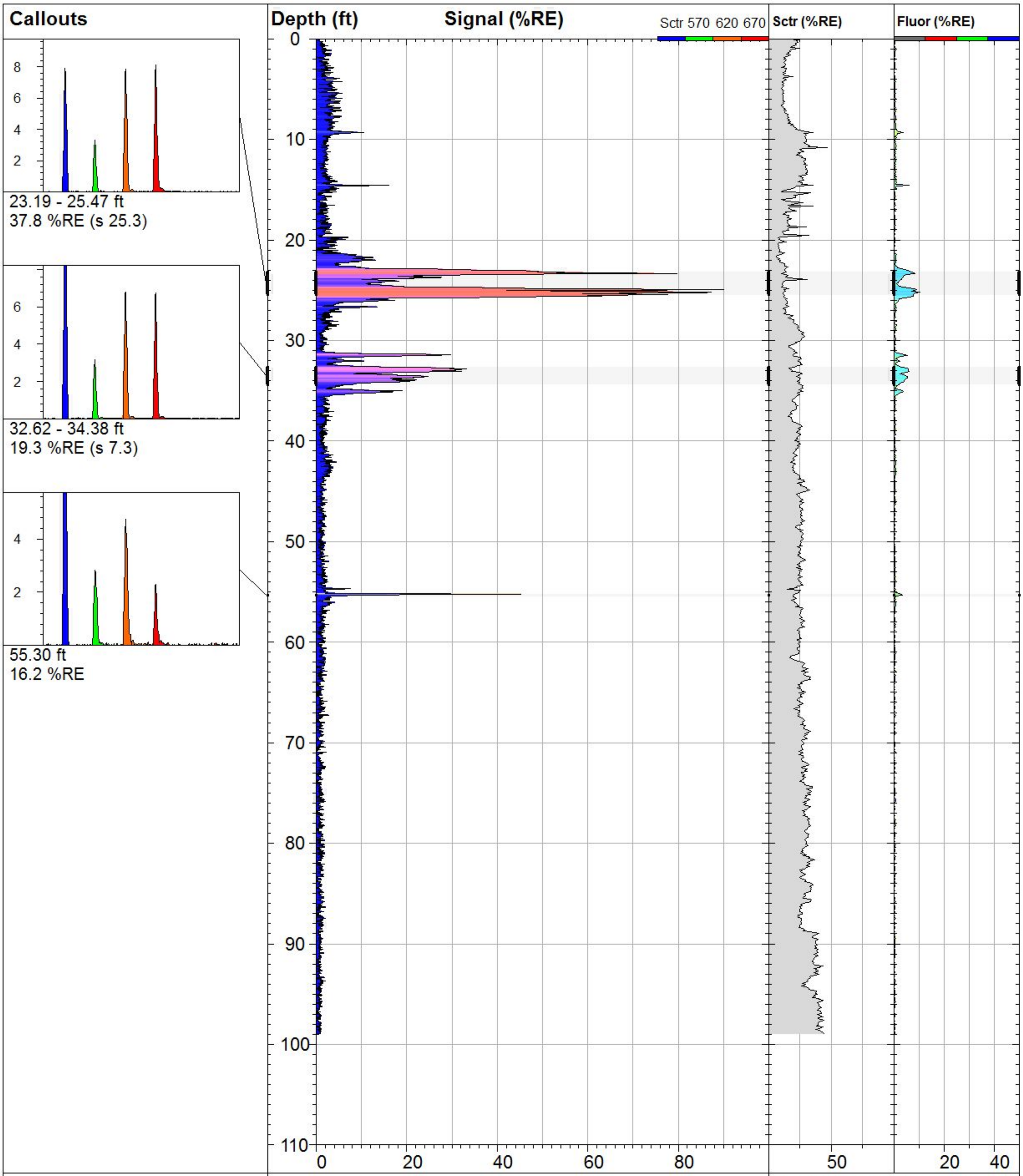
Site: **Gasco**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **90.15 ft**
Client / Job: **Anchor QEA /**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **124.3 %RE @ 21.55 ft**
Operator / Unit: **S MILLER / TG1004**	*Elevation:* **Unavailable**	*Date & Time:* **2017-05-17 08:16 PDT**



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TG-DG-21

TarGOST® By Dakota
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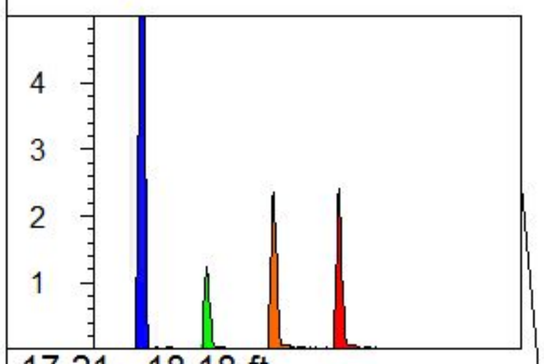
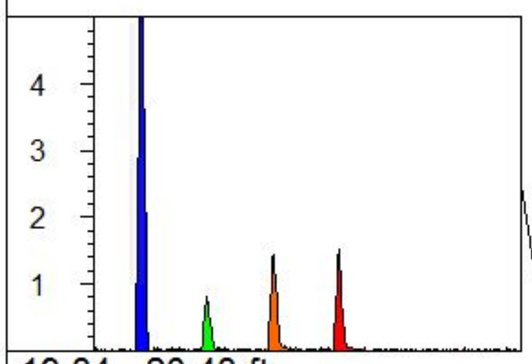
Site: **Gasco**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **98.99 ft**
Client / Job: **Anchor QEA /**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **93.8 %RE @ 24.97 ft**
Operator / Unit: **S Miller / TG1004**	*Elevation:* **Unavailable**	*Date & Time:* **2017-05-16 11:04 PDT**

Callouts

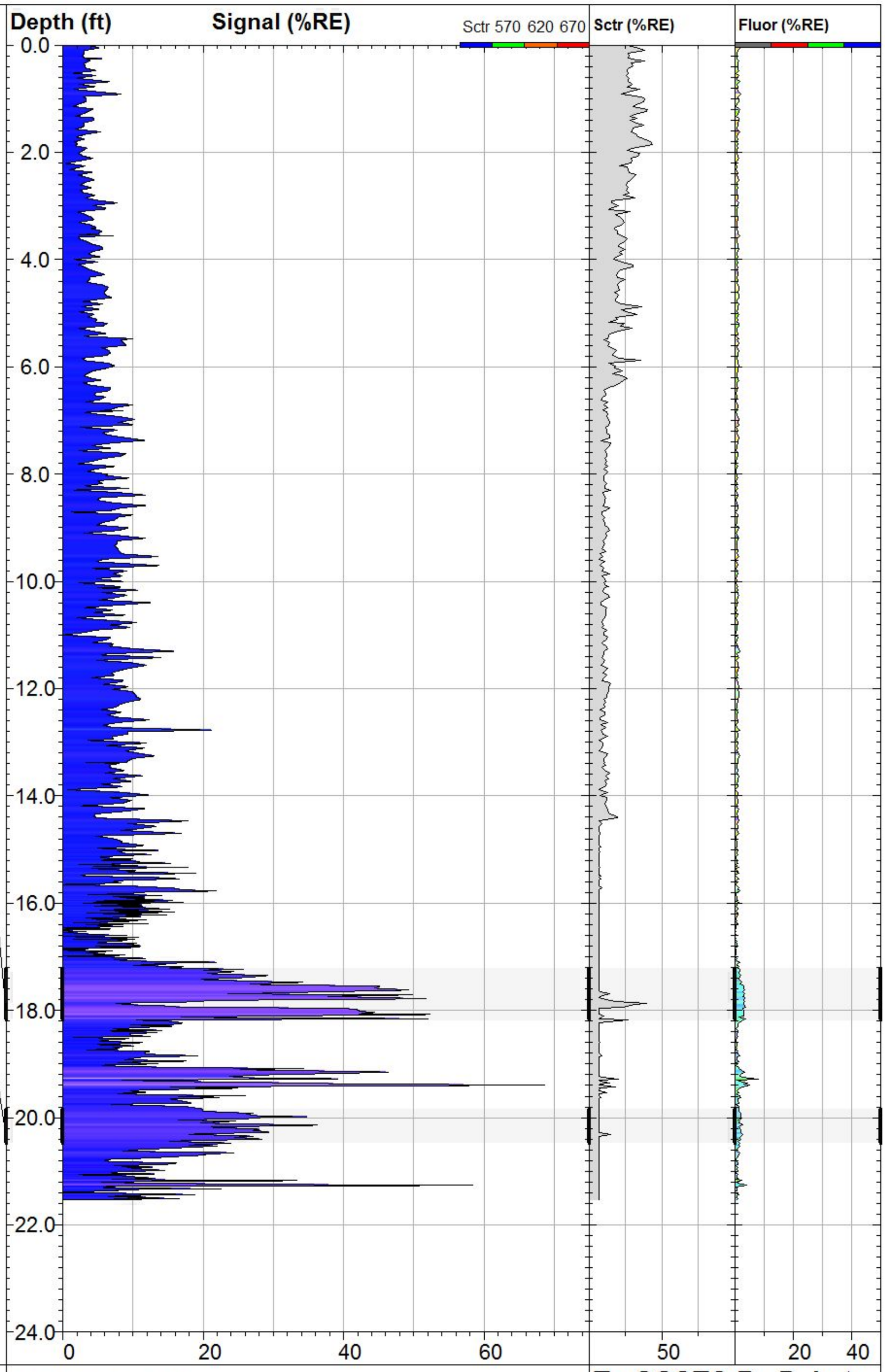


17.21 - 18.18 ft
32.0 %RE (s 13.8)



19.84 - 20.48 ft
25.9 %RE (s 5.5)

BORING DEAD. PREPROBE ROD BROKEN OFF IN THE HOLE.



DAKOTA TECHNOLOGIES

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TG-DG-22

TarGOST® By Dakota
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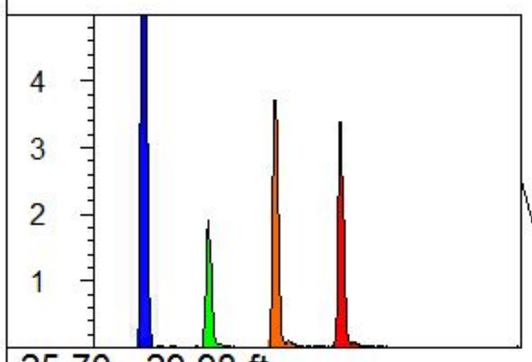
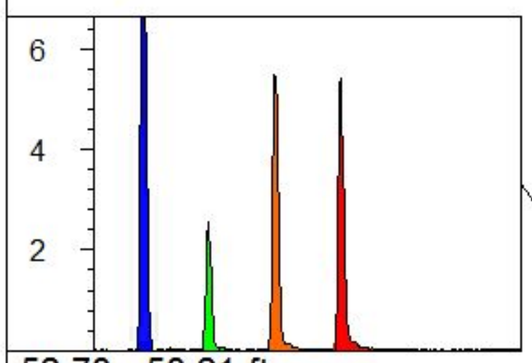
Site: **Gasco**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **21.53 ft**
Client / Job: **Anchor QEA /**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **70.3 %RE @ 19.39 ft**
Operator / Unit: **S Miller / TG1004**	*Elevation:* **Unavailable**	*Date & Time:* **2017-05-16 08:09 PDT**

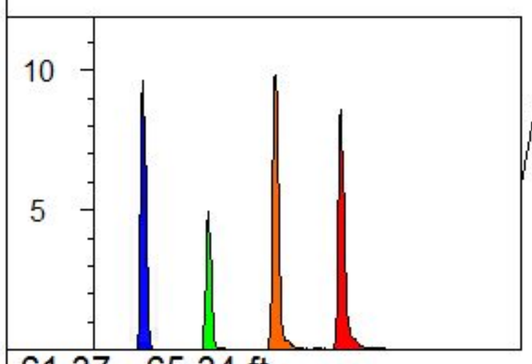
Callouts



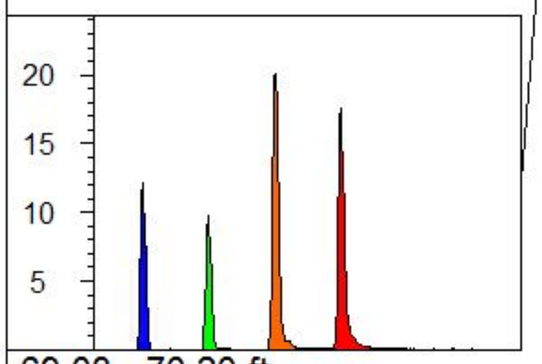
25.70 - 29.98 ft
18.3 %RE (s 11.6)



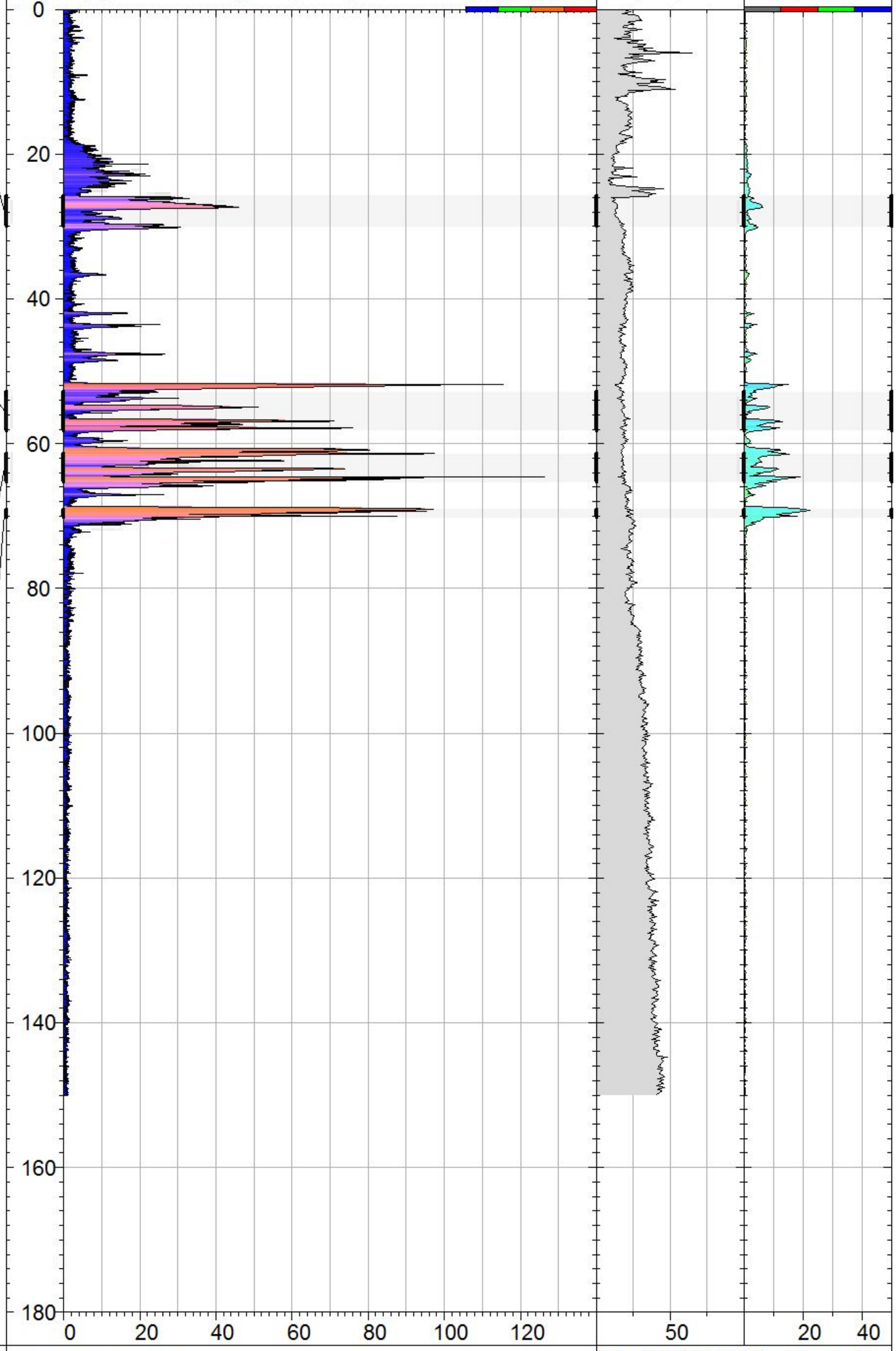
52.78 - 58.21 ft
23.0 %RE (s 19.2)



61.37 - 65.34 ft
41.9 %RE (s 24.1)



69.08 - 70.20 ft
66.1 %RE (s 22.5)



TG-DG-23

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Site: **Gasco**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **150.06 ft**
Client / Job: **Anchor QEA /**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **131.4 %RE @ 64.62 ft**
Operator / Unit: **S Miller / TG1004**	*Elevation:* **Unavailable**	*Date & Time:* **2017-05-23 08:23 PDT**

DAKOTA TECHNOLOGIES
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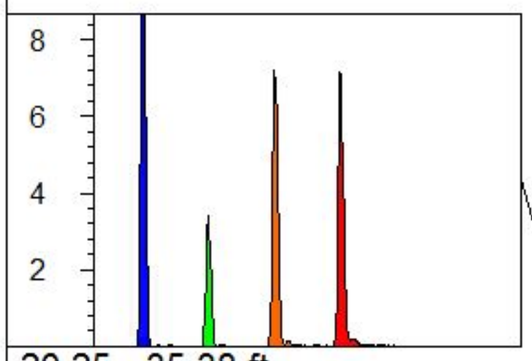
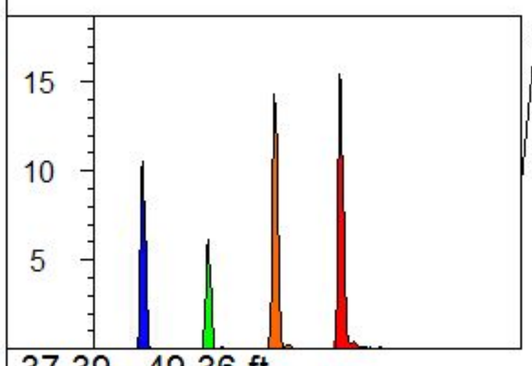
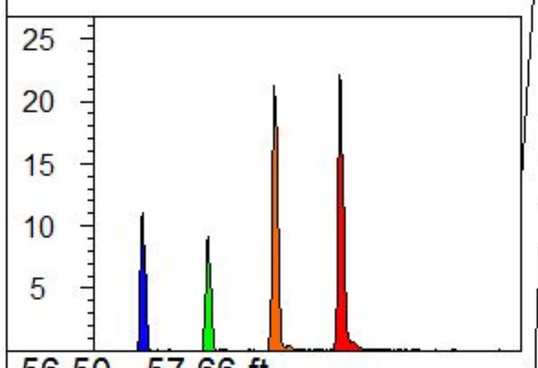
Callouts



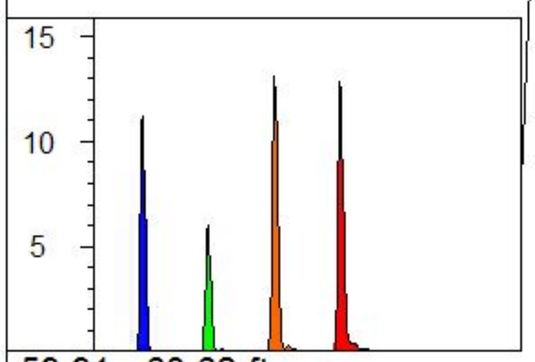
20.25 - 35.38 ft
33.4 %RE (s 20.5)



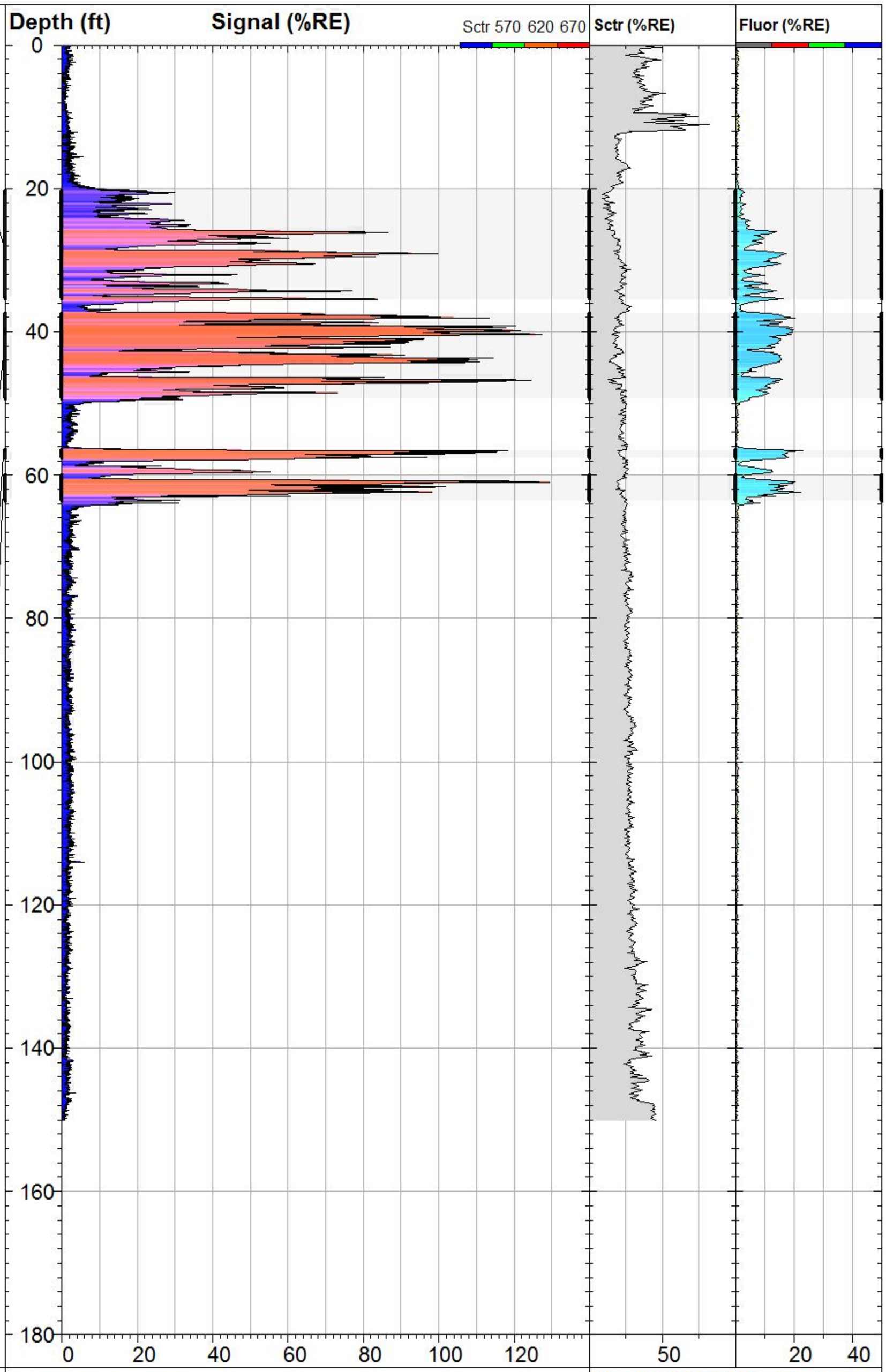
37.39 - 49.36 ft
60.2 %RE (s 32.0)



56.50 - 57.66 ft
83.8 %RE (s 20.6)



59.91 - 63.62 ft
49.3 %RE (s 33.5)



DAKOTA TECHNOLOGIES

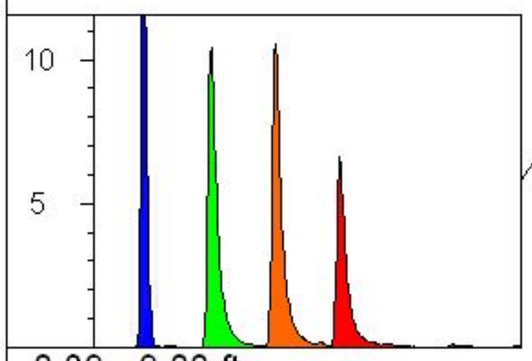
www.DakotaTechnologies.com

TG-DG-24

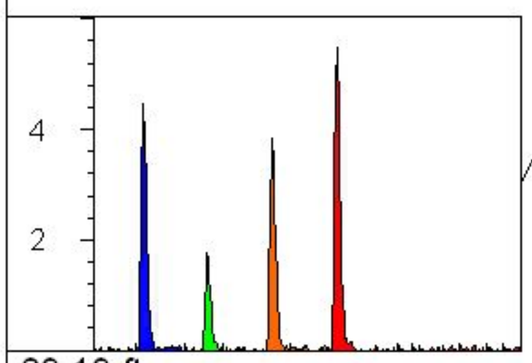
TarGOST® By Dakota
www.DakotaTechnologies.com

Site: **Gasco**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **150.08 ft**
Client / Job: **Anchor QEA /**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **133.5 %RE @ 60.99 ft**
Operator / Unit: **S Miller / TG1004**	*Elevation:* **Unavailable**	*Date & Time:* **2017-05-15 10:52 PDT**

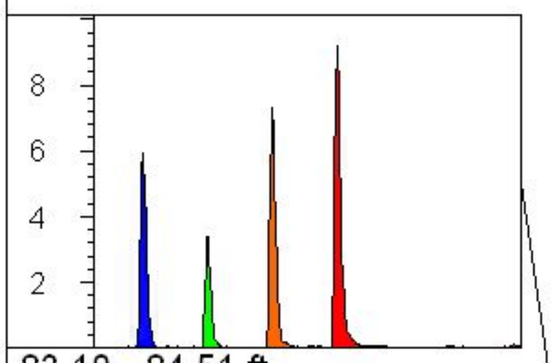
Callouts



-0.39 - 9.00 ft
38.9 %RE (s 3.6)
Inside PVC Casing

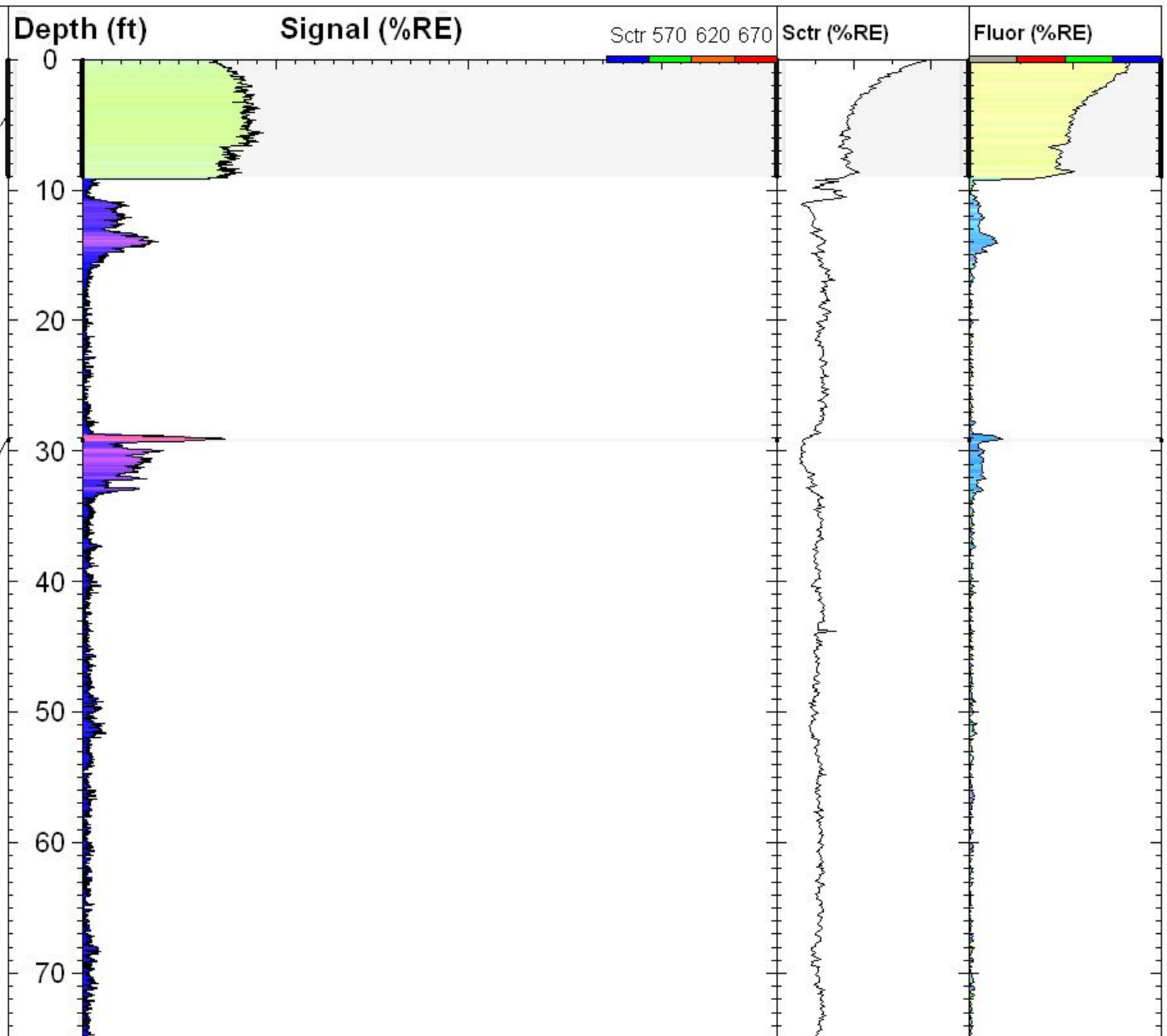


29.19 ft
29.1 %RE



83.10 - 84.51 ft
40.6 %RE (s 18.6)

110.96 - 114.52 ft
54.7 %RE (s 34.3)



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TG-PW2-130

TarGOST By Dakota
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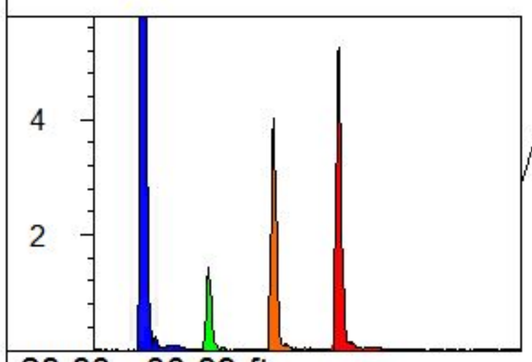
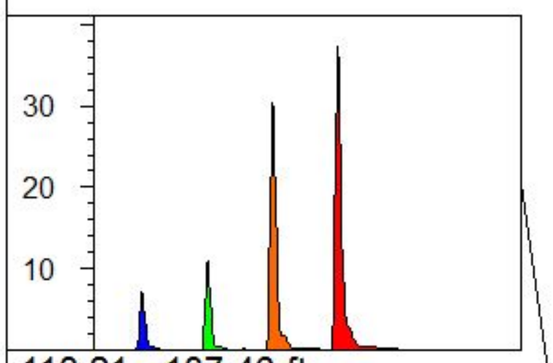
Site: **NW Natural Gasco**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **130.25 ft**
Client / Job: **Anchor QEA /**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **154.4 %RE @ 111.93 ft**
Operator / Unit: **T. Rudolph / TG1003**	*Elevation:* **Unavailable**	*Date & Time:* **2012-04-16 14:40 CDT**

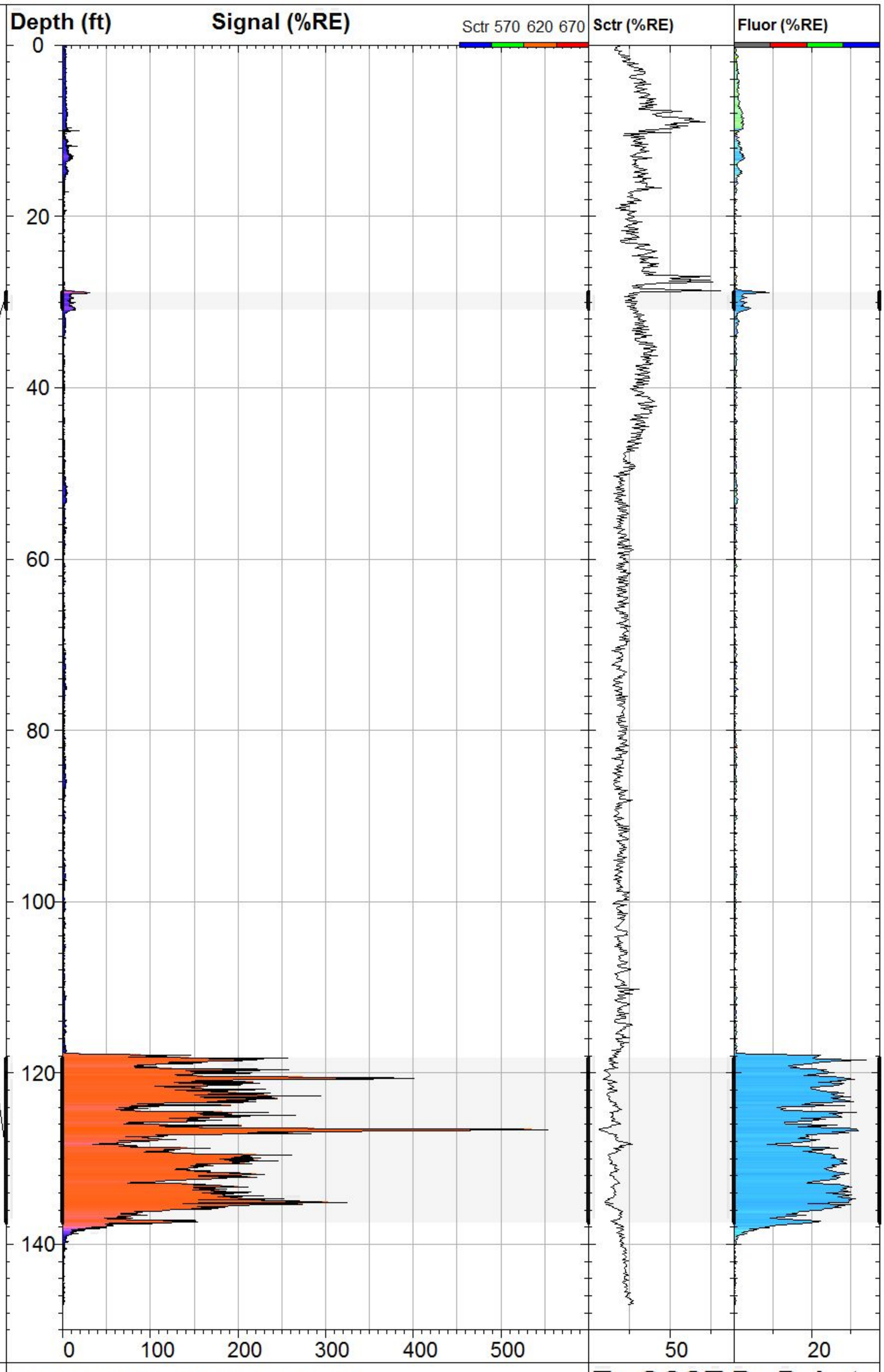
Callouts



28.83 - 30.89 ft
11.1 %RE (s 5.6)



118.21 - 137.46 ft
152.2 %RE (s 69.8)



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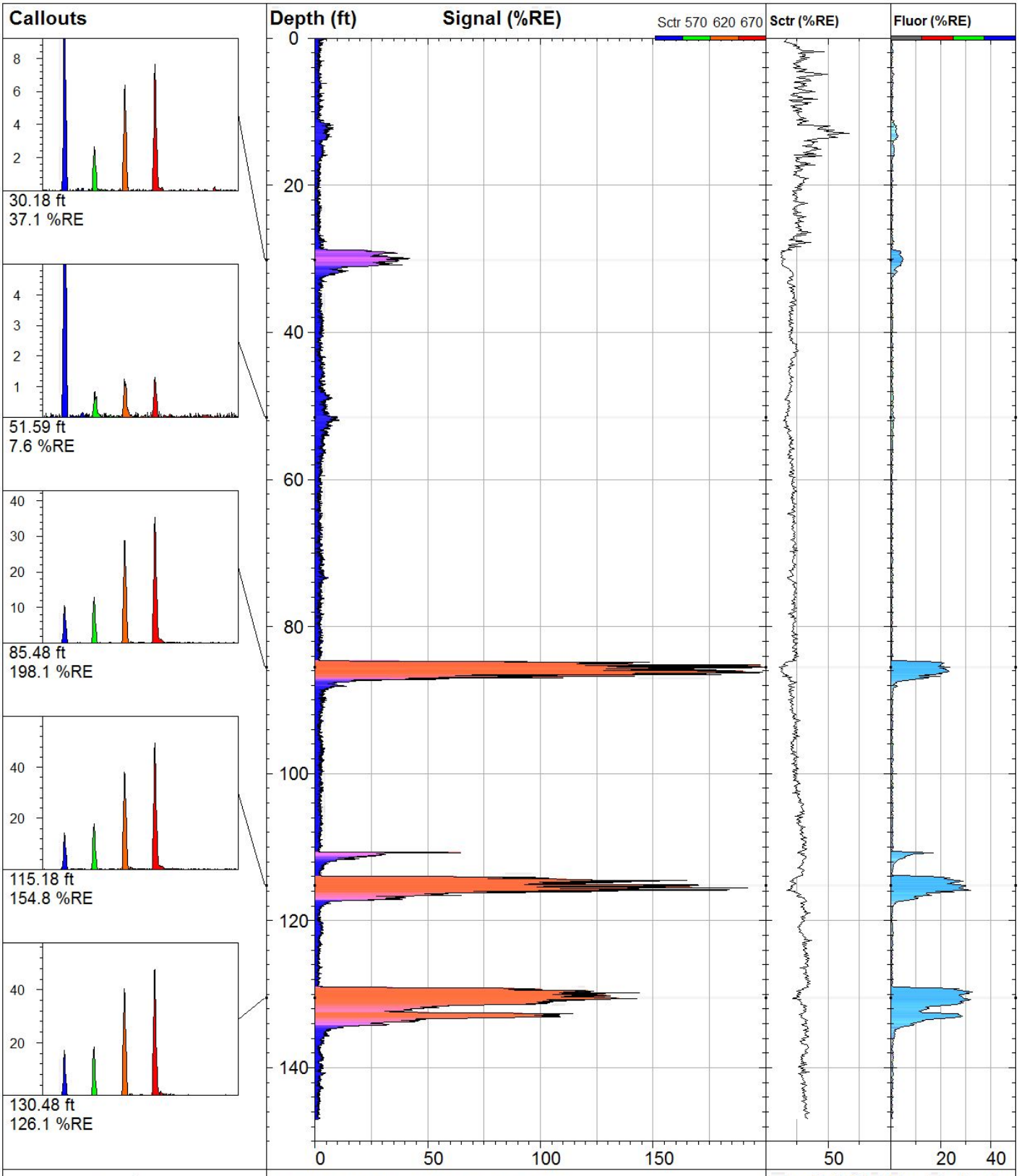
TG-PW2-147-062614

TarGOST By Dakota
www.DakotaTechnologies.com

Site: **Gasco**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **147.05 ft**
Client / Job: **Anchor QEA /**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **554.4 %RE @ 126.61 ft**
Operator / Unit: **T.Rudolph / TG1003**	*Elevation:* **Unavailable**	*Date & Time:* **2014-06-26 09:16 PDT**



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TG-PW2-147-110915

TarGOST By Dakota
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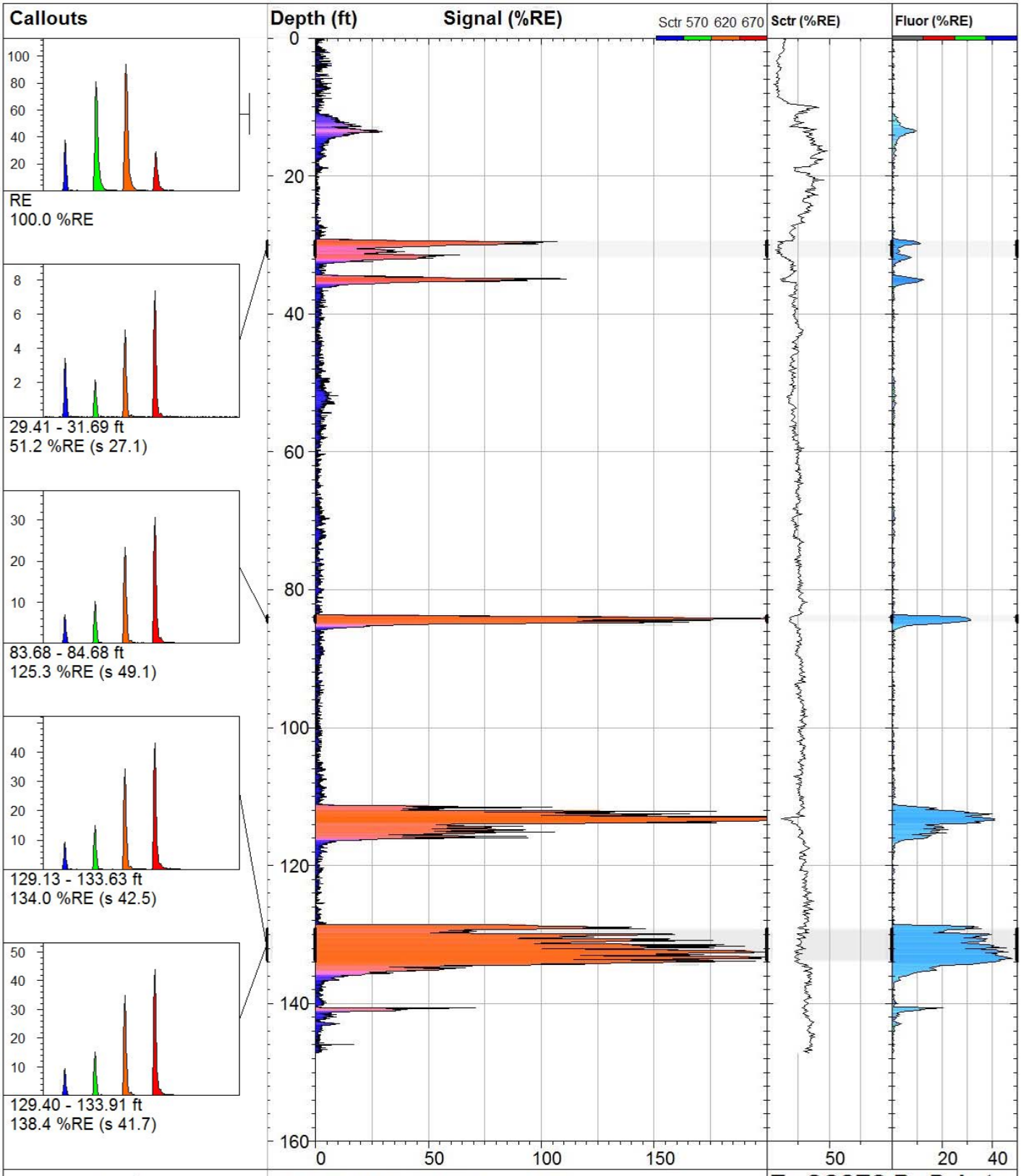
Site: **Gasco/Siltronics**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **147.00 ft**
Client / Job: **Anchor QEA /**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **225.2 %RE @ 85.56 ft**
Operator / Unit: **SDA / TG1000**	*Elevation:* **Unavailable**	*Date & Time:* **2015-11-09 13:49 EST**



TG-PW2-147-062116

TarGOST® By Dakota
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Site: **Gasco**	*Y Coord.(Lat-N) / System:* **Unavailable / NA**	*Final depth:* **147.10 ft**
Client / Job: **Anchor /**	*X Coord.(Lng-E) / Fix:* **Unavailable / NA**	*Max signal:* **452.8 %RE @ 113.04 ft**
Operator / Unit: **KVDV / TG1003**	*Elevation:* **Unavailable**	*Date & Time:* **2016-06-21 15:01 EDT**

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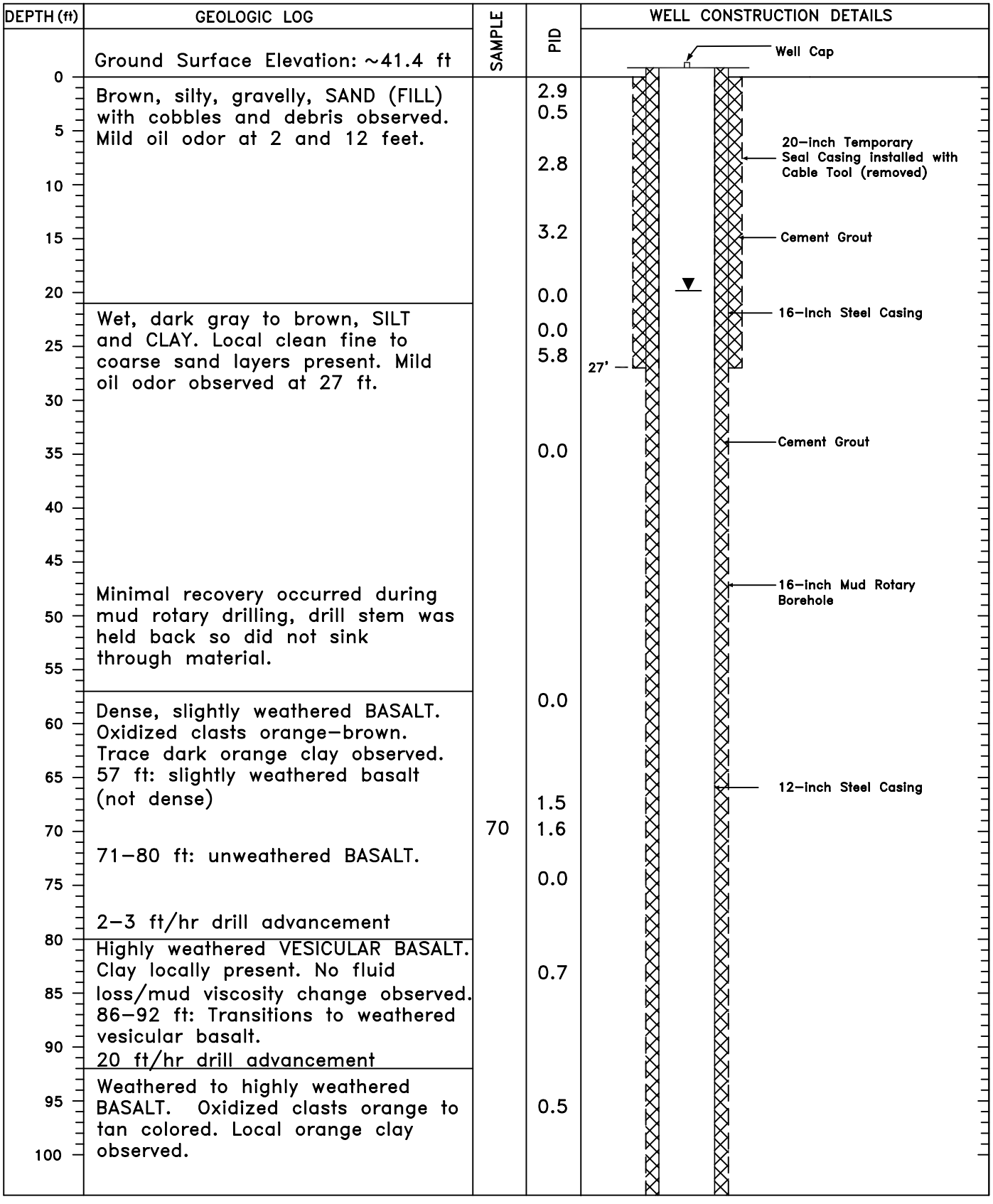
Figure 2 Geologic Log and Well Design for Siltronic TW-1

