COOLING TOWER BLOWDOWN LINE

SUPPLEMENTAL GROUNDWATER ASSESSMENT REPORT

SHEARON HARRIS NUCLEAR POWER PLANT

NEW HILL, NORTH CAROLINA

PREPARED FOR:

Progress Energy

PROGRESS ENERGY CAROLINAS

PREPARED BY:

SSi

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

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1 INTRODUCTION

1.1 Purpose of Report

Silar Services Incorporated (SSi) has prepared this Cooling Tower Blowdown Line (CTBL) Supplemental Groundwater Assessment Report to document the results of investigation activities performed along the CTBL at the Shearon Harris Nuclear Power Plant (SHNPP), located in New Hill, North Carolina. The purpose of this assessment is to further investigate the potential presence and extent of radiological materials in groundwater within the vicinity of the line with respect to the integrity of the line.

1.2 Project Background

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

1.2.1 Project Location

The Shearon Harris Nuclear Power Plant is located approximately 1.6-miles east of the Town of New Hill, North Carolina, and is situated on approximately 10,700 acres. The Site location is depicted on **Figure 1**.

The CTBL, which is buried several feet below the ground surface, runs for approximately 2 miles from the cooling tower south to the edge of Harris Lake and thence, approximately 2 additional miles to its discharge point beneath the lake. The CTBL is also depicted on **Figure 1**.

1.2.2 Project Background

On December 15, 2008, Progress Energy personnel discovered the presence of water in Air Release System Manhole ARS#2. The manhole was investigated by purging the water from the manhole and evaluating conditions. It was observed that subsequent to purging the manhole dry, water continued to enter the bottom of the manhole through a 2-inch pipe designed to drain the manhole. A water sample was collected and analyzed

for tritium. Tritium was detected at an approximate concentration of 800 picocuries per liter (pCi/L). Based on these observations, Progress Energy determined that additional evaluation was warranted.

Initial assessment activities were conducted at the Site from January 21, 2009 through March 4, 2009. An Assessment Report, issued on April 1, 2009, provided an analysis of groundwater conditions as determined through the installation of nine (9) monitoring wells installed within a limited study area along the length of the pipeline between ARS#1 and ARS#2. This assessment identified tritium in groundwater in the immediate area of ARS#2 at concentrations up to 1,450 pCi/L. Tritium was also identified at 1,060 pCi/L in a groundwater well located along the pipeline approximately 655 feet north of ARS#2 (approximately 460 feet south of ARS#1). Tritium was also detected in groundwater at 372 pCi/L near ARS#1 and approximately 335 feet south of ARS#1 at 373pCi/L. The report also presented a fate and transport evaluation for tritium identified at ARS#2, estimating that groundwater flow was generally trending east-northeast from the vicinity of ARS#2 at a rate of 1.14 foot/day or 208 feet/year. Further evaluation of the pipeline and the surrounding groundwater was recommended as a result of these findings.

A pipeline inspection was performed in April 2009. Approximately 5,600 feet of the targeted 8,800 feet of pipeline were able to be accessed and manually inspected. The inspection revealed that the pipeline exhibits deformation, cracking and buckling throughout the entire length. One repair of note was successfully conducted at a leaking joint in the pipeline located approximately 200 feet south of ARS#2. Additional leaks that were not amenable to repair were also identified. SHNPP is currently planning pipeline replacement alternatives

1.3 Scope and Objectives

As a result of an evaluation of the abovementioned studies, the installation of seven (7) additional monitoring wells along the CTBL was approved. The objectives of the installation of these wells include:

- Evaluate groundwater quality near locations along the pipeline that could not be manually inspected.
- Evaluate groundwater quality at locations identified during the inspection as likely points of leakage from the pipeline.
- Further characterize the hydrogeology and geology along the length of the pipeline.
- Provide groundwater monitoring and elevation measuring points along the length of the pipeline.

The scope of the assessment included the collection of data as close as reasonably possible to the Cooling Tower Blowdown Line while not compromising the integrity of the line.

1.4 Report Organization

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

Section 2.0 - 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 3.0 - Investigation Activities and Findings

A summary of the activities completed during planning and implementation of the assessment is provided. The methods, locations, and results of the sampling and analysis program are presented in detail.

Section 4.0 - Summary and Conclusions

A summary of the relevant environmental conditions to