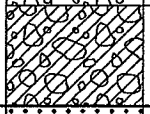
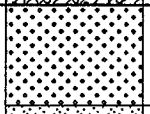
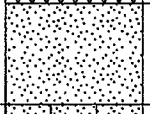
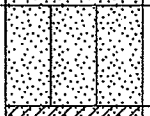
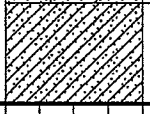
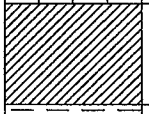
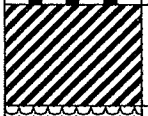
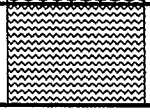
APPENDIX 2AA

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

GRANULAR MATERIAL	
RELATIVE DENSITY	SPT N Value (blows/ft)
VERY LOOSE	0 - 4
LOOSE	5 - 10
MEDIUM DENSE	11 - 30
DENSE	31 - 50
VERY DENSE	> 50

SILTS AND CLAYS	
CONSISTENCY	SPT N Value (blows/ft)
VERY SOFT	0 - 2
SOFT	3 - 4
MED. STIFF	5 - 8
STIFF	9 - 15
VERY STIFF	16 - 30
HARD	> 30

MOISTURE CONTENT

DRY-Absence of moisture

MOIST-Damp/no visible H2O

WET-Visible free water

HCl Reaction

NONE - No visible reaction

WEAK - Some reaction/slow

STRONG - Violent reaction

MODIFIERS

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.

TRACE	<5%
FEW	5 to 10%
LITTLE	15 to 25%
SOME	30 to 45%
MOSTLY	50 to 100%

INDURATION

For sedimentary rocks, induration is the hardening of the material by cementing, heat, pressure, etc.

FRIABLE	Rubbing with finger frees numerous grains; gentle blow by hammer disintegrates sample.
MODERATELY INDURATED	Grains can be separated from sample with steel probe/knife; breaks easily when hit with hammer.
INDURATED	Grains are difficult to separate with steel probe/knife; difficult to break with hammer.
EXTREMELY INDURATED	Sharp hammer blows required to break sample; sample breaks across grains.

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

Particle Size Range for Sand: Fine, Medium, Coarse

Particle Size Range for Gravel: Fine or Coarse

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).

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 rotosonic drilling
TV = Torvane Test (tsf)
PP = Pocket Penetrometer Test (tsf)
tsf = tons per square foot
ND = Not Determined

MACTEC

GEOTECHNICAL BORING LOG

Prepared By MPR Date 7/10/09

Checked By JAJ 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. (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	4	7	8	15	SS-1		12.8 0.0 ARTIFICIAL FILL: Clayey SAND (SC), grayish brown (2.5Y 5/2), medium dense, moist, little angular gravel, trace organics
10.3	2.5							10.8 2.0 HYDRAULIC FILL: FAT CLAY (CH), dark greenish gray (10Y 3/1), stiff, moist, trace angular gravel, trace organics, no HCl reaction
		3	6	6	12	SS-2		
7.8	5.0							7.0 5.8 HYDRAULIC FILL: Clayey SAND (SC), olive brown (2.5Y 5/3), loose, moist, trace angular gravel, no HCl reaction
		2	4	6	10	SS-3		5.8 7.0 HYDRAULIC FILL: FAT CLAY (CH), greenish gray (10Y 5/1), very soft, moist, little subrounded gravel, no HCl reaction
5.3	7.5							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
		WOH	WOH	WOH	0 WOH	SS-4		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
2.8	10.0							15.0ft: No recovery, very soft
		WOH	8	12	20	SS-5		
0.3	12.5							
		7	16	20	36	SS-6		
-2.2	15.0							
		WOH	WOH	WOH	0 WOH	SS-7		
-7.2	20.0							20.0ft: Moist to wet
		WOH	WOH	WOH	0 WOH	SS-8		
-12.2	25.0							
		WOH	WOH	WOH	0 WOH	SS-9		25.0ft: Moist
-17.2	30.0							
		WOH	WOH	WOH	0 WOH	SS-10		30.0ft: Dark greenish gray (10Y 4/1)
-22.2	35.0							
		1	2	2	4	SS-11		35.0ft: Moist to wet
-27.2	40.0							
		WOH	WOH	WOH	0 WOH	SS-12		40.0ft: Moist
-32.2	45.0							
		WOH	4	12	16	SS-13A/B		-33.2 46.0 ALLUVIUM: Clayey SAND (SC), greenish gray (10Y 5/1), medium dense, wet, fine sand, no HCl reaction
-37.2	50.0							-35.2 48.0 ALLUVIUM: Poorly graded SAND with silt (SP-SM), grayish brown (2.5Y 5/2), dense, wet, fine sand, no HCl reaction
		6	16	18	34	SS-14		
-42.2	55.0							54.0ft: Slight bit chatter to 55.0ft
		WOH	WOH	WOH	0 WOH	SS-15		-42.2 55.0

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

MACTEC

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
-43.3					Continued from previous page			
-47.2	60.0							KIRKWOOD FORMATION: FAT CLAY (CH), olive (5Y 5/3), very soft, moist, no HCl reaction *(continued)*
		WOH	WOH	WOH	0 WOH	SS-16		60.0ft: Dark gray (5Y 4/1), trace fine sand
-50.2								63.0
-52.2	65.0	5	12	17	29	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
-56.2								69.0
-57.2	70.0	6	5	5	10	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
-60.2								73.0
-62.2	75.0	9	15	15	30	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	15	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	17	SS-21		85.0ft: Greenish gray (10Y 5/1), trace friable to moderately indurated layers, trace glauconite, no oxidation
-75.2								88.0
-77.2	90.0	2	5	9	14	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	17	SS-23		95.0ft: Trace moderately indurated layers, strong HCl reaction
-87.2	100.0	21	14	12	26	SS-24		100.0ft: Greenish gray (10Y 5/1), little friable to moderately indurated layers
-92.2	105.0	11	8	16	24	SS-25		105.0ft: Trace friable layers
-97.2	110.0	7	8	18	26	SS-26		

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

MACTEC

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
-99.4					Continued from previous page			
-102.2	115.0	8	10	16	26	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)
-105.2								118.0
-107.2	120.0	18	50/0.3		50/0.3	SS-28		HORNERSTOWN FORMATION: Silty SAND (SM), greenish gray (10Y 5/1), very dense, wet, fine to medium sand, strong HCl reaction, trace to few glauconite
-112.2	125.0	4	6	12	18	SS-29		125.0ft: Medium dense
-117.2	130.0	6	11	15	26	SS-30		
-122.2	135.0	9	11	20	31	SS-31		135.0ft: Dense, few to little glauconite
-126.2								139.0
-127.2	140.0	16	23	25	48	SS-32		NAVESINK FORMATION: Clayey SAND (SC), very dark greenish gray (10GY 3/1), dense, wet, few shell fragments, strong HCl reaction, mostly glauconite
-130.2								143.0
-132.2	145.0	27	36	42	78	SS-33		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
-135.2								148.0
-137.2	150.0	18	21	23	44	SS-34		NAVESINK FORMATION: Clayey SAND (SC), very dark greenish gray (10Y 3/1), dense, moist, trace shells, strong HCl reaction, mostly glauconite
-140.2								153.0
-142.2	155.0	18	28	37	65	SS-35		NAVESINK FORMATION: Silty SAND (SM), very dark greenish gray (10Y 3/1), very dense, wet, weak HCl reaction, mostly glauconite
-147.2	160.0	23	38	44	82	SS-36		
-150.2								163.0
-152.2	165.0	22	33	45	78	SS-37		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

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

GEOTECHNICAL BORING LOG

MACTEC

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 Rig 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
-185.2								198.0
-187.2	200.0	20	80/0.5		100/1.0	SS-44		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
-192.2								205.0
-197.2	210.0	48	52/0.2		100/0.7	SS-45		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
-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.GPJ PSEG ESP.GDT 7/10/09

GEOTECHNICAL BORING LOG

MACTEC

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.	L O G	SOIL AND ROCK DESCRIPTION
-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
-222.2	235.0							
-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
-233.2	246.0							
-237.2	250.0	8	9	14	23	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
-242.2	255.0							
-247.2	260.0	7	17	32	49	SS-50		MOUNT LAUREL FORMATION: Silty SAND (SM), dark gray (5Y 4/1), dense, wet, fine sand, weak HCl reaction
-252.2	265.0							
-257.2	270.0	5	12	14	26	SS-51		WENONAH FORMATION: Sandy LEAN CLAY (CL), very dark gray (N 3/), very stiff, wet, fine sand, weak HCl reaction
-267.2	280.0							

PSEG ESP BORE_PSEG ESP_7-07-09.GPJ PSEG ESP.GDT 7/10/09

GEOTECHNICAL BORING LOG

MACTEC

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.	L O G	SOIL AND ROCK DESCRIPTION
-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)*
-272.2								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	34	SS-53		
-287.2	300.0	15	32	68/0.4	100/0.9	SS-54		300.0ft: Greenish black (10Y 2.5/1), very dense, weak HCl reaction, trace to few glauconite
-292.2								305.0 ENGLISHTOWN FORMATION: Clayey SAND (SC), very dark gray (N 3/), dense, moist, fine sand, no HCl reaction, trace glauconite
-297.2	310.0	5	14	20	34	SS-55		
-302.2								315.0 ENGLISHTOWN FORMATION: FAT CLAY (CH), black (N 2.5/), hard, moist, few fine sand, weak HCl reaction
-307.2	320.0	32	45	55/0.3	100/0.8	SS-56		
-317.2	330.0	8	11	14	25	SS-57		330.0ft: Very stiff, no HCl reaction

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

GEOTECHNICAL BORING LOG

MACTEC

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
-323.8					Continued from previous page			
								ENGLISHTOWN FORMATION: FAT CLAY (CH), black (N 2.5/), hard, moist, few fine sand, weak HCl reaction *(continued)*
-327.2	340.0	5	16	30	46	SS-58		340.0ft: Hard
-336.2	349.0							WOODBURY FORMATION: FAT CLAY (CH), greenish black (5GY 2.5/1), hard, moist, few fine sand, trace indurated layers, no HCl reaction, trace glauconite
-337.2	350.0	19	23	26	49	SS-59		
-347.2	360.0	5	10	17	27	SS-60		360.0ft: Very dark gray (10Y 3/1), very stiff
-357.2	370.0	4	9	12	21	SS-61		370.0ft: Trace mica, PP=4.0 tsf
-367.2	380.0	5	5	14	19	SS-62		380.0ft: Trace shell fragments, PP=4.5 tsf
-372.2	385.0							MERCHANTVILLE FORMATION: Sandy LEAN CLAY (CL), greenish black (10GY 2.5/1), hard, moist, fine sand, no HCl reaction, few glauconite
-377.2	390.0	20	23	25	48	SS-63		390.0ft: PP=3.5 tsf

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

GEOTECHNICAL BORING LOG

MACTEC

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
-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	52	SS-64		400.0ft: PP=4.5 tsf
-397.2	410.0	8	14	17	31	SS-65		410.0ft: Black (N 2.5/), very stiff, trace glauconite, PP=3.0 tsf
								415.0ft: Bit chatter to 416.0ft
-402.2	415.0							MAGOTHY FORMATION: SILT with sand (ML), gray (7.5YR 5/1), very dense, wet, fine sand, no HCl reaction
-407.2	420.0	42	58/0.3		100/0.3	SS-66		
-415.2	428.0							MAGOTHY FORMATION: Clayey SAND (SC), dark gray (2.5Y 4/1), very dense, moist, trace of lignite
-417.2	430.0	12	27	45	72	SS-67		430.0ft: PP=3.0 tsf
-427.2	440.0	40	60/0.3		100/0.8	SS-68		440.0ft: No recovery-sample pulled out, catcher inverted; replaced with steel catcher 441.0ft: Hard drilling to 443.0ft
-432.2	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

GEOTECHNICAL BORING LOG

MACTEC

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
-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)*
-454.2	467.0							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
-456.5	469.3	24	38	42	80	SS-70		
-467.2	480.0							POTOMAC FORMATION: Silty SAND (SM), dark gray (2.5Y 4/1), very dense, wet, fine sand, trace lignite, no HCl reaction
-477.1	489.9	100/0.2			100/0.2	SS-71		

GEOTECHNICAL BORING LOG

MACTEC

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
-492.1					Continued from previous page			
								POTOMAC FORMATION: Silty SAND (SM), dark gray (2.5Y 4/1), very dense, wet, fine sand, trace lignite, no HCl reaction *(continued)*
-496.7	509.5	100/0.3			100/0.3	SS-72		509.5ft: Dark gray (10YR 4/1), fine to medium sand
-512.2								525.0 POTOMAC FORMATION: SILT (ML), gray (7.5YR 5/1), hard, moist, few fine sand, no HCl reaction
-516.8	529.6	100/0.5			100/0.5	SS-73A/B		-517.1 529.9 POTOMAC FORMATION: Poorly graded SAND with silt (SP-SM), gray (2.5Y 6/1), very dense, wet, fine sand, no HCl reaction -Drill without sampling from 530.1ft to 600.0ft for geophysical testing
-525.2								538.0 POTOMAC FORMATION: LEAN CLAY (CL)-Interpreted from geophysical log

GEOTECHNICAL BORING LOG

MACTEC

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
-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 Collected SPT at 600.0ft after geophysical testing completed.
-587.2	600.0	40	60/0.4		100/0.9	SS-74			-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 600.9
									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

MACTEC

GEOTECHNICAL BORING LOG

Prepared By MAR Date 7/10/09

Checked By JAD Date 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	FLUID LEVEL (ft)
BORING NO.: NB-1UD	DRILL METHOD: Mud Rotary	SAMPLE METHODS: Shelby Tube/Pitcher Barrel	0 HR. ND
GROUND SURFACE ELEV.: 12.7 US ft (NAVD88)	NORTHING: 234556.0 US ft (NAD83)	EASTING: 198459.0 US ft (NAD83)	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
								Boring drilled for collection of undisturbed samples. See boring NB-1 for complete strata and soil descriptions.
10.7								2.0 ARTIFICIAL FILL: Not sampled
9.5	3.2					UD-1		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;
-33.4								46.0 TV=0.25-0.35 tsf; PP=<0.25-0.25 tsf ALLUVIUM: Not sampled
-42.4								55.0 KIRKWOOD FORMATION
-43.2	55.8							

PSEG ESP BORE_PSEG ESP_7-07-09.GPJ PSEG ESP.GDT 7/10/09

MACTEC

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	FLUID LEVEL (ft)
BORING NO.: NB-1UD	DRILL METHOD: Mud Rotary	SAMPLE METHODS: Shelby Tube/Pitcher Barrel	0 HR. ND
GROUND SURFACE ELEV.: 12.7 US ft (NAVD88)	NORTHING: 234556.0 US ft (NAD83)	EASTING: 198459.0 US ft (NAD83)	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
-43.5					Continued from previous page				
						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 KIRKWOOD FORMATION *(continued)* 59.1ft: Shelby tube UD-9 pushed to 61.1ft; recovery=0.0ft-lost tube in hole
-46.5	59.1					UD-9			
-49.4	62.0					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 (5Y5/2), wet, fine sand, no HCl reaction; recovery=1.8ft -Change sample method to Pitcher Barrel Sampler
-55.5	68.1					UD-11			-56.4 68.1ft: Pitcher tube UD-11 advanced to 70.6ft; recovery=0.0ft 69.0 VINCENTOWN FORMATION
-59.4	72.0					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
-62.4	75.0					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
-65.4	78.0					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
-68.4	81.0					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
-71.9	84.5					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
-76.0	88.6					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
-80.0	92.6					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
-83.8	96.4					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
-88.0	100.6					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
-91.7	104.3					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
-94.6	107.2					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

GEOTECHNICAL BORING LOG

MACTEC

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	FLUID LEVEL (ft)
BORING NO.: NB-1UD	DRILL METHOD: Mud Rotary	SAMPLE METHODS: Shelby Tube/Pitcher Barrel	0 HR. ND
GROUND SURFACE ELEV.: 12.7 US ft (NAVD88)	NORTHING: 234556.0 US ft (NAD83)	EASTING: 198459.0 US ft (NAD83)	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
-99.6					Continued from previous page			
-99.9	112.5					UD-23		VINCENTOWN FORMATION *(continued)* 112.5ft: Pitcher tube UD-23 advanced to 114.4ft in Silty SAND (SM), greenish gray (10GY 5/1), wet, fine sand, few indurated zones, strong HCl reaction; recovery=0.8ft
-105.4								118.0 HORNERSTOWN FORMATION
-108.9	121.5					UD-24		121.5ft: Pitcher tube UD-24 advanced to 124.0ft in Poorly graded SAND with silt (SP-SM), greenish gray (10GY 5/1), wet, fine sand, few indurated to friable zones, strong HCl reaction, trace glauconite; recovery=2.4ft
-113.0	125.6					UD-25		125.6ft: Pitcher tube UD-25 advanced to 128.1ft in Silty SAND (SM), greenish gray (10GY 5/1), wet, fine sand, strong HCl reaction, trace glauconite; recovery=2.2ft
-117.1	129.7					UD-26		129.7ft: Pitcher tube UD-26 advanced to 132.2ft in Silty SAND (SM), greenish gray (10GY 5/1), wet, fine sand, few indurated zones, weak HCl reaction, trace glauconite; recovery=1.1ft
-126.4								139.0 NAVESINK FORMATION
-127.4	140.0					UD-27		140.0ft: Pitcher tube UD-27 advanced to 142.5ft in Silty SAND (SM), very dark grayish green (5G 3/2), wet, fine sand, strong HCl reaction, mostly glauconite; recovery=2.3ft
-131.3	143.9					UD-28		143.9ft: Pitcher tube UD-28 advanced to 146.4ft in Silty SAND (SM), very dark grayish green (5G 3/2), wet, fine sand, strong HCl reaction, trace shell fragments, mostly glauconite; recovery=2.4ft
-135.0	147.6					UD-29		147.6ft: Pitcher tube UD-29 advanced to 150.1ft in Clayey SAND (SC), very dark grayish green (5G 3/2), wet, fine sand, strong HCl reaction, little shell fragments, mostly glauconite; recovery=0.8ft
-139.5	152.1					UD-30		152.1ft: Pitcher tube UD-30 advanced to 154.6ft in Clayey SAND (SC), greenish black (5G 2.5/1), wet, fine sand, weak HCl reaction, trace shell fragments, mostly glauconite; recovery=1.3ft
-143.3	155.9					UD-31		155.9ft: Pitcher tube UD-31 advanced to 158.4ft in Silty SAND (SM), very dark grayish green (5G 3/2), wet, fine sand, strong HCl reaction, mostly glauconite; recovery=1.9ft
-147.5	160.1					UD-32		160.1ft: Pitcher tube UD-32 advanced to 162.6ft in Clayey SAND (SM), very dark grayish green (5G 3/2), to black (5Y 2.5/1), wet, fine sand, strong HCl reaction, little shell fragments, mostly glauconite; recovery=2.3ft
-150.4								163.0 MOUNT LAUREL FORMATION
-150.7	163.3					UD-33		163.3ft: Pitcher tube UD-33 advanced to 165.8ft in Clayey SAND (SC), very dark gray (5Y 3/1), moist, fine to coarse sand, trace gravel, strong HCl reaction; recovery=1.6ft
-154.9	167.5					UD-34		

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

GEOTECHNICAL BORING LOG

MACTEC

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	FLUID LEVEL (ft)
BORING NO.: NB-1UD	DRILL METHOD: Mud Rotary	SAMPLE METHODS: Shelby Tube/Pitcher Barrel	0 HR. ND
GROUND SURFACE ELEV.: 12.7 US ft (NAVD88)	NORTHING: 234556.0 US ft (NAD83)	EASTING: 198459.0 US ft (NAD83)	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
-155.7					Continued from previous page				
									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)*
-170.9	183.5					UD-35			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
-175.6	188.2					UD-36			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
-204.2	216.8					UD-37			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
-209.2	221.8					UD-38			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.GPJ PSEG ESP.GDT 7/10/09

GEOTECHNICAL BORING LOG

MACTEC

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	FLUID LEVEL (ft)
BORING NO.: NB-1UD	DRILL METHOD: Mud Rotary	SAMPLE METHODS: Shelby Tube/Pitcher Barrel	0 HR. ND
GROUND SURFACE ELEV.: 12.7 US ft (NAVD88)	NORTHING: 234556.0 US ft (NAD83)	EASTING: 198459.0 US ft (NAD83)	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
-211.8					Continued from previous page				
									reaction, trace glauconite; recovery=2.0ft MOUNT LAUREL FORMATION *(continued)*
-217.2	229.8					UD-39			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
-219.7	232.3								Boring terminated at 232.3 feet. Boring closed by tremie method with cement-bentonite grout on 3/13/09.

MACTEC

GEOTECHNICAL BORING LOG

Prepared By MAL Date 7/10/09

Checked 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	FLUID LEVEL (ft)
BORING NO.: CH NB-1A	DRILL METHOD: Mud Rotary		SAMPLE METHODS: NA	0 HR. ND
GROUND SURFACE ELEV.: 12.8 US ft (NAVD88)	NORTHING: 234544.4 US ft (NAD83)		EASTING: 198483.1 US ft (NAD83)	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

MACTEC

GEOTECHNICAL BORING LOG

Prepared By MM Date 7/10/09

Checked By [signature] Date 7/10/09

SHEET 1 OF 1

PERMIT NO.: P200905733	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-1B	DRILL METHOD: Mud Rotary	SAMPLE METHODS: NA	0 HR. ND
GROUND SURFACE ELEV.: 13.0 US ft (NAVD88)	NORTHING: 234537.1 US ft (NAD83)	EASTING: 198476.0 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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	▼	LOG	SOIL AND ROCK DESCRIPTION
13.0					Ground Surface				13.0 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.
									-188.0 201.0
									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

MACTEC

GEOTECHNICAL BORING LOG

Prepared By MM Date 7/10/09

Checked By JA Date 7/10/09

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	▼	LOG	SOIL AND ROCK DESCRIPTION
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.

