

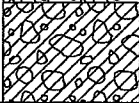
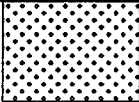
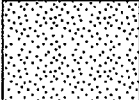
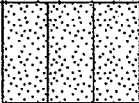
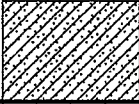
APPENDIX 2AA

BORING LOGS

FROM

ESPA INVESTIGATION

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50			ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50			MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

KEY TO CLASSIFICATION OF SOILS					
Soils classified under the Unified Soil Classification System (USCS) and in accordance with ASTM D 2488-06					
CORRELATION OF SPT RESISTANCE WITH RELATIVE DENSITY-CONSISTENCY				MOISTURE CONTENT	
GRANULAR MATERIAL			SILTS AND CLAYS		DRY-Absence of moisture
RELATIVE DENSITY	SPT N Value (blows/ft)		CONSISTENCY	SPT N Value (blows/ft)	MOIST-Damp/no visible H2O
VERY LOOSE	0 - 4		VERY SOFT	0 - 2	WET-Visible free water
LOOSE	5 - 10		SOFT	3 - 4	
MEDIUM DENSE	11 - 30		MED. STIFF	5 - 8	HCl Reaction
DENSE	31 - 50		STIFF	9 - 15	NONE - No visible reaction
VERY DENSE	> 50		VERY STIFF	16 - 30	WEAK - Some reaction/slow
			HARD	> 30	STRONG - Violent reaction
MODIFIERS			INDURATION		
Modifiers provide an estimate of the percentages of gravel, sand, and fines (silt or clay size particles) or other material such as organics, shells, gluaconite, indurated material, etc.			For sedimentary rocks, induration is the hardening of the material by cementing, heat, pressure, etc.		
TRACE	<5%	FRIABLE	Rubbing with finger frees numerous grains; gentle blow by hammer disintegrates sample.		
FEW	5 to 10%	MODERATELY INDURATED	Grains can be separated from sample with steel probe/knife; breaks easily when hit with hammer.		
LITTLE	15 to 25%	INDURATED	Grains are difficult to separate with steel probe/knife; difficult to break with hammer.		
SOME	30 to 45%	EXTREMELY INDURATED	Sharp hammer blows required to break sample; sample breaks across grains.		
MOSTLY	50 to 100%	SPT Sample Numbering: SS-1, SS-2, SS-3, etc.			
		Undisturbed Sample Numbering: UD-1, UD-2, UD-3, etc.			
COLOR of Soil: see Munsell Soil Color Charts		MEASUREMENTS: Horizontal measurements and vertical measurements, such as SPT sample recovery or penetration, sample depths, etc., are rounded to nearest tenth of a foot (0.1 ft).			
Particle Size Range for Sand: Fine, Medium, Coarse					
Particle Size Range for Gravel: Fine or Coarse					
GROUND WATER: Fluid level observations were recorded at the boring locations at the start of each work day, when possible. Due to the use of drilling fluid additives, these values may not represent the ground water conditions at the site. See observation wells for measured ground water levels.		HORIZONTAL COORDINATES (Northing and Easting) = NAD83 (2007), New Jersey State Plane Coordinate System Zone (2900), US Survey Feet.			
		ELEVATIONS = North American Vertical Datum of 1988 (NAVD88), US Survey Feet.			
FLUID LEVELS (ft) : 0 HR = Measured fluid level in boring immediately after drilling completed 24 HR = Measured fluid level in boring prior to grouting		ABBREVIATIONS USED: Run = Soil cored length during rotasonic drilling TV = Torvane Test (tsf) PP = Pocket Penetrometer Test (tsf) tsf = tons per square foot ND = Not Determined			



GEOTECHNICAL BORING LOG

Prepared By MW Date 7/10/09Checked By JAS Date 7/10/09

SHEET 1 OF 11

PERMIT NO.: P200900084		DRILLER: G. McAneny / R. Bartholomew			NJ LICENSE NO.: 0024058 / 0001383		GEOLOGIST: R. Clark / S. Johnson							
SITE DESCRIPTION: PSEG SITE ESP APPLICATION					COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251		FLUID LEVEL (ft)					
BORING NO.: NB-1		DRILL METHOD: Mud Rotary			SAMPLE METHODS: SPT			0 HR. ND						
GROUND SURFACE ELEV.: 12.8 US ft (NAVD88)		NORTHING: 234567.6 US ft (NAD83)			EASTING: 198469.1 US ft (NAD83)			24 HR. 11.0						
TOTAL DEPTH: 600.9 ft		DRILL MACHINE: CME-75 Truck			CASING DEPTH: 13.5 ft			HAMMER (ID): 140 lb Auto. (CTB-2)						
DATE STARTED: 1/13/09		COMPLETED: 2/9/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit						
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT					SAMP.	LOG	SOIL AND ROCK DESCRIPTION		
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			NO.	
12.8					Ground Surface									
12.8	0.0	4	7	8								12.8	0.0	
10.3	2.5													
10.3	2.5	3	6	6								10.8	2.0	ARTIFICIAL FILL: Clayey SAND (SC), grayish brown (2.5Y 5/2), medium dense, moist, little angular gravel, trace organics
7.8	5.0													HYDRAULIC FILL: FAT CLAY (CH), dark greenish gray (10Y 3/1), stiff, moist, trace angular gravel, trace organics, no HCl reaction
7.8	5.0	2	4	6								7.0	5.8	
5.3	7.5											5.8	7.0	HYDRAULIC FILL: Clayey SAND (SC), olive brown (2.5Y 5/3), loose, moist, trace angular gravel, no HCl reaction
5.3	7.5	WOH	WOH	WOH										HYDRAULIC FILL: FAT CLAY (CH), greenish gray (10Y 5/1), very soft, moist, little subrounded gravel, no HCl reaction
2.8	10.0											3.3	9.5	HYDRAULIC FILL: Clayey SAND (SC), very dark greenish gray (10Y 3/1), medium dense, moist, little subrounded coarse sand and fine gravel, no HCl reaction
2.8	10.0	WOH	8	12								0.8	12.0	HYDRAULIC FILL: FAT CLAY with sand (CH), very dark greenish gray (10Y 3/1), hard, moist, trace gravel, some organics, no HCl reaction
0.3	12.5													15.0ft: No recovery, very soft
0.3	12.5	7	16	20										
-2.2	15.0													
-2.2	15.0	WOH	WOH	WOH										
-7.2	20.0													20.0ft: Moist to wet
-7.2	20.0	WOH	WOH	WOH										
-12.2	25.0													25.0ft: Moist
-12.2	25.0	WOH	WOH	WOH										
-17.2	30.0													30.0ft: Dark greenish gray (10Y 4/1)
-17.2	30.0	WOH	WOH	WOH										
-22.2	35.0													35.0ft: Moist to wet
-22.2	35.0	1	2	2										
-27.2	40.0													40.0ft: Moist
-27.2	40.0	WOH	WOH	WOH										
-32.2	45.0													
-32.2	45.0	WOH	4	12										
-37.2	50.0													
-37.2	50.0	6	16	18										
-42.2	55.0													54.0ft: Slight bit chatter to 55.0ft
-42.2	55.0	WOH	WOH	WOH										

PSEG ESP BORE PSEG ESP 7-07-09.GPJ PSEG ESP.GDT 7/10/09

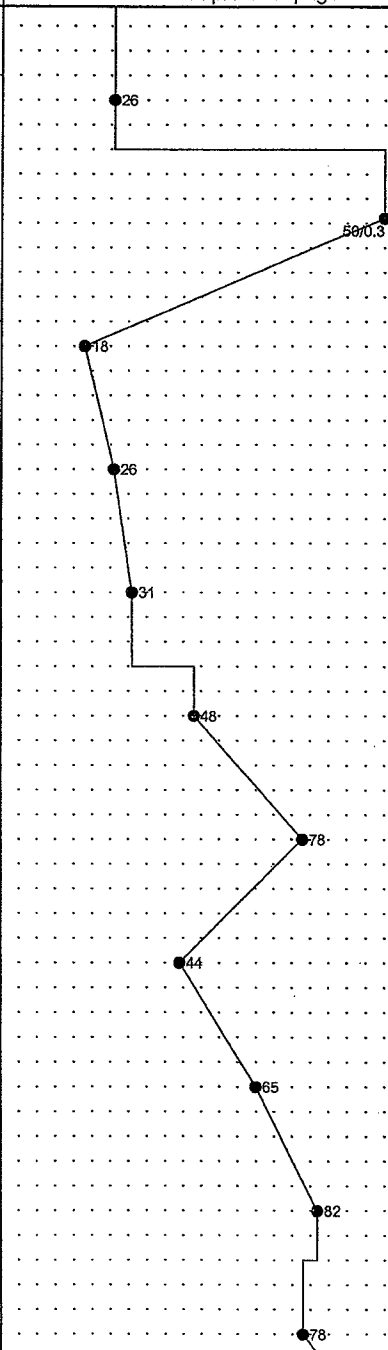


PERMIT NO.: P200900084		DRILLER: G. McAneny / R. Bartholomew				NJ LICENSE NO.: 0024058 / 0001383				GEOLOGIST: R. Clark / S. Johnson											
SITE DESCRIPTION: PSEG SITE ESP APPLICATION						COUNTY: Salem, NJ				MACTEC PROJECT NO.: 6468-08-2251				FLUID LEVEL (ft)							
BORING NO.: NB-1		DRILL METHOD: Mud Rotary				SAMPLE METHODS: SPT				0 HR.				ND							
GROUND SURFACE ELEV.: 12.8		US ft (NAVD88)				NORTHING: 234567.6				US ft (NAD83)				EASTING: 198469.1		US ft (NAD83)		24 HR.		11.0	
TOTAL DEPTH: 600.9 ft		DRILL MACHINE: CME-75 Truck				CASING DEPTH: 13.5 ft				HAMMER (ID): 140 lb Auto. (CTB-2)											
DATE STARTED: 1/13/09		COMPLETED: 2/9/09				HOLE DIA.: 4"				ROD TYPE: NWJ				BITS USED: 3-7/8" Drag Bit							
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT						SAMP.	LOG	SOIL AND ROCK DESCRIPTION								
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100	NO.										
-43.3					Continued from previous page																
-47.2	60.0																				
		WOH	WOH	WOH							SS-16		KIRKWOOD FORMATION: FAT CLAY (CH), olive (5Y 5/3), very soft, moist, no HCl reaction (continued)								
													60.0ft: Dark gray (5Y 4/1), trace fine sand								
-52.2	65.0																				
		5	12	17							SS-17		KIRKWOOD FORMATION: Silty SAND (SM), olive gray (5Y 5/2), medium dense, wet, fine sand, little subrounded to rounded gravel, no HCl reaction								
-57.2	70.0																				
		6	5	5							SS-18		VINCENTOWN FORMATION: Clayey SAND (SC), brown (7.5YR 4/3), loose, wet, fine sand, trace subrounded to rounded gravel, weak HCl reaction, strongly oxidized								
-62.2	75.0																				
		9	15	15							SS-19		VINCENTOWN FORMATION: Silty SAND (SM), light olive brown (2.5Y 5/4), medium dense, wet, fine sand, weak HCl reaction, strongly oxidized								
-67.2	80.0																				
		2	4	11							SS-20		80.0ft: Yellowish brown (10YR 5/4), fine to medium sand, weak HCl reaction, moderately oxidized								
-72.2	85.0																				
		12	8	9							SS-21		85.0ft: Greenish gray (10Y 5/1), trace friable to moderately indurated layers, trace glauconite, no oxidation								
-77.2	90.0																				
		2	5	9							SS-22		VINCENTOWN FORMATION: Silty, clayey SAND (SC-SM), greenish gray (10Y 6/1), medium dense, wet, fine to medium sand, weak HCl reaction, trace glauconite								
-82.2	95.0																				
		9	8	9							SS-23		95.0ft: Trace moderately indurated layers, strong HCl reaction								
-87.2	100.0																				
		21	14	12							SS-24		100.0ft: Greenish gray (10Y 5/1), little friable to moderately indurated layers								
-92.2	105.0																				
		11	8	16							SS-25		105.0ft: Trace friable layers								
-97.2	110.0																				
		7	8	18							SS-26										

PSEG ESP BORE PSEG ESP 7-07-09.GPJ PSEG ESP.GDT 7/10/09



SHEET 3 OF 11

PERMIT NO.: P200900084		DRILLER: G. McAneny / R. Bartholomew				NJ LICENSE NO.: 0024058 / 0001383				GEOLOGIST: R. Clark / S. Johnson					
SITE DESCRIPTION: PSEG SITE ESP APPLICATION						COUNTY: Salem, NJ				MACTEC PROJECT NO.: 6468-08-2251				FLUID LEVEL (ft)	
BORING NO.: NB-1		DRILL METHOD: Mud Rotary				SAMPLE METHODS: SPT				0 HR.				ND	
GROUND SURFACE ELEV.: 12.8		US ft (NAVD88)		NORTHING: 234567.6		US ft (NAD83)		EASTING: 198469.1		US ft (NAD83)		24 HR.		11.0	
TOTAL DEPTH: 600.9 ft		DRILL MACHINE: CME-75 Truck				CASING DEPTH: 13.5 ft				HAMMER (ID): 140 lb Auto. (CTB-2)					
DATE STARTED: 1/13/09		COMPLETED: 2/9/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit							
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT						SAMP.	LOG	SOIL AND ROCK DESCRIPTION		
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100	NO.				
-99.4					Continued from previous page										
-102.2	115.0	8	10	16							SS-27		VINCENTOWN FORMATION: Silty, clayey SAND (SC-SM), greenish gray (10Y 6/1), medium dense, wet, fine to medium sand, weak HCl reaction, trace glauconite (continued) 115.0ft: Dark greenish gray (10Y 4/1)		
-107.2	120.0	18	50/0.3								SS-28		-105.2 HORNERSTOWN FORMATION: Silty SAND (SM), greenish gray (10Y 5/1), very dense, wet, fine to medium sand, strong HCl reaction, trace to few glauconite 118.0		
-112.2	125.0	4	6	12							SS-29		125.0ft: Medium dense		
-117.2	130.0	6	11	15							SS-30				
-122.2	135.0	9	11	20							SS-31		135.0ft: Dense, few to little glauconite		
-127.2	140.0	16	23	25							SS-32		-126.2 NAVESINK FORMATION: Clayey SAND (SC), very dark greenish gray (10GY 3/1), dense, wet, few shell fragments, strong HCl reaction, mostly glauconite 139.0		
-132.2	145.0	27	36	42							SS-33		-130.2 NAVESINK FORMATION: Silty SAND (SM), very dark greenish gray (10GY 3/1), very dense, wet, fine to coarse sand, few shell fragments, weak HCl reaction, mostly glauconite 143.0		
-137.2	150.0	18	21	23							SS-34		-135.2 NAVESINK FORMATION: Clayey SAND (SC), very dark greenish gray (10Y 3/1), dense, moist, trace shells, strong HCl reaction, mostly glauconite 148.0		
-142.2	155.0	18	28	37							SS-35		-140.2 NAVESINK FORMATION: Silty SAND (SM), very dark greenish gray (10Y 3/1), very dense, wet, weak HCl reaction, mostly glauconite 153.0		
-147.2	160.0	23	38	44							SS-36				
-152.2	165.0	22	33	45							SS-37		-150.2 MOUNT LAUREL FORMATION: Clayey SAND (SC), dark olive gray (5Y 3/2), very dense, moist to wet, fine to medium sand, few subangular to subrounded coarse sand, strong HCl reaction, trace to few glauconite 163.0		

PSEG ESP BORE PSEG ESP 7-07-09 GFI PSEG ESP GDT 7/10/09



PERMIT NO.: P200900084		DRILLER: G. McAneny / R. Bartholomew			NJ LICENSE NO.: 0024058 / 0001383		GEOLOGIST: R. Clark / S. Johnson					
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251		FLUID LEVEL (ft)				
BORING NO.: NB-1		DRILL METHOD: Mud Rotary			SAMPLE METHODS: SPT			0 HR. ND				
GROUND SURFACE ELEV.: 12.8 US ft (NAVD88)		NORTHING: 234567.6 US ft (NAD83)			EASTING: 198469.1 US ft (NAD83)			24 HR. 11.0				
TOTAL DEPTH: 600.9 ft		DRILL MACHINE: CME-75 Truck			CASING DEPTH: 13.5 ft			HAMMER (ID): 140 lb Auto. (CTB-2)				
DATE STARTED: 1/13/09		COMPLETED: 2/9/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit				
ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft 0.5ft 0.5ft			BLOWS PER FOOT 0 20 40 60 80 100					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-155.5		Continued from previous page										
-157.2	170.0	50/0.3			50/0.3					SS-38		MOUNT LAUREL FORMATION: Clayey SAND (SC), dark olive gray (5Y 3/2), very dense, moist to wet, fine to medium sand, few subangular to subrounded coarse sand, strong HCl reaction, trace to few glauconite (continued)
-162.2	175.0	50/0.3			50/0.3					SS-39		175.0ft: Trace shell fragments
-167.2	180.0	50/0.3			50/0.3					SS-40		
-172.2	185.0	12	20	44	64					SS-41		185.0ft: Trace coarse sand S. Johnson takes over as Rlg Geologist
-177.2	190.0	13	24	35	59					SS-42		190.0ft: Dark gray (5Y 4/1), weak HCl reaction
-182.2	195.0	8	23	28	51					SS-43		195.0ft: No HCl reaction, trace glauconite
-187.2	200.0	20	80/0.5		100/1.0					SS-44		-185.2 MOUNT LAUREL FORMATION: Silty SAND (SM), dark greenish gray (5GY 4/1), very dense, wet, fine to medium sand, no HCl reaction, trace to few glauconite 198.0
-197.2	210.0	48	52/0.2		100/0.7					SS-45		-192.2 MOUNT LAUREL FORMATION: Poorly graded SAND with silt (SP-SM), dark greenish gray (10GY 4/1), very dense, wet, fine to medium sand, no HCl reaction, trace glauconite 205.0
-207.2	220.0	55	45/0.2		100/0.7					SS-46		220.0ft: Weak HCl reaction

PSEG ESP BORE PSEG ESP 7-07-09 GFI PSEG ESP GDI 7/10/09



PERMIT NO.: P200900084		DRILLER: G. McAneny / R. Bartholomew				NJ LICENSE NO.: 0024058 / 0001383				GEOLOGIST: R. Clark / S. Johnson			
SITE DESCRIPTION: PSEG SITE ESP APPLICATION						COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251				FLUID LEVEL (ft)	
BORING NO.: NB-1		DRILL METHOD: Mud Rotary				SAMPLE METHODS: SPT				0 HR. ND			
GROUND SURFACE ELEV.: 12.8 US ft (NAVD88)		NORTHING: 234567.6 US ft (NAD83)				EASTING: 198469.1 US ft (NAD83)				24 HR. 11.0			
TOTAL DEPTH: 600.9 ft		DRILL MACHINE: CME-75 Truck				CASING DEPTH: 13.5 ft				HAMMER (ID): 140 lb Auto. (CTB-2)			
DATE STARTED: 1/13/09		COMPLETED: 2/9/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit					
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	▼	LOG	SOIL AND ROCK DESCRIPTION
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
-211.6					Continued from previous page								
-217.2	230.0	36	64/0.3							100/0.8	SS-47		MOUNT LAUREL FORMATION: Poorly graded SAND with silt (SP-SM), dark greenish gray (10GY 4/1), very dense, wet, fine to medium sand, no HCl reaction, trace glauconite (continued)
													230.0ft: Trace friable layers, no HCl reaction
-227.2	240.0	25	38	62/0.4						100/0.9	SS-48		MOUNT LAUREL FORMATION: Silty SAND (SM), very dark greenish gray (5GY 3/1), very dense, wet, fine to medium sand, weak HCl reaction, trace glauconite
													235.0
-237.2	250.0	8	9	14							SS-49		MOUNT LAUREL FORMATION: Clayey SAND (SC), very dark gray (2.5Y 3/1), medium dense, wet, fine to medium sand, weak HCl reaction
													246.0
-247.2	260.0	7	17	32							SS-50		MOUNT LAUREL FORMATION: Silty SAND (SM), dark gray (5Y 4/1), dense, wet, fine sand, weak HCl reaction
													255.0
-257.2	270.0	5	12	14							SS-51		WENONAH FORMATION: Sandy LEAN CLAY (CL), very dark gray (N 3/), very stiff, wet, fine sand, weak HCl reaction
													265.0
-267.2	280.0												280.0

PSEG ESP BORE PSEG ESP 7-07-09.GPJ PSEG ESP.GDT 7/10/09



PERMIT NO.: P200900084		DRILLER: G. McAneny / R. Bartholomew		NJ LICENSE NO.: 0024058 / 0001383		GEOLOGIST: R. Clark / S. Johnson							
SITE DESCRIPTION: PSEG SITE ESP APPLICATION			COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251		FLUID LEVEL (ft)						
BORING NO.: NB-1		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT		0 HR. ND							
GROUND SURFACE ELEV.: 12.8 US ft (NAVD88)		NORTHING: 234567.6 US ft (NAD83)		EASTING: 198469.1 US ft (NAD83)		24 HR. 11.0							
TOTAL DEPTH: 600.9 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 13.5 ft		HAMMER (ID): 140 lb Auto. (CTB-2)							
DATE STARTED: 1/13/09		COMPLETED: 2/9/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit					
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	▼	LOG	SOIL AND ROCK DESCRIPTION
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
-267.7					Continued from previous page								
		8	20	42				62			SS-52		MARSHALLTOWN FORMATION: Clayey SAND (SC), very dark gray (N 3/), very dense, wet, fine sand, trace friable zones, strong HCl reaction, trace glauconite (continued)
													285.0ft: Bit chatter to 289.0ft
													285.0
													MARSHALLTOWN FORMATION: Silty SAND (SM), very dark gray (N 3/), dense, wet, fine to medium sand, strong HCl reaction, few glauconite
-277.2	290.0	9	17	17							SS-53		
-287.2	300.0	15	32	68/0.4							SS-54		300.0ft: Greenish black (10Y 2.5/1), very dense, weak HCl reaction, trace to few glauconite
										100/0.9			
-297.2	310.0	5	14	20							SS-55		ENGLISHTOWN FORMATION: Clayey SAND (SC), very dark gray (N 3/), dense, moist, fine sand, no HCl reaction, trace glauconite
-307.2	320.0	32	45	55/0.3							SS-56		ENGLISHTOWN FORMATION: FAT CLAY (CH), black (N 2.5/), hard, moist, few fine sand, weak HCl reaction
-317.2	330.0	8	11	14							SS-57		330.0ft: Very stiff, no HCl reaction

PSEG ESP BORE PSEG ESP 7-07-09.GP! PSEG ESP.GDT 7/10/09

GEOTECHNICAL BORING LOG



SHEET 7 OF 11

PERMIT NO.: P200900084		DRILLER: G. McAneny / R. Bartholomew		NJ LICENSE NO.: 0024058 / 0001383		GEOLOGIST: R. Clark / S. Johnson							
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251		FLUID LEVEL (ft)					
BORING NO.: NB-1		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT				0 HR.	ND				
GROUND SURFACE ELEV.: 12.8		US ft (NAVD88)		NORTHING: 234567.6		EASTING: 198469.1		24 HR.	11.0				
TOTAL DEPTH: 600.9 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 13.5 ft		HAMMER (ID): 140 lb Auto. (CTB-2)							
DATE STARTED: 1/13/09		COMPLETED: 2/9/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit					
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
-323.8					Continued from previous page								
-327.2	340.0	5	16	30							SS-58		ENGLISHTOWN FORMATION: FAT CLAY (CH), black (N 2.5/), hard, moist, few fine sand, weak HCl reaction (continued)
													340.0ft: Hard
-337.2	350.0	19	23	26							SS-59		WOODBURY FORMATION: FAT CLAY (CH), greenish black (5GY 2.5/1), hard, moist, few fine sand, trace indurated layers, no HCl reaction, trace glauconite
-347.2	360.0	5	10	17							SS-60		360.0ft: Very dark gray (10Y 3/1), very stiff
-357.2	370.0	4	9	12							SS-61		370.0ft: Trace mica, PP=4.0 tsf
-367.2	380.0	5	5	14							SS-62		380.0ft: Trace shell fragments, PP=4.5 tsf
-377.2	390.0	20	23	25							SS-63		MERCHANTVILLE FORMATION: Sandy LEAN CLAY (CL), greenish black (10GY 2.5/1), hard, moist, fine sand, no HCl reaction, few glauconite
													390.0ft: PP=3.5 tsf

PSEG ESP BORE PSEG ESP 7-07-09.GPJ PSEG ESP.GDT 7/10/09



PERMIT NO.: P200900084		DRILLER: G. McAneny / R. Bartholomew		NJ LICENSE NO.: 0024058 / 0001383		GEOLOGIST: R. Clark / S. Johnson						
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251		FLUID LEVEL (ft)				
BORING NO.: NB-1		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT				0 HR.	ND			
GROUND SURFACE ELEV.: 12.8		US ft (NAVD88)		NORTHING: 234567.6		US ft (NAD83)		24 HR.	11.0			
TOTAL DEPTH: 600.9 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 13.5 ft		HAMMER (ID): 140 lb Auto. (CTB-2)						
DATE STARTED: 1/13/09		COMPLETED: 2/9/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit				
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT					SAMP.	LOG	SOIL AND ROCK DESCRIPTION
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100		
-379.9					Continued from previous page							
												MERCHANTVILLE FORMATION: Sandy LEAN CLAY (CL), greenish black (10GY 2.5/1), hard, moist, fine sand, no HCl reaction, few glauconite (continued)
-387.2	400.0	15	22	30							SS-64	400.0ft: PP=4.5 tsf
-397.2	410.0	8	14	17							SS-65	410.0ft: Black (N 2.5/), very stiff, trace glauconite, PP=3.0 tsf
												415.0ft: Bit chatter to 416.0ft
												415.0
-407.2	420.0	42	58/0.3								SS-66	MAGOTHY FORMATION: SILT with sand (ML), gray (7.5YR 5/1), very dense, wet, fine sand, no HCl reaction
-417.2	430.0	12	27	45							SS-67	430.0ft: PP=3.0 tsf
-427.2	440.0	40	60/0.3								SS-68	440.0ft: No recovery-sample pulled out, catcher inverted; replaced with steel catcher
												441.0ft: Hard drilling to 443.0ft
												445.0
												MAGOTHY FORMATION: Silty SAND (SM), very dark gray (2.5Y 3/1), very dense, moist, fine sand, trace lignite, no HCl reaction

PSEG ESP BORE PSEG ESP 7-07-09.GPJ PSEG ESP.GDT 7/10/09



PERMIT NO.: P200900084		DRILLER: G. McAneny / R. Bartholomew		NJ LICENSE NO.: 0024058 / 0001383		GEOLOGIST: R. Clark / S. Johnson	
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251	
BORING NO.: NB-1		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT		FLUID LEVEL (ft)	
GROUND SURFACE ELEV.: 12.8 US ft (NAVD88)		NORTHING: 234567.6 US ft (NAD83)		EASTING: 198469.1 US ft (NAD83)		0 HR. ND	
TOTAL DEPTH: 600.9 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 13.5 ft		HAMMER (ID): 140 lb Auto. (CTB-2)	
DATE STARTED: 1/13/09		COMPLETED: 2/9/09		HOLE DIA.: 4"		ROD TYPE: NWJ	
BITS USED: 3-7/8" Drag Bit							

ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100
-436.0					Continued from previous page								
-437.2	450.0	75	25/0.5							100/1.0	SS-69		MAGOTHY FORMATION: Silty SAND (SM), very dark gray (2.5Y 3/1), very dense, moist, fine sand, trace lignite, no HCl reaction (continued)
-456.5	469.3	24	38	42						80	SS-70		POTOMAC FORMATION: LEAN CLAY (CL), dark gray (2.5Y 4/1), hard, moist, trace fine sand seams, no HCl reaction -Top of Potomac Formation interpreted from geophysical log. 469.3 ft: PP=4.0 tsf
-477.1	489.9	100/0.2								100/0.2	SS-71		POTOMAC FORMATION: Silty SAND (SM), dark gray (2.5Y 4/1), very dense, wet, fine sand, trace lignite, no HCl reaction

PSEG ESP BORE PSEG ESP 7-07-09 GFI PSEG ESP GDI 7/10/09

PSEGE ESP BORE PSEGE ESP 7-07-09.GPJ PSEGE ESP.GDT 7/10/09



PERMIT NO.: P200900084		DRILLER: G. McAneny / R. Bartholomew		NJ LICENSE NO.: 0024058 / 0001383		GEOLOGIST: R. Clark / S. Johnson								
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251								
BORING NO.: NB-1		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT		FLUID LEVEL (ft)								
GROUND SURFACE ELEV.: 12.8 US ft (NAVD88)		NORTHING: 234567.6 US ft (NAD83)		EASTING: 198469.1 US ft (NAD83)		0 HR. ND								
TOTAL DEPTH: 600.9 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 13.5 ft		HAMMER (ID): 140 lb Auto. (CTB-2)								
DATE STARTED: 1/13/09		COMPLETED: 2/9/09		HOLE DIA.: 4"		ROD TYPE: NWJ								
BITS USED: 3-7/8" Drag Bit														
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION		
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100				
-548.2					Continued from previous page									
													POTOMAC FORMATION: LEAN CLAY (CL)-Interpreted from geophysical log (continued)	
													565.0ft: Drill fluid changed colors from gray to gray with reddish tint	
										DF-1			570.0ft: Collected drill fluid sample DF-1	
										DF-2			580.0ft: Collected drill fluid sample DF-2	
										DF-3			590.0ft: Collected drill fluid sample DF-3	
										DF-4			600.0ft: Collected drill fluid sample DF-4	
										SS-74			Collected SPT at 600.0ft after geophysical testing completed.	
-587.2	600.0	40	60/0.4										-588.1	POTOMAC FORMATION: LEAN CLAY (CL), dusky red (10R 3/4) and light gray (2.5Y 7/1), hard, moist, no HCl reaction, PP=3.5 to 4.5 tsf
														Boring terminated at 600.9 feet.
														Boring closed by tremie method with cement-bentonite grout on 2/09/09.

PSEG ESP BORE PSEG ESP 7-07-09.GPJ PSEG ESP.GDT 7/10/09



GEOTECHNICAL BORING LOG

Prepared By nan Date 7/10/09Checked By MS Date 7/10/09

SHEET 1 OF 5

PERMIT NO.: P200901783		DRILLER: G. McAneny / J. Schuster		NJ LICENSE NO.: 0024058 / 482821		GEOLOGIST: S. Johnson				
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251				
BORING NO.: NB-1UD		DRILL METHOD: Mud Rotary		SAMPLE METHODS: Shelby Tube/Pitcher Barrel						
GROUND SURFACE ELEV.: 12.7 US ft (NAVD88)		NORTHING: 234556.0 US ft (NAD83)		EASTING: 198459.0 US ft (NAD83)		FLUID LEVEL (ft) 0 HR. ND 24 HR. 8.5				
TOTAL DEPTH: 232.3 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 13.5 ft		HAMMER (ID): 140 lb Auto. (CTB-2)				
DATE STARTED: 3/4/09		COMPLETED: 3/13/09		HOLE DIA.: 6"		ROD TYPE: NWJ				
						BITS USED: 5-7/8" Drag Bit				
ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft 0.5ft 0.5ft			BLOWS PER FOOT 0 20 40 60 80 100			SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
12.7					Ground Surface					12.7 0.0
9.5	3.2							UD-1		10.7 2.0 Boring drilled for collection of undisturbed samples. See boring NB-1 for complete strata and soil descriptions. ARTIFICIAL FILL: Not sampled HYDRAULIC FILL 3.2ft: Shelby tube UD-1 pushed to 5.2ft in Sandy LEAN CLAY (CL), very dark greenish gray (10Y 3/1), wet, little fine to coarse angular gravel, no HCl reaction; recovery=1.8ft
-2.4	15.0							UD-2		15.0ft: Shelby tube UD-2 pushed to 17.0ft in FAT CLAY (CH), very dark greenish gray (10Y 3/1), wet, little organics, trace fine sand, no HCl reaction; recovery=1.4ft; TV=0.4 tsf; PP=0.5 tsf
-7.0	19.6							UD-3		19.6ft: Shelby tube UD-3 pushed to 21.6ft in ELASTIC SILT (MH), very dark greenish gray (10Y 3/1), wet, trace fine gravel, few organics, no HCl reaction; recovery=1.9ft; TV=0.3 tsf; PP=0.25 tsf
-16.9	29.5							UD-4		29.5ft: Shelby tube UD-4 pushed to 31.5ft in FAT CLAY (CH), very dark greenish gray (10Y 3/1), wet, no HCl reaction; recovery=1.7ft; TV=0.35 tsf; PP=0.25 tsf
-22.1	34.7							UD-5		34.7ft: Shelby tube UD-5 pushed to 36.7ft in FAT CLAY (CH), dark greenish gray (10Y 4/1), wet, few thin sand seams, no HCl reaction; recovery=1.9ft; TV=0.2 tsf; PP=<0.25 tsf
-26.9	39.5							UD-6		39.5ft: Shelby tube UD-6 pushed to 41.5ft; recovery=0.0ft
-30.9	43.5							UD-7		43.5ft: Shelby tube UD-7 pushed to 45.5ft in FAT CLAY (CH), dark greenish gray (10Y 4/1), wet, few thin sand seams, no HCl reaction; recovery=1.7ft; TV=0.25-0.35 tsf; PP=<0.25-0.25 tsf ALLUVIUM: Not sampled
-43.2	55.8									-33.4 46.0 -42.4 55.0 KIRKWOOD FORMATION

PSEG ESP BORE PSEG ESP 7-07-09.GPJ PSEG ESP.GDT 7/10/09



PERMIT NO.: P200901783		DRILLER: G. McAneny / J. Schuster		NJ LICENSE NO.: 0024058 / 482821		GEOLOGIST: S. Johnson	
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251	
BORING NO.: NB-1UD		DRILL METHOD: Mud Rotary		SAMPLE METHODS: Shelby Tube/Pitcher Barrel		FLUID LEVEL (ft)	
GROUND SURFACE ELEV.: 12.7 US ft (NAVD88)		NORTHING: 234556.0 US ft (NAD83)		EASTING: 198459.0 US ft (NAD83)		0 HR. ND	
TOTAL DEPTH: 232.3 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 13.5 ft		HAMMER (ID): 140 lb Auto. (CTB-2)	
DATE STARTED: 3/4/09		COMPLETED: 3/13/09		HOLE DIA.: 6"		ROD TYPE: NWJ	
BITS USED: 5-7/8" Drag Bit							

ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT						SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
-43.5					Continued from previous page								
-46.5	59.1										UD-8		55.8ft: Shelby tube UD-8 pushed to 57.8ft in Sandy LEAN CLAY (CL), very dark gray (5Y 3/1), wet, trace gravel, no HCl reaction; recovery=1.9ft; TV=0.6 tsf; PP=0.75 tsf
-49.4	62.0										UD-9		KIRKWOOD FORMATION (continued) 59.1ft: Shelby tube UD-9 pushed to 61.1ft; recovery=0.0ft-lost tube in hole
-55.5	68.1										UD-10		62.0ft: Shelby tube UD-10 pushed to 64.0ft in FAT CLAY (CH), very dark gray (5Y 3/1) wet, no HCl reaction to 63.0ft, then Silty SAND (SM), olive gray (5Y 5/2), wet, fine sand, no HCl reaction; recovery=1.8ft -Change sample method to Pitcher Barrel Sampler
-59.4	72.0										UD-11		68.1ft: Pitcher tube UD-11 advanced to 70.6ft; recovery=0.0ft VINCENTOWN FORMATION
-62.4	75.0										UD-12		72.0ft: Pitcher tube UD-12 advanced to 74.5ft in Silty SAND (SM), brown (7.5YR 4/3), wet, strong HCl reaction; recovery=1.0ft
-65.4	78.0										UD-13		75.0ft: Pitcher tube UD-13 advanced to 77.5ft in Silty SAND (SM), yellowish brown (10YR 5/6) wet, fine sand, strong HCl reaction; recovery=1.4ft
-68.4	81.0										UD-14		78.0ft: Pitcher tube UD-14 advanced to 80.5ft in Silty SAND (SM), light gray (2.5Y 7/2), wet, fine sand, strong HCl reaction; recovery=1.3ft
-71.9	84.5										UD-15		81.0ft: Pitcher tube UD-15 advanced to 83.5ft in Silty SAND (SM), yellowish brown (10YR 5/4), wet, fine sand, few indurated zones, strong HCl reaction; recovery=1.7ft
-76.0	88.6										UD-16		84.5ft: Pitcher tube UD-16 advanced to 86.8ft in Silty SAND (SM), yellowish brown (10YR 5/4), wet, fine sand, few indurated zones, strong HCl reaction; recovery=1.2ft
-80.0	92.6										UD-17		88.6ft: Pitcher tube UD-17 advanced to 91.1ft in Silty SAND (SM), greenish gray (10GY 5/1), wet, fine sand, few indurated zones, strong HCl reaction; recovery=1.7ft
-83.8	96.4										UD-18		92.6ft: Pitcher tube UD-18 advanced to 95.1ft in Silty SAND (SM), greenish gray (10GY 5/1), wet, fine sand, few indurated zones, strong HCl reaction; recovery=1.4ft
-88.0	100.6										UD-19		96.4ft: Pitcher tube UD-19 advanced to 98.9ft in Silty SAND (SM), greenish gray (10GY 5/1), wet, fine sand, strong HCl reaction; recovery=2.1ft
-91.7	104.3										UD-20		100.6ft: Pitcher tube UD-20 advanced to 103.1ft in Silty SAND (SM), greenish gray (10GY 5/1), wet, fine sand, mostly indurated, strong HCl reaction; recovery=0.5ft
-94.6	107.2										UD-21		104.3ft: Pitcher tube UD-21 advanced to 106.5ft in Silty SAND (SM), greenish gray (10GY 5/1), wet, fine sand, few indurated to friable zones, strong HCl reaction; recovery=2.0ft
											UD-22		107.2ft: Pitcher tube UD-22 advanced to 108.7ft in Silty SAND (SM), greenish gray (10GY 5/1), wet, fine sand, few indurated zones, strong HCl reaction, trace glauconite; recovery=1.0ft

PSEG ESP BORE PSEG ESP 7-07-09.GPJ PSEG ESP.GDT 7/10/09

[illegible]



PERMIT NO.: P200901783		DRILLER: G. McAneny / J. Schuster		NJ LICENSE NO.: 0024058 / 482821		GEOLOGIST: S. Johnson	
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251	
BORING NO.: NB-1UD		DRILL METHOD: Mud Rotary		SAMPLE METHODS: Shelby Tube/Pitcher Barrel		FLUID LEVEL (ft)	
GROUND SURFACE ELEV.: 12.7 US ft (NAVD88)		NORTHING: 234556.0 US ft (NAD83)		EASTING: 198459.0 US ft (NAD83)		0 HR. ND	
TOTAL DEPTH: 232.3 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 13.5 ft		HAMMER (ID): 140 lb Auto. (CTB-2)	
DATE STARTED: 3/4/09		COMPLETED: 3/13/09		HOLE DIA.: 6"		ROD TYPE: NWJ	
BITS USED: 5-7/8" Drag Bit							

ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT						SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
-155.7					Continued from previous page								
-170.9	183.5										UD-35		167.5ft: Pitcher tube UD-34 advanced to 168.9ft in Clayey SAND (SC), dark olive gray (5Y 3/2), moist, fine to coarse sand, strong HCl reaction; recovery=1.1ft MOUNT LAUREL FORMATION (continued)
-175.6	188.2										UD-36		183.5ft: Pitcher tube UD-35 advanced to 186.0ft in Silty SAND (SM), dark olive gray (5Y 3/2), moist, fine to coarse sand, trace fine gravel, strong HCl reaction, trace glauconite; recovery=1.8ft
-204.2	216.8										UD-37		188.2ft: Pitcher tube UD-36 advanced to 190.7ft in Silty SAND (SM), dark olive gray (5Y 3/2), wet, fine to coarse sand, trace fine gravel, strong HCl reaction, trace glauconite; recovery=1.1ft
-209.2	221.8										UD-38		216.8ft: Pitcher tube UD-37 advanced to 219.3ft in Poorly graded SAND with silt (SP-SM), dark greenish gray (10GY 4/1), wet, fine to medium sand, no HCl reaction, trace glauconite; recovery=1.8ft
													221.8ft: Pitcher tube UD-38 advanced to 224.3ft in Poorly graded SAND with silt (SP-SM), dark greenish gray (10GY 4/1), wet, fine to coarse sand, no HCl

PSEG ESP BORE PSEG ESP 7-07-09 GPI PSEG ESP GDI 7/10/09



SHEET 5 OF 5

PERMIT NO.: P200901783		DRILLER: G. McAneny / J. Schuster		NJ LICENSE NO.: 0024058 / 482821		GEOLOGIST: S. Johnson							
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251							
BORING NO.: NB-1UD		DRILL METHOD: Mud Rotary		SAMPLE METHODS: Shelby Tube/Pitcher Barrel		FLUID LEVEL (ft)							
GROUND SURFACE ELEV.: 12.7 US ft (NAVD88)		NORTHING: 234556.0 US ft (NAD83)		EASTING: 198459.0 US ft (NAD83)		0 HR. ND							
TOTAL DEPTH: 232.3 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 13.5 ft		HAMMER (ID): 140 lb Auto. (CTB-2)							
DATE STARTED: 3/4/09		COMPLETED: 3/13/09		HOLE DIA.: 6"		ROD TYPE: NWJ							
BITS USED: 5-7/8" Drag Bit													
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
-211.8					Continued from previous page								
-217.2	229.8									UD-39			reaction, trace glauconite; recovery=2.0ft MOUNT LAUREL FORMATION (continued)
													229.8ft: Pitcher tube UD-39 advanced to 232.3ft in Poorly graded SAND with silt (SP-SM), dark greenish gray (10GY 4/1), wet, fine sand, weak HCl reaction, trace glauconite; recovery=1.4ft Boring terminated at 232.3 feet.
													-219.7 232.3
													Boring closed by tremie method with cement-bentonite grout on 3/13/09.



