Appendix B

Geotechnical Analytical Results

AMERICAN GEOTECH, INC.
Engineers, Consultants, and Material Testing Laboratories

Particle Size Analysis of Soils

(In accordance with ASTM D 422)

Client:	Tim Silar	Boring Number:	
Project:		Sample Number:	1
Location:		Sample Depth:	
AGI Project No.:	G-07-42	Date(s) Tested:	8/8/2007

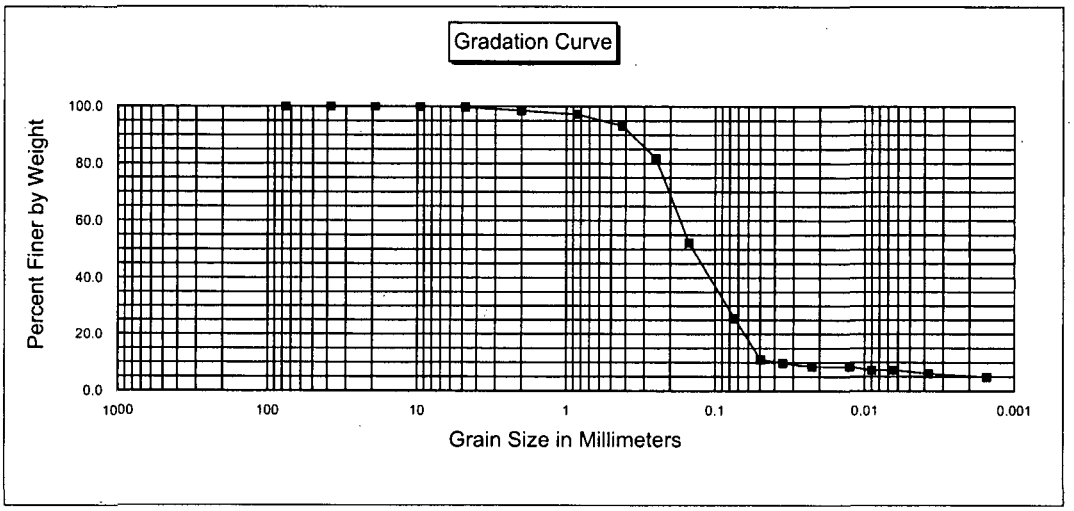
TEST DATA - SIEVE ANALYSIS:

Sieve Opening Inches	Sieve Opening Millimeter	U.S. Standard Sieve Size or Number	Weight Retained on Sieve	Cumulative Weight Retained	Cumulative Percent Retained	Percent Finer by Weight	Total Weight of Sieve + Soil	Sieve Weight
3.00	76	3"	0.0	0.0	0.0	100.0		
1.50	38	1 1/2"	0.0	0.0	0.0	100.0		
0.75	19	3/4"	0.0	0.0	0.0	100.0		
0.375	10	3/8"	0.0	0.0	0.0	100.0	535.8	535.8
0.187	5	No. 4	0.2	0.2	0.2	99.8	504.1	503.9
0.079	2	No. 10	1.0	1.2	1.5	98.5	471.2	470.2
0.033	1	No.20	1.1	2.3	2.8	97.2	429.4	428.3
0.0165	0	No.40	3.2	5.5	6.8	93.2	358.5	355.3
0.0098	0	No. 60	9.3	14.8	18.2	81.8	352.2	342.9
0.0059	0.149	No. 100	24.1	38.9	47.8	52.2	359.4	335.3
0.0029	0.074	No. 200	21.6	60.5	74.4	25.6	316.2	294.6
			3.9				380.0	376.1
		Pan	16.9					
Total Sample Weight in Grams			81.3					

TEST DATA - HYDROMETER ANALYSIS:

Graduate Number:	1	Composite Correction:	5
Hydrometer Number:	152H	Specific Gravity	2.702
Dispersing Agent / Quantity:	5 mg	Specific Gravity Correction (a)	0.99
Total Sample Weight for Hydrometer Analysis	16.9		

Elapsed Time (min)	Temperature (deg. C)	Temperature Correction (K)	Hydrometer Reading (R')	Corrected Reading (R)	Effective Depth (L, cm)	Percent Finer Partial	Percent Finer Total	Particle Diameter (mm)
1	25	0.01286	14.0	9.0	14.8	52.7	11.0	0.049
2	25	0.01286	13.0	8.0	15.0	46.9	9.7	0.035
5	25	0.01286	12.0	7.0	15.2	41.0	8.5	0.022
15	25	0.01286	12.0	7.0	14.3	41.0	8.5	0.013
30	25	0.01286	11.0	6.0	14.6	35.1	7.3	0.009
60	24	0.01301	11.0	6.0	14.7	35.1	7.3	0.006
175	25	0.01286	10.0	5.0	15.0	29.3	6.1	0.004
1075	25	0.01286	9.0	4.0	15.2	23.4	4.9	0.002



Technician:	sh	Date:	8/8/2007
Reviewed By:	KC	Date:	8/13/07

AMERICAN GEOTECH, INC.
Civil/Geotechnical/Environmental/Hydrogeological/Structural Engineering
Geophysical and Materials Testing
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Branch Office: 209 Main Street, Woodbridge, NJ 07095; Tel.: (732) 750-1668
E-mail: AGIMAIL@americangeotech.com

MOISTURE CONTENT

(in accordance with ASTM D 2216)

CLIENT	JOB NO.	DATE:
Tim Silar	**G-07-42**	**8/8/2007**
PROJECT	LOCATION	

SAMPLE NUMBER	SAMPLE ID	WEIGHT OF DISH + WET SAMPLE (g)	WEIGHT OF DISH + DRY SAMPLE (g)	WATER LOSS (g)	DISH WEIGHT (g)	DRY SAMPLE WEIGHT (g)	**MOISTURE CONTENT** (%)
1		184.5	160.7	23.80	51.3	109.40	**21.76**
2		199.30	175.00	24.30	51.40	123.60	**19.66**

REMARKS:

TECHNICIAN: sh DATE: 8/8/2007
REVIEWED BY: KC DATE: 8/16/2007

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E-mail: AGIMAIL89@aol.com

ORGANIC CONTENT

CLIENT	JOB NO.	DATE:
Tim Silar	**G-07-42**	**8/7/2007**
PROJECT	LOCATION	

NUMBER	WEIGHT OF DISH + DRY SAMPLE (g)	WEIGHT OF DISH + BURNT SAMPLE (g)	ORGANIC LOSS (g)	DISH WEIGHT (g)	BURNT SAMPLE WEIGHT (g)	**ORGANIC CONTENT (%)**
1	160.7	159.9	0.80	51.3	108.60	**0.74**
2	175.0	173.8	1.20	51.40	122.40	**0.98**

REMARKS:

TECHNICIAN: sh DATE: 8/7/2007
REVIEWED BY: KC DATE: 8/16/2007

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FALLING HEAD PERMEABILITY

(In accordance with EM 1110-2-1906, COE)

SAMPLE DATA: #1

Specific Gravity	2.702		Diameter	7.13	cm
Weight of Wet Soils	0.50	lbs.	Area (A)	39.93	sq. cm
Wet Density	140.5	pcf	Initial Height	2.54	cm
Dry Density	115.2	pcf	Initial Volume	101.42	cc
Maximum Dry Density		pcf		0.0036	cu. ft.
Percent Compaction	-	%	Initial Moisture Content	21.98	%
Moisture Content at Saturation	22.5	%	Initial Void Ratio:	0.58	
Standpipe Diameter	1.00	cm	**Porosity:**	**0.367**	**or (36.7%)**
Standpipe Area	0.785	cm			

TEST DATA:

TEST NO.	1	2	3
Head loss across specimen at start, cm	29.125	28.9375	28.75
Head loss across specimen at finish, cm	28.9375	28.75	28.675
Elapsed time (t) in seconds	3600	3600	3600
Water temperature in degrees Celsius	25	25	25
Viscosity correction factor (RT)	1.04	1.04	1.04
Coefficient of Permeability or Hydraulic Conductivity (k) in cm/sec	9.32E-08	9.38E-08	3.77E-08

AVERAGE k, CM/SEC = 6.55E-08 (k = 2.303 a L (log ho/hf) RT / (A t))

REMARKS: Cylinder A = 411.2 g
1" sample = 229.7 g

TECHNICIAN SH DATE: 8/9/2007
CHECKED BY : KC DATE : 8/16/2007

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FALLING HEAD PERMEABILITY

(In accordance with EM 1110-2-1906, COE)

SAMPLE DATA: #2

Specific Gravity	2.642		Diameter	7.13	cm
Weight of Wet Soils	0.56	lbs.	Area (A)	39.93	sq. cm
Wet Density	155.8	pcf	Initial Height	2.54	cm
Dry Density	126.7	pcf	Initial Volume	101.42	cc
Maximum Dry Density		pcf		0.0036	cu. ft.
Percent Compaction	-	%	Initial Moisture Content	22.99	%
Moisture Content at Saturation	23.5		Initial Void Ratio:	0.59	
Standpipe Diameter	1.00	cm	**Porosity:**	**0.373**	**or (37.3%)**
Standpipe Area	0.785	cm			

TEST DATA:

TEST NO.	1	2	3
Head loss across specimen at start, cm	29	29	29
Head loss across specimen at finish, cm	28.5625	28.5	28.5
Elapsed time (t) in seconds	3600	3600	3600
Water temperature in degrees Celsius	25	25	25
Viscosity correction factor (RT)	1.04	1.04	1.04
Coefficient of Permeability or			
Hydraulic Conductivity (k) in cm/sec	2.19E-07	2.51E-07	2.51E-07

AVERAGE k, CM/SEC = **2.35E-07** (k = 2.303 a L (log ho/hf) RT / (A t))

REMARKS: Cylinder A = 411.2
1" sample = 253.5

TECHNICIAN SH DATE: 8/9/2007
CHECKED BY : KC DATE : 8/16/2007

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SPECIFIC GRAVITY OF SOILS AND COARSE AGGREGATE

(In Accordance with ASTM D 854 and/or C 127)

Client: Tim Silar
Project:
Location:
AGI Project No.: **G-07-42**

SAMPLE INFORMATION:

Sample I.D.	Boring Number	Sample Number	Sample Depth	Max. Particle Size (mm)	Percent > 4.75 mm	Sample Description

TEST DATA:

Sample I.D.	1	2			
Test Method	D 854	D 854			
Container Number	F	B			
Container Volume, mL					
Temperature of Water and Sample (deg. C)	26.0	26.0			
Dish Number	110	110			
Weight of Dish + Dry Soil (g)	94.50	96.30			
Weight of Dish (g)	32.00	32.00			
Weight of Dry Soil, Ws (g)	62.50	64.30			
Weight of Container and Water, Wbw (g)	681.50	679.80			
Ws + Wbw	744.00	744.10			
Weight of Container, Water, and Immersed Soil (g) Wbws	720.90	719.80			
Weight of Displaced Water (g)	23.10	24.30			
Correction Factor	0.9986	0.9986			
SPECIFIC GRAVITY OF SOLIDS <4.75 mm	2.702	2.642			
APPARENT SPECIFIC GRAVITY OF SOLIDS >4.75 mm					
WEIGHTED AVERAGE SPECIFIC GRAVITY					
Date(s) Tested	8/7/07	8/7/07			
Technician	sh	sh			

REMARKS:

Reviewed By: KC
Date: 8/16/2007

AMERICAN GEOTECH, INC.
Engineers, Consultants, and Material Testing Laboratories

Particle Size Analysis of Soils

(In accordance with ASTM D 422)

Client:	**Tim Silar**	Boring Number:	
Project:		Sample Number:	**2**
Location:		Sample Depth:	
AGI Project No.:	**G-07-42**	Date(s) Tested:	**8/8/2007**

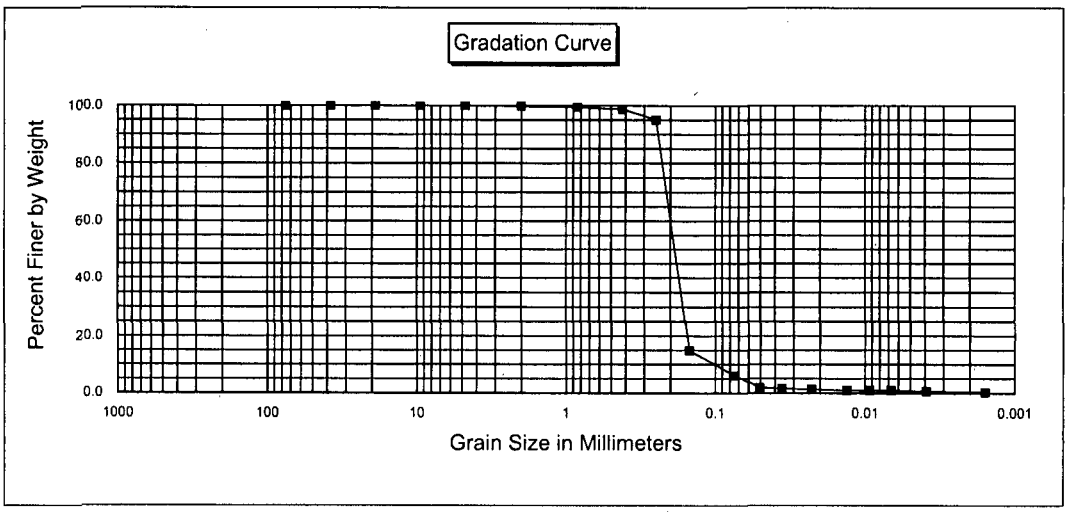
TEST DATA - SIEVE ANALYSIS:

Sieve Opening Inches	Sieve Opening Millimeter	U.S. Standard Sieve Size or Number	Weight Retained on Sieve	Cumulative Weight Retained	Cumulative Percent Retained	Percent Finer by Weight	Total Weight of Sieve + Soil	Sieve Weight
3.00	76	3"	0.0	0.0	0.0	100.0		
1.50	38	1 1/2"	0.0	0.0	0.0	100.0		
0.75	19	3/4"	0.0	0.0	0.0	100.0		
0.375	10	3/8"	0.0	0.0	0.0	100.0	535.8	535.8
0.187	5	No. 4	0.0	0.0	0.0	100.0	503.9	503.9
0.079	2	No. 10	0.6	0.6	0.2	99.8	470.8	470.2
0.033	1	No.20	0.8	1.4	0.6	99.4	429.1	428.3
0.0165	0	No.40	1.8	3.2	1.3	98.7	357.1	355.3
0.0098	0	No. 60	9.3	12.5	4.9	95.1	352.2	342.9
0.0059	0.149	No. 100	203.5	216.0	85.1	14.9	538.8	335.3
0.0029	0.074	No. 200	22.2	238.2	93.9	6.1	316.8	294.6
			2.6				378.7	376.1
		Pan	12.9					
Total Sample Weight in Grams			253.7					

TEST DATA - HYDROMETER ANALYSIS:

Graduate Number:	1	Composite Correction:	5
Hydrometer Number:	152H	Specific Gravity	2.642
Dispersing Agent / Quantity:	5 mg	Specific Gravity Correction (a)	1.00
Total Sample Weight for Hydrometer Analysis	16.9		

Elapsed Time (min)	Temperature (deg. C)	Temperature Correction (K)	Hydrometer Reading (R')	Corrected Reading (R)	Effective Depth (L, cm)	Percent Finer Partial	Percent Finer Total	Particle Diameter (mm)
1	25	0.01286	11.0	6.0	15.3	35.5	1.8	0.050
2	25	0.01286	10.0	5.0	15.5	29.6	1.5	0.036
5	25	0.01286	9.0	4.0	15.6	23.7	1.2	0.023
15	25	0.01286	8.0	3.0	15.8	17.8	0.9	0.013
30	25	0.01286	8.0	3.0	15.8	17.8	0.9	0.009
60	24	0.01301	8.0	3.0	15.8	17.8	0.9	0.007
175	25	0.01286	7.0	2.0	16.0	11.8	0.6	0.004
1075	25	0.01286	6.0	1.0	16.1	5.9	0.3	0.002



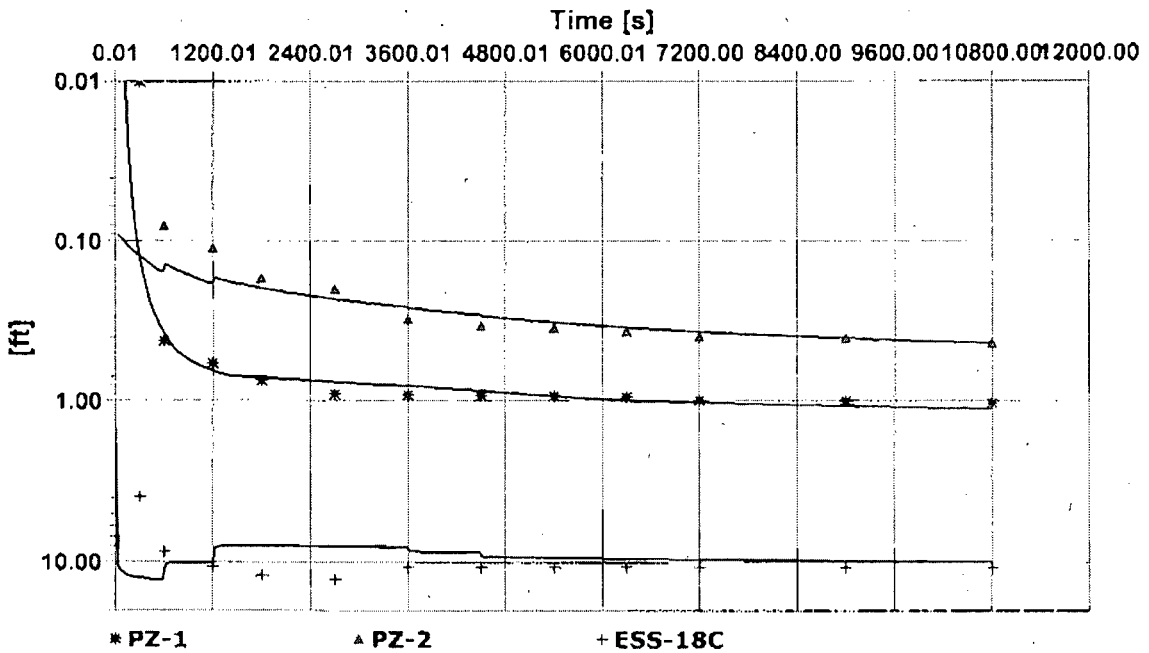
Technician: sh Date: 8/8/2007
Reviewed By: KC Date: 8/13/07

Appendix C

Pump Test Results

Silar Services, Inc. 983 Butler Pike Blue Bell, Pennsylvania	Pumping Test Analysis Report
	Project: Brunswick SDSP
	Number:
	Client: Progress Energy

Location: Southport, NC	Pumping Test: Pumping Test - ESS-18C	Pumping well. ESS-18C
Test conducted by: B Sladky		Test date: 8/8/2007
Analysis performed by: B. Sladky	Neuman 2	Date. 2/22/2008
Aquifer Thickness: 25 00 ft	Discharge: variable, average rate 0.43233 [U S gal/min]	



Calculation after Neuman

Observation well	Transmissivity [ft²/d]	K [ft/d]	Specific Yield	Ratio K(v)/K(h)	Ratio Sy/S	Radial distance to PW [ft]
PZ-1	8.06×10^{0}	3.22×10^{-1}	1.56×10^{-2}	1.00×10^{0}	1.00×10^{1}	10.0
PZ-2	3.75×10^{1}	1.50×10^{0}	1.45×10^{-3}	1.00×10^{0}	7.20×10^{3}	25.0
ESS-18C	8.23×10^{0}	3.29×10^{-1}	1.23×10^{-3}	1.00×10^{0}	1.00×10^{1}	0.08
Average	1.79×10^{1}	7.17×10^{-1}	6.09×10^{-3}	1.00×10^{0}	2.41×10^{3}	

Silar Services, Inc. 983 Butler Pike Blue Bell, Pennsylvania	Pumping Test - Water Level Data	Page 1 of 1
	Project: Brunswick SDSP	
	Number:	
	Client: Progress Energy	

Location: Southport, NC	Pumping Test Pumping Test - ESS-18C	Pumping well. ESS-18C
Test conducted by: B Sladky	Test date: 8/8/2007	Discharge: variable, average rate 0.43233 [U.S gal/min]
Observation well: ESS-18C	Static water level [ft] 0 00	Radial distance to PW [ft]

	Time [s]	Water Level [ft]	Drawdown [ft]
1	0	0.00	0 00
2	300	3.92	3 92
3	600	8.59	8 59
4	1200	10 63	10.63
5	1800	12.01	12.01
6	2700	12.84	12 84
7	3600	10.73	10.73
8	4500	10.74	10.74
9	5400	10 74	10.74
10	6300	10.74	10.74
11	7200	10 74	10 74
12	9000	10.74	10.74
13	10800	10 74	10.74

Silar Services, Inc.
983 Butler Pike
Blue Bell, Pennsylvania

Pumping Test - Water Level Data	Page 1 of 1
Project: Brunswick SDSP	
Number:	
Client: Progress Energy	

Location: Southport, NC	Pumping Test: Pumping Test - ESS-18C	Pumping well: ESS-18C
Test conducted by: B Sladky	Test date: 8/8/2007	Discharge: variable, average rate 0.43233 [U.S gal/min]
Observation well: PZ-2	Static water level [ft]. 0 00	Radial distance to PW [ft]: 25

	Time [s]	Water Level [ft]	Drawdown [ft]
1	0	0.00	0 00
2	300	0.00	0 00
3	600	0.08	0.08
4	1200	0.11	0.11
5	1800	0 17	0 17
6	2700	0.20	0.20
7	3600	0.31	0 31
8	4500	0.34	0 34
9	5400	0.35	0.35
10	6300	0.37	0 37
11	7200	0 40	0 40
12	9000	0.41	0.41
13	10800	0.44	0.44

Silar Services, Inc.
983 Butler Pike
Blue Bell, Pennsylvania

Pumping Test - Water Level Data	Page 1 of 1
Project: Brunswick SDSP	
Number:	
Client: Progress Energy	

Location: Southport, NC	Pumping Test: Pumping Test - ESS-18C	Pumping well: ESS-18C
Test conducted by. B Sladky	Test date: 8/8/2007	Discharge: variable, average rate 0.43233 [U.S gal/min]
Observation well. PZ-1	Static water level [ft]: 0.00	Radial distance to PW [ft]: 10

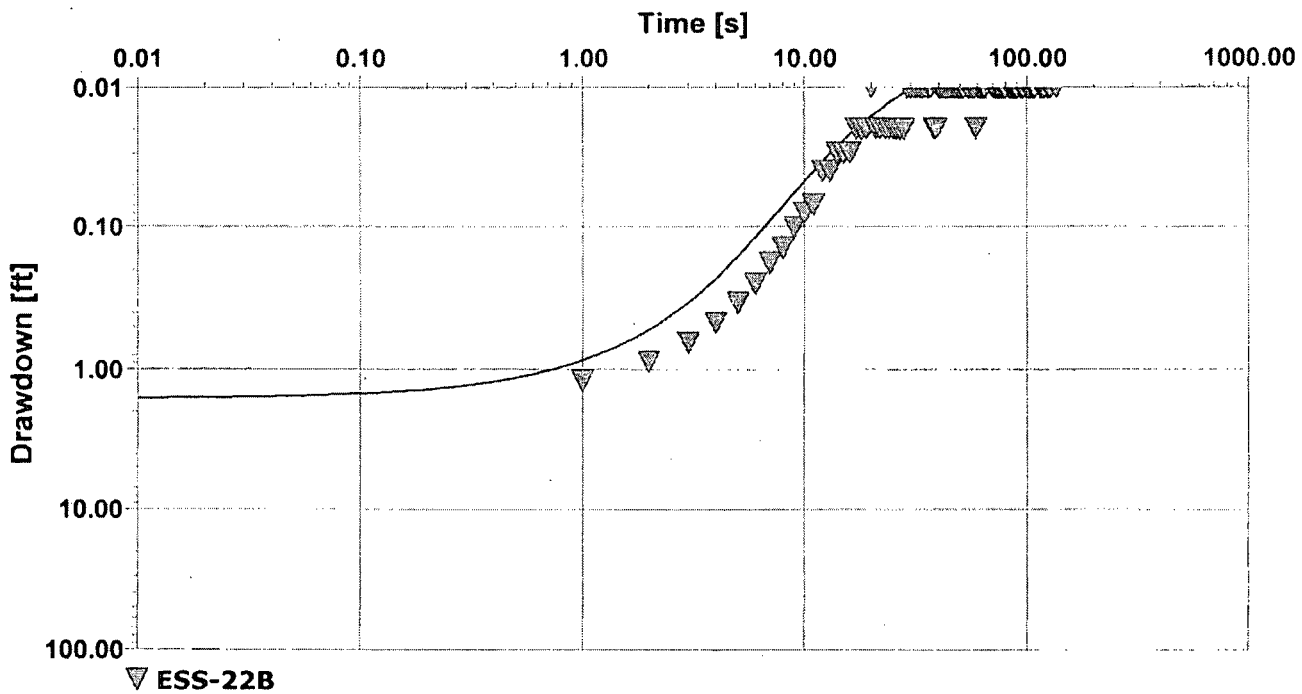
	Time [s]	Water Level [ft]	Drawdown [ft]
1	0	0.00	0 00
2	300	0 01	0.01
3	600	0.42	0.42
4	1200	0.58	0.58
5	1800	0 74	0 74
6	2700	0.91	0.91
7	3600	0.92	0.92
8	4500	0.93	0 93
9	5400	0.94	0.94
10	6300	0.95	0.95
11	7200	1.00	1 00
12	9000	1.01	1 01
13	10800	1 04	1 04

Appendix D

Slug Test Results

Silar Services, Inc. 983 Butler Pike Blue Bell, Pennsylvania 19460	**Slug Test Analysis Report**
	Project: Brunswick SDSP
	Number:
	Client: Progress Energy

Location: Southport, NC	Slug Test: ESS-22B-1	Test Well: ESS-22B
Test conducted by:		Test date: 10/4/2007
Analysis performed by: B Sladky	ESS-22B Cooper-Bred-Pap	Analysis date: 11/14/2007
Aquifer Thickness: 25.00 ft		



Calculation after Cooper-Bredehoeft-Papadopulos

Observation well	Transmissivity [ft²/d]	Hydraulic Conductivity [ft/d]	Well-bore storage coefficient
ESS-22B	9.30×10^{2}	3.72×10^{1}	1.00×10^{-4}

Silar Services, Inc.
983 Butler Pike
Blue Bell, Pennsylvania 19460

Slug Test - Water Level Data

Project: Brunswick SDSP

Number:

Client: Progress Energy

Location: Southport, NC	Slug Test: ESS-22B-1	Test Well: ESS-22B
Test conducted by:	Test date: 10/4/2007	
Water level at t=0 [ft]: 27.19	Static water level [ft]: 28.80	Water level change at t=0 [ft]: 1.61

	Time [s]	Water Level [ft]	WL Change [ft]
1	0	27.19	-1.61
2	1	27.59	-1.21
3	2	27.92	-0.88
4	3	28.15	-0.65
5	4	28.33	-0.47
6	5	28.46	-0.34
7	6	28.55	-0.25
8	7	28.62	-0.18
9	8	28.66	-0.14
10	9	28.70	-0.10
11	10	28.72	-0.08
12	11	28.73	-0.07
13	12	28.76	-0.04
14	13	28.76	-0.04
15	14	28.77	-0.03
16	15	28.77	-0.03
17	16	28.77	-0.03
18	17	28.78	-0.02
19	18	28.78	-0.02
20	19	28.78	-0.02
21	20	28.79	-0.01
22	21	28.78	-0.02
23	22	28.78	-0.02
24	23	28.78	-0.02
25	24	28.78	-0.02
26	25	28.78	-0.02
27	26	28.78	-0.02
28	27	28.78	-0.02
29	28	28.78	-0.02
30	29	28.79	-0.01
31	30	28.79	-0.01
32	31	28.79	-0.01
33	32	28.79	-0.01
34	33	28.79	-0.01
35	34	28.79	-0.01
36	35	28.79	-0.01
37	36	28.79	-0.01
38	37	28.79	-0.01
39	38	28.78	-0.02
40	39	28.78	-0.02
41	40	28.79	-0.01
42	41	28.79	-0.01
43	42	28.79	-0.01
44	43	28.79	-0.01
45	44	28.79	-0.01
46	45	28.79	-0.01

Silar Services, Inc.
983 Butler Pike
Blue Bell, Pennsylvania 19460

Slug Test - Water Level Data

Project: Brunswick SDSP

Number:

Client: Progress Energy

	Time [s]	Water Level [ft]	WL Change [ft]
47	46	28.79	-0.01
48	47	28.79	-0.01
49	48	28.79	-0.01
50	49	28.79	-0.01
51	50	28.79	-0.01
52	51	28.79	-0.01
53	52	28.79	-0.01
54	53	28.80	0.00
55	54	28.79	-0.01
56	55	28.79	-0.01
57	56	28.79	-0.01
58	57	28.79	-0.01
59	58	28.79	-0.01
60	59	28.78	-0.02
61	60	28.79	-0.01
62	61	28.79	-0.01
63	62	28.79	-0.01
64	63	28.79	-0.01
65	64	28.79	-0.01
66	65	28.79	-0.01
67	70	28.79	-0.01
68	71	28.79	-0.01
69	72	28.79	-0.01
70	73	28.79	-0.01
71	74	28.79	-0.01
72	75	28.79	-0.01
73	76	28.79	-0.01
74	77	28.79	-0.01
75	78	28.79	-0.01
76	79	28.79	-0.01
77	80	28.79	-0.01
78	81	28.80	0.00
79	82	28.80	0.00
80	83	28.79	-0.01
81	84	28.79	-0.01
82	85	28.79	-0.01
83	86	28.79	-0.01
84	87	28.79	-0.01
85	88	28.79	-0.01
86	89	28.79	-0.01
87	90	28.79	-0.01
88	91	28.79	-0.01
89	92	28.80	0.00
90	93	28.80	0.00
91	94	28.79	-0.01
92	95	28.79	-0.01
93	96	28.79	-0.01
94	97	28.79	-0.01
95	98	28.80	0.00
96	99	28.80	0.00
97	100	28.79	-0.01

Silar Services, Inc.
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Blue Bell, Pennsylvania 19460

Slug Test - Water Level Data

Project: Brunswick SDSP

Number:

Client: Progress Energy

	Time [s]	Water Level [ft]	WL Change [ft]
98	101	28.79	-0.01
99	102	28.79	-0.01
100	103	28.79	-0.01
101	104	28.80	0.00
102	105	28.79	-0.01
103	106	28.79	-0.01
104	107	28.79	-0.01
105	108	28.79	-0.01
106	109	28.79	-0.01
107	110	28.80	0.00
108	111	28.80	0.00
109	112	28.80	0.00
110	113	28.80	0.00
111	114	28.80	0.00
112	115	28.79	-0.01
113	116	28.79	-0.01
114	117	28.80	0.00
115	118	28.79	-0.01
116	119	28.79	-0.01
117	120	28.80	0.00
118	121	28.79	-0.01
119	122	28.80	0.00
120	123	28.80	0.00
121	124	28.80	0.00
122	125	28.79	-0.01
123	126	28.79	-0.01
124	127	28.80	0.00
125	128	28.79	-0.01
126	129	28.80	0.00
127	130	28.80	0.00
128	131	28.80	0.00
129	132	28.80	0.00
130	133	28.80	0.00
131	134	28.80	0.00
132	135	28.80	0.00
133	136	28.79	-0.01
134	137	28.80	0.00
135	138	28.80	0.00
136	139	28.80	0.00
137	140	28.80	0.00
138	141	28.80	0.00
139	142	28.80	0.00
140	143	28.80	0.00
141	144	28.80	0.00
142	145	28.80	0.00
143	146	28.80	0.00
144	147	28.80	0.00
145	148	28.80	0.00
146	149	28.80	0.00
147	150	28.80	0.00
148	151	28.80	0.00

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Slug Test - Water Level Data

Project: Brunswick SDSP

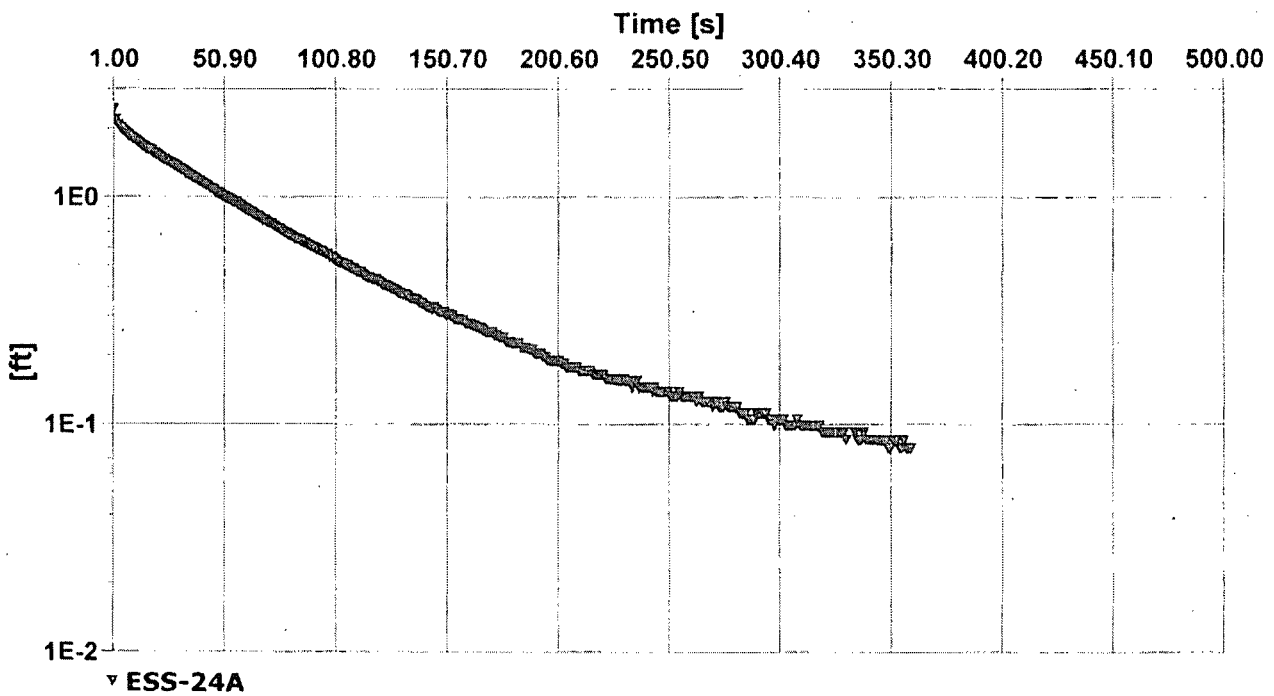
Number:

Client: Progress Energy

	Time [s]	Water Level [ft]	WL Change [ft]
149	152	28.80	0.00
150	153	28.80	0.00
151	154	28.80	0.00
152	155	28.80	0.00
153	156	28.80	0.00
154	157	28.80	0.00
155	158	28.80	0.00
156	159	28.80	0.00
157	160	28.80	0.00
158	161	28.80	0.00
159	162	28.80	0.00
160	163	28.80	0.00
161	164	28.80	0.00
162	165	28.80	0.00
163	166	28.80	0.00
164	167	28.80	0.00
165	168	28.80	0.00
166	169	28.80	0.00
167	170	28.80	0.00
168	171	28.80	0.00
169	172	28.80	0.00
170	173	28.80	0.00
171	174	28.80	0.00
172	175	28.80	0.00
173	176	28.80	0.00
174	177	28.80	0.00
175	178	28.80	0.00
176	179	28.80	0.00
177	180	28.80	0.00
178	181	28.80	0.00

Silar Services, Inc. 983 Butler Pike Blue Bell, Pennsylvania 19460	**Slug Test Analysis Report**
	Project: Brunswick SDSP
	Number:
	Client: Progress Energy

Location: Southport, NC	Slug Test: ESS-24A Slug Test	Test Well: ESS-24A
Test conducted by: E Myer		Test date: 10/4/2007
Analysis performed by:	ESS-24A CBP Analysis 2	Analysis date: 12/11/2007
Aquifer Thickness: 400.00 ft		



Calculation after Cooper-Bredehoeft-Papadopulos

Observation well	Transmissivity [ft²/d]	Hydraulic Conductivity [ft/d]	Well-bore storage coefficient
ESS-24A	9.30×10^{2}	2.33×10^{0}	1.00×10^{-4}

Silar Services, Inc.
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Slug Test - Water Level Data

Project: Brunswick SDSP

Number:

Client: Progress Energy

Location: Southport, NC	Slug Test: ESS-24A Slug Test	Test Well: ESS-24A
Test conducted by: E Myer	Test date: 10/4/2007	
Water level at t=0 [ft]: 53.46	Static water level [ft]: 53.48	Water level change at t=0 [ft]: 0.02

	Time [s]	Water Level [ft]	WL Change [ft]
1	0	53.458	0.0197
2	1	51.0367	2.4409
3	2	51.2894	2.1883
4	3	51.3944	2.0833
5	4	51.4534	2.0243
6	5	51.5059	1.9718
7	6	51.5486	1.9291
8	7	51.5879	1.8898
9	8	51.6207	1.857
10	9	51.647	1.8307
11	10	51.6732	1.8045
12	11	51.706	1.7717
13	12	51.7323	1.7454
14	13	51.7585	1.7192
15	14	51.7913	1.6864
16	15	51.8176	1.6601
17	16	51.8471	1.6306
18	17	51.8635	1.6142
19	18	51.8865	1.5912
20	19	51.9127	1.565
21	20	51.9324	1.5453
22	21	51.9587	1.519
23	22	51.9783	1.4993
24	23	51.998	1.4797
25	24	52.0177	1.46
26	25	52.0407	1.437
27	26	52.0571	1.4206
28	27	52.0768	1.4009
29	28	52.0997	1.378
30	29	52.1161	1.3615
31	30	52.1391	1.3386
32	31	52.1588	1.3189
33	32	52.1719	1.3058
34	33	52.1916	1.2861
35	34	52.2113	1.2664
36	35	52.231	1.2467
37	36	52.2441	1.2336
38	37	52.2638	1.2139
39	38	52.2769	1.2008
40	39	52.2966	1.1811
41	40	52.3097	1.168
42	41	52.3228	1.1549
43	42	52.3425	1.1352
44	43	52.3556	1.122
45	44	52.3753	1.1024
46	45	52.3885	1.0892

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Slug Test - Water Level Data

Project: Brunswick SDSP

Number:

Client: Progress Energy

	Time [s]	Water Level [ft]	WL Change [ft]
47	46	52.4016	1.0761
48	47	52.4245	1.0531
49	48	52.4377	1.04
50	49	52.4508	1.0269
51	50	52.4639	1.0138
52	51	52.477	1.0007
53	52	52.4902	0.9875
54	53	52.4967	0.981
55	54	52.5098	0.9678
56	55	52.5295	0.9482
57	56	52.5361	0.9416
58	57	52.5492	0.9285
59	58	52.5623	0.9154
60	59	52.5755	0.9022
61	60	52.5886	0.8891
62	61	52.5951	0.8825
63	62	52.6083	0.8694
64	63	52.6214	0.8563
65	64	52.6345	0.8432
66	65	52.6509	0.8268
67	66	52.6542	0.8235
68	67	52.6673	0.8104
69	68	52.6837	0.794
70	69	52.687	0.7907
71	70	52.7001	0.7776
72	71	52.71	0.7677
73	72	52.7133	0.7644
74	73	52.7297	0.748
75	74	52.7362	0.7415
76	75	52.7493	0.7283
77	76	52.7559	0.7218
78	77	52.769	0.7087
79	78	52.7822	0.6955
80	79	52.7887	0.689
81	80	52.7953	0.6824
82	81	52.8018	0.6759
83	82	52.815	0.6627
84	83	52.8215	0.6562
85	84	52.8281	0.6496
86	85	52.8346	0.643
87	86	52.8478	0.6299
88	87	52.8478	0.6299
89	88	52.8609	0.6168
90	89	52.8675	0.6102
91	90	52.874	0.6037
92	91	52.8806	0.5971
93	92	52.8871	0.5906
94	93	52.8937	0.584
95	94	52.9003	0.5774
96	95	52.9068	0.5709
97	96	52.9199	0.5577

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Slug Test - Water Level Data

Project: Brunswick SDSP

Number:

Client: Progress Energy

	Time [s]	Water Level [ft]	WL Change [ft]
98	97	52.9199	0.5577
99	98	52.9364	0.5413
100	99	52.9364	0.5413
101	100	52.9495	0.5282
102	101	52.9528	0.5249
103	102	52.9626	0.5151
104	103	52.9659	0.5118
105	104	52.9659	0.5118
106	105	52.979	0.4987
107	106	52.979	0.4987
108	107	52.9888	0.4888
109	108	52.9954	0.4823
110	109	52.9987	0.479
111	110	53.0085	0.4692
112	111	53.0118	0.4659
113	112	53.0118	0.4659
114	113	53.0217	0.456
115	114	53.0282	0.4495
116	115	53.0348	0.4429
117	116	53.0348	0.4429
118	117	53.0413	0.4364
119	118	53.0479	0.4298
120	119	53.0479	0.4298
121	120	53.0545	0.4232
122	121	53.061	0.4167
123	122	53.0676	0.4101
124	123	53.0676	0.4101
125	124	53.0741	0.4035
126	125	53.0807	0.397
127	126	53.0807	0.397
128	127	53.0873	0.3904
129	128	53.0938	0.3839
130	129	53.1004	0.3773
131	130	53.1004	0.3773
132	131	53.107	0.3707
133	132	53.107	0.3707
134	133	53.1135	0.3642
135	134	53.1201	0.3576
136	135	53.1201	0.3576
137	136	53.1201	0.3576
138	137	53.1266	0.351
139	138	53.1332	0.3445
140	139	53.1332	0.3445
141	140	53.1398	0.3379
142	141	53.1463	0.3314
143	142	53.1529	0.3248
144	143	53.1529	0.3248
145	144	53.1594	0.3182
146	145	53.1529	0.3248
147	146	53.1594	0.3182
148	147	53.166	0.3117

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Slug Test - Water Level Data

Project: Brunswick SDSP

Number:

Client: Progress Energy

	Time [s]	Water Level [ft]	Wt. Change [ft]
149	148	53.166	0.3117
150	149	53.166	0.3117
151	150	53.1726	0.3051
152	151	53.1726	0.3051
153	152	53.1791	0.2986
154	153	53.1791	0.2986
155	154	53.189	0.2887
156	155	53.189	0.2887
157	156	53.189	0.2887
158	157	53.1923	0.2854
159	158	53.1923	0.2854
160	159	53.2021	0.2756
161	160	53.2021	0.2756
162	161	53.2021	0.2756
163	162	53.2054	0.2723
164	163	53.2087	0.269
165	164	53.2119	0.2657
166	165	53.2119	0.2657
167	166	53.2119	0.2657
168	167	53.2185	0.2592
169	168	53.2251	0.2526
170	169	53.2251	0.2526
171	170	53.2251	0.2526
172	171	53.2251	0.2526
173	172	53.2316	0.2461
174	173	53.2316	0.2461
175	174	53.2382	0.2395
176	175	53.2382	0.2395
177	176	53.2382	0.2395
178	177	53.248	0.2297
179	178	53.248	0.2297
180	179	53.248	0.2297
181	180	53.2513	0.2264
182	181	53.2513	0.2264
183	182	53.2513	0.2264
184	183	53.2513	0.2264
185	184	53.2612	0.2165
186	185	53.2612	0.2165
187	186	53.2612	0.2165
188	187	53.2644	0.2133
189	188	53.2644	0.2133
190	189	53.2644	0.2133
191	190	53.2743	0.2034
192	191	53.2743	0.2034
193	192	53.2743	0.2034
194	193	53.2743	0.2034
195	194	53.2808	0.1969
196	195	53.2808	0.1969
197	196	53.2874	0.1903
198	197	53.2874	0.1903
199	198	53.2874	0.1903

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Slug Test - Water Level Data

Project: Brunswick SDSP

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Client: Progress Energy

	Time [s]	Water Level [ft]	WL Change [ft]
200	199	53.2874	0.1903
201	200	53.2874	0.1903
202	201	53.2874	0.1903
203	202	53.294	0.1837
204	203	53.294	0.1837
205	204	53.3005	0.1772
206	205	53.3005	0.1772
207	206	53.3005	0.1772
208	207	53.3005	0.1772
209	208	53.3005	0.1772
210	209	53.3005	0.1772
211	210	53.3071	0.1706
212	211	53.3071	0.1706
213	212	53.3071	0.1706
214	213	53.3071	0.1706
215	214	53.3071	0.1706
216	215	53.3071	0.1706
217	216	53.3136	0.164
218	217	53.3136	0.164
219	218	53.3136	0.164
220	219	53.3136	0.164
221	220	53.3136	0.164
222	221	53.3136	0.164
223	222	53.3202	0.1575
224	223	53.3202	0.1575
225	224	53.3202	0.1575
226	225	53.3202	0.1575
227	226	53.3202	0.1575
228	227	53.3235	0.1542
229	228	53.3235	0.1542
230	229	53.3235	0.1542
231	230	53.3202	0.1575
232	231	53.3235	0.1542
233	232	53.3235	0.1542
234	233	53.3235	0.1542
235	234	53.3333	0.1444
236	235	53.3235	0.1542
237	236	53.3235	0.1542
238	237	53.3333	0.1444
239	238	53.3333	0.1444
240	239	53.3333	0.1444
241	240	53.3333	0.1444
242	241	53.3333	0.1444
243	242	53.3333	0.1444
244	243	53.3399	0.1378
245	244	53.3333	0.1444
246	245	53.3399	0.1378
247	246	53.3399	0.1378
248	247	53.3399	0.1378
249	248	53.3399	0.1378
250	249	53.3399	0.1378

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Client: Progress Energy

	Time [s]	Water Level [ft]	WL Change [ft]
251	250	53.3399	0.1378
252	251	53.3465	0.1312
253	252	53.3465	0.1312
254	253	53.3465	0.1312
255	254	53.3465	0.1312
256	255	53.3399	0.1378
257	256	53.3465	0.1312
258	257	53.3465	0.1312
259	258	53.3465	0.1312
260	259	53.3465	0.1312
261	260	53.3465	0.1312
262	261	53.3465	0.1312
263	262	53.3465	0.1312
264	263	53.353	0.1247
265	264	53.3465	0.1312
266	265	53.353	0.1247
267	266	53.353	0.1247
268	267	53.353	0.1247
269	268	53.353	0.1247
270	269	53.353	0.1247
271	270	53.3596	0.1181
272	271	53.353	0.1247
273	272	53.353	0.1247
274	273	53.3596	0.1181
275	274	53.3596	0.1181
276	275	53.3596	0.1181
277	276	53.353	0.1247
278	277	53.3596	0.1181
279	278	53.3596	0.1181
280	279	53.3596	0.1181
281	280	53.3596	0.1181
282	281	53.3596	0.1181
283	282	53.3661	0.1115
284	283	53.3661	0.1115
285	284	53.3661	0.1115
286	285	53.3661	0.1115
287	286	53.3727	0.105
288	287	53.3727	0.105
289	288	53.3727	0.105
290	289	53.3727	0.105
291	290	53.3661	0.1115
292	291	53.3661	0.1115
293	292	53.3661	0.1115
294	293	53.3661	0.1115
295	294	53.3661	0.1115
296	295	53.3727	0.105
297	296	53.3727	0.105
298	297	53.3727	0.105
299	298	53.3793	0.0984
300	299	53.3727	0.105
301	300	53.3727	0.105

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Slug Test - Water Level Data

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Client: Progress Energy

	Time [s]	Water Level [ft]	WL Change [ft]
302	301	53.3727	0.105
303	302	53.3727	0.105
304	303	53.3793	0.0984
305	304	53.3793	0.0984
306	305	53.3793	0.0984
307	306	53.3793	0.0984
308	307	53.3793	0.0984
309	308	53.3727	0.105
310	309	53.3793	0.0984
311	310	53.3793	0.0984
312	311	53.3793	0.0984
313	312	53.3793	0.0984
314	313	53.3793	0.0984
315	314	53.3793	0.0984
316	315	53.3793	0.0984
317	316	53.3793	0.0984
318	317	53.3793	0.0984
319	318	53.3793	0.0984
320	319	53.3858	0.0919
321	320	53.3858	0.0919
322	321	53.3858	0.0919
323	322	53.3858	0.0919
324	323	53.3858	0.0919
325	324	53.3858	0.0919
326	325	53.3858	0.0919
327	326	53.3858	0.0919
328	327	53.3858	0.0919
329	328	53.3858	0.0919
330	329	53.3858	0.0919
331	330	53.3924	0.0853
332	334	53.3858	0.0919
333	335	53.3924	0.0853
334	336	53.3924	0.0853
335	337	53.3924	0.0853
336	338	53.3858	0.0919
337	339	53.3924	0.0853
338	340	53.3924	0.0853
339	341	53.3924	0.0853
340	342	53.3924	0.0853
341	343	53.3924	0.0853
342	344	53.3924	0.0853
343	345	53.3924	0.0853
344	346	53.3924	0.0853
345	347	53.3924	0.0853
346	348	53.3924	0.0853
347	349	53.399	0.0787
348	350	53.399	0.0787
349	351	53.3924	0.0853
350	352	53.3924	0.0853
351	353	53.3924	0.0853
352	354	53.399	0.0787

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Project: Brunswick SDSP

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Client: Progress Energy

	Time [s]	Water Level [ft]	WL Change [ft]
353	355	53.399	0.0787
354	356	53.3924	0.0853
355	357	53.399	0.0787
356	358	53.399	0.0787
357	359	53.399	0.0787
358	361	53.399	0.0787
359	362	53.399	0.0787

DRAFT

SITEWIDE GROUNDWATER ASSESSMENT REPORT

OWNER CONTROLLED AREA

BRUNSWICK NUCLEAR PLANT

SOUTHPORT, NORTH CAROLINA

PREPARED FOR:

PROGRESS ENERGY CAROLINAS

PREPARED BY:

SILAR SERVICES, INC.
983 BUTLER PIKE
BLUE BELL, PA 19422

MAY 2009

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1 INTRODUCTION

1.1 Purpose of Report

Silar Services Incorporated (SSi) has prepared this Sitewide Groundwater Assessment Report (SGAR) to document the results of groundwater assessment activities performed at the Owner Controlled Area (OCA) of the Brunswick Nuclear Plant (BNP), located in Southport, Brunswick County, North Carolina. The purpose of the groundwater assessment was to evaluate hydrogeology and determine the presence of potential radiological impacts to groundwater in various areas of the BNP OCA.

The investigations activities were not commenced to investigate a known release of radiological materials. Rather, the assessment was initiated to be consistent with industry standard practice and guidance documents associated with the protection of groundwater resources from radiological materials, including the following:

- Guideline for Implementing a Groundwater Protection Program at Nuclear Power Plants [Electric Power Research Institute, November, 2007]; and,
- Industry Ground Water Protection Initiative – Final Guidance Document [Nuclear Energy Institute (NEI), August 2007].

1.2 Project Background

This section includes information on the location, description and history of the Site.

1.2.1 Site Location

The Brunswick Nuclear Plant Site is located approximately 2.5-miles north-northeast of the City of Southport, Brunswick County, North Carolina, and is situated on approximately 1,200 acres of land. The Site location is depicted on **Figure 1**. For purposes of the assessment, the OCA was broken into ten (10) areas as follows:

Area 1 – Caswell Beach Pumping Station

Area 2 – Discharge Canal

Area 3 – Turbine Rotor Storage Area

Area 4 – South Dredge Pond

Area 5 – North Dredge Pond

Area 6 – Recovery Pond

Area 8 – Dry Fuel Storage Area

Area 9 – Area North of Nancy's Creek

Area 10 – Construction Laydown Area

Area 11 – Plant Support Area

Areas not included as part of this investigation include the Storm Drain Stabilization Pond (SDSP) and the Protected Area within the plant that were the subjects of separate investigations. The Site layout, including the various areas is depicted on **Figure 2**.

1.2.2 Project Background

The NEI Ground Water Protection Initiative identifies actions to improve utilities' management and response to instances where the inadvertent release of radioactive substances may result in low but detectible levels of plant-related materials in subsurface soils and water. The inadvertent releases addressed by this Initiative fall outside the current requirements of the Nuclear Regulatory Commission (NRC) and are well below the NRC's limits that ensure protection of public health and safety. This SGAR meets objectives 1.1 and 1.3 of the NEI guidance by characterizing the sitewide groundwater hydrogeology and performing initial groundwater sampling and analysis to be used in the development of long-term groundwater monitoring requirements.

1.3 Scope and Objectives

The overall objectives of the groundwater assessment were to provide sampling points to evaluate groundwater quality in order to assess the potential for sources of contamination in various areas of the OCA and, characterize the geology and hydrogeology of the various areas.

The specific objectives of each element of the investigation as they apply to each area of the OCA are presented in Section 2 of this report.

1.4 Report Organization

The organization and content of the remainder of this report are described below.

Section 2.0 - Investigation Activities and Findings

The activities completed during planning and execution of the assessment are described. Results of the sampling and analysis program are summarized.

Section 3.0 - Physical Characteristics of the Study Area

A description of the study area including: surface features, geology and soils, surface water hydrology, and groundwater hydrology.

Section 4.0 - Summary and Conclusions

A summary of the environmental conditions relevant to satisfy the objectives of the investigation are provided.

Section 5.0 - References

A list of references utilized during the preparation of this Report.

2 INVESTIGATION ACTIVITIES AND FINDINGS

The sitewide groundwater assessment involved the installation and development of a total of forty-one (41) shallow groundwater monitoring wells and five (5) intermediate monitoring wells followed by groundwater elevation measurements and collection and analyses of groundwater samples. The field investigations were performed in multiple phases beginning in April 2008 and continuing through April 2009.

This section includes a summary of the results of chemical analyses performed on groundwater samples collected from the monitoring wells. The analytical results are presented and, where concentrations of radiological materials were observed, the results are also presented on figures. Throughout this section, groundwater data are compared and discussed with respect to the USEPA drinking water standard of 20,000 pCi/L (picocuries per liter).

The activities and findings are summarized in the following subsections.

2.1 Groundwater Investigation Activities

The overall objectives of the groundwater assessment were to provide sampling points to evaluate groundwater quality in order to assess the potential for sources of contamination in various areas of the OCA and, characterize the geology and hydrogeology of the various areas.

To accomplish these objectives, several investigation elements were completed including: groundwater screening, monitoring well installation, groundwater elevation measurements and groundwater sampling.

2.1.1 Area 11 Groundwater Screening and Piezometer Installation

A groundwater screening program was conducted in Area 11 in April and May 2008. Screening locations were generally located on a grid with some locations biased to potential source areas, such as the discharge pipe from the basin to the stabilization pond. A total of fifty-eight (58) soil borings (A11-1 through A11-58) were advanced by Geoprobe to approximately 25' below grade. Soil samples were visually inspected and monitored to construct boring logs and determine site specific geologic stratigraphy. Soil boring logs are included in **Appendix A**. Groundwater samples were collected from temporary well screens advanced by Geoprobe. Samples were collected by SSi and analyzed for tritium by BNP.

Piezometers were installed in Area 11 soil borings to provide groundwater elevation measuring points and thereby an understanding of groundwater flow in this area. Eighteen (18) piezometers were installed in soil borings as follows: A11-3 through A11-6, A11-8 through A11-12, A11-26 through A11-31, A11-33, A11-34 and A11-37. Surveying was conducted to establish the horizontal location of all screening points and the vertical elevation within third-order accuracy and 0.01-foot precision of all piezometers. Water elevation measurements were collected (Section 2.1.3) from all piezometers. The eighteen piezometers were abandoned on May 19, 2008 by cutting the well casing below grade and filling the hole with bentonite-cement grout to the surface.

2.1.2 Groundwater Monitoring Well Installation

The primary objective of the monitoring well installation was to establish a network of monitoring wells in the various areas to evaluate groundwater

quality and hydrology. To accomplish this objective, monitoring wells were installed in each area as described in **Table 1**.

All drilling activities were performed by Geologic Exploration, Inc. of Statesville, North Carolina and overseen by SSi. Hollow-stem auger drilling methods were employed to complete the installation of the temporary groundwater monitoring well network. The drilling activities are described in the following sections.

During the investigation, a total of forty-one (41) shallow groundwater monitoring wells and five (5) intermediate monitoring wells were installed in the various areas described in **Table 1**. All shallow monitoring wells were installed using 3 ¼-inch I.D. hollow-stem auger drilling techniques. **Figure 3** shows all of the monitoring well locations on an aerial photograph of the Site. **Figures 4 through 10** depict the monitoring wells installed in each of the areas. Monitoring wells were constructed using 2-inch I.D. Schedule 40 PVC well casing and 0.010-slotted 2-inch diameter Schedule 40 PVC well screen.

The general monitoring well installation procedures are summarized below.

1. The field Geologist selected the well depth for each of the shallow wells based on presence of saturated groundwater conditions at each well location.
2. The shallow wells (Type I) were installed using 3¼-inch inner diameter (I.D.) hollow stem augers with the bottom of the well screen placed at least 3 feet into the saturated interval of the sand aquifer. No low-permeability units were penetrated during the drilling and installation of the temporary monitoring wells.
3. Core samples were obtained at 5-foot intervals from the surface to designated depths of each well location. These samples were logged by the field Geologist.
4. Formation water and drill cuttings generated during the construction of monitoring wells were transported to the SDSP.

5. At least ten feet of 2-inch-ID, Schedule 40 PVC, machine cut, well screen with 0.010-inch-slot size was set at the bottom of each Type I well. A sufficient length of Schedule 40 PVC riser pipe was coupled to the screen to allow the PVC riser pipe to extend above the ground surface. Well screens were fitted with a nominal 2-inch solid (unslotted) bottom sediment trap.
6. Intermediate wells (Type II) were constructed with the same construction defined in Item 9 above except that a 6-inch I.D. PVC surface casing was installed into the low-permeability aquitard to prevent the possibility that the monitoring well could serve as a conduit between the overburden aquifer and intermediate zones
7. The annular space around the well screen was back-filled with clean uniform sand (filter pack sieve #2). The filter pack was placed from the bottom of the well to approximately 2 to 3 feet above the top of the well screen. A seal consisting of a minimum of a 2-foot-thick bentonite seal was placed above the sand and allowed to hydrate. The remaining annular space was filled with bentonite-cement grout.
8. All wells were completed as stick-up wells, with a lockable expansion plug.
9. A concrete pad was installed around the security casing and mounded in such a way as to direct surface runoff away from the casing.
10. Monitoring well construction sketches (**Appendix A**) were prepared for each monitoring well.
11. Dedicated groundwater sampling equipment, including dedicated polyethylene tubing, was installed in each of the monitoring wells to facilitate the collection of groundwater samples.