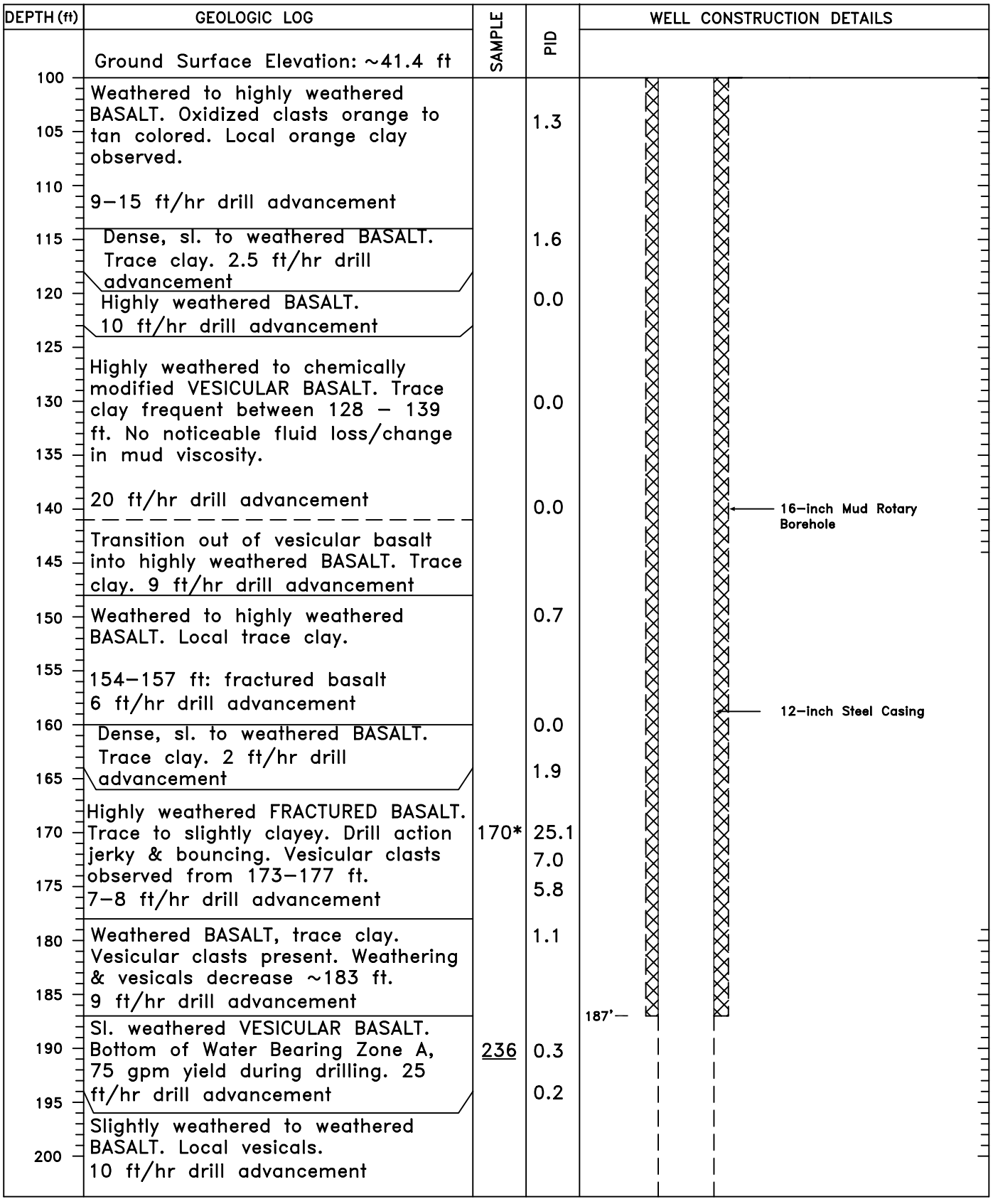


PROJECT NAME: Silronic Water Supply Development
WELL INDENTIFICATION NUMBER: TW-1
LOCATION: NW ¼ SE ¼ Sec. 12, T.1N., R.3E.
CONSULTING FIRM: Pacific Groundwater Group
REPRESENTATIVE: Glenn Mutti-Driscoll
OREGON WID: L109613

WATER LEVEL ELEVATION: ~20.3 ft, Portland Datum
WATER LEVEL DATE: 8/5/13
DRILLING METHOD: Cable Tool/Mud Rotary/Air Rotary
FIRM: Hansen Drilling

PgG

Figure 2 Geologic Log and Well Design for Siltronic TW-1



PROJECT NAME: Silronic Water Supply Development
WELL INDENTIFICATION NUMBER: TW–1
LOCATION: NW ¼ SE ¼ Sec. 12, T.1N., R.3E.
CONSULTING FIRM: Pacific Groundwater Group
REPRESENTATIVE: Glenn Mutti–Driscoll
OREGON WID: L109613

WATER LEVEL ELEVATION: ~20.3 ft, Portland Datum
WATER LEVEL DATE: 8/5/13
DRILLING METHOD: Cable Tool/Mud Rotary/Air Rotary
FIRM: Hansen Drilling

PgG

Figure 2 Geologic Log and Well Design for Siltronic TW-1

DEPTH (ft)	GEOLOGIC LOG	SAMPLE	PID	WELL CONSTRUCTION DETAILS
	Ground Surface Elevation: ~41.4 ft			
200	Unweathered VESICULAR BASALT. No vesicals noticed in hand sample, 1–in vesicals and vertical fracture observed in video log.		0.2	
205				
210	19 ft/hr drill advancement	210	1.5	
	Unweathered BASALT.			
215				
	10 ft/hr drill advancement			
220			0.4	
	Unweathered FRACTURED BASALT. Several fracture sets observed in video log.			
225	20 ft/hr drill advancement		1.1	
230			1.7	
	Unweathered BASALT.			
235				
	239–240 ft: pyritization noted on clasts			
240			1.2	
	12– 15 ft/hr drill advancement			
245				
	Unweathered VESICULAR BASALT. No clay observed.			
250	Water Bearing Unit B, ~225 gpm yield during drilling.		1.3	
		269P		
255	37 ft/hr drill advancement.			
				← 12–inch Air Rotary Borehole
260	Unweathered BASALT. Limitted rock chip recovery.			
265				
270				
275	274–276 ft: possible fracture set based on drill action.			
280	15 ft/hr drill advancement.			
285	Unweathered BASALT. Local vesicals and oxidation observed in hand sample. Numerous vesicals observed in video log, vesicals do not appear interconnected.			
290				
295				
300	19–26 ft/hr drill advancement.			

PROJECT NAME: Silronic Water Supply Development
WELL INDENTIFICATION NUMBER: TW–1
LOCATION: NW ¼ SE ¼ Sec. 12, T.1N., R.3E.
CONSULTING FIRM: Pacific Groundwater Group
REPRESENTATIVE: Glenn Mutti–Driscoll
OREGON WID: L109613

WATER LEVEL ELEVATION: ~20.3 ft, Portland Datum
WATER LEVEL DATE: 8/5/13
DRILLING METHOD: Cable Tool/Mud Rotary/Air Rotary
FIRM: Hansen Drilling

PgG

Figure 2 Geologic Log and Well Design for Siltronic TW-1

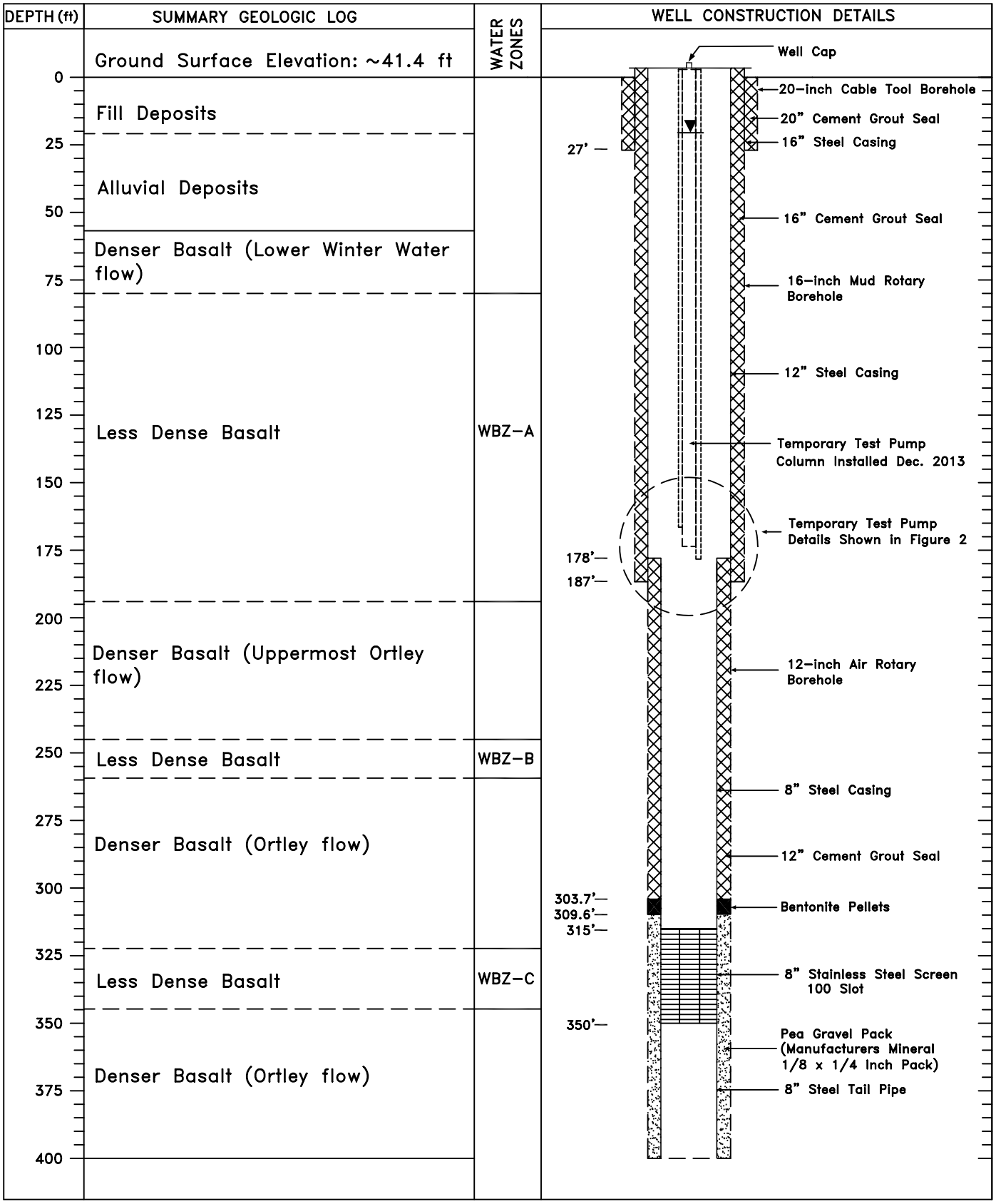
DEPTH (ft)	GEOLOGIC LOG	SAMPLE	PID	WELL CONSTRUCTION DETAILS
	Ground Surface Elevation: ~41.4 ft			
300	See previous page for unit description.			
305	Unweathered BASALT.			
310				
315				
320	12 ft/hr drill advancement	320		
325	Highly weathered VESICULAR BASALT. 37 ft/hr drill advancement 322.5–344.5 ft: Water Bearing Unit C, ~300 gpm yield while drilling.			
330				
335	Chemically modified VESICULAR BASALT. 45–75% of clasts magenta colored, other oxidized clasts compose up to 20% of samples. 45 ft/hr drill advancement	355P		
340				
345	Weathered BASALT. 15–20% oxidized, frequency of magenta & vesicular clasts decrease with depth. 10 ft/hr drill advancement			
350				
355	Dense, unweathered BASALT.			
360				← 12–inch Air Rotary Borehole
365				
370	5 ft/hr drill advancement			
375	Unweathered to slightly weathered FRACTURED BASALT. Drill action rougher, pyritized chip faces, magenta & dark green oxides. 11 ft/hr drill advancement			
380				
385	Dense, unweathered BASALT.			
390		390		
395	1–5 ft/hr drill advancement			
400				

PROJECT NAME: Silronic Water Supply Development
WELL INDENTIFICATION NUMBER: TW–1
LOCATION: NW ¼ SE ¼ Sec. 12, T.1N., R.3E.
CONSULTING FIRM: Pacific Groundwater Group
REPRESENTATIVE: Glenn Mutti–Driscoll
OREGON WID: L109613

WATER LEVEL ELEVATION: ~20.3 ft, Portland Datum
WATER LEVEL DATE: 8/5/13
DRILLING METHOD: Cable Tool/Mud Rotary/Air Rotary
FIRM: Hansen Drilling

PgG

Figure 2 Siltronic TW-1 Well Completion Log



PROJECT NAME: Siltronic Water Supply Development
WELL INDENTIFICATION NUMBER: TW-1
LOCATION: NW ¼ SE ¼ Sec. 12, T.1N., R.3E.
CONSULTING FIRM: Pacific Groundwater Group
REPRESENTATIVE: Glenn Mutti-Driscoll
OREGON WID: L019613

WATER LEVEL ELEVATION: ~20.3 ft, Portland Datum
WATER LEVEL DATE: 8/5/13
DRILLING METHOD: Cable Tool/Mud Rotary/Air Rotary
FIRM: Hansen Drilling

PgG

HAI

Hahn and Associates, Inc.
Environmental Consultants

Site ID: U-2		Date(s): **2/5/09**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **Not Surveyed**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing:	Easting:
Well Construction:		Borehole Dia.:	Total Depth: **23.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/4" Bentonite Chips (Cetco Pure Gold) 0-23 feet		Remarks: **Location is adjacent to P-7.**	
Sample No. Prefix: 5237-090205-			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	1–17								**0.0 - 18.0 Feet:** No Recovery. Closed point sampler pushed directly to 18.0 feet below ground surface.		
	18	☒	016 (18-19') 016G (18.5')					ML	**18.0 - 18.1 Feet:** SILT, gray, moist, soft, non-plastic. No odor, sheen, or discolorations observed. Wood fragments (5-10%) present.		
	19							SM			
								ML	**18.1 - 19.1 Feet:** silty SAND with some gravel, gray, moist, fine grained, loose, poorly graded. Gravel is medium grained, sub-angular.		

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface

Report: SILTRONIC; File: 5237 (4_08).GPJ; 2/17/09

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: U-2
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	21			4 (18-23)				ML	No odor present and minor sheen observed when tested in water. **19.1 - 22.0 Feet:** SILT with some sand, gray, moist, soft, non-plastic. No odor, sheen, or discolorations observed.		
	22								**22.0 - 23.0 Feet:** No Recovery.		
	23								End of boring at 23.0 feet below ground surface. NOTES: Sample 016G is a grab sample (2 oz. container) obtained in a zone showing evidence of possible oil. Sample 016 is a homogenized sample (16 oz., 8 oz., 4 oz. containers) collected from the 18 to 19 feet interval of one boring.		

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface

Report: SILTRONIC; File: 5237 (4_08).GPJ; 2/17/09

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: U-2A		Date(s): **1/28/09**	
Location: **7200 NW Front Avenue, Portland, Oregon**			
Logged By: **Ben Uhl**		Checked By: **Rob Ede**	
Driller: **Boart Longyear E & I Division**			
Drilling Method: **Geoprobe 6600 - direct push**		GS Elevation: **Not Surveyed**	TOC: Not Applicable
Sampling Method: **Macrocore**		Northing:	Easting:
Well Construction:		Borehole Dia.: **2.5 inches**	Total Depth: **25.0 feet bgs**
Blank Casing: NA	NA	Project Number: **5237**	
Screen: NA	NA	Project Name: **Remedial Investigation - Siltronic Corporation**	
Annular Fill: 3/4" Bentonite Chips (Cetco Pure Gold) 0-25 feet		Remarks: **Location is adjacent to P-7.**	
Sample No. Prefix: 5237-090128-			

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	1–14								**0.0 - 15.0 Feet:** No Recovery. Closed pin sampler pushed directly to 15.0 feet below ground surface.		
	15							SP	**15.0 - 16.0 Feet:** SAND, gray, moist, medium grained, loose, poorly graded, no odor, no discoloration, no sheen. Wood fragments present at 15.8 feet.		
	16							SP	**16.0 - 18.5 Feet:** SAND with silt layers (1" thickness) and some wood chips, gray, moist, medium grained, loose, poorly graded. Mild odor present with minor sheen observed during sheen testing, no visible tar or oil. UV screen identified no fluorescence.		
	17–18	☒	013 (18-19')	3.5 (15-20)	-	0.0					
	19								**18.5 - 20.0 Feet:** No Recovery.		

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface

Report: SILTRONIC; File: 5237 (4_08).GPJ; 2/17/09

HAI
Hahn and Associates, Inc.
Environmental Consultants

Site ID: U-2A
Project Name: **Remedial Investigation - Siltronic Corporation**
Project Number: **5237**

Elevation (ft)	Depth (ft)	Sample Interval	Sample Number (depth)	Recovery (ft) (core interval)	UV Screen	PID (ppm)	Lithology	USCS Code	Lithologic Description	Groundwater	Boring Abandonment Details
	21		013G (20')	4.5 (20-25)				SM ML	**20.0 - 20.3 Feet:** silty SAND, gray, moist, fine to medium grained, loose, poorly sorted. Mild odor present with mild sheen observed during sheen testing, no visible oil or tar. **20.3 - 24.5 Feet:** SILT, gray to olive green, moist, soft, low plasticity, no odor, no discoloration, no sheen, no visible oil or tar.		
	22										
	23										
	24										
	25								**24.5 - 25.0 Feet:** No Recovery. End of boring at 25.0 feet below ground surface. NOTE: Sample 013G is a grab sample (2 oz. container) collected from a zone having a mild odor and showing a minor sheen. Sample 013 is a homogenized sample (16 oz., 8 oz., 4 oz. containers) from the 18 to 19 foot from 6 co-located borings.		

NOTES: UV screen consisted of visual with ultraviolet light.
(-) = no indication of fluorescence,
(+) = fluorescence observed.

PID=photoionization detector
bgs = below ground surface

Report: SILTRONIC; File: 5237 (4_08).GPJ; 2/17/09

TD=91.5 ft
GS = 33.4 ft COP

Project: Rhone Poulenc RI / FS
Project Location: Portland, Oregon
Project Number: 5292C0804A.00 00045

Log of Boring W-03-81

Sheet 1 of 3

Date(s) Drilled and Installed	2/16/00	Geologist	G. Lukert	Reviewer	
Drilling Method	Air Rotary	Drilling Contractor	Cascade Drilling, Inc.	Total Depth of Borehole	91.5 feet
Sampling Method	Grab from cuttings, SPT split spoon	Hammer Data	140 lbs / 30-inch drop	Top of Casing Elevation	Not available
Size and Type of Well Casing	2-inch-dia. Schedule 40 PVC	Screen Perforation	0.010-inch slot (75-80 feet)	Approximate Surface Elevation	Not available
Seal or Backfill	Aquaguard bentonite grout 2-73 feet, bentonite chips 82-91.5 feet	Groundwater Level(s)	Not measured ATD; water equilibrium at 39 feet bgs on 2/17/00 at 0700		

Elevation feet	Depth, feet	SAMPLES: Type Number	Sampling Resistance, blows / 6 in.	Recovery, inches	Headspace OVA, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
	0							Surface Conditions: debris, topsoil		8-inch-dia. steel protective casing; Concrete (0-2 ft)
	5	01	NA	NA	0.0		SP	SAND; dark brown (10YR 3/3), medium subrounded to rounded grains, trace rounded gravel, no fines, damp		7-3/8-in.-dia. borehole
	10	02	NA	NA	0.0					2-in.-dia. Sch. 40 PVC riser (to 75 ft)
	15	03	NA	NA	0.0			Becomes very dark gray (5Y 3/1), fine to medium, no gravel		Aquaguard bentonite grout (2-73 ft)
	20	04	NA	NA	0.0		SM	Silty SAND; very dark gray (5Y 3/1), fine, ~20% low plasticity fines, wet		
	25	05	NA	NA	0.0		SP-SM	SAND with silt; very dark gray (5Y 3/1), fine to medium, trace low plasticity fines, wet		
	30									

Report: ENV_12W_CLEVELAND+USCS; File: RPACR145.GPJ; 4/5/2000 W-03-81

URS Greiner Woodward Clyde

Project: Rhone Poulenc RI / FS
Project Location: Portland, Oregon
Project Number: 5292C0804A.00 00045

Log of Boring W-03-81

Sheet 2 of 3

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Sampling Resistance, blows / 6 in.	Recovery, inches	Headspace OVA, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
	30		06	NA	NA	0.0		ML	Sandy SILT; very dark gray (5Y 3/1), ~20% sand, wet		7-3/8-in.-dia. borehole
	35		07	NA	NA	0.0		ML/MH	SILT; very dark gray (5Y 3/1), medium to high plasticity, trace sand, wet		2-in.-dia. Sch. 40 PVC riser (to 75 ft)
	40		08	NA	NA	0.0			Becomes high plasticity, with trace clay, no sand		Aquaguard bentonite grout (2-73 ft)
	45		09	NA	NA	0.0			Becomes medium to high plasticity, no clay		
	50		10	NA	NA	0.0					
	55		11	NA	NA	0.0		ML	Sandy SILT; very dark gray (5Y 3/1), medium plasticity, very fine sand, wet		
	60										
	65										

Report: ENV_12W_...VELAND\AUSCS; File: RPACRI45.GPJ; 4/5/2000 W-03-81

Project: Rhone Poulenc RI / FS
Project Location: Portland, Oregon
Project Number: 5292C0804A.00 00045

Log of Boring W-03-81

Sheet 3 of 3

Elevation feet	Depth, feet	SAMPLES Type	SAMPLES Number	Sampling Resistance, blows / 6 in.	Recovery, inches	Headspace OVA, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
	65							ML	Sandy SILT; very dark gray (5Y 3/1), medium plasticity, very fine sand, wet (continued)		7-3/8-in.-dia. borehole
	70										2-in.-dia. Sch. 40 PVC riser (to 75 ft); Aquaguard bentonite grout (2-73 ft)
	75										20-40 silica sand (73-75 ft); Prepacked well screen, 20-40 silica sand (75-80 ft); 2-in. dia. 0.010-in. slot Sch. 40 PVC screen (75-80 ft)
	80		12	3-3-4	18	0.0		ML	SILT; very dark gray (5Y 3/1), medium plasticity, organic debris, loose, damp		10-20 silica sand outside prepack (75-82 ft); Sump (80-81 ft)
	85		13	4-4-3	18	0.0					Bentonite (82-91.5 ft)
	90		14	3-4-5	NA	0.0			With fine sand layers 1 to 2 inches thick		
									Bottom of boring at 91.5 feet.		
	95										
	100										

Report: EINV_12W_CLEVELAND+/-USCS; Fm: RPACRI45.GPJ; 4/5/2000 W-03-81

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET
P19436.A2	MW-1/WS-1	1 OF 2

SOIL BORING RECORD DRAWING

PROJECT WACKER SILTRONIC CORPORATION LOCATION PORTLAND, OREGON

ELEVATION _____ DRILLING CONTRACTOR GEOTECH EXPLORATIONS, BEAVERTON, OREGON

DRILLING METHOD AND EQUIPMENT CME-55, 6" HS AUGERS

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER _____

ELEVATION	DEPTH BELOW SURFACE (FT.)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS: 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	5	5.0						Grout to surface
		6.5	S-1	18	1-1-1 (2)	SILT, low plasticity, medium gray with brown mottling, moist, soft (ML), fill		Top of bentonite at 2 1/2"
								Top of gravel at 5'
								Screen top at 7'
								▽ Driller notes water at ±9'
	10	10.0						
		11.5	S-2	0	4-4-5 (9)	Upper 10" - SILT, same as S-1, some hydrocarbon odor (Jar 1 of 2), fill Lower 8" - SAND, poorly graded, fine sand, dark gray, wet compact (SP), heavily saturated with oil, strong odor (Jar 2 of 2), fill.		Prominent oily sheen and odor to cuttings between 10' and 15'
	15	15.0						
		16.5	S-3	18	3-4-5 (9)	SAND, poorly graded, fine sand, dark gray, wet, compact (SP), heavily saturated with oil, fill.		
	20	20.0						
		21.5	S-4	18	4-3-4 (7)	SAND, same as S-3, heavily saturated with oil, fill.		Screen bottom at 22'
								Driller notes 3 feet of heave at 25', had to wash out hole to clean out heave
	25	25.0						
		26.5	S-5	18	3-3-4	Upper 14" - SAND as in S-3 (SP), mild hydrocarbon odor, probably is slough from washing out heave and not representative. Lower 4" - SILT, low plasticity, medium brownish gray, moist, firm (ML), no noticeable hydrocarbon odor, probably native soil.		Fill Native ±21' Sump bottom at 27'

REL. 11-93 FORM D1488

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET
P19436.A2	MW-1 WS-1	2 OF 2

SOIL BORING RECORD DRAWING

PROJECT **WACKER SILTRONIC CORPORATION** LOCATION PORTLAND, OREGON

ELEVATION _____ DRILLING CONTRACTOR GEOTECH EXPLORATIONS, BEAVERTON, OREGON

DRILLING METHOD AND EQUIPMENT CME-55, 6" HS AUGERS

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER _____

ELEVATION	DEPTH BELOW SURFACE (FT.)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	30	30.0						
		31.5	S-6	18	4-4-5 (9)	SILT, low plasticity, medium brownish gray, moist to wet, includes some sandy silt in upper 6", firm (ML), no noticeable hydrocarbon odor, native soil.		Bottom gravel at 31.5'
						END MW at 31.5 feet.		

Worst samples

S-2, Jar 2 of 2 and S-3 are equally bad, more sample in S-3 for testing.

REV. 11-83 FORM D1886

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET
P19436.A2	MW- MW-2 WS-2	1 OF 2

SOIL BORING RECORD DRAWING

PROJECT **WACKER SILTRONIC CORPORATION** LOCATION **PORTLAND, OREGON**

ELEVATION _____ DRILLING CONTRACTOR **GEOTECH EXPLORATIONS, BEAVERTON, OREGON**

DRILLING METHOD AND EQUIPMENT **CME-55, 6" HS AUGERS**

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER _____

ELEVATION	DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	5	5.0						Grout to surface
		6.5	S-1	18	1-2-3 (5)	SAND, poorly graded, fine sand, brown, moist, loose (SP), fill.		Top of bentonite at 3'
								Top of gravel at 4 1/2'
								Screen top at 7 1/2'
								Driller notes water at ±8';
	10	10.0						
		11.5	S-2	0	1-4-5	NO RECOVERY; sample tube came up oily, strong hydrocarbon odor, sandy material on outside of sampler.		
	15	15.0						15' screen 2" schedule 40 10 slot PVC
		16.5	S-3	18	1-1-2 (3)	SAND, poorly graded, fine sand, chalk gray, wet, loose (SP), some lenses of silt; strong hydrocarbon odor, oily material observed on sample fill.		
	20	20.0						Driller notes considerabe degree of oiliness to cutting from 15'-25', more than in MW-1
		21.5	S-4	18	5-6-6 (12)	SANDY SILT, non-plastic, ~30% fill sand, medium to dark gray, wet, firm, (ML), strong hydrocarbon odor, noticeable oil in sample fill?		Screen bottom at 22'
	25	25.0						5' sump
		26.5	S-5	18	3-5-5 (10)	Upper 14" - SAND, as in S-3, includes strong hydrocarbon odor and visible oil in sample, material may be slough from drilling and washing out heaved zone, may not be representative of 25'-26.5' interval. Lower 4" - SILT, low plasticity, medium grayish brown, firm, moist (ML), no apparent hydrocarbon, native.		Driller notes 2' heave at 25', had to wash out hole
								Sump bottom at 27' 4"

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET
P19436.A2	MW-2 (MS-2)	2 OF 2

SOIL BORING RECORD DRAWING

PROJECT **WACKER SILTRONIC CORPORATION** LOCATION PORTLAND, OREGON

ELEVATION _____ DRILLING CONTRACTOR GEOTECH EXPLORATIONS, BEAVERTON, OREGON

DRILLING METHOD AND EQUIPMENT CME-55, 6" HS AUGERS

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER _____

ELEVATION	DEPTH BELOW SURFACE (FT.)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	30							
		31.5	S-6	18	3-3-4 (7)	**SILT, low plasticity, grayish brown, moist, firm (ML), no noticeable hydrocarbon odor, native soil.**		
						END MW at 31.5 feet		
								Worst sample
								S-3, S-4 - about the same

RE. [illegible] FORM D1836

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET
P19436.A2	MW-4 (WS-4)	1 OF 2

SOIL BORING RECORD DRAWING

PROJECT **WACKER SILTRONIC CORPORATION** LOCATION PORTLAND, OREGON

ELEVATION _____ DRILLING CONTRACTOR GEOTECH EXPLORATIONS, BEAVERTON, OREGON

DRILLING METHOD AND EQUIPMENT CME-55, 6" HS AUGERS

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER _____

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS: 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
5	5.0						Hole is within 20' of abandoned natural gas line
	6.5	S-1	18	5-1-2 (3)	Upper 9" - SAND, poorly graded, fine sand, brown, moist to wet, loose (SP).		Grout 5' to surface
					Lower 9" - SILT, non-plastic, 10-20% fine sand, dark gray, moist, soft (ML), fill.		Bentonite from 5'-6'
							Screen top at 6 1/2'
							Some gravel - like material at 8'
							Driller notes water at ±8';
10	10.0						
	11.5	S-2	18	11-13-11 (24)	Upper 6" - SAND, same as S-1, maybe slough.		15' screen 10 slot 2" schedule 40 PVC
					Lower 12" - SILT, same as above.		
15	15.0						
	16.5	S-3	8"	3-3-4 (7)	SAND, poorly graded, fine sand, saturated, loose, (SP), maybe slough, possible mild odor of hydrocarbon.		Piece wood jammed into end of shoe
20	20.0						Fill ±20'
	21.5	S-4	18	1-4-4 (8)	SILT, low plasticity, brownish gray, moist, firm, (ML), native soil; included pieces of wire, probably dragged into sample.		Native
							Screen bottom at 21 1/2'
							5'- 4" Sump
25	25.0						
	26.5	S-5	12	4-4-4 (8)	SILT, same as above.		Tailpiece bottom at 27'
							Bentonite from 27-28'
							Gravel to 41 1/2'
30	30.0						

REV. 11-83 FORM D1886

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET
P19436.A2	MW-4 (WS-4)	2 OF 2

SOIL BORING RECORD DRAWING

PROJECT **WACKER SILTRONIC CORPORATION** LOCATION PORTLAND, OREGON

ELEVATION _____ DRILLING CONTRACTOR GEOTECH EXPLORATIONS, BEAVERTON, OREGON

DRILLING METHOD AND EQUIPMENT CME-55, 6" HS AUGERS

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER _____

ELEVATION / DEPTH BELOW SURFACE (FT.)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	31.5	S-6	18	4-5-4 (9)	SILT, low plasticity, gray with brown mottling, moist, firm (ML), includes some decomposed plant fragments.		
35	35.0						
	36.5	S-7	8	2-3-8 (11)	SANDY SILT, non-plastic, 30-50% fine sand, brown, moist, firm (ML).		Gravel to 41 1/2'
40	40.0						
	41.5	S-8	8		END MW at 41.5'		

Worst samples

None - all have clean appearance

REV. 11-83 FORM D1556

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET
P19436.A2	MW-5 WS-5	1 OF 2

SOIL BORING RECORD DRAWING

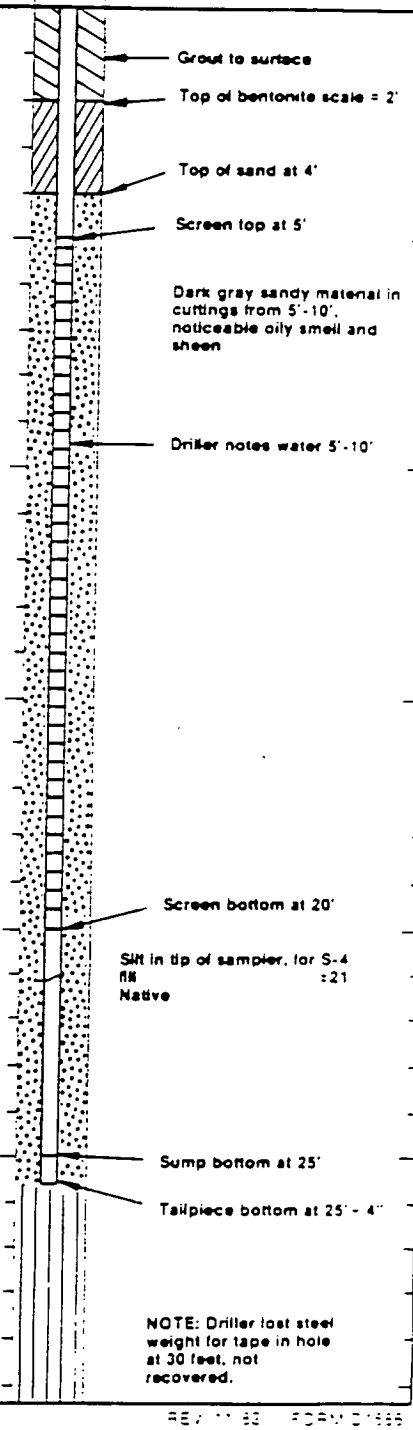
PROJECT **WACKER SILTRONIC CORPORATION** LOCATION PORTLAND, OREGON

ELEVATION _____ DRILLING CONTRACTOR GEOTECH EXPLORATIONS, BEAVERTON, OREGON

DRILLING METHOD AND EQUIPMENT CME-55, 6" HS AUGERS

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER _____

ELEVATION / DEPTH BELOW SURFACE (FT.)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS: 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL
5	5.0				
	6.5	S-1	18	4-4-8 (12)	SAND, poorly graded, fine sands, brown and gray, some 1/2" silt lenses, moist, loose; includes some oil sheen and odor.
10	10.0				
	11.5	S-2	18	6-8-8 (14)	SAND, poorly graded, fine sand, dark gray, wet, loose to compact, (SP), fill, saturated with oil (split samples taken, Jar 1 and Jar 2).
15	15.0				
	16.5	S-3	18		SAND, same as S-2, except only has oily odor and occassional sheen in soil.
20	20.0				
	21.5	S-4	18	3-4-5 (9)	SAND, same as S-2, excet has mild odor of oil; silt in top.
25	25.0				
	26.5	S-5	9	3-5-10 (15)	SILT, low plasticity, 10-15% fine sand, medium gray with brown, yellow and reddish mottling, slightly moist, very stiff (ML), no noticeable hydrocarbon odor.
30	30.0				



REV. 11-83 FORM D-1555

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET	OF
P19436.A2	MW-5 (WS-5)	2	2

SOIL BORING RECORD DRAWING

PROJECT **WACKER SILTRONIC CORPORATION** LOCATION PORTLAND, OREGON

ELEVATION _____ DRILLING CONTRACTOR GEOTECH EXPLORATIONS, BEAVERTON, OREGON

DRILLING METHOD AND EQUIPMENT CME-55, 6" HS AUGERS

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER _____

ELEVATION	DEPTH BELOW SURFACE (FT.)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	31.5	31.5	S-6	18	4-5-5 (10)	**SILT, low plasticity, about 10% fine sand, gray with brown mottling, moist, stiff (ML), no noticeable hydrocarbon odor.**		
						END MW at 31.5 feet.		
								Worst samples
								S-2 = worst
								S-3

REV. 11/90 FORM D1499

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET
P19436.A2	MW-6 (WS-6)	1 OF 2

SOIL BORING RECORD DRAWING

PROJECT **WACKER SILTRONIC CORPORATION** LOCATION PORTLAND, OREGON

ELEVATION _____ DRILLING CONTRACTOR GEOTECH EXPLORATIONS, BEAVERTON, OREGON

DRILLING METHOD AND EQUIPMENT CME-55, 6" HS AUGERS

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER _____

ELEVATION / DEPTH BELOW SURFACE (FT.)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL
5	5.0				
	6.5	S-1	18	3-8-11 (19)	SAND, poorly graded, fine sand, less than 10% fine, brown, moist, compact (SP), fill.
10	10.0				
	11.5	S-2	18	10-10-11 (21)	Primarily sand, as in S-1, but with several 1-inch silt layers; lower 6" of sample has strong hydrocarbon odor to it.
15	15.0				
	16.5	S-3	18	1-1-2 (3)	SAND, as in S-1, except lower 6" have blackish discoloration and strong hydrocarbon odor; small oily splotches noticeable in soil.
20	20.0				
	21.5	S-4	18	3-3-5 (8)	Upper 6" - SAND as in S-1, have blackish discoloration and hydrocarbon odor, fill. Lower 12" - SILT, low plasticity, gray with brown mottling, firm (ML), hydrocarbon odor not noticeable.
25	25.0				
	26.5	S-5	18	9-26-26 (52)	SAND, as in S-1, but dark gray with mild hydrocarbon odor, material might be heaved sands and not representative of in-situ soil at 25'.
30	30.0				

SYMBOLIC LOG

COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION

- Grout to surface
- Bentonite to 6 1/2'
- Sand to 7 1/2'
- Top of screen at 9'
- Driller notes water at ±12', coincident with appearance of "oily" odor from cuttings while drilling from 10-15'
- A-rods came out of hold with unusual yellow discoloration from water at 20-25'
- Bottom of screen at 24'
- Driller notes 4' of heave after drilling to 25'; also, chain fell in hole, but was able to recover by retracting augers from hole; Augers moved during SPT from S-5, driller says no contact with sampler; why so high of an N value?
- Sump to 29 1/2'

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET
P19436.A2	MW-6 (WS-6)	2 OF 2

SOIL BORING RECORD DRAWING

PROJECT **WACKER SILTRONIC CORPORATION** LOCATION PORTLAND, OREGON

ELEVATION _____ DRILLING CONTRACTOR GEOTECH EXPLORATIONS, BEAVERTON, OREGON

DRILLING METHOD AND EQUIPMENT CME-55, 6" HS AUGERS

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER _____

ELEVATION	DEPTH BELOW SURFACE (FT.)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
		31.5	S-6	18	S-7-12 (19)	All 18" of soil in barrel is SAND, poorly graded, fine sand, less than 10% fine, medium to dark gray, wet, compact, (SP), probably heave or disturbed soil, not representative of 30' depth; mild hydrocarbon odor. 2" of soil in shoe of sampler is SANDY SILT, non-plastic, 30-50% fine sand, medium gray, wet, firm, (ML); no noticeable hydrocarbon odor, sandy silt is probably representative of in-situ soil.		Driller notes 3' of heave from 30-29' prior to sampling S-6; had to drill/wash out heave

Sample choices

S-3

CH2M HILL

PROJECT NUMBER P19436.A2 | BORING NUMBER MW-7 WS-7 | SHEET 1 OF 2

SOIL BORING RECORD DRAWING

PROJECT **WACKER SILTRONIC CORPORATION** LOCATION PORTLAND, OREGON

ELEVATION _____ DRILLING CONTRACTOR GEOTECH EXPLORATIONS, BEAVERTON, OREGC

DRILLING METHOD AND EQUIPMENT CME-55, 6" HS AUGERS

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER _____

ELEVATION	DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME GRADATION OR PLASTICITY PARTICLE SIZE DISTRIBUTION COLOR MOISTURE CONTENT RELATIVE DENSITY OR CONSISTENCY SOIL STRUCTURE MINERALOGY USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING DRILLING RATE DRILLING FLUID LOSS TESTS AND INSTRUMENTATION
5	5.0							Grout to surface
	6.5	S-1		12"	1-3-1 (4)	Lower 6" - SILT, low plasticity, moist, gray, soft (ML). Upper 6" - SAND, poorly graded, fine sand, brown, wet, loose, (SP), fill.		5 1/2' top of bentonite
10	10.0							Cavings around PVC 7-15'
	11.5	S-2		14	5-8-11 (19)	SAND as in upper 6" of S-1, (SP), fill.		10' of top of screen
15	15.0							▽ Driller notes water at ±12
	16.5	S-3		18	2-1-5	SAND, same as upper 6" of S-1 (SP), fill.		15' section 10 slot PVC wells
20	20.0							During well construction, drill hole walls began squeezing in at 5' up to 7', sand was packed in auger and walls apparently squeezed in faster than sand could drop out; tried twice unsuccessfully to jet-out sand.
	21.5	S-4		18	5-5-6 (11)	Upper 6" - sand as in upper 6" of S-1, (SP), fill; mild hydrocarbon odor. Lower 12" - SILT, low plasticity, medium brown with gray mottling, moist, firm, (ML); native soil.		Fill / Native
25	25.0							25' bottom screen
	26.5	S-5		18	4-3-4 (7)	Upper 9" - SILT, low plasticity, medium brown with gray mottling, moist, firm, (ML). Lower 9" - SAND, poorly graded, fine sand, medium gray, wet, loose, (SP), strong hydrocarbon odor, visible blotches of oil (?) in both silt and sand.		5'-4" Sump
30	30.0							Bottom of Sump = 30' Driller notes heave at 30' ±4' of heave

REV. 11-88 FORM DH88

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET
P19436.A2	MW-7 WSF	2 OF 2

SOIL BORING RECORD DRAWING

PROJECT **WACKER SILTRONIC CORPORATION** LOCATION PORTLAND, OREGON

ELEVATION _____ DRILLING CONTRACTOR GEOTECH EXPLORATIONS, BEAVERTON, OREGO

DRILLING METHOD AND EQUIPMENT CME-55, 6" HS AUGERS

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER _____

ELEVATION	DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
		31.5	S-6	18	2-1-2 (3)	Lower 9" - SAND, poorly graded, fine, brown, wet, soft, (SP),. Upper 9" - SAND, very fine, brown, wet, loose, (SM); All has definite hydrocarbon (?) odor, not visible in soil, however. Sample may be distrubed, heave material.		Reamed out heaved area from 26 to 30' with wash water and tricone bit to clea auger. Backfill to 32'-4"
35		35.0						
		38.5	S-7	18	3-5-5 (10)	SANDY SILT, low plasticity, 20-30% fine sand, medium brown, moist, soft, (ML); noticeable hydrocarbon (?) odor.		
40		40.0				Upper 7" - SILT, low plasticity, brown, wet, firm, (ML).		
		41.5	S-8	14"	8-11-17 (28)	Lower 7" - SILTY SAND, fine sand, about 30% fine, brown, wet, compact, (SM); both silt and sand have noticeable hydrocarbon (?) odor, no visible traces. END MW at 41.5 feet		

Sample choices

(Ranked from worst)

*S-5
S-6
S-7 - S-8 (about the same)

*amount of odor

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

PROJECT:
RI / Source Control Evaluation
Wacker Siltronic Corporation Property
Portland, Oregon
PROJECT: 5237

MONITORING WELL NUMBER WS-8-33

OWRD #L52678 Start Card #135292

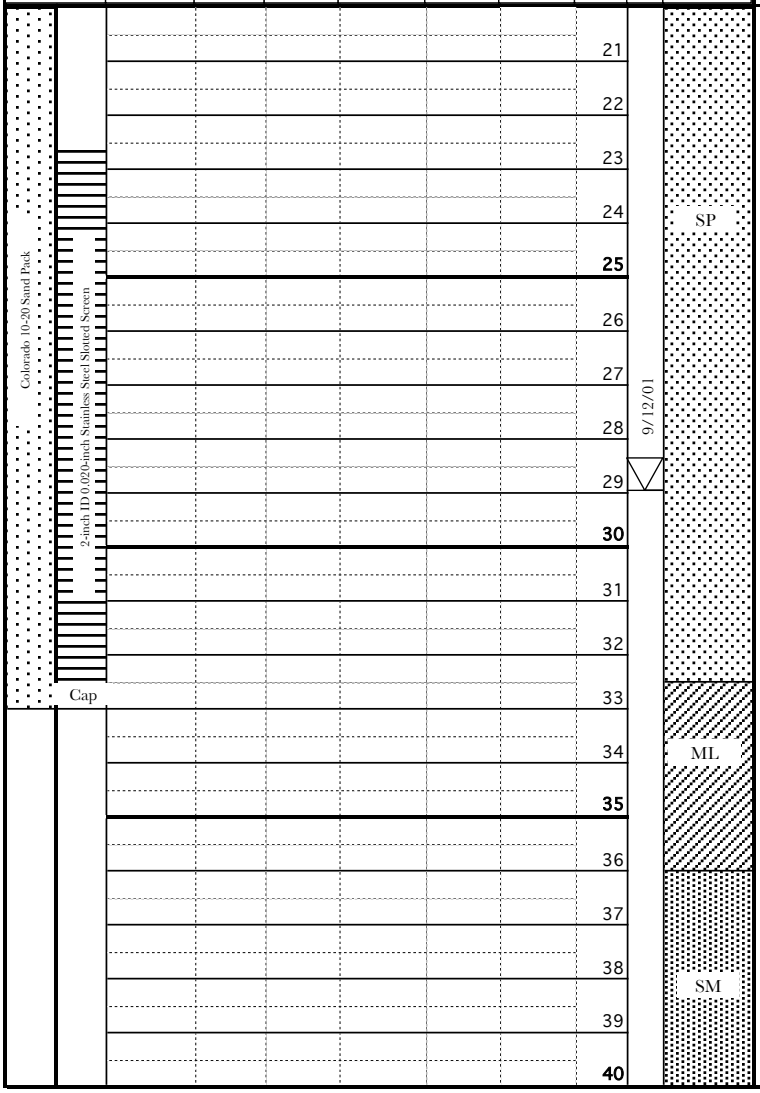
		DRILL START	DRILL FINISH
HAI LOGGER:	Jill Bets		
SAMPLING METHOD:	1.5-inch OD Split Spoon		
DRILLING METHOD:	6 1/4-inch ID Hollow Stem Auger	Time:	Time:
EQUIPMENT TYPE	B-59 Mobil Drill	15:30	16:15
DRILLER:	Armando Paco	Date:	Date:
DRILLING CONTRACTOR:	Geo-Tech Explorations	12-Sep-01	12-Sep-01

BORING DIAMETER:	10-inch
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	34.54 feet msl
TOP OF CASING ELEVATION:	34.28 feet msl

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	SPLIT SPOON BLOW COUNT	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Flush Monument										Ground surface
Concrete							1			NOTE: No Soil Samples Collected. For full Soil Description, see log for boring P-3, installed approximately 5 feet to the northwest of WS-8-33.
							2			
							3			
							4			
							5		SP	
							6			
							7			
							8			
Bentonite Chips							9			
							10			
2-inch ID Blank Schedule 40 PVC							11			
							12			
							13			
							14			
							15			
							16			
							17			
							18		SP	
							19			
							20			

HAHN & ASSOCIATES, INC.	MONITORING WELL NUMBER	WS-8-33		
434 NW Sixth Avenue	OWRD #L52678 Start Card #135292			
Portland, Oregon				
(503) 796-0717	HAI LOGGER:	Jill Bets	DRILL START	DRILL FINISH
PROJECT:	SAMPLING METHOD:	1.5-inch OD Split Spoon		
RI / Source Control Evaluation	DRILLING METHOD:	6 1/4-inch ID Hollow Stem Auger	Time:	Time:
Wacker Siltronic Corporation Property	EQUIPMENT TYPE	B-59 Mobil Drill	15:30	16:15
Portland, Oregon	DRILLER:	Armando Paco	Date:	Date:
PROJECT: 5237	DRILLING CONTRACTOR:	Geo-Tech Explorations	12-Sep-01	12-Sep-01

BORING DIAMETER:	10-inch
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	34.54 feet msl
TOP OF CASING ELEVATION:	34.28 feet msl



SOIL DESCRIPTION

Boring terminated at 33.0 feet bgs
Monitoring well installed to 33.0 feet bgs

Materials:
0.5-feet PVC sump/end cap
10 feet 2-inch diameter, 0.010-inch PVC slotted screen
23 feet 2-inch diameter PVC blank casing
12 50# bags 10/20 Colorado sand
9 50# bags bentonite chips
1 locking cap
Flush steel monument

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**MONITORING WELL NUMBER**	**WS-8-59**
	OWRD #L52677 Start Card #135291	
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT: 5237	HAI LOGGER: Jill Betts SAMPLING METHOD: 1.5-inch OD Split Spoon DRILLING METHOD: 6 1/4-inch ID Hollow Stem Auger EQUIPMENT TYPE B-59 Mobil Drill DRILLER: Armando Paco DRILLING CONTRACTOR: Geo-Tech Explorations	DRILL START Time: 9:30 Date: 12-Sep-01 DRILL FINISH Time: 14:57 Date: 12-Sep-01

BORING DIAMETER:	10-inch
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	34.54 feet msl
TOP OF CASING ELEVATION:	34.16 feet msl

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	SPLIT SPOON BLOW COUNT	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Flush Monument										Ground surface
Concrete							1			NOTE: For full Soil Description, see log for boring P-3, installed approximately 5 feet to the north of WS-8-59.
							2			
							3			
							4			
							5		SP	
							6			
							7			
							8			
Bentonite Chips							9			
							10			
2-inch ID Blank Schedule 40 PVC							11			
							12			
							13			
							14			
							15			
							16			
Bentonite Grout							17			
							18		SP	
							19			
							20			

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Portland, Oregon
(503) 796-0717

PROJECT:
RI / Source Control Evaluation
Wacker Siltronic Corporation Property
Portland, Oregon
PROJECT: 5237

MONITORING WELL NUMBER WS-8-59

OWRD #L52677 Start Card #135291

		DRILL START	DRILL FINISH
HAI LOGGER:	Jill Betts		
SAMPLING METHOD:	1.5-inch OD Split Spoon		
DRILLING METHOD:	6 1/4-inch ID Hollow Stem Auger	Time:	Time:
EQUIPMENT TYPE	B-59 Mobil Drill	9:30	14:57
DRILLER:	Armando Paco	Date:	Date:
DRILLING CONTRACTOR:	Geo-Tech Explorations	12-Sep-01	12-Sep-01

BORING DIAMETER:	10-inch
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	34.54 feet msl
TOP OF CASING ELEVATION:	34.16 feet msl

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	SPLIT SPOON BLOW COUNT	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
2-inch ID Blank Schedule 40 PVC Bentonite Grout							21–40	9/12/01	SP ML SM	

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**MONITORING WELL NUMBER**	**WS-8-59**
	OWRD #L52677 Start Card #135291	
PROJECT: RI / Source Control Evaluation Wacker Siltronic Corporation Property Portland, Oregon PROJECT: 5237	HAI LOGGER: Jill Betts SAMPLING METHOD: 1.5-inch OD Split Spoon DRILLING METHOD: 6 1/4-inch ID Hollow Stem Auger EQUIPMENT TYPE B-59 Mobil Drill DRILLER: Armando Paco DRILLING CONTRACTOR: Geo-Tech Explorations	DRILL START Time: 9:30 Date: 12-Sep-01 DRILL FINISH Time: 14:57 Date: 12-Sep-01

BORING DIAMETER:	10-inch
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	34.54 feet msl
TOP OF CASING ELEVATION:	34.16 feet msl

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	SPLIT SPOON BLOW COUNT	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)
Bentonite Chip Plug / Bentonite Grout									SM
							41		SP
							42		
							43		SM
							44		ML
							45		
2-inch ID Blank Schedule 40 PVC							46		SP
							47		
							48		
							49		ML
							50		
							51		
							52		
							53		SP
							54		
							55		
							56		
2-inch ID 0.020-inch Stainless Steel Slotted Screen	-	11:20	-	-	3	100			
					4	100	57		
					13	100			ML
							58		
Cap	-	11:55	-	-	3	100	59		SP
Colorado 10-20 Sand Pack					4	100			
					5	100	60		

SOIL DESCRIPTION

Boring terminated at 59.0 feet bgs
Monitoring well installed to 59.0 feet bgs
Well Pressure Grouted from bentonite plug to 15 feet bgs, remainder sealed with bentonite chips.