GEOTECHNICAL BORING LOG

Prepared By man Date 7/10/09Checked By jas Date 7/10/09

SHEET 1 OF 1

PERMIT NO.: P200905732		DRILLER: M. Adams		NJ LICENSE NO.: 0001350		GEOLOGIST: M. Lear					
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251					
BORING NO.: CH NB-1A		DRILL METHOD: Mud Rotary		SAMPLE METHODS: NA							
GROUND SURFACE ELEV.: 12.8 US ft (NAVD88)		NORTHING: 234544.4 US ft (NAD83)		EASTING: 198483.1 US ft (NAD83)		FLUID LEVEL (ft) 0 HR. ND 24 HR. ND					
TOTAL DEPTH: 201.0 ft		DRILL MACHINE: IR-T2W		CASING DEPTH: NA		HAMMER (ID): NA					
DATE STARTED: 5/18/09		COMPLETED: 5/18/09		HOLE DIA.: 8"		ROD TYPE: 3.5" IR Rod BITS USED: 7-7/8" Drag Bit					
ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft 0.5ft 0.5ft			BLOWS PER FOOT 0 20 40 60 80 100			SAMP. NO.	▼	LOG	SOIL AND ROCK DESCRIPTION
12.8					Ground Surface						12.8 0.0
											Boring drilled for installation of crosshole seismic casing. See boring NB-1 for strata and soil descriptions. Installed flush-jointed 4" Schedule 40 PVC casing with end cap from ground surface to 200.1 feet. -Steel centralizers installed at approximately 195, 145, 95, 45, and 5 feet below ground surface. -PVC casing held down/in place with 200 feet of NWJ drill rod set inside casing during grouting. -Annulus grouted via tremie method to ground surface with cement-bentonite grout per NJDEP regulations. -Approximately 2 feet of PVC casing sticking up above ground surface at completion.
											-188.2 201.0
											Boring terminated at 201.0 feet and crosshole seismic casing installed. For strata and soil descriptions see geotechnical boring NB-1.

PSEG ESP BORE PSEG ESP 7-07-09.GPJ PSEG ESP.GDT 7/10/09

GEOTECHNICAL BORING LOG

Prepared By M/M Date 7/10/09

Checked By AA Date 7/10/09

SHEET 1 OF 1

[illegible]

GEOTECHNICAL BORING LOG

Prepared By MM Date 7/10/09

Checked By JA Date 1/10/09

SHEET 1 OF 1

PERMIT NO.: P200905734			DRILLER: M. Adams			NJ LICENSE NO.: 0001350			GEOLOGIST: M. Lear					
SITE DESCRIPTION: PSEG SITE ESP APPLICATION						COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251			FLUID LEVEL (ft)			
BORING NO.: CH NB-1C			DRILL METHOD: Mud Rotary			SAMPLE METHODS: NA						0 HR. ND		
GROUND SURFACE ELEV.: 13.3			US ft (NAVD88)		NORTHING: 234529.8		US ft (NAD83)		EASTING: 198469.5			US ft (NAD83) 24 HR. ND		
TOTAL DEPTH: 201.0 ft			DRILL MACHINE: IR-T2W			CASING DEPTH: NA			HAMMER (ID): NA					
DATE STARTED: 5/19/09			COMPLETED: 5/19/09			HOLE DIA.: 8"		ROD TYPE: 3.5" IR Rod		BITS USED: 7-7/8" Drag Bit				
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	▼	L O G	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100				
13.3					Ground Surface								13.3	0.0
													Boring drilled for installation of crosshole seismic casing. See boring NB-1 for strata and soil descriptions. Installed flush-jointed 4" Schedule 40 PVC casing with end cap from ground surface to 200.0 feet. -Steel centralizers installed at approximately 195, 145, 95, 45, and 5 feet below ground surface. -PVC casing held down/in place with 200 feet of NWJ drill rod set inside casing during grouting. -Annulus grouted via tremie method to ground surface with cement-bentonite grout per NJDEP regulations. -Approximately 2 feet of PVC casing sticking up above ground surface at completion.	
													-187.7	201.0
													Boring terminated at 201.0 feet and crosshole seismic casing installed. For strata and soil descriptions see geotechnical boring NB-1.	



GEOTECHNICAL BORING LOG

Prepared By MM Date 7/10/09Checked By JAJ Date 7/10/09

SHEET 1 OF 6

PERMIT NO.: P200900085		DRILLER: T. Ward		NJ LICENSE NO.: 0001105		GEOLOGIST: J. Howard / S. Johnson								
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251								
BORING NO.: NB-2		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT/Shelby Tube										
GROUND SURFACE ELEV.: 8.2 US ft (NAVD88)		NORTHING: 235205.0 US ft (NAD83)		EASTING: 197764.7 US ft (NAD83)		FLUID LEVEL (ft) 0 HR. ND 24 HR. ND								
TOTAL DEPTH: 301.5 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 14.0 ft		HAMMER (ID): 140 lb Auto. (CBT-1)								
DATE STARTED: 2/20/09		COMPLETED: 3/4/09		HOLE DIA.: 4"		ROD TYPE: NWJ								
						BITS USED: 3-7/8" Drag Bit								
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION		
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100				
8.2					Ground Surface								8.2	0.0
8.2	0.0	6	7	8						SS-1		ARTIFICIAL FILL: Sandy CLAY (CL), very dark brown (10YR 2/2), stiff, moist, weak HCl reaction		
5.7	2.5									SS-2		2.5ft: Very dark grayish brown (10YR 3/2), no HCl reaction		
3.8	4.4	6	6	9						UD-1		HYDRAULIC FILL: Sandy CLAY (CL), very dark grayish brown (10YR 3/2), very soft, moist, no HCl reaction	4.0	
1.2	7.0									SS-3		2.2ft: Pushed shelby tube UD-1 from 4.4ft to 6.4ft; recovery=0.2ft	6.0	
-0.8	9.0	1	WOH	1						UD-2		HYDRAULIC FILL: FAT CLAY (CH), black (N 2.5), very soft, moist, trace fine sand, no HCl reaction		
-3.3	11.5									UD-3		9.0ft: Pushed shelby tube UD-2 to 11.0ft; recovery=0.0ft		
-5.8	14.0									SS-4		11.5ft: Pushed shelby tube UD-3 to 13.5ft; recovery=0.0ft		
		WOH	WOH	WOH								14.0ft: Trace mica, PP=0.0 tsf		
-11.7	19.9									SS-5				
		WOH	WOH	WOH										
-16.8	25.0									SS-6		25.0ft: Soft		
		WOH	WOH	2										
-21.8	30.0									SS-7		30.0ft: PP=0.0 tsf		
-23.9	32.1	2	2	2						UD-4		32.1ft: Pushed shelby tube UD-4 to 34.1ft; recovery=1.9ft		
-26.8	35.0									SS-8		35.0ft: Very soft, trace fine sand lenses		
		WOH	1	WOH										
-31.8	40.0									SS-9		40.0ft: Very dark gray (N 3/), soft		
		1	2	1										
-36.8	45.0									SS-10		ALLUVIUM: Clayey SAND (SC), very dark gray (N 3/), loose, moist, no HCl reaction	43.5	
		4	3	4										
-41.7	49.9									SS-11A/B		ALLUVIUM: PEAT (PT), brown (10YR 4/3), very soft, moist	48.0	
		WOH	1	1										
-46.8	55.0									SS-12		ALLUVIUM: Silty SAND (SM), dark gray (N 4/), very loose, wet, fine to medium sand, no HCl reaction	50.5	
		5	5	9								55.0ft: Medium dense		

PSEG ESP BORE PSEG ESP 7-07-09 GPH PSEG ESP GDT 7/10/09



PERMIT NO.: P200900085		DRILLER: T. Ward		NJ LICENSE NO.: 0001105		GEOLOGIST: J. Howard / S. Johnson						
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251		FLUID LEVEL (ft)				
BORING NO.: NB-2		DRILL METHOD: Mud Rotary			SAMPLE METHODS: SPT/Shelby Tube			0 HR. ND				
GROUND SURFACE ELEV.: 8.2		US ft (NAVD88)		NORTHING: 235205.0		US ft (NAD83)		EASTING: 197764.7 US ft (NAD83)		24 HR. ND		
TOTAL DEPTH: 301.5 ft		DRILL MACHINE: CME-75 Truck			CASING DEPTH: 14.0 ft			HAMMER (ID): 140 lb Auto. (CBT-1)				
DATE STARTED: 2/20/09		COMPLETED: 3/4/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit				
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT					SAMP.	LOG	SOIL AND ROCK DESCRIPTION
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100		
-47.9					Continued from previous page							
-51.7	59.9	5	9	12							SS-13	59.9ft: Greenish gray (10Y 5/1), fine to coarse subrounded sand, trace gravel
-56.9	65.1	12	12	7							SS-14A/B	-57.8 66.0
-61.8	70.0	7	4	4							SS-15	KIRKWOOD FORMATION: Silty SAND (SM), dark greenish gray (10GY 4/1), medium dense, wet, fine to medium sand, no HCl reaction
-67.1	75.3	3	2	3							SS-16	70.0ft: Dark yellowish brown (10YR 4/4), loose
-71.8	80.0	13	19	10							SS-17	75.3ft: Greenish gray (10GY 5/1), loose, trace glauconite
-73.9	82.1										UD-5	-69.8 78.0
-76.8	85.0	15	5	6							SS-18	VINCENTOWN FORMATION: Silty SAND (SM), light yellowish brown (2.5Y 6/3), medium dense, wet, fine to medium sand, few friable to indurated zones, strong HCl reaction, strongly oxidized
-78.7	86.9										UD-6	82.1ft: Pushed shelby tube UD-5 to 84.1ft; recovery=1.9 ft
-81.9	90.1	4	4	7							SS-19	85.0ft: Brown (10YR 5/3), moist, trace moderately indurated layers, moderately oxidized
-83.8	92.0										UD-7	86.9ft: Pushed shelby tube UD-6 to 87.1ft; recovery=0.1ft (Refused on indurated layer)
-86.9	95.1	5	4	27							SS-20	90.1ft: Grayish brown (10YR 5/2), wet, trace glauconite, weakly oxidized
-91.8	100.0	5	6	15							SS-21	92.0ft: Shelby tube UD-7 pushed to 93.4ft; recovery=1.4ft
-96.8	105.0	8	8	17							SS-22	95.1ft: Light grayish brown (10YR 6/2), dense, trace friable to moderately indurated layers
-101.8	110.0	16	11	14							SS-23	100.0ft: Dark greenish gray (10Y 4/1), medium dense, no oxidation

PSEG ESP BORE PSEG ESP 7-07-09 GPI PSEG ESP GDI 7/10/09



PERMIT NO.: P200900085		DRILLER: T. Ward		NJ LICENSE NO.: 0001105		GEOLOGIST: J. Howard / S. Johnson						
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251		FLUID LEVEL (ft)				
BORING NO.: NB-2		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT/Shelby Tube		0 HR.		ND				
GROUND SURFACE ELEV.: 8.2		US ft (NAVD88)		NORTHING: 235205.0		US ft (NAD83)		EASTING: 197764.7 US ft (NAD83)				
TOTAL DEPTH: 301.5 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 14.0 ft		HAMMER (ID): 140 lb Auto. (CBT-1)		24 HR.				
DATE STARTED: 2/20/09		COMPLETED: 3/4/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit				
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT					SAMP.	LOG	SOIL AND ROCK DESCRIPTION
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100		
-104.0					Continued from previous page							
-106.8	115.0	21	14	19							SS-24	-104.8 HORNERSTOWN FORMATION: Silty SAND (SM), dark greenish gray (10Y 4/1), dense, wet, fine to medium sand, trace friable layers, strong HCl reaction, few to little glauconite
-111.8	120.0	7	9	15							SS-25	120.0ft: Medium dense
-116.8	125.0	6	13	20							SS-26	125.0ft: Very dark greenish gray (10GY 3/1), dense, few shell fragments, some glauconite
-121.7	129.9	18	24	25							SS-27	-120.8 NAVESINK FORMATION: Silty SAND (SM), very dark grayish green (5G 2.5/2), dense, moist, fine sand, trace shell fragments, weak HCl reaction, mostly glauconite
-126.7	134.9	23	30	45							SS-28	134.9ft: Greenish black (5G 2.5/1), very dense, wet, fine to medium sand, few shell fragments
-131.8	140.0	19	25	31							SS-29	140.0ft: Trace shell fragments
-136.8	145.0	19	29	36							SS-30	
-141.7	149.9	22	29	38							SS-31	149.9ft: No HCl reaction
-146.8	155.0	100/0.5									SS-32	-144.8 MOUNT LAUREL FORMATION: Silty, Clayey SAND (SC-SM), dark grayish brown (10YR 4/2), very dense, moist, fine to coarse subrounded sand, strong HCl reaction, little glauconite
-151.7	159.9	100/0.2									SS-33	159.9ft: Greenish gray (10Y 5/1), dry, trace shell fragments
-156.8	165.0	100/0.3									SS-34	165.0ft: Moist, few shell fragments, no HCl reaction

PSEG ESP BORE PSEG ESP 7-07-09 GPI PSEG ESP GDT 7/10/09



PERMIT NO.: P200900085		DRILLER: T. Ward		NJ LICENSE NO.: 0001105		GEOLOGIST: J. Howard / S. Johnson	
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251	
BORING NO.: NB-2		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT/Shelby Tube		FLUID LEVEL (ft)	
GROUND SURFACE ELEV.: 8.2		US ft (NAVD88)		NORTHING: 235205.0		US ft (NAD83)	
TOTAL DEPTH: 301.5 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 14.0 ft		HAMMER (ID): 140 lb Auto. (CBT-1)	
DATE STARTED: 2/20/09		COMPLETED: 3/4/09		HOLE DIA.: 4"		ROD TYPE: NWJ	
BITS USED: 3-7/8" Drag Bit							

ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
		0.5ft	0.5ft	0.5ft	0	20	40	60	80			
-160.1					Continued from previous page							
-161.8	170.0											
		100/0.3								100/0.3	SS-35	MOUNT LAUREL FORMATION: Silty, Clayey SAND (SC-SM), dark grayish brown (10YR 4/2), very dense, moist, fine to coarse subrounded sand, strong HCl reaction, little glauconite (continued)
-166.8	175.0	19	33	60						93	SS-36	175.0ft: Strong HCl reaction, few glauconite
-171.8	180.0	16	25	30						55	SS-37	
-176.8	185.0	15	24	35						59	SS-38	185.0ft: Greenish gray (10Y 6/1)
-181.8	190.0	39	61/0.5							100/1.0	SS-39	MOUNT LAUREL FORMATION: Silty SAND (SM), greenish gray (5GY 5/1), very dense, dry, fine to medium sand, trace indurated layers, strong HCl reaction, trace glauconite
-186.9	195.1	57	43/0.3							100/0.8	SS-40	195.1ft: Moist, no HCl reaction
-191.8	200.0	80	20/0.1							100/0.6	SS-41	200.0ft: Weak HCl reaction
-201.8	210.0	52	48/0.3							100/0.8	SS-42	
-211.7	219.9	40	60/0.5							100/1.0	SS-43	219.9ft: Strong HCl reaction

PSEG ESP BORE PSEG ESP 7-07-09.GPJ PSEG ESP.GDT 7/10/09



PERMIT NO.: P200900085			DRILLER: T. Ward			NJ LICENSE NO.: 0001105			GEOLOGIST: J. Howard / S. Johnson				
SITE DESCRIPTION: PSEG SITE ESP APPLICATION					COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251			FLUID LEVEL (ft)			
BORING NO.: NB-2		DRILL METHOD: Mud Rotary			SAMPLE METHODS: SPT/Shelby Tube			0 HR.			ND		
GROUND SURFACE ELEV.: 8.2		US ft (NAVD88)		NORTHING: 235205.0		US ft (NAD83)		EASTING: 197764.7		24 HR.		ND	
TOTAL DEPTH: 301.5 ft			DRILL MACHINE: CME-75 Truck			CASING DEPTH: 14.0 ft			HAMMER (ID): 140 lb Auto. (CBT-1)				
DATE STARTED: 2/20/09		COMPLETED: 3/4/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit					
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	▼	L O G	SOIL AND ROCK DESCRIPTION
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
-216.2					Continued from previous page								
-221.8	230.0	8	20	35						SS-44			MOUNT LAUREL FORMATION: Silty SAND (SM), greenish gray (5GY 5/1), very dense, dry, fine to medium sand, trace indurated layers, strong HCl reaction, trace glauconite (continued)
-231.8	240.0	9	19	28						SS-45			230.0ft: Greenish black (10Y 2.5/1), trace mica
-241.8	250.0	10	14	26						SS-46			240.0ft: Dense
-251.8	260.0	11	16	21						SS-47			WENONAH FORMATION: Sandy LEAN CLAY (CL), greenish black (10Y 2.5/1), hard, moist, strong HCl reaction, trace mica, trace to few glauconite
-261.8	270.0	7	16	24						SS-48			WENONAH FORMATION: Silty, Clayey SAND (SC-SM), greenish black (10Y 2.5/1), dense, moist, fine to medium sand, strong HCl reaction, trace to few glauconite
-271.8	280.0												MARSHALLTOWN FORMATION: Sandy LEAN CLAY (CL), black (N 2.5/), very stiff, moist, strong HCl reaction, trace glauconite

PSEG ESP BORE PSEG ESP 7-07-09 GFI PSEG ESP GDT 7/10/09



PERMIT NO.: P200900085		DRILLER: T. Ward		NJ LICENSE NO.: 0001105		GEOLOGIST: J. Howard / S. Johnson	
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251	
BORING NO.: NB-2		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT/Shelby Tube		FLUID LEVEL (ft)	
GROUND SURFACE ELEV.: 8.2		US ft (NAVD88)		NORTHING: 235205.0 US ft (NAD83)		EASTING: 197764.7 US ft (NAD83)	
TOTAL DEPTH: 301.5 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 14.0 ft		HAMMER (ID): 140 lb Auto. (CBT-1)	
DATE STARTED: 2/20/09		COMPLETED: 3/4/09		HOLE DIA.: 4"		ROD TYPE: NWJ	
BITS USED: 3-7/8" Drag Bit							

ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
		0.5ft	0.5ft	0.5ft				
-272.3								Continued from previous page
		9	11	15		SS-49		MARSHALLTOWN FORMATION: Sandy LEAN CLAY (CL), black (N 2.5/), very stiff, moist, strong HCl reaction, trace glauconite (<i>continued</i>)
-281.8	290.0	16	22	34		SS-50		MARSHALLTOWN FORMATION: Silty SAND (SM), black (N 2.5/), very dense, moist, fine to medium sand, strong HCl reaction, trace glauconite
-291.8	300.0	7	11	17		SS-51		ENGLISHTOWN FORMATION: Sandy LEAN CLAY (CL), black (N 2.5/), very stiff, moist, trace shell fragments, no HCl reaction
								Boring terminated at 301.5 feet.
								Boring closed by tremie method with cement-bentonite grout on 3/05/09.



GEOTECHNICAL BORING LOG

Prepared By MAN Date 7/10/09
Checked By Jan Date 7/10/09
SHEET 1 OF 4

PERMIT NO.: P200900086		DRILLER: R. Bartholomew			NJ LICENSE NO.: 0001383			GEOLOGIST: S. Johnson				
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251			FLUID LEVEL (ft)			
BORING NO.: NB-3		DRILL METHOD: Mud Rotary			SAMPLE METHODS: SPT			0 HR. ND				
GROUND SURFACE ELEV.: 7.4 US ft (NAVD88)		NORTHING: 234554.7 US ft (NAD83)		EASTING: 197895.8 US ft (NAD83)			24 HR. 9.0					
TOTAL DEPTH: 200.3 ft		DRILL MACHINE: CME-75 Truck			CASING DEPTH: 13.7 ft			HAMMER (ID): 140 lb Auto. (CTB-2)				
DATE STARTED: 2/17/09		COMPLETED: 2/20/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit				
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100		
7.4					Ground Surface							7.4
7.4	0.0	8	14	25								0.0
4.9	2.5	2	6	5								
2.4	5.0	WOH	WOH	WOH								2.4
-0.1	7.5	WOH	WOH	WOH								5.0
-2.2	9.6	WOH	WOH	WOH								-1.6
-4.4	11.8	WOH	WOH	WOH								-4.1
-7.6	15.0	WOH	WOH	WOH								-10.6
-12.8	20.2	WOH	WOH	WOH								-18.2
-17.7	25.1	2	4	2								-20.6
-22.7	30.1	WOH	WOH	WOH								-30.6
-27.7	35.1	WOH	WOH	WOH								-32.8
-32.3	39.7	1	1	1								-35.6
-37.3	44.7	WOH	2	3								-40.6
-42.2	49.6	6	7	6								-43.2
-47.2	54.6	WOH	WOH	WOH								

PSEG ESP BORE PSEG ESP 7-07-09 GFI PSEG ESP GDI 7/10/09



PERMIT NO.: P200900086		DRILLER: R. Bartholomew		NJ LICENSE NO.: 0001383		GEOLOGIST: S. Johnson									
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251		FLUID LEVEL (ft)							
BORING NO.: NB-3		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT		0 HR.		ND							
GROUND SURFACE ELEV.: 7.4		US ft (NAVD88)		NORTHING: 234554.7		US ft (NAD83)		EASTING: 197895.8		US ft (NAD83)		24 HR.		9.0	
TOTAL DEPTH: 200.3 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 13.7 ft		HAMMER (ID): 140 lb Auto. (CTB-2)									
DATE STARTED: 2/17/09		COMPLETED: 2/20/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit							
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT					SAMP.	LOG	SOIL AND ROCK DESCRIPTION			
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			NO.		
-48.7					Continued from previous page										
-52.2	59.6	WOH	WOH	WOH							SS-16	-50.6	58.0	KIRKWOOD FORMATION: SILT (ML), dark gray (5YR 4/1), very soft, wet, trace fine sand, trace mica, no HCl reaction 59.6ft: PP=0.75 tsf	
-57.2	64.6	5	2	4							SS-17	-56.6	64.0	64.0ft: Bit chatter to 64.6ft VINCENTOWN FORMATION: Silty SAND (SM), olive brown (2.5Y 4/4), loose, wet, fine to medium sand, strong HCl reaction, trace glauconite, moderately oxidized	
-62.2	69.6	5	3	5							SS-18				
-67.2	74.6	10	8	8							SS-19	-65.6	73.0	VINCENTOWN FORMATION: Poorly graded SAND with silt (SP-SM), dark greenish gray (5GY 3/1), medium dense, wet, fine to medium sand, trace indurated layers, strong HCl reaction, trace to few glauconite	
-72.2	79.6	11	17	16							SS-20			79.6ft: Dark greenish gray (5GY 4/1), dense, trace friable layers	
-77.2	84.6	14	9	8							SS-21	-75.6	83.0	VINCENTOWN FORMATION: Silty SAND (SM), dark greenish gray (5GY 4/1), medium dense, wet, fine to medium sand, trace indurated layers, strong HCl reaction, trace glauconite	
-82.2	89.6	10	10	25							SS-22	-80.6	88.0	VINCENTOWN FORMATION: Poorly graded SAND with silt (SP-SM), dark greenish gray (5GY 4/1), dense, wet, fine to medium sand, weak HCl reaction, trace glauconite, trace indurated layers	
-87.2	94.6	25	24	25							SS-23	-85.6	93.0	VINCENTOWN FORMATION: Silty SAND (SM), dark greenish gray (5GY 4/1), dense, wet, fine sand, trace friable layers, strong HCl reaction, trace glauconite	
-92.2	99.6	8	9	11							SS-24			99.6ft: Greenish gray (10Y 5/1), medium dense	
-97.2	104.6	5	66	33							SS-25			104.6ft: Very dense, few friable to indurated layers	
-102.2	109.6	50/0.5									SS-26	-100.6	108.0	VINCENTOWN FORMATION: Poorly graded SAND with silt (SP-SM), dark greenish gray (5GY 4/1), very dense, wet, fine to medium sand, strong HCl reaction, trace glauconite	
-104.2	111.6										SS-27			111.6ft: No recovery, indurated layer	

PSEG ESP BORE PSEG ESP 7-07-09 GPJ PSEG ESP GDT 7/10/09



PERMIT NO.: P200900086		DRILLER: R. Bartholomew		NJ LICENSE NO.: 0001383		GEOLOGIST: S. Johnson							
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251		FLUID LEVEL (ft)					
BORING NO.: NB-3		DRILL METHOD: Mud Rotary			SAMPLE METHODS: SPT			0 HR. ND					
GROUND SURFACE ELEV.: 7.4		US ft (NAVD88)		NORTHING: 234554.7		US ft (NAD83)		EASTING: 197895.8 US ft (NAD83)					
TOTAL DEPTH: 200.3 ft		DRILL MACHINE: CME-75 Truck			CASING DEPTH: 13.7 ft			HAMMER (ID): 140 lb Auto. (CTB-2)					
DATE STARTED: 2/17/09		COMPLETED: 2/20/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit					
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
-104.8					Continued from previous page								
-107.2	114.6	10	12	14									-105.6 HORNERSTOWN FORMATION: Silty SAND (SM), dark greenish gray (5GY 4/1), medium dense, wet, fine to medium sand, strong HCl reaction, trace to few glauconite
-112.2	119.6	13	30	19									119.6ft: Dense
-117.2	124.6	10	12	16									124.6ft: Medium dense
-122.2	129.6	25	21	21									129.6ft: Dense, trace friable layers
-127.2	134.6	18	28	33									-124.6 NAVESINK FORMATION: Clayey SAND (SC), very dark greenish gray (5G 3/2), very dense, wet, fine sand, trace to few shell fragments, mostly glauconite
-132.2	139.6	30	40	40									-129.6 NAVESINK FORMATION: Silty SAND (SM), very dark greenish gray (10BG 2.5/1), very dense, wet, fine sand, weak HCl reaction, little shell fragments, mostly glauconite
-137.2	144.6	11	20	18									-135.6 NAVESINK FORMATION: Clayey SAND (SC), very dark greenish gray (10Y 3/1), dense, wet, fine to medium sand, weak HCl reaction, mostly glauconite
-142.2	149.6	20	37	52									-140.6 NAVESINK FORMATION: Silty SAND (SM), very dark greenish gray (5G 3/2), very dense, wet, fine sand, weak HCl reaction, mostly glauconite
-147.2	154.6	37	38	45									-150.6 MOUNT LAUREL FORMATION: Clayey SAND (SC), dark greenish gray (10Y 4/1), very dense, moist, fine to coarse subrounded sand, strong HCl reaction
-152.2	159.6	30	39	61/0.3									-155.6 MOUNT LAUREL FORMATION: Silty SAND (SM), greenish gray (10Y 5/1), very dense, wet, fine to coarse subangular to subrounded sand, trace indurated layers, trace shell fragments, weak HCl reaction, little glauconite
-157.2	164.6	100/0.3											

PSEG ESP BORE PSEG ESP 7-07-09.GPJ PSEG ESP.GDT 7/10/09



PERMIT NO.: P200900086		DRILLER: R. Bartholomew		NJ LICENSE NO.: 0001383		GEOLOGIST: S. Johnson	
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251	
BORING NO.: NB-3		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT		FLUID LEVEL (ft)	
GROUND SURFACE ELEV.: 7.4 US ft (NAVD88)		NORTHING: 234554.7 US ft (NAD83)		EASTING: 197895.8 US ft (NAD83)		0 HR. ND	
TOTAL DEPTH: 200.3 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 13.7 ft		24 HR. 9.0	
DATE STARTED: 2/17/09		COMPLETED: 2/20/09		HOLE DIA.: 4"		BITS USED: 3-7/8" Drag Bit	
ROD TYPE: NWJ		HAMMER (ID): 140 lb Auto. (CTB-2)					

ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT						SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100				
-160.9					Continued from previous page									
-162.2	169.6	100/0.2									100/0.2	SS-39		MOUNT LAUREL FORMATION: Silty SAND (SM), greenish gray (10Y 5/1), very dense, wet, fine to coarse subangular to subrounded sand, trace indurated layers, trace shell fragments, weak HCl reaction, little glauconite (continued) 169.6ft: Dark greenish gray (10Y 4/1)
-167.2	174.6	100/0.4									100/0.4	SS-40		
-172.2	179.6	18	48	52/0.4							100/0.9	SS-41		MOUNT LAUREL FORMATION: Clayey SAND (SC), dark greenish gray (5GY 4/1), very dense, wet, fine sand, trace indurated layers, strong HCl reaction, trace glauconite
-177.2	184.6	16	24	45								SS-42		184.6ft: Weak HCl reaction
-182.2	189.6	19	24	42								SS-43		
-187.2	194.6	43	57/0.3								100/0.8	SS-44		MOUNT LAUREL FORMATION: Silty SAND (SM), greenish gray (5GY 6/1), very dense, wet, fine to coarse subrounded sand, no HCl reaction, trace glauconite
-192.2	199.6	75	25/0.2								100/0.7	SS-45		MOUNT LAUREL FORMATION: Poorly graded SAND with silt (SP-SM), dark green gray (5GY 4/1), very dense, wet, fine to coarse sand, no HCl reaction, trace glauconite
														Boring terminated at 200.3 feet. Boring closed by tremie method with cement-bentonite grout on 2/20/09.

PSEG ESP BORE PSEG ESP 7-07-09 GFI PSEG ESP GDI 7/10/09



GEOTECHNICAL BORING LOG

Prepared By mm Date 7/10/09Checked By Jo J Date 7/10/09

SHEET 1 OF 4

PERMIT NO.: P200900087			DRILLER: D. Osuch			NJ LICENSE NO.: 0024289			GEOLOGIST: M. Lear / S. Johnson						
SITE DESCRIPTION: PSEG SITE ESP APPLICATION					COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251			FLUID LEVEL (ft)					
BORING NO.: NB-4		DRILL METHOD: Mud Rotary			SAMPLE METHODS: SPT/Shelby Tube			0 HR.		ND					
GROUND SURFACE ELEV.: 11.5		US ft (NAVD88)		NORTHING: 233960.4		US ft (NAD83)		EASTING: 198139.0		US ft (NAD83)					
TOTAL DEPTH: 201.3 ft		DRILL MACHINE: CME-75 Truck			CASING DEPTH: 13.5 ft			HAMMER (ID): 140 lb Auto. (CTB-3)							
DATE STARTED: 2/19/09		COMPLETED: 2/25/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit							
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT					SAMP.	LOG	SOIL AND ROCK DESCRIPTION			
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			NO.		
11.5					Ground Surface										
11.5	0.0	25	47	52								11.5	0.0		
9.0	2.5	2	2	2								9.5	2.0	ARTIFICIAL FILL: Silty GRAVEL (GM), dark grayish brown (10YR 4/2), very dense, dry to moist, angular, trace organics	
6.5	5.0	WOH	WOH	WOH										HYDRAULIC FILL: FAT CLAY (CH), very dark gray (5Y 3/1), soft to very soft, moist, trace to little organics, trace to few fine sand, PP=0.25 tsf	
4.0	7.5	WOH	WOH	WOH										PP=0.0 tsf for samples SS-3 to SS-12	
1.5	10.0	WOH	WOH	WOH											
-1.0	12.5	WOH	WOH	WOH											
-3.5	15.0	WOH	WOH	WOH											
-6.0	17.5	WOH	WOH	WOH										17.5ft: Dark gray (5Y 4/1)	
-8.5	20.0	WOH	WOH	WOH											
-11.0	22.5	WOH	WOH	WOH											
-13.5	25.0	WOH	WOH	WOH										25.0ft: Trace fine sand partings	
-16.0	27.5	WOH	WOH	WOH											
-18.5	30.0	2	4	4									-18.0	29.5	HYDRAULIC FILL: Silty SAND (SM), very dark gray (5Y 3/1), loose, wet, fine sand, no HCl reaction
-21.0	32.5	WOH	WOH	WOH									-20.5	32.0	HYDRAULIC FILL: FAT CLAY with sand (CH), very dark gray (5Y 3/1), very soft, wet, little fine sand, no HCl reaction
-23.5	35.0	WOH	WOH	WOH											35.0ft: Few fine sand partings, PP=0.0 tsf
-26.0	37.5	2	2	3									-25.5	37.0	ALLUVIUM: Clayey SAND (SC), very dark gray (5Y 3/1), loose, wet, fine to coarse sand, trace gravel, no HCl reaction
-28.5	40.0	2	2	2									-28.0	39.5	ALLUVIUM: Sandy FAT CLAY (CH), very dark gray (5Y 3/1), soft, wet, fine to coarse sand, trace organics
-31.0	42.5	WOH	2	3											42.5ft: Medium stiff
-33.5	45.0	4	9	11									-33.0	44.5	ALLUVIUM: Poorly graded SAND (SP), greenish gray (10Y 5/1), medium dense, wet, fine to coarse sand, trace subrounded fine gravel
-36.0	47.5	14	11	9									-35.5	47.0	ALLUVIUM: Clayey SAND (SC), light greenish gray (5GY 7/1), medium dense, moist, fine to medium sand, trace gravel
-38.5	50.0	5	11	12									-38.0	49.5	ALLUVIUM: Clayey GRAVEL (GC), brown (7.5YR 5/2), medium dense, wet, fine to coarse subrounded to angular gravel, few fine sand
-41.0	52.5	5	6	6											
-43.5	55.0	2	2	2									-43.0	54.5	

PSEG ESP BORE PSEG ESP 7-07-09 GFI PSEG ESP GDT 7/10/09



SHEET 2 OF 4

PERMIT NO.: P200900087		DRILLER: D. Osuch		NJ LICENSE NO.: 0024289		GEOLOGIST: M. Lear / S. Johnson							
SITE DESCRIPTION: PSEG SITE ESP APPLICATION			COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251		FLUID LEVEL (ft)						
BORING NO.: NB-4		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT/Shelby Tube		0 HR.		ND					
GROUND SURFACE ELEV.: 11.5 US ft (NAVD88)		NORTHING: 233960.4 US ft (NAD83)		EASTING: 198139.0 US ft (NAD83)		24 HR.		5.5					
TOTAL DEPTH: 201.3 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 13.5 ft		HAMMER (ID): 140 lb Auto. (CTB-3)							
DATE STARTED: 2/19/09		COMPLETED: 2/25/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit					
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
-44.6					Continued from previous page								
-45.5	57.0										UD-1	KIRKWOOD FORMATION: FAT CLAY (CH), Olive Gray (5Y 5/2), soft, moist, trace organics, trace fine sand, PP=0.0 tsf (continued) 57.0ft: Pushed shelly tube UD-1 to 59.0ft; recovery=2.0ft, PP=1.75 tsf, TV=0.7 tsf 59.0ft: Pushed shelly tube UD-2 to 61.0ft; recovery=2.0ft, PP=0.75 tsf, TV=0.4 tsf 61.0ft: Medium stiff, PP=0.5 tsf	
-47.5	59.0										UD-2		
-50.0	61.5										SS-24		
		WOH	WOH	6									
-53.5	65.0										SS-25		
		WOH	WOH	2									
-56.0	67.5	4	10	32							SS-26		
-58.5	70.0	4	4	10							SS-27		
-60.5	72.0										UD-3		
-63.5	75.0	5	15	8							SS-28		
-65.5	77.0	13	5	7							UD-4/SS-29		
-68.5	80.0	11	15	11							SS-30		
-71.0	82.5	5	8	12							SS-31		
-73.5	85.0	6	6	30							SS-32		
-76.0	87.5	8	9	28							SS-33		
-78.5	90.0	13	10	12							SS-34		
-81.0	92.5	6	7	11							SS-35		
-83.5	95.0	19	78	22							SS-36		
-86.0	97.5	6	8	13							SS-37		
-88.5	100.0	7	7	9							SS-38		
-91.0	102.5	5	6	7							SS-39		
-93.0	104.5										UD-5		
-96.0	107.5	5	8	12							SS-40		
-98.5	110.0	13	12	86							SS-41		

PSEG ESP BORE PSEG ESP 7-07-09 GFI PSEG ESP GDT 7/10/09



PERMIT NO.: P200900087		DRILLER: D. Osuch		NJ LICENSE NO.: 0024289		GEOLOGIST: M. Lear / S. Johnson							
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251							
BORING NO.: NB-4		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT/Shelby Tube		FLUID LEVEL (ft)							
GROUND SURFACE ELEV.: 11.5 US ft (NAVD88)		NORTHING: 233960.4 US ft (NAD83)		EASTING: 198139.0 US ft (NAD83)		0 HR. ND							
TOTAL DEPTH: 201.3 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 13.5 ft		24 HR. 5.5							
DATE STARTED: 2/19/09		COMPLETED: 2/25/09		HOLE DIA.: 4"		ROD TYPE: NWJ							
						BITS USED: 3-7/8" Drag Bit							
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
-100.7					Continued from previous page								
-101.0	112.5	49	24	20							SS-42		VINCENTOWN FORMATION: Silty SAND (SM), greenish gray (10Y 5/1), medium dense, moist to wet, fine to medium sand, trace gravel, trace friable zones, weak HCl reaction, trace to few glauconite
-103.5	115.0	6	10	15							SS-43		(continued)
-106.0	117.5										SS-44	-105.5	112.5ft: Dense, trace to few friable layers
-108.5	120.0	100/0.4									SS-45	115.0ft: Medium dense	117.0
-108.5	120.0	6	9	10							SS-46	-107.5	VINCENTOWN FORMATION: Poorly graded SAND with silt (SP-SM), greenish gray (10Y 5/1), very dense, wet, mostly indurated, trace glauconite
-111.0	122.5										SS-47	119.0	VINCENTOWN FORMATION: Silty SAND (SM), greenish gray (10Y 5/1), medium dense, wet, fine sand, strong HCl reaction, trace glauconite
-111.0	122.5	100/0.3									SS-48		122.5ft: Mostly indurated
-113.5	125.0	8	10	13							SS-49	-113.0	HORNERSTOWN FORMATION: Silty SAND (SM), dark greenish gray (10Y 4/1), medium dense, wet, fine sand, strong HCl reaction, trace glauconite
-116.0	127.5	10	12	15							SS-50	-115.5	HORNERSTOWN FORMATION: Poorly graded SAND with silt (SP-SM), dark greenish gray (10Y 4/1), medium dense, wet, fine to medium sand, strong HCl reaction, trace to few glauconite
-118.5	130.0	10	12	17							SS-51		
-121.0	132.5	65	35/0.1								SS-52	-120.5	HORNERSTOWN FORMATION: Silty SAND (SM), dark greenish gray (5GY 4/1), very dense, wet, fine sand, little friable layers, weak HCl reaction, few glauconite
-123.5	135.0	12	15	17							SS-53	-123.0	HORNERSTOWN FORMATION: Poorly graded SAND with silt (SP-SM), very dark greenish gray (5GY 3/1), dense, wet, fine to medium sand, weak to strong HCl reaction, few glauconite
-126.0	137.5	10	17	22							SS-54		
-128.5	140.0	12	17	22							SS-55	140.0ft: Trace shell fragments	
-131.0	142.5	17	22	32							SS-56	-130.5	NAVESINK FORMATION: Clayey SAND (SC), very dark greenish gray (10BG 3/1), very dense, wet, fine sand, trace shell fragments, weak HCl reaction, mostly glauconite
-133.5	145.0	26	35	40							SS-57	-133.0	NAVESINK FORMATION: Silty SAND (SM), very dark greenish gray (10BG 3/1), very dense, wet, fine sand, trace shell fragments, no to weak HCl reaction, mostly glauconite
-136.0	147.5	22	33	37							SS-58		147.5ft: Greenish black (10BG 2.5/1)
-138.5	150.0	16	28	35							SS-59	-140.5	NAVESINK FORMATION: Clayey SAND (SC), greenish black (10BG 2.5/1), dense, wet, fine sand, weak HCl reaction, mostly glauconite
-141.0	152.5	14	20	28							SS-60		155.0ft: Very dense, trace shell fragments
-143.5	155.0	20	27	37							SS-61	-145.5	NAVESINK FORMATION: Silty SAND (SM), very dark greenish gray (5G 3/2), very dense, wet, fine sand, weak HCl reaction, mostly glauconite
-146.0	157.5	25	37	46							SS-62	-148.0	NAVESINK FORMATION: Clayey SAND (SC), very dark grayish green (5G 3/2), very dense, wet, fine sand, no to weak HCl reaction, mostly glauconite
-148.5	160.0	28	31	37							SS-63		162.5ft: Trace shell fragments
-151.0	162.5	28	36	49							SS-64	-153.0	MOUNT LAUREL FORMATION: Clayey SAND (SC), very dark gray (5Y 3/1), very dense, moist, fine to coarse sand, strong HCl reaction, trace to few glauconite
-153.5	165.0	16	28	65								-155.5	
-156.0	167.5	70	30/0.3										

PSEG ESP BORE PSEG ESP 7-07-09 GPT PSEG ESP GDT 7/10/09



PERMIT NO.: P200900087		DRILLER: D. Osuch		NJ LICENSE NO.: 0024289		GEOLOGIST: M. Lear / S. Johnson	
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251	
BORING NO.: NB-4		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT/Shelby Tube		FLUID LEVEL (ft)	
GROUND SURFACE ELEV.: 11.5 US ft (NAVD88)		NORTHING: 233960.4 US ft (NAD83)		EASTING: 198139.0 US ft (NAD83)		0 HR. ND	
						24 HR. 5.5	
TOTAL DEPTH: 201.3 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 13.5 ft		HAMMER (ID): 140 lb Auto. (CTB-3)	
DATE STARTED: 2/19/09		COMPLETED: 2/25/09		HOLE DIA.: 4"		ROD TYPE: NWJ	
						BITS USED: 3-7/8" Drag Bit	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT						SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100				
-156.8					Continued from previous page									
-158.5	170.0	45	55/0.1								SS-65		-158.0	MOUNT LAUREL FORMATION: Sandy LEAN CLAY (CL), very dark gray (5Y 3/1), hard, moist, fine to coarse sand, strong HCl reaction, PP=4.0 tsf (continued)
-161.0	172.5	100/0.2									SS-66		-160.5	MOUNT LAUREL FORMATION: Clayey SAND (SC), dark greenish gray (10Y 4/1), very dense, moist, fine to coarse sand, weak HCl reaction, trace glauconite
-163.5	175.0	100/0.3									SS-67			MOUNT LAUREL FORMATION: Silty SAND (SM), dark greenish gray (10Y 4/1), very dense, moist, fine to coarse sand, weak HCl reaction, trace glauconite
-166.0	177.5	100/0.2									SS-68			175.0ft: Trace shell fragments
-168.5	180.0	100/0.5									SS-69			
-171.0	182.5	33	60	40/0.2							SS-70			
-173.5	185.0	23	33	38							SS-71			
-176.0	187.5	16	31	39							SS-72			
-178.5	190.0	15	29	36							SS-73		-178.0	MOUNT LAUREL FORMATION: Clayey SAND (SC), dark gray (5Y 4/1), very dense, wet, fine to coarse sand, weak HCl reaction, trace glauconite
-181.0	192.5	14	30	38							SS-74			
-183.5	195.0	15	25	31							SS-75			
-186.0	197.5	19	33	45							SS-76			
-188.5	200.0	33	53	47/0.3							SS-77		-187.5	MOUNT LAUREL FORMATION: Silty SAND (SM), gray (5Y 5/1), very dense, wet, fine sand, weak HCl reaction, trace glauconite
													-189.8	Boring terminated at 201.3 feet.
														Boring closed by tremie method with cement-bentonite grout on 2/25/09.