2.1.3 Groundwater Elevation Measurements

Groundwater elevation measurements were collected from the temporary piezometers and the monitoring wells and used to provide data to map the potentiometric surface of the shallow aquifer and interpret the direction of groundwater flow in the shallow aquifer in the various areas. Six (6) rounds of depth-to-water measurements were recorded from the eighteen (18) temporary piezometers in April and May 2008. Two (2) rounds of depth-to-water

measurements were recorded from the forty-one shallow and five intermediate monitoring wells in September and October 2008. Measurements were collected using a Keck ET Model 122 Water Level Indicator Probe capable of measuring depth to water within 0.01-foot accuracy. These measurements are summarized in **Table 3**. The results of the groundwater elevation measurements are presented as potentiometric surface maps for the various areas in Section 3 of this report.

2.1.4 Groundwater Sampling

Two rounds of groundwater samples were collected from the monitoring wells. The groundwater samples were analyzed for tritium in Progress Energy's onsite radiological analytical laboratory.

Prior to sampling, each well was purged in accordance with Progress Energy's low flow groundwater sampling procedure to assure collection of a representative groundwater sample. Groundwater sampling was completed using a peristaltic pump, dedicated pump (flex) tubing, and dedicated down-hole polyethylene tubing at each temporary well to eliminate the potential for cross-contamination between sampling points. Water quality measurements were collected during the purging activities. The procedure for well purging and sampling is generally as follows:

1. First, the security cap was removed, and the depth to water in the well was determined by sounding the well with a water level meter (Keck ET). The depth to water was recorded on a groundwater sample form.
2. The dedicated down-hole tubing is lowered into the monitoring well and cut to the desired length, attached to the pre-cut flex tubing on the peristaltic pump, and a new section of poly tubing is inserted on the effluent side of the pump and the sample line was connected from the pump to the in-line water quality instrument (YSI MP556 with flow through cell), the effluent line from the

flow-through cell is inserted into a purge water container to capture purge water, the peristaltic pump is started, and purging of groundwater at the well was commenced.

3. An optimum low-flow pumping rate was established at each well to minimize drawdown. The groundwater quality parameters and depth to water were monitored and recorded at prescribed time intervals to determine when the water quality parameters had stabilized to within 10%.
4. Following the stabilization of the groundwater quality parameters, groundwater samples were collected from the wells and delivered to the radiological analytical laboratory.
5. Purge water was collected in dedicated purge water containers and transported to the SDSP.

2.1.5 Groundwater Analytical Results Summary

The first round of groundwater samples were collected from the monitoring wells in July and August 2008. The second round of groundwater samples were collected from the monitoring wells in March and April 2009. Groundwater samples from the wells were analyzed for tritium at the on-site radiological analytical laboratory. The lower limit of detection for the sample analyses ranged from 233 pCi/L to 274 pCi/L. **Appendix B** presents tabulated analytical results from the groundwater sampling events. The results of the laboratory analyses of groundwater samples are summarized below.

During the first round of groundwater sampling, tritium was below the lower limits of detection in all but two (2) of the monitoring wells in the OCA. These were monitoring wells ESS-67C and ESS-73C, both located in Area 1, near the Caswell Beach Pumping Station. These monitoring wells were initially sampled on July 17, 2008. Concentrations of tritium were 491 pCi/L in the groundwater sample from ESS-67C and 439 pCi/L in the groundwater sample from ESS-73C.

These two monitoring wells were sampled again on thirteen occasions between August 1, 2008 and April 9, 2009. Results of these samples are tabulated in Appendix B. For monitoring well ESS-67C, tritium was detected during six (6) of the thirteen (13) additional sampling rounds. Concentrations in the additional samples ranged from non-detectable to 528 pCi/L detected in monitoring well ESS-67C on August 25, 2008. For monitoring well ESS-73C, tritium was detected during four (4) of the thirteen (13) additional sampling rounds. Concentrations in the additional samples ranged from non-detect to 423 pCi/L detected in monitoring well ESS-73C on August 5, 2008. None of the detected concentrations approached the USEPA MCL for tritium of 20,000 pCi/L.

The second round of groundwater samples was collected in March and April 2009. During the second round of groundwater sampling, tritium analytical results were below the lower limits of detection for groundwater samples collected from all OCA monitoring wells except two. The two monitoring wells, ESS-38C and ESS-39B, are both located in Area 8 – the Dry Fuel Storage Area or ISFSI Pad along with monitoring wells ESS-38B and ESS-39C. Concentrations of tritium were 516.9 pCi/L in the groundwater sample from ESS-38C and 490.1 pCi/L in the groundwater sample from ESS-39B.

The ISFSI Pad monitoring wells (ESS-38C, ESS-38B, ESS-39C and ESS-39B) were sampled a total of seven (7) times between July 2008 and March 2009 as part of a separate investigation of Area 8. Results of these samples are tabulated in Appendix B. Initial results of that study were presented in a January 15, 2009 memorandum from John Magee of SSi to Jim Paul of PE. Tritium was not detected in any of the groundwater samples collected from monitoring wells ESS-38B and ESS-39C. For monitoring well ESS-38C, tritium was not detected in any of the groundwater samples except that collected in March 2009 as described above. For monitoring well ESS-39B, tritum was detected in groundwater samples from three (3) of the seven (7)

gsampling events at concentrations of 798.9 pCi/L (December 2008), 579.1 pCi/L (January 2009) and 490.1 pCi/L (March 2009). None of the detected concentrations approached the USEPA MCL for tritium of 20,000 pCi/L.

2.2 Surveying and Mapping

A site survey was conducted. Surveying activities were performed and certified by a North Carolina Registered Land Surveyor (McKim and Creed). The surveyor reviewed existing site maps and other maps that encompassed the project area prior to mobilization. The surveyor ascertained the locations and conditions of all horizontal and vertical controls available for the project utilizing benchmark descriptions, maps, and listings provided by Progress Energy, as well as other documents. The survey was georeferenced using the previously established local monuments of known northing and easting as defined by the North Carolina Geological Survey.

A survey map was produced that includes scale, benchmarks, North arrow, dimensions and locations of property boundaries, the locations of monitoring wells and sample locations. The survey map provided the information required to produce a site basemap, which all of the site maps presented in this report have been based on.

3 PHYSICAL CHARACTERISTICS OF THE STUDY AREA

This section presents the physical characteristics of the Site including surface features, geology, soils, surface water hydrology, groundwater hydrology, climate, and demographics.

3.1 Surface Features

The Site is located within approximately 2.5 miles north-northeast of the City of Southport, North Carolina. Access to the Site is from River Road (State Route 87). The Site encompasses approximately 1,000 acres.

Significant surface features are referenced in bold in the following Section.

Storm Drain Stabilization Pond (SDSP): The SDSP is located approximately 880 feet northeast of the BNP power generating facility and consists of a constructed sediment dewatering pond that has been converted for use as a storm water retention/treatment facility. The SDSP was constructed above the pre-construction surface topography and includes an earthen berm that surrounds the 64-acre pond. The earthen berm is approximately ten (10) feet higher in elevation than the surrounding land surface to the west and south, and approximately twenty (20) feet higher in elevation than the land surface to the north and east. Organic silts and other sediments that have accumulated as a result of the industrial use of the pond are assumed to be the predominant sediment/soil materials present within the interior of the pond.

Nancy's Creek: Approximately 100 feet to the north of the SDSP, a marine estuary is present that consists of Nancy's Creek and associated tidal wetland habitats. The creek and wetlands drain to the east during the outward flow of the tides into the Cape Fear River. Water in Nancy's Creek is brackish (low tide) to saline (high tide).

Gum Log Branch: To the east/northeast of the SDSP, Gum Log Branch and associated tidal wetlands are present. Gum Log Branch generally flows to the north during outward tidal flows and is a tributary to Nancy's Creek. Gum Log Branch is a natural surface

drainage feature, but also receives water from a constructed **recovery pond** that is used to facilitate the return of marine life that was captured/impinged on the cooling water intake screens adjacent to the BNP generating facility. A constructed drainage system (referred to as the "slide for life") feeds water and marine life recovered from the intake structure to the recovery pond, where the wildlife can "recover" and return to the marine environment. Further to the east of Gum Log Branch, a larger dredge pond is present that was used during the construction of the intake canal, and has been used to periodically provide a sediment dewatering basin for dredged intake canal sediments.

Intake Canal: The cooling water intake canal is located adjacent to the SDSP to the south. The intake canal is approximately 18 feet deep and is designed to provide a constant source of water from the **Cape Fear River** to the BNP to cool the nuclear reactors. The design of the intake canal permits flow into the plant area, and cannot be reversed by tides or other hydraulic conditions. As such, the water elevation in the canal is relatively consistent and presents a shallow hydraulic boundary to the south of the SDSP. To the south of the intake canal, a dredge pond is present that was used during the construction of the intake canal, and has been used to periodically provide a sediment dewatering basin for dredged intake canal sediments.

Discharge Canal: The cooling water discharge canal is located at the southwest corner of the plant. The discharge canal is approximately 18 feet deep and is designed to convey the approximately 1 million gallons per minute of cooling water from the Plant to the Caswell Beach Pumping Station, where it is pumped approximately ¾-mile into the Atlantic Ocean. Groundwater flow in the vicinity of the Discharge Canal is generally toward the canal.

The Site location is shown in **Figure 1**.

3.2 Geology

3.2.1 Regional Geology and Hydrogeology

According to the 1985 Geologic Map of North Carolina, prepared by the North Carolina Geological Survey Section of the North Carolina Department of Environment and Natural Resources (NCDENR), the Site is located in the North Carolina Coastal Plain Physiographic Province. The geology of this area is characterized by an easterly thickening wedge of unconsolidated sediments underlain by limestone aquifers. According to the United States Geologic Survey (USGS) *Water Resources Investigations Report 03-4051* (USGS, 2003), the Site is located in the Coastal Lowlands subregion of the coastal plain, which consists of sediments deposited in estuarine and near-shore environments; however, close to the north is the interpreted boundary with the middle-coastal plain subregion, which is characterized by variable sediment conditions laterally and vertically, and includes coarse sands associated with shoreline deposits to silts and clays associated with estuaries and lagoons deposited during the Pleistocene.

Based on the *Water Resources Investigations Report,* the geologic formations in the area, from most recent to oldest include the following:

- the quaternary-aged surficial sand deposits;
- the undifferentiated Pleistocene and Pliocene deposits of the quaternary and later tertiary system;
- the Tertiary-aged Castle Hayne Formation;
- the Tertiary-aged Beaufort Formation (Peedee Confining Unit); and,
- the Cretaceous-aged Peedee Formation.

According to the North Carolina Geologic Survey, the Site area is underlain by the Waccamaw Formation, which is generalized as a fossiliferous bluish-gray to tan loosely consolidated sand with silt and clay. The Waccamaw Formation

straddles the Pleistocene-Pliocene boundary, and generally correlates with the data provided by US Geologic Survey.

These units are described in the USGS report as follows:

Surficial Sand Deposits: Light yellow to grey fine to medium sands with traces of clay, coarse-grained sand, pebbles, and minerals. These deposits are part of the *surficial aquifer*, which is a shallow groundwater aquifer in the uppermost strata in Brunswick County.

Pleistocene and Pliocene Deposits: An undifferentiated, variable unit that does not have sufficient to divide into discrete formations, this unit is characterized by shelly quartz sands with well preserved shell material or shell hash, and shelly carbonates consisting of shell hash and sandy marls or sandy moldic limestone.

> "In areas where the Castle Hayne...confining unit is missing, the surficial aquifer is in direct contact with the Castle Hayne Aquifer..." (Pg. 14, USGS, 2003).

Clays and silts in these deposits are generally thin, discontinuous, and lack lateral continuity. However, the USGS points out that, at Sunny Point Military Terminal (SPMT), a clay unit separates the surficial aquifer into a surficial aquifer and a deeper tertiary sand aquifer, which is directly underlain by the Castle Hayne aquifer at SPMT.

Castle Hayne Formation: The Castle Hayne Formation consists primarily of limestone and sand deposited in a marine environment (Winner and Coble, 1996). The elevation of the top of the Castle Hayne in the vicinity of the Site is documented to be approximately 45 feet below mean sea level (-45 feet MSL), as documented on the hydrogeologic cross section provided as Plate G of the USGS Water Resources Report (USGS, 2003). The Castle Hayne

aquifer is one of the principal sources of potable water supply for the City of Southport (USGS, 2003).

Peedee Confining Unit: The Peedee confining unit is generally the closest clay or silt beds that occur near the top of the Peedee Formation. Where it is present, the Peedee confining unit is part of the Beaufort Formation in southeastern Brunswick County (Lautier, 1998). The elevation of the top of the Peedee confining unit is documented to be approximately -65 feet MSL, as documented on Plate G of the USGS Water Resources Report (USGS, 2003).

Peedee Formation: The composition of the Peedee Formation in southeastern Brunswick County is described as the Rocky Point Member of the Upper Peedee Formation consisting of gray, sandy, moldic limestone that grades downward to a calcareous sandstone. The upper part of the Peedee aquifer is an important source of water for domestic and commercial use, and is used in combination with the Castle Hayne aquifer as the source of municipal water supply by Brunswick County (USGS, 2003).

3.2.2 Site-Specific Geology

In general, the site-specific geology observed in is as follows:

Upper Sand: The surficial sand was generally observed as a loose tan to light grey fine sand, with varying amounts of silt. Towards the middle to bottom of the Upper Sand, silt and clay lenses were often observed, although the depth of the silt and clay lenses were not generally consistent between borings. In some borings, clay and silt lenses were not observed. The Upper Sand was typically observed to be saturated at a depth of approximately five to ten feet below grade. Towards the base of the Upper Sand, shelly layers were often encountered in thin lenses of silt, and the contact with the underlying low-permeability unit was typically characterized by interlayered sandy silts, silty

sands, and clayey silts. This unit correlates with the *Surficial Deposits* described by USGS (USGS, 2003).

A shallow aquifer is observed in the Upper Sand at approximately 15-feet below grade. This aquifer correlates with the *Surficial Aquifer* described by USGS (USGS, 2003).

Low-Permeability Unit: Below the Upper Sand Unit, a low permeability unit was encountered. The low permeability unit consists of cohesive dark grey silt and clay. As described above, the contact with the overlying Upper Sand is typically gradational until the competent dark grey silt and clay unit is encountered. At previously investigated areas of the Site it is approximately four (4) to fifteen (15) feet thick, and exhibits shelly layers and occasional thin laminates of very fine grained sand within the low to medium moist silt and clay. Shelly layers were observed in a number of the borings around 20 to 25 feet bgs.

The low permeability unit is believed to hydraulically separate the Shallow Aquifer and the Intermediate Aquifer that is observed in other areas of the Site.

3.2.3 Site-Specific Surface Water Hydrology

Surface water runoff is generally percolated directly into the shallow aquifer (Upper Sand). Groundwater in the shallow aquifer appears to migrate laterally to nearby surface waters including the plant cooling water Intake and Discharge Canals, Nancy's Creek and Gum Log Branch.

3.3 Groundwater Hydrology

3.3.1 Shallow Aquifer

The shallow aquifer, which is generally encountered at a depth of approximately fifteen feet bgs, extends to approximately -11 feet msl. The

thickness of the aquifer is approximately 15 feet thick. The aquifer exhibits unconfined, water table conditions, and is recharged directly through infiltration from precipitation.

The shallow aquifer is generally underlain by the low-permeability unit, which was encountered in several of boreholes advanced at the Site. Based on the previous work conducted at the Site, the low permeability unit separates the shallow aquifer and the intermediate aquifer that is below the low-permeability unit; however, there is a small degree of hydraulic and chemical exchange between the shallow and intermediate aquifers that occurs vertically through the clay, as observed in previous investigation activities.

The interpretations regarding groundwater flow direction at the Site is based on water level measurements collected from the shallow wells. These data are presented in **Table 2** and provided the basis for the interpretation of horizontal flow in the shallow aquifer. Groundwater flow for the areas investigated is discussed below.

Area 1 – The locations and orientation of monitoring wells along the Discharge Canal do not lend themselves to the preparation of groundwater elevation contours; however some general interpretations can be made based on the data presented in **Table 2**. Groundwater flow in the immediate vicinity of the Discharge Canal is toward the Discharge Canal. The overall flow of shallow groundwater is to the south in the direction of the Atlantic Ocean.

Areas 3 and 4 – **Figures 11 and 12** illustrate the potentiometric surface of the shallow unconfined aquifer at Areas 3 and 4 on September 30 and October 20, 2008, respectively. These figures illustrate the local influence of the Intake and Discharge Canals on the direction of groundwater flow in the shallow unconfined aquifer. The elevation differences between 56 and 55 are representative of the regional groundwater flow pattern toward the south.

Areas 5, 6 and 10 – **Figures 13 and 14** illustrate the potentiometric surface of the shallow unconfined aquifer at Areas 5, 6 and 10 on September 30 and October 20, 2008, respectively. These figures illustrate the general radial flow from the former dredge spoil site as well as the local influence of the Intake Canal on the direction of groundwater flow in the shallow unconfined aquifer.

Area 11 Piezometers – **Figures 15 and 16** illustrate the potentiometric surface of the shallow unconfined aquifer as observed in the Area 11 piezometers on April 8, 2008 and May 5, 2008. These figures illustrate the observed groundwater divide at the Site. Groundwater in the northwest of the Site is observed to flow to the north toward Nancy's Creek. Groundwater in the southeast of the Site is observed to flow to the South toward the Intake Canal and eventually toward the Atlantic Ocean.

Areas 8 and 11 – **Figures 17 and 18** illustrate the potentiometric surface of the shallow unconfined aquifer at Areas 8 and 11 on September 30 and October 20, 2008, respectively. These figures depict a shallow groundwater flow pattern in general agreement with that observed in the area 11 piezometers.

In addition, the groundwater elevation data from the two intermediate depth wells located at Area 9 indicates that groundwater in the intermediate aquifer flows to the south and is not influenced by the various surface features at the Site.

4 SUMMARY AND CONCLUSIONS

Silar Services Incorporated (SSi) has prepared this Sitewide Groundwater Assessment Report (SGAR) to document the results of groundwater assessment activities performed at the Owner Controlled Area (OCA) of the Brunswick Nuclear Plant (BNP), located in Southport, Brunswick County, North Carolina. The purpose of the groundwater assessment was to evaluate hydrogeology and determine the presence of potential radiological impacts to groundwater in various areas of the BNP OCA.

The assessment was initiated to be consistent with industry standard practice and current guidance documents associated with the protection of groundwater resources from radiological materials.

The overall objectives of the groundwater assessment were to provide sampling points to evaluate groundwater quality in order to assess the potential for sources of contamination in various areas of the OCA and, characterize the geology and hydrogeology of the various areas.

Over fifty temporary piezometers, 41 shallow monitoring wells and 5 intermediate depth wells were installed in the eight OCA areas. At each location, groundwater samples were collected and analyzed to determine the presence and concentrations of radiological material in site media. The investigation locations were surveyed by a Professional Land Surveyor licensed in the State of North Carolina to facilitate the evaluation of the chemical and physical data collected during the project. The results are summarized in the following subsections.

4.1 Summary of Groundwater Conditions

Fifty-eight temporary groundwater monitoring wells, forty-one shallow groundwater monitoring wells and five intermediate groundwater monitoring wells were installed. The monitoring well construction diagrams are provided in **Appendix A**. The temporary monitoring wells have been abandoned in accordance with the NCDENR requirements.

Groundwater elevation measurements were obtained from each of the monitoring wells to evaluate the direction of groundwater flow in the study area. The results of the elevation measurements were plotted to develop the potentiometric surface maps presented on **Figures 11 through 18**. Based on the measurements recorded, shallow groundwater in the shallow aquifer flows predominantly to the south, but is influenced by local surface features including the former north dredge spoil pond, Nancy's Creek, the SDSP and the Intake and Discharge Canals. The SDSP and former north dredge spoil pond create radial flow in their vicinity as observed in Areas 5, 6 and 10 and in the northwestern portion of Area 11. The presence of Nancy's Creek and the Canals create a groundwater flow divide such that groundwater in the northwest of the Site is observed to flow to the north toward Nancy's Creek. Groundwater in the southeast of the Site is observed to flow to the South toward the Intake Canal and eventually toward the Atlantic Ocean. The effect of the Discharge Canal is also observed in Areas 3 and 4.

Representative groundwater samples were obtained from each of the temporary and permanent monitoring wells using low-flow groundwater sampling techniques. All groundwater samples were analyzed for tritium in Progress Energy's onsite radiological laboratory. Tritium was detected in only two (2) of the monitoring wells during the first round of groundwater sampling. These were monitoring wells ESS-67C and ESS-73C, both located in Area 1, near the Caswell Beach Pumping Station. These monitoring wells were initially sampled on July 17, 2008. Concentrations of tritium were 491 pCi/L in the groundwater sample from ESS-67C and 439 pCi/L in the groundwater sample from ESS-73C. These two monitoring wells were sampled again on thirteen (13) occasions between August 1, 2008 and April 9, 2009. Results of these samples are tabulated in Appendix B. For monitoring well ESS-67C, tritium was detected during six (6) of the thirteen (13) additional sampling rounds. Concentrations in the additional samples ranged from non-detect to 528 pCi/L detected in monitoring well ESS-67C on August 25, 2008. For monitoring well ESS-73C, tritium was detected during four (4) of the thirteen (13) additional sampling rounds. Concentrations in the additional samples ranged from non-detect to 423 pCi/L detected in monitoring well ESS-73C on August 5, 2008. None of the detected concentrations approached the USEPA MCL for tritium of 20,000 pCi/L.

During the second round of groundwater sampling, tritium analytical results were below the lower limits of detection for groundwater samples collected from all OCA monitoring wells except two. The two monitoring wells, ESS-38C and ESS-39B, are both located in Area 8 – the Dry Fuel Storage Area or ISFSI Pad along with monitoring wells ESS-38B and ESS-39C. Concentrations of tritium were 516.9 pCi/L in the groundwater sample from ESS-38C and 490.1 pCi/L in the groundwater sample from ESS-39B. The ISFSI Pad monitoring wells were sampled a total of seven (7) times from July 2008 through March 2009 as part of a separate investigation of Area 8. Tritium was also detected in groundwater samples from monitoring well ESS-39B in December 2008 and January 2009. No other groundwater samples exhibited detectable tritium concentrations during the investigation.

4.2 Conclusions

Radiological constituents in the form of tritium were observed in groundwater samples from only two of the OCA areas included in this investigation. SSi recommends that groundwater samples be collected annually from all of the OCA monitoring wells as part of an OCA groundwater monitoring program.

Groundwater samples from monitoring wells ESS-67C and ESS-73C are currently collected monthly and results from these sampling events will be evaluated separately from the OCA groundwater monitoring program. In addition, groundwater samples from the four (4) ISFSI pad monitoring wells (ESS-38C, ESS-38B, ESS-39C and ESS-39B) are currently collected monthly. Results from these sampling events will also be evaluated separately from the OCA groundwater monitoring program.

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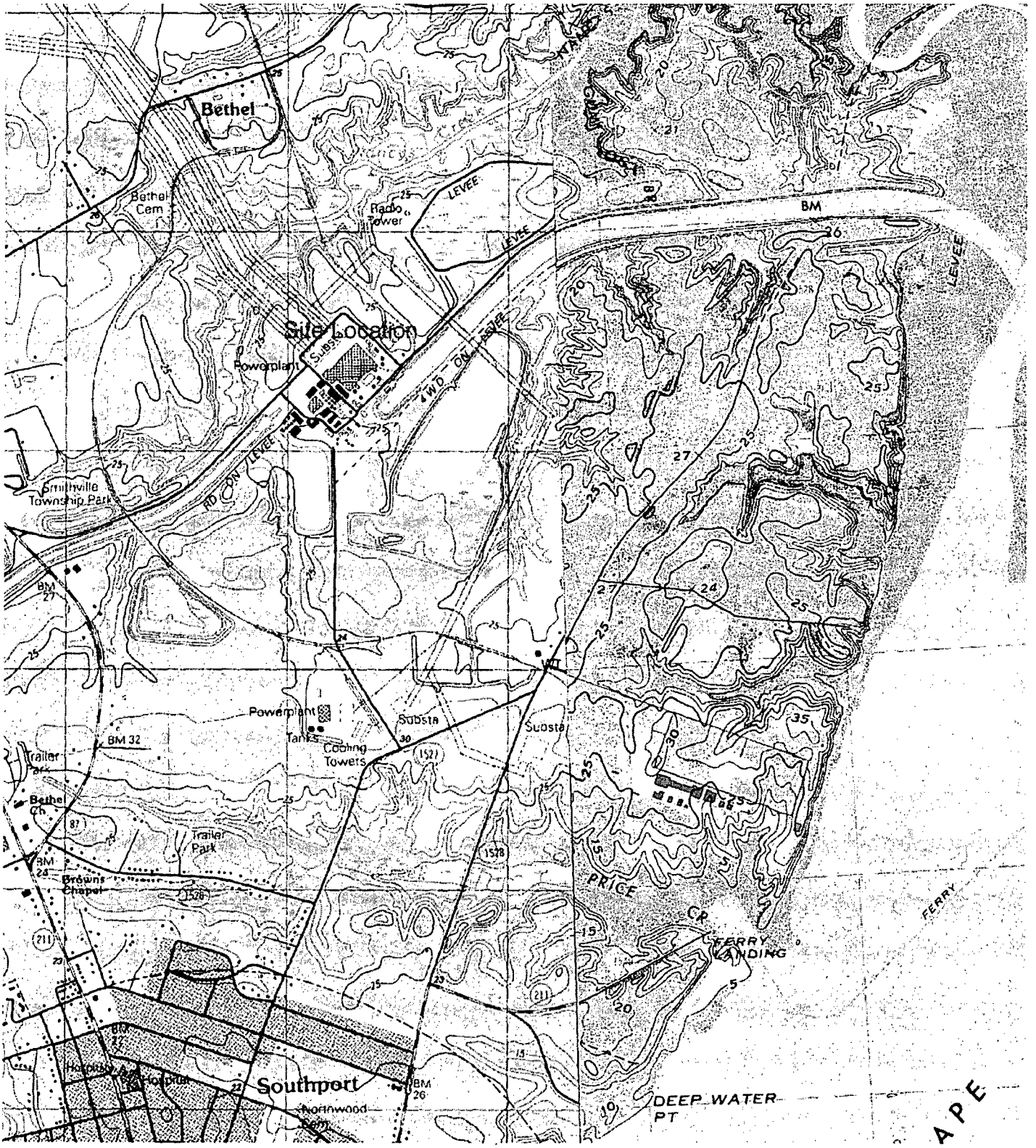
FIGURES



Quadrangle Location

0 2000 4000 Feet

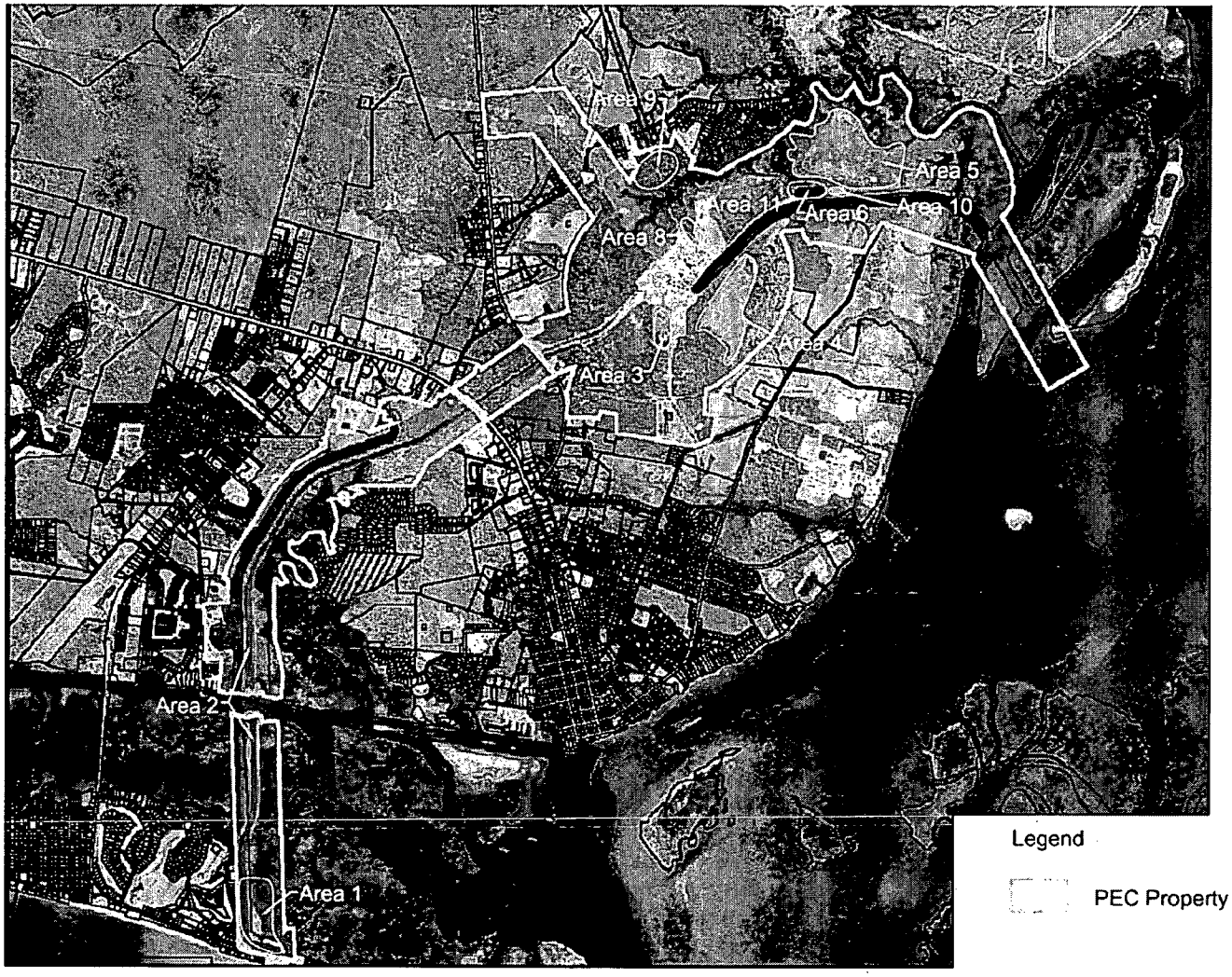
N

Source: U.S.G.S. Topographic Map (7.5 minute)
Southport & Kure Beach, NC quadrangles

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 1
Site Location Map

SSi Silar Services Inc.



Key

Area 1 - Caswell Beach Pumping Station

Area 2 - Discharge Canal

Area 3 - Turbine Rotor Storage Area

Area 4 - Dredge Pond

Area 5 - Dredge Pond

Area 6 - Recovery Pond

Area 8 - Dry Fuel Storage Area

Area 9 - North of Nancy's Creek

Area 10 - Construction Laydown Area

Area 11 - Plant Support Area

Legend

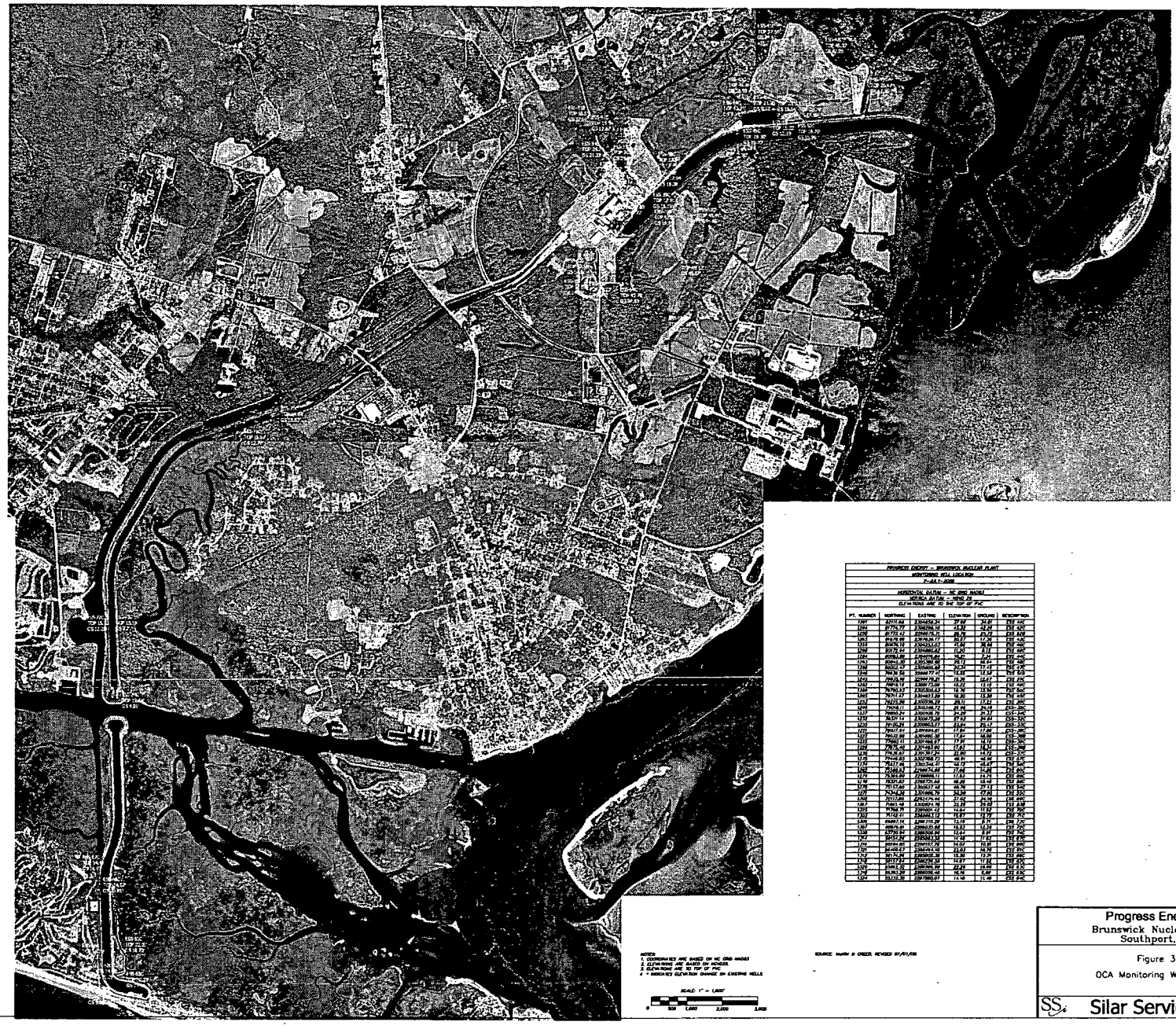
PEC Property

0 0.5 1 2 Miles

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 2
OCA Assessment Areas

Silar Services Inc.



PROGRESS ENERGY - BRUNSWICK NUCLEAR PLANT
MONITORING WELL LOCATION
P-84.7-2008

HORIZONTAL DATUM - NC GRID NAD83
VERTICAL DATUM - NGVD 29
ELEVATIONS ARE TO THE TOP OF PVC

PT. NUMBER	NORTHING	EASTING	ELEVATION	GROUND	DESCRIPTION
1001	82111.68	2,504,532.34	27.68	24.87	OCA-10C
1004	81705.77	2,504,096.10	15.38	12.47	OCA-10D
1005	81723.12	2,504,114.21	25.71	22.71	OCA-11B
1013	81474.98	2,504,136.17	16.67	13.36	OCA-3C
1014	81474.98	2,504,136.17	16.67	13.36	OCA-3C
1015	80779.15	2,504,000.21	15.85	12.98	OCA-4C
1016	80779.14	2,504,000.21	15.80	3.11	OCA-4C
1017	80779.14	2,504,000.21	15.80	3.11	OCA-4C
1024	80556.88	2,504,000.46	16.67	2.21	OCA-5C
1043	80013.30	2,503,991.95	20.13	16.64	OCA-9C
1044	80013.13	2,503,991.95	20.13	16.64	OCA-9C
1045	79439.56	2,504,172.17	16.38	13.49	OCA-9B
1046	79439.56	2,504,172.17	16.38	13.49	OCA-9B
1047	79439.19	2,504,174.27	15.28	12.41	OCA-11C
1048	79439.19	2,504,174.27	15.28	12.41	OCA-11C
1049	79439.13	2,503,994.43	15.19	12.58	OCA-4C
1050	79439.13	2,503,994.43	15.19	12.58	OCA-4C
1051	79711.17	2,504,011.89	18.30	15.39	OCA-3C
1052	79711.17	2,504,011.89	18.30	15.39	OCA-3C
1053	79705.11	2,503,996.72	25.16	24.13	OCA-2C
1054	79705.11	2,503,996.72	25.16	24.13	OCA-2C
1055	79995.42	2,504,000.25	19.27	16.12	OCA-1C
1056	79995.42	2,504,000.25	19.27	16.12	OCA-1C
1057	80130.12	2,503,991.29	27.63	25.01	OCA-10C
1058	80130.12	2,503,991.29	27.63	25.01	OCA-10C
1059	80130.24	2,504,011.17	22.84	20.12	OCA-10B
1060	80130.24	2,504,011.17	22.84	20.12	OCA-10B
1061	79995.84	2,504,000.41	17.84	15.68	OCA-1B
1062	79995.84	2,504,000.41	17.84	15.68	OCA-1B
1063	79995.61	2,504,000.41	17.81	15.12	OCA-1A
1064	79995.61	2,504,000.41	17.81	15.12	OCA-1A
1065	79705.43	2,504,000.25	22.80	19.72	OCA-2B
1066	79705.43	2,504,000.25	22.80	19.72	OCA-2B
1067	79711.20	2,504,011.17	18.11	15.47	OCA-3A
1068	79711.20	2,504,011.17	18.11	15.47	OCA-3A
1069	79439.32	2,504,174.24	15.46	12.46	OCA-11A
1070	79439.32	2,504,174.24	15.46	12.46	OCA-11A
1071	80130.37	2,504,011.17	18.14	15.12	OCA-10A
1072	80130.37	2,504,011.17	18.14	15.12	OCA-10A
1073	79711.20	2,504,011.17	18.11	15.47	OCA-3A
1074	79711.20	2,504,011.17	18.11	15.47	OCA-3A
1075	79705.32	2,503,996.79	25.38	22.80	OCA-2A
1076	79705.32	2,503,996.79	25.38	22.80	OCA-2A
1077	79995.42	2,504,000.21	19.27	16.12	OCA-1C
1078	79995.42	2,504,000.21	19.27	16.12	OCA-1C
1079	80130.12	2,503,991.29	27.63	25.01	OCA-10C
1080	80130.12	2,503,991.29	27.63	25.01	OCA-10C
1081	80130.24	2,504,011.17	22.84	20.12	OCA-10B
1082	80130.24	2,504,011.17	22.84	20.12	OCA-10B
1083	79995.61	2,504,000.41	17.81	15.12	OCA-1A
1084	79995.61	2,504,000.41	17.81	15.12	OCA-1A
1085	79705.43	2,504,000.25	22.80	19.72	OCA-2B
1086	79705.43	2,504,000.25	22.80	19.72	OCA-2B
1087	79711.20	2,504,011.17	18.11	15.47	OCA-3A
1088	79711.20	2,504,011.17	18.11	15.47	OCA-3A
1089	79439.32	2,504,174.24	15.46	12.46	OCA-11A
1090	79439.32	2,504,174.24	15.46	12.46	OCA-11A
1091	80130.37	2,504,011.17	18.14	15.12	OCA-10A
1092	80130.37	2,504,011.17	18.14	15.12	OCA-10A
1093	79711.20	2,504,011.17	18.11	15.47	OCA-3A
1094	79711.20	2,504,011.17	18.11	15.47	OCA-3A
1095	79705.32	2,503,996.79	25.38	22.80	OCA-2A
1096	79705.32	2,503,996.79	25.38	22.80	OCA-2A
1097	79995.42	2,504,000.21	19.27	16.12	OCA-1C
1098	79995.42	2,504,000.21	19.27	16.12	OCA-1C
1099	80130.12	2,503,991.29	27.63	25.01	OCA-10C
1100	80130.12	2,503,991.29	27.63	25.01	OCA-10C
1101	80130.24	2,504,011.17	22.84	20.12	OCA-10B
1102	80130.24	2,504,011.17	22.84	20.12	OCA-10B
1103	79995.61	2,504,000.41	17.81	15.12	OCA-1A
1104	79995.61	2,504,000.41	17.81	15.12	OCA-1A
1105	79705.43	2,504,000.25	22.80	19.72	OCA-2B
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1107	79711.20	2,504,011.17	18.11	15.47	OCA-3A
1108	79711.20	2,504,011.17	18.11	15.47	OCA-3A
1109	79439.32	2,504,174.24	15.46	12.46	OCA-11A
1110	79439.32	2,504,174.24	15.46	12.46	OCA-11A
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1112	80130.37	2,504,011.17	18.14	15.12	OCA-10A
1113	79711.20	2,504,011.17	18.11	15.47	OCA-3A
1114	79711.20	2,504,011.17	18.11	15.47	OCA-3A
1115	79705.32	2,503,996.79	25.38	22.80	OCA-2A
1116	79705.32	2,503,996.79	25.38	22.80	OCA-2A
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1118	79995.42	2,504,000.21	19.27	16.12	OCA-1C
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1120	80130.12	2,503,991.29	27.63	25.01	OCA-10C
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1122	80130.24	2,504,011.17	22.84	20.12	OCA-10B
1123	79995.61	2,504,000.41	17.81	15.12	OCA-1A
1124	79995.61	2,504,000.41	17.81	15.12	OCA-1A
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1126	79705.43	2,504,000.25	22.80	19.72	OCA-2B
1127	79711.20	2,504,011.17	18.11	15.47	OCA-3A
1128	79711.20	2,504,011.17	18.11	15.47	OCA-3A
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1132	80130.37	2,504,011.17	18.14	15.12	OCA-10A
1133	79711.20	2,504,011.17	18.11	15.47	OCA-3A
1134	79711.20	2,504,011.17	18.11	15.47	OCA-3A
1135	79705.32	2,503,996.79	25.38	22.80	OCA-2A
1136	79705.32	2,503,996.79	25.38	22.80	OCA-2A
1137	79995.42	2,504,000.21	19.27	16.12	OCA-1C
1138	79995.42	2,504,000.21	19.27	16.12	OCA-1C
1139	80130.12	2,503,991.29	27.63	25.01	OCA-10C
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1141	80130.24	2,504,011.17	22.84	20.12	OCA-10B
1142	80130.24	2,504,011.17	22.84	20.12	OCA-10B
1143	79995.61	2,504,000.41	17.81	15.12	OCA-1A
1144	79995.61	2,504,000.41	17.81	15.12	OCA-1A
1145	79705.43	2,504,000.25	22.80	19.72	OCA-2B
1146	79705.43	2,504,000.25	22.80	19.72	OCA-2B
1147	79711.20	2,504,011.17	18.11	15.47	OCA-3A
1148	79711.20	2,504,011.17	18.11	15.47	OCA-3A
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1150	79439.32	2,504,174.24	15.46	12.46	OCA-11A
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1153	79711.20	2,504,011.17	18.11	15.47	OCA-3A
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1155	79705.32	2,503,996.79	25.38	22.80	OCA-2A
1156	79705.32	2,503,996.79	25.38	22.80	OCA-2A
1157	79995.42	2,504,000.21	19.27	16.12	OCA-1C
1158	79995.42	2,504,000.21	19.27	16.12	OCA-1C
1159	80130.12	2,503,991.29	27.63	25.01	OCA-10C
1160	80130.12	2,503,991.29	27.63	25.01	OCA-10C
1161	80130.24	2,504,011.17	22.84	20.12	OCA-10B
1162	80130.24	2,504,011.17	22.84	20.12	OCA-10B
1163	79995.61	2,504,000.41	17.81	15.12	OCA-1A
1164	79995.61	2,504,000.41	17.81	15.12	OCA-1A
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1166	79705.43	2,504,000.25	22.80	19.72	OCA-2B
1167	79711.20	2,504,011.17	18.11	15.47	OCA-3A
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1169	79439.32	2,504,174.24	15.46	12.46	OCA-11A
1170	79439.32	2,504,174.24	15.46	12.46	OCA-11A
1171	80130.37	2,504,011.17	18.14	15.12	OCA-10A
1172	80130.37	2,504,011.17	18.14	15.12	OCA-10A
1173	79711.20	2,504,011.17	18.11	15.47	OCA-3A
1174	79711.20	2,504,011.17	18.11	15.47	OCA-3A
1175	79705.32	2,503,996.79	25.38	22.80	OCA-2A
1176	79705.32	2,503,996.79	25.38	22.80	OCA-2A
1177	79995.42	2,504,000.21	19.27	16.12	OCA-1C
1178	79995.42	2,504,000.21	19.27	16.12	OCA-1C
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1181	80130.24	2,504,011.17	22.84	20.12	OCA-10B
1182	80130.24	2,504,011.17	22.84	20.12	OCA-10B
1183	79995.61	2,504,000.41	17.81	15.12	OCA-1A
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1186	79705.43	2,504,000.25	22.80	19.72	OCA-2B
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1189	79439.32	2,504,174.24	15.46	12.46	OCA-11A
1190	79439.32	2,504,174.24	15.46	12.46	OCA-11A
1191	80130.37	2,504,011.17	18.14	15.12	OCA-10A
1192	80130.37	2,504,011.17	18.14	15.12	OCA-10A
1193	79711.20	2,504,011.17	18.11	15.47	OCA-3A
1194	79711.20	2,504,011.17	18.11	15.47	OCA-3A
1195	79705.32	2,503,996.79	25.38	22.80	OCA-2A
1196	79705.32	2,503,996.79	25.38	22.80	OCA-2A
1197	79995.42	2,504,000.21	19.27	16.12	OCA-1C
1198	79995.42	2,504,000.21	19.27	16.12	OCA-1C
1199	80130.12	2,503,991.29	27.63	25.01	OCA-10C
1200	80130.12	2,503,991.29	27.63	25.01	OCA-10C
1201	80130.24	2,504,011.17	22.84	20.12	OCA-10B
1202	80130.24	2,504,011.17	22.84	20.12	OCA-10B
1203	79995.61	2,504,000.41	17.81	15.12	OCA-1A
1204	79995.61	2,504,000.41	17.81	15.12	OCA-1A

NOTES:
1. COORDINATES ARE BASED ON NC GRID NAD83
2. ELEVATIONS ARE BASED ON NGVD29
3. ELEVATIONS ARE TO TOP OF PVC
4. * INDICATES ELEVATION CHANGE ON EXISTING WELLS

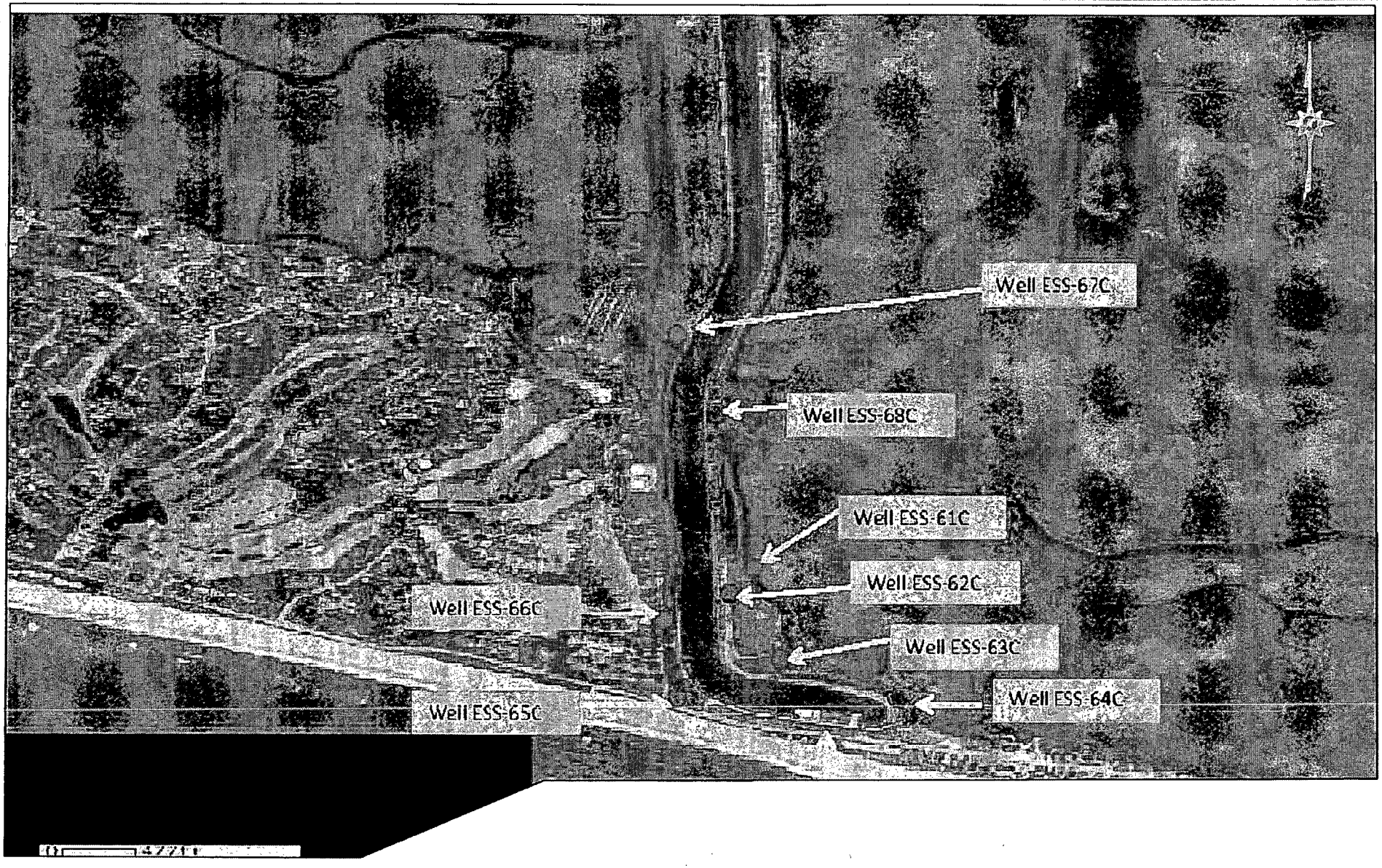
SCALE: 1" = 1,000'
0 500 1,000 2,000 3,000

SOURCE: HARRIS & CREECH, REVISED 07/01/08

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 3
OCA Monitoring Well Locations

Silar Services Inc.



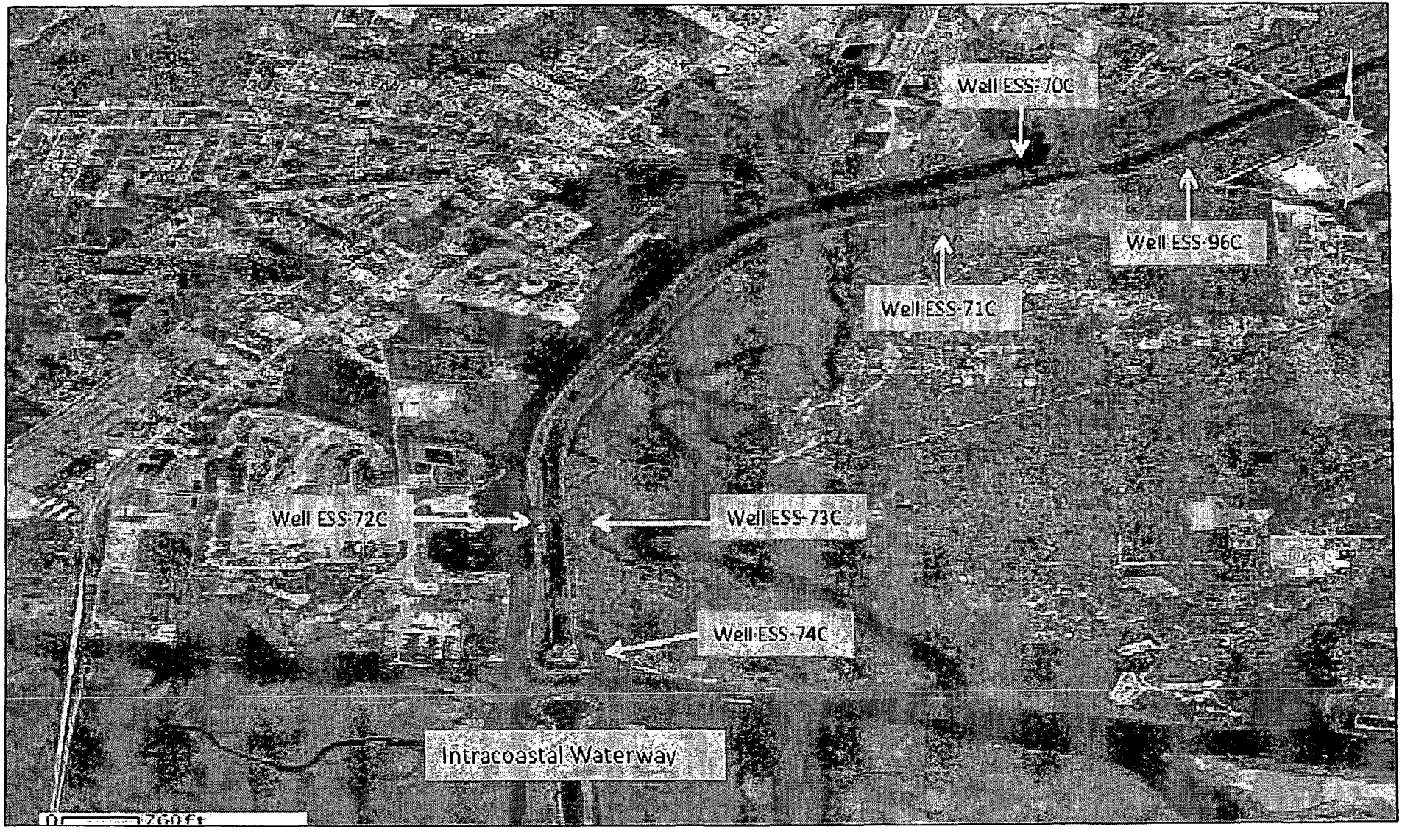
SOURCE:
Brunswick County NC GIS

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 4

Area 1 Monitoring Wells
Near Caswell Beach

Silar Services Inc.



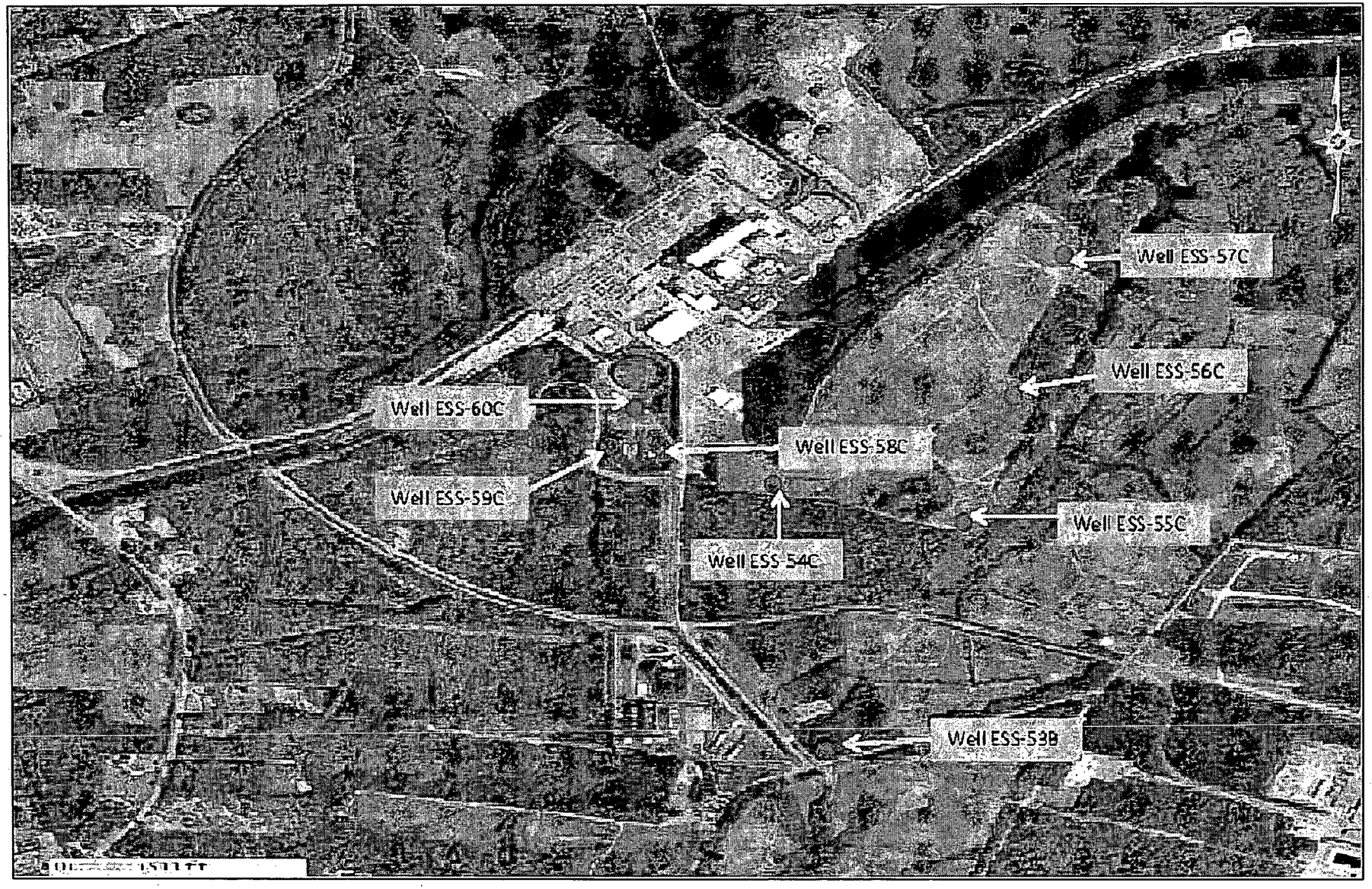
SOURCE:
Brunswick County NC GIS

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 5

Area 1 Monitoring Wells
Near Intercoastal Waterway

SSi Silar Services Inc.