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

MACTEC

GEOTECHNICAL BORING LOG

Prepared By MRL Date 7/10/09

Checked 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	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. (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
8.2					Ground Surface			
8.2	0.0	6	7	8	15	SS-1		8.2 0.0 ARTIFICIAL FILL: Sandy CLAY (CL), very dark brown (10YR 2/2), stiff, moist, weak HCl reaction
5.7	2.5							2.5ft: Very dark grayish brown (10YR 3/2), no HCl reaction
		6	6	9	15	SS-2		4.2 4.0 HYDRAULIC FILL: Sandy CLAY (CL), very dark grayish brown (10YR 3/2), very soft, moist, no HCl reaction
3.8	4.4					UD-1		2.2 6.0 -Pushed shelby tube UD-1 from 4.4ft to 6.4ft; recovery=0.2ft
1.2	7.0							HYDRAULIC FILL: FAT CLAY (CH), black (N 2.5/), very soft, moist, trace fine sand, no HCl reaction
		1	WOH	1	1	SS-3		9.0ft: Pushed shelby tube UD-2 to 11.0ft; recovery=0.0ft
-0.8	9.0					UD-2		
-3.3	11.5					UD-3		11.5ft: Pushed shelby tube UD-3 to 13.5ft; recovery=0.0ft
-5.8	14.0							
		WOH	WOH	WOH	WOH 0	SS-4		14.0ft: Trace mica, PP=0.0 tsf
-11.7	19.9							
		WOH	WOH	WOH	WOH 0	SS-5		
-16.8	25.0							25.0ft: Soft
		WOH	WOH	2	2	SS-6		
-21.8	30.0							30.0ft: PP=0.0 tsf
		2	2	2	4	SS-7		
-23.9	32.1					UD-4		32.1ft: Pushed shelby tube UD-4 to 34.1ft; recovery=1.9ft
-26.8	35.0							
		WOH	1	WOH	1	SS-8		35.0ft: Very soft, trace fine sand lenses
-31.8	40.0							
		1	2	1	3	SS-9		40.0ft: Very dark gray (N 3/), soft
-35.3								43.5 ALLUVIUM: Clayey SAND (SC), very dark gray (N 3/), loose, moist, no HCl reaction
-36.8	45.0							
		4	3	4	7	SS-10		
-39.8								48.0 ALLUVIUM: PEAT (PT), brown (10YR 4/3), very soft, moist
-41.7	49.9							
		WOH	1	1	2	SS-11A/B		
-42.3								50.5 ALLUVIUM: Silty SAND (SM), dark gray (N 4/), very loose, wet, fine to medium sand, no HCl reaction
-46.8	55.0							
		5	5	9	14	SS-12		55.0ft: Medium dense

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

MACTEC

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. (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
-47.9					Continued from previous page			
-51.7	59.9							ALLUVIUM: Silty SAND (SM), dark gray (N 4/), very loose, wet, fine to medium sand, no HCl reaction *(continued)*
-56.9	65.1	5	9	12	21	SS-13		59.9ft: Greenish gray (10Y 5/1), fine to coarse subrounded sand, trace gravel
-57.8	66.0	12	12	7	19	SS-14A/B		KIRKWOOD FORMATION: Silty SAND (SM), dark greenish gray (10GY 4/1), medium dense, wet, fine to medium sand, no HCl reaction
-61.8	70.0	7	4	4	8	SS-15		70.0ft: Dark yellowish brown (10YR 4/4), loose
-67.1	75.3	3	2	3	5	SS-16		75.3ft: Greenish gray (10GY 5/1), loose, trace glauconite
-69.8	78.0							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
-71.8	80.0	13	19	10	29	SS-17		
-73.9	82.1					UD-5		82.1ft: Pushed shelby tube UD-5 to 84.1ft; recovery=1.9 ft
-76.8	85.0	15	5	6	11	SS-18		85.0ft: Brown (10YR 5/3), moist, trace moderately indurated layers, moderately oxidized
-78.7	86.9					UD-6		86.9ft: Pushed shelby tube UD-6 to 87.1ft; recovery=0.1ft (Refused on indurated layer)
-81.9	90.1	4	4	7	11	SS-19		90.1ft: Grayish brown (10YR 5/2), wet, trace glauconite, weakly oxidized
-83.8	92.0					UD-7		92.0ft: Shelby tube UD-7 pushed to 93.4ft; recovery=1.4ft
-86.9	95.1	5	4	27	31	SS-20		95.1ft: Light grayish brown (10YR 6/2), dense, trace friable to moderately indurated layers
-91.8	100.0	5	6	15	21	SS-21		100.0ft: Dark greenish gray (10Y 4/1), medium dense, no oxidation
-96.8	105.0	8	8	17	25	SS-22		
-101.8	110.0	16	11	14	25	SS-23		

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

GEOTECHNICAL BORING LOG

MACTEC

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. (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
-104.0					Continued from previous page			
-104.8								113.0
-106.8	115.0	21	14	19	33	SS-24		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	24	SS-25		120.0ft: Medium dense
-116.8	125.0	6	13	20	33	SS-26		125.0ft: Very dark greenish gray (10GY 3/1), dense, few shell fragments, some glauconite
-120.8								129.0
-121.7	129.9	18	24	25	49	SS-27		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	75	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	56	SS-29		140.0ft: Trace shell fragments
-136.8	145.0	19	29	36	65	SS-30		
-141.7	149.9	22	29	38	67	SS-31		149.9ft: No HCl reaction
-144.8								153.0
-146.8	155.0	100/0.5			100/0.5	SS-32		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			100/0.2	SS-33		159.9ft: Greenish gray (10Y 5/1), dry, trace shell fragments
-156.8	165.0	100/0.3			100/0.3	SS-34		165.0ft: Moist, few shell fragments, no HCl reaction

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

GEOTECHNICAL BORING LOG

MACTEC

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. (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
-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)* 170.0ft: Fine to medium sand, trace shell fragments, weak HCl reaction
-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)
-179.8								188.0
-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

MACTEC

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. (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
-216.2					Continued from previous page			
								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)*
-221.8	230.0	8	20	35	55	SS-44		230.0ft: Greenish black (10Y 2.5/1), trace mica
-231.8	240.0	9	19	28	47	SS-45		240.0ft: Dense
-241.8	250.0	10	14	26	40	SS-46		
-249.8	258.0							WENONAH FORMATION: Sandy LEAN CLAY (CL), greenish black (10Y 2.5/1), hard, moist, strong HCl reaction, trace mica, trace to few glauconite
-251.8	260.0	11	16	21	37	SS-47		
-259.8	268.0							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
-261.8	270.0	7	16	24	40	SS-48		
-264.8	273.0							MARSHALLTOWN FORMATION: Sandy LEAN CLAY (CL), black (N 2.5/), very stiff, moist, strong HCl reaction, trace glauconite
-271.8	280.0							

GEOTECHNICAL BORING LOG

MACTEC

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. (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
-272.3					Continued from previous page			
		9	11	15	26	SS-49		MARSHALLTOWN FORMATION: Sandy LEAN CLAY (CL), black (N 2.5/), very stiff, moist, strong HCl reaction, trace glauconite *(continued)*
-279.8								288.0
-281.8	290.0	16	22	34	56	SS-50		MARSHALLTOWN FORMATION: Silty SAND (SM), black (N 2.5/), very dense, moist, fine to medium sand, strong HCl reaction, trace glauconite
-289.8								298.0
-291.8	300.0	7	11	17	28	SS-51		ENGLISHTOWN FORMATION: Sandy LEAN CLAY (CL), black (N 2.5/), very stiff, moist, trace shell fragments, no HCl reaction
-293.3								301.5
								Boring terminated at 301.5 feet. Boring closed by tremie method with cement-bentonite grout on 3/05/09.

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

MACTEC

GEOTECHNICAL BORING LOG

Prepared By MJR Date 7/10/09

Checked By Jan Date 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. (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
7.4					Ground Surface			7.4 0.0
7.4	0.0	8	14	25	39	SS-1		ARTIFICIAL FILL: Silty SAND (SM), light olive brown (2.5Y 5/3), dense, moist, fine to coarse sand, little angular gravel, weak HCl reaction
4.9	2.5							
		2	6	5	11	SS-2		2.5ft: Black (N 2.5/), medium dense, fine to medium sand
2.4	5.0							2.4 5.0
		WOH	WOH	WOH	0 WOH	SS-3		HYDRAULIC FILL: LEAN CLAY (CL), very dark gray (N 3/), very soft, wet, trace fine sand, no HCl reaction
-0.1	7.5							
		WOH	WOH	WOH	0 WOH	SS-4		-1.6 9.0
-2.2	9.6							HYDRAULIC FILL: SILT (ML), very dark gray (N 3/), very soft, wet, trace fine sand, trace organic matter, no HCl reaction
		WOH	WOH	WOH	0 WOH	SS-5		-4.1 11.5
-4.4	11.8							HYDRAULIC FILL: FAT CLAY with sand (CH), very dark gray (N 3/), very soft, wet, fine to medium sand, trace organics, no HCl reaction
		WOH	WOH	WOH	0 WOH	SS-6		11.8ft: PP=0.0 tsf
-7.6	15.0							
		WOH	WOH	WOH	0 WOH	SS-7		
-10.6	18.0							HYDRAULIC FILL: SILT (ML), very dark gray (N 3/), very soft, wet, trace organics, no HCl reaction, trace fine sand
-12.8	20.2							
		WOH	WOH	WOH	0 WOH	SS-8		
-17.7	25.1							-18.2 25.1ft: Medium stiff 25.6
		2	4	2	6	SS-9A/B		HYDRAULIC FILL: Silty SAND (SM), dark greenish gray (N 4/), loose, wet, fine sand
-20.6	28.0							HYDRAULIC FILL: SILT with sand (ML), very dark gray (N 3/), very soft, wet, no HCl reaction, little fine sand partings
-22.7	30.1							
		WOH	WOH	WOH	0 WOH	SS-10		
-27.7	35.1							
		WOH	WOH	WOH	0 WOH	SS-11		
-30.6	38.0							ALLUVIUM: Silty SAND (SM), dark gray (N 4/), very loose, wet, fine to coarse sand
-32.3	39.7							-32.8 40.2
		1	1	1	2	SS-12A/B		ALLUVIUM: FAT CLAY (CH), very dark gray (N 3/), very soft, wet, trace organics, no HCl reaction
-35.6	43.0							ALLUVIUM: Sandy SILT (ML), dark gray (N 4/), medium stiff, wet, fine to medium subrounded to angular sand, trace organics
-37.3	44.7							
		WOH	2	3	5	SS-13		
-40.6	48.0							ALLUVIUM: Poorly graded SAND with silt (SP-SM), gray (N 6/), medium dense, wet, fine to medium sand, no HCl reaction
-42.2	49.6							
		6	7	6	13	SS-14A/B		-43.2 50.6
-47.2	54.6							KIRKWOOD FORMATION: FAT CLAY (CH), greenish gray (5G 5/1), stiff, wet, few fine to medium sand, no HCl reaction, PP=1.5 tsf
		WOH	WOH	WOH	0 WOH	SS15		54.6ft: PP=1.0 tsf

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

GEOTECHNICAL BORING LOG

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-48.7					Continued from previous page			
-50.6								58.0
-52.2	59.6	WOH	WOH	WOH	0 WOH	SS-16		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
-56.6								64.0
-57.2	64.6	5	2	4	6	SS-17		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	8	SS-18		
-65.6								73.0
-67.2	74.6	10	8	8	16	SS-19		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	33	SS-20		79.6ft: Dark greenish gray (5GY 4/1), dense, trace friable layers
-75.6								83.0
-77.2	84.6	14	9	8	17	SS-21		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
-80.6								88.0
-82.2	89.6	10	10	25	35	SS-22		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
-85.6								93.0
-87.2	94.6	25	24	25	49	SS-23		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	20	SS-24		99.6ft: Greenish gray (10Y 5/1), medium dense
-97.2	104.6	5	66	33	99	SS-25		104.6ft: Very dense, few friable to indurated layers
-100.6								108.0
-102.2	109.6	50/0.5			50/0.5	SS-26		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 111.6ft: No recovery, indurated layer
-104.2	111.6				100/0.0	SS-27		

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

GEOTECHNICAL BORING LOG

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-104.8					Continued from previous page			
		100/0.0						-105.6 113.0 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
-107.2	114.6							
		10	12	14	26	SS-28		
-112.2	119.6							119.6ft: Dense
		13	30	19	49	SS-29		
-117.2	124.6							124.6ft: Medium dense
		10	12	16	28	SS-30		
-122.2	129.6							129.6ft: Dense, trace friable layers
		25	21	21	42	SS-31		
-127.2	134.6							-124.6 132.0 NAVESINK FORMATION: Clayey SAND (SC), very dark greenish gray (5G 3/2), very dense, wet, fine sand, trace to few shell fragments, mostly glauconite
		18	28	33	61	SS-32		
-132.2	139.6							-129.6 137.0 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
		30	40	40	80	SS-33		
-137.2	144.6							-135.6 143.0 NAVESINK FORMATION: Clayey SAND (SC)), very dark greenish gray (10Y 3/1), dense, wet, fine to medium sand, weak HCl reaction, mostly glauconite
		11	20	18	38	SS-34		
-142.2	149.6							-140.6 148.0 NAVESINK FORMATION: Silty SAND (SM), very dark greenish gray (5G 3/2), very dense, wet, fine sand, weak HCl reaction, mostly glauconite
		20	37	52	89	SS-35		
-147.2	154.6							
		37	38	45	83	SS-36		
-152.2	159.6							-150.6 158.0 MOUNT LAUREL FORMATION: Clayey SAND (SC), dark greenish gray (10Y 4/1), very dense, moist, fine to coarse subrounded sand, strong HCl reaction
		30	39	61/0.3	100/0.8	SS-37		
-157.2	164.6							-155.6 163.0 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
		100/0.3			100/0.3	SS-38		

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

GEOTECHNICAL BORING LOG

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-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		
-170.6								178.0
-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	69	SS-42		184.6ft: Weak HCl reaction
-182.2	189.6	19	24	42	66	SS-43		
-185.6								193.0
-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
-189.6								197.0
-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
-192.9								200.3
								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.GPJ PSEG ESP.GDT 7/10/09

MACTEC

GEOTECHNICAL BORING LOG

Prepared By MLR Date 7/10/09

Checked By JJ 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)	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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
11.5					Ground Surface			11.5 0.0
11.5	0.0	25	47	52	99	SS-1		ARTIFICIAL FILL: Silty GRAVEL (GM), dark grayish brown (10YR 4/2), very dense, dry to moist, angular, trace organics
9.0	2.5							9.5 2.0
		2	2	2	4	SS-2		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
6.5	5.0							
		WOH	WOH	WOH	0 WOH	SS-3		PP=0.0 tsf for samples SS-3 to SS-12
4.0	7.5							
		WOH	WOH	WOH	0 WOH	SS-4		
1.5	10.0							
		WOH	WOH	WOH	0 WOH	SS-5		
-1.0	12.5							
		WOH	WOH	WOH	0 WOH	SS-6		
-3.5	15.0							
		WOH	WOH	WOH	0 WOH	SS-7		
-6.0	17.5							
		WOH	WOH	WOH	0 WOH	SS-8		17.5ft: Dark gray (5Y 4/1)
-8.5	20.0							
		WOH	WOH	WOH	0 WOH	SS-9		
-11.0	22.5							
		WOH	WOH	WOH	0 WOH	SS-10		
-13.5	25.0							
		WOH	WOH	WOH	0 WOH	SS-11		25.0ft: Trace fine sand partings
-16.0	27.5							
		WOH	WOH	WOH	0 WOH	SS-12		
-18.5	30.0							-18.0 29.5
		2	4	4	8	SS-13		HYDRAULIC FILL: Silty SAND (SM), very dark gray (5Y 3/1), loose, wet, fine sand, no HCl reaction
-21.0	32.5							-20.5 32.0
		WOH	WOH	WOH	0 WOH	SS-14		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	0 WOH	SS-15		35.0ft: Few fine sand partings, PP=0.0 tsf
-26.0	37.5							-25.5 37.0
		2	2	3	5	SS-16		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							-28.0 39.5
		2	2	2	4	SS-17		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	5	SS-18		42.5ft: Medium stiff
-33.5	45.0							-33.0 44.5
		4	9	11	20	SS-19		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							-35.5 47.0
		14	11	9	20	SS-20		ALLUVIUM: Clayey SAND (SC), light greenish gray (5GY 7/1), medium dense, moist, fine to medium sand, trace gravel
-38.5	50.0							-38.0 49.5
		5	11	12	23	SS-21		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	12	SS-22		
-43.5	55.0							-43.0 54.5
		2	2	2	4	SS-23		

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

GEOTECHNICAL BORING LOG

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION
-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 shelby tube UD-1 to 59.0ft; recovery=2.0ft, PP=1.75 tsf, TV=0.7 tsf 59.0ft: Pushed shelby 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	WOH	WOH	6	6	SS-24		
-53.5	65.0	WOH	WOH	2	2	SS-25		65.0ft: Very soft, few to little organics, few fine sand, PP=0.25 tsf
-55.5	67.0							
-56.0	67.5	4	10	32	42	SS-26		KIRKWOOD FORMATION: Silty GRAVEL with sand (GM), dark gray (5Y 4/1), and brown (7.5YR 4/3), dense, moist, to wet, subangular gravel, fine to coarse sand, few organics, trace glauconite
-58.0	69.5							
-58.5	70.0	4	4	10	14	SS-27		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 72.0ft: Pushed shelby tube UD-3 to 73.6ft; recovery=1.5ft
-60.5	72.0					UD-3		
-63.5	75.0	5	15	8	23	SS-28		
-65.5	77.0	13	5	7	12	UD-4/SS-29		77.0ft: Attempted shelby tube UD-4, refused with no penetration; Few friable to moderately indurated layers
-68.5	80.0	11	15	11	26	SS-30		80.0ft: Trace friable layers, strong HCl reaction, trace glauconite
-71.0	82.5	5	8	12	20	SS-31		82.5ft: Weak HCl reaction
-73.5	85.0	6	6	30	36	SS-32		85.0ft: Dense
-76.0	87.5	8	9	28	37	SS-33		
-78.5	90.0	13	10	12	22	SS-34		90.0ft: Medium dense
-81.0	92.5	6	7	11	18	SS-35		
-83.5	95.0	19	78	22	100/1.0	SS-36		95.0ft: Very dense, few moderately indurated zones, strong HCl reaction
-86.0	97.5	6	8	13	21	SS-37		97.5ft: Medium dense, trace friable zones, weak HCl reaction
-88.5	100.0	7	7	9	16	SS-38		
-91.0	102.5	5	6	7	13	SS-39		102.5ft: Strong HCl reaction
-93.0	104.5					UD-5		104.5ft: Pushed shelby tube UD-5 to 105.5ft; recovery=0.0ft
-96.0	107.5	5	8	12	20	SS-40		
-98.5	110.0	13	12	86	98	SS-41		110.0ft: Very dense, trace to few moderately indurated layers

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

GEOTECHNICAL BORING LOG

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-100.7					Continued from previous page			
-101.0	112.5	49	24	20	44	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 *(continued)*
-103.5	115.0	6	10	15	25	SS-43		112.5ft: Dense, trace to few friable layers
-105.5								115.0ft: Medium dense — 117.0
-106.0	117.5	100/0.4			100/0.4	SS-44		VINCENTOWN FORMATION: Poorly graded SAND with silt (SP-SM), greenish gray (10Y 5/1), very dense, wet, mostly indurated, trace glauconite — 119.0
-107.5								VINCENTOWN FORMATION: Silty SAND (SM), greenish gray (10Y 5/1), medium dense, wet, fine sand, strong HCl reaction, trace glauconite
-108.5	120.0	6	9	10	19	SS-45		
-111.0	122.5	100/0.3			100/0.3	SS-46		122.5ft: Mostly indurated
-113.0								— 124.5
-113.5	125.0	8	10	13	23	SS-47		HORNERSTOWN FORMATION: Silty SAND (SM), dark greenish gray (10Y 4/1), medium dense, wet, fine sand, strong HCl reaction, trace glauconite
-115.5								— 127.0
-116.0	127.5	10	12	15	27	SS-48		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	29	SS-49		
-120.5								— 132.0
-121.0	132.5	65	35/0.1		100/0.6	SS-50		HORNERSTOWN FORMATION: Silty SAND (SM), dark greenish gray (5GY 4/1), very dense, wet, fine sand, little friable layers, weak HCl reaction, few glauconite
-123.0								— 134.5
-123.5	135.0	12	15	17	32	SS-51		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	39	SS-52		
-128.5	140.0	12	17	22	39	SS-53		140.0ft: Trace shell fragments
-130.5								— 142.0
-131.0	142.5	17	22	32	54	SS-54		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
-133.0								— 144.5
-133.5	145.0	26	35	40	75	SS-55		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	70	SS-56		147.5ft: Greenish black (10BG 2.5/1)
-138.5	150.0	16	28	35	63	SS-57		
-140.5								— 152.0
-141.0	152.5	14	20	28	48	SS-58		NAVESINK FORMATION: Clayey SAND (SC), greenish black (10BG 2.5/1), dense, wet, fine sand, weak HCl reaction, mostly glauconite
-143.5	155.0	20	27	37	64	SS-59		155.0ft: Very dense, trace shell fragments
-145.5								— 157.0
-146.0	157.5	25	37	46	83	SS-60		NAVESINK FORMATION: Silty SAND (SM), very dark greenish gray (5G 3/2), very dense, wet, fine sand, weak HCl reaction, mostly glauconite
-148.0								— 159.5
-148.5	160.0	28	31	37	68	SS-61		NAVESINK FORMATION: Clayey SAND (SC), very dark grayish green (5G 3/2), very dense, wet, fine sand, no to weak HCl reaction, mostly glauconite
-151.0	162.5	28	36	49	85	SS-62		162.5ft: Trace shell fragments
-153.0								— 164.5
-153.5	165.0	16	28	65	93	SS-63		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
-155.5								— 167.0
-156.0	167.5	70	30/0.3		100/0.8	SS-64		

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

GEOTECHNICAL BORING LOG

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-156.8					Continued from previous page			
-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)* — 169.5
-158.5	170.0	45	55/0.1		100/0.6	SS-65		
-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 — 172.0
-161.0	172.5	100/0.2			100/0.2	SS-66		
-163.5	175.0	100/0.3			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 175.0ft: Trace shell fragments
-166.0	177.5	100/0.2			100/0.2	SS-68		
-168.5	180.0	100/0.5			100/0.5	SS-69		
-171.0	182.5	33	60	40/0.2	100/0.7	SS-70		
-173.5	185.0	23	33	38	71	SS-71		
-176.0	187.5	16	31	39	70	SS-72		
-178.0								189.5
-178.5	190.0	15	29	36	65	SS-73		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	68	SS-74		
-183.5	195.0	15	25	31	56	SS-75		
-186.0	197.5	19	33	45	78	SS-76		
-187.5								199.0
-188.5	200.0	33	53	47/0.3	100/0.8	SS-77		MOUNT LAUREL FORMATION: Silty SAND (SM), gray (5Y 5/1), very dense, wet, fine sand, weak HCl reaction, trace glauconite
-189.8								201.3
								Boring terminated at 201.3 feet. Boring closed by tremie method with cement-bentonite grout on 2/25/09.