GEOTECHNICAL BORING LOG

Prepared By MMH Date 7/10/09Checked By JOJ Date 7/10/09

SHEET 1 OF 4

PERMIT NO.: P200900091		DRILLER: M. Adams		NJ LICENSE NO.: 0001350		GEOLOGIST: R. Clark								
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251		FLUID LEVEL (ft)						
BORING NO.: NB-5		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT				0 HR.	ND					
GROUND SURFACE ELEV.: 7.8		US ft (NAVD88)		NORTHING: 234891.0		US ft (NAD83)		EASTING: 198445.7	US ft (NAD83)	24 HR.	2.5			
TOTAL DEPTH: 200.0 ft		DRILL MACHINE: CME-850 ATV		CASING DEPTH: 69.5 ft		HAMMER (ID): 140 lb Auto. (CTB-4)								
DATE STARTED: 2/6/09		COMPLETED: 2/8/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit						
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT					SAMP.	LOG	SOIL AND ROCK DESCRIPTION		
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			NO.	
7.8					Ground Surface							7.8		
7.8	0.0	22	25	19							SS-1		ARTIFICIAL FILL: Clayey SAND (SC), yellowish brown (10YR 5/4), dense, moist, fine to coarse sand, few angular gravel, little organics, no HCl reaction	0.0
5.2	2.6	7	5	6							SS-2		ARTIFICIAL FILL: LEAN CLAY with sand and gravel (CL), dark greenish gray (5GY 4/1), stiff, moist, angular gravel, trace organics, PP=1.0 tsf	2.0
2.8	5.0	4	3	3							SS-3		HYDRAULIC FILL: FAT CLAY with sand (CH), greenish black (10Y 3/1), medium stiff, moist, no HCl reaction, PP=1.0 tsf	4.5
0.3	7.5	WOH	WOH	WOH							SS-4		7.5ft: FAT CLAY (CH), very soft, few organics, PP=0.5 tsf	
-2.2	10.0	WOH	WOH	WOH							SS-5		10.0ft: Very dark greenish gray (5GY 3/1), trace organics, PP=0.25 tsf	
-4.7	12.5	WOH	WOH	WOH							SS-6			
-7.2	15.0	WOH	WOH	WOH							SS-7		HYDRAULIC FILL: ELASTIC SILT (MH), very dark greenish gray (5GY 3/1), very soft, moist, trace fine sand, PP=0.25 tsf	14.5
-12.2	20.0	WOR	WOH	WOH							SS-8		20.0ft: PP=0.15 tsf	
-16.7	24.5	WOH	1	1							SS-9		24.5ft: Dark olive gray (5Y 3/2), PP=0.5 tsf	
-21.7	29.5	WOH	WOH	WOH							SS-10		29.5ft: PP=0.25 tsf	
-26.7	34.5	WOH	3	5							SS-11		34.5ft: Medium stiff, few fine sand, trace organics, PP=0.5 tsf	
-31.7	39.5	9	29	36							SS-12		ALLUVIUM: Poorly graded SAND with silt and gravel (SP-SM), greenish gray (5GY 5/1), very dense, wet, fine to coarse subangular to subrounded sand, fine to coarse subrounded to angular gravel, trace glauconite	37.0
-36.7	44.5	6	4	2							SS-13A/B			
-41.7	49.5	3	3	4							SS-14		KIRKWOOD FORMATION: FAT CLAY (CH), dark olive gray (5Y 3/2), medium stiff, moist, few fine sand, no HCl reaction, PP=0.5 tsf	45.0
-46.7	54.5	4	4	5							SS-15		49.5ft: PP=0.25 tsf	
													54.5ft: Stiff, PP=1.0 tsf	

PSEG ESP BORE PSEG ESP 7-07-09 GP1 PSEG ESP GDT 7/10/09



PERMIT NO.: P200900091			DRILLER: M. Adams			NJ LICENSE NO.: 0001350			GEOLOGIST: R. Clark						
SITE DESCRIPTION: PSEG SITE ESP APPLICATION					COUNTY: Salem, NJ			MACTEC PROJECT NO.: 6468-08-2251			FLUID LEVEL (ft)				
BORING NO.: NB-5			DRILL METHOD: Mud Rotary			SAMPLE METHODS: SPT			0 HR.			ND			
GROUND SURFACE ELEV.: 7.8			US ft (NAVD88)			NORTHING: 234891.0			US ft (NAD83)			EASTING: 198445.7	US ft (NAD83)	24 HR.	2.5
TOTAL DEPTH: 200.0 ft			DRILL MACHINE: CME-850 ATV			CASING DEPTH: 69.5 ft			HAMMER (ID): 140 lb Auto. (CTB-4)						
DATE STARTED: 2/6/09			COMPLETED: 2/8/09			HOLE DIA.: 4"			ROD TYPE: NWJ			BITS USED: 3-7/8" Drag Bit			
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT					SAMP.	LOG	SOIL AND ROCK DESCRIPTION			
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			NO.		
-48.3					Continued from previous page										
-51.7	59.5	3	4	6							SS-16	KIRKWOOD FORMATION: FAT CLAY (CH), dark olive gray (5Y 3/2), medium stiff, moist, few fine sand, no HCl reaction, PP=0.5 tsf (continued)			
-56.7	64.5	15	8	9							SS-17	59.5ft: FAT CLAY with sand (CH), few subrounded gravel, trace organics, PP=0.25 tsf			
-61.7	69.5	36	49	16							SS-18	KIRKWOOD FORMATION: Silty SAND with gravel (SM), dark greenish gray (5GY 4/1), medium dense, wet, fine sand, little subrounded to rounded gravel, no HCl reaction, trace glauconite			
-66.7	74.5	8	11	19							SS-19	VINCETOWN FORMATION: Silty SAND (SM), reddish brown (5Y 4/3), very dense, moist to wet, fine to medium sand, no HCl reaction, strongly oxidized			
-71.7	79.5	7	6	10							SS-20	74.5ft: Reddish brown (5Y 4/3) and light yellowish brown (2.5Y 6/3), medium dense, wet, fine sand, trace cross-bedding, no to strong HCl reaction			
-76.7	84.5	11	7	9							SS-21	79.5ft: Yellowish brown (10Y 5/4) to light yellowish brown (2.5Y 6/4), strong HCl reaction, weakly oxidized			
-81.7	89.5	15	16	15							SS-22	84.5ft: Yellowish brown (10YR 5/6) and light brownish gray (2.5Y 6/2), weakly oxidized			
-86.7	94.5	41	7	12							SS-23	89.5ft: Greenish gray (10Y 6/1), dense, few to little glauconite, no oxidation			
-91.7	99.5	12	28	39							SS-24	VINCETOWN FORMATION: Poorly graded SAND with clay (SP-SC), greenish gray (10Y 6/1), medium dense, moist, fine sand, trace moderately indurated layers, strong HCl reaction, few glauconite			
-96.7	104.5	6	19	24							SS-25	VINCETOWN FORMATION: Poorly graded SAND with silt (SP-SM), greenish gray (10Y 5/1), very dense, wet, fine sand, strong HCl reaction, few glauconite			
-101.7	109.5	12	12	13							SS-26	104.5ft: Dense			
												109.5ft: Medium dense			

PSEG ESP BORE PSEG ESP 7-07-09 GPT PSEG ESP GDT 7/10/09



PERMIT NO.: P200900091		DRILLER: M. Adams		NJ LICENSE NO.: 0001350		GEOLOGIST: R. Clark								
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251		FLUID LEVEL (ft)						
BORING NO.: NB-5		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT		0 HR.		ND						
GROUND SURFACE ELEV.: 7.8		US ft (NAVD88)		NORTHING: 234891.0		US ft (NAD83)		EASTING: 198445.7 US ft (NAD83)		24 HR.		2.5		
TOTAL DEPTH: 200.0 ft		DRILL MACHINE: CME-850 ATV		CASING DEPTH: 69.5 ft		HAMMER (ID): 140 lb Auto. (CTB-4)								
DATE STARTED: 2/6/09		COMPLETED: 2/8/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit						
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT					SAMP.	LOG	SOIL AND ROCK DESCRIPTION		
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			NO.	
-104.4					Continued from previous page									
-106.7	114.5	9	11	13							SS-27	-105.2	HORNERSTOWN FORMATION: Silty SAND (SM), greenish gray (10Y 5/1), medium dense, wet, fine to medium sand, strong HCl reaction, few glauconite	113.0
-111.7	119.5	12	11	15							SS-28	119.5ft:	Few to little glauconite	
-116.7	124.5	17	19	21							SS-29	124.5ft:	Dense, few to little glauconite	
-121.7	129.5	12	13	16							SS-30	129.5ft:	Medium dense, little to some glauconite	
-126.7	134.5	21	22	32							SS-31	-124.2	NAVESINK FORMATION: Poorly graded SAND with silt (SP-SM), very dark greenish gray (5GY 3/1), very dense, wet, fine sand, trace to little shell fragments, strong HCl reaction, mostly glauconite	132.0
-131.7	139.5	23	28	42							SS-32			
-136.7	144.5	17	19	27							SS-33	-135.2	NAVESINK FORMATION: Clayey SAND (SC), very dark greenish gray (5GY 3/1), dense, moist, fine sand, strong HCl reaction, mostly glauconite	143.0
-141.7	149.5	32	36	49							SS-34	-140.2	NAVESINK FORMATION: Poorly graded SAND with silt (SP-SM), very dark greenish gray (10GY 3/1), very dense, wet, fine sand, strong HCl reaction, mostly glauconite	148.0
-146.7	154.5	24	25	40							SS-35	154.5ft:	Very dark greenish gray (5GY 3/1)	
-151.7	159.5	36	40	50/0.2							SS-36	-149.2	MOUNT LAUREL FORMATION: Clayey SAND (SC), very dark grayish brown (2.5Y 3/2), very dense, moist, fine to coarse subrounded sand, strong HCl reaction, little glauconite	157.0
-156.7	164.5	50/0.2									SS-37	164.5ft:	Dark olive gray (5Y 3/2), some glauconite -Observed apparent artesian flow of drill fluids from boring, possibly tidal influenced, driller thickens drill mud. -Mud tub overflowing due to artesian added flow at	

PSEG ESP BORE PSEG ESP 7-07-09 GFI PSEG ESP GDT 7/10/09



PERMIT NO.: P200900091			DRILLER: M. Adams			NJ LICENSE NO.: 0001350			GEOLOGIST: R. Clark							
SITE DESCRIPTION: PSEG SITE ESP APPLICATION					COUNTY: Salem, NJ			MACTEC PROJECT NO.: 6468-08-2251			FLUID LEVEL (ft)					
BORING NO.: NB-5			DRILL METHOD: Mud Rotary			SAMPLE METHODS: SPT						0 HR. ND				
GROUND SURFACE ELEV.: 7.8			US ft (NAVD88)			NORTHING: 234891.0			US ft (NAD83)			EASTING: 198445.7 US ft (NAD83)		24 HR. 2.5		
TOTAL DEPTH: 200.0 ft			DRILL MACHINE: CME-850 ATV			CASING DEPTH: 69.5 ft				HAMMER (ID): 140 lb Auto. (CTB-4)						
DATE STARTED: 2/6/09			COMPLETED: 2/8/09			HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit						
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT						SAMP. NO.	▼	L O G	SOIL AND ROCK DESCRIPTION		
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100						
-160.5					Continued from previous page											
-161.7	169.5	50/0.2									50/0.2	SS-38		174.5 feet. MOUNT LAUREL FORMATION: Clayey SAND (SC), very dark grayish brown (2.5Y 3/2), very dense, moist, fine to coarse subrounded sand, strong HCl reaction, little glauconite (continued)		
-166.7	174.5	50/0.3									50/0.3	SS-39				
-171.7	179.5	17	32	47							79	SS-40	179.5ft: Wet, trace shell fragments, little glauconite			
-176.7	184.5	17	27	28							55	SS-41		184.5ft: Olive gray (5Y 4/2), fine to coarse sand, trace shell fragments, few glauconite		
-181.7	189.5	17	24	32							56	SS-42		189.5ft: Olive gray (5Y 5/2), little glauconite		
-186.7	194.5	38	50/0.4								50/0.4	SS-43				
-191.7	199.5	50/0.5									50/0.5	SS-44				
														-192.2	200.0	Boring terminated at 200.0 feet.
																Boring closed by tremie method with cement-bentonite grout on 2/09/09.



GEOTECHNICAL BORING LOG

Prepared By MM Date 7/10/09Checked By Jaw Date 7/10/09

SHEET 1 OF 4

PERMIT NO.: P200900088		DRILLER: M. Adams		NJ LICENSE NO.: 0001350		GEOLOGIST: B. Deobald							
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251							
BORING NO.: NB-6		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT/Shelby Tube		FLUID LEVEL (ft)							
GROUND SURFACE ELEV.: 9.3 US ft (NAVD88)		NORTHING: 235251.5 US ft (NAD83)		EASTING: 198315.4 US ft (NAD83)		0 HR. ND							
TOTAL DEPTH: 200.0 ft		DRILL MACHINE: CME-850 ATV		CASING DEPTH: 14.5 ft		24 HR. 13.0							
DATE STARTED: 2/19/09		COMPLETED: 2/22/09		HOLE DIA.: 4"		ROD TYPE: NWJ							
						BITS USED: 3-7/8" Drag Bit							
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
9.3					Ground Surface							9.3	0.0
9.3	0.0	5	6	4	●10					SS-1		ARTIFICIAL FILL: SILT (ML), very dark grayish brown (2.5Y 3/2), stiff, moist, trace organics, trace angular gravel, cobbles and boulders 2.1ft: Very dark gray (2.5Y 3/1), very soft, trace fine sand 4.7ft: Stiff, wet	
7.2	2.1	2	1	1	●2					SS-2			
4.6	4.7	WOH	4	6	●10					SS-3			
1.7	7.6	WOH	5	4	●9					SS-4		2.3	7.0
-0.4	9.7	2	2	1	●3					SS-5		-0.2	9.5
-3.7	13.0	WOH	WOH	WOH	●0					SS-6		-2.7	12.0
-5.7	15.0	WOH	1	1	●2					SS-7			
		WOH	1	1	●2					SS-8		-8.7	18.0
-10.7	20.0	WOH	2	1	●3					UD-1			
-12.7	22.0	WOH	1	WOH	●1					SS-9			
-15.2	24.5	1	1	1	●2					SS-10			
-20.3	29.6	WOH	WOH	WOH	●0					SS-11			
-25.3	34.6	1	2	7	●9					SS-12		-28.7	38.0
-30.3	39.6	WOH	3	4	●7					SS-13		-33.7	43.0
-35.3	44.6	3	4	5	●9					SS-14			
-40.3	49.6									UD-2			
-42.3	51.6									UD-3			
-44.9	54.2												

22.0ft: Pushed shelly tube UD-1 to 24.0ft; recovery=2.0ft, PP=0.25 tsf, TV=0.25 tsf

49.6ft: Gray (2.5Y 5/1)

51.6ft: Pushed shelly tube UD-2 to 53.6ft; recovery=1.9ft, PP=2.0 tsf, TV=1.7 tsf; moist to wet

54.2ft: Pushed shelly tube UD-3 to 56.2ft; recovery=1.8ft, PP=1.5 tsf, TV=1.3 tsf; very dark gray

PSEG ESP BORE PSEG ESP 7-07-09.GPJ PSEG ESP.GDT 7/10/09



PERMIT NO.: P200900088		DRILLER: M. Adams		NJ LICENSE NO.: 0001350		GEOLOGIST: B. Deobald							
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251		FLUID LEVEL (ft)					
BORING NO.: NB-6		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT/Shelby Tube		0 HR.		ND					
GROUND SURFACE ELEV.: 9.3		US ft (NAVD88)		NORTHING: 235251.5 US ft (NAD83)		EASTING: 198315.4 US ft (NAD83)		24 HR. 13.0					
TOTAL DEPTH: 200.0 ft		DRILL MACHINE: CME-850 ATV		CASING DEPTH: 14.5 ft		HAMMER (ID): 140 lb Auto. (CTB-4)							
DATE STARTED: 2/19/09		COMPLETED: 2/22/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit					
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
-46.8					Continued from previous page								
-47.4	56.7	5	5	6									(2.5Y 3/1) KIRKWOOD FORMATION: FAT CLAY (CH), gray (2.5Y 5/1) and light olive brown (2.5Y 5/4), medium stiff, moist, trace fine sand, no HCl reaction (continued) 56.7ft: Very dark gray (2.5Y 3/1), and dark olive brown (2.5Y 3/3), stiff, few to little organics
-55.3	64.6	8	11	12									-52.7 KIRKWOOD FORMATION: Well graded SAND with gravel (SW), gray (2.5Y 5/1), medium dense, moist to wet, little subangular gravel, no HCl reaction
-60.3	69.6	10	8	6									-58.7 KIRKWOOD FORMATION: Poorly graded SAND with silt (SP-SM), grayish green (5G 4/2), medium dense, wet, fine to medium sand, no HCl reaction
-65.3	74.6	29	24	15									-62.7 VINCENTOWN FORMATION: Poorly graded SAND with silt (SP-SM), dark yellowish brown (10YR 4/6), dense, wet, fine to medium grained, no HCl reaction, strongly oxidized
-67.3	76.6												
-68.6	77.9	22	9	10									76.6ft: Pushed shelby tube UD-4 to 76.9ft; recovery=0.2ft 77.9ft: Dark yellowish brown (10YR 4/6), medium dense, trace friable layers, no to strong HCl reaction, moderately oxidized 80.2ft: Pushed shelby tube UD-5 to 81.5; recovery=1.3ft; moist to wet
-70.9	80.2												
-73.3	82.6	8	9	15									82.6ft: Dark greenish gray (10Y 4/1), wet, trace shell fragments, no oxidation
-80.3	89.6	7	10	12									89.6ft: Weak HCl reaction
-85.3	94.6	50/0.4											-83.7 VINCENTOWN FORMATION: Silty SAND (SM), greenish gray (10Y 5/1), very dense, moist, fine sand, trace shell fragments, trace friable layers, weak to strong HCl reaction, trace glauconite
-90.3	99.6	12	14	16									99.6ft: Medium dense, strong HCl reaction
-95.3	104.6	8	10	15									104.6ft: Weak to strong HCl reaction
-100.3	109.6	12	17	21									109.6ft: Dark greenish gray (5G 4/1), dense, fine to medium sand, weak HCl reaction

PSEG ESP BORE PSEG ESP 7-07-09.GP1 PSEG ESP.GDT 7/10/09



PERMIT NO.: P200900088			DRILLER: M. Adams			NJ LICENSE NO.: 0001350			GEOLOGIST: B. Deobald								
SITE DESCRIPTION: PSEG SITE ESP APPLICATION						COUNTY: Salem, NJ			MACTEC PROJECT NO.: 6468-08-2251			FLUID LEVEL (ft)					
BORING NO.: NB-6			DRILL METHOD: Mud Rotary			SAMPLE METHODS: SPT/Shelby Tube						0 HR. ND					
GROUND SURFACE ELEV.: 9.3			US ft (NAVD88)			NORTHING: 235251.5			US ft (NAD83)			EASTING: 198315.4 US ft (NAD83)			24 HR. 13.0		
TOTAL DEPTH: 200.0 ft			DRILL MACHINE: CME-850 ATV			CASING DEPTH: 14.5 ft						HAMMER (ID): 140 lb Auto. (CTB-4)					
DATE STARTED: 2/19/09			COMPLETED: 2/22/09			HOLE DIA.: 4"			ROD TYPE: NWJ			BITS USED: 3-7/8" Drag Bit					
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT						SAMP.	LOG	SOIL AND ROCK DESCRIPTION				
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100	NO.						
-102.9					Continued from previous page												
-105.3	-114.6	50/0.3									50/0.3	SS-26	-103.7	VINCENTOWN FORMATION: Poorly graded SAND with silt (SP-SM), dark greenish gray (5G 4/1), very dense, moist, fine to medium sand, trace friable zones, weak to strong HCl reaction, little glauconite	113.0		
-110.3	-119.6	9	10	34								SS-27	-107.7	HORNERSTOWN FORMATION: Poorly graded SAND with silt (SP-SM), dark greenish gray (5G 4/1), dense, moist, fine to medium sand, trace friable zones, weak to strong HCl reaction, little glauconite	117.0		
-115.3	-124.6	12	14	42								SS-28	124.6ft:	Dark greenish gray (5G 4/1), very dense, trace shell fragments, strong HCl reaction			
-120.3	-129.6	13	17	28								SS-29	129.6ft:	Very dark greenish gray (5GY 3/1), dense, trace to few shell fragments, weak HCl reaction, some glauconite			
-125.3	-134.6	20	35	46								SS-30	-124.7	NAVESINK FORMATION: Silty SAND (SM), grayish green (5G 4/2), to greenish black (5G 2.5/1), very dense, moist, fine to medium sand, trace shell fragments, no HCl reaction, mostly glauconite	134.0		
-130.3	-139.6	22	24	32								SS-31	139.6ft:	Greenish black (5G 2.5/1), fine sand, trace to few shell fragments			
-135.3	-144.6	17	21	29								SS-32	144.6ft:	Dense			
-140.3	-149.6	24	31	36								SS-33	149.6ft:	Very dense			
-145.3	-154.6	24	30	33								SS-34	-143.7	NAVESINK FORMATION: Clayey SAND (SC), grayish green (5G 5/1) to greenish black (5G 2.5/1), very dense, moist, fine to medium sand, trace shell fragments, no HCl reaction, mostly glauconite	153.0		
-150.3	-159.6	48	50/0.3									SS-35	-148.7	MOUNT LAUREL FORMATION: Clayey SAND (SC), dark greenish gray (5GY 4/1), very dense, dry to moist, fine to coarse subrounded sand, trace subangular gravel, strong HCl reaction, glauconite	158.0		
-155.3	-164.6	50/0.2									50/0.2	SS-36	164.6ft:	Few shell fragments			

PSEG ESP BORE PSEG ESP 7-07-09 GPI PSEG ESP GDI 7/10/09



PERMIT NO.: P200900088		DRILLER: M. Adams		NJ LICENSE NO.: 0001350		GEOLOGIST: B. Deobald						
SITE DESCRIPTION: PSEG SITE ESP APPLICATION			COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251		FLUID LEVEL (ft)					
BORING NO.: NB-6		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT/Shelby Tube		0 HR. ND						
GROUND SURFACE ELEV.: 9.3		US ft (NAVD88)		NORTHING: 235251.5 US ft (NAD83)		EASTING: 198315.4 US ft (NAD83)		24 HR. 13.0				
TOTAL DEPTH: 200.0 ft		DRILL MACHINE: CME-850 ATV		CASING DEPTH: 14.5 ft		HAMMER (ID): 140 lb Auto. (CTB-4)						
DATE STARTED: 2/19/09		COMPLETED: 2/22/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit				
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT					SAMP.	LOG	SOIL AND ROCK DESCRIPTION
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100		
-159.0					Continued from previous page							
-160.3	169.6	50/0.2								60/0.2	SS-37	MOUNT LAUREL FORMATION: Clayey SAND (SC), dark greenish gray (5GY 4/1), very dense, dry to moist, fine to coarse subrounded sand, trace subangular gravel, strong HCl reaction, glauconite (continued) 169.6ft: Weak HCl reaction, trace shell fragments
-165.3	174.6	33	45	50/0.3						50/0.5	SS-38	
-170.3	179.6	20	33	50						83	SS-39	MOUNT LAUREL FORMATION: Silty SAND (SM), dark greenish gray (5GY 4/1), very dense, dry to moist, fine to coarse sand, trace shell fragments, weak HCl reaction, trace glauconite
-175.3	184.6	20	30	35						65	SS-40	MOUNT LAUREL FORMATION: Clayey SAND (SC), dark greenish gray (5GY 4/1), very dense, moist, fine to coarse sand, trace shell fragments, weak HCl reaction, trace glauconite
-180.3	189.6	18	28	37						65	SS-41	MOUNT LAUREL FORMATION: Silty SAND (SM), dark greenish gray (5GY 4/1), very dense, moist, fine to coarse sand, trace shell fragments, no to weak HCl reaction, trace glauconite
-185.3	194.6	37	50/0.4							50/0.4	SS-42	194.6ft: Dark greenish gray (5GY 4/1) and greenish gray (10Y 6/1), dry to moist, no HCl reaction
-190.3	199.6	50/0.4								50/0.4	SS-43	Boring terminated at 200.0 feet. Boring closed by tremie method with cement-bentonite grout on 2/22/09.

PSEG ESP BORE PSEG ESP 7-07-09.GPJ PSEG ESP.GDT 7/10/09



GEOTECHNICAL BORING LOG

Prepared By MAN Date 7/10/09Checked By JA2 Date 7/10/09

SHEET 1 OF 4

PERMIT NO.: P200900089			DRILLER: T. Ward			NJ LICENSE NO.: 0001105			GEOLOGIST: J. Howard						
SITE DESCRIPTION: PSEG SITE ESP APPLICATION					COUNTY: Salem, NJ			MACTEC PROJECT NO.: 6468-08-2251			FLUID LEVEL (ft)				
BORING NO.: NB-7			DRILL METHOD: Mud Rotary			SAMPLE METHODS: SPT			0 HR.		ND				
GROUND SURFACE ELEV.: 6.2			US ft (NAVD88)			NORTHING: 234965.7 US ft (NAD83)			EASTING: 199685.6 US ft (NAD83)			24 HR.		ND	
TOTAL DEPTH: 201.2 ft			DRILL MACHINE: CME-75 Truck			CASING DEPTH: 44.0 ft			HAMMER (ID): 140 lb Auto. (CBT-1)						
DATE STARTED: 1/24/09			COMPLETED: 1/27/09			HOLE DIA.: 4"			ROD TYPE: NWJ			BITS USED: 3-7/8" Drag Bit			
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT						SAMP.	LOG	SOIL AND ROCK DESCRIPTION		
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100	NO.				
6.2					Ground Surface										
6.2	0.0	27	17	9									6.2	0.0	
3.7	2.5	2	3	3									5.8	0.6	ARTIFICIAL FILL: Poorly graded GRAVEL with sand (GP), yellow (10YR 8/8), medium dense, dry to wet, angular gravel, no HCl reaction
1.5	4.7												2.2	4.0	ARTIFICIAL FILL: Sandy LEAN CLAY (CL), black (10YR 2/1), very stiff, moist, no HCl reaction
-1.3	7.5	WOH	WOH	WOH									-0.8	7.0	2.5ft: Greenish Black (5GY 2.5/1), medium stiff HYDRAULIC FILL: Sandy LEAN CLAY (CL), greenish black (5GY 2.5/1), very soft, moist, no HCl reaction
-4.1	10.3	WOH	WOH	WOH											HYDRAULIC FILL: FAT CLAY (CH), very dark greenish gray (10Y 3/1), very soft, moist, few organics, no HCl reaction
-6.6	12.8	WOH	1	1											
-9.1	15.3	WOH	WOH	WOH											
-14.0	20.2	2	3	3											
-19.1	25.3	WOH	WOH	WOH											
-24.0	30.2	5	6	6											
-29.0	35.2	13	17	18											
-33.8	40.0	WOH	3	2											
-38.8	45.0	7	7	9											
-43.8	50.0	7	7	7											
-48.8	55.0	7	8	10											

PSEG ESP BORE PSEG ESP 7-07-09 GFI PSEG ESP GDT 7/10/09



PERMIT NO.: P200900089		DRILLER: T. Ward		NJ LICENSE NO.: 0001105		GEOLOGIST: J. Howard							
SITE DESCRIPTION: PSEG SITE ESP APPLICATION			COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251		FLUID LEVEL (ft)						
BORING NO.: NB-7		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT		0 HR. ND							
GROUND SURFACE ELEV.: 6.2		US ft (NAVD88)		NORTHING: 234965.7 US ft (NAD83)		EASTING: 199685.6 US ft (NAD83)		24 HR. ND					
TOTAL DEPTH: 201.2 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 44.0 ft		HAMMER (ID): 140 lb Auto. (CBT-1)							
DATE STARTED: 1/24/09		COMPLETED: 1/27/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit					
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
-49.9					Continued from previous page								
-53.8	60.0												VINCENTOWN FORMATION: Poorly Graded SAND with Silt (SP-SM), dark yellowish brown (10YR 4/6), medium dense, wet, fine to medium sand, strong HCl reaction, trace glauconite, strongly oxidized (continued) 60.0ft: Yellowish red (5YR 5/8)
-58.9	65.1	13	8	13							SS-16		
-63.8	70.0	7	7	9							SS-17		65.1ft: Brownish yellow (10YR 6/6), trace friable layers, weak to strong HCl reaction, moderately oxidized
-68.8	75.0	7	20	19							SS-18		VINCENTOWN FORMATION: Clayey SAND (SC), light yellowish brown (10YR 6/4), dense, moist, fine to medium sand, strong HCl reaction, trace glauconite, weakly oxidized
-73.8	80.0	14	11	34							SS-19		VINCENTOWN FORMATION: Silty SAND (SM), greenish gray (10Y 5/1), dense, wet, fine to medium sand, trace friable layers, strong HCl reaction, trace glauconite, no oxidation
-79.0	85.2	11	27	19							SS-20		
-84.0	90.2	19	13	15							SS-21		85.2ft: Medium dense
-89.0	95.2	8	92/0.3								SS-22		90.2ft: Dark greenish gray (10Y 4/1), very dense, trace shell fragments, trace moderately indurated layers
-93.8	100.0	7	12	30							SS-23		95.2ft: Dense
-98.9	105.1	13	13	14							SS-24		100.0ft: Medium dense
-103.9	110.1	9	16	29							SS-25		105.1ft: Greenish gray (10Y 5/1), very dense, trace friable cemented layers, weak HCl reaction
		6	26	16							SS-26		110.1ft: Dense, trace shell fragments, strong HCl reaction

PSEG ESP BORE PSEG ESP 7-07-09.GPJ PSEG ESP.GDT 7/10/09



SHEET 3 OF 4

PERMIT NO.: P200900089		DRILLER: T. Ward		NJ LICENSE NO.: 0001105		GEOLOGIST: J. Howard	
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251	
BORING NO.: NB-7		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT		FLUID LEVEL (ft)	
GROUND SURFACE ELEV.: 6.2		US ft (NAVD88)		NORTHING: 234965.7 US ft (NAD83)		EASTING: 199685.6 US ft (NAD83)	
TOTAL DEPTH: 201.2 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 44.0 ft		HAMMER (ID): 140 lb Auto. (CBT-1)	
DATE STARTED: 1/24/09		COMPLETED: 1/27/09		HOLE DIA.: 4"		ROD TYPE: NWJ	
BITS USED: 3-7/8" Drag Bit							

ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
		0.5ft	0.5ft	0.5ft	0	20	40	60	80			
-106.0					Continued from previous page							
-108.8	115.0	12	12	16							SS-27	VINCENTOWN FORMATION: Silty SAND (SM), greenish gray (10Y 5/1), dense, wet, fine to medium sand, trace friable layers, strong HCl reaction, trace glauconite, no oxidation (continued) 115.1ft: Medium dense, few glauconite
-113.8	120.0	6	25	27							SS-28	HORNERSTOWN FORMATION: Silty SAND (SM), Greenish Gray (10Y 5/1), very dense, wet, fine to medium sand, trace friable layers, strong HCl reaction, few to little glauconite
-118.8	125.0	7	9	15							SS-29	125.0ft: Medium dense, trace shell fragments, little glauconite
-123.8	130.0	7	12	13							SS-30	
-128.8	135.0	9	15	19							SS-31	
-133.8	140.0	21	60	40/0.4							SS-32	NAVESINK FORMATION: Silty SAND (SM), very dark grayish green (5G 2.5/2), very dense, moist, fine to medium sand, few shell fragments, weak HCl reaction, mostly glauconite
-138.8	145.0	19	30	40							SS-33	145.0ft: Trace shell fragments
-143.8	150.0	27	29	42							SS-34	
-148.9	155.1	26	32	46							SS-35	
-153.8	160.0	33	49	51/0.3							SS-36	160.0ft: Very dark grayish green (5G 3/2), few shell fragments
-158.8	165.0	35	65/0.2								SS-37	MOUNT LAUREL FORMATION: Clayey SAND (SC), very dark greenish gray (10Y 3/1), very dense, moist, fine to medium sand, trace coarse sand, trace fine gravel, trace shell fragments, weak HCl reaction, little glauconite

PSEG ESP BORE PSEG ESP 7-07-09 GFI PSEG ESP GDI 7/10/09



PERMIT NO.: P200900089			DRILLER: T. Ward			NJ LICENSE NO.: 0001105			GEOLOGIST: J. Howard						
SITE DESCRIPTION: PSEG SITE ESP APPLICATION						COUNTY: Salem, NJ			MACTEC PROJECT NO.: 6468-08-2251			FLUID LEVEL (ft)			
BORING NO.: NB-7			DRILL METHOD: Mud Rotary			SAMPLE METHODS: SPT			0 HR.		ND				
GROUND SURFACE ELEV.: 6.2			US ft (NAVD88)			NORTHING: 234965.7 US ft (NAD83)			EASTING: 199685.6 US ft (NAD83)			24 HR.		ND	
TOTAL DEPTH: 201.2 ft			DRILL MACHINE: CME-75 Truck			CASING DEPTH: 44.0 ft			HAMMER (ID): 140 lb Auto. (CBT-1)						
DATE STARTED: 1/24/09			COMPLETED: 1/27/09			HOLE DIA.: 4"			ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit				
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT						SAMP.	LOG	SOIL AND ROCK DESCRIPTION		
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100	NO.				
-162.1					Continued from previous page										
-163.8	170.0	100/0.4									SS-38		MOUNT LAUREL FORMATION: Clayey SAND (SC), very dark greenish gray (10Y 3/1), very dense, moist, fine to medium sand, trace coarse sand, trace fine gravel, trace shell fragments, weak HCl reaction, little glauconite (continued)		
-168.8	175.0	100/0.5									SS-39		175.0ft: Dark greenish gray (10Y 4/1)		
-173.8	180.0	40	60/0.4								SS-40		180.0ft: Weak to strong HCl reaction, trace glauconite		
-178.8	185.0	23	35	41							SS-41		185.0ft: Few shell fragments, strong HCl reaction		
-183.8	190.0	15	26	46							SS-42		190.0ft: Weak HCl reaction		
-188.8	195.0	34	42	58/0.3							SS-43		MOUNT LAUREL FORMATION: Silty SAND (SM), Greenish Gray (10Y 5/1), very dense, moist, fine to medium sand, weak HCl reaction		
-193.8	200.0	38	53	47/0.2							SS-44		MOUNT LAUREL FORMATION: Poorly Sorted SAND with silt (SP-SM), greenish gray (10Y 5/1), very dense, moist, fine to medium sand, no HCl reaction		
													191.8	198.0	
													195.0	201.2	
													Boring terminated at 201.2 feet.		
													Boring closed by tremie method with cement-bentonite grout on 1/27/09.		