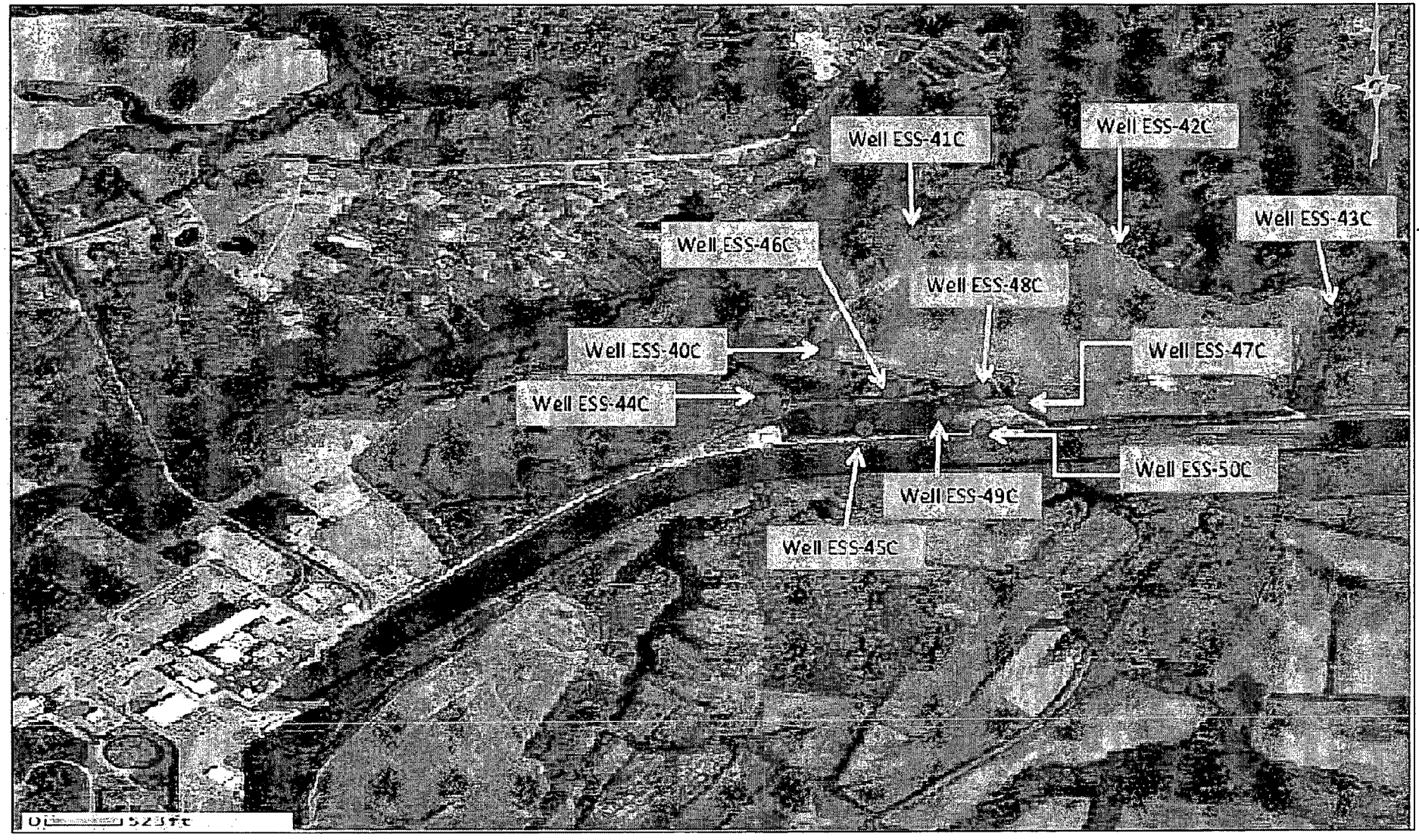


SOURCE:
Brunswick County NC GIS

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 6
Area 3 & 4 Monitoring Wells

Silar Services Inc.



SOURCE:
Brunswick County NC GIS

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 7

Area 5, Area 6 & Area 10 Monitoring Wells

Silar Services Inc.

SOURCE:
McKim & Creed, 2008

NOTES:
1. COORDINATES ARE BASED ON NC GRID NAD83
2. ELEVATIONS ARE BASED ON NGVD29.

LEGEND:

AREA A WELLS

GROUNDWATER FLOW DIRECTION

GROUNDWATER CONTOUR LINE (DASHED WHERE INFERRED)

2.1 ELEVATION MEAN SEA LEVEL

SCALE 1" = 300

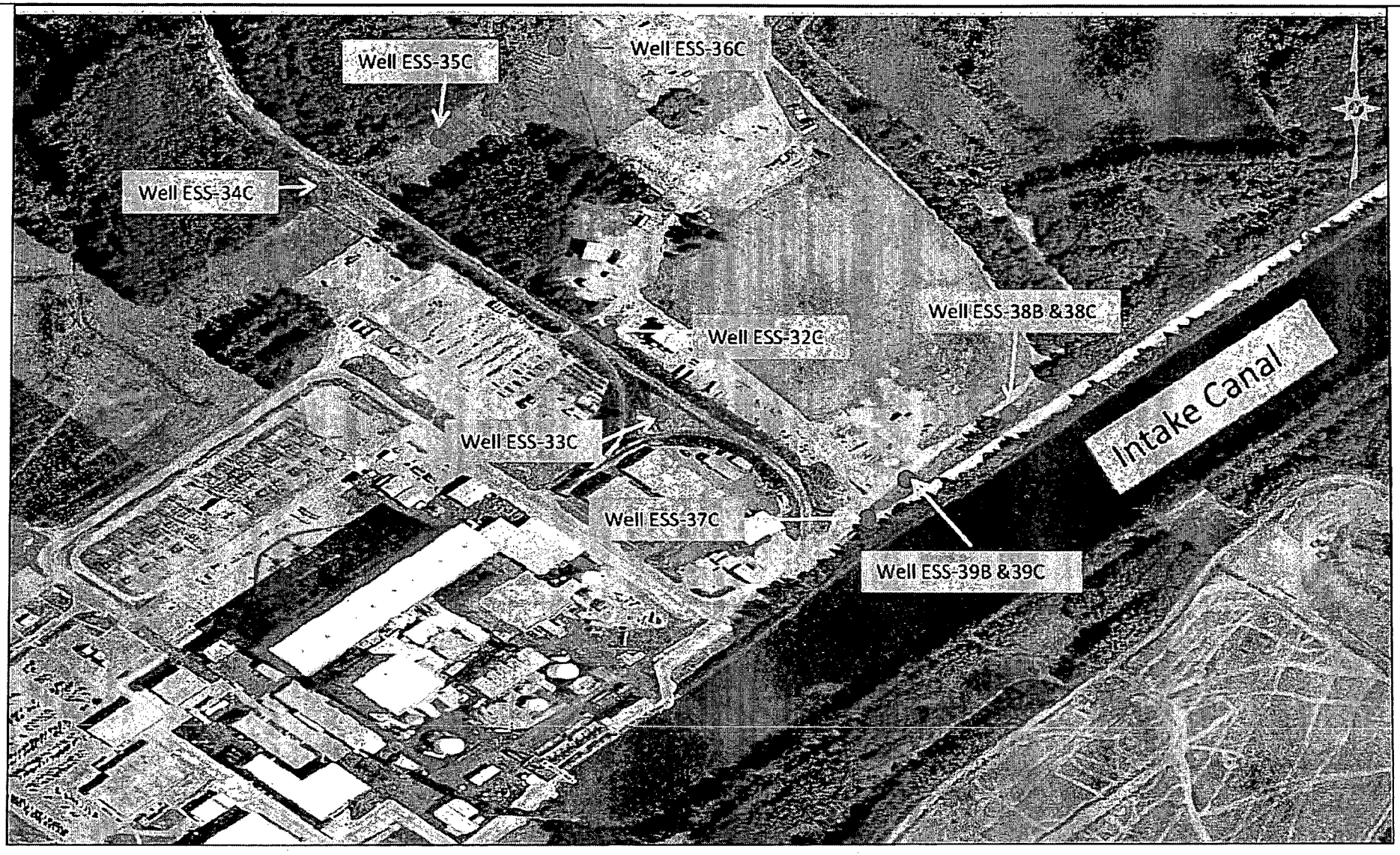
0 150 300 600 1200

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 8

Area11 Piezometers

Silar Services Inc.



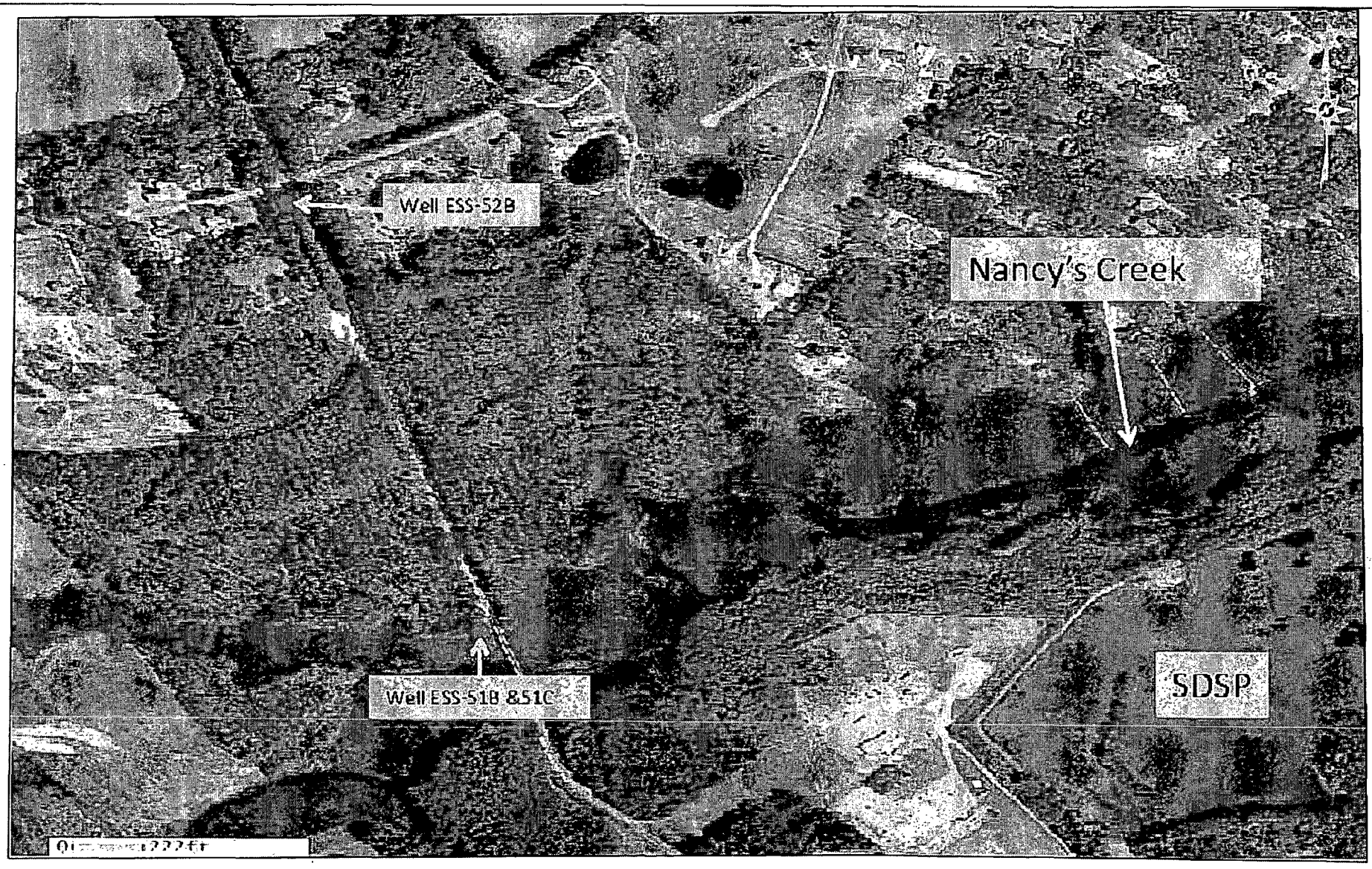
SOURCE:
Brunswick County NC GIS

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 9

Area 8 & Area 11 Monitoring Wells

Silar Services Inc.



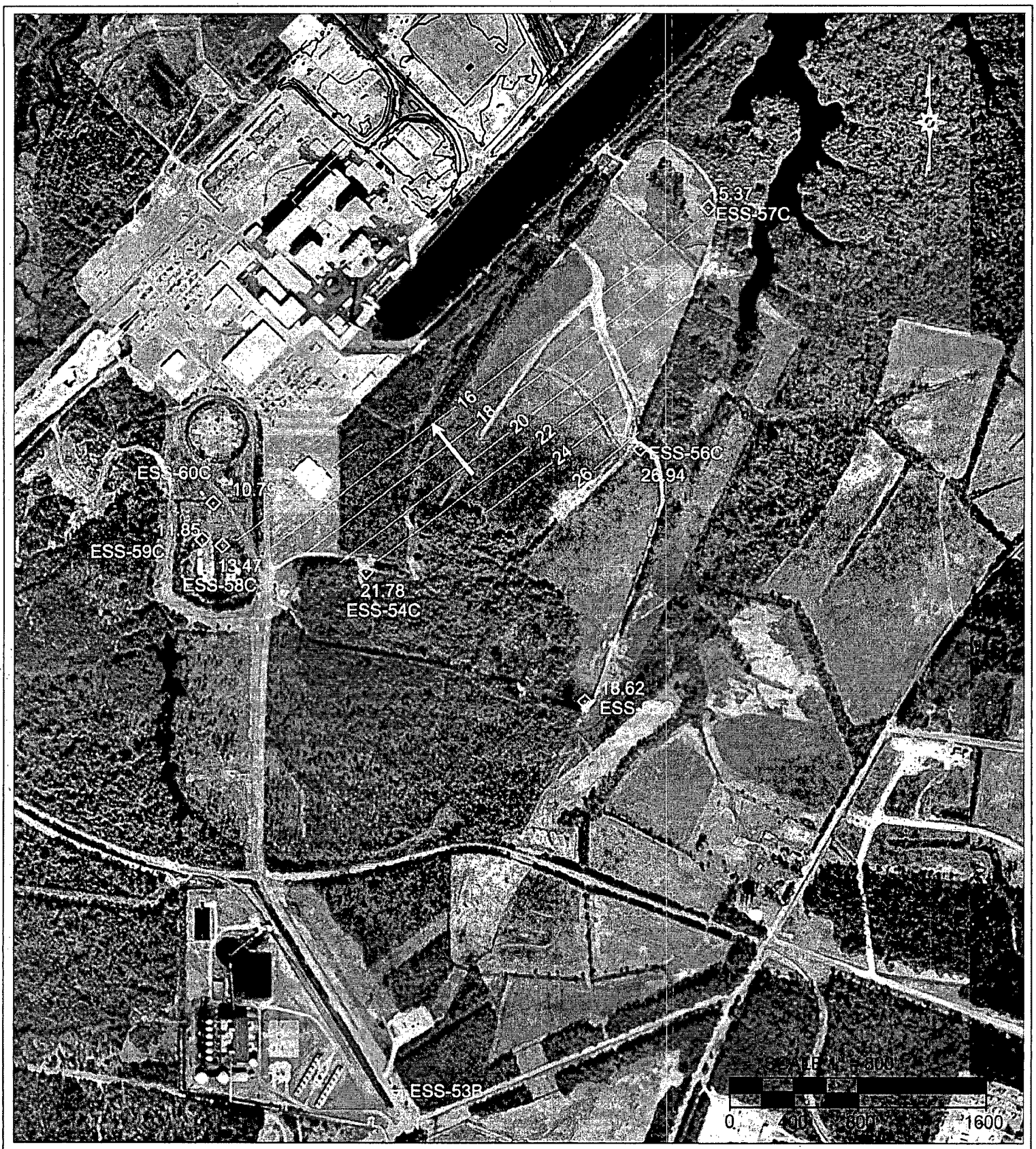
SOURCE:
Brunswick County NC GIS

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 10

Area 9 Monitoring Wells

Silar Services Inc.



SOURCE:
McKim & Creed, 2008

NOTES:
1. COORDINATES ARE BASED ON NC GRID NAD83
2. ELEVATIONS ARE BASED ON NGVD29.

LEGEND:

AREAS 3 & 4 WELLS

GROUNDWATER FLOW DIRECTION

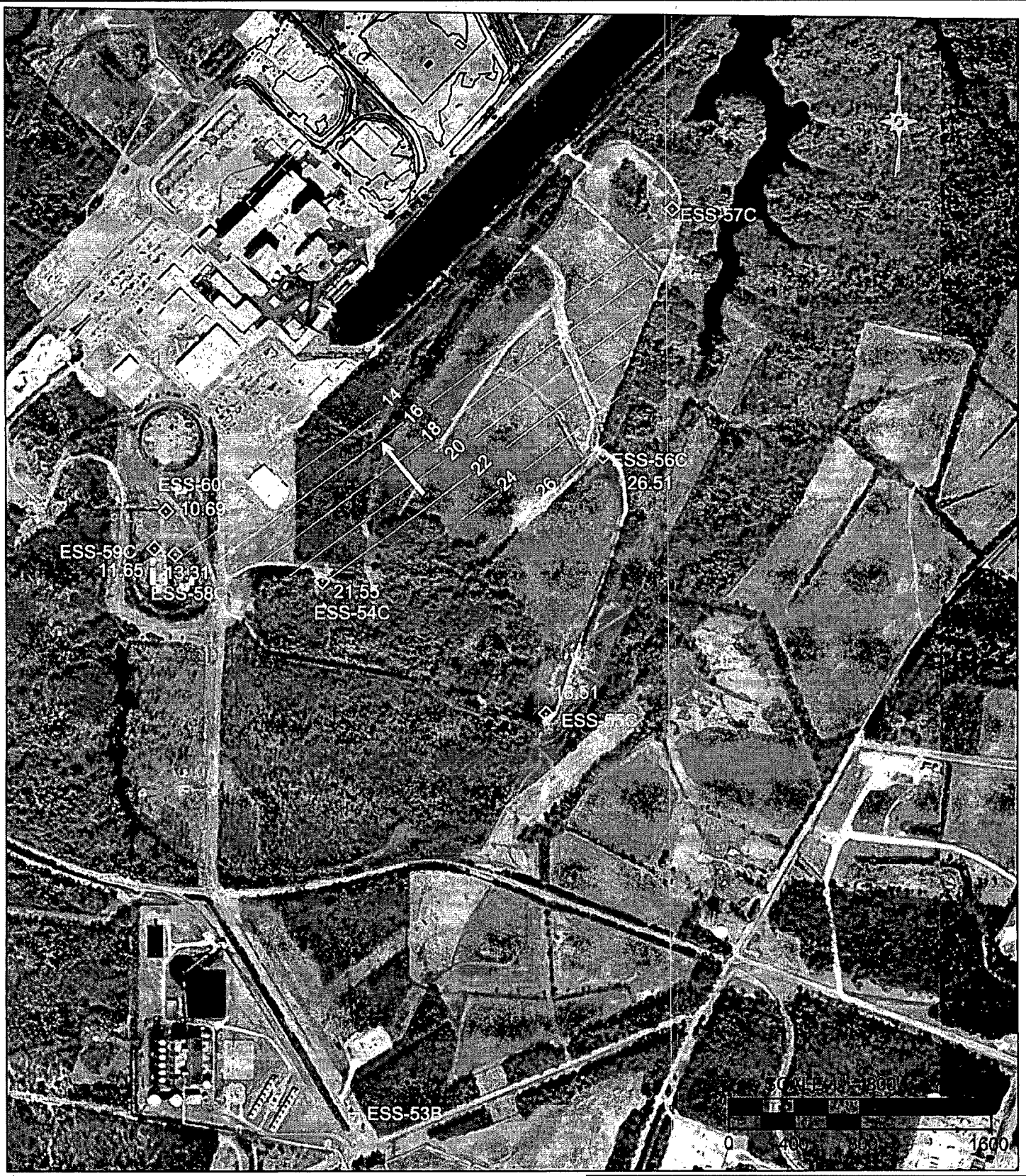
GROUNDWATER CONTOUR LINE (DASHED WHERE INFERRED)

2.1 ELEVATION MEAN SEA LEVEL

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 11
Area 3 and Area 4 Potentiometric Surface
September 30, 2008

Silar Services Inc.



SOURCE:
McKim & Creed, 2008

NOTES:
1. COORDINATES ARE BASED ON NC GRID NAD83
2. ELEVATIONS ARE BASED ON NGVD29.

LEGEND:

AREAS 3 & 4 WELLS

GROUNDWATER FLOW DIRECTION

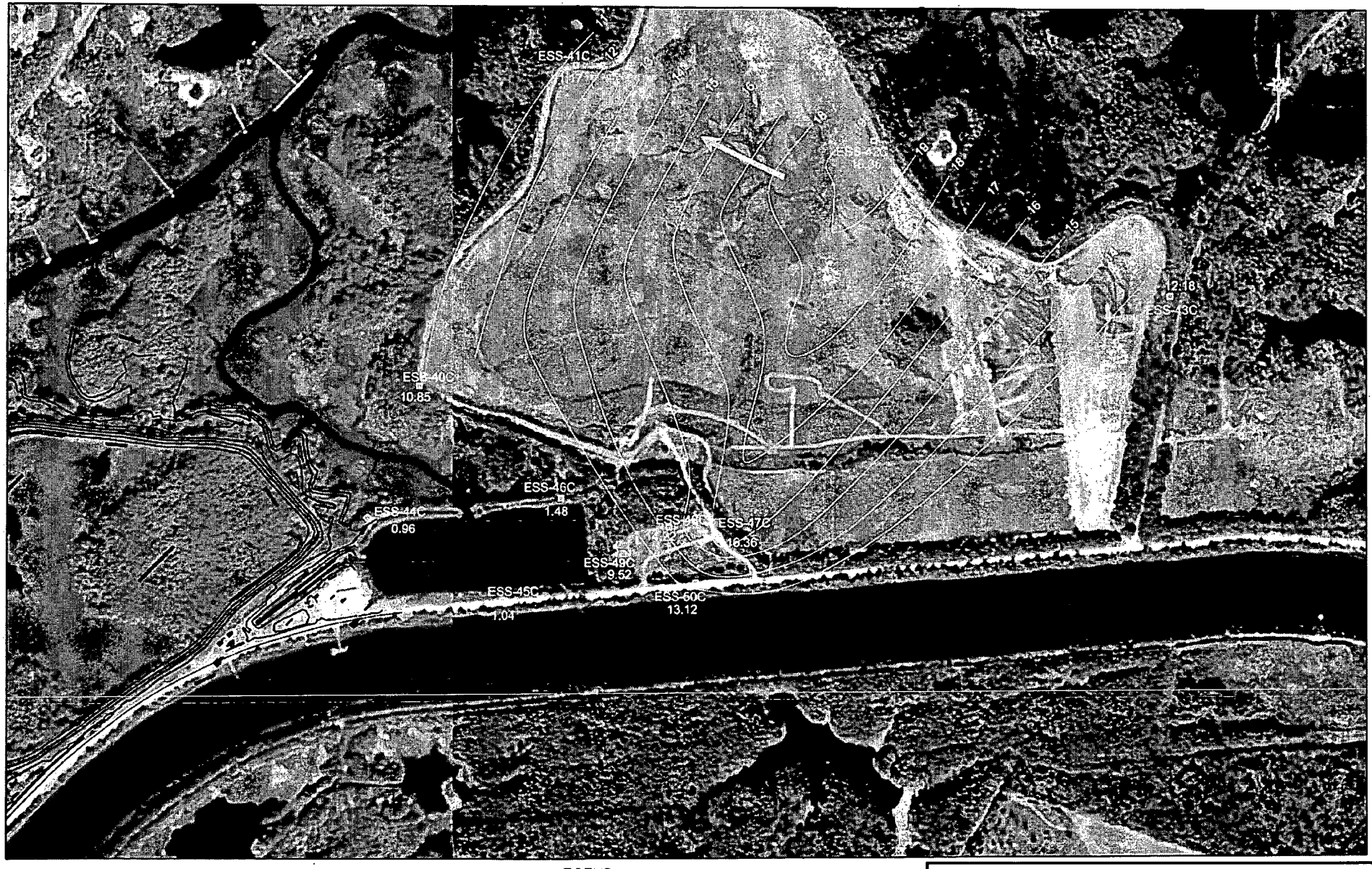
GROUNDWATER CONTOUR LINE (DASHED WHERE INFERRED)

2.1 ELEVATION MEAN SEA LEVEL

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 12
Area 3 and Area 4 Potentiometric Surface
October 20, 2008

SS Silar Services Inc.



SOURCE:
McKim & Creed, 2008

NOTES:
1. COORDINATES ARE BASED ON NC GRID NAD83
2. ELEVATIONS ARE BASED ON NGVD29.

SCALE 1" = 600'

0 300 600 1200

LEGEND:

AREAS 5, 6 & 10 WELLS

GROUNDWATER FLOW DIRECTION

GROUNDWATER CONTOUR LINE (DASHED WHERE INFERRED)

2.1 ELEVATION MEAN SEA LEVEL

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 13
Areas 5, 6 & 10
Groundwater Potentiometric Surface
September 30, 2008

Silar Services Inc.

SOURCE:
McKim & Creed, 2008

NOTES:
1. COORDINATES ARE BASED ON NC GRID NAD83
2. ELEVATIONS ARE BASED ON NGVD29.

SCALE 1" = 600'

0 300 600 1200

LEGEND:

AREAS 5, 6 & 10 WELLS

GROUNDWATER FLOW DIRECTION

GROUNDWATER CONTOUR LINE (DASHED WHERE INFERRED)

2.1 ELEVATION MEAN SEA LEVEL

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 14
Areas 5, 6 & 10
Groundwater Potentiometric Surface
October 20, 2008

Silar Services Inc.

LEGEND:

- AREA A WELLS
- GROUNDWATER FLOW DIRECTION
- GROUNDWATER CONTOUR LINE (DASHED WHERE INFERRED)
- 2.1 ELEVATION MEAN SEA LEVEL

SOURCE:
McKim & Creed, 2008

NOTES:
1. COORDINATES ARE BASED ON NC GRID NAD83
2. ELEVATIONS ARE BASED ON NGVD29.

SCALE 1" = 300

0 150 300 600 1200

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 15
Area11 Piezometers
Groundwater Potentiometric Surface
April 3, 2008

Silar Services Inc.

SOURCE:
McKim & Creed, 2008

NOTES:
1. COORDINATES ARE BASED ON NC GRID NAD83
2. ELEVATIONS ARE BASED ON NGVD29.

LEGEND:

AREA A WELLS

GROUNDWATER FLOW DIRECTION

GROUNDWATER CONTOUR LINE (DASHED WHERE INFERRED)

2.1 ELEVATION MEAN SEA LEVEL

SCALE 1" = 300

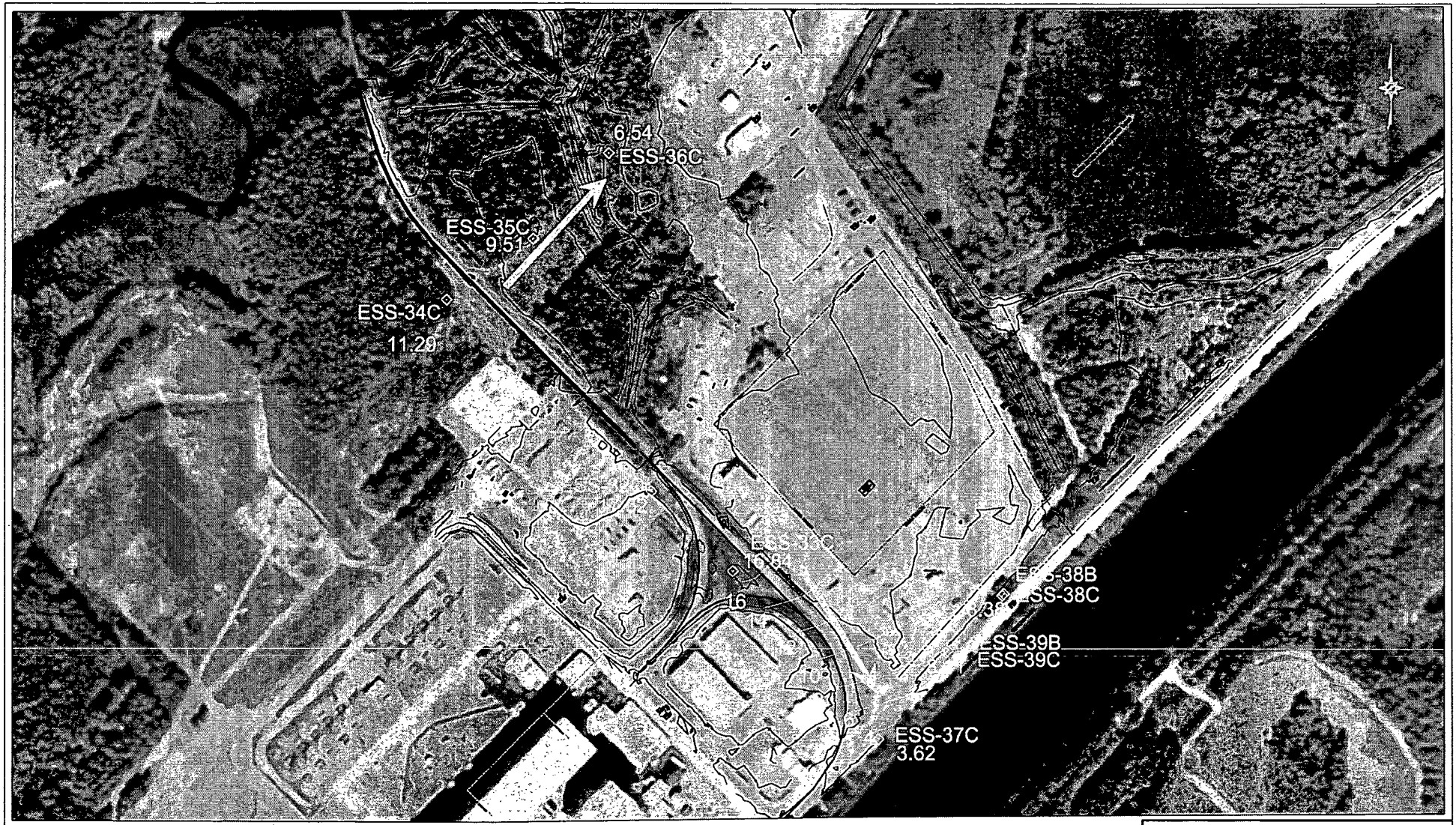
0 150 300 600 1200

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 16

Area11 Piezometers
Groundwater Potentiometric Surface
May 5, 2008

Silar Services Inc.



LEGEND:

- AREA A WELLS
- GROUNDWATER FLOW DIRECTION
- GROUNDWATER CONTOUR LINE (DASHED WHERE INFERRED)
- 2.1 ELEVATION MEAN SEA LEVEL

SCALE 1" = 250'

0 750 500 750

SOURCE:
McKim & Creed, 2008

NOTES:
1. COORDINATES ARE BASED ON NC GRID NAD83
2. ELEVATIONS ARE BASED ON NGVD29.

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 17
Areas 5 & 11
Groundwater Potentiometric Surface
September 30, 2008

Silar Services Inc.

SOURCE:
McKim & Creed, 2008

NOTES:
1. COORDINATES ARE BASED ON NC GRID NAD83
2. ELEVATIONS ARE BASED ON NGVD29.

LEGEND:

AREA A WELLS

GROUNDWATER FLOW DIRECTION

GROUNDWATER CONTOUR LINE (DASHED WHERE INFERRED)

2.1 ELEVATION MEAN SEA LEVEL

SCALE 1" = 250'

0 750 500 750

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 18
Areas 8 & 11
Groundwater Potentiometric Surface
October 20, 2008

Silar Services Inc.

TABLES

TABLE 1 MONITORING WELL LOCATION/RATIONALE SITEWIDE GROUNDWATER ASSESSMENT BRUNSWICK NUCLEAR PLANT SOUTHPORT, NORTH CAROLINA		
AREA	**MONITORING WELL NUMBERS**	**LOCATION/RATIONALE**
Caswell Beach Pumping Station (Area 1)	ESS-61C through ESS-66C (shallow)	Characterize subsurface geology and groundwater quality in the vicinity of the pumping station. Oak Island potable water supply well is located approximately 1.5 miles west northwest of the pumping station.
Discharge Canal (Area 2)	ESS-67C through ESS-74C (shallow)	Characterize subsurface geology and groundwater quality along the discharge canal.
Turbine Rotor Storage Area/Training Center (Area 3)	ESS-58C through ESS-60C (shallow)	Characterize subsurface geology and groundwater quality in this area.
Dredge Spoil Pond (south of intake canal) (Area 4)	ESS-54C through ESS-57C (shallow) and ESS-53B (intermediate)	Characterize subsurface geology and groundwater quality in the vicinity of the southern dredge spoil pond. Shallow wells installed on southern side of the pond between the pond and the boundary of the owner control area. Intermediate well installed to provide groundwater quality data on intermediate aquifer downgradient from the plant area.
Dredge Spoil Pond (north of intake canal) (Area 5)	ESS-40C through ESS-43C (shallow)	Characterize subsurface geology and groundwater quality in the vicinity of the northern dredge spoil pond. Wells installed on northern side of the pond between the pond and Nancy's Creek.
Recovery Pond (Area 6)	ESS-44C through ESS-46C (shallow)	Characterize subsurface geology and groundwater quality in the vicinity of the recovery pond. Wells installed at the northeast and northwest corners of the pond and between the pond and intake canal.

TABLE 1 MONITORING WELL LOCATION/RATIONALE SITEWIDE GROUNDWATER ASSESSMENT BRUNSWICK NUCLEAR PLANT SOUTHPORT, NORTH CAROLINA		
AREA	**MONITORING WELL NUMBERS**	**LOCATION/RATIONALE**
Dry Fuel Storage Area (Area 8)	ESS-38C/ESS-38B and ESS-39C/ESS-39B (Shallow/intermediate pairs)	Monitor potential affect of dry fuel storage installation on groundwater quality. Installed two shallow and intermediate monitoring well pairs between the proposed dry fuel storage pad and the intake canal.
North of Nancy's Creek (Area 9)	ESS-51C (shallow) and ESS-51B and ESS-52B (intermediate)	Characterize subsurface geology and groundwater quality in the area north of Nancy's Creek. Installed one shallow and two intermediate monitoring wells.
Construction Laydown Area (Area 10)	ESS-47C through ESS-50C (shallow)	Characterize subsurface geology and groundwater quality in this area which appears to have been used as an impoundment during plant construction. Installed four shallow monitoring wells.
Plant Support Area (Area 11)	ESS-32C through ESS-37C (shallow)	Characterize subsurface geology and groundwater quality in the areas near NPDES Outfall No. 8 and the area north of the landfill along railroad track. Initial activities included groundwater screening using Geoprobe and/or hydropunch techniques. Groundwater samples collected on a grid through this area and analyzed. Six shallow wells installed based on the groundwater screening results.

Table 2
Water Elevation Measurements
OCA Report
Brunswick Nuclear Plant, Southport, NC

Monitoring Well Identification	Area	Top of Casing (TOC) Elevation[7] (feet above MSL)	9/30/2008		10/20/2008	
			Depth to Water (feet from TOC)	Groundwater Elevation (feet above MSL)	Depth to Water (feet from TOC)	Groundwater Elevation (feet above MSL)
ESS 32-C	11	27.62	10.10	17.52	10.33	17.29
ESS 33-C	11	23.64	6.80	16.84	6.97	16.67
ESS 34-C	11	24.29	13.00	11.29	12.33	11.96
ESS 35-C	11	26.95	17.44	9.51	17.51	9.44
ESS 36C	11	20.11	13.57	6.54	12.79	7.32
ESS 37-C	11	22.80	19.18	3.62	20.04	2.76
ESS 38-B	8	17.94	NM	NM	16.49	1.45
ESS 38-C	8	17.84	9.46	8.38	10.30	7.54
ESS 39-B	8	17.93	NM	NM	16.49	1.44
ESS 39-C	8	17.91	9.80	8.11	10.62	7.29
ESS 40C	5	41.86	31.01	10.85	31.64	10.22
ESS 41C	5	37.66	26.49	11.17	26.52	11.14
ESS 42C	5	45.32	25.44	19.88	25.71	19.61
ESS 43C	5	20.67	8.49	12.18	8.91	11.76
ESS 44C	6	10.21	9.25	0.96	9.31	0.90
ESS 45C	6	18.30	17.26	1.04	17.51	0.79
ESS 46C	6	11.20	9.72	1.48	11.88	(0.68)
ESS 47C	10	20.34	3.98	16.36	4.33	16.01
ESS 48C	10	20.12	5.90	14.22	6.08	14.04
ESS 49C	10	15.22	5.70	9.52	5.78	9.44
ESS 50C	10	18.76	5.64	13.12	6.02	12.74
ESS 51B	9	15.55	11.43	4.12	10.74	4.81
ESS 51C	9	15.36	12.20	3.16	12.36	3.00
ESS 52B	9	28.78	21.04	7.74	21.33	7.45
ESS 53B	4	32.25	29.25	3.00	29.41	2.84
ESS 54C	4	40.78	19.00	21.78	19.23	21.55
ESS 55C	4	50.50	31.88	18.62	31.99	18.51
ESS 56C	4	49.12	22.18	26.94	22.61	26.51
ESS 57C	4	48.91	33.54	15.37	33.93	14.98
ESS 58C	3	18.20	4.73	13.47	4.89	13.31
ESS 59C	3	17.83	5.98	11.85	6.18	11.65
ESS 60C	3	17.68	6.89	10.79	6.99	10.69
ESS 61C	1	22.03	19.49	2.54	14.58	7.45
ESS 62C	1	14.67	12.30	2.37	9.80	4.87
ESS 63C	1	22.29	19.42	2.87	17.48	4.81
ESS 64C	1	14.18	11.59	2.59	11.47	2.71
ESS 65C	1	10.16	6.56	3.60	7.29	2.87
ESS 66C	1	15.30	12.32	2.98	12.54	2.76
ESS 67C	2	14.48	12.76	1.72	12.12	2.36
ESS 68C	2	14.07	11.31	2.76	11.53	2.54
ESS 69C	2	37.02	26.19	10.83	26.21	10.81
ESS 70C	2	14.64	11.89	2.75	11.86	2.78
ESS 71C	2	15.67	11.08	4.59	11.16	4.51
ESS 72C	2	15.23	11.89	3.34	11.41	3.82
ESS 73C	2	13.19	8.12	5.07	8.47	4.72
ESS 74C	2	12.64	9.92	2.72	9.52	3.12

Notes:

NM - not measured

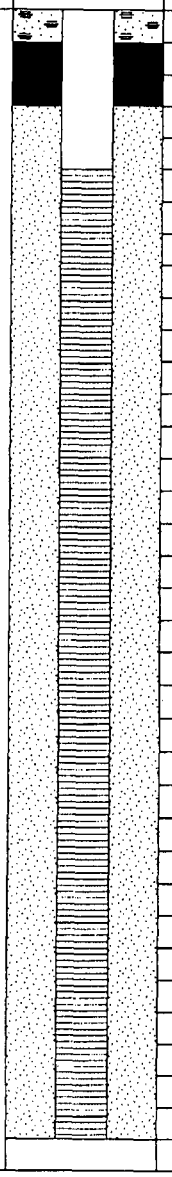
Appendix A

Boring Logs/Well Construction Diagrams

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	5/20/08
Boring Dia:	6.5 Inches	Boring Number:	ESS-32C

Logged By: Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					light brown silt, loose and dry
					light tan fine grain sand, loose, md. stiff, dry
			5		gray fine grain sand, md. stiff, moist @ 6' bgs
					gray/brown sandy clay, md. stiff, dry
			10		gray/brown clayey fine grain sand, md. stiff, moist
					gray clayey fine grain sand, md. stiff, moist
			15		gray clayey fine grain sand, md. stiff, moist
			20		gray clayey fine grain sand, md. stiff, moist
			25		gray/brown clayey fine grain sand, loose, wet
			30		brown clayey fine grain sand, loose, wet
			35		blue clay, trace shell fragments, stiff, sticky, dry

Completion Notes:

Well consists of 30' of 0.010" slot 2" PVC screen with solid 2" PVC riser.. Steel protective casing with locking top. Ground elevation 24.64', casing 27.62'

Site:

BNP -OCA

Southport, NC

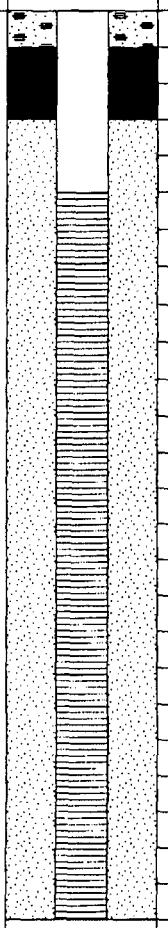
Project No.:

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	5/20/08
Boring Dia:	6.5 Inches	Boring Number:	ESS-33C

Logged By: Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					light to dark brown silty sand, loose and dry
					gray fine grain sand, md.firm, slightly moist
			5		light to dark gray clayey fine grain sand, md. firm, moist
			10		light gray clayey fine grain sand, soft, saturated
			15		dark gray clayey fine grain sand, md. firm, tr gravel and shell, moist
			20		NO RECOVERY
			25		blue gray clay, trace shell, firm, slightly moist
			30		blue gray clay and shell fragments, firm, slightly moist



Completion Notes:

Well consists of 20' of 0.010" slot 2" PVC screen with solid 2" PVC riser. Steel protective casing with locking top. Ground elevation 20.47', casing 23.64'

Site:

BNP -OCA

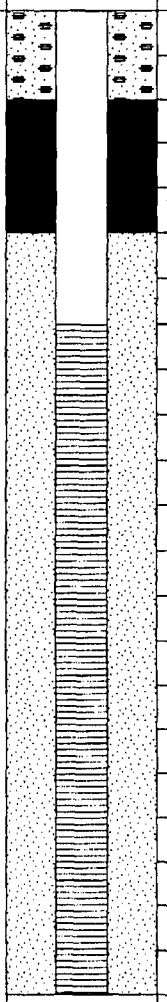
Southport, NC

Project No.:

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	5/21/08
Boring Dia:	6.5 Inches	Boring Number:	ESS-34 C

Logged By: Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					dark brown silt and organic material, loose and dry
					lite brown silty very fine grain sand, md.dense very slightly moist
			5		A/A
					orange/gray clayey very fine grain sand, md.dense (well sorted) moist
			10		A/A
					gray clayey fine grain sand, md.loose saturated
					drk brown silty clayey fine grained sand. md.loose, saturated
			15		A/A
					blue silty clay, md. loose, saturated
			20		A/A
					blue clay, md.stiff becoming stiff by 25' bgs. very slightly moist to dry
			25		

Completion Notes:

Well consists of 15' of 0.010" slot 2" PVC screen with solid 2" PVC riser. Steel protective casing with locking top. Ground elevation 21.33', casing 24.29'

Site:

BNP -OCA

Southport, NC

Project No.:

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	5/21/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	ESS 35C	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					dark brown silt and organic material, very slightly moist
					light and dark brown silt and fine grain sand, md. loose, dry
			5		light tan fine grain sand, well sorted, dry
					md. brown fine grain sandy clay, stiff, dry
			10		light brown and orange fine grain sand, dry, well sorted
					gray clayey fine grain sand, moist
			15		orange and gray clayey fine to md.grain sand, md.loose, saturated
			20		blue clay, gummy, md.stiff, very slightly moist to dry

Completion Notes:

Well consists of 15' of 0.010" slot 2 " PVC screen with 2" solid PVC riser. Steel protective casing with locking top. Ground elevation 24.10', casing 26.95'

Site:

BNP - OCA

Southport, NC

Project No.:

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	5/22/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	ESS-36C	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					dark brown silt and organic material, loose and dry
					light brown silt and fine grain sand, loose, dry
			5		dark gray clayey fine grain sand, md. dense, slightly moist
			10		A/A, moist
					light tan fine grain sand, loose, well sorted, saturated
			15		tan clayey fine sand, md.dense, saturated
					dark gray/ blue silty soft clay, wet
			20		blue silty shelly clay, md.stiff, very slightly moist to dry
			25		NO RECOVERY - tube empty, shoe coated in blue soft clay
			30		

Completion Notes:

Well consists of 15' of 0.010" slot 2 " PVC screen with 2" solid PVC riser. Steel protective casing with locking top. Ground elevation 17.25', casing 20.11'

Site:

BNP - OCA

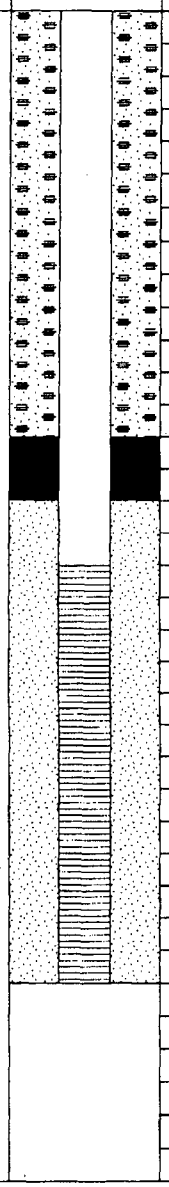
Southport, NC

Project No.:

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	5/27/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	ESS-37C	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					dark brown sandy silt, loose, dry
					orange and tan clayey fine grain sand, md. dense, dry
			5		orange and brown clayey fine grain sand, md.dense, dry
					gray silty clay, soft, gummy, dry
			10		gray-dark gray, silty, fine grain sandy clay, md.firm, very slightly moist
			15		A/A
					dark gray clayey fine grain sand, loose, wet
					gray silty clay, md. firm to very firm, dry
			20		gray silty clay, very soft, saturated
			25		gray/blue sandy shelly clay, soft to md. firm, wet
			30		gray clayey fine grain sand, loose to md dense, saturated
			35		



Completion Notes:

Well consists of 10' of 0.010" slot 2 " PVC screen with 2" solid PVC riser. Steel protective casing with locking top. Ground elevation 19.72', casing 22.80'

Site:

BNP

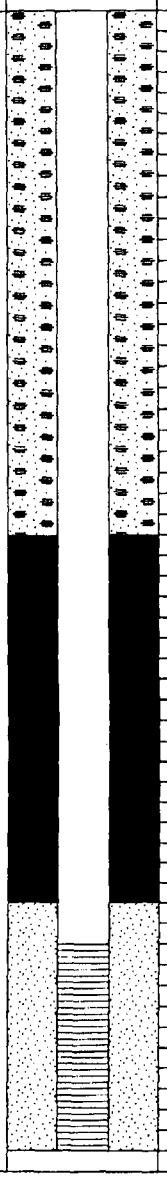
Southport , NC

Project No.:

Page 1

BORING LOG

Drill Rig:	Dietrich	Date Drilled:	6/12/08	Logged By:	
Boring Dia:	8 Inches	Boring Number:	ESS-38B	Bryan Sladky	

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
			5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55		see log for ESS-38C gray silty clay, dry w/ some wet lenses 6" PVC casing set at 31' bgs gray-greenish gray md.-coarse grain sand

Completion Notes:

8" ID HSAs to 31' bgs. Set 6" PVC casing to 31' bgs. 5 7/8" rotary to 55' bgs. Well consists of 10' of 0.010" slot 2 " PVC screen set at 55' bgs with solid 2" PVC riser. Steel protective casing with locking top. Ground elevation 18.08', casing 17.94'.

Site:

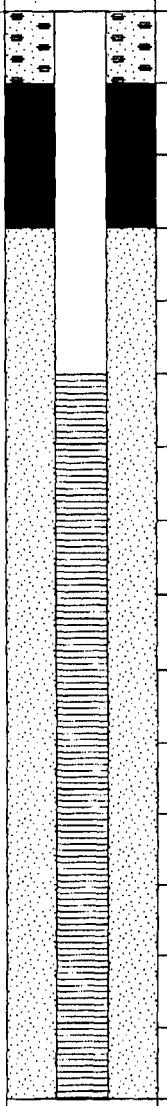
BNP - OCA

Southport, NC

Project No.:

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	5/27/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	ESS-38C	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					light brown- brown fine grain sand
					gray fine grain sand grading to silty clay
					gray silty clay
			5		brown md. to fine grain sand transitioning to gray sand at 7' bgs
					gray to dark gray silt
			10		
					gray fine to md. grain sand, saturated
					gay to dark gray silty clay
			15		

Completion Notes:

Well consists of 10' of 0.010" slot 2 " PVC screen with 2" solid PVC riser. Steel protective casing with locking top. Ground elevation 17.86', casing 17.84'.

Site:

BNP - OCA

Southport, NC

Project No.:

BORING LOG

Drill Rig:	Dietrich	Date Drilled:	6/12/08	Logged By:
Boring Dia:	8 Inches	Boring Number:	ESS-39B	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
			5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55		see log for ESS-39C gray silty clay, dry w/ some shells A/A grading to silty clay @ 32.5-33- bgs, 6" PVC casing set at 33' bgs gray-greenish gray md.-coarse grain sand

Completion Notes:

8" ID HSAs to 33' bgs. Set 6" PVC casing to 33' bgs. 5 7/8" rotary to 55' bgs. Well consists of 10' of 0.010" slot 2" PVC screen set at 55' bgs with solid 2" PVC riser. Steel protective casing with locking top. Ground elevation 18.34', casing 17.93'.

Site:

BNP - OCA

Southport, NC

Project No.:

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	5-28-08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	ESS-39C	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					gray-dark brown silt and fine grain sand
					brown fine grain sand, moist
					gray fine- medium grain sand, wet
			5		gray silt
					gray fine grain sand with silt and traces of shell fragments
			10		A/A, saturated
					gray fine-medium grain sand
					gray medium sand (good water zone)
					gray silt and clay
			15		A/A
					A/A grading to fine grain sand
					gray medium to fine grain sand
					gray fine grain sand with tr silt
			20		

Completion Notes:

Well consists of 10' of 0.010" slot 2 " PVC screen with 2" solid PVC riser. Steel protective casing with locking top. Ground elevation 18.19', casing 17.91'

Site:

BNP - OCA

Southport, NC

Project No.:

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	6/2/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	ESS-40C	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					light brown clayey silt, tr fine grain sand, cohesive, low plasticity
			5		brown-gray silt
					dark gray sand and silt w/shells, dredge material
					dark brown/black organic layer, tr fine grain sand, some root material
					light brown fine grain sand, tr silt, low moisture, non cohesive
			10		A/A, increasing moisture, 3" silty layer @ 14-14.25
			15		dark brown silty clay, cohesive, tight, low moisture, high plasticity
			20		light brown sandy silty clay becomes less clayey @ 20, med moisture
					brown gray sandy silty clay, low moisture, high plasticity
					light brown-light gray silty fine grain sand, wet
			25		light brown-gray silty fine grain sand, wet
			30		light gray clay, stiff
			35		

Completion Notes:

Well consists of 10' of 0.010" slot 2" PVC screen with solid 2" PVC riser. Steel protective casing with locking top. Ground elevation 38.69', casing 41.86'

Site:

BNP - OCA

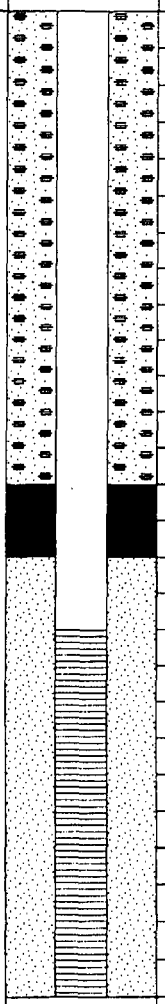
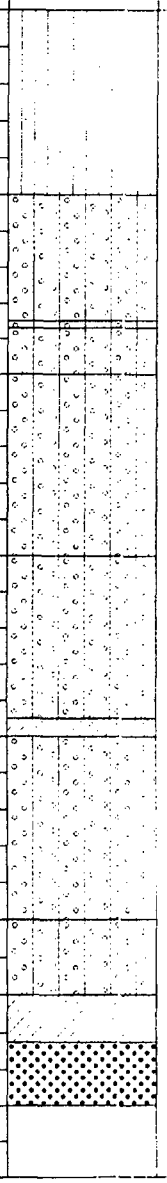
Southport, NC

Project No.:

Page 1

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	6/3/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	ESS-41C	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					dark brown silt and clay silt with traces of fine sand, bottom inch light brown fine grain sand, loose, moist
			5		light brown fine grain sand, siltier with depth
					black silty fine grain sand
			10		light brown/grey clayey silty sand, moist, firm, cohesive
					light brown/reddish brown silty fine grain sand to sandy silty clay, stiff, cohesive, mod. plastic, moist
			15		light brown fine grain sand, increasing clay content w/ depth, wet
			20		grey clay, red mottling
					light brown/grey silty fine grain sand, tr clay grading to gray silty sand, wet
			25		A/A, saturated
					gray clay, firm cohesive, plastic
					light brown med. grain sand, tr silt, saturated
			30		

Completion Notes:

Well consists of 10' of 0.010" slot 2" PVC screen with solid 2' PVC riser. Steel protective casing with locking top. Ground elevation 34.81', casing 37.66'

Site:

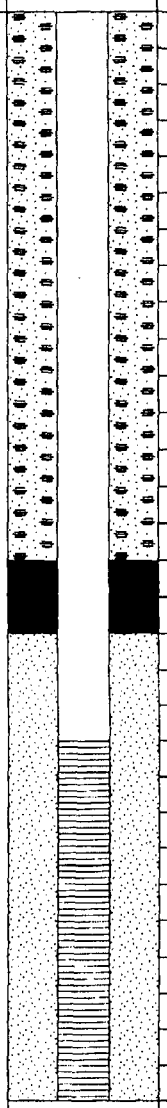
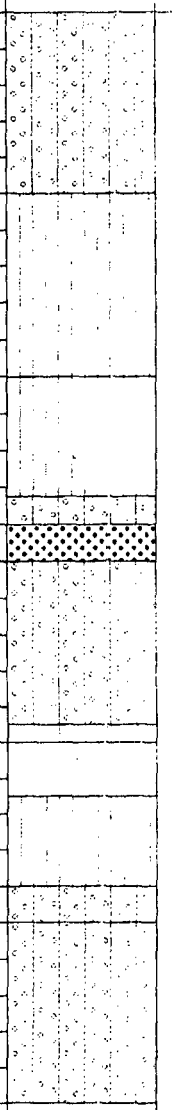
BNP - OCA

Southport, NC

Project No.:

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	6/4/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	ESS-42 C	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					light brown silty fine grain sand and sandy silt, moist, mod. cohesive
			5		dark gray clayey silt. @ 7.5' bgs plant roots, cohesive, firm, moist
			10		brown clayey sandy silt, moist, non cohesive
					gray shelly silt and fine grain sand (dredge material)
					light brown fine grain sand
			15		light brown fine grain sand, some shelly material, moist, gradual change to dark gray silty sand, saturated
			20		black silt, root material dark brown fine-medium grain sand, saturated
					dark gray silt, tight, cohesive, some root material
			25		light brown silty fine-md. grain sand. tight, cohesive, saturated A/A, more clayey silt @ base
			30		

Completion Notes:

Well consists of 10' of 0.010" slot 2" PVC screen with solid 2" PVC riser. Steel protective casing with locking top. Ground elevation 42.26', casing 45.32'

Site:

BNP - OCA

Southport, NC

Project No.:

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	6/4/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	ESS-43C	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					light brown to dark brown silty fine grain sand, dry, loose, cohesive, becoming siltier w/ depth, moist @ 4' bgs
			5		light brown fine-med grain sand
					gray fine-med grain sand, increasing silt w/ depth, cohesive, saturated
			10		gray clayey silt w/ tr fine grain sand, moist, low plasticity, soft
					grey fine to md. grain sand, saturated, loose
			15		dark gray silty fine grain sand, moderatly cohesive, saturated
					dark gray sandy silt, dense
			20		

Completion Notes:

Well consists of 10' of 0.010" slot 2" PVC screen with solid 2" PVC riser. Steel protective casing with locking top. Ground elevation 17.36', casing 20.67'

Site:

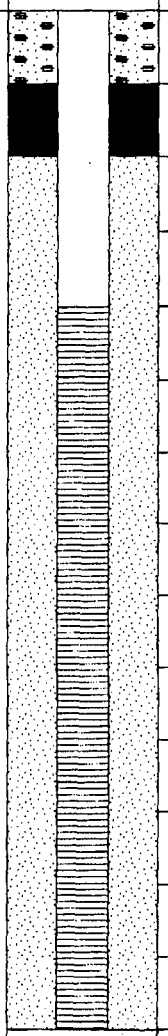
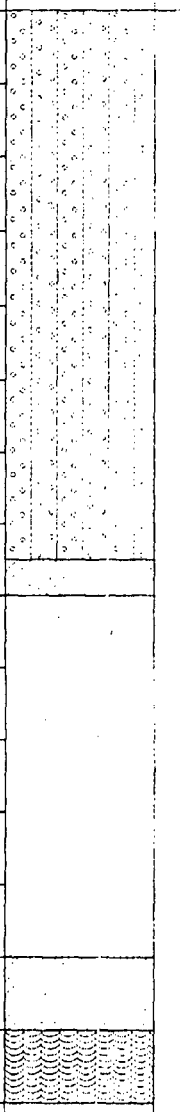
3NP - OCA

Southport , NC

Project No.:

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	6/5/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	ESS-44C	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
			5 10 15		light brown s lty fine grain sand, dry, loose, gravel @ 3.5' bgs light brown sandy silty clay, moist, cohesive, firm light brown/gray fine-medium grain sand, tr silt, wet, firm gray/browr sandy clayey silt, moist, tight black peat root material, med moist, sulphur odor

Completion Notes:

Well consists of 10' of 0.010" slot 2" PVC screen witn solid 2" PVC riser. Steel protective casing with locking top. Ground elevation 7.34', casing 10.21'

Site:

BNP - OCA

Southport, NC

Project No.:

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	6/5/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	ESS-45C	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					light brown silty fine grain sand, loose, dry, non cohesive variable amounts of silt, tr clay from 2.5-3' bgs
			5		
					brown clayey sandy silt, tight, moisture
					A/A, increase fine grain sand
			10		grey fine grain sand, loose, dry reddish brown - gray silty fine grain sand, moist
			15		reddish brown silty sand, wet, soft reddish brown and gray silty fine grain sand, wet, med soft, tr clay from 19 - 20'
			20		brown/gray silty fine grain sand, wet
					gray silt with fine grain sand, tight, moist
					gray clay (greenish), low moisture, cohesive
			25		gray/green shelly clay

Completion Notes:

Well consists of 10' of 0.010" slot 2" PVC screen with solid 2" PVC riser. Steel protective casing with locking top. Ground elevation 15.30', casing 18.30'

Site:

BNP - OCA

Southport, NC

Project No.:

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	6/9/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	ESS-46C	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					brown fine grain sand w/ tr organic matter
			5		A/A
					green/gray silty clay
					gray md. grain sand, wet
					gray clay
			10		NO RECOVERY
					gray medium grain sand, saturated
			15		gray silty clay, saturated
			20		

Completion Notes:

Well consists of 10' of 0.010" slot 2" PVC screen with solid 2" PVC riser. Steel protective casing with locking top. Ground elevation 9.12', casing 11.20'

Site:

BNP - OCA

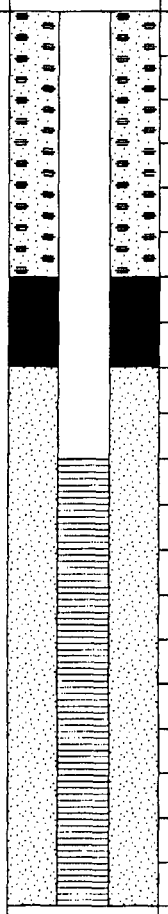
Southport, NC

Project No.:

Page 1

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	6/9/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	ESS-47C	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					brown clay with some fine grain sand
					brown clay and fine grain sand
			5		brown fine grain sand with some clay, very moist
			10		brown fine grain sand with some clay, saturated
			15		NO RECOVERY, probable saturated sand
			20		gray clay
			25		

Completion Notes:

Well consists of 10' of 0.010" slot 2" PVC screen with solid 2" PVC riser. Steel protective casing with locking top. Ground elevation 17.45', casing 20.34'

Site:

BNP - OCA

Southport, NC

Project No.:

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	6/10/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	ESS-48C	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					grey/brown fine grain sand with organic material
					brown and grey clay with some fine sand
			5		greenish/grey clay with fine/medium grain sand NO RECOVERY, debris at base of sampler (fill)
					light brown fine grain sand, trace of silt, saturated
			10		grey fine grain sand, saturated
					tan w/ some grey fine/medium grain sand w/ tr silt, saturated
			15		grey fine grain sand w/ organic matter and tr silt, saturated
			20		

Completion Notes:

Well consists of 10' of 0.010" slot 2" PVC screen with solid 2" PVC riser. Steel protective casing with locking top. Ground elevation 16.64', casing 20.12'

Site:

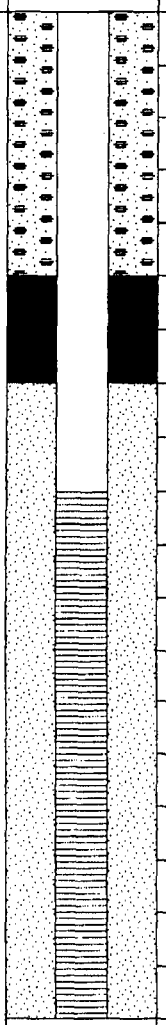
BNP- OCA

Southport, NC

Project No.:

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	6/10/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	ESS-49C	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					brown/gray fine grain sand w/ tr silt
					green gray clay w/ some sand
					gray clay w/ tr organic matter
			5		gray clay w/ organic matter (big hunks of wood) and grey sand, saturated
			10		gray clay with sand and organic matter, wet
			15		gray fine grain sand w/ tr. silt, saturated
					gray silt, saturated
					gray fine grain sand with some silt and organic matter, saturated
			20		

Completion Notes:

Well consists of 10' of 0.010" slot 2" PVC screen with solid 2" PVC riser. Steel protective casing with locking top. Ground elevation 12.19', casing 15.22'

Site:

BNP - OCA

Southport, NC

Project No.:

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	6/10/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	ESS-50C	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					gray fine grain sand and some silt
			5		gray silt
					gray silt with some clay
					gray fine grain sand w/ tr silt
			10		gray fine grain sand
					greyish clay with some fine grain sand
					brown fine grain sand, saturated
					light grey/brown fine grain sand w/ tr silt, saturated
			15		light grey and brown fine grain sand, saturated
					dark grey silty clay
			20		gray fine-med. grain sand, saturated
					gray silty fine grain sand, saturated
			25		

Completion Notes:

Well consists of 10' of 0.010" slot 2" PVC screen with solid 2" PVC riser. Steel protective casing with locking top. Ground elevation 15.96', casing 18.76'

Site:

BNP - OCA

Southport, NC

Project No.:

Page 1

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	6/18/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	ESS-51C	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					brown and gray fine grain sand, tr silt, moist @5' bgs
			5		
			10		greenish silt w/ fine grain sand brown and gray fine grain sand, tr silt, increasing silt/clay content @ 14.5-15' bgs clay, wet @ 12' bgs
			15		
					brown-org. brown md. grain sand w/ tr fine grain sand and tr silt, saturated
			20		gray fine grain sand. saturated
					gray silty fine grain sand w/ tr shell, saturated
			25		

Completion Notes:

Well consists of 10' of 0.010" slot 2" PVC screen with solid 2" PVC riser. Steel protective casing with locking top. Ground elevation 12.67', casing 15.36'

Site:

BNP - OCA

Southport, NC

Project No.:

Page 1

BORING LOG

Drill Rig:	Dietrich	Date Drilled:	6/12/08	Logged By:
Boring Dia:	8 Inches	Boring Number:	ESS-51B	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
			5 10 15 20 25 30 35 40 45		see log for ESS-51C gray silty w/ organic matter, 6" PVC casing set at 24' bgs gray fine-med grain sand w/ shells gray-off white shell hash gray-off white fine-med grain sand w/ shell gray-greenish gray med.-coarse grain sand

Completion Notes:

8" ID HSAs to 24' bgs. Set 6" PVC casing to 24' bgs. 5 7/8" rotary to 45' bgs. Well consists of 10' of 0.010" slot 2 " PVC screen set at 45' bgs with solid 2" PVC riser. Steel protective casing with locking top. Ground elevation 12.59', casing 15.55'.