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

MACTEC

GEOTECHNICAL BORING LOG

Prepared By MBL Date 7/10/09

Checked By JQ2 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. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT	SAMP. NO.	SOIL AND ROCK DESCRIPTION
7.8					Ground Surface		7.8 / 0.0
7.8	0.0	22	25	19	44	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
5.2	2.6	7	5	6	11	SS-2	5.8 / 2.0 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
2.8	5.0	4	3	3	6	SS-3	3.3 / 4.5 HYDRAULIC FILL: FAT CLAY with sand (CH), greenish black (10Y 3/1), medium stiff, moist, no HCl reaction, PP=1.0 tsf
0.3	7.5	WOH	WOH	WOH	0 WOH	SS-4	7.5ft: FAT CLAY (CH), very soft, few organics, PP=0.5 tsf
-2.2	10.0	WOH	WOH	WOH	0 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	0 WOH	SS-6	-6.7 / 14.5 HYDRAULIC FILL: ELASTIC SILT (MH), very dark greenish gray (5GY 3/1), very soft, moist, trace fine sand, PP=0.25 tsf
-7.2	15.0	WOH	WOH	WOH	0 WOH	SS-7	
-12.2	20.0	WOR	WOH	WOH	0 WOH	SS-8	20.0ft: PP=0.15 tsf
-16.7	24.5	WOH	1	1	2	SS-9	24.5ft: Dark olive gray (5Y 3/2), PP=0.5 tsf
-21.7	29.5	WOH	WOH	WOH	0 WOH	SS-10	29.5ft: PP=0.25 tsf
-26.7	34.5	WOH	3	5	8	SS-11	34.5ft: Medium stiff, few fine sand, trace organics, PP=0.5 tsf
-31.7	39.5	9	29	36	65	SS-12	-29.2 / 37.0 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
-36.7	44.5	6	4	2	6	SS-13A/B	-37.2 / 45.0 KIRKWOOD FORMATION: FAT CLAY (CH), dark olive gray (5Y 3/2), medium stiff, moist, few fine sand, no HCl reaction, PP=0.5 tsf
-41.7	49.5	3	3	4	7	SS-14	49.5ft: PP=0.25 tsf
-46.7	54.5	4	4	5	9	SS-15	54.5ft: Stiff, PP=1.0 tsf

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

GEOTECHNICAL BORING LOG

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION
-48.3					Continued from previous page			
-51.7	59.5							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)*
		3	4	6	10	SS-16		59.5ft: FAT CLAY with sand (CH), few subrounded gravel, trace organics, PP=0.25 tsf
-54.2								62.0
-56.7	64.5							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
		15	8	9	17	SS-17		
-60.2								68.0
-61.7	69.5							VINCENTOWN FORMATION: Silty SAND (SM), reddish brown (5Y 4/3), very dense, moist to wet, fine to medium sand, no HCl reaction, strongly oxidized
		36	49	16	65	SS-18		
-66.7	74.5							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
		8	11	19	30	SS-19		
-71.7	79.5							79.5ft: Yellowish brown (10Y 5/4) to light yellowish brown (2.5Y 6/4), strong HCl reaction, weakly oxidized
		7	6	10	16	SS-20		
-76.7	84.5							84.5ft: Yellowish brown (10YR 5/6) and light brownish gray (2.5Y 6/2), weakly oxidized
		11	7	9	16	SS-21		
-81.7	89.5							89.5ft: Greenish gray (10Y 6/1), dense, few to little glauconite, no oxidation
		15	16	15	31	SS-22		
-84.2								92.0
-86.7	94.5							VINCENTOWN 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
		41	7	12	19	SS-23		
-90.2								98.0
-91.7	99.5							VINCENTOWN FORMATION: Poorly graded SAND with silt (SP-SM), greenish gray (10Y 5/1), very dense, wet, fine sand, strong HCl reaction, few glauconite
		12	28	39	67	SS-24		
-96.7	104.5							104.5ft: Dense
		6	19	24	43	SS-25		
-101.7	109.5							109.5ft: Medium dense
		12	12	13	25	SS-26		

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

GEOTECHNICAL BORING LOG

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-104.4					Continued from previous page			
-105.2								113.0
-106.7	114.5							HORNERSTOWN FORMATION: Silty SAND (SM), greenish gray (10Y 5/1), medium dense, wet, fine to medium sand, strong HCl reaction, few glauconite
		9	11	13	24	SS-27		
-111.7	119.5							119.5ft: Few to little glauconite
		12	11	15	26	SS-28		
-116.7	124.5							124.5ft: Dense, few to little glauconite
		17	19	21	40	SS-29		
-121.7	129.5							129.5ft: Medium dense, little to some glauconite
		12	13	16	29	SS-30		
-124.2								132.0
-126.7	134.5							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
		21	22	32	54	SS-31		
-131.7	139.5							
		23	28	42	70	SS-32		
-135.2								143.0
-136.7	144.5							NAVESINK FORMATION: Clayey SAND (SC), very dark greenish gray (5GY 3/1), dense, moist, fine sand, strong HCl reaction, mostly glauconite
		17	19	27	46	SS-33		
-140.2								148.0
-141.7	149.5							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
		32	36	49	85	SS-34		
-146.7	154.5							
		24	25	40	65	SS-35		154.5ft: Very dark greenish gray (5GY 3/1)
-149.2								157.0
-151.7	159.5							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
		36	40	50/0.2	50/0.2	SS-36		
-156.7	164.5							
		50/0.2			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.GPJ PSEG ESP.GDT 7/10/09

GEOTECHNICAL BORING LOG

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-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.

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

MACTEC

GEOTECHNICAL BORING LOG

Prepared By MRM Date 7/10/09

Checked By JWJ 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	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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT (0 20 40 60 80 100)	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
9.3					Ground Surface			
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
7.2	2.1	2	1	1	2	SS-2		2.1ft: Very dark gray (2.5Y 3/1), very soft, trace fine sand
4.6	4.7	WOH	4	6	10	SS-3		4.7ft: Stiff, wet
1.7	7.6	WOR	5	4	9	SS-4		ARTIFICIAL FILL: Silty SAND (SM), very dark gray (2.5Y 3/1), loose, wet, fine to medium sand, few organics, trace angular to rounded gravel
-0.4	9.7	2	2	1	3	SS-5		HYDRAULIC FILL: SILT (ML), very dark gray (2.5Y 3/1), soft, wet, few organics
-3.7	13.0	WOH	WOH	WOH	WOH 0	SS-6		HYDRAULIC FILL: FAT CLAY (CH), black (2.5Y 2.5/1), very soft, wet, trace to few organics
-5.7	15.0	WOH	1	1	2	SS-7		15.0ft: Very dark gray (2.5Y 3/1), no HCl reaction, silt layers, no organics
-10.7	20.0	WOH	2	1	3	SS-8		HYDRAULIC FILL: SILT with sand (ML), very dark gray (2.5Y 3/1), soft, wet, little fine sand, no HCl reaction
-12.7	22.0					UD-1		22.0ft: Pushed shelby tube UD-1 to 24.0ft; recovery=2.0ft, PP=0.25 tsf, TV=0.25 tsf
-15.2	24.5	WOH	1	WOH	WOH 1	SS-9		
-20.3	29.6	1	1	1	2	SS-10		
-25.3	34.6	WOH	WOH	WOH	WOH 0	SS-11		
-30.3	39.6	1	2	7	9	SS-12		ALLUVIUM: Well graded SAND (SW), dark gray (2.5Y 4/1), loose, wet, fine to coarse sand, trace rounded gravel, no HCl reaction
-35.3	44.6	WOH	3	4	7	SS-13		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
-40.3	49.6	3	4	5	9	SS-14		49.6ft: Gray (2.5Y 5/1)
-42.3	51.6					UD-2		51.6ft: Pushed shelby tube UD-2 to 53.6ft; recovery=1.9ft, PP=2.0 tsf, TV=1.7 tsf; moist to wet
-44.9	54.2					UD-3		54.2ft: Pushed shelby tube UD-3 to 56.2ft; recovery=1.8ft, PP=1.5 tsf, TV=1.3 tsf; very dark gray

-2.3 7.0
-0.2 9.5
-2.7 12.0
-8.7 18.0
-28.7 38.0
-33.7 43.0

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

GEOTECHNICAL BORING LOG

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-46.8					Continued from previous page			
-47.4	56.7	5	5	6	11	SS-15		(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
-52.7	62.0							KIRKWOOD FORMATION: Well graded SAND with gravel (SW), gray (2.5Y 5/1), medium dense, moist to wet, little subangular gravel, no HCl reaction
-55.3	64.6	8	11	12	23	SS-16		
-58.7	68.0							KIRKWOOD FORMATION: Poorly graded SAND with silt (SP-SM), grayish green (5G 4/2), medium dense, wet, fine to medium sand, no HCl reaction
-60.3	69.6	10	8	6	14	SS-17		
-62.7	72.0							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
-65.3	74.6	29	24	15	39	SS-18		
-67.3	76.6					UD-4		76.6ft: Pushed shelby tube UD-4 to 76.9ft; recovery=0.2ft
-68.6	77.9	22	9	10	19	SS-19		77.9ft: Dark yellowish brown (10YR 4/6), medium dense, trace friable layers, no to strong HCl reaction, moderately oxidized
-70.9	80.2					UD-5		80.2ft: Pushed shelby tube UD-5 to 81.5; recovery=1.3ft; moist to wet
-73.3	82.6	8	9	15	24	SS-20		82.6ft: Dark greenish gray (10Y 4/1), wet, trace shell fragments, no oxidation
-80.3	89.6	7	10	12	22	SS-21		89.6ft: Weak HCl reaction
-83.7	93.0							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
-85.3	94.6	50/0.4			50/0.4	SS-22		
-90.3	99.6	12	14	16	30	SS-23		99.6ft: Medium dense, strong HCl reaction
-95.3	104.6	8	10	15	25	SS-34		104.6ft: Weak to strong HCl reaction
-100.3	109.6	12	17	21	38	SS-25		109.6ft: Dark greenish gray (5G 4/1), dense, fine to medium sand, weak HCl reaction

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

GEOTECHNICAL BORING LOG

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION
-102.9					Continued from previous page			
								-103.7 113.0 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
-105.3	114.6	50/0.3			50/0.3	SS-26		-107.7 117.0 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
-110.3	119.6	9	10	34	44	SS-27		
-115.3	124.6	12	14	42	56	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	45	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	81	SS-30		-124.7 134.0 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
-130.3	139.6	22	24	32	56	SS-31		139.6ft: Greenish black (5G 2.5/1), fine sand, trace to few shell fragments
-135.3	144.6	17	21	29	50	SS-32		144.6ft: Dense
-140.3	149.6	24	31	36	67	SS-33		149.6ft: Very dense
-145.3	154.6	24	30	33	63	SS-34		-143.7 153.0 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
-150.3	159.6	48	50/0.3		50/0.3	SS-35		-148.7 158.0 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
-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.GPJ PSEG ESP.GDT 7/10/09

GEOTECHNICAL BORING LOG

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-159.0					Continued from previous page			
-160.3	169.6	50/0.2			50/0.2	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	50/0.3	SS-38		
-168.7	178.0							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
-170.3	179.6	20	33	50	83	SS-39		
-173.7	183.0							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
-175.3	184.6	20	30	35	65	SS-40		
-178.7	188.0							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
-180.3	189.6	18	28	37	65	SS-41		
-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		
-190.7	200.0							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

MACTEC

GEOTECHNICAL BORING LOG

Prepared By NMR Date 7/10/09

Checked By JA 2 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. (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
6.2					Ground Surface			
6.2	0.0	27	17	9	26	SS-1A/B		0.0 6.2 5.6 0.6 ARTIFICIAL FILL: Poorly graded GRAVEL with sand (GP), yellow (10YR 8/8), medium dense, dry to wet, angular gravel, no HCl reaction
3.7	2.5	2	3	3	6	SS-2		ARTIFICIAL FILL: Sandy LEAN CLAY (CL), black (10YR 2/1), very stiff, moist, no HCl reaction 2.5ft: Greenish Black (5GY 2.5/1), medium stiff 2.2 4.0
1.5	4.7	WOH	WOH	WOH	0 WOH	SS-3		HYDRAULIC FILL: Sandy LEAN CLAY (CL), greenish black (5GY 2.5/1), very soft, moist, no HCl reaction -0.8 7.0
-1.3	7.5	WOH	WOH	WOH	0 WOH	SS-4		HYDRAULIC FILL: FAT CLAY (CH), very dark greenish gray (10Y 3/1), very soft, moist, few organics, no HCl reaction
-4.1	10.3	WOH	1	1	2	SS-5		
-6.6	12.8	WOH	WOH	WOH	0 WOH	SS-6		
-9.1	15.3	WOH	WOH	WOH	0 WOH	SS-7		
-14.0	20.2	2	3	3	6	SS-8		-11.8 18.0 HYDRAULIC FILL: Silty SAND (SM), black (N 2.5/), loose, wet, fine sand, no HCl reaction
-19.1	25.3	WOH	WOH	WOH	0 WOH	SS-9		-16.8 23.0 HYDRAULIC FILL: ELASTIC SILT (MH), very dark gray (N 3/), very soft, moist, no HCl reaction
-24.0	30.2	5	6	6	12	SS-10		-21.8 28.0 ALLUVIUM: Silty SAND with Gravel (SM), greenish gray (10Y 5/1), medium dense, wet, fine to medium sand, fine subrounded gravel, no HCl reaction
-29.0	35.2	13	17	18	35	SS-11		-27.8 34.0 ALLUVIUM: Clayey GRAVEL with sand (GC), dark grayish brown (10YR 4/2), dense, moist, subrounded gravel, fine to medium sand, no HCl reaction
-33.8	40.0	WOH	3	2	5	SS-12		-32.8 39.0 VINCENTOWN FORMATION: Silty SAND (SM), yellowish brown (10YR 5/8), loose, wet, fine to medium sand, weak HCl reaction, trace glauconite, strongly oxidized
-38.8	45.0	7	7	9	16	SS-13		45.0ft: Medium dense, strong HCl reaction
-43.8	50.0	7	7	7	14	SS-14		50.0ft: Dark yellowish brown (10YR 4/6), fine to coarse sand
-48.8	55.0	7	8	10	18	SS-15		-46.8 53.0 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

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

GEOTECHNICAL BORING LOG

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-49.9					Continued from previous page			
-53.8	60.0	13	8	13	21	SS-16		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	7	7	9	16	SS-17		65.1ft: Brownish yellow (10YR 6/6), trace friable layers, weak to strong HCl reaction, moderately oxidized
-62.8	69.0							VINCENTOWN FORMATION: Clayey SAND (SC), light yellowish brown (10YR 6/4), dense, moist, fine to medium sand, strong HCl reaction, trace glauconite, weakly oxidized
-63.8	70.0	7	20	19	39	SS-18		
-66.8	73.0							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
-68.8	75.0	14	11	34	45	SS-19		
-73.8	80.0	11	27	19	46	SS-20		
-79.0	85.2	19	13	15	28	SS-21		85.2ft: Medium dense
-84.0	90.2	8	92/0.3		100/0.8	SS-22		90.2ft: Dark greenish gray (10Y 4/1), very dense, trace shell fragments, trace moderately indurated layers
-89.0	95.2	7	12	30	42	SS-23		95.2ft: Dense
-93.8	100.0	13	13	14	27	SS-24		100.0ft: Medium dense
-98.9	105.1	9	16	29	45	SS-25		105.1ft: Greenish gray (10Y 5/1), very dense, trace friable cemented layers, weak HCl reaction
-103.9	110.1	6	26	16	42	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

GEOTECHNICAL BORING LOG

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-106.0					Continued from previous page			
-108.8	115.0	12	12	16	28	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
-111.8	118.0							
-113.8	120.0	6	25	27	52	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	24	SS-29		125.0ft: Medium dense, trace shell fragments, little glauconite
-123.8	130.0	7	12	13	25	SS-30		
-128.8	135.0	9	15	19	34	SS-31		
-131.8	138.0							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
-133.8	140.0	21	60	40/0.4	100/0.9	SS-32		
-138.8	145.0	19	30	40	70	SS-33		145.0ft: Trace shell fragments
-143.8	150.0	27	29	42	71	SS-34		
-148.9	155.1	26	32	46	78	SS-35		
-153.8	160.0	33	49	51/0.3	100/0.8	SS-36		160.0ft: Very dark grayish green (5G 3/2), few shell fragments
-156.8	163.0							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
-158.8	165.0	35	65/0.2		100/0.7	SS-37		

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

GEOTECHNICAL BORING LOG

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-162.1					Continued from previous page			
-163.8	170.0	100/0.4			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			100/0.5	SS-39		175.0ft: Dark greenish gray (10Y 4/1)
-173.8	180.0	40	60/0.4		100/0.9	SS-40		180.0ft: Weak to strong HCl reaction, trace glauconite
-178.8	185.0	23	35	41	76	SS-41		185.0ft: Few shell fragments, strong HCl reaction
-183.8	190.0	15	26	46	72	SS-42		190.0ft: Weak HCl reaction
-185.8								192.0
-188.8	195.0	34	42	58/0.3	100/0.8	SS-43		MOUNT LAUREL FORMATION: Silty SAND (SM), Greenish Gray (10Y 5/1), very dense, moist, fine to medium sand, weak HCl reaction
-191.8								198.0
-193.8	200.0	38	53	47/0.2	100/0.7	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
-195.0								201.2
								Boring terminated at 201.2 feet.
								Boring closed by tremie method with cement-bentonite grout on 1/27/09.

MACTEC

GEOTECHNICAL BORING LOG

Prepared By MBL Date 7/10/09

Checked By JAJ 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)	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. (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
8.9					Ground Surface			8.9 0.0
8.9	0.0	8	10	50	60	SS-1		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							6.9 2.0
		3	4	4	8	SS-2		HYDRAULIC FILL: LEAN CLAY with sand (CL), very dark gray (10Y 3/1), medium stiff, moist, little fine sand
3.9	5.0							5.0ft: Soft, wet
		2	2	2	4	SS-3		
1.4	7.5							1.9 7.0
		7	9	5	14	SS-4		HYDRAULIC FILL: Silty SAND (SM), gray (N 5/), medium dense, wet, few gravel
-1.1	10.0							-0.6 9.5
		WOH	WOH	WOH	WOH 0	SS-5		HYDRAULIC FILL: FAT CLAY (CH), very dark gary (N 3/), very soft, wet, trace to few organics
-3.3	12.2							-3.1 12.0
		3	5	4	9	SS-6		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							-5.1 14.0
		WOH	WOH	WOH	WOH 0	SS-7		HYDRAULIC FILL: FAT CLAY (CH), dark greenish gray (10Y 4/1), very soft, wet, few organics
-11.1	20.0							20.0ft: Trace organics
		WOH	WOH	WOH	WOH 0	SS-8		
-15.6	24.5							24.5ft: Trace fine sand
		WOH	WOH	WOH	WOH 0	SS-9		
-20.6	29.5							
		WOH	WOH	WOH	WOH 0	SS-10		
-25.6	34.5							-24.1 33.0
		1	1	1	2	SS-11A/B		ALLUVIUM: Sandy SILT (ML), dark gray (N 4/), very soft, wet, fine sand
-30.6	39.5							-26.6 35.5
		1	3	7	10	SS-12		ALLUVIUM: PEAT (PT), very dark brown (5Y4/2), very soft, wet
-35.6	44.5							-29.1 38.0
		10	11	4	15	SS-13A/B		ALLUVIUM: Silty SAND (SM), olive gray (5Y 4/2), loose, wet, fine to medium sand
-40.6	49.5							-35.1 44.0
		WOH	2	3	5	SS-14		ALLUVIUM: Silty GRAVEL with sand (GM), very dark gray (10YR 3/1), medium dense, wet, fine to coarse sand, fine to coarse gravel
-45.6	54.5							-36.6 45.5
		WOH	WOH	WOH	WOH 0	SS-15		ALLUVIUM: Sandy LEAN CLAY (CL), very dark greenish gray (10G 3/1), stiff, wet, fine to medium sand, trace of gravel
								-39.1 48.0
								KIRKWOOD FORMATION: Clayey SAND (SC), dark brown (7.5YR 3/2), loose, wet, fine to medium sand, trace gravel
								54.5ft: Reddish brown (5YR 4/4), very loose

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

GEOTECHNICAL BORING LOG

MACTEC

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. (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
-47.2					Continued from previous page			
-50.6	59.5							KIRKWOOD FORMATION: Clayey SAND (SC), dark brown (7.5YR 3/2), loose, wet, fine to medium sand, trace gravel *(continued)*
-55.6	64.5	WOH	WOH	WOH	0 WOH	SS-16		
-60.6	69.5	8	10	12	22	SS-17		-54.6 63.5 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
-65.6	74.5	8	8	7	15	SS-18		
-70.6	79.5	19	9	9	18	SS-19		74.5ft: Reddish yellow (7.5YR 6/6)
-75.6	84.5	7	20	15	35	SS-20		-68.1 77.0 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
-80.6	89.5	6	6	18	24	SS-21		84.5ft: Medium dense
-85.6	94.5	100/0.5			100/0.5	SS-22		89.5ft: Very dense, mostly indurated
-90.6	99.5	11	11	65	76	SS-23		-83.1 92.0 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
-95.6	104.5	48	12	14	26	SS-24		99.5ft: Medium dense, few friable layers
-100.6	109.5	7	12	50	62	SS-25		104.5ft: Light greenish gray (5GY 7/1), very dense
		100/0.2			100/0.2	SS-26		109.5ft: Mostly friable to indurated

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

GEOTECHNICAL BORING LOG

MACTEC

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. (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
-103.3					Continued from previous page			
-105.6	114.5	8	14	19	33	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	42	SS-28		119.5ft: Greenish gray (5GY 5/1), dense, trace friable layers
-114.1	123.0							HORNERSTOWN FORMATION: Silty SAND (SM), dark greenish gray (10Y 5/1), medium dense, wet, fine to medium sand, strong HCl reaction, trace of glauconite
-115.6	124.5	8	12	17	29	SS-29		129.5ft: Few to little glauconite
-120.6	129.5	6	10	16	26	SS-30		
-125.6	134.5	8	14	42	56	SS-31		134.5ft: Very dense
-130.6	139.5	33	22	20	42	SS-32		139.5ft: Dark greenish gray (5GY 4/1), dense, trace friable layers, little glauconite
-132.6	141.5							NAVESINK FORMATION: Silty SAND (SM), very dark greenish gray (5G 3/2), dense, wet, fine sand, trace shell fragments, weak HCl reaction, mostly glauconite
-135.6	144.5	13	16	31	47	SS-33		
-140.6	149.5	20	29	32	61	SS-34		149.5ft: Very dense, little shell fragments
-144.1	153.0							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
-145.6	154.5	28	40	40	80	SS-35		
-150.6	159.5	23	39	36	75	SS-36		
-153.1	162.0							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
-155.6	164.5	27	36	43	79	SS-37		
-157.1	166.0							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.GPJ PSEG ESP.GDT 7/10/09

GEOTECHNICAL BORING LOG

MACTEC

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. (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
-159.4					Continued from previous page			
-160.6	169.5	30	40	60/0.2	100/0.7	SS-38		MOUNT LAUREL FORMATION: Sandy LEAN CLAY (CL), dark gray (2.5Y 4/1), hard, moist, fine to coarse sand, little glauconite, strong HCl reaction *(continued)*
-164.1	173.0							MOUNT LAUREL FORMATION: Clayey SAND (SC), dark greenish gray (10Y 4/1), very dense, moist, fine to coarse sand, trace shell fragments, strong HCl reaction, little glauconite
-165.6	174.5	100/0.2			100/0.2	SS-39		
-170.6	179.5	100/0.3			100/0.3	SS-40		
-174.1	183.0							MOUNT LAUREL FORMATION: Silty SAND (SM), very dark greenish gray (5GY 3/1), very dense, wet, fine sand, strong HCl reaction, mostly glauconite
-175.6	184.5	60	40/0.2		100/0.7	SS-41		
-179.1	188.0							MOUNT LAUREL FORMATION: Clayey SAND (SC), very dark greenish gray (5GY 3/1), very dense, wet, fine to medium sand, trace shell fragments, strong HCl reaction, little glauconite
-180.6	189.5	25	33	53	86	SS-42		
-185.6	194.5	23	33	41	74	SS-43		194.5ft: Trace glauconite
-190.6	199.5	19	35	57	92	SS-44		199.5ft: Greenish gray (5GY 5/1), weak HCl reaction
-199.1	208.0							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
-200.6	209.5	50	50/0.2		100/0.7	SS-45		
-210.6	219.5	75	25/0.1		100/0.6	SS-46		219.5ft: Very dark greenish gray (5GY 3/1), moist to wet, weak HCl reaction

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

GEOTECHNICAL BORING LOG

MACTEC

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. (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
-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		
-236.1	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
-240.6	249.5	39	44	48	92	SS-49		
-249.1	258.0							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
-250.6	259.5	17	30	43	73	SS-50		
-259.1	268.0							WENONAH FORMATION: FAT CLAY with sand (CH), very dark gray (N 3/), very stiff, wet, little fine sand, strong HCl reaction
-260.6	269.5	5	5	13	18	SS-51		
-267.1	276.0							WENONAH FORMATION: Clayey SAND (SC), very dark gray (N 3/), loose, wet, fine to medium sand, strong HCl reaction
-270.6	279.5	2	3	4	7	SS-52		

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

GEOTECHNICAL BORING LOG

MACTEC

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. (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
-271.6					Continued from previous page			
								WENONAH FORMATION: Clayey SAND (SC), very dark gray (N 3/), loose, wet, fine to medium sand, strong HCl reaction *(continued)*
-277.1	286.0							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
-280.6	289.5	7	10	20	30	SS-53		
-289.1	298.0							MARSHALLTOWN FORMATION: Sandy FAT CLAY (CH), very dark greenish gray (10Y 3/1), hard, fine sand, trace glauconite
-290.6	299.5	7	13	18	31	SS-54		
								Boring advanced without sampling from 301.0ft to 315.3ft to provide "rat hole" for geophysical testing.
-306.4	315.3							Boring terminated at 315.3 feet.
								Boring closed by tremie method with cement-bentonite grout on 1/21/09.