GEOTECHNICAL BORING LOG

Prepared By MR Date 7/10/09Checked By JSW Date 7/10/09

SHEET 1 OF 6

PERMIT NO.: P200900090		DRILLER: D. Osuch		NJ LICENSE NO.: 0024289		GEOLOGIST: S. Johnson / M. Lear									
SITE DESCRIPTION: PSEG SITE ESP APPLICATION			COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251		FLUID LEVEL (ft)								
BORING NO.: NB-8		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT		0 HR.		ND							
GROUND SURFACE ELEV.: 8.9		US ft (NAVD88)		NORTHING: 234140.4		US ft (NAD83)		24 HR. 5.4							
TOTAL DEPTH: 315.3 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 8.5 ft		HAMMER (ID): 140 lb Auto. (CTB-3)									
DATE STARTED: 1/9/09		COMPLETED: 1/13/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag & Roller Cone Bits							
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT					SAMP.	LOG	SOIL AND ROCK DESCRIPTION			
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			NO.		
8.9					Ground Surface										
8.9	0.0	8	10	50				60			SS-1	8.9	0.0	ARTIFICIAL FILL: Silty GRAVEL with sand (GM), very dark gray (5Y 3/1), very dense, moist, fine to coarse gravel, little fine sand	
6.4	2.5	3	4	4							SS-2	6.9	2.0	HYDRAULIC FILL: LEAN CLAY with sand (CL), very dark gray (10Y 3/1), medium stiff, moist, little fine sand	
3.9	5.0	2	2	2							SS-3			5.0ft: Soft, wet	
1.4	7.5	7	9	5							SS-4	1.9	7.0	HYDRAULIC FILL: Silty SAND (SM), gray (N 5/), medium dense, wet, few gravel	
-1.1	10.0	WOH	WOH	WOH							SS-5	-0.6	9.5	HYDRAULIC FILL: FAT CLAY (CH), very dark gray (N 3/), very soft, wet, trace to few organics	
-3.3	12.2	3	5	4							SS-6	-3.1	12.0	HYDRAULIC FILL: Silty, Clayey SAND (SC-SM), very dark gray (N 3/), loose, wet, fine to medium sand, trace fine gravel, trace organics	
-5.6	14.5	WOH	WOH	WOH							SS-7	-5.1	14.0	HYDRAULIC FILL: FAT CLAY (CH), dark greenish gray (10Y 4/1), very soft, wet, few organics	
		WOH	WOH	WOH											
-11.1	20.0	WOH	WOH	WOH							SS-8			20.0ft: Trace organics	
		WOH	WOH	WOH											
-15.6	24.5	WOH	WOH	WOH							SS-9			24.5ft: Trace fine sand	
		WOH	WOH	WOH											
-20.6	29.5	WOH	WOH	WOH							SS-10				
		WOH	WOH	WOH											
-25.6	34.5	1	1	1							SS-11A/B	-24.1	33.0	ALLUVIUM: Sandy SILT (ML), dark gray (N 4/), very soft, wet, fine sand	
												-26.6	35.5	ALLUVIUM: PEAT (PT), very dark brown (5Y4/2), very soft, wet	
-30.6	39.5	1	3	7							SS-12	-29.1	38.0	ALLUVIUM: Silty SAND (SM), olive gray (5Y 4/2), loose, wet, fine to medium sand	
-35.6	44.5	10	11	4							SS-13A/B	-35.1	44.0	ALLUVIUM: Silty GRAVEL with sand (GM), very dark gray (10YR 3/1), medium dense, wet, fine to coarse sand, fine to coarse gravel	
												-36.6	45.5	ALLUVIUM: Sandy LEAN CLAY (CL), very dark greenish gray (10G 3/1), stiff, wet, fine to medium sand, trace of gravel	
-40.6	49.5	WOH	2	3							SS-14	-39.1	48.0	KIRKWOOD FORMATION: Clayey SAND (SC), dark brown (7.5YR 3/2), loose, wet, fine to medium sand, trace gravel	
-45.6	54.5	WOH	WOH	WOH							SS-15			54.5ft: Reddish brown (5YR 4/4), very loose	

PSEG ESP BORE PSEG ESP 7-07-09.GPJ PSEG ESP.GDT 7/10/09



PERMIT NO.: P200900090		DRILLER: D. Osuch		NJ LICENSE NO.: 0024289		GEOLOGIST: S. Johnson / M. Lear							
SITE DESCRIPTION: PSEG SITE ESP APPLICATION			COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251		FLUID LEVEL (ft)						
BORING NO.: NB-8		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT		0 HR. ND							
GROUND SURFACE ELEV.: 8.9		US ft (NAVD88)		NORTHING: 234140.4		EASTING: 199745.9		24 HR. 5.4					
TOTAL DEPTH: 315.3 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 8.5 ft		HAMMER (ID): 140 lb Auto. (CTB-3)							
DATE STARTED: 1/9/09		COMPLETED: 1/13/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag & Roller Cone Bits					
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
-47.2					Continued from previous page								
-50.6	59.5	WOH	WOH	WOH									KIRKWOOD FORMATION: Clayey SAND (SC), dark brown (7.5YR 3/2), loose, wet, fine to medium sand, trace gravel (continued)
-55.6	64.5	8	10	12									-54.6 VINCENTOWN FORMATION: Silty SAND (SM), reddish yellow (7.5YR 6/8), medium dense, wet, fine to medium sand, trace friable layers, strong HCl reaction, trace of glauconite, strongly oxidized 63.5
-60.6	69.5	8	8	7									
-65.6	74.5	19	9	9									74.5ft: Reddish yellow (7.5YR 6/6)
-70.6	79.5	7	20	15									-68.1 VINCENTOWN FORMATION: Clayey SAND (SC), light gray (2.5Y 7/2), dense, wet, fine to medium sand, trace indurated layers, strong HCl reaction, trace glauconite, weakly oxidized 77.0
-75.6	84.5	6	6	18									84.5ft: Medium dense
-80.6	89.5	100/0.5											89.5ft: Very dense, mostly indurated
-85.6	94.5	11	11	65									-83.1 VINCENTOWN FORMATION: Silty, Clayey SAND (SC-SM), light greenish gray (5GY 8/1), very dense, wet, fine to medium sand, trace indurated layers, strong HCl reaction, trace glauconite, no oxidation 92.0
-90.6	99.5	48	12	14									99.5ft: Medium dense, few friable layers
-95.6	104.5	7	12	50									104.5ft: Light greenish gray (5GY 7/1), very dense
-100.6	109.5	100/0.2											109.5ft: Mostly friable to indurated

PSEG ESP BORE PSEG ESP 7-07-09.CPJ PSEG ESP.GDT 7/10/09



PERMIT NO.: P200900090			DRILLER: D. Osuch			NJ LICENSE NO.: 0024289			GEOLOGIST: S. Johnson / M. Lear			
SITE DESCRIPTION: PSEG SITE ESP APPLICATION					COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251			FLUID LEVEL (ft)		
BORING NO.: NB-8			DRILL METHOD: Mud Rotary			SAMPLE METHODS: SPT			0 HR. ND			
GROUND SURFACE ELEV.: 8.9			US ft (NAVD88)		NORTHING: 234140.4		US ft (NAD83)		EASTING: 199745.9		US ft (NAD83) 24 HR. 5.4	
TOTAL DEPTH: 315.3 ft			DRILL MACHINE: CME-75 Truck			CASING DEPTH: 8.5 ft			HAMMER (ID): 140 lb Auto. (CTB-3)			
DATE STARTED: 1/9/09		COMPLETED: 1/13/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag & Roller Cone Bits				
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT					SAMP.	LOG	SOIL AND ROCK DESCRIPTION
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100		
-103.3					Continued from previous page							
-105.6	114.5	8	14	19							SS-27	VINCENTOWN FORMATION: Silty, Clayey SAND (SC-SM), light greenish gray (5GY 8/1), very dense, wet, fine to medium sand, trace indurated layers, strong HCl reaction, trace glauconite, no oxidation (continued) 114.5ft: Greenish gray (5GY 5/1), dense, trace to few glauconite
-110.6	119.5	43	21	21							SS-28	119.5ft: Greenish gray (5GY 5/1), dense, trace friable layers
-115.6	124.5	8	12	17							SS-29	HORNERSTOWN FORMATION: Silty SAND (SM), dark greenish gray (10Y 5/1), medium dense, wet, fine to medium sand, strong HCl reaction, trace of glauconite
-120.6	129.5	6	10	16							SS-30	129.5ft: Few to little glauconite
-125.6	134.5	8	14	42							SS-31	134.5ft: Very dense
-130.6	139.5	33	22	20							SS-32	139.5ft: Dark greenish gray (5GY 4/1), dense, trace friable layers, little glauconite
-135.6	144.5	13	16	31							SS-33	NAVESINK FORMATION: Silty SAND (SM), very dark greenish gray (5G 3/2), dense, wet, fine sand, trace shell fragments, weak HCl reaction, mostly glauconite
-140.6	149.5	20	29	32							SS-34	149.5ft: Very dense, little shell fragments
-145.6	154.5	28	40	40							SS-35	NAVESINK FORMATION: Silty, Clayey SAND (SC-SM), very dark greenish gray (5G 3/2), very dense, wet, fine to coarse sand, trace fine gravel, few to little shell fragments, weak HCl reaction, mostly glauconite
-150.6	159.5	23	39	36							SS-36	159.5ft: Very dense, little shell fragments
-155.6	164.5	27	36	43							SS-37	NAVESINK FORMATION: Clayey SAND (SC), very dark greenish gray (5G 3/2), very dense, wet, fine to coarse sand, trace fine gravel, trace shell fragments, no HCl reaction, mostly glauconite
												MOUNT LAUREL FORMATION: Sandy LEAN CLAY (CL), dark gray (2.5Y 4/1), hard, moist, fine to coarse sand, little glauconite, strong HCl reaction

PSEG ESP BORE PSEG ESP 7-07-09 GPT PSEG ESP GDT 7/10/09

PSEG ESP BORE PSEG ESP 7-07-09.GPJ PSEG ESP.GDT 7/10/09



PERMIT NO.: P200900090		DRILLER: D. Osuch		NJ LICENSE NO.: 0024289		GEOLOGIST: S. Johnson / M. Lear	
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251	
BORING NO.: NB-8		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT		FLUID LEVEL (ft)	
GROUND SURFACE ELEV.: 8.9 US ft (NAVD88)		NORTHING: 234140.4 US ft (NAD83)		EASTING: 199745.9 US ft (NAD83)		0 HR. ND	
TOTAL DEPTH: 315.3 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 8.5 ft		HAMMER (ID): 140 lb Auto. (CTB-3)	
DATE STARTED: 1/9/09		COMPLETED: 1/13/09		HOLE DIA.: 4"		ROD TYPE: NWJ	
BITS USED: 3-7/8" Drag & Roller Cone Bits							

ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT						SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100				
-215.5		Continued from previous page												
-220.6	229.5	55	45	0.3							100/0.8	SS-47	MOUNT LAUREL FORMATION: Poorly graded SAND with silt (SP-SM), greenish gray (10GY 5/1), very dense, wet, fine to coarse subangular sand, few friable layers, no HCl reaction, trace of glauconite (continued) 229.5ft: trace to few glauconite	
-230.6	239.5	30	53	47/0.4							100/0.9	SS-48		
-240.6	249.5	39	44	48							92	SS-49	MOUNT LAUREL FORMATION: Silty, Clayey SAND (SC-SM), very dark greenish gray (5G 3/1), very dense, wet, fine to medium sand, weak HCl reaction, trace to few glauconite	
-250.6	259.5	17	30	43							73	SS-50		
-260.6	269.5	5	5	13							18	SS-51	WENONAH FORMATION: FAT CLAY with sand (CH), very dark gray (N 3/), very stiff, wet, little fine sand, strong HCl reaction	
-270.6	279.5	2	3	4								SS-52		
													245.0	MOUNT LAUREL FORMATION: Silty, Clayey SAND (SC-SM), very dark greenish gray (5G 3/1), very dense, wet, fine to medium sand, weak HCl reaction, trace to few glauconite
													258.0	
													259.1	WENONAH FORMATION: FAT CLAY with sand (CH), very dark gray (N 3/), very stiff, wet, little fine sand, strong HCl reaction
													268.0	
													267.1	WENONAH FORMATION: Clayey SAND (SC), very dark gray (N 3/), loose, wet, fine to medium sand, strong HCl reaction
													276.0	

PSEG ESP BORE PSEG ESP 7-07-09.GPJ PSEG ESP.CDT 7/10/09

PERMIT NO.: P200900090			DRILLER: D. Osuch			NJ LICENSE NO.: 0024289			GEOLOGIST: S. Johnson / M. Lear				
SITE DESCRIPTION: PSEG SITE ESP APPLICATION						COUNTY: Salem, NJ			MACTEC PROJECT NO.: 6468-08-2251			FLUID LEVEL (ft)	
BORING NO.: NB-8			DRILL METHOD: Mud Rotary			SAMPLE METHODS: SPT						0 HR. ND	
GROUND SURFACE ELEV.: 8.9			US ft (NAVD88)			NORTHING: 234140.4			US ft (NAD83)			24 HR. 5.4	
TOTAL DEPTH: 315.3 ft			DRILL MACHINE: CME-75 Truck			CASING DEPTH: 8.5 ft			HAMMER (ID): 140 lb Auto. (CTB-3)				
DATE STARTED: 1/9/09			COMPLETED: 1/13/09			HOLE DIA.: 4"			ROD TYPE: NWJ			BITS USED: 3-7/8" Drag & Roller Cone Bits	
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT						SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
-271.6					Continued from previous page								
-280.6	289.5	7	10	20	●30						SS-53		WENONAH FORMATION: Clayey SAND (SC), very dark gray (N 3/), loose, wet, fine to medium sand, strong HCl reaction (continued)
-290.6	299.5	7	13	18	●31						SS-54		MARSHALLTOWN FORMATION: Clayey SAND (SC), greenish gray (10Y 5/1), medium dense, wet, fine sand, trace friable layers, trace pyrite nodules, strong HCl reaction, little to some glauconite MARSHALLTOWN FORMATION: Sandy FAT CLAY (CH), very dark greenish gray (10Y 3/1), hard, fine sand, trace glauconite
													Boring advanced without sampling from 301.0ft to 315.3ft to provide "rat hole" for geophysical testing. Boring terminated at 315.3 feet. Boring closed by tremie method with cement-bentonite grout on 1/21/09.

GEOTECHNICAL BORING LOG

Prepared By MPB Date 7/10/09

Checked By Y02 Date 7/10/09

SHEET 1 OF 1

PERMIT NO.: P200905736						DRILLER: T. Samuelson						NJ LICENSE NO.: 0001238						GEOLOGIST: M. Lear											
SITE DESCRIPTION: PSEG SITE ESP APPLICATION												COUNTY: Salem, NJ						MACTEC PROJECT NO.: 6468-08-2251						FLUID LEVEL (ft)					
BORING NO.: CH NB-8B						DRILL METHOD: Mud Rotary						SAMPLE METHODS: NA						0 HR. ND											
GROUND SURFACE ELEV.: 8.9 US ft (NAVD88)						NORTHING: 234130.2 US ft (NAD83)						EASTING: 199713.0 US ft (NAD83)						24 HR. ND											
TOTAL DEPTH: 201.5 ft						DRILL MACHINE: IR-T2W						CASING DEPTH: NA						HAMMER (ID): NA											
DATE STARTED: 5/21/09						COMPLETED: 5/22/09						HOLE DIA.: 8"						ROD TYPE: 3.5" IR Rod						BITS USED: 7-7/8" Drag Bit					
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT						SAMP. NO.	▼	L O G	SOIL AND ROCK DESCRIPTION															
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100																			
8.9					Ground Surface									8.9	0.0														
															Boring drilled for installation of crosshole seismic casing. See boring NB-8 for strata and soil descriptions. Installed flush-jointed 4" Schedule 40 PVC casing with end cap from ground surface to 199.5 feet. -Steel centralizers installed at approximately 195, 145, 95, 45, and 5 feet below ground surface. -PVC casing held down/in place with 200 feet of NWJ drill rod set inside casing during grouting. -Annulus grouted via tremie method to ground surface with cement-bentonite grout per NJDEP regulations. -Approximately 2 feet of PVC casing sticking up above ground surface at completion.														
															Boring terminated at 201.5 feet and crosshole seismic casing installed. For strata and soil descriptions see geotechnical boring NB-8.														



SHEET 2 OF 7

PERMIT NO.: P200900125			DRILLER: T. Ward			NJ LICENSE NO.: 0001105			GEOLOGIST: J. Howard				
SITE DESCRIPTION: PSEG SITE ESP APPLICATION					COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251			FLUID LEVEL (ft)			
BORING NO.: EB-1			DRILL METHOD: Mud Rotary			SAMPLE METHODS: SPT			0 HR. ND				
GROUND SURFACE ELEV.: 15.9 US ft (NAVD88)			NORTHING: 232316.7 US ft (NAD83)		EASTING: 202774.1 US ft (NAD83)		24 HR. 3.1						
TOTAL DEPTH: 351.5 ft			DRILL MACHINE: CME-75 Truck			CASING DEPTH: 4"=38.5' / 6"=18.5'			HAMMER (ID): 140 lb Auto. (CBT-1)				
DATE STARTED: 1/9/09		COMPLETED: 1/21/09		HOLE DIA.: 4"-6"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit					
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
-40.2					Continued from previous page								
-44.1	60.0	10	9	10							SS-16		KIRKWOOD FORMATION: Poorly graded SAND (SP), Light greenish gray (5GY 7/1), medium dense, wet, fine to medium sand, no HCl reaction (continued)
-49.1	65.0	6	10	13							SS-17		65.0ft: Greenish gray (5GY 6/1), fine to medium sand
-53.9	69.8	4	10	10							SS-18		69.8ft: Gray (N 5)
-59.1	75.0	NA	NA	NA							SS-19		KIRKWOOD FORMATION: Sandy ELASTIC SILT (MH), dark greenish gray (10Y 4/1), soft, moist, no HCl reaction
-60.6	76.5	1	2	12							SS-20		75.0ft: Rods dropped, penetrated 1.5ft, no SPT values
-64.3	80.2	1	4	4							SS-21		KIRKWOOD FORMATION: Silty SAND (SM), dark gray (N 4/), medium dense, wet, fine to medium sand, no HCl reaction, trace wood fragments and organics
-69.1	85.0	2	4	5							SS-22		KIRKWOOD FORMATION: FAT CLAY (CH), dark greenish gray (10Y 4/1), medium stiff, moist, no HCl reaction
-74.1	90.0	2	1	4							SS-23		85.0ft: Greenish gray (10Y 5/1), stiff
-79.2	95.1	3	5	6							SS-24		90.0ft: Dark greenish gray (10Y 4/1), medium stiff, trace organics
-84.1	100.0	5	7	12							SS-25		95.1ft: Stiff, trace to few organics, trace mica
-89.1	105.0	100/0.4									SS-26		100.0ft: Very stiff, trace organics, few mica 100.9ft: silty SAND (SM) layer to 101.1ft
-93.9	109.8	7	10	12							SS-27		VINCENTOWN FORMATION: Clayey SAND (SC), greenish gray (10Y 6/1), very dense, moist, fine to medium sand, mostly indurated, weak HCl reaction, trace shell fragments, trace glauconite
													VINCENTOWN FORMATION: ELASTIC SILT (MH), greenish gray (5GY 5/1), very stiff, wet, trace fine sand, no HCl reaction, trace glauconite

PSEG ESP BORE PSEG ESP 7-07-09.GPI PSEG ESP GDI 7/10/09



SHEET 3 OF 7

PERMIT NO.: P200900125			DRILLER: T. Ward			NJ LICENSE NO.: 0001105			GEOLOGIST: J. Howard						
SITE DESCRIPTION: PSEG SITE ESP APPLICATION					COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251			FLUID LEVEL (ft)					
BORING NO.: EB-1		DRILL METHOD: Mud Rotary			SAMPLE METHODS: SPT			0 HR.			ND				
GROUND SURFACE ELEV.: 15.9		US ft (NAVD88)		NORTHING: 232316.7		US ft (NAD83)		EASTING: 202774.1		US ft (NAD83)		24 HR.		3.1	
TOTAL DEPTH: 351.5 ft		DRILL MACHINE: CME-75 Truck			CASING DEPTH: 4"=38.5' / 6"=18.5'			HAMMER (ID): 140 lb Auto. (CBT-1)							
DATE STARTED: 1/9/09		COMPLETED: 1/21/09		HOLE DIA.: 4"-6"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit							
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT					SAMP.	LOG	SOIL AND ROCK DESCRIPTION			
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			NO.		
-96.3					Continued from previous page										
-99.0	114.9						30				SS-28	-97.1	VINCENTOWN FORMATION: Silty SAND (SM), greenish gray (5GY 5/1), medium dense, wet, fine to medium sand, no HCl reaction, trace glauconite	113.0	
		17	14	16											
-104.2	120.1						46				SS-29	120.1ft: Greenish gray (10Y 5/1), dense, moist, no to weak HCl reaction, few friable to moderately indurated layers			
		41	28	18											
-109.3	125.2						39				SS-30	125.2ft: Weak to strong HCl reaction, trace shell fragments, few moderately indurated layers			
		9	24	15											
-114.1	130.0									100/1.0	SS-31	130.0ft: Greenish gray (10Y 6/1), very dense, wet, few friable layers			
		9	76	24											
-119.1	135.0									100/0.9	SS-32	135.0ft: Greenish gray (10Y 5/1), strong HCl reaction, few friable to moderately indurated layers			
		7	93/0.4												
-124.1	140.0						25				SS-33	140.0ft: Greenish gray (10Y 6/1), medium dense, no to weak HCl reaction			
		9	12	13											
-129.1	145.0									100/0.1	SS-34	HORNERSTOWN FORMATION: Silty SAND (SM), greenish gray (10Y 6/1), very dense, moist, fine to medium sand, weak HCl reaction, trace to few glauconite	-127.1	143.0	
		100/0.1										145.0ft: Moderately indurated to friable			
-134.1	150.0						27				SS-35	150.0ft: Medium dense, strong HCl reaction, few glauconite			
		6	11	16											
-139.2	155.1						31				SS-36	155.1ft: Greenish gray (10Y 5/1), dense			
		6	12	19											
-144.0	159.9									62	SS-37	159.9ft: Dark greenish gray (5GY 4/1), very dense, trace shell fragments, few to little glauconite			
		7	36	26											
-149.1	165.0									60	SS-38	NAVESINK FORMATION: Silty, Clayey SAND (SC-SM), dark bluish gray (5B 4/1), very dense, moist, fine to medium sand, trace shell fragments, weak HCl reaction, mostly glauconite	-147.1	163.0	
		41	28	32											

PSEG ESP BORE PSEG ESP 7-07-09.GPJ PSEG ESP.GDT 7/10/09



SHEET 4 OF 7

PERMIT NO.: P200900125		DRILLER: T. Ward		NJ LICENSE NO.: 0001105		GEOLOGIST: J. Howard							
SITE DESCRIPTION: PSEG SITE ESP APPLICATION			COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251		FLUID LEVEL (ft)						
BORING NO.: EB-1		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT		0 HR. ND							
GROUND SURFACE ELEV.: 15.9 US ft (NAVD88)		NORTHING: 232316.7 US ft (NAD83)		EASTING: 202774.1 US ft (NAD83)		24 HR. 3.1							
TOTAL DEPTH: 351.5 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 4"=38.5' / 6"=18.5'		HAMMER (ID): 140 lb Auto. (CBT-1)							
DATE STARTED: 1/9/09		COMPLETED: 1/21/09		HOLE DIA.: 4"-6"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit					
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
-152.4					Continued from previous page								
-154.0	169.9	19	30	34	64					SS-38		NAVESINK FORMATION: Silty, Clayey SAND (SC-SM), dark bluish gray (5B 4/1), very dense, moist, fine to medium sand, trace shell fragments, weak HCl reaction, mostly glauconite (continued) 169.9ft: Greenish black (5BG 2.5/1), no HCl reaction	
-159.1	175.0	17	28	38	66					SS-40		175.0ft: Medium dense, weak HCl reaction	
-164.1	180.0	26	39	57	96					SS-41		180.0ft: No HCl reaction	
-169.0	184.9	20	30	38	68					SS-42A/B	-169.6	185.5	MOUNT LAUREL FORMATION: Silty, Clayey SAND (SC-SM), dark gray (10YR 4/1), very dense, moist, fine to coarse subrounded sand, little shell fragments, weak to strong HCl reaction, little glauconite
-174.0	189.9	35	65/0.1		100/0.6					SS-43		189.9ft: Dark greenish gray (10Y 4/1), strong HCl reaction	
-179.1	195.0	100/0.3			100/0.3					SS-44		195.0ft: Fine to medium sand, weak HCl reaction	
-184.0	199.9	100/0.4			100/0.4					SS-45			
-194.1	210.0	21	36	42	78					SS-46		210.0ft: Trace shell fragments, few glauconite	
-203.9	219.8	26	40	60	100/1.0					SS-47	-202.1	218.0	MOUNT LAUREL FORMATION: Silty SAND (SM), greenish gray (10Y 5/1), very dense, moist, fine to medium sand, weak HCl reaction, trace glauconite

PSEG ESP BORE PSEG ESP 7-07-09.GPJ PSEG ESP.GDI 7/10/09



SHEET 5 OF 7

PERMIT NO.: P200900125		DRILLER: T. Ward		NJ LICENSE NO.: 0001105		GEOLOGIST: J. Howard	
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251	
BORING NO.: EB-1		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT		FLUID LEVEL (ft)	
GROUND SURFACE ELEV.: 15.9 US ft (NAVD88)		NORTHING: 232316.7 US ft (NAD83)		EASTING: 202774.1 US ft (NAD83)		0 HR. ND	
TOTAL DEPTH: 351.5 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 4"=38.5' / 6"=18.5'		24 HR. 3.1	
DATE STARTED: 1/9/09		COMPLETED: 1/21/09		HOLE DIA.: 4"-6"		ROD TYPE: NWJ	
						BITS USED: 3-7/8" Drag Bit	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT						SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
-208.5					Continued from previous page								
-214.0	229.9	58	42/0.2								SS-48		MOUNT LAUREL FORMATION: Silty SAND (SM), greenish gray (10Y 5/1), very dense, moist, fine to medium sand, weak HCl reaction, trace glauconite (continued)
													229.9ft: No HCl reaction
-224.1	240.0	100/0.5									SS-49		
-234.0	249.9	60	40/0.2								SS-50		249.9ft: Weak HCl reaction
-244.1	260.0	63	37/0.2								SS-51		260.0ft: No HCl reaction
-254.1	270.0	100/0.5									SS-52		270.0ft: Dark greenish gray (10Y 4/1), weak HCl reaction
-259.1													
-264.0	279.9										SS-53		MOUNT LAUREL FORMATION: Poorly graded SAND with silt (SP-SM), dark greenish gray (5GY 4/1), very dense, moist, fine to medium sand, no HCl reaction, trace glauconite

PSEG ESP BORE PSEG ESP 7-07-09.GPI PSEG ESP.GDT 7/10/09

PSEGE ESP BORE PSEGE ESP 7-07-09.GPJ PSEGE ESP.GDT 7/10/09

PERMIT NO.: P200900125		DRILLER: T. Ward		NJ LICENSE NO.: 0001105		GEOLOGIST: J. Howard										
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251		FLUID LEVEL (ft)								
BORING NO.: EB-1		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT				0 HR. ND								
GROUND SURFACE ELEV.: 15.9		US ft (NAVD88)		NORTHING: 232316.7		US ft (NAD83)		EASTING: 202774.1 US ft (NAD83)		24 HR. 3.1						
TOTAL DEPTH: 351.5 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 4"=38.5' / 6"=18.5'				HAMMER (ID): 140 lb Auto. (CBT-1)								
DATE STARTED: 1/9/09		COMPLETED: 1/21/09		HOLE DIA.: 4"-6"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit								
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT					SAMP.	▼	L	O	G	SOIL AND ROCK DESCRIPTION	
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100	NO.					
-320.7																
-323.9	339.8															
		10	18	32							SS-60					
-329.1	345.0															
		7	15	35								SS-61				
-334.1	350.0															
		6	7	11								SS-62				



GEOTECHNICAL BORING LOG

Prepared By NB Date 7/10/09Checked By JH Date 7/10/09

SHEET 1 OF 4

PERMIT NO.: P200804329		DRILLER: T. Ward		NJ LICENSE NO.: 0001105		GEOLOGIST: J. Howard						
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251		FLUID LEVEL (ft)				
BORING NO.: EB-2		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT		0 HR.		ND				
GROUND SURFACE ELEV.: 14.1 US ft (NAVD88)		NORTHING: 233264.7 US ft (NAD83)		EASTING: 202166.5 US ft (NAD83)		24 HR.		6.3				
TOTAL DEPTH: 200.7 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 14.0 ft		HAMMER (ID): 140 lb Auto. (CBT-1)						
DATE STARTED: 2/3/09		COMPLETED: 2/6/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit				
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT					SAMP.	LOG	SOIL AND ROCK DESCRIPTION
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100		
14.1					Ground Surface							
14.1	0.0	5	5	10						SS-1		14.1
11.6	2.5	5	5	4						SS-2		12.1
9.1	5.0	8	11	6						SS-3		9.6
6.6	7.5	4	1	2						SS-4		7.1
4.1	10.0	WOH	1	1						SS-5		10.0ft: No recovery, very soft
1.6	12.5	1	1	1						SS-6		2.1
-0.9	15.0	WOH	WOH	WOH						SS-7		HYDRAULIC FILL: ELASTIC SILT (MH), very dark greenish gray (10Y 3/1), very soft, moist, trace fine sand, trace organics, no HCl reaction, PP=0.0 tsf
-5.9	20.0	WOH	WOH	2						SS-8		
-11.2	25.3	WOH	WOH	WOH						SS-9		
-16.2	30.3	WOH	WOH	WOH						SS-10		
-21.1	35.2	WOH	WOH	WOH						SS-11		
-25.9	40.0	4	6	10						SS-12		-24.9
-31.7	45.8	1	3	4						SS-13		-29.9
-35.9	50.0	WOH	2	3						SS-14		-33.9
-40.9	55.0	WOH	1	2						SS-15		

PSEG ESP BORE PSEG ESP 7-07-09 GPJ PSEG ESP GDT 7/10/09



PERMIT NO.: P200804329		DRILLER: T. Ward		NJ LICENSE NO.: 0001105		GEOLOGIST: J. Howard							
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251		FLUID LEVEL (ft)					
BORING NO.: EB-2		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT				0 HR. ND					
GROUND SURFACE ELEV.: 14.1 US ft (NAVD88)		NORTHING: 233264.7 US ft (NAD83)		EASTING: 202166.5 US ft (NAD83)				24 HR. 6.3					
TOTAL DEPTH: 200.7 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 14.0 ft				HAMMER (ID): 140 lb Auto. (CBT-1)					
DATE STARTED: 2/3/09		COMPLETED: 2/6/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit					
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	▼	L O G	SOIL AND ROCK DESCRIPTION
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
-42.0					Continued from previous page								
-45.9	60.0												ALLUVIUM: FAT CLAY (CH), greenish gray (10Y 5/1), medium stiff, moist, no HCl reaction (continued)
		WOH	2	3	5						SS-16		60.0ft: Medium stiff, PP=1.5 tsf
-51.2	65.3												63.0
		WOH	1	2	3						SS-17		KIRKWOOD FORMATION: Sandy LEAN CLAY (CL), very dark greenish gray (10Y 3/1), soft, moist, some fine to medium sand, trace shell fragments, no HCl reaction, PP=0.25 tsf
-55.9	70.0												
		1	1	1	2						SS-18		70.0ft: Very soft, trace organics, PP=1.0 tsf
-58.9													73.0
		WOH	WOH	1	1						SS-19		KIRKWOOD FORMATION: FAT CLAY (CH), dark greenish gray (10Y 4/1), very soft, moist, no HCl reaction, trace organics, PP=1.0 tsf
-61.0	75.1												
		WOH	1	1	2						SS-20		80.0ft: PP=0.25 tsf
-65.9	80.0												
		1	2	1	3						SS-21		85.0ft: Soft, few organics, PP=0.25 tsf
-70.9	85.0												
		WOH	WOH	WOH	0						SS-22		90.3ft: Very soft, trace organics, PP=0.5 tsf
-76.2	90.3												
		WOH	WOH	WOH	0						SS-23		95.0ft: PP=0.5 tsf
-80.9	95.0												
		10	15	14	29						SS-24		98.0
-85.9	100.0												KIRKWOOD FORMATION: Poorly graded SAND with silt and gravel (SP-SM), greenish gray (10Y 5/1), medium dense, wet, fine to coarse sand, little fine to coarse gravel, no HCl reaction
-89.9													104.0
		10	14	14	28						SS-25		VINCENTOWN FORMATION: Silty SAND (SM), greenish gray (5GY 5/1), medium dense, wet, fine to medium sand, few friable layers, strong HCl reaction, trace glauconite
-90.9	105.0												
		8	92/0.4								SS-26		110.0ft: Greenish gray (5GY 6/1), very dense, few moderately indurated layers
-95.9	110.0												

PSEG ESP BORE PSEG ESP 7-07-09 GPI PSEG ESP GDI 7/10/09



SHEET 3 OF 4

PERMIT NO.: P200804329			DRILLER: T. Ward			NJ LICENSE NO.: 0001105			GEOLOGIST: J. Howard				
SITE DESCRIPTION: PSEG SITE ESP APPLICATION					COUNTY: Salem, NJ			MACTEC PROJECT NO.: 6468-08-2251			FLUID LEVEL (ft)		
BORING NO.: EB-2			DRILL METHOD: Mud Rotary			SAMPLE METHODS: SPT			0 HR.		ND		
GROUND SURFACE ELEV.: 14.1 US ft (NAVD88)					NORTHING: 233264.7 US ft (NAD83)			EASTING: 202166.5 US ft (NAD83)			24 HR. 6.3		
TOTAL DEPTH: 200.7 ft			DRILL MACHINE: CME-75 Truck			CASING DEPTH: 14.0 ft			HAMMER (ID): 140 lb Auto. (CBT-1)				
DATE STARTED: 2/3/09			COMPLETED: 2/6/09			HOLE DIA.: 4"			ROD TYPE: NWJ			BITS USED: 3-7/8" Drag Bit	
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	▼	L O G	SOIL AND ROCK DESCRIPTION
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
-98.1					Continued from previous page								
-100.8	114.9												VINCENTOWN FORMATION: Silty SAND (SM), greenish gray (5GY 5/1), medium dense, wet, fine to medium sand, few friable layers, strong HCl reaction, trace glauconite (continued)
		6	12	26						SS-27			114.9 ft: Greenish gray (10Y 5/1), dense, fine to medium sand, trace friable to moderately indurated layers
-105.9	120.0												
		40	13	87/0.2						SS-28			120.0ft: Greenish gray (10Y 6/1), very dense, moist, few friable layers
-110.9	125.0												
		100/0.3								SS-29			125.0ft: Mostly friable to moderately indurated
-115.7	129.8												
		20	14	45						SS-30			VINCENTOWN FORMATION: Clayey SAND (SC), greenish gray (5GY 6/1), very dense, moist, fine to medium sand, strong HCl reaction, trace glauconite
-120.9	135.0												
		100/0.4								SS-31			135.0ft: Mostly friable to moderately indurated
-125.9	140.0												
		9	91/0.5							SS-32			140.0ft: Few friable layers
-130.9	145.0												
		9	16	39						SS-33			HORNERSTOWN FORMATION: Silty SAND (SM), dark greenish gray (5GY 4/1), very dense, moist, fine to medium sand, trace friable layers, trace shell fragments, strong HCl reaction, trace glauconite
-135.9	150.0												
		14	20	24						SS-34			150.0ft: Dense, few to little glauconite
-140.9	155.0												
		8	15	24						SS-35			
-145.7	159.8												
		11	25	33						SS-36			159.8ft: Greenish black (10GY 2.5/1), very dense, wet, trace shell fragments, little to some glauconite
-150.9	165.0												
		18	39	37						SS-37			NAVESINK FORMATION: Poorly graded SAND with silt (SP-SM), greenish black (10GY 2.5/1), very dense, wet, fine to medium sand, few shell fragments, weak HCl reaction, mostly glauconite

PSEG ESP BORE PSEG ESP 7-07-09.GPJ PSEG ESP.GDT 7/10/09



PERMIT NO.: P200804329		DRILLER: T. Ward		NJ LICENSE NO.: 0001105		GEOLOGIST: J. Howard	
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251	
BORING NO.: EB-2		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT		FLUID LEVEL (ft)	
GROUND SURFACE ELEV.: 14.1 US ft (NAVD88)		NORTHING: 233264.7 US ft (NAD83)		EASTING: 202166.5 US ft (NAD83)		0 HR. ND	
TOTAL DEPTH: 200.7 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 14.0 ft		HAMMER (ID): 140 lb Auto. (CBT-1)	
DATE STARTED: 2/3/09		COMPLETED: 2/6/09		HOLE DIA.: 4"		ROD TYPE: NWJ	
BITS USED: 3-7/8" Drag Bit							

ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT						SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
-154.2					Continued from previous page								
-155.9	170.0	11	18	30							SS-38		NAVESINK FORMATION: Clayey SAND (SC), greenish black (10GY 2.5/1), dense, wet, fine to medium sand, weak HCl reaction, mostly glauconite (continued)
-161.1	175.2	16	30	47							SS-39		NAVESINK FORMATION: Poorly graded SAND with silt (SP-SM), greenish black (10GY 2.5/1), very dense, wet, fine to medium sand, weak HCl reaction, mostly glauconite
-165.7	179.8	36	45	55/0.3							SS-40		
-170.9	185.0	20	80/0.5								SS-41		
-175.8	189.9	100/0.3									SS-42		
-180.9	195.0	100/0.3									SS-43		195.0ft: Very dark greenish gray (10Y 3/1)
-185.9	200.0	70	30/0.2								SS-44		Boring terminated at 200.7 feet.
													Boring closed by tremie method with cement-bentonite grout on 2/07/09.