Site:

BNP - OCA

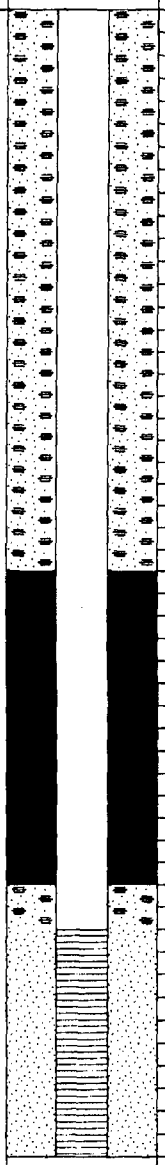
Southport, NC

Project No.:

Page 1

BORING LOG

Drill Rig:	Dietrich	Date Drilled:	6/12/08	Logged By:
Boring Dia:	8 Inches	Boring Number:	ESS-52B	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
			5 10 15 20 25 30 35 40 45 50		sand and silt brown-greenish brown fine grain sand some silt, tr organic matter brown fine grain sand tr silt brown silt with some clay tr fine grain sand A/A grading to gray silt with tr clay, dry, set 6" PVC casing at 30' bgs gray-greenish gray md.-coarse grain sand, very hard at 51' bgs (Castle Hayne)

Completion Notes:

8" ID HSAs to 30' bgs. Set 6" PVC casing to 30' bgs. 5 7/8" rotary to 51' bgs. Well consists of 10' of 0.010" slot 2 " PVC screen set at 51' bgs with solid 2" PVC riser. Steel protective casing with locking top. Ground elevation 25.72', casing 28.78'.

Site:

BNP - OCA

Southport, NC

Project No.:

BORING LOG

Drill Rig:	Dietrich	Date Drilled:	6/13/08	Logged By:
Boring Dia:	8 Inches	Boring Number:	ESS-53B	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
			5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75		sand and silt gray-greenish gray fine-md. grain sand tr organic matter A/A, no organic matter gray fine grain sand and silt grading to silty sand at 27.8-28' bgs gray silt with some fine grain sand, dry, set 6" PVC casing at 30' bgs gray-greenish gray md.-coarse grain sand, very hard at 51' bgs (Castle Hayne) Dense sand Castle Hayne sandy limestone

Completion Notes:

8" ID HSAs to 30' bgs. Set 6" PVC casing to 30' bgs. 5 7/8" rotary to 51' bgs. Well consists of 10' of 0.010" slot 2 " PVC screen set at 76' bgs with solid 2" PVC riser. Steel protective casing with locking top. Ground elevation 29.02', casing 32.25'.

Site:

BNP - OCA

Southport, NC

Project No.:

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	6/12/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	ESS-54C	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					brown fine grain sand
					brown clay with fine grain sand, tr shells
					brown fine grain sand
			5		clay with some fine grain sand
					light gray/gray fine grain sand, moist
			10		light grey/green sandy clay, saturated
			15		
			20		light grey fine grain sand, tr silt, saturated
					gray fine-med. grain sand sand
					gray sandy clay
			25		

Completion Notes:

Well consists of 10' of 0.010" slot 2" PVC screen with solid 2" PVC riser. Steel protective casing with locking top. Ground elevation 37.43', casing 40.78'

Site:

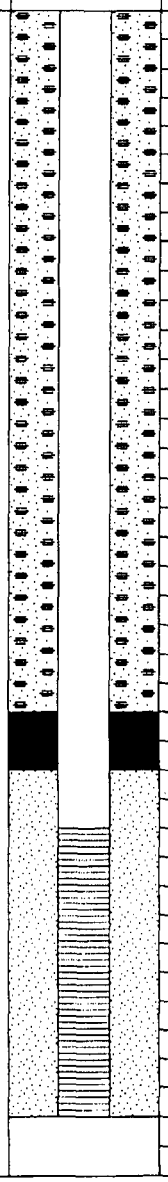
BNP - OCA

Southport, NC

Project No.:

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	6/13/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	ESS-55C	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
			5 10 15 20 25 30 35		brown fine-mid grain sand tr clay (fill) gray fine grain sand and silt gray/brown med. grain sand w/ some crushed rock @ 13-15'bgs (base of dike) gray fine grain sand, tr silt, moist brown silty fine grain sand, grading to gray fine grain sand @ 24.5-25' bgs wet gray fine grain sand, tr silt, wet, becoming saturated @ 30' bgs gray medium grain sand, saturated

Completion Notes:

Well consists of 10' of 0.010" slot 2" PVC screen with solid 2" PVC riser. Steel protective casing with locking top. Ground elevation 47.90', casing 50.50'

Site:

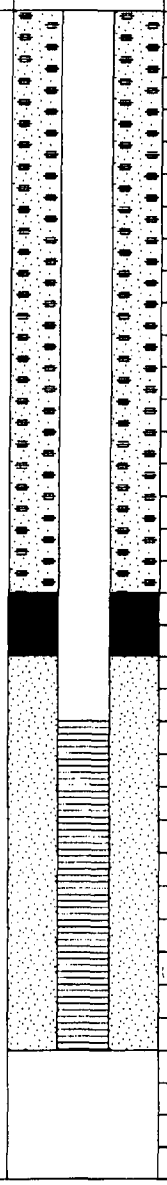
BNP - OCA

Southport, NC

Project No.:

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	6/13/08	Logged By:	
Boring Dia:	6.5 Inches	Boring Number:	ESS-56C	Bryan Sladky	

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					brown fine grain sand with tr clay
					brown sandy clay
			5		dark gray clay with some fine grain sand and shells
			10		gray fine grain sand
					gray clay
					gray medium grain sand, saturated
					gray sandy clay
			15		organic matter (wood)
					gray sandy clay
			20		gray fine grain sand, dry
					gray md. grain sand, saturated
			25		gray md. grain sand. saturated
					gray sandy clay
			30		tan fine-md. grain sand with tr. clay, good water zone
			35		

Completion Notes:

Well consists of 10' of 0.010" slot 2" PVC screen with solid 2" PVC riser. Steel protective casing with locking top. Ground elevation 45.67', casing 49.12'

Site:

BNP - OCA

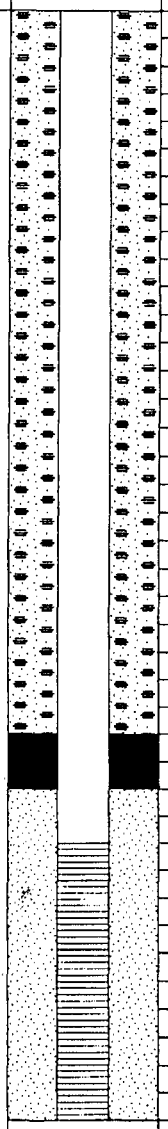
Southport, NC

Project No.:

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	6/12/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	ESS-57C	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					brown sand and clay (fill)
			5		gray sandy clay
			10		gray clay with some fine grain sand
			15		gray clay
					gray md. grain sand, saturated
					gray clay, saturated
			20		gray md. grain sand with tr. silt, saturated
					gray clay
			25		gray organic matter (wood)
					gray fine grain sand with silt
					gray clay with some fine grain sand
					gray fine grain sand
			30		gray sandy clay
					gray fine-med grain sand
			35		gray clay
					gray fine-med grain sand
			40		



Completion Notes:

Well consists of 10' of 0.010" slot 2" PVC screen with solid 2" PVC riser. Steel protective casing with locking top. Ground elevation 45.96', casing 48.91'

Site:

BNP - OCA

Southport, NC

Project No.:

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	6/17/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	ESS-58C	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					brown fine-md. grain sand
					gray fine grain sand, w/ silt.
			5		A/A
					dk brown md. grain sand, saturated
			10		NO RECOVERY
			15		Gray fine-mc. grain sand w/ some silt, saturated
					Gray silt
			20		

Completion Notes:

Well consists of 10' of 0.010" slot 2" PVC screen with solid 2" PVC riser. Steel protective casing with locking top. Ground elevation 15.40', casing 18.20'

Site:

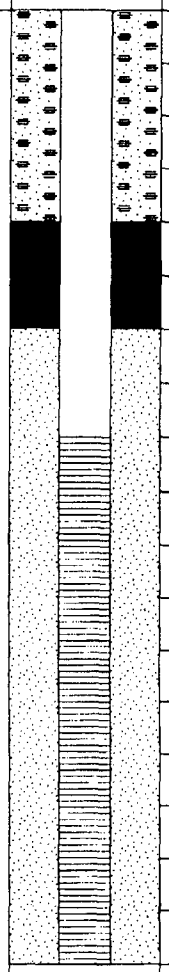
BNP - OCA

Southport, NC

Project No.:

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	6/17/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	ESS-59C	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					brown fine grain sand
					gray fine grain sand, w/ silt @ 4.5-5' bgs, moist @ 3.5' bgs
			5		A/A
					dk gray fine-md. grain sand, saturated Gray fine grain sand, saturated
			10		
					Gray silty fine-vfine grain sand w/ some silt lenses, saturated
			15		Gray fine-md. grain sand
					Gray silty fine grain sand
			20		

Completion Notes:

Well consists of 10' of 0.010" slot 2" PVC screen with solid 2" PVC riser. Steel protective casing with locking top. Ground elevation 14.79', casing 17.83'

Site:

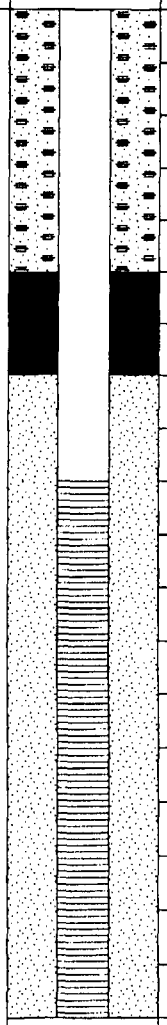
BNP - OCA

Southport, NC

Project No.:

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	6/17/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	ESS-60C	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					tan fine grain sand
					gray fine grain sand, tr silt, wet
			5		gray fine grain sand with some md. grain @ 9' bgs, silt @ 8.5-9' bgs, saturated
			10		Gray silty fine grain sand, saturated
					Gray fine grain sand, saturated
			15		Gray fine-md. grain sand, saturated
					Gray silty clay
			20		

Completion Notes:

Well consists of 10' of 0.010" slot 2" PVC screen with solid 2" PVC riser. Steel protective casing with locking top. Ground elevation 14.88', casing 17.68'

Site:

BNP - OCA

Southport, NC

Project No.:

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	6/19/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	ESS-61C	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					brown to gray fine/medium grain sand
			5		A/A, 8-10' bgs w/ more blackish sand
			10		A/A
					dk gray fine grain sand with tr silt, wet
			15		gray fine grain sand, wet @ 16-17' bgs
					dk gry organic matter (roots)
					gray fine grain sand, wet
			20		gray md. grain sand. saturated
			25		A/A
			30		gray clay, wet

Completion Notes:

Well consists of 10' of 0.010" slot 2" PVC screen with solid 2" PVC riser. Steel protective casing with locking top. Ground elevation 18.70', casing 22.03'

Site:

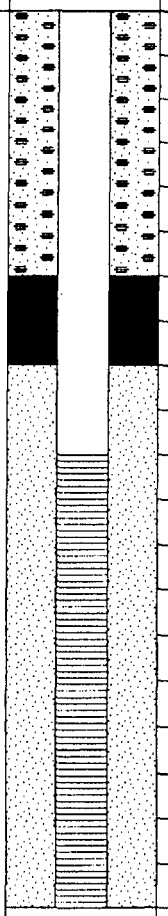
BNP - OCA

Southport, NC

Project No.:

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	6/23/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	ESS-62C	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					grey/tan md. grain sand
			5		dk. gray organic material
					grey/tan md. grain sand, moist @ 9-10' bgs
			10		tan md. grain sand, saturated
			15		A/A
			20		gray sandy clay, saturated
					gray silty clay, saturated
			25		

Completion Notes:

Well consists of 10' of 0.010" slot 2" PVC screen with solid 2" PVC riser. *Steel protective casing with locking top. Ground elevation* 11.28', casing 14.67'

Site:

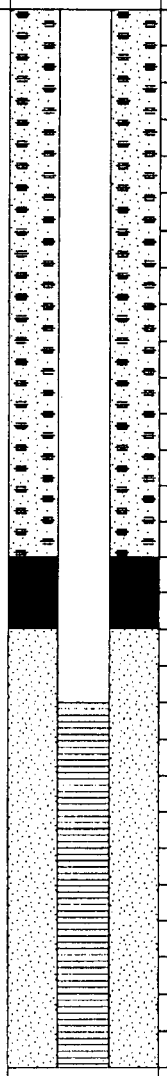
BNP - OCA

Southport, NC

Project No.:

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	6/19/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	ESS-63C	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					tan fine grain sand
			5		A/A
			10		A/A, moist, wet @13' bgs
			15		A/A, wet to saturated
			20		dk gray organic matter19.1 dk gray fine grain sand, saturated tan md grain sand, saturated
			25		tan to gray mdl.-coarse grain sand, saturated
			30		dk. gray silty clay

Completion Notes:

Well consists of 10' of 0.010" slot 2" PVC screen with solid 2" PVC riser. Steel protective casing with locking top. Ground elevation 19.60', casing 22.29'

Site:

BNP - OCA

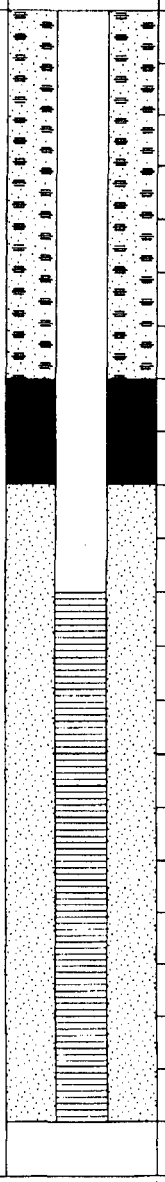
Southport, NC

Project No.:

Page 1

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	6/23/08	Logged By:	
Boring Dia:	6.5 Inches	Boring Number:	ESS-64C	Bryan Sladky	

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					light tan fine grain sand
			5		dk gray organic matter (grass)
					gray silty clay
					tan fine grain sand, wet
					A/A, saturated
			10		tan and gray fine grain sand, saturated
			15		A/A
			20		gray clay

Completion Notes:

Well consists of 10' of 0.010" slot 2" PVC screen with solid 2" PVC riser. Steel protective casing with locking top. Ground elevation 11.40', casing 14.18'

Site:

BNP - OCA

Southport, NC

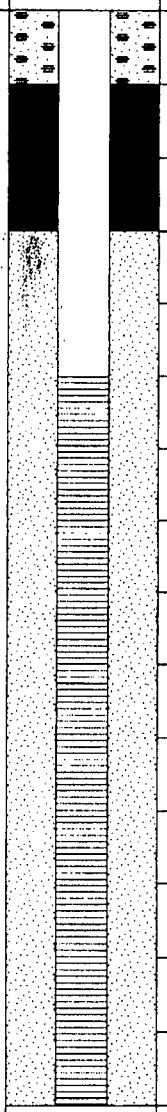
Project No.:

Page 1

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	6/24/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	ESS-65C	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					tan md. grain sand
					A/A, moist
			5		gray to black md.-coarse grain sand, saturated
			10		A/A
					gray silty clay
			15		



Completion Notes:

Well consists of 10' of 0.010" slot 2" PVC screen with solid 2" PVC riser. Steel protective casing with locking top. Ground elevation 6.89', casing 10.16'

Site:

BNP - OCA

Southport, NC

Project No.:

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	6/24/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	ESS-66C	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					crushed rock tan/white fine grain sand
			5		
					tan/brown fine grain sand w/ organic matter (grass) from ~6-6.5' bgs
					light tan fine grain sand, moist @ ~9' bgs
			10		A/A brown fine to md. grain sand, saturated
			15		brown fine grain sand with tr silt, saturated
					off-white fine grain sand, w/ tr clay and silt, saturated
			20		

Completion Notes:

Well consists of 10' of 0.010" slot 2" PVC screen with solid 2" PVC riser. Steel protective casing with locking top. Ground elevation 12.21', casing 15.30'

Site:

BNP - OCA

Southport, NC

Project No.:

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	6/25/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	ESS-67C	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					organic matter, wood, shells, grass
					tan fine grain sand, dense @ 4-5' bgs
			5		tan fine grain sand
			10		A/A
					gray fine grain sand, moist
			15		gray fine grain sand with organic matter, wet
			20		gray fine grain sand with organic matter (shells, wood), saturated
			25		A/A
			30		gray clay

Completion Notes:

Well consists of 10' of 0.010" slot 2" PVC screen with solid 2" PVC riser. Steel protective casing with locking top. Ground elevation 11.93', casing 14.48'

Site:

BNP - OCA

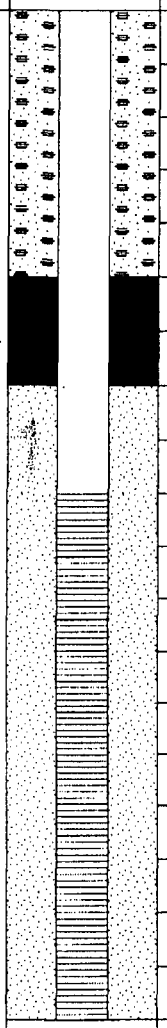
Southport, NC

Project No.:

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	6/27/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	ESS-68C	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					tan fine grain sand w/ organic matter (sticks, shells)
			5		A/A
					white md. to coarse grain sand, slightly moist
			10		white md grain sand, saturated
			15		A/A
					clay with natural organic matter
			20		



Completion Notes:

Well consists of 10' of 0.010" slot 2" PVC screen with solid 2" PVC riser. Steel protective casing with locking top. Ground elevation 10.81', casing 14.07'

Site:

BNP - OCA

Southport, NC

Project No.:

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	6/29/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	ESS-69C	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					NO RECOVERY
			5		tan fine grain sand
					brown fine grain sand
					dark brown fine grain sand with some silt
					gray clay with fine grain sand, dense
					gray fine grain sand with organic matter (sticks), dense
			10		gray/brown fine grain sand with organic matter
					tan, yellow and gray fine grain sand, wet at ~12' bgs
					gray/black fine grain sand w/ silt
			15		gray and brown fine grain sand w/ tr silt and organic matter, saturated
			20		brown amd gray fine grain sand with tr silt and organic matter, coarse grain from ~22.0 - 22.3' bgs.
					gray silt with trv fine grain sand
			25		
			30		

Completion Notes:

Well consists of 10' of 0.010" slot 2" PVC screen with solid 2" PVC riser. Steel protective casing with locking top. Ground elevation 34.18', casing 37.02'

Site:

BNP - OCA

Southport, NC

Project No.:

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	7/2/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	ESS-70C	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					tan/yellow fine grain sand with tr clay lenses
			5		brown and yellow fine grain sand with organic matter
					grey and yellow fine grain sand with some silt, saturated
			10		A/A, organic matter @ 13' (roots), saturated
			15		tan fine grain sand, saturated
					brown fine grain sand with tr silt, saturated
					gray silty clay
			20		

Completion Notes:

Well consists of 10' of 0.010" slot 2" PVC screen with solid 2" PVC riser. Steel protective casing with locking top. Ground elevation 11.92', casing 14.64'

Site:

ENP - OCA

Southport, NC

Project No.:

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	6/30/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	ESS-71C	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					tan fine grain sand w/ organic matter
					yellow and gray fine grain sand
			5		tan fine grain sand w/ organic matter
					yellow fine grain sand with tr silt
					gray to tan fine grain sand, wet, md grain saturated zone from 9.1'-9.2'
			10		gray fine grain sand, wet
					tan fine grain sand, moist
					tan md. grain sand, moist
					A/A
					tan md. grain sand, saturated
			15		tan md. grain sand, saturated
					dark gray silt with some sand, saturated
					organic matter (wood) with coarse grain sand, saturated
			20		dark gray silt with clay and organic matter

Completion Notes:

Well consists of 10' of 0.010" slot 2" PVC screen with solid 2" PVC riser. Steel protective casing with locking top. Ground elevation 12.72', casing 15.67'

Site:

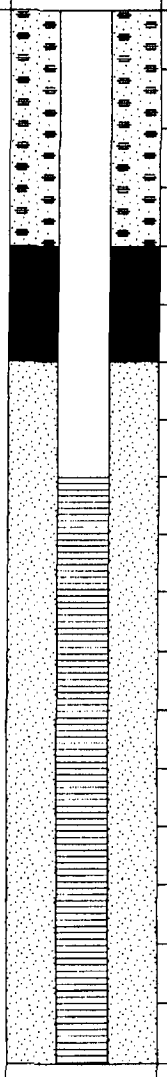
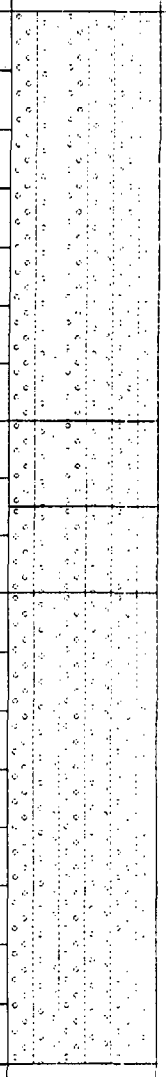
BNP - OCA

Southport, NC

Project No.:

BORING LOG

Drill Rig:	Geoprobe	Date Drilled: 7/2/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number: ESS-72C	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
			5 10 15		Advance with hand auger, brown to tan fine grain sand with silt tan fine grain sand A/A, wet brown fine grain sand with some silt, saturated

Completion Notes:

Well consists of 10' of 0.010" slot 2" PVC screen with solid 2" PVC riser. Steel protective casing with locking top. Ground elevation 12.28', casing 15.23'

Site:

ENP - OCA

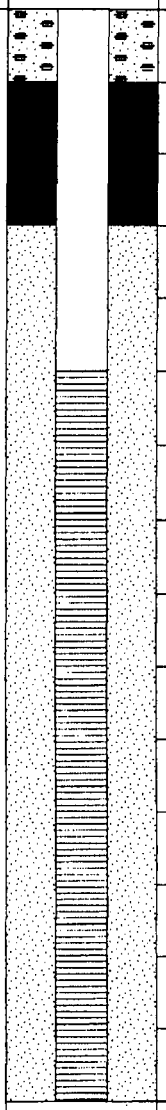
Southport, NC

Project No.:

Page 1

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	7/1/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	ESS-73C	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					brown fine grain sand
					grey to white fine grain sand
					black to dark brown silty fine grain sand; saturated
			5		brown medium grain sand, wet to saturated
			10		brown md. grain sand, saturated
					coarse grain sand, saturated
			15		

Completion Notes:

Well consists of 10' of 0.010" slot 2" PVC screen with solid 2" PVC riser. Steel protective casing with locking top. Ground elevation 12.28', casing 15.23'

Site:

BNP - OCA

Southport, NC

Project No.:

BORING LOG

Drill Rig:	Geoprobe	Date Drilled:	7/1/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	ESS-74C	Bryan Sladky

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					tan with some gray fine grain sand, organic matter (roots) throughout
			5		A/A
					A/A with tr shell, wet
					gray fine grain sand with lenses of clay, saturated
					dark gray/brown silty fine grain sand with some clay lenses, saturated
			10		brown fine grain silty sand, saturated
			15		dark brown fine grain silty sand, saturated
			20		

Completion Notes:

Well consists of 10' of 0.010" slot 2" PVC screen with solid 2" PVC riser. Steel protective casing with locking top. Ground elevation 9.91', casing 12.64'

Site:

BNP - OCA

Southport, NC

Project No.:

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE | NC | 28625
City or Town | State | Zip Code

(704) - 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-32-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use)

DATE DRILLED 05/20/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE / LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT | NC
City or Town | State | Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX 10429

SOUTHPORT | NC | 28419
City or Town | State | Zip Code

( ) -
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 35.0

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 8.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 0.0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):
From ___ To ___ From ___ To ___
From ___ To ___ From ___ To ___
From ___ To ___ From ___ To ___

6. **CASING:**

Depth From	To	Ft.	Diameter	Thickness/ Weight	Material
0.0	5.0		2 INCH	SCH 40	PVC

7. **GROUT:**

Depth From	To	Ft.	Material	Method
0.0	1.0		Portland bentonite	SLURRY

8. **SCREEN:**

Depth From	To	Ft.	Diameter	Slot Size	Material
5.0	35.0		2.0 in.	.010 in.	PVC
			in.	in.	
			in.	in.	

9. **SAND/GRAVEL PACK:**

Depth From	To	Ft.	Size	Material
3.0	35.0		20-40	Fine Silica Sand

10. **DRILLING LOG**

From	To	Formation Description
0.0	1.0	BLACK TOP SOIL
1.0	5.0	YELLOW SAND
5.0	28.0	GRAY SANDY CLAY
28.0	35.0	GRAY CLAY

11. **REMARKS:**
Bentonite seal from 1.0 to 3.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE 06/11/08

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704) 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-33-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐ Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐ Irrigation ☐ Other ☐ (list use)

DATE DRILLED 05/20/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT NC
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 25.0

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 5.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 0.0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):

From To From To
From To From To
From To From To

6. CASING:

Depth From	To	Ft.	Diameter	Thickness/ Weight	Material
0.0	5.0		2 INCH	SCH40	PVC

7. GROUT:

Depth From	To	Ft.	Material	Method
0.0	1.0		Portland bentonite	SLURRY

8. SCREEN:

Depth From	To	Ft.	Diameter	Slot Size	Material
5.0	25.0		2.0 in.	.010 in.	PVC
			in.	in.	
			in.	in.	

9. SAND/GRAVEL PACK:

Depth From	To	Ft.	Size	Material
3.0	25.0		20-40	Fine Silica Sand

10. DRILLING LOG

From	To	Formation Description
0.0	1.0	BLACK TOP SOIL
1.0	6.0	YELLOW SAND
6.0	18.0	GRAY SAND
18.0	20.0	GRAY CLAY

11. REMARKS:

Bentonite seal from 1.0 to 3.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

06/11/08

SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704) 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-34-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use)

DATE DRILLED 05/20/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT NC
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 22.0

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 10.0 FT
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 0.0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):
From To From To
From To From To
From To From To

6. **CASING:**

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 7.0	Ft.	2 INCH	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

7. **GROUT:**

	Depth		Material	Method
From 0.0	To 3.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. **SCREEN:**

	Depth		Diameter		Slot Size		Material
From 7.0	To 22.0	Ft.	2.0	in.	.010	in.	PVC
From	To	Ft.		in.		in.	
From	To	Ft.		in.		in.	

9. **SAND/GRAVEL PACK:**

	Depth		Size	Material
From 5.0	To 22.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. **DRILLING LOG**

From	To	Formation Description
0.0	2.0	BLACK TOP SOIL
2.0	6.0	YELLOW SAND
6.0	18.0	GRAY SAND
18.0	22.0	GRAY CLAY

11. **REMARKS:**

Bentonite seal from 3.0 to 5.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Johnny Burr 06/11/08
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE | NC | 28625
City or Town | State | Zip Code

(704) 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-35-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐ Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐ Irrigation ☐ Other ☐ (list use)

DATE DRILLED 05/20/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE 3
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT | NC
City or Town | State | Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX 10429

SOUTHPORT | NC | 28419
City or Town | State | Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 20.0

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 7.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 0.0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):
From To From To
From To From To
From To From To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 5.0	Ft.	2 INCH	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 1.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 5.0	To 20.0	Ft.	2.0 in.	.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 3.0	To 20.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	1.0	BLACK TOP SOIL
1.0	4.0	YELLOW SAND
4.0	19.0	GRAY SAND
19.0	20.0	GRAY CLAY

11. REMARKS:

Bentonite seal from 1.0 to 3.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

06/11/08
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources · Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE | NC | 28625
City or Town | State | Zip Code

(704) 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-37-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use)

DATE DRILLED 05/20/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT | NC
City or Town | State | Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX 10429

SOUTHPORT | NC | 28419
City or Town | State | Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 30.0

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 17.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 0.0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD** (gpm): N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):
From ___ To ___ From ___ To ___
From ___ To ___ From ___ To ___
From ___ To ___ From ___ To ___

6. **CASING:**

	Depth	Diameter	Thickness/ Weight	Material
From 0.0	To 17.0 Ft.	2 INCH	SCH 40	PVC
From ___	To ___ Ft.			
From ___	To ___ Ft.			

7. **GROUT:**

	Depth	Material	Method
From 0.0	To 10.0 Ft.	Portland bentonite	SLURRY
From ___	To ___ Ft.		
From ___	To ___ Ft.		

8. **SCREEN:**

	Depth	Diameter	Slot Size	Material
From 17.0	To 30.0 Ft.	2.0 in.	.010 in.	PVC
From ___	To ___ Ft.	in.	in.	
From ___	To ___ Ft.	in.	in.	

9. **SAND/GRAVEL PACK:**

	Depth	Size	Material
From 15.0	To 30.0 Ft.	20-40	Fine Silica Sand
From ___	To ___ Ft.		
From ___	To ___ Ft.		

10. **DRILLING LOG**

From	To	Formation Description
0.0	2.0	BLACK TOP SOIL
2.0	7.0	YELLOW SAND
7.0	28.0	GRAY SAND
28.0	29.0	GRAY CLAY
29.0	35.0	GRAY SAND

11. **REMARKS:**

Bentonite seal from 10.0 to 15.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE 06/11/08

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-36-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use)

DATE DRILLED 05/20/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE
May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY - is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT NC
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 22.0

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 10.0 FT
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 0.0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):

From	To	From	To
From	To	From	To
From	To	From	To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 7.0	Ft.	2 INCH	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT

	Depth		Material	Method
From 0.0	To 3.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 7.0	To 22.0	Ft.	2.0 in.	.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 3.0	To 22.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	1.0	BLACK TOP SOIL
1.0	5.0	YELLOW SAND
5.0	20.0	GRAY SAND
20.0	22.0	GRAY CLAY

11. REMARKS:

Bentonite seal from 3.0 to 5.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

06/11/08
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-38-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐ Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐ Irrigation ☐ Other ☐ (list use)

DATE DRILLED 05/20/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT NC
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 15.0

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 7.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 0.0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):
From ___ To ___ From ___ To ___
From ___ To ___ From ___ To ___
From ___ To ___ From ___ To ___

6. **CASING:**

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 5.0	Ft.	2 INCH	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

7. **GROUT:**

	Depth		Material	Method
From 0.0	To 1.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. **SCREEN:**

	Depth		Diameter		Slot Size		Material
From 5.0	To 15.0	Ft.	2.0	in.	.010	in.	PVC
From	To	Ft.		in.		in.	
From	To	Ft.		in.		in.	

9. **SAND/GRAVEL PACK:**

	Depth		Size	Material
From 3.0	To 15.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. **DRILLING LOG**

From	To	Formation Description
0.0	2.0	BLACK TOP SOIL
2.0	8.0	YELLOW SAND
8.0	13.0	GRAY SAND
13.0	15.0	GRAY CLAY

11. **REMARKS:**

Bentonite seal from 1.0 to 3.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE 06/11/08

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-39-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐ Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐ Irrigation ☐ Other ☐ (list use)

DATE DRILLED 05/20/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY - is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT NC
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 20.0

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 11.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 0.0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):
From To From To
From To From To
From To From To

6. **CASING:**

Depth From	To	Ft.	Diameter	Thickness/ Weight	Material
0.0	10.0		2 INCH	SCH40	PVC

7. **GROUT:**

Depth From	To	Ft.	Material	Method
0.0	6.0		Portland bentonite	SLURRY

8. **SCREEN:**

Depth From	To	Ft.	Diameter	Slot Size	Material
10.0	20.0		2.0 in.	.010 in.	PVC
			in.	in.	
			in.	in.	

9. **SAND/GRAVEL PACK:**

Depth From	To	Ft.	Size	Material
8.0	20.0		20-40	Fine Silica Sand

10. **DRILLING LOG**

From	To	Formation Description
0.0	2.0	BLACK TOP SOIL
2.0	9.0	YELLOW SAND
9.0	17.0	GRAY SAND
17.0	20.0	GRAY CLAY

11. **REMARKS:**
Bentonite seal from 6.0 to 8.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

06/11/08
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2581

1. WELL CONTRACTOR:

BRIAN THOMAS
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE | NC | 28625
City or Town | State | Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-38-B

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/09-06/13/08

TIME COMPLETED ____ AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT | NC | 28419
City or Town | State | Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX10429

SOUTHPORT | NC | 28419
City or Town | State | Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 55.0'

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 7.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 0.0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):
From ____ To ____ From ____ To ____
From ____ To ____ From ____ To ____
From ____ To ____ From ____ To ____

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 45.0	Ft.	2 INCH	SCH 40	PVC
From 0.0	To 31.0	Ft.	6 INCH	SCH 40	PVC
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 26.0	Ft.	Portland bentonite	SLURRY
From 0.0	To 31.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 45.0	To 55.0	Ft.	2.0 in.	.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 43.0	To 55.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	4.0	TAN SAND
4.0	18.0	BROWN SANDY CLAY
18.0	39.0	GRAY SANDY CLAY
39.0	55.0	GRAY SAND/SHELLS

11. REMARKS:

Bentonite seal from 26.0 to 43.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

[redacted] 06/26/08
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

BRIAN THOMAS
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2581

1. WELL CONTRACTOR:

BRIAN THOMAS
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE | NC | 28625
City or Town | State | Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-39-B

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/09-06/13/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map

(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT | NC | 28419
City or Town | State | Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX10429

SOUTHPORT | NC | 28419
City or Town | State | Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 55.0'

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 7.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 0.0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):

From To From To
From To From To
From To From To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 45.0	Ft.	2 INCH	SCH 40	PVC
From 0.0	To 33.0	Ft.	6 INCH	SCH 40	PVC
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 27.0	Ft.	Portland bentonite	SLURRY
From 0.0	To 33.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 45.0	To 55.0	Ft.	2.0 in.	.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 43.0	To 55.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	4.0	TAN SAND
4.0	18.0	BROWN SANDY CLAY
18.0	35.0	GRAY SANDY CLAY
35.0	55.0	GRAY SAND/SHELLS

11. REMARKS:

Bentonite seal from 27.0 to 43.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE 06/26/08

BRIAN THOMAS
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-40-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/10/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT NC 28419
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX10429

SOUTHPORT NC 28419
City or Town State Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 30.0'

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 15.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):

From	To	From	To
From	To	From	To
From	To	From	To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 20.0	Ft.	2 INCH	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 16.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 20.0	To 30.0	Ft.	2.0 in.	.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 18.0	To 30.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	1.0	BLACK SANDY TOP SOIL
1.0	6.0	YELLOW SANDY CLAY
6.0	20.0	GRAY SANDY CLAY
20.0	30.0	GRAY SAND
30.0	35.0	GRAY CLAY

11. REMARKS:

Bentonite seal from 16.0 to 18.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR 06/25/08 DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-41-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/02-06/10/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map

(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT NC 28419
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX10429

SOUTHPORT NC 28419
City or Town State Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 27.0'

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 15.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):

From To From To
From To From To
From To From To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 17.0	Ft.	2 INCH	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 13.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 17.0	To 27.0	Ft.	2.0 in.	.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 15.0	To 27.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	1.0	BLACK SANDY TOP SOIL
1.0	6.0	YELLOW SANDY CLAY
6.0	20.0	GRAY SANDY CLAY
20.0	27.0	GRAY SAND

11. REMARKS:

Bentonite seal from 13.0 to 15.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR 06/25/08 DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE | NC | 28625
City or Town | State | Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-42-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/03-06/10/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map

(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT | NC | 28419
City or Town | State | Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX10429

SOUTHPORT | NC | 28419
City or Town | State | Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 30.0'

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 16.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):

From To From To
From To From To
From To From To

6. CASING:

From	To	Depth Ft.	Diameter	Thickness/ Weight	Material
0.0	20.0		2 INCH	SCH 40	PVC

7. GROUT:

From	To	Depth Ft.	Material	Method
0.0	16.0		Portland bentonite	SLURRY

8. SCREEN:

From	To	Depth Ft.	Diameter	Slot Size	Material
20.0	30.0		2.0 in.	.010 in.	PVC
			in.	in.	
			in.	in.	

9. SAND/GRAVEL PACK:

From	To	Depth Ft.	Size	Material
18.0	30.0		20-40	Fine Silica Sand

10. DRILLING LOG

From	To	Formation Description
0.0	1.0	BLACK SANDY TOP SOIL
1.0	6.0	YELLOW SANDY CLAY
6.0	20.0	GRAY SANDY CLAY
20.0	30.0	GRAY SAND

11. REMARKS:

Bentonite seal from 16.0 to 18.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH *15A NCAC 2C, WELL CONSTRUCTION STANDARDS*, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE 06/25/08

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-43-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/03-06/10/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map

(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT NC 28419
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX10429

SOUTHPORT NC 28419
City or Town State Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 17.0'

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 8.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):

From To From To
From To From To
From To From To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 7.0	Ft.	2 INCH	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 3.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 7.0	To 17.0	Ft.	2.0 in.	.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 5.0	To 17.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	2.0	BLACK TOP SOIL
2.0	6.0	YELLOW SANDY CLAY
6.0	12.0	GRAY SANDY CLAY
12.0	17.0	GRAY SAND

11. REMARKS:

Bentonite seal from 3.0 to 5.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR 06/25/08 DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704) 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-44-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/04-06/10/08

TIME COMPLETED AM ☐ PM ☐.

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map

(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- *is the name of the business where the well is located.*

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT NC 28419
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX10429

SOUTHPORT NC 28419
City or Town State Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 15.0'

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 7.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):

From To From To
From To From To
From To From To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 5.0	Ft.	2 INCH	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 1.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 5.0	To 15.0	Ft.	2.0 in.	.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 3.0	To 15.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	1.0	BLACK TOP SOIL
1.0	7.0	GRAY SAND
7.0	14.0	GRAY SANDY CLAY
14.0	15.0	GRAY CLAY

11. REMARKS:

Bentonite seal from 1.0 to 3.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR 06/25/08 DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704) - 872-7686
Area code - Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-45-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/04-06/10/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map

(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- *is the name of the business where the well is located.*

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT NC 28419
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX10429

SOUTHPORT NC 28419
City or Town State Zip Code

( ) -
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 21.0'

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 13.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):

From To From To
From To From To
From To From To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 11.0	Ft.	2 INCH	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 6.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 11.0	To 21.0	Ft.	2.0 in.	.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 9.0	To 21.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	2.0	BLACK TOP SOIL
2.0	6.0	YELLOW SANDY CLAY
6.0	12.0	GRAY SANDY CLAY
12.0	21.0	GRAY SAND

11. REMARKS:

Bentonite seal from 6.0 to 9.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE 06/25/08

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE | NC | 28625
City or Town | State | Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-46-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐ Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐ Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/09-06/16/08

TIME COMPLETED ____ AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other ____
(check appropriate box)

LATITUDE ____
LONGITUDE ____

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT | NC | 28419
City or Town | State | Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX10429

SOUTHPORT | NC | 28419
City or Town | State | Zip Code

(____)-____
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 18.0'

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 6.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):

From ____ To ____ From ____ To ____
From ____ To ____ From ____ To ____
From ____ To ____ From ____ To ____

6. CASING:

From	To	Ft.	Diameter	Thickness/ Weight	Material
0.0	8.0		2 INCH	SCH 40	PVC

7. GROUT:

From	To	Ft.	Material	Method
0.0	4.0		Portland bentonite	SLURRY

8. SCREEN:

From	To	Ft.	Diameter	Slot Size	Material
8.0	18.0		2.0 in.	.010 in.	PVC
			in.	in.	
			in.	in.	

9. SAND/GRAVEL PACK:

From	To	Ft.	Size	Material
6.0	18.0		20-40	Fine Silica Sand

10. DRILLING LOG

From	To	Formation Description
0.0	1.0	BLACK TOP SOIL
1.0	3.0	YELLOW SANDY CLAY
3.0	16.0	GRAY SANDY CLAY
16.0	18.0	GRAY SAND

11. REMARKS:

Bentonite seal from 4.0 to 6.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE 06/25/08

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE | NC | 28625
City or Town | State | Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-47-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation☐ Other ☐ (list use)

DATE DRILLED 06/10-06/11/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐Slope ☐Valley ☐Flat ☐Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐GPS ☐Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT | NC | 28419
City or Town | State | Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX10429

SOUTHPORT | NC | 28419
City or Town | State | Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 20.0'

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 10.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):

From To From To
From To From To
From To From To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 10.0	Ft.	2 INCH	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 6.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 10.0	To 20.0	Ft.	2.0 in.	.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 8.0	To 20.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	1.0	BLACK TOP SOIL
1.0	4.0	YELLOW SANDY CLAY
4.0	16.0	GRAY SANDY CLAY
16.0	20.0	GRAY SAND

11. REMARKS:

Bentonite seal from 6.0 to 8.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 02C WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE 06/25/08

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE | NC | 28625
City or Town | State | Zip Code

(704) - 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-48-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/10-06/16/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map

(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT | NC | 28419
City or Town | State | Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX10429

SOUTHPORT | NC | 28419
City or Town | State | Zip Code

( ) -
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 18.0'

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 10.0 FT
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):

From To From To
From To From To
From To From To

6. CASING:

From	To	Depth	Diameter	Thickness/ Weight	Material
0.0	8.0	Ft.	2 INCH	SCH 40	PVC
		Ft.			
		Ft.			

7. GROUT:

From	To	Depth	Material	Method
0.0	4.0	Ft.	Portland bentonite	SLURRY
		Ft.		
		Ft.		

8. SCREEN:

From	To	Depth	Diameter	Slot Size	Material
8.0	18.0	Ft.	2.0 in.	.010 in.	PVC
		Ft.	in.	in.	
		Ft.	in.	in.	

9. SAND/GRAVEL PACK:

From	To	Depth	Size	Material
6.0	18.0	Ft.	20-40	Fine Silica Sand
		Ft.		
		Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	1.0	BLACK TOP SOIL
1.0	2.0	YELLOW SANDY CLAY
2.0	7.0	GRAY SANDY CLAY
7.0	18.0	GRAY SAND

11. REMARKS:

Bentonite seal from 4.0 to 6.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

06/26/08
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE | NC | 28625
City or Town | State | Zip Code

(704) - 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-49-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/10-06/11/08

TIME COMPLETED ____ AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map

(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT | NC | 28419
City or Town | State | Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX10429

SOUTHPORT | NC | 28419
City or Town | State | Zip Code

( ) -
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 19.0'

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 11.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):

From ____ To ____ From ____ To ____
From ____ To ____ From ____ To ____
From ____ To ____ From ____ To ____

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 9.0	Ft.	2 INCH	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 5.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 9.0	To 19.0	Ft.	2.0 in.	.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 7.0	To 19.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	1.0	BLACK TOP SOIL
1.0	5.0	YELLOW SANDY CLAY
5.0	12.0	GRAY SANDY CLAY
12.0	19.0	GRAY SAND

11. REMARKS:

Bentonite seal from 5.0 to 7.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Johnny Burr — 06/26/08
SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-50-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/11-06/11/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map

(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT NC 28419
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX10429

SOUTHPORT NC 28419
City or Town State Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 22.0'

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 10.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):

From To From To
From To From To
From To From To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 12.0	Ft.	2 INCH	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 8.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 12.0	To 22.0	Ft.	2.0 in.	.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 10.0	To 22.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	1.0	BLACK TOP SOIL
1.0	6.0	YELLOW SANDY CLAY
6.0	20.0	GRAY SANDY CLAY
20.0	22.0	GRAY SAND

11. REMARKS:

Bentonite seal from 8.0 to 10.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

06/26/08
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2581

1. WELL CONTRACTOR:

BRIAN THOMAS
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-51-B

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation☐ Other ☐ (list use)

DATE DRILLED 06/09-06/13/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐Slope ☐Valley ☐Flat ☐Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐GPS ☐Topographic map

(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT NC 28419
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX10429

SOUTHPORT NC 28419
City or Town State Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 45.0'

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 7.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):

From To From To
From To From To
From To From To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 35.0	Ft.	2 INCH	SCH 40	PVC
From 0.0	To 24.0	Ft.	6 INCH	SCH 40	PVC
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 19.0	Ft.	Portland bentonite	SLURRY
From 0.0	To 24.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 35.0	To 45.0	Ft.	2.0 in.	.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 33.0	To 45.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	4.0	TAN SAND
4.0	18.0	BROWN SANDY CLAY
18.0	29.0	GRAY SANDY CLAY
29.0	45.0	GRAY SAND/SHELLS

11. REMARKS:

Bentonite seal from 19.0 to 33.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

[redacted] 06/26/08
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

BRIAN THOMAS
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-51-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/18/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY - is the name of the business where the well is located

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT NC 28419
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX10429

SOUTHPORT NC 28419
City or Town State Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 22.0'

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 4.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):
From To From To
From To From To
From To From To

6. CASING:

From	To	Ft.	Diameter	Thickness/ Weight	Material
0.0	12.0		2 INCH	SCH 40	PVC

7. GROUT:

From	To	Ft.	Material	Method
0.0	8.0		Portland bentonite	SLURRY

8. SCREEN:

From	To	Ft.	Diameter	Slot Size	Material
12.0	22.0		2.0 in.	.010 in.	PVC
			in.	in.	
			in.	in.	

9. SAND/GRAVEL PACK:

From	To	Ft.	Size	Material
10.0	22.0		20-40	Fine Silica Sand

10. DRILLING LOG

From	To	Formation Description
0.0	2.0	BLACK TOP SOIL
2.0	14.0	BROWN SAND
14.0	21.0	GRAY SANDY CLAY
21.0	22.0	GRAY SAND

11. REMARKS:

Bentonite seal from 8.0 to 10.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

06/26/08
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2581

1. WELL CONTRACTOR:

BRIAN THOMAS
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-52-B

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/09-06/13/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map

(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT NC 28419
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX10429

SOUTHPORT NC 28419
City or Town State Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 51.0'

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 7.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):

From To From To
From To From To
From To From To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 41.0	Ft.	2 INCH	SCH 40	PVC
From 0.0	To 30.0	Ft.	6 INCH	SCH 40	PVC
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 25.0	Ft.	Portland bentonite	SLURRY
From 0.0	To 30.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 41.0	To 51.0	Ft.	2.0 in.	.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 39.0	To 51.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	4.0	TAN SAND
4.0	18.0	BROWN SANDY CLAY
18.0	34.0	GRAY SANDY CLAY
34.0	49.0	GRAY SAND/SHELLS
49.0	51.0	LIMESTONE

11. REMARKS:

Bentonite seal from 25.0 to 39.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

[redacted] 06/26/08
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

BRIAN THOMAS
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2581

1. WELL CONTRACTOR:

BRIAN THOMAS
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704) - 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-53-B

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/09-06/13/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map

(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY - is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT NC 28419
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX10429

SOUTHPORT NC 28419
City or Town State Zip Code

( ) -
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 76.0'

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 7.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):

From To From To
From To From To
From To From To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 66.0	Ft.	2 INCH	SCH 40	PVC
From 0.0	To 30.0	Ft.	6 INCH	SCH 40	PVC
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 28.0	Ft.	Portland bentonite	SLURRY
From 0.0	To 30.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 66.0	To 76.0	Ft.	2.0 in.	.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 64.0	To 76.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	4.0	TAN SAND
4.0	18.0	BROWN SANDY CLAY
18.0	22.0	GRAY SANDY CLAY
22.0	36.0	GRAY SANDY CLAY/SHELLS
36.0	51.0	GRAY SAND/SHELLS
51.0	64.0	LIMESTONE
64.0	76.0	GRAY SANDY CLAY W/SHELLS

11. REMARKS:

Bentonite seal from 28.0 to 64.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

[redacted] 06/26/08
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

BRIAN THOMAS
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-54-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐ Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐ Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/12/08

TIME COMPLETED _____ AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other _____
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY - is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT NC 28419
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX10429

SOUTHPORT NC 28419
City or Town State Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 24.0'

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 15.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):
From To From To
From To From To
From To From To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 14.0	Ft.	2 INCH	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 10.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 14.0	To 24.0	Ft.	2.0 in.	.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 12.0	To 24.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	1.0	BLACK TOP SOIL
1.0	3.0	YELLOW SANDY CLAY
3.0	15.0	GRAY SANDY CLAY
15.0	24.0	GRAY SAND

11. REMARKS:

Bentonite seal from 10.0 to 12.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR 06/26/08 DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-55-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐ Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐ Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/13/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD) 28419
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE 3 ___ ___

LONGITUDE ___ ___ ___

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map

(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- Is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT NC 28419
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 38.0 FEET

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: ___ FT
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):

From ___ To ___ From ___ To ___
From ___ To ___ From ___ To ___
From ___ To ___ From ___ To ___

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 28.0	Ft.	2 INCH	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 24.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter		Slot Size		Material
From 28.0	To 38.0	Ft.	2.0	in.	.010	in.	PVC
From	To	Ft.		in.		in.	
From	To	Ft.		in.		in.	

9. SAND/GRAVEL PACK:

Depth			Size	Material
From 26.0	To 38.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	8.0	BROWN FINE MEDIUM GRAIN SAND TRACE OF CLAY (FILL)
8.0	10.0	GRAY FINE SAND AND SILT (FILL)
10.0	16.0	GRAY BROWN MEDIUM GRAIN SAND WITH
		CRUSHED ROCK @ 13' - 15' (BASE OF DIKE)
16.0	22.0	GRAY FINE GRAIN SAND, TRACE OF SILT, MOIST
22.0	25.0	BROWN SILTY FINE GRAIN SAND, GRADING TO
		GRAY FINE SAND @ 24.5' - 25', WET
25.0	31.0	GRAY FINE GRAIN SAND, TRACE OF SILT,
		WET BECOMING SATURATED @ 30 FEET
31.0	38.0	GRAY MEDIUM GRAIN SAND, SATURATED

11. REMARKS:

Bentonite seal from 24.0 to 26.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR 01/02/09 DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-56-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/13-06/17/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT NC 28419
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX10429

SOUTHPORT NC 28419
City or Town State Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 32.0'

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 20.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):

From	To	From	To

6. CASING:

	Depth From	To	Diameter	Thickness/ Weight	Material
	0.0	22.0 Ft.	2 INCH	SCH 40	PVC
		Ft.			
		Ft.			

7. GROUT:

	Depth From	To	Material	Method
	0.0	18.0 Ft.	Portland bentonite	SLURRY
		Ft.		
		Ft.		

8. SCREEN:

	Depth From	To	Diameter	Slot Size	Material
	22.0	32.0 Ft.	2.0 in.	.010 in.	PVC
		Ft.	in.	in.	
		Ft.	in.	in.	

9. SAND/GRAVEL PACK:

Depth From	To	Size	Material
20.0	32.0 Ft.	20-40	Fine Silica Sand
	Ft.		
	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	1.0	BLACK TOP SOIL
1.0	3.0	YELLOW SANDY CLAY
3.0	20.0	GRAY SANDY CLAY
20.0	25.0	SHELLY CLAY
25.0	30.0	GRAY SANDY CLAY
30.0	32.0	TAN SANDY CLAY

11. REMARKS:

Bentonite seal from 18.0 to 20.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

06/26/08
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-57-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation☐ Other ☐ (list use)

DATE DRILLED 06/12-06/16/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐Slope ☐Valley ☐Flat ☐Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐GPS ☐Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT NC 28419
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX10429

SOUTHPORT NC 28419
City or Town State Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 40.0'

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 28.0 FT
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):

From To From To
From To From To
From To From To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 30.0	Ft.	2 INCH	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 26.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 30.0	To 40.0	Ft.	2.0 in.	.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 28.0	To 40.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	1.0	BLACK TOP SOIL
1.0	7.0	YELLOW SANDY CLAY
7.0	25.0	GRAY SANDY CLAY
25.0	34.0	GRAY SAND
34.0	40.0	YELLOW SAND

11. REMARKS:

Bentonite seal from 26.0 to 28.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

06/26/08
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704) - 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-58-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/16-06/18/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map

(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT NC 28419
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX10429

SOUTHPORT NC 28419
City or Town State Zip Code

( ) -
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 18.0'

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 4.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):

From To From To
From To From To
From To From To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 8.0	Ft.	2 INCH	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 4.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 8.0	To 18.0	Ft.	2.0 in.	.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 6.0	To 18.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	2.0	BLACK TOP SOIL
2.0	7.0	BROWN SANDY CLAY
7.0	18.0	GRAY SANDY CLAY

11. REMARKS:

Bentonite seal from 4.0 to 6.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

06/26/08
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-59-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation☐ Other ☐ (list use)

DATE DRILLED 06/18/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐Slope ☐Valley ☐Flat ☐Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐GPS ☐Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT NC 28419
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX10429

SOUTHPORT NC 28419
City or Town State Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 18.0'

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 5.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):
From To From To
From To From To
From To From To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 8.0	Ft.	2 INCH	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 4.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 8.0	To 18.0	Ft.	2.0 in.	.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 6.0	To 18.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	1.0	BLACK TOP SOIL
2.0	8.0	BROWN SANDY CLAY
8.0	18.0	GRAY SANDY CLAY

11. REMARKS:

Bentonite seal from 4.0 to 6.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

06/26/08
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE | NC | 28625
City or Town | State | Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-60-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐ Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐ Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/18/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT | NC | 28419
City or Town | State | Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX10429

SOUTHPORT | NC | 28419
City or Town | State | Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 19.0'

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 4.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):
From To From To
From To From To
From To From To

6. CASING:

From	To	Ft.	Diameter	Thickness/ Weight	Material
0.0	9.0		2 INCH	SCH 40	PVC

7. GROUT:

From	To	Ft.	Material	Method
0.0	5.0		Portland bentonite	SLURRY

8. SCREEN:

From	To	Ft.	Diameter	Slot Size	Material
9.0	19.0		2.0 in.	.010 in.	PVC
			in.	in.	
			in.	in.	