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

MACTEC

GEOTECHNICAL BORING LOG

Prepared By Mar Date 7/10/09

Checked By JLJ Date 7/10/09

SHEET 1 OF 1

PERMIT NO.: P200905735	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-8A	DRILL METHOD: Mud Rotary	SAMPLE METHODS: NA	0 HR. ND
GROUND SURFACE ELEV.: 8.8 US ft (NAVD88)	NORTHING: 234137.6 US ft (NAD83)	EASTING: 199720.2 US ft (NAD83)	24 HR. ND
TOTAL DEPTH: 201.0 ft	DRILL MACHINE: IR-T2W	CASING DEPTH: NA	HAMMER (ID): NA
DATE STARTED: 5/20/09	COMPLETED: 5/20/09	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
8.8					Ground Surface				8.8 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 199.2 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.
									-192.2 201.0
									Boring terminated at 201.0 feet and crosshole seismic casing installed. For strata and soil descriptions see geotechnical boring NB-8.

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

MACTEC

GEOTECHNICAL BORING LOG

Prepared By MBL Date 7/10/09

Checked By JCD 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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	▼	LOG	SOIL AND ROCK DESCRIPTION
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.
									-192.7 201.5
									Boring terminated at 201.5 feet and crosshole seismic casing installed. For strata and soil descriptions see geotechnical boring NB-8.

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

MACTEC

GEOTECHNICAL BORING LOG

Prepared By MR Date 7/10/09

Checked By JLZ Date 7/10/09

SHEET 1 OF 1

PERMIT NO.: P200905737	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-8C	DRILL METHOD: Mud Rotary	SAMPLE METHODS: NA	0 HR. ND
GROUND SURFACE ELEV.: 9.0 US ft (NAVD88)	NORTHING: 234122.3 US ft (NAD83)	EASTING: 199705.9 US ft (NAD83)	24 HR. ND
TOTAL DEPTH: 201.0 ft	DRILL MACHINE: IR-T2W	CASING DEPTH: NA	HAMMER (ID): NA
DATE STARTED: 5/22/09	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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	▼	LOG	SOIL AND ROCK DESCRIPTION
9.0					Ground Surface				9.0 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 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.
									-192.0 201.0
									Boring terminated at 201.0 feet and crosshole seismic casing installed. For strata and soil descriptions see geotechnical boring NB-8.

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

MACTEC

GEOTECHNICAL BORING LOG

Prepared By NBR Date 7/10/09

Checked By JA Date 7/10/09

SHEET 1 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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
15.9					Ground Surface			
15.9	0.0	7	11	9	20	SS-1		15.9 0.0 15.0 ARTIFICIAL FILL: Silty SAND with gravel (SM), greenish gray (10Y 5/1), medium dense, wet, fine to coarse sand, subangular gravel, no HCl reaction, few organics 0.9
13.4	2.5	3	5	5	10	SS-2		ARTIFICIAL FILL: Poorly graded SAND with silt (SP-SM), reddish yellow (7.5YR 6/6), medium dense, wet, fine to medium sand, no HCl reaction
10.9	5.0	1	WOH	1	1	SS-3		10.9 5.0 HYDRAULIC FILL: FAT CLAY (CH), very dark greenish gray (5GY 3/1), very soft, moist, no HCl reaction
8.4	7.5	WOH	WOH	WOH	0 WOH	SS-4		
5.9	10.0	WOH	WOH	1	1	SS-5		
3.4	12.5	1	WOH	1	1	SS-6		13.0ft: Silty SAND (SM) layer to 13.4ft
0.9	15.0	WOH	1	WOH	1	SS-7		15.0ft: Wet
-4.1	20.0	WOH	1	1	2	SS-8		
-9.1	25.0	WOH	WOH	WOH	0 WOH	SS-9		25.0ft: Moist
-14.1	30.0	WOH	WOH	WOH	0 WOH	SS-10		30.0ft: Trace mica
-19.1	35.0	WOH	WOH	WOH	0 WOH	SS-11		
-24.1	40.0	12	16	13	29	SS-12		-22.1 38.0 ALLUVIUM: Silty SAND (SM), dark greenish gray (5GY 4/1) and yellowish brown (10YR 5/6), medium dense, wet, fine to medium sand, no HCl reaction
-29.1	45.0	6	8	9	17	SS-13		-29.1 45.0 ALLUVIUM: Poorly graded SAND (SP), greenish gray (5GY 6/1), medium dense, wet, fine to medium sand, trace coarse sand and fine gravel, no HCl reaction
-34.1	50.0	5	11	13	24	SS-14		-36.1 52.0 KIRKWOOD FORMATION: Poorly graded SAND (SP), Light greenish gray (5GY 7/1), medium dense, wet, fine to medium sand, no HCl reaction
-39.1	55.0	7	8	13	21	SS-15		

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

GEOTECHNICAL BORING LOG

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-40.2					Continued from previous page			
-44.1	60.0	10	9	10	19	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	23	SS-17		65.0ft: Greenish gray (5GY 6/1), fine to medium sand
-53.9	69.8	4	10	10	20	SS-18		69.8ft: Gray (N 5/)
-57.1	73.0							KIRKWOOD FORMATION: Sandy ELASTIC SILT (MH), dark greenish gray (10Y 4/1), soft, moist, no HCl reaction
-59.1	75.0	NA	NA	NA		SS-19		75.0ft: Rods dropped, penetrated 1.5ft, no SPT values
-60.6	76.5	1	2	12	14	SS-20		
-61.7	77.6							KIRKWOOD FORMATION: Silty SAND (SM), dark gray (N 4/), medium dense, wet, fine to medium sand, no HCl reaction, trace wood fragments and organics
-64.3	80.2	1	4	4	8	SS-21		KIRKWOOD FORMATION: FAT CLAY (CH), dark greenish gray (10Y 4/1), medium stiff, moist, no HCl reaction
-69.1	85.0	2	4	5	9	SS-22		85.0ft: Greenish gray (10Y 5/1), stiff
-74.1	90.0	2	1	4	5	SS-23		90.0ft: Dark greenish gray (10Y 4/1), medium stiff, trace organics
-79.2	95.1	3	5	6	11	SS-24		95.1ft: Stiff, trace to few organics, trace mica
-84.1	100.0	5	7	12	19	SS-25		100.0ft: Very stiff, trace organics, few mica 100.9ft: silty SAND (SM) layer to 101.1ft
-87.1	103.0							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
-89.1	105.0	100/0.4			100/0.4	SS-26		
-92.1	108.0							VINCENTOWN FORMATION: ELASTIC SILT (MH), greenish gray (5GY 5/1), very stiff, wet, trace fine sand, no HCl reaction, trace glauconite
-93.9	109.8	7	10	12	22	SS-27		

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

GEOTECHNICAL BORING LOG

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-96.3					Continued from previous page			
-97.1	113.0							VINCENTOWN FORMATION: Silty SAND (SM), greenish gray (5GY 5/1), medium dense, wet, fine to medium sand, no HCl reaction, trace glauconite
-99.0	114.9	17	14	16	30	SS-28		
-104.2	120.1	41	28	18	46	SS-29		120.1ft: Greenish gray (10Y 5/1), dense, moist, no to weak HCl reaction, few friable to moderately indurated layers
-109.3	125.2	9	24	15	39	SS-30		125.2ft: Weak to strong HCl reaction, trace shell fragments, few moderately indurated layers
-114.1	130.0	9	76	24	100/1.0	SS-31		130.0ft: Greenish gray (10Y 6/1), very dense, wet, few friable layers
-119.1	135.0	7	93/0.4		100/0.9	SS-32		135.0ft: Greenish gray (10Y 5/1), strong HCl reaction, few friable to moderately indurated layers
-124.1	140.0	9	12	13	25	SS-33		140.0ft: Greenish gray (10Y 6/1), medium dense, no to weak HCl reaction
-127.1	143.0							HORNERSTOWN FORMATION: Silty SAND (SM), greenish gray (10Y 6/1), very dense, moist, fine to medium sand, weak HCl reaction, trace to few glauconite
-129.1	145.0	100/0.1			100/0.1	SS-34		145.0ft: Moderately indurated to friable
-134.1	150.0	6	11	16	27	SS-35		150.0ft: Medium dense, strong HCl reaction, few glauconite
-139.2	155.1	6	12	19	31	SS-36		155.1ft: Greenish gray (10Y 5/1), dense
-144.0	159.9	7	36	26	62	SS-37		159.9ft: Dark greenish gray (5GY 4/1), very dense, trace shell fragments, few to little glauconite
-147.1	163.0							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
-149.1	165.0	41	28	32	60	SS-38		

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

GEOTECHNICAL BORING LOG

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-152.4					Continued from previous page			
-154.0	169.9							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
		19	30	34	64	SS-39		
-159.1	175.0							175.0ft: Medium dense, weak HCl reaction
		17	28	38	66	SS-40		
-164.1	180.0							180.0ft: No HCl reaction
		26	39	57	96	SS-41		
-169.0	184.9							184.9ft: Little coarse shell fragments
		20	30	38	68	SS-42A/B		
-174.0	189.9							-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
		35	65/0.1		100/0.6	SS-43		189.9ft: Dark greenish gray (10Y 4/1), strong HCl reaction
-179.1	195.0							195.0ft: Fine to medium sand, weak HCl reaction
		100/0.3			100/0.3	SS-44		
-184.0	199.9							
		100/0.4			100/0.4	SS-45		
-194.1	210.0							210.0ft: Trace shell fragments, few glauconite
		21	36	42	78	SS-46		
-203.9	219.8							-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
		26	40	60	100/1.0	SS-47		

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

GEOTECHNICAL BORING LOG

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-208.5					Continued from previous page			
								MOUNT LAUREL FORMATION: Silty SAND (SM), greenish gray (10Y 5/1), very dense, moist, fine to medium sand, weak HCl reaction, trace glauconite *(continued)*
-214.0	229.9	58	42/0.2		100/0.7	SS-48		229.9ft: No HCl reaction
-224.1	240.0	100/0.5			100/0.5	SS-49		
-234.0	249.9	60	40/0.2		100/0.7	SS-50		249.9ft: Weak HCl reaction
-244.1	260.0	63	37/0.2		100/0.7	SS-51		260.0ft: No HCl reaction
-254.1	270.0	100/0.5			100/0.5	SS-52		270.0ft: Dark greenish gray (10Y 4/1), weak HCl reaction
								-259.1 275.0 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
-264.0	279.9					SS-53		

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

GEOTECHNICAL BORING LOG

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-264.6					Continued from previous page			
		64	36/0.3		100/0.8			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 *(continued)*
-274.0	289.9	43	50	50/0.4	100/0.9	SS-54		289.9ft: Strong HCl reaction
								-280.1 296.0
-284.0	299.9	16	18	25	43	SS-55		WENONAH FORMATION: Sandy LEAN CLAY (CL), dark greenish gray (5GY 4/1), hard, moist, strong HCl reaction, trace glauconite
-294.2	310.1	9	16	29	45	SS-56		-293.1 309.0 MARSHALLTOWN FORMATION: Clayey SAND (SC), dark greenish gray (5GY 4/1), medium dense to dense, moist, fine to medium sand, trace subrounded gravel, strong HCl reaction, trace glauconite
-299.1	315.0	13	10	12	22	SS-57		310.1ft: No Recovery
-304.0	319.9	10	13	29	42	SS-58		
-314.0	329.9	14	27	60	87	SS-59		329.9ft: Very dense, no HCl reaction
								-319.1 335.0

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

GEOTECHNICAL BORING LOG

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-320.7					Continued from previous page			
-323.9	339.8	10	18	32	50	SS-60		ENGLISHTOWN FORMATION: Sandy SILT (ML), very dark greenish gray (10Y 3/1), hard, moist, no HCl reaction, micaceous, trace shell fragments *(continued)*
-329.1	345.0	7	15	35	50	SS-61		'339.8ft: No recovery-sample pulled out, catcher inverted
-334.1	350.0	6	7	11	18	SS-62		350.0ft: Black (N 2.5/), very stiff, no to weak HCl reaction, few shell fragments
-335.6	351.5							Boring terminated at 351.5 feet.

Boring terminated before proposed termination depth due to persistent problems with boring cave-in and loss of drill fluid circulation. Boring EB-3 proposed termination depth extended as replacement.

Boring closed by tremie method with cement-bentonite grout on 1/22/09.

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

MACTEC

GEOTECHNICAL BORING LOG

Prepared By NBL Date 7/10/09

Checked By JDJ 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. (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
14.1					Ground Surface			14.1 0.0
14.1	0.0	5	5	10	15	SS-1		ARTIFICIAL FILL: Clayey GRAVEL with sand (GC), grayish brown (10YR 5/2), medium dense, wet, fine to coarse subangular gravel, little fine to coarse sand, no HCl reaction
11.6	2.5							12.1 2.0
		5	5	4	9	SS-2		ARTIFICIAL FILL: Sandy CLAY (CL), black (N 2.5/)stiff, moist, trace gravel, no HCl reaction, PP= 1.0 tsf
9.1	5.0							9.6 4.5
		8	11	6	17	SS-3		ARTIFICIAL FILL: Clayey SAND (SC), grayish brown (10YR 5/2), medium dense, wet, fine to coarse sand, trace fine gravel, no HCl reaction
6.6	7.5							7.1 7.0
		4	1	2	3	SS-4		HYDRAULIC FILL: Sandy LEAN CLAY (CL), black (N 2.5/), soft, moist, no HCl reaction, PP=0.0 tsf
4.1	10.0							
		WOH	1	1	2	SS-5		10.0ft: No recovery, very soft
1.6	12.5							2.1 12.0
		1	1	1	2	SS-6		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
-0.9	15.0							
		WOH	WOH	WOH	0 WOH	SS-7		
-5.9	20.0							
		WOH	WOH	2	2	SS-8		
-11.2	25.3							
		WOH	WOH	WOH	0 WOH	SS-9		
-16.2	30.3							
		WOH	WOH	WOH	0 WOH	SS-10		
-21.1	35.2							
		WOH	WOH	WOH	0 WOH	SS-11		
-25.9	40.0							-24.9 39.0
		4	6	10	16	SS-12		ALLUVIUM: Silty SAND with gravel (SM), greenish gray (10Y 6/1), medium dense, wet, fine to coarse sand, little fine subrounded gravel, no HCl reaction
-31.7	45.8							-29.9 44.0
		1	3	4	7	SS-13		ALLUVIUM: Sandy SILT (ML), greenish gray (10Y 5/1), medium stiff, moist, some fine sand, no HCl reaction
-35.9	50.0							-33.9 48.0
		WOH	2	3	5	SS-14		ALLUVIUM: FAT CLAY (CH), greenish gray (10Y 5/1), medium stiff, moist, no HCl reaction
-40.9	55.0							50.0ft: PP=2.0 tsf
		WOH	1	2	3	SS-15		55.0ft: Very dark greenish gray (10Y 3/1), soft, PP=0.75 tsf

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

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION
-42.0					Continued from previous page			
								ALLUVIUM: FAT CLAY (CH), greenish gray (10Y 5/1), medium stiff, moist, no HCl reaction *(continued)*
-45.9	60.0	WOH	2	3	5	SS-16		60.0ft: Medium stiff, PP=1.5 tsf
-48.9	63.0							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
-51.2	65.3	WOH	1	2	3	SS-17		
-55.9	70.0	1	1	1	2	SS-18		70.0ft: Very soft, trace organics, PP=1.0 tsf
-58.9	73.0							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	WOH	1	1	SS-19		
-65.9	80.0	WOH	1	1	2	SS-20		80.0ft: PP=0.25 tsf
-70.9	85.0	1	2	1	3	SS-21		85.0ft: Soft, few organics, PP=0.25 tsf
-76.2	90.3	WOH	WOH	WOH	WOH 0	SS-22		90.3ft: Very soft, trace organics, PP=0.5 tsf
-80.9	95.0	WOH	WOH	WOH	WOH 0	SS-23		95.0ft: PP=0.5 tsf
-83.9	98.0							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
-85.9	100.0	10	15	14	29	SS-24		
-89.9	104.0							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	10	14	14	28	SS-25		
-95.9	110.0	8	92/0.4		100/0.9	SS-26		110.0ft: Greenish gray (5GY 6/1), very dense, few moderately indurated layers

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

GEOTECHNICAL BORING LOG

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION
-98.1					Continued from previous page			
-100.8	114.9	6	12	26	38	SS-27		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)* 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	100/0.7	SS-28		120.0ft: Greenish gray (10Y 6/1), very dense, moist, few friable layers
-110.9	125.0	100/0.3			100/0.3	SS-29		125.0ft: Mostly friable to moderately indurated
								-113.9 128.0
-115.7	129.8	20	14	45	59	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			100/0.4	SS-31		135.0ft: Mostly friable to moderately indurated
-125.9	140.0	9	91/0.5		100/1.0	SS-32		140.0ft: Few friable layers
								-128.9 143.0
-130.9	145.0	9	16	39	55	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	44	SS-34		150.0ft: Dense, few to little glauconite
-140.9	155.0	8	15	24	39	SS-35		
-145.7	159.8	11	25	33	58	SS-36		159.8ft: Greenish black (10GY 2.5/1), very dense, wet, trace shell fragments, little to some glauconite
								-148.9 163.0
-150.9	165.0	18	39	37	76	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
								-153.9 168.0

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

GEOTECHNICAL BORING LOG

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-154.2					Continued from previous page			
-155.9	170.0	11	18	30	48	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)*
-158.9								173.0
-161.1	175.2	16	30	47	77	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	100/0.8	SS-40		
-168.9								183.0
-170.9	185.0	20	80/0.5		100/1.0	SS-41		MOUNT LAUREL FORMATION: Sandy LEAN CLAY (CL), dark greenish gray (10Y 4/1), hard, dry to moist, fine to coarse subrounded sand, strong HCl reaction, little glauconite, trace mica, PP=>4.5 tsf
-175.8	189.9	100/0.3			100/0.3	SS-42		
-180.9	195.0	100/0.3			100/0.3	SS-43		195.0ft: Very dark greenish gray (10Y 3/1)
-185.9	200.0	70	30/0.2		100/0.7	SS-44		
-186.6								200.7
								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

MACTEC

GEOTECHNICAL BORING LOG

Prepared By NBR Date 7/10/09

Checked By JAZ 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. (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
16.5					Ground Surface			16.5 0.0
16.5	0.0	33	30	9	39	SS-1		ARTIFICIAL FILL: Silty GRAVEL with sand (GM), grayish brown (10YR 5/2), dense, dry to moist, fine to coarse gravel
14.0	2.5							14.5 2.0
		5	5	4	9	SS-2		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							12.0 4.5
		WOH	2	2	4	SS-3		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							7.5ft: Wet
		2	1	2	3	SS-4		
6.5	10.0							10.0ft: Medium stiff
		2	4	3	7	SS-5		
4.0	12.5							3.7 12.8
		2	1	1	2	SS-6		HYDRAULIC FILL: Poorly graded SAND (SP), dark gray (2.5Y 4/1), very loose, wet, fine to coarse sand, trace organics
1.5	15.0							2.0 14.5
		WOH	WOH	2	2	SS-7		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	2	SS-8		
-8.5	25.0							-6.5 23.0
		WOH	WOH	WOH	WOH 0	SS-9		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
-13.5	30.0							-11.0 27.5
		WOH	WOH	WOH	WOH 0	SS-10		HYDRAULIC FILL: FAT CLAY (CH), very dark gray (2.5Y 3/1), very soft, wet, trace fine sand, trace organics, PP=0.5 tsf
-18.5	35.0							
		WOH	WOH	WOH	WOH 0	SS-11		35.0ft: Moist to wet, trace fine sand partings, PP=0.0 tsf
-23.5	40.0							-21.5 38.0 38.0ft: Harder drilling with slight bit chatter
		5	8	10	18	SS-12		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
-28.5	45.0							-27.5 44.0
		5	2	4	6	SS-13		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
-33.5	50.0							
		WOH	2	3	5	SS-14		50.0ft: Moist, PP=1.25 tsf
-38.5	55.0							-36.5 53.0
		WOH	2	5	7	SS-15		KIRKWOOD FORMATION: FAT CLAY (CH), very dark greenish gray (10Y 3/1), medium stiff, wet, few fine sand, trace organics, PP=1.25 tsf