PSEG ESP BORE PSEG ESP 7-07-09.GPJ PSEG ESP.GDT 7/10/09



GEOTECHNICAL BORING LOG

Prepared By NBR Date 7/10/09

Checked By JS Date 7/10/09

SHEET 1 OF 12

PERMIT NO.: P200900124		DRILLER: D. Osuch / R. Bartholomew		NJ LICENSE NO.: 0024289 / 0001383		GEOLOGIST: M. Lear							
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251		FLUID LEVEL (ft)					
BORING NO.: EB-3		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT		0 HR.		ND					
GROUND SURFACE ELEV.: 16.5 US ft (NAVD88)		NORTHING: 232349.0 US ft (NAD83)		EASTING: 202473.9 US ft (NAD83)		24 HR.		13.8					
TOTAL DEPTH: 631.5 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 53.7 ft		HAMMER (ID): 140 lb Auto. (CTB-3)							
DATE STARTED: 1/24/09		COMPLETED: 2/17/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag & Roller Cone Bits					
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT					SAMP.	LOG	SOIL AND ROCK DESCRIPTION	
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			NO.
16.5					Ground Surface								
16.5	0.0	33	30	9							SS-1	16.5	ARTIFICIAL FILL: Silty GRAVEL with sand (GM), grayish brown (10YR 5/2), dense, dry to moist, fine to coarse gravel
14.0	2.5	5	5	4							SS-2	14.5	ARTIFICIAL FILL: Poorly graded SAND with gravel (SP), dark gray (10YR 4/1), loose, wet, fine to medium sand, little fine gravel
11.5	5.0	WOH	2	2							SS-3	12.0	HYDRAULIC FILL: SILT (ML), very dark gray (2.5Y 3/1), soft, moist to wet, trace fine sand, PP=0.5 tsf
9.0	7.5	2	1	2							SS-4		7.5ft: Wet
6.5	10.0	2	4	3							SS-5		10.0ft: Medium stiff
4.0	12.5	2	1	1							SS-6	3.7	
1.5	15.0	WOH	WOH	2							SS-7	2.0	HYDRAULIC FILL: Poorly graded SAND (SP), dark gray (2.5Y 4/1), very loose, wet, fine to coarse sand, trace organics
		WOH	WOH	2									HYDRAULIC FILL: Sandy SILT (ML), very dark gray (2.5Y 3/1), very soft, wet, some fine sand, trace organics, PP=0.0 tsf
-3.5	20.0	WOH	WOH	2							SS-8		
		WOH	WOH	2								-8.5	HYDRAULIC FILL: FAT CLAY with sand (CH), very dark gray (2.5Y 3/1), very soft, wet, few to little fine sand, trace organics, PP=0.0 tsf
-8.5	25.0	WOH	WOH	WOH							SS-9	-11.0	HYDRAULIC FILL: FAT CLAY (CH), very dark gray (2.5Y 3/1), very soft, wet, trace fine sand, trace organics, PP=0.5 tsf
		WOH	WOH	WOH							SS-10		
-13.5	30.0	WOH	WOH	WOH							SS-11		35.0ft: Moist to wet, trace fine sand partings, PP=0.0 tsf
		WOH	WOH	WOH								-21.5	ALLUVIUM: Poorly graded SAND with silt and gravel (SP-SM), gray (5Y 5/1), medium dense, wet, fine to coarse sand, little fine to coarse subrounded to rounded gravel
-18.5	35.0	5	8	10							SS-12	-27.5	ALLUVIUM: LEAN CLAY with sand (CL), dark greenish gray (10Y 4/1), medium stiff, moist to wet, little fine to medium sand, PP=0.75 tsf
		5	2	4							SS-13		50.0ft: Moist, PP=1.25 tsf
-23.5	40.0	WOH	2	3							SS-14	-36.5	KIRKWOOD FORMATION: FAT CLAY (CH), very dark greenish gray (10Y 3/1), medium stiff, wet, few fine sand, trace organics, PP=1.25 tsf
		WOH	2	5							SS-15	53.0	

PSEG ESP BORE PSEG ESP 7-07-09 GP1 PSEG ESP GDT 7/10/09



PERMIT NO.: P200900124			DRILLER: D. Osuch / R. Bartholomew			NJ LICENSE NO.: 0024289 / 0001383			GEOLOGIST: M. Lear				
SITE DESCRIPTION: PSEG SITE ESP APPLICATION					COUNTY: Salem, NJ			MACTEC PROJECT NO.: 6468-08-2251			FLUID LEVEL (ft)		
BORING NO.: EB-3		DRILL METHOD: Mud Rotary			SAMPLE METHODS: SPT			0 HR.		ND			
GROUND SURFACE ELEV.: 16.5		US ft (NAVD88)		NORTHING: 232349.0		US ft (NAD83)		EASTING: 202473.9		US ft (NAD83)		24 HR.	13.8
TOTAL DEPTH: 631.5 ft		DRILL MACHINE: CME-75 Truck			CASING DEPTH: 53.7 ft			HAMMER (ID): 140 lb Auto. (CTB-3)					
DATE STARTED: 1/24/09		COMPLETED: 2/17/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag & Roller Cone Bits					
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT					SAMP.	LOG	SOIL AND ROCK DESCRIPTION	
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
-39.6					Continued from previous page								
-41.5													58.0
-43.5	60.0	3	3	4							SS-16		KIRKWOOD FORMATION: Silty SAND (SM), very dark greenish gray (10Y 3/1), loose, wet, fine sand, few organics
-46.5													63.0
-48.5	65.0	WOH	WOH	2							SS-17		KIRKWOOD FORMATION: FAT CLAY (CH), very dark greenish gray (10Y 3/1), very soft, moist to wet, trace fine sand, trace organics, trace shell fragments, PP=0.0 tsf
-53.5	70.0	WOH	3	4							SS-18		70.0ft: Medium stiff, moist, PP=1.25 tsf
-58.5	75.0	WOH	WOH	2							SS-19		75.0ft: Very soft, PP=1.25 tsf
-63.5	80.0	WOH	WOH	WOH							SS-20		80.0ft: Little fine to medium sand, PP=0.75 tsf
-68.5	85.0	WOH	WOH	WOH							SS-21		85.0ft: PP=0.75 tsf
-73.5	90.0	WOR	WOR	WOH							SS-22		90.0ft: Olive gray (5Y 4/2), PP=0.0 tsf
-77.0													93.5ft: Harder drilling
-78.5	95.0	4	9	14							SS-23		KIRKWOOD FORMATION: Poorly graded SAND with silt (SP-SM), dark olive gray (5Y 3/2), medium dense, wet, fine to coarse sand, few fines, no HCl reaction
-83.5	100.0	6	7	6							SS-24		
-85.5													102.0
-88.5	105.0	24	27	18							SS-25		KIRKWOOD FORMATION: Poorly graded GRAVEL with sand (GP), dark gray (5Y 4/1), dense, wet, little fine to coarse sand, fine to coarse subrounded to subangular gravel, trace fines
-90.5													107.0
-93.5	110.0	24	13	58							SS-26		VINCENTOWN FORMATION: Silty SAND (SM), greenish gray (5GY 5/1), very dense, moist to wet, fine to medium sand, few friable to moderately indurated layers, strong HCl reaction, few glauconite

PSEG ESP BORE PSEG ESP 7-07-09 GP1 PSEG ESP GDI 7/10/09



PERMIT NO.: P200900124		DRILLER: D. Osuch / R. Bartholomew		NJ LICENSE NO.: 0024289 / 0001383		GEOLOGIST: M. Lear							
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251		FLUID LEVEL (ft)					
BORING NO.: EB-3		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT				0 HR.	ND				
GROUND SURFACE ELEV.: 16.5		US ft (NAVD88)		NORTHING: 232349.0		US ft (NAD83)		EASTING: 202473.9		US ft (NAD83)		24 HR.	13.8
TOTAL DEPTH: 631.5 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 53.7 ft		HAMMER (ID): 140 lb Auto. (CTB-3)							
DATE STARTED: 1/24/09		COMPLETED: 2/17/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag & Roller Cone Bits					
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT					SAMP.	LOG	SOIL AND ROCK DESCRIPTION	
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			NO.
-95.7					Continued from previous page								
-98.5	115.0												VINCENTOWN FORMATION: Silty SAND (SM), greenish gray (5GY 5/1), very dense, moist to wet, fine to medium sand, few friable to moderately indurated layers, strong HCl reaction, few glauconite (continued)
		15	11	26						37	SS-27	115.0ft: Dense, wet	
-103.5	120.0												
		9	10	21						31	SS-28	120.0ft: Few friable layers, weak HCl reaction	
													122ft: Bit chatter to 124ft
-108.1	124.6												
		9	10	12						22	SS-29	124.6ft: Medium dense, trace glauconite	
-113.1	129.6												
		12	13	19						32	SS-30	129.6ft: Greenish gray (10Y 5/1), dense, trace friable layers	
													-Bit chatter drilling to 134.6ft
-118.1	134.6												
		50/0.5											
										50/0.5	SS-31	134.6ft: Very dense, moist, trace moderately indurated to indurated layers	
													-Bit chatter from 135ft to 137ft and 138ft to 139ft
-123.1	139.6												
		7	8	92/0.2									
										100/0.7	SS-32	139.6ft: Trace moderately indurated layers	
													-Bit chatter from 141ft to 143ft
-128.1	144.6												
		62	28	25									
										53	SS-33	-127.5 HORNERSTOWN FORMATION: Clayey SAND (SC), greenish gray (10Y 5/1), very dense, moist to wet, fine to medium sand, trace to few moderately indurated layers, weak to strong HCl reaction, trace glauconite	
-133.1	149.6												
		3	8	14						22	SS-34	-Slight bit chatter from 148ft to 149ft	
													149.6ft: Medium dense, weak HCl reaction, trace to few glauconite
-138.1	154.6												
		5	53	47/0.1									
										100/0.6	SS-35	154.6ft: Very dense, trace moderately indurated layers	
-143.1	159.6												
		23	40	29									
										69	SS-36	159.6ft: Moist, trace friable layers, strong HCl reaction, few to little glauconite	
-148.1	164.6												
		25	75/0.2										
										100/0.7	SS-37	-147.5 NAVESINK FORMATION: Silty SAND (SM), very dark greenish gray (5GY 3/1), very dense, moist, fine to medium sand, trace shell fragments, trace moderately indurated layers, weak HCl reaction, some to mostly glauconite	
													164.0

PSEG ESP BORE PSEG ESP 7-07-09.GPJ PSEG ESP.GDT 7/10/09



PERMIT NO.: P200900124		DRILLER: D. Osuch / R. Bartholomew		NJ LICENSE NO.: 0024289 / 0001383		GEOLOGIST: M. Lear									
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251		FLUID LEVEL (ft)							
BORING NO.: EB-3		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT				0 HR. ND							
GROUND SURFACE ELEV.: 16.5 US ft (NAVD88)		NORTHING: 232349.0 US ft (NAD83)		EASTING: 202473.9 US ft (NAD83)				24 HR. 13.8							
TOTAL DEPTH: 631.5 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 53.7 ft				HAMMER (ID): 140 lb Auto. (CTB-3)							
DATE STARTED: 1/24/09		COMPLETED: 2/17/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag & Roller Cone Bits							
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION			
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100					
-151.8					Continued from previous page										
-153.1	169.6	30	25	35							SS-38		NAVESINK FORMATION: Silty SAND (SM), very dark greenish gray (5GY 3/1), very dense, moist, fine to medium sand, trace shell fragments, trace moderately indurated layers, weak HCl reaction, some to mostly glauconite (continued) 169.6ft: Greenish black (10Y 2.5/1), moist to wet, trace to few shell fragments, no HCl reaction, mostly glauconite		
-158.1	174.6	16	23	26							SS-39		169.6ft: Greenish black (10Y 2.5/1), moist to wet, trace to few shell fragments, no HCl reaction, mostly glauconite		
-163.1	179.6	20	38	48							SS-40		NAVESINK FORMATION: Clayey SAND (SC), greenish black (10Y 2.5/1), dense, moist, fine to medium sand, trace shell fragments, weak HCl reaction, mostly glauconite		
-168.1	184.6	13	30	33							SS-41		NAVESINK FORMATION: Silty SAND (SM), greenish black (10Y 2.5/1), very dense, moist, fine to medium sand, trace shell fragments, weak HCl reaction, mostly glauconite		
-173.1	189.6	25	39	61/0.1							SS-42		MOUNT LAUREL FORMATION: Clayey SAND (SC), dark olive gray (5Y 3/2), very dense, moist, fine to coarse subrounded sand, few to little shell fragments, weak HCl reaction, some glauconite		
-178.1	194.6	100/0.4									SS-43		189.6ft: Trace shell fragments, little glauconite		
-183.1	199.6	100/0.4									SS-44		194.6ft: Trace to few shell fragments, trace glauconite		
-193.1	209.6	17	27	39							SS-45		MOUNT LAUREL FORMATION: Silty SAND (SM), olive gray (5Y 4/2), very dense, moist, fine to coarse subrounded to subangular sand, trace fine gravel, trace shell fragments, weak to no HCl reaction, trace glauconite		
-203.1	219.6	25	40	60							SS-46				

PSEG ESP BORE PSEG ESP 7-07-09.GPJ PSEG ESP.GDT 7/10/09

PERMIT NO.: P200900124			DRILLER: D. Osuch / R. Bartholomew			NJ LICENSE NO.: 0024289 / 0001383			GEOLOGIST: M. Lear				
SITE DESCRIPTION: PSEG SITE ESP APPLICATION						COUNTY: Salem, NJ			MACTEC PROJECT NO.: 6468-08-2251			FLUID LEVEL (ft)	
BORING NO.: EB-3			DRILL METHOD: Mud Rotary			SAMPLE METHODS: SPT			0 HR.		ND		
GROUND SURFACE ELEV.: 16.5 US ft (NAVD88)			NORTHING: 232349.0 US ft (NAD83)			EASTING: 202473.9 US ft (NAD83)			24 HR.		13.8		
TOTAL DEPTH: 631.5 ft			DRILL MACHINE: CME-75 Truck			CASING DEPTH: 53.7 ft			HAMMER (ID): 140 lb Auto. (CTB-3)				
DATE STARTED: 1/24/09			COMPLETED: 2/17/09			HOLE DIA.: 4"			ROD TYPE: NWJ		BITS USED: 3-7/8" Drag & Roller Cone Bits		
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	▼	L O G	SOIL AND ROCK DESCRIPTION
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
-207.9					Continued from previous page								
-213.1	229.6												MOUNT LAUREL FORMATION: Silty SAND (SM), olive gray (5Y 4/2), very dense, moist, fine to coarse subrounded to subangular sand, trace fine gravel, trace shell fragments, weak to no HCl reaction, trace glauconite (<i>continued</i>)
		50	42/0.2										
-223.1	239.6												239.6ft: Fine to medium subrounded to subangular sand, trace fine gravel, no HCl reaction, few glauconite -Intermittent bit chatter from 239.6ft to 249.6ft
		56	44/0.2										
-233.1	249.6												
		45	55/0.4										
-243.1	259.6												
		39	55	45/0.3									
-253.1	269.6												269.6ft: Weak HCl reaction
		40	60/0.4										
-263.1	279.6												
		37	55	45/0.3									

[illegible]



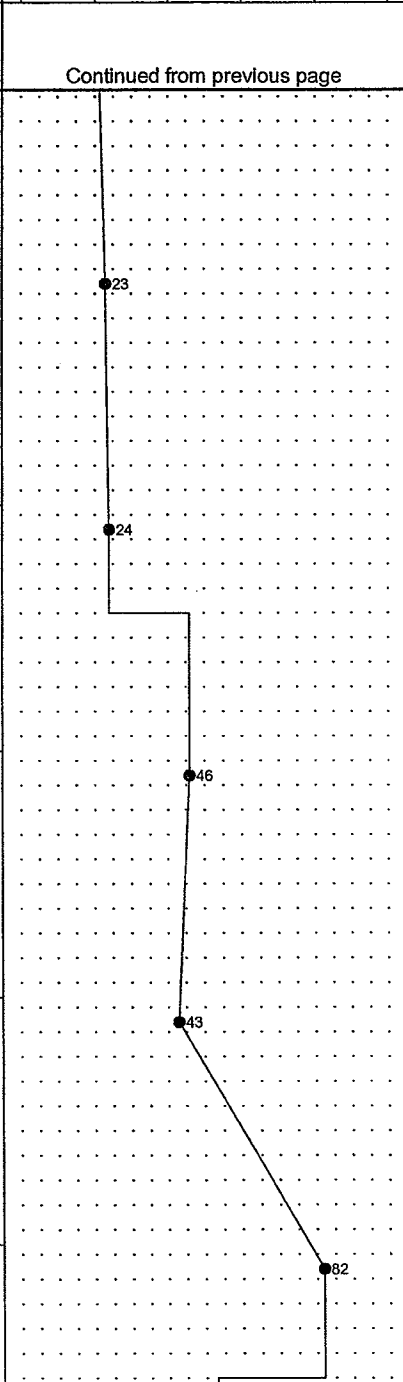
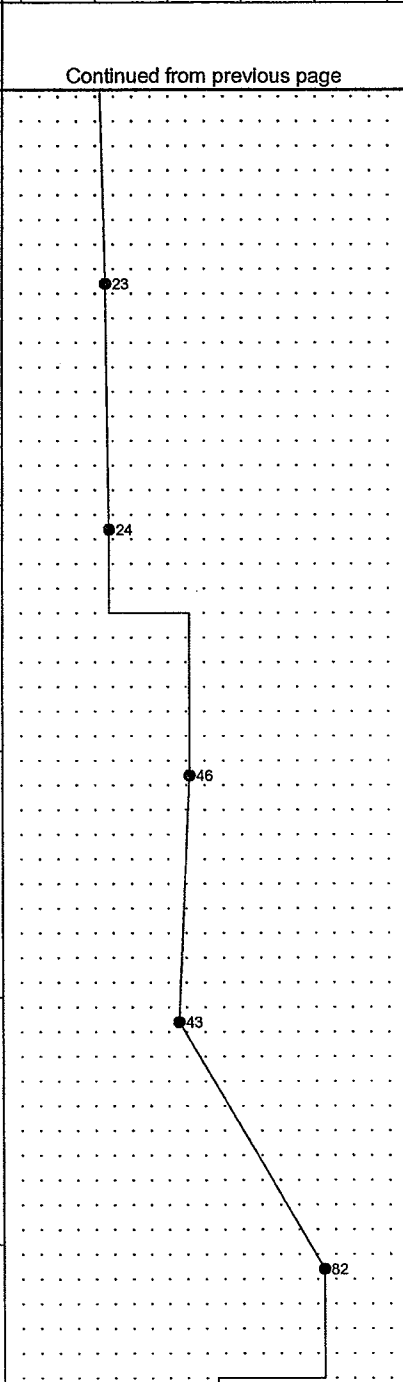
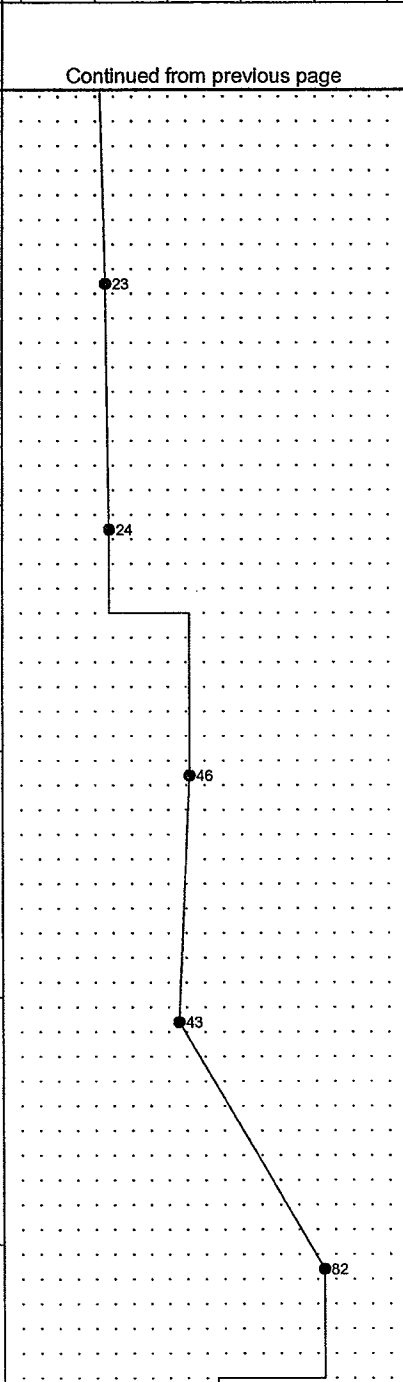
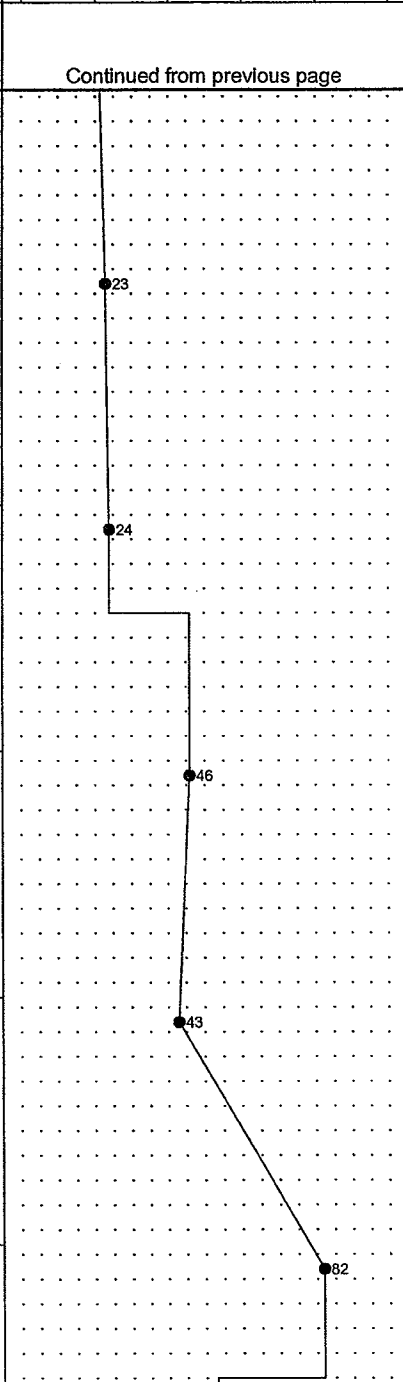
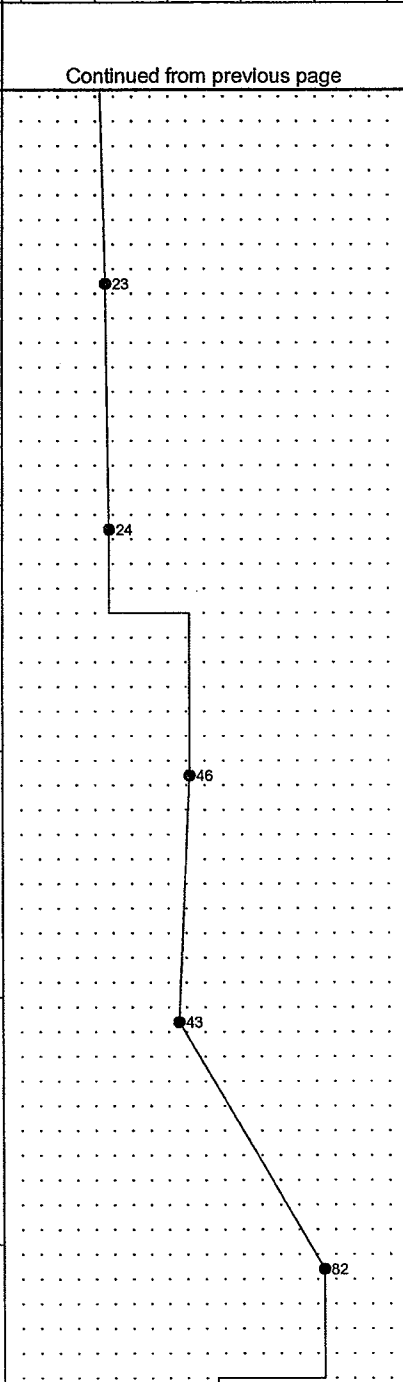
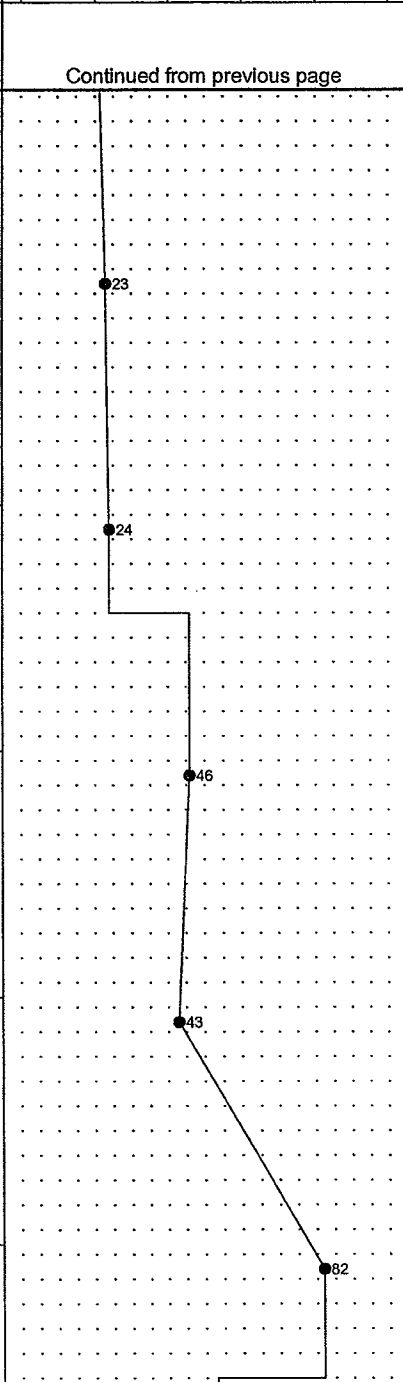
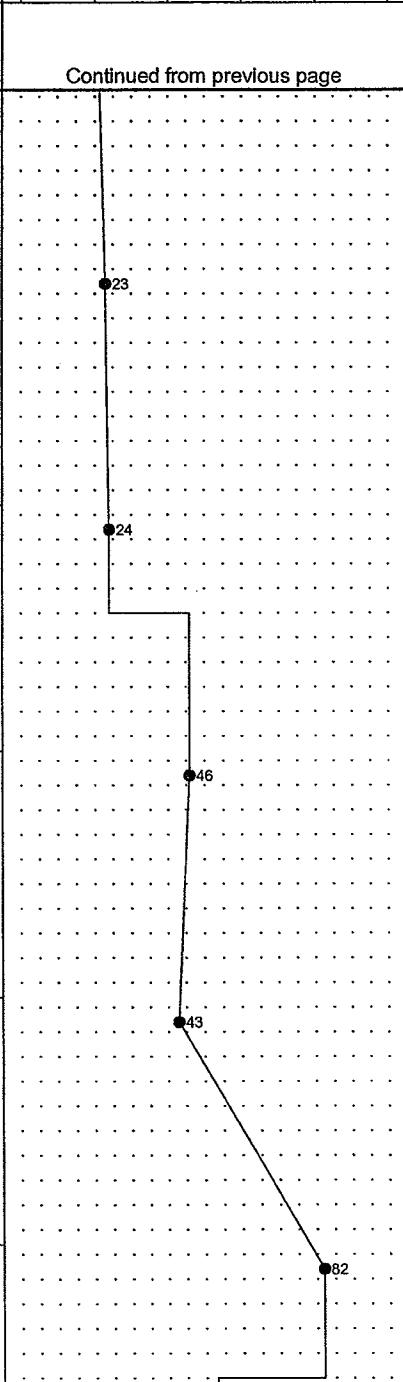
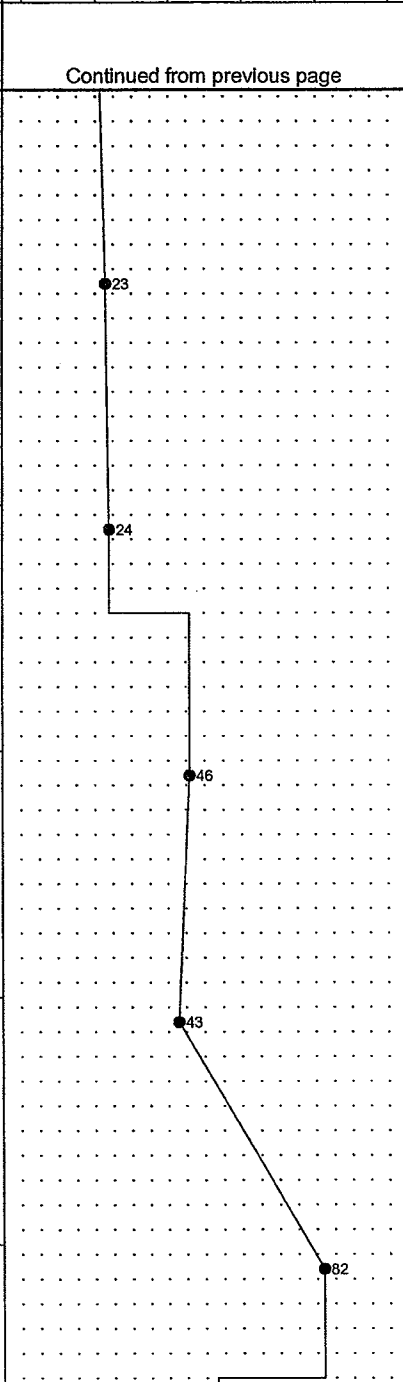
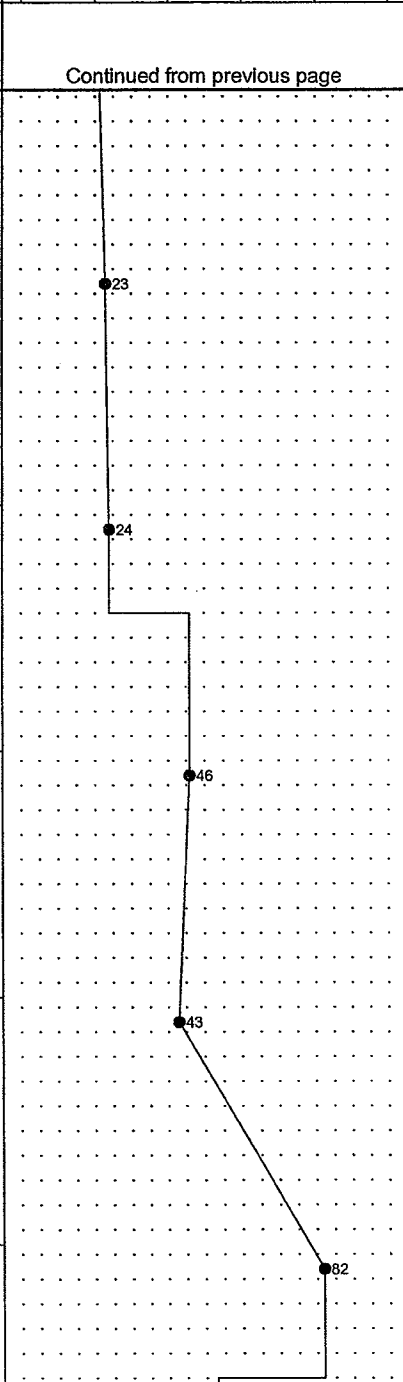
SHEET 7 OF 12

PERMIT NO.: P200900124		DRILLER: D. Osuch / R. Bartholomew		NJ LICENSE NO.: 0024289 / 0001383		GEOLOGIST: M. Lear	
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251	
BORING NO.: EB-3		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT		FLUID LEVEL (ft)	
GROUND SURFACE ELEV.: 16.5 US ft (NAVD88)		NORTHING: 232349.0 US ft (NAD83)		EASTING: 202473.9 US ft (NAD83)		0 HR. ND	
TOTAL DEPTH: 631.5 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 53.7 ft		HAMMER (ID): 140 lb Auto. (CTB-3)	
DATE STARTED: 1/24/09		COMPLETED: 2/17/09		HOLE DIA.: 4"		ROD TYPE: NWJ	
BITS USED: 3-7/8" Drag & Roller Cone Bits							

ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
		0.5ft	0.5ft	0.5ft	0	20	40	60	80			
-320.2					Continued from previous page							
-323.1	339.6	7	11	17								ENGLISHTOWN FORMATION: Sandy LEAN CLAY (CL), black (5Y 2.5/1), very stiff, moist, some fine sand, trace coarse sand, trace shell fragments, micaceous, weak HCl reaction, few to little glauconite, PP=3.25 tsf (continued)
-333.1	349.6	2	4	6								349.6ft: Stiff, trace glauconite, PP=1.75 tsf
-343.1	359.6	3	6	12								ENGLISHTOWN FORMATION: ELASTIC SILT (MH), black (5Y 2.5/1), very stiff, dry to moist, trace fine sand, trace shell fragments, weak to no HCl reaction, micaceous
-353.1	369.6	WOR	6	16								369.6ft: PP=3.5 tsf
-363.1	379.6	WOR	7	14								379.6ft: PP=3.5 tsf
-373.1	389.6	WOR	4	17								WOODBURY FORMATION: FAT CLAY (CH), black (5Y 2.5/1), very stiff, dry to moist, trace shell fragments, weak HCl reaction, micaceous, PP=>4.5 tsf

PSEG ESP BORE PSEG ESP 7-07-09.GPJ PSEG ESP.GDT 7/10/09



PERMIT NO.: P200900124		DRILLER: D. Osuch / R. Bartholomew		NJ LICENSE NO.: 0024289 / 0001383		GEOLOGIST: M. Lear											
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251		FLUID LEVEL (ft)									
BORING NO.: EB-3		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT				0 HR.	ND								
GROUND SURFACE ELEV.: 16.5 US ft (NAVD88)		NORTHING: 232349.0 US ft (NAD83)		EASTING: 202473.9 US ft (NAD83)				24 HR.	13.8								
TOTAL DEPTH: 631.5 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 53.7 ft		HAMMER (ID): 140 lb Auto. (CTB-3)											
DATE STARTED: 1/24/09		COMPLETED: 2/17/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag & Roller Cone Bits									
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	▼	L O G	SOIL AND ROCK DESCRIPTION				
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100							
-376.3					Continued from previous page												
																	WOODBURY FORMATION: FAT CLAY (CH), black (5Y 2.5/1), very stiff, dry to moist, trace shell fragments, weak HCl reaction, micaceous, PP=>4.5 tsf (continued)
-383.1	399.6	2	7	16							SS-64						
																	
-393.1	409.6	3	7	17							SS-65						
																	
-403.1	419.6	13	23	23							SS-66			MERCHANTVILLE FORMATION: SILT (ML), greenish black (10Y 2.5/1), hard, moist, trace fine sand, trace friable layers, trace mica, weak HCl reaction, few to little glauconite, PP=3.5 tsf			
																	
-413.1	429.6	14	17	26							SS-67			429.6ft: PP=4.0 tsf			
																	
-423.1	439.6	7	11	71							SS-68			MERCHANTVILLE FORMATION: LEAN CLAY (CL), greenish black (10Y 2.5/1), hard, dry to moist, trace fine sand, trace friable to moderately indurated layers, no HCl reaction, few glauconite, PP=3.25 to 4.5 tsf			
																	
																	
																	MAGOTHY FORMATION: FAT CLAY (CH), gray (5YR 5/1) and very dark gray (2.5Y 3/1) mottled, hard, dry to moist, carbonaceous, trace lignite, no HCl reaction, PP=2.5 to >4.5 tsf
																	

PSEGE ESP BORE PSEGE ESP 7-07-09.GPJ PSEGE ESP.GDT 7/10/09

[illegible]

[illegible]



PERMIT NO.: P200900124		DRILLER: D. Osuch / R. Bartholomew		NJ LICENSE NO.: 0024289 / 0001383		GEOLOGIST: M. Lear							
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251							
BORING NO.: EB-3		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT		FLUID LEVEL (ft)							
						0 HR. ND							
GROUND SURFACE ELEV.: 16.5 US ft (NAVD88)		NORTHING: 232349.0 US ft (NAD83)		EASTING: 202473.9 US ft (NAD83)		24 HR. 13.8							
TOTAL DEPTH: 631.5 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 53.7 ft		HAMMER (ID): 140 lb Auto. (CTB-3)							
DATE STARTED: 1/24/09		COMPLETED: 2/17/09		HOLE DIA.: 4"		ROD TYPE: NWJ							
						BITS USED: 3-7/8" Drag & Roller Cone Bits							
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
-544.6					Continued from previous page								
													POTOMAC FORMATION: SAND-Interpreted from geophysical log (continued)
													565.0ft: Driller indicates change in drill response drilling from 565ft to 575ft
													-551.5 POTOMAC FORMATION: LEAN CLAY (CL)-Interpreted from geophysical log 568.0
													-Change in drill fluid color from gray to reddish tint observed drilling from 575ft to 580ft

PERMIT NO.: P200900124			DRILLER: D. Osuch / R. Bartholomew			NJ LICENSE NO.: 0024289 / 0001383			GEOLOGIST: M. Lear					
SITE DESCRIPTION: PSEG SITE ESP APPLICATION					COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251			FLUID LEVEL (ft)				
BORING NO.: EB-3		DRILL METHOD: Mud Rotary			SAMPLE METHODS: SPT			0 HR.		ND				
GROUND SURFACE ELEV.: 16.5 US ft (NAVD88)			NORTHING: 232349.0 US ft (NAD83)			EASTING: 202473.9 US ft (NAD83)			24 HR.		13.8			
TOTAL DEPTH: 631.5 ft			DRILL MACHINE: CME-75 Truck			CASING DEPTH: 53.7 ft			HAMMER (ID): 140 lb Auto. (CTB-3)					
DATE STARTED: 1/24/09		COMPLETED: 2/17/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag & Roller Cone Bits						
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION		
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100				
-600.7					Continued from previous page									
												POTOMAC FORMATION: LEAN CLAY (CL)-Interpreted from geophysical log (continued)		
-613.5	630.0	15	25	46	71					SS-70		-615.0	631.5	POTOMAC FORMATION: LEAN CLAY (CL), gray (5YR 6/1) and reddish brown (5YR 4/4) mottled, hard, moist to dry, trace fine sand, no HCl reaction, PP=>4.5 tsf Boring terminated at 631.5 feet. Boring closed by tremie method with cement-bentonite grout on 2/18/09.