9. SAND/GRAVEL PACK:

From	To	Ft.	Size	Material
7.0	19.0		20-40	Fine Silica Sand

10. DRILLING LOG

From	To	Formation Description
0.0	1.0	BLACK TOP SOIL
1.0	6.0	BROWN SANDY CLAY
6.0	19.0	GRAY SANDY CLAY

11. REMARKS:

Bentonite seal from 5.0 to 7.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

06/26/08
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

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NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-61-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/19/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map

(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT NC 28419
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX10429

SOUTHPORT NC 28419
City or Town State Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 28.0'

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 14.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):

From To From To
From To From To
From To From To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 18.0	Ft.	2 INCH	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 14.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 18.0	To 28.0	Ft.	2.0 in.	.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 16.0	To 28.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	2.0	BLACK TOP SOIL
2.0	12.0	BROWN SANDY CLAY
12.0	20.0	GRAY SANDY CLAY
20.0	27.0	GRAY SAND
27.0	28.0	GRAY CLAY

11. REMARKS:

Bentonite seal from 14.0 to 16.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

06/26/08
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704) 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-62-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐ Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐ Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/23/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE 3 __ __
LONGITUDE __ __ __

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT NC
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 20.0

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 6.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 0.0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):
From To From To
From To From To
From To From To

6. **CASING:**

From	To	Depth Ft.	Diameter	Thickness/ Weight	Material
0.0	10.0		2 INCH	SCH 40	PVC

7. **GROUT:**

From	To	Depth Ft.	Material	Method
0.0	6.0		Portland bentonite	SLURRY

8. **SCREEN:**

From	To	Depth Ft.	Diameter in.	Slot Size in.	Material
10.0	20.0		2.0	.010	PVC

9. **SAND/GRAVEL PACK:**

From	To	Depth Ft.	Size	Material
8.0	20.0		20-40	Fine Silica Sand

10. **DRILLING LOG**

From	To	Formation Description
0.0	1.0	BLACK TOP SOIL
1.0	10.0	BROWN SANDY CLAY
10.0	19.0	GRAY SAND
19.0	20.0	GRAY SANDY CLAY

11. **REMARKS:**

Bentonite seal from 6.0 to 8.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

07/15/08
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-63-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation☐ Other ☐ (list use)

DATE DRILLED 06/19/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐Slope ☐Valley ☐Flat ☐Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐GPS ☐Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT NC 28419
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX10429

SOUTHPORT NC 28419
City or Town State Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 29.0'

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 14.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):
From To From To
From To From To
From To From To

6. CASING:

	Depth From	Depth To	Diameter	Thickness/ Weight	Material
	0.0	19.0	2 INCH	SCH 40	PVC

7. GROUT:

	Depth From	Depth To	Material	Method
	0.0	15.0	Portland bentonite	SLURRY

8. SCREEN:

	Depth From	Depth To	Diameter	Slot Size	Material
	19.0	29.0	2.0 in.	.010 in.	PVC
			in.	in.	
			in.	in.	

9. SAND/GRAVEL PACK:

	Depth From	Depth To	Size	Material
	17.0	29.0	20-40	Fine Silica Sand

10. DRILLING LOG

From	To	Formation Description
0.0	1.0	BLACK TOP SOIL
1.0	7.0	BROWN SANDY CLAY
7.0	9.0	GRAY SANDY CLAY
9.0	28.0	GRAY SAND
28.0	29.0	GRAY CLAY

11. REMARKS:

Bentonite seal from 15.0 to 17.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR 06/26/08 DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-64-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/23/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE 3
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT NC
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 21.0

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 8.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 0.0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):
From To From To
From To From To
From To From To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 11.0	Ft.	2 INCH	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 7.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 11.0	To 21.0	Ft.	2.0 in.	.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 9.0	To 21.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	1.0	BLACK TOP SOIL
1.0	4.0	YELLOW SANDY CLAY
4.0	14.0	BROWN SAND
14.0	20.0	GRAY SANDY CLAY
20.0	21.0	GRAY SANDY CLAY

11. REMARKS:

Bentonite seal from 7.0 to 9.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

07/1508

SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704) - 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-65-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/24/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE 3
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT NC
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

( ) -
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 15.0

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 5.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 0.0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):
From To From To
From To From To
From To From To

6. CASING:

	Depth From	Depth To	Diameter	Thickness/ Weight	Material
	0.0	5.0	2 INCH	SCH 40	PVC

7. GROUT:

	Depth From	Depth To	Material	Method
	0.0	1.0	Portland bentonite	SLURRY

8. SCREEN:

	Depth From	Depth To	Diameter	Slot Size	Material
	5.0	15.0	2.0 in.	.010 in.	PVC
			in.	in.	
			in.	in.	

9. SAND/GRAVEL PACK:

Depth From	Depth To	Size	Material
3.0	15.0	20-40	Fine Silica Sand

10. DRILLING LOG

From	To	Formation Description
0.0	1.0	BLACK TOP SOIL
1.0	12.0	BROWN SANDY CLAY
12.0	15.0	GRAY SANDY CLAY

11. REMARKS:

Bentonite seal from 1.0 to 3.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C WELL CONSTRUCTION STANDARDS AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

07/15/08
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

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NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704) 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-66-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/24/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE 3 ___ ___
LONGITUDE ___ ___ ___

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT NC
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 20.0

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 9.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 0.0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):
From ___ To ___ From ___ To ___
From ___ To ___ From ___ To ___
From ___ To ___ From ___ To ___

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 10.0	Ft.	2 INCH	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 6.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 10.0	To 20.0	Ft.	2.0 in.	.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 8.0	To 20.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	1.0	BLACK TOP SOIL
1.0	14.0	BROWN SAND
14.0	18.0	GRAY SAND
18.0	20.0	GRAY SANDY CLAY

11. REMARKS:

Bentonite seal from 6.0 to 8.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE 07/15/08

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-67-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/25/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE 3
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT NC
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 25.0

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 12.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 0.0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):
From To From To
From To From To
From To From To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 15.0	Ft.	2 INCH	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 10.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 15.0	To 25.0	Ft.	2.0 in.	.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 13.0	To 25.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	1.0	BLACK TOP SOIL
1.0	11.0	BROWN SAND
11.0	24.0	GRAY SAND
24.0	25.0	GRAY SANDY CLAY

11. REMARKS:

Bentonite seal from 10.0 to 13.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE 07/15/08

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-68-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/25/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE 3
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT NC
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 19.0

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 10.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 0.0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):
From To From To
From To From To
From To From To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 9.0	Ft.	2 INCH	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 5.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 9.0	To 19.0	Ft.	2.0 in.	.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 7.0	To 19.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	1.0	BLACK TOP SOIL
1.0	4.0	YELLOW SANDY CLAY
4.0	18.0	GRAY SAND
18.0	20.0	GRAY SANDY CLAY

11. REMARKS:

Bentonite seal from 5.0 to 7.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

07/15/08
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-69-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Puolic ☐ Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐ Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/27/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No. Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE 3
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT NC
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 30.0

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 12.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 0.0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):

From To From To
From To From To
From To From To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 20.0	Ft.	2 INCH	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 16.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 20.0	To 30.0	Ft.	2.0 in.	.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 18.0	To 30.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	1.0	BLACK TOP SOIL
1.0	5.0	BROWN SANDY CLAY
5.0	25.0	GRAY SAND
25.0	30.0	GRAY SANDY CLAY

11. REMARKS:

Bentonite seal from 16.0 to 18.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Johnny Burr 07/15/08
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704) 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-70-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use)

DATE DRILLED 07/02/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT NC
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 18.0

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 10.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 0.0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):
From To From To
From To From To
From To From To

6. CASING:

	Depth From	Depth To	Diameter	Thickness/ Weight	Material
	0.0	8.0	2 INCH	SCH 40	PVC

7. GROUT:

	Depth From	Depth To	Material	Method
	0.0	4.0	Portland bentonite	SLURRY

8. SCREEN:

	Depth From	Depth To	Diameter	Slot Size	Material
	8.0	18.0	2.0 in.	.010 in.	PVC
			in.	in.	
			in.	in.	

9. SAND/GRAVEL PACK:

Depth From	Depth To	Size	Material
6.0	18.0	20-40	Fine Silica Sand

10. DRILLING LOG

From	To	Formation Description
0.0	2.0	BLACK TOP SOIL
2.0	3.0	YELLOW SANDY CLAY
3.0	8.0	GRAY SAND
8.0	18.0	BROWN BLACK SAND

11. REMARKS:

Bentonite seal from 4.0 to 6.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

07/16/08
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-71-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/30/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT NC
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 19.0

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 8.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 0.0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):
From To From To
From To From To
From To From To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 9.0	Ft.	2 INCH	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 5.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 9.0	To 19.0	Ft.	2.0 in.	.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 7.0	To 19.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	1.0	BLACK TOP SOIL
1.0	2.0	YELLOW SANDY CLAY
2.0	18.0	GRAY SAND
18.0	19.0	GRAY SAND

11. REMARKS:

Bentonite seal from 5.0 to 7.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE 07/16/08

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-72-C

STATE WELL PERMIT#(if applicable) _____

DWQ or OTHER PERMIT #(if applicable) _____

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use) _____

DATE DRILLED 07/02/08

TIME COMPLETED _____ AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other _____
(check appropriate box)

LATITUDE _____

LONGITUDE _____

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map

(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable) _____

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT NC
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 18.0

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 7.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 0.0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):

From ____ To ____ From ____ To ____
From ____ To ____ From ____ To ____
From ____ To ____ From ____ To ____

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 8.0	Ft.	2 INCH	SCH 40	PVC
From ____	To ____	Ft.			
From ____	To ____	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 4.0	Ft.	Portland bentonite	SLURRY
From ____	To ____	Ft.		
From ____	To ____	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 8.0	To 18.0	Ft.	2.0 in.	.010 in.	PVC
From ____	To ____	Ft.	in.	in.	
From ____	To ____	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 6.0	To 18.0	Ft.	20-40	Fine Silica Sand
From ____	To ____	Ft.		
From ____	To ____	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	2.0	BLACK TOP SOIL
2.0	3.0	YELLOW SANDY CLAY
3.0	16.0	BROWN SAND
16.0	18.0	GRAY SAND

11. REMARKS:

Bentonite seal from 4.0 to 6.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

07/16/08

SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-73-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐ Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐ Irrigation ☐ Other ☐ (list use)

DATE DRILLED 07/01/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT NC
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 15.0

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 4.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 0.0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):

From To From To
From To From To
From To From To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 5.0	Ft.	2 INCH	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 1.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 5.0	To 15.0	Ft.	2.0 in.	.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 3.0	To 15.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	1.0	BLACK TOP SOIL
1.0	4.0	YELLOW SANDY CLAY
4.0	10.0	BROWN SAND
10.0	15.0	BLACK SAND

11. REMARKS:

Bentonite seal from 1.0 to 3.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Johnny Burr 07/16/08
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704) - 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) ESS-74-C

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐ Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐ Irrigation ☐ Other ☐ (list use)

DATE DRILLED 07/01/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT NC
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

( ) -
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 20.0

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 8.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 0.0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):
From To From To
From To From To
From To From To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 10.0	Ft.	2 INCH	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 6.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter		Slot Size		Material
From 10.0	To 20.0	Ft.	2.0	in.	.010	in.	PVC
From	To	Ft.		in.		in.	
From	To	Ft.		in.		in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 8.0	To 20.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	2.0	BLACK TOP SOIL
2.0	3.0	YELLOW SANDY CLAY
3.0	16.0	BROWN SAND
16.0	20.0	BROWN SAND

11. REMARKS:

Bentonite seal from 6.0 to 8.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

07/16/08

SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

Appendix B

Tabulated Groundwater Analytical Results

Appendix B
Tabulated Groundwater Analytical Data

Well ID	Activity, pCi/L															
	Round 1		Round 2		Additional Sampling Rounds											
	Date	Result	Date	Result	Date	Result	Date	Result	Date	Result	Date	Result	Date	Result	Date	Result
ESS-32C	29-Jul-08	<242	30-Mar-09	<244.7												
ESS-33C	29-Jul-08	<243	31-Mar-09	<243.8												
ESS-34C	29-Jul-08	<241	31-Mar-09	<243.7												
ESS-35C	29-Jul-08	<249	31-Mar-09	<242.9												
ESS-36C	29-Jul-08	<251	31-Mar-09	<244.6												
ESS-37C	1-Aug-08	<243	1-Apr-09	<243.1												
ESS-38B	1-Aug-08	<246	17-Mar-09	<241.0	17-Jul-08	<246.3	19-Nov-08	<244.9	18-Dec-08	<240.7	23-Jan-09	<244.9	23-Feb-09	<238.4		
ESS-38C	1-Aug-08	<244	17-Mar-09	**516.9**	18-Jul-08	<243.7	21-Nov-08	<243.9	18-Dec-08	<246.9	23-Jan-09	<247.1	23-Feb-09	<214.7		
ESS-39B	1-Aug-08	<247	18-Mar-09	**490.1**	18-Jul-08	<242.5	19-Nov-08	<245.7	18-Dec-08	**798.9**	23-Jan-09	**579.1**	23-Feb-09	<237.7		
ESS-39C	1-Aug-08	<245	18-Mar-09	<243.2	18-Jul-08	<244.9	21-Nov-08	<245.7	18-Dec-08	<242.6	23-Jan-09	<247.1	23-Feb-09	<238.8		
ESS-40C	15-Jul-08	<270	30-Mar-09	<244.4												
ESS-41C	15-Jul-08	<274	31-Mar-09	<242.7												
ESS-42C	15-Jul-08	<267	31-Mar-09	<244.3												
ESS-43C	15-Jul-08	<257	31-Mar-09	<244.5												
ESS-44C	15-Jul-08	<267	30-Mar-09	<244.5												
ESS-45C	29-Jul-08	<250	30-Mar-09	<246.0												
ESS-46C	29-Jul-08	<250	30-Mar-09	<244.5												
ESS-47C	29-Jul-08	<255	30-Mar-09	<241.8												
ESS-48C	29-Jul-08	<243	30-Mar-09	<241.1												
ESS-49C	29-Jul-08	<242	30-Mar-09	<241.6												
ESS-50C	30-Jul-08	<242	30-Mar-09	<243.6												
ESS-51B	1-Aug-08	<247	3-Apr-09	<237.6												
ESS-51C	5-Nov-08	<245	3-Apr-09	<239.1												
ESS-52B	1-Aug-08	<248	3-Apr-09	<239.9												
ESS-53B	1-Aug-08	<250	2-Apr-09	<240.9												
ESS-54C	28-Jul-08	<241	2-Apr-09	<238.5												
ESS-55C	30-Jul-08	<242	2-Apr-09	<238.3												
ESS-56C	28-Jul-08	<261	2-Apr-09	<238.4												
ESS-57C	28-Jul-08	<247	2-Apr-09	<239.3												
ESS-58C	28-Jul-08	<241	2-Apr-09	<239.0												
ESS-59C	28-Jul-08	<233	2-Apr-09	<239.6												
ESS-60C	28-Jul-08	<247	2-Apr-09	<238.4												
ESS-61C	31-Jul-08	<245	1-Apr-09	<243.7												
ESS-62C	28-Jul-08	<252	1-Apr-09	<243.7												
ESS-63C	28-Jul-08	<252	1-Apr-09	<244.1												
ESS-64C	31-Jul-08	<245	1-Apr-09	<243.7												
ESS-65C	30-Jul-08	<247	1-Apr-09	<244.3												
ESS-66C	30-Jul-08	<257	1-Apr-09	<243.2												
ESS-67C	1-Aug-08	**345**	1-Apr-09	<243.5	17-Jul-08	**491**	5-Aug-08	**456**	25-Aug-08	**528**	9-Sep-08	**298**	14-Oct-08	<244	23-Oct-08	<241
ESS-67C (cont)					12-Nov-08	<245.2	9-Dec-08	**496.1**	21-Jan-09	**458.7**	17-Feb-09	<238.5	9-Mar-09	<237.1	9-Apr-09	<241.4
ESS-68C	31-Jul-08	<253	1-Apr-09	<243.7												
ESS-69C	1-Aug-08	<245	2-Apr-09	<240.2												
ESS-70C	1-Aug-08	<267	2-Apr-09	<242.0												
ESS-71C	1-Aug-08	<269	2-Apr-09	<242.2												
ESS-72C	1-Aug-08	<260	2-Apr-09	<242.4												
ESS-73C	1-Aug-08	**308**	2-Apr-09	<241.6	17-Jul-08	**439**	5-Aug-08	**423**	25-Aug-08	**329**	9-Sep-08	**246**	14-Oct-08	<244	23-Oct-08	<241
ESS-73C (comt)					12-Nov-08	<245.6	9-Dec-08	<236.1	21-Jan-09	<246.1	17-Feb-09	<240.0	9-Mar-09	<235.4	9-Apr-09	<236.1
ESS-74C	1-Aug-09	<249	2-Apr-09	<241.7												

Acn. ML081050029

Progress Energy

APR 0 3 2008

SERIAL: BSEP 08-0043

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Subject: Brunswick Steam Electric Plant, Unit Nos. 1 and 2
Docket Nos. 50-325 and 50-324/License Nos. DPR-71 and DPR-62
Voluntary Groundwater Protection Plan Report

Ladies and Gentlemen:

In accordance with the Nuclear Energy Institute (NEI) Industry Groundwater Protection Initiative, Carolina Power & Light Company, now doing business as Progress Energy Carolinas, Inc., submits the enclosed voluntary report identifying tritium concentrations in onsite water samples at the Brunswick Steam Electric Plant.

No regulatory commitments are contained in this letter. Please refer any questions regarding this submittal to Mr. Randy C. Ivey, Manager - Support Services, at (910) 457-2447.

Sincerely,

Edward L. Wills, Jr.
Plant General Manager
Brunswick Steam Electric Plant

LJG/ljg

Enclosure:

Voluntary Groundwater Protection Plan Report

Progress Energy Carolinas, Inc.
Brunswick Nuclear Plant
PO Box 10429
Southport, NC 28461

cc (with enclosure):

U. S. Nuclear Regulatory Commission, Region II
ATTN: Mr. Victor M. McCree, Regional Administrator (Acting)
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW, Suite 23T85
Atlanta, GA 30303-8931

U. S. Nuclear Regulatory Commission
ATTN: Mr. Joseph D. Austin, NRC Senior Resident Inspector
8470 River Road
Southport, NC 28461-8869

U. S. Nuclear Regulatory Commission (Electronic Copy Only)
ATTN: Mrs. Farideh E. Saba (Mail Stop OWFN 8G9A)
11555 Rockville Pike
Rockville, MD 20852-2738

U. S. Nuclear Regulatory Commission (Electronic Copy Only)
ATTN: Mr. Stewart N. Bailey (Mail Stop OWFN 8B1)
11555 Rockville Pike
Rockville, MD 20852-2738

Chair - North Carolina Utilities Commission
P.O. Box 29510
Raleigh, NC 27626-051

Ms. Beverly O. Hall
Chief – Radiation Protection Section
North Carolina Department of Environment and Natural Resources
3825 Barrett Drive
Raleigh, NC 27609-7221

Voluntary Groundwater Protection Plan Report

Background

The Nuclear Energy Institute (NEI) Industry Groundwater Protection Initiative is a voluntary industry-wide effort designed to assure timely detection of, and effective responses to, situations involving inadvertent radiological releases in groundwater to prevent migration of licensed radioactive materials offsite. NEI has issued guidance for development of action plans and a voluntary communications protocol. The voluntary communication protocol requires submittal of a 30-day written report to the NRC for any water sample result from an onsite groundwater monitoring well that exceeds the criterion in the Brunswick Steam Electric Plant Radiological Environmental Monitoring Program (REMP)/ Off-site Dose Calculation Manual (ODCM), and is, or could potentially be, used as a source of drinking water.

On June 13, 2007, tritium levels in excess of NEI voluntary reporting criteria (i.e., 30,000 pCi/L for onsite groundwater, as specified in the ODCM) were confirmed to be present in new onsite shallow groundwater monitoring wells. A 10 CFR 50.72 report (i.e., EN 43420) was made with this information on June 13, 2007. Additionally, state and local officials were contacted to inform them of the findings. A public meeting was held on June 19, 2007, to offer local residents an opportunity to hear actions being taken in response to this finding and to respond to their questions or concerns.

On March 7, 2008, an ongoing investigation determined that tritium levels in excess of NEI voluntary reporting criteria in an onsite shallow groundwater monitoring well resulted from a condition not previously reported. A follow-up notification was made on March 7, 2008, in accordance with 10 CFR 50.72 (i.e., EN 44041) containing this information. Additionally, state and local officials were contacted to inform them of the findings.

Analysis

The initial report made on June 13, 2007, identified an onsite shallow groundwater well (i.e., ESS-18C) near the Storm Drain Stabilization Pond (SDSP) exceeding the NEI voluntary reporting criteria. As previously indicated in that report (i.e., EN 43420), the storm drain system routes tritiated water into the SDSP. Overflow from the Turbine Building air-wash system was identified as the primary contributor to the storm drain system. The air-wash is no longer routed into the storm drains, which eliminated the major source of tritium into the storm drain collection system.

On March 7, 2008, an ongoing investigation determined that tritium levels in excess of NEI voluntary reporting criteria present in an onsite shallow groundwater well (i.e., ESS-2C), resulted from a condition not previously reported. Though elevated levels of tritium for each incident are most likely a result of the same source (i.e., effluent routed in the storm drain collection system), subsequent investigations indicate that the storm drain piping may allow an inadvertent pathway to groundwater in close proximity to ESS-2C. The monitoring wells are well within the boundaries of the site owner controlled area and there is no indication that tritium has migrated into any drinking water.

Carolina Power & Light Company (CP&L), now doing business as Progress Energy Carolinas, Inc., continues to take actions to address the elevated tritium levels. CP&L has installed 30 new wells, including shallow, intermediate, and deep wells, since June, 2007, as part of the ongoing groundwater monitoring program. In addition, 12 previously existing wells continue to be monitored. The monitoring wells are located around the plant site in order to: (1) determine the extent of tritium levels in the groundwater, and (2) confirm the hydrologic conditions, including the pattern, of the affected area. A site conceptual model determining the groundwater flow profile has been completed by a third-party vendor and a final review is in progress.

Conclusion

An environmental sampling program and ongoing analysis has demonstrated that there has been no adverse offsite impact resulting from this condition. CP&L is implementing a response plan which includes actions to fully determine the extent of the elevated tritium, and to confirm the hydrologic conditions of the affected area. Based on the results of these actions, CP&L will establish appropriate long-term actions to address the situation.

Progress Energy

Acn. ML072150376

July 12, 2007

SERIAL: BSEP 07-0068

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Subject: Brunswick Steam Electric Plant, Unit Nos. 1 and 2
Docket Nos. 50-325 and 50-324/License Nos. DPR-71 and DPR-62
Voluntary Groundwater Protection Plan Report

Ladies and Gentlemen:

In accordance with the Nuclear Energy Institute (NEI) Industry Initiative on Groundwater Protection, Carolina Power & Light Company, now doing business as Progress Energy Carolinas, Inc., submits the enclosed voluntary report identifying tritium concentrations in onsite water samples at the Brunswick Steam Electric Plant.

No regulatory commitments are contained in this letter. Please refer any questions regarding this submittal to Mr. Randy C. Ivey, Manager - Support Services, at (910) 457-2447.

Sincerely,

Terry D. Hobbs
Plant General Manager
Brunswick Steam Electric Plant

LJG/ljg

Enclosure:

Voluntary Groundwater Protection Plan Report

Progress Energy Carolinas, Inc.
Brunswick Nuclear Plant
PO Box 10429
Southport NC 28461

cc (with enclosure):

U. S. Nuclear Regulatory Commission, Region II
ATTN: Dr. William D. Travers, Regional Administrator
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW, Suite 23T85
Atlanta, GA 30303-8931

U. S. Nuclear Regulatory Commission
ATTN: Mr. Eugene M. DiPaolo, NRC Senior Resident Inspector
8470 River Road
Southport, NC 28461-8869

U. S. Nuclear Regulatory Commission **(Electronic Copy Only)**
ATTN: Mr. Stewart N. Bailey (Mail Stop OWFN 8B1)
11555 Rockville Pike
Rockville, MD 20852-2738

Chair - North Carolina Utilities Commission
P.O. Box 29510
Raleigh, NC 27626-051

Ms. Beverly O. Hall
Chief – Radiation Protection Section
North Carolina Department of Environment and Natural Resources
3825 Barrett Drive
Raleigh, NC 27609-7221

Voluntary Groundwater Protection Plan Report

Background

The Nuclear Energy Institute (NEI) Industry Groundwater Protection Initiative is a voluntary industry-wide effort designed to assure timely detection of, and effective responses to, situations involving inadvertent radiological releases in groundwater to prevent migration of licensed radioactive materials offsite. NEI has issued interim guidance for development of action plans and a voluntary communications protocol. The voluntary communication protocol requires submittal of a 30-day written report to the NRC for any sample result that exceeds the criterion in the Brunswick Steam Electric Plant Radiological Environmental Monitoring Program (REMP)/ Off-site Dose Calculation Manual (ODCM) and that could potentially reach the groundwater that is, or could be in the future, used as a source of drinking water.

On May 8, 2007, measurable levels of tritium were identified in two manholes (i.e., MW-5 and MW-6) that route cable to a nearby meteorological tower. The manholes are located within the boundaries of the site owner controlled area. The manholes are also in close proximity to the Storm Drain Stabilization Pond (SDSP). The SDSP is an area of approximately 64 acres consisting of a non-lined perimeter dike of approximately 12 to 15 feet in height. The site storm drain system collects in the storm drain collector basin and is then pumped to the SDSP. The storm drain collector basin receives overflow from the Turbine Building air-wash system, which contains tritium. By plant design, the water from the SDSP is then pumped into the intake canal during monitored, controlled releases, compliant with all permits and regulations.

On June 13, 2007, tritium levels in excess of NEI voluntary reporting criteria (i.e., 30,000 pCi/L for onsite groundwater, as specified in the ODCM) were confirmed to be present in new onsite shallow groundwater wells. The highest level observed in the shallow groundwater wells was 506,500 pCi/L, at a depth of 5 to 20 feet. A 10 CFR 50.72 (i.e., EN 43420) report was made with this information on June 13, 2007. Additionally, state and local officials were contacted to inform them of the findings. A public meeting was held on June 19, 2007, to offer local residents an opportunity to hear actions being taken in response to this finding and to respond to their questions or concerns.

Analysis

Carolina Power & Light Company (CP&L), now doing business as Progress Energy Carolinas, Inc., continues to take actions to address the unmonitored tritium release. The primary source of tritium to the SDSP was determined to be coming from the Turbine Building air-wash system overflow, which has now been isolated and is being routed to the radwaste system. An evaluation is in progress to determine the root cause of this event and the long-term corrective actions to address this condition.

CP&L is installing new shallow, intermediate, and deep wells around the perimeter of the SDSP in order to: (1) determine the extent of the release, and (2) confirm the hydrologic conditions, including the pattern, of the affected area. To date, a total of nine (9) new shallow wells and six (6) intermediate sampling wells have been installed. Thus far, approximately 100 samples, from both onsite and offsite locations (including surface water), have been analyzed. Tritium analyses

in offsite samples have been below the detection level. Additionally, tritium has been below detection levels in the Castle Hayne aquifer; the main drinking water aquifer for the area which is located at a depth of approximately 150 feet. To date, tritium activity in sample results from onsite shallow and intermediate sampling wells have not exceeded the originally reported maximum level of 506,500 pCi/L. The highest value in intermediate wells was 5,406 pCi/L. To date, it does not appear that the intermediate groundwater is connected to the Castle Hayne aquifer. Surface water samples (e.g., standing water in ditches near the SDSP) has contained tritium levels exceeding 800,000 pCi/L. A collection system has been installed to collect and route the surface water back to the SDSP.

Conclusion

Preliminary sampling and analysis has demonstrated that there has been no adverse offsite impact resulting from this condition. CP&L is implementing a response plan which includes actions to fully determine the extent of the release, and confirm the hydrologic conditions of the affected area. Based on the results of these actions, CP&L will establish appropriate long-term actions to address the situation.

GROUNDWATER ASSESSMENT REPORT

PROTECTED AREA

BRUNSWICK NUCLEAR PLANT

SOUTHPORT, NORTH CAROLINA

PREPARED FOR:

Progress Energy

PROGRESS ENERGY CAROLINAS

PREPARED BY:

SSi

SILAR SERVICES, INC.
983 BUTLER PIKE
BLUE BELL, PA 19422

October 2009

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1 INTRODUCTION

1.1 Purpose of Report

Silar Services Incorporated (SSi) has prepared this Groundwater Assessment Report (GAR) to document the results of groundwater assessment activities performed within the Protected Area (PA) of the Brunswick Nuclear Plant (BNP), located in Southport, Brunswick County, North Carolina. The PA includes all accessible areas within the secured access area of the power generating facility, and the assessment of the PA included areas adjacent to the perimeter of the PA. The purpose of the groundwater assessment in the PA was to evaluate the geology and hydrogeology in the PA and to identify the presence and extent of radiological materials in groundwater within the PA of the BNP.

The groundwater assessment was initiated in the PA to characterize groundwater quality at areas where tritium and/or other radiological sources are known to exist as part of Progress Energy's commitment to comply with the Industry Groundwater Protection Initiative (NEI, 2007) and to address recommendations provided by American Nuclear Insurers after the completion of a routine inspection of the BNP. The scope of the groundwater assessment in the PA was also developed to assist in determining the source of persistent elevated concentrations of tritium detected in monitoring well ESS-2C.

The activities included in the groundwater assessment were established consistent with industry standard practice and guidance documents associated with the protection of groundwater resources from radiological materials, including the following:

- Guideline for Implementing a Groundwater Protection Program at Nuclear Power Plants [Electric Power Research Institute, November, 2007]; and,
- Industry Ground Water Protection Initiative – Final Guidance Document [Nuclear Energy Institute (NEI), August 2007].

The groundwater assessment activities were initiated at the Site in July 2008, and this report provides a comprehensive presentation of the activities completed to date and the findings of the assessment.

1.2 Project Background

This section includes information on the location, description and history of the Site.

1.2.1 Site Location

The Brunswick Nuclear Plant Site is located approximately 2.5 miles north-northeast of the City of Southport, Brunswick County, North Carolina, and is situated on approximately 1,200 acres of land. The Site location is depicted on **Figure 1**.

The PA includes all accessible areas within the secured access area of the power generating facility and areas adjacent to the perimeter of the PA. The Site layout, including the various areas is depicted on **Figure 2**.

Areas not included as part of this assessment include the Storm Drain Stabilization Pond (SDSP), and the Site-Wide Area of the BNP. The groundwater assessments of the SDSP and the Site-Wide Area have been completed and the results are summarized in separate reports provided to Progress Energy.

1.2.2 Project Background

The NEI Ground Water Protection Initiative identifies actions to improve utilities' management and response to instances where the inadvertent release of radioactive substances may result in low but detectible levels of plant-related materials in subsurface soils and water. The inadvertent releases addressed by this initiative fall outside the current requirements of the Nuclear Regulatory Commission (NRC) and are well below the NRC's limits that ensure protection of public health and safety. This GAR meets objectives 1.1 and 1.3 of the NEI guidance by characterizing the

groundwater hydrogeology and performing initial groundwater sampling and analysis in the vicinity of the PA to be considered in the development of a long-term groundwater monitoring program at the BNP.

1.3 Scope and Objectives

The overall objectives of the groundwater assessment in the Protected Area were to provide sampling points to evaluate groundwater quality, to assess potential sources of contamination in the PA, and to characterize the geology and hydrogeology of the PA. The scope of the assessment included the collection of groundwater data as close as reasonably possible to the identified systems, structures, or components (SSCs) in the PA that contain or could contain licensed material and for which there is a credible mechanism for the licensed material to reach ground water. The information collected within the PA will be utilized in conjunction with other data collected in the owner controlled area (OCA) to establish a comprehensive site-wide groundwater monitoring program to ensure timely detection of inadvertent radiological releases to groundwater.

In addition to the primary objectives of the groundwater assessment, an evaluation of potential radiological materials in subsurface soils was completed via the collection and analysis of soil samples obtained from the borings included in the groundwater assessment program. The soils component of the assessment was added to the scope of the groundwater assessment to provide additional information in support of long-term considerations associated with subsurface materials in the PA.

1.4 Report Organization

The organization and content of the remainder of this report are described below.

Section 2.0 - Investigation Activities and Findings

Section 2 provides a summary of the activities completed during planning and implementation of the assessment. The methods, locations, and results of the sampling and analysis program are summarized in detail for soil and groundwater.

Section 3.0 - Physical Characteristics of the Study Area

A description of the study area including surface features, geology and soils, surface water hydrology, and groundwater hydrology is provided in Section 3.

Section 4.0 - Summary and Conclusions

A summary of the environmental conditions relevant to satisfying the objectives of the investigation are provided in Section 4.

Section 5.0 - References

Section 5 presents a list of references utilized during the preparation of this report.

2 ASSESSMENT ACTIVITIES AND FINDINGS

The planning and implementation of the PA groundwater assessment was completed in several phases. The sequence of these activities is generally summarized below. Following this general summary, a detailed description of the field activities, methods, and findings of the soil and groundwater assessment is provided.

The planning of the groundwater assessment activities involved a number of meetings that included appropriate plant personnel and groundwater professionals to identify SSCs within the PA and to select assessment locations in the vicinity of the SSCs that would provide the necessary information to meet the intent of the NEI initiatives. Additionally, the selected investigation locations were carefully examined by plant engineering personnel in order to target each sampling area as reasonably close to a respective SSC as possible while maintaining the integrity of the plant infrastructure. Twenty-four (24) groundwater screening locations were selected within and around the PA for inclusion in the assessment at locations shown on **Figure 3**. Drilling and monitoring well installation activities were performed by Geologic Exploration, Inc. of Statesville, North Carolina and overseen by SSi.

The protected area groundwater assessment field activities were completed in two phases. The first phase was completed from May 30, 2008 to August 28, 2008, and included the following activities:

- Groundwater profiling at five (5) temporary groundwater screening locations (TP-PA1 through TP-PA5) at areas around the perimeter of the PA, as summarized in Section 2.2;

- Collection of soil samples at sixteen (16) locations within the protected area (TP-PA6 through TP-PA24) as summarized in Section 2.1;

- Groundwater profiling at nineteen (19) temporary groundwater screening locations (TP-PA6 through TP-PA24) within the PA, as summarized in Section 2.2; and,

- Collection of groundwater screening samples from various depth intervals at each location, as summarized in Section 2.2.

The installation of the screening locations in the PA (TP-PA6 through TP-PA24) was completed by using air-assisted soil boring techniques to avoid potential damage to subsurface utilities and plant infrastructure (Section 2.1.1). After each location was safely cleared for deeper investigation, Geo-probe® drilling techniques were utilized to advance each boring to pre-determined depth intervals for the collection and analysis of groundwater screening samples. Geo-probe® drilling techniques were utilized exclusively at locations TP-PA1 through TP-PA5 since there were no potential subsurface conflicts with critical plant infrastructure.

Phase 2 of the assessment was completed from August 29, 2008 to September 19, 2008, and included the evaluation of the screening data, the installation and development of groundwater monitoring wells, and the completion of the first complete round of groundwater monitoring activities. The groundwater screening results provided the basis for selecting the location(s) and depth(s) at which to install the permanent groundwater monitoring well network in the protected area. These activities are described in detail in Section 2.2. The locations of the groundwater monitoring wells installed in the protected area are depicted on **Figure 4**.

The activities and findings are summarized in the following subsections. The analytical results are presented and, where concentrations of radiological materials were observed, the results are also presented on figures. Throughout this section, groundwater data are compared and discussed with respect to the USEPA drinking water standard of 20,000 pCi/L (picocuries per liter).

2.1 Soil Investigation

The soils investigation included the collection soil samples from borings advanced within the PA (TP-PA6 through TP-PA24) to evaluate whether radiolonuclides may be present in the shallow subsurface soils within the PA as a result of historical inadvertent releases. The methods and findings of these activities are summarized in the following subsections.

2.1.1 Methods

During the initial phase of the assessment, the initial 14-feet of each soil borings was advanced into the subsurface using an air knife to eliminate the potential risk of damaging critical infrastructure. The air knife activities were performed by McKim & Creed of Raleigh, North Carolina and overseen by SSi. The air knife method uses a combination of a focused stream of pressurized air in conjunction with applied vacuum to advance a 12-inch diameter boring into the subsurface. At depths greater than 14 feet below ground surface (BGS), soil sampling was completed using direct-push drilling techniques in general accordance with ASTM D 6282 at the screening locations. Soil samples were generally collected at 5-foot intervals using a 5-foot macro-core sampling tube and new acetate liners to provide detailed information in support of the development of geologic and hydrogeologic cross sections for areas within the protected area.

Borehole logs were maintained by a Professional Geologist for all borings advanced during the drilling program. The boring logs were recorded to document the results of the soil sampling activities and support an interpretation of the subsurface stratigraphy and geologic framework at the Site. Interpretation of borehole logs and soil cores provide tools that aid in understanding the geologic and hydrogeologic framework of the Site. The borehole logs (**Appendix A**) describe soil units/lithologies encountered, depths

of various strata, moisture content, and other pertinent data. Section 3.2 (Geology) and Section 3.3 (Groundwater Hydrology) describe additional details regarding the physical site settings.

A total of thirty-four (34) soil samples were collected for analysis and were analyzed in the on-site radiochemistry laboratory by Progress Energy chemists. All soil samples were analyzed for gamma-spec radionuclides. The soil samples were collected while advancing the initial 10-feet of each boring in the unsaturated zone with the air knife.

2.1.2 Findings

The general purpose of the soil investigation program was to identify the presence/absence of radionuclides in shallow subsurface soils and to characterize the subsurface stratigraphy in the vicinity of the SDSP. The results of the analyses of the soil samples collected during the assessment are discussed below in Section 2.1.2.1. The findings of the soil boring investigation with respect to the geology and hydrology are discussed in Section 3.2 (Geology) and Section 3.3 (Groundwater Hydrology). Borehole logs for each of the soil borings are included as **Appendix A**.

2.1.2.1 Radiological Results – Soil Samples

A total of thirty-four (34) soil samples were collected for purposes of determining the presence/absence of radiological materials in shallow subsurface soils in the PA. The samples were analyzed for gamma-emitting isotopes. The results are presented in **Table 2**. **Figure 5** presents the locations and results of soil samples that exhibited a detection of radionuclides above the background level of radiological activity.

As depicted on **Figure 5**, four of the locations in the PA exhibited a detection of the gamma-emitting isotope Cesium-137. Three of the four locations (TP-PA8, TP-PA9, and TP-PA10) are within the transformer yard, and one location (TP-PA16) is near the Radwaste Building.

It is important to note that the soil investigation activities were generally not performed with the intent of providing a detailed profile of the nature and extent of radiological materials in the soils underlying the PA. The results of the soil assessment are intended to provide general information in support of future plant operation and maintenance considerations, and to provide preliminary information in support of decommissioning planning.

2.2 Groundwater Investigation Activities

The overall objectives of the groundwater assessment were to provide sampling points to evaluate groundwater quality in order to assess the potential for sources of contamination in various areas of the PA and, to characterize the geology and hydrogeology of the various areas.

To accomplish these objectives, several investigation activities were completed including: groundwater screening, monitoring well installation, groundwater elevation measurements and groundwater sampling. The assessment methods and results are discussed in the following subsections.

2.2.1 Groundwater Profiling

Groundwater profiling included the collection of groundwater screening samples from multiple depth intervals at each of the groundwater screening locations depicted on **Figure 3**. The profiling activities were conducted in the PA from May 30 through September 19, 2008. The screening locations within the PA

were generally positioned as close as possible to plant SSCs and areas where there had been a known or suspected inadvertent release of licensed radionuclides (i.e. the Radwaste Line, storm drain piping, and condensate storage tanks).

The methods used and the results obtained at each screening location are summarized in the following subsections.

2.2.1.1 Groundwater Screening Point Installation and Sampling Methods

Groundwater profiling was conducted at each of the 24 groundwater screening locations by Geoprobe® methods to various depths ranging from 20 feet to 65 feet below ground surface (bgs) during the assessment. Soil and groundwater samples were collected at various depth intervals to characterize the subsurface geology and hydrostratigraphy in the protected area. The general procedures employed to complete the groundwater profiling included the following sequence of activities:

- Geoprobe® drilling equipment fitted with a stainless steel groundwater profiler (sample collection tool) was advanced into the subsurface (initial depths were generally 20 or 25 feet bgs).
- The drill stem was then retracted approximately four feet to expose the stainless steel well screen to groundwater (e.g. 16'-20' bgs).
- A disposable polyethylene sample tube with a stainless steel check valve was inserted through the drill rods to the approximate depth of the screened interval.

- Groundwater was then purged from the well using a low-flow, peristaltic or inertial pumping method to extract groundwater from the subsurface. Approximately 3-5 gallons of groundwater were purged from the well until the discharge from the tubing was visually non-turbid.

- A representative groundwater sample was then collected by the field geologist from the associated depth interval. The groundwater samples were collected in new, unused sample containers provided by Progress Energy.

- After the groundwater sample was collected from a respective interval, the drill stem, including the drill rods and groundwater profiler, was removed from the boring, decontaminated, and prepared for use in subsequent deeper groundwater screening intervals.

- A discrete soil sampling device (5-foot macro-core soil sampler) was then advanced to the depth that corresponds to the base of the previous groundwater screening sample (e.g. 20' bgs), and a soil sample was retrieved from the next five-foot depth increment (e.g. 20'-25' bgs) for soil/geological characterization by the field geologist. The soil sampling equipment was subsequently decontaminated and prepared for use.

- The groundwater sampling procedure was then repeated for the next 5-foot increment of the screening location.

- The above procedure was repeated to the terminal depth of each boring.

In general, one groundwater sample and one soil sample were collected in each 10-foot interval of each screening location. This procedure continued to the terminal depth of each screening location. The terminal depth of each boring was reached when the Geoprobe® could not penetrate deeper into the subsurface (refusal) or if plant infrastructure limited deeper penetration (i.e. cooling water intake conveyance, approximate 34 feet bgs at TP-PA18). The terminal depth of the screening locations ranged from 34 feet bgs (TP-PA18) to 65 feet bgs (TP-PA24). The groundwater samples were collected by SSi and delivered to the radiochemistry laboratory at BNP for tritium analysis.

The soil samples were visually inspected by a field geologist to provide a record of the materials encountered and to support geologic and hydrogeologic interpretation. The boring logs for each location are provided in **Appendix A**.

2.2.1.2 Analytical Results - Groundwater Screening Samples

A total of 97 groundwater samples were collected from the 24 groundwater screening locations and analyzed for tritium by radiochemists in the on-site radiochemistry lab at BNP. The results of the analyses are presented on **Table 3** and are depicted on **Figure 6**.

Tritium was detected in 20 of 97 groundwater screening samples, representing 8 of the 24 screening locations at a detection limit of approximately 2,000 pCi/L. All of the samples exhibiting a detectable concentration of tritium were collected from screening locations within the protected area. The concentration of tritium ranged from 3,004 pCi/L at TP-PA8-3 (36-40' bgs) to 57,760 pCi/L at TP-PA10-4 (51-55' bgs). At several locations (TP-PA-10, TP-PA13,

and TP-PA18), the highest concentrations of tritium were observed at the terminal (deepest) depth of the screening location.

2.2.2 Groundwater Monitoring Well Installation

The primary objective of the monitoring well installation was to establish a network of monitoring wells in the PA to evaluate groundwater quality and hydrology. To accomplish this objective, monitoring wells were installed at each of the groundwater screening point locations. Where appropriate, the screened interval for each monitoring well was selected to intersect the depth intervals where radiological activity was detected to be highest in the groundwater screening samples. Where no radiological activity was observed in the screening samples, the screened interval was selected to intersect the top of the shallow aquifer at approximately 15'-30' bgs.

Hollow-stem auger drilling methods were employed to complete the installation of the groundwater monitoring well network, with the exception of MWPA-107B/107C, which was installed using mud-rotary drilling methods. The drilling activities are described in the following sections.

During the investigation, a total of nineteen (19) shallow groundwater monitoring wells and four (4) intermediate monitoring wells were installed in the various areas described in **Table 1**. All monitoring wells (except MWPA-107B/107C) were installed using 3 ¼-inch I.D. hollow-stem auger drilling techniques. MWPA-107B/107C were installed with mud rotary drilling techniques initially in September 2008 and replaced in April 2009 due to well damage. **Figure 4** shows all of the monitoring well locations on an aerial photograph of the Site. Monitoring wells were constructed using 1-inch I.D. Schedule 40 PVC well casing and 0.010-slotted 1-inch diameter Schedule 40 PVC well screen.

The general monitoring well installation procedures are summarized below.

1. The depth for each of the wells was selected by the project team based on presence and depth of the maximum concentrations of tritium observed in the analytical results of groundwater screening samples at each location. Where no tritium was observed in screening samples, the depth of the well was selected to intersect the top of the shallow aquifer.
2. The shallow wells were generally installed using 3¼-inch inner diameter (I.D.) hollow stem augers with the bottom of the well screen placed at least 10 feet into the saturated interval of the sand aquifer.
3. The four intermediate wells were installed as cluster wells within the same borehole as the corresponding shallow well. A bentonite seal was used to isolate the shallow groundwater interval from the intermediate groundwater interval to minimize the possibility for cross-contamination between these intervals.
4. Formation water and drill cuttings generated during the construction of monitoring wells were transported to the SDSP.
5. At least ten feet of 1-inch-ID, Schedule 40 PVC, machine cut, well screen with 0.010-inch-slot size was set at the bottom of each shallow and intermediate well. A sufficient length of Schedule 40 PVC riser pipe was coupled to the screen to allow the PVC riser pipe to extend to just below ground surface. Well screens were fitted with a nominal 1-inch solid (unslotted) bottom sediment trap.
6. The annular space around the well screens was back-filled with clean uniform sand (filter pack sieve #2). The filter pack was placed from the bottom of the well to approximately 2 to 3 feet above the top of the well screen. A seal consisting of a minimum of a 2-foot-thick bentonite seal was placed above the sand and allowed to hydrate. At the three locations where cluster wells were installed in the same borehole, a bentonite seal was also installed between the two screened intervals to minimize potential cross-contamination between these groundwater zones. The remaining annular space was filled with bentonite-cement grout.
7. All wells were completed as flush-mount wells, with lockable expansion plugs.
8. A concrete pad was installed around the well box and mounded to direct surface runoff away from the casing.
9. Monitoring well construction reports (**Appendix A**) were prepared for each monitoring well.

A summary of the monitoring well construction details is provided in **Table 4** and depicted in the Well Construction Records are included in **Appendix B**.

2.2.3 Groundwater Monitoring

2.2.3.1 Groundwater Elevation Measurements

Groundwater elevation measurements were collected from the monitoring wells and used to provide data to map the potentiometric surface of the shallow and intermediate aquifers and interpret the horizontal and vertical gradients in the shallow and intermediate aquifers. Two rounds of depth-to-water measurements were recorded from the twenty-two (22) monitoring wells in October 2008. Measurements were collected using a Keck ET Model 122 Water Level Indicator Probe capable of measuring depth to water within 0.01-foot accuracy. These measurements are presented in **Table 5**. The results of the groundwater elevation measurements are presented as potentiometric surface maps that are presented and discussed in Section 3.3 of this report.

2.2.3.2 Groundwater Sampling

Two rounds of groundwater samples were collected from the monitoring wells. The groundwater samples were analyzed for tritium in Progress Energy's onsite radiological analytical laboratory.

Prior to sampling, each well was purged in accordance with Progress Energy's low flow groundwater sampling procedure (OE-RC-3250, Rev. 29) to assure collection of a representative groundwater sample. Groundwater sampling was completed using a peristaltic pump, dedicated pump (flex) tubing, and dedicated down-hole polyethylene tubing at each well to eliminate the potential for cross-contamination.

Water quality measurements were collected during the purging activities. The procedure for well purging and sampling is generally as follows:

- First, the security cap was removed, and the depth to water in the well was determined by sounding the well with a water level meter (Keck ET). The depth to water was recorded on a groundwater sample form.

- The dedicated down-hole tubing was lowered into the monitoring well and cut to the desired length, attached to the pre-cut flex tubing on the peristaltic pump, and a new section of poly tubing was inserted on the effluent side of the pump and the sample line was connected from the pump to the in-line water quality instrument (YSI MP556 with flow through cell), the effluent line from the flow-through cell was inserted into a purge water container to capture purge water, the peristaltic pump was started, and purging of groundwater at the well was commenced.

- An optimum low-flow pumping rate was established at each well to minimize drawdown. The groundwater quality parameters and depth to water were monitored and recorded at prescribed time intervals to determine when the water quality parameters had stabilized to within 10%.

- Following the stabilization of the groundwater quality parameters, groundwater samples were collected from the wells and delivered to the radiological analytical laboratory.

Purge water was collected in dedicated purge water containers and transported to the SDSP.

2.2.3.3 Groundwater Analytical Results Summary – Shallow Monitoring Wells

The initial round of groundwater samples were collected from the shallow monitoring wells between October 3, 2008 and 13, 2008. A second round of groundwater samples were collected from all shallow monitoring wells between March 19, 2009 and March 25, 2009. A third groundwater sample was collected from MWPA-107C on June 2, 2009 subsequent to installation of the replacement wells in April 2009. Groundwater samples from the wells were analyzed for tritium at the on-site radiological analytical laboratory. **Figure 7** depicts the spatial location of the groundwater analytical results. **Table 6** presents tabulated analytical results from the groundwater sampling event. The results of the laboratory analyses of groundwater samples are summarized below.

- Tritium was detected in groundwater samples from fourteen (14) of the nineteen (19) shallow monitoring wells in the PA. The detection limit for the analyses was approximately 250 pCi/L. The results are summarized below.

- Concentrations of tritium in groundwater samples from the nineteen (19) shallow wells ranged from less than the detection limit (4 samples) to 40,630 pCi/L at MWPA-111C during the first round.

- The analytical results from the groundwater samples collected from the monitoring wells were generally comparable to the results obtained from the screening samples. However, the analytical results of the monitoring well groundwater samples are typically lower than corresponding screening samples.

This is likely due to the fact that the screened interval of the monitoring wells (10-15 vertical feet) represents a depth interval that is approximately 2-4 times larger than the depth interval intersected by the groundwater profiler (4 vertical feet). Therefore, the concentration data obtained from the samples collected from the monitoring wells provides a better representation of the average concentration of tritium present in the aquifer since it intersects a wider depth interval of the aquifer.

- The highest concentration of tritium detected in the shallow wells was detected east of the Radwaste building at MWPA-111C. The second highest concentration of tritium was detected at MWPA-115C adjacent to the condensate storage tank.

- The shallow wells that exhibited elevated concentrations of tritium are generally clustered in four discrete areas of the PA, including the following:

    - An area near the location where a historical release of radionuclide from the radwaste effluent line was known to have occurred MWPA-104C;

    - An area near the condensate storage tank (MWPA-115C);

    - An area adjacent and to and east of the Radwaste Building (MWPA-111C); and,

    - An area adjacent to the storm drain collection system piping (MWPA-101C).

The specific source of the elevated tritium concentrations in the shallow aquifer is difficult to determine directly from the groundwater analytical results alone. Analysis of the hydrogeology and groundwater conditions within the PA is presented and discussed in Section 3, and further discussion regarding the possible sources of tritium in shallow groundwater is presented in Section 4. A summary of the conclusions and recommended response actions that may be selected to evaluate potential source areas and address the groundwater conditions is presented in Section 4 of the report.

2.2.3.4 Groundwater Analytical Results Summary – Intermediate Monitoring Wells

The initial round of groundwater samples were collected from the intermediate monitoring wells on October 4 and 13, 2008, with the exception of MWPA-107B, which was sampled on January 30, 2009. A second round of groundwater samples were collected from all intermediate monitoring wells (except MWPA-107B due to siltation) between March 19, 2009 and March 24, 2009. A groundwater sample was collected from MWPA-107B on June 2, 2009 subsequent to installation of the replacement wells in April 2009. Groundwater samples from the wells were analyzed for tritium at the on-site radiological analytical laboratory. **Figure 7** depicts the spatial location of the groundwater analytical results. **Table 6** presents tabulated analytical results from the groundwater sampling events. The results of the laboratory analyses of groundwater samples are summarized below.

Tritium was detected in groundwater samples from three (3) of four (4) intermediate monitoring wells in the PA. The concentration of tritium in the intermediate well groundwater samples ranged from less

than the detection limit (MWPA-118B) to 37,210 pCi/L (MWPA-107B). Elevated concentrations of tritium were also detected at MWPA-104B (29,090 pCi/L and 27,210 pCi/L) and MWPA-111B (2,908 pCi/L and 2,862 pCi/L). Intermediate wells MWPA-104B and MWPA-107B are located is in the vicinity of a historical release of radionuclides from the radwaste effluent line that occurred near monitoring well ESS-2C.

It should be noted that an obstruction in the well casing was observed at MWPA-107B which required the well to be flushed with clean water to remove the obstruction. Because the flushing occurred approximately 1 week prior to the well being sampled, the analytical result obtained from MWPA-107B (3,809 pCi/L) during the initial round of groundwater sampling is biased low as a result of dilution. The tritium concentration (37,210 pCi/L) detected at MWPA-107B during the June 2009 sampling is considered more representative of the tritium concentration in the intermediate aquifer in this area.

2.3 Surveying and Mapping

A site survey was conducted. Surveying activities were performed and certified by a North Carolina Registered Land Surveyor (McKim & Creed). The surveyor reviewed existing site maps and other maps that encompassed the project area prior to mobilization. The surveyor ascertained the locations and conditions of all horizontal and vertical controls available for the project utilizing benchmark descriptions, maps, and listings provided by Progress Energy, as well as other documents. The survey was georeferenced using the previously established local monuments of known northing and easting as defined by the North Carolina Geological Survey.

A survey map was produced that includes scale, benchmarks, North arrow, dimensions and locations of property boundaries, the locations of monitoring wells and sample

locations. The survey map provided the information required to produce a site basemap, which all of the site maps presented in this report have been based on.

3 PHYSICAL CHARACTERISTICS OF THE STUDY AREA

This section presents the physical characteristics of the Site including surface features, geology, and groundwater hydrology.

3.1 Surface Features

The BNP is located within approximately 2.5 miles north-northeast of the City of Southport, North Carolina. Access to the BNP is from River Road (State Route 87). The owner controlled area encompasses approximately 1,200 acres. The Protected Area of the Site, which is the focus of this assessment, includes approximately 25 acres.

Significant surface features in the PA are referenced in bold in the following Section, and are shown on **Figure 2**. In the descriptions of these site features, the direction of north, south, east, and west are described relative to the generating facility (plant north, etc.). The "plant north" direction is generally oriented in the N45°W direction.

Transformer Yard: The transformer yard is located west of the turbine building. This area is generally surrounded by a security fence. Surface cover generally consists of pervious gravel surfaces, although a small portion of the transformer yard is covered by an asphalt pavement near the two electric transformers. The subsurface Radwaste line is located to the west/southwest of the turbine building. The north and south storm drain conveyance lines are located to the north and south of the reactor and turbine building, and convey stormwater to the west and into the storm drain collection basin, which is northwest of the turbine building near the edge of the transformer yard.

Turbine Building, Reactor Buildings, and Power Generation Buildings: The electric power generating equipment and associated equipment/support buildings generally encompass the majority of the PA. The primary surface structures include the Turbine Building, 2 Reactor Buildings (Unit 1 and Unit 2 Reactors), and Radwaste Buildings, which are generally located in the middle of the PA. It should be noted that the reactor buildings extend approximately thirty nine (39) feet bgs, and the turbine and

Radwaste Building extend approximately twenty (20) feet bgs (D'Appolonia Consulting Engineers, Inc., 1968), and may present a significant vertical barrier impeding the horizontal flow of groundwater in the subsurface around these facilities (discussed in greater detail in Section 3.3). Administrative buildings and a number of support structures are located around the perimeter of the electric generating facility to the south, east, and north, as shown on **Figure 2**. Farther to the east, the cooling water intake pumping facilities and intake structure are located adjacent to the Intake Canal. The large subsurface cooling water conveyance tunnels extend from the canal bulkhead to the Reactor Buildings, and are located approximately 36 feet bgs. The cooling water discharge tunnels extend to the west from the Reactor Buildings and Turbine Building, and then turn to the south and exit the PA where the cooling water is discharged to the Discharge Canal.

Intake Canal: The cooling water Intake Canal is located adjacent to the PA to the east (not considered part of the PA). The Intake Canal is approximately 18 feet deep and is designed to provide a constant source of water from the Cape Fear River to the BNP to cool the nuclear reactors. The design of the Intake Canal permits flow into the plant area, and cannot be reversed by tides or other hydraulic conditions. As such, the water elevation in the canal is relatively consistent (although it fluctuates with the tidal cycles) and presents a shallow hydraulic boundary to the east of the PA.