Materials:
0.5-feet PVC sump/end cap
10 feet 2-inch diameter, 0.010-inch PVC slotted screen
50 feet 2-inch diametor PVC blank casing
18 50# bags 10/20 Colorado sand
14 50# bags bentonite chips
110 gallons bentonite grout
1 locking cap
Flush steel monument

NOTE: Split spoon sample collected at 56 to 57.5 feet bgs indicates Sandy SILT, grey, wet, no sheen, with an approximate 2-inch silt layer just above 57.5 feet bgs. Driller reported approximately 1 foot of heave in the augers prior to collecting this sample, thereby indicating much of the collected split spoon sample is likely representative of the heave originating from the base of the augers.

NOTE: Split spoon sample collected at 58.5 to 60 feet bgs indicates SAND grey, wet, fine grained, with some silt present, no sheen. Driller reported 4 feet of heave in the augers prior to collecting this sample, thereby indicating the collected split spoon sample is likely representative of the heave originating from the base of the augers.

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PROJECT:
RI / Source Control Evaluation
Wacker Siltronic Corporation Property
Portland, Oregon
PROJECT: 5237

MONITORING WELL NUMBER WS-9-34

OWRD #L52679 Start Card #135293

		DRILL START	DRILL FINISH
HAI LOGGER:	Jill Bets		
SAMPLING METHOD:	1.5-inch OD Split Spoon		
DRILLING METHOD:	6 1/4-inch ID Hollow Stem Auger	Time:	Time:
EQUIPMENT TYPE	B-59 Mobil Drill	15:30	16:15
DRILLER:	Armando Paco	Date:	Date:
DRILLING CONTRACTOR:	Geo-Tech Explorations	13-Sep-01	13-Sep-01

BORING DIAMETER:	10-inch
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	34.84 feet msl
TOP OF CASING ELEVATION:	33.51 feet msl

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	SPLIT SPOON BLOW COUNT	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Flush Monument										Ground surface
Concrete							1		GP	NOTE: No Soil Samples Collected. For full Soil Description, see log for boring P-5, installed approximately10 feet to the east of WS-9-34.
							2			
							3			
							4			
							5		SP	
							6			
							7			
Bentonite Chips							8			
							9			
							10			
2-inch ID Blank Schedule 40 PVC							11			
							12			
							13			
							14		SP	
							15			
							16			
							17			
							18			
							19			
							20			

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PROJECT:
RI / Source Control Evaluation
Wacker Siltronic Corporation Property
Portland, Oregon
PROJECT: 5237

MONITORING WELL NUMBER WS-9-34

OWRD #L52679 Start Card #135293

		DRILL START	DRILL FINISH
HAI LOGGER:	Jill Bets		
SAMPLING METHOD:	1.5-inch OD Split Spoon		
DRILLING METHOD:	6 1/4-inch ID Hollow Stem Auger	Time:	Time:
EQUIPMENT TYPE	B-59 Mobil Drill	15:30	16:15
DRILLER:	Armando Paco	Date:	Date:
DRILLING CONTRACTOR:	Geo-Tech Explorations	13-Sep-01	13-Sep-01

BORING DIAMETER:	10-inch
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	34.84 feet msl
TOP OF CASING ELEVATION:	33.51 feet msl

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	SPLIT SPOON BLOW COUNT	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
							21		SP	
							22			
							23			
							24			
							25			
							26			
							27			
							28		SM	
							29			
							30			
							31			Boring terminated at 34.0 feet bgs Monitoring well installed to 34.0 feet bgs Well was dry upon completion.
							32			
							33			
							34			Materials: 0.5-feet PVC sump/end cap 10 feet 2-inch diameter, 0.010-inch PVC slotted screen 24 feet 2-inch diameter PVC blank casing 15 50# bags 10/20 Colorado sand 8 50# bags bentonite chips 1 locking cap Flush steel monument
							35		ML	
							36			
							37		SM	
							38			
							39		ML	
							40			

Colorado 10-20 Sand Pack
2-inch ID 0.020-inch Stainless Steel Slotted Screen
Cap

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	WS-10	1 of 6

Project Name	Wacker Siltronic Corporation	TOC Elevation (feet NGVD)	33.4540
Project Location	7200 Northwest Front Avenue, Portland Oregon 97210	Surface Elevation (feet NGVD)	33.7410
Start/End Date	9/3/2003 to 9/6/2003	Northing	7624393.7
Driller/Equipment	Prosonic Corporation/Rotosonic	Easting	704307.1
Geologist/Engineer	Tony Silva / Eric Roth	Hole Depth	106.0-feet
Sample Method	4x6 Core Barrel	Outer Hole Diam	9.0/6.0-inch

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1			75%	CB		PID = 5.0			0.0 to 0.8 feet: ASPHALT with GRAVELLY SAND (SP); gravels rounded; damp to wet.
2									0.8 to 3.6 feet: SANDY GRAVEL (GW); reddish-brown; trace fines; 30% sand, fine to medium; 70% gravel, fine to medium, angular to subangular; moist.
3						PID = 1.0			
4									3.6 to 4.4 feet: GRAVELLY SILT (ML); grayish-brown; 40% fines, medium plasticity; 30% sand, fine to medium; 30% gravel, fine to medium, subangular to angular; moist.
5									4.4 to 6.0 feet: NO RECOVERY.
6			100%	CB		PID = 0.0			6.0 to 6.4 feet: GRAVELLY SILT (ML-GM); grayish-brown; 40% fines, medium plasticity; 30% sand, fine to medium; 30% gravel, fine to medium, subangular to angular; moist.
7									6.4 to 8.0 feet: CLAY (CL); greenish-gray with yellowish-brown mottling; 90% fines, high plasticity; 10% gravel, fine, angular; moist to dry.
8						PID = 0.0			8.0 to 8.7 feet: SAND (SP); blackish-brown; 100% sand, medium; dry. Petroleum-like odor.
9									8.7 to 12.8 feet: SAND (SP); grayish-brown; 100% sand, medium; dry.
10						PID = 0.0			
11									
12									
13						PID = 0.0			12.8 to 14.0 feet: GRAVELLY CLAY (CL); grayish-brown; 80% fines, high plasticity, dense; 20% gravel, fine to coarse, subrounded to angular; trace cobbles; slightly micaceous; dry.
14			100%	CB					14.0 to 15.0 feet: SAND (SP); yellowish-brown; 100% sand, fine to medium; dry.
15	▽					PID = 0.0			15.0 to 16.0 feet: GRAVELLY SILT with COBBLES (ML-GM); yellowish-brown; 60% fines, low plasticity; <5% sand, fine; 15% gravel, fine to medium, subangular; 20% cobbles; dry.
16									16.0 to 16.8 feet: SAND (SP); grayish-black; 100% sand, fine to medium; dry.
17			100%	CB		PID = 0.0			16.8 to 17.0 feet: GRAVELLY CLAY (CL); yellowish-brown.
18						PID = 5.2			17.0 to 18.0 feet: SAND with GRAVEL (SP); brownish-gray; <10% fines; 80% sand, fine to coarse; 10% gravel, coarse, subrounded; moist to wet.
19									18.0 to 21.5 feet: GRAVELLY SILTY CLAY (CL); brownish-yellow; 70% fines, medium to high plasticity, dense; <10% sand; 20% gravel, fine to medium, subangular; micaceous; dry.
20									

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. bgs = below ground surface. 4. PVC = poly vinyl chloride.

▽ **Approximate water level observed prior to well development.**

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	WS-10	2 of 6

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21						PID = 78.4			21.0 to 27.0 feet: Free product present; petroleum-like staining; dark gray to black fluid with reddish-green sheen; fluid stains sample bag dark brown to black; hydrocarbon-like odor.
22									21.5 to 26.0 feet: SAND (SP); yellowish-brownish-gray; <5% fines; 95% sand, fine to medium; trace rootlets; slightly micaceous; wet.
23									
24			100%	CB		PID = 26.0			
25									
26			100%	CB		PID = 179.0			26.0 to 57.0 feet: SILT to CLAYEY SILT (ML); greenish-gray to gray; 100% fines, low to medium plasticity; slightly micaceous; trace organic debris, roots; damp.
27									
28						PID = 0.0			
29									
30						PID = 0.0			
31									
32									
33						PID = 0.0			
34									
35						PID = 0.0			
36			100%	CB					
37						PID = 0.0			
38									
39									
40						PID = 0.0			
41									
42									

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. bgs = below ground surface. 4. PVC = poly vinyl chloride.

▽ ***Approximate water level observed prior to well development.***

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	**WS-10**	**3 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43						PID = 0.0			
44									
45						PID = 0.0			
46			100%	CB					
47									
48						PID = 0.0			
49									
50						PID = 0.0			
51									
52									
53						PID = 0.0			
54									
55						PID = 0.0			55.0 to 57.0 feet: Slight increase in moisture content.
56									
57			100%	CB		PID = 0.0			57.0 to 87.0 feet: SILT (ML-SM); greenish-gray; 90% fines, low to medium plasticity; 10% sand, fine; micaceous; damp to wet.
58									
59									
60						PID = 0.0			
61									
62									
63						PID = 0.0			
64									
65									

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. bgs = below ground surface. 4. PVC = poly vinyl chloride.

▽ ***Approximate water level observed prior to well development.***

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	**WS-10**	**4 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66						PID = 0.0			
67			100%	CB		PID = 0.0			
68									
69									
70						PID = 0.0			
71									
72									
73						PID = 0.0			
74									
75						PID = 0.0			
76									
77			90%	CB		PID = 0.0			
78									
79									
80						PID = 0.0			
81									
82									
83						PID = 0.0			
84									
85						PID = 0.0			
86									
87			100%	CB		PID = 0.0			87.0 to 93.0 feet: SILT to CLAYEY SILT (ML); greenish-gray; 100% fines, low

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. bgs = below ground surface. 4. PVC = poly vinyl chloride.

▽ ***Approximate water level observed prior to well development.***

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	**WS-10**	**5 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88									to medium plasticity; trace sand, fine; micaceous; wet.
89									
90						**PID = 0.0**			
91									
92									
93						**PID = 0.0**			93.0 to 97.0 feet: GRAVELLY SILT (ML-GM); greenish-gray to reddish-gray; 60% fines, low plasticity; 5% sand; 35% gravel, fine to coarse, subangular; trace organic debris; damp to wet.
94									
95						**PID = 0.0**			
96									
97			**100%**	**CB**		**PID = 0.0**			97.0 to 99.0 feet: SILT to CLAYEY SILT (ML); greenish-gray to gray; 100% fines, low to medium plasticity; micaceous; organic debris, roots; damp.
98						**PID = 0.0**			
99									99.0 to 100.5 feet: GRAVELLY SILT (ML-GM); greenish-gray to gray; 60% fines, low plasticity; 40% gravels, medium to coarse, subangular; damp.
100						**PID = 0.0**			
101									100.5 to 106.0 feet: BASALT; light gray to dark gray; moist to wet; bedrock. Significant increase in resistance, drilling hardness.
102			**100%**	**CB**					
103									
104									
105									
106									Total Depth = 106.0 feet below ground surface.

NOTES: *1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. bgs = below ground surface. 4. PVC = poly vinyl chloride.*

▽ ***Approximate water level observed prior to well development.***

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Maul Foster & Alongi, Inc.	Geologic Borehole Log/Well Construction		
	Project Number **8128.01.06**	Well Number **WS-10**	Sheet **6 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description

WS10 Completion Details

Oregon Water Resources Department Well Start Card Number: W147653
Oregon Water Resources Department Well Identification Number: L64996

Boring:
0.0 to 37.0 feet bgs: 9-inch temporary, threaded steel, isolation casing.
0.0 to 36.0 feet bgs: 8-inch temporary, threaded steel, isolation casing.
0.0 to 36.0 feet bgs: 7-inch temporary, threaded steel, isolation casing.
0.0 to 106.0 feet bgs: 6-inch temporary, threaded steel, isolation casing.
0.0 to 106.0 feet bgs: 4x6-inch core barrel sampler.

0.0 to 2.0 feet bgs: flush mount vault and cement seal.
2.0 to 9.0 feet bgs: 3/8-inch Baroid bentonite chips hydrated with potable water.
9.0 to 27.0 feet bgs: 10x20 washed Colorado silica sand, primary filter pack.
27.0 to 37.0 feet bgs: 3/8-inch Baroid bentonite chips hydrated with potable water.
37.0 to 106.0 feet bgs: bentonite grout slurry, 9.8 pounds per gallon.

Well:
0.0 to 11.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe.
11.0 to 26.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-slot.
26.0 to 27.0 feet bgs: 2-inch diameter, stainless steel sump.

NOTES: *1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. bgs = below ground surface. 4. PVC = poly vinyl chloride.*

▽ ***Approximate water level observed prior to well development.***

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	**WS-11**	**1 of 11**

Project Name	**Wacker Siltronic Corporation**	TOC Elevation (feet NGVD)	**31.8500**
Project Location	**7200 Northwest Front Avenue, Portland Oregon 97210**	Surface Elevation (feet NGVD)	**31.9350**
Start/End Date	**9/21/03 to 10/3/03**	Northing	**7624628.3**
Driller/Equipment	**Prosonic Corporation/Rotosonic**	Easting	**705147.0**
Geologist/Engineer	**Tony Silva**	Hole Depth	**207.0-feet**
Sample Method	**4x6 Core Barrel**	Outer Hole Diam	**9.0/6.0-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1			100%	CB		PID = 0.0			0.0 to 0.5 feet: TOPSOIL, GRAVELLY SILT (ML); grayish brown; 20% fines, non plastic; 30% gravel, medium, subangular; 50% organic debris, rootlets, woody debris; moist.
									0.5 to 1.5 feet: SANDY GRAVEL (GP); brownish-gray; 40% sand, fine to medium; 60% gravel, fine, subangular to subrounded; dry. (Fill)
2									1.5 to 7.0 feet: SAND (SP); light brown; 95% sand, medium; 5% gravels, fine to medium, subrounded; moist. (Fill)
3						PID = 0.0			
4			100%	CB					
5						PID = 0.0			
6									
7			100%	CB					7.0 to 12.0 feet: SAND (SP); dark brown; 100% sand, fine to medium; trace fines and gravels; moist. (Fill)
8						PID = 0.0			
9									
10						PID = 0.0			
11									
12						PID = 0.0			12.0 to 16.0 feet: WOOD; core of wood; staining at upper end of wood; naphthalene or petroleum like odor. (Fill)
13									
14									
15						PID = 0.0			
16			100%	CB					16.0 to 17.0 feet: SAND (SP); dark brown; 100% sand, fine to medium; trace fines and gravels; moist. Possibly drilling sluff from trying to clean out the hole from the wood. (Fill)
17									17.0 to 18.0 feet: WOOD; core of wood; staining at upper end of wood; naphthalene or petroleum like odor. (Fill)
18			100%	CB		PID = 0.0			18.0 to 19.0 feet: SAND (SP); light brown, moist; 100% sand, fine to medium; trace fines and gravels; moist. (Fill)
19									19.0 to 21.0 feet: SANDY SILT (ML-SM); light gray; 50% fines, non plastic; 50% sand, fine to medium; dry. Brittle, breaks apart in flakes. (Fill)
20						PID = 0.0			

NOTES: *1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.*

▽ ***Approximate water level observed prior to well development.***

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	**WS-11**	**2 of 11**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21						**PID = 0.0**			*21.0 to 27.0 feet: SAND (SP); reddish-brown; 90% sand, fine to medium; 10% gravel, fine to medium, subrounded; dry to moist. (Fill)*
22									
23						**PID = 0.0**			*@ 22.5 feet: 0.2-foot layer color change to light gray. Steel debris, possibly steel shackle from a padlock.*
						PID = 0.0			
24						**PID = 0.0**			
25									
26									
27			**90%**	**CB**		**PID = 0.0**			*27.0 to 28.0 feet: NO RECOVERY.*
28	▽								*28.0 to 31.5 feet: SAND (SP); dark gray; 95% sand, fine to medium; 5% gravels, subrounded; wet. (Fill)*
29						**PID = 0.0**			
30									
31									
32						**PID = 13.5**			*31.5 to 37.0 feet: SILTY SAND to SANDY SILT (SM-ML); dark gray; 50% fines, non plastic; 50% sand, fine; organic debris, roots; moist to wet.*
33						**PID = 7.0**			*@ 31.5 feet: 0.2-foot thick layer of staining, sheen. Petroleum like odor.*
34									
35						**PID = 0.0**			
36									
37			**90%**	**CB**		**PID = 0.0**			*37.0 to 38.0 feet: NO RECOVERY.*
38									*38.0 to 41.0 feet: SANDY SILT (ML); dark gray; 60% fines, non plastic; 40% sand, fine; organic debris, wood, roots; wet.*
39									
40						**PID = 0.0**			
41									*41.0 to 47.0 feet: SILTY SAND (SM); dark gray; 25% fines, non plastic; 75% sand, fine to medium; organic debris, roots, woody debris; wet. Faint petroleum-like odor.*
42									

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▽ ***Approximate water level observed prior to well development.***

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	WS-11	3 of 11

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43						PID = 0.0			
44									
45									
46									
47			100%	CB		PID = 0.0			47.0 to 50.0 feet: SILTY SAND (SM); dark gray; 40% fines, non plastic; 60% sand, fine to medium; micaceous; organic debris; wet.
48									
49									
50						PID = 0.0			50.0 to 53.5 feet: SAND with SILT (SP-SM); dark gray; 15% fines, non plastic; 85% sand, fine to medium; micaceous; wet.
51									
52						PID = 0.0			
53									
54						PID = 0.0			53.5 to 54.0 feet: SILT (ML); dark gray; 95% fines, low to medium plasticity; 5% sand, fine; sand in pockets; micaceous; organic debris.
55									54.0 to 57.0 feet: SAND with SILT (SP-SM); dark gray; 15% fines, non plastic; 85% sand, fine to medium; micaceous; wet.
56									
57			100%	CB		PID = 0.0			57.0 to 58.0 feet: SILTY SAND (SM); dark gray; 20% fines, non plastic; 80% sand, fine to medium; micaceous; organic debris; wet.
58									58.0 to 59.0 feet: SILT (ML); dark gray; 100% fines, medium plasticity, trace fine sand in pockets; micaceous; organic debris, roots; wet.
59						PID = 0.0			59.0 to 60.0 feet: SAND with SILT (SP-SM); dark gray; 15% fines, non plastic; 85% sand, fine to medium; micaceous; wet.
60						PID = 0.0			60.0 to 64.0 feet: SILTY SAND (SM); dark gray; 20% fines, non plastic; 80% sand, fine to medium, micaceous; organic debris; wet.
61									
62			100%	CB		PID = 0.0			
63						PID = 0.0			
64									64.0 to 67.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium; micaceous, coarse mica flakes; wet.
65									

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▽ **Approximate water level observed prior to well development.**

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	**WS-11**	**4 of 11**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66						PID = 0.0			
67			100%	CB		PID = 0.0			67.0 to 67.5 feet: NO RECOVERY; sluff.
68						PID = 0.0			67.5 to 72.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine; micaceous; organic debris, roots; moist to wet.
69									
70				GW		WS11-W-72.0			@ 70.0 feet: 0.2-foot layer of silt with organic debris.
71						PID = 0.0			
72			80%	CB		PID = 0.0			72.0 to 75.0 feet: NO RECOVERY; sluff.
73									
74									
75									75.0 to 78.0 feet: SILTY SAND (SM); dark gray; 20% fines, non plastic; 80% sand, fine to medium; micaceous; wet.
76									
77									
78						PID = 0.0			78.0 to 82.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine; micaceous; wet.
79									
80						PID = 0.0			
81									
82						PID = 0.0			82.0 to 83.0 feet: SILT (ML); dark gray; 95% fines, non plastic; 5% sand, fine, sand in pockets; micaceous; organic debris, roots; moist.
83									83.0 to 84.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine; micaceous; organic debris; wet.
84									84.0 to 85.5 feet: SILTY SAND (SM); dark gray; 20% fines, non plastic; 80% sand, fine to medium; micaceous; wet.
85				GW		WS11-W-87.0			
86						PID = 0.0			85.5 to 86.0 feet: SILT (ML); dark gray; 85% fines, non plastic; 15% sand, fine, sand in pockets; micaceous; moist.
87									86.0 to 87.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 90% sand, fine; 5% organic debris, woody debris; micaceous; wet.
			100%	CB		PID = 0.0			87.0 to 87.5 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand,

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▽ ***Approximate water level observed prior to well development.***

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	WS-11	5 of 11

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88						PID = 0.0			fine; micaceous; wet.
									87.5 to 88.0 feet: SILT with SAND (ML); dark gray; 70% fines, non plastic; 30% sand, fine to medium; micaceous; organic debris; moist to wet.
89									88.0 to 92.5 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine; micaceous; wet.
90						PID = 0.0			
91									
92									
93									92.5 to 94.5 feet: SILT (ML); dark gray; 90% fines, medium plasticity; 10% sand, fine to medium, sand in pockets; micaceous; organic debris; wet.
94									
95						PID = 1.5			94.5 to 98.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine; micaceous; wet.
96									
97						PID = 1.5			
98									98.0 to 102.0 feet: SAND with SILT (SP-SM); dark gray; 15% fines, non plastic; 85% sand, fine to medium; micaceous; wet. Fines occur in nodules, up to 0.5-inches in diameter.
99									
100				GW		WS11-W-102.0			
101						PID = 4.5			
102			100%	CB		PID = 13.6			102.0 to 107.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium, red and green lithics; micaceous; wet.
103						PID = 0.0			
104									
105						PID = 0.0			@ 105.0 feet: 0.2-foot layer of SILT (ML); dark gray; 90% fines, 10% sand, fine, sand in pockets; wet.
106									@ 105.5 feet: 0.2-foot layer of SILT (ML); dark gray; 90% fines, 10% sand, fine, sand in pockets; wet.
107			90%	CB		PID = 0.0			107.0 to 108.0 feet: NO RECOVERY.
108						PID = 3.0			108.0 to 112.0 feet: SILT (ML); dark gray to greenish-gray; 100% fines, low to medium plasticity; micaceous; organic debris, roots, leaves; wet.
109									Visible sheen on water in soil core bag.
110									

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▽ **Approximate water level observed prior to well development.**

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	WS-11	6 of 11

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
111						PID = 3.1			
112									112.0 to 118.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium, red and green lithics; micaceous; wet.
113						PID = 0.0			
114									
115				GW		WS11-W-117.0			
116						WS11-W-DUP PID = 3.1			@ 116.0 feet: 0.1-foot layer of SILT (ML).
117			100%	CB		PID = 3.1			
118						PID = 6.2			118.0 to 118.5 feet: SILTY SAND (SM); dark gray; 20% fines, non plastic; 80% sand, fine to medium; wet. Strong odor, visible sheen on soil.
119									118.5 to 119.5 feet: SILT (ML); dark gray; 95% fines, low to medium plasticity; 5% sand, fine to medium; wet. Faint odor.
120						PID = 0.0			119.5 to 119.7 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium, red and green lithics; micaceous; wet.
121									119.7 to 120.0 feet: SILT (ML); dark gray; 95% fines, low to medium plasticity; 5% sand, fine to medium; micaceous; wet.
122									120.0 to 122.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium, red and green lithics; micaceous; wet.
123						PID = 0.0			122.0 to 123.0 feet: SILT (ML); dark gray; 95% fines, low to medium plasticity; 5% sand, fine to medium; micaceous; wet.
124									123.0 to 127.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium, red and green lithics; micaceous; wet.
125						PID = 0.0			
126									
127			100%	CB		PID = 0.0			127.0 to 128.0 feet: SILTY SAND (SM); dark gray; 20% fines, non plastic; 80% sand, fine to medium, red and green lithics; wet.
128									128.0 to 132.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium, red and green lithics; micaceous; wet.
129									
130				GW		WS11-W-132.0			@ 130.0 feet: 0.3-foot layer of SILT (ML); dark gray; organic debris.
131						PID = 0.0			
132			100%	CB		PID = 0.0			132.0 to 137.0 feet: SAND (SP); dark gray with white speckles, salt and

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▽ ***Approximate water level observed prior to well development.***

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	WS-11	7 of 11

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
133						PID = 0.0			pepper look; 5% fines, non plastic; 95% sand, medium; micaceous; wet.
134									
135						PID = 0.0			
136									
137			70%	CB		PID = 0.0			137.0 to 140.0 feet: NO RECOVERY.
138									
139									
140						PID = 0.0			140.0 to 146.5 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, medium, dark green and red lithics; micaceous; wet.
141									
142									
143						PID = 0.0			
144									
145				GW		WS11-W-147.0			
146						PID = 0.0			
147			100%	CB		PID = 0.0			146.5 to 147.0 feet: SILT (ML); dark gray; 95% fines, low to medium plasticity; 5% sand, fine to medium, sand in pockets; micaceous; wet.
148						PID = 0.0			147.0 to 150.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, medium, dark green and red lithics; micaceous; wet.
149									
150						PID = 0.0			150.0 to 152.0 feet: SILT with SAND (ML); dark gray; 70% fines, low to medium plasticity; 30% sand, fine to medium, sand in pockets; micaceous; organic debris; wet.
151									
152									152.0 to 153.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, medium, dark green and red lithics; micaceous; wet.
153						PID = 0.0			153.0 to 153.5 feet: SILT with SAND (ML); dark gray; 70% fines, low to medium plasticity; 30% sand, fine to medium, sand in pockets; micaceous; organic debris; wet.
154									153.5 to 157 feet: SAND with SILT (SP-SM); dark gray; 15% fines, non plastic; 85% sand, fine to medium, red and green lithics; organic debris; wet. Fines occur in chunks or balls.
155									

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.

▽ ***Approximate water level observed prior to well development.***

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	WS-11	8 of 11

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
156						PID = 0.0			
157			100%	CB		PID = 0.0			@ 157.0 feet: 0.2-foot layer of SILT (ML).
158									157.2 to 160.0 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, medium, green and red lithics; wet.
159									
160						PID = 0.0			160.0 to 161.0 feet: SILT with SAND (ML); dark gray; 70% fines, low to medium plasticity; 30% sand, fine to medium; wet.
161									161.0 to 164.0 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, medium, green and red lithics; wet.
162									@162.0 feet: 0.3-foot layer of SILT (ML).
163						PID = 0.0			@162.8 feet: 0.3-foot layer of SILT (ML).
164									164.0 to 165.0 feet: SILT (ML); dark gray to greenish-gray; 90% fines, low to medium plasticity; 10% sand, fine, sand in pockets; organic debris; wet.
165				GW		WS11-W-167.0			165.0 to 165.5 feet: SANDY SILT (ML); dark gray to greenish gray; 60% fines, non plastic; 40% sand, fine; wet.
166						PID = 0.0			165.5 to 167.0 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, medium, green and red lithics; wet.
167			80%	CB		PID = 0.0			167.0 to 169.0 feet: NO RECOVERY.
168									
169									169.0 to 170.5 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, fine, green and red lithics; wet.
170						PID = 0.0			
171									170.5 to 171 feet: SILTY SAND (SM); dark gray; 20% fines, low plasticity; 80% sand, fine; wet.
172									171.0 to 174.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium, dark green and red lithics; wet.
173						PID = 0.0			
174									174.0 to 174.5 feet: SILT (ML); dark gray to greenish-gray; 90% fines, medium plasticity; 10% sand, fine, sand in pockets; wet.
175						PID = 0.0			174.5 to 179.0 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, fine to medium, green and red lithics; wet.
176									
177			100%	CB		PID = 0.0			

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▽ ***Approximate water level observed prior to well development.***

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	WS-11	9 of 11

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
178						PID = 0.0			
179									179.0 to 182.0 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 100% sand, medium, green and red lithics; wet.
180				GW		WS11-W-182.0			
181						PID = 0.0			
182									
183			100%	CB		PID = 0.0			182.0 to 187.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine, red lithics; wet.
184						PID = 0.0			
185						PID = 0.0			
186									
187									
188			90%	CB		PID = 0.0			187.0 to 188.0 feet: NO RECOVERY.
189									188.0 to 195.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine, red lithics; wet.
190						PID = 0.0			
191									
192									
193						PID = 0.0			
194									
195				GW		WS11-W-197.0			195.0 to 195.5 feet: SILT (ML); dark gray to greenish-gray; 95% fines, low plasticity; 5% sand, fine, sand in pockets; organic debris, roots, leaves; wet.
196						PID = 0.0			195.5 to 201.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium, red lithics; wet.
197									
198			40%	CB		PID = 0.0			
199									
200									

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.

▽ **Approximate water level observed prior to well development.**

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	**WS-11**	**10 of 11**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
201						**PID = 0.0**			
202						**PID = 0.0**			*201.0 to 204.5 feet: SILTY GRAVEL (GM); dark gray; 15% fines, non plastic; 85% gravel, fine to coarse, subrounded to rounded; wet.*
203									
204				**GW**		**WS11-206.0**			
205									*204.5 to 207.0 feet: BASALT; light gray to dark gray; moist to wet; bedrock. (Columbia River Basalt Group) Significant increase in resistance, drilling hardness.*
206									
207									

Total Depth = 207.0 feet below ground surface.

WS11 Completion Details

Oregon Water Resources Department Well Start Card Number: W147655
Oregon Water Resources Department Well Identification Number: L67076

Boring:
0.0 to 58.0 feet bgs: 9-inch temporary, threaded steel, isolation casing.
0.0 to 137.0 feet bgs: 8-inch temporary, threaded steel, isolation casing.
0.0 to 58.0 feet bgs: 7-inch temporary, threaded steel, isolation casing.
0.0 to 207.0 feet bgs: 6-inch temporary, threaded steel, isolation casing.
0.0 to 207.0 feet bgs: 4x6-inch core barrel sampler.

0.0 to 1.5 feet bgs: flush mount vault and cement seal.
1.5 to 5.0 feet bgs: 3/8-inch Baroid bentonite chips hydrated with potable water.
5.0 to 102.0 feet bgs: bentonite grout slurry, 10.0 pounds per gallon.
102.0 to 104.0 feet bgs: non-acetone coated, 3/8-inch bentonite chips hydrated with potable water.
104.0 to 106.0 feet bgs: 20x40 washed Colorado silica sand, secondary filter pack.
106.0 to 124.0 feet bgs: 10x20 washed Colorado silica sand, primary filter pack.
124.0 to 126.0 feet bgs: non-acetone coated, 3/8-inch bentonite chips hydrated with potable water.
126.0 to 139.0 feet bgs: bentonite grout slurry, 10.3 pounds per gallon.
139.0 to 140.0 feet bgs: non-acetone coated, 3/8-inch bentonite chips hydrated with potable water.
140.0 to 142.0 feet bgs: 20x40 washed Colorado silica sand, secondary filter pack.
142.0 to 161.0 feet bgs: 10x20 washed Colorado silica sand, primary filter pack.
161.0 to 207.0 feet bgs: non-acetone coated, 3/8-inch bentonite chips hydrated with potable water.

Well WS11-125:
0.0 to 109.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe.
109.0 to 124.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-slot.
124.0 to 125.0 feet bgs: 2-inch diameter, stainless steel sump.

NOTES: *1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.*

▽ ***Approximate water level observed prior to well development.***

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Maul Foster & Alongi, Inc.	Geologic Borehole Log/Well Construction		
	Project Number **8128.01.06**	Well Number **WS-11**	Sheet **11 of 11**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description

Well WS11-161:
0.0 to 145.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe.
145.0 to 160.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-slot.
160.0 to 161.0 feet bgs: 2-inch diameter, stainless steel sump.

NOTES: *1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.*

▽ ***Approximate water level observed prior to well development.***

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	WS-12	1 of 11

Project Name	Wacker Siltronic Corporation	TOC Elevation (feet NGVD)	32.7730
Project Location	7200 Northwest Front Avenue, Portland Oregon 97210	Surface Elevation (feet NGVD)	33.1270
Start/End Date	9/6/2003 to 9/21/03	Northing	7624836.8
Driller/Equipment	Prosonic Corporation/Rotosonic	Easting	704998.8
Geologist/Engineer	Tony Silva	Hole Depth	207.0-feet
Sample Method	4x6 Core Barrel	Outer Hole Diam	9.0/6.0-inch

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1			100%	CB		PID = 0.0			0.0 to 0.5 feet: TOPSOIL, GRAVELLY SILT (ML); dark gray to black; 60% fines, non to low plasticity; 40% gravel, medium to coarse, subrounded; organic debris, rootlets, woody debris; moist.
2									0.5 to 13.0 feet: SAND (SP); grayish-brown to light brown; 100% sand, medium; trace gravel, fine, subrounded; dry. (Fill)
3						PID = 0.0			
4									
5						PID = 0.0			
6			100%	CB					
7									
8						PID = 0.0			
9									
10						PID = 0.0			
11									
12									
13						PID = 0.0			13.0 to 13.5 feet: SAND (SP); dark black; 90% sand, fine to medium; 10% fines, non plastic; dry to moist. Stained dark black luster; slight petroleum-like odor. Three-inch long piece of rubber like material. (Fill)
14									13.5 to 15.5 feet: SAND (SP); grayish-brown to light brown; 100% sand, medium; trace gravel, fine, subrounded; moist. (Fill)
15						PID = 0.0			
16									15.5 to 17.0 feet: SAND (SP); dark gray to black; 100% sand, medium; trace gravel, fine, subrounded; moist to wet. Stained dark black luster; petroleum-like odor. (Fill)
17			90%	CB		PID = 87.0			17.0 to 18.0 feet: NO RECOVERY; sluff.
18									18.0 to 20.0 feet: SAND (SP); dark gray to black; 90% sand, medium; 10% fines, non plastic; moist. Stained dark black luster; petroleum-like odor. (Fill)
19									
20									

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▽ **Approximate water level observed prior to well development.**

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	WS-12	2 of 11

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21						PID = 84.1			20.0 to 27.0 feet: SAND (SP); light to dark gray; 100% sand, medium; trace gravel, fine, well rounded; moist. Stained dark black luster; petroleum-like odor. (Fill)
22						PID = 78.0			
23									
24						PID = 58.5			
25									
26									
27			70%	CB		PID = 4.8			27.0 to 30.0 feet: NO RECOVERY; sluff.
28									
29									
30	▽					PID = 9.7			30.0 to 31.5 feet: SILTY SAND to SANDY SILT (SM-ML); grayish-brown; wet. (Fill)
31									
32						PID = 4.0			31.5 to 33.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 90% sand, medium to coarse; 5% gravel, fine, subrounded; trace rootlets; wet. Petroleum-like odor. (Fill)
33									33.0 to 34.5 feet: SILTY SAND to SANDY SILT (SM-ML); grayish-brown; wet. (Fill)
34						PID = 0.0			
35									34.5 to 37.0 feet: SAND (SP); dark gray; 10% fines, non plastic; 85% sand, medium; 5% gravel, fine, subrounded; wet. Slight petroleum-like odor. (Fill)
36									
37			100%	CB					37.0 to 40.0 feet: SILT (ML); light gray; 90% fines, low plasticity; 10% sand, fine; micaceous; organic debris; wet.
38									
39									
40						PID = 0.0			40.0 to 42.0 feet: SILTY SAND (SM); dark gray; 15% fines, non plastic; 85% sand, fine to medium; micaceous; wet.
41									
42						PID = 0.0			42.0 to 44.0 feet: SILT (ML); dark gray; 100% fines, medium plasticity;

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▽ ***Approximate water level observed prior to well development.***

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	**WS-12**	**3 of 11**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43									organic debris, roots; wet.
44						PID = 0.0			44.0 to 47.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium; micaceous; wet.
45									
46									
47			100%	CB		PID = 0.0			47.0 to 48.0 feet: NO RECOVERY; sluff.
48						PID = 0.0			48.0 to 51.0 feet: SILT (ML); greenish-gray; 90% fines, medium plasticity; 10% sand, fine; micaceous; organic debris, roots, weeds; moist.
49									
50						PID = 0.0			
51									51.0 to 52.5 feet: SILTY SAND (SM); greenish-gray to gray; 30% fines, non plastic; 70% sand, fine to medium; micaceous; organic debris; moist to wet.
52						PID = 0.0			
53									52.5 to 54.5 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium; micaceous; moist to wet.
54									
55									54.5 to 55.0 feet: SILT (ML); greenish-gray; 100% fines, low to medium plasticity; micaceous; organic debris; moist.
56						PID = 0.0			55.0 to 57.0 feet: SAND (SP); dark gray; 15% fines, non plastic; 85% sand, fine to medium; micaceous; organic debris; moist to wet.
57			100%	CB		PID = 0.0			57.0 to 59.0 feet: SILTY SAND (SM); dark gray; 25% fines, non plastic; 75% sand, fine to medium; micaceous; wet.
58									
59									59.0 to 62.0 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, fine to medium; micaceous; wet.
60						PID = 0.0			
61									
62						PID = 0.0			62.0 to 63.5 feet: SILT (ML); dark gray to greenish-gray; 100% fines, medium plasticity; micaceous; organic debris, roots, weeds; moist to wet.
63									
64									63.5 to 65.5 feet: SILTY SAND (SM); dark gray; 20% fines, non plastic; 80% sand, fine to medium; micaceous; wet.
65									

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.

▽ ***Approximate water level observed prior to well development.***

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	**WS-12**	**4 of 11**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66						PID = 0.0			65.5 to 66.5 feet: SILT (ML); dark gray to greenish-gray; 100% fines, medium plasticity; micaceous; organic debris, roots, weeds; moist to wet.
67			100%	CB		PID = 0.0			66.5 to 67.5 feet: SILTY SAND (SM); dark gray; 30% fines, low plasticity; 70% sand, fine to medium; micaceous; wet.
68						PID = 0.0			67.5 to 68.0 feet: SILT (ML); dark gray; 90% fines, medium plasticity; 10% sand, fine; micaceous; organic debris; wet.
69									68.0 to 70.0 feet: SILTY SAND (SM); dark gray; 30% fines, non to low plasticity; 70% sand, fine to medium; micaceous; wet.
70						PID = 0.0			70.0 to 71.5 feet: SILT (ML); dark gray; 100% fines; micaceous; organic debris; moist to wet.
71									
72						PID = 0.0			71.5 to 77.0 feet: SAND (SP); dark gray; 15% fines, non plastic; 85% sand, fine to medium; micaceous; organic debris; wet.
73									
74									
75						PID = 0.0			
76									
77			100%	CB		PID = 0.0			77.0 to 81.0 feet: SAND with SILT (SP-SM); dark gray with white speckles, salt and pepper look; 20% fines, non plastic; 80% sand, fine to medium; micaceous; wet.
78						PID = 0.0			
79									
80						PID = 0.0			
81									81.0 to 82.5 feet: SILT (ML); dark gray to greenish gray; 95% fines, medium plasticity; 5% sand, fine; micaceous; organic debris, roots; moist.
82						PID = 8.9			
83									82.5 to 83.0 feet: SANDY SILT (ML-SM); dark gray; 70% fines, low plasticity; 30% sand, fine; micaceous; organic debris, roots; moist to wet.
84									83.0 to 84.0 feet: SILT (ML); dark gray to greenish gray; 95% fines, medium plasticity; 5% sand, fine; micaceous; organic debris, roots; moist.
85						PID = 0.0			84.0 to 86.0 feet: SILTY SAND (SM); dark gray; 30% fines, low plasticity; 70% sand, fine to medium; micaceous; moist to wet.
86									
87									86.0 to 87.0 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 10% fines, non plastic; 90% sand, fine to medium; micaceous; moist to wet.
			100%	CB		PID = 4.3			87.0 to 88.0 feet: SILTY SAND (SM); dark gray with white speckles, salt and

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▽ ***Approximate water level observed prior to well development.***

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	WS-12	5 of 11

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88						PID = 13.0			pepper look; 10-15% fines, non plastic; 85-90% sand, fine to medium; micaceous; moist to wet.
89									88.0 to 88.5 feet: SILT (ML); dark gray; 95% fines, medium plasticity; 5% sand, fine; micaceous; moist.
									88.5 to 89.0 feet: SILTY SAND (SM); dark gray with white speckles, salt and pepper look; 10-15% fines, non plastic; 85-90% sand, fine to medium; micaceous; moist to wet.
90						PID = 13.0			89.0 to 90.0 feet: SANDY SILT (ML); dark gray; 70% fines, low plasticity; 30% sand, fine to medium; micaceous; organic debris; moist.
91									90.0 to 91.0 feet: SAND with SILT (SP-SM); dark gray with white speckles, salt and pepper look; 10-15% fines, non plastic; 85-90% sand, fine to medium; micaceous; moist to wet.
92						PID = 13.0			91.0 to 92.0 feet: SILT (ML); dark gray; 90% fines, medium plasticity; 10% sand, fine to medium, sand in pockets; micaceous; moist.
93									92.0 to 92.5 feet: SANDY SILT (ML); dark gray; 70% fines, low plasticity; 30% sand, fine to medium; micaceous; organic debris; moist.
									92.5 to 97.0 feet: SAND and SILT (SP-ML); alternating 0.5-foot thick layers.
94									SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium; micaceous; wet.
									SILT (ML); dark gray; 90% fines, low to medium plasticity; 10% sand, fine; micaceous; moist to wet.
95						PID = 0.0			
96									
97			100%	CB		PID = 0.0			97.0 to 102.0 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, fine to medium; micaceous; wet.
98				GW		WS12-W-100.0			
99						PID = 0.0			
100						PID = 0.0			
101									
102									102.0 to 102.6 feet: SAND and SILT (SP-ML); alternating 0.2-foot thick layers.
103						PID = 0.0			SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium; micaceous; wet.
									SILT (ML); dark gray; 90% fines, low to medium plasticity; 10% sand, fine; micaceous; moist to wet.
104									102.6 to 103.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium; micaceous; wet.
105						PID = 0.0			103.0 to 107.0 feet: SAND and SILT (SP-ML); alternating 0.2-foot thick layers.
106									SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium; micaceous; wet.
									SILT (ML); dark gray; 90% fines, low to medium plasticity; 10% sand, fine; micaceous; moist to wet.
107			80%	CB		PID = 0.0			107.0 to 108.0 feet: NO RECOVERY.
108						PID = 0.0			108.0 to 109.0 feet: SANDY SILT (ML); dark gray; 70% fines, non plastic; 30% sand, fine to medium; micaceous; wet.
109									109.0 to 110.5 feet: SILTY SAND (SM); dark gray with white speckles, salt and pepper look; 30% fines, non plastic; 70% sand, fine to medium; micaceous; wet.
110									

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.