7-07-09.GPJ PSEG ESP.GDT 7/10/09



PERMIT NO.: P200901785		DRILLER: T. Ward		NJ LICENSE NO.: 0001105		GEOLOGIST: J. Howard							
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251							
BORING NO.: EB-3UD		DRILL METHOD: Mud Rotary		SAMPLE METHODS: Shelby/Osterburg/Pitcher		FLUID LEVEL (ft)							
GROUND SURFACE ELEV.: 16.4 US ft (NAVD88)		NORTHING: 232350.2 US ft (NAD83)		EASTING: 202492.3 US ft (NAD83)		0 HR. ND							
TOTAL DEPTH: 226.2 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 24.0 ft		HAMMER (ID): 140 lb Auto. (CBT-1)							
DATE STARTED: 3/6/09		COMPLETED: 3/11/09		HOLE DIA.: 6"		ROD TYPE: NWJ							
BITS USED: 5-7/8" Drag Bit													
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
-39.7					Continued from previous page								
-47.6	64.0									UD-8		to 55.0ft then Silty SAND (SM), dark gray (N 4), moist, fine to medium sand, no HCl reaction; recovery=0.8ft KIRKWOOD FORMATION (continued)	
-51.6	68.0									UD-9		64.0ft: Shelby tube UD-8 pushed to 66.0ft; recovery=0.0ft	
-55.9	72.3									UD-10		68.0ft: Shelby tube UD-9 pushed to 70.0ft; recovery=0.0ft -Change sample method to Osterburg Sampler	
-62.2	78.6									UD-11		72.3ft: Shelby tube UD-10 pushed to 74.3ft in LEAN CLAY (CL), very dark greenish gray (10Y 3/1), moist, no HCl reaction; recovery=1.9ft; TV=1.6 tsf; PP=2.5 tsf	
-65.7	82.1									UD-12		78.6ft: Shelby tube UD-11 pushed to 80.6ft in FAT CLAY (CH), dark greenish gray (10Y 4/1), moist, no HCl reaction; recovery=1.8ft; TV=1.5 tsf; PP=1.75 tsf	
-71.6	88.0									UD-13		82.1ft: Shelby tube UD-12 pushed to 84.1ft in FAT CLAY (CH), dark greenish gray (10Y 4/1), moist, no HCl reaction; recovery=1.8ft; TV=1.6 tsf; PP=1.75 tsf	
-90.6												88.0ft: Shelby tube UD-13 pushed to 90.0ft in FAT CLAY (CH), dark greenish gray (10Y 4/1), moist, no HCl reaction, trace mica; recovery=1.9ft; TV=1.7 tsf; PP=1.75 tsf	
-93.6	110.0									UD-14		VINCENTOWN FORMATION -Change sample method to Pitcher Barrel Sampler	
												110.0ft: Pitcher tube UD-14 advanced to 112.5ft in Silty SAND (SM), light gray (N 7), wet, fine sand, strong HCl reaction, with indurated layers;	

PSEG ESP BORE PSEG ESP 7-07-09 GP1 PSEG ESP GDT 7/10/09



PERMIT NO.: P200901785		DRILLER: T. Ward		NJ LICENSE NO.: 0001105		GEOLOGIST: J. Howard							
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251							
BORING NO.: EB-3UD		DRILL METHOD: Mud Rotary		SAMPLE METHODS: Shelby/Osterburg/Pitcher		FLUID LEVEL (ft)							
GROUND SURFACE ELEV.: 16.4 US ft (NAVD88)		NORTHING: 232350.2 US ft (NAD83)		EASTING: 202492.3 US ft (NAD83)		0 HR. ND							
						24 HR. 9.5							
TOTAL DEPTH: 226.2 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 24.0 ft		HAMMER (ID): 140 lb Auto. (CBT-1)							
DATE STARTED: 3/6/09		COMPLETED: 3/11/09		HOLE DIA.: 6"		ROD TYPE: NWJ							
						BITS USED: 5-7/8" Drag Bit							
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
-95.8					Continued from previous page								
-97.4	113.8										UD-15		recovery=1.3ft VINCENTOWN FORMATION -Change sample method to Pitcher Barrel Sampler (continued) 113.8ft: Pitcher tube UD-15 advanced to 116.3ft in Silty SAND (SM), light gray (N 7/), wet, fine sand, strong HCl reaction; recovery=1.8ft
-101.5	117.9										UD-16		117.9ft: Pitcher tube UD-16 advanced to 120.4ft in Silty SAND (SM), light gray (N 7/), wet, fine to medium sand, strong HCl reaction; recovery=1.8ft
-105.6	122.0										UD-17		122.0ft: Pitcher tube UD-17 advanced to 124.5ft in Silty SAND (SM), light gray (N 7/), wet, fine sand, strong HCl reaction, with indurated layers; recovery=0.2ft
-110.7	127.1										UD-18		127.1ft: Pitcher tube UD-18 advanced to 129.6ft in Silty SAND (SM), dark greenish gray (10Y 4/1), moist, fine sand, strong HCl reaction, with friable to moderately indurated layers; recovery=1.5ft
-115.0	131.4										UD-19		131.4ft: Pitcher tube UD-19 advanced to 133.9ft in Silty SAND (SM), dark greenish gray (10Y 4/1), moist, fine to medium sand, strong HCl reaction, with moderately indurated to indurated layers; recovery=0.9ft
-123.7	140.1										UD-20		140.1ft: Pitcher tube UD-20 advanced to 142.5ft in Clayey SAND (SC), greenish gray (5G 6/1), moist, fine sand, strong HCl reaction; recovery=0.4ft
													-127.6 HORNERSTOWN FORMATION 144.0
-132.8	149.2										UD-21		149.2ft: Pitcher tube UD-21 advanced to 151.7ft in Silty SAND (SM), greenish gray (10Y 6/1), moist, fine to medium sand, strong HCl reaction, with indurated layers; recovery=2.3ft
-135.1	151.5										UD-22		151.5ft: Pitcher tube UD-22 advanced to 154.0ft in Silty SAND (SM), greenish gray (10Y 6/1), moist, fine to medium sand, strong HCl reaction, with indurated layers; recovery=1.0ft
-143.6	160.0										UD-23		160.0ft: Pitcher tube UD-23 advanced to 161.2ft in Silty SAND (SM), dark greenish gray (5GY 4/1), moist, fine to medium sand, strong HCl reaction, some glauconite; recovery=1.2ft
													-147.6 NAVESINK FORMATION 164.0
-151.8	168.2												

PSEG ESP BORE PSEG ESP 7-07-09.GP1 PSEG ESP.GDI 7/10/09



PERMIT NO.: P200901785		DRILLER: T. Ward		NJ LICENSE NO.: 0001105		GEOLOGIST: J. Howard							
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251							
BORING NO.: EB-3UD		DRILL METHOD: Mud Rotary		SAMPLE METHODS: Shelby/Osterburg/Pitcher									
GROUND SURFACE ELEV.: 16.4 US ft (NAVD88)		NORTHING: 232350.2 US ft (NAD83)		EASTING: 202492.3 US ft (NAD83)		FLUID LEVEL (ft) 0 HR. ND 24 HR. 9.5							
TOTAL DEPTH: 226.2 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 24.0 ft		HAMMER (ID): 140 lb Auto. (CBT-1)							
DATE STARTED: 3/6/09		COMPLETED: 3/11/09		HOLE DIA.: 6"		ROD TYPE: NWJ							
						BITS USED: 5-7/8" Drag Bit							
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
-151.9					Continued from previous page								
-155.3	171.7										UD-24		168.2ft: Pitcher tube UD-24 advanced to 170.7ft in Silty SAND (SM), greenish black (10GY 2.5/1), wet, fine to medium sand, strong HCl reaction, mostly glauconite; recovery=0.8ft
-159.6	176.0										UD-25		NAVESINK FORMATION (continued) 171.7ft: Pitcher tube UD-25 advanced to 174.2ft in Silty SAND (SM), dark greenish gray (5GY 4/1), moist, fine to medium sand, strong HCl reaction, mostly glauconite, few shell fragments; recovery=0.5ft
-163.6	180.0										UD-26		176.0ft: Pitcher tube UD-26 advanced to 178.5ft in Clayey SAND (SC), greenish black (5GY 2.5/1), moist, fine to medium sand, strong HCl reaction, mostly glauconite, few shell fragments; recovery=2.0ft
-167.6	184.0										UD-27		180.0ft: Pitcher tube UD-27 advanced to 182.5ft in Silty SAND (SM), very dark grayish green (5G 3/2), moist, fine to medium sand, weak HCl reaction, mostly glauconite; recovery=1.0ft
-171.9	188.3										UD-28		MOUNT LAUREL FORMATION 184.0ft: Pitcher tube UD-28 advanced to 186.5ft in Clayey SAND (SC), very dark grayish green (5G 2.5/2), to dark greenish gray (10Y 4/1), moist, fine to medium sand, no to strong HCl reaction; recovery=2.4ft
											UD-29		188.3ft: Pitcher tube UD-29 advanced to 189.8ft; recovery=0.0ft, tube damaged and discarded
-185.6	202.0										UD-30		202.0ft: Pitcher tube UD-30 advanced to 204.5ft in Silty SAND (SM), olive gray (5Y 4/2), moist, fine to medium sand, strong HCl reaction; recovery=1.2ft
-191.6	208.0										UD-31		208.0ft: Pitcher tube UD-31 advanced to 210.5ft in Clayey, Silty SAND (SC-SM), olive gray (5Y 4/2), moist, fine to medium sand, strong HCl reaction; recovery=2.5ft
-203.7	220.1										UD-32		220.1ft: Pitcher tube UD-32 advanced to 222.6ft in Silty SAND (SM), olive gray (5Y 4/2), moist, fine to medium sand, strong HCl reaction; recovery=1.2ft
-207.8	224.2												

PSEG ESP BORE PSEG ESP 7-07-09.GPJ PSEG ESP.GDI 7/10/09



SHEET 5 OF 5

PERMIT NO.: P200901785		DRILLER: T. Ward		NJ LICENSE NO.: 0001105		GEOLOGIST: J. Howard							
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251							
BORING NO.: EB-3UD		DRILL METHOD: Mud Rotary		SAMPLE METHODS: Shelby/Osterburg/Pitcher		FLUID LEVEL (ft)							
GROUND SURFACE ELEV.: 16.4 US ft (NAVD88)		NORTHING: 232350.2 US ft (NAD83)		EASTING: 202492.3 US ft (NAD83)		0 HR. ND							
						24 HR. 9.5							
TOTAL DEPTH: 226.2 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 24.0 ft		HAMMER (ID): 140 lb Auto. (CBT-1)							
DATE STARTED: 3/6/09		COMPLETED: 3/11/09		HOLE DIA.: 6"		ROD TYPE: NWJ							
						BITS USED: 5-7/8" Drag Bit							
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
-208.0					Continued from previous page					UD-33			
													224.2ft: Pitcher tube UD-33 advanced to 226.2ft in Silty SAND (SM), olive gray (5Y 4/2), moist, fine to medium sand, strong HCl reaction; recovery=0.0ft, tube destroyed in extraction, sample jarred MOUNT LAUREL FORMATION (continued)
													Boring terminated at 226.2 feet.
													Boring closed by tremie method with cement-bentonite grout on 3/11/09.

PSEG ESP BORE PSEG ESP 7-07-09 GPJ PSEG ESP.GDI 7/10/09



GEOTECHNICAL BORING LOG

Prepared By mm Date 7/16/09Checked By js Date 7/16/09

SHEET 1 OF 4

PERMIT NO.: P200804330		DRILLER: G. McAneny		NJ LICENSE NO.: 0024058		GEOLOGIST: R. Clark									
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251		FLUID LEVEL (ft)							
BORING NO.: EB-4		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT		0 HR.		ND							
GROUND SURFACE ELEV.: 20.3 US ft (NAVD88)		NORTHING: 231783.2 US ft (NAD83)		EASTING: 202017.5 US ft (NAD83)		24 HR.		3.5							
TOTAL DEPTH: 200.2 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 17.0 ft		HAMMER (ID): 140 lb Auto. (CTB-2)									
DATE STARTED: 1/8/09		COMPLETED: 1/13/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit							
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT					SAMP.	LOG	SOIL AND ROCK DESCRIPTION			
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			NO.		
20.3					Ground Surface										
20.3	0.0	29	48	17									20.3	0.0	
17.7	2.6	4	6	9									18.3	2.0	ARTIFICIAL FILL: Poorly graded GRAVEL with sand (GP), light olive brown (2.5Y 5/3) and light greenish gray (10Y 7/1), very dense, moist, angular, trace organics, weak HCl reaction
15.3	5.0	2	1	2									15.8	4.5	ARTIFICIAL FILL: Gravely LEAN CLAY (CL), brown (7.5YR 5/2), stiff, moist to wet, angular gravel, trace organics, no HCl reaction
13.0	7.3	3	2	2									13.3	7.0	HYDRAULIC FILL: FAT CLAY (CH), very dark greenish gray (10Y 3/1), soft, moist, trace fine sand
10.3	10.0	1	1	1									10.8	9.5	HYDRAULIC FILL: Poorly graded SAND with gravel (SP), greenish gray (10Y 5/1), very loose, wet, fine to coarse sand, subrounded to rounded gravel, trace fines, no HCl reaction
7.8	12.5	WOH	WOH	4									9.3	11.0	HYDRAULIC FILL: Silty SAND (SM), dark greenish gray (10Y 4/1), very loose, wet, fine sand, no HCl reaction
5.3	15.0	3	9	12									8.3	12.0	HYDRAULIC FILL: ELASTIC SILT (MH), dark greenish gray (10Y 4/1), very soft, wet, trace fine sand
2.8	17.5	4	5	5									5.8	14.5	HYDRAULIC FILL: LEAN CLAY (CL), dark greenish gray (5GY 4/1), soft, moist to wet, trace fine sand
0.5	19.8	3	4	6											HYDRAULIC FILL: Poorly graded SAND with silt (SP-SM), greenish gray (10Y 5/1), medium dense to loose, wet, fine quartz sand, trace fine subrounded to rounded gravel, no HCl reaction
-2.2	22.5	4	2	3											
-4.7	25.0	3	4	5											
-7.2	27.5	2	2	4											
-9.7	30.0	2	2	6											
-12.2	32.5	WOH	1	WOH											
-14.7	35.0	WOH	1	1											
-17.2	37.5	WOH	WOH	WOH											
-19.7	40.0	WOH	WOH	WOH											
-22.2	42.5	WOH	4	4											
-24.7	45.0	WOH	3	5											
-27.2	47.5	WOH	3	2											
-29.7	50.0	8	11	10											
-32.2	52.5	9	9	10											
-34.7	55.0	7	8	7											

PSEG ESP BORE PSEG ESP 7-07-09 G.P. PSEG ESP.GDT 7/10/09



PERMIT NO.: P200804330		DRILLER: G. McAneny		NJ LICENSE NO.: 0024058		GEOLOGIST: R. Clark						
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251		FLUID LEVEL (ft)				
BORING NO.: EB-4		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT				0 HR.	ND			
GROUND SURFACE ELEV.: 20.3 US ft (NAVD88)		NORTHING: 231783.2 US ft (NAD83)		EASTING: 202017.5 US ft (NAD83)				24 HR.	3.5			
TOTAL DEPTH: 200.2 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 17.0 ft		HAMMER (ID): 140 lb Auto. (CTB-2)						
DATE STARTED: 1/8/09		COMPLETED: 1/13/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit				
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT					SAMP.	LOG	SOIL AND ROCK DESCRIPTION
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100		
-35.8					Continued from previous page							
-37.2	57.5	9	11	13						SS-24		ALLUVIUM: Poorly graded SAND with silt (SP-SM), greenish gray (10Y 5/1), medium dense, wet, fine to medium sand, trace mica, no HCl reaction (continued)
-39.7	60.0	7	3	2						SS-25		
-42.2	62.5	WOH	WOH	WOH						SS-26		ALLUVIUM: FAT CLAY (CH), dark greenish gray (10Y 4/1), medium stiff, moist, no HCl reaction
-44.7	65.0	WOH	WOH	WOH						SS-27		62.5ft: Very soft, trace angular gravel
-47.2	67.5	1	2	4						SS-28		KIRKWOOD FORMATION: FAT CLAY (CH), dark gray (5Y 4/1), medium stiff, moist, trace organics, no HCl reaction
-49.7	70.0	WOH	2	3						SS-29		67.5ft: Greenish gray (10Y 5/1), trace fine sand
-52.2	72.5	WOH	3	4						SS-30		
-54.7	75.0	7	9	13						SS-31		KIRKWOOD FORMATION: Poorly graded SAND with silt (SP-SM), dark greenish gray (10Y 4/1), medium dense, wet, fine sand, no HCl reaction
-57.2	77.5	WOH	WOH	4						SS-32		KIRKWOOD FORMATION: FAT CLAY (CH), dark greenish gray (10Y 4/1), soft, moist, trace fine sand, trace organics, weak HCl reaction
-59.7	80.0	WOH	2	4						SS-33		77.5ft: Medium stiff, no HCl reaction
-62.2	82.5	WOH	1	3						SS-34		KIRKWOOD FORMATION: LEAN CLAY (CL), dark greenish gray (10Y 4/1), soft, moist, trace to few fine sand, trace organics, no HCl reaction
-64.7	85.0	1	1	1						SS-35		KIRKWOOD FORMATION: FAT CLAY (CH), dark gray (5Y 4/1), very soft, moist, trace organics, no HCl reaction
-67.2	87.5	WOH	3	3						SS-36		85.0ft: Medium stiff
-69.7	90.0	2	3	4						SS-37		87.5ft: Dark gray (10YR 4/1)
-72.2	92.5	WOH	WOH	WOH						SS-38		90.0ft: Dark gray (5Y 4/1), very soft
-74.7	95.0	WOH	2	4						SS-39		92.5ft: Dark gray (2.5Y 4/1), medium stiff
-77.2	97.5	WOH	WOH	WOH						SS-40		95.0ft: Very soft
-79.7	100.0	WOH	WOH	3						SS-41		97.5ft: Dark gray (2.5Y 4/1) mottled with olive yellow (2.5Y 6/6), soft
-82.2	102.5	WOH	WOH	WOH						SS-42		100.0ft: Dark gray (5Y 4/1), very soft
-84.7	105.0	WOH	WOH	2						SS-43		102.5ft: Trace laminations
-87.2	107.5	WOR	WOH	3						SS-44		105.0ft: Soft
-89.7	110.0	50/0.4								SS-45		-Bit chatter/ harder drilling at 107ft
		50/0.5										KIRKWOOD FORMATION: Poorly graded SAND with silt and gravel (SP-SM), olive gray (5Y 4/2), very dense, wet, angular to subrounded gravel, few glauconite

PSEG ESP BORE PSEG ESP 7-07-09 GPT PSEG ESP GDT 7/10/09



PERMIT NO.: P200804330		DRILLER: G. McAneny		NJ LICENSE NO.: 0024058		GEOLOGIST: R. Clark							
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251		FLUID LEVEL (ft)					
BORING NO.: EB-4		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT		0 HR.		ND					
GROUND SURFACE ELEV.: 20.3		US ft (NAVD88)		NORTHING: 231783.2 US ft (NAD83)		EASTING: 202017.5 US ft (NAD83)		24 HR. 3.5					
TOTAL DEPTH: 200.2 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 17.0 ft		HAMMER (ID): 140 lb Auto. (CTB-2)							
DATE STARTED: 1/8/09		COMPLETED: 1/13/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit					
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT					SAMP.	LOG	SOIL AND ROCK DESCRIPTION	
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			NO.
-91.9					Continued from previous page								
-92.2	112.5	7	6	9							SS-46		VINCENTOWN FORMATION: Poorly graded SAND with silt (SP-SM), olive gray (5Y 4/2), very dense, wet, fine sand, mostly moderately indurated, trace glauconite (continued)
-94.7	115.0	5	41	31							SS-47		112.5ft: Olive gray (5Y 5/2), medium dense, trace shells, strong HCl reaction, no induration
-97.2	117.5	11	8	10							SS-48		115.0ft: Greenish gray (10Y 7/1), very dense, few friable to moderately indurated layers, weak HCl reaction
-99.7	120.0										SS-49		117.5ft: Medium dense
		50/0.4											120.0ft: Very dense, little indurated layers
-102.2	122.5										SS-50		122.5ft: Mostly moderately indurated
		50/0.4											
-104.7	125.0	6	50/0.2								SS-51		125.0ft: Greenish gray (10Y 6/1), some moderately indurated layers
-107.2	127.5	9	10	42							SS-52		VINCENTOWN FORMATION: Silty SAND (SM), greenish gray (10Y 6/1), very dense, wet, fine sand, few friable to moderately indurated layers, weak HCl reaction, trace glauconite
-109.7	130.0										SS-53		130.0ft: Moist, mostly moderately indurated
		50/0.2											
-112.2	132.5	8	11	50/0.3							SS-54		132.5ft: Moist to wet
-114.7	135.0	8	14	11							SS-55		VINCENTOWN FORMATION: Clayey SAND (SC), greenish gray (10Y 6/1), medium dense, wet, fine sand, weak HCl reaction, trace glauconite
-117.2	137.5										SS-56		137.5ft: Very dense, moist, mostly moderately indurated, strong HCl reaction
		50/0.4											
-119.7	140.0										SS-57		140.0ft: Weak HCl reaction
		50/0.3											
-122.2	142.5	3	10	19							SS-58		142.5ft: Medium dense, wet, strong HCl reaction, no induration
-124.7	145.0	4	50/0.4								SS-59		145.0ft: Very dense
-127.2	147.5	9	50/0.3								SS-60		HORNERSTOWN FORMATION: Clayey SAND (SC), greenish gray (10Y 6/1), very dense, wet, fine sand, strong HCl reaction, trace glauconite
-129.7	150.0	4	50/0.3								SS-61		
-132.2	152.5	6	50/0.3								SS-62		
-134.7	155.0										SS-63		155.0ft: Mostly moderately indurated
		50/0.3											
-137.2	157.5										SS-64		
		50/0.3											
-139.7	160.0	35	18	25							SS-65		160.0ft: Dense, moist, few moderately indurated layers
-142.2	162.5	7	39	25							SS-66		HORNERSTOWN FORMATION: Silty SAND (SM), dark greenish gray (10Y 4/1), dense, moist to wet, fine sand, trace shell fragments, strong HCl reaction, few to little glauconite
-144.7	165.0	7	13	25							SS-67		
-147.2	167.5										SS-68		167.5ft: Very dense, moist, mostly indurated
		50/0.3											

PSEG ESP BORE PSEG ESP 7-07-09 GFI PSEG ESP GDT 7/10/09



PERMIT NO.: P200804330		DRILLER: G. McAneny		NJ LICENSE NO.: 0024058		GEOLOGIST: R. Clark							
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251		FLUID LEVEL (ft)					
BORING NO.: EB-4		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT		0 HR. ND		24 HR. 3.5					
GROUND SURFACE ELEV.: 20.3		US ft (NAVD88)		NORTHING: 231783.2		US ft (NAD83)		EASTING: 202017.5		US ft (NAD83)			
TOTAL DEPTH: 200.2 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 17.0 ft		HAMMER (ID): 140 lb Auto. (CTB-2)							
DATE STARTED: 1/8/09		COMPLETED: 1/13/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit					
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
-148.0					Continued from previous page								
-149.7	170.0	21	40	50/0.3									-148.7 169.0
-152.2	172.5	20	28	50									NAVESINK FORMATION: Silty SAND (SM), very dark greenish gray (10GY 3/1), very dense, wet, fine sand, trace shell fragments, trace moderately indurated layers, strong HCl reaction, mostly glauconite
-154.7	175.0	22	32	45									172.5ft: Few shell fragments
-157.2	177.5	22	33	45									175.0ft: Greenish black (10GY 2.5/1), little shell fragments, weak HCl reaction
-159.7	180.0	9	40	35									177.5ft: Very dark greenish gray (5GY 3/1)
-162.2	182.5	25	39	46									180.0ft: Trace shell fragments
-164.7	185.0	27	35	50/0.3									185.0ft: Moist, strong organic/hydrocarbon odor
-167.2	187.5	34	35	50/0.4									187.5ft: Trace shell fragments
-169.7	190.0	18	25	29									-169.2 189.5
-172.2	192.5	18	35	50									MOUNT LAUREL FORMATION: Clayey SAND (SC), dark gray (2.5Y 4/1), very dense, moist, fine to coarse rounded to subrounded sand, trace to little shell fragments, trace friable layers, strong HCl reaction, trace to little glauconite
-174.7	195.0	25	50/0.4										192.5ft: Dark gray (5Y 4/1), fine sand, trace coarse subrounded sand, trace shells, trace friable zones
-177.2	197.5	50/0.3											197.5ft: Trace to little coarse subrounded to subangular sand
-179.7	200.0	50/0.2											200.0ft: Trace coarse rounded to subrounded sand
													-179.9 200.2
													Boring terminated at 200.2 feet.
													Boring closed by tremie method with cement-bentonite grout on 1/13/09.



GEOTECHNICAL BORING LOG

Prepared By MAC Date 7/10/09
 Checked By JL2 Date 7/10/09
 SHEET 1 OF 4

PERMIT NO.: P200804331			DRILLER: T. Samuelson / M. Adams			NJ LICENSE NO.: 0001238 / 0001350			GEOLOGIST: M. Lear				
SITE DESCRIPTION: PSEG SITE ESP APPLICATION					COUNTY: Salem, NJ			MACTEC PROJECT NO.: 6468-08-2251			FLUID LEVEL (ft)		
BORING NO.: EB-5			DRILL METHOD: Mud Rotary			SAMPLE METHODS: SPT			0 HR.		ND		
GROUND SURFACE ELEV.: 13.8 US ft (NAVD88)			NORTHING: 233048.3 US ft (NAD83)			EASTING: 203016.4 US ft (NAD83)			24 HR.		5.4		
TOTAL DEPTH: 199.3 ft			DRILL MACHINE: CME-850 ATV			CASING DEPTH: 18.5 ft			HAMMER (ID): 140 lb Auto. (CTB-4)				
DATE STARTED: 1/10/09			COMPLETED: 1/14/09			HOLE DIA.: 4"			ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit		
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
13.8					Ground Surface								
13.8	0.0	2	4	6						SS-1		13.8	ARTIFICIAL FILL: LEAN CLAY (CL), dark brown (10YR 3/3), stiff, moist, few fine gravel, trace fine sand, trace organics
11.3	2.5	6	5	5						SS-2		9.3	2.5ft: Very dark grayish brown (10YR 3/2), trace fine gravel, trace to few organics
8.1	5.7	WOH	WOH	WOH						SS-3		6.3	HYDRAULIC FILL: FAT CLAY (CH), dark grayish brown (10YR 4/2), very soft, wet, trace fine sand, few organics
6.3	7.5	2	3	7						SS-4		4.3	HYDRAULIC FILL: Silty SAND (SM), very dark gray (10YR 3/1), loose, wet, fine to coarse sand, trace fine gravel, few organics
3.8	10.0	1	1	1						SS-5		1.8	HYDRAULIC FILL: Sandy SILT (ML), very dark gray (10YR 3/1), very soft, wet, some fine sand, trace organics
1.3	12.5	WOH	WOH	WOH						SS-6			HYDRAULIC FILL: FAT CLAY (CH), very dark gray (10YR 3/1), very soft, wet, trace fine sand, few organics
-1.2	15.0	WOH	WOH	WOH						SS-7			
-5.5	19.3	WOH	WOH	WOH						SS-8			19.3ft: Trace organics
-10.8	24.6	WOH	WOH	WOH						SS-9			
-15.5	29.3	WOH	WOH	WOH						SS-10			
-20.2	34.0	7	9	11						SS-11		-19.2	ALLUVIUM: Poorly graded SAND with silt (SP-SM), olive gray (5Y 4/2), medium dense, wet, fine to coarse sand, trace fine gravel
-25.2	39.0	9	9	8						SS-12		-23.2	ALLUVIUM: Poorly graded SAND with silt and gravel (SP-SM), olive gray (5Y 4/2), medium dense, wet, fine to coarse sand, little fine to coarse gravel
-30.2	44.0	7	6	7						SS-13			
-35.4	49.2	5	6	6						SS-14			49.2ft: Dark gray (5Y 4/1)
-40.2	54.0	3	4	5						SS-15		-38.2	KIRKWOOD FORMATION: Silty SAND (SM), greenish gray (10Y 5/1), loose, wet, fine sand, trace fine gravel, no HCl reaction

PSEG ESP BORE PSEG ESP 7-07-09.GPJ PSEG ESP.GDT 7/10/09



PERMIT NO.: P200804331		DRILLER: T. Samuelson / M. Adams			NJ LICENSE NO.: 0001238 / 0001350			GEOLOGIST: M. Lear				
SITE DESCRIPTION: PSEG SITE ESP APPLICATION					COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251			FLUID LEVEL (ft)		
BORING NO.: EB-5		DRILL METHOD: Mud Rotary			SAMPLE METHODS: SPT			0 HR.		ND		
GROUND SURFACE ELEV.: 13.8		US ft (NAVD88)		NORTHING: 233048.3		US ft (NAD83)		EASTING: 203016.4		US ft (NAD83)		
TOTAL DEPTH: 199.3 ft		DRILL MACHINE: CME-850 ATV			CASING DEPTH: 18.5 ft			HAMMER (ID): 140 lb Auto. (CTB-4)				
DATE STARTED: 1/10/09		COMPLETED: 1/14/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit				
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT					SAMP.	LOG	SOIL AND ROCK DESCRIPTION
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100		
-42.3					Continued from previous page							
-45.2	59.0											KIRKWOOD FORMATION: Silty SAND (SM), greenish gray (10Y 5/1), loose, wet, fine sand, trace fine gravel, no HCl reaction (continued)
		3	4	6						SS-16		
-50.2	64.0											
		6	6	8						SS-17		64.0ft: Medium dense, moist to wet
-55.2	69.0											
		9	11	13						SS-18		
-60.2	74.0											
		14	12	12						SS-19		
-65.2	79.0											
		12	16	17						SS-20		79.0ft: Dense, wet
-70.2	84.0											
		9	16	15						SS-21		84.0ft: Weak HCl reaction, orange iron staining at very end of sample
-75.2	89.0											-73.2 -Bit chatter from 87ft to 89ft 87.0
		32	31	33						SS-22		KIRKWOOD FORMATION: Poorly graded GRAVEL with sand (GP), olive gray (5Y 4/2), very dense, moist to wet, fine to coarse subrounded gravel, fine to coarse subangular to subrounded sand -Bit chatter drilling to 94.0 feet
-80.2	94.0											
		41	35	31						SS-23		94.0ft: No recovery-sample catcher inverted/mangled-same as above based on drill response
-85.2	99.0											-82.2 VINCENTOWN FORMATION: Silty SAND (SM), brown (10YR 5/3), dense to very dense, moist to wet, fine to coarse sand, trace friable layers, trace shell fragments, weak to strong HCl reaction, trace glauconite, moderately oxidized 96.0
		22	24	24						SS-24		
-90.2	104.0											
		12	25	28						SS-25		
-95.2	109.0											-Bit chatter drilling to 109ft (indurated layers)
		11	15	12						SS-26		109.0ft: Medium dense, strong HCl reaction
												-Bit chatter from 111ft to 112ft

PSEG ESP BORE PSEG ESP 7-07-09 GFI PSEG ESP GDT 7/10/09



PERMIT NO.: P200804331		DRILLER: T. Samuelson / M. Adams			NJ LICENSE NO.: 0001238 / 0001350			GEOLOGIST: M. Lear					
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251			FLUID LEVEL (ft)				
BORING NO.: EB-5		DRILL METHOD: Mud Rotary			SAMPLE METHODS: SPT			0 HR. ND					
GROUND SURFACE ELEV.: 13.8		US ft (NAVD88)		NORTHING: 233048.3		US ft (NAD83)		EASTING: 203016.4		US ft (NAD83)		24 HR. 5.4	
TOTAL DEPTH: 199.3 ft		DRILL MACHINE: CME-850 ATV			CASING DEPTH: 18.5 ft			HAMMER (ID): 140 lb Auto. (CTB-4)					
DATE STARTED: 1/10/09		COMPLETED: 1/14/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit					
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT					SAMP.	LOG	SOIL AND ROCK DESCRIPTION	
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			NO.
-98.4					Continued from previous page								
-100.2	114.0	9	12	12							SS-27	VINCENTOWN FORMATION: Silty SAND (SM), brown (10YR 5/3), dense to very dense, moist to wet, fine to coarse sand, trace friable layers, trace shell fragments, weak to strong HCl reaction, trace glauconite, moderately oxidized (continued)	
-105.2	119.0	17	12	14							SS-28	-Bit chatter from 116ft to 118ft	
-110.2	124.0	50/0.0									SS-29	-Hard drilling/bit chatter to 124ft	
-115.2	129.0	15	10	18							SS-30	124.0ft: Very dense, SPT refusal with no penetration at 124.0 feet; hard drilling/bit chatter to 123ft	
-120.2	134.0	7	28	31							SS-31	129.0ft: Greenish gray (10Y 6/1), medium dense, trace friable to moderately indurated layers, no oxidation	
-125.2	139.0	8	22	36							SS-32	134.0ft: Very dense, wet, trace friable layers	
-130.2	144.0	WOH	9	91/0.4							SS-33	144.0ft: Greenish gray (10Y 5/1), moist to wet, few friable to moderately indurated layers	
-135.2	149.0	9	58	42/0.4							SS-34	HORNERSTOWN FORMATION: Clayey SAND (SC), greenish gray (10Y 5/1), dense, moist to wet, fine to medium sand, trace shell fragments, few friable layers, strong HCl reaction, few glauconite	
-140.2	154.0	6	8	17							SS-35	154.0ft: Medium dense, moist to wet, fine sand, trace glauconite	
-145.2	159.0	5	14	21							SS-36	159.0ft: Dark grayish green (10Y 4/1), dense, fine to medium sand, few shell fragments, few to little glauconite	
-150.2	164.0	23	27	50							SS-37	NAVESINK FORMATION: Silty SAND (SM), greenish black (5GY 2.5/1), very dense, moist to wet, fine to medium sand, few to little shell fragments, strong HCl reaction, some to mostly glauconite	

PSEG ESP BORE PSEG ESP 7-07-09.GPJ PSEG ESP.GDT 7/10/09



PERMIT NO.: P200804331		DRILLER: T. Samuelson / M. Adams		NJ LICENSE NO.: 0001238 / 0001350		GEOLOGIST: M. Lear						
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251		FLUID LEVEL (ft)				
BORING NO.: EB-5		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT				0 HR.	ND			
GROUND SURFACE ELEV.: 13.8		US ft (NAVD88)		NORTHING: 233048.3		US ft (NAD83)		EASTING: 203016.4 US ft (NAD83)		24 HR.	5.4	
TOTAL DEPTH: 199.3 ft		DRILL MACHINE: CME-850 ATV		CASING DEPTH: 18.5 ft		HAMMER (ID): 140 lb Auto. (CTB-4)						
DATE STARTED: 1/10/09		COMPLETED: 1/14/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit				
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT					SAMP.	LOG	SOIL AND ROCK DESCRIPTION
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100		
-154.5					Continued from previous page							
-155.2	169.0	23	32	48						SS-38		NAVESINK FORMATION: Silty SAND (SM), greenish black (5GY 2.5/1), very dense, moist to wet, fine to medium sand, few to little shell fragments, strong HCl reaction, some to mostly glauconite (continued)
-160.2	174.0	21	28	38						SS-39		NAVESINK FORMATION: Clayey SAND (SC), greenish black (5GY 2.5/1), very dense, moist, fine to medium sand, trace shell fragments, no to weak HCl reaction, mostly glauconite
-165.2	179.0	34	41	59						SS-40		NAVESINK FORMATION: Silty SAND (SM), greenish black (5GY 2.5/1), very dense, moist, fine to medium sand, trace shell fragments, trace friable to moderately indurated layers, weak to strong HCl reaction, mostly glauconite
-170.2	184.0	34	43	57/0.4						SS-41		MOUNT LAUREL FORMATION: Clayey SAND (SC), very dark gray (5Y 3/1), very dense, moist, fine to coarse subrounded sand, trace fine gravel, trace shell fragments, strong HCl reaction, trace glauconite
-175.2	189.0	100/0.4								SS-42		
-180.2	194.0	100/0.2								SS-43		
-185.2	199.0	100/0.3								SS-44		Boring terminated at 199.3 feet. Boring closed by tremie method with cement-bentonite grout on 1/14/09.

PSEG ESP BORE PSEG ESP 7-07-09.GPJ PSEG ESP.GDT 7/10/09



GEOTECHNICAL BORING LOG

Prepared By mm Date 7/10/09Checked By JS Date 7/10/09
SHEET 1 OF 4

PERMIT NO.: P200804332		DRILLER: M. Adams		NJ LICENSE NO.: 0001350		GEOLOGIST: B. Deobald / R. Clark					
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251					
BORING NO.: EB-6		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT		FLUID LEVEL (ft)					
GROUND SURFACE ELEV.: 13.7 US ft (NAVD88)		NORTHING: 232587.2 US ft (NAD83)		EASTING: 203262.4 US ft (NAD83)		0 HR. ND					
TOTAL DEPTH: 199.9 ft		DRILL MACHINE: CME-850 ATV		CASING DEPTH: 54.5 ft		HAMMER (ID): 140 lb Auto. (CTB-4)					
DATE STARTED: 1/26/09		COMPLETED: 2/4/09		HOLE DIA.: 4"		ROD TYPE: NWJ					
BITS USED: 3-7/8" Drag Bit											
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT			SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100	
13.7					Ground Surface						13.7
11.2	2.5	4	8	16						SS-1	ARTIFICIAL FILL: Silty SAND with gravel (SM), very dark grayish brown (10YR 3/2), medium dense, moist to wet, fine to coarse sand, little angular gravel, trace organics
9.4	4.3	11	7	7						SS-2	2.5ft: Few angular to rounded gravel
6.1	7.6	3	2	2						SS-3	HYDRAULIC FILL: SILT (ML), very dark greenish gray (10Y 3/1), soft, wet, trace rounded gravel
3.7	10.0	9	5	12						SS-4	7.6ft: Very stiff, few rounded gravel
1.2	12.5	2	3	1						SS-5	4.2
-0.9	14.6	WOH	WOH	WOH						SS-6	HYDRAULIC FILL: SILT (ML), very dark greenish gray (10Y 3/1), very loose, wet, fine sand
-5.8	19.5	WOH	1	2						SS-7	1.7
-10.8	24.5	WOH	WOH	WOH						SS-8	HYDRAULIC FILL: SILT (ML), very dark greenish gray (10Y 3/1), very soft, wet
-15.8	29.5	WOH	WOH	WOH						SS-9	-0.8
-20.8	34.5	5	16	22						SS-10	HYDRAULIC FILL: SILT with sand (ML), very dark greenish gray (10Y 3/1), soft, wet, little fine sand
-25.8	39.5	12	14	10						SS-11	19.5ft: Very dark grayish brown (10YR 3/1), very soft, moist
-30.8	44.5	15	14	17						SS-12	-9.3
-35.8	49.5	10	8	9						SS-13	HYDRAULIC FILL: FAT CLAY (CH), very dark grayish brown (10YR 3/1), very soft, moist
-40.8	54.5	8	8	10						SS-14	29.5ft: Black (10YR 2/1)
										SS-15	-19.3
											ALLUVIUM: Poorly graded SAND (SP), dark greenish gray (10Y 4/1), dense, wet, fine to medium sand, trace organics, no HCl reaction
											39.5ft: Medium dense
											-29.3
											ALLUVIUM: Silty SAND (SM), greenish gray (10GY 5/1), dense, wet, trace rounded gravel, no HCl reaction
											-34.3
											ALLUVIUM: Well graded SAND (SW), dark gray (10YR 4/1), medium dense, wet, little subangular gravel, no HCl reaction
											-39.3
											KIRKWOOD FORMATION: Poorly graded SAND with silt (SP-SM), greenish gray (5GY 6/1), medium dense, wet, trace subrounded gravel, no HCl reaction

PSEG ESP BORE PSEG ESP 7-07-09 GPT PSEG ESP GDI 7/10/09



SHEET 2 OF 4

PERMIT NO.: P200804332		DRILLER: M. Adams		NJ LICENSE NO.: 0001350		GEOLOGIST: B. Deobald / R. Clark									
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251		FLUID LEVEL (ft)							
BORING NO.: EB-6		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT		0 HR.		ND							
GROUND SURFACE ELEV.: 13.7		US ft (NAVD88)		NORTHING: 232587.2		US ft (NAD83)		EASTING: 203262.4		US ft (NAD83)		24 HR.		0.0	
TOTAL DEPTH: 199.9 ft		DRILL MACHINE: CME-850 ATV		CASING DEPTH: 54.5 ft		HAMMER (ID): 140 lb Auto. (CTB-4)									
DATE STARTED: 1/26/09		COMPLETED: 2/4/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit							
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT					SAMP.	LOG	SOIL AND ROCK DESCRIPTION			
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			NO.		
-42.4					Continued from previous page										
-45.8	59.5	8	7	8							SS-16	KIRKWOOD FORMATION: Poorly graded SAND with silt (SP-SM), greenish gray (5GY 6/1), medium dense, wet, trace subrounded gravel, no HCl reaction (continued)			
-50.8	64.5	3	5	8							SS-17	KIRKWOOD FORMATION: Sandy LEAN CLAY (CL), olive (5Y 5/3) and brownish yellow (10YR 6/8), stiff, moist, some fine sand, no HCl reaction			
-55.8	69.5	19	18	15							SS-18	VINCENTOWN FORMATION: Silty SAND (SM), light greenish gray (10Y 8/1) and brownish yellow (10YR 6/8), dense, moist, fine to coarse sand, few shell fragments, trace rounded gravel, weak HCl reaction 69.5ft: Strongly oxidized			
-60.8	74.5	73	14	14							SS-19	74.5ft: Very dense, weak to strong HCl reaction			
-65.8	79.5	10	10	13							SS-20	79.5ft: Light greenish gray (10Y 7/1) and brownish yellow (10YR 6/8), medium dense, wet, little shell fragments, moderately oxidized			
-70.8	84.5	18	13	15							SS-21	84.5ft: Dense, few shell fragments, weakly oxidized			
-75.8	89.5	36	20	13							SS-22	89.5ft: Greenish gray (10GY 6/1) and light greenish gray (10GY 7/1), dense, moist, no oxidation			
-80.8	94.5										SS-23	94.5ft: Very dense, with indurated layers			
-85.8	99.5										SS-24	99.5ft: Greenish gray (5GY 6/1), very dense, wet, fine to medium sand, weak HCl reaction, trace subrounded gravel, trace shell fragments			
-90.8	104.5										SS-25	104.5ft: Dense, moist, weak to strong HCl reaction, trace friable layers			
-95.8	109.5										SS-26	109.5ft: Moist to wet, strong HCl reaction -Bit chatter drilling to 114.5 feet			

PSEG ESP BORE PSEG ESP 7-07-09 GPI PSEG ESP GDI 7/10/09



PERMIT NO.: P200804332		DRILLER: M. Adams		NJ LICENSE NO.: 0001350		GEOLOGIST: B. Deobald / R. Clark	
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251	
BORING NO.: EB-6		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT		FLUID LEVEL (ft)	
GROUND SURFACE ELEV.: 13.7 US ft (NAVD88)		NORTHING: 232587.2 US ft (NAD83)		EASTING: 203262.4 US ft (NAD83)		0 HR. ND	
						24 HR. 0.0	
TOTAL DEPTH: 199.9 ft		DRILL MACHINE: CME-850 ATV		CASING DEPTH: 54.5 ft		HAMMER (ID): 140 lb Auto. (CTB-4)	
DATE STARTED: 1/26/09		COMPLETED: 2/4/09		HOLE DIA.: 4"		ROD TYPE: NWJ	
						BITS USED: 3-7/8" Drag Bit	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
		0.5ft	0.5ft	0.5ft	0	20	40	60	80			
-98.5					Continued from previous page							
-100.8	114.5										SS-27	VINCENTOWN FORMATION: Silty SAND (SM), light greenish gray (10Y 8/1) and brownish yellow (10YR 6/8), dense, moist, fine to coarse sand, few shell fragments, trace rounded gravel, weak HCl reaction (continued) 114.5ft: Medium dense, wet, weak HCl reaction
-105.8	119.5										SS-28	119.5ft: Dense, moist -Bit chatter drilling to 124.5 feet
-110.8	124.5										SS-29	124.5ft: Medium dense
-115.8	129.5										SS-30	129.5ft: Very dense, indurated -Hard drilling/bit chatter to 133ft
-120.8	134.5										SS-31	VINCENTOWN FORMATION: Clayey SAND (SC), greenish gray (10Y 5/1), very dense, moist, fine sand, some moderately indurated layers, strong HCl reaction, few to little glauconite -Bit chatter 134.5ft to 135ft, 137ft to 139.5ft, and 139.5ft to 140ft
-125.8	139.5										SS-32	
-130.8	144.5										SS-33	HORNERSTOWN FORMATION: Silty SAND (SM), greenish gray (10Y 5/1), dense, moist to wet, fine sand, few moderately indurated layers, strong HCl reaction, little glauconite
-135.8	149.5										SS-34	149.5ft: Very dense
-140.8	154.5										SS-35	154.5ft: Dense, wet
-145.8	159.5										SS-36	159.5ft: Very dense, trace shell fragments, some glauconite
-150.8	164.5										SS-37	NAVESINK FORMATION: Silty SAND (SM), very dark greenish gray (5GY 3/1), very dense, wet, trace shell fragments, strong HCl reaction, mostly glauconite

PSEG ESP BORE PSEG ESP 7-07-09.GPJ PSEG ESP.GDT 7/10/09



SHEET 4 OF 4

PERMIT NO.: P200804332		DRILLER: M. Adams		NJ LICENSE NO.: 0001350		GEOLOGIST: B. Deobald / R. Clark							
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251							
BORING NO.: EB-6		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT		FLUID LEVEL (ft)							
GROUND SURFACE ELEV.: 13.7 US ft (NAVD88)		NORTHING: 232587.2 US ft (NAD83)		EASTING: 203262.4 US ft (NAD83)		0 HR. ND							
TOTAL DEPTH: 199.9 ft		DRILL MACHINE: CME-850 ATV		CASING DEPTH: 54.5 ft		24 HR. 0.0							
DATE STARTED: 1/26/09		COMPLETED: 2/4/09		HOLE DIA.: 4"		HAMMER (ID): 140 lb Auto. (CTB-4)							
ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit											
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
-154.6					Continued from previous page								
-155.8	169.5										SS-38		NAVESINK FORMATION: Silty SAND (SM), very dark greenish gray (5GY 3/1), very dense, wet, trace shell fragments, strong HCl reaction, mostly glauconite (continued)
-160.8	174.5										SS-39		NAVESINK FORMATION: Clayey SAND (SC), very dark greenish gray (5GY 3/1), very dense, wet, weak HCl reaction, mostly glauconite
-165.8	179.5										SS-40		NAVESINK FORMATION: Silty SAND (SM), very dark greenish gray (5GY 3/1), very dense, wet, weak HCl reaction, mostly glauconite
-170.8	184.5										SS-41		MOUNT LAUREL FORMATION: Clayey SAND (SC), olive gray (5Y 4/2), very dense, moist, little coarse subrounded sand, strong HCl reaction, few to little glauconite
-175.8	189.5										SS-42		189.5ft: Dark greenish gray (10GY 4/1), trace glauconite
-180.8	194.5										SS-43		MOUNT LAUREL FORMATION: Silty SAND (SM), dark greenish gray (10GY 4/1), very dense, moist, fine to coarse subrounded sand, little shell fragments, strong HCl reaction, trace glauconite
-185.8	199.5										SS-44		199.5ft: Dark greenish gray (5GY 4/1), trace to little glauconite
													Boring terminated at 199.9 feet.
													Boring closed by tremie method with cement-bentonite grout on 2/04/09.
													NOTE: N-Values at 94.5ft and deeper not reported.