Surface water runoff in the PA is generally transferred into a storm water drainage and collection system and transported to the SDSP located approximately 1,000 feet east of the PA. In general, all surface water drainage from within the PA is conveyed to the storm drain collection system; however, in the gravel areas within the transformer yard, surface water from precipitation may percolate directly into the shallow aquifer (upper sand) and migrate as groundwater into the PA.

The Site location is shown in **Figure 1**, and the Site Layout is depicted on **Figure 2**.

3.2 Geology

3.2.1 Regional Geology and Hydrogeology

According to the 1985 Geologic Map of North Carolina, prepared by the North Carolina Geological Survey Section of the North Carolina Department of Environment and Natural Resources (NCDENR), the Site is located in the North Carolina Coastal Plain Physiographic Province. The geology of this area is characterized by an easterly thickening wedge of unconsolidated sediments underlain by limestone aquifers. According to the United States Geologic Survey (USGS) *Water Resources Investigations Report 03-4051* (USGS, 2003), the Site is located in the Coastal Lowlands subregion of the coastal plain, which consists of sediments deposited in estuarine and near-shore environments; however, close to the north is the interpreted boundary with the middle-coastal plain subregion, which is characterized by variable sediment conditions laterally and vertically, and includes coarse sands associated with shoreline deposits to silts and clays associated with estuararies and lagoons deposited during the Pleistocene Age.

Based on the *Water Resources Investigations Report,* the geologic formations in the area, from most recent to oldest include the following:

- the Quaternary Age surficial sand deposits;
- the undifferentiated Pleistocene and Pliocene Age deposits of the quaternary and later tertiary system;
- the Tertiary Age Castle Hayne Formation;
- the Tertiary Age Beaufort Formation (Peedee Confining Unit); and,
- the Cretaceous Age Peedee Formation.

According to the North Carolina Geologic Survey, the Site area is underlain by the Waccamaw Formation, which is generalized as a fossiliferous bluish-gray to tan loosely consolidated sand with silt and clay. The Waccamaw Formation

straddles the Pleistocene-Pliocene boundary, and generally correlates with the data provided by US Geologic Survey.

These units are described in the USGS report as follows:

Quaternary Age Deposits: Light yellow to grey fine to medium sands with traces of clay, coarse-grained sand, pebbles, and minerals. These deposits are part of the *surficial aquifer*, which is a shallow groundwater aquifer in the uppermost strata in Brunswick County. The surficial aquifer system is used as a source of agricultural and domestic water supply in Brunswick County (USGS, 2003)

Pleistocene and Pliocene Deposits: An undifferentiated, variable unit that does not have sufficient structure to divide into discrete formations, this unit is characterized by shelly quartz sands with well preserved shell material or shell hash, and shelly carbonates consisting of shell hash and sandy marls or sandy moldic limestone.

> "In areas where the Castle Hayne...confining unit is missing, the surficial aquifer is in direct contact with the Castle Hayne Aquifer..." (Pg. 14, USGS, 2003).

Clays and silts in these deposits are generally thin, discontinuous, and lack lateral continuity. However, the USGS points out that, at Sunny Point Military Terminal (SPMT), a clay unit separates the surficial aquifer into a surficial aquifer and a deeper tertiary sand aquifer, which is directly underlain by the Castle Hayne aquifer at SPMT. As mentioned above, the surficial aquifer system includes groundwater present in the Pleistocene and Pliocene Deposits, and is used as a source of agricultural and domestic water supply in Brunswick County (USGS, 2003)

Castle Hayne Formation: The Castle Hayne Formation consists primarily of limestone and sand deposited in a marine environment (Winner and Coble,

1996). The elevation of the top of the Castle Hayne in the vicinity of the Site is documented to be approximately 45 feet below mean sea level (-45 feet MSL), as documented on the hydrogeologic cross section provided as Plate G of the USGS Water Resources Report (USGS, 2003). The Castle Hayne aquifer is one of the principal sources of potable water supply for the City of Southport (USGS, 2003).

The Castle Hayne is recharged primarily from the overlying surficial aquifers and where it is exposed or unconfined. The Castle Hayne is also prone to the development of sinkholes, and, where their occurrence is prevalent, the aquifer can be recharged through the development and collapse of sinkholes. A minor amount of recharge (~1-inch) is provided through seepage from the shallow surficial aquifer into the deeper intermediate aquifer directly through infiltration from precipitation, and from the underlying Peedee aquifer.

Peedee Confining Unit: The Peedee confining unit is generally the clay or silt beds that occur near the top of the Peedee Formation. Where it is present, the Peedee confining unit is part of the Beaufort Formation in southeastern Brunswick County (Lautier, 1998). The elevation of the top of the Peedee confining unit is documented to be approximately -65 feet MSL, as documented on Plate G of the USGS Water Resources Report (USGS, 2003).

Peedee Formation: The composition of the Peedee Formation in southeastern Brunswick County is described as the Rocky Point Member of the Upper Peedee Formation consisting of gray, sandy, moldic limestone that grades downward to a calcareous sandstone. The upper part of the Peedee aquifer is an important source of water for domestic and commercial use, and is used in combination with the Castle Hayne aquifer as the source of municipal water supply by Brunswick County (USGS, 2003).

3.2.2 Site-Specific Geology

A site-specific interpretation of the geology in the PA has been developed by using boring logs from the assessment activities, boring logs from nearby assessment activities, historical plant construction information, and sources of publicly available geologic and environmental information. The following section presents a summary of the geologic units that are present within and in the vicinity of the PA. Additionally, geologic and hydrogeologic cross sections have been developed that depict plant infrastructure, site features, subsurface stratigraphic units, groundwater monitoring data, and groundwater analytical results, and are presented on **Figure 8** and **Figure 9**.

The site-specific geology in the vicinity of the plant area has been significantly modified as a result of the construction of the plant. As observed in pre-construction drawings related to the construction of the plant foundation (D'Appolonia Consulting Engineers, Inc., 1968), a benched excavation extending to a terminal depth of approximately forty five (45) feet bgs (-25 feet MSL) was required to construct the plant foundation and associated power generation facilities, and areas within the excavation footprint were backfilled with sand fill materials and compacted to various specifications. These drawings are included as **Appendix C** of this report. The information obtained from the referenced documents was carefully considered during the interpretation of the site-specific geology and the development of the geologic cross sections.

In general, the site-specific geology observed in the PA is as follows:

Plant Backfill: Very hard, sandy fill material is generally present in the area surrounding the reactor and turbine building, and extends laterally in all directions as a result of the significant excavation and foundation construction completed as part of the plant construction activities. The sandy fill is a very dense, well compacted material, and generally exhibits no sedimentary structure.

In some areas, the fill unit was not penetrable via Geoprobe® soil sampling techniques because of the high density obtained from compaction of the fill during plant construction. As a result, soil samples from these materials were typically not able to be obtained. The thickness of the backfill materials is greatest at locations near the reactor and turbine buildings (up to 45 to 50 feet thick). The thickness of the backfill decreases radially in general proportion to the lateral distance from the reactor and turbine building areas.

Groundwater is observed in the plant backfill at approximately 15 feet bgs. Because the excavation of the plant foundations penetrates through a low-permeability unit that provides a vertical hydraulic barrier between a shallow and intermediate depth aquifer (described below), the groundwater in the plant backfill is associated with both shallow and intermediate depth aquifers. Outside of the plant backfill, the shallow aquifer is typically observed in the upper sand from approximately 8 to 30 feet bgs, and the intermediate aquifer is generally present in the lower sand unit from approximately 35 to 65 feet bgs. As a result, both of these aquifers are hydraulically connected to the plant backfill. It should be noted that the lower sand aquifer is also hydraulically connected to the Tertiary Age Castle Hayne aquifer, which is one of the sources of potable water supply in the region. Groundwater hydrology in the plant area is further discussed in Section 3.3.

Upper Sand: The upper sand is generally present at locations where it was not removed during the excavation and construction of the foundations. The upper sand is generally observed as a loose tan to light grey fine sand, with varying amounts of silt. Towards the middle to bottom of the upper sand, silty and clayey sub-units are often observed, although the depths of the silt and clay lenses are generally not consistent between borings. In several borings, the clay and silt lenses are not observed. The upper sand was typically observed to be saturated at a depth of approximately 8 to 10 feet bgs and has a thickness from 10 to 20 feet. Towards the base of the upper sand, shelly layers were often

encountered in thin lenses of silt, and the contact with the underlying low-permeability unit was typically characterized by interlayered sandy silts, silty sands, and clayey silts. The upper sand generally occurs from the surface to 1 to 10 feet MSL. This unit correlates with the *Surficial Deposits* described by USGS (USGS, 2003).

A shallow aquifer is observed in the upper sand at approximately 15 feet bgs. This aquifer represents the shallow hydrostratigraphic unit in the *Surficial Aquifer* described by USGS (USGS, 2003).

Low-Permeability Unit: Below the upper sand, a low permeability unit was encountered. The low permeability unit consists of cohesive dark grey silt and clay. As described above, the contact with the overlying upper sand is typically gradational until the competent dark grey silt and clay unit is encountered. At previously investigated areas of the plant it is approximately four (4) to fifteen (15) feet thick, and exhibits shelly layers and occasional thin laminates of very fine grained sand within the low to medium moist silt and clay. Shelly layers were observed in a number of the borings around 20 to 25 feet bgs.

The low permeability unit hydraulically separates the shallow aquifer and the intermediate aquifer that is observed in other areas of the plant.

Lower Sand Unit: Below the low permeability unit, a layer of fine to medium grey dense sand is observed. The lower sand generally consists of quartz sands and silty limey sands (sandy carbonates) with occasional shells, shell hash, clayey sands, clayey silt, and sandy silt layers. The lower portion of this sand unit generally grades to a limey sand/sandy carbonate. The thickness of the lower sand is generally 35 to 40 feet thick. This unit correlates with the *Undifferentiated Pleistocene and Pliocene Deposits* described by USGS (USGS, 2003)

The lower sand exhibits saturated conditions generally throughout the vertical thickness of the unit. A groundwater aquifer is observed in the lower sand and is referred to in this report as the intermediate aquifer. This aquifer correlates with the *Tertiary Sand Aquifer* described by USGS (USGS, 2003).

Castle Hayne Formation: None of the borings completed during the assessment of the PA were advanced deep enough to encounter the Castle Hayne Formation; however, because the unit is present approximately 15 to 20 feet below the constructed foundations of the nuclear reactors, it is important to consider the Castle Hayne Formation in the assessment of the PA given its importance with respect to local and regional groundwater supplies. The Castle Hayne Formation is a very hard, consolidated sandy limestone, and is an important source water supply in the vicinity of Southport (USGS, 2003).

3.3 Groundwater Hydrology

Groundwater hydrology within the PA is relatively complex as a result of the significant depth of the subsurface excavation activities associated with plant construction. The groundwater system within the plant area is therefore best characterized by presenting a discussion of the aquifers that are present outside of the plant backfill, and concluding with a discussion of the groundwater hydrology within the plant backfill materials.

3.3.1 Shallow Aquifer

In the areas upgradient of the plant backfill, a shallow groundwater aquifer is generally encountered at a depth of approximately eight feet bgs and extends to approximately -8 to -14 feet msl. The thickness of the aquifer is approximately 16 to 25 feet, and exhibits unconfined, water table conditions. The upgradient

shallow aquifer is generally recharged directly through infiltration from precipitation.

Based on previous groundwater investigations completed at the upgradient area (SSi, 2008), the groundwater originating from the upgradient area flows towards and into the PA from the north, west, and south. Groundwater monitoring activities completed during the assessment of the PA support these interpretations, and indicate that groundwater flows radially from the upgradient areas into the PA and into the plant backfill, as depicted as shallow potentiometric surface maps presented on **Figure 10** and **Figure 11**.

The shallow aquifer outside of the plant backfill area is generally underlain by the low-permeability unit (described in Section 3.2.2), which was encountered in several of boreholes advanced in the PA (but outside of the plant backfill area) during the groundwater assessment. Based on the previous work conducted at the Site, the low permeability unit separates the shallow aquifer from an intermediate aquifer that is below the low-permeability unit. Where the low permeability unit is present, the vertical migration of contaminants from the shallow aquifer into the intermediate aquifer is generally impeded or significantly retarded; however, there is a small degree of hydraulic and chemical exchange between the shallow and intermediate aquifers that occurs vertically through the clay, as observed in previous investigation activities.

The interpretations regarding groundwater flow direction at the Site is based on water level measurements collected from the shallow wells. These data are presented in **Table 5** and provided the basis for the interpretation of the horizontal flow of groundwater in the shallow aquifer.

3.3.2 Intermediate Aquifer

Based on previous groundwater investigations completed in the vicinity of the PA (SSi, 2008), an intermediate-depth aquifer is located beneath the low

permeability unit in the lower sand unit (at areas outside of the plant backfill). The intermediate aquifer in the lower sand is generally encountered at a depth of approximately -10 to -20 feet msl, and extends to top of the Castle Hayne Formation, approximately -50 feet msl. As such, the intermediate aquifer in the lower sand is hydraulically connected to the underlying Castle Hayne Formation aquifer, which is a source of potable water in Southport. As a result, these two aquifers behave as a single aquifer (USGS, 2003), which is an important consideration with respect to groundwater conditions within the plant backfill.

Each of the four groundwater monitoring wells installed in the intermediate aquifer during the assessment of the PA were installed in the lower sand unit below the plant backfill. Based on groundwater elevation measurements collected from the four intermediate monitoring wells, groundwater in the intermediate aquifer flows to the southeast toward the Intake Canal, as depicted on potentiometric surface maps presented as **Figure 12** and **Figure 13**.

Based on the depth of the bottom of the Intake Canal relative to the top of the intermediate aquifer, groundwater in the intermediate aquifer appears to discharge into the intake canal; however, it cannot be determined from the available information whether that Intake Canal intercepts all of the groundwater in the intermediate aquifer in the vicinity of the PA.

Based on the previous investigations in other areas of the BNP, the combined thickness of the intermediate aquifer is approximately 40 to 55 feet, and extends to a depth of approximately -50 to -65 feet msl in the vicinity of the PA. At areas outside of the footprint of the plant backfill, the intermediate aquifer exhibits semi-confined to confined conditions, is recharged primarily by inflow from the Castle Hayne Formation aquifer, and receives a relatively small volume of recharge from vertical percolation through the overlying low-permeability unit.

The intermediate aquifer (Castle Hayne member) is generally underlain by the low-permeability Peedee confining unit. The Peedee confining unit is considered a vertical hydraulic boundary between the intermediate aquifer and the deep (Peedee) aquifer that is below the low-permeability unit (SSi, 2008).

3.3.3 Groundwater in the Plant Backfill

Groundwater flow into and out of the plant backfill is conceptualized on the Geologic Cross Sections provided on **Figure 8** and **Figure 9**. Saturated conditions are present in the plant backfill from a depth of approximately 15 feet bgs to below the base of backfill (approximately 45 to 50 feet bgs). As described in Section 3.2.2, the excavation that was completed to construct the foundations for the reactor and turbine buildings penetrates through a low-permeability unit that provided a vertical hydraulic barrier between the shallow and intermediate depth aquifer (described above). As a result, the groundwater in the plant backfill receives groundwater inflow from the shallow and intermediate depth aquifers, as evidenced by the potentiometric surface maps presented as **Figure 10 and Figure 11** (shallow groundwater) and **Figure 12 and Figure 13** (intermediate aquifer).

Groundwater is observed to flow radially into the plant backfill from the shallow aquifer surrounding the plant. Groundwater elevations are notably lower within the plant backfill than the surrounding shallow aquifer, primarily the result of an increase in the vertical thickness of porous media in which the groundwater may flow. As a result, horizontal groundwater flows into the plant backfill from the shallow aquifer at areas immediately adjacent to the plant backfill area as a result of the lower hydraulic head in the plant backfill.

Similarly, groundwater in the intermediate aquifer flows horizontally to the south and southeast based on the potentiometric surface depicted on **Figure 12** and **Figure 13,** which is consistent with the observed flow direction in the intermediate aquifer at other areas of the BNP. Because the plant backfill

intersects the upper portion of the intermediate aquifer, some of the groundwater from the intermediate aquifer appears to flow into the plant backfill, where it becomes intermixed with groundwater that enters the plant backfill from the shallow aquifer. Additionally, because the vertical hydraulic gradient between the shallow wells installed in the plant backfill and the intermediate wells installed in the PA is in the downward direction, the shallow groundwater in the backfill migrates vertically into the deeper plant backfill and into the intermediate aquifer. The groundwater in the intermediate aquifer flows to the south-southeast from the PA.

The intermediate aquifer extends to an estimated depth of -50 to -65 feet msl (the estimated top of the Peedee confining unit), which separates the shallow and intermediate aquifer from the deeper Peedee aquifer.

4 SUMMARY AND CONCLUSIONS

Silar Services Incorporated (SSi) has prepared this Groundwater Assessment Report (GAR) to document the results of groundwater assessment activities performed at the Protected Area (PA) of the Brunswick Nuclear Plant (BNP), located in Southport, Brunswick County, North Carolina. The purpose of the groundwater assessment was to evaluate hydrogeology and determine the presence of potential radiological impacts to groundwater in various areas of the BNP PA.

The assessment was initiated to be consistent with industry standard practice and current guidance documents associated with the protection of groundwater resources from radiological materials.

The overall objectives of the groundwater assessment were to provide sampling points to evaluate groundwater quality in order to assess the potential for sources of contamination in various areas of the PA and, characterize the geology and hydrogeology in the PA.

Groundwater profiling was completed at twenty-four (24) temporary groundwater screening points located within and around the PA. A total of ninety-seven (97) groundwater screening samples were collected from the screening points and analyzed for tritium. Additionally, soil samples were collected from seventeen (17) of the nineteen screening locations inside the PA and analyzed for gamma-emitting isotopes.

Following the evaluation of the groundwater screening data, nineteen (19) shallow groundwater monitoring wells and four (4) intermediate groundwater monitoring wells were installed in the PA to provide groundwater monitoring locations that may be selected for inclusion, as necessary, in a site-wide groundwater monitoring program. Two rounds of groundwater samples were collected and analyzed to assess the presence and concentrations of tritium in groundwater. The investigation locations were surveyed by a Professional Land Surveyor licensed in the State of North Carolina to

facilitate the evaluation of the chemical and physical data collected during the project. The results are summarized in the following subsections.

4.1 Summary of Soil Conditions

A total of thirty-four (34) soil samples were collected from seventeen (17) locations for purposes of determining the presence/absence of residual radiological materials in shallow subsurface soils in the PA. The samples were analyzed for gamma-emitting isotopes.

As depicted on **Figure 5**, four of the locations in the PA exhibited a detection of the gamma-emitting isotope Cesium-137. Three of the four locations (TP-PA8, TP-PA9, and TP-PA10) are within the transformer yard, and one location (TP-PA16) is near the Radwaste Building. Future groundwater samples will be collected from these areas and analyzed for gamma-emitting isotopes to determine if there are related impacts to groundwater quality in these areas. Should plant operation and maintenance activities in these areas require subsurface work, worker protection measures should be considered by the appropriate qualified plant personnel ensure that exposures to radiological materials is minimized.

The results of the soil assessment are intended to provide general information in support of plant operation and maintenance considerations, and to provide preliminary information in support of decommissioning considerations. Additional assessment of the nature and extent of radionuclides in the subsurface may be warranted in the future to support plant operations and maintenance and/or decommissioning activities, as required by the NEI Industry Groundwater Protection Initiative 07-07 (NEI, August 2007):

NEI Objective 1.4: "Establish a remediation protocol to prevent migration of licensed material off-site and to minimize decommissioning impacts."

4.2 Summary of Groundwater Conditions

Twenty-four (24) temporary groundwater screening locations, nineteen (19) shallow monitoring wells, and four (4) intermediate monitoring wells were completed as part of the PA assessment.

Groundwater elevation measurements were obtained from each of the monitoring wells to evaluate the direction of groundwater flow in the study area. The results of the elevation measurements were plotted to develop the potentiometric surface maps presented on **Figures 10 through Figure 13**. Based on the measurements recorded, groundwater in the shallow aquifer around the PA flows radially into the plant backfill. Groundwater in the intermediate aquifer flows to the south-southeast in the vicinity of the PA. Because the plant backfill intersects the upper portion of the intermediate aquifer, some of the groundwater from the intermediate aquifer appears to flow into the plant backfill, where it becomes intermixed with groundwater that enters the plant backfill from the shallow aquifer. The general vertical hydraulic gradient between the shallow wells installed in the plant backfill and the intermediate wells installed in the PA is in the downward direction indicating that the shallow groundwater in the backfill migrates vertically into the deeper plant backfill and into the intermediate aquifer.

The groundwater in the intermediate aquifer flows to the south-southeast from the PA. Some of the groundwater in the intermediate aquifer may discharge into the Intake Canal, although the groundwater in the Castle Hayne aquifer, which is hydraulically connected to the intermediate aquifer, is not likely to discharge into the Intake Canal. The hydrogeologic cross sections presented on **Figure 8** and **Figure 9** depicts the interconnectedness of the shallow aquifer, the intermediate aquifer, and the groundwater in the plant backfill.

The groundwater samples collected during the groundwater screening program resulted in the development of a detailed vertical profile of groundwater quality, which is depicted on Cross Sections A-A' and B-B' on **Figure 8** and **Figure 9**, respectively. Ninety-seven (97) groundwater screening samples were obtained from depth intervals

throughout the saturated thickness of the plant backfill and adjacent shallow and intermediate aquifers. The results indicate that, in general, groundwater in the shallow aquifer in the vicinity of the plant has been affected by the release of tritium from several potential sources. As evidenced by the distribution of tritium in the groundwater screening samples, the majority of tritium is observed within the plant backfill materials. Additionally, an increasing trend of tritium activity is observed in groundwater screening samples collected from the intermediate aquifer below the plant backfill at TP-PA10 and TP-PA13, where the highest concentrations of tritium were observed below the plant backfill in the intermediate aquifer. The concentrations of tritium at TP-PA10-4 and TP-PA13-5 were 57,760 pCi/L and 49,830 pCi/L, respectively, which exceed the USEPA drinking water standard of 20,000 pCi/L. This may be the result of the downward vertical hydraulic gradient and tritium present in the shallow aquifer may have migrated downward into the intermediate aquifer. The source of tritium may be in the vicinity of monitoring well ESS-2C, where a historical release of tritium has resulted in a localized area of impacts.

Based on the results of the groundwater screening nineteen (19) shallow and four (4) intermediate permanent monitoring wells were installed in the PA. Representative groundwater samples were obtained from each of the permanent monitoring wells using low-flow groundwater sampling techniques. All groundwater samples were analyzed for tritium in Progress Energy's onsite radiological laboratory. Tritium was detected in fourteen (14) of the nineteen (19) shallow monitoring wells. Only three (3) of the nineteen (19) shallow groundwater samples exhibited concentrations of tritium that exceed the USEPA drinking water standard, and include: MWPA-104C located near the radwaste effluent line; MWPA-111C (located near the Radwaste Building); and, MWPA-115C (located adjacent to the Condensate Storage Tank). Tritium was also detected at three (3) of four (4) intermediate monitoring wells in the PA. The USEPA drinking water standard was exceeded at MW-PA104B and MWPA-107B. Both these wells are located in the general vicinity of the historic radwaste effluent line leak.

4.3 Conclusions

Radiological constituents in the form of tritium were observed in groundwater samples collected from groundwater monitoring wells in the PA included in this assessment. In general, the results from the initial groundwater sampling event conducted in October 2008 and the second round collected in March 2009 are similar. It is recommended that additional groundwater monitoring be completed on a monthly basis for one year. All groundwater samples should be analyzed for tritium; groundwater from monitoring wells MWPA-102C, MWPA103C, MWPA-104C, MWPA104B, and MWPA110C should be analyzed for gamma-specific nuclides by January 2010; groundwater from all other monitoring wells should be analyzed for gamma-specific nuclides at least once during the first year of monitoring. These results will be evaluated to establish a basis for which PA wells should be included in a long-term, site-wide groundwater monitoring program.

Additionally, further investigation in the vicinity of monitoring well ESS-2C (**Figure 7**) is warranted to delineate the vertical and horizontal extent of tritium in the shallow and intermediate aquifers in this area. Although it may be unlikely that the tritium activity observed in groundwater collected from monitoring well ESS-2C and in the vicinity of the PA are high enough to pose a risk to off-site potable groundwater supplies, concentration of tritium detected in the intermediate aquifer at MWPA-104B and MWPA-107B exceed the USEPA drinking water standard, and exhibit an increasing trend that has not been fully evaluated. Since the intermediate aquifer is hydraulically connected with a water supply aquifer for private wells in the City of Southport and surrounding area (the Castle Hayne Formation), delineating the extent of tritium in this area should be completed to provide conclusive evidence that demonstrates groundwater quality is not at risk as a result of plant operations.

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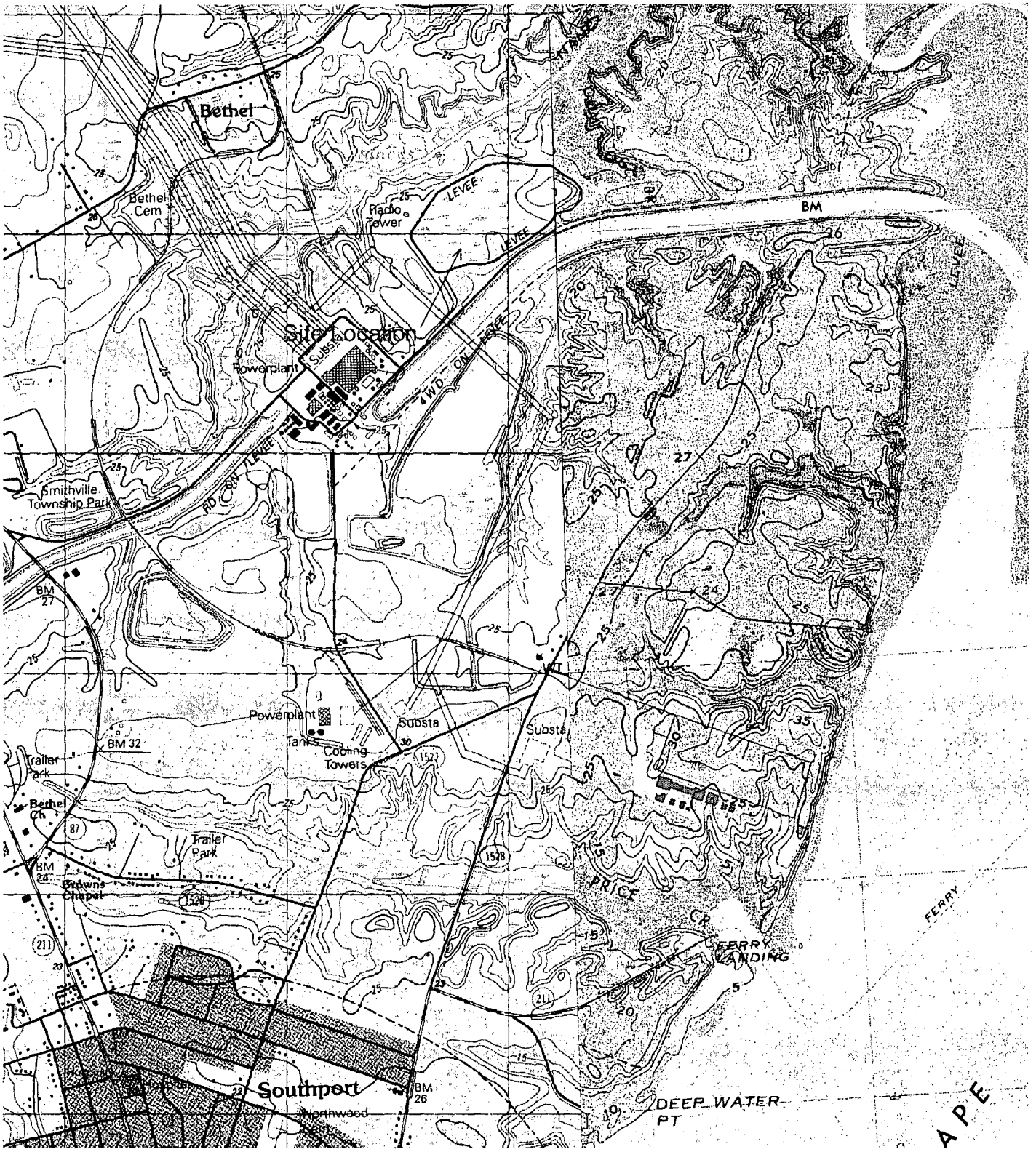
FIGURES



Quadrangle Location

0 2000 4000 Feet

N

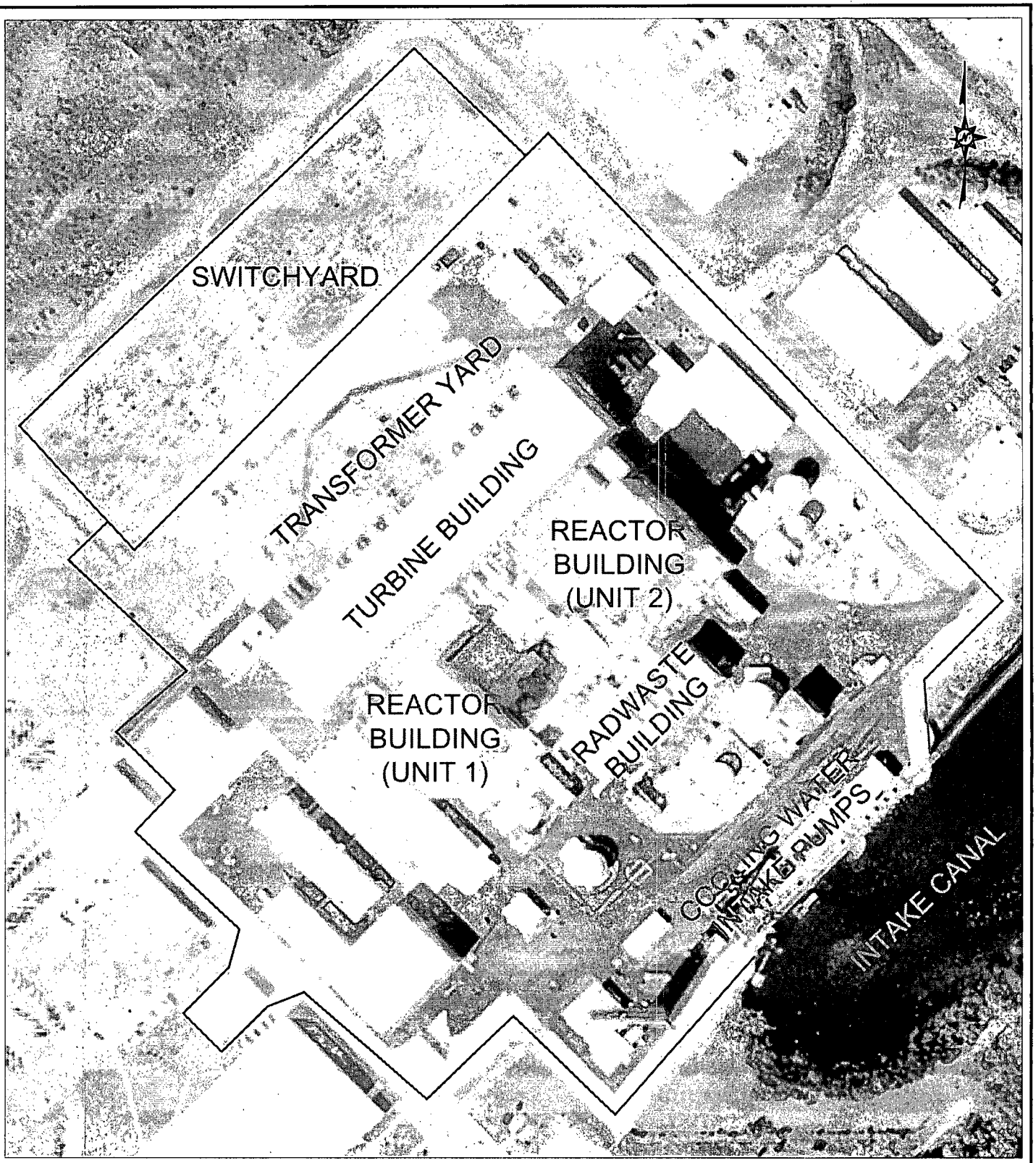
Source: U.S.G.S. Topographic Map (7.5 minute)
Southport & Kure Beach, NC quadrangles

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 1

Site Location Map

SSi Silar Services Inc.



GENERAL BOUNDARY OF THE PROTECTED AREA

SCALE 1" = 200'

0 100 200 400 600

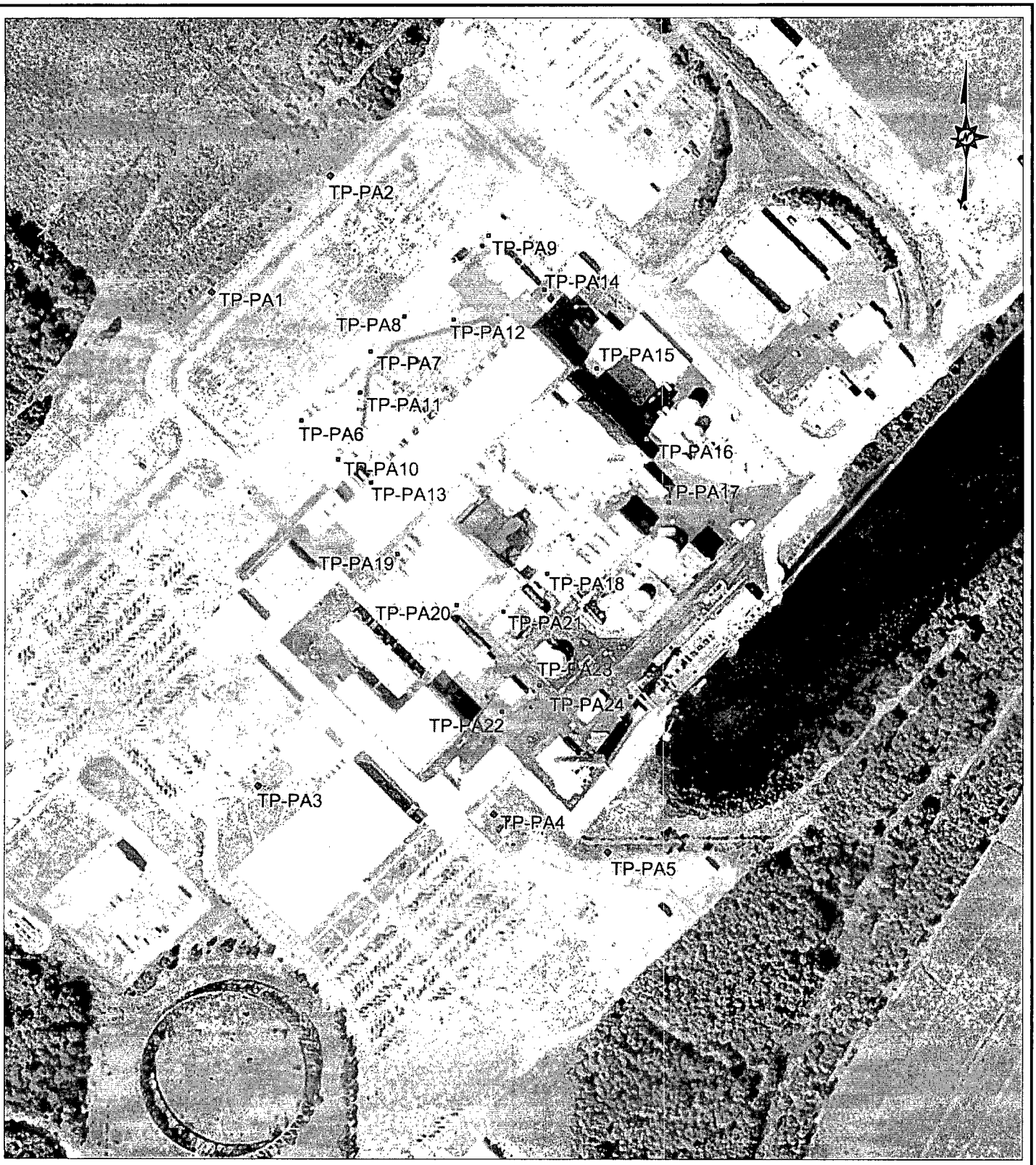
Progress Energy
Brunswick Nuclear Plant
Southport, NC

Groundwater Assessment Report

Figure 2

Site Layout - Protected Area

SSi Silar Services Inc.



SCALE 1" = 300'

0 150 300 600 1200

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Southport, NC

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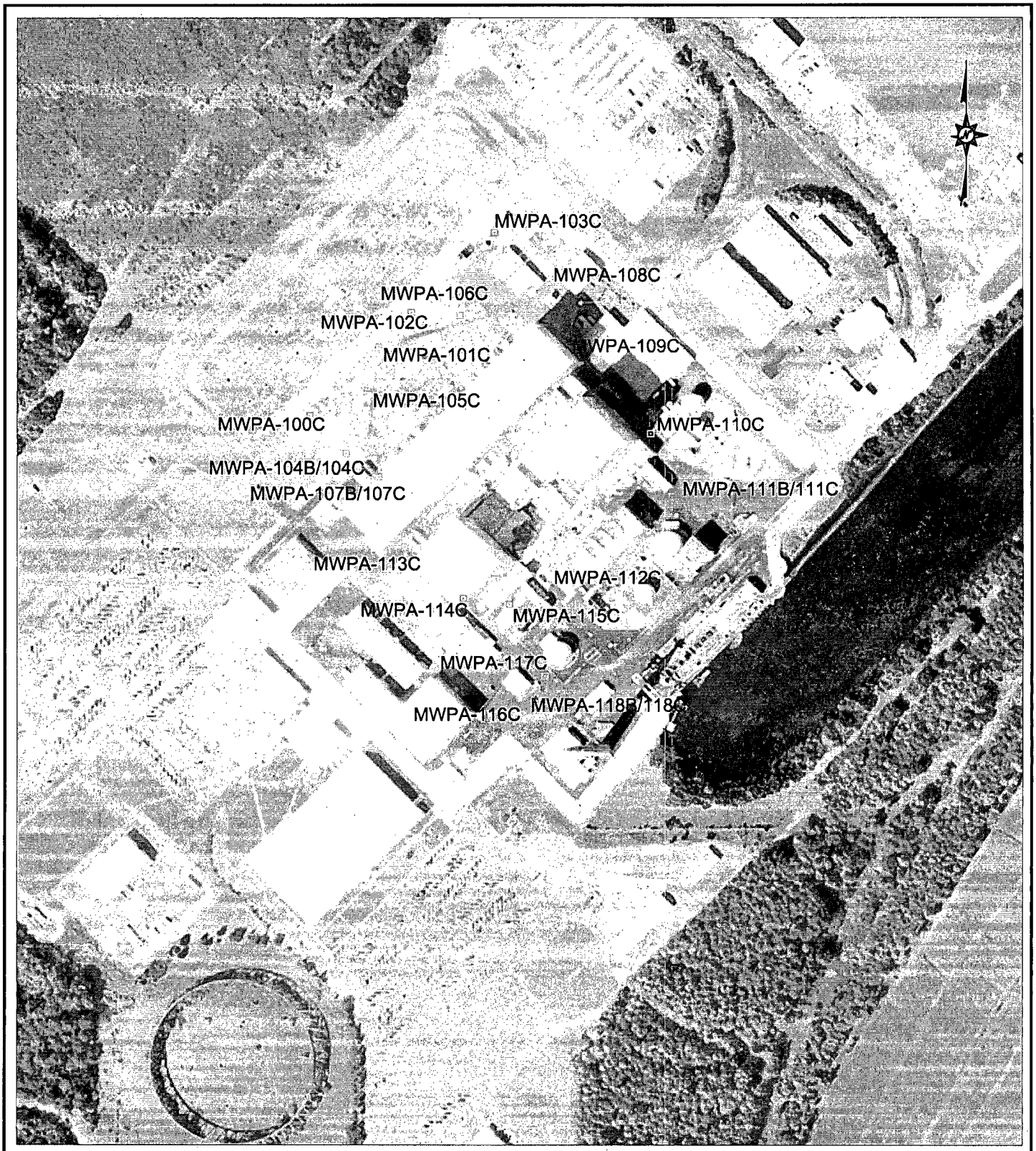
Figure 3

Protected Area Groundwater Screening Locations

SSi Silar Services Inc.



LEGEND:

MWPA-113C *Monitoring Well*
C – Designates shallow well
B – Designates intermediate well

SCALE 1" = 300'

0 150 300 600 1200

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Southport, NC

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Figure 4

Protected Area Groundwater Monitoring Well Locations

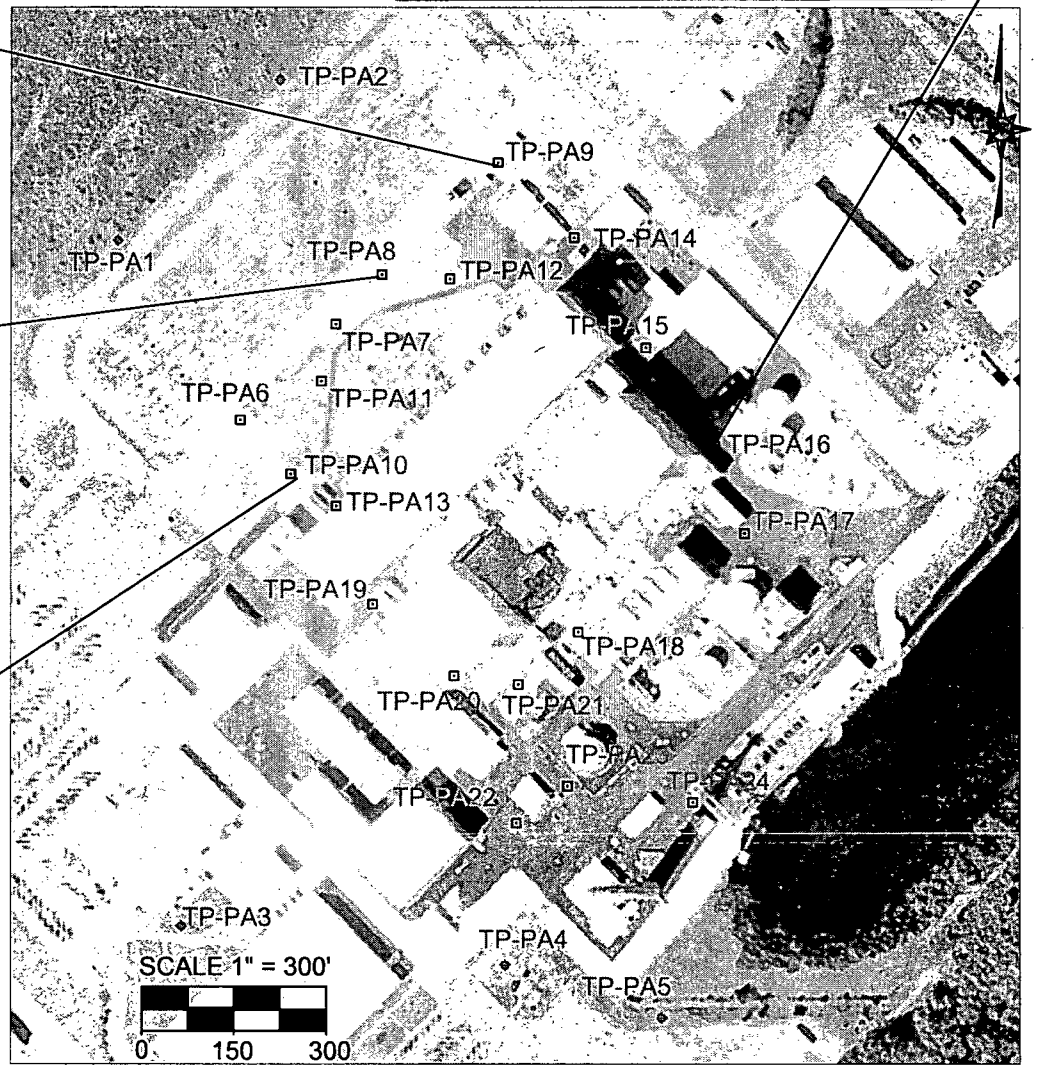
SSi Silar Services Inc.

Sample I.D.	Sample Depth	Nuclide	Activity
TP-PA16-2	10	Cs-137	4.390E-02

Sample I.D.	Sample Depth	Nuclide	Activity
TP-PA9-1	6	Cs-137	2.007E-01
TP-PA9-2	9	Cs-137	2.712E-01

Sample I.D.	Sample Depth	Nuclide	Activity
TP-PA8-1	5	Cs-137	9.090E-02
TP-PA8-2	10	Cs-137	2.459E-02

Sample I.D.	Sample Depth	Nuclide	Activity
TP-PA10-1	5-6	Cs-137	2.608E-02



Legend:

TP-PA9-1 Temporary Point (soil boring)

All soil samples collected from 7/29/2008 to 8/1/2008
Results reported in pCi/ml (picocuries per milliliter)
Cs-137 - Cesium 137

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Groundwater Assessment Report

Figure 5

Analytical Results - Soil Samples

Silar Services Inc.

Sample Number	Depth feet	Activity pCi/L
TP-PA7-1	16-20	3,150
TP-PA7-2	26-30	ND
TP-PA7-3	36-40	ND
TP-PA7-4	46-50	ND
TP-PA7-5	56-60	ND

Sample Number	Depth feet	Activity pCi/L
TP-PA8-1	16-20	ND
TP-PA8-2	26-30	ND
TP-PA8-3	36-40	3,004
TP-PA8-4	46-50	3,331
TP-PA8-5	56-60	ND

Sample Number	Depth feet	Activity pCi/L
TP-PA2-1	16-20	ND
TP-PA2-2	26-30	ND
TP-PA2-3	36-40	ND
TP-PA2-4	46-50	ND
TP-PA2-5	61-65	ND

Sample Number	Depth feet	Activity pCi/L
TP-PA9-1	16-20	ND
TP-PA9-2	26-30	ND
TP-PA9-3	36-40	ND
TP-PA9-4	46-50	ND
TP-PA9-5	56-60	ND

Sample Number	Depth feet	Activity pCi/L
TP-PA12-1	16-20	ND
TP-PA12-2	26-30	ND
TP-PA12-3	36-40	ND
TP-PA12-4	46-50	ND
TP-PA12-5	56-60	ND

Sample Number	Depth feet	Activity pCi/L
TP-PA14-1	21-25	ND
TP-PA14-2	36-40	ND
TP-PA14-3	46-50	ND
TP-PA14-4	56-60	ND

Sample Number	Depth feet	Activity pCi/L
TP-PA1-1	16-20	ND
TP-PA1-2	26-30	ND
TP-PA1-3	36-40	ND
TP-PA1-4	46-50	ND

Sample Number	Depth feet	Activity pCi/L
TP-PA11-1	16-20	ND
TP-PA11-2	26-30	4,984
TP-PA11-3	36-40	ND
TP-PA11-4	46-50	ND
TP-PA11-5	56-60	ND

Sample Number	Depth feet	Activity pCi/L
TP-PA6-1	16-20	ND
TP-PA6-2	26-30	ND
TP-PA6-3	36-40	ND
TP-PA6-4	46-50	ND
TP-PA6-5	56-60	ND

Sample Number	Depth feet	Activity pCi/L
TP-PA10-1	16-20	ND
TP-PA10-2	26-30	49,260
TP-PA10-3	36-40	40,690
TP-PA10-4	46-50	57,760

Sample Number	Depth feet	Activity pCi/L
TP-PA13-1	18-22	5,213
TP-PA13-2	26-30	4,595
TP-PA13-3	36-40	3,517
TP-PA13-4	46-50	31,300
TP-PA13-5	56-60	49,380

Sample Number	Depth feet	Activity pCi/L
TP-PA19-1	21-25	ND
TP-PA19-2	31-35	ND
TP-PA19-3	41-45	ND

Sample Number	Depth feet	Activity pCi/L
TP-PA3-1	16-20	ND
TP-PA3-2	26-30	ND
TP-PA3-3	36-40	ND
TP-PA3-4	46-50	ND
TP-PA3-5	56-60	ND

Sample Number	Depth feet	Activity pCi/L
TP-PA20-1	21-25	ND
TP-PA20-2	30-34	ND

Sample Number	Depth feet	Activity pCi/L
TP-PA22-1	21-25	ND
TP-PA22-2	31-35	ND
TP-PA22-3	41-45	ND
TP-PA22-4	51-55	ND
TP-PA22-5	61-65	ND

Sample Number	Depth feet	Activity pCi/L
TP-PA23-1	21-25	ND
TP-PA23-2	31-35	ND
TP-PA23-3	41-45	ND
TP-PA23-4	51-55	ND

Sample Number	Depth feet	Activity pCi/L
TP-PA5-1	46-50	ND
TP-PA5-2	54-58	ND

Sample Number	Depth feet	Activity pCi/L
TP-PA15-1	21-25	ND
TP-PA15-2	31-35	ND
TP-PA15-3	41-48	ND

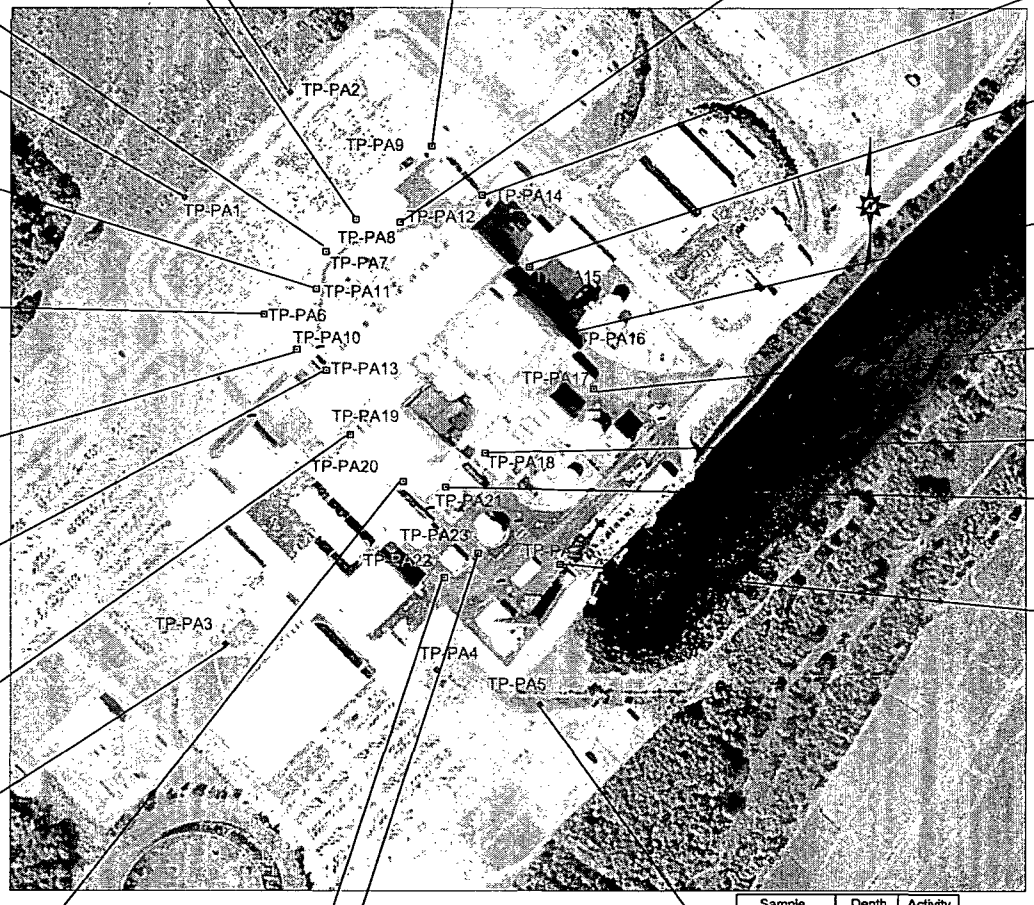
Sample Number	Depth feet	Activity pCi/L
TP-PA16-1	21-25	ND
TP-PA16-2	31-35	ND
TP-PA16-3	41-45	ND
TP-PA16-4	51-55	ND

Sample Number	Depth feet	Activity pCi/L
TP-PA17-1	21-25	3,031
TP-PA17-2	31-35	5,330
TP-PA17-5	51-55	5,523

Sample Number	Depth feet	Activity pCi/L
TP-PA18-1	21-25	9,347
TP-PA18-2	30-34	22,370

Sample Number	Depth feet	Activity pCi/L
TP-PA21-1	21-25	41,830
TP-PA21-2	31-35	9,219
TP-PA21-3	41-45	7,401
TP-PA21-4	51-55	ND

Sample Number	Depth feet	Activity pCi/L
TP-PA24-1	21-25	ND
TP-PA24-2	31-35	ND
TP-PA24-3	41-45	ND
TP-PA24-4	51-55	ND
TP-PA24-5	61-65	ND



LEGEND

TP-PA3 TEMPORARY POINT (SOIL BORING)

ND LESS THAN THE LOWER LIMIT OF DETECTION (LLD)

CONCENTRATIONS FOR TRITIUM

SCALE 1" = 300'

0 150 300 600 900

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Groundwater Assessment Report

Figure 6
Analytical Results - Groundwater Screening Samples

SSi Silar Services Inc.

Well ID	10/3/08	3/24/09
MWPA-106C	445	386

Well ID	10/3/08	3/24/09
MWPA-103C	ND	ND

Well ID	10/3/08	3/24/09
MWPA-108C	400	404

Well ID	10/3/08	3/24/09
MWPA-102C	8,050	9,288

Well ID	10/3/08	3/25/09
MWPA-109C	ND	287

Well ID	10/3/08	3/19/09
MWPA-110C	ND	300

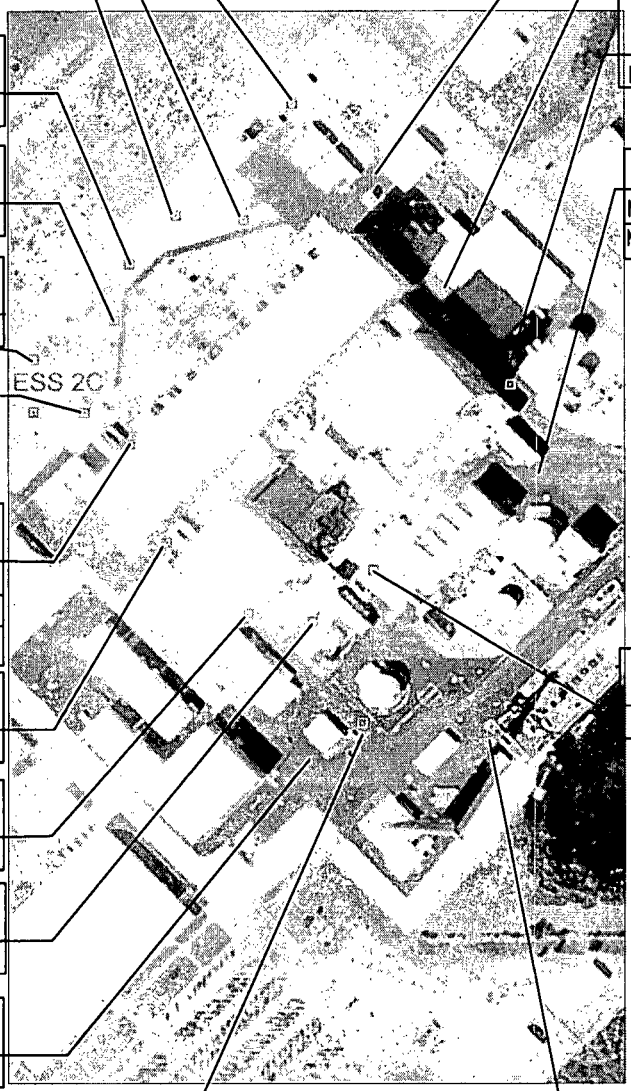
Well ID	10/4/08	3/24/09
MWPA-101C	19,120	3,411

Well ID	10/4/08	3/24/09
MWPA-105C	2,893	4,821

Well ID	10/13/08	3/19/09
MWPA-111B	2,908	2,862
MWPA-111C	40,630	30,790

Well ID	10/4/08	3/24/09
MWPA-100C	ND	ND

Well ID	10/4/08	3/24/09
MWPA-104B	29,090	27,210
MWPA-104C	17,110	23,000



Well ID	10/13/08	6/2/09
MWPA-107C	1,733	1,309
	1/30/09	6/2/09
MWPA-107B	3,809	37,210

Well ID	10/4/08	3/25/09
MWPA-112C	13,590	10,960

Well ID	10/3/08	3/23/09
MWPA-113C	ND	ND

Well ID	10/4/08	3/24/09
MWPA-114C	ND	523

Well ID	10/3/08	3/23/09
MWPA-115C	33,440	31,290

Well ID	10/4/08	3/23/09
MWPA-116C	ND	ND

Well ID	10/3/08	3/23/09
MWPA-117C	2,656	1,585

Well ID	10/4/08	3/23/09
MWPA-118B	ND	ND
MWPA-118C	ND	ND

Results are reported in pCi/L

ND = Less than the Lower Limit of Detection (LLD)

SCALE 1" = 300'

0 150 300 600 1200

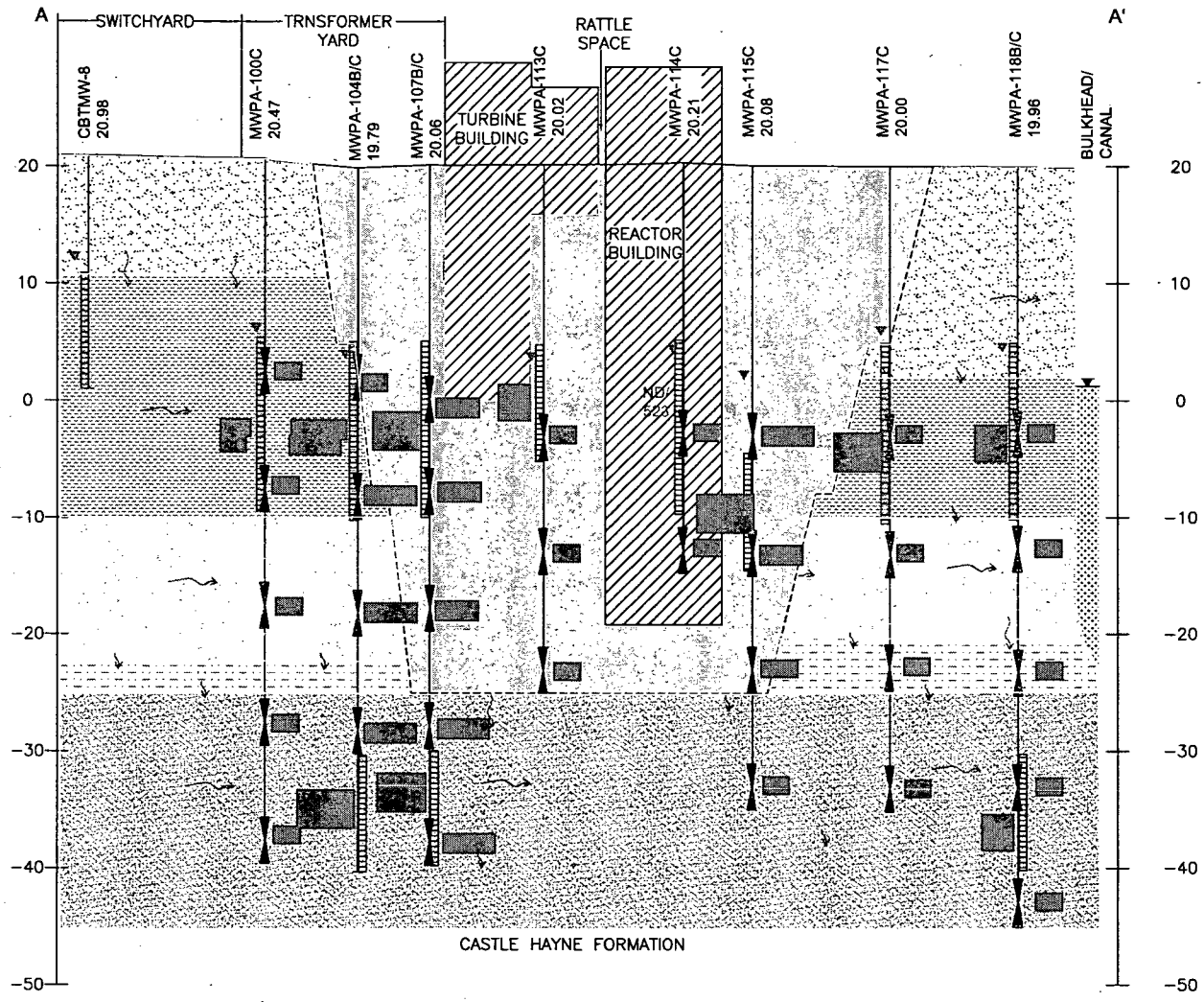
Progress Energy
Brunswick Nuclear Plant
Southport, NC

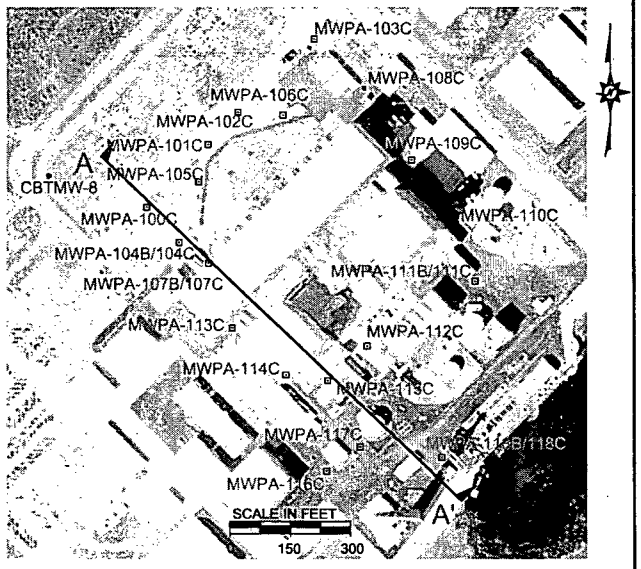
Groundwater Assessment Report

Figure 7

Analytical Results - Groundwater Samples

SSi Silar Services Inc.