▽ ***Approximate water level observed prior to well development.***

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	WS-12	6 of 11

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
111						PID = 0.0			110.5 to 112.0 feet: SILT (ML); dark gray; 100% fines, medium plasticity; micaceous; organic debris; moist.
112						PID = 0.0			112.0 to 115.5 feet: SAND (SP); dark gray; 10% fines, non plastic; 90% sand, fine to medium; micaceous; moist to wet.
113									
114									
115				GW		WS12-W-117.0			
116						PID = 0.0			115.5 to 116.0 feet: SILT (ML); dark gray; 100% fines, low to medium plasticity; micaceous; organic debris, roots; moist.
117			100%	CB		PID = 0.0			116.0 to 119.5 feet: SAND (SP); dark gray; 10% fines, non plastic; 90% sand, fine to medium; micaceous; moist to wet.
118									
119									
120						PID = 0.0			119.5 to 120.5 feet: SILT (ML); greenish-gray to dark gray; 90% fines, low plasticity; 10% sand, fine to medium, sand in lenses; micaceous; organic debris; moist.
121									120.5 to 121.5 feet: SILTY SAND (SM); dark gray; 30% fines, non plastic; 70% sand, fine to medium; micaceous; moist.
122						PID = 0.0			121.5 to 124.5 feet: SILT (ML); greenish-gray; 95% fines, medium plasticity; 5% sand, fine, sand in pockets; micaceous; organic debris; moist. @ 122.0 feet: 0.2-foot layer of SAND (SP).
123									
124									
125						PID = 0.0			124.5 to 126.5 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 10% fines, non plastic; 90% sand, fine to medium; micaceous; moist.
126									
127			100%	CB		PID = 0.0			126.5 to 127.0 feet: SILT (ML); dark gray; 95% fines, medium plasticity; 5% sand, fine, sand in pockets; micaceous; organic debris; moist. 127.0 to 128.0 feet: SILTY SAND (SM); dark gray; 20% fines, non plastic; 80% sand, fine to medium; micaceous; moist.
128									128.0 to 129.5 feet: SILT (ML); dark gray; 95% fines, low to medium plasticity; 5% sand, fine, sand in pockets; micaceous; organic debris; moist.
129									
130				GW		WS12-W-132.0			129.5 to 134.0 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, fine to medium; micaceous; moist to wet.
131						PID = 0.0			
132			100%	CB		PID = 0.0			

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▽ **Approximate water level observed prior to well development.**

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	**WS-12**	**7 of 11**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
133									
134						**PID = 0.0**			*134.0 to 135.5 feet: SANDY SILT (ML); dark gray; 70% fines, non plastic; 30% sand, fine; micaceous; wet.*
135									
136						**PID = 0.0**			*135.5 to 137.0 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 10% fines, non plastic; 90% sand, fine to medium; micaceous; wet.*
137									
138						**PID = 0.0**			*137.0 to 141.0 feet: SANDY SILT (ML); dark gray; 60% fines, low plasticity; 40% sand, fine to medium, sand in concentric layers; micaceous; wet.*
139									
140						**PID = 0.0**			
141									
142						**PID = 0.0**			*141.0 to 144.0 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 10% fines, non plastic; 90% sand, fine to medium; micaceous; wet.*
143									
144									*144.0 to 145.5 feet: SILT (ML); dark gray; 95% fines, medium plasticity; 5% sand, fine to medium, sand in lenses; micaceous; organic debris, roots, shell fragments; moist.*
145				**GW**		**WS12-W-147.0**			
146						**PID = 0.0**			*145.5 to 147.0 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 10% fines, non plastic; 90% sand, fine to medium; micaceous; wet.*
147			**90%**	**CB**		**PID = 0.0**			*147.0 to 148.0 feet: NO RECOVERY; sluff.*
148						**PID = 0.0**			*148.0 to 157.0 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 10% fines, non plastic; 90% sand, fine to medium; micaceous; wet. Flowing sands. Silt layers >0.1-foot thick.*
149									
150						**PID = 0.0**			
151									
152						**PID = 0.0**			
153									
154									
155									

NOTES: *1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.*

▽ ***Approximate water level observed prior to well development.***

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	WS-12	8 of 11

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
156						PID = 0.0			
157			100%	CB		PID = 0.0			157.0 to 157.5 feet: SILT (ML); greenish-gray; 95% fines, medium plasticity; 5% sand, fine, sand in pockets; micaceous; organic debris; moist.
158						PID = 0.0			157.5 to 160.0 feet: SAND with SILT (SP-SM); dark gray with white speckles, salt and pepper look; 10-15% fines, non plastic; 85-90% sand, fine to medium; micaceous; wet.
159									
160						PID = 0.0			160.0 to 161.0 feet: SILT with SAND (ML); greenish-gray; 70% fines, low plasticity; 30% sand, fine to medium; micaceous; moist to wet.
161									161.0 to 163.0 feet: SILT (ML); greenish-gray; 100% fines, medium plasticity; trace sand, fine; micaceous; organic debris; moist.
162						PID = 0.0			
163									163.0 to 163.5 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, fine to medium; micaceous; wet.
164				GW		WS12-W-166.0			163.5 to 164.5 feet: SILT (ML); greenish-gray; 100% fines, medium plasticity; trace sand, fine; micaceous; organic debris; moist.
165						PID = 0.0			164.5 to 165.5 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, fine to medium; micaceous; wet.
166									165.5 to 166.0 feet: SILT (ML); greenish-gray; 100% fines, medium plasticity; trace sand, fine; micaceous; organic debris; moist.
167									166.0 to 166.5 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, fine to medium; micaceous; wet.
168			100%	CB		PID = 0.0			166.5 to 167.0 feet: SILT (ML); greenish-gray; 100% fines, medium plasticity; trace sand, fine; micaceous; organic debris; moist.
169						PID = 0.0			167.0 to 168.0 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, fine to medium; micaceous; wet.
170									168.0 to 169.0 feet: SILTY SAND (SM); greenish-gray; 30% fines, non plastic; 70% sand, fine to medium; micaceous; wet.
171						PID = 0.0			169.0 to 170.0 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, fine to medium; micaceous; wet.
172									170.0 to 170.5 feet: SILT (ML); greenish-gray; 95% fines, low to medium plasticity; 5% sand, fine, sand in lenses; micaceous; organic debris; moist.
173						PID = 0.0			170.5 to 172.0 feet: SILTY SAND (SM); greenish-gray; 40% fines, low to medium plasticity; 60% sand, fine to medium; micaceous; wet.
174									172.0 to 174.0 feet: SILT (ML); greenish-gray; 95% fines, low to medium plasticity; 5% sand, fine, sand in lenses; micaceous; organic debris; moist.
175									@ 173.0 feet: 0.2-foot layer of SAND (SP).
176						PID = 0.0			174.0 to 175.0 feet: SILTY SAND (SM); greenish-gray; 40% fines, low to medium plasticity, fines occur in nodules; 60% sand, fine to medium; micaceous; wet.
177									175.0 to 175.5 feet: SILT with SAND (ML); dark gray; 80% fines, low plasticity; 20% sand, fine to medium; micaceous; wet.
									175.5 to 178.5 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, fine to medium; micaceous; wet.
									@ 176.5 feet: 0.2-foot layer of SILT (ML).

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.

▽ **Approximate water level observed prior to well development.**

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	WS-12	9 of 11

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
178						PID = 0.0			
179									178.5 to 179.5 feet: SILT with SAND (ML); dark gray; 80% fines, low plasticity; 20% sand, fine to medium; micaceous; wet.
180				GW		WS12-W-182.0			179.5 to 182.0 feet: SILTY SAND (SM); greenish-gray; 40% fines, low to medium plasticity, fines occur in nodules; 60% sand, fine to medium; micaceous; wet.
181						PID = 0.0			
182			80%	CB		PID = 0.0			182.0 to 185.0 feet: NO RECOVERY; sluff.
183									
184									
185						PID = 0.0			185.0 to 186.0 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, fine to medium; micaceous; wet.
186									186.0 to 188.5 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 10% fines, non plastic, fines occur in nodules; 90% sand, fine to medium; micaceous; wet.
187						PID = 0.0			
188									
189									188.5 to 191.0 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, fine; micaceous; wet. @ 189.0 feet: 0.2-foot layer of SILT (ML).
190						PID = 0.0			
191									@ 191.0 feet: 0.2-foot layer of SILT (ML).
192						PID = 0.0			191.2 to 197.0 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, fine to medium; micaceous; wet.
193									
194									
195				GW		WS12-W-197.0			
196						PID = 0.0			
197			80%	CB		PID = 0.0			197.0 to 199.0 feet: NO RECOVERY; sluff.
198									
199									199.0 to 201.5 feet: SAND (SP); light brown; trace fines; 100% sand, fine to medium; wet.
200									

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.

▽ ***Approximate water level observed prior to well development.***

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	**WS-12**	**10 of 11**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
201						PID = 0.0			
202						PID = 0.0			201.5 to 202.0 feet: SAND (SP); dark gray; trace fines; 100% sand, medium; wet.
203						PID = 0.0			202.0 to 203.0 feet: SILT (ML); greenish-gray; 95% fines, low plasticity; 5% sand, fine to medium, sand in pockets; organic debris; moist to wet.
				GW		WS12-W-205.0			203.0 to 206.0 feet: SAND (SP); reddish-brown; trace fines; 100% sand, fine to medium; wet.
204						PID = 0.0			
				GW		WS12-W-206.0			
205									
206									
207						PID = 0.0			206.0 to 206.5 feet: GRAVEL (GP); light gray; 10% fines, non plastic; 90% gravel, medium to coarse, subangular to subrounded; wet.
									206.5 to 207.0 feet: BASALT; light gray to dark gray; dry to wet; bedrock. Significant increase in resistance, drilling hardness. (Columbia River Basalt Group)

Total Depth = 207.0 feet below ground surface.

WS12 Completion Details

Oregon Water Resources Department Well Start Card Number: W147654
Oregon Water Resources Department Well Identification Number: L671000

Boring:
0.0 to 42.0 feet bgs: 9-inch temporary, threaded steel, isolation casing.
0.0 to 168.0 feet bgs: 8-inch temporary, threaded steel, isolation casing.
0.0 to 42.0 feet bgs: 7-inch temporary, threaded steel, isolation casing.
0.0 to 207.0 feet bgs: 6-inch temporary, threaded steel, isolation casing.
0.0 to 207.0 feet bgs: 4x6-inch core barrel sampler.

0.0 to 1.5 feet bgs: flush mount vault and cement seal.
1.5 to 5.0 feet bgs: 3/8-inch Baroid bentonite chips hydrated with potable water.
5.0 to 101.5 feet bgs: bentonite grout slurry, 9.9 pounds per gallon.
101.5 to 104.0 feet bgs: non-acetone coated, 3/8-inch bentonite chips hydrated with potable water.
104.0 to 106.0 feet bgs: 20x40 washed Colorado silica sand, secondary filter pack.
106.0 to 125.0 feet bgs: 10x20 washed Colorado silica sand, primary filter pack.
125.0 to 139.0 feet bgs: bentonite grout slurry, 10.0 pounds per gallon.
139.0 to 140.0 feet bgs: non-acetone coated, 3/8-inch bentonite chips hydrated with potable water.
140.0 to 142.0 feet bgs: 20x40 washed Colorado silica sand, secondary filter pack.
142.0 to 161.0 feet bgs: 10x20 washed Colorado silica sand, primary filter pack.
161.0 to 207.0 feet bgs: coated, 3/8-inch bentonite chips hydrated with potable water.

Well WS12-125:
0.0 to 109.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe.
109.0 to 124.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-slot.
124.0 to 125.0 feet bgs: 2-inch diameter, stainless steel sump.

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.

▽ ***Approximate water level observed prior to well development.***

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Maul Foster & Alongi, Inc.	Geologic Borehole Log/Well Construction		
	Project Number **8128.01.06**	Well Number **WS-12**	Sheet **11 of 11**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description

Well WS12-161:
0.0 to 145.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe.
145.0 to 160.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-slot.
160.0 to 161.0 feet bgs: 2-inch diameter, stainless steel sump.

NOTES: *1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.*

▽ ***Approximate water level observed prior to well development.***

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	**WS13**	**1 of 11**

Project Name	**Wacker Siltronic Corporation**	TOC Elevation (feet NGVD)	**33.1500**
Project Location	**7200 Northwest Front Avenue, Portland Oregon 97210**	Surface Elevation (feet NGVD)	**33.4250**
Start/End Date	**10/3/03 to 10/11/03**	Northing	**7624575.1**
Driller/Equipment	**Prosonic Corporation/Rotosonic**	Easting	**704633.3**
Geologist/Engineer	**Tony Silva**	Hole Depth	**207.0-feet**
Sample Method	**4x6 Core Barrel**	Outer Hole Diam	**9.0/6.0-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1									0.0 to 0.2 feet: ASPHALT. 0.2 to 5.0 feet: SAND (SP); light brown; 10% fines, non plastic; 80% sand, fine; 20% gravel, fine to medium, subrounded; moist. (Fill) ** Lithology for 0.0 to 25.0 feet below ground surface from Geoprobe boring GP9 drilled on 07/17/03. GP9 is approximately 10 feet west of WS13.
2									
3									
4									
5									
6									5.0 to 10.0 feet: SAND (SP); dark brown to light gray; 10% fines, non plastic; 80% sand, fine; 20% gravel, fine to medium, subrounded; moist. (Fill)
7									
8									
9									
10									
11									10.0 to 15.0 feet: GRAVEL (GP); light gray; trace fines; 10% sand, fine; 90% gravel, fine, well rounded; moist. (Fill)
12									
13									
14									
15									
16									15.0 to 24.0 feet: SAND (SP); dark gray grading to black; 10% fines, non plastic; 90% sand, fine; 10% gravel, fine, subrounded; organic debris, roots; wet. (Fill)
17									
18									
19									
20									

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.

▽ **Approximate water level observed prior to well development.**

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	**WS13**	**2 of 11**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21									
22									
23									
24									24.0 to 25.0 feet: SILT (ML); dark gray; 100% fines, medium plasticity; organic debris, roots; moist.
25									24.0 to 25.0 feet: Not sampled.
26			**100%**	**CB**					26.0 to 30.5 feet: SILTY CLAY to CLAYEY SILT (CL-ML); light gray with dark orangish-red mottling; 100% fines, medium to high plasticity; micaceous; wet.
27	▽								
28						**PID = 9.3**			
29									
30						**PID = 9.3**			
31									30.5 to 34 feet: CLAYEY SILT (ML); light gray with light orangish-red mottling; 100% fines, medium to high plasticity; micaceous; organic debris, roots; wet.
32									
33						**PID = 12.0**			
34									34.0 to 37.0 feet: SILT (ML); greenish-gray with light brown mottling; 85% fines, medium plasticity; 15% sand, fine; micaceous; wet.
35						**PID = 14.6**			
36									
37			**100%**	**CB**		**PID = 12.0**			37.0 to 39.0 feet: SILT with SAND (ML-SM); brownish gray; 70% fines, medium plasticity; 30% sand, fine; micaceous; moist to wet.
38						**PID = 0.0**			
39									39.0 to 42.0 feet: SILTY CLAY to CLAYEY SILT (CL-ML); light gray; 100% fines, medium to high plasticity; micaceous; moist.
40						**PID = 0.0**			
41									
42									42.0 to 43.5 feet: SANDY SILT (ML); light gray; 60% fines, low to medium

NOTES: *1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.*

▽ ***Approximate water level observed prior to well development.***

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	**WS13**	**3 of 11**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43						PID = 0.0			plasticity; 40% sand, fine; micaceous; moist to wet.
44									43.5 to 45.0 feet: SILT with SAND (ML); light gray; 70% fines, medium plasticity; 30% sand, fine; micaceous; moist to wet.
45						PID = 0.0			45.0 to 48.0 feet: SILTY SAND (SM); dark gray to blackish-gray; 40% fines, low plasticity; 60% sand, fine; wet.
46									
47			100%	CB		PID = 4.0			
48						PID = 6.0			48.0 to 49.5 feet: SILT (ML); greenish gray; 90% fines, non to low plasticity; 10% sand, fine, sand in pockets; micaceous; moist.
49									
50						PID = 9.3			49.5 to 51.5 feet: SAND (SP); light gray; 10% fines, non plastic; 90% sand, fine; micaceous; most to wet.
51									
52									51.5 to 54.0 feet: SANDY SILT (ML); light gray; 60% fines, low to medium plasticity; 40% sand, fine; micaceous; wet.
53						PID = 25.0			
54									54.0 to 55.5 feet: SAND with SILT (SP-SM); dark gray; 15% fines, non to low plasticity; 85% sand, fine; wet.
55						PID = 49.0			
56									55.5 to 56.0 feet: SILT (ML); brownish gray; 100% fines, medium plasticity; micaceous; organic debris; moist.
									56.0 to 57.0 feet: SAND (SP); dark gray; 10% fines, non plastic; 90% sand, fine to medium; micaceous; wet.
57			100%	CB		PID = 1.3			57.0 to 58.0 feet: SILT (ML); greenish-gray; 90% fines, low plasticity; 10% sand, fine; micaceous; organic debris; crumbles and breaks apart; dry to moist.
58						PID = 0.0			58.0 to 60.0 feet: SILT with SAND (ML); greenish-gray; 75% fines, low to medium plasticity; 25% sand, fine; micaceous; moist to wet.
59									
60						PID = 0.0			60.0 to 62.5 feet: SANDY SILT (ML); greenish-gray; 60% fines, low plasticity; 40% sand, fine; micaceous; organic debris; wet.
61									
62									
63						PID = 0.0			62.5 to 67.0 feet: SAND (SP); greenish-gray to light gray; 15% fines, non plastic; 85% sand, fine; micaceous; wet.
64									
65									

NOTES: *1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.*

▽ ***Approximate water level observed prior to well development.***

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	WS13	4 of 11

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66						PID = 12.0			
67			100%	CB		PID = 0.0			67.0 to 68.0 feet: SAND with SILT (SP-SM); light gray; 20% fines, non plastic; 80% sand, fine; micaceous; organic debris; wet.
68						PID = 0.0			68.0 to 69.0 feet: SILT with SAND (ML); light gray; 80% fines, low to medium plasticity; 20% sand, fine; micaceous; organic debris; wet.
69									69.0 to 69.5 feet: SILT (ML); greenish-gray; 90% fines, medium plasticity; 10% sand, fine; micaceous; organic debris, pieces of black wood; moist to wet.
70				GW		WS13-W-72.0			69.5 to 70.0 feet: SAND (SP); light gray; 10% fines, non plastic; 90% sand, fine; micaceous; wet.
71						PID = 0.0			70.0 to 71.0 feet: SILTY SAND (SM); light gray; 40% fines, non to low plasticity; 60% sand, fine; micaceous; wet.
72			100%	CB		PID = 0.0			71.0 to 72.5 feet: SAND (SP); light gray; 10% fines, non plastic; 90% sand, fine; micaceous; wet.
73						PID = 0.0			72.5 to 75.0 feet: SILT with SAND (ML); light gray; 70% fines, low to medium plasticity; 30% sand, fine; micaceous; wet.
74									
75						PID = 0.0			75.0 to 76.5 feet: SAND (SP); light gray; 10% fines, non plastic; 90% sand, fine, red lithics; micaceous; wet.
76									
77			100%	CB		PID = 0.0			76.5 to 80.0 feet: SILT with SAND (ML); light gray; 70-75% fines, low to medium plasticity; 25-30% sand, fine; micaceous; organic debris; wet.
78						PID = 0.0			
79									
80						PID = 0.0			80.0 to 82.0 feet: SILT (ML); light gray with dark brown mottling; 85% fines, medium plasticity; 15% sand, fine; micaceous; organic debris, woody debris, increase in size of wood fragments; wet.
81									
82									82.0 to 84.0 feet: SAND (SP); light gray; 10% fines, non plastic; 90% sand, fine, green and red lithics; micaceous; wet.
83						PID = 54.6			@ 82.5 feet: 0.2-foot layer of SILT (ML). @83.0 feet: Sheen and strong odor from 83.0 to 84.0 feet.
84									84.0 to 89.0 feet: SILT (ML); light gray; 85% fines, medium to high plasticity; 15% sand, fine; micaceous; wet.
85				GW		WS13-W-87.0			
86						PID = 115.0			
87			100%	CB		PID = 139.0			

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▽ ***Approximate water level observed prior to well development.***

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	WS13	5 of 11

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88									
89									89.0 to 97.0 feet: SILT (ML); light gray; 90% fines, medium to high plasticity; 10% sand, fine, sand in pockets; micaceous; organic debris; wet.
90						PID = 14.0			@ 90.0 feet: 0.2-foot layer of SAND (SP).
91									@ 91.0 feet: 0.2-foot layer of SAND (SP).
92									
93						PID = 1.3			@ 92.5 feet: 0.2-foot layer of SAND (SP).
94									
95						PID = 0.0			@ 94.5 feet: 0.2-foot layer of SAND (SP).
96									@ 95.5 feet: 0.2-foot layer of SAND (SP).
97			100%	CB		PID = 0.0			97.0 to 99.5 feet: SAND (SP); light gray; 10% fines, non plastic; 90% sand, fine, green and red lithics; micaceous; wet.
98						PID = 6.0			
99									
100				GW		WS13-W-102.0			99.5 to 102.0 feet: SILT (ML); light gray; 90% fines, medium plasticity; 10% sand, fine, sand in pockets; micaceous; organic debris, woody debris; wet.
101						PID = 0.0			
102			90%	CB		PID = 0.0			102.0 to 103.0 feet: NO RECOVERY; sluff. Material from water sample interval.
103									103.0 to 104.0 feet: SILT with SAND (ML-SM); light gray; 80% fines, medium plasticity; 20% sand, fine, sand in pockets; micaceous; organic debris; wet.
104						PID = 0.0			104.0 to 110.0 feet: SILT (ML); light gray; 90% fines, medium plasticity; 10% sand, fine, sand in pockets; micaceous; organic debris; wet.
105						PID = 0.0			
106									
107						PID = 0.0			
108									
109									
110									

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.

▽ **Approximate water level observed prior to well development.**

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	WS13	6 of 11

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
111						PID = 0.0			110.0 to 111.0 feet: SILT with SAND (ML); light gray; 80% fines, medium plasticity; 20% sand, fine, sand in pockets; micaceous; organic debris; wet.
			100%	CB					111.0 to 118.0 feet: SILT (ML); light gray; 90% fines, medium plasticity; 10% sand, fine, sand in pockets; micaceous; organic debris; wet.
112									
113						PID = 0.0			
114									
115						PID = 0.0			
116									
117			100%	CB		PID = 0.0			
118						PID = 0.0			118.0 to 119.0 feet: SILTY SAND (SM); light gray; 30% fines, non to low plasticity; 70% sand, fine, green and red lithics; micaceous; wet.
119									119.0 to 119.5 feet: SILT (ML); light gray; 90% fines, medium plasticity; 10% sand, fine, sand in pockets; micaceous; organic debris; wet.
120						PID = 0.0			119.5 to 120.0 feet: SAND with SILT (SP-SM); light gray; 15% fines, non plastic; 85% sand, fine, green and red lithics; micaceous; wet.
121									120.0 to 121.0 feet: SILT (ML); light gray; 90% fines, medium plasticity; 10% sand, fine, sand in pockets; micaceous; organic debris; wet.
122									121.0 to 124.0 feet: SAND (SP); light gray; 10% fines, non plastic; 90% sand, fine, green and red lithics; micaceous; moist to wet.
			100%	CB		PID = 0.0			
123						PID = 0.0			
124									124.0 to 132.0 feet: SILT to CLAYEY SILT (ML); light gray; 95% fines, medium to high plasticity; 5% sand, fine, sand in pockets; organic debris, woody debris; moist.
125						PID = 0.0			
126									
127						PID = 0.0			
128									
129									@ 128.5 feet: 0.3-foot thick piece of woody debris.
130						PID = 0.0			
131									
132			100%	CB		PID = 0.0			132.0 to 139.0 feet: SILT (ML); light gray; 90% fines, medium plasticity; 10%

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.

▽ ***Approximate water level observed prior to well development.***

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	WS13	7 of 11

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
133						PID = 0.0			sand, fine, sand in pockets; moist.
134									
135						PID = 0.0			
136									
137			100%	CB		PID = 0.0			
138									
139									139.0 to 139.5 feet: SAND (SP); dark gray with white speckles; salt and pepper look; 100% sand, medium, red lithics; wet.
140						PID = 0.0			139.5 to 142.0 feet: SILT with SAND (ML); light gray; 75% fines, non plastic; 25% sand, fine; organic debris; wet.
141									
142									142.0 to 142.5 feet: SILT with WOODY DEBRIS (ML); light gray to dark gray; 60% fines, non plastic; 40% woody debris; moist.
143						PID = 0.0			142.5 to 143.0 feet: SANDY SILT (ML-SM); light gray; 60% fines, non plastic; 30% sand, fine; 10% gravel, fine to medium, subrounded to angular; wet.
144									143.0 to 144.0 feet: SILT with WOODY DEBRIS (ML); light gray to dark gray; 60% fines, non plastic; 40% woody debris; moist.
145						PID = 0.0			144.0 to 144.5 feet: SILTY GRAVEL (GM); brownish-orange; 40% fines, non plastic; trace sand, fine; 60% gravel, fine to medium, subangular to subrounded; wet.
146									144.5 to 145.5 feet: SILT (ML); light gray; 90% fines, low to medium plasticity; 10% sand, fine; moist to wet.
147			100%	CB		PID = 0.0			145.5 t0 147.0 feet: SILTY SANDY GRAVEL (GP-GM); light gray; 20% fines, non plastic; 20% sand, fine to medium; 50% gravel, fine, subangular to subrounded; 10% organic debris, woody debris; most.
148						PID = 0.0			147.0 to 148.0 feet: SILTY GRAVEL (GM); orangish-brown with reddish brown mottling; 20% fines, non plastic; 10% sand, medium; 70% gravel, fine to medium, angular to subrounded; wet.
149									148.0 to 149.5 feet: SILT with SAND (ML); orangish-brown; 75% fines, non to low plasticity; 25% sand, fine; wet.
150				GW		WS13-W-152.0 WS13-W-DUP			149.5 to 150.0 feet: SAND with SILT (SP-SM); orangish brown; 15% fines, non plastic; 85% sand, fine; wet.
151						PID = 0.0			150.0 to 151.0 feet: SANDY SILT (ML); light gray; 60% fines, non plastic; 40% sand, fine; wet.
152			100%	CB		PID = 0.0			151.0 to 151.5 feet: SAND (SP); reddish brown; 5% fines, non plastic; 95% sand, fine; wet.
153						PID = 0.0			151.5 to 152.0 feet: SANDY SILT (ML-SM); light gray; 60% fines, non plastic; 40% sand, fine; wet.
154									152.0 to 154.0 feet: SILT (ML); light gray; 85% fines, low plasticity; 15% sand, fine, sand in pockets; organic debris; moist to wet.
155									154.0 to 154.5 feet: SAND (SP); orangish-brown; 10% fines, non plastic; 90% sand, fine; wet. 154.5 to 156.0 feet: SILT (ML); light gray; 85% fines, low plasticity; 15%

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.

▽ ***Approximate water level observed prior to well development.***

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	WS13	8 of 11

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
						PID = 0.0			sand, fine, sand in pockets; organic debris; moist to wet.
156									156.0 to 157.0 feet: SAND (SP); orangish-brown; 10% fines, non plastic; 90% sand, fine; wet.
157						PID = 0.0			157.0 to 158.5 feet: SILT (ML); orangish-brown; 85% fines, medium plasticity; 15% sand, fine, sand in pockets; moist to wet.
158									
159									@158.5 feet: 0.3-foot layer of SILTY GRAVEL (GM).
									159.0 to 160.0 feet: SILTY SAND (SM); orangish-brown; 25% fines, non plastic; 75% sand, fine; wet.
160						PID = 0.0			160.0 to 161.0 feet: SAND with SILT (SP-SM); orangish-brown; 15% fines, non plastic; 85% sand, fine; wet.
161									161.0 to 162.0 feet: SAND (SP); orangish-brown; 5% fines, non plastic; 95% sand, medium, red and orangish red lithics; wet.
162			100%	CB		PID = 0.0			162.0 to 163.5 feet: SILT (ML); light gray; 90% fines, medium plasticity; 10% sand, fine, sand in pockets; organic debris; moist to wet.
163						PID = 0.0			
164									163.5 to 164.0 feet: SAND (SP); gray; 10% fines, non plastic; 80% sand, fine, red lithics; 10% gravel, fine, subangular; wet.
									164.0 to 165.0 feet: SILT (ML); orangish-brown; 90% fines, low to medium plasticity; 10% sand, fine; wet.
165						PID = 0.0			165.0 to 167.0 feet: SILT (ML); light gray; 90% fines, medium plasticity; 10% sand, fine, sand in pockets; wet.
166									@ 166.0 feet: 0.2-foot thick layer of WOODY DEBRIS.
167			100%	CB GW		WS13-W-169.0 PID = 0.0			167.0 to 167.5 feet: SAND (SP); brownish-gray; 10% fines, non plastic; 90% sand, medium, red and orangish-red lithics; wet.
168						PID = 0.0			167.5 to 168.0 feet: SAND (SP); orangish-brown; 10% fines, non plastic; 90% sand, medium, orangish-red lithics; wet.
									168.0 to 169.0 feet: SAND with SILT (SP-SM); grayish-brown; 15% fines, non plastic; 85% sand, fine, red and orangish-red lithics; organic debris; wet.
169									169.0 to 169.3 feet: SILT (ML); grayish-brown; 90% fines, medium plasticity; 10% sand, fine, sand in pockets; organic debris; wet.
170						PID = 0.0			169.3 to 169.5 feet: SAND (SP); brownish-gray; 10% fines, non plastic; 90% sand, medium, red and orangish-red lithics; wet.
									169.5 to 170.8 feet: SAND (SP); orangish-brown; 10% fines, non plastic; 90% sand, medium, orangish-red lithics; wet.
171									170.8 to 172.0 feet: SILT (ML); light gray to orangish-brown; 90% fines, medium plasticity; 10% sand, fine, sand in pockets; organic debris; wet.
172			100%	CB		PID = 0.0			172.0 to 175.5 feet: SAND (SP); light brown; 100% sand, medium; red and orangish-red lithics; wet.
173						PID = 0.0			
174									
175						PID = 0.0			
176									175.5 to 176.0 feet: GRAVELY SAND (SP); light brown; 5% fines, non plastic; 80% sand, fine, red and orangish red lithics; 15% gravel, medium, subangular to subrounded; wet.
177									176.0 to 176.5 feet: SAND (SP); light brown; 10% fines, non plastic; 90% sand, fine, red and orangish-red lithics; wet.
			70%	CB		PID = 0.0			176.5 to 177.0 feet: GRAVEL (GP); light brown; 10% fines, non plastic; 90%

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.

▽ ***Approximate water level observed prior to well development.***

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	**WS13**	**9 of 11**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
178									gravel; medium to coarse, subangular to angular; wet. Basalt clasts up to 3-inches in diameter.
179									177.0 to 187.0 feet: SILTY GRAVEL (GM); reddish-brown to grayish-brown, dark red and orangish-red mottling; 15-25% fines, non to low plasticity; 75-85% gravel, fine to coarse, subangular to subrounded; dry to wet. Sample very hot, steaming from drilling action. Significant increase in drilling resistance. Large cobbles up to 3-inches in diameter.
180						PID = 0.0			
181									
182									
183						PID = 0.0			
184									
185						PID = 0.0			
186									
187									
188			120%	CB GW		WS13-W-207.0 PID = 0.0			187.0 to 200.0 feet: SILTY GRAVEL (GM); orangish-brown to reddish-brown; 15-25% fines, non to low plasticity; 75-85% gravel, fine to coarse, subangular to subrounded; dry to wet. Sample very hot, steaming from drilling action. Significant increase in drilling resistance. Sample is indurated, partially cemented, very stiff, gravels are pitted.
189									
190						PID = 0.0			
191									
192									
193						PID = 0.0			
194									
195						PID = 0.0			
196									
197									
198			170%	CB		PID = 0.0			
199									
200									

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▽ ***Approximate water level observed prior to well development.***

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.06	**WS13**	**10 of 11**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
201						PID = 0.0			200.0 to 207.0 feet: BASALT; light gray to dark gray; weathered; subangular broken basalt fragments up to 4-inches in diameter; wet at the bottom of the core. (Columbia River Basalt Group)
202									
203						PID = 0.0			
204									
205						PID = 0.0			
206									
207						PID = 0.0			

Total Depth = 207.0 feet below ground surface.

WS13 Completion Details

Oregon Water Resources Department Well Start Card Number: W158756
Oregon Water Resources Department Well Identification Number: L67091

Boring:
0.0 to 27.0 feet bgs: 9-inch temporary, threaded steel, isolation casing.
0.0 to 131.0 feet bgs: 8-inch temporary, threaded steel, isolation casing.
0.0 to 131.0 feet bgs: 7-inch temporary, threaded steel, isolation casing.
0.0 to 187.0 feet bgs: 6-inch temporary, threaded steel, isolation casing.
26.0 to 207.0 feet bgs: 4x6-inch core barrel sampler.

0.0 to 1.0 feet bgs: flush mount vault and cement seal.
1.0 to 4.0 feet bgs: 3/8-inch Baroid bentonite chips hydrated with potable water.
4.0 to 46.5 feet bgs: bentonite grout slurry, 10.0 pounds per gallon.
46.5 to 48.5 feet bgs: non-acetone coated, 3/8-inch bentonite chips hydrated with potable water.
48.5 to 50.5 feet bgs: 20x40 washed Colorado silica sand, secondary filter pack.
50.5 to 68.9 feet bgs: 10x20 washed Colorado silica sand, primary filter pack.
68.9 to 73.0 feet bgs: non-acetone coated, 3/8-inch bentonite chips hydrated with potable water.
73.0 to 82.0 feet bgs: bentonite grout slurry, 10.3 pounds per gallon.
82.0 to 84.0 feet bgs: non-acetone coated, 3/8-inch bentonite chips hydrated with potable water.
84.0 to 86.0 feet bgs: 20x40 washed Colorado silica sand, secondary filter pack.
86.0 to 105.0 feet bgs: 10x20 washed Colorado silica sand, primary filter pack.
105.0 to 117.0 feet bgs: non-acetone coated, 3/8-inch bentonite chips hydrated with potable water.
117.0 to 165.0 feet bgs: bentonite grout slurry, 10.0 pounds per gallon.
165.0 to 207.0 feet bgs: non-acetone coated, 3/8-inch bentonite chips hydrated with potable water.

Well WS13-69:
0.0 to 52.6 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe.
52.6 to 67.6 feet bgs: 2-inch diameter, stainless steel wire wrapped screen,

NOTES: *1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.*

▽ ***Approximate water level observed prior to well development.***

Maul Foster & Alongi, Inc.	Geologic Borehole Log/Well Construction		
	Project Number **8128.01.06**	Well Number **WS13**	Sheet **11 of 11**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description

0.010-slot.
67.8 to 68.8 feet bgs: 2-inch diameter, stainless steel sump.

Well WS13-105:
0.0 to 89.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe.
89.0 to 104.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-slot.
104.0 to 105.0 feet bgs: 2-inch diameter, stainless steel sump.

NOTES: *1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.*

▽ ***Approximate water level observed prior to well development.***

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**WS-14**	**1 of 11**

Project Name	**Siltronic Corporation**	TOC Elevation (feet)	
Project Location	**7200 NW Front Avenue Portland, Oregon**	Surface Elevation (feet)	**32.4**
Start/End Date	**6/22/2004 to 7/9/2004**	Northing	**705183.4**
Driller/Equipment	**Boart Longyear/Rotosonic**	Easting	**7624486.1**
Geologist/Engineer	**ABC/EB**	Hole Depth	**210.0-feet**
Sample Method	**4x6-inch core barrel.**	Outer Hole Diam	**10.0 to 6.0-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1			**100**	**CB**					0.0 to 1.3 feet: GRAVELLY SILT (ML); dark yellowish-brown; 70% fines, non plastic; 30% gravels, fine, subangular; trace organic debris; dry.
2									1.3 to 10.0 feet: SILTY SAND (SM); dark gray; 40-50% fines, low plasticity; 50-60% sand, fine; damp.
3						**PID = 0ppm.**			
4			**80%**	**CB**					
5						**PID = 0ppm.**			@ 5.0-feet: Increased fines to 50%.
6			**95%**	**CB**					
7									
8						**PID = 0ppm.**			
9									
10									@ 9.5-feet: slight odor.
11									10.0 to 11.0 feet: SAND (SP); light grayish-brown; 100% sand, fine; trace fines; no noticeable odor; damp.
12			**100**	**CB**					11.0 to 14.0 feet: SAND (SP); light grayish-brown; 100% sand, fine; trace fines; trace gravels, fine to coarse; trace organic debris; slight odor; tarr-like balls; damp.
13						**PID = 0ppm.**			
14									14.0 to 16.0 feet: SAND (SP); light grayish-brown; 100% sand, fine; trace fines; trace organic debris; no noticeable odor; damp.
15									
16			**100**	**CB**		**PID = 0ppm.**			16.0 to 18.5 feet: GRAVELLY SAND (SP); light grayish-brown; 70% sand, fine; 30% gravels, fine to medium, subangular; trace fines; damp.
17									
18									
19						**PID = 0ppm.**			18.5 to 22.0 feet: SAND (SP); dark yellowish-brown; 100% sand, fine; trace fines, non plastic; damp.
20									

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**WS-14**	**2 of 11**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			100	CB					
22						PID = 0ppm.			22.0 to 22.5 feet: SILT (ML); light brownish-gray; 85% fines, low plasticity; 15% sand, fine; trace gravels, fine to medium, subrounded; trace organic debris; trace woody debris; damp.
23									22.5 to 23.5 feet: SAND (SP); dark yellowish-brown; 100% sand, fine; trace fines, non plastic; damp.
24			100	CB					23.5 to 26.0 feet: GRAVELLY SILT (ML); light grayish-brown; 65% fines, medium plasticity; 35% gravels, fine to coarse, subangular; trace sand; moist.
25						PID = 0ppm.			
26			100	CB					26.0 to 29.0 feet: GRAVELLY SILT (ML); dark brownish-gray; 65% fines, medium plasticity; 35% gravels, fine to coarse, subangular; trace sand; strong sheen and odor; possible product; moist.
27									
28						PID = 29.7ppm.			
29									29.0 to 33.0 feet: SANDY SILT (ML); dark brownish gray; 65% fines, low plasticity; 35% sand, fine; heavy sheen and odor; tarry-like impacts, possible product; moist.
30									
31			100	CB		PID = 8.1ppm.			
32									
33						PID = 0ppm.			33.0 to 35.0 feet: SILTY SAND (SM); dark grayish-brown; 40% fines, low plasticity; 60% sand, fine; subrounded clast approximately 5-inches in diameter; heavy sheen and odor; moist.
34									
35						PID = 0ppm.			35.0 to 35.5 feet: SAND (SP); light yellowish-brown; 100% sand, fine; trace fines, non plastic; heavy sheen and odor; moist.
36			90	CB					35.5 to 38.5 feet: SAND (SP); dark brownish-gray; 100% sand, fine; trace fines, non plastic; heavy sheen and odor; globules; moist to wet.
37									
38						PID = 0ppm.			
39									38.5 to 52.5 feet: SILTY SAND (SM); dark brownish-gray; 25% fines, non to low plasticity; 75% sand, fine; trace gravels, subangular; strong odor; wet.
40									
41			100	CB		PID = 8ppm.			
42									

NOTES: *1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	WS-14	3 of 11

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43									
44						PID = 0ppm.			
45									
46									
47						PID = 0ppm.			
48									
49									
50						PID = 0ppm.			
51									
52									
53						PID = 0ppm.			52.5 to 53.0 feet: SILT (ML); dark brownish-gray; 90% fines, low plasticity; 10% sand, fine; strong odor; moist to wet.
54									53.0 to 55.5 feet: SILTY SAND (SM); dark brownish-gray; 25% fines, non to low plasticity; 75% sand, fine; trace gravels, subangular; strong odor; wet.
55									
56			100	CB		PID = 0ppm.			55.5 to 56.0 feet: SILT (ML); dark brownish-gray; 90% fines, low plasticity; 10% sand, fine; strong odor; moist to wet.
57									56.0 to 58.0 feet: SAND WITH SILT (SP-SM); dark brownish-gray; 15% fines, non plastic; 85% sand, fine; strong odor; wet.
58									58.0 to 66.0 feet: SILTY SAND (SM); dark brownish-gray; 15 to 20% fines, non to low plasticity; 75 to 80% sand, fine; trace cobbles, subrounded; strong odor; wet.
59						PID = 0ppm.			
60									@ 60.0 feet: 3-inch silt layer.
61			90	CB					
62						PID = 0ppm.			
63									
64									@ 63.5.0 feet: odor becoming slight.
65									

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	WS-14	4 of 11

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66						PID = 0ppm.			
67			100	CB					66.0 to 67.0 feet: SANDY SILT (ML); dark grayish-brown; 80% fines, non to low plasticity; 20% sand, fine; micaceous; moderate odor; moist to wet.
68						PID = 0ppm.			67.0 to 69.5 feet: SAND (SP); dark grayish-brown; 5% fines, non plastic; 95% sand, fine; micaceous; no noticeable odor; moist to wet. @ 68.0 feet: 2-inch silt layer.
69									
70									69.5 to 70.0 feet: SILT (ML); dark gray; 85% fines, low plasticity; 15% sand, fine; moist.
71			0	CB		PID = 0ppm. WS14-W-71			70.0 to 71.0 feet: SAND (SP); dark grayish-brown; 5% fines, non plastic; 95% sand, fine; micaceous; moist to wet. 71.0 to 75.5 feet: NO RECOVERY.
72									
73									
74									
75									
76			100	CB		PID = 9.4ppm.			75.5 to 81.5 feet: SAND (SP); dark brownish-gray; trace to 5% fines, non plastic; 95 to 100% sand, fine; micaceous; slight odor; wet.
77									
78			100	CB		PID = 0ppm.			
79									@ 79.0 feet: trace silty balls.
80									
81						PID = 0ppm.			
82									81.5 to 82.5 feet: SILT (ML); dark gray; 90% fines, medium plasticity; 10% sand, fine; slight odor; wet.
83									82.5 to 83.5 feet: SAND (SP); dark gray; 100% sand, fine; trace fines; moderate odor; wet.
84						PID = 0ppm.			83.5 to 84.3 feet: SILT (ML); dark gray; 90% fines, medium plasticity; 10% sand, fine; slight odor; wet.
85									84.3 to 84.5 feet: SAND (SP); dark gray; 100% sand, fine; trace fines; moderate odor; wet. 84.5 to 85.0 feet: SAND and SILT (SP-ML); dark gray; alternating 1/4-inch to 1/2-inch sand and silt layers; wet.
86						WS14-W-86			85.0 to 87.5 feet: SAND (SP); dark gray; 10% fines, non plastic; 90% sand, fine; micaceous; odor; wet.
87						PID = 0ppm.			