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

GEOTECHNICAL BORING LOG

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-39.6					Continued from previous page			
-41.5	58.0							KIRKWOOD FORMATION: Silty SAND (SM), very dark greenish gray (10Y 3/1), loose, wet, fine sand, few organics
-43.5	60.0	3	3	4	7	SS-16		
-46.5	63.0							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
-48.5	65.0	WOH	WOH	2	2	SS-17		
-53.5	70.0	WOH	3	4	7	SS-18		70.0ft: Medium stiff, moist, PP=1.25 tsf
-58.5	75.0	WOH	WOH	2	2	SS-19		75.0ft: Very soft, PP=1.25 tsf
-63.5	80.0	WOH	WOH	WOH	0 WOH	SS-20		80.0ft: Little fine to medium sand, PP=0.75 tsf
-68.5	85.0	WOH	WOH	WOH	0 WOH	SS-21		85.0ft: PP=0.75 tsf
-73.5	90.0	WOR	WOR	WOH	0 WOH	SS-22		90.0ft: Olive gray (5Y 4/2), PP=0.0 tsf
-77.0	93.5							93.5ft: Harder drilling
-78.5	95.0	4	9	14	23	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	13	SS-24		
-85.5	102.0							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
-88.5	105.0	24	27	18	45	SS-25		
-90.5	107.0							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
-93.5	110.0	24	13	58	71	SS-26		

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

GEOTECHNICAL BORING LOG

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION
-95.7					Continued from previous page			
-98.5	115.0	15	11	26	37	SS-27		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)* 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
-127.5	144.0							
-128.1	144.6	62	28	25	53	SS-33		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 -Slight bit chatter from 148ft to 149ft
-133.1	149.6	3	8	14	22	SS-34		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
-147.5	164.0							
-148.1	164.6	25	75/0.2		100/0.7	SS-37		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

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

GEOTECHNICAL BORING LOG

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-151.8					Continued from previous page			
-153.1	169.6	30	25	35	60	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
-156.5								173.0
-158.1	174.6	16	23	26	49	SS-39		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
-160.5								177.0
-163.1	179.6	20	38	48	86	SS-40		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
-167.5								184.0
-168.1	184.6	13	30	33	63	SS-41		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
-173.1	189.6	25	39	61/0.1	100/0.6	SS-42		189.6ft: Trace shell fragments, little glauconite
-178.1	194.6	100/0.4			100/0.4	SS-43		194.6ft: Trace to few shell fragments, trace glauconite
-181.5								198.0
-183.1	199.6	100/0.4			100/0.4	SS-44		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
-193.1	209.6	17	27	39	66	SS-45		
-203.1	219.6	25	40	60	100/1.0	SS-46		

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

GEOTECHNICAL BORING LOG

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	▼	LOG	SOIL AND ROCK DESCRIPTION
-207.9					Continued from previous page				
-213.1	229.6	50	42/0.2		100/0.7	SS-47			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 *(continued)*
-223.1	239.6	56	44/0.2		100/0.7	SS-48			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
-233.1	249.6	45	55/0.4		100/0.9	SS-49			
-243.1	259.6	39	55	45/0.3	100/0.8	SS-50			
-253.1	269.6	40	60/0.4		100/0.9	SS-51			269.6ft: Weak HCl reaction
-263.1	279.6	37	55	45/0.3		SS-52			

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

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-264.1					Continued from previous page			
					100/0.5			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 *(continued)*
-273.1	289.6	25	28	35	63	SS-53		
-278.5	295.0							WENONAH FORMATION: Sandy LEAN CLAY (CL), dark gray (2.5Y 4/1), very stiff, moist, some fine sand, weak to strong HCl reaction, trace glauconite, PP=2.5 tsf
-283.1	299.6	4	7	10	17	SS-54		
-292.5	309.0							MARSHALLTOWN FORMATION: Clayey SAND (SC), very dark gray (5Y 3/1), very dense, moist to wet, fine to medium sand, few to little shell fragments, weak HCl reaction, little glauconite
-293.1	309.6	9	15	38	53	SS-55		
-303.1	319.6	8	10	15	25	SS-56		319.6ft: Medium dense, moist, fine sand, trace shell fragments
-313.1	329.6	26	28	33	61	SS-57		329.6ft: Very dense, moist to wet, fine to medium sand, trace coarse subrounded sand
-318.5	335.0							

GEOTECHNICAL BORING LOG

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-320.2					Continued from previous page			
-323.1	339.6	7	11	17	28	SS-58		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	10	SS-59		349.6ft: Stiff, trace glauconite, PP=1.75 tsf
-337.5	354.0							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
-343.1	359.6	3	6	12	18	SS-60		
-353.1	369.6	WOR	6	16	22	SS-61		369.6ft: PP=3.5 tsf
-363.1	379.6	WOR	7	14	21	SS-62		379.6ft: PP=3.5 tsf
-367.5	384.0							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
-373.1	389.6	WOR	4	17	21	SS-63		

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

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-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	23	SS-64		
-393.1	409.6	3	7	17	24	SS-65		
-397.5	414.0							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
-403.1	419.6	13	23	23	46	SS-66		
-413.1	429.6	14	17	26	43	SS-67		429.6ft: PP=4.0 tsf
-418.5	435.0							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
-423.1	439.6	7	11	71	82	SS-68		
-428.5	445.0							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

GEOTECHNICAL BORING LOG

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-432.4					Continued from previous page			
-433.1	449.6	9	20	33	53	SS-69		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 *(continued)* 450.0ft: Drilling without sampling to 630.0ft for geophysical testing; Interpreted as CLAY to 469.0ft from geophysical log
								-452.5 — 469.0 MAGOTHY FORMATION: SAND-Interpreted from geophysical log -Bit chatter/hard drilling to 474ft
								-456.5 — 473.0 MAGOTHY FORMATION: CLAY-Interpreted from geophysical log
								-464.5 — 481.0 MAGOTHY FORMATION: SAND-Interpreted from geophysical log -Bit chatter from 490ft to 500ft
								-483.5 — 500.0 POTOMAC FORMATION: CLAY-Interpreted from geophysical log -Occasional bit chatter from 500ft to 540ft

PSEG ESP BORE PSEG ESP_7-07-09.GPJ PSEG ESP.GDT 7/10/09

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	▼	LOG	SOIL AND ROCK DESCRIPTION
-488.5					Continued from previous page				
									POTOMAC FORMATION: CLAY-Interpreted from geophysical log -Occasional bit chatter from 500ft to 540ft *(continued)*
-520.5									POTOMAC FORMATION: SAND-Interpreted from geophysical log -Bit chatter from 540ft to 550ft
-532.5									POTOMAC FORMATION: CLAY-Interpreted from geophysical log
-544.5									

537.0

549.0

561.0

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	▼	LOG	SOIL AND ROCK DESCRIPTION
-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									568.0 POTOMAC FORMATION: LEAN CLAY (CL)-Interpreted from geophysical log
									-Change in drill fluid color from gray to reddish tint observed drilling from 575ft to 580ft

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

GEOTECHNICAL BORING LOG

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	▼	LOG	SOIL AND ROCK DESCRIPTION
-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 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 631.5
									Boring terminated at 631.5 feet.
									Boring closed by tremie method with cement-bentonite grout on 2/18/09.

PSEG ESP BORE_PSEG ESP_7-07-09.GPJ PSEG ESP.GDT 7/10/09

MACTEC

GEOTECHNICAL BORING LOG

Prepared By MAH Date 7/10/09

Checked By JAH Date 7/10/09

SHEET 1 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	FLUID LEVEL (ft)
BORING NO.: EB-3UD	DRILL METHOD: Mud Rotary	SAMPLE METHODS: Shelby/Osterburg/Pitcher	0 HR. ND
GROUND SURFACE ELEV.: 16.4 US ft (NAVD88)	NORTHING: 232350.2 US ft (NAD83)	EASTING: 202492.3 US ft (NAD83)	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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
16.4					Ground Surface			16.4 — 0.0
								Boring drilled for collection of undisturbed samples. See geotechnical boring EB-3 for complete strata and soil descriptions. ARTIFICIAL FILL: Not sampled
								11.9 — 4.5
10.1	6.3					UD-1		HYDRAULIC FILL -Begin sampling with Shelby Tube Sampler
								6.3ft: Shelby tube UD-1 pushed to 8.3ft in ELASTIC SILT (MH), black (N 2.5/), moist, no HCl reaction; recovery=1.1ft; TV=0.3 tsf; PP=0.0 tsf
6.1	10.3					UD-2		10.3ft: Shelby tube UD-2 pushed to 12.3ft in Silty SAND (SM), dark gray (N 4/), moist, fine sand, no HCl reaction to 11.0ft then ELASTIC SILT (MH), dark gray (N 4/), moist, no HCL reaction; recovery=1.6ft; TV=0.0 tsf; PP=0.0 tsf
-8.6	25.0					UD-3		25.0ft: Shelby tube UD-3 pushed to 27.0ft in ELASTIC SILT (MH), very dark gray (N 3/), wet, no HCl reaction to 26.0ft then Silty SAND (SM), dark gray (N 4/), moist, no HCl reaction, trace mica; recovery=1.3ft
-15.6	32.0					UD-4		32.0ft: Shelby tube UD-4 pushed to 34.0ft in ELASTIC SILT (MH), black (N 2.5/), moist, no HCl reaction; recovery=1.6ft; PP=0.5 tsf
								-21.6 — 38.0
								ALLUVIUM
-28.6	45.0					UD-5		45.0ft: Shelby tube UD-5 pushed to 47.0ft; recovery=0.0ft; tube damaged and discarded
-32.6	49.0					UD-6		49.0ft: Shelby tube UD-6 pushed to 51.0ft; recovery=0.0ft; tube damaged and discarded
								-36.6 — 53.0
-38.0	54.4					UD-7		KIRKWOOD FORMATION 54.4ft: Shelby tube UD-7 pushed to 56.4ft in Fat CLAY (CH), dark gray (N 4/), moist, no HCl reaction

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

GEOTECHNICAL BORING LOG

MACTEC

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	FLUID LEVEL (ft)
BORING NO.: EB-3UD	DRILL METHOD: Mud Rotary		SAMPLE METHODS: Shelby/Osterburg/Pitcher	0 HR. ND
GROUND SURFACE ELEV.: 16.4 US ft (NAVD88)	NORTHING: 232350.2 US ft (NAD83)		EASTING: 202492.3 US ft (NAD83)	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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	▼	LOG	SOIL AND ROCK DESCRIPTION
-39.7					Continued from previous page				
									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)*
-47.6	64.0					UD-8			64.0ft: Shelby tube UD-8 pushed to 66.0ft; recovery=0.0ft
-51.6	68.0					UD-9			68.0ft: Shelby tube UD-9 pushed to 70.0ft; recovery=0.0ft -Change sample method to Osterburg Sampler
-55.9	72.3					UD-10			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
-62.2	78.6					UD-11			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
-65.7	82.1					UD-12			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
-71.6	88.0					UD-13			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
-90.6	107.0								VINCENTOWN FORMATION -Change sample method to Pitcher Barrel Sampler
-93.6	110.0					UD-14			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;

MACTEC

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	FLUID LEVEL (ft)
BORING NO.: EB-3UD	DRILL METHOD: Mud Rotary		SAMPLE METHODS: Shelby/Osterburg/Pitcher	0 HR. ND
GROUND SURFACE ELEV.: 16.4 US ft (NAVD88)	NORTHING: 232350.2 US ft (NAD83)		EASTING: 202492.3 US ft (NAD83)	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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	▼	LOG	SOIL AND ROCK DESCRIPTION
-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	144.0								HORNERSTOWN FORMATION
-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	164.0								NAVESINK FORMATION
-151.8	168.2								

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

GEOTECHNICAL BORING LOG

MACTEC

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	FLUID LEVEL (ft)
BORING NO.: EB-3UD	DRILL METHOD: Mud Rotary		SAMPLE METHODS: Shelby/Osterburg/Pitcher	0 HR. ND
GROUND SURFACE ELEV.: 16.4 US ft (NAVD88)	NORTHING: 232350.2 US ft (NAD83)		EASTING: 202492.3 US ft (NAD83)	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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	▼	LOG	SOIL AND ROCK DESCRIPTION
-151.9					Continued from previous page				
						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
-155.3	171.7								NAVESINK FORMATION *(continued)*
						UD-25			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
-159.6	176.0								
						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
-163.6	180.0								
						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
-167.6	184.0								-167.6 184.0 MOUNT LAUREL FORMATION
						UD-28			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
-171.9	188.3					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.GDT 7/10/09

GEOTECHNICAL BORING LOG

MACTEC

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	FLUID LEVEL (ft)
BORING NO.: EB-3UD	DRILL METHOD: Mud Rotary	SAMPLE METHODS: Shelby/Osterburg/Pitcher	0 HR. ND
GROUND SURFACE ELEV.: 16.4 US ft (NAVD88)	NORTHING: 232350.2 US ft (NAD83)	EASTING: 202492.3 US ft (NAD83)	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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	▼	LOG	SOIL AND ROCK DESCRIPTION
-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)*
-209.8	226.2								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.GDT 7/10/09

MACTEC

GEOTECHNICAL BORING LOG

Prepared By MAR Date 7/10/09

Checked By JHS Date 7/10/09

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. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	SAMP. NO.	SOIL AND ROCK DESCRIPTION
20.3						Ground Surface
20.3	0.0	29	48	17	SS-1	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
18.3	2.0					
17.7	2.6	4	6	9	SS-2	ARTIFICIAL FILL: Gravelly LEAN CLAY (CL), brown (7.5YR 5/2), stiff, moist to wet, angular gravel, trace organics, no HCl reaction
15.8	4.5					
15.3	5.0	2	1	2	SS-3	HYDRAULIC FILL: FAT CLAY (CH), very dark greenish gray (10Y 3/1), soft, moist, trace fine sand
13.3	7.0					
13.0	7.3	3	2	2	SS-4	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
10.8	9.5					
10.3	10.0	1	1	1	SS-5A/B	HYDRAULIC FILL: Silty SAND (SM), dark greenish gray (10Y 4/1), very loose, wet, fine sand, no HCl reaction
9.3	11.0					
8.3	12.0					HYDRAULIC FILL: ELASTIC SILT (MH), dark greenish gray (10Y 4/1), very soft, wet, trace fine sand
7.8	12.5	WOH	WOH	4	SS-6	
5.8	14.5					HYDRAULIC FILL: LEAN CLAY (CL), dark greenish gray (5GY 4/1), soft, moist to wet, trace fine sand
5.3	15.0	3	9	12	SS-7	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
2.8	17.5	4	5	5	SS-8	
0.5	19.8	3	4	6	SS-9	
-2.2	22.5					
-2.7	23.0	4	2	3	SS-10A/B	HYDRAULIC FILL: FAT CLAY (CH), very dark greenish gray (10Y 3/1), medium stiff, moist, trace organics
-4.7	25.0	3	4	5	SS-11	25.0ft: Stiff, wet, trace to few fine sand, no HCl reaction
-7.2	27.5	2	2	4	SS-12	27.5ft: Dark greenish gray (10Y 4/1), medium stiff, moist, trace fine sand
-9.2	29.5					HYDRAULIC FILL: Poorly graded SAND with silt (SP-SM), greenish gray (10Y 5/1), loose, moist to wet, trace clay layers (<0.1ft thick)
-9.7	30.0	2	2	6	SS-13	
-11.7	32.0					HYDRAULIC FILL: FAT CLAY (CH), dark greenish gray (10Y 4/1), very soft, moist, trace organics, no HCl reaction
-12.2	32.5	WOH	1	WOH	SS-14	
-14.7	35.0	WOH	1	1	SS-15	
-17.2	37.5	WOH	WOH	WOH	SS-16	
-19.7	40.0	WOH	WOH	WOH	SS-17	
-22.2	42.5	WOH	4	4	SS-18	
-23.2	43.5					ALLUVIUM: FAT CLAY (CH), greenish gray (10GY 6/1), medium stiff, moist, trace fine sand, trace iron staining
-24.7	45.0	WOH	3	5	SS-19	
-27.2	47.5	WOH	3	2	SS-20	48.0ft: Silty SAND (SM) layer to 48.2 ft, no HCl reaction
-29.2	49.5					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
-29.7	50.0	8	11	10	SS-21	
-32.2	52.5	9	9	10	SS-22	
-34.7	55.0	7	8	7	SS-23	

BLOWS PER FOOT: 0 20 40 60 80 100

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

GEOTECHNICAL BORING LOG

MACTEC

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. (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
-35.8					Continued from previous page			
-37.2	57.5							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)*
		9	11	13	24	SS-24		
-39.7	60.0							
		7	3	2	5	SS-25		
-40.2								60.5
-42.2	62.5							ALLUVIUM: FAT CLAY (CH), dark greenish gray (10Y 4/1),medium stiff, moist, no HCl reaction
		WOH	WOH	WOH	0 WOH	SS-26		62.5ft: Very soft, trace angular gravel
-44.2								64.5
-44.7	65.0							KIRKWOOD FORMATION: FAT CLAY (CH), dark gray (5Y 4/1), medium stiff, moist, trace organics, no HCl reaction
		1	2	4	6	SS-27		
-47.2	67.5							
		WOH	2	3	5	SS-28		67.5ft: Greenish gray (10Y 5/1), trace fine sand
-49.7	70.0							
		WOH	3	4	7	SS-29		
-51.7								72.0
-52.2	72.5							KIRKWOOD FORMATION: Poorly graded SAND with silt (SP-SM), dark greenish gray (10Y 4/1), medium dense, wet, fine sand, no HCl reaction
		7	9	13	22	SS-30		
-54.2								74.5
-54.7	75.0							KIRKWOOD FORMATION: FAT CLAY (CH), dark greenish gray (10Y 4/1), soft, moist, trace fine sand, trace organics, weak HCl reaction
		WOH	WOH	4	4	SS-31		
-57.2	77.5							77.5ft: Medium stiff, no HCl reaction
		WOH	2	4	6	SS-32		
-59.2								79.5
-59.7	80.0							KIRKWOOD FORMATION: LEAN CLAY (CL), dark greenish gray (10Y 4/1), soft, moist, trace to few fine sand, trace organics, no HCl reaction
		WOH	1	3	4	SS-33		
-61.7								82.0
-62.2	82.5							KIRKWOOD FORMATION: FAT CLAY (CH), dark gray (5Y 4/1), very soft, moist, trace organics, no HCl reaction
		1	1	1	2	SS-34		
-64.7	85.0							85.0ft: Medium stiff
		WOH	3	3	6	SS-35		
-67.2	87.5							87.5ft: Dark gray (10YR 4/1)
		2	3	4	7	SS-36		
-69.7	90.0							90.0ft: Dark gray (5Y 4/1), very soft
		WOH	WOH	WOH	0 WOH	SS-37		
-72.2	92.5							92.5ft: Dark gray (2.5Y 4/1), medium stiff
		WOH	2	4	6	SS-38		
-74.7	95.0							95.0ft: Very soft
		WOH	WOH	WOH	0 WOH	SS-39		
-77.2	97.5							97.5ft: Dark gray (2.5Y 4/1) mottled with olive yellow (2.5Y 6/6), soft
		WOH	WOH	3	3	SS-40		
-79.7	100.0							100.0ft: Dark gray (5Y 4/1), very soft
		WOH	WOH	WOH	0 WOH	SS-41		
-82.2	102.5							102.5ft: Trace laminations
		WOH	WOH	2	2	SS-42		
-84.7	105.0							105.0ft: Soft
		WOR	WOH	3	3	SS-43		-Bit chatter/ harder drilling at 107ft
-86.7								107.0
-87.2	107.5							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
		50/0.4			50/0.4	SS-44		
-88.7								109.0
-89.7	110.0							
		50/0.5			50/0.5	SS-45		

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

GEOTECHNICAL BORING LOG

MACTEC

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. (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
-91.9					Continued from previous page			
-92.2	112.5	7	6	9	15	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	72	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	19	SS-48		115.0ft: Greenish gray (10Y 7/1), very dense, few friable to moderately indurated layers, weak HCl reaction
-99.7	120.0	50/0.4			50/0.4	SS-49		117.5ft: Medium dense
-102.2	122.5	50/0.4			50/0.4	SS-50		120.0ft: Very dense, little indurated layers
-104.7	125.0	6	50/0.2		50/0.2	SS-51		122.5ft: Mostly moderately indurated
-107.2	127.5	9	10	42	52	SS-52		125.0ft: Greenish gray (10Y 6/1), some moderately indurated layers
-109.7	130.0	50/0.2			50/0.2	SS-53		-106.2 126.5
-112.2	132.5	8	11	50/0.3	50/0.3	SS-54		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
-114.7	135.0	8	14	11	25	SS-55		130.0ft: Moist, mostly moderately indurated
-117.2	137.5	50/0.4			50/0.4	SS-56		132.5ft: Moist to wet
-119.7	140.0	50/0.3			50/0.3	SS-57		-114.2 134.5
-122.2	142.5	3	10	19	29	SS-58		VINCENTOWN FORMATION: Clayey SAND (SC), greenish gray (10Y 6/1), medium dense, wet, fine sand, weak HCl reaction, trace glauconite
-124.7	145.0	4	50/0.4		50/0.4	SS-59		137.5ft: Very dense, moist, mostly moderately indurated, strong HCl reaction
-127.2	147.5	9	50/0.3		50/0.3	SS-60		140.0ft: Weak HCl reaction
-129.7	150.0	4	50/0.3		50/0.3	SS-61		142.5ft: Medium dense, wet, strong HCl reaction, no induration
-132.2	152.5	6	50/0.3		50/0.3	SS-62		145.0ft: Very dense
-134.7	155.0	50/0.3			50/0.3	SS-63		-126.7 147.0
-137.2	157.5	50/0.3			50/0.3	SS-64		HORNERSTOWN FORMATION: Clayey SAND (SC), greenish gray (10Y 6/1), very dense, wet, fine sand, strong HCl reaction, trace glauconite
-139.7	160.0	35	18	25	43	SS-65		155.0ft: Mostly moderately indurated
-142.2	162.5	7	39	25	64	SS-66		160.0ft: Dense, moist, few moderately indurated layers
-144.7	165.0	7	13	25	38	SS-67		-141.7 162.0
-147.2	167.5	50/0.3			50/0.3	SS-68		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
								167.5ft: Very dense, moist, mostly indurated

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

GEOTECHNICAL BORING LOG

MACTEC

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. (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
-148.0					Continued from previous page			
-148.7								169.0
-149.7	170.0	21	40	50/0.3	50/0.3	SS-69		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
-152.2	172.5	20	28	50	78	SS-70		172.5ft: Few shell fragments
-154.7	175.0	22	32	45	77	SS-71		175.0ft: Greenish black (10GY 2.5/1), little shell fragments, weak HCl reaction
-157.2	177.5	22	33	45	78	SS-72		177.5ft: Very dark greenish gray (5GY 3/1)
-159.7	180.0	9	40	35	75	SS-73		180.0ft: Trace shell fragments
-162.2	182.5	25	39	46	85	SS-74		
-164.7	185.0	27	35	50/0.3	50/0.3	SS-75		185.0ft: Moist, strong organic/hydrocarbon odor
-167.2	187.5	34	35	50/0.4	50/0.4	SS-76		187.5ft: Trace shell fragments
-169.2								189.5
-169.7	190.0	18	25	29	54	SS-77		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
-172.2	192.5	18	35	50	85	SS-78		192.5ft: Dark gray (5Y 4/1), fine sand, trace coarse subrounded sand, trace shells, trace friable zones
-174.7	195.0	25	50/0.4		50/0.4	SS-79		
-177.2	197.5	50/0.3			50/0.3	SS-80		197.5ft: Trace to little coarse subrounded to subangular sand
-179.7	200.0							200.0ft: Trace coarse rounded to subrounded sand
-179.9								200.2
		50/0.2			50/0.2	SS-81		Boring terminated at 200.2 feet.
								Boring closed by tremie method with cement-bentonite grout on 1/13/09.