Cross Section Location Map

Legend

- Groundwater Elevation (Intermediate-B Zone)
- Groundwater Elevation (Shallow-C Zone)
- 9,219 — Groundwater Screening Interval (Temporary Well Point) and Screening Concentration (pCi/L) for Tritium
- 1,733 / ND — Monitoring Well Screened Interval and Groundwater Analytical Results (pCi/L) for Tritium (1st Round/2nd Round)
- Groundwater Flow Direction

pCi/L = Pico Curies per Liter

ND = No Activity Detected Above the Lower Limit of Detection (LLA)

- Plant Backfill
- Clayey Silt (Low Permeability Unit)
- Clayey Silt, Silty Clay (Part of Lower Sand Unit)
- Sand/Silty Sand (Upper Sand)
- Sand (Part of Lower Sand Unit)
- Fine-Medium Dense Sand (Part of Lower Sand Unit)

Horizontal Scale: 1" = 150'
Vertical Scale: 1" = 10'

Note:
Depth of backfill based on geologic interpretation of boring logs and drawing 68-118-E12, "Proposed Foundation Scheme, Brunswick Nuclear Power Plant".

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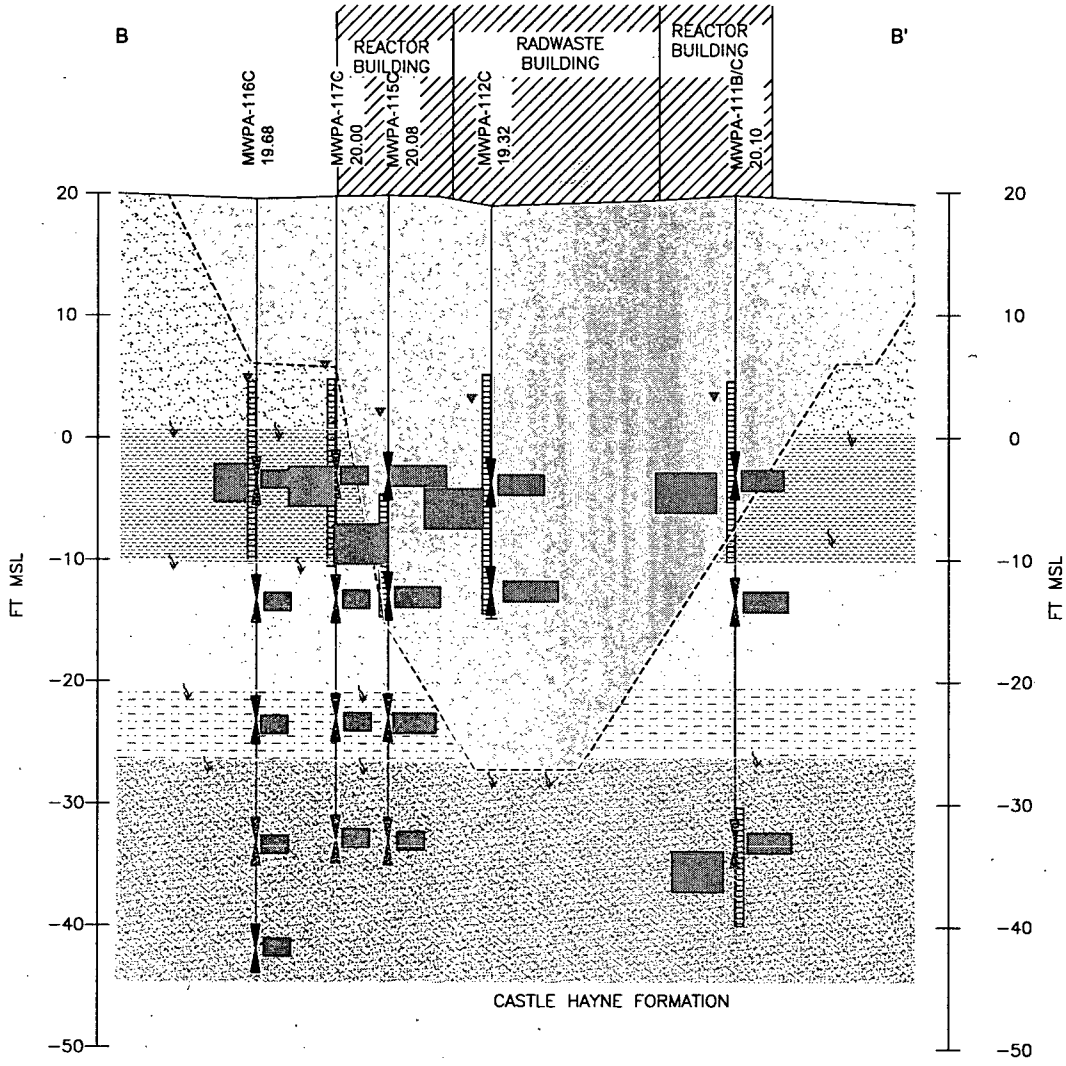
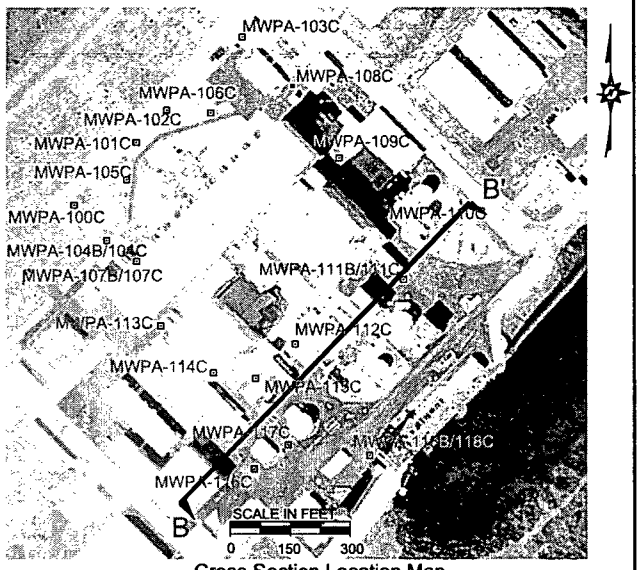
Southport, NC

Groundwater Assessment Report

Figure 8
Geologic Cross Section A-A'

SS$_i$ Silar Services Inc.





Cross Section Location Map

Legend

- Groundwater Elevation (Intermediate-B Zone)
- Groundwater Elevation (Shallow-C Zone)
- 9,219 — Groundwater Screening Interval (Temporary Well Point) and Screening Concentration (pCi/L) for Tritium
- 1,733 / ND — Monitoring Well Screened Interval and Groundwater Analytical Results (pCi/L) for Tritium (1st Round/2nd Round)
- Groundwater Flow Direction

pCi/L = Pico Curies per Liter

ND = No Activity Detected Above the Lower Limit of Detection (LLA)

- Plant Backfill
- Sand/Silty Sand (Upper Sand)
- Clayey Silt (Low Permeability Unit)
- Sand (Part of Lower Sand Unit)
- Clayey Silt, Silty Clay (Part of Lower Sand Unit)
- Fine-Medium Dense Sand (Part of Lower Sand Unit)

Horizontal Scale: 1" = 150'
Vertical Scale: 1" = 10'

Note:
Depth of backfill based on geologic interpretation of boring logs and drawing 68-118-E12, "Proposed Foundation Scheme, Brunswick Nuclear Power Plant".

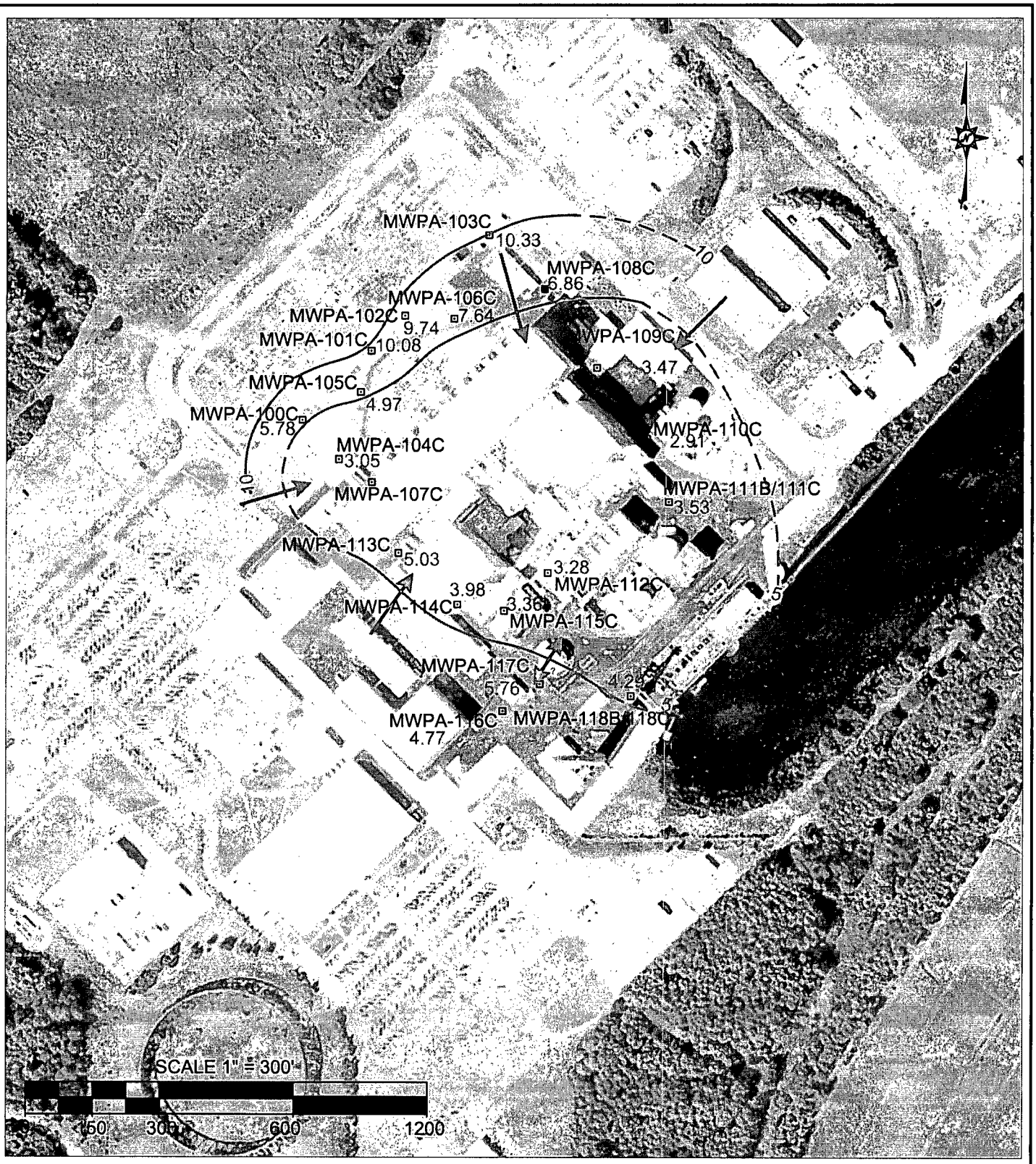
Progress Energy
Brunswick Nuclear Plant
Southport, NC

Groundwater Assessment Report

Figure 9

Geologic Cross Section B-B'

SSi Silar Services Inc.



LEGEND:

- ▣ *MONITORING WELL*
- ← *GROUNDWATER FLOW DIRECTION*
- — *GROUNDWATER CONTOUR LINE (DASHED WHERE INFERRED)*
- 2.59 *ELEVATION MEAN SEA LEVEL*

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Groundwater Assessment Report

Figure 10

Potentiometric Surface Map-Shallow Wells

October 3, 2008

Silar Services Inc.

LEGEND:

- ▣ *MONITORING WELL*
- ← *GROUNDWATER FLOW DIRECTION*
- — *GROUNDWATER CONTOUR LINE (DASHED WHERE INFERRED)*
- 2.59 *ELEVATION MEAN SEA LEVEL*

Progress Energy
Brunswick Nuclear Plant
Southport, NC

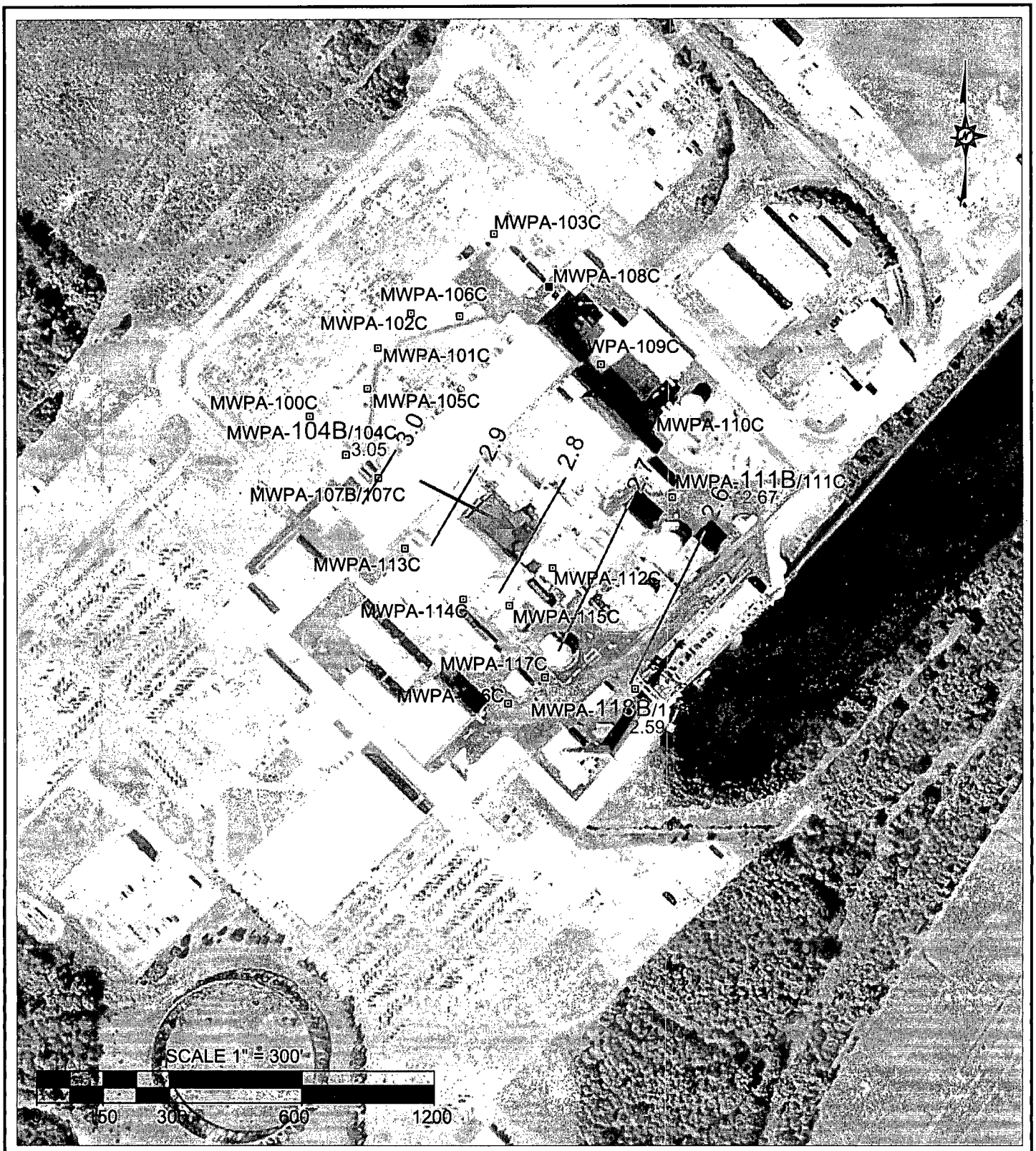
Groundwater Assessment Report

Figure 11

Potentiometric Surface Map-Shallow Wells

October 9, 2008

SSi Silar Services Inc.



LEGEND:

- ▣ *MONITORING WELL*
- ← *GROUNDWATER FLOW DIRECTION*
- — *GROUNDWATER CONTOUR LINE (DASHED WHERE INFERRED)*
- 2.59 *ELEVATION MEAN SEA LEVEL*

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Groundwater Assessment Report

Figure 12

Potentiometric Surface Map-Deep Wells
October 3, 2008

SSi Silar Services Inc.

LEGEND:

- ▣ *MONITORING WELL*
- ← *GROUNDWATER FLOW DIRECTION*
- — *GROUNDWATER CONTOUR LINE (DASHED WHERE INFERRED)*
- 2.59 *ELEVATION MEAN SEA LEVEL*

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Groundwater Assessment Report

Figure 13
Potentiometric Surface Map-Deep Wells
October 10, 2008

SSi Silar Services Inc.

TABLES

TABLE 1
GROUNDWATER ASSESSMENT REPORT – PROTECTED AREA
BRUNSWICK NUCLEAR PLANT, SOUTHPORT, NORTH CAROLINA
GROUNDWATER ASSESSMENT LOCATIONS / RATIONALE

AREA	MONITORING WELL NUMBERS	LOCATION/RATIONALE
Perimeter of Protected Area	PA-TP1 though PA-TP5	Characterize subsurface geology and groundwater quality around the perimeter of the Protected Area.
West of Turbine Building / Reactors	TP-PA6 through TP-PA13	Characterize subsurface geology and establish a groundwater quality profile west of the turbine buildings, and near the subsurface radwaste line, storm sewer mains, and storm sewer collection basin. Install groundwater monitoring wells as necessary to facilitate future groundwater monitoring programs. Identify the presence/absence of gamma nuclides in shallow subsurface soils.
North of Turbine Building / Reactors	TP-PA14 through TP-PA16	Characterize subsurface geology and establish a groundwater quality profile on the northern portion of the Protected Area near the north storm drain line. Install groundwater monitoring wells as necessary to facilitate future groundwater monitoring programs. Identify the presence/absence of gamma nuclides in shallow subsurface soils.
East of Turbine Building / Reactors	TP-PA17, TP-PA18, TP-PA21, and TP-PA24	Characterize subsurface geology and establish a groundwater quality profile downgradient of the Reactor Buildings on the eastern portion of the Protected Area near the Radwaste Building, and the Condensate Storage Tank (TP-PA21). Install groundwater monitoring wells as necessary to facilitate future groundwater monitoring programs. Identify the presence/absence of gamma nuclides in shallow subsurface soils.

TABLE 1
GROUNDWATER ASSESSMENT REPORT – PROTECTED AREA
BRUNSWICK NUCLEAR PLANT, SOUTHPORT, NORTH CAROLINA
GROUNDWATER ASSESSMENT LOCATIONS / RATIONALE

AREA	MONITORING WELL NUMBERS	LOCATION/RATIONALE
South of Turbine Building / Reactors	TP-PA19, TP-PA20, TP-PA22 and TP-PA23	Characterize subsurface geology and establish a groundwater quality profile adjacent to the Reactor Building (TP-PA20) and turbine building (TP-PA19), and to the southeast of these areas near the south storm drain sewer main. Install groundwater monitoring wells as necessary to facilitate future groundwater monitoring programs. Identify the presence/absence of gamma nuclides in shallow subsurface soils.

Table 2
Progress Energy - Brunswick Nuclear Plant
Groundwater Assessment Report - Protected Area
Analytical Results - Soils

Well I.D.	Sample Date	Sample Depth (feet BGS)	Nuclide	Activity, pCi/ml
TP-PA6-1	7/29/2008	4.5-5.5	NORM	NA
TP-PA6-2	7/29/2008	9.5-10	NORM	NA
TP-PA7-1	7/29/2008	5-6	NORM	NA
TP-PA7-2	7/29/2008	10	NORM	NA
TP-PA8-1	7/30/2008	5	**Cs-137**	**9.090E-02**
TP-PA8-2	7/30/2008	10	**Cs-137**	**2.459E-02**
TP-PA9-1	7/31/2008	6	**Cs-137**	**2.007E-01**
TP-PA9-2	7/31/2008	9	**Cs-137**	**2.712E-01**
TP-PA10-1	7/29/2008	5-6	**Cs-137**	**2.608E-02**
TP-PA-10-2	7/29/2008	10	NORM	NA
TP-PA11-1	7/30/2008	5	NORM	NA
TP-PA11-2	7/30/2008	10	NORM	NA
TP-PA12-1	7/31/2008	6	NORM	NA
TP-PA12-2	7/31/2008	10	NORM	NA
TP-PA13-1	7/30/2008	6	NORM	NA
TP-PA13-2	7/30/2008	10	NORM	NA
TP-PA15-1	8/1/2008	5	NORM	NA
TP-PA15-2	8/1/2008	10	NORM	NA
TP-PA16-1	8/1/2008	5	NORM	NA
TP-PA16-2	8/1/2008	10	**Cs-137**	**4.390E-02**
TP-PA17-1	8/4/2008	5	NORM	NA
TP-PA17-2	8/4/2008	10	NORM	NA
TP-PA18-1	8/4/2008	5	NORM	NA
TP-PA18-2	8/5/2008	10	NORM	NA
TP-PA19-1	8/6/2008	5	NORM	NA
TP-PA19-2	8/6/2008	10	NORM	NA
TP-PA20-1	8/5/2008	5	NORM	NA
TP-PA20-2	8/5/2008	10	NORM	NA
TP-PA22-1	8/6/2008	5	NORM	NA
TP-PA22-2	8/6/2008	10	NORM	NA
TP-PA23-1	8/5/2008	5	NORM	NA
TP-PA23-2	8/5/2008	10	NORM	NA
TP-PA24-1	8/7/2008	5	NORM	NA
TP-PA24-2	8/7/2008	10	NORM	NA

Notes:

All samples analyzed by Progress Energy for Gamma Spec Nuclides

pCi/mL = picocuries per milliliter

NS = Not sampled

NORM - Naturally Occurring Radioactive Material (no radiological activity was detected above normal background radiological acti

Cs - Cesium

BGS - below ground surface

Table 3
Progress Energy - Brunswick Nuclear Plant
Groundwater Assessment Report - Protected Area
Analytical Results - Groundwater Screening Samples

Screening Location (well ID)	Sample Name	Sample Date	Groundwater Depth Interval (feet BGS)	Activity, pCi/L
TP-PA1 (No Well)	TP-PA1-1	05/30/08	16-20	NA
	TP-PA1-2	05/30/08	26-30	NA
	TP-PA1-3	05/30/08	36-40	NA
	TP-PA1-4	05/30/08	46-50	NA
TP-PA2 (No Well)	TP-PA2-1	07/07/08	16-20	NA
	TP-PA2-2	07/07/08	26-30	NA
	TP-PA2-3	07/08/08	36-40	NA
	TP-PA2-4	07/08/08	46-50	NA
	TP-PA2-5	07/08/08	61-65	NA
TP-PA3 (No Well)	TP-PA3-1	07/10/09	16-20	NA
	TP-PA3-2	07/10/09	26-30	NA
	TP-PA3-3	07/10/09	36-40	NA
	TP-PA3-4	07/10/09	46-50	NA
	TP-PA3-5	07/11/08	56-60	NA
TP-PA4 (No Well)	TP-PA4-1	07/09/09	16-20	NA
	TP-PA4-2	07/09/09	26-30	NA
	TP-PA4-3	07/09/09	36-40	NA
	TP-PA4-4	07/10/09	50-54	NA
TP-PA5 (No Well)	TP-PA5-1	07/09/09	46-50	NA
	TP-PA5-2	07/09/08	54-58	NA
TP-PA6 MWPA-100C	TP-PA6-1	07/29/08	16-20	NA
	TP-PA6-2	07/30/08	26-30	NA
	TP-PA6-3	07/30/08	36-40	NA
	TP-PA6-4	07/30/08	46-50	NA
	TP-PA6-5	07/30/08	56-60	NA
TP-PA7 MWPA-101C	TP-PA7-1	07/31/08	16-20	**3,150**
	TP-PA7-2	07/31/08	26-30	NA
	TP-PA7-3	08/01/08	36-40	NA
	TP-PA7-4	08/01/08	46-50	NA
	TP-PA7-5	08/01/08	56-60	NA
TP-PA8 MWPA-102C	TP-PA8-1	08/05/08	16-20	NA
	TP-PA8-2	08/05/08	26-30	NA
	TP-PA8-3	08/05/08	36-40	**3,004**
	TP-PA8-4	08/06/08	46-50	**3,331**
	TP-PA8-5	08/06/08	56-60	NA

Table 3
Progress Energy - Brunswick Nuclear Plant
Groundwater Assessment Report - Protected Area
Analytical Results - Groundwater Screening Samples

Screening Location (well ID)	Sample Name	Sample Date	Groundwater Depth Interval (feet BGS)	Activity, pCi/L
TP-PA9 MWPA-103C	TP-PA9-1	08/07/08	16-20	NA
	TP-PA9-2	08/07/08	26-30	NA
	TP-PA9-3	08/08/08	36-40	NA
	TP-PA9-4	08/08/08	46-50	NA
	TP-PA9-5	08/09/08	56-60	NA
TP-PA10 MWPA-104B/C	TP-PA10-1	07/31/08	16-20	NA
	TP-PA10-2	07/31/08	26-30	**49,260**
	TP-PA10-3	07/31/08	36-40	**40,690**
	TP-PA10-4	07/31/08	46-50	**57,760**
TP-PA11 MWPA-105	TP-PA11-1	08/01/08	16-20	NA
	TP-PA11-2	08/01/08	26-30	**4,984**
	TP-PA11-3	08/04/08	36-40	NA
	TP-PA11-4	08/04/08	46-50	NA
	TP-PA11-5	08/04/08	56-60	NA
TP-PA12 MWPA-106C	TP-PA12-1	08/06/08	16-20	NA
	TP-PA12-2	08/06/08	26-30	NA
	TP-PA12-3	08/06/08	36-40	NA
	TP-PA12-4	08/07/08	46-50	NA
TP-PA13 MWPA-107B/C	TP-PA13-1	08/05/08	18-22	**5,213**
	TP-PA13-2	08/05/08	26-30	**4,595**
	TP-PA13-3	08/05/08	36-40	**3,517**
	TP-PA13-4	08/05/08	46-50	**31,300**
	TP-PA13-5	08/05/08	56-60	**49,380**
TP-PA14 MWPA-108C	TP-PA14-1	08/11/08	21-25	NA
	TP-PA14-2	08/11/08	36-40	NA
	TP-PA14-3	08/11/08	46-50	NA
	TP-PA14-4	08/11/08	56-60	NA
TP-PA15 MWPA-109C	TP-PA15-1	08/11/08	21-25	NA
	TP-PA15-2	08/12/08	31-35	NA
	TP-PA15-3	08/12/08	41-48	NA
TP-PA16 MWPA-110C	TP-PA16-1	08/12/08	21-25	NA
	TP-PA16-2	08/14/08	31-35	NA
	TP-PA16-3	08/14/08	41-45	NA
	TP-PA16-4	08/14/08	51-55	NA

Table 3
Progress Energy - Brunswick Nuclear Plant
Groundwater Assessment Report - Protected Area
Analytical Results - Groundwater Screening Samples

Screening Location (well ID)	Sample Name	Sample Date	Groundwater Depth Interval (feet BGS)	Activity, pCi/L
TP-PA17	TP-PA17-1	08/14/08	21-25	**3,031**
MWPA-111B/C	TP-PA17-2	08/15/08	31-35	**5,330**
	TP-PA17-5	08/18/08	51-55	**5,523**
TP-PA18	TP-PA18-1	08/18/08	21-25	**9,347**
MWPA-112C	TP-PA18-2	08/18/08	30-34	**22,370**
TP-PA19	TP-PA19-1	08/19/08	21-25	NA
MWPA-113C	TP-PA19-2	08/19/08	31-35	NA
	TP-PA19-3	08/20/08	41-45	NA
TP-PA20	TP-PA20-1	08/20/08	21-25	NA
MWPA-114C	TP-PA20-2	08/20/08	31-35	NA
	TP-PA21-1	08/28/08	21-25	**41,830**
TP-PA21	TP-PA21-2	08/28/08	31-35	**9,219**
MWPA-115C	TP-PA21-3	08/28/08	41-45	**7,401**
	TP-PA21-4	08/28/08	51-55	NA
	TP-PA22-1	08/22/08	21-25	NA
TP-PA22	TP-PA22-2	08/22/08	31-35	NA
MWPA-116C	TP-PA22-3	08/22/08	41-45	NA
	TP-PA22-4	08/25/08	51-55	NA
	TP-PA22-5	08/25/08	61-65	NA
	TP-PA23-1	08/20/08	21-25	NA
TP-PA23	TP-PA23-2	08/21/08	31-35	NA
MWPA-117B/C	TP-PA23-3	08/22/08	41-45	NA
	TP-PA23-4	08/22/08	51-55	NA
	TP-PA24-1	08/25/08	21-25	NA
TP-PA24	TP-PA24-2	08/25/08	31-35	NA
MWPA-118C	TP-PA24-3	08/26/08	41-45	NA
	TP-PA24-4	08/26/08	51-55	NA
	TP-PA24-5	08/26/08	61-65	NA

Notes:
All samples analyzed by Progress Energy for tritium only
pCi/L = picocuries per liter
NA = No Radiological Activity
BGS = below ground surface (feet)

Table 4
Groundwater Assessment - Protected Area
Brunswick Nuclear Plant, Southport, North Carolina
Monitoring Well Construction Summary

Well I.D.	Previous Well I.D.[2]	Well Depth (TOC)	Surface Casing Depth (bgs)	TOC (MSL)	Ground Surface Elevation (MSL)	Annular Fill Material			
						Screen Interval (feet bgs)	Sand Interval (feet bgs)	Seal Interval (feet bgs)	Concrete Interval (feet bgs)
Shallow Wells									
MWPA-100C	MWPA-6C	29.59	NA	19.75	20.47	30-15	30-13	13-4	4-0
MWPA-101C	MWPA-7C	29.26	NA	20.34	20.84	30-15	30-13	13-5	5-0
MWPA-102C	MWPA-8C	29.5	NA	20.7	20.92	30-15	30-13	13-5	5-0
MWPA-103C	MWPA-9C	29.9	NA	19.25	20.02	30-15	30-13	13-5	5-0
MWPA-104C	MWPA-10C	29.19	NA	19.36	19.79	30-15	34-13	13-4	4-0
MWPA-105C	MWPA11C	29.92	NA	19.08	19.57	30-15	30-13	13-5	5-0
MWPA-106C	MWPA-12C	29.45	NA	18.89	19.4	30-15	30-127	12.7-5	5-0
MWPA-107C*	MWPA-13C	28.94	NA	19.78	20.06	30-15	34-13	13-4	4-0
MWPA-108C	MWPA-14C	29.45	NA	19.91	20.19	30-15	30-13.2	13.2-5	5-0
MWPA-109C	MWPA-15C	29.13	NA	20.19	20.41	29.5-14.5	30-12.5	12.5-5	5-0
MWPA-110C	MWPA-16C	29.31	NA	19.74	19.94	30-15	30-13	13-5	5-0
MWPA-111C	MWPA-17C	29.71	NA	19.87	20.1	30-15	30-13	13-4	4-0
MWPA-112C	MWPA-18C	33.65	NA	19.06	19.32	34-14	34-12	12-3.5	3.5-0
MWPA-113C	MWPA-19C	24.51	NA	19.52	20.02	25.25-15.25	25.25-8.1 (5-3)	8.1-5	3-0
MWPA-114C	MWPA-20C	29.68	NA	19.59	20.21	30-15	30-13	13-5	5-0
MWPA-115C	MWPA-21C	33.92	NA	19.78	20.08	34.5-24.5	34.5-20	20-5	5-0
MWPA-116C	MWPA-22C	29.64	NA	19.39	19.68	30-15	30-13	13-5	5-0
MWPA-117C	MWPA-23C	29.66	NA	19.22	20	30.5-15.5	30.5-13	13-5	5-0
MWPA-118C	MWPA-24C	29.72	NA	19.53	19.96	30-15	32-13	13-5	5-0
Intermediate Wells									
MWPA-104B[1]	MWPA-10B[1]	58.99	NA	19.53	19.79	60-50	60-46 (34-13)	46-34 (13-4)	4-0
MWPA-107B[1*]	MWPA-13B[1]	~60	NA	19.78	20.06	60-50	65-45 (35-13)	45-35 (13-4)	4-0
MWPA-111B[1]	MWPA-17B[1]	59.34	NA	19.61	20.10	60-50	60-48 (40-30)	48-40 (13-4)	4-0
MWPA-118B[1]	MWPA-24B[1]	59.57	NA	19.51	19.96	60-50	60-48 (32-13)	48-32 (13-5)	5-0

Notes:
bgs - Below Ground Surface
TOC - Top of Well Casing
MSL - Mean Sea Level
[1] - Intermediate well installed in same boring as the corresponding shallow monitoring well.
Survey data provided by McKimm & Creed, accurate to 0.01 feet MSL
[2] - Well identification numbers were changed following the completion of the assessment to be consistent with the monitoring well identification system for all of the monitoring wells in the owner controlled area.
* indicates measurements are estimated pending final land survey

Table 5
Groundwater Assessment Report -Protected Area
Brunswick Nuclear Plant, Southport, NC
Water Elevation Measurements

Monitoring Well Identification	Previous Well I.D.[2]	Depth of Well[1] (feet)	Top of Casing (TOC) Elevation (feet above MSL)	10/3/2008		10/9/2008	
				Depth to Water (feet from TOC)	Elevation (feet above MSL)	Depth to Water (feet from TOC)	Elevation (feet above MSL)
Shallow Wells							
MWPA-100C	MWPA-6C	29.59	19.75	13.97	5.78	13.66	6.09
MWPA-101C	MWPA-7C	29.26	20.34	10.26	10.08	10.32	10.02
MWPA-102C	MWPA-8C	29.5	20.7	10.96	9.74	10.93	9.77
MWPA-103C	MWPA-9C	29.9	19.25	8.92	10.33	6.13	13.12
MWPA-104C	MWPA-10C	29.19	19.36	16.31	3.05	16.04	3.32
MWPA-105C	MWPA-11C	29.92	19.08	14.11	4.97	13.85	5.23
MWPA-106C	MWPA-12C	29.45	18.89	11.25	7.64	11.08	7.81
MWPA-107C	MWPA-13C	28.94	19.78	NM	NM	16.86	2.92
MWPA-108C	MWPA-14C	29.45	19.91	13.05	6.86	13.04	6.87
MWPA-109C	MWPA-15C	29.13	20.19	16.72	3.47	16.71	3.48
MWPA-110C	MWPA-16C	29.31	19.74	16.83	2.91	16.81	2.93
MWPA-111C	MWPA-17C	29.71	19.87	16.34	3.53	16.42	3.45
MWPA-112C	MWPA-18C	33.65	19.06	15.88	3.18	15.93	3.13
MWPA-113C	MWPA-19C	24.51	19.52	14.49	5.03	16.23	3.29
MWPA-114C	MWPA-20C	29.68	19.59	15.61	3.98	15.55	4.04
MWPA-115C	MWPA-21C	33.92	19.78	16.42	3.36	17.7	2.08
MWPA-116C	MWPA-22C	29.64	19.39	14.62	4.77	14.77	4.62
MWPA-117C	MWPA-23C	29.66	19.22	13.46	5.76	13.44	5.78
MWPA-118C	MWPA-24C	29.72	19.53	15.24	4.29	15.28	4.25
Intermediate Wells							
MWPA-104B[1]	MWPA-10B[1]	58.99	19.53	17.06	2.47	16.74	2.79
MWPA-107B[1]	MWPA-13B[1]	~60	19.78	10.00	9.78	13.86	5.92
MWPA-111B[1]	MWPA-17B[1]	59.34	19.61	17.67	1.94	17.43	2.18
MWPA-118B[1]	MWPA-24B[1]	59.57	19.51	17.94	1.57	17.37	2.14
Intake Canal							
Canal Data (U2SCW125)		-	-	-	1.78	-	-

Notes:
[1] - Depth of Well for tritium and radiological wells from ground surface; Depth of Well for Other Site Wells from TOC.
[2] - Well identification numbers were changed following the completion of the assessment to be consistent with the monitoring well identification system for all of the monitoring wells in the owner controlled area.

Table 6
Groundwater Assessment - Protected Area
Brunswick Nuclear Plant, Southport, North Carolina
Analytical Results for Tritium - Groundwater Samples

Well ID.	Previous Well I.D.[1]	Sample Date	Tritium Concentration (pCi/L)	Sample Date	Tritium Concentration (pCi/L)
Shallow Wells					
MWPA-100C	MWPA-6C	10/4/2008	< 398	3/24/2009	< 253
MWPA-101C	MWPA-7C	10/4/2008	19,120	3/24/2009	3,411
MWPA-102C	MWPA-8C	10/3/2008	8,050	3/24/2009	9,288
MWPA-103C	MWPA-9C	10/3/2008	< 246	3/24/2009	< 241
MWPA-104C	MWPA-10C	10/4/2008	17,110	3/24/2009	**23,000**
MWPA-105C	MWPA11C	10/4/2008	2,893	3/24/2009	4,821
MWPA-106C	MWPA-12C	10/3/2008	445	3/24/2009	368
MWPA-107C	MWPA-13C	10/13/2008	1,733	3/23/09 6/2/2009	4,615 1,309
MWPA-108C	MWPA-14C	10/3/2008	400	3/25/2009	404
MWPA-109C	MWPA-15C	10/3/2008	< 251	3/25/2009	287
MWPA-110C	MWPA-16C	10/3/2008	< 252	3/19/2009	300
MWPA-111C	MWPA-17C	10/13/2008	**40,630**	3/19/2009	**30,790**
MWPA-112C	MWPA-18C	10/4/2008	13,590	3/25/2009	10,960
MWPA-113C	MWPA-19C	10/3/2008	< 266	3/25/2009	< 243
MWPA-114C	MWPA-20C	10/4/2008	< 250	3/23/2009	523
MWPA-115C	MWPA-21C	10/3/2008	**33,440**	3/23/2009	**31,290**
MWPA-116C	MWPA-22C	10/4/2008	< 253	3/23/2009	< 275
MWPA-117C	MWPA-23C	10/3/2008	2,656	3/23/2009	1,585
MWPA-118C	MWPA-24C	10/4/2008	< 252	3/23/2009	< 241
Intermediate Wells					
MWPA-104B	MWPA-10B	10/4/2008	**29,040**	3/24/09	**27,210**
MWPA-107B	MWPA-13B	1/30/2009	3,809	6/2/09	**37,210**
MWPA-111B	MWPA-17B	10/13/2008	2,908	3/19/2009	2,862
MWPA-118B	MWPA-24B	10/4/2008	< 251	3/23/09	< 240

Notes:
C-Series wells are installed in the upper 35 feet of sandy plant backfill.
B-Series wells are installed from 50-60 feet below ground surface
in the sandy plant backfill.
pCi/L - Picocuries of radiological activity per Liter
Bold indicates concentration exceeds the federal and state drinking water standard.
[1] - Well identification numbers were changed following the completion of the assessment to be consistent with the monitoring well identification system for all of the monitoring wells in the owner controlled area.

Appendix A

Boring Logs / Well Completion Reports

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig:	Geoprobe	Date Drilled:	6/2/08	Logged By:
Boring Dia:	2 Inches	Boring Number:	PA-TP1	RMears / TSilar

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
			5		
			10		
			15		
	TP-PA1-1 ND				(16-20') Groundwater sample PA-TP1-1 Collected
			20		
			25		
	TP-PA1-2 ND				(26-30') Groundwater sample PA-TP1-2 Collected
			30		
			35		
	TP-PA1-3 ND				(36-40') Groundwater sample PA-TP1-3 Collected

Completion Notes:

-Grab groundwater samples collected at specified intervals using inertial pump sampling techniques.
-No soil samples collected.
-Borehole sealed to ground surface with bentonite.

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig:	Geoprobe	Date Drilled:	6/2/08	Logged By:
Boring Dia:	2 Inches	Boring Number:	PA-TP1	RMears / TSilar

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
			45		(46-50') Groundwater sample PA-TP1-4 Collected
	TP-PA1-4 ND		50		
			55		
			60		
			65		
			70		
			75		

Completion Notes:

-Grab groundwater samples collected at specified intervals using inertial pump sampling techniques.
-No soil samples collected.
-Borehole sealed to ground surface with bentonite.

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig:	Geoprobe	Date Drilled:	7/8/08	Logged By:
Boring Dia:	2 Inches	Boring Number:	PA-TP2	RMears / TSilar

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
			5, 10, 15		
	TP-PA2-20 ND				(16-20') Groundwater sample PA-TP2-1 collected
			20, 25		
	TP-PA2-30 ND				(26-30') Groundwater sample PA-TP2-2 collected
			30, 35		
	TP-PA2-40 ND				(36-40') Groundwater sample PA-TP2-3 collected

Completion Notes:

-Grab groundwater samples collected at specified intervals using inertial pump sampling techniques.
-No soil samples collected.
-Borehole sealed to ground surface with bentonite.

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig:	Geoprobe	Date Drilled:	7/8/08	Logged By:
Boring Dia:	2 Inches	Boring Number:	PA-TP2	RMears / TSilar

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
			45		(46-50') Groundwater sample PA-TP2-4 collected
	TP-PA2-50 ND		50		
			55		(61-65') Groundwater sample PA-TP2-5 collected
			60		
	TP-PA2-65 ND		65		
			70		
			75		

Completion Notes:

-Grab groundwater samples collected at specified intervals using inertial pump sampling techniques.
-No soil samples collected.
-Borehole sealed to ground surface with bentonite.

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig:	Geoprobe	Date Drilled:	7/11/08	Logged By:
Boring Dia:	2 Inches	Boring Number:	PA-TP-3	RMears / TSilar

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
			5, 10, 15		
	TP-PA3-20 ND				(16-20') Groundwater sample PA-TP3-20 collected
			20, 25		
	TP-PA3-30 ND				(26-30') Groundwater sample PA-TP3-30 collected
			30, 35		
	TP-PA3-40 ND				(36-40') Groundwater sample PA-TP3-40 collected

Completion Notes:

-Grab groundwater samples collected at specified intervals using inertial pump sampling techniques.
-No soil samples collected.
-Borehole sealed to ground surface with bentonite.

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig:	Geoprobe	Date Drilled:	7/11/08	Logged By:
Boring Dia:	2 Inches	Boring Number:	PA-TP-3	RMears / TSilar

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
			45		(46-50') Groundwater sample PA-TP3-50 collected
	TP-PA3-50 ND		50		
			55		(60-64') Groundwater sample PA-TP3-60 collected
			60		
	TP-PA3-60 ND		65		
			70		
			75		

Completion Notes:

-Grab groundwater samples collected at specified intervals using inertial pump sampling techniques.
-No soil samples collected.
-Borehole sealed to ground surface with bentonite.

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig:	Geoprobe	Date Drilled:	7/10/08	Logged By:
Boring Dia:	2 Inches	Boring Number:	PA-TP4	CSilar / TSilar

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
			5, 10, 15		
	TP-PA4-20 ND				(16-20') Groundwater sample PA-TP4-20 collected
			20, 25		
	TP-PA4-30 ND				(26-30') Groundwater sample PA-TP4-30 collected
			30, 35		
	TP-PA4-40 ND				(36-40') Groundwater sample PA-TP4-40 collected

Completion Notes:

-Grab groundwater samples collected at specified intervals using inertial pump sampling techniques.
-No soil samples collected.
-Borehole sealed to ground surface with bentonite.

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig:	Geoprobe	Date Drilled:	7/10/08	Logged By:
Boring Dia:	2 Inches	Boring Number:	PA-TP4	CSilar / TSilar

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
			45		
			50		(60-64') Groundwater sample PA-TP4-54 collected
	TP-PA4-54 ND				
			55		
			60		
			65		
			70		
			75		

Completion Notes:

-Grab groundwater samples collected at specified intervals using inertial pump sampling techniques.
-No soil samples collected.
-Borehole sealed to ground surface with bentonite.

Site:

BNP- Protected Area

Southport , NC

Project No.:

Silar Services Inc.

BORING LOG / WELL CONSTRUCTION REPORT

Drill Rig: Geoprobe	Date Drilled: 7/9/08	Logged By:	
Boring Dia: 2 Inches	Boring Number: PA-TP5	CSilar / TSilar	

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
			5		
			10		
			15		
			20		
			25		
			30		
			35		

Completion Notes:

-Grab groundwater samples collected at specified intervals using inertial pump sampling techniques.
-No soil samples collected.
-Borehole sealed to ground surface with bentonite.

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig:	Geoprobe	Date Drilled:	7/9/08	Logged By:
Boring Dia:	2 Inches	Boring Number:	PA-TP5	CSilar / TSilar

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
			45		(46-50') Groundwater Sample PA-TP5-50 collected
	TP-PA5-50 ND		50		
			55		(54-58') Groundwater sample PA-TP5-58 collected
	TP-PA5-58 ND		60		
			65		
			70		
			75		

Completion Notes:

-Grab groundwater samples collected at specified intervals using inertial pump sampling techniques.
-No soil samples collected.
-Borehole sealed to ground surface with bentonite.

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig:	Geoprobe	Date Drilled:	9/12/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	MWPA-6C / 100C	RMears / TSilar

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
					Soil Sample TP-PA6-1 collected (4.5-5.0')
	Soil Sample		5		Soil sample TP-PA6-2 collected (9.5-10')
	Soil Sample		10		
			15		(16-20') Groundwater sample TP-PA6-1 collected
	TP-PA6-1 ND @ 3066 pCi/L				
			20		Gray silt w/ some clay, thin zone of very fine grain sand, saturated at ~ 23' bgs, increasing shell fragments with depth, 5% shells from 24-25' bgs (bivalves). Contact between fill and native soils appears to be at 20.5'.
			25		
	TP-PA6-2 ND@ 3926 pCi/L				
			30		Gray silt with tr fine grain sand and shell fragments (<5%), saturated.
			35		
	TP-PA6-3 ND @ 3640 pCi/L				(36-40') Groundwater sample PA-TP6-3 collected

Completion Notes:

-Vaccum excavation to approximayely 14' bgs on 7-29-08
-Direct push drilling techniques using Geoprobe for groundwater screening from terminus of vaccum extraction borehole to boring total depth (60' bgs)
-Borehole sealed fron the terminal depth of the boring to the bottom of monitoring well screen
-1" PVC monitoring well installed in borehole and finished with flush mount manhole
-Ground Elevation 20.47; Casing Elevation 19.75
-

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig:	Geoprobe	Date Drilled:	9/12/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	MWPA-6C / 100C	RMears / TSilar

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
					Gray medium-coarse grained sand with tr shells, saturated.
			45		
	TP-PA6-4 ND @ 2997 pCi/L				(46-50') Groundwater sample TP-PA6-4 collected
			50		Tan fine to medium grained sand, well sorted, saturated.
			55		
	TP-PA6-5 ND @ 2938 pCi/L				(56-60') Groundwater sample TP-PA6-5 collected
			60		Boring terminated at 60 ft bgs
			65		
			70		
			75		

Completion Notes:

-Vaccum excavation to approximayely 14' bgs on 7-29-08
-Direct push drilling techniques using Geoprobe for groundwater screening from terminus of vaccum extraction borehole to boring total depth (60' bgs)
-Borehole sealed fron the terminal depth of the boring to the bottom of monitoring well screen
-1" PVC monitoring well installed in borehole and finished with flush mount manhole
-Ground Elevation 20.47; Casing Elevation 19.75
-

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig:	Geoprobe	Date Drilled:	9/12/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	MWPA-7C / 101C	TSilar

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
					Soil Sample TP-PA7-1 collected (5-6')
	Soil sample		5		Soil Sample TP-PA7-2 collected (9-10')
	Soil sample		10		
			15		(16-20') Groundwater sample TP-PA7-1 collected
	TP-PA7-1 ND @ 3150 pCi/L				
			20		Gray silt with tr very fine grain sand, tr shell fragments.
			25		(26-30') Groundwater sample TP-PA7-2 collected
	TP-PA7-2 ND@ 2860 pCi/L				
			30		Gray silt with tr very fine grain sand, less than 1% shell fragments, increase shell content from 33'-35' bgs, appears to be backfill, no observed depositional structure.
			35		(36-40') Groundwater sample TP-PA7-3 collected
	TP-PA7-3 ND @ 2857 pCi/L				

Completion Notes:

-Vaccum excavation to approximayely 14' bgs
-Direct push drilling techniques using Geoprobe for groundwater screening from terminus of vaccum extraction borehole to boring total depth (60' bgs)
-Borehole grouted from the termninal depth of the boring to the bottom of monitoring well screen
-1" PVC monitoring well installed in borehole and finished with flush mount manhole
-Ground Elevation 20.84; Casing Elevation 20.34

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig:	Geoprobe	Date Drilled:	9/12/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	MWPA-7C / 101C	TSilar

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
					0% recovery, material in tip of sampler is gray fine grained sand with shell fragments.
			45		
	TP-PA7-4 ND @ 2807 pCi/L				(46-50') Groundwater sample TP-PA7-4 collected
			50		
					Light gray medium grained sand, tr coarse grain sand to 54.5, gray fine grained sand from 54.5 to 55.0.
			55		
	TP-PA7-5 ND @ 2823 pCi/L				(56-60') Groundwater sample TP-PA7-5 collected
			60		
			65		
			70		
			75		

Completion Notes:

-Vaccum excavation to approximayely 14' bgs
-Direct push drilling techniques using Geoprobe for groundwater screening from terminus of vaccum extraction borehole to boring total depth (60' bgs)
-Borehole grouted from the termninal depth of the boring to the bottom of monitoring well screen
-1" PVC monitoring well installed in borehole and finished with flush mount manhole
-Ground Elevation 20.84; Casing Elevation 20.34

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig:	Geoprobe	Date Drilled:	9/15/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	MWPA-8C / 102C	JMagee

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
	Soil Sample		5		(5-6') Soil Sample TP-PA8-1 collected
	Soil Sample		10		(9-10') Soil sample TP-PA8-2 collected
	TP-PA8-1 ND @ 3200 pCi/L		15		(16-20') Groundwater screening sample TP-PA8-1 collected
			20		(20-20.5) Medium brown sand, (20.5-25) gray silt with very fine sand, 21-23' saturated, 23-25 shell fragments and dry
	TP-PA8-2 ND @ 2661 pCi/L		25		(26-30') Groundwater sample TP-PA8-2 collected
			30		Gray silt with shell fragments, highly saturated zone from 33.5-34.5', saturated zone from 31-32'
	TP-PA8-3 3004 pCi/L		35		(36-40') Groundwater sample TP-PA8-3 collected

Completion Notes:

-Vaccum excavation to approximayely 14' bgs
-Direct push drilling techniques using Geoprobe for groundwater screening from terminus of vaccum extraction borehole to boring total depth (60' bgs)
-Groundwater samples collected using inertial pump sampling method
-Borehole sealed from the terminal depth of the boring to the base of monitoring well
-1" PVC monitoring well installed in borehole and finished with flush mount manhole
-Gr

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig:	Geoprobe	Date Drilled:	9/15/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	MWPA-8C / 102C	JMagee

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
					40-45 gray silt with shells, saturated at 42', high shell content 42'42.5, very fine sand 42.5-43.5, medium grained sand 43.5-45
			45		
	TP-PA8-4 3331 pCi/L				(46-50') Groundwater screening sample TP-PA8-4 collected
			50		No recovery, sampler refusal encountered at 50" bgs.
			55		
	TP-PA8-5 ND @ 2914 pCi/L				(56-60') Groundwater screening sample TP-PA8-5 collected
			60		
			65		
			70		
			75		

Completion Notes:

-Vaccum excavation to approximayely 14' bgs
-Direct push drilling techniques using Geoprobe for groundwater screening from terminus of vaccum extraction borehole to boring total depth (60' bgs)
-Groundwater samples collected using inertial pump sampling method
-Borehole sealed from the terminal depth of the boring to the base of monitoring well
-1" PVC monitoring well installed in borehole and finished with flush mount manhole
-Gr

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig:	Geoprobe	Date Drilled:	9/16/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	MWPA-9C / 103C	John Magee

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
	Soil Sample		5		(4-5') Soil Sample TP-PA9-1 collected
	Soil Sample		10		(9-10') Soil sample TP-PA9-2 collected
	TP-PA9-1 ND @ 2682 pCi/L		15		(16-20') Groundwater screening sample TP-PA9-1 collected
			20		(90% recovery) 20-24.5 gray fine/very fine grained sand, shell fragments @ 24.5' bgs.
			25		Gray silt with shell fragments
	TP-PA9-2 ND@ 2687 pCi/L				(26-30') Groundwater sample TP-PA9-2 collected
			30		Gray very fine grain sand Dark gray silt with shell fragments, saturated
			35		
	TP-PA9-3 ND @ 2695 pCi/L				(36-40') Groundwater sample TP-PA9-3 collected

Completion Notes:

-Vaccum excavation to approximayely 14' bgs
-Direct push drilling techniques using Geoprobe for groundwater screening from terminus of vaccum extraction borehole to boring total depth (60' bgs)
-Groundwater sampled collected using inertial pump sampling method
-Borehole sealed from terminal depth of boring to the bottom of monitoring well screen
-1" PVC monitoring well installed in borehole and finished with flush mount manhole
-Gro

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig:	Geoprobe	Date Drilled:	9/16/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	MWPA-9C / 103C	John Magee

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
					Gray very fine grain sand, saturated, grading to medium grain sand 41-42.5' bgs, 42.5-45 light gray medium grain sand.
			45		
	TP-PA9-4 ND @ 2764 pCi/L				(46-50') Groundwater sample TP-PA9-4 collected
			50		Light gray medium grain sand.
					Light brown coarse grain sand
					Light brown medium grain sand
					Light brown coarse grain sand
			55		
	TP-PA9-5 ND @ 2894 pCi/L				(56-60') Groundwater sample TP-PA9-5 collected
			60		
			65		
			70		
			75		

Completion Notes:

-Vaccum excavation to approximayely 14' bgs
-Direct push drilling techniques using Geoprobe for groundwater screening from terminus of vaccum extraction borehole to boring total depth (60' bgs)
-Groundwater sampled collected using inertial pump sampling method
-Borehole sealed from terminal depth of boring to the bottom of monitoring well screen
-1" PVC monitoring well installed in borehole and finished with flush mount manhole
-Gro

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig:	Geoprobe	Date Drilled:	9/8/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	MWPA-10B/C / 104B/C	Tim Silar

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
					(5-6') Soil sampleTP-PA10-1 collected
	Soil Sample		5		
	Soil Sample		10		(9-10') Soil sample TP-PA10-2 collected
			15		(16-20') Grouondwater sample TP-PA10-1 collected
	TP-PA10-1 ND @ 2913 pCi/L		20		Dark gray silt with little very fine grain sand, tr shell fragments, no structure, within backfill area, moist-dry
			25		(26-30') Groundwater sample TP-PA10-2 collected
	TP-PA10-2 49,260 pCi/L		30		Dark gray silt with some very fine grain sand and tr shell fragements, more shells than 20-25, saturated, no structure
			35		(36-40') Groundwater sample TP-PA10-3 collected
	TP-PA10-3 40,690 pCi/L				