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**WS-14**	**5 of 11**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88			**100**	**CB**					*87.5 to 88.0 feet: SANDY SILT (ML); gray; 60% fines, low to medium plasticity; 40% sand, fine; micaceous; moderate odor; wet.*
89									*88.0 to 89.5 feet: SILTY SAND (SM); gray; 15% fines, non plastic; 85% sand, fine; micaceous; slight odor; wet.*
90						**PID = 13ppm.**			*89.5 to 90.5 feet: SILT (ML); dark gray; 100% fines, medium plasticity; trace sand, fine; micaceous; moist.*
91									*90.5 to 92.0 feet: SILTY SAND (SM); gray; 15% fines, non plastic; 85% sand, fine; micaceous; sheen and strong odor; wet.*
92									*92.0 to 96.0 feet: SILT (ML); gray; 100% fines, medium to high plasticity; trace sand, fine; micaceous; sheen and strong odor; moist. Several zones of 2-inch pockets with fine sand.*
93						**PID = 28.3ppm.**			
94									
95									
96			**100**	**CB**		**PID = 0ppm.**			*96.0 to 98.0 feet: SANDY SILT (ML); dark gray; 85% fines, medium plasticity; 15% sand, fine; micaceous; strong odor; moist.*
97									
98									*98.0 to 102.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine; micaceous; strong odor; wet. Between 99.0 and 99.5 feet several 1/2-inch silt bands intermixed with sand.*
99						**PID = 0ppm.**			
100									
101						**WS14-W-101**			*@ 100.5 feet: 1-inch silt layer.*
102			**100**	**CB**		**PID = 0ppm.**			*102.0 to 105.0 feet: SAND (SP); gray; 100% sand, fine; micaceous; trace fines; sheen and strong odor; wet.*
103									
104									
105						**PID = 84ppm.**			*105.0 to 105.5 feet: SILT (ML); gray; 90% fines, low plasticity; 10% sand, fine; strong odor; moist.*
106									*105.5 to 106.0 feet: SAND (SP); gray; 100% sand, fine; micaceous; trace fines; sheen and strong odor; wet.*
107									*106.0 to 108.0 feet: SILT (ML); gray; 100% fines; low plasticity; trace sand, fine; trace rootlets; moderate odor; moist.* *@ 107.0 feet: 2-inch gray sand layer with stong odor.*
108						**PID = 9.5ppm.**			*108.0 to 108.5 feet: SILTY SAND (SM); gray; 30% fines, low plasticity; 70% sand, fine; sheen and strong odor; wet.*
109									*108.5 to 110.5 feet: SILT (ML); gray; 100% fines; low plasticity; trace sand, fine; sheen and strong odor; moist.* *@ 109.0 feet: 4-inch silty sand layer with sheen and strong odor.*
110									

NOTES: *1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**WS-14**	**6 of 11**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
111			**100**	**CB**		**PID = 0ppm.**			110.5 to 111.0 feet: SAND (SP); gray; 100% sand, fine; micaceous; trace fines; slight odor; wet.
									111.0 to 113.0 feet: NO RECOVERY; sluff.
112									
113						**PID = 0ppm.**			113.0 to 114.0 feet: SANDY SILT (ML); dark brownish-gray; 60% fines, non to low plasticity; 40% sand, fine; micaceous; faint odor; moist to wet.
114									114.0 to 120.5 feet: SAND (SP); dark brownish-gray; 5% fines, non plastic; 95% sand, fine; micaceous; no noticeable odor; wet.
115									
116						**PID = 0ppm.**			@ 116.0 feet: 3-inch silt layer.
117									
118									
119						**PID = 0ppm.**			
120						**WS14-W-120**			
121			**100**	**CB**					120.5 to 121.0 feet: SILT (ML); dark brownish-gray; 85% fines, low plasticity; 15% sand, fine; micaceous; moist.
									121.0 to 132.5 feet: SAND (SP); dark gray; 100% sand, fine; trace fines; micaceous; wet.
122									
123									
124						**PID = 0ppm.**			@ 124 feet: sheen and strong odor present.
125									
126									
127						**PID = 0ppm.**			
128									
129									
130						**PID = 0ppm.**			@ 130 feet: sheen and strong odor fading.
131									
132									

NOTES: *1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**WS-14**	**7 of 11**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
133						PID = 0ppm.			132.5 to 133.5 feet: SILT (ML); dark grayish-brown; 90% fines, low plasticity; 10% sand, fine; micaceous; moist.
134									133.5 to 134.0 feet: SAND (SP); dark gray; 100% sand, fine; trace fines; micaceous; wet.
									134.0 to 134.5 feet: SILT (ML); dark grayish-brown; 90% fines, low plasticity; 10% sand, fine; micaceous; moist.
135									134.5 to 136.0 feet: SAND (SP); dark gray; 100% sand, fine; trace fines; micaceous; wet.
136			0	CB					@ 135.5 feet: 3-inch silt layer.
									136.0 to 138.5 feet: NO RECOVERY.
137									
138									
139			100	CB		PID = 0ppm.			138.5 to 141.5 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine; micaceous; slight odor; wet.
140									
141									
142			100	CB		PID = 0ppm. WS14-W-142			141.5 to 142.0 feet: SILT (ML); dark brownish-gray; 85% fines, low plasticity; 15% sand, fine; micaceous; moist.
									@ 141.7 feet: 1-inch sand layer.
143									142.0 to 143.0 feet: SAND (SP); gray; 100% sand, fine; trace fines; wet.
									143.0 to 145.0 feet: SILT (ML); gray; 100% fines, medium to high plasticity; trace sand; moist.
144									@ 143.5 feet: 3-inch sand layer.
145						PID = 0ppm.			145.0 to 148.5 feet: SILT (ML); gray; 100% fines, medium to high plasticity; intermixed with 1-inch to 2-inch sand layers; moist.
146									
147									
148									
149									148.5 to 149.0 feet: SAND (SP); gray; 100% sand, fine; trace fines; wet.
						PID = 0ppm.			149.0 to 149.5 feet: SILT (ML); gray; 100% fines, medium to high plasticity; trace sand; moist.
150									149.5 to 150.0 feet: SAND (SP); gray; 100% sand, fine; trace fines; wet.
			100	CB		WS14-W-150			150.0 to 167.0 feet: SAND (SP); gray; 5% fines, non plastic; 95% sand, fine to medium; trace wood debris; wet.
151									
152						PID = 0ppm.			@ 152.0 feet: 2-inch silt layer.
153									
154									
155									

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**WS-14**	**8 of 11**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
156						**PID = 0ppm.**			*@ 155.0 feet: Wood fragments.*
157									*@ 157.0 feet: 3-inch silt layer.*
158						**PID = 0ppm.**			
159									
160									
161						**PID = 0ppm.**			
162									
163									
164						**PID = 0ppm.**			
165									
166									
167			**100**	**CB**		**PID = 0ppm.**			*167.0 to 167.5 feet: NO RECOVERY; sluff.*
168						**WS14-W-167**			*167.5 to 169.5 feet: SAND (SP); gray; 100% sand, fine; micaceous; trace fines; wet.*
169									
170						**PID = 0ppm.**			*169.5 to 172.0 feet: SAND (SP); gray; 100% sand, fine; micaceous; increasing fines to 15%; wet.*
171									
172									*172.0 to 173.0 feet: SILTY SAND (SM); gray; 35% fines, non plastic; 65% sand, fine; wet.*
173						**PID = 0ppm.**			*173.0 to 182.0 feet: SAND (SP); gray; 100% sand, fine; micaceous; trace fines; wet.*
174									
175									
176						**PID = 0ppm.**			
177			**100**	**CB**					

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	WS-14	9 of 11

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
178									
179						PID = 0ppm.			
180									
181									
182									
			80	CB		PID = 0ppm. WS14-W-182			182.0 to 185.5 feet: NO RECOVERY; sluff.
183									
184									
185									
186						PID = 0ppm.			185.5 to 186.5 feet: Sand (SP); gray; 100 % sand, fine; micaceous; trace fines; wet.
187									186.5 to 188.0 feet: SILTY SAND (SM); gray; 35% fines, low plasticity; 65% sand, fine; wet.
188									188.0 to 190.0 feet: SILT (ML); gray; 100% fines, low to medium plasticity; damp.
189						PID = 0ppm.			@ 189.0 feet: 2-inch fine, sand layer.
190									190.0 to 195.0 feet: SAND (SP); gray; 100% sand, fine; micaceous; trace fines; wet.
191									
192									
			100	CB		PID = 0ppm.			
193									
194									
195						PID = 0ppm.			195.0 to 196.0 feet: SILTY SAND (SM); gray; 50% fines, low plasticity; 50% sand, fine; wet.
196									196.0 to 197.0 feet: SAND (SP); gray; 100% sand, fine; micaceous; trace fines; wet.
197									
			90	CB		WS14-W-197			197.0 to 198.0 feet: SILT (ML); gray; 100% fines, medium to high plasticity; damp.
198						PID = 0ppm.			198.0 to 204.0 feet: SAND (SP); gray; 100% sand, fine to medium; micaceous; trace fines; wet.
199									
200									

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**WS-14**	**10 of 11**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
201						**PID = 0ppm.**			
202									
203									
204						**PID = 0ppm.**			204.0 to 208.0 feet: GRAVEL with SILT (GW-GM); gray; 15% fines, non plastic; 85% gravels, fine to coarse, subangular to subrounded; wet.
205									
206									
207									
208						**WS14-W-208**			208.0 to 210.0 feet: BASALT; light gray to dark gray; moist to wet; bedrock. (Columbia River Basalt Group) Significant increase in resistance, drilling hardness.
209									
210									Total Depth = 210.0 feet.

WS14 Completion Details

Oregon Water Resources Department Well Start Card Number: 164731
Oregon Water Resources Department Well Identification Number: L67967

Boring:
0.0 to 69.0 feet bgs: 10-inch temporary, threaded steel, isolation casing.
0.0 to 110.0 feet bgs: 9-inch temporary, threaded steel, isolation casing.
0.0 to 135.0 feet bgs: 8-inch temporary, threaded steel, isolation casing.
0.0 to 210.0 feet bgs: 6-inch temporary, threaded steel, isolation casing.
0.0 to 210.0 feet bgs: 4x6-inch core barrel sampler.

0.0 to 1.5 feet bgs: flush mount vault and cement seal.
1.5 to 7.0 feet bgs: 1/4-inch Baroid bentonite chips hydrated with potable water.
7.0 to 104.0 feet bgs: bentonite grout slurry, 10.0 pounds per gallon.
104.0 to 106.0 feet bgs: 20x40 washed Colorado silica sand, secondary filter pack.
106.0 to 125.0 feet bgs: 10x20 washed Colorado silica sand, primary filter pack.
125.0 to 140.0 feet bgs: non-IPA coated, 1/4-inch bentonite pellets hydrated with potable water.
140.0 to 142.0 feet bgs: 20x40 washed Colorado silica sand, secondary filter pack.
142.0 to 161.0 feet bgs: 10x20 washed Colorado silica sand, primary filter pack.
161.0 to 210.0 feet bgs: non-IPA coated, 1/4-inch bentonite pellets hydrated with potable water.

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Maul Foster & Alongi, Inc.	Geologic Borehole Log/Well Construction		
	Project Number **8128.01.08**	Well Number **WS-14**	Sheet **11 of 11**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Sample Data: Percent Recovery	Sample Data: Collection Method	Sample Data: Number	Sample Data: Name (Type)	Sample Data: Blows/6"	Lithologic Column	Soil Description

Well WS14-125:
0.0 to 109.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe.
109.0 to 124.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-slot.
124.0 to 125.0 feet bgs: 2-inch diameter, stainless steel sump.

Well WS14-161:
0.0 to 145.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe.
145.0 to 160.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-slot.
160.0 to 161.0 feet bgs: 2-inch diameter, stainless steel sump.

NOTES: *1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**WS-15**	**1 of 10**

Project Name	**Siltronic Corporation**	TOC Elevation (feet)	
Project Location	**7200 NW Front Avenue Portland, Oregon**	Surface Elevation (feet)	**33.1**
Start/End Date	**7/9/2004 to 7/23/2004**	Northing	**704728.2**
Driller/Equipment	**Boart Longyear/Rotosonic**	Easting	**7624438.9**
Geologist/Engineer	**EB**	Hole Depth	**196.0-feet**
Sample Method	**4x6-inch core barrel.**	Outer Hole Diam	**10.0 to 6.0-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1			**0**	**NR**					*0.0 to 15.0 feet: NO RECOVERY; Air knife to 15 feet bgs. to clear for possible utilities. Soil observed from cuttings yellowish-brown; fine sand to silty sand; dry to damp.*
15			**95**	**CB**					*15.0 to 16.0 feet: SAND (SP); dark yellowish-brown; 10% fines, non plastic; 90% sand, fine; damp.*
16						***PID = 15ppm.***			*16.0 to 22.0 feet: GRAVELLY SILT (ML); layered brown and gray; 70% fines, medium to high plasticity; 30% gravels, fine to medium, angular to subangular; damp. Slight odor to strong odor increasing with depth.*
18						***PID = 0ppm.***			

NOTES: *1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**WS-15**	**2 of 10**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21						**PID = 11ppm.**			
22									22.0 to 24.0 feet: ORGANIC SOIL (OL); black; organic matter comprised of wood fibers and chips; black residue with heavy sheen and odor; damp.
23									
24						**PID = 295ppm.**			24.0 to 26.0 feet: SILTY SAND (SM); dark gray; 40% fines, low plasticity; 60% sand, fine; black residue with strong odor; damp.
25									
26			**100**	**CB**					26.0 to 29.0 feet: SAND (SP); dark yellowish-brown; 10% fines, non plastic; 90% sand, fine to medium; slight odor; damp.
27						**PID = 11ppm.**			
28									
29									29.0 to 34.5 feet: GRAVELLY SILT (ML); layered brown and gray; 70% fines, medium to high plasticity; 30% gravels, fine to medium, angular to subangular; damp. Slight odor to strong odor increasing with depth.
30						**PID = 0ppm.**			
31									
32									
33						**PID = 0ppm.**			
34									
35									34.5 to 36.0 feet: ORGANIC SOIL (OL); black; organic matter comprised of wood fibers and chips; black residue with heavy sheen and odor; damp.
36			**90**	**CB**					36.0 to 42.5 feet: SAND (SP); dark gray to black; 10% fines, non plastic; 90% sand, fine; black residue with heavy sheen and odor; damp.
37						**PID = 211ppm.**			
38									
39									
40						**PID = 219ppm.**			
41									
42									

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**WS-15**	**3 of 10**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43						PID = 64ppm.			42.5 to 45.5 feet: SILT (ML); gray; 100% fines, medium to high plasticity; trace gravels, fine, subangular; strong odor; damp.
44									
45									
46			95	CB		PID = 11ppm.			45.5 to 46.0 feet: SILTY SAND (SM); dark gray; 20% fines, low plasticity; 80% sand, fine; moderate odor and sheen; damp.
47									46.0 to 52.0 feet: SILTY SAND (SM); dark gray; 20% fines, low plasticity; 80% sand, fine; strong odor and sheen; wet.
48									
49						PID = 86ppm.			
50									
51									
52						PID = 412ppm.			52.0 to 53.5 feet: SILT (ML); grayish-brown; 100% fines, medium to high plasticity; strong odor; damp.
53									53.5 to 57.0 feet: SILTY SAND (SM); brownish-gray; 30% fines, low plasticity; 70% sand, fine; strong odor and sheen to 56 feet; damp to wet.
54									
55						PID = 386ppm.			
56			95	CB					
57									57.0 to 59.0 feet: SANDY SILT (ML); gray; 60% fines, non to low plasticity; 40% sand, fine; no noticeable impacts; damp.
58						PID = 0ppm.			
59									59.0 to 60.5 feet: SILTY SAND (SM); gray; 40% fines, low plasticity; 60% sand, fine; damp.
60									
61						PID = 0ppm.			60.5 to 62.0 feet: SILT (ML); gray; 100% fines, non plastic; damp.
62									62.0 to 66.0 feet: SILTY SAND (SM); gray; 20% fines, low plasticity; 80% sand, fine; damp.
63									
64						PID = 0ppm.			@ 64.0 feet: 4-inch silt layer.
65									

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**WS-15**	**4 of 10**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66						**WS15-W-65**			
			40	**CB**					*66.0 to 72.0 feet: NO RECOVERY.*
67									
68									
69									
70									
71									
72									*72.0 to 78.0 feet: SILTY SAND (SM); gray; 30% fines, low to medium plasticity; 70% sand, fine; wet.*
73						**PID = 0ppm.**			
74									
75									
76						**PID = 8ppm.**			
77									
78									*78.0 to 79.5 feet: SILT (ML); gray; 100% fines, medium to high plasticity; damp to wet.*
79									
80									*79.5 to 80.0 feet: SAND (SP); gray; 100% sand, fine, wet.*
			100	**CB**		**PID = 24ppm.**			*80.0 to 82.0 feet: SILTY SAND (SM); gray; 20% fines, non plastic; 80% sand, fine; wet.*
81						**WS15-W-80**			
82									*82.0 to 88.0 feet: SILT (ML); gray; 100% fines, medium to high plasticity; damp.*
83						**PID = 0ppm.**			
84									
85									
86						**PID = 0ppm.**			
87									

NOTES: *1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**WS-15**	**5 of 10**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88									88.0 to 89.5 feet: SILTY SAND (SM); gray; 15% fines, low plasticity; 85% sand, fine; wet.
89						**PID = 0ppm.**			
90									89.5 to 95.0 feet: SILT (ML); gray; 100% fines, medium to high plasticity; damp to wet.
91									
92						**PID = 0ppm.**			
93									
94									
95			**30**	**CB**		**PID = 0ppm.**			95.0 to 105.0 feet: NO RECOVERY.
96									
97									
98									
99									
100									
101									
102									
103									
104									
105									105.0 to 108.0 feet: SAND (SP); gray; 100% sand, fine; trace fines; wet.
106						**PID = 0ppm.**			@ 106.0 feet: 3-inch silt layer.
107									
108						**WS15-W-108**			108.0 to 109.5 feet: SILT (ML); gray; 90% fines, low to medium plasticity; 10% sand, fine; wet.
109						**PID = 0ppm.**			
110									109.5 to 117.5 feet: SAND (SP); gray; 100% sand, fine; trace fines; wet.

NOTES: *1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**WS-15**	**6 of 10**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
111			**80**	**CB**					
112									
113									
114						**PID = 22ppm.**			
115									
116									
117						**PID = 66ppm.**			
118									*117.5 to 120.0 feet: SILT (ML); gray; 100% fines, non to low plasticity; trace sand, fine; damp.*
119									
120						**PID = 53ppm.**			*120.0 to 122.0 feet: SANDY SILT (ML); gray; 70% fines, non plastic; 30% sand, fine; wet.*
121									
122									*122.0 to 126.5 feet: SILTY SAND (SM); gray; 15% fines, non plastic; 85% sand, fine; wet.*
123						**PID = 85ppm.**			
124									
125			**90**	**CB**		**WS15-W-125**			
126						**PID = 0ppm.**			
127									*126.5 to 128.5 feet: SILT to CLAYEY SILT (ML-CL); gray; 100% fines, medium to high plasticity; damp.*
128									
129						**PID = 0ppm.**			*128.5 to 129.0 feet: SAND (SP); gray; 100% sand, fine to medium; trace fines; damp.*
130									*129.0 to 131.0 feet: SILT to CLAYEY SILT (ML-CL); gray; 100% fines, medium to high plasticity; damp.*
131									
132						**PID = 0ppm.**			*131.0 to 136.0 feet: SAND (SP); gray; 100% sand, fine to medium; trace fines; damp.* *@ 132.0 feet: 2-inch silt layer.*

NOTES: *1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**WS-15**	**7 of 10**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
133									@ 133.0 feet: 1-inch silt layer.
134									
135						**PID = 0ppm. WS15-W-135**			
136									136.0 to 137.0 feet: SANDY SILT (ML); gray; 70% fines, low plasticity; 30% sand, fine; wet.
137									137.0 to 140.0 feet: SAND (SP); gray; 100% sand, fine to medium; trace fines; damp.
138						**PID = 0ppm.**			
139									@ 138.5 feet: 3-inch silt layer.
140			**100**	**CB**					140.0 to 142.5 feet: SAND (SP); gray; 100% sand, fine; trace fines; wet.
141						**PID = 0ppm.**			
142									
143									142.5 to 143.5 feet: CLAYEY SILT (ML-CL); gray; 100% fines, medium to high plasticity; trace sand, fine; damp.
144						**PID = 0ppm.**			143.5 to 144.5 feet: SAND (SP); gray; 100% sand, fine; trace fines; wet. @ 144.0 feet: 2-inch silt layer.
145									105.0 to 105.5 feet: SILT (ML); gray; 90% fines, low plasticity; 10% sand, fine; strong odor; moist.
146									@ 146.0 feet: 1-inch sand layer.
147						**PID = 0ppm.**			
148									147.5 to 154.0 feet: SILT with SAND (ML); gray; 80% fines, non to low plasticity; 20% sand, fine; damp to wet. @ 148.0 feet: 1-inch sand layer.
149									
150			**100**	**CB**		**PID = 0ppm.**			
151									
152									
153						**PID = 0ppm.**			
154									@ 154.0 feet: 2-inch sand layer.
155									154.0 to 156.0 feet: CLAYEY SILT (ML-CL); gray; 100% fines, medium to high plasticity; trace sand, fine; trace organic debris; damp.

NOTES: *1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	WS-15	8 of 10

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
156						PID = 0ppm.			156.0 to 158.0 feet: SILTY SAND (SM); gray; 20% fines, non plastic; 80% sand, fine; wet.
157									
158						WS15-W-158			158.0 to 160.0 feet: Alternating 2-inch layers of SILT (ML) and SAND (SP).
159						PID = 0ppm.			
160									160.0 to 162.0 feet: SILTY SAND (SM); gray; 40% fines, medium plasticity; 60% sand, fine; wet.
161									
162						PID = 0ppm.			162.0 to 162.5 feet: SAND (SP); gray; 100% sand, fine; trace fines, non plastic; wet.
163									162.5 to 163.5 feet: SAND (SP); dark yellowish-brown; 100% sand, fine; trace fines; wet.
164									163.5 to 164.3 feet: CLAYEY SILT (ML-CL); dark gray; 100% fines, medium to high plasticity; damp.
165									164.3 to 165.0 feet: SAND (SP); dark yellowish-brown; 100% sand, fine; trace fines; wet.
166			100	CB		PID = 0ppm.			165.0 to 168.0 feet: SAND (SP); gray; 100% sand, fine; trace fines; wet.
167									
168						PID = 0ppm.			168.0 to 171.0 feet: SAND (SP); dark yellowish-brown laminated with gray; 100% sand, fine; trace fines, non plastic; wet.
169									
170									
171						PID = 0ppm.			171.0 to 172.5 feet: SILTY SAND (SM); gray; wet; 20% fines, non plastic; 80% sand, fine; wet.
172									172.5 to 173.8 feet: SAND (SP); dark yellowish-brown; 100% sand, fine to medium; trace fines; wet.
173									
174						PID = 0ppm.			173.8 to 174.5 feet: SAND (SP); gray; 100% sand, fine to medium; trace fines; wet.
175			100	CB					174.5 to 186.0 feet: SAND (SP); dark yellowish-brown; 100% sand, fine; trace fines; wet.
176						WS15-W-176			
177						PID = 0ppm.			

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**WS-15**	**9 of 10**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
178									
179									
180						**PID = 0ppm.**			
181									
182									
183						**PID = 0ppm.**			
184									
185									
186						**PID = 0ppm.**			*186.0 to 187.5 feet: CLAYEY SILT (ML-CL); light brown; 100% fines, high plasticity; damp.*
187									
188									*187.5 to 193.0 feet: SANDY GRAVEL (GP); grayish-brown; 5% fines, non plastic; 25% sand, fine to coarse; 70% gravels, fine to coarse, angular to subrounded; wet.*
189						**PID = 0ppm.**			
190			**100**	**CB**					
191									
192									
193						**WS15-W-193**			*193.0 to 196.0 feet: BASALT; light gray to dark gray; moist to wet; bedrock. (Columbia River Basalt Group) Significant increase in resistance, drilling hardness.*
194									
195									
196									*Total Depth = 196.0 feet.*

WS15 Completion Details

Oregon Water Resources Department Well Start Card Number: 164732
Oregon Water Resources Department Well Identification Number: L67966

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Maul Foster & Alongi, Inc.	Geologic Borehole Log/Well Construction		
	Project Number **8128.01.08**	Well Number **WS-15**	Sheet **10 of 10**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description

Boring:
0.0 to 58.0 feet bgs: 10-inch temporary, threaded steel, isolation casing.
0.0 to 130.0 feet bgs: 9-inch temporary, threaded steel, isolation casing.
0.0 to 196.0 feet bgs: 6-inch temporary, threaded steel, isolation casing.
0.0 to 196.0 feet bgs: 4x6-inch core barrel sampler.

0.0 to 1.5 feet bgs: flush mount vault and cement seal.
1.5 to 11.0 feet bgs: 1/4-inch Baroid bentonite chips hydrated with potable water.
11.0 to 65.0 feet bgs: bentonite grout slurry, 10.0 pounds per gallon.
65.0 to 67.0 feet bgs: 20x40 washed Colorado silica sand, secondary filter pack.
67.0 to 86.0 feet bgs: 10x20 washed Colorado silica sand, primary filter pack.
86.0 to 120.0 feet bgs: non-IPA coated, 1/4-inch bentonite pellets hydrated with potable water.
120.0 to 122.0 feet bgs: 20x40 washed Colorado silica sand, secondary filter pack.
122.0 to 141.0 feet bgs: 10x20 washed Colorado silica sand, primary filter pack.
141.0 to 196.0 feet bgs: non-IPA coated, 1/4-inch bentonite pellets hydrated with potable water.

Well WS15-86:
0.0 to 70.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe.
70.0 to 85.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-slot.
85.0 to 86.0 feet bgs: 2-inch diameter, stainless steel sump.

Well WS15-141:
0.0 to 125.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe.
125.0 to 140.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-slot.
140.0 to 141.0 feet bgs: 2-inch diameter, stainless steel sump.

NOTES: *1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**WS-16**	**1 of 12**

Project Name	**Siltronic Corporation**	TOC Elevation (feet)	
Project Location	**7200 NW Front Avenue Portland, Oregon**	Surface Elevation (feet)	**33.1**
Start/End Date	**7/22/2004 to 8/5/2004**	Northing	**704965.0**
Driller/Equipment	**Boart Longyear/Rotosonic**	Easting	**7624326.8**
Geologist/Engineer	**EB/JP**	Hole Depth	**236.0-feet**
Sample Method	**4x6-inch core barrel.**	Outer Hole Diam	**10.0 to 6.0-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1			**100**	**CB**					0.0 to 1.0 feet: SANDY GRAVEL (GW); dark yellowish-brown; 30% sand, fine; 70% gravels, fine to medium, subangular to subrounded; damp.
2									1.0 to 2.5 feet: SAND (SW); dark yellowish-brown; 100% sand, fine to coarse; damp.
3			**90**	**CB**					@ 2.5 feet: 2-inch weathered concrete 2.5 to 3.0 feet: GRAVEL (GW); 100% gravel, fine to coarse, subangular to subrounded; wet.
4									3.0 to 5.5 feet: SAND (SW); dark yellowish brown; 100% sand, fine to coarse; trace gravel, fine, subrounded; damp.
5									
6			**95**	**CB**		**PID = 0ppm.**			5.5 to 6.0 feet: SAND (SP); dark gray; 10% fines, non plastic; 90% sand, fine; damp. 6.0 to 7.0 feet: GRAVEL (GW); 100% gravel, fine to coarse, subangular to subrounded; wet.
7									7.0 to 9.0 feet: SAND (SW); dark gray; 10% fines, non plastic; 90% sand, fine to coarse; damp.
8									
9						**PID = 0ppm.**			9.0 to 11.0 feet: SAND (SW); dark yellowish brown; 100% sand, fine to coarse; trace gravel, subrounded; damp.
10									
11			**95**	**CB**					11.0 to 12.5 feet: NO RECOVERY; sluff.
12									
13						**PID = 0ppm.**			12.0 to 15.0 feet: SAND (SW); dark yellowish brown; 100% sand, fine to coarse; trace fines; damp.
14									
15									15.0 to 16.0 feet: ASPHALT.
16			**85**	**CB**					16.0 to 20.0 feet: SILTY SAND (SM); dark yellowish brown; 20% fines, low plasticity; 80% sand, fine to coarse; wet.
17						**PID = 0ppm.**			
18									
19									
20									

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**WS-16**	**2 of 12**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21						PID = 0ppm.			20.0 to 21.0 feet: GRAVEL WITH SAND (GP); dark gray; 50% sand, fine to coarse; 50% gravel, fine to medium, subangular to subrounded; damp.
22									21.0 to 23.0 feet: CLAYEY SILT WITH GRAVEL (ML-CL); dark gray; 80% fines, medium to high plasticity; 20% gravel, fine, subangular to subrounded; damp. @ 22.0 feet: 3-inch to 4-inch diameter cobbles.
23									
24						PID = 13ppm.			23.0 to 26.0 feet: CLAYEY SILT WITH GRAVEL (ML-CL); black; 80% fines, medium to high plasticity; 20% gravel, fine, subangular to subrounded; strong odor and sheen; moist.
25									
26			90	CB					26.0 to 28.0 feet: GRAVELLY SAND (SW); dark yellowish brown; 70% sand, fine to coarse; 30% gravel, fine to medium, subangular to subrounded; no noticeable odor; wet.
27						PID = 0ppm.			
28									28.0 to 36.0 feet: SAND (SW); dark yellowish brown; 100% sand, fine to coarse; moist.
29									
30						PID = 0ppm.			
31									
32									@ 32.5 to 36.0 feet: moderate odor.
33						PID = 0ppm.			
34									
35									
36			100	CB		PID = 0ppm.			36.0 to 38.5 feet: CLAYEY SILT WITH GRAVEL (ML-CL); dark gray; 70% fines, high plasticity; 30% gravel, medium to coarse, angular to subangular; moist.
37									
38									
39			100	CB		PID = 75ppm.			38.5 to 44.0 feet: CLAYEY SILT (ML-CL); dark grey; 100% fines, high plasticity; trace gravel, subrounded; strong odor and sheen; wet.
40									
41									
42						PID = 13ppm.			

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**WS-16**	**3 of 12**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43									
44									44.0 to 52.0 feet: CLAYEY SILT WITH SAND (ML-CL); dark grey; 80% fines, high plasticity; 20% sand, fine; strong odor and sheen; wet.
45						PID = 124ppm.			
46			100	CB					
47									
48						PID = 41ppm.			
49									
50									
51						PID = 13ppm.			@ 51.0 feet: 3-inch sand layer.
52									52.0 to 56.0 feet: SAND (SP); dark gray; 100% sand, fine; heavy sheen and odor, moist to wet.
53									
54						PID = 0ppm.			@ 53.5 feet: 2-inch silt layer.
55									@ 54.5 feet: 1-inch silt layer.
56									@ 55.5 feet: 4-inch silt layer.
57			100	CB		PID = 27ppm.			56.0 to 58.5 feet: SILTY SAND (SM); dark gray; 50% fines, high plasticity; 50% sand, fine; strong odor and sheen; wet.
58									
59									58.5 to 74.0 feet: SAND (SP); dark gray; 100% sand, fine; trace fines; heavy sheen and odor; moist to wet.
60						PID = 20ppm.			
61									
62									
63						PID = 34ppm.			
64									
65									

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**WS-16**	**4 of 12**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66			**100**	**CB**		**PID = 82ppm.**			*@ 66.0 feet to 74.0 feet: product visible.*
67									
68									
69						**PID = 27ppm.**			
70									
71									
72						**PID = 27ppm.**			
						WS16-W-72			
73									
74									*74.0 to 76.0 feet: SILT (ML); dark gray; 90% fines, medium to high plasticity; 10% sand, fine; no noticeable odor; moist.*
75						**PID = 0ppm.**			
76									*@ 75.5 feet: 2-inch sand layer.*
			100	**CB**					*76.0 to 80.0 feet: SILT WITH SAND (ML); dark gray; 85% fines, medium to high plasticity; 15% sand, fine; trace gravel, fine; moist.*
77									
78						**PID = 0ppm.**			
79									
80									*@ 80.0 feet: 3-inch rock, subangular.*
									80.0 to 86.0 feet: SILT (ML); dark gray; 100% fines, low to medium plasticity; moist.
81						**PID = 0ppm.**			
82									
83									
84						**PID = 0ppm.**			
85									
86			**90**	**CB**					*86.0 to 92.5 feet: SAND WITH SILT (SP-SM); dark gray; 15% fines, medium plasticity; 85% sand, fine; wet.*
87									

NOTES: *1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**WS-16**	**5 of 12**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88						**PID = 0ppm.**			
89									
90						**WS16-W-90**			@ 90.0 feet: 3-inch silt layer.
91						**PID = 0ppm.**			
92									
93									92.5 to 94.0 feet: SILT (ML); dark gray; 100% fines, low to medium plasticity; moist.
94						**PID = 0ppm.**			94.0 to 95.0 feet: SAND WITH SILT (SP-SM); dark gray; 15% fines, medium plasticity; 85% sand, fine; wet.
95									95.0 to 101.0 feet: SILT (ML); dark gray; 100% fines, medium plasticity; moist.
96									
97						**PID = 0ppm.**			
98									
99									
100						**PID = 0ppm.**			
101			**90**	**CB**					101.0 to 110.0 feet: SAND (SP); dark gray; 100% sand, fine to medium; trace fines; wet.
102									
103						**PID = 0ppm.**			
104									
105									
106						**PID = 0ppm.**			
107						**WS16-W-106**			@ 106.5 feet: three 1/2-inch clayey silt layers separated by 1/2-inch sand layers. @ 107.0 feet: 2-inch silt layer
108									@ 108.0 feet: 2-inch silt layer
109						**PID = 0ppm.**			@ 108.5 feet: two 1-inch silt layers separated by 3-inches of sand.
110									

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**WS-16**	**6 of 12**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
111									110.0 to 112.5 feet: SILT (ML); dark gray; 100% fines, low to medium plasticity; moist. @111.0 feet: two 2-inch sand layers separated by 2-inches of silt.
112						**PID = 0ppm.**			@ 112.0 feet: 3-inch sand layer.
113									112.5 to 124.0 feet: SAND (SP); dark gray; 100% sand, fine to medium; trace fines; wet.
114			**100**	**CB**					
115						**PID = 0ppm.**			
116									
117									
118						**PID = 0ppm.**			
119									
120									
121						**PID = 0ppm.** **WS16-W-121**			
122									
123									
124						**PID = 0ppm.**			124.0 to 126.0 feet: SAND (SP); dark gray; 100% sand, fine; wet.
125									@ 125.0 feet: three 1/2-inch clayey silt layers separated by 1-inch sand layers.
126			**40**	**CB**					126.0 to 128.0 feet: NO RECOVERY; sluff.
127									
128						**PID = 0ppm.**			128.0 to 136.5 feet: SAND (SP); dark gray; 100% sand, fine; wet.
129									
130									
131						**PID = 0ppm.**			
132									

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**WS-16**	**7 of 12**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
133									
134						**PID = 0ppm.**			
135									
136			**100**	**CB**		**WS16-W-136**			
137						**PID = 0ppm.**			136.5 to 137.0 feet: SILT (ML); dark gray; 100% fines, low to medium plasticity; moist.
138									137.0 to 139.0 feet: SAND (SP); dark gray; 10% fines, non plastic; 90% sand, fine; wet.
139									139.0 to 143.0 feet: CLAYEY SILT (ML-CL); dark grey; 100% fines, medium to high plasticity; moist.
140						**PID = 0ppm.**			
141									@ 140.5 feet: 2-inch sand layer.
142									@ 142.0 feet: 4-inch sand layer.
143						**PID = 0ppm.**			143.0 to 144.0 feet: SAND (SP); dark gray; 10% fines, non plastic; 90% sand, fine; wet.
144									144.0 to 146.0 feet: CLAYEY SILT (ML-CL); dark grey; 100% fines, medium to high plasticity; moist.
145									
146						**PID = 0ppm.**			146.0 to 148.5 feet: SAND (SP); dark gray; 10% fines, non plastic; 90% sand, fine; wet.
147									
148						**WS16-W-148**			
149						**PID = 0ppm.**			148.5 to 149.5 feet: SILTY SAND (SM); dark gray; 40% fines, medium to high plasticity; 60% sand, fine; wet.
150									144.0 to 146.0 feet: CLAYEY SILT (ML-CL); dark grey; 100% fines, medium to high plasticity; moist.
151			**90**	**CB**					
152						**PID = 0ppm.**			
153									153.0 to 154.5 feet: SAND (SP); dark gray; 100% sand, fine; trace fines; micaceous; wet.
154						**PID = 0ppm.**			
155									154.5 to 156.5 feet: CLAYEY SILT (ML-CL); dark grey; 100% fines,

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**WS-16**	**8 of 12**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
156									medium to high plasticity; moist.
157									156.5 to 160.5 feet: SAND (SP); dark gray; 100% sand, fine; trace fines; micaceous; wet.
158						PID = 0ppm.			
159									
160									
161						PID = 0ppm.			160.5 to 161.5 feet: CLAYEY SILT (ML-CL); dark grey; 100% fines, medium to high plasticity; moist.
162									161.5 to 165.5 feet: SAND (SP); dark gray; 100% sand, fine; trace fines; micaceous; wet.
163									
164						PID = 0ppm.			
165						WS16-W-165			
166			0	NR					165.5 to 166.0 feet: CLAYEY SILT (ML-CL); dark grey; 100% fines, medium to high plasticity; moist.
167									166.0 to 181.0 feet: NO RECOVERY.
168									
169									
170									
171									
172		○							
173									
174									
175									
176									
177									

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**WS-16**	**9 of 12**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
178									
179		○							
180						**WS16-W-180**			
181									
182			**100**	**CB**					181.0 to 183.0 feet: SAND (SP); dark gray; 100% sand, fine; trace fines; wet. @ 181.5 feet: 2-inch silt layer.
183									183.0 to 183.5 feet: CLAYEY SILT (ML-CL); dark grey; 100% fines, medium to high plasticity; moist.
184									183.5 to 185.5 feet: SAND (SP); dark gray; 100% sand, fine to medium; trace fines; wet.
185									
186									185.5 to 189.5 feet: CLAYEY SILT (ML-CL); dark grey; 100% fines, medium to high plasticity; moist.
187									
188									
189									
190									189.5 to 193.5 feet: SAND (SP); dark gray; 100% sand, fine to medium; trace fines; wet.
191									
192									
193									
194									193.5 to 195.0 feet: SILTY SAND (SM); dark gray; 40% fines, non plastic; 60% sand, fine; wet.
195									195.0 to 197.0 feet: SAND (SP); dark yellowish brown; 100% sand, fine to medium; trace fines; wet.
196									
197									197.0 to 198.5 feet: CLAYEY SILT (ML-CL); dark grey; 100% fines, medium to high plasticity; moist.
198									
199									198.5 to 201.0 feet: SAND (SP); dark gray; 100% sand, fine to medium; wet.
200									

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**WS-16**	**10 of 12**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
201			**100**	**CB**		**PID = 0ppm.**			201.0 to 206.8 feet: SAND (SW); dark gray; 100% sand, fine; trace fines, no plasticity; wet.
202						**PID = 0ppm.**			
203									
204						**PID = 0ppm.**			
205									
206						**PID = 0ppm.**			
207									206.8 to 207.2 feet: SAND (SW); orange-brown; 100% sand; moist to wet.
									207.2 to 207.8 feet: SILTY SAND (SM); dark gray; fine; dense.
208									@ 207.7 feet: 0.1-inch black reaction layer.
						PID = 0ppm.			207.8 to 210.0 feet: SAND (SW); dark orange-brown, becomes olive brown, then orange-brown/rust; 100% sand, fine; wet.
209									
210									
						PID = 0ppm.			210.0 to 210.4 feet: SILTY CLAY (CL-ML); gray; 100% fines, medium plasticity, dense; moist.
211									210.4 to 210.7 feet: SAND (SW); dark brown; 100% sand, fine to medium; wet.
									210.7 to 213.6 feet: SILTY SAND (SM); gray-brown; 30% fines; 70% sand; wet.
212						**PID = 0ppm.**			
213									
214									213.6 to 214.0 feet: CLAYEY SILT (ML-CL); orange-brown, banded; 100% fines, medium plasticity; moist.
						PID = 0ppm.			214.0 to 220.0 feet: SILTY SAND (SM); gray-brown; 50% fines; 50% sand; wet.
215									
216			**100**	**CB**		**PID = 0ppm.**			
217									
218						**PID = 0ppm.**			
219									
220									
						PID = 0ppm.			220.0 to 220.5 feet: SANDY SILT (ML); dark gray; 70% fines; 30% sand; wet.
221									220.5 to 228.5 feet: SAND (SW); orangish-brown; 100% sand, fine to medium; trace fines; wet.
222						**PID = 0ppm.**			

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**WS-16**	**11 of 12**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
223									@ 223.0 feet: change to grayish brown.
224						**PID = 0ppm.**			
225									
226						**PID = 0ppm.**			
227						**WS16-W-227**			
228						**PID = 0ppm.**			228.5 to 232.5 feet: SILT (ML); gray; 90% fines, medium plasticity; 10% sand, fine; moist.
229									
230						**PID = 0ppm.**			
231									@ 231.0 feet: increased clay content.
232						**PID = 0ppm.**			
233									232.5 to 234.5 feet: SILTY CLAYEY GRAVEL (GP-GM); dark gray to black; moist to wet.
234						**PID = 0ppm.**			
235									234.5 to 235.0 feet: SAND (SW); dark reddish brown; 100% sand, coarse; wet.
236									235.0 to 236.0 feet: BASALT; light gray to dark gray; moist to wet; bedrock. (Columbia River Basalt Group) Significant increase in resistance, drilling hardness.
						PID = 0ppm.			Total Depth = 236.0 feet.

WS16 Completion Details

Oregon Water Resources Department Well Start Card Number: 164733
Oregon Water Resources Department Well Identification Number: L67965

Boring:
0.0 to 75.0 feet bgs: 10-inch temporary, threaded steel, isolation casing.
0.0 to 98.0 feet bgs: 9-inch temporary, threaded steel, isolation casing.
0.0 to 140.0 feet bgs: 8-inch temporary, threaded steel, isolation casing.
0.0 to 236.0 feet bgs: 6-inch temporary, threaded steel, isolation casing.
0.0 to 236.0 feet bgs: 4x6-inch core barrel sampler.

0.0 to 1.5 feet bgs: flush mount vault and cement seal.
1.5 to 10.0 feet bgs: 1/4-inch Baroid bentonite chips hydrated with potable water.
10.0 to 104.0 feet bgs: bentonite grout slurry, 10.0 pounds per gallon.
104.0 to 106.0 feet bgs: 20x40 washed Colorado silica sand, secondary filter pack.
106.0 to 125.0 feet bgs: 10x20 washed Colorado silica sand, primary filter

NOTES: *1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.*

Maul Foster & Alongi, Inc.	Geologic Borehole Log/Well Construction		
	Project Number **8128.01.08**	Well Number **WS-16**	Sheet **12 of 12**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description

pack.
125.0 to 140.0 feet bgs: non-IPA coated, 1/4-inch bentonite pellets hydrated with potable water.
140.0 to 142.0 feet bgs: 20x40 washed Colorado silica sand, secondary filter pack.
142.0 to 161.0 feet bgs: 10x20 washed Colorado silica sand, primary filter pack.
161.0 to 236.0 feet bgs: non-IPA coated, 1/4-inch bentonite pellets hydrated with potable water.

Well WS16-125:
0.0 to 109.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe.
109.0 to 124.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-slot.
124.0 to 125.0 feet bgs: 2-inch diameter, stainless steel sump.

Well WS16-161:
0.0 to 145.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe.
145.0 to 160.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-slot.
160.0 to 161.0 feet bgs: 2-inch diameter, stainless steel sump.

NOTES: *1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**WS-17**	**1 of 7**

Project Name	**Siltronic Corporation**	TOC Elevation (feet)	
Project Location	**7200 NW Front Avenue Portland, Oregon**	Surface Elevation (feet)	**33.9**
Start/End Date	**8/5/2004 to 8/13/2004**	Northing	**704484.3**
Driller/Equipment	**Boart Longyear/Rotosonic**	Easting	**7624607.5**
Geologist/Engineer	**EB**	Hole Depth	**122.0-feet**
Sample Method	**4x6-inch core barrel.**	Outer Hole Diam	**10.0 to 6.0-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–9			**0**	**NR**					*0.0 to 10.0 feet: NO RECOVERY; Air knife to 10 feet bgs. to clear for possible utilities.*
10			**100**	**CB**					*10.0 to 11.0 feet: CLAYEY SAND (SC); grayish brown; 20% fines, high plasticity; 80% sand, fine; moderate odor.*
11–12						**PID = 0ppm.**			*11.0 to 23.0 feet: SILTY SAND (SM); dark gray; 20% fines, non plastic; 80% sand, fine to medium, strong odor and sheen.*
13			**90**	**CB**					
14–15						**PID = 0ppm.**			
16–18						**PID = 0ppm.**			
19–20									

NOTES: *1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	WS-17	2 of 7

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21						PID = 0ppm.			@ 21.0 feet: plastic sheeting/liner fragment.
22									
23									23.0 to 24.5 feet: SAND (SP); dark yellowish brown; 100% sand, fine to medium; trace fines; slight odor; damp.
24						PID = 0ppm.			
25			75	CB					24.5 to 25.0 feet: SAND (SP); dark gray; 100% sand, fine to medium; trace fines; slight odor; damp.
26									25.0 to 27.5 feet: NO RECOVERY; sluff.
27						PID = 0ppm.			
28									27.5 to 30.0 feet: SAND (SP); dark gray; 100% sand, fine to medium; trace fines; moderate odor and sheen diminishing with depth; wet.
29									
30						PID = 0ppm.			30.0 to 32.5 feet: SAND (SP); grayish brown; 100% sand, fine to medium; trace fines; slight odor; wet.
31									
32									
33						PID = 0ppm.			32.5 to 35.0 feet: SAND (SP); dark gray; 100% sand, fine to medium; trace fines; slight odor; wet.
34									
35			80	CB					35.0 to 41.0 feet: SILTY CLAY (CL-ML); dark yellowish brown; 100% fines, high plasticity; trace sand; no noticeable odor; moist.
36						PID = 0ppm.			
37									@ 37.0 feet: 2-inch sand layer.
38									@ 38.0 feet: 2-inch sand layer.
39						PID = 0ppm.			@ 39.0 feet: color changes to greenish-brownish-gray; trace organics.
40									
41			95	CB					41.0 to 44.5 feet: SILTY SAND (SM); dark gray; 20% fines, low to medium plasticity; 80% sand, fine; strong odor and sheen; wet.
42						PID = 0ppm.			

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**WS-17**	**3 of 7**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43									
44									
45						PID = 0ppm.			44.5 to 45.5 feet: SILTY CLAY (CL-ML); dark yellowish brown; 100% fines, high plasticity; trace sand; no noticeable odor; moist.
46						WS17-W-46			45.5 to 51.0 feet: SILTY SAND (SM); dark gray; 20% fines, non plastic; 80% sand, fine to coarse; slight odor and sheen; wet.
47									
48						PID = 0ppm.			
49									
50									
51						PID = 0ppm.			51.0 to 57.0 feet: CLAYEY SILT (ML-CL); stratified dark gray to dark brownish gray; 100% fines, high plasticity; trace rootlets; no noticeable odor; moist.
52									
53									
54						PID = 0ppm.			
55									
56			95	CB					
57						PID = 0ppm.			57.0 to 58.0 feet: SANDY SILT (ML); dark gray; 60% fines, medium to high plasticity; 40% sand, fine; moist.
58									58.0 to 60.0 feet: CLAYEY SILT (ML-CL); dark gray; 100% fines, high plasticity; trace rootlets; moist.
59									
60						PID = 0ppm.			60.0 to 60.5 feet: SANDY SILT (ML); dark gray; 60% fines, medium to high plasticity; 40% sand, fine; moist.
61						PID = 0ppm.			60.5 to 61.0 feet: CLAYEY SILT (ML-CL); dark gray; 100% fines, high plasticity; trace rootlets; moist.
62									61.0 to 62.5 feet: SILTY SAND (SM); dark gray; 30% fines, medium plasticity; 70% sand, fine; wet.
63						WS17-W-62.5			62.5 to 71.0 feet: CLAYEY SILT (ML-CL); dark gray; 100% fines, high plasticity; trace rootlets; moist. @ 63.0 feet: 1/4 inch dark banding.
64						PID = 0ppm.			@ 64.0 feet: 4 inch silty sand layer.
65									

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**WS-17**	**4 of 7**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66									
67						**PID = 0ppm.**			
68									
69									@ 69.0 feet: 1/4 inch dark banding.
70						**PID = 0ppm.**			
71			**100**	**CB**					71.0 to 71.5 feet: SILTY SAND (SM); dark gray; 50% fines, low plasticity; 50% sand, fine; wet.
72									71.5 to 74.0 feet: CLAYEY SILT (ML-CL); dark gray; 100% fines, high plasticity; trace rootlets; moist.
73						**PID = 0ppm.**			
74									74.0 to 80.0 feet: SILTY SAND (SM); dark gray; 50% fines, low plasticity; 50% sand, fine; wet.
75									
76						**PID = 0ppm.**			
77									
78									
79						**PID = 0ppm.**			
80									80.0 to 81.0 feet: CLAYEY SILT (ML-CL); dark gray; 100% fines, high plasticity; trace rootlets; moist.
81									81.0 to 90.0 feet: SAND (SP); dark gray; 100% sand, fine; wet.
82						**PID = 0ppm.**			
83									
84									
85						**PID = 0ppm.**			
86			**95**	**CB**		**WS17-W-86**			
87									

NOTES: *1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**WS-17**	**5 of 7**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88						**PID = 0ppm.**			
89									
90									
									90.0 to 91.0 feet: SILTY SAND (SM); dark gray; 20% fines, non plastic; 80% sand, fine; wet.
91						**PID = 0ppm.**			*91.0 to 92.0 feet: SAND (SP); dark gray; 100% sand, fine; wet.*
92									*92.0 to 93.0 feet: SILTY SAND (SM); dark gray; 20% fines, non plastic; 80% sand, fine; wet.*
93									*93.0 to 94.0 feet: CLAYEY SILT (ML-CL); dark gray; 100% fines, high plasticity; moist.*
94						**PID = 0ppm.**			*94.0 to 95.0 feet: SILTY SAND (SM); dark gray; 20% fines, non plastic; 80% sand, fine; wet.*
95									*95.0 to 97.0 feet: SILT (ML); dark gray; 100% fines, non plastic; trace organics, rootlets and wood fragments; moist.*
96									
97						**PID = 0ppm.**			*97.0 to 100.0 feet: SAND (SP); dark gray; 100% sand, fine; wet.*
98									
99									
100						**PID = 0ppm.** **WS17-W-100**			*100.0 to 101.0 feet: SILT (ML); dark gray; 100% fines, non plastic; moist.*
101			**95**	**CB**					*101.0 to 102.5 feet: SILTY SAND (SM); dark gray; 20% fines, non plastic; 80% sand, fine; wet.*
102									
103						**PID = 0ppm.**			*102.5 to 106.0 feet: SILT (ML); dark gray; 100% fines, low to medium plasticity; moist.*
104									
105									
106						**PID = 0ppm.**			*106.0 to 108.0 feet: CLAYEY SILT (ML-CL); stratified dark yellowish brown to light gray; 100% fines, medium to high plasticity; moist.*
107									
108									*108.0 to 112.0 feet: SILTY SAND (SM); dark yellowish brown; 20% fines, non plastic; 80% sand, fine; wet.*
109						**PID = 0ppm.**			*@ 109.0 feet: 2-inch clayey silt layer.*
110									

NOTES: *1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**WS-17**	**6 of 7**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
111									
112						PID = 0ppm.			112.0 to 116.0 feet: WEATHERED BASALT; dark reddish brown to dark gray; moist to wet. Significant increase in resistance, drilling hardness.
113									
114									
115						PID = 0ppm.			
116			100	CB					116.0 to 122.0 feet: BASALT; light gray to dark gray; dry to moist; bedrock. (Columbia River Basalt Group) Significant increase in resistance, drilling hardness.
117						WS17-W-112			
118									
119			100	CB					
120			100	CB		PID = 0ppm.			
121									
122						PID = 0ppm.			Total Depth = 122.0 feet.