PSEG ESP BORE PSEG ESP 7-07-09.GPJ PSEG ESP GDT 7/10/09



PERMIT NO.: P200804332		DRILLER: M. Adams / T. Ward		NJ LICENSE NO.: 0001350 / 0001105		GEOLOGIST: B. Deobald	
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251	
BORING NO.: EB-6A		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT		FLUID LEVEL (ft)	
GROUND SURFACE ELEV.: 14.1 US ft (NAVD88)		NORTHING: 232587.0 US ft (NAD83)		EASTING: 203251.3 US ft (NAD83)		0 HR. ND 24 HR. 15.0	
TOTAL DEPTH: 151.1 ft		DRILL MACHINE: CME-850 ATV		CASING DEPTH: 34.0 ft		HAMMER (ID): 140 lb Auto. (CTB-4)	
DATE STARTED: 2/22/09		COMPLETED: 2/24/09		HOLE DIA.: 4"		ROD TYPE: NWJ	
BITS USED: 3-7/8" Drag Bit							

ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
		0.5ft	0.5ft	0.5ft	0	20	40	60	80			
-42.0					Continued from previous page							
-45.9	60.0											Driller advanced 4" casing to 34.0 ft and drilled without sampling to 94.6 feet. See EB-6 for information. (continued)
-55.9	70.0											
-65.9	80.0											
-75.9	90.0											
-80.5	94.6	17	11	43								
-85.5	99.6	9	8	12								VINCENTOWN FORMATION: Silty SAND (SM), dark greenish gray (10GY 4/1), very dense, wet, fine to medium sand, trace moderately indurated layers, strong HCl reaction, trace glauconite 99.6ft: Greenish gray (10Y 5/1), medium dense, fine to coarse sand, trace shell fragments, weak HCl reaction 104.6ft: Dense, moist, fine to medium sand, trace friable to moderately indurated layers, weak to strong HCl reaction 109.6ft: Medium dense, moist to wet, weak HCl reaction -Bit chatter 113ft to 114ft
-90.5	104.6	36	20	22								
-95.5	109.6	11	10	11								

PSEG ESP BORE PSEG ESP 7-07-09.GPJ PSEG ESP.GDT 7/10/09



SHEET 3 OF 3

PERMIT NO.: P200804332		DRILLER: M. Adams / T. Ward		NJ LICENSE NO.: 0001350 / 0001105		GEOLOGIST: B. Deobald	
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251	
BORING NO.: EB-6A		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT		FLUID LEVEL (ft)	
GROUND SURFACE ELEV.: 14.1 US ft (NAVD88)		NORTHING: 232587.0 US ft (NAD83)		EASTING: 203251.3 US ft (NAD83)		0 HR. ND	
TOTAL DEPTH: 151.1 ft		DRILL MACHINE: CME-850 ATV		CASING DEPTH: 34.0 ft		HAMMER (ID): 140 lb Auto. (CTB-4)	
DATE STARTED: 2/22/09		COMPLETED: 2/24/09		HOLE DIA.: 4"		ROD TYPE: NWJ	
BITS USED: 3-7/8" Drag Bit							

ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
		0.5ft	0.5ft	0.5ft	0	20	40	60	80			
-98.1					Continued from previous page							
-100.5	114.6	20	17	13								VINCENTOWN FORMATION: Silty SAND (SM), dark greenish gray (10GY 4/1), very dense, wet, fine to medium sand, trace moderately indurated layers, strong HCl reaction, trace glauconite (continued)
-105.5	119.6	22	14	16								119.6ft: wet, trace moderately indurated layers
-110.5	124.6	35	13	14								124.6ft: Trace friable layers, weak HCl reaction
-115.5	129.6	50/0.2										129.6ft: Very dense, moist to wet, trace moderately indurated layers
-120.5	134.6	17	50/0.1									-Bit chatter from 133ft to 134ft
-125.5	139.6	50/0.4										139.6ft: Moist -Bit chatter 139.6ft to 141ft
-130.5	144.6	50/0.1										-128.9 HORNERSTOWN FORMATION: Silty SAND (SM), greenish gray (10Y 6/1), very dense, moist, fine to medium sand, friable to moderately indurated, weak HCl reaction, trace glauconite
-135.5	149.6	5	11	17								149.6ft: Medium dense, wet
												-137.0 Boring terminated at 151.1 feet.
												Boring closed by tremie method with cement-bentonite grout on 2/24/09.

PSEG ESP BORE PSEG ESP 7-07-09.GPJ PSEG ESP.GDT 7/10/09

GEOTECHNICAL BORING LOG

Prepared By NMR Date 7/10/09

Checked By Q. J. J. Date 7/10/09

SHEET 1 OF 4

PERMIT NO.: P200900126		DRILLER: T. Ward / G. McAneny			NJ LICENSE NO.: 0001105 / 0024058			GEOLOGIST: M. Lear					
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251			FLUID LEVEL (ft)				
BORING NO.: EB-7		DRILL METHOD: Mud Rotary			SAMPLE METHODS: SPT			0 HR. ND					
GROUND SURFACE ELEV.: 17.0 US ft (NAVD88)		NORTHING: 232084.2 US ft (NAD83)		EASTING: 203023.1 US ft (NAD83)			24 HR. 4.2						
TOTAL DEPTH: 200.3 ft		DRILL MACHINE: CME-75 Truck			CASING DEPTH: 14.0 ft			HAMMER (ID): 140 lb Auto. (CBT-1)					
DATE STARTED: 12/19/08		COMPLETED: 1/6/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" & 4-7/8" Drag Bits					
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
17.0					Ground Surface								
17.0	0.0	14	13	14						SS-1		ARTIFICIAL FILL: Poorly graded GRAVEL with sand (GP), dark gray (2.5Y 4/1), medium dense, wet, trace roots/organics, fine to coarse angular gravel	0.0
14.5	2.5	6	3	3						SS-2A/B		ARTIFICIAL FILL: Poorly graded SAND (SP), grayish brown (2.5Y 5/2), loose, wet, fine to coarse sand, trace coarse gravel	2.0
12.0	5.0	WOH	WOH	WOH						SS-3		HYDRAULIC FILL: SILT (ML), dark gray (2.5Y 4/1), medium stiff, moist, few fine sand, trace organics	3.0
9.8	7.2	5	4	2						SS-4		HYDRAULIC FILL: FAT CLAY (CH), dark gray (N 4/), very soft, wet, trace organics	4.5
7.6	9.4	7	7	8						SS-5		HYDRAULIC FILL: Silty SAND (SM), dark gray (10YR 4/1), loose, moist, fine sand, trace mica, trace organics	7.0
4.5	12.5	1	1	WOH						SS-6		HYDRAULIC FILL: Sandy SILT (ML), dark gray (10YR 4/1), stiff, wet, fine to sand, trace organics	9.0
1.6	15.4	WOH	1	1						SS-7		HYDRAULIC FILL: LEAN CLAY with sand (CL), dark gray (N 4/), very soft, moist, little fine sand, few organics	11.5
-3.0	20.0	1	1	1						SS-8		20.0ft: Trace to few fine sand partings	15.0
-8.0	25.0	WOH	WOH	WOH						SS-9			
-13.0	30.0	WOH	WOH	WOH						SS-10			
-18.0	35.0	WOH	1	1						SS-11			
-23.0	40.0	9	6	6						SS-12		ALLUVIUM: Poorly graded SAND with silt (SP-SM), olive gray (5Y 5/2), medium dense, wet, fine to coarse subangular sand, trace fine subangular to subrounded gravel	32.5
-28.0	45.0	5	4	5						SS-13		45.0ft: Loose	
-33.0	50.0	6	7	7						SS-14		50.0ft: Medium dense, little fine to coarse subangular to subrounded gravel	38.0
-38.0	55.0	3	3	4						SS-15		KIRKWOOD FORMATION: Silty SAND (SM), greenish gray (5GY 5/1), loose, wet, fine sand, few to little mica	54.0



PERMIT NO.: P200900126		DRILLER: T. Ward / G. McAneny		NJ LICENSE NO.: 0001105 / 0024058		GEOLOGIST: M. Lear							
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251		FLUID LEVEL (ft)					
BORING NO.: EB-7		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT				0 HR.	ND				
GROUND SURFACE ELEV.: 17.0		US ft (NAVD88)		NORTHING: 232084.2		US ft (NAD83)		EASTING: 203023.1		US ft (NAD83)		24 HR.	4.2
TOTAL DEPTH: 200.3 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 14.0 ft		HAMMER (ID): 140 lb Auto. (CBT-1)							
DATE STARTED: 12/19/08		COMPLETED: 1/6/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" & 4-7/8" Drag Bits					
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT					SAMP.	LOG	SOIL AND ROCK DESCRIPTION	
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			NO.
-39.1					Continued from previous page								
-43.0	60.0	3	8	8							SS-16	KIRKWOOD FORMATION: Silty SAND (SM), greenish gray (5GY 5/1), loose, wet, fine sand, few to little mica (continued) 60.0ft: Medium dense, few mica	
-48.0	65.0	2	3	4							SS-17	-46.0 KIRKWOOD FORMATION: Sandy SILT (ML), greenish gray (5GY 5/1), medium stiff, wet, fine sand, trace to few mica 63.0	
-53.0	70.0	WOH	3	8							SS-18	-50.0 KIRKWOOD FORMATION: LEAN CLAY with sand (CL), dark brown (7.5YR 3/2), stiff, moist to wet, little fine sand, few mica, few organics 67.0	
-58.0	75.0	WOH	WOH	WOH							SS-19	-56.0 KIRKWOOD FORMATION: Silty, Clayey SAND (SC-SM), dark brown (7.5YR 3/2), loose, moist, fine to medium sand, trace shells, trace organics 73.0	
-63.0	80.0	2	3	8							SS-20A/B	-63.5 KIRKWOOD FORMATION: Silty SAND (SM), dark grayish brown (2.5Y 4/2), medium dense, wet, fine sand, trace shells, little mica 80.5	
-68.0	85.0	3	8	7							SS-21	-66.0 KIRKWOOD FORMATION: GRAVEL-Not sampled interpreted from bit chatter from 83.0ft to 84.0ft 83.0 -67.0 VINCENTOWN FORMATION: Silty SAND (SM), greenish gray (10Y 6/1), medium dense, wet, fine to medium sand, few friable to moderately indurated layers, strong HCl reaction 84.0	
-73.0	90.0	48	23	15							SS-22	90.0ft: Brownish yellow (10YR 6/6), to greenish gray (10Y 6/1), dense, few shell fragments, little friable to moderately indurated layers, few glauconite, weakly oxidized	
-78.0	95.0	18	14	16							SS-23	95.0ft: Medium dense, moist, fine to coarse sand, few friable to moderately indurated layers	
-83.0	100.0	11	89/0.2								SS-24	-81.0 VINCENTOWN FORMATION: LEAN CLAY with sand (CL), light greenish gray (10Y 7/1), hard, moist to wet, little fine to medium sand, trace moderately indurated layers, trace shell fragments, strong HCl reaction, trace glauconite 98.0	
-88.0	105.0	11	11	12							SS-25	-86.0 VINCENTOWN FORMATION: Silty SAND (SM), light greenish gray (10Y 7/1), medium dense, moist to wet, fine to medium sand, trace moderately indurated layers, few to little shell fragments, strong HCl reaction, trace glauconite 103.0	
-93.0	110.0	7	17	14							SS-26	110.0ft: Dense	

PSEG ESP BORE PSEG ESP 7-07-09.GPJ PSEG ESP.GDT 7/10/09

PSEG ESP BORE PSEG ESP 7-07-09.GPJ PSEG ESP.GDT 7/10/09



PERMIT NO.: P200900126		DRILLER: T. Ward / G. McAneny		NJ LICENSE NO.: 0001105 / 0024058		GEOLOGIST: M. Lear							
SITE DESCRIPTION: PSEG SITE ESP APPLICATION			COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251		FLUID LEVEL (ft)						
BORING NO.: EB-7		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT		0 HR. ND							
GROUND SURFACE ELEV.: 17.0 US ft (NAVD88)		NORTHING: 232084.2 US ft (NAD83)		EASTING: 203023.1 US ft (NAD83)		24 HR. 4.2							
TOTAL DEPTH: 200.3 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 14.0 ft		HAMMER (ID): 140 lb Auto. (CBT-1)							
DATE STARTED: 12/19/08		COMPLETED: 1/6/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" & 4-7/8" Drag Bits					
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
-151.3					Continued from previous page								
-153.0	170.0												NAVESINK FORMATION: Silty, Clayey SAND (SC-SM), very dark greenish gray (10Y 3/1), dense, moist, fine to medium sand, few shell fragments, weak HCl reaction, mostly glauconite (continued) 170.0ft: N-Value for SS-38 invalid due to insufficient drop height of auto hammer (Hammer operation adjusted prior to drilling/sampling at 175.0ft)
		10	15	26						SS-38			
-158.0	175.0												175.0ft: Very dense
		19	28	44						SS-39			
-163.0	180.0												NAVESINK FORMATION: Clayey SAND (SC), very dark greenish gray (10Y 3/1), very dense, moist, trace shell fragments, weak HCl reaction, mostly glauconite
		16	23	39						SS-40			
-168.0	185.0												NAVESINK FORMATION: Silty SAND (SM), very dark greenish gray (10Y 3/1), very dense, moist, trace shell fragments, trace moderately indurated layers, weak HCl reaction, mostly glauconite
		23	37	63/0.3						SS-41			
-173.0	190.0												MOUNT LAUREL FORMATION: Sandy LEAN CLAY (CL), dark gray (2.5Y 4/1), hard, dry to moist, fine to coarse subrounded sand, few fine subrounded gravel, trace shell fragments, strong HCl reaction, little glauconite
		37	63/0.4							SS-42			
-178.0	195.0												MOUNT LAUREL FORMATION: Silty SAND (SM), dark gray (2.5Y 4/1), very dense, dry to moist, fine to coarse subrounded sand, trace fine subrounded gravel, trace shell fragments, strong HCl reaction, little glauconite
		100/0.4								SS-43			
-183.0	200.0												Boring terminated at 200.3 feet. Boring closed by tremie method with cement-bentonite grout on 1/09/09.
		100/0.3								SS-44			

PSEG ESP BORE PSEG ESP 7-07-09 GPT PSEG ESP GDT 7/10/09



GEOTECHNICAL BORING LOG

Prepared By MM Date 7/10/09Checked By JS Date 7/10/09

SHEET 1 OF 6

PERMIT NO.: P200900127		DRILLER: T. Ward		NJ LICENSE NO.: 0001105		GEOLOGIST: J. Howard							
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251		FLUID LEVEL (ft)					
BORING NO.: EB-8		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT/Shelby Tube				0 HR. ND					
GROUND SURFACE ELEV.: 15.3 US ft (NAVD88)		NORTHING: 231160.7 US ft (NAD83)		EASTING: 203499.7 US ft (NAD83)				24 HR. 4.2					
TOTAL DEPTH: 301.7 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 14.0 ft				HAMMER (ID): 140 lb Auto. (CBT-1)					
DATE STARTED: 2/7/09		COMPLETED: 2/19/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit					
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
15.3					Ground Surface								
15.3	0.0	3	6	8									15.3
12.8	2.5	5	2	2									13.3
10.3	5.0	WOH	WOH	WOH									2.0
7.8	7.5	WOH	WOH	WOH									5.0ft: Very soft, trace mica
5.3	10.0	WOH	WOH	WOH									7.5ft: Dark gray (N 4/)
3.0	12.3	WOH	1	WOH									10.0ft: Trace organics
0.5	14.8	WOH	WOH	WOH									12.3ft: No recovery-Same as above
		WOH	3	2									14.0ft: Some fine to medium sand, PP=0.25 tsf
-4.8	20.1	WOH	WOH	WOH									15.4
-9.9	25.2	WOH	WOH	WOH									19.0
-15.0	30.3	WOH	2	5									31.4
-19.7	35.0	2	2	3									33.0
-26.1	41.4	7	4	4									36.0
-28.1	43.4												41.0
-30.7	46.0	2	3	3									43.0
-32.7	48.0	4	3	1									46.0
-35.5	50.8												55.0ft: Yellowish red (5YR 4/6)
-39.7	55.0	WOH	WOH	WOH									

PSEG ESP BORE PSEG ESP 7-07-09 GPJ PSEG ESP.GDI 7/10/09



PERMIT NO.: P200900127		DRILLER: T. Ward		NJ LICENSE NO.: 0001105		GEOLOGIST: J. Howard						
SITE DESCRIPTION: PSEG SITE ESP APPLICATION			COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251		FLUID LEVEL (ft)					
BORING NO.: EB-8		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT/Shelby Tube		0 HR. ND						
GROUND SURFACE ELEV.: 15.3 US ft (NAVD88)		NORTHING: 231160.7 US ft (NAD83)		EASTING: 203499.7 US ft (NAD83)		24 HR. 4.2						
TOTAL DEPTH: 301.7 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 14.0 ft		HAMMER (ID): 140 lb Auto. (CBT-1)						
DATE STARTED: 2/7/09		COMPLETED: 2/19/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit				
ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft 0.5ft 0.5ft			BLOWS PER FOOT 0 20 40 60 80 100					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-40.8		Continued from previous page										
-42.3	57.6									UD-3		-41.7 KIRKWOOD FORMATION: Sandy SILT (ML), yellowish brown (10YR 5/6), wet, fine to medium sand, no HCl reaction 57.0
-44.7	60.0	3	4	6						SS-16		-44.7 57.6ft: Pushed shelly tube UD-3 to 59.6ft, recovery=1.7ft, PP=0.0 tsf 60.0
-49.5	64.8	19	16	9						SS-17		-47.7 VINCENTOWN FORMATION: Sandy SILT (ML), brownish yellow (10YR 6/8), stiff, wet, fine to medium sand, strong HCl reaction, trace friable layers, trace glauconite, strongly oxidized 63.0
-51.6	66.9									UD-4		VINCENTOWN FORMATION: Silty SAND (SM), brownish yellow (10YR 6/8), medium dense, wet, fine to medium sand, strong HCl reaction, trace friable to moderately indurated layers, trace glauconite, strongly oxidized
-54.2	69.5	7	7	9						SS-18		66.9ft: Pushed shelly tube UD-4 to 68.9ft, recovery=1.9ft
-59.5	74.8	9	8	13						SS-19		69.5ft: Yellowish brown (10YR 5/6)
-64.7	80.0	31	13	10						SS-20		74.8ft: Very pale brown (10YR 7/4), trace friable layers, trace glauconite, moderately oxidized
-66.6	81.9									UD-5		80.0ft: Brownish yellow (10YR 6/6), weakly oxidized
-67.9	83.2	12	22	21						SS-21		81.9ft: Pushed shelly tube UD-5 to 82.4ft, recovery=0.4ft
-74.7	90.0	9	12	12						SS-22		83.2ft: Dense, trace friable to moderately indurated layers
-76.6	91.9									UD-6		90.0ft: Medium dense, trace friable layers
-78.6	93.9	8	46	13						SS-23		91.9ft: Pushed shelly tube UD-6 to 93.7ft, recovery=1.3ft
-84.6	99.9	8	49	18						SS-24		93.9ft: Very dense
-89.7	105.0	9	7	9						SS-25		99.9ft: Yellow (2.5Y 7/6), moist, trace moderately indurated layers
-94.5	109.8	10	12	20						SS-26		105.0ft: Pale yellow (2.5Y 7/3), medium dense, trace shell fragments, very weakly oxidized
												109.8ft: Light brownish gray (2.5Y 6/2), dense, trace friable layers, no oxidation

PSEG ESP BORE PSEG ESP 7-07-09.GPJ PSEG ESP GDT 7/10/09



PERMIT NO.: P200900127			DRILLER: T. Ward			NJ LICENSE NO.: 0001105			GEOLOGIST: J. Howard							
SITE DESCRIPTION: PSEG SITE ESP APPLICATION					COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251			FLUID LEVEL (ft)						
BORING NO.: EB-8			DRILL METHOD: Mud Rotary			SAMPLE METHODS: SPT/Shelby Tube			0 HR. ND							
GROUND SURFACE ELEV.: 15.3 US ft (NAVD88)			NORTHING: 231160.7 US ft (NAD83)			EASTING: 203499.7 US ft (NAD83)			24 HR. 4.2							
TOTAL DEPTH: 301.7 ft			DRILL MACHINE: CME-75 Truck			CASING DEPTH: 14.0 ft			HAMMER (ID): 140 lb Auto. (CBT-1)							
DATE STARTED: 2/7/09		COMPLETED: 2/19/09		HOLE DIA.: 4"		ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit								
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	▼	L O G	SOIL AND ROCK DESCRIPTION			
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100						
-96.9					Continued from previous page											
-99.7	115.0	21	13	11							SS-27		VINCENTOWN FORMATION: Silty SAND (SM), brownish yellow (10YR 6/8), medium dense, wet, fine to medium sand, strong HCl reaction, trace friable to moderately indurated layers, trace glauconite, strongly oxidized (continued) 115.0ft: Greenish gray (10Y 5/1), medium dense, wet			
-104.7	120.0	9	12	12							SS-28		120.0ft: Greenish gray (10Y 6/1)			
-109.8	125.1	11	9	12							SS-29		125.1ft: Greenish gray (10Y 5/1), moist			
-114.5	129.8	8	8	8							SS-30		129.8ft: Greenish gray (10Y 6/1), wet			
-119.5	134.8	18	7	16							SS-31					
-124.7	140.0	100/0.4									SS-32		140ft: Very dense, indurated			
-129.7	145.0	15	9	19							SS-33		145.0ft: Medium dense			
-134.5	149.8	100/0.3									SS-34		149.8ft: Very dense, moderately indurated			
-139.7	155.0	44	15	39							SS-35		HORNERSTOWN FORMATION: Clayey SAND (SC), greenish gray (10Y 5/1), very dense, moist, fine to medium sand, few friable layers, strong HCl reaction, trace to few glauconite			
-144.7	160.0	9	26	36							SS-36		160ft: Greenish gray (10Y 6/1), trace friable layers			
-149.9	165.2	8	92/0.4								SS-37		165.2ft: Trace moderately indurated layers, few to little glauconite			

PSEG ESP BORE PSEG ESP 7-07-09 GPI PSEG ESP GDT 7/10/09



PERMIT NO.: P200900127			DRILLER: T. Ward			NJ LICENSE NO.: 0001105			GEOLOGIST: J. Howard			
SITE DESCRIPTION: PSEG SITE ESP APPLICATION					COUNTY: Salem, NJ			MACTEC PROJECT NO.: 6468-08-2251			FLUID LEVEL (ft)	
BORING NO.: EB-8			DRILL METHOD: Mud Rotary			SAMPLE METHODS: SPT/Shelby Tube			0 HR. ND		4.2	
GROUND SURFACE ELEV.: 15.3 US ft (NAVD88)			NORTHING: 231160.7 US ft (NAD83)			EASTING: 203499.7 US ft (NAD83)			24 HR.		4.2	
TOTAL DEPTH: 301.7 ft			DRILL MACHINE: CME-75 Truck			CASING DEPTH: 14.0 ft			HAMMER (ID): 140 lb Auto. (CBT-1)			
DATE STARTED: 2/7/09			COMPLETED: 2/19/09			HOLE DIA.: 4"			ROD TYPE: NWJ		BITS USED: 3-7/8" Drag Bit	
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT					SAMP.	LOG	SOIL AND ROCK DESCRIPTION
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100		
-153.0					Continued from previous page							
-154.6	169.9	9	17	48						SS-38		HORNERSTOWN FORMATION: Clayey SAND (SC), greenish gray (10Y 5/1), very dense, moist, fine to medium sand, few friable layers, strong HCl reaction, trace to few glauconite (continued) 169.9ft: Very dark greenish gray (5GY 3/1), weak HCl reaction, trace shell fragments, some glauconite NAVESINK FORMATION: Silty SAND (SM), black (N 2.5/), very dense, moist, fine to medium sand, few shell fragments, strong HCl reaction, mostly glauconite
-159.7	175.0	25	39	59						SS-39		
-164.7	180.0	27	33	36						SS-40		180.0ft: Weak HCl reaction, trace shell fragments
-169.7	185.0	41	38	51						SS-41		185.0ft: Very dark grayish green (5G 2.5/2)
-174.7	190.0	27	33	52						SS-42		190.0ft: Very dark grayish green (5G 2.5/2) to greenish black (10Y 2.5/1), few shell fragments
-179.9	195.2	40	60/0.3							SS-43		MOUNT LAUREL FORMATION: Clayey SAND (SC), very dark greenish gray (10Y 3/1), very dense, moist, fine to coarse subrounded sand, strong HCl reaction, little glauconite
-184.5	199.8	100/0.4								SS-44		
-194.5	209.8	100/0.3								SS-45		209.8ft: Dark greenish gray (10Y 4/1), fine to medium sand, few glauconite
-199.7												MOUNT LAUREL FORMATION: Silty SAND (SM), dark greenish gray (10Y 4/1), very dense, wet, fine to medium sand, weak to strong HCl reaction, few glauconite
-204.7	220.0	18	50	50/0.3						SS-46		

PSEG ESP BORE PSEG ESP 7-07-09.GPJ PSEG ESP.GDT 7/10/09



PERMIT NO.: P200900127		DRILLER: T. Ward		NJ LICENSE NO.: 0001105		GEOLOGIST: J. Howard						
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251						
BORING NO.: EB-8		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT/Shelby Tube		FLUID LEVEL (ft)						
GROUND SURFACE ELEV.: 15.3 US ft (NAVD88)		NORTHING: 231160.7 US ft (NAD83)		EASTING: 203499.7 US ft (NAD83)		0 HR. ND						
						24 HR. 4.2						
TOTAL DEPTH: 301.7 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 14.0 ft		HAMMER (ID): 140 lb Auto. (CBT-1)						
DATE STARTED: 2/7/09		COMPLETED: 2/19/09		HOLE DIA.: 4"		ROD TYPE: NWJ						
						BITS USED: 3-7/8" Drag Bit						
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
		0.5ft	0.5ft	0.5ft	0	20	40	60	80			
-209.1					Continued from previous page							
-214.5	229.8	31	50	50/0.4	100/0.9					SS-47		MOUNT LAUREL FORMATION: Silty SAND (SM), dark greenish gray (10Y 4/1), very dense, wet, fine to medium sand, weak to strong HCl reaction, few glauconite (continued)
-224.6	239.9	38	45	55/0.4	100/0.9					SS-48		229.8ft: Dark greenish gray (5GY 4/1), trace to few glauconite
-234.7	250.0	63	37/0.3		100/0.8					SS-49		239.9ft: No HCl reaction, trace shell fragments, trace glauconite
-244.7	260.0	58	42/0.3		100/0.8					SS-50		
-254.5	269.8	43	57/0.4		100/0.9					SS-51		269.8ft: Wet
-264.7	280.0											280.0ft: Weak HCl reaction

PSEG ESP BORE PSEG ESP 7-07-09.GPJ PSEG ESP.GDT 7/10/09



PERMIT NO.: P200900127		DRILLER: T. Ward		NJ LICENSE NO.: 0001105		GEOLOGIST: J. Howard	
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251	
BORING NO.: EB-8		DRILL METHOD: Mud Rotary		SAMPLE METHODS: SPT/Shelby Tube		FLUID LEVEL (ft)	
GROUND SURFACE ELEV.: 15.3 US ft (NAVD88)		NORTHING: 231160.7 US ft (NAD83)		EASTING: 203499.7 US ft (NAD83)		0 HR. ND	
TOTAL DEPTH: 301.7 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 14.0 ft		24 HR. 4.2	
DATE STARTED: 2/7/09		COMPLETED: 2/19/09		HOLE DIA.: 4"		HAMMER (ID): 140 lb Auto. (CBT-1)	
DATE STARTED: 2/7/09		COMPLETED: 2/19/09		HOLE DIA.: 4"		ROD TYPE: NWJ	
DATE STARTED: 2/7/09		COMPLETED: 2/19/09		HOLE DIA.: 4"		BITS USED: 3-7/8" Drag Bit	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
		0.5ft	0.5ft	0.5ft	0	20	40	60	80			
-265.2					Continued from previous page							
		53	47/0.3		100/0.8					SS-52		MOUNT LAUREL FORMATION: Silty SAND (SM), dark greenish gray (10Y 4/1), very dense, wet, fine to medium sand, weak to strong HCl reaction, few glauconite (continued)
-274.7	290.0	50	50/0.3		100/0.8					SS-53		MOUNT LAUREL FORMATION: Clayey, Silty SAND (SC-SM), Greenish gray (5GY 5/1), very dense, wet, fine to medium sand, weak to strong HCl reaction, few glauconite
-285.1	300.4	36	44	56/0.3	100/0.8					SS-54		
												Boring terminated at 301.7 feet.
												Boring closed by tremie method with cement-bentonite grout on 2/19/09.

PSEG ESP BORE PSEG ESP 7-07-09 GPT PSEG ESP GDT 7/10/09

GEOTECHNICAL BORING LOG

Prepared By MM Date 7/10/09

Checked By JAB Date 7/10/09

SHEET 1 OF 6

PERMIT NO.: P200900127						DRILLER: D. Osuch								NJ LICENSE NO.: 0024289								GEOLOGIST: M. Lear															
SITE DESCRIPTION: PSEG SITE ESP APPLICATION												COUNTY: Salem, NJ								MACTEC PROJECT NO.: 6468-08-2251								FLUID LEVEL (ft) 0 HR. ND 24 HR. 3.2									
BORING NO.: EB-8G						DRILL METHOD: Mud Rotary								SAMPLE METHODS: NA																							
GROUND SURFACE ELEV.: 15.7 US ft (NAVD88)						NORTHING: 231153.3 US ft (NAD83)								EASTING: 203528.3 US ft (NAD83)																							
TOTAL DEPTH: 315.0 ft						DRILL MACHINE: CME-75 Truck								CASING DEPTH: 9.0 ft								HAMMER (ID): 140 lb Auto. (CTB-3)															
DATE STARTED: 1/22/09						COMPLETED: 1/23/09								HOLE DIA.: 4"								ROD TYPE: NWJ								BITS USED: 3-7/8" Drag & Roller Cone Bits							
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT						SAMP.	L O G	SOIL AND ROCK DESCRIPTION																								
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100	NO.																										
15.7					Ground Surface										15.7	0.0																					
					.	.	.	.	.	.	.	.	.	. ▼		Boring drilled without sampling to perform down-hole geophysical testing. Strata breaks inferred from geophysical log and boring EB-8. See geotechnical boring EB-8 for complete soil descriptions. <u>ARTIFICIAL FILL:</u> GRAVEL-Not sampled <u>HYDRAULIC FILL:</u> SILT-Not sampled, drill fluid changed color from brown to black at 3.5 feet.	12.2	3.5																			
					.	.	.	.	.	.	.	.	.	.		-15.8	ALLUVIUM: SAND-Not sampled, bit chatter/harder drilling at 36.0 feet, drilling fluid color change from black to brown. -Change bit from drag bit to roller cone for gravelly zone.	31.5	46.0																		
					.	.	.	.	.	.	.	.	.	.		-30.3	KIRKWOOD FORMATION: Silty/Clayey SAND-Not sampled	46.0																			



PERMIT NO.: P200900127		DRILLER: D. Osuch		NJ LICENSE NO.: 0024289		GEOLOGIST: M. Lear					
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251					
BORING NO.: EB-8G		DRILL METHOD: Mud Rotary		SAMPLE METHODS: NA							
GROUND SURFACE ELEV.: 15.7 US ft (NAVD88)		NORTHING: 231153.3 US ft (NAD83)		EASTING: 203528.3 US ft (NAD83)		FLUID LEVEL (ft) 0 HR. ND 24 HR. 3.2					
TOTAL DEPTH: 315.0 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 9.0 ft		HAMMER (ID): 140 lb Auto. (CTB-3)					
DATE STARTED: 1/22/09		COMPLETED: 1/23/09		HOLE DIA.: 4"		ROD TYPE: NWJ					
BITS USED: 3-7/8" Drag & Roller Cone Bits											
ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft 0.5ft 0.5ft			BLOWS PER FOOT 0 20 40 60 80 100			SAMP. NO.	▼	L O G	SOIL AND ROCK DESCRIPTION
-208.7					Continued from previous page						
											MOUNT LAUREL FORMATION: SAND-Not sampled, hard drilling throughout, coarse sand, fine gravel, trace glauconite in drill fluid return. (continued)

PSEG ESP BORE PSEG ESP 7-07-09.GPJ PSEG ESP.GDT 7/10/09



PERMIT NO.: P200900127		DRILLER: D. Osuch		NJ LICENSE NO.: 0024289		GEOLOGIST: M. Lear							
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251							
BORING NO.: EB-8G		DRILL METHOD: Mud Rotary		SAMPLE METHODS: NA		FLUID LEVEL (ft)							
GROUND SURFACE ELEV.: 15.7 US ft (NAVD88)		NORTHING: 231153.3 US ft (NAD83)		EASTING: 203528.3 US ft (NAD83)		0 HR. ND							
						24 HR. 3.2							
TOTAL DEPTH: 315.0 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: 9.0 ft		HAMMER (ID): 140 lb Auto. (CTB-3)							
DATE STARTED: 1/22/09		COMPLETED: 1/23/09		HOLE DIA.: 4"		ROD TYPE: NWJ							
						BITS USED: 3-7/8" Drag & Roller Cone Bits							
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100
-264.8					Continued from previous page								
													MOUNT LAUREL FORMATION: SAND-Not sampled, hard drilling throughout, coarse sand, fine gravel, trace glauconite in drill fluid return. (continued)
													300.0ft: Driller mixes fresh mud
													-288.3 WENONAH FORMATION: SAND-Not sampled (Interpreted from geophysical log) 304.0
													315.0ft: Driller mixes fresh mud and flushes hole, pulls rods for geophysical testing
													-299.3 Boring terminated at 315.0 feet. 315.0
													Boring closed by tremie method with cement-bentonite grout on 1/24/09.

PSEG ESP BORE PSEG ESP 7-07-09.CPJ PSEG ESP.GDT 7/10/09

Observation Well Boring Logs

GEOTECHNICAL BORING LOG

Prepared By NPA Date 6/16/09

Checked By LAZ Date 6/17/09

SHEET 1 OF 2



PERMIT NO.: P200900115			DRILLER: R. Tabor			NJ LICENSE NO.: 0001335			GEOLOGIST: R. Clark						
SITE DESCRIPTION: PSEG SITE ESP APPLICATION						COUNTY: Salem, NJ			MACTEC PROJECT NO.: 6468-08-2251			FLUID LEVEL (ft)			
BORING NO.: NOW-2L			DRILL METHOD: Rotosonic			SAMPLE METHODS: Rotosonic disturbed soil core						0 HR. ND			
GROUND SURFACE ELEV.: 8.3			US ft (NAVD88)			NORTHING: 235227.7			US ft (NAD83)			24 HR. ND			
TOTAL DEPTH: 115.0 ft			DRILL MACHINE: Minisonic Track			CASING DEPTH: 115						HAMMER (ID): NA			
DATE STARTED: 1/22/09			COMPLETED: 1/22/09			HOLE DIA.: 6"			ROD TYPE: Sonic			BITS USED: 4" Auger Core Bit			
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT						SAMP.	LOG	SOIL AND ROCK DESCRIPTION		
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100	NO.				
-66.5					Continued from previous page										
-71.7	80.0										S-10		VINCENTOWN FORMATION: Clayey SAND (SC), yellowish brown (10YR 5/4), wet, fine sand, no to weak HCl reaction, moderately oxidized (continued) 77.0ft: Light yellowish brown (2.5Y 6/3), few friable to moderately indurated zones, strong HCl reaction, trace glauconite, weakly oxidized		
											RUN 9				
											S-11				
-81.7	90.0										RUN 10				
											S-12				
											S-13		-88.2	VINCENTOWN FORMATION: FAT CLAY with sand (CH), grayish brown (2.5Y 5/2), moist to wet, strong HCL reaction	96.5
-91.7	100.0										RUN 11		-91.7	VINCENTOWN FORMATION: Poorly graded SAND with silt (SP-SM), dark greenish gray (10GY 4/1), wet, strong HCl reaction, glauconitic	100.0
											S-14				
-101.7	110.0										RUN 12				
											S-15		-106.7		115.0
Boring terminated at 115.0 feet and observation well NOW-2L constructed.															
Boring logged to establish the general geologic conditions for the selection of observation well depths and well screen intervals. For complete strata and soil descriptions see geotechnical boring NB-2.															