Completion Notes:

-Vaccum excavation to approximayely 14' bgs
-Soil samples collected on 7/29/08
-Direct push drilling techniques using Geoprobe for groundwater screening from terminus of vaccum extraction borehole to boring total depth (60' bgs)
-Groundwater screening samples collected using inertial pump sampling method
-Two 1" PVC monitoring wells installed in borehole (MW-PA10C / 104C and MW-PA10B / 104B) and finished with flush mount manhole

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig:	Geoprobe	Date Drilled:	9/12/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	MWPA-11C / 105C	Tim Silar

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
	Soil Sample		5		(5-6') Soil Sample TP-PA11-1 collected
	Soil Sample		10		(9-10') Soil sample TP-PA11-2 collected
	TP-PA11-1 ND @ 3043 pCi/L		15		(16-20') Groundwater screening sample TP-PA11-1 collected
			20		Brown fine gr sand, dense
	TP-PA11-2 4984 pCi/L		25		(26-30') Groundwater samnple TP-PA11-2 collected
			30		Brown fine grained sand with trace crushed stone (backfill), some gray sand @ 33-33.5
	TP-PA11-3 ND @ 3035 pCi/L		35		(36-40') Groundwater sample TP-PA11-3 collected

Completion Notes:

-Vaccum excavation to approximayely 14' bgs
-Direct push drilling techniques using Geoprobe for groundwater screening from terminus of vaccum extraction borehole to boring total depth (60' bgs)
-Groundwater screening samples collected using inertial pump sampling technique
-Borehole sealed to bottom of monitoring well
-1" PVC monitoring well installed in borehole and finished with flush mount manhole
-Ground Elevation 19.57; Cas

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig:	Geoprobe	Date Drilled:	9/12/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	MWPA-11C / 105C	Tim Silar

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
					brown fine grained sand, little medium grained sand, tr stone (backfill)
			45		Gray fine grain sand, appears to be native soils
	TP-PA11-4 ND @ 3214 pCi/L				(46-40') Groundwater sample TP-PA11-4 collected
			50		No recovery, sampler refusal
			55		
	TP-PA11-5 ND @ 3060 pCi/L				(56-60') Groundwater sample TP-PA11-5 collected
			60		
			65		
			70		
			75		

Completion Notes:

-Vaccum excavation to approximayely 14' bgs
-Direct push drilling techniques using Geoprobe for groundwater screening from terminus of vaccum extraction borehole to boring total depth (60' bgs)
-Groundwater screening samples collected using inertial pump sampling technique
-Borehole sealed to bottom of monitoring well
-1" PVC monitoring well installed in borehole and finished with flush mount manhole
-Ground Elevation 19.57; Cas

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig:	Geoprobe	Date Drilled:	9/15/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	MWPA-12C / 106C	JMagee / TSilar

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
					Soil Sample TP-PA12-1 collected (5-6')
	Soil Sample		5		
					Soil Sample TP-PA12-2 collected (9-10')
	Soil Sample		10		
			15		
	TP-PA12-1 ND @ 2890pCi/L				(16-20') Groundwater sample TP-PA12-1 collected
			20		Gray silt, loose
					Gray clayey silt, trace shells, moist
			25		
	TP-PA12-2 ND @ 2934 pCi/L				(26-30') Groundwater sample TP-PA12-2 collected
			30		Gray fine grained sand, saturated
					Gray fine grained sand with some shells, saturated
					Gray silty fine grained sand, saturated
			35		Gray fine grained sand trace shells, moist
	TP-PA12-3 ND @ 2914 pCi/L				(36-40') Groundwater sample TP-PA12-3 collected

Completion Notes:

-Vaccum excavation to approximayely 14' bgs
-Direct push drilling techniques using Geoprobe for groundwater screening from terminus of vaccum extraction borehole to boring total depth (60' bgs)
-Groundwater samples collected using inertial pump sampling method and dedicated PTFE sample tubing
-Borehole sealed from terminal depth of boring up to the bottom of monitoring well screen
-1" PVC monitoring well installed in borehole and finished with flush mount manhole

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig:	Geoprobe	Date Drilled:	9/15/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	MWPA-12C / 106C	JMagee / TSilar

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
					Gray medium grained sand grading to light gray fine grained sand saturated
			45		
	TP-PA12-4 ND @ 3109 pCi/L				(46-50') Groundwater sample TP-PA12-4 collected
			50		Soil sampler refusal encountered at 50 feet
			55		
	TP-PA12-5 ND @ 2685 pCi/L				(56-60') Groundwater sample TP-PA12-5 collected
			60		
			65		
			70		
			75		

Completion Notes:

-Vaccum excavation to approximayely 14' bgs
-Direct push drilling techniques using Geoprobe for groundwater screening from terminus of vaccum extraction borehole to boring total depth (60' bgs)
-Groundwater samples collected using inertial pump sampling method and dedicated PTFE sample tubing
-Borehole sealed from terminal depth of boring up to the bottom of monitoring well screen
-1" PVC monitoring well installed in borehole and finished with flush mount manhole

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig:	Geoprobe	Date Drilled:	9/11/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	MWPA-13B/C / 107B/C	Bryan Sladky

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
			5		(5-6') Soil Sample TP-PA13-1 collected
			10		(9-10') Soil sample TP-PA13-2 collected
			15		Brown Fine-medium grained sand, poorly sorted. Groundwater sample TP-PA13-1 collected (18-22')
			20		
			25		(26-30') Groundwater sample TP-PA13-2 collected
			30		Soil sampler refusal
			35		(36-40') Groundwater sample TP-PA13-3 collected

Completion Notes:

-Vaccum excavation to approximayely 14' bgs
-Direct push drilling techniques using Geoprobe for groundwater screening from terminus of vaccum extraction borehole to boring total depth (60' bgs)
-Groundwater screening samples collected using inertial pump sampling technique
-Two 1" PVC monitoring wells installed in borehole (MWPA-13C and MW-13B) and finished with flush mount manhole
-Wells were redrilled and installed on 4/24/2009
-Ground elevation 20.06; Casing elevation 19.78 (MWPA-107B) and 19.81 (MWPA-107C)

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig:	Geoprobe	Date Drilled:	9/11/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	MWPA-13B/C / 107B/C	Bryan Sladky

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
					No soil sample collected due to previous refusal
			45		
					(46-50') Groundwater sample TP-PA13-4 collected
			50		
					No soil sample collected due to previous refusal
			55		
					(56-60') Groundwater sample TP-PA13-5 collected
			60		
			65		
			70		
			75		

Completion Notes:

-Vaccum excavation to approximayely 14' bgs
-Direct push drilling techniques using Geoprobe for groundwater screening from terminus of vaccum extraction borehole to boring total depth (60' bgs)
-Groundwater screening samples collected using inertial pump sampling technique
-Two 1" PVC monitoring wells installed in borehole (MWPA-13C and MW-13B) and finished with flush mount manhole
-Wells were redrilled and installed on 4/24/2009
-Ground elevation 20.06; Casing elevation 19.78 (MWPA-107B) and 19.81 (MWPA-107C)

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig:	Geoprobe	Date Drilled:	9/16/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	MWPA-14C / 108C	Bryan Sladky

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
	Soil Sample		5		
	Soil Sample		10		
			15		No water (attempted to collect groundwater sample)
			20		
	TP-PA14-1 ND @ 2958 pCi/L		25		(21-25') Groundwater sample TP-PA14-1 collected
			30		Gray silt abundant shells @ 32-33,
					Gray clayey silt
			35		
	TP-PA14-2 ND @ 2967 pCi/L				(36-40') Groundwater sample TP-PA14-2 collected

Completion Notes:

Vaccum excavation to approximayely 14' bgs
-Direct push drilling techniques using Geoprobe for groundwater screening from terminus of vaccum extraction borehole to boring total depth (60' bgs)
-Groundwater samples collected using inertial pump sampling method and dedicated PTFE tubing
-Borehole sealed from the terminal depth of the boring to the bottom of monitoring well screen
-1" PVC monitoring well installed in borehole and finished with flush mount manhole

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig:	Geoprobe	Date Drilled:	9/8/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	MWPA-10B/C / 104B/C	Tim Silar

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
					Gray-dark gray fine grain sand, dense
			45		(46-50') Groundwater sample TP-PA10-4 collected
	TP-PA10-4 57,760 pCi/L		50		No recovery, sampler refusal encountered at ~50' bgs.
			55		
			60		
			65		
			70		
			75		

Completion Notes:

-Vaccum excavation to approximayely 14' bgs
-Soil samples collected on 7/29/08
-Direct push drilling techniques using Geoprobe for groundwater screening from terminus of vaccum extraction borehole to boring total depth (60' bgs)
-Groundwater screening samples collected using inertial pump sampling method
-Two 1" PVC monitoring wells installed in borehole (MW-PA10C / 104C and MW-PA10B / 104B) and finished with flush mount manhole

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig:	Geoprobe	Date Drilled:	9/16/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	MWPA-14C / 108C	Bryan Sladky

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
					No recovery
			45		
	TP-PA14-3 ND @ 2928 pCi/L				(46-50') Groundwater sample TP-PA14-3 collected
			50		
			55		Gray medium grain sand, well sorted.
	TP-PA14-4 ND @ 2967 pCi/L				(57-60') Groundwater sample TP--PA14-4 collected
			60		
			65		
			70		
			75		

Completion Notes:

Vaccum excavation to approximayely 14' bgs
-Direct push drilling techniques using Geoprobe for groundwater screening from terminus of vaccum extraction borehole to boring total depth (60' bgs)
-Groundwater samples collected using inertial pump sampling method and dedicated PTFE tubing
-Borehole sealed from the terminal depth of the boring to the bottom of monitoring well screen
-1" PVC monitoring well installed in borehole and finished with flush mount manhole

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig: Geoprobe	Date Drilled: 9/16/08	Logged By:	
Boring Dia: 6.5 Inches	Boring Number: MWPA-15C / 109C	JMagee / TSilar	

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
					Soil Sample TP-PA15-1 collected (5-6')
	Soil Sample		5		Soil Sample TP-PA15-2 collected (9-10')
	Soil Sample		10		
			15		(16-20') Groundwater sample TP-PA15-1 collected
			20		
	TP-PA15-1 ND @ 3005 pCi/L		25		No recovery, very hard drilling at this location
			30		(31-35') Groundwater sample TP-PA15-2 collected
	TP-PA15-2 ND @ 2880 pCi/L		35		No recovery, refusal @ about 32', very hard

Completion Notes:

-Vaccum excavation to approximayely 14' bgs
-Direct push drilling techniques using Geoprobe for groundwater screening from terminus of vaccum extraction borehole to boring total depth (48' bgs)
-Groundwater screening samples collected using inertial pump sampling method and new PTFE tubing at each interval
-Borehole sealed from terminal depth of boring to bottom of monitoring well screen
-1" PVC monitoring well installed in borehole and finished with flush mount manhole

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig:	Geoprobe	Date Drilled:	9/16/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	MWPA-15C / 109C	JMagee / TSilar

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
	TP-PA15-3 ND @ 3242 pCi/L		45		(41-45') Groundwater sample TP-PA15-3 collected
			50		Attempt to collect groundwater samples at 51-55' bgs and 56-60' bgs, no recovery of groundwater
			55		
			60		
			65		
			70		
			75		

Completion Notes:

-Vaccum excavation to approximayely 14' bgs
-Direct push drilling techniques using Geoprobe for groundwater screening from terminus of vaccum extraction borehole to boring total depth (48' bgs)
-Groundwater screening samples collected using inertial pump sampling method and new PTFE tubing at each interval
-Borehole sealed from terminal depth of boring to bottom of monitoring well screen
-1" PVC monitoring well installed in borehole and finished with flush mount manhole

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig:	Geoprobe	Date Drilled:	9/17/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	MWPA-16C / 110C	J Magee

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
					Soil Sample TP-PA16-1 collected (5-6')
	Soil Sample		5		
					Soil Sample TP-PA16-2 collected (9-10')
	Soil Sample		10		
			15		
			20		
	TP-PA16-1 ND @ 2810 pCi/L				(21-25') Groundwater sample TP-PA16-1 collected
			25		Soil sampler refusal, could not advance soil sampler
			30		
	TP-PA16-2 ND @ 3214 pCi/L				(31-35') Groundwater sample TP-PA16-2 collected
			35		Sampler refusal

Completion Notes:

-Vaccum excavation to approximayely 14' bgs
-Direct push drilling techniques using Geoprobe for groundwater screening from terminus of vaccum extraction borehole to boring total depth (55' bgs)
-Groundwater samples colected using inertial pump sampling method
-Borehole sealed fornm the terminal depth of the boring to the bottom of monitoring well screen
-1" PVC monitoring well installed in borehole and finished with flush mount manhole

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig:	Geoprobe	Date Drilled:	9/17/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	MWPA-16C / 110C	J Magee

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
	TP-PA16-3 ND @ 2979 pCi/L		45		(41-45') Groundwater sample TP-PA16-3 collected
	TP-PA16-4 ND @ 2817		50, 55		(51-55') Groundwater sample TP-PA16-4 collected
			60, 65, 70, 75		

Completion Notes:

-Vaccum excavation to approximayely 14' bgs
-Direct push drilling techniques using Geoprobe for groundwater screening from terminus of vaccum extraction borehole to boring total depth (55' bgs)
-Groundwater samples colected using inertial pump sampling method
-Borehole sealed fornm the terminal depth of the boring to the bottom of monitoring well screen
-1" PVC monitoring well installed in borehole and finished with flush mount manhole

Site:

BNP- Protected Area

Southport , NC

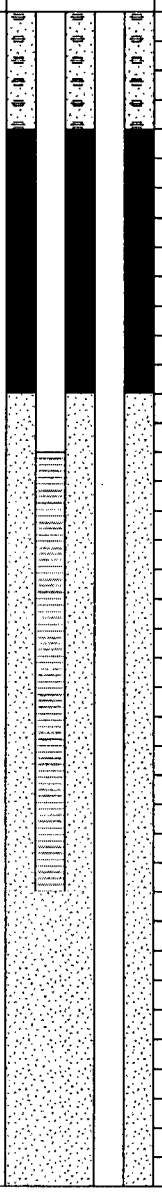
Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig:	Geoprobe	Date Drilled:	9/5/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	MWPA-17B/C / 111B/C	T Silar

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
					Soil Sample TP-PA17-1 collected (5-6')
	Soil Sample		5		
					Soil Sample TP-PA17-2 collected (9-10')
	Soil Sample		10		
			15		
			20		
	TP-PA17-1 3031 pCi/L				(21-25') Groundwater sample TP-PA17-1 collected
			25		No recovery, could not advance soil sampler
			30		
	TP-PA17-2 5330 pCi/L				(31-35') Groundwater sample TP-PA17-2 collected
			35		Sampler refusal



Completion Notes:

-Vaccum excavation to approximayely 14' bgs
-Direct push drilling techniques using Geoprobe for groundwater screening from terminus of vaccum extraction borehole to boring total depth (60' bgs)
-Groundwater screening samples collected using inertial pump sampling method
-Two 1" PVC monitoring well installed in borehole (MWPA-17C / 111C and MW-17B / 111B) and finished with flush mount manhole
-Ground Elevation 20.1; Casing Elevation 19.61 (MWPA-17B / 111B) and 19.87 (MWPA17C / 111C)

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig:	Geoprobe	Date Drilled:	9/5/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	MWPA-17B/C / 111B/C	T Silar

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
					Groundwater sampling attempted, no groundwater could be recovered
			45		
			50		(51-55') Groundwater sample TP-PA17-5 collected
	TP-PA17-5 5330		55		
			60		
			65		
			70		
			75		

Completion Notes:

-Vaccum excavation to approximayely 14' bgs
-Direct push drilling techniques using Geoprobe for groundwater screening from terminus of vaccum extraction borehole to boring total depth (60' bgs)
-Groundwater screening samples collected using inertial pump sampling method
-Two 1" PVC monitoring well installed in borehole (MWPA-17C / 111C and MW-17B / 111B) and finished with flush mount manhole
-Ground Elevation 20.1; Casing Elevation 19.61 (MWPA-17B / 111B) and 19.87 (MWPA17C / 111C)

Site:

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Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig: Geoprobe	Date Drilled: 9/17/08	Logged By:	
Boring Dia: 6.5 Inches	Boring Number: MWPA-18C / 112C	J Magee	

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
					Soil Sample TP-PA18-1 collected (5-6')
	Soil Sample		5		Soil Sample TP-PA18-2 collected (9-10')
	Soil Sample		10		
			15		Dark brown medium grain sand, saturated
			20		(21-25') Groundwater sample TP-PA18-1 collected
	TP-PA18-1 9,347 pCi/L		25		Sampler refusal
	TP-PA18-2 22,370 pCi/L		30		(30-34') Groundwater sample TP-PA18-2 collected
			35		

Completion Notes:

Vaccum excavation to approximayely 14' bgs
-Direct push drilling techniques using Geoprobe for groundwater screening from terminus of vaccum extraction borehole to boring total depth (34' bgs)
-1" PVC monitoring well installed in borehole and finished with flush mount manhole
-Ground Elevation 19.32; Casing Elevation 19.06

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig:	Geoprobe	Date Drilled:	9/18/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	MWPA-19C / 113C	Bryan Sladky

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
					Soil Sample TP-PA19-1 collected (5-6')
	Soil Sample		5		Soil Sample TP-PA19-2 collected (9-10')
	Soil Sample		10		
			15		Light brown coarse to medium grain sand
					Brown medium grain sand,saturated
					Brown medium grain sand
			20		(21-25') Groundwater sample TP-PA19-1 collected
	TP-PA19-1 ND @ 2790 pCi/L				
			25		No recovery, sampler refusal
			30		(31-35') Groundwater sample TP-PA19-2 collected
	TP-PA19-2 ND @ 2882 pCi/L				
			35		Sampler refusal

Completion Notes:

-Vaccum excavation to approximayely 14' bgs
-Direct push drilling techniques using Geoprobe for groundwater screening from terminus of vaccum extraction borehole to boring total depth (45' bgs)
-Groundwater screening samples collected via inertial pump sampling method and dedicated PTFE tubing
-Borehole sealed form the terminal depth of the boring to the bottom of monitoring well screen
-1" PVC monitoring well installed in borehole and finished with flush mount manhole

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig:	Geoprobe	Date Drilled:	9/18/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	MWPA-19C / 113C	Bryan Sladky

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
	TP-PA19-3 ND @ 3246 pCi/L				(41-45') Groundwater sample TP-PA19-3 collected
			45		
			50		
			55		
			60		
			65		
			70		
			75		

Completion Notes:

-Vaccum excavation to approximayely 14' bgs
-Direct push drilling techniques using Geoprobe for groundwater screening from terminus of vaccum extraction borehole to boring total depth (45' bgs)
-Groundwater screening samples collected via inertial pump sampling method and dedicated PTFE tubing
-Borehole sealed form the terminal depth of the boring to the bottom of monitoring well screen
-1" PVC monitoring well installed in borehole and finished with flush mount manhole

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig: Geoprobe	Date Drilled: 9/03/08	Logged By:	
Boring Dia: 6.5 Inches	Boring Number: MWPA-20C / 114C	Bryan Sladky	

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
					Soil Sample TP-PA20-1 collected (4-5')
	Soil Sample		5		Soil Sample TP-PA20-2 collected (9-10')
	Soil sample		10		
			15		Light brown fine-medium grain sand, trace silt, med. moist to wet
			20		(21-25') Groundwater sample TP-PA20-1 collected
	TP-PA20-1 ND @ 3117 pCi/L		25		No recovery- soil hardness welded threads together on piston sampler.
			30		(31-35') Groundwater sample TP-PA20-2 collected
	TP-PA20-2 ND @ 3339 pCi/L		35		

Completion Notes:

-Vaccum excavation to approximayely 14' bgs
-Direct push drilling techniques using Geoprobe for groundwater screening from terminus of vaccum extraction borehole to boring total depth (35' bgs)
-Groundwater screeing samples collected using inertial pump sampling technique
-1" PVC monitoring well installed in borehole and finished with flush mount manhole
-Ground Elevation 20.21; Casing Elevation 19.59

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig: Geoprobe	Date Drilled: 8/29/08	Logged By:	
Boring Dia: 6.5 Inches	Boring Number: MWPA-21C / 115C	T Silar	

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
					Soil Sample TP-PA21-1 collected (4-5')
	Soil Sample		5		Soil Sample TP-PA21-2 collected (9-10')
	Soil Sample		10		
			15		Brown Fine to medium grained sand, moist
			20		(21-25') Groundwater sample TP-PA21-1 collected
	TP-PA21-1 41,830 pCi/L		25		
			30		(31-35') Groundwater sample TP-PA21-2 collected
	TP-PA21-2 9,219 pCi/L		35		

Completion Notes:

-Vaccum excavation to approximayely 14' bgs
-Direct push drilling techniques using Geoprobe rig for groundwater screening from terminus of vaccum extraction borehole to boring total depth (55' bgs)
Groundwater screening samples collected using inertial pump sampling method and new PTFE tubing at each interval
-Borehole sealed from the terminal depth of the boring to the bottom of monitoring well screen
-1" PVC monitoring well installed in borehole and finished with flush mount manhole

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig:	Geoprobe	Date Drilled:	8/29/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	MWPA-21C / 115C	T Silar

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
	TP-PA21-3 7,401 pCi/L		45		(41-45') Groundwater sample TP-PA21-3 collected
	TP-PA21-4 ND @ 3006 pCi/L		50, 55		(51-55') Groundwater sample TP-PA21-4 collected
			60, 65, 70, 75		Refusal

Completion Notes:

-Vaccum excavation to approximayely 14' bgs
-Direct push drilling techniques using Geoprobe rig for groundwater screening from terminus of vaccum extraction borehole to boring total depth (55' bgs)
Groundwater screening samples collected using inertial pump sampling method and new PTFE tubing at each interval
-Borehole sealed from the terminal depth of the boring to the bottom of monitoring well screen
-1" PVC monitoring well installed in borehole and finished with flush mount manhole

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig:	Geoprobe	Date Drilled:	9/02/08	Logged By:	
Boring Dia:	6.5 Inches	Boring Number:	MWPA-22C / 116C	Bryan Sladky	

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
					Soil Sample TP-PA22-1 collected (4-5')
			5		Soil Sample TP-PA22-2 collected (9-10')
			10		
			15		
			20		
					(21-25') Groundwater sample TP-PA-22-1 collected
			25		
			30		
					(31-35') Groundwater sample TP-PA-22-2 collected
			35		

Completion Notes:

-Vaccum excavation to approximayely 14' bgs
-Soil samples not collected due to extreme hardness of formation
-Direct push drilling techniques using Geoprobe for groundwater screening from terminus of vaccum extraction borehole to boring total depth (65' bgs)
-Groundwater samples collected using inertial pump sampling method
-Borehole sealed from base of borehole to the bottom of monitoring well screen
-1" PVC monitoring well

Site:

BNP- Protected Area

Southport , NC

Project No.:

Page 1

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig: Geoprobe	Date Drilled: 9/02/08	Logged By:	
Boring Dia: 6.5 Inches	Boring Number: MWPA-22C / 118C	Bryan Sladky	

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
			45		(41-45') Groundwater sample TP-PA-22-3 collected
			50		
			55		(51-55') Groundwater sample TP-PA-22-4 collected
			60		
			65		
			70		
			75		

Completion Notes:

-Vaccum excavation to approximayely 14' bgs
-Soil samples not collected due to extreme hardness of formation
-Direct push drilling techniques using Geoprobe for groundwater screening from terminus of vaccum extraction borehole to boring total depth (65' bgs)
-Groundwater samples collected using inertial pump sampling method
-Borehole sealed from base of borehole to the bottom of monitoring well screen
-1" PVC monitoring well

Site:

BNP- Protected Area

Southport , NC

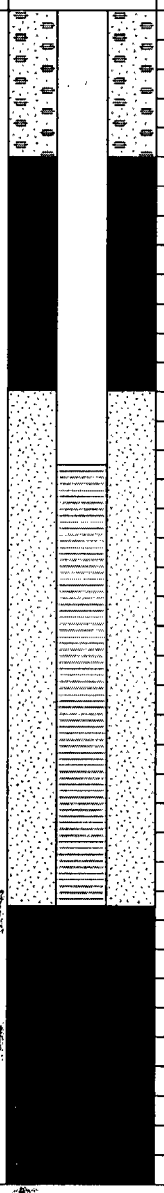
Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig: Geoprobe	Date Drilled: 9/02/08	Logged By:	
Boring Dia: 6.5 Inches	Boring Number: MWPA-23C / 117C	Bryan Sladky	

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
	Soil Sample		5		Soil Sample TP-PA23-1 collected (4-5')
	Soil Sample		10		Soil Sample TP-PA23-2 collected (9-10')
	TP-PA-23-1 ND @ 3002 pCi/L		15, 20		(21-25') Groundwater sample TP-PA23-1 collected
	TP-PA-23-2 ND @ 3656 pCi/L		25, 30, 35		(31-35') Groundwater sample TP-PA23-2 collected



Completion Notes:

-Vaccum excavation to approximayely 14' bgs
-Direct push drilling techniques using Geoprobe for groundwater screening from terminus of vaccum extraction borehole to boring total depth (55' bgs)
-Groundwater screening samples collected using inertial pump sampling method and new PTFE tubing
-Borehole sealed from the terminal depth of boring to the bottom of monitoring well screen
-1" PVC monitoring well installed in borehole and finished with flush mount manhole

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig:	Geoprobe	Date Drilled:	9/02/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	MWPA-23C / 117C	Bryan Sladky

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
	TP-PA23-3 ND @ 2793 pCi/L		45		(41-45') Groundwater sample TP-PA23-3 collected
	TP-PA23-4 ND @ 3029 pCi/L		50, 55		(51-55') Groundwater sample TP-PA23-4 collected
			60, 65, 70, 75		

Completion Notes:

-Vaccum excavation to approximayely 14' bgs
-Direct push drilling techniques using Geoprobe for groundwater screening from terminus of vaccum extraction borehole to boring total depth (55' bgs)
-Groundwater screening samples collected using inertial pump sampling method and new PTFE tubing
-Borehole sealed from the terminal depth of boring to the bottom of monitoring well screen
-1" PVC monitoring well installed in borehole and finished with flush mount manhole

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig: Geoprobe	Date Drilled: 9/03/08	Logged By:	
Boring Dia: 6.5 Inches	Boring Number: MWPA-24B/C / 118B/C	Bryan Sladky	

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
					Soil Sample TP-PA23-1 collected (4-5')
	Soil Sample		5		
					Soil Sample TP-PA23-2 collected (9-10')
	Soil sample		10		
			15		
			20		
	TP-PA22-1 ND @ 2887 pCi/L				(21-25') Groundwater sample TP-PA-24-1 collected
			25		
			30		
	TP-PA22-2 ND @ 2906 pCi/L				(31-35') Groundwater sample TP-PA-24-2 collected
			35		

Completion Notes:

-Vaccum excavation to approximayely 14' bgs
-Direct push drilling techniques using Geoprobe for groundwater screening from terminus of vaccum extraction borehole to boring total depth (65' bgs)
-Groundwater sanmples collected using inertial pump sampling method and new PTFE tubing at each interval
-Two 1" PVC monitoring wells installed in borehole (MWPA-24C / 118C and MWPA-24B / 118B) and finished with flush mount manhole
-Ground Elevation 19.96; Casing Elevations: 19.51 (MWPA24B / 118B) and 19.51 (MWPA-24C / 118C).

Site:

BNP- Protected Area

Southport , NC

Project No.:

BORING LOG / WELL CONSTRUCTION REPORT

Silar Services Inc.

Drill Rig:	Geoprobe	Date Drilled:	9/03/08	Logged By:
Boring Dia:	6.5 Inches	Boring Number:	MWPA-24B/C / 118B/C	Bryan Sladky

Sample	Sample Intervals (pCi/L)	Completion	Depth Feet	Lithology	Description
	TP-PA22-3 ND @ 2793 pCi/L		45		(41-45') Groundwater sample TP-PA-24-3 collected
	TP-PA22-4 ND @ 3029 pCi/L		50, 55		(51-55') Groundwater sample TP-PA-24-4 collected
	TP-PA22-5 ND @ 2907 pCi/L		60, 65		(61-65') Groundwater sample TP-PA-24-5 collected
			70, 75		

Completion Notes:

-Vaccum excavation to approximayely 14' bgs
-Direct push drilling techniques using Geoprobe for groundwater screening from terminus of vaccum extraction borehole to boring total depth (65' bgs)
-Groundwater sanmples collected using inertial pump sampling method and new PTFE tubing at each interval
-Two 1" PVC monitoring wells installed in borehole (MWPA-24C / 118C and MWPA-24B / 118B) and finished with flush mount manhole
-Ground Elevation 19.96; Casing Elevations: 19.51 (MWPA24B / 118B) and 19.51 (MWPA-24C / 118C).

Site:

BNP- Protected Area

Southport , NC

Project No.:

Appendix B

DENR Well Construction Records

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704) - 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) MWPA-6

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use)

DATE DRILLED 09/11/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

PO BOX 10429 28419
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS PO BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS PO BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

( ) -
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 30.0

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: FT
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):
From To From To
From To From To
From To From To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 15.0	Ft.	1 INCH	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 4.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 15.0	To 30.0	Ft.	1.0 in.	.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 13.0	To 35.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	8.0	GRAVEL
8.0	20.0	BROWN SAND
20.0	30.0	GRAY SAND SILT

11. REMARKS:
Bentonite seal from 4.0 to 13.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE 10/01/08

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) MWPA-7

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 09/15/08 - 09/18/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

PO BOX 10429 28419
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map

(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS PO BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS PO BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 30.0

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 20.0 FT
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm)** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):

From To From To
From To From To
From To From To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 15.0	Ft.	1 INCH	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 4.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 15.0	To 30.0	Ft.	1.0 in.	.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 13.0	To 30.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	10.0	GRAVEL
10.0	18.0	BROWN SAND
18.0	30.0	GRAY SANDY CLAY

11. REMARKS:

Bentonite seal from 4 0 to 13.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR 10/01/08 DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE | NC | 28625
City or Town | State | Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) MWPA-8

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use)

DATE DRILLED 09/15/08 - 09/18/08

TIME COMPLETED ____ AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

PO BOX 10429 28419
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS PO BOX 10429

SOUTHPORT | NC | 28419
City or Town | State | Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS PO BOX 10429

SOUTHPORT | NC | 28419
City or Town | State | Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 30.0

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 20.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):
From ____ To ____ From ____ To ____
From ____ To ____ From ____ To ____
From ____ To ____ From ____ To ____

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 15.0	Ft.	1 INCH	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 4.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 15.0	To 30.0	Ft.	1.0 in.	.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 13.0	To 30.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	10.0	GRAVEL
10.0	18.0	BROWN SAND
18.0	30.0	GRAY SANDY CLAY

11. REMARKS:

Bentonite seal from 4.0 to 13.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE 10/01/08

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE | NC | 28625
City or Town | State | Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) MWPA-9

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 09/15/08 - 09/18/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

PO BOX 10429 28419
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map

(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS PO BOX 10429

SOUTHPORT | NC | 28419
City or Town | State | Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS PO BOX 10429

SOUTHPORT | NC | 28419
City or Town | State | Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 30.0

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 20.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):

From To From To
From To From To
From To From To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 15.0	Ft.	1 INCH	SCH40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 4.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 15.0	To 30.0	Ft.	1.0 in.	.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 13.0	To 30.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	10.0	GRAVEL
10.0	18.0	BROWN SAND
18.0	30.0	GRAY SANDY CLAY

11. REMARKS:

Bentonite seal from 4.0 to 13.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Johnny Burr 10/01/08
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704) 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) MWPA-10D, 10S

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use)

DATE DRILLED 09/09/08 - 09/11/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

PO BOX 10429 28419
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☒ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS PO BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS PO BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 60.0, 30.0

b. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒

c. WATER LEVEL Below Top of Casing: FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): N/A METHOD OF TEST N/A

f. DISINFECTION: Type N/A Amount N/A

g. WATER ZONES (depth):
From To From To
From To From To
From To From To

6. CASING:

Depth From	To	Ft.	Diameter	Thickness/ Weight	Material
0.0	50.0		1 INCH	SCH 40	PVC
0.0	15.0		1 INCH	SCH 40	PVC

7. GROUT:

Depth From	To	Ft.	Material	Method
0.0	4.0		Portland bentonite	SLURRY

8. SCREEN:

Depth From	To	Ft.	Diameter	Slot Size	Material
50.0	60.0		1.0 in.	.010 in.	PVC
15.0	30.0		1.0 in.	.010 in.	PVC
			in.	in.	

9. SAND/GRAVEL PACK:

Depth From	To	Ft.	Size	Material
48.0	60.0		20-40	Fine Silica Sand
13.0	35.0		20-40	Fine Silica Sand

10. DRILLING LOG

From	To	Formation Description
0.0	8.0	GRAVEL
8.0	40.0	BROWN SAND
40.0	60.0	GRAY SAND SILT

11. REMARKS:

Bentonite Holeblock from 35.0 to 48.0 Feet and 4.0 to 13.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE 10/01/08

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704) 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) MWPA-11

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐ Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐ Irrigation ☐ Other ☐ (list use)

DATE DRILLED 09/11/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

PO BOX 10429 28419
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY - is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS PO BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS PO BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 30.0

b. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒

c. WATER LEVEL Below Top of Casing: Ft.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): N/A METHOD OF TEST N/A

f. DISINFECTION: Type N/A Amount N/A

g. WATER ZONES (depth):
From To From To
From To From To
From To From To

6. CASING:

Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 15.0 Ft.	1 INCH	SCH 40	PVC
From	To Ft.			
From	To Ft.			

7. GROUT:

Depth		Material	Method
From 0.0	To 4.0 Ft.	Portland bentonite	SLURRY
From	To Ft.		
From	To Ft.		

8. SCREEN:

Depth		Diameter	Slot Size	Material
From 15.0	To 30.0 Ft.	1.0 in.	.010 in.	PVC
From	To Ft.	in.	in.	
From	To Ft.	in.	in.	

9. SAND/GRAVEL PACK:

Depth		Size	Material
From 13.0	To 35.0 Ft.	20-40	Fine Silica Sand
From	To Ft.		
From	To Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	8.0	GRAVEL
8.0	20.0	BROWN SAND
20.0	30.0	GRAY SAND SILT

11. REMARKS:

Bentonite seal from 4.0 to 13.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR 10/01/08 DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE | NC | 28625
City or Town | State | Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) MWPA-12

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use)

DATE DRILLED 09/15/08 - 09/18/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

PO BOX 10429 28419
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS PO BOX 10429

SOUTHPORT | NC | 28419
City or Town | State | Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS PO BOX 10429

SOUTHPORT | NC | 28419
City or Town | State | Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 30.0

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 20.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):

From To From To
From To From To
From To From To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 15.0	Ft.	1 INCH	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 4.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 15.0	To 30.0	Ft.	1.0 in.	.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 13.0	To 30.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	10.0	GRAVEL
10.0	18.0	BROWN SAND
18.0	30.0	GRAY SANDY CLAY

11. REMARKS:

Bentonite seal from 4.0 to 13.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Johnny Burr — 10/01/08
SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2402

1. WELL CONTRACTOR:

MIKE MCCONAHEY
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704) - 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) MW-PA-13A, MW-PA-13B

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 04/23/09 - 04/24/09

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

PO BOX 10429 28419
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map

(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS PO BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS PO BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

( ) -
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 60.0 FEET/30.0 FEET

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 12.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 0.0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):

From To From To
From To From To
From To From To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 50.0	Ft.	1 INCH	SCH 40	PVC
From 0.0	To 15.0	Ft.	1 INCH	SCH 40	PVC
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 1.0	To 2.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 50.0	To 60.0	Ft.	1.0 in.	.010 in.	PVC
From 15.0	To 30.0	Ft.	1.0 in.	.010 in.	PVC
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 47.0	To 60.0	Ft.	20-40	FINE SILICA SAND
From 13.0	To 30.0	Ft.	20-40	FINE SILICA SAND
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	1.0	MANHOLE/CONCRETE
1.0	13.0	HOLE BLOCK
13.0	31.0	SAND - 2
31.0	47.0	BENTONITE
47.0	62.0	SAND - 2

11. REMARKS:

BENTONITE SEAL FROM 31.0 TO 47.0 FEET & 2.0 TO 13.0 FEET

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

06/22/09
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

MIKE MCCONAHEY
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704) - 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) MWPA-14

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use)

DATE DRILLED 09/16/08 - 09/19/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

PO BOX 10429 28419
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS PO BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS PO BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

( ) -
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 30.0

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 20.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):
From To From To
From To From To
From To From To

6. CASING:

Depth From	Depth To	Ft.	Diameter	Thickness/ Weight	Material
0.0	15.0		1 INCH	SCH 40	PVC

7. GROUT:

Depth From	Depth To	Ft.	Material	Method
0.0	4.0		Portland bentonite	SLURRY

8. SCREEN:

Depth From	Depth To	Ft.	Diameter	Slot Size	Material
15.0	30.0		1.0 in.	.010 in.	PVC
			in.	in.	
			in.	in.	

9. SAND/GRAVEL PACK:

Depth From	Depth To	Ft.	Size	Material
13.0	30.0		20-40	Fine Silica Sand

10. DRILLING LOG

From	To	Formation Description
0.0	4.0	ASPHALT
4.0	10.0	GRAVEL
10.0	18.0	BROWN SAND
18.0	30.0	GRAY SANDY CLAY

11. REMARKS:

Bentonite seal from 4.0 to 13.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Johnny Burr 10/01/08
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE | NC | 28625
City or Town | State | Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) MWPA-15

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use)

DATE DRILLED 09/16/08 - 09/19/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

PO BOX 10429 28419
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS PO BOX 10429

SOUTHPORT | NC | 28419
City or Town | State | Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS PO BOX 10429

SOUTHPORT | NC | 28419
City or Town | State | Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 30.0

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 20.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):
From To From To
From To From To
From To From To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 15.0	Ft.	1 INCH	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 4.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 15.0	To 30.0	Ft.	1.0 in.	.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 13.0	To 30.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	4.0	ASPHALT
4.0	10.0	GRAVEL
10.0	18.0	BROWN SAND
18.0	30.0	GRAY SANDY CLAY

11. REMARKS:

Bentonite seal from 4.0 to 13.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE 10/01/08

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE | NC | 28625
City or Town | State | Zip Code

(704)- 872-7686
Area code - Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) MWPA-16

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use)

DATE DRILLED 09/16/08 - 09/19/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

PO BOX 10429 28419
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS PO BOX 10429

SOUTHPORT | NC | 28419
City or Town | State | Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS PO BOX 10429

SOUTHPORT | NC | 28419
City or Town | State | Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 30.0

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 20.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION:** Type N/A **Amount** N/A

g. **WATER ZONES** (depth):

From	To	From	To

6. CASING:

Depth From	Depth To	Ft.	Diameter	Thickness/ Weight	Material
0.0	15.0		1 INCH	SCH 40	PVC

7. GROUT:

Depth From	Depth To	Ft.	Material	Method
0.0	4.0		Portland bentonite	SLURRY

8. SCREEN:

Depth From	Depth To	Ft.	Diameter	Slot Size	Material
15.0	30.0		1.0 in.	.010 in.	PVC
			in.	in.	
			in.	in.	

9. SAND/GRAVEL PACK:

Depth From	Depth To	Ft.	Size	Material
13.0	30.0		20-40	Fine Silica Sand

10. DRILLING LOG

From	To	Formation Description
0.0	4.0	ASPHALT
4.0	10.0	GRAVEL
10.0	18.0	BROWN SAND
18.0	30.0	GRAY SANDY CLAY

11. REMARKS:

Bentonite seal from 4.0 to 13.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE 10/01/08

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD.

STATESVILLE NC 28625
City or Town State Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) MWPA-17, D-175

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use)

DATE DRILLED 09/02/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

PO BOX 10429 28419
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS PO BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS PO BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 60.0, 30.0

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 20.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):

From To From To
From To From To
From To From To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 50.0	Ft.	1 INCH	SCH 40	PVC
From 0.0	To 15.0	Ft.	1 INCH	SCH 40	PVC
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 4.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 50.0	To 60.0	Ft.	1.0 in.	.010 in.	PVC
From 15.0	To 30.0	Ft.	1.0 in.	.010 in.	PVC
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 48.0	To 60.0	Ft.	20-40	Fine Silica Sand
From 13.0	To 35.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	4.0	ASPHALT
4.0	10.0	GRAVEL
10.0	60.0	BROWN SAND

11. REMARKS:

Bentonite Holeblock from 35.0 to 48.0 Feet and 4.0 to 13.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

09/30/08
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704) - 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) MWPA-18

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use)

DATE DRILLED 09/17/08 - 09/22/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

PO BOX 10429 28419
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS PO BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS PO BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

( ) -
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 30.0

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 20.0 FT
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):
From To From To
From To From To
From To From To

6. CASING:

From	To	Ft.	Diameter	Thickness/ Weight	Material
0.0	15.0		1 INCH	SCH 40	PVC

7. GROUT:

From	To	Ft.	Material	Method
0.0	4.0		Portland bentonite	SLURRY

8. SCREEN:

From	To	Ft.	Diameter	Slot Size	Material
15.0	30.0		1.0 in.	.010 in.	PVC
			in.	in.	
			in.	in.	

9. SAND/GRAVEL PACK:

From	To	Ft.	Size	Material
13.0	30.0		20-40	Fine Silica Sand

10. DRILLING LOG

From	To	Formation Description
0.0	10.0	CONCRETE
10.0	18.0	GRAVEL
18.0	30.0	BROWN SAND

11. REMARKS:

Bentonite seal from 4.0 to 13.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE 10/01/08

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704) 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) MWPA-19

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use)

DATE DRILLED 09/18/08 - 09/22/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

PO BOX 10429 28419
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS PO BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS PO BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 30.0

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 20.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):

From	To	From	To
From	To	From	To
From	To	From	To

6. CASING:

Depth From	Depth To	Ft.	Diameter	Thickness/ Weight	Material
0.0	15.0		1 INCH	SCH 40	PVC

7. GROUT:

Depth From	Depth To	Ft.	Material	Method
0.0	4.0		Portland bentonite	SLURRY

8. SCREEN:

Depth From	Depth To	Ft.	Diameter	in.	Slot Size	in.	Material
15.0	30.0		1.0		.010		PVC

9. SAND/GRAVEL PACK:

Depth From	Depth To	Ft.	Size	Material
13.0	30.0		20-40	Fine Silica Sand

10. DRILLING LOG

From	To	Formation Description
0.0	10.0	CONCRETE
10.0	18.0	GRAVEL
18.0	30.0	BROWN SAND

11. REMARKS:

Bentonite seal from 4.0 to 13.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE 10/01/08

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

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NON RESIDENTIAL WELL CONSTRUCTION RECORD

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WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) MWPA-20, D-205

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use)

DATE DRILLED 09/02/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

PO BOX 10429 28419
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS PO BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS PO BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 60.0, 30.0

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 20.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm)** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):
From To From To
From To From To
From To From To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 50.0	Ft.	1 INCH	SCH 40	PVC
From 0.0	To 15.0	Ft.	1 INCH	SCH 40	PVC
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 4.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 50.0	To 60.0	Ft.	1.0 in.	.010 in.	PVC
From 15.0	To 30.0	Ft.	1.0 in.	.010 in.	PVC
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 48.0	To 60.0	Ft.	20-40	Fine Silica Sand
From 13.0	To 30.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	4.0	ASPHALT
4.0	8.0	GRAVEL
8.0	30.0	BROWN SAND

11. REMARKS:

Bentonite Holeblock from 35.0 to 48.0 Feet and 4.0 to 13.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR 09/30/08 DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE NC 28625
City or Town State Zip Code

(704) 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) MW-PA-21

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use)

DATE DRILLED 08/29/08 - 09/02/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

HWY 87 (RIVER ROAD)
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS HWY 87 (RIVER ROAD)

SOUTHPORT NC 28419
City or Town State Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS P.O. BOX 10429

SOUTHPORT NC 28419
City or Town State Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 30.0

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 20.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 0.0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):

From	To	From	To
From	To	From	To
From	To	From	To

6. CASING:

Depth From	To	Ft.	Diameter	Thickness/ Weight	Material
0.0	20.0		2 INCH	SCH 40	PVC

7. GROUT:

Depth From	To	Ft.	Material	Method
0.0	4.0		Portland bentonite	SLURRY

8. SCREEN:

Depth From	To	Ft.	Diameter	Slot Size	Material
20.0	30.0		2.0 in.	.010 in.	PVC
			in.	in.	
			in.	in.	

9. SAND/GRAVEL PACK:

Depth From	To	Ft.	Size	Material
18.0	30.0		20-40	Fine Silica Sand

10. DRILLING LOG

From	To	Formation Description
0.0	4.0	ASPHALT
4.0	10.0	GRAVEL
10.0	30.0	BROWN SAND

11. REMARKS:

Bentonite seal from 4.0 to 18.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

09/22/08
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE | NC | 28625
City or Town | State | Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) MWPA-22

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use)

DATE DRILLED 09/02/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

PO BOX 10429 28419
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS PO BOX 10429

SOUTHPORT | NC | 28419
City or Town | State | Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS PO BOX 10429

SOUTHPORT | NC | 28419
City or Town | State | Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 30.0

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 20.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm)** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):
From To From To
From To From To
From To From To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 15.0	Ft.	1 INCH	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 4.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 15.0	To 30.0	Ft.	1.0 in.	.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

Depth			Size	Material
From 13.0	To 30.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	4.0	ASPHALT
4.0	10.0	GRAVEL
10.0	30.0	BROWN SAND

11. REMARKS:

Bentonite seal from 4.0 to 13.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

09/30/08
SIGNATURE OF CERTIFIED WELL CONTRACTOR | DATE

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., **1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.**

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE | NC | 28625
City or Town | State | Zip Code

(704)- 872-7686
Area code - Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) MWPA-23

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 09/02/08

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

PO BOX 10429 28419
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map

(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS PO BOX 10429

SOUTHPORT | NC | 28419
City or Town | State | Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS PO BOX 10429

SOUTHPORT | NC | 28419
City or Town | State | Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 30.0

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 20.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):

From To From To
From To From To
From To From To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 15.0	Ft.	1 INCH	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 4.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 15.0	To 30.0	Ft.	1.0 in.	.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 13.0	To 30.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	4.0	ASPHALT
4.0	10.0	GRAVEL
10.0	60.0	BROWN SAND

11. REMARKS:

Bentonite seal from 4.0 to 13.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE 09/30/08

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3098

1. WELL CONTRACTOR:

JOHNNY BURR
Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC.
Well Contractor Company Name

STREET ADDRESS 176 COMMERCE BLVD

STATESVILLE | NC | 28625
City or Town | State | Zip Code

(704)- 872-7686
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) MWPA-24, D-24B

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use)

DATE DRILLED 09/02/08

TIME COMPLETED _____ AM ☐ PM ☐

3. WELL LOCATION:

CITY: SOUTHPORT COUNTY BRUNSWICK

PO BOX 10429 28419
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE
LONGITUDE

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- *is the name of the business where the well is located.*

FACILITY ID #(if applicable)

NAME OF FACILITY PROGRESS ENERGY

STREET ADDRESS PO BOX 10429

SOUTHPORT | NC | 28419
City or Town | State | Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS PO BOX 10429

SOUTHPORT | NC | 28419
City or Town | State | Zip Code

( )
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 60.0, 30.0

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 20.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm)** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):
From ____ To ____ From ____ To ____
From ____ To ____ From ____ To ____
From ____ To ____ From ____ To ____

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 50.0	Ft.	1 INCH	SCH 40	PVC
From 0.0	To 15.0	Ft.	1 INCH	SCH 40	PVC
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 4.0	Ft.	Portland bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter		Slot Size		Material
From 50.0	To 60.0	Ft.	1.0	in.	.010	in.	PVC
From 15.0	To 30.0	Ft.	1.0	in.	.010	in.	PVC
From	To	Ft.		in.		in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 48.0	To 60.0	Ft.	20-40	Fine Silica Sand
From 13.0	To 30.0	Ft.	20-40	Fine Silica Sand
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	4.0	ASPHALT
4.0	10.0	GRAVEL
10.0	60.0	BROWN SAND

11. REMARKS:

Bentonite Holeblock from 35.0 to 48.0 Feet and 4.0 to 13.0 Feet.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE 09/30/08

JOHNNY BURR
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

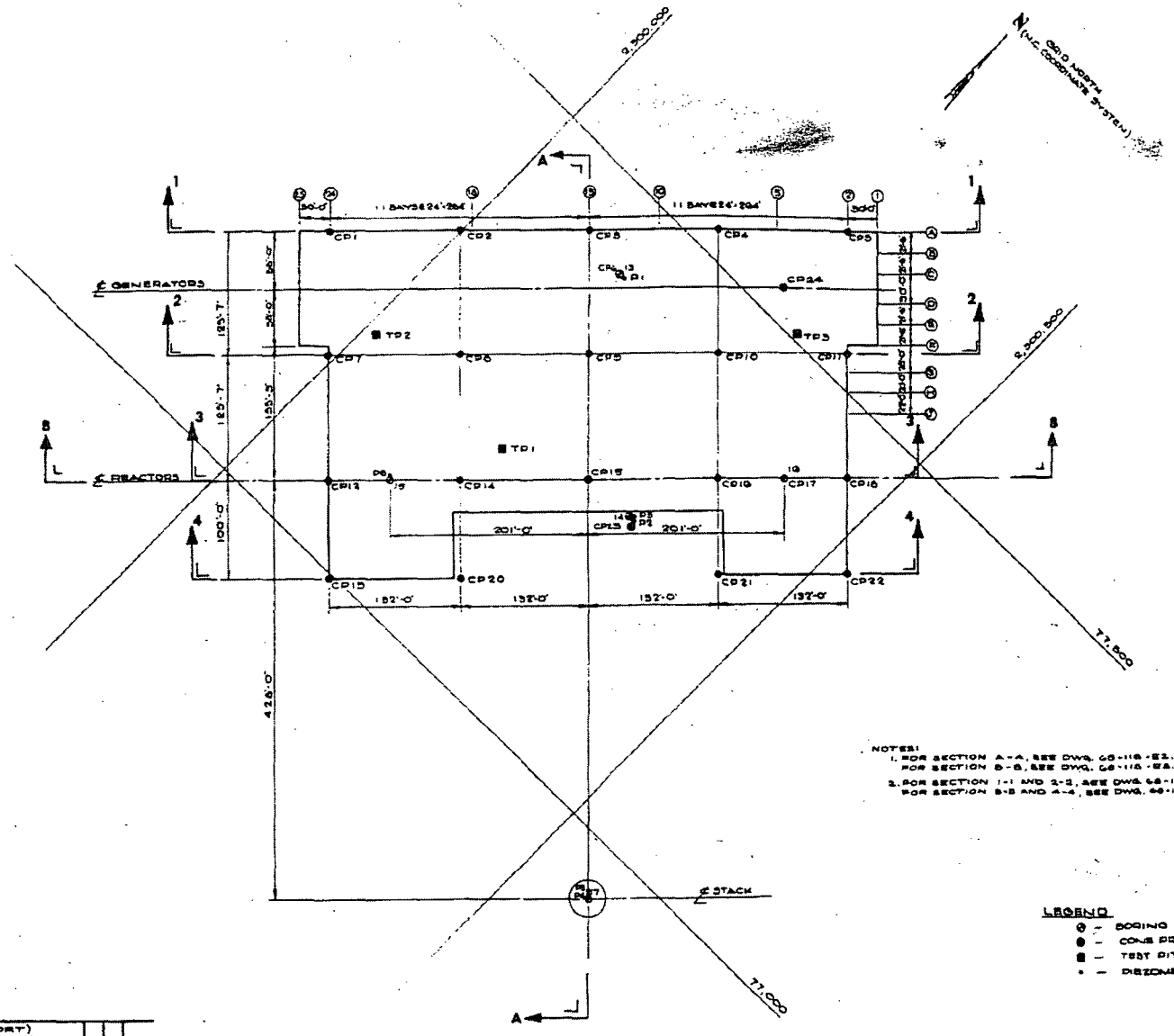
Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

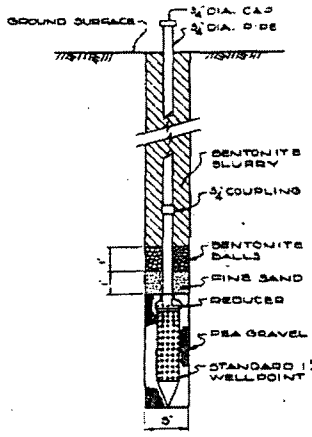
Form GW-1b
Rev. 7/05

Appendix C

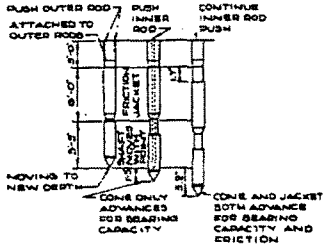
Plant Foundation Pre-Construction Drawings

68-118-E1





TYPICAL PIEZOMETER INSTALLATION



ACTION OF FRICTION CONE

NOTES:
1. FOR SECTION A-A, SEE DWG. 68-118-E2.
   FOR SECTION B-B, SEE DWG. 68-118-E3.
2. FOR SECTION 1-1 AND 2-2, SEE DWG. 68-118-E4.
   FOR SECTION 3-3 AND 4-4, SEE DWG. 68-118-E5.

50 0 50 100 FEET

LEGEND
- BORING
- CONE PROBE
- TEST PIT
- PIEZOMETERS

PLANT SITE (SOUTHPORT)
BY MOORE, GARDNER & ASSOC., INC.
CONSULTING ENGINEERS, ASHEBORO
N.C. - SCALE: 1" = 60' - DATED APRIL 1968

REFERENCE DRAWINGS

REVISION	DESCRIPTION

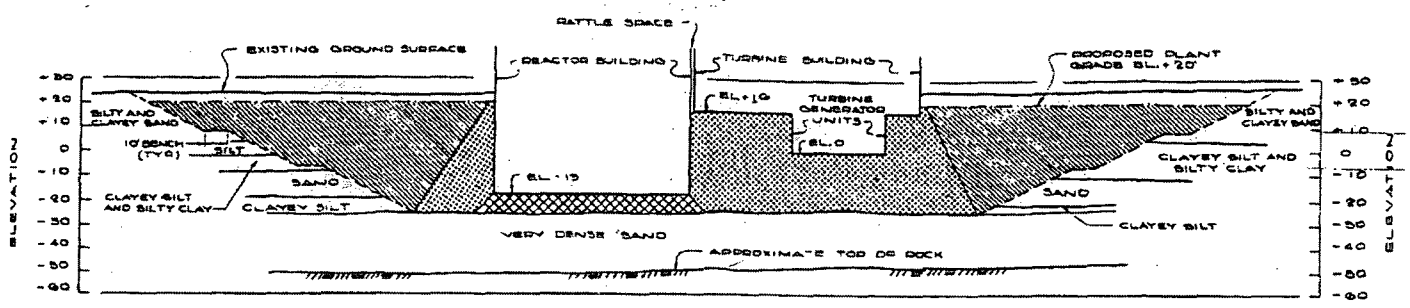
CAROLINA POWER AND LIGHT CO.
RALEIGH, N. C.

E. D'APPOLONIA
CONSULTING ENGINEERS, INC.
15 DUFF ROAD
PITTSBURGH, PA. 15235
WASHINGTON, D.C.

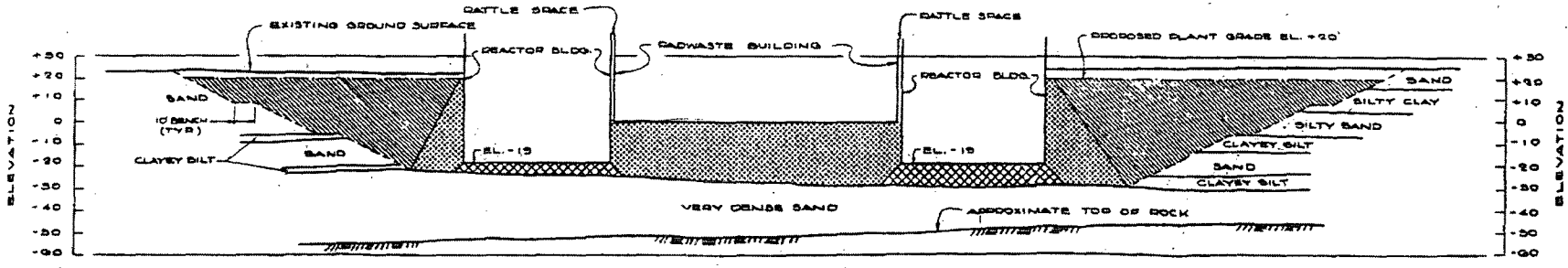
BRUNSWICK STEAM ELECTRIC PLANT
- SITE INVESTIGATION -
PLAN AND LOCATION OF
BORINGS, CONE PROBES, PIEZOMETERS
AND TEST PITS

DRAWN BY
CHECKED BY
DATE
DRAWING NO. 68-118-E1

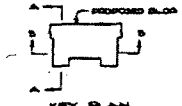
68-118-E12



SECTION 'A-A'



SECTION 'B-B'



NOTE:
PROPOSED SLOPE LINES FOR EXCAVATION ARE TENTATIVE ONLY. FINAL DESIGN OF SLOPES TO BE CONSISTENT WITH DEWATERING SCHEME.

HORIZONTAL SCALE
20 0 20 40 FEET

VERTICAL SCALE
10 0 10 20 FEET

LEGEND

- EXCAVATE AND BACKFILL WITH SAND COMPACTED TO 65% RELATIVE DENSITY.
- EXCAVATE AND BACKFILL WITH SAND COMPACTED TO 75% RELATIVE DENSITY.
- EXCAVATE AND BACKFILL WITH SAND COMPACTED TO 90% RELATIVE DENSITY.

CAROLINA POWER AND LIGHT CO.
RALEIGH, N.C.

E. D'APPOLONIA
CONSULTING ENGINEERS, INC.

BRUNSWICK STEAM ELECTRIC PLANT
- SITE INVESTIGATION -
PROPOSED FOUNDATION BORING

T.S.C. 68-118-E12