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

MACTEC

GEOTECHNICAL BORING LOG

Prepared By MAL Date 7/10/09

Checked By JAJ 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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
13.8					Ground Surface			
13.8	0.0	2	4	6	10	SS-1		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	10	SS-2		2.5ft: Very dark grayish brown (10YR 3/2), trace fine gravel, trace to few organics
9.3	4.5							HYDRAULIC FILL: FAT CLAY (CH), dark grayish brown (10YR 4/2), very soft, wet, trace fine sand, few organics
8.1	5.7	WOH	WOH	WOH	0 WOH	SS-3		
6.3	7.5	2	3	7	10	SS-4		HYDRAULIC FILL: Silty SAND (SM), very dark gray (10YR 3/1), loose, wet, fine to coarse sand, trace fine gravel, few organics
4.3	9.5							HYDRAULIC FILL: Sandy SILT (ML), very dark gray (10YR 3/1), very soft, wet, some fine sand, trace organics
3.8	10.0	1	1	1	2	SS-5		
1.8	12.0							HYDRAULIC FILL: FAT CLAY (CH), very dark gray (10YR 3/1), very soft, wet, trace fine sand, few organics
1.3	12.5	WOH	WOH	WOH	0 WOH	SS-6		
-1.2	15.0	WOH	WOH	WOH	0 WOH	SS-7		
-5.5	19.3	WOH	WOH	WOH	0 WOH	SS-8		19.3ft: Trace organics
-10.8	24.6	WOH	WOH	WOH	0 WOH	SS-9		
-15.5	29.3	WOH	WOH	WOH	0 WOH	SS-10		
-19.2	33.0							ALLUVIUM: Poorly graded SAND with silt (SP-SM), olive gray (5Y 4/2), medium dense, wet, fine to coarse sand, trace fine gravel
-20.2	34.0	7	9	11	20	SS-11		
-23.2	37.0							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
-25.2	39.0	9	9	8	17	SS-12		
-30.2	44.0	7	6	7	13	SS-13		
-35.4	49.2	5	6	6	12	SS-14		49.2ft: Dark gray (5Y 4/1)
-38.2	52.0							KIRKWOOD FORMATION: Silty SAND (SM), greenish gray (10Y 5/1), loose, wet, fine sand, trace fine gravel, no HCl reaction
-40.2	54.0	3	4	5	9	SS-15		

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

GEOTECHNICAL BORING LOG

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-42.3					Continued from previous page			
-45.2	59.0	3	4	6	10	SS-16		KIRKWOOD FORMATION: Silty SAND (SM), greenish gray (10Y 5/1), loose, wet, fine sand, trace fine gravel, no HCl reaction *(continued)*
-50.2	64.0	6	6	8	14	SS-17		64.0ft: Medium dense, moist to wet
-55.2	69.0	9	11	13	24	SS-18		
-60.2	74.0	14	12	12	24	SS-19		
-65.2	79.0	12	16	17	33	SS-20		79.0ft: Dense, wet
-70.2	84.0	9	16	15	31	SS-21		84.0ft: Weak HCl reaction, orange iron staining at very end of sample
-73.2	87.0							-Bit chatter from 87ft to 89ft
-75.2	89.0	32	31	33	64	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	66	SS-23		94.0ft: No recovery-sample catcher inverted/mangled-same as above based on drill response
-82.2	96.0							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
-85.2	99.0	22	24	24	48	SS-24		
-90.2	104.0	12	25	28	53	SS-25		-Bit chatter drilling to 109ft (indurated layers)
-95.2	109.0	11	15	12	27	SS-26		109.0ft: Medium dense, strong HCl reaction -Bit chatter from 111ft to 112ft

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

GEOTECHNICAL BORING LOG

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-98.4					Continued from previous page			
-100.2	114.0	9	12	12	24	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	26	SS-28		-Bit chatter from 116ft to 118ft
-110.2	124.0	50/0.0			50/0.0	SS-29		-Hard drilling/bit chatter to 124ft 124.0ft: Very dense, SPT refusal with no penetration at 124.0 feet; hard drilling/bit chatter to 123ft
-115.2	129.0	15	10	18	28	SS-30		129.0ft: Greenish gray (10Y 6/1), medium dense, trace friable to moderately indurated layers, no oxidation
-120.2	134.0	7	28	31	59	SS-31		134.0ft: Very dense, wet, trace friable layers
-125.2	139.0	8	22	36	58	SS-32		
-130.2	144.0	WOH	9	91/0.4	100/0.9	SS-33		144.0ft: Greenish gray (10Y 5/1), moist to wet, few friable to moderately indurated layers
-133.2								147.0 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
-135.2	149.0	9	58	42/0.4	100/0.9	SS-34		
-140.2	154.0	6	8	17	25	SS-35		154.0ft: Medium dense, moist to wet, fine sand, trace glauconite
-145.2	159.0	5	14	21	35	SS-36		159.0ft: Dark grayish green (10Y 4/1), dense, fine to medium sand, few shell fragments, few to little glauconite
-149.2								163.0 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
-150.2	164.0	23	27	50	77	SS-37		

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

GEOTECHNICAL BORING LOG

MACTEC

SHEET 4 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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-154.5					Continued from previous page			
-155.2	169.0	23	32	48	80	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)*
-158.2	172.0							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
-160.2	174.0	21	28	38	66	SS-39		
-163.2	177.0							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
-165.2	179.0	34	41	59	100	SS-40		
-168.2	182.0							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
-170.2	184.0	34	43	57/0.4	100/0.9	SS-41		
-175.2	189.0	100/0.4			100/0.4	SS-42		
-180.2	194.0	100/0.2			100/0.2	SS-43		
-185.2	199.0	100/0.3			100/0.3	SS-44		
-185.5	199.3							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

MACTEC

GEOTECHNICAL BORING LOG

Prepared By MMC Date 7/10/09

Checked By JDJ 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	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. (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
13.7					Ground Surface			13.7 0.0
13.7	0.0	4	8	16	24	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
11.2	2.5	11	7	7	14	SS-2		2.5ft: Few angular to rounded gravel
9.4	4.3							9.7 4.0
		3	2	2	4	SS-3		HYDRAULIC FILL: SILT (ML), very dark greenish gray (10Y 3/1), soft, wet, trace rounded gravel
6.1	7.6	9	5	12	17	SS-4		7.6ft: Very stiff, few rounded gravel
3.7	10.0							4.2 9.5
		2	3	1	4	SS-5		HYDRAULIC FILL: Silty SAND (SM), very dark greenish gray (10Y 3/1), very loose, wet, fine sand
1.2	12.5							1.7 12.0
		WOH	WOH	WOH	WOH 0	SS-6		HYDRAULIC FILL: SILT (ML), very dark greenish gray (10Y 3/1), very soft, wet
-0.9	14.6							-0.8 14.5
		WOH	1	2	3	SS-7		HYDRAULIC FILL: SILT with sand (ML), very dark greenish gray (10Y 3/1), soft, wet, little fine sand
-5.8	19.5							19.5ft: Very dark grayish brown (10YR 3/1), very soft, moist
		WOH	1	1	2	SS-8		
-10.8	24.5							-9.3 23.0
		WOH	WOH	WOH	WOH 0	SS-9		HYDRAULIC FILL: FAT CLAY (CH), very dark grayish brown (10YR 3/1), very soft, moist
-15.8	29.5							
		WOH	WOH	WOH	WOH 0	SS-10		29.5ft: Black (10YR 2/1)
-20.8	34.5							-19.3 33.0
		5	16	22	38	SS-11		ALLUVIUM: Poorly graded SAND (SP), dark greenish gray (10Y 4/1), dense, wet, fine to medium sand, trace organics, no HCl reaction
-25.8	39.5							39.5ft: Medium dense
		12	14	10	24	SS-12		
-30.8	44.5							-29.3 43.0
		15	14	17	31	SS-13		ALLUVIUM: Silty SAND (SM), greenish gray (10GY 5/1), dense, wet, trace rounded gravel, no HCl reaction
-35.8	49.5							-34.3 48.0
		10	8	9	17	SS-14		ALLUVIUM: Well graded SAND (SW), dark gray (10YR 4/1), medium dense, wet, little subangular gravel, no HCl reaction
-40.8	54.5							-39.3 53.0
		8	8	10	18	SS-15		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.GPJ PSEG ESP.GDT 7/10/09

GEOTECHNICAL BORING LOG

MACTEC

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. (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
-42.4					Continued from previous page			
-45.8	59.5	8	7	8	15	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)*
-49.3	63.0							KIRKWOOD FORMATION: Sandy LEAN CLAY (CL), olive (5Y 5/3) and brownish yellow (10YR 6/8), stiff, moist, some fine sand, no HCl reaction
-50.8	64.5	3	5	8	13	SS-17		
-54.3	68.0							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
-55.8	69.5	19	18	15	33	SS-18		69.5ft: Strongly oxidized
-60.8	74.5	73	14	14	28	SS-19		74.5ft: Very dense, weak to strong HCl reaction
-65.8	79.5	10	10	13	23	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	28	SS-21		84.5ft: Dense, few shell fragments, weakly oxidized
-75.8	89.5	36	20	13	33	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.GPJ PSEG ESP.GDT 7/10/09

GEOTECHNICAL BORING LOG

MACTEC

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. (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
-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
-119.3	133.0								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
-120.8	134.5					SS-31			
-125.8	139.5					SS-32			
-129.3	143.0								HORNERSTOWN FORMATION: Silty SAND (SM), greenish gray (10Y5/1), dense, moist to wet, fine sand, few moderately indurated layers, strong HCl reaction, little glauconite
-130.8	144.5					SS-33			
-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
-149.3	163.0								NAVESINK FORMATION: Silty SAND (SM), very dark greenish gray (5GY 3/1), very dense, wet, trace shell fragments, strong HCl reaction, mostly glauconite
-150.8	164.5					SS-37			

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

GEOTECHNICAL BORING LOG

MACTEC

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. (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
-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)*
-158.3	172.0							NAVESINK FORMATION: Clayey SAND (SC), very dark greenish gray (5GY 3/1), very dense, wet, weak HCl reaction, mostly glauconite
-160.8	174.5					SS-39		
-163.3	177.0							NAVESINK FORMATION: Silty SAND (SM), very dark greenish gray (5GY 3/1), very dense, wet, weak HCl reaction, mostly glauconite
-165.8	179.5					SS-40		
-168.3	182.0							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
-170.8	184.5					SS-41		
-175.8	189.5					SS-42		189.5ft: Dark greenish gray (10GY 4/1), trace glauconite
-179.3	193.0							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
-180.8	194.5					SS-43		
-185.8	199.5							199.5ft: Dark greenish gray (5GY 4/1), trace to little glauconite
-186.2	199.9					SS-44		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

MACTEC

GEOTECHNICAL BORING LOG

Prepared By NMM Date 7/10/09

Checked By JDS Date 7/10/09

SHEET 1 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	FLUID LEVEL (ft)
BORING NO.: EB-6A	DRILL METHOD: Mud Rotary	SAMPLE METHODS: SPT	0 HR. ND
GROUND SURFACE ELEV.: 14.1 US ft (NAVD88)	NORTHING: 232587.0 US ft (NAD83)	EASTING: 203251.3 US ft (NAD83)	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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	▼	LOG	SOIL AND ROCK DESCRIPTION
14.1					Ground Surface				14.1 0.0
14.1	0.0								Driller advanced 4" casing to 34.0 ft and drilled without sampling to 94.6 feet. See EB-6 for information.
4.1	10.0								
-5.9	20.0								
-15.9	30.0								
-25.9	40.0								
-35.9	50.0								

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

GEOTECHNICAL BORING LOG

MACTEC

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	FLUID LEVEL (ft)
BORING NO.: EB-6A	DRILL METHOD: Mud Rotary	SAMPLE METHODS: SPT	0 HR. ND
GROUND SURFACE ELEV.: 14.1 US ft (NAVD88)	NORTHING: 232587.0 US ft (NAD83)	EASTING: 203251.3 US ft (NAD83)	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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	▼	LOG	SOIL AND ROCK DESCRIPTION
-42.0					Continued from previous page				
									Driller advanced 4" casing to 34.0 ft and drilled without sampling to 94.6 feet. See EB-6 for information. *(continued)*
-45.9	60.0								
-55.9	70.0								
-65.9	80.0								
-75.9	90.0								
-80.5	94.6								-80.5 94.6
		17	11	43	54	SS-1			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
-85.5	99.6								
		9	8	12	20	SS-2			99.6ft: Greenish gray (10Y 5/1), medium dense, fine to coarse sand, trace shell fragments, weak HCl reaction
-90.5	104.6								
		36	20	22	42	SS-3			104.6ft: Dense, moist, fine to medium sand, trace friable to moderately indurated layers, weak to strong HCl reaction
-95.5	109.6								
		11	10	11	21	SS-4			109.6ft: Medium dense, moist to wet, weak HCl reaction -Bit chatter 113ft to 114ft

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

GEOTECHNICAL BORING LOG

MACTEC

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	FLUID LEVEL (ft)
BORING NO.: EB-6A	DRILL METHOD: Mud Rotary	SAMPLE METHODS: SPT	0 HR. ND
GROUND SURFACE ELEV.: 14.1 US ft (NAVD88)	NORTHING: 232587.0 US ft (NAD83)	EASTING: 203251.3 US ft (NAD83)	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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-98.1					Continued from previous page			
-100.5	114.6	20	17	13	30	SS-5		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)* 114.6ft: Greenish gray (10Y 6/1), trace friable to moderately indurated layers, weak to strong HCl reaction
-105.5	119.6	22	14	16	30	SS-6		119.6ft: wet, trace moderately indurated layers
-110.5	124.6	35	13	14	27	SS-7		124.6ft: Trace friable layers, weak HCl reaction
-115.5	129.6	50/0.2			50/0.2	SS-8		129.6ft: Very dense, moist to wet, trace moderately indurated layers
-120.5	134.6	17	50/0.1		50/0.1	SS-9		-Bit chatter from 133ft to 134ft
-125.5	139.6	50/0.4			50/0.4	SS-10		139.6ft: Moist -Bit chatter 139.6ft to 141ft
-126.9	143.0							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
-130.5	144.6	50/0.1			50/0.1	SS-11		
-135.5	149.6	5	11	17	28	SS-12		149.6ft: Medium dense, wet
-137.0	151.1							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

MACTEC

GEOTECHNICAL BORING LOG

Prepared By NMM Date 7/10/09

Checked By JAW 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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
17.0					Ground Surface			
17.0	0.0	14	13	14	27	SS-1		17.0 — 0.0 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
14.5	2.5	6	3	3	6	SS-2A/B		15.0 — 2.0 14.0 — 3.0 ARTIFICIAL FILL: Poorly graded SAND (SP), grayish brown (2.5Y 5/2), loose, wet, fine to coarse sand, trace coarse gravel
12.0	5.0	WOH	WOH	WOH	WOH 0	SS-3		12.5 — 4.5 HYDRAULIC FILL: SILT (ML), dark gray (2.5Y 4/1), medium stiff, moist, few fine sand, trace organics
9.8	7.2	5	4	2	6	SS-4		10.0 — 7.0 HYDRAULIC FILL: FAT CLAY (CH), dark gray (N 4/), very soft, wet, trace organics
7.6	9.4	7	7	8	15	SS-5		8.0 — 9.0 HYDRAULIC FILL: Silty SAND (SM), dark gray (10YR 4/1), loose, moist, fine sand, trace mica, trace organics
4.5	12.5	1	1	WOH	1	SS-6		5.5 — 11.5 HYDRAULIC FILL: Sandy SILT (ML), dark gray (10YR 4/1), stiff, wet, fine to sand, trace organics
1.6	15.4	WOH	1	1	2	SS-7		HYDRAULIC FILL: LEAN CLAY with sand (CL), dark gray (N 4/), very soft, moist, little fine sand, few organics
-3.0	20.0	1	1	1	2	SS-8		2.0 — 15.0 HYDRAULIC FILL: ELASTIC SILT (MH), dark gray (N 4/), very soft, moist to wet, trace fine sand partings, trace organics 20.0ft: Trace to few fine sand partings
-8.0	25.0	WOH	WOH	WOH	WOH 0	SS-9		
-13.0	30.0	WOH	WOH	WOH	WOH 0	SS-10		-15.5 — 32.5 HYDRAULIC FILL: FAT CLAY (CH), dark gray (10YR 4/1), very soft, moist, trace fine sand, trace organics
-18.0	35.0	WOH	1	1	2	SS-11		-21.0 — 38.0 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
-23.0	40.0	9	6	6	12	SS-12		
-28.0	45.0	5	4	5	9	SS-13		45.0ft: Loose
-33.0	50.0	6	7	7	14	SS-14		50.0ft: Medium dense, little fine to coarse subangular to subrounded gravel
-38.0	55.0	3	3	4	7	SS-15		-37.0 — 54.0 KIRKWOOD FORMATION: Silty SAND (SM), greenish gray (5GY 5/1), loose, wet, fine sand, few to little mica

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

MACTEC

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 0.5ft	0.5ft	0.5ft	SAMP. NO.	SOIL AND ROCK DESCRIPTION
-39.1						Continued from previous page
						KIRKWOOD FORMATION: Silty SAND (SM), greenish gray (5GY 5/1), loose, wet, fine sand, few to little mica *(continued)*
-43.0	60.0					
		3	8	8	SS-16	60.0ft: Medium dense, few mica
-46.0						63.0
						KIRKWOOD FORMATION: Sandy SILT (ML), greenish gray (5GY 5/1), medium stiff, wet, fine sand, trace to few mica
-48.0	65.0					
		2	3	4	SS-17	
-50.0						67.0
						KIRKWOOD FORMATION: LEAN CLAY with sand (CL), dark brown (7.5YR 3/2), stiff, moist to wet, little fine sand, few mica, few organics
-53.0	70.0					
		WOH	3	8	SS-18	
-56.0						73.0
						KIRKWOOD FORMATION: Silty, Clayey SAND (SC-SM), dark brown (7.5YR 3/2), loose, moist, fine to medium sand, trace shells, trace organics
-58.0	75.0					
		WOH	WOH	WOH	SS-19	
-63.0	80.0					
-63.5						80.5
		2	3	8	SS-20A/B	KIRKWOOD FORMATION: Silty SAND (SM), dark grayish brown (2.5Y 4/2), medium dense, wet, fine sand, trace shells, little mica
-66.0						83.0
-67.0						84.0
						KIRKWOOD FORMATION: GRAVEL-Not sampled interpreted from bit chatter from 83.0ft to 84.0ft
-68.0	85.0					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
		3	8	7	SS-21	
-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
-81.0						98.0
						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
-83.0	100.0					
		11	89/0.2		SS-24	
-86.0						103.0
						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
-88.0	105.0					
		11	11	12	SS-25	
-93.0	110.0					
		7	17	14	SS-26	110.0ft: Dense

BLOWS PER FOOT: 0 20 40 60 80 100

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

GEOTECHNICAL BORING LOG

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-95.2					Continued from previous page			
-98.0	115.0	8	19	39	58	SS-27		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 *(continued)* 115.ft: Very dense, few shell fragments, few moderately indurated layers -Bit chatter from 116ft to 117ft
-103.0	120.0	13	11	15	26	SS-28		120.0ft: Medium dense, trace friable layers
-108.0	125.0	9	91/0.2		100/0.7	SS-29		125.0ft: Very dense, few moderately indurated to indurated layers, trace shell fragments
-113.0	130.0	31	13	17	30	SS-30		130.0ft: Greenish gray (10Y 5/1), medium dense, moist, few friable to moderately indurated layers
-118.0	135.0	50/0.0			50/0.0	SS-31		135.0ft: No Recovery- SPT refusal with no penetration on indurated layers, very dense
-121.0								-Bit chatter from 138ft to 140ft 138.0
-123.0	140.0	7	26	74/0.1	100/0.6	SS-32		VINCENTOWN FORMATION: Clayey SAND (SC), greenish gray (10Y 5/1), very dense, moist, fine to medium sand, few moderately indurated to indurated layers, trace shell fragments, strong HCl reaction, trace glauconite
-128.0	145.0	6	9	14	23	SS-33		145.0ft: Medium dense
-131.0								-Bit chatter/hard drilling from 147ft to 148ft 148.0
-133.0	150.0	10	19	27	46	SS-34		HORNERSTOWN FORMATION: Silty SAND (SM), greenish gray (10Y 5/1), dense, moist, fine sand, trace shell fragments, strong HCl reaction, few to little glauconite
-138.0	155.0	6	11	46	57	SS-35		155.0ft: Very dense, trace moderate indurated layers
-143.0	160.0	40	58	39	97	SS-36		160.0ft: Few to little friable to moderately indurated layers, few shell fragments, little glauconite
-148.0	165.0	4	13	26	39	SS-37		165.0ft: Very dark greenish gray (10Y 3/1), dense, trace shell fragments, some glauconite
-151.0								168.0

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

GEOTECHNICAL BORING LOG

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-151.3					Continued from previous page			
-153.0	170.0	10	15	26	INVALID 41	SS-38		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)
-158.0	175.0	19	28	44	72	SS-39		175.0ft: Very dense
-161.0								178.0
-163.0	180.0	16	23	39	62	SS-40		NAVESINK FORMATION: Clayey SAND (SC), very dark greenish gray (10Y 3/1), very dense, moist, trace shell fragments, weak HCl reaction, mostly glauconite
-166.0								183.0
-168.0	185.0	23	37	63/0.3	100/0.8	SS-41		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
-171.0								188.0
-173.0	190.0	37	63/0.4		100/0.9	SS-42		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
-175.0								192.0
-178.0	195.0	100/0.4			100/0.4	SS-43		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
-183.0	200.0	100/0.3			100/0.3	SS-44		-183.3 200.3 Boring terminated at 200.3 feet. Boring closed by tremie method with cement-bentonite grout on 1/09/09.