WS17 Completion Details

Oregon Water Resources Department Well Start Card Number: 164734
Oregon Water Resources Department Well Identification Number: L67992

Boring:
0.0 to 39.0 feet bgs: 10-inch temporary, threaded steel, isolation casing.
0.0 to 68.0 feet bgs: 9-inch temporary, threaded steel, isolation casing.
0.0 to 122.0 feet bgs: 6-inch temporary, threaded steel, isolation casing.
0.0 to 122.0 feet bgs: 4x6-inch core barrel sampler.

0.0 to 1.5 feet bgs: flush mount vault and cement seal.
1.5 to 7.0 feet bgs: 1/4-inch Baroid bentonite chips hydrated with potable water.
7.0 to 36.0 feet bgs: bentonite grout slurry, 10.0 pounds per gallon.
36.0 to 38.0 feet bgs: 20x40 washed Colorado silica sand, secondary filter pack.
38.0 to 52.0 feet bgs: 10x20 washed Colorado silica sand, primary filter pack.
52.0 to 73.0 feet bgs: non-IPA coated, 1/4-inch bentonite pellets hydrated with potable water.
73.0 to 75.0 feet bgs: 20x40 washed Colorado silica sand, secondary filter pack.
75.0 to 94.0 feet bgs: 10x20 washed Colorado silica sand, primary filter

NOTES: *1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.*

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Maul Foster & Alongi, Inc.	Geologic Borehole Log/Well Construction		
	Project Number **8128.01.08**	Well Number **WS-17**	Sheet **7 of 7**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Sample Data: Percent Recovery	Sample Data: Collection Method	Sample Data: Number	Sample Data: Name (Type)	Sample Data: Blows/6"	Lithologic Column	Soil Description

pack.
94.0 to 122.0 feet bgs: non-IPA coated, 1/4-inch bentonite pellets hydrated with potable water.

<u>Well WS17-52:</u>
0.0 to 41.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe.
41.0 to 51.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-slot.
51.0 to 52.0 feet bgs: 2-inch diameter, stainless steel sump.

<u>Well WS17-94:</u>
0.0 to 78.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe.
78.0 to 93.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-slot.
93.0 to 94.0 feet bgs: 2-inch diameter, stainless steel sump.

NOTES: *1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.*

MONITORING WELL REPORT

(as required by ORS 537.765 & OAR 690-240-095)

MULT 84174

Well ID# 82844

Start Card # 186531

Instructions for completing this report are on the last page of this form.

(1) OWNER/PROJECT

WELL NO. MW-WS-2-112

Name SILTRONIC CORP

Address 7200 NW FRONT AVE

City PORTLAND State OR Zip 97210

(2) TYPE OF WORK

☒ New construction ☐ Alteration (Repair/Recondition)

☐ Conversion ☐ Deepening ☐ Abandonment

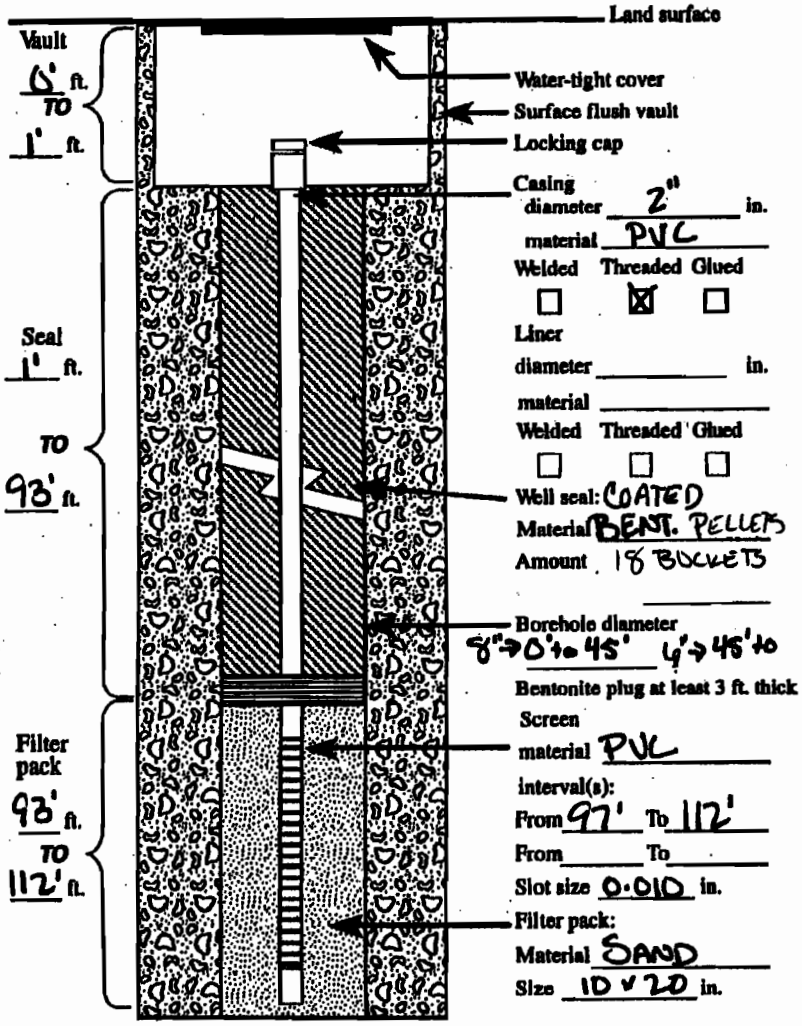
(3) DRILLING METHOD

☐ Rotary Air ☐ Rotary Mud ☐ Cable

☐ Hollow Stem Auger ☒ Other SONIC

(4) BORE HOLE CONSTRUCTION:

Special Standards Yes ☒ No ☐ Depth of Completed Well 112' ft.



(5) WELL TESTS:

☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Permeability _____ Yield _____ GPM

Conductivity _____ PH _____

Temperature of water 63 (F) C Depth artesian flow found _____ ft.

Was water analysis done? ☐ Yes ☐ No

By whom? _____

Depth of strata to be analyzed. From _____ ft. to _____ ft.

Remarks: _____

Name of supervising Geologist/Engineer MFA

(6) LOCATION OF WELL By legal description:

County MULT. Latitude _____ Longitude _____

Township 1N (N) or S) Range 1W (E or (W) Section 13

NW 1/4 of NW 1/4 of above section.

Street address of well location SAME AS OWNER

Tax lot number of well location 1200

ATTACH MAP WITH LOCATION IDENTIFIED. Map shall include approximate scale and north arrow.

(7) STATIC WATER LEVEL:

19.45' Ft. below land surface. Date 6-13-06

Artesian Pressure _____ lb/sq. in. Date _____

(8) WATER BEARING ZONES:

Depth at which water was first found _____

From	To	Est. Flow Rate	SWL

(9) WELL LOG:

Ground Elevation _____

Material	From	To	SWL
GRASS	0"	6"	—
BASE ROCK	6"	1.3"	—
FILL	1.3"	24.6'	19.45'
BROWN/GRAY SANDY SILT	24.6'	29.9'	
FINE GRAY SAND	29.9'	112'	

RECEIVED

JUN 26 2006

WATER RESOURCES DEPT
SALEM, OREGON

Date started 6-12-06 Completed 6-13-06

(unbonded) Monitor Well Constructor Certification:

I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.

Signed _____ MWC Number 1443 Date 6-20-06

(bonded) Monitor Well Constructor Certification:

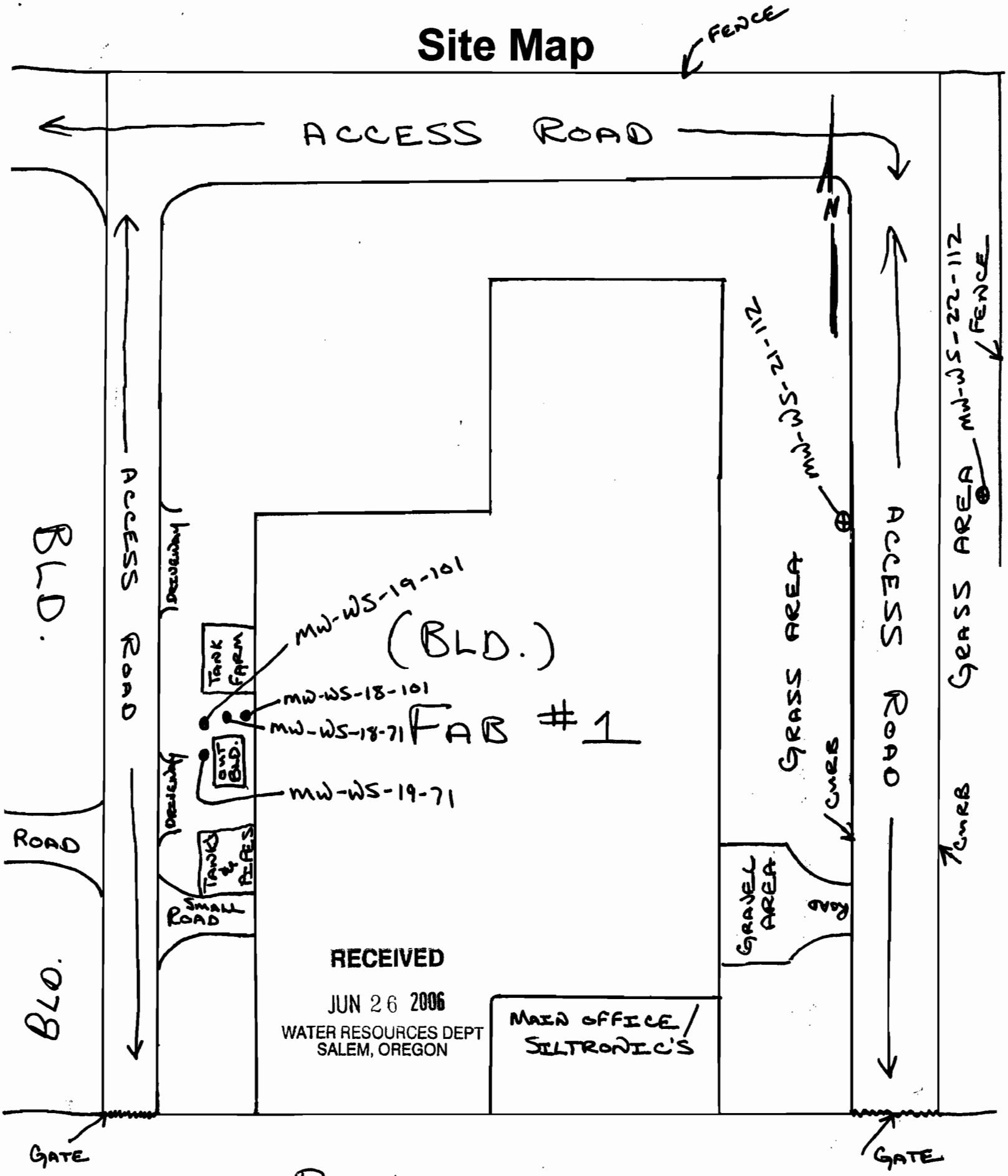
I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.

Signed _____ MWC Number 1461 Date 6-20-06

ORIGINAL COPY – WATER RESOURCES DEPARTMENT FIRST COPY – CONSTRUCTOR SECOND COPY – CUSTOMER

N.W. FRONT MULE 84174 PORTLAND OREGON

Site Map



RECEIVED
JUN 26 2006
WATER RESOURCES DEPT
SALEM, OREGON

MULT 84174

Oregon
Theodore R. Kulongoski, Governor

Water Resources Department
North Mall Office Building
725 Summer Street NE, Suite A
Salem, OR 97301-1266
503-986-0900
FAX 503-986-0904

June 9, 2006

GEO TECH EXPLORATIONS
BILL KLOSTERMANN #10442
19700 SW TETON
TUALATIN OR 97062

FINAL ORDER

Dear Bill:

The Special Standard request you submitted for owner: Siltronic Corp, Start Card numbers 186530 through 186532, is hereby approved for the following: You may construct these three monitoring wells with unhydrated coated bentonite pellet seals. The seals shall not extend to a depth greater than 95 feet bgs. The placement of the bentonite shall conform to both the Departments rules and the manufacturers specifications and result in a seal that is free of voids or bridges. Care shall be taken to minimize the introduction of bentonite dust. All other standards must be adhered to. Your Special Standard request form is enclosed.

The Well Construction Standards serve to protect ground water resources. By approving and issuing this special construction standard the Oregon Water Resources Department is not representing that a well constructed in accordance with this condition will maintain structural integrity or that it meets engineering standards. The well constructor/or landowner is responsible for ensuring that a well is constructed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240.

If you have any questions regarding this letter, I may be contacted at (503) 986-0851, or by e-mail at Kristopher.R.Byrd@wrd.state.or.us.

Sincerely,

Kristopher Byrd
Well Construction Program Coordinator
Enforcement Section

enclosure

cc: John Unger, NW Region Well Inspector
File

This is a final order in other than a contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review must be filed within the 60 day time period specified by ORS 183.484(2). Pursuant to ORS 536.075 and OAR 137-004-0080 you may either petition for judicial review or petition the Director for reconsideration of this order. A petition for reconsideration may be granted or denied by the director, and if no action is taken within 60 days following the date the petition was filed, the petition shall be deemed denied.

MaulFoster &Alongi, Inc.

GeologicBorehole Log/WellConstruction

Project Number	Well Number	Sheet
8128.01.20	**WS21-131**	**1 of 6**

Project Name	**Siltronic well installation**	TOC Elevation (feet)	
Project Location	**7200 NW Front**	Surface Elevation (feet)	
Start/End Date	**to 11/14/08**	Northing	
Driller/Equipment	**Boart Longyear/Spider mini sonic**	Easting	
Geologist/Engineer	**J. Pounds**	Hole Depth	**131.0-feet**
Sample Method	**Mini-Rotosonic**	Outer Hole Diam	**6-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
0			**0%**	**GP**	**1**	**WS21131-0.0**			*0 to 10.0 feet; Air knife.*
10				**GP**	**2**				*10.0 to 21.2 feet: SAND (SP-SM); dark brown; 10% fines; 80% sand; 10% gravel; moist.*

NOTES:

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MaulFoster &Alongi, Inc.

GeologicBorehole Log/WellConstruction

Project Number	Well Number	Sheet
8128.01.20	**WS21-131**	**2 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21				GP	3				21.2 to 23.5 feet: SILTY SAND (SM); black; 20% fines; 80% sand; 0% gravel; with organics, with wood; hydrocarbon odor, hydrocarbon staining; wet.
24									23.5 to 26.0 feet: SAND (SP-SM); dark brown; 10% fines; 80% sand; 10% gravel; moist.
26									26.0 to 32.0 feet: SAND; brown; 100% sand; wet.
30				GP	4				
32									32.0 to 33.9 feet: GRAVELLY SAND; dark gray; no staining; wet.
34									33.9 to 40.0 feet: SILT; dark gray; 100% fines, medium plasticity; 0% sand; 0% gravel; moist.
40			60%	GP	5				40.0 to 43.0 feet; No recovery.
42									

NOTES:

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MaulFoster &Alongi, Inc.

GeologicBorehole Log/WellConstruction

Project Number	Well Number	Sheet
8128.01.20	**WS21-131**	**3 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43									43.0 to 46.0 feet: SILTY SAND (SM); dark gray; 30% fines; 70% sand; 0% gravel; some organics; hydrocarbon odor, no staining; wet.
44									
45									
46									46.0 to 60.0 feet; No recovery.
47									
48									
49									
50			**0%**	**GP**	**7**				
51									
52									
53									
54									
55									
56									
57									
58									
59									
60			**50%**	**GP**	**8**				60.0 to 61.7 feet: SILTY SAND (SM); dark gray; 20% fines; 80% sand; 0% gravel; wet.
61									
62									61.7 to 62.3 feet: SILT; dark gray; 100% fines, medium plasticity; moist.
63									62.3 to 64.2 feet: SILTY SAND (SM); dark gray; 20% fines; 80% sand; 0% gravel; with organics; wet.
64									
65									64.2 to 65.0 feet: SILT; dark gray; 100% fines, medium plasticity; moist.

NOTES:

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MaulFoster &Alongi, Inc.

GeologicBorehole Log/WellConstruction

Project Number	Well Number	Sheet
8128.01.20	**WS21-131**	**4 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66									65.0 to 70.0 feet; No recovery.
67									
68									
69									
70			**90%**	**GP**	**9**				70.0 to 71.0 feet: SILT; dark gray; 100% fines, medium plasticity; moist.
71									71.0 to 74.3 feet: SILTY SAND (SM); dark gray; 20% fines; 80% sand; 0% gravel; with organics; wet.
72									
73									
74									
75									74.3 to 75.7 feet: SILT; dark gray; 100% fines, medium plasticity; moist.
76									75.7 to 77.6 feet: SILTY SAND (SM); dark gray; 20% fines; 80% sand; 0% gravel; with organics; wet.
77									
78									77.6 to 78.1 feet: SILT; dark gray; 100% fines, medium plasticity; moist.
79									78.1 to 79.1 feet: SILTY SAND (SM); dark gray; 20% fines; 80% sand; 0% gravel; with organics; wet.
80			**52%**	**GP**	**10**				79.1 to 80.0 feet; No recovery.
81									80.0 to 85.2 feet; dark grayish black; wet. SAND WITH SILT (SP-SM).Fine to medium sand. No odor..
82									
83									
84									
85									
86									85.2 to 90.0 feet; NO RECOVERY..
87									

NOTES:

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MaulFoster &Alongi, Inc.

GeologicBorehole Log/WellConstruction

Project Number	Well Number	Sheet
8128.01.20	**WS21-131**	**5 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88									
89									
90									
			95%	**GP**	**11**				90.0 to 90.9 feet: (SP-SM); dark brownish gray; 10% fines; 90% sand; 0% gravel; trace mica; wet.
91									90.9 to 92.7 feet; dark brownish gray; 100% fines, low plasticity; 0% sand; 0% gravel; trace mica; moist.
92									
93									92.7 to 97.0 feet: (SP-SM); dark brownish gray; 10% fines; 90% sand; 0% gravel; trace mica; wet. @ 94.7 to 95.2 ft: Trace wood fragments..
94									
95									
96									
97									97.0 to 98.3 feet; dark brownish gray; 100% fines, low plasticity; 0% sand; 0% gravel; trace mica; moist. @ 97.6 ft: 0.1-ft sand lens..
98									98.3 to 99.5 feet: (SP-SM); dark brownish gray; 10% fines; 90% sand; 0% gravel; trace mica; wet.
99									99.5 to 100.0 feet; NO RECOVERY..
100			**40%**	**GP**	**12**				100.0 to 104.0 feet: (SP-SM); dark brownish gray; 10% fines; 90% sand; 0% gravel; trace mica; wet.
101									
102									
103									
104									104.0 to 110.0 feet; NO RECOVERY..
105									
106									
107									
108									
109									
110									

NOTES:

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MaulFoster &Alongi, Inc.

GeologicBorehole Log/WellConstruction

Project Number	Well Number	Sheet
8128.01.20	**WS21-131**	**6 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
111			**100%**	**GP**	**13**				110.0 to 112.0 feet: (SP-SM); dark brownish gray; 10% fines; 90% sand; 0% gravel; trace mica; wet.
112									112.0 to 117.8 feet; dark brownish gray; moist to wet. INTERBEDDED SAND WITH SILT (SP-SM) AND SILT (ML). Beds up to 1.0 ft thick..
113									
114									
115									
116									
117									
118									117.8 to 120.0 feet: (SP-SM); dark brownish gray; 10% fines; 90% sand; 0% gravel; trace mica; wet.
119									
120			**95%**	**GP**	**14**				120.0 to 120.5 feet: (SP-SM); dark brownish gray; 10% fines; 90% sand; 0% gravel; trace mica; wet. Moderate organic odor..
121									120.5 to 121.9 feet: SILTY SAND (SM); dark brownish gray; 30% fines; 70% sand; 0% gravel; trace mica; wet. Moderate organic odor..
122									121.9 to 123.4 feet: (SP-SM); dark brownish gray; 10% fines; 90% sand; 0% gravel; trace mica; wet. Mild organic odor..
123									
124									123.4 to 125.1 feet; dark brownish gray; 100% fines, low plasticity; 0% sand; 0% gravel; trace mica; moist.
125									125.1 to 130.0 feet: (SP-SM); dark brownish gray; 10% fines; 90% sand; 0% gravel; trace mica; wet. @ 126.0 to 126.3 ft: Silt lens. @ 128.4 to 128.6 ft: Trace wood fragments..
126									
127									
128									
129									
130									130.0 to 130.5 feet; NO RECOVERY..
131									

NOTES:

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MaulFoster &Alongi, Inc.

GeologicBorehole Log/WellConstruction

Project Number	Well Number	Sheet
8128.01.20	**WS23-116**	**1 of 6**

Project Name	**Siltronic well installation**	TOC Elevation (feet)	
Project Location	**7200 NW Front**	Surface Elevation (feet)	
Start/End Date	**11/18/08 to 11/18/08**	Northing	
Driller/Equipment	**Boart Longyear/Spider mini sonic**	Easting	
Geologist/Engineer	**K. Titkemeier**	Hole Depth	**116.0-feet**
Sample Method	**Mini-Rotosonic**	Outer Hole Diam	**6-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–10			0%	GP	1	WS23116-0.0			0 to 10.0 feet; AIRKNIFED 0-10FT BGS. NO RECOVERY..
10–14			40%	GP	2				10.0 to 14.0 feet: SAND (SW); dark grayish brown; 0% fines; 100% sand; 0% gravel; trace silt, trace fine to coarse gravel; dry to moist.
14–20									14.0 to 20.0 feet; NO RECOVERY..

NOTES:

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MaulFoster &Alongi, Inc.

GeologicBorehole Log/WellConstruction

Project Number	Well Number	Sheet
8128.01.20	**WS23-116**	**2 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			**95%**	**GP**	**3**				*20.0 to 21.5 feet: SAND (SW); dark grayish brown; 0% fines; 100% sand; 0% gravel; trace silt, trace fine to coarse gravel; dry to moist.*
22									*21.5 to 24.0 feet: SILTY SAND (SM); dark gray; 15% fines; 80% sand; 5% gravel; with fine to coarse gravel; moist. sub-rounded to rounded gravel..*
23									
24									*24.0 to 28.0 feet: CLAYEY SILT (CL-ML); light brown; 75% fines, medium to high plasticity; 0% sand; 25% gravel; with fine to coarse gravel and cobbles, trace organics; no staining; moist. trace gray mottling. Stiff. Trace wood and twigs. Gravel- and cobble-sized concrete and bricks. Trac.*
25									
26									
27									
28									*28.0 to 29.5 feet: SILT (ML); dark gray; 90% fines, low to medium plasticity; 10% sand; 0% gravel; trace mica, trace wood; moist.*
29									
30									*29.5 to 30.0 feet; NO RECOVERY..*
31			**75%**	**GP**	**4**				*30.0 to 32.0 feet: SILT (ML); 90% fines, low to medium plasticity; 10% sand; 0% gravel; trace mica, trace blue rainbow sheen; hydrocarbon odor; moist. Mottled gray, brown, and rust-orange. Mild to moderate hydrocarbon-like odor.*
32									*32.0 to 37.5 feet; moist to wet. INTERBEDDED SP, SM, ML, AND SANDY SILT. Mottled gray, brown, and rust-orange. Heavy rainbow sheen an.*
33									
34									
35									
36									
37									
38									*37.5 to 40.0 feet; NO RECOVERY..*
39									
40			**33%**	**GP**	**5**				*40.0 to 43.3 feet; dark gray; trace mica; moist to wet. INTERBEDDED SILTY SAND (SM) AND SANDY SILT (ML); beds 0.2-0.6 ft thick. Moderate hydrocarbon-like od.*
41									
42									

NOTES:

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MaulFoster &Alongi, Inc.

GeologicBorehole Log/WellConstruction

Project Number	Well Number	Sheet
8128.01.20	**WS23-116**	**3 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43									
									43.3 to 50.0 feet; NO RECOVERY..
50			**95%**	**GP**	**6**				*50.0 to 59.5 feet; dark gray; trace mica; moist to wet. INTERBEDDED SILTY SAND (SM) AND SANDY SILT (ML); beds 0.1-1.0 ft thick. Mild to moderate hydrocarbon.*
60									*59.5 to 60.0 feet; NO RECOVERY..*
			82%	**GP**	**7**				*60.0 to 63.0 feet: SANDY SILT (ML); dark gray; 70% fines, low plasticity; 30% sand; 0% gravel; trace mica; wet. Fine sand. Trace blue rainbow sheen. Strong hydrocarbon-like odor..*
63									*63.0 to 65.5 feet; dark gray; trace mica; wet. INTERBEDDED SILTY SAND (SM) AND SANDY SILT (ML). Dark gray with heavy brownish-black staining. Stron.*
65									

NOTES:

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MaulFoster &Alongi, Inc.

GeologicBorehole Log/WellConstruction

Project Number	Well Number	Sheet
8128.01.20	**WS23-116**	**4 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66									65.5 to 68.2 feet: (SP-SM); 10% fines; 90% sand; 0% gravel; wet. Dark gray with heavy brownish-black staining. Heavy rainbow sheen. Strong hydrocarbon-like odor. @66.
67									
68									
69									68.2 to 70.0 feet; NO RECOVERY..
70			**95%**	**GP**	**8**				70.0 to 72.0 feet; dark gray; trace mica, trace Blue sheen.; wet. INTERBEDDED SILTY SAND (SM) AND SANDY SILT (ML). Strong hydrocarbon-like odor..
71									
72									72.0 to 74.0 feet: SANDY SILT; dark gray; trace mica, trace roots; moist. Moderate to strong hydrocarbon-like odor..
73									
74									74.0 to 75.0 feet; dark gray; wet. INTERBEDDED SILTY SAND (SM) AND SANDY SILT (ML). Moderate to strong hydrocarbon-like odor..
75									75.0 to 79.5 feet: SAND (SP); dark gray; wet. Fine to medium sand. Strong hydrocarbon-like odor. Rainbow sheen..
76									
77									
78									
79									
80			**95%**	**GP**	**9**				79.5 to 80.0 feet; NO RECOVERY..
81									80.0 to 81.7 feet: SILTY SAND (SM); dark gray; 20% fines; 80% sand; 0% gravel; trace mica; wet. Mild to moderate hydrocarbon-like odor..
82									81.7 to 84.0 feet: (SP-SM); dark gray; 10% fines; 90% sand; 0% gravel; trace mica; moist to wet.
83									
84									84.0 to 87.0 feet; dark gray; trace mica; moist. INTERBEDDED SAND WITH SILT (SP-SM) AND SILT (ML).
85									
86									
87									87.0 to 88.6 feet: SILT (ML); dark gray; 100% fines, low plasticity;

NOTES:

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MaulFoster &Alongi, Inc.

GeologicBorehole Log/WellConstruction

Project Number	Well Number	Sheet
8128.01.20	**WS23-116**	**5 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88									0% sand; 0% gravel; trace mica; moist.
89									88.6 to 89.5 feet: (SP-SM); dark gray; 10% fines; 90% sand; 0% gravel; trace mica; moist to wet. Mild hydrocrbon-like odor..
90									89.5 to 90.0 feet; NO RECOVERY..
91			**100%**	**GP**	**10**				90.0 to 91.1 feet: (SP-SM); dark gray; 10% fines; 90% sand; 0% gravel; trace mica; moist to wet. Hydrocrbon-like odor. Rainbow sheen..
92									91.1 to 93.5 feet; moist to wet. INTERBEDDED SAND WITH SILT (SP-SM) AND SILT (ML). Dark gray with brownish-black staining. Strong hyd.
93									
94									93.5 to 94.5 feet: SILT (ML); dark gray; 100% fines, non to low plasticity; 0% sand; 0% gravel; trace mica; moist. Strong hydrocarbon-like odor. Rainbow sheen..
95									94.5 to 95.8 feet: (SP-SM); dark gray; 10% fines; 90% sand; 0% gravel; trace mica; moist to wet. Dark gray with brownish-black staining. Hydrocarbon-like odor..
96									95.8 to 97.1 feet: SILT (ML); dark gray; 100% fines, non to low plasticity; 0% sand; 0% gravel; trace mica; moist. Strong hydrocarbon-like odor. Rainbow sheen..
97									97.1 to 100.0 feet: (SP-SM); dark gray; 10% fines; 90% sand; 0% gravel; trace mica; moist to wet. Dark gray with brownish-black staining. Hydrocarbon-like odor. @ 97.4 to 97.7 ft: Silt lens..
98									
99									
100			**91%**	**GP**	**11**				100.0 to 105.0 feet: (SP-SM); dark gray; 10% fines; 90% sand; 0% gravel; trace mica; moist to wet. Hydrocarbon-like odor..
101									
102									
103									
104									
105									105.0 to 105.5 feet; NO RECOVERY..
106			**100%**	**GP**	**12**				105.5 to 113.8 feet: (SP-SM); dark gray; 10% fines; 90% sand; 0% gravel; trace mica; moist to wet. Hydrocarbon-like odor. Trace silt lenses..
107									
108									
109									
110									

NOTES:

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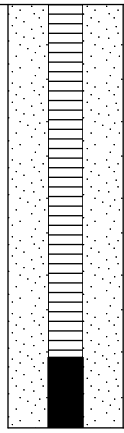
MaulFoster &Alongi, Inc.

GeologicBorehole Log/WellConstruction

Project Number	Well Number	Sheet
8128.01.20	**WS23-116**	**6 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Sample Data: Percent Recovery	Sample Data: Collection Method	Sample Data: Number	Sample Data: Name (Type)	Sample Data: Blows/6"	Lithologic Column	Soil Description
111									
112									
113									
114									113.8 to 115.5 feet: SILT (ML); dark gray; 100% fines, non to low plasticity; 0% sand; 0% gravel; trace mica; moist. Hydrocarbon-like odor..
115									
116									

NOTES:

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	**WS24-111**	**1 of 6**

Project Name	**Siltronic well installation**	TOC Elevation (feet)	
Project Location	**7200 NW Front**	Surface Elevation (feet)	
Start/End Date	**11/12/09 to 11/13/09**	Northing	
Driller/Equipment	**Boart Longyear/Spider mini sonic**	Easting	
Geologist/Engineer	**K. Titkemeier**	Hole Depth	**111.0-feet**
Sample Method	**Mini-Rotosonic**	Outer Hole Diam	**6-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–10			**0%**	**CB**	**1**				*0 to 10.0 feet; Air knifed..*
10–18			**100%**	**CB**	**2**				*10.0 to 18.2 feet: SILTY SAND (SM); dark brown; 20% fines; 80% sand; no staining; moist.*
18–19									*18.2 to 19.6 feet: SANDY SILT (ML); dark gray; 70% fines, medium plasticity; 30% sand; 0% gravel; moist.*
19–20									*19.6 to 22.2 feet: SILTY SAND (SM); dark brown; 20% fines; 80%*

NOTES:

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Geologic Borehole Log/Well Construction

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Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			**100%**	**CB**	**3**				*sand; no staining; moist.*
22									
23									*22.2 to 26.3 feet: SANDY SILT (ML); dark gray; 70% fines, low plasticity; 30% sand; 0% gravel; no odor; wet.*
24									
25									
26									
27									*26.3 to 32.1 feet: SILT (ML); dark gray; 100% fines, medium plasticity; damp.*
28									
29									
30			**100%**	**CB**	**4**				
31									
32									*32.1 to 40.0 feet: SILT (ML); brown; 100% fines, medium to high plasticity; damp.*
33									
34									
35									
36									
37									
38									
39									
40			**100%**	**CB**	**5**				*40.0 to 50.7 feet: SANDY SILT; dark gray; 80% fines, medium plasticity; 20% sand; 0% gravel; wet.*
41									
42									

NOTES:

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Geologic Borehole Log/Well Construction

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Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43									
44									
45									
46									
47									
48									
49									
50			**95%**	**CB**	**6**				
51									*50.7 to 53.9 feet: SILT; brownish gray; 100% fines, medium plasticity; wet.*
52									
53									
54									*53.9 to 56.0 feet: SANDY SILT; dark gray; 80% fines, medium plasticity; 20% sand; 0% gravel; wet.*
55									
56									*56.0 to 59.5 feet: SILT; brownish gray; 100% fines, medium plasticity; wet.*
57									
58									
59									
60			**82%**	**CB**	**7**				*59.5 to 60.0 feet; No recovery.*
61									*60.0 to 63.0 feet: SAND (SW); dark gray; 100% sand; hydrocarbon odor; wet.*
62									
63									*63.0 to 63.8 feet: SILT; dark gray; 100% fines, medium plasticity; wet.*
64									*63.8 to 68.2 feet: SILTY SAND (SM); dark gray; 25% fines; 75% sand; 0% gravel; wet.*
65									

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
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Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66									
67									
68									
69									68.2 to 70.0 feet; No recovery.
70									
71			**100%**	**CB**	**8**				70.0 to 72.1 feet: SILT; dark gray; 100% fines, medium plasticity; wet.
72									
73									72.1 to 76.3 feet: SILTY SAND (SM); dark gray; 20% fines; 80% sand; no staining; wet.
74									
75									
76									
77									76.3 to 80.0 feet: SANDY SILT; dark gray; 70% fines; 30% sand; 0% gravel.
78									
79									
80			**100%**	**CB**	**9**				80.0 to 86.2 feet: SILTY SAND (SM); dark gray; 20% fines; 80% sand; no staining; wet.
81									
82									
83									
84									
85									
86									
87									86.2 to 87.0 feet: SILT; dark gray; 100% fines, medium plasticity; wet.
									87.0 to 91.8 feet: SILTY SAND (SM); dark gray; 20% fines; 80%

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	**WS24-111**	**5 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88									sand; no staining; wet.
89									
90			**100%**	**CB**	**10**				
91									
92									91.8 to 92.3 feet: SILT; dark gray; 100% fines, medium plasticity; wet.
93									92.3 to 99.0 feet: SILTY SAND (SM); dark gray; 20% fines; 80% sand; no staining; wet.
94									
95									
96									
97									
98									
99									99.0 to 100.0 feet: SILT; dark gray; 100% fines, medium plasticity; wet.
100			**100%**	**CB**	**11**				100.0 to 108.1 feet: SAND; dark gray; 100% sand.
101									
102									
103									
104									
105									
106									
107									
108									108.1 to 108.8 feet: SILT lense.
109									108.8 to 110.3 feet: SAND; dark gray; 100% sand.
110									

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Geologic Borehole Log/Well Construction

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Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
111			**100%**	**CB**	**12**				*110.3 to 111.0 feet: SILT lense.*

NOTES:

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	**WS24-126**	**1 of 6**

Project Name	**Siltronic well installation**	TOC Elevation (feet)	
Project Location	**7200 NW Front**	Surface Elevation (feet)	
Start/End Date	**11/10/09 to 11/11/09**	Northing	
Driller/Equipment	**Boart Longyear/Spider mini sonic**	Easting	
Geologist/Engineer	**K. Titkemeier**	Hole Depth	**126.0-feet**
Sample Method	**Mini-Rotosonic**	Outer Hole Diam	**6-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–10			0%	CB	1				0 to 10.0 feet; Air knifed..
10–20			100%	CB	2				10.0 to 18.2 feet: SILTY SAND (SM); dark brown; 20% fines; 80% sand; no staining; moist.
18–19									18.2 to 19.6 feet: SANDY SILT (ML); dark gray; 70% fines, medium plasticity; 30% sand; 0% gravel; moist.
19–20									19.6 to 22.2 feet: SILTY SAND (SM); dark brown; 20% fines; 80%

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
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Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			**100%**	**CB**	**3**				sand; no staining; moist.
22									
23									22.2 to 26.3 feet: SANDY SILT (ML); dark gray; 70% fines, low plasticity; 30% sand; 0% gravel; no odor; wet.
24									
25									
26									
27									26.3 to 32.1 feet: SILT (ML); dark gray; 100% fines, medium plasticity; damp.
28									
29									
30			**100%**	**CB**	**4**				
31									
32									32.1 to 40.0 feet: SILT (ML); brown; 100% fines, medium to high plasticity; damp.
33									
34									
35									
36									
37									
38									
39									
40									
41			**100%**	**CB**	**5**				40.0 to 50.7 feet: SANDY SILT; dark gray; 80% fines, medium plasticity; 20% sand; 0% gravel; wet.
42									

NOTES:

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	**WS24-126**	**3 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43									
44									
45									
46									
47									
48									
49									
50			**95%**	**CB**	**6**				
51									*50.7 to 53.9 feet: SILT; brownish gray; 100% fines, medium plasticity; wet.*
52									
53									
54									*53.9 to 56.0 feet: SANDY SILT; dark gray; 80% fines, medium plasticity; 20% sand; 0% gravel; wet.*
55									
56									*56.0 to 59.5 feet: SILT; brownish gray; 100% fines, medium plasticity; wet.*
57									
58									
59									
60									*59.5 to 60.0 feet; No recovery.*
			82%	**CB**	**7**				*60.0 to 63.0 feet: SAND (SW); dark gray; 100% sand; hydrocarbon odor; wet.*
61									
62									
63									*63.0 to 63.8 feet: SILT; dark gray; 100% fines, medium plasticity; wet.*
64									*63.8 to 68.2 feet: SILTY SAND (SM); dark gray; 25% fines; 75% sand; 0% gravel; wet.*
65									

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
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Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66									
67									
68									
69									68.2 to 70.0 feet; No recovery.
70			**100%**	**CB**	**8**				70.0 to 72.1 feet: SILT; dark gray; 100% fines, medium plasticity; wet.
71									
72									72.1 to 76.3 feet: SILTY SAND (SM); dark gray; 20% fines; 80% sand; no staining; wet.
73									
74									
75									
76									76.3 to 80.0 feet: SANDY SILT; dark gray; 70% fines; 30% sand; 0% gravel.
77									
78									
79									
80			**100%**	**CB**	**9**				80.0 to 86.2 feet: SILTY SAND (SM); dark gray; 20% fines; 80% sand; no staining; wet.
81									
82									
83									
84									
85									
86									86.2 to 87.0 feet: SILT; dark gray; 100% fines, medium plasticity; wet.
87									87.0 to 91.8 feet: SILTY SAND (SM); dark gray; 20% fines; 80%

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Geologic Borehole Log/Well Construction

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Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88									sand; no staining; wet.
89									
90			**100%**	**CB**	**10**				
91									
92									91.8 to 92.3 feet: SILT; dark gray; 100% fines, medium plasticity; wet.
93									92.3 to 99.0 feet: SILTY SAND (SM); dark gray; 20% fines; 80% sand; no staining; wet.
94									
95									
96									
97									
98									
99									99.0 to 100.0 feet: SILT; dark gray; 100% fines, medium plasticity; wet.
100			**100%**	**CB**	**11**				100.0 to 108.1 feet: SAND; dark gray; 100% sand.
101									
102									
103									
104									
105									
106									
107									
108									108.1 to 108.8 feet: SILT lense.
109									108.8 to 110.3 feet: SAND; dark gray; 100% sand.
110									

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Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
111			**100%**	**CB**	**12**				*110.3 to 111.4 feet: SILT lense.*
112									*111.4 to 119.0 feet: SAND with SILT; dark gray; 95% sand; 5% silt.*
113									
114									
115									
116									
117									
118									
119									*119.0 to 119.5 feet: SILT lense.*
120									*119.5 to 120.8 feet: SAND with SILT; dark gray; 95% sand; 5% silt.*
121			**100%**	**CB**	**13**				*120.8 to 121.3 feet: SILT lense.*
122									*121.3 to 126.0 feet: SAND with SILT: dark blackish gray; 75% sand; 25% silt.*
123									
124									
125									
126									

NOTES:

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	**WS25-96**	**1 of 5**

Project Name	**Siltronic well installation**	TOC Elevation (feet)	
Project Location	**7200 NW Front**	Surface Elevation (feet)	
Start/End Date	**11/3/08 to 11/4/08**	Northing	
Driller/Equipment	**Boart Longyear/Spider mini sonic**	Easting	
Geologist/Engineer	**J. Pounds**	Hole Depth	**96.0-feet**
Sample Method	**Mini-Rotosonic**	Outer Hole Diam	**6-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–10			**0%**	**CB**	**1**				*0.0 to 10.0 feet: Air knife.*
10–20			**100%**	**CB**	**2**				*10.0 to 25.0 feet: GRAVELLY SAND; dark brown; 85% sand, fine to medium; 15% gravel*

NOTES:

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	**WS25-96**	**2 of 5**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			**72%**	**CB**	**3**				
22									
23									
24									
25									*25.0 to 25.5 feet: SILTY SAND; tar with wood.*
26									*25.5 to 27.2 feet: SAND; black; fine to medium; damp.*
27									
28									*27.2 to 30.0 feet: No recovery.*
29									
30			**82%**	**CB**	**4**				*30.0 to 31.5 feet: SANDY SILT (ML); medium brown; 60% fines; 40% fine sand; trace mica; wet.*
31									
32									*31.5 to 38.2 feet: SILT (ML); mottled medium to dark gray, medium brown and rust orange; trace mica; trace organics; low to medium plasticity; fine sand; moist.*
33									
34									
35									
36									
37									
38									
39									*38.2 to 40.0 feet: No recovery.*
40			**84%**	**CB**	**5**				*40.0 to 42.0 feet: SAND with SILT (SP); medium to dark gray; 90% fines sand; 10% fines; trace mica; trace silt; wet.*
41									
42									*42.0 to 43.0 feet: SILT (ML); medium to dark gray; low plasticity*

NOTES:

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Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43									fines; 20% fine sand; trace mica; moist to wet.
44									43.0 to 44.5 feet: SAND with SILT (SP); medium to dark gray; 90% fines sand; 10% fines; trace mica; trace silt; wet.
45									44.5 to 50.0 feet: No recovery.
			100%	**CB**	**6**				45.0 to 49.1 feet: SAND with SILT (SP); medium to dark brown; 90% fine sand; 10% fines; trace mica; wet.
46									
47									
48									
49									
50									49.1 to 53.5 feet: SILTY SAND; medium to dark gray; trace; wet.
			60%	**CB**	**7**				
51									
52									
53									
54									53.5 to 55.0 feet: No recovery.
55									
			90%	**CB**	**8**				55.0 to 59.5 feet: SAND with SILT (SP); medium to dark gray; 90% sand; 10% fines; trace mica; wet.
56									
57									
58									
59									
60									59.5 to 60.0 feet: No recovery.
			90%	**CB**	**9**				60.0 to 62.2 feet: SAND with SILT (SP); medium to dark gray; 90% fine sand; 10% fines; trace mica; wet.
61									
62									
63									62.2 to 63.5 feet: SANDY SILT (ML); medium to dark gray; trace organics; trace mica; moist to wet.
64									63.5 to 64.5 feet: SILTY SAND (SM); medium to dark gray; 80% fine sand; 20% fines; trace organics; trace mica; wet.
65									64.5 to 65.9 feet: SILT (ML); medium to dark gray; non to low

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8128.01.20	**WS25-96**	**4 of 5**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66									plasticity fines; 15% fine sand; trace mica; trace organics; moist.
67									
68									
69									65.9 to 69.0 feet: SAND with SILT (SP); medium to dark gray; 90% fine sand; 10% fines, decreasing fines with depth; trace mica; wet.
70			**100%**	**CB**	**10**				69.0 to 70.0 feet: No Recovery.
71									70.0 to 71.3 feet: SAND with SILT (SP); medium to dark gray; 90% fine sand; 10% fines; trace mica; wet.
72									71.3 to 73.2 feet: SANDY SILT (ML); medium to dark gray; 60% fines; 40% fine sand; trace mica; moist.
73									
74									73.2 to 74.0 feet: SANDY SILT (ML); medium to dark gray; trace mica; moist to wet.
75									74.0 to 75.0 feet: No Recovery.
76									75.0 to 75.5 feet: SANDY SILT (ML); medium to dark gray; trace mica; moist to wet.
77									75.5 to 77.4 feet: SAND with SILT; medium to dark gray; 90% fine sand; 10 % fines; trace mica; moist to wet.
78									77.4 to 78.0 feet: SILT (ML); medium to dark gray; low to medium plasticity; trace mica; moist to wet.
79									78.0 to 79.1 feet: SANDY SILT (ML); medium to dark gray; trace mica; moist to wet.
80			**100%**	**CB**	**11**				79.1 to 79.7 feet: SILT (ML); medium to dark gray; low to medium plasticity; trace mica; moist to wet.
81									79.7 to 81.4 feet: SAND with SILT; medium to dark gray; 90% fine sand; 10 % fines; trace mica; moist to wet.
82									81.4 to 82.6 feet: SANDY SILT (ML); medium to dark gray; trace mica; moist to wet.
83									82.6 to 85.0 feet: SAND with SILT; medium to dark gray; 90% fine sand; 10 % fines; trace mica; moist to wet.
84									
85									85.0 to 87.0 feet: SAND with SILT; medium to dark gray; 90% fine sand; 10 % fines; trace mica; moist to wet.
86									
87									87.0 to 89.7 feet: SILT (ML); medium to dark gray; low to medium

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Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88									plasticity; trace mica; white fragments; moist to wet.
89									
90									89.7 to 96.0 feet: SAND with SILT; medium to dark gray; 90% fine sand; 10% fines; trace mica; moist to wet.
91			**100%**	**CB**	**12**				
92									
93									
94									
95									
96									

NOTES:

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	**WS25-111**	**1 of 6**

Project Name	**Siltronic well installation**	TOC Elevation (feet)	
Project Location	**7200 NW Front**	Surface Elevation (feet)	
Start/End Date	**10/30/08 to 10/31/08**	Northing	
Driller/Equipment	**Boart Longyear/Spider mini sonic**	Easting	
Geologist/Engineer	**J. Pounds**	Hole Depth	**111.0-feet**
Sample Method	**Mini-Rotosonic**	Outer Hole Diam	**6-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–10			**0%**	**CB**	**1**				*0.0 to 10.0 feet: Air knife.*
10–20			**100%**	**CB**	**2**				*10.0 to 25.0 feet: GRAVELLY SAND; dark brown; 85% sand, fine to medium; 15% gravel*

NOTES:

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Project Number	Well Number	Sheet
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Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			**72%**	**CB**	**3**				
22									
23									
24									
25									*25.0 to 25.5 feet: SILTY SAND; tar with wood.*
26									*25.5 to 27.2 feet: SAND; black; fine to medium; damp.*
27									
28									*27.2 to 30.0 feet: No recovery.*
29									
30			**82%**	**CB**	**4**				*30.0 to 31.5 feet: SANDY SILT (ML); medium brown; 60% fines; 40% fine sand; trace mica; wet.*
31									
32									*31.5 to 38.2 feet: SILT (ML); mottled medium to dark gray, medium brown and rust orange; trace mica; trace organics; low to medium plasticity; fine sand; moist.*
33									
34									
35									
36									
37									
38									
39									*38.2 to 40.0 feet: No recovery.*
40			**84%**	**CB**	**5**				*40.0 to 42.0 feet: SAND with SILT (SP); medium to dark gray; 90% fines sand; 10% fines; trace mica; trace silt; wet.*
41									
42									*42.0 to 43.0 feet: SILT (ML); medium to dark gray; low plasticity*

NOTES:

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	WS25-111	3 of 6

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43									fines; 20% fine sand; trace mica; moist to wet.
44									43.0 to 44.5 feet: SAND with SILT (SP); medium to dark gray; 90% fines sand; 10% fines; trace mica; trace silt; wet.
45									44.5 to 50.0 feet: No recovery.
			100%	CB	6				45.0 to 49.1 feet: SAND with SILT (SP); medium to dark brown; 90% fine sand; 10% fines; trace mica; wet.
46									
47									
48									
49									
50									49.1 to 53.5 feet: SILTY SAND; medium to dark gray; trace; wet.
			60%	CB	7				
51									
52									
53									
54									53.5 to 55.0 feet: No recovery.
55									
			90%	CB	8				55.0 to 59.5 feet: SAND with SILT (SP); medium to dark gray; 90% sand; 10% fines; trace mica; wet.
56									
57									
58									
59									
60									59.5 to 60.0 feet: No recovery.
			90%	CB	9				60.0 to 62.2 feet: SAND with SILT (SP); medium to dark gray; 90% fine sand; 10% fines; trace mica; wet.
61									
62									
63									62.2 to 63.5 feet: SANDY SILT (ML); medium to dark gray; trace organics; trace mica; moist to wet.
64									63.5 to 64.5 feet: SILTY SAND (SM); medium to dark gray; 80% fine sand; 20% fines; trace organics; trace mica; wet.
65									64.5 to 65.9 feet: SILT (ML); medium to dark gray; non to low

NOTES:

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	**WS25-111**	**4 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66									plasticity fines; 15% fine sand; trace mica; trace organics; moist.
67									
68									
69									65.9 to 69.0 feet: SAND with SILT (SP); medium to dark gray; 90% fine sand; 10% fines, decreasing fines with depth; trace mica; wet.
70									69.0 to 70.0 feet: No Recovery.
71			**100%**	**CB**	**10**				70.0 to 71.3 feet: SAND with SILT (SP); medium to dark gray; 90% fine sand; 10% fines; trace mica; wet.
72									71.3 to 73.2 feet: SANDY SILT (ML); medium to dark gray; 60% fines; 40% fine sand; trace mica; moist.
73									
74									73.2 to 74.0 feet: SANDY SILT (ML); medium to dark gray; trace mica; moist to wet.
75									74.0 to 75.0 feet: No Recovery.
76									75.0 to 75.5 feet: SANDY SILT (ML); medium to dark gray; trace mica; moist to wet.
77									75.5 to 77.4 feet: SAND with SILT; medium to dark gray; 90% fine sand; 10 % fines; trace mica; moist to wet.
78									77.4 to 78.0 feet: SILT (ML); medium to dark gray; low to medium plasticity; trace mica; moist to wet.
79									78.0 to 79.1 feet: SANDY SILT (ML); medium to dark gray; trace mica; moist to wet.
80									79.1 to 79.7 feet: SILT (ML); medium to dark gray; low to medium plasticity; trace mica; moist to wet.
81			**100%**	**CB**	**11**				79.7 to 81.4 feet: SAND with SILT; medium to dark gray; 90% fine sand; 10 % fines; trace mica; moist to wet.
82									81.4 to 82.6 feet: SANDY SILT (ML); medium to dark gray; trace mica; moist to wet.
83									82.6 to 85.0 feet: SAND with SILT; medium to dark gray; 90% fine sand; 10 % fines; trace mica; moist to wet.
84									
85									85.0 to 87.0 feet: SAND with SILT; medium to dark gray; 90% fine sand; 10 % fines; trace mica; moist to wet.
86									
87									87.0 to 89.7 feet: SILT (ML); medium to dark gray; low to medium

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	**WS25-111**	**5 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88									plasticity; trace mica; white fragments; moist to wet.
89									
90			**100%**	**CB**	**12**				89.7 to 98.5 feet: SAND with SILT; medium to dark gray; 90% fine sand; 10 % fines; trace mica; moist to wet.
91									
92									
93									
94									
95									
96									
97									
98									
99									98.5 to 102.7: SAND with SILT (SP); medium to dark gray; moist.
100			**100%**	**CB**	**13**				
101									
102									
103									102.7 to 111.0 feet: SAND with SILT; medium to dark gray; 60% fines; 40% fine sand; trace mica; trace white fragments; moist.
104									
105									
106									
107									
108									
109									
110									

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	**WS25-111**	**6 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
111			**100%**	**CB**	**14**				

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GeologicBorehole Log/WellConstruction

Project Number	Well Number	Sheet
8128.01.20	**WS26-86**	**1 of 4**

Project Name	**Siltronic well installation**	TOC Elevation (feet)	
Project Location	**7200 NW Front**	Surface Elevation (feet)	
Start/End Date	**10/27/08 to 10/29/08**	Northing	
Driller/Equipment	**Boart Longyear/Spider mini sonic**	Easting	
Geologist/Engineer	**J. Pounds**	Hole Depth	**86.0-feet**
Sample Method	**Mini-Rotosonic**	Outer Hole Diam	**6-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–9									0.0 to 10.0 feet: Air knife.
10						**PID = 0.2 ppm**			10.0 to 18.5 feet: SAND (SW); medium to dark brown; fine to coarse; trace fines' trace gravel: fine to medium; dry.
11–14									
15						**PID = 0.3 ppm**			
16–18									
19									18.5 to 20.0 feet: No recovery.
20									

NOTES:

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GeologicBorehole Log/WellConstruction

Project Number	Well Number	Sheet
8128.01.20	**WS26-86**	**2 of 4**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21						**PID = 0.3 ppm**			20.0 to 26.4 feet: SAND (SW); dark gray; fine to coarse sand; trace fines; mica; wood fragments; trace gravel; mild hydrocarbon odor; moist to wet.
22									
23									
24									
25						**PID = 0.3 ppm**			
26									
27									26.4 to 39.5 SILT (ML); medium to dark gray; non to low plasticity fines; trace organics; mica; fine sand; moist.
28									@ 27.5 feet: color change to mottled medium to dark gray and rust orange.
29									
30						**PID = 0.1 ppm**			
31									
32									
33									
34									
35						**PID = 0.1 ppm**			
36									
37									
38									
39									
40									39.5 to 40.0 feet: No recovery.
41						**PID = 0.0 ppm**			40.0 to 61.7 feet: SAND WITH SILT (SP); medium to dark gray; 90% sand: fine to medium; 10% fines; trace mica; trace organics; wet.
42									

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GeologicBorehole Log/WellConstruction

Project Number	Well Number	Sheet
8128.01.20	**WS26-86**	**3 of 4**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Sample Data: Percent Recovery	Sample Data: Collection Method	Sample Data: Number	Sample Data: Name (Type)	Sample Data: Blows/6"	Lithologic Column	Soil Description
43									
44									
45						***PID = 0.0 ppm***			
46									
47									
48									
49									
50						***PID = 0.0 ppm***			
51									
52									
53									
54									
55						***PID = 0.1 ppm***			
56									
57									
58									
59									
60						***PID = 2.5 ppm***			
61									
62									*61.7 to 63.0 feet: SANDY SILT; dark gray; 60% fines; 40% sand: fine to medium; wet.*
63									*63.0 to 66.0 feet: SAND WITH SILT (SP); medium to dark gray; 90% sand: fine to medium; 10% fines; trace mica; trace organics; wet.*
64									
65									

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GeologicBorehole Log/WellConstruction

Project Number	Well Number	Sheet
8128.01.20	**WS26-86**	**4 of 4**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66									
						PID = 0.2 ppm			*66.0 to 70.0 feet: No recovery.*
67									
68									
69									
70									
						PID = 0.6 ppm			*63.0 to 66.0 feet: SAND WITH SILT (SP); medium to dark gray; 90% sand: fine to medium; 10% fines; trace mica; wet.*
71									
72									
73									*72.5 to 73.0 feet: SANDY SILT (ML); medium to dark gray; 65% fines: non to low plasticity; 35% sand: fine; trace mica; wet.*
									73.0 to 74.0 feet: SAND WITH SILT (SP); medium to dark gray; 90% sand: fine to medium; 10% fines; trace mica; wet.
74									*74.0 to 74.2 feet: SANDY SILT (ML); medium to dark gray; 65% fines: non to low plasticity; 35% sand: fine; trace mica; wet.*
75									*74.2 to 74.5 feet: SAND WITH SILT (SP); medium to dark gray; 90% sand: fine to medium; 10% fines; trace mica; wet.*
						PID = 0.8 ppm			*74.5 to 76.0 feet: SANDY SILT (ML); medium to dark gray; 65% fines: non to low plasticity; 35% sand: fine; trace mica; wet.*
76									*76.0 to 80.0 feet: SAND WITH SILT (SP); medium to dark gray; 90% sand: fine to medium; 10% fines; trace mica; wet.*
77									
78									
79									
80									
						PID = 0.3 ppm			*80.0 to 86.0 feet: SAND; medium to dark gray; trace mica; moist to wet.*
81									
82									
83									
84									
85									
86									

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GeologicBorehole Log/WellConstruction

Project Number	Well Number	Sheet
8128.01.20	**WS26-116**	**1 of 6**

Project Name	**Siltronic well installation**	TOC Elevation (feet)	
Project Location	**7200 NW Front**	Surface Elevation (feet)	
Start/End Date	**10/23/08 to 10/24/08**	Northing	
Driller/Equipment	**Boart Longyear/Spider mini sonic**	Easting	
Geologist/Engineer	**J. Pounds**	Hole Depth	**116.0-feet**
Sample Method	**Mini-Rotosonic**	Outer Hole Diam	**6-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–9									0.0 to 10.0 feet: Air knife.
10						**PID = 0.3 ppm**			10.0 to 18.5 feet: SAND (SW); medium to dark brown; fine to coarse; trace fines' trace gravel: fine to medium; dry.
11–14									
15						**PID = 2.1 ppm**			
16–18									
19									18.5 to 20.0 feet: No recovery.
20									

NOTES:

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GeologicBorehole Log/WellConstruction

Project Number	Well Number	Sheet
8128.01.20	**WS26-116**	**2 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21									**PID = 3.2 ppm** — 20.0 to 26.4 feet: SAND (SW); dark gray; fine to coarse sand; trace fines; mica; wood fragments; trace gravel; mild hydrocarbon odor; moist to wet.
22									
23									
24									
25									**PID = 0.4 ppm**
26									
27									26.4 to 39.5 SILT (ML); medium to dark gray; non to low plasticity fines; trace organics; mica; fine sand; moist.
28									@ 27.5 feet: color change to mottled medium to dark gray and rust orange.
29									
30									**PID = 0.0 ppm**
31									
32									
33									
34									
35									**PID = 0.0 ppm**
36									
37									
38									
39									
40									39.5 to 40.0 feet: No recovery.
41									**PID = 0.0 ppm** — 40.0 to 61.7 feet: SAND WITH SILT (SP); medium to dark gray; 90% sand: fine to medium; 10% fines; trace mica; trace organics; wet.
42									

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GeologicBorehole Log/WellConstruction

Project Number	Well Number	Sheet
8128.01.20	**WS26-116**	**3 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Sample Data: Percent Recovery	Sample Data: Collection Method	Sample Data: Number	Sample Data: Name (Type)	Sample Data: Blows/6"	Lithologic Column	Soil Description
43									
44									
45									
						PID = 0.0 ppm			
46									
47									
48									
49									
50									
						PID = 0.2 ppm			
51									
52									
53									
54									
55									
						PID = 0.3 ppm			
56									
57									
58									
59									
60									
						PID = 3.8 ppm			
61									
62									*61.7 to 63.0 feet: SANDY SILT; dark gray; 60% fines; 40% sand: fine to medium; wet.*
63									*63.0 to 66.0 feet: SAND WITH SILT (SP); medium to dark gray; 90% sand: fine to medium; 10% fines; trace mica; trace organics; wet.*
64									
65									

NOTES:

MaulFoster &Alongi, Inc.

GeologicBorehole Log/WellConstruction

Project Number	Well Number	Sheet
8128.01.20	**WS26-116**	**4 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66					**PID = 0.0 ppm**				
									66.0 to 70.0 feet: No recovery.
70					**PID = 0.5 ppm**				*63.0 to 66.0 feet: SAND WITH SILT (SP); medium to dark gray; 90% sand: fine to medium; 10% fines; trace mica; wet.*
73									*72.5 to 73.0 feet: SANDY SILT (ML); medium to dark gray; 65% fines: non to low plasticity; 35% sand: fine; trace mica; wet.*
74									*73.0 to 74.0 feet: SAND WITH SILT (SP); medium to dark gray; 90% sand: fine to medium; 10% fines; trace mica; wet.*
75					**PID = 0.5 ppm**				*74.0 to 74.2 feet: SANDY SILT (ML); medium to dark gray; 65% fines: non to low plasticity; 35% sand: fine; trace mica; wet.* *74.2 to 74.5 feet: SAND WITH SILT (SP); medium to dark gray; 90% sand: fine to medium; 10% fines; trace mica; wet.*
76									*74.5 to 76.0 feet: SANDY SILT (ML); medium to dark gray; 65% fines: non to low plasticity; 35% sand: fine; trace mica; wet.* *76.0 to 80.0 feet: SAND WITH SILT (SP); medium to dark gray; 90% sand: fine to medium; 10% fines; trace mica; wet.*
80					**PID = 0.0 ppm**				*80.0 to 89.0 feet: SAND; medium to dark gray; trace mica; moist to wet.*
85					**PID = 0.0 ppm**				
87									

NOTES:

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GeologicBorehole Log/WellConstruction

Project Number	Well Number	Sheet
8128.01.20	**WS26-116**	**5 of 6**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Sample Data: Percent Recovery	Sample Data: Collection Method	Sample Data: Number	Sample Data: Name (Type)	Sample Data: Blows/6"	Lithologic Column	Soil Description
88									
89									*89.0 to 90.0 feet: No recovery.*
90						***PID = 0.0 ppm***			*90.0 to 92.5 feet: INTERBEDDED SANDY SILT AND SILTY SAND; dark gray; mica; moist.*
91									
92									
93									*92.5 to 103.9 feet: SAND (SP); medium to dark gray; 95% sand: fine to medium; 5% fines; trace mica; moist to wet.*
94									
95						***PID = 0.2 ppm***			
96									
97									
98									
99									
100									
101									
102									
103									
104									*103.9 to 106.0: No recovery.*
105									
106									*106.0 to 113.0 feet: SAND (SP); medium to dark gray; 95% sand: fine to medium; 5% fines; trace mica; moist to wet.*
107									
108									
109									
110									

NOTES:

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GeologicBorehole Log/WellConstruction

Project Number	Well Number	Sheet
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Depth (feet, BGS)	Well Details	Sample Data: Interval	Sample Data: Percent Recovery	Sample Data: Collection Method	Sample Data: Number	Sample Data: Name (Type)	Sample Data: Blows/6"	Lithologic Column	Soil Description
111									
112									
113									113.0 to 115.5 feet: SILT (ML); medium to dark gray; low plasticity; trace mica; moist.
114									
115									
116									115.5 to 116.0 feet: SAND (SP); medium to dark gray; 95% sand: fine to medium; 5% fines; trace mica; moist to wet.

NOTES:

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	**WS27-86**	**1 of 5**

Project Name	**Siltronic well installation**	TOC Elevation (feet)	
Project Location	**7200 NW Front**	Surface Elevation (feet)	
Start/End Date	**10/21/08 to 10/22/08**	Northing	
Driller/Equipment	**Boart Longyear/Spider mini sonic**	Easting	
Geologist/Engineer	**J. Pounds**	Hole Depth	**87.7-feet**
Sample Method	**Mini-Rotosonic**	Outer Hole Diam	**6-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–10			0%	CB	1				0 to 10.0 feet: Air knife
10			96%	CB	2	PID = 0.0 ppm			10.0 to 14.2 feet: SAND (SW); medium brown; fine to coarse; no odor; no sheen; dry.
14						PID = 0.0 ppm			14.2 to 16.5 feet: SANDY SILT (ML); dark gray; 70% fines; 30% sand: very fine to fine; trace wood fragments; mica; trace angular to rounded cobbles; dry to moist.
17						PID = 0.5 ppm			16.5 to 19.6 feet: SAND (SP); dark gray; 90% fine to medium sand; 10% fines; trace mica; fine to medium sub-angular gravel; trace wood fragment; moist.
20									19.6 to 20.0 feet: No recovery.

NOTES:

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	**WS27-86**	**2 of 5**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			**72%**	**CB**	**3**	**PID = 17.1 ppm**			@ 20.0 feet: NAPL; strong hydrocarbon odor; trace wood fragments. 20.0 to 22.0 feet: SAND (SP); dark gray; fine to medium; 10% fines; trace mica; dry to moist.
22									22.0 to 22.7 feet: SILTY SAND (SM); dark gray; 60% fine to medium sand; 40% fines; trace mica; hydrocarbon odor; moist.
23									22.7 to 27.2 feet: SILTY SAND (SM); dark gray; low plasticity fines; hydrocarbon odor; trace mica; moist
24									
25						**PID = 5.2 ppm**			
26									
27									27.2 to 40.0 feet: No recovery.
28									
29									
30			**0%**	**CB**	**4**	**PID = 3.2 ppm**			
31									
32									
33									
34									
35						**PID = 0.4 ppm**			
36									
37									
38									
39									
40			**100%**	**CB**	**5**	**PID = 0.3 ppm**			40.0 to 44.5 feet: SANDY SILT; dark gray; 70% fines; 30% sand: fine; trace organics; wet.
41									
42									

NOTES:

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	**WS27-86**	**3 of 5**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43									
44									
45						PID = 3.5 ppm			44.5 to 46.2 feet: SAND WITH SILT; dark gray; 90% sand: fine to medium; 10% fines; wet.
46									
47									46.2 to 48.0 feet: SANDY SILT; brownish gray; 70% fines; 30% sand.
48									48.0 to 57.5 feet: SILTY SAND; dark gray; 30% fines; 70% sand; fine to medium; wet.
49									
50			**100%**	**CB**	**6**	**PID = 1.2 ppm**			
51									
52									
53									
54									
55						PID = 2.3 ppm			
56									
57									
58									57.5 to 63.1 feet: SAND WITH SILT; dark gray; 90% sand: fine to medium; 10% fines; wet.
59									
60			**72%**	**CB**	**7**	**PID = 0.4 ppm**			
61									
62									
63									
64									63.1 to 65.6 feet: SAND; black; wet.
65									

NOTES:

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	**WS27-86**	**4 of 5**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66						PID = 2.3 ppm			65.6 to 67.2 feet: SILTY SAND; dark gray; 30% fines; 70% sand; fine to medium; wet.
67									67.2 to 70.0 feet: No recevery.
68									
69									
70			100%	CB	8	PID = 0.4 ppm			70.0 to 77.6 feet: SILTY SAND; dark gray; 20% fines; 80% sand: fine to medium; wet.
71									
72									
73									
74									
75						PID = 0.3 ppm			
76									
77									
78									77.6 to 81.0 feet: SANDY SILT; dark gray; 60% fines: low plasticity; 40% sand; wet.
79									
80			77%	CB	9	PID = 1.6 ppm			
81									81.0 to 86.0 feet: SAND WITH SILT; dark gray; 10% fines: low plasticity; wet.
82									
83									
84									
85									
86									86.0 to 87.7 feet: No recovery.
87									

NOTES:

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	**WS27-86**	**5 of 5**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Sample Data: Percent Recovery	Sample Data: Collection Method	Sample Data: Number	Sample Data: Name (Type)	Sample Data: Blows/6"	Lithologic Column	Soil Description

NOTES:

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	WS40-36	1 of 2

Project Name	Siltronic Corporation - Monitoring Well Installation	TOC Elevation (feet)	32.94
Project Location	7200 NW Front Avenue, Portland, Oregon 97210	Surface Elevation (feet)	33.3
Start/End Date	3/25/11 to 3/25/11	Northing	704690.2
Driller/Equipment	Jeff Jones, Cascade Drilling/Compact RotoSonic	Easting	7624571.0
Geologist/Engineer	K. Titkemeier	Hole Depth	36.8-feet
Sample Method	Compact RotoSonic	Outer Hole Diam	6-inch

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–10			0%	CB					0.0 to 10.0 feet: Air knifed by vacuum truck. No observations.
10–11			60%	CB					10.0 to 11.0 feet: SILTY SAND (SM); dark brownish gray; 70% fine to medium sand; 30% fines; trace roots and wood fragments; wet.
11–15									11.0 to 15.0 feet: NO RECOVERY.
15–17									15.0 to 17.0 feet: SAND WITH SILT (SP-SM); dark brownish gray; 90% fine to medium sand; 10% fines; trace red lithics; moist. Grading to SILTY SAND (SM) with depth.
17–21.5									17.0 to 21.5 feet: SAND WITH SILT (SP-SM); dark gray to black; 90% fine to medium sand; 10% fines; strong hydrocarbon-like odor; tacky; moist. @ 17.0 feet: Trace fine to coarse, rounded to subangular gravel.

NOTES: 1. bgs = below ground surface. 2. CB = core barrel soil sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. PVC = poly vinyl chloride. 6. TOC = top of casing. 7. Depths are relative to feet below ground surface. 8. Horizontal Datum: NAD 83/91, Oregon State Plane Coordinate System, North Zone, International Feet, HARN. 9. Vertical Datum: NGVD 29/47.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	**WS40-36**	**2 of 2**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			100%	CB					
22									21.5 to 24.0 feet: SILT (ML); dark browish gray; 90-95% low to medium plasticity fines; 5-10% fine sand; trace mica and roots; hydrocarbon-like odor; trace sheen; moist.
23									
24									24.0 to 25.0 feet: SANDY SILT (ML); dark brownish gray; 70% low to medium plasticity fines; 30% fine sand; hydrocarbon-like odor; trace sheen; moist.
25			100%	CB					25.0 to 35.0 feet: INTERBEDDED SILTY SAND (SM), SANDY SILT (ML), AND SILT (ML); dark brownish gray; trace mica and roots; hydrocarbon-like odor; silver sheen; sand is tacky; moist. Soil is visibly stained.
26									@ 25.0 to 32.0 feet: Rust-orange mottling in silt layers.
27									@ 27.0 feet: Moderate sheen.
28									
29									@ 29.0 to 30.0 feet: Moderate sheen.
30			100%	CB					@ 30.0 to 35.0 feet: Visible staining; "blebs" of dark brown to black product. Silty sand lenses becoming increasingly tacky.
31									
32									@ 31.5 to 32.0 feet: SILTY SAND (SM); moderate sheen.
33									
34									@ 33.5 to 34.0 feet: SILTY SAND (SM); heavy sheen.
35									
36									

Total Depth = 36.8 feet below ground surface.

Well Completion Details

Oregon Water Resources Department Well Start Card: 1012651
Oregon Water Resources Department Well Identification: L105554
Boring:
0.0 to 2.0 feet bgs: flush mount Sherwood vault and cement seal.
2.0 to 24.0 feet bgs: 3/8-inch Baroid bentonite chips hydrated with potable water.
24.0 to 36.8 feet bgs: 10x20 Colorado silica sand.
Well:
0.0 to 25.8 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe.
25.8 to 35.8 feet bgs: 2-inch diameter, stainless steel screen, 0.010-slot.
35.8 feet bgs: DNAPL funnel.
35.8 to 36.8 feet bgs: 2-inch diameter, stainless steel sump.

NOTES: *1. bgs = below ground surface. 2. CB = core barrel soil sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. PVC = poly vinyl chloride. 6. TOC = top of casing. 7. Depths are relative to feet below ground surface. 8. Horizontal Datum: NAD 83/91, Oregon State Plane Coordinate System, North Zone, International Feet, HARN. 9. Vertical Datum: NGVD 29/47.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	WS41-36	1 of 3

Project Name	Siltronic Corporation - Monitoring Well Installation	TOC Elevation (feet)	32.41
Project Location	7200 NW Front Avenue, Portland, Oregon 97210	Surface Elevation (feet)	32.7
Start/End Date	3/29/11 to 3/29/11	Northing	704635.5
Driller/Equipment	Jeff Jones, Cascade Drilling/Compact RotoSonic	Easting	7624534.6
Geologist/Engineer	K. Titkemeier	Hole Depth	37.3-feet
Sample Method	Compact RotoSonic	Outer Hole Diam	6-inch

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–10			0%	CB					0.0 to 10.0 feet: Air knifed by vacuum truck. No observations.
10–16			95%	CB					10.0 to 16.0 feet: SAND (SP); very dark brown; 95% fine to medium sand; 5% fines; trace fine gravel; loose; dry to moist.
13						PID = 4.2 ppm			
14–16									@ 14.0 to 16.0 feet: Color change from very dark brown to very dark gray to black.
16–19.5									16.0 to 19.5 feet: SILTY SAND (SM); black; 70% fine to medium sand; 30% fines; trace roots and fine to medium gravel; hydrocarbon-like odor; black staining; tacky; moist.
17									@ 17.0 feet: 1-inch lens of brown, fibrous material (decayed wood fragments?).
18						PID = 77.1 ppm			
19.5–20									19.5 to 20.0 feet: SAND WITH SILT (SP-SM); very dark brownish gray

NOTES: 1. bgs = below ground surface. 2. CB = core barrel soil sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. PVC = poly vinyl chloride. 6. TOC = top of casing. 7. Depths are relative to feet below ground surface. 8. Horizontal Datum: NAD 83/91, Oregon State Plane Coordinate System, North Zone, International Feet, HARN. 9. Vertical Datum: NGVD 29/47.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	**WS41-36**	**2 of 3**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			**95%**	**CB**					*to black; 90% fine to medium sand; 10% fines; hydrocarbon-like odor; rainbow sheen; moist. Inside of core bag stained dark brown (NAPL).*
22									*20.0 to 23.0 feet: SILTY SAND (SM); black; 60% fine to medium sand; 40% low to medium plasticity fines; trace roots; strong hydrocarbon-like odor; rainbow sheen; tacky; moist to wet. Inside of core bag stained dark brown (NAPL).*
23						**PID = 133.6 ppm**			
24									*23.0 to 30.0 feet: SAND WITH SILT (SP-SM); very dark gray; 90% fine to medium sand; 10% fines; trace mica; hydrocarbon-like odor; rainbow sheen; moist to wet. Inside of core bag stained dark brown (NAPL).*
25									
26									
27									
28						**PID = 42.2 ppm**			
29									*@ 28.5 to 30.0 feet: Visible staining and product (NAPL) presence diminishes.*
30			**92%**	**CB**					*30.0 to 36.0 feet: SANDY SILT (ML); greenish gray; 55-80% low to medium plasticity fines; 20-45% fine sand; trace mica; rainbow sheen; stiff; moist. Visible staining and "blebs" of dark brown to black product throughout. Sand and silt percentages vary with depth. Lenses of SILTY SAND (SM).*
31									
32									
33						**PID = 42.7 ppm**			
34									
35									
36									
37									

Total Depth = 37.3 feet below ground surface.

Well Completion Details

Oregon Water Resources Department Well Start Card: 1012648
Oregon Water Resources Department Well Identification: L105556

Boring:
0.0 to 2.0 feet bgs: flush mount Sherwood vault and cement seal.
2.0 to 5.0 feet bgs: 3/8-inch Baroid bentonite chips hydrated with potable water.
5.0 to 22.0 feet bgs: Organoclay-bentonite grout slurry (1:10 Organoclay: bentonite grout mixture), 9.7 pounds per gallon.
22.0 to 23.0 feet bgs: coated, 3/8-inch bentonite pellets hydrated with potable water.
23.0 to 37.3 feet bgs: 10x20 Colorado silica sand.

Well:
0.0 to 26.3 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe.

NOTES: *1. bgs = below ground surface. 2. CB = core barrel soil sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. PVC = poly vinyl chloride. 6. TOC = top of casing. 7. Depths are relative to feet below ground surface. 8. Horizontal Datum: NAD 83/91, Oregon State Plane Coordinate System, North Zone, International Feet, HARN. 9. Vertical Datum: NGVD 29/47.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	**WS41-36**	**3 of 3**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
									26.3 to 36.3 feet bgs: 2-inch diameter, stainless steel screen, 0.010-slot. *36.3 feet bgs: DNAPL funnel.* *36.3 to 37.3 feet bgs: 2-inch diameter, stainless steel sump.*

NOTES: *1. bgs = below ground surface. 2. CB = core barrel soil sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. PVC = poly vinyl chloride. 6. TOC = top of casing. 7. Depths are relative to feet below ground surface. 8. Horizontal Datum: NAD 83/91, Oregon State Plane Coordinate System, North Zone, International Feet, HARN. 9. Vertical Datum: NGVD 29/47.*

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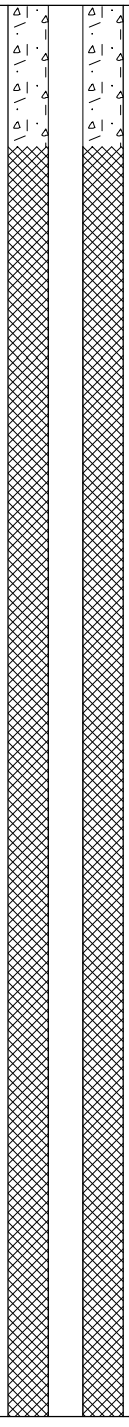
Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	**WS41-91**	**1 of 5**

Project Name	**Siltronic Corporation - Monitoring Well Installation**	TOC Elevation (feet)	**32.48**
Project Location	**7200 NW Front Avenue, Portland, Oregon 97210**	Surface Elevation (feet)	**32.8**
Start/End Date	**3/28/11 to 3/28/11**	Northing	**704638.5**
Driller/Equipment	**Jeff Jones, Cascade Drilling/Compact RotoSonic**	Easting	**7624530.2**
Geologist/Engineer	**K. Titkemeier**	Hole Depth	**91.3-feet**
Sample Method	**Compact RotoSonic**	Outer Hole Diam	**8-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–9			0%	CB					0.0 to 10.0 feet: Air knifed by vacuum truck. No observations.
10			95%	CB					10.0 to 16.5 feet: SAND (SP); very dark brown; 95% fine to medium sand; 5% fines; loose; dry to moist.
14									@ 14.0 to 16.5 feet: Color change to very dark gray to black.
16									@ 16.5 feet: Large wood fragments and twigs up to 4 inches in length.
17									16.5 to 17.0 feet: SANDY SILT (ML); very dark gray to black; 65% non- to low plasticity fines; 35% fine sand; trace mica; moist.
17–18									17.0 to 19.0 feet: SILTY SAND (SM); black; 75% fine to medium sand; 25% fines; trace mica, roots and wood fragments; fine to coarse rounded to subangular gravel and cobbles up to 4 inches in diameter; hydrocarbon-like odor; tacky; moist.
19–20									19.0 to 20.0 feet: SAND WITH SILT (SP-SM); black; 90% fine to medium sand; 10% fines; trace mica; hydrocarbon-like odor; tacky; moist.

NOTES: 1. bgs = below ground surface. 2. CB = core barrel soil sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. PVC = poly vinyl chloride. 6. TOC = top of casing. 7. Depths are relative to feet below ground surface. 8. Horizontal Datum: NAD 83/91, Oregon State Plane Coordinate System, North Zone, International Feet, HARN. 9. Vertical Datum: NGVD 29/47.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	WS41-91	2 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
20			60%	CB					20.0 to 24.0 feet: NO RECOVERY.
21									
22									
23									
24									24.0 to 29.5 feet: SAND WITH SILT (SP-SM); very dark gray; 90% fine to medium sand; 10% fines; trace mica and roots; strong hydrocarbon-like odor; rainbow sheen; moist to wet. Inside of core bags are stained dark brown (NAPL). Water shows dark brown to black patches of product (NAPL).
25									
26									
27									
28									
29									
30			100%	CB					29.5 to 35.0 feet: SILT (ML); very dark greenish gray; 80% low to medium plasticity fines; 20% fine sand; trace mica, roots, and leaves; hydrocarbon-like odor; silver rainbow sheen; stiff; moist. Visible staining and "blebs" of viscous, dark brown to black product throughout.
31									@ 29.5 to 30.0 feet: Veins of NAPL along organic material.
32									@ 31.5 feet: 3-inch SAND lens; very dark gray to black; trace mica; hydrocarbon-like odor; tacky; moist to wet. Water shows dark brown to black patches of product (NAPL).
33						PID = 204.4 ppm			
34									@ 33.5 feet: 3-inch SAND lens; very dark gray to black; trace mica; hydrocarbon-like odor; tacky; moist to wet. Water shows dark brown to black patches of product (NAPL).
35			100%	CB					@ 35.0 feet: 3-inch SAND lens; very dark gray to black; trace mica; hydrocarbon-like odor; tacky; moist to wet. Water shows dark brown to black patches of product (NAPL).
36									35.0 to 37.0 feet: SAND WITH SILT (SP-SM); very dark gray to black; 90% fine to medium sand; 10% fines; hydrocarbon-like odor; silver rainbow sheen; moist to wet.
37									37.0 to 40.0 feet: SANDY SILT (ML); very dark gray; 55% low to medium plasticity fines; 45% fine sand; trace mica; moist to wet. No sheen; no staining; no visible product. Lenses of SILTY SAND (SM).
38						PID = 95.5 ppm			
39									
40			100%	CB					40.0 to 41.5 feet: SILT (ML); very dark gray; 90-95% medium to high plasticity fines; 5-10% very fine sand; trace mica; very stiff; moist.
41									
42									41.5 to 43.0 feet: SANDY SILT (ML); very dark gray; 55% low to medium plasticity fines; 45% fine sand; trace mica; moist to wet. Lenses of SILTY SAND (SM).

NOTES: 1. bgs = below ground surface. 2. CB = core barrel soil sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. PVC = poly vinyl chloride. 6. TOC = top of casing. 7. Depths are relative to feet below ground surface. 8. Horizontal Datum: NAD 83/91, Oregon State Plane Coordinate System, North Zone, International Feet, HARN. 9. Vertical Datum: NGVD 29/47.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	**WS41-91**	**3 of 5**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43			**83%**	**CB**					*43.0 to 45.0 feet: NO RECOVERY.*
44									
45									*45.0 to 47.0 feet: SILTY SAND (SM); very dark gray; 70% fine to medium sand; 30% fines; trace mica; moist to wet.*
46									
47									*47.0 to 49.5 feet: INTERBEDDED SILTY SAND AND SANDY SILT (SM/ML); very dark gray; trace mica; moist to wet.*
48						**PID = 12.9 ppm**			*SILTY SAND (SM); 55% sand; 45% fines.*
49									*SANDY SILT (ML); 55% fines; 45% sand.*
50									*49.5 to 55.0 feet: SILTY SAND (SM); very dark gray; 70% fine to medium sand; 30% fines; trace mica; moist to wet.*
51									
52									
53						**PID = 43.4 ppm**			
54									
55			**40%**	**CB**					*55.0 to 65.0 feet: SAND WITH SILT (SP-SM); very dark gray; 90% fine to medium sand; 10% fines; trace mica; moist. Soupy at top 1 ft.*
56									*@ 55.0 to 60.0 feet: Trace nodules of SILT (ML).*
57									
58						**PID = 37.1 ppm**			
59									
60									
61									
62									
63						**PID = 7.7 ppm**			
64									
65									

NOTES: *1. bgs = below ground surface. 2. CB = core barrel soil sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. PVC = poly vinyl chloride. 6. TOC = top of casing. 7. Depths are relative to feet below ground surface. 8. Horizontal Datum: NAD 83/91, Oregon State Plane Coordinate System, North Zone, International Feet, HARN. 9. Vertical Datum: NGVD 29/47.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	WS41-91	4 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66			100%	CB					65.0 to 68.0 feet: SILTY SAND (SM); 60% fine to medium sand; 40% fines; trace mica; moist to wet.
67									
68									68.0 to 69.0 feet: SANDY SILT (ML); 55% low plasticity fines; 45% fine sand; trace mica; moist to wet.
69									69.0 to 75.0 feet: SILTY SAND (SM); 70% fine to medium sand; 30% fines; trace mica; moist to wet.
70									
71									
72									
73									
74									
75			95%	CB					75.0 to 85.0 feet: INTERBEDDED SILTY SAND AND SANDY SILT (SM/ML); very dark gray; trace mica and roots; moist to wet. SANDY SILT (ML) more abundant than SILTY SAND (SM). SILTY SAND (SM); 55% sand; 45% fines. SANDY SILT (ML); 55% fines; 45% sand.
76									
77									
78						PID = 11.1 ppm			
79									
80									@ 79.5 to 80.0 feet: SILTY SAND (SM) lens; 70% sand; 30% fines.
81									
82									
83						PID = 11.3 ppm			
84									@ 83.5 to 84.5 feet: 1-millimeter thick laminations of white, fine sand-sized material, with centimeters to inches between laminations.
85			83%	CB					85.0 to 91.0 feet: SILTY SAND (SM); very dark gray; 60-80% fine to medium sand; 20-40% fines; trace mica; moist to wet. Sand and silt percentages vary with depth. Lenses of SANDY SILT (ML) and SILT (ML).
86									
87									

NOTES: 1. bgs = below ground surface. 2. CB = core barrel soil sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. PVC = poly vinyl chloride. 6. TOC = top of casing. 7. Depths are relative to feet below ground surface. 8. Horizontal Datum: NAD 83/91, Oregon State Plane Coordinate System, North Zone, International Feet, HARN. 9. Vertical Datum: NGVD 29/47.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	**WS41-91**	**5 of 5**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88						**PID = 12.7 ppm**			
89									
90									
91									

Total Depth = 91.3 feet below ground surface.

Well Completion Details

Oregon Water Resources Department Well Start Card: 1012672
Oregon Water Resources Department Well Identification: L105559

Boring:
0.0 to 43.0 feet bgs: 8-inch temporary, threaded steel, isolation casing.
40.0 to 43.0 feet bgs: Bentonite seal: 3/8-inch Baroid bentonite chips hydrated with potable water.
0.0 to 91.0 feet bgs: 6-inch temporary, threaded steel, isolation casing.
0.0 to 91.0 feet bgs: 4-inch core barrel sampler.

0.0 to 2.0 feet bgs: flush mount Sherwood vault and cement seal.
2.0 to 5.0 feet bgs: 3/8-inch Baroid bentonite chips hydrated with potable water.
5.0 to 70.0 feet bgs: Organoclay-bentonite grout slurry (1:10 Organoclay: bentonite grout mixture), 9.6-9.7 pounds per gallon.
70.0 to 72.0 feet bgs: coated, 3/8-inch bentonite pellets hydrated with potable water.
72.0 to 91.3 feet bgs: 10x20 Colorado silica sand.

Well:
0.0 to 75.3 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe.
75.3 to 90.3 feet bgs: 2-inch diameter, stainless steel screen, 0.010-slot.
90.3 feet bgs: DNAPL funnel.
90.3 to 91.3 feet bgs: 2-inch diameter, stainless steel sump.

NOTES: *1. bgs = below ground surface. 2. CB = core barrel soil sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. PVC = poly vinyl chloride. 6. TOC = top of casing. 7. Depths are relative to feet below ground surface. 8. Horizontal Datum: NAD 83/91, Oregon State Plane Coordinate System, North Zone, International Feet, HARN. 9. Vertical Datum: NGVD 29/47.*

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	WS42-36	1 of 3

Project Name	Siltronic Corporation - Monitoring Well Installation	TOC Elevation (feet)	33.05
Project Location	7200 NW Front Avenue, Portland, Oregon 97210	Surface Elevation (feet)	33.3
Start/End Date	3/29/11 to 3/29/11	Northing	704583.4
Driller/Equipment	Jeff Jones, Cascade Drilling/Compact RotoSonic	Easting	7624596.5
Geologist/Engineer	K. Titkemeier	Hole Depth	36.8-feet
Sample Method	Compact RotoSonic	Outer Hole Diam	6-inch

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–10			0%	CB					0.0 to 10.0 feet: Air knifed by vacuum truck. No observations.
10–11			100%	CB					10.0 to 11.2 feet: SANDY SILT (ML); very dark gray; 60% medium plasticity fines; 40% fine sand; trace mica; dry to moist.
11–16									11.2 to 16.0 feet: SAND (SP); very dark gray; 95% fine to medium sand; 5% fines; trace red lithics; moist. Increasing silt content with depth.
13						PID = 12.9 ppm			
15									@ 15.3 feet: 1-inch SILT (ML) lens.
16									@ 16.0 feet: Trace fine to medium gravel and wood fragments and twigs up to 4 inches in length.
16–20									16.0 to 20. feet: SILTY SAND WITH GRAVEL (SM); black; 70% fine to medium sand; 20% fines; 10% fine to coarse, angular to rounded gravel; trace roots and twigs; strong hydrocarbon-like odor; tacky; moist to wet.
18						PID = 361 ppm			
19–20									@ 19.2 to 20.0 feet: Dark brown staining (NAPL); less tacky.

NOTES: 1. bgs = below ground surface. 2. CB = core barrel soil sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. PVC = poly vinyl chloride. 6. TOC = top of casing. 7. Depths are relative to feet below ground surface. 8. Horizontal Datum: NAD 83/91, Oregon State Plane Coordinate System, North Zone, International Feet, HARN. 9. Vertical Datum: NGVD 29/47. 10. WS42-36 has a collar associated with its dedicated bladder pump. The collar rests directly on the TOC and serves as the monitoring point for groundwater elevation measurements. The elevation of this collar is 33.20 feet NGVD 29/47.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	WS42-36	2 of 3

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			100%	CB					@ 19.8 feet: Wood fragments up to 3-inches in length. 20.0 to 20.2 feet: SILTY SAND (SM); black; 55% fine to medium sand; 45% fines; hydrocarbon-like odor; heavy sheen; tacky; moist to wet. 20.2 to 26.0 feet: SAND WITH SILT AND GRAVEL (SP-SM); very dark gray; 85% fine to medium sand; 10% fines; 5% fine to medium, rounded to subrounded gravel; trace mica and roots; moist. Diminishing sheen and staining (NAPL).
22									
23						PID = 95 ppm			
24									
25									@ 24.5 to 26.0 feet: No visible sheen or staining; no gravel.
26									@ 25.5 feet: Large wood fragment.
27									26.0 to 30.0 feet: SANDY SILT (ML); very dark gray; 55% medium plasticity fines; 45% fine sand; trace mica; moist. No visible sheen or staining. Black, vein-like structures (decaying organics?). Lenses of SILTY SAND (SM).
28						PID = 21.3 ppm			@ 28.0 to 29.2 feet: Color change to dark brown; abundant roots.
29									
30									@ 29.5 feet: Wood fragment, 3.5 inches in length.
31			83%	CB					30.0 to 36.0 feet: SILT (ML); gray; 90-95% medium to high plasticity fines; 5-10% very fine sand; trace mica; stiff to very stiff; moist.
32									
33						PID = 47 ppm			
34									
35									
36									

Total Depth = 36.8 feet below ground surface.

Well Completion Details

Oregon Water Resources Department Well Start Card: 1012649
Oregon Water Resources Department Well Identification: L105557

Boring:
0.0 to 2.0 feet bgs: flush mount Sherwood vault and cement seal.
2.0 to 5.0 feet bgs: 3/8-inch Baroid bentonite chips hydrated with potable water.
5.0 to 22.0 feet bgs: Organoclay-bentonite grout slurry (1:10 Organoclay: bentonite grout mixture), 9.8 pounds per gallon.
22.0 to 23.0 feet bgs: coated, 3/8-inch bentonite pellets hydrated with potable water.
23.0 to 36.8 feet bgs: 10x20 Colorado silica sand.

Well:
0.0 to 25.8 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe.
25.8 to 35.8 feet bgs: 2-inch diameter, stainless steel screen,

NOTES: 1. bgs = below ground surface. 2. CB = core barrel soil sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. PVC = poly vinyl chloride. 6. TOC = top of casing. 7. Depths are relative to feet below ground surface. 8. Horizontal Datum: NAD 83/91, Oregon State Plane Coordinate System, North Zone, International Feet, HARN. 9. Vertical Datum: NGVD 29/47. 10. WS42-36 has a collar associated with its dedicated bladder pump. The collar rests directly on the TOC and serves as the monitoring point for groundwater elevation measurements. The elevation of this collar is 33.20 feet NGVD 29/47.

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Maul Foster & Alongi, Inc.	Geologic Borehole Log/Well Construction		
	Project Number **8128.01.20**	Well Number **WS42-36**	Sheet **3 of 3**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
									0.010-slot. *35.8 feet bgs: DNAPL funnel.* *35.8 to 36.8 feet bgs: 2-inch diameter, stainless steel sump.*

NOTES: *1. bgs = below ground surface. 2. CB = core barrel soil sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. PVC = poly vinyl chloride. 6. TOC = top of casing. 7. Depths are relative to feet below ground surface. 8. Horizontal Datum: NAD 83/91, Oregon State Plane Coordinate System, North Zone, International Feet, HARN. 9. Vertical Datum: NGVD 29/47. 10. WS42-36 has a collar associated with its dedicated bladder pump. The collar rests directly on the TOC and serves as the monitoring point for groundwater elevation measurements. The elevation of this collar is 33.20 feet NGVD 29/47.*

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34.8 ft COP

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	WS43-36	1 of 2

Project Name	Siltronic Corporation - Monitoring Well Installation	TOC Elevation (feet)	32.85
Project Location	7200 NW Front Avenue, Portland, Oregon 97210	Surface Elevation (feet)	33.4
Start/End Date	3/25/11 to 3/25/11	Northing	704567.9
Driller/Equipment	Jeff Jones, Cascade Drilling/Compact RotoSonic	Easting	7624570.3
Geologist/Engineer	K. Titkemeier	Hole Depth	36.8-feet
Sample Method	Compact RotoSonic	Outer Hole Diam	6-inch

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–10			0%	CB					0.0 to 10.0 feet: Air knifed by vacuum truck. No observations.
10–13			100%	CB					10.0 to 12.8 feet: SANDY SILT (ML); dark brownish-gray; 60-70% non- to low plasticity fines; 30-40% fine sand; trace mica, roots, and wood fragments; moist.
13									12.8 to 13.7 feet: SAND WITH SILT (SP-SM); black; 90% fine to medium sand; 10% fines; hydrocarbon-like odor; tacky; heavy black staining; moist.
14–18									13.7 to 18.2 feet: SAND WITH SILT (SP-SM); dark brownish-gray; 90% fine to medium sand; 10% fines; trace red lithics and fine gravel; moist.
18–20									18.2 to 25.0 feet: SAND WITH SILT AND GRAVEL (SP-SM); black; 80% fine to coarse sand; 10% fines; 10% fine to medium, rounded to angular gravel; trace roots; hydrocarbon-like odor; heavy black staining; tacky. Gravel fining with depth.

NOTES: 1. bgs = below ground surface. 2. CB = core barrel soil sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. PVC = poly vinyl chloride. 6. TOC = top of casing. 7. Depths are relative to feet below ground surface. 8. Horizontal Datum: NAD 83/91, Oregon State Plane Coordinate System, North Zone, International Feet, HARN. 9. Vertical Datum: NGVD 29/47.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.20	**WS43-36**	**2 of 2**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			**80%**	**CB**					@ 21.5 to 25.0 feet: Decrease in black staining; soil color transitioning to dark brownish gray with no staining. Tackiness (tar) absent by 25.0 feet; hydrocarbon-like odor.
22									
23									
24									
25			**100%**	**CB**					25.0 to 27.5 feet: SAND WITH SILT (SP-SM); dark brownish-gray; 90% fine to medium sand; 10% fines; trace roots and mica; hydrocarbon-like odor; moist. @ 25.0 to 26.0 feet: Heavy black staining; tacky. @ 26.0 to 27.5 feet: Rainbow sheen; brown staining inside core bag (NAPL).
26									
27									
28									27.5 to 35.0 feet: SANDY SILTY (ML); dark brownish-gray; 70-80% low-plasticity fines; 20-30% fine sand; trace mica, twigs, and fine rounded gravel. @ 27.5 to 31.0 feet: NAPL present.
29									
30			**100%**	**CB**					@ 30.0 to 30.3 feet: SAND WITH SILT (SP-SM); dark brownish-gray with heavy rainbow sheen; moist. Brown staining inside core bag.
31									@ 31.0 to 35.0 feet: Dark brown to black, vein-like mottling.
32									
33									
34									
35									
36									

Total Depth = 36.8 feet below ground surface.

Well Completion Details

Oregon Water Resources Department Well Start Card: 1012650
Oregon Water Resources Department Well Identification: L105555

Boring:
0.0 to 2.0 feet bgs: flush mount Sherwood vault and cement seal.
2.0 to 22.0 feet bgs: 3/8-inch Baroid bentonite chips hydrated with potable water.
22.0 to 36.8 feet bgs: 10x20 Colorado silica sand.

Well:
0.0 to 25.8 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe.
25.8 to 35.8 feet bgs: 2-inch diameter, stainless steel screen, 0.010-slot.
35.8 feet bgs: DNAPL funnel.
35.8 to 36.8 feet bgs: 2-inch diameter, stainless steel sump.

NOTES: 1. bgs = below ground surface. 2. CB = core barrel soil sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. PVC = poly vinyl chloride. 6. TOC = top of casing. 7. Depths are relative to feet below ground surface. 8. Horizontal Datum: NAD 83/91, Oregon State Plane Coordinate System, North Zone, International Feet, HARN. 9. Vertical Datum: NGVD 29/47.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.12	WS44-29	1 of 2

Project Name	Siltronic Corporation - Fill Zone Monitoring Well Installation	TOC Elevation (feet)	NA
Project Location	7200 NW Front Avenue, Portland, Oregon 97210	Surface Elevation (feet)	NA
Start/End Date	8/16/13 to 8/16/13	Northing	
Driller/Equipment	Cascade Drilling/Geoprobe 7720 DT	Easting	
Geologist/Engineer	K. Titkemeier	Hole Depth	35.0-feet
Sample Method	Direct Push	Outer Hole Diam	4.5-inch

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–10		0		GRAB					0 - 10.0 feet: Air knifed, logged by downhole observation. Appears to be SANDY GRAVEL; brown; grades to SAND, dry; then grades to GRAVELLY SAND; brown; dry. (Fill)
10			90%	GP		PID = 12.4 ppm			10.0 to 11.5 feet: SANDY GRAVEL (GP); very dark grayish brown. 60-70% fine to medium gravel; 30-40% fine to medium sand; dry to damp. (Fill)
11–14									11.5 to 15.0 feet: GRAVELLY SAND (SP); very dark grayish brown; 70-90% fine to medium sand; 10-30% fine to medium gravel; trace coarse sand; loose; dry to damp; micaceous; gravel:sand ratio varies with depth. (Fill)
15			90%	GP		PID = 13.0 ppm			15.0 to 15.8 feet: SILTY SAND (SM); very dark gray; 55% very fine to fine sand; 45% non- to low-plasticity fines; trace wood debris; medium dense; dry to damp; micaceous. (Fill)
16									15.8 to 16.1 feet: SAND (SP); very dark grayish brown; fine to medium sand; trace fine gravel; loose; dry to damp. (Fill)
17									16.1 to 16.4 feet: SAND (SP); black; fine to medium sand; trace coarse sand and fine gravel; dense; damp; stained; slightly tacky; strong hydrocarbon-like odor; blue sheen when wet; micaceous. (Fill)
18									16.4 to 17.2 feet: GRAVELLY SAND (SP); very dark grayish brown; 60% fine to medium sand; 40% fine to medium gravel; loose; dry to damp; mild hydrocarbon-like odor. (Fill)
19									@ 17.0 feet: Trace cobble.
20									17.2 to 19.0 feet: SAND (SP); very dark grayish brown; 90-95% fine to

NOTES: 1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. PVC = poly vinyl chloride. 6. TOC = top of casing. 7. Depths are relative to feet below ground surface. 8. 2-inch diameter 5-foot long direct-push macro sampler. 9. NAPL = Non-aqueous phase liquid. 10. No groundwater encountered.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.12	**WS44-29**	**2 of 2**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			**90%**	**GP**		**PID = 14.5 ppm**			*medium sand; 5-10% fine to coarse gravel; loose; dry to damp; very mild hydrocarbon-like odor. (Fill)*
									19.0 to 20.0 feet: GRAVELLY SANDY SILT (ML); very dark gray; 60% low to medium plasticity fines; 30% fine to coarse sand; 10% fine to coarse gravel; trace wood fragments; damp; mild hydrocarbon-like odor. (Fill)
22									*@ 19.6 feet: Cobble.*
									@ 19.7 feet: Thin copper wire.
23									*20.0 to 23.0 feet: SILTY SAND (SM); very dark gray; 75% fine to medium sand; 15% fines; 10% fine to medium gravel; loose to medium dense; damp to moist; silt lenses. (Fill)*
24									*@ 21.0 feet: Copper wire and copper piece.*
						WS44-S-24-26			*@ 21.5 feet: Large wood fragment.*
						WS44-S-24-29			
25			**120%**	**GP**		**PID = 4.9 ppm**			*23.0 to 26.0 feet: CLAYEY GRAVEL (GC); very dark brown; 55% fine to coarse gravel; 35% clay; 10% fine to coarse sand; dense to very dense; damp to moist; sticky; trace rootlets, wood fragments, and brick fragments. (Fill)*
26						**WS44-S-26-29**			*@ 23.0 feet: Large wood fragment.*
									@ 23.5 feet: Brick fragment.
									@ 24.0 feet: Reddish brown.
27									*@ 25.0 to 30.0 feet: Drillers note that material is expansive.*
									26.0 to 28.9 feet: SILTY SAND (SP); very dark gray; 55% fine sand; 45% low plasticity fines; moist; SANDY SILT (ML); very dark gray; 55% low plasticity fines; 45% fine sand; moist; alternating layers of SP and ML up to 0.5 feet thick; trace rootlets and wood fragments; micaceous. (Fill)
28									
29									*28.9 to 31.5 feet: SANDY SILT (ML); dark gray with reddish brown mottling; 55-60% low- to medium-plasticity fines; 40-45% very fine sand; stiff; damp; micaceous.*
30			**100%**	**GP**		**PID = 5.2 ppm**			*@ 30.0 feet: Moist to wet.*
31									*@ 31.0 to 31.3 feet: SILTY SAND; wet; soft to medium stiff.*
32									*31.5 to 34.5 feet: Alternating 3 inch to 1 foot thick layers of SILTY SAND (SM); very dark gray with reddish brown mottling, grades to very dark brown with depth; 55% fine sand; 45% low plasticity fines; wet; and SANDY SILT (ML); mottled very dark gray and reddish brown grades to very dark brown with depth; 55% low plasticity fines; 45% fine sand; wet; micaceous.*
33									
34									
35									*34.5 to 35.0 feet: SAND (SP); brown; 95% fine sand; 5% fines; dense; moist; micaceous.*

Total Depth = 35 feet below ground surface

Completion Details

Oregon Water Resources Department Well Start Card: 1020739
Oregon Water Resources Department Well Identification: L111345

Boring:

0.0 to 1.5 feet bgs: Flush mount Sherwood vault and concrete seal.
1.5 to 22.0 feet bgs: Bentonite chips hydrated with potable water.
22.0 to 29.7 feet bgs: 10X20 Colorado silica sand.
29.7 to 35.0 feet bgs: Bentonite chips hydrated with potable water.

Well:

0.8 to 24.4 feet bgs: Schedule 40 PVC blank riser pipe.
24.4 to 29.4 feet bgs: Schedule 40 PVC 0.010 machine slot prepack screen.
29.4 to 29.7 feet bgs: Schedule 40 PVC sump with 3X1/8 inch holes drilled in the bottom for drainage.

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. PVC = poly vinyl chloride. 6. TOC = top of casing. 7. Depths are relative to feet below ground surface. 8. 2-inch diameter 5-foot long direct-push macro sampler. 9. NAPL = Non-aqueous phase liquid. 10. No groundwater encountered.*

32.8 ft COP

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.12	WS45-23	1 of 3

Project Name	Siltronic Corporation - Fill Zone Monitoring Well Installation	TOC Elevation (feet)	NA
Project Location	7200 NW Front Avenue, Portland, Oregon 97210	Surface Elevation (feet)	NA
Start/End Date	8/16/13 to 8/22/13	Northing	
Driller/Equipment	Cascade Drilling/Geoprobe 7720 DT	Easting	
Geologist/Engineer	K. Titkemeier	Hole Depth	40.0-feet
Sample Method	Direct Push	Outer Hole Diam	3.25-inch

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–10		0		GRAB					0 to 10.0 feet: Air knifed, logged by downhole observation. Appears to be SANDY GRAVEL and SAND; brown; dry. (Fill)
10–12			100%	GP		PID = 4.0 ppm			10.0 to 12.0 feet: SILTY SAND (SM); very dark brown grading to very dark gray; 75-85% fine to medium sand; 10-15% fines; 5-10% fine to medium gravel; loose, increasing density with depth to medium dense; damp to moist; micaceous; mild hydrocarbon-like odor. (Fill)
12–15									12.0 to 15.0 feet: CLAYEY GRAVEL (GC); brown with orange mottling; 70% fine to coarse gravel and cobbles, decreasing gravel size with depth; 20-25% fines (silt and clay), increasing fines with depth; 5-10% fine to coarse sand; very dense; damp to moist; micaceous; trace rootlets and small wood fragments. (Fill)
15–18			40%	GP		PID = 15.1 ppm			15.0 to 18.0 feet: No recovery.
18						WS45-S-18-23			18.0 to 18.3 feet: SINGLE SOLID PIECE OF WOOD.
18–20									18.3 to 19.3 feet: SANDY GRAVEL (GP); black; 80% fine to coarse gravel and cobbles; 15% fine to coarse sand; 5% fines; moist to damp; possible brick fragments (red porous); some of the gravel-sized material appears to be charred wood; sheen when wet; strong hydrocarbon-like odor. (Fill)

NOTES: 1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. PVC = poly vinyl chloride. 6. TOC = top of casing. 7. Depths are relative to feet below ground surface. 8. 2-inch diameter 5-foot long direct-push macro sampler. 9. NAPL = Non-aqueous phase liquid. 10. No groundwater encountered.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.12	**WS45-23**	**2 of 3**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			**90%**	**GP**		**PID = 15.6 ppm**			*19.3 to 21.0 feet: SANDY GRAVEL WITH SILT AND CLAY (GP-GM/GC); very dark brown with orange and dark grayish olive mottling; 70% fine to coarse gravel; 20% fine to medium sand; 10% fines; damp; brick fragments; wood fragment; mild hydrocarbon-like odor. (Fill)*
22									*21.0 to 22.7 feet: SAND WITH SILT (SP-SM); very dark brown; 90% fine to medium sand; 10% fines; moist to wet; micaceous; mild to moderate hydrocarbon-like odor. (Fill)*
23									*22.7 to 25.0 feet: SILT (ML); dark gray; 80-90% medium plasticity fines; 10-20% very fine sand; moist; trace rootlets; micaceous; strong hydrocarbon-like odor; increasing sheen and trace rootlets with depth.*
24									*@ 23.3 to 23.7 feet: very dark gray/black laminations.*
25									*@ 24.2 feet: heavy sheen/staining; increase in sand content.*
26			**80%**	**GP**		**PID = 139.1 ppm**			*@ 25.0 feet: Veins of tacky/black =SILT (MH); 90-95% medium to high plasticity fines; 5-10% sand.*
27									*25.0 to 25.2 feet: SAND (SP); very dark gray; 90-95% fine to medium sand; 5-10% fines; trace fine gravel; wet; micaceous; sheen; strong hydrocarbon-like odor.*
28									*25.2 to 29.7 feet: SILT (ML); very dark gray; 75-95% medium to high plasticity fines (variable throughout); 5-25% very fine to fine sand; moist to wet; micaceous; strong hydrocarbon-like odor; brown staining; sheen; NAPL globules; trace rootlets throughout.*
29									
30			**100%**	**GP**		**PID = 396 ppm**			*29.7 to 30.7 feet: SILTY SAND (SM); very dark gray; 70% fine to medium sand; 30% fines; moist to wet; slightly tacky; micaceous; strong hydrocarbon-like odor; brown staining; sheen.*
31									*@ 30.0 feet: Increase in sand; 75-80% fine to medium sand; 20-25% fines.*
32									*30.7 to 34.6 feet: SAND (SP); very dark gray; 90% fine sand; 10% fines; wet; strong hydrocarbon-like odor; strong rainbow sheen; brown staining; NAPL globules (abundant, increasing with depth); micaceous; soupy.*
33									*@ 30.7 to 30.8 feet: SANDY SILT (ML); very dark gray; moist.*
34									*@ 31.1 to 31.2 feet: SANDY SILT (ML); very dark gray with rust orange mottling; trace roots; moist.*
35									*@ 32.0 to 32.8 feet: SANDY SILT (ML); very dark gray with rust orange mottling; 60-70% fines; 30-40% very fine to fine sand; moist to wet; micaceous; trace rootlets; sheen; brown staining; NAPL globules; hydrocarbon-like odor.*
36			**95%**	**GP**		**PID = 611 ppm**			*34.6 to 35.0 feet: SANDY SILT (ML); very dark gray with rust orange mottling; 60-70% medium plasticity fines; 30-40% very fine to fine sand; micaceous; moist to wet; trace rootlets.*
37									*35.0 to 38.8 feet: SAND (SP); very dark gray; 90-95% fine to medium sand; 5-10% fines; wet; strong hydrocarbon-like odor; strong rainbow sheen; heavy brown staining; abundant NAPL.*
38									
39									*38.8 to 40.0 feet: SANDY SILT (ML); dark gray with rust orange mottling; wet; interbedded with SILTY SAND (SM); very dark gray; wet; same sheen/odor/staining as above.*
40									

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. PVC = poly vinyl chloride. 6. TOC = top of casing. 7. Depths are relative to feet below ground surface. 8. 2-inch diameter 5-foot long direct-push macro sampler. 9. NAPL = Non-aqueous phase liquid. 10. No groundwater encountered.*

Maul Foster & Alongi, Inc.	Geologic Borehole Log/Well Construction		
	Project Number **8128.01.12**	Well Number **WS45-23**	Sheet **3 of 3**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description

Total Depth = 40 feet below ground surface

Completion Details

Boring:

0.0 to 1.5 feet bgs: Flush mount Sherwood vault and concrete seal.
1.5 to 15.5 feet bgs: Bentonite chips hydrated with potable water.
15.1 to 23.0 feet bgs: 10X20 Colorado silica sand.
23.0 to 40.0 feet bgs: Slough.

Well:

0.7 to 17.7 feet bgs: Schedule 40 PVC blank riser pipe.
17.7 to 22.7 feet bgs: Schedule 40 PVC 0.010 machine slot prepack screen.
22.7 to 23.0 feet bgs: Schedule 40 PVC sump with 3X1/8 inch holes drilled in the bottom for drainage.

NOTES: *1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. PVC = poly vinyl chloride. 6. TOC = top of casing. 7. Depths are relative to feet below ground surface. 8. 2-inch diameter 5-foot long direct-push macro sampler. 9. NAPL = Non-aqueous phase liquid. 10. No groundwater encountered.*

34.2 ft COP

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.12	WS46-33	1 of 2

Project Name	Siltronic Corporation - Fill Zone Monitoring Well Installation	TOC Elevation (feet)	NA
Project Location	7200 NW Front Avenue, Portland, Oregon 97210	Surface Elevation (feet)	NA
Start/End Date	8/14/13 to 8/15/13	Northing	
Driller/Equipment	Cascade Drilling/Geoprobe 7720 DT	Easting	
Geologist/Engineer	K. Titkemeier	Hole Depth	35.0-feet
Sample Method	Direct Push	Outer Hole Diam	4.5-inch

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1		0		GRAB					0 to 0.3 feet: ASPHALT. 0.3 to 2.0 feet; Air knifed, logged by downhole observation; SANDY GRAVEL (GW); brown; 65% fine to coarse gravel; 35% fine to medium sand; dry. (Fill)
2									
3									2.0 to 10.0 feet: Air knifed, logged by downhole observation. Appears to be SAND (SP); dark grayish-brown; fine to medium sand; loose; dry to damp. (Fill)
4									
5									
6									
7									
8									
9									
10			32%	GP		PID = 0.5 ppm			10.0 to 15.0 feet: SAND (SP); dark grayish-brown; fine to medium sand, trace mica; loose; dry to damp. (Fill)
11									
12									
13									
14									@ 14.0 feet: Laminations of black sand.
15			60%	GP		PID = 0.3 ppm			15.0 to 20.0 feet: SAND (SP); very dark grayish-brown; fine to medium sand; loose; damp; trace silt laminations; trace mica. (Fill)
16									
17									
18									@ 18.0 feet: Damp to moist.
19									
20									@ 19.5 feet: Very dark gray.

NOTES: 1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. PVC = poly vinyl chloride. 6. TOC = top of casing. 7. Depths are relative to feet below ground surface. 8. 2-inch diameter 5-foot long direct-push macro sampler. 9. NAPL = Non-aqueous phase liquid.

▼ **Water level = 21.15 feet below TOC**

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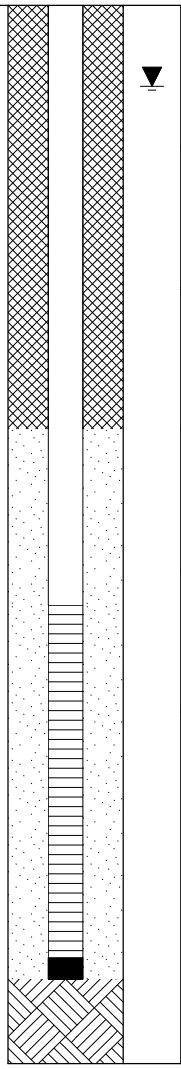
Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.12	WS46-33	2 of 2

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			75%	GP	PID = 1.0 ppm				20.0 to 21.5 feet: SAND (SP); very dark gray; fine to medium sand; wet. (Fill)
22			75%	GP	PID = 18.3 ppm				21.5 to 24.0 feet: SANDY SILT (ML); very dark gray; 60-70% low plasticity fines; 30-40% very fine sand; trace fine gravel; moist; mild hydrocarbon-like odor; micaceous. (Fill) @ 22.0 to 24.0 feet: Trace rootlets and wood debris, up to 1 inch wood chunks.
24			75%	GP	PID = 6.8 ppm				24.0 to 26.0 feet: SAND WITH SILT (SP-SM); very dark gray; 80-85% fine to medium sand; 15-20% fines; trace fine gravel; wet; mild hydrocarbon-like odor. (Fill)
26			75%	GP	PID = 0.4 ppm				26.0 to 28.0 feet: GRAVELLY SANDY SILT (ML); very dark gray; 45% low plasticity fines; 35% very fine sand; 20% fine to coarse gravel; trace wood debris; micaceous; wet; mild hydrocarbon-like odor. (Fill) @ 26.0 feet: SILT (ML); very dark gray.
28			75%	GP	PID = 36.9 ppm WS46-S-28.5-33.5				28.0 to 29.3 feet: SANDY SILT/SILTY SAND (ML/SM); very dark gray; 45% very fine to fine sand; 45% fines; 10% fine gravel; very loose; wet; trace rootlets; mild hydrocarbon-like odor; soupy. (Fill) @ 28.0 feet: SAND WITH SILT (SP-SM); very dark gray.
30			80%	GP	PID = 6.5 ppm				29.3 to 30.0 feet: SAND (SP); very dark gray; fine to medium sand; wet; micaceous; mild hydrocarbon-like odor; rootlets. (Fill) 30.0 to 32.0 feet: Alternating layers up to 1 inch thick of SANDY SILT and SILTY SAND (SP/SM); very dark gray; 50% fine to medium sand; 50% low plasticity fines; moist to wet; mild hydrocarbon-like odor; trace rootlets; micaceous. (Fill) @ 30.0 feet: Gravelly silty sand; dark gray, with wood fragments.
32									32.0 to 33.6 feet: SAND (SP); very dark gray; fine to medium sand; wet; micaceous; mild hydrocarbon-like odor. (Fill)
34									33.6 to 35.0 feet: SILT (ML); 80% low to medium plasticity fines; 20% very fine sand; stiff; moist; micaceous; mild hydrocarbon-like odor. @ 33.6 feet: 1/2 inch thick lens of SILT (ML); black; low plasticity fines; strong hydrocarbon-like odor; sheen. @ 33.8 to 33.9 feet: laminations of SILT; black; strong hydrocarbon-like odor; sheen.
35									

Total Depth = 35 feet below ground surface

Completion Details

Oregon Water Resources Department Well Start Card: 1020736
Oregon Water Resources Department Well Identification: L111344

Boring:
0.0 to 1.5 feet bgs: Flush mount Sherwood vault and concrete seal.
1.5 to 11.0 feet bgs: Bentonite chips hydrated with potable water.
11.0 to 15.0 feet bgs: Granular bentonite hydrated with potable water.
15.0 to 26.5 feet bgs: Bentonite chips hydrated with potable water.
26.5 to 33.65 feet bgs: 10X20 Colorado silica sand.
33.65 to 35.0 feet bgs: Slough.

Well:
0.45 to 28.35 feet bgs: Schedule 40 PVC blank riser pipe.
28.35 to 33.35 feet bgs: Schedule 40 PVC 0.010 machine slot prepack screen.
33.35 to 33.65 feet bgs: Schedule 40 PVC sump with 3X1/8 inch holes drilled in the bottom for drainage.

NOTES: 1. bgs = below ground surface. 2. GP = Geoprobe macro core sampler. 3. PID = photo ionization detector, soil head space reading in parts per million. 4. ppm = parts per million. 5. PVC = poly vinyl chloride. 6. TOC = top of casing. 7. Depths are relative to feet below ground surface. 8. 2-inch diameter 5-foot long direct-push macro sampler. 9. NAPL = Non-aqueous phase liquid.

▼ **Water level = 21.15 feet below TOC**

34.0 ft COP

NGVD29

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**WS47-183**	**1 of 9**

Project Name	**Siltronic Corporation**	TOC Elevation (feet)	**32.37**
Project Location	**7200 Northwest Front Avenue, Portland, Oregon**	Surface Elevation (feet)	**32.6**
Start/End Date	**4/7/2015 to 4/16/2015**	Northing	**705154.4**
Driller/Equipment	**Cascade Drilling, L.P./Sonic**	Easting	**7624602.8**
Geologist/Engineer	**Kelly Titkemeier**	Hole Depth	**183.0-feet**
Sample Method	**Sonic**	Outer Hole Diam	**10-inch to 6-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1–20			0%						0.0 to 10.0 feet: NO RECOVERY. Interval was removed using airknife and vacuum truck to check for underground utilities. Down-hole observations: SAND (SP); brown; some gravel from 0 to 3 feet.
10–20			100%	CB					10.0 to 29.0 feet: SAND (SW); very dark grayish brown; 100% sand, fine to coarse, loose; trace gravel, fine to coarse, subrounded to rounded; trace wood fragments; dry to damp.
13						PID = 24 ppm			
16									@ 16.0 to 17.0 feet: Black staining; trace blue sheen produced when wet.
17						PID = 273 ppm			
18									@ 18.0 feet: Thin wire, approximately 4 inches long.
18									@ 18.0 to 22.0 feet: Trace micaceous silt nodules.
19						PID = 47 ppm			

NOTES: 1. bgs = below ground surface. 2. CB = core barrel soil sampler. 3. ppm = parts per million. 4. PID = photoionization detector, soil head space reading in ppm. 5. PVC = polyvinyl chloride. 6. TOC = top of casing. 7. Depths are approximate and relative to feet bgs. 8. Horizontal Datum: NAD 83/91, Oregon State Plane Coordinate System, North Zone, International Feet, HARN. 9. Vertical Datum: NGVD 29/47. 10. Seal placed from 30 to 35 feet bgs and from 160 to 163 feet bgs using 3/8-inch bentonite chips, hydrated in place. 11. A magnet was held to soil from 90 to 135 feet bgs at approximately 1-foot intervals. No reaction was observed. 12. DNAPL = dense nonaqueous-phase liquid. 13. NR = not recorded.

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Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	WS47-183	2 of 9

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21									
22			100%	CB					@ 22.0 to 29.0 feet: Fines increasing from 5% to 15% with depth. Decreasing coarse sand content with depth. Damp, becoming moist with depth.
23									
24									
25						PID = 24.7 ppm			
26									
27									@ 27.0 feet: Color change to very dark gray.
									@ 27.0 to 29.0 feet: Trace silt nodules.
28						PID = 20 ppm			
29			100%	CB					29.0 to 29.5 feet: SAND WITH SILT (SW-SM); very dark gray; 15% fines; 85% sand, fine to coarse, loose; hydrocarbon-like odor; moist.
30			70%	CB		PID = 173 ppm			29.5 to 40.0 feet: SANDY SILT (ML); very dark gray; 55-80% fines, low to medium plasticity; 20-45% sand, very fine to fine; trace mica, rootlet, and decayed wood fragments; moist. Lenses of SILTY SAND (SM); very dark gray; 30% fines; 70% sand; trace mica; moist to wet. Lenses vary in thickness up to 4 inches.
31						PID = 18 ppm			
32									@ 29.5 to 30.0 feet: Strong hydrocarbon-like odor; trace blue sheen when wet; some black staining. Large decayed wood fragment, approximately 7 inches by 1 inch; flexible.
33									@ 30.0 to 31.0 feet: Hydrocarbon-like odor, decreasing with depth.
						PID = 17.7 ppm			@ 31.0 to 34.0 feet: Reddish-brown mottling. Medium to coarse sand-sized fragments of friable red material (brick?) observed in mottled areas.
34									@ 34.0 to 35.0 feet: Increasing sand content; moist to wet.
35			100%	CB					@ 35.0 to 36.0 feet: Mild hydrocarbon-like odor.
36									@ 36.0 to 38.0 feet: Very dark grayish-brown mottling.
37									
38						PID = 672 ppm			
39									
40									40.0 to 41.5 feet: SILTY SAND (SM); very dark gray; 30% fines; 70% sand, fine; trace mica and silt nodules; wet.
41									@ 40.0 to 40.5 feet: Very dark grayish-brown mottling.
42									41.5 to 46.0 feet: SILT WITH SAND (ML); very dark gray; 80% fines, low to medium plasticity; 20% sand, very fine to fine; trace mica and friable white fine-to-medium sand-sized material (ash?);

NOTES: 1. bgs = below ground surface. 2. CB = core barrel soil sampler. 3. ppm = parts per million. 4. PID = photoionization detector, soil head space reading in ppm. 5. PVC = polyvinyl chloride. 6. TOC = top of casing. 7. Depths are approximate and relative to feet bgs. 8. Horizontal Datum: NAD 83/91, Oregon State Plane Coordinate System, North Zone, International Feet, HARN. 9. Vertical Datum: NGVD 29/47. 10. Seal placed from 30 to 35 feet bgs and from 160 to 163 feet bgs using 3/8-inch bentonite chips, hydrated in place. 11. A magnet was held to soil from 90 to 135 feet bgs at approximately 1-foot intervals. No reaction was observed. 12. DNAPL = dense nonaqueous-phase liquid. 13. NR = not recorded.

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	WS47-183	3 of 9

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43						PID = 8.1 ppm			moist.
44									@ 43.5 feet: 8-inch-thick lens of SANDY SILT (ML); very dark gray; 55% fines; 45% sand; trace mica; moist to wet.
45			95%	CB					
46									46.0 to 61.0 feet: SILTY SAND (SM); very dark gray; 15-30% fines; 70-85% sand, fine; trace mica; moist.
47									
48									
49									@ 49.0 to 50.0 feet: Very dark grayish brown mottling.
50									@ 50.0 feet: 6-inch-thick lens of SILT WITH SAND (ML); very dark gray; 80% fines; 20% sand; trace mica; moist.
51									
52									
53									
54									@ 53.5 feet: 6-inch-thick lens of SANDY SILT (ML); very dark gray; 55% fines; 45% sand; trace mica; moist to wet.
55			90%	CB					
56									
57									
58									
59									
60									
61									61.0 to 62.0 feet: SILT WITH SAND (ML); very dark gray; 80% fines, low to medium plasticity; 20% sand, very fine to fine; trace mica; moist.
62									62.0 to 69.5 feet: SILTY SAND (SM); very dark gray; 15-30% fines; 70-85% sand, fine; trace mica; moist.
63									
64									
65									

NOTES: 1. bgs = below ground surface. 2. CB = core barrel soil sampler. 3. ppm = parts per million. 4. PID = photoionization detector, soil head space reading in ppm. 5. PVC = polyvinyl chloride. 6. TOC = top of casing. 7. Depths are approximate and relative to feet bgs. 8. Horizontal Datum: NAD 83/91, Oregon State Plane Coordinate System, North Zone, International Feet, HARN. 9. Vertical Datum: NGVD 29/47. 10. Seal placed from 30 to 35 feet bgs and from 160 to 163 feet bgs using 3/8-inch bentonite chips, hydrated in place. 11. A magnet was held to soil from 90 to 135 feet bgs at approximately 1-foot intervals. No reaction was observed. 12. DNAPL = dense nonaqueous-phase liquid. 13. NR = not recorded.

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	WS47-183	4 of 9

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
66			95%	CB					@ 65.0 to 69.5 feet: Trace silt nodules. @ 66.0 feet: 3-inch-thick lens of SILT WITH SAND (ML); very dark gray; 70-80% fines, low to medium plasticity, firm; 20-30% sand, very fine to fine; trace mica and rootlets; moist.
67									
68									
69									
70						PID = 6.2 ppm			69.5 to 70.5 feet: SANDY SILT (ML) grading to SILT (ML); very dark gray; trace mica; moist.
71									70.5 to 71.5 feet: SILTY SAND (SM) to SANDY SILT (ML); very dark gray; 50% fines; 50% sand; trace mica; moist. @ 70.5 feet: 1-inch-thick layer of woody debris.
72									@ 71.4 feet: 5-inch-thick lens of SANDY SILT (ML); very dark gray; 55% fines; 45% sand; moist. 71.5 to 75.0 feet: SILTY SAND (SM); very dark gray; 15-30% fines; 70-85% sand, fine; trace mica and silt nodules; moist.
73									
74									@ 74.5 to 75.0 feet: Twig, approximately 2-3 millimeters in thickness; increase in fines to 40%.
75			95%	CB					
76									75.0 to 76.5 feet: SILT WITH SAND (ML); very dark gray; 70% fines, low to medium plasticity; 30% sand, very fine to fine; trace mica, plant material, and friable white fine to medium sand-sized material (ash?); moist.
77									76.5 to 77.0 feet: SILTY SAND (SM); very dark gray; 20-30% fines; 70-80% sand, fine; trace mica; moist to wet.
78									77.0 to 78.0 feet: SILT WITH SAND (ML); very dark gray; 70% fines, low to medium plasticity; 30% sand, very fine to fine; trace mica, plant material, and friable white fine to medium sand-sized material (ash?); moist.
79									78.0 to 79.5 feet: SANDY SILT (ML) to SILTY SAND (SM); very dark gray; 50% fines; 50% sand; trace mica; moist.
80						PID = 4.1 ppm			79.5 to 80.0 feet: SILT WITH SAND (ML); very dark gray; 70% fines, low to medium plasticity; 30% sand, very fine to fine; trace mica, plant material, and friable white fine to medium sand-sized material (ash?); moist.
81									80.0 to 80.5 feet: SANDY SILT (ML); very dark gray; 55% fines; 45% sand, very fine to fine; trace mica; wet.
82									80.5 to 83.0 feet: SILTY SAND (SM); very dark gray; 15-30% fines; 70-85% sand, very fine to fine; trace mica; moist.
83									83.0 to 84.5 feet: SILT WITH SAND (ML); very dark gray; 70-80% fines, low to medium plasticity; 20-30% sand; trace mica and plant material; moist. Lenses of SILTY SAND (SM) up to 1 inch thick.
84									
85			100%	CB					84.5 to 85.0 feet: SILTY SAND (SM); very dark gray; 30% fines; 70% sand, very fine to fine; trace mica; moist.
86									85.0 to 91.5 feet: SANDY SILT (ML); very dark gray; 55-70% fines, low to medium plasticity; 30-45% sand, very fine to fine; trace mica, plant material, and friable white fine to medium sand-sized material (ash?); moist. Lenses of SILTY SAND (SM); very dark gray; 30% fines; 70% sand; trace mica; moist. Lenses are up to 12 inches thick.
87									

NOTES: 1. bgs = below ground surface. 2. CB = core barrel soil sampler. 3. ppm = parts per million. 4. PID = photoionization detector, soil head space reading in ppm. 5. PVC = polyvinyl chloride. 6. TOC = top of casing. 7. Depths are approximate and relative to feet bgs. 8. Horizontal Datum: NAD 83/91, Oregon State Plane Coordinate System, North Zone, International Feet, HARN. 9. Vertical Datum: NGVD 29/47. 10. Seal placed from 30 to 35 feet bgs and from 160 to 163 feet bgs using 3/8-inch bentonite chips, hydrated in place. 11. A magnet was held to soil from 90 to 135 feet bgs at approximately 1-foot intervals. No reaction was observed. 12. DNAPL = dense nonaqueous-phase liquid. 13. NR = not recorded.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**WS47-183**	**5 of 9**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88									
89									
90						**PID = 7.1 ppm**			
91									
92									*91.5 to 96.0 feet: SILTY SAND (SM); very dark gray; 20-30% fines; 70-80% sand, very fine to fine; trace mica; moist.*
93									
94									
95			**100%**	**CB**					*@ 95.0 to 96.0 feet: Decrease in fines to 15%. Mild unidentifiable odor.*
96						**PID = 5.1 ppm**			
97									*96.0 to 100.0 feet: SILT WITH SAND (ML); very dark gray; 70-80% fines, low plasticity; 20-30% sand, very fine to fine; trace mica, plant material, and friable white fine to medium sand-sized material (ash?); mild unidentifiable odor, decreasing with depth; moist.*
98									
99									
100						**PID = 9.6 ppm**			*100.0 to 100.5 feet: SAND WITH SILT (SP-SM); very dark gray; 10% fines; 90% sand, very fine to fine; trace mica; moist.*
101									*100.5 to 105.0 feet: Interbedded SILTY SAND (SM), SANDY SILT (ML), and SILT (ML); very dark gray; trace mica; moist. Beds are 1/2 inch to 6 inches thick.*
102									
103									
104									
105			**100%**	**CB**					*105.0 to 108.0 feet: SAND WITH SILT (SP-SM); very dark gray; 15% fines; 85% sand, very fine to fine; trace mica and red and green lithics; mild unidentifiable odor; moist.*
106									
107									
108						**PID = 5.6 ppm**			*108.0 to 115.0 feet: Interbedded SILTY SAND (SM); very dark gray; 15-30% fines; 70-85% sand, very fine to fine; trace mica and red and green lithics; moist; and SILT WITH SAND (ML); very dark gray; 80% fines, low to medium plasticity; 20% sand; trace mica; moist. Beds are 1 inch to 9 inches thick.*
109									
110									

NOTES: *1. bgs = below ground surface. 2. CB = core barrel soil sampler. 3. ppm = parts per million. 4. PID = photoionization detector, soil head space reading in ppm. 5. PVC = polyvinyl chloride. 6. TOC = top of casing. 7. Depths are approximate and relative to feet bgs. 8. Horizontal Datum: NAD 83/91, Oregon State Plane Coordinate System, North Zone, International Feet, HARN. 9. Vertical Datum: NGVD 29/47. 10. Seal placed from 30 to 35 feet bgs and from 160 to 163 feet bgs using 3/8-inch bentonite chips, hydrated in place. 11. A magnet was held to soil from 90 to 135 feet bgs at approximately 1-foot intervals. No reaction was observed. 12. DNAPL = dense nonaqueous-phase liquid. 13. NR = not recorded.*

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	WS47-183	6 of 9

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
111									
112									
113						PID = 6.8 ppm			@ 113.0 to 115.0 feet: Mild hydrocarbon-like odor.
114									
115			NR	CB					115.0 to 116.7 feet: SILT WITH SAND (ML); very dark gray; 70% fines, low to medium plasticity; 30% sand, very fine to fine; trace mica, plant material, and friable white fine to medium sand-sized material (ash?); mild hydrocarbon-like odor; trace blue sheen on outside of soil core; moist.
116									
117									116.7 to 117.3 feet: SILTY SAND (SM); very dark gray; 30-40% fines; 60-70% sand, very fine to fine; trace mica; mild hydrocarbon-like odor; moist to wet.
118						PID = 4.7 ppm			117.3 to 118.2 feet: SILT WITH SAND (ML); very dark gray; 70% fines; 30% sand; trace mica and friable white fine to medium sand-sized material (ash?); mild hydrocarbon-like odor; moist.
119									118.2 to 121.0 feet: SILTY SAND (SM); very dark gray; 30% fines; 70% sand, very fine to fine; trace mica; moist.
120						WS47-SO-118.2-121			@ 120 feet: Twig, approximately 2 inches long and 2 to 3 millimeters thick.
121									121.0 to 125.0 feet: SILT WITH SAND (ML); very dark gray; 80% fines, low to medium plasticity; 20% sand, very fine to fine; trace mica and friable white fine to medium sand-sized material (ash?); moist.
122									
123						PID = 6.4 ppm WS47-SO-121-125			
124									
125			95%	CB					125.0 to 126.5 feet: SANDY SILT (ML); very dark gray; 60% fines, non to low plasticity; 40% sand, very fine to fine; trace mica and woody debris; mild hydrocarbon-like odor; trace blue sheen on outside of soil core; moist.
126									
127						WS47-SO-125-126.5			126.5 to 144.0 feet: SAND WITH SILT (SP-SM); very dark gray; 15% fines; 85% sand; trace mica; moist. @ 126.5 to 135.0 feet: Mild hydrocarbon-like odor; trace silt nodules.
128						PID = 154 ppm WS47-SO-126.5-128.5			
129									@ 128.5 to 144.0 feet: Decrease in fines to 5-10%.
130									
131									
132						WS47-SO-128.5-135			

NOTES: 1. bgs = below ground surface. 2. CB = core barrel soil sampler. 3. ppm = parts per million. 4. PID = photoionization detector, soil head space reading in ppm. 5. PVC = polyvinyl chloride. 6. TOC = top of casing. 7. Depths are approximate and relative to feet bgs. 8. Horizontal Datum: NAD 83/91, Oregon State Plane Coordinate System, North Zone, International Feet, HARN. 9. Vertical Datum: NGVD 29/47. 10. Seal placed from 30 to 35 feet bgs and from 160 to 163 feet bgs using 3/8-inch bentonite chips, hydrated in place. 11. A magnet was held to soil from 90 to 135 feet bgs at approximately 1-foot intervals. No reaction was observed. 12. DNAPL = dense nonaqueous-phase liquid. 13. NR = not recorded.

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	WS47-183	7 of 9

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
133						PID = 130 ppm			
134									
135			85%	CB					@ 135.0 to 144.0 feet: Hydrocarbon-like odor.
136									
137						PID = 313 ppm			
138									@ 138.5 feet: 1.5-inch-thick lens of SILT (ML); very dark gray; 80-90% fines; 10-20% sand; trace mica.
139									@ 138.5 to 141.5 feet: Strong hydrocarbon-like odor, rainbow sheen, and moderate dark brown staining. Dark brown staining observed on inside of core bags and on gloves after handling soil.
140						WS47-SO-135-144			
						PID = 606 ppm			
141									
142									@ 141.5 to 143.0 feet: Slight rainbow sheen when wet. Sheen decreasing with depth.
143						PID = 190 ppm			
144									144.0 to 145.0 feet: NO RECOVERY. Soil fell out of the bottom of the core barrel.
145			100%	CB					145.0 to 183.0 feet: SAND WITH SILT (SP-SM); very dark gray; 5-10% fines; 90-95% sand, fine; trace mica; moist.
146						PID = 70 ppm			@ 145.0 to 147.0: Hydrocarbon-like odor; trace blue sheen when wet.
						WS47-SO-145-147			
147									@ 147.0 to 150.0 feet: Increase in fines to 15%; strong hydrocarbon-like odor.
148									@ 148.5 to 149.5 feet: Dense; compact. Some blue-silver sheen; light to moderate dark brown staining. Some dark brown staining is observed on inside of core bags and on gloves after handling soil.
149						PID = 90 ppm			
						WS47-SO-147-150			
150			50%	CB		WS47-SO-150			@ 150.0 feet: 1-inch-thick lens of SILT (ML); very dark gray; 80-90% fines; 10-20% sand; trace mica.
151									@ 150.0 to 161.0 feet: Hydrocarbon-like odor, decreasing with depth.
152						PID = 290 ppm			@ 150.0 to 183.0 feet: Trace silt nodules; moist to wet.
						WS47-SO-150-153			
153			100%	CB					
154									
155									

NOTES: *1. bgs = below ground surface. 2. CB = core barrel soil sampler. 3. ppm = parts per million. 4. PID = photoionization detector, soil head space reading in ppm. 5. PVC = polyvinyl chloride. 6. TOC = top of casing. 7. Depths are approximate and relative to feet bgs. 8. Horizontal Datum: NAD 83/91, Oregon State Plane Coordinate System, North Zone, International Feet, HARN. 9. Vertical Datum: NGVD 29/47. 10. Seal placed from 30 to 35 feet bgs and from 160 to 163 feet bgs using 3/8-inch bentonite chips, hydrated in place. 11. A magnet was held to soil from 90 to 135 feet bgs at approximately 1-foot intervals. No reaction was observed. 12. DNAPL = dense nonaqueous-phase liquid. 13. NR = not recorded.*

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**WS47-183**	**8 of 9**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
156						**PID = 4.9 ppm**			
157									
158						**WS47-SO-153-163**			
159									
160									
161						**PID = 6.1 ppm**			
162						**WS47-SO-162**			*@ 162.0 feet: 2-inch-thick lens of SILT (ML).*
163			**75%**	**CB**					*@ 163.0 to 183.0 feet: Trace woody debris.*
164									
165									
166						**WS47-SO-163-168**			
167									
168						**PID = 7.6 ppm**			
169						**WS47-SO-169**			*@ 169.0 feet: 9-inch-thick lens of SILT (ML); 80-90% fines; 10-20% sand.*
170									
171									*@ 171.0 feet: 3-inch-thick lens of SILT (ML).*
172									
173									
174									*@ 174.0 feet: 3-inch-long wood fragment.*
175									
176									
177									

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.08	**WS47-183**	**9 of 9**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
178						**PID = 5.7 ppm**			
179									
180									
181									
182									
183									

Total Depth = 183.0 ft bgs.

WS47-183 Completion Details

Oregon Water Resources Department Well Start Card Number: 1025931
Oregon Water Resources Department Well Identification Number: L115779

Boring Completion Details:
0.0 to 10.0 feet bgs: Removed using airknife and vac truck to check for underground utilities.
0.0 to 35.0 feet bgs: 10-inch-diameter temporary, threaded steel, isolation casing.
0.0 to 163.0 feet bgs: 8-inch-diameter temporary, threaded steel, isolation casing.
0.0 to 183.0 feet bgs: 6-inch-diameter temporary, threaded steel, isolation casing.
10.0 to 35.0 feet bgs: 8-inch-diameter core barrel sampler.
35.0 to 163.0 feet bgs: 7-inch-diameter core barrel sampler.
163.0 to 183.0 feet bgs: 5-inch-diameter core barrel sampler.

0.0 to 2.5 feet bgs: 8-inch-diameter flush mount Sherwood monument and cement seal.
2.5 to 3.0 feet bgs: pea gravel.
3.0 to 13.0 feet bgs: 3/8-inch bentonite chips hydrated with potable water.
13.0 to 20.0 feet bgs: organoclay-bentonite grout slurry, 9.7 pounds per gallon.
20.0 to 26.5 feet bgs: bentonite grout slurry, 10.1 pounds per gallon.
26.5 to 33.0 feet bgs: organoclay-bentonite grout slurry, 9.75 pounds per gallon.
33.0 to 132.0 feet bgs: bentonite grout slurry, 9.8 to 10.1 pounds per gallon.
132.0 to 153.0 feet bgs: organoclay-bentonite grout slurry, 9.75 to 9.8 pounds per gallon.
153.0 to 167.0 feet bgs: bentonite grout slurry, 9.7 pounds per gallon.
167.0 to 169.0 feet bgs: 20x40 washed Colorado silica sand, transition sand.
169.0 to 183.0 feet bgs: 10x20 washed Colorado silica sand, filter pack.

Well Completion Details:
0.0 to 172.0 feet bgs: 2-inch-diameter, schedule 40 PVC blank riser pipe with centralizers at 20-foot intervals.
172.0 to 182.0 feet bgs: 2-inch-diameter, stainless steel wire wrapped screen, 0.010-slot.
@ 182.0 feet bgs: DNAPL funnel.
182.0 to 183.0 feet bgs: 2-inch-diameter, stainless steel sump.

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