GEOTECHNICAL BORING LOG

Prepared By MM Date 6/16/09

Checked By PAJ Date 6/17/09

SHEET 1 OF 2

PERMIT NO.: P200900117				DRILLER: R. Tabor				NJ LICENSE NO.: 0001335				GEOLOGIST: R. Clark														
SITE DESCRIPTION: PSEG SITE ESP APPLICATION								COUNTY: Salem, NJ				MACTEC PROJECT NO.: 6468-08-2251				FLUID LEVEL (ft)										
BORING NO.: NOW-3L				DRILL METHOD: Rotosonic				SAMPLE METHODS: Rotosonic disturbed soil core								0 HR. ND										
GROUND SURFACE ELEV.: 7.4 US ft (NAVD88)				NORTHING: 234565.5 US ft (NAD83)				EASTING: 197897.9 US ft (NAD83)								24 HR. ND										
TOTAL DEPTH: 102.5 ft				DRILL MACHINE: Minisonic Track				CASING DEPTH: 102.5				HAMMER (ID): NA														
DATE STARTED: 1/20/09				COMPLETED: 1/21/09				HOLE DIA.: 6"				ROD TYPE: Sonic				BITS USED: 4" Auger Core Bit										
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT						SAMP. NO.	▼	L O G	SOIL AND ROCK DESCRIPTION												
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100																
7.4					Ground Surface												7.4	0.0								
7.4	0.0														RUN 1			ARTIFICIAL FILL: Poorly graded SAND with silt and gravel (SP-SM), grayish brown (2.5Y 5/2), wet, angular to subrounded gravel, no HCl reaction								
															S-1			2.4	HYDRAULIC FILL: LEAN CLAY with sand (CL), very dark greenish gray (5GY 3/1), wet, weak HCl reaction							
-2.6	10.0														S-2			-2.6	HYDRAULIC FILL: FAT CLAY (CH), black (N 2.5/), to greenish black (10Y 2.5/1), moist to wet, trace to little fine sand, little to some organics							
															RUN 2											
															S-3											
-12.6	20.0														RUN 3											
															S-4											
-22.6	30.0														RUN 4			-22.6	ALLUVIUM: Poorly graded SAND with silt (SP-SM), greenish gray (10Y 5/1), wet, fine sand, no HCl reaction							
															S-5											
															S-6			-27.6	ALLUVIUM: FAT CLAY (CH), dark greenish gray (10Y 4/1), moist, trace gravel, trace shell fragments, few fine sand lenses, weak HCl reaction							
-32.6	40.0														RUN 5			-32.6	ALLUVIUM: Silty SAND (SM), gray (5Y 5/1), wet, fine to medium sand, no HCl reaction							
															S-7											
															S-8			-36.6	ALLUVIUM: Clayey SAND (SC), dark greenish gray (10Y 4/1), wet, no HCl reaction							
-42.6	50.0														S-9			-38.6	ALLUVIUM: Poorly graded SAND with silt (SP-SM), greenish gray (10Y 5/1), wet, trace to little fines							
															RUN 6											
															S-10			-44.6	KIRKWOOD FORMATION: FAT CLAY (CH), greenish gray (10Y 5/1), to grayish brown (2.5Y 5/2), mottled, moist to wet, trace subangular to subrounded gravel, trace iron staining, no HCl reaction							
-52.6	60.0														RUN 7			-54.6	KIRKWOOD FORMATION: Clayey SAND (SC), dark olive gray (5Y 3/2), wet, few to little subrounded fine to coarse gravel							
															S-12			-56.6	VINCENTOWN FORMATION: Poorly graded SAND with silt (SP-SM), olive (5Y 5/3), wet, fine sand, strong HCl reaction, trace subrounded gravel, trace moderately indurated layers							
-62.6	70.0														RUN 8			-63.6	71.0							



GEOTECHNICAL BORING LOG

Prepared By nm Date 6/17/09Checked By JA2 Date 6/17/09

SHEET 1 OF 2

PERMIT NO.: P200900119		DRILLER: R. Bartholomew		NJ LICENSE NO.: 0001383		GEOLOGIST: S. Johnson/J. Howard								
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251								
BORING NO.: NOW-4L		DRILL METHOD: Mud Rotary with Ream		SAMPLE METHODS: SPT		FLUID LEVEL (ft)								
GROUND SURFACE ELEV.: 10.6 US ft (NAVD88)		NORTHING: 233972.7 US ft (NAD83)		EASTING: 198147.9 US ft (NAD83)		0 HR. ND								
TOTAL DEPTH: 85.0 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: NA		HAMMER (ID): 140 lb. Auto (CTB-5)								
DATE STARTED: 1/22/09		COMPLETED: 1/24/09		HOLE DIA.: 6"		ROD TYPE: NWJ								
BITS USED: 3-7/8" & 5-7/8" Drag Bit														
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT			SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION				
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100				
10.6					Ground Surface						10.6	0.0		
												Drill without sampling to 18.0 feet. Boring advanced with a 4" drag bit during sampling, then reamed with a 6" drag bit for observation well installation.		
-7.4	18.0	WOH	WOH	WOH	WOH						SS-1	-7.4	18.0	HYDRAULIC FILL: ELASTIC SILT (MH), dark greenish gray (5GY 4/1), very soft, moist, trace sand, trace mica, trace shells, no HCl reaction
-12.7	23.3	WOH	WOH	WOH	WOH						SS-2			
-17.4	28.0	5	4	4							SS-3	-16.4	27.0	HYDRAULIC FILL: Sandy ELASTIC SILT (MH), dark greenish gray (5GY 4/1), medium stiff, wet, little to some fine sand, few shell fragments, no HCl reaction
-22.4	33.0	WOH	2	1							SS-4			33.0ft: Very dark greenish gray (5GY 3/1), soft, moist
-27.5	38.1	1	1	1							SS-5	-25.4	36.0	ALLUVIUM: Silty SAND (SM), very dark greenish gray (5GY 3/1), very loose, wet, fine to medium sand, no HCl reaction
-32.4	43.0	2	3	5							SS-6	-32.4	43.0	ALLUVIUM: Poorly graded SAND with silt (SP-SM), gray (N 5), loose, wet, fine to medium sand, no HCl reaction
-37.4	48.0	8	11	15							SS-7	-36.4	47.0	ALLUVIUM: Clayey SAND (SC), dark grayish brown (10YR 4/2), medium dense, moist, fine to medium sand, few fine gravel, no HCl reaction
-42.3	52.9	6	2	2							SS-8	-41.4	52.0	KIRKWOOD FORMATION: SILT (ML), brownish yellow (10YR 6/8), soft, moist, no HCl reaction
												-43.8	54.4	Drill without sampling to 62.9 feet.
-52.3	62.9	6	6	11							SS-9	-52.3	62.9	KIRKWOOD FORMATION: Sandy LEAN CLAY (CL), very dark gray (N 3), very stiff, moist, no HCl reaction
-57.2	67.8	8	11	23							SS-10	-56.4	67.0	VINCENTOWN FORMATION: Silty, clayey SAND (SC-SM), dark greenish gray (5GY 4/1), dense, moist, fine to medium sand, strong HCl reaction, glauconitic
-62.4	73.0	6	6	9							SS-11	-62.4	73.0	

PSEG ESP BORE PSEG ESP 6-15-09 GPI PSEG ESP GDT 6/17/09



SHEET 2 OF 2

PERMIT NO.: P200900119		DRILLER: R. Bartholomew		NJ LICENSE NO.: 0001383		GEOLOGIST: S. Johnson/J. Howard							
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251							
BORING NO.: NOW-4L		DRILL METHOD: Mud Rotary with Reverse Circulation		SAMPLE METHODS: SPT		FLUID LEVEL (ft)							
GROUND SURFACE ELEV.: 10.6 US ft (NAVD88)		NORTHING: 233972.7 US ft (NAD83)		EASTING: 198147.9 US ft (NAD83)		0 HR. ND							
						24 HR. ND							
TOTAL DEPTH: 85.0 ft		DRILL MACHINE: CME-75 Truck		CASING DEPTH: NA		HAMMER (ID): 140 lb. Auto (CTB-5)							
DATE STARTED: 1/22/09		COMPLETED: 1/24/09		HOLE DIA.: 6"		ROD TYPE: NWJ							
						BITS USED: 3-7/8" & 5-7/8" Drag Bit							
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
-64.2					Continued from previous page								
-67.4	78.0	15	12	14						SS-12		VINCENTOWN FORMATION: Silty SAND (SM), greenish gray (5GY 6/1), medium dense, moist, fine to medium sand, strong HCl reaction (<i>continued</i>)	
-72.4	83.0	11	19	72						SS-13		78.0ft: Greenish gray (5GY 5/1), trace shell fragments	
													83.0ft: Very dense, weak to strong HCl reaction
													Boring terminated at 85.0 feet and observation well NOW-4L constructed. Boring logged to establish the general geologic conditions for the selection of observation well depths and well screen intervals. For complete strata and soil descriptions see geotechnical boring NB-4.



GEOTECHNICAL BORING LOG

Prepared By MAN Date 6/17/09Checked By JOS Date 6/17/09
SHEET 1 OF 2

PERMIT NO.: P200900123		DRILLER: R. Tabor		NJ LICENSE NO.: 0001335		GEOLOGIST: R. Clark							
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251							
BORING NO.: NOW-5L		DRILL METHOD: Rotasonic		SAMPLE METHODS: Rotasonic disturbed soil core		FLUID LEVEL (ft)							
GROUND SURFACE ELEV.: 7.6 US ft (NAVD88)		NORTHING: 234927.5 US ft (NAD83)		EASTING: 198438.4 US ft (NAD83)		0 HR. ND							
TOTAL DEPTH: 102.3 ft		DRILL MACHINE: Minisonic Track		CASING DEPTH: 102.3		HAMMER (ID): NA							
DATE STARTED: 1/26/09		COMPLETED: 1/26/09		HOLE DIA.: 6"		ROD TYPE: Sonic							
						BITS USED: 4" Auger Core Bit							
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT			SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION			
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
7.6					Ground Surface						7.6	0.0	
7.6	0.0									RUN 1		ARTIFICIAL FILL: LEAN CLAY with gravel (CL), very dark grayish brown (2.5Y 3/2), wet, trace organics, few sand, no HCL reaction	
										S-1		2.6	5.0
-2.5	10.0									RUN 2		HYDRAULIC FILL: FAT CLAY with gravel (CH), greenish black (10Y 3/1), moist to wet, no HCL reaction	
										S-2		10.0ft: FAT CLAY (CH), very dark greenish gray (5GY 3/1), moist to wet, little fine sand, no HCL reaction	
-12.5	20.0									RUN 3		20.0ft: Very dark gray (5Y 3/1), moist	
										S-3			
-22.5	30.0									RUN 4			
										S-4			
-32.5	40.0									RUN 5		-29.5	37.0
										S-5		ALLUVIUM: Poorly graded SAND with clay (SP-SC), greenish gray (5GY 5/1), wet, no HCL reaction, trace glauconite	39.0
-42.5	50.0									RUN 6		-31.5	
										S-6		-33.5	41.0
-52.5	60.0									RUN 7		ALLUVIUM: Poorly graded SAND with silt (SP-SM), greenish gray (5GY 5/1), wet, trace subrounded gravel, trace glauconite, no HCL reaction	
										S-7		KIRKWOOD FORMATION: FAT CLAY (CH), dark olive gray (5Y 3/2), moist, no HCL reaction	
-62.5	70.0									RUN 8		-52.0	59.5
										S-8		KIRKWOOD FORMATION: Clayey SAND (SC), dark gray (5Y 4/1), wet, fine sand, no HCL reaction	62.0
										S-9		-54.5	
												KIRKWOOD FORMATION: Poorly graded GRAVEL with silt and sand (GP-GM), dark gray (5Y 4/1), wet, subrounded, no HCL reaction	66.0
												-58.5	
												VINCENTOWN FORMATION: Poorly graded SAND with silt (SP-SM), olive gray (5Y 4/2), to reddish brown (5Y 4/3), wet, no HCL reaction, strongly oxidized	
												70.0ft: Yellowish brown (10YR 5/4), strong HCL reaction	

PSEG ESP BORE PSEG ESP 6-15-09.GPJ PSEG ESP.GDT 6/17/09



GEOTECHNICAL BORING LOG

Prepared By Wm Date 6/16/09

Checked By B.J. Date 6/17/09

SHEET 1 OF 2

PERMIT NO.: P200900121		DRILLER: R. Tabor		NJ LICENSE NO.: 0001335		GEOLOGIST: R. Clark	
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251	
BORING NO.: NOW-6L		DRILL METHOD: Rotosonic		SAMPLE METHODS: Rotosonic disturbed soil core			
GROUND SURFACE ELEV.: 7.8 US ft (NAVD88)		NORTHING: 235287.9 US ft (NAD83)		EASTING: 198312.8 US ft (NAD83)		FLUID LEVEL (ft) 0 HR. ND 24 HR. ND	
TOTAL DEPTH: 92.3 ft		DRILL MACHINE: Minisonic Track		CASING DEPTH: 92.3		HAMMER (ID): NA	
DATE STARTED: 1/25/09		COMPLETED: 1/25/09		HOLE DIA.: 6"		ROD TYPE: Sonic	
						BITS USED: 4" Auger Core Bit	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100
7.8					Ground Surface							7.8	0.0
7.8	0.0									RUN 1		ARTIFICIAL FILL: FAT CLAY (CH), very dark greenish gray (5GY 3/1), moist to wet, little angular gravel and sand	0.0
										S-1			
-2.2	10.0									RUN 2		HYDRAULIC FILL: FAT CLAY (CH), very dark greenish gray (5GY 3/1), moist to wet, few organics, no HCl reaction	5.0
										S-2			
										RUN 3		10.0ft: Wet, little sand, trace gravel	
										S-3			
-12.2	20.0									RUN 4		20.0ft: Very dark greenish gray (10Y 3/1), trace sand, trace organics	
										S-4			
										RUN 5			
										S-5			
-22.2	30.0									RUN 6			
										S-6			
										RUN 7			
										S-7			
-32.2	40.0									RUN 8		ALLUVIUM: poorly graded SAND with silt (SP-SM), greenish gray (10Y 5/1), wet, fine sand, little subangular to subrounded gravel, no HCl reaction	39.0
										S-8			
										RUN 9		KIRKWOOD FORMATION: FAT CLAY (CH), dark olive gray (5Y 3/2), moist, trace fine sand, no HCl reaction	44.5
										S-9			
-42.2	50.0									RUN 10			
										S-10			
										RUN 11			
										S-11			
-52.2	60.0									RUN 12		KIRKWOOD FORMATION: Clayey SAND (SC), olive gray (5Y 5/2), wet	63.0
										S-12			
										RUN 13		KIRKWOOD FORMATION: Silty SAND (SM), olive gray (5Y 5/2), wet, fine to coarse sand, trace subrounded gravel, no HCl reaction	67.0
										S-13			
-62.2	70.0									RUN 14		VINCENTOWN FORMATION: Poorly graded SAND with clay (SP-SC), greenish gray (10Y 6/1), wet, fine sand, glauconitic, strong HCl reaction	72.0
										S-14			

PSEG ESP BORE PSEG ESP. 6-15-09 GPJ PSEG ESP.GDT 6/16/09



GEOTECHNICAL BORING LOG

Prepared By NH Date 6/16/09Checked By JAJ Date 6/17/09

SHEET 1 OF 2

PERMIT NO.: P200900095		DRILLER: R. Tabor		NJ LICENSE NO.: 0001335		GEOLOGIST: R. Clark						
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251						
BORING NO.: NOW-7L		DRILL METHOD: Rotosonic		SAMPLE METHODS: Rotosonic disturbed soil core								
GROUND SURFACE ELEV.: 6.1 US ft (NAVD88)		NORTHING: 234973.4 US ft (NAD83)		EASTING: 199675.9 US ft (NAD83)		FLUID LEVEL (ft) 0 HR. ND 24 HR. ND						
TOTAL DEPTH: 97.0 ft		DRILL MACHINE: Minisonic Track		CASING DEPTH: 97.0		HAMMER (ID): NA						
DATE STARTED: 1/23/09		COMPLETED: 1/24/09		HOLE DIA.: 6"		ROD TYPE: Sonic						
						BITS USED: 4" Auger Core Bit						
ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft 0.5ft 0.5ft			BLOWS PER FOOT 0 20 40 60 80 100					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
6.1					Ground Surface							6.1 0.0
6.1	0.0									RUN 1		4.1 ARTIFICIAL FILL: FAT CLAY with gravel and sand (CH), very pale brown (10YR 7/3) HYDRAULIC FILL: FAT CLAY (CH), very dark greenish gray (10Y 3/1), wet, few organics, trace gravel and sand, no HCl reaction
										S-1		2.0
-3.9	10.0									RUN 2		
										S-2		
-13.9	20.0									RUN 3		-13.9 ALLUVIUM: Clayey SAND (SC), dark greenish gray (10Y 4/1), wet, few shell fragments, little angular gravel
										S-3		-16.9 ALLUVIUM: FAT CLAY (CH), very dark greenish gray (10Y 3/1), wet, few fine sand, no HCl reaction
-23.9	30.0									S-4		29.0
										RUN 4		-22.9 ALLUVIUM: Clayey SAND (SC), dark greenish gray (10Y 4/1), wet, trace angular gravel, no HCl reaction
										S-5		-26.4 KIRKWOOD FORMATION: LEAN CLAY with sand and gravel (CL), brown (10YR 5/3), moist, subangular to subrounded gravel and sand, no HCl reaction
-33.9	40.0									RUN 5		40.0
										S-6		-33.9 VINCENTOWN FORMATION: Clayey SAND (SC), yellowish brown (10YR 5/6), wet, fine sand, strong HCl reaction, strongly oxidized
-43.9	50.0									RUN 6		48.5
										S-7		-42.4 VINCENTOWN FORMATION: Poorly graded SAND with silt (SP-SM), yellowish brown (10YR 5/6), wet, fine sand, strong HCl reaction, strongly oxidized
-53.9	60.0									RUN 7		63.5
										S-8		-57.4 VINCENTOWN FORMATION: Poorly graded SAND with clay (SP-SC), light yellowish brown (10YR 6/4), wet, fine sand, strong HCl reaction, moderately oxidized
-63.9	70.0									RUN 8		71.5
										S-9		-65.4

PSEG ESP BORE PSEG ESP 6-15-09 GPJ PSEG ESP.GDT 6/16/09



PERMIT NO.: P200900095		DRILLER: R. Tabor		NJ LICENSE NO.: 0001335		GEOLOGIST: R. Clark													
SITE DESCRIPTION: PSEG SITE ESP APPLICATION			COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251		FLUID LEVEL (ft)												
BORING NO.: NOW-7L		DRILL METHOD: Rotosonic		SAMPLE METHODS: Rotosonic disturbed soil core		0 HR. ND													
GROUND SURFACE ELEV.: 6.1		US ft (NAVD88)		NORTHING: 234973.4 US ft (NAD83)		EASTING: 199675.9 US ft (NAD83)		24 HR. ND											
TOTAL DEPTH: 97.0 ft		DRILL MACHINE: Minisonic Track		CASING DEPTH: 97.0		HAMMER (ID): NA													
DATE STARTED: 1/23/09		COMPLETED: 1/24/09		HOLE DIA.: 6"		ROD TYPE: Sonic		BITS USED: 4" Auger Core Bit											
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	▼	L O G	SOIL AND ROCK DESCRIPTION						
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100									
-68.7					Continued from previous page														
-73.9	80.0									S-10			-74.4	80.5	VINCENTOWN FORMATION: Clayey SAND (SC), greenish gray (10Y 6/1), wet, trace moderately indurated layers, glauconitic, strong HCl reaction, no oxidation (continued)				
										RUN 9						VINCENTOWN FORMATION: Poorly graded SAND with silt (SP-SM), greenish gray (10Y 6/1), wet, trace moderately indurated layers, glauconitic, strong HCl reaction			
-83.9	90.0									S-11									
										RUN 10									
													-90.9	97.0	Boring terminated at 97.0 feet and observation well NOW-7L constructed.				
															Boring logged to establish the general geologic conditions for the selection of observation well depths and well screen intervals. For complete strata and soil descriptions see geotechnical boring NB-7.				

</



GEOTECHNICAL BORING LOG

Prepared By MM Date 6/16/09

Checked By JH Date 6/17/09

SHEET 1 OF 2

PERMIT NO.: P200900105		DRILLER: C. Marsh		NJ LICENSE NO.: 0001190		GEOLOGIST: T. Longley	
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251	
BORING NO.: EOW-2L		DRILL METHOD: Rotasonic		SAMPLE METHODS: Rotasonic disturbed soil core			
GROUND SURFACE ELEV.: 13.9 US ft (NAVD88)		NORTHING: 233271.5 US ft (NAD83)		EASTING: 202177.7 US ft (NAD83)		FLUID LEVEL (ft) 0 HR. ND 24 HR. ND	
TOTAL DEPTH: 111.0 ft		DRILL MACHINE: Prosonic Truck		CASING DEPTH: 111.0		HAMMER (ID): NA	
DATE STARTED: 1/26/09		COMPLETED: 1/26/09		HOLE DIA.: 6"		ROD TYPE: Sonic	
						BITS USED: 4" Auger Core Bit	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT						SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION		
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100					
13.9					Ground Surface								13.9	0.0	
13.9	0.0										RUN 1		11.4	2.5	ARTIFICIAL FILL: SILT with sand (ML), very dark grayish brown (2.5Y 3/2), moist, trace rounded gravel
6.9	7.0										S-1				HYDRAULIC FILL: Silty SAND (SM), black (2.5Y 2.5/1), to greenish black (10GY 2.5/1), moist, trace fine to coarse rounded gravel; gravel and silt increase with depth
											RUN 2				
-3.1	17.0										S-2		1.6	12.3	HYDRAULIC FILL: FAT CLAY (CH), dark greenish gray (10Y 3/1), moist, no HCl reaction, trace to few organics, few fine sand partings
											RUN 3				
-13.1	27.0										S-3				
											RUN 4				27.0ft: Greenish black (5GY 2.5/1)
											S-4				
-23.1	37.0										RUN 5		-25.1	39.0	ALLUVIUM: Well graded SAND (SW), light brownish gray (10YR 6/2), wet, few fine gravel
											S-5				
-33.1	47.0										RUN 6		-33.1	47.0	ALLUVIUM: Silty SAND (SM), dark gray (10YR 4/1), wet, fine to medium sand
											S-6		-34.1	48.0	ALLUVIUM: FAT CLAY (CH), very dark gray (10YR 3/1), moist, no HCl reaction
-43.1	57.0										RUN 7		-41.1	55.0	KIRKWOOD FORMATION: FAT CLAY (CH), very dark grayish brown (2.5Y 3/2), moist, few to little shell fragments, no HCl reaction
											S-7				
-53.1	67.0										RUN 8				67.0ft: Very dark gray (2.5Y 3/1) mottled with light yellowish brown (10YR 6/4), trace shell fragments
											S-8				

PSEG ESP BORE PSEG ESP 6-15-09 GP1 PSEG ESP GDI 6/16/09



SHEET 2 OF 2

PERMIT NO.: P200900105		DRILLER: C. Marsh		NJ LICENSE NO.: 0001190		GEOLOGIST: T. Longley	
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251	
BORING NO.: EOW-2L		DRILL METHOD: Rotosonic		SAMPLE METHODS: Rotosonic disturbed soil core		FLUID LEVEL (ft)	
GROUND SURFACE ELEV.: 13.9 US ft (NAVD88)		NORTHING: 233271.5 US ft (NAD83)		EASTING: 202177.7 US ft (NAD83)		0 HR. ND	
TOTAL DEPTH: 111.0 ft		DRILL MACHINE: Prosonic Truck		CASING DEPTH: 111.0		HAMMER (ID): NA	
DATE STARTED: 1/26/09		COMPLETED: 1/26/09		HOLE DIA.: 6"		ROD TYPE: Sonic	
BITS USED: 4" Auger Core Bit							

ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT						SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION		
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100					
-60.9					Continued from previous page										
-63.1	77.0										RUN 9		KIRKWOOD FORMATION: FAT CLAY (CH), very dark grayish brown (2.5Y 3/2), moist, few to little shell fragments, no HCl reaction (<i>continued</i>) 77.0ft: Very dark gray (5Y 3/1) mottled with light yellowish brown (10YR 6/4) 87.0ft: Dark olive gray (5Y 3/2)		
-73.1	87.0										S-9				
											RUN 10				
											S-10				
-83.1	97.0										RUN 11				
											S-11		-85.1	99.0	KIRKWOOD FORMATION: Well graded SAND with gravel (SW), gray (5Y 6/1), wet, fine to coarse rounded gravel, no HCl reaction VINCENTOWN FORMATION: Poorly graded SAND (SP), greenish gray (10Y 5/1), wet, strong HCl reaction, few indurated layers, fine to medium sand, trace glauconite
											S-12		-87.6	101.5	
													-97.1	111.0	Boring terminated at 111.0 feet and observation well EOW-2L constructed. Boring logged to establish the general geologic conditions for the selection of observation well depths and well screen intervals. For complete strata and soil descriptions see geotechnical boring EB-2.



GEOTECHNICAL BORING LOG

Prepared By nm Date 6/17/09
 Checked By JSJ Date 6/17/09
 SHEET 1 OF 2

PERMIT NO.: P200900109		DRILLER: M. Adams		NJ LICENSE NO.: 0001350		GEOLOGIST: B. Deobald	
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251	
BORING NO.: EOW-6L		DRILL METHOD: Mud Rotary with Reverse Circulation		SAMPLE METHODS: SPT		FLUID LEVEL (ft)	
GROUND SURFACE ELEV.: 13.3 US ft (NAVD88)		NORTHING: 232588.1 US ft (NAD83)		EASTING: 203300.7 US ft (NAD83)		0 HR. ND	
TOTAL DEPTH: 102.0 ft		DRILL MACHINE: CME-850 Track		CASING DEPTH: 9.3		HAMMER (ID): 140 lb. Auto (CTB-4)	
DATE STARTED: 1/22/09		COMPLETED: 1/23/09		HOLE DIA.: 6"		ROD TYPE: NWJ	
BITS USED: 3-7/8" & 5-7/8" Drag Bits							

ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100
13.3					Ground Surface							13.3	0.0
-6.4	19.6	1	WOH	1								SS-1	19.6
-11.4	24.6	WOH	WOH	WOH								SS-2	24.6
-16.4	29.6	WOH	WOH	WOH								SS-3	29.6
-21.4	34.6	4	4	6								SS-4	34.6
-26.4	39.6	3	7	5								SS-5	39.6
-31.4	44.6	4	2	4								SS-6	44.6
-36.4	49.6	12	14	17								SS-7	49.6
-41.3	54.5	10	5	16								SS-8	54.5

Drilling Log Description:
 13.3 to 19.6 ft: Ground Surface
 19.6 to 24.6 ft: HYDRAULIC FILL: Sandy SILT (ML), very dark greenish gray (10Y 3/1), very soft, moist to wet, little sand, trace organics
 24.6 to 28.0 ft: SILT (ML), soft, few sand
 28.0 to 33.0 ft: HYDRAULIC FILL: FAT CLAY (CH), very dark greenish gray (10Y 3/1), very soft, moist, trace fine sand
 33.0 to 38.0 ft: ALLUVIUM: Well graded SAND (SW), very dark gray (10YR 3/1), loose, wet, fine to coarse sand, trace angular gravel
 38.0 to 43.0 ft: ALLUVIUM: LEAN CLAY (CL), light gray (10YR 7/1) mottled very pale brown (10YR 7/4), soft, moist
 43.0 to 48.5 ft: ALLUVIUM: Silty SAND (SM), gray (10YR 6/1), loose, moist to wet, fine sand
 48.5 to 53.0 ft: ALLUVIUM: Well graded SAND with gravel (SW), light olive gray (5Y 6/2), dense, wet, little sub-angular to rounded gravel
 53.0 to 56.0 ft: ALLUVIUM: Poorly graded SAND (SP), light olive gray (5Y 6/2), medium dense, moist to wet, fine to medium sand, trace sub-angular to rounded gravel
 56.0 to 84.5 ft: Drill without sampling to 84.5 feet. Continue SPT's at 84.5 feet

PSEG ESP BORE PSEG ESP 6-15-09 GFI PSEG ESP GDT 6/17/09





GEOTECHNICAL BORING LOG

Prepared By MM Date 6/16/09Checked By JS Date 6/17/09

SHEET 1 OF 2

PERMIT NO.: P200900111		DRILLER: C. Marsh		NJ LICENSE NO.: 0001190		GEOLOGIST: T. Longley						
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251						
BORING NO.: EOW-8L		DRILL METHOD: Rotosonic		SAMPLE METHODS: Rotosonic disturbed soil core								
GROUND SURFACE ELEV.: 15.4 US ft (NAVD88)		NORTHING: 231163.5 US ft (NAD83)		EASTING: 203516.0 US ft (NAD83)		FLUID LEVEL (ft) 0 HR. ND 24 HR. ND						
TOTAL DEPTH: 79.0 ft		DRILL MACHINE: Prosonic Truck		CASING DEPTH: 79.0		HAMMER (ID): NA						
DATE STARTED: 1/25/09		COMPLETED: 1/25/09		HOLE DIA.: 6"		ROD TYPE: Sonic						
						BITS USED: 4" Auger Core Bit						
ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft 0.5ft 0.5ft			BLOWS PER FOOT 0 20 40 60 80 100					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
15.4					Ground Surface							15.4 0.0
15.4	0.0									RUN 1		ARTIFICIAL FILL: Poorly graded SAND with silt (SP-SM), brown (7.5YR 4/3), moist, trace gravel
8.4	7.0									S-1 RUN 2		11.9 3.5 HYDRAULIC FILL: FAT CLAY (CH), black (5Y 2.5/1), moist, trace organics, trace to few fine sand partings, no HCl reaction
-1.6	17.0									S-2		-1.6 17.0 HYDRAULIC FILL: Silty SAND (SM), black (5Y 2.5/1), wet, no HCl reaction
-11.6	27.0									RUN 3 S-3		-4.6 20.0 HYDRAULIC FILL: FAT CLAY (CH), black (5Y 2.5/1), moist, trace organics, few fine sand partings
-21.6	37.0									S-4 RUN 4		-15.9 31.3 ALLUVIUM: Poorly graded SAND (SP), gray (5Y 6/1), wet, no HCl reaction
-31.6	47.0									S-5 RUN 5		-17.6 33.0 ALLUVIUM: FAT CLAY (CH), black (5Y 2.5/1), moist, little organics, no HCl reaction
-41.6	57.0									S-6 RUN 6		-19.9 35.3 ALLUVIUM: PEAT (PT), dark reddish brown (5YR 3/2), moist, mostly organics, grades into SILT (ML), gray (N 5/), no HCl reaction
-51.6	67.0									S-7 RUN 7		-21.6 37.0 ALLUVIUM: Silty SAND (SM), greenish gray (10Y 5/1), moist, fine sand, trace to little gravel (increases with depth)
										S-8 RUN 8		-26.6 42.0 KIRKWOOD FORMATION: SILT (ML), brown (10YR 4/3), moist, no HCl reaction
										S-9 RUN 9		-40.6 56.0 VINCENTOWN FORMATION: Silty SAND (SM), reddish brown (5YR 4/4), wet, fine sand, no HCl reaction, strongly oxidized
										S-10 RUN 10		-52.6 68.0 VINCENTOWN FORMATION: Poorly graded SAND with silt (SP-SM), light yellowish brown (2.5Y 6/4), wet, strong HCl reaction, trace friable layers, moderately oxidized
										S-11 RUN 11		
										S-12 RUN 12		

PSEG ESP BORE PSEG ESP 6-15-09 GPJ PSEG ESP GDI 6/15/09

PERMIT NO.: P200900111			DRILLER: C. Marsh			NJ LICENSE NO.: 0001190			GEOLOGIST: T. Longley					
SITE DESCRIPTION: PSEG SITE ESP APPLICATION					COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251			FLUID LEVEL (ft)				
BORING NO.: EOW-8L			DRILL METHOD: Rotosonic			SAMPLE METHODS: Rotosonic disturbed soil core			0 HR. ND					
GROUND SURFACE ELEV.: 15.4 US ft (NAVD88)			NORTHING: 231163.5 US ft (NAD83)			EASTING: 203516.0 US ft (NAD83)			24 HR. ND					
TOTAL DEPTH: 79.0 ft			DRILL MACHINE: Prosonic Truck			CASING DEPTH: 79.0			HAMMER (ID): NA					
DATE STARTED: 1/25/09			COMPLETED: 1/25/09			HOLE DIA.: 6"			ROD TYPE: Sonic					
									BITS USED: 4" Auger Core Bit					
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	▼	L O G	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100				
-59.4					Continued from previous page									
-61.6	77.0									RUN 9			VINCENTOWN FORMATION: Poorly graded SAND with silt (SP-SM), light yellowish brown (2.5Y 6/4), wet, strong HCl reaction, trace friable layers, moderately oxidized (continued) 76.0ft: Light gray (2.5Y 7/2), weakly oxidized Boring terminated at 79.0 feet and observation well EOW-8L constructed. Boring logged to establish the general geologic conditions for the selection of observation well depths and well screen intervals. For complete strata and soil descriptions see geotechnical boring EB-8.	
													79.0	





SHEET 2 OF 2

PERMIT NO.: P200900100		DRILLER: C. Marsh		NJ LICENSE NO.: 0001190		GEOLOGIST: T. Longley							
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251							
BORING NO.: EOW-9L		DRILL METHOD: Rotosonic		SAMPLE METHODS: Rotosonic disturbed soil core		FLUID LEVEL (ft)							
GROUND SURFACE ELEV.: 17.9 US ft (NAVD88)		NORTHING: 230925.6 US ft (NAD83)		EASTING: 202844.6 US ft (NAD83)		0 HR. ND							
TOTAL DEPTH: 129.0 ft		DRILL MACHINE: Prosonic Truck		CASING DEPTH: 129		HAMMER (ID): NA							
DATE STARTED: 1/20/09		COMPLETED: 1/20/09		HOLE DIA.: 6"		ROD TYPE: Sonic							
						BITS USED: 4" Auger Core Bit							
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
-56.9					Continued from previous page								
-59.1	77.0										S-12	KIRKWOOD FORMATION: FAT CLAY (CH), very dark greenish gray (10Y 3/1), moist, little shell fragments, no HCl reaction, trace fine sand, trace organics (continued) 77.0ft: Trace shell fragments	
											RUN 9		
											S-13		
-69.1	87.0										RUN 10	87.0ft: Sand increasing	
											S-14	-71.6	KIRKWOOD FORMATION: Poorly graded SAND (SP), greenish gray (10Y 5/1), to gray (5Y 5/1), wet, fine to coarse sand, no HCl reaction
-79.1	97.0										RUN 11	97.0ft: Light gray (5Y 7/1)	
											S-15	-84.1	KIRKWOOD FORMATION: FAT CLAY (CH), very dark gray (5Y 3/1), moist, few organics
-89.1	107.0										S-16	-87.1	VINCENNTOWN FORMATION: Poorly graded SAND (SP), dark greenish gray (10Y 4/1), to light greenish gray (10Y 7/1), and greenish gray (10Y 6/1), wet, fine to medium sand, glauconitic, weak to strong HCl reaction, trace indurated layers
											RUN 12		
											S-17		
-99.1	117.0										RUN 13	-99.1	VINCENNTOWN FORMATION: Silty SAND (SM), greenish gray (10Y 5/1), to olive gray (5Y 5/1), wet, weak HCl reaction, few indurated layers
											S-18		
												-111.1	129.0
Boring terminated at 129.0 feet and observation well EOW-9L constructed.													
Boring logged to establish the general geologic conditions for the selection of observation well depths and well screen intervals.													

PSEG ESP BORE PSEG ESP 6-15-09.GPJ PSEG ESP.GDT 6/16/09



GEOTECHNICAL BORING LOG

Prepared By MM Date 6/16/09

Checked By JS Date 6/17/09

SHEET 1 OF 2

PERMIT NO.: P200900102		DRILLER: C. Marsh		NJ LICENSE NO.: 0001190		GEOLOGIST: T. Longley	
SITE DESCRIPTION: PSEG SITE ESP APPLICATION				COUNTY: Salem, NJ		MACTEC PROJECT NO.: 6468-08-2251	
BORING NO.: EOW-10L		DRILL METHOD: Rotosonic		SAMPLE METHODS: Rotosonic disturbed soil core			
GROUND SURFACE ELEV.: 11.7 US ft (NAVD88)		NORTHING: 231706.7 US ft (NAD83)		EASTING: 203521.9 US ft (NAD83)		FLUID LEVEL (ft) 0 HR. ND 24 HR. ND	
TOTAL DEPTH: 97.0 ft		DRILL MACHINE: Prosonic Truck		CASING DEPTH: 97		HAMMER (ID): NA	
DATE STARTED: 1/22/09		COMPLETED: 1/22/09		HOLE DIA.: 6"		ROD TYPE: Sonic	
						BITS USED: 4" Auger Core Bit	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT						SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION			
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100						
11.7					Ground Surface								11.7	0.0		
11.7	0.0										RUN 1			ARTIFICIAL FILL: SILT with sand and gravel (ML), dark reddish brown (5YR 3/4), dry		
4.7	7.0										S-1			6.7	5.0	
											RUN 2			HYDRAULIC FILL: FAT CLAY (CH), black (5Y 2/5), wet, trace sand and gravel		
														7.0ft: Very dark gray (N 3/), moist to wet, few fine sand partings, trace organics		
-5.3	17.0										S-2					
											RUN 3			17.0ft: Black (5Y 2.5/1), moist, little organics		
											S-3					
-15.3	27.0										RUN 4					
											S-4			-17.3	29.0	
														ALLUVIUM: Poorly graded SAND (SP), yellowish brown (10YR 5/4), to grayish brown (2.5Y 5/2), wet, trace fines, trace rounded gravel		
											S-5			-22.3	34.0	
											RUN 5			-23.3	35.0	
											S-5			ALLUVIUM: Sandy SILT (SM), light olive brown (2.5Y 5/3), wet, trace gravel		
-25.3	37.0										RUN 5			-25.3	37.0	
											S-6			KIRKWOOD FORMATION: FAT CLAY (CH), black (2.5Y 2.5/1), moist, trace organics		
														KIRKWOOD FORMATION: SILT (ML), greenish black (10Y 2.5/1), moist, trace fine sand, trace organics, no HCl reaction		
											S-6					
											RUN 6			-36.8	48.5	
											S-7			-39.6	51.3	
														KIRKWOOD FORMATION: Poorly graded SAND (SP), very dark greenish gray (10Y 3/1), wet, trace fines, trace rounded gravel, no HCl reaction		
											S-8			VINCENTOWN FORMATION: Poorly graded SAND with silt (SP-SM), greenish gray (10Y 6/1), wet, trace gravel, strong HCl reaction, trace friable layers		
											RUN 7			57.0ft: Moist to wet, few moderately indurated layers		
											S-9					
											RUN 8					
											S-10					
-55.3	67.0															

PSEG ESP BORE PSEG ESP 6-15-09 GFI PSEG ESP GDI 6/16/09

[illegible]