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

MACTEC

GEOTECHNICAL BORING LOG

Prepared By MMR Date 7/10/09

Checked By JA2 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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
15.3					Ground Surface			15.3 0.0
15.3	0.0	3	6	8	14	SS-1		ARTIFICIAL FILL: Clayey SAND with gravel (SC), dark grayish brown (10YR 4/2), medium dense, moist, fine to coarse sand, no HCl reaction, subrounded gravel
13.3	2.0							HYDRAULIC FILL: FAT CLAY (CH), black (N 2.5/), soft, moist, no HCl reaction, PP=0.0 tsf
12.8	2.5	5	2	2	4	SS-2		
10.3	5.0	WOH	WOH	WOH	0 WOH	SS-3		5.0ft: Very soft, trace mica
7.8	7.5	WOH	WOH	WOH	0 WOH	SS-4		7.5ft: Dark gray (N 4/)
5.3	10.0	WOH	1	WOH	1	SS-5		10.0ft: Trace organics
3.0	12.3	WOH	WOH	WOH	0 WOH	SS-6		12.3ft: No recovery-Same as above
0.5	14.8	WOH	3	2	5	SS-7A/B		14.0ft: Some fine to medium sand, PP=0.25 tsf
-0.1	15.4							HYDRAULIC FILL: Poorly graded SAND with silt (SP-SM), very dark gray (N 4/), wet, loose, fine to medium sand, no HCl reaction
-3.7	19.0							HYDRAULIC FILL: SILT (ML), very dark gray (N 3/), very soft, moist, no HCl reaction, trace mica, PP=0.0 tsf
-4.8	20.1	WOH	WOH	WOH	0 WOH	SS-8		
-9.9	25.2	WOH	WOH	WOH	0 WOH	SS-9		25.2ft: Few to little fine sand
-15.0	30.3	WOH	2	5	7	SS-10A/B		
-16.1	31.4							ALLUVIUM: Poorly graded SAND (SP), dark greenish gray (5GY 4/1), loose, wet, medium to coarse sand, no HCl reaction
-17.7	33.0							ALLUVIUM: PEAT (PT), dark brown (7.5YR 3/3), stiff, moist, no HCl reaction
-19.7	35.0	2	2	3	5	SS-11A/B		
-20.7	36.0							ALLUVIUM: LEAN CLAY (CL), dark greenish gray (5GY 4/1), stiff, moist, no HCl reaction
-25.7	41.0							ALLUVIUM: Clayey SAND (SC), greenish gray (10GY 6/1), to very dark greenish gray (5GY 3/1), loose, moist, fine to medium sand, no HCl reaction
-26.1	41.4	7	4	4	8	SS-12		
-27.7	43.0							ALLUVIUM: FAT CLAY (CH), very dark greenish gray (5GY 3/1), moist
-28.1	43.4					UD-1		43.4ft: Pushed shelby tube UD-1 to 45.4ft, recovery=1.8ft, PP=2.25 tsf
-30.7	46.0	2	3	3	6	SS-13		KIRKWOOD FORMATION: Clayey SAND (SC), dark yellowish brown (10YR 4/4), to brown (10YR 4/3), loose, moist, fine to medium sand, no HCl reaction
-32.7	48.0					UD-2		48.0ft: Pushed shelby tube UD-2 to 50.0ft, recovery=1.8ft
-35.5	50.8	4	3	1	4	SS-14		50.8ft: Strong brown (7.5YR 4/6), very loose, wet, fine to coarse subrounded sand
-39.7	55.0	WOH	WOH	WOH	0 WOH	SS-15		55.0ft: Yellowish red (5YR 4/6)

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

GEOTECHNICAL BORING LOG

MACTEC

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			
-41.7	57.0							KIRKWOOD FORMATION: Sandy SILT (ML), yellowish brown (10YR 5/6), wet, fine to medium sand, no HCl reaction
-42.3	57.6					UD-3		57.6ft: Pushed shelby tube UD-3 to 59.6ft, recovery=1.7ft, PP=0.0 tsf
-44.7	60.0							
		3	4	6	10	SS-16		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
-47.7	63.0							
-49.5	64.8	19	16	9	25	SS-17		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
-51.6	66.9					UD-4		66.9ft: Pushed shelby tube UD-4 to 68.9ft, recovery=1.9ft
-54.2	69.5	7	7	9	16	SS-18		69.5ft: Yellowish brown (10YR 5/6)
-59.5	74.8	9	8	13	21	SS-19		74.8ft: Very pale brown (10YR 7/4), trace friable layers, trace glauconite, moderately oxidized
-64.7	80.0	31	13	10	23	SS-20		80.0ft: Brownish yellow (10YR 6/6), weakly oxidized
-66.6	81.9					UD-5		81.9ft: Pushed shelby tube UD-5 to 82.4ft, recovery=0.4ft
-67.9	83.2	12	22	21	43	SS-21		83.2ft: Dense, trace friable to moderately indurated layers
-74.7	90.0	9	12	12	24	SS-22		90.0ft: Medium dense, trace friable layers
-76.6	91.9					UD-6		91.9ft: Pushed shelby tube UD-6 to 93.7ft, recovery=1.3ft
-78.6	93.9	8	46	13	59	SS-23		93.9ft: Very dense
-84.6	99.9	8	49	18	67	SS-24		99.9ft: Yellow (2.5Y 7/6), moist, trace moderately indurated layers
-89.7	105.0	9	7	9	16	SS-25		105.0ft: Pale yellow (2.5Y 7/3), medium dense, trace shell fragments, very weakly oxidized
-94.5	109.8	10	12	20	32	SS-26		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

GEOTECHNICAL BORING LOG

MACTEC

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
-96.9					Continued from previous page			
-99.7	115.0	21	13	11	24	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	24	SS-28		120.0ft: Greenish gray (10Y 6/1)
-109.8	125.1	11	9	12	21	SS-29		125.1ft: Greenish gray (10Y 5/1), moist
-114.5	129.8	8	8	8	16	SS-30		129.8ft: Greenish gray (10Y 6/1), wet
-119.5	134.8	18	7	16	23	SS-31		
-124.7	140.0	100/0.4			100/0.4	SS-32		140ft: Very dense, indurated
-129.7	145.0	15	9	19	28	SS-33		145.0ft: Medium dense
-134.5	149.8	100/0.3			100/0.3	SS-34		149.8ft: Very dense, moderately indurated
-137.2	152.5							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
-139.7	155.0	44	15	39	54	SS-35		
-144.7	160.0	9	26	36	62	SS-36		160ft: Greenish gray (10Y 6/1), trace friable layers
-149.9	165.2	8	92/0.4		100/0.9	SS-37		165.2ft: Trace moderately indurated layers, few to little glauconite

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

GEOTECHNICAL BORING LOG

MACTEC

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.	L O G	SOIL AND ROCK DESCRIPTION
-153.0					Continued from previous page			
-154.6	169.9	9	17	48	65	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)*
-156.7								169.9ft: Very dark greenish gray (5GY 3/1), weak HCl reaction, trace shell fragments, some glauconite 172.0
-159.7	175.0	25	39	59	98	SS-39		NAVESINK FORMATION: Silty SAND (SM), black (N 2.5/), very dense, moist, fine to medium sand, few shell fragments, strong HCl reaction, mostly glauconite
-164.7	180.0	27	33	36	69	SS-40		180.0ft: Weak HCl reaction, trace shell fragments
-169.7	185.0	41	38	51	89	SS-41		185.0ft: Very dark grayish green (5G 2.5/2)
-174.7	190.0	27	33	52	85	SS-42		190.0ft: Very dark grayish green (5G 2.5/2) to greenish black (10Y 2.5/1), few shell fragments
-176.7								192.0 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
-179.9	195.2	40	60/0.3		100/0.8	SS-43		
-184.5	199.8	100/0.4			100/0.4	SS-44		199.8ft: Dry
-194.5	209.8	100/0.3			100/0.3	SS-45		209.8ft: Dark greenish gray (10Y 4/1), fine to medium sand, few glauconite
-199.7								215.0 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	100/0.8	SS-46		

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

GEOTECHNICAL BORING LOG

MACTEC

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
-209.1					Continued from previous page			
								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)*
-214.5	229.8	31	50	50/0.4	100/0.9	SS-47		229.8ft: Dark greenish gray (5GY 4/1), trace to few glauconite
-224.6	239.9	38	45	55/0.4	100/0.9	SS-48		239.9ft: No HCl reaction, trace shell fragments, trace glauconite
-234.7	250.0	63	37/0.3		100/0.8	SS-49		
-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

GEOTECHNICAL BORING LOG

MACTEC

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
-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)*
-269.7								285.0
-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		
-286.4								301.7
								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.GPJ PSEG ESP.GDT 7/10/09

MACTEC

GEOTECHNICAL BORING LOG

Prepared By MAL Date 7/10/09

Checked By JAD 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)
BORING NO.: EB-8G	DRILL METHOD: Mud Rotary	SAMPLE METHODS: NA	0 HR. ND
GROUND SURFACE ELEV.: 15.7 US ft (NAVD88)	NORTHING: 231153.3 US ft (NAD83)	EASTING: 203528.3 US ft (NAD83)	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.	▼	LOG	SOIL AND ROCK DESCRIPTION
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.
							▼		12.2 ARTIFICIAL FILL: GRAVEL-Not sampled 3.5
									HYDRAULIC FILL: SILT-Not sampled, drill fluid changed color from brown to black at 3.5 feet.
									-15.8 31.5 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.
									-30.3 46.0 KIRKWOOD FORMATION: Silty/Clayey SAND-Not sampled

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

MACTEC

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)
BORING NO.: EB-8G	DRILL METHOD: Mud Rotary	SAMPLE METHODS: NA	0 HR. ND
GROUND SURFACE ELEV.: 15.7 US ft (NAVD88)	NORTHING: 231153.3 US ft (NAD83)	EASTING: 203528.3 US ft (NAD83)	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.	▼	LOG	SOIL AND ROCK DESCRIPTION
-40.4					Continued from previous page				KIRKWOOD FORMATION: Silty/Clayey SAND-Not sampled *(continued)*
-44.3	60.0								VINCENTOWN FORMATION: SAND-Not sampled, intermittent bit chatter/hard drilling throughout, trace glauconite in drill fluid return.
									100.0ft: Driller mixes fresh mud

MACTEC

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)
BORING NO.: EB-8G	DRILL METHOD: Mud Rotary		SAMPLE METHODS: NA	0 HR. ND
GROUND SURFACE ELEV.: 15.7 US ft (NAVD88)	NORTHING: 231153.3 US ft (NAD83)		EASTING: 203528.3 US ft (NAD83)	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.	▼	LOG	SOIL AND ROCK DESCRIPTION
-96.5					Continued from previous page				VINCENTOWN FORMATION: SAND-Not sampled, intermittent bit chatter/hard drilling throughout, trace glauconite in drill fluid return. *(continued)*
-136.8	152.5								HORNERSTOWN FORMATION: SAND-Not sampled, intermittent bit chatter/hard drilling throughout, trace to some glauconite in drill fluid return, glauconite increases with depth.

GEOTECHNICAL BORING LOG

MACTEC

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)
BORING NO.: EB-8G	DRILL METHOD: Mud Rotary		SAMPLE METHODS: NA	0 HR. ND
GROUND SURFACE ELEV.: 15.7 US ft (NAVD88)	NORTHING: 231153.3 US ft (NAD83)		EASTING: 203528.3 US ft (NAD83)	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.	▼	LOG	SOIL AND ROCK DESCRIPTION
-152.6					Continued from previous page				HORNERSTOWN FORMATION: SAND-Not sampled, intermittent bit chatter/hard drilling throughout, trace to some glauconite in drill fluid return, glauconite increases with depth. *(continued)*
-156.3	172.0								NAVESINK FORMATION: SAND-Not sampled, Some to mostly glauconite, few shell fragments in drill fluid return.
-176.3	192.0								MOUNT LAUREL FORMATION: SAND-Not sampled, hard drilling throughout, coarse sand, fine gravel, trace glauconite in drill fluid return. 195.0ft: Boring choked off around drill bit overnight, pull rods and change bit from roller cone to drag bit, driller mixes fresh mud.

MACTEC

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)
BORING NO.: EB-8G	DRILL METHOD: Mud Rotary	SAMPLE METHODS: NA	0 HR. ND
GROUND SURFACE ELEV.: 15.7 US ft (NAVD88)	NORTHING: 231153.3 US ft (NAD83)	EASTING: 203528.3 US ft (NAD83)	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.	▼	LOG	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)*

GEOTECHNICAL BORING LOG

MACTEC

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)
BORING NO.: EB-8G	DRILL METHOD: Mud Rotary	SAMPLE METHODS: NA	0 HR. ND
GROUND SURFACE ELEV.: 15.7 US ft (NAVD88)	NORTHING: 231153.3 US ft (NAD83)	EASTING: 203528.3 US ft (NAD83)	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.	▼	LOG	SOIL AND ROCK DESCRIPTION
-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									304.0 WENONAH FORMATION: SAND-Not sampled (Interpreted from geophysical log)
									315.0ft: Driller mixes fresh mud and flushes hole, pulls rods for geophysical testing
-299.3									315.0 Boring terminated at 315.0 feet. Boring closed by tremie method with cement-bentonite grout on 1/24/09.

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

Observation Well Boring Logs

MACTEC

GEOTECHNICAL BORING LOG

Prepared By NM Date 6/16/09

Checked By JAZ 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)		EASTING: 197752.8 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. (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
8.3					Ground Surface			8.3 0.0
8.3	0.0					RUN 1		ARTIFICIAL FILL: Poorly graded SAND with silt and gravel (SP-SM), dark grayish brown (10YR 4/2), moist, angular gravel, trace organics 5.3 3.0
						S-1		HYDRAULIC FILL: FAT CLAY (CH), dark olive gray (5Y 3/2), moist, trace to little fine sand, some organics, no HCl reaction
-1.7	10.0					RUN 2		10.0ft: Dark gray (2.5Y 4/1), little organics
						S-2		
-11.7	20.0					RUN 3		
-21.7	30.0					RUN 4		30.0ft: Dark gray (5Y 4/1), to black (5Y 2.5/1), trace fine sand lenses
						S-3		
-31.7	40.0					RUN 5		
						S-4		-35.2 43.5 ALLUVIUM: Clayey SAND (SC) and interbedded poorly graded SAND with silt (SP-SM), dark greenish gray (10Y 4/1), wet, fine sand, trace glauconite, no to weak HCl reaction
						S-5		-39.7 48.0 ALLUVIUM: LEAN CLAY with sand (CL), dark olive gray (5Y 3/2), moist to wet, some organics, no HCl reaction
-41.7	50.0					S-6		
						RUN 6		-43.7 52.0 ALLUVIUM: Poorly graded SAND with silt (SP-SM), grayish brown (2.5Y 5/2), wet, fine to coarse sand, trace subrounded to rounded gravel, no HCl reaction, trace mica
						S-7		
-51.7	60.0					RUN 7		
						S-8		
-61.7	70.0					S-9		-60.2 68.5 68.0ft: FAT CLAY (CH) lense to 68.5ft VINCENTOWN FORMATION: Clayey SAND (SC), yellowish brown (10YR 5/4), wet, fine sand, no to weak HCl reaction, moderately oxidized
						RUN 8		

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

GEOTECHNICAL BORING LOG

MACTEC

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)	EASTING: 197752.8 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. (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
-66.5					Continued from previous page			
						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
-71.7	80.0					RUN 9		
						S-11		
-81.7	90.0					RUN 10		
						S-12		
						S-13		-88.2 96.5 VINCENTOWN FORMATION: FAT CLAY with sand (CH), grayish brown (2.5Y 5/2), moist to wet, strong HCL reaction
-91.7	100.0					RUN 11		-91.7 100.0 VINCENTOWN FORMATION: Poorly graded SAND with silt (SP-SM), dark greenish gray (10GY 4/1), wet, strong HCl reaction, glauconitic
						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.

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

MACTEC

GEOTECHNICAL BORING LOG

Prepared By MR Date 6/16/09

Checked By JAJ Date 6/17/09

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	▼	LOG	SOIL AND ROCK DESCRIPTION
7.4					Ground Surface				7.4 — 0.0
7.4	0.0					RUN 1 S-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
									2.4 — 5.0 HYDRAULIC FILL: LEAN CLAY with sand (CL), very dark greenish gray (5GY 3/1), wet, weak HCl reaction
-2.6	10.0					S-2 RUN 2 S-3			-2.6 — 10.0 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
-12.6	20.0					RUN 3 S-4			
-22.6	30.0					RUN 4 S-5			-22.6 — 30.0 ALLUVIUM: Poorly graded SAND with silt (SP-SM), greenish gray (10Y 5/1), wet, fine sand, no HCl reaction
						S-6			-27.6 — 35.0 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 S-7			-32.6 — 40.0 ALLUVIUM: Silty SAND (SM), gray (5Y 5/1), wet, fine to medium sand, no HCl reaction
						S-8			-36.6 — 44.0 ALLUVIUM: Clayey SAND (SC), dark greenish gray (10Y 4/1), wet, no HCl reaction
						S-9			-38.6 — 46.0 ALLUVIUM: Poorly graded SAND with silt (SP-SM), greenish gray (10Y 5/1), wet, trace to little fines
-42.6	50.0					RUN 6 S-10			-44.6 — 52.0 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 S-11			-54.6 — 62.0 KIRKWOOD FORMATION: Clayey SAND (SC), dark olive gray (5Y 3/2), wet, few to little subrounded fine to coarse gravel
						S-12			-56.6 — 64.0 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

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

GEOTECHNICAL BORING LOG

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	▼	LOG	SOIL AND ROCK DESCRIPTION
-67.4					Continued from previous page				
						S-13			VINCENTOWN FORMATION: Poorly graded SAND with silt (SP-SM), greenish gray (10Y 5/1), wet, fine sand, trace shell fragments, strong HCl reaction, trace friable to moderately indurated layers, glauconitic *(continued)*
-72.6	80.0					RUN 9			
						S-14			
-82.6	90.0					RUN 10			
						S-15			
-92.6	100.0					RUN 11			
-95.1	102.5								Boring terminated at 102.5 feet and observation well NOW-3L 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-3.

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

MACTEC

GEOTECHNICAL BORING LOG

Prepared By MM Date 6/17/09

Checked By JAH 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	FLUID LEVEL (ft)
BORING NO.: NOW-4L	DRILL METHOD: Mud Rotary with Reve	SAMPLE METHODS: SPT	0 HR. ND
GROUND SURFACE ELEV.: 10.6 US ft (NAVD88)	NORTHING: 233972.7 US ft (NAD83)	EASTING: 198147.9 US ft (NAD83)	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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION
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	0	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	0	SS-2		
-16.4	27.0	5	4	4	8	SS-3		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	3	SS-4		33.0ft: Very dark greenish gray (5GY 3/1), soft, moist
-25.4	36.0	1	1	1	2	SS-5		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	8	SS-6		ALLUVIUM: Poorly graded SAND with silt (SP-SM), gray (N 5/), loose, wet, fine to medium sand, no HCl reaction
-36.4	47.0	8	11	15	26	SS-7		ALLUVIUM: Clayey SAND (SC), dark grayish brown (10YR 4/2), medium dense, moist, fine to medium sand, few fine gravel, no HCl reaction
-41.4	52.0	6	2	2	4	SS-8		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	17	SS-9		-52.3 62.9 KIRKWOOD FORMATION: Sandy LEAN CLAY (CL), very dark gray (N 3/), very stiff, moist, no HCl reaction
-56.4	67.0	8	11	23	34	SS-10		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	15	SS-11		-62.4 73.0

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

MACTEC

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	FLUID LEVEL (ft)
BORING NO.: NOW-4L	DRILL METHOD: Mud Rotary with Rever		SAMPLE METHODS: SPT	0 HR. ND
GROUND SURFACE ELEV.: 10.6 US ft (NAVD88)	NORTHING: 233972.7 US ft (NAD83)		EASTING: 198147.9 US ft (NAD83)	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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	▼	LOG	SOIL AND ROCK DESCRIPTION
-64.2					Continued from previous page				
-67.4	78.0	15	12	14	26	SS-12			VINCENTOWN FORMATION: Silty SAND (SM), greenish gray (5GY 6/1), medium dense, moist, fine to medium sand, strong HCl reaction *(continued)*
									78.0ft: Greenish gray (5GY 5/1), trace shell fragments
-72.4	83.0	11	19	72	91	SS-13			83.0ft: Very dense, weak to strong HCl reaction
									-74.4 85.0
									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.

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

MACTEC

GEOTECHNICAL BORING LOG

Prepared By MAK Date 6/17/09

Checked By JBZ 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	FLUID LEVEL (ft)
BORING NO.: NOW-5L	DRILL METHOD: Rotosonic	SAMPLE METHODS: Rotosonic disturbed soil core	0 HR. ND
GROUND SURFACE ELEV.: 7.6 US ft (NAVD88)	NORTHING: 234927.5 US ft (NAD83)	EASTING: 198438.4 US ft (NAD83)	24 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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
7.6					Ground Surface			
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							HYDRAULIC FILL: FAT CLAY with gravel (CH), greenish black (10Y 3/1), moist to wet, no HCl reaction
-2.5	10.0					RUN 2		10.0ft: FAT CLAY (CH), very dark greenish gray (5GY 3/1), moist to wet, little fine sand, no HCl reaction
						S-2		
-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		
-29.5	37.0							ALLUVIUM: Poorly graded SAND with clay (SP-SC), greenish gray (5GY 5/1), wet, no HCl reaction, trace glauconite
-31.5	39.0					S-5		
-32.5	40.0					RUN 5		
-33.5	41.0							ALLUVIUM: Poorly graded SAND with silt (SP-SM), greenish gray (5GY 5/1), wet, trace subrounded gravel, trace glauconite, no HCl reaction
						S-6		KIRKWOOD FORMATION: FAT CLAY (CH), dark olive gray (5Y 3/2), moist, no HCl reaction
-42.5	50.0					RUN 6		
						S-7		
-52.0	59.5							KIRKWOOD FORMATION: Clayey SAND (SC), dark gray (5Y 4/1), wet, fine sand, no HCl reaction
-52.5	60.0					RUN 7		
-54.5	62.0							KIRKWOOD FORMATION: Poorly graded GRAVEL with silt and sand (GP-GM), dark gray (5Y 4/1), wet, subrounded, no HCl reaction
						S-8		
-58.5	66.0							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
						S-9		
-62.5	70.0					RUN 8		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

MACTEC

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	FLUID LEVEL (ft)	
BORING NO.: NOW-5L	DRILL METHOD: Rotosonic	SAMPLE METHODS: Rotosonic disturbed soil core	0 HR.	ND
GROUND SURFACE ELEV.: 7.6 US ft (NAVD88)	NORTHING: 234927.5 US ft (NAD83)	EASTING: 198438.4 US ft (NAD83)	24 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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-67.3					Continued from previous page			
						S-10		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 *(continued)*
-72.5	80.0					RUN 9		80.0ft: Light yellowish brown (2.5Y6/4), moderately oxidized
						S-11		86.0ft: Greenish gray (10Y 5/1), fine sand, glauconitic, no oxidation
-82.5	90.0					RUN 10		VINCENTOWN FORMATION: Poorly graded SAND with clay (SP-SC), greenish gray (10Y 5/1), wet, fine sand, strong HCl reaction, glauconitic
						S-12		
-92.5	100.0					RUN 11		
-94.8	102.3							Boring terminated at 102.3 feet and observation well NOW-5L 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-5.

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

MACTEC

GEOTECHNICAL BORING LOG

Prepared By MM Date 6/16/09

Checked By BJ 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	FLUID LEVEL (ft)
BORING NO.: NOW-6L	DRILL METHOD: Rotosonic		SAMPLE METHODS: Rotosonic disturbed soil core	0 HR. ND
GROUND SURFACE ELEV.: 7.8 US ft (NAVD88)	NORTHING: 235287.9 US ft (NAD83)		EASTING: 198312.8 US ft (NAD83)	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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
7.8					Ground Surface			7.8 0.0
7.8	0.0					RUN 1		ARTIFICIAL FILL: FAT CLAY with gravel (CH), very dark greenish gray (5GY 3/1), moist to wet, little angular gravel and sand
						S-1		2.8 5.0 HYDRAULIC FILL: FAT CLAY (CH), very dark greenish gray (5GY 3/1), moist to wet, few organics, no HCl reaction
-2.2	10.0					RUN 2		10.0ft: Wet, little sand, trace gravel
-12.2	20.0					S-2		
						RUN 3		20.0ft: Very dark greenish gray (10Y 3/1), trace sand, trace organics
						S-3		
-22.2	30.0					RUN 4		
						S-4		
-32.2	40.0					S-5		-31.2 39.0 ALLUVIUM: poorly graded SAND with silt (SP-SM), greenish gray (10Y 5/1), wet, fine sand, little subangular to subrounded gravel, no HCl reaction
						RUN 5		-36.7 44.5 KIRKWOOD FORMATION: FAT CLAY (CH), dark olive gray (5Y 3/2), moist, trace fine sand, no HCl reaction
-42.2	50.0					S-6		
						RUN 6		
						S-7		
-52.2	60.0					RUN 7		-55.2 63.0
						S-8		-56.2 64.0 KIRKWOOD FORMATION: Clayey SAND (SC), olive gray (5Y 5/2), wet
								-59.2 67.0 KIRKWOOD FORMATION: Silty SAND (SM), olive gray (5Y 5/2), wet, fine to coarse sand, trace subrounded gravel, no HCl reaction
-62.2	70.0					S-9		VINCENTOWN FORMATION: Poorly graded SAND with clay (SP-SC), greenish gray (10Y 6/1), wet, fine sand, glauconitic, strong HCl reaction
						RUN 8		-64.2 72.0

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

GEOTECHNICAL BORING LOG

MACTEC

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	FLUID LEVEL (ft)
BORING NO.: NOW-6L	DRILL METHOD: Rotosonic		SAMPLE METHODS: Rotosonic disturbed soil core	0 HR. ND
GROUND SURFACE ELEV.: 7.8 US ft (NAVD88)		NORTHING: 235287.9 US ft (NAD83)	EASTING: 198312.8 US ft (NAD83)	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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-67.0					Continued from previous page			
						S-10		VINCENTOWN FORMATION: Poorly graded SAND with silt (SP-SM), strong brown (7.5YR 4/6), wet, fine to medium sand, strong HCl reaction, glauconitic, strongly oxidized *(continued)*
-72.2	80.0					RUN 9		80.0ft: Greenish gray (10Y 6/1), no oxidation
						S-11		
-82.2	90.0					RUN 10		
-84.5	92.3							Boring terminated at 92.3 feet and observation well NOW-6L 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-6.

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

MACTEC

GEOTECHNICAL BORING LOG

Prepared By NR Date 6/16/09

Checked By JAJ Date 6/17/09

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 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 S-1			ARTIFICIAL FILL: FAT CLAY with gravel and sand (CH), very pale brown (10YR 7/3)
									4.1 — 2.0 HYDRAULIC FILL: FAT CLAY (CH), very dark greenish gray (10Y 3/1), wet, few organics, trace gravel and sand, no HCl reaction
-3.9	10.0					RUN 2 S-2			
-13.9	20.0					RUN 3 S-3			-13.9 — 20.0 ALLUVIUM: Clayey SAND (SC), dark greenish gray (10Y 4/1), wet, few shell fragments, little angular gravel
									-16.9 — 23.0 ALLUVIUM: FAT CLAY (CH), very dark greenish gray (10Y 3/1), wet, few fine sand, no HCl reaction
-23.9	30.0					S-4 RUN 4 S-5			-22.9 — 29.0 ALLUVIUM: Clayey SAND (SC), dark greenish gray (10Y 4/1), wet, trace angular gravel, no HCl reaction
									-26.4 — 32.5 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 S-6			-33.9 — 40.0 VINCENTOWN FORMATION: Clayey SAND (SC), yellowish brown (10YR 5/6), wet, fine sand, strong HCl reaction, strongly oxidized
-43.9	50.0					RUN 6 S-7			-42.4 — 48.5 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 S-8 S-9			-57.4 — 63.5 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			-65.4 — 71.5

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

GEOTECHNICAL BORING LOG

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-68.7					Continued from previous page			
						S-10		VINCENTOWN FORMATION: Clayey SAND (SC), greenish gray (10Y 6/1), wet, trace moderately indurated layers, glauconitic, strong HCl reaction, no oxidation *(continued)*
-73.9	80.0					RUN 9		-74.4 80.5
						S-11		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					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.

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

MACTEC

GEOTECHNICAL BORING LOG

Prepared By MM Date 6/16/09

Checked By JAJ 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	FLUID LEVEL (ft)
BORING NO.: EOW-2L	DRILL METHOD: Rotosonic		SAMPLE METHODS: Rotosonic disturbed soil core	0 HR. ND
GROUND SURFACE ELEV.: 13.9 US ft (NAVD88)		NORTHING: 233271.5 US ft (NAD83)	EASTING: 202177.7 US ft (NAD83)	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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
13.9					Ground Surface			13.9 0.0
13.9	0.0					RUN 1		ARTIFICIAL FILL: SILT with sand (ML), very dark grayish brown (2.5Y 3/2), moist, trace rounded gravel
								11.4 2.5
						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
6.9	7.0					RUN 2		
								1.6 12.3
						S-2		HYDRAULIC FILL: FAT CLAY (CH), dark greenish gray (10Y 3/1), moist, no HCl reaction, trace to few organics, few fine sand partings
-3.1	17.0					RUN 3		
						S-3		
-13.1	27.0					RUN 4		27.0ft: Greenish black (5GY 2.5/1)
						S-4		
-23.1	37.0					RUN 5		-25.1 39.0
						S-5		ALLUVIUM: Well graded SAND (SW), light brownish gray (10YR 6/2), wet, few fine gravel
-33.1	47.0					RUN 6		-33.1 47.0
						S-6		-34.1 48.0 ALLUVIUM: Silty SAND (SM), dark gray (10YR 4/1), wet, fine to medium sand
								ALLUVIUM: FAT CLAY (CH), very dark gray (10YR 3/1), moist, no HCl reaction
-43.1	57.0					RUN 7		-41.1 55.0
						S-7		KIRKWOOD FORMATION: FAT CLAY (CH), very dark grayish brown (2.5Y 3/2), moist, few to little shell fragments, no HCl reaction
-53.1	67.0					RUN 8		
						S-8		67.0ft: Very dark gray (2.5Y 3/1) mottled with light yellowish brown (10YR 6/4), trace shell fragments

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

GEOTECHNICAL BORING LOG

MACTEC

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	FLUID LEVEL (ft)
BORING NO.: EOW-2L	DRILL METHOD: Rotosonic		SAMPLE METHODS: Rotosonic disturbed soil core	0 HR. ND
GROUND SURFACE ELEV.: 13.9 US ft (NAVD88)	NORTHING: 233271.5 US ft (NAD83)		EASTING: 202177.7 US ft (NAD83)	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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	▼	LOG	SOIL AND ROCK DESCRIPTION
-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 *(continued)* 77.0ft: Very dark gray (5Y 3/1) mottled with light yellowish brown (10YR 6/4)
						S-9			
-73.1	87.0					RUN 10			87.0ft: Dark olive gray (5Y 3/2)
						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
						S-12			-87.6 (101.5) VINCENTOWN FORMATION: Poorly graded SAND (SP), greenish gray (10Y 5/1), wet, strong HCl reaction, few indurated layers, fine to medium sand, trace glauconite
									-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.

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

MACTEC

GEOTECHNICAL BORING LOG

Prepared By NM Date 6/17/09

Checked By JDJ 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	FLUID LEVEL (ft)
BORING NO.: EOW-6L	DRILL METHOD: Mud Rotary with Rever	SAMPLE METHODS: SPT	0 HR. ND
GROUND SURFACE ELEV.: 13.3 US ft (NAVD88)	NORTHING: 232588.1 US ft (NAD83)	EASTING: 203300.7 US ft (NAD83)	24 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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION
13.3					Ground Surface			13.3 0.0
								Drill without sampling to 19.6 feet, set 4" casing to 9.3 feet. Boring advanced with a 4" drag bit during sampling, then reamed with a 6" drag bit for observation well installation.
-6.4	19.6	1	WOH	1	1	SS-1		-6.4 19.6 HYDRAULIC FILL: Sandy SILT (ML), very dark greenish gray (10Y 3/1), very soft, moist to wet, little sand, trace organics
-11.4	24.6	WOH	WOH	WOH	0 WOH	SS-2		24.6ft: SILT (ML), soft, few sand
-14.8	28.0							HYDRAULIC FILL: FAT CLAY (CH), very dark greenish gray (10Y 3/1), very soft, moist, trace fine sand
-16.4	29.6	WOH	WOH	WOH	0 WOH	SS-3		
-19.8	33.0							ALLUVIUM: Well graded SAND (SW), very dark gray (10YR 3/1), loose, wet, fine to coarse sand, trace angular gravel
-21.4	34.6	4	4	6	10	SS-4		
-24.8	38.0							ALLUVIUM: LEAN CLAY (CL), light gray (10YR 7/1) mottled very pale brown (10YR 7/4), soft, moist
-26.4	39.6	3	7	5	12	SS-5		
-29.8	43.0							ALLUVIUM: Silty SAND (SM), gray (10YR 6/1), loose, moist to wet, fine sand
-31.4	44.6	4	2	4	6	SS-6		
-35.3	48.5							ALLUVIUM: Well graded SAND with gravel (SW), light olive gray (5Y 6/2), dense, wet, little sub-angular to rounded gravel
-36.4	49.6	12	14	17	31	SS-7		
-39.8	53.0							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
-41.3	54.5	10	5	16	21	SS-8		-42.8 56.0 Drill without sampling to 84.5 feet. Continue SPT's at 84.5 feet

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

GEOTECHNICAL BORING LOG

MACTEC

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	FLUID LEVEL (ft)
BORING NO.: EOW-6L	DRILL METHOD: Mud Rotary with Reve		SAMPLE METHODS: SPT	0 HR. ND
GROUND SURFACE ELEV.: 13.3 US ft (NAVD88)	NORTHING: 232588.1 US ft (NAD83)		EASTING: 203300.7 US ft (NAD83)	24 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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-61.6					Continued from previous page			
								Drill without sampling to 84.5 feet. Continue SPT's at 84.5 feet *(continued)*
-71.3	84.5							-71.3 84.5
		18	13	15	28	SS-9		VINCENTOWN FORMATION: Poorly graded SAND with silt (SP-SM), very pale brown (10YR 7/2), mottled yellow (10YR 7/6), dense, moist, fine to medium sand, trace shell fragments, weak HCl reaction, weakly oxidized
-74.8	88.0							
-76.3	89.5	20	13	15	28	SS-10		VINCENTOWN FORMATION: Silty SAND (SM), greenish gray (5GY 6/1), medium dense, moist, fine to coarse sand, few shell fragments, trace friable layers, weak to strong HCl reaction, no oxidation
-81.3	94.5	14	8	11	19	SS-11		94.5ft: Moist to wet, fine to medium sand, trace shell fragments, trace rounded gravel, weak HCl reaction
-86.3	99.5	40	16	14	30	SS-12		99.5ft: Greenish gray (5GY 6/1), to dark greenish gray (5GY 4/1), very dense, glauconitic
-88.8	102.0							Boring terminated at 102.0 feet and observation well EOW-6L 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-6.

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

MACTEC

GEOTECHNICAL BORING LOG

Prepared By NAM Date 6/16/09

Checked By JRJ Date 6/17/09

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 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					RUN 1		ARTIFICIAL FILL: Poorly graded SAND with silt (SP-SM), brown (7.5YR 4/3), moist, trace gravel
11.9	3.5					S-1		HYDRAULIC FILL: FAT CLAY (CH), black (5Y 2.5/1), moist, trace organics, trace to few fine sand partings, no HCl reaction
8.4	7.0					RUN 2		
						S-2		
-1.6	17.0					RUN 3		
						S-3		HYDRAULIC FILL: Silty SAND (SM), black (5Y 2.5/1), wet, no HCl reaction
-4.6	20.0							HYDRAULIC FILL: FAT CLAY (CH), black (5Y 2.5/1), moist, trace organics, few fine sand partings
						S-4		
-11.6	27.0					RUN 4		
-15.9	31.3					S-5		
-17.6	33.0							ALLUVIUM: Poorly graded SAND (SP), gray (5Y 6/1), wet, no HCl reaction
-19.9	35.3							ALLUVIUM: FAT CLAY (CH), black (5Y 2.5/1), moist, little organics, no HCl reaction
-21.6	37.0					S-6 S-7		ALLUVIUM: PEAT (PT), dark reddish brown (5YR 3/2), most, mostly organics, grades into SILT (ML), gray (N 5/), no HCl reaction
						RUN 5		
						S-8		ALLUVIUM: Silty SAND (SM), greenish gray (10Y 5/1), moist, fine sand, trace to little gravel (increases with depth)
-26.6	42.0					S-9		KIRKWOOD FORMATION: SILT (ML), brown (10YR 4/3), moist, no HCl reaction
-31.6	47.0					RUN 6		47.0ft: Dark yellowish brown (10YR 4/4), moist to wet, few to little fine to coarse sand
						S-10		
-40.6	56.0					RUN 7		VINCENTOWN FORMATION: Silty SAND (SM), reddish brown (5YR 4/4), wet, fine sand, no HCl reaction, strongly oxidized
-41.6	57.0							57.0ft: Strong brown (7.5YR 5/6), no to strong HCl reaction, trace friable layers
						S-11		
-51.6	67.0					RUN 8		
-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-12		

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

GEOTECHNICAL BORING LOG

MACTEC

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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	▼	LOG	SOIL AND ROCK DESCRIPTION
-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)*
-63.6	79.0								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.

PSEG ESP BORE_PSEG ESP_6-15-09.GPJ PSEG ESP.GDT 6/16/09

MACTEC

GEOTECHNICAL BORING LOG

Prepared By NRL Date 6/16/09

Checked By JAL Date 4/17/09

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	FLUID LEVEL (ft)
BORING NO.: EOW-9L	DRILL METHOD: Rotosonic	SAMPLE METHODS: Rotosonic disturbed soil core	0 HR. ND
GROUND SURFACE ELEV.: 17.9 US ft (NAVD88)	NORTHING: 230925.6 US ft (NAD83)	EASTING: 202844.6 US ft (NAD83)	24 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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
17.9					Ground Surface			17.9 0.0
17.9	0.0					RUN 1 S-1		ARTIFICIAL FILL: Poorly graded SAND with silt (SP-SM), strong brown (7.5YR 4/6), to dark gray (2.5Y 3/1), moist to wet, fine sand, no HCl reaction, trace organics
10.9	7.0					RUN 2 S-2		10.9 7.0 HYDRAULIC FILL: Silty SAND (SM), very dark greenish gray (10Y 3/1), wet, fine sand
								7.4 10.5 HYDRAULIC FILL: Sandy SILT (ML), very dark gray (N 3/), moist, trace fine gravel
						S-3		5.9 12.0 HYDRAULIC FILL: Poorly graded SAND with silt (SP-SM), very dark greenish gray (10Y 3/1), wet 3.4 14.5 HYDRAULIC FILL: Silty SAND (SM), very dark greenish gray (10Y 3/1), wet
0.9	17.0					RUN 3		0.9 17.0 HYDRAULIC FILL: Poorly graded SAND (SP), very dark greenish gray (10Y 3/1), wet -1.1 19.0 HYDRAULIC FILL: LEAN CLAY (CL), very dark greenish gray (10Y 3/1), wet
						S-4		-7.1 25.0 HYDRAULIC FILL: Silty SAND (SM), very dark greenish gray (10Y 3/1), wet, fine sand, no HCl reaction
-9.1	27.0					RUN 4		-9.1 27.0 HYDRAULIC FILL: ELASTIC SILT (MH), greenish black (10Y 2.5/1), moist, trace fine sand, trace organics, no HCl reaction
						S-5		
-19.1	37.0					RUN 5		
						S-6		-23.6 41.5 -24.1 42.0 ALLUVIUM: Poorly graded SAND (SP), very dark gray (2.5Y 3/1), wet, trace fines ALLUVIUM: PEAT (PT), reddish black (2.5YR 2.5/1), dry to moist, trace to little fines, mostly organics
						S-7		
-29.1	47.0					RUN 6 S-8		-29.9 47.8 ALLUVIUM: Clayey SAND (SC), dark gray (2.5Y 4/1), moist, trace glauconite
						S-9		-32.6 50.5 ALLUVIUM: Well graded SAND with gravel (SW), gray (2.5Y 5/1), wet, little rounded gravel, trace fines
								-36.6 54.5 ALLUVIUM: Poorly graded SAND with silt (SP-SM), dark gray (10YR 4/1), to dark gray (N 4/), moist to wet, trace organics
-39.1	57.0					RUN 7 S-10		
								-43.6 61.5 KIRKWOOD FORMATION: SILT (ML), very dark greenish gray (10Y 3/1), moist, trace organics
-49.1	67.0					S-11 RUN 8		
								-53.1 71.0 KIRKWOOD FORMATION: FAT CLAY (CH), very dark greenish gray (10Y 3/1), moist, little shell fragments, no HCl reaction, trace fine sand, trace organics

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

MACTEC

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	FLUID LEVEL (ft)
BORING NO.: EOW-9L	DRILL METHOD: Rotosonic	SAMPLE METHODS: Rotosonic disturbed soil core	0 HR. ND
GROUND SURFACE ELEV.: 17.9 US ft (NAVD88)	NORTHING: 230925.6 US ft (NAD83)	EASTING: 202844.6 US ft (NAD83)	24 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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-56.9					Continued from previous page			
-59.1	77.0					S-12 RUN 9 S-13		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
-69.1	87.0					RUN 10 S-14		87.0ft: Sand increasing
-71.6	89.5							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)
-84.1	102.0					S-15 S-16		KIRKWOOD FORMATION: FAT CLAY (CH), very dark gray (5Y 3/1), moist, few organics
-87.1	105.0					RUN 12 S-17		VINCENTOWN 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
-89.1	107.0							
-99.1	117.0					RUN 13 S-18		VINCENTOWN FORMATION: Silty SAND (SM), greenish gray (10Y 5/1), to olive gray (5Y 5/1), wet, weak HCl reaction, few indurated layers
-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

MACTEC

GEOTECHNICAL BORING LOG

Prepared By NAM Date 6/16/09

Checked By [illegible] Date 6/17/09

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	FLUID LEVEL (ft)
BORING NO.: EOW-10L	DRILL METHOD: Rotosonic	SAMPLE METHODS: Rotosonic disturbed soil core	0 HR. ND
GROUND SURFACE ELEV.: 11.7 US ft (NAVD88)	NORTHING: 231706.7 US ft (NAD83)	EASTING: 203521.9 US ft (NAD83)	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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
11.7					Ground Surface			
11.7	0.0					RUN 1		ARTIFICIAL FILL: SILT with sand and gravel (ML), dark reddish brown (5YR 3/4), dry
6.7	5.0					S-1		HYDRAULIC FILL: FAT CLAY (CH), black (5Y 2/5), wet, trace sand and gravel
4.7	7.0					RUN2		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
-15.3	27.0					S-3		
						RUN 4		
-17.3	29.0					S-4		ALLUVIUM: Poorly graded SAND (SP), yellowish brown (10YR 5/4), to grayish brown (2.5Y 5/2), wet, trace fines, trace rounded gravel
-22.3	34.0							
-23.3	35.0					S-5		ALLUVIUM: Sandy SILT (SM), light olive brown (2.5Y 5/3), wet, trace gravel
-25.3	37.0							KIRKWOOD FORMATION: FAT CLAY (CH), black (2.5Y 2.5/1), moist, trace organics
						RUN 5		KIRKWOOD FORMATION: SILT (ML), greenish black (10Y 2.5/1), moist, trace fine sand, trace organics, no HCl reaction
-35.3	47.0					S-6		
						RUN 6		
-36.8	48.5					S-7		KIRKWOOD FORMATION: Poorly graded SAND (SP), very dark greenish gray (10Y 3/1), wet, trace fines, trace rounded gravel, no HCl reaction
-39.6	51.3							VINCENTOWN FORMATION: Poorly graded SAND with silt (SP-SM), greenish gray (10Y 6/1), wet, trace gravel, strong HCl reaction, trace friable layers
-45.3	57.0					S-8		
						RUN 7		57.0ft: Moist to wet, few moderately indurated layers
-55.3	67.0					S-9		
						RUN 8		
						S-10		

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

GEOTECHNICAL BORING LOG

MACTEC

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	FLUID LEVEL (ft)
BORING NO.: EOW-10L	DRILL METHOD: Rotosonic	SAMPLE METHODS: Rotosonic disturbed soil core	0 HR. ND
GROUND SURFACE ELEV.: 11.7 US ft (NAVD88)	NORTHING: 231706.7 US ft (NAD83)	EASTING: 203521.9 US ft (NAD83)	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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
-63.1					Continued from previous page			
-65.3	77.0					RUN 9 S-11		VINCENTOWN FORMATION: Poorly graded SAND with silt (SP-SM), greenish gray (10Y 6/1), wet, trace gravel, strong HCl reaction, trace friable layers *(continued)* 77.0ft: Pale olive yellow (5Y 6/3)
-75.3	87.0					RUN 10 S-12		
-85.3	97.0							Boring terminated at 97.0 feet and observation well EOW-10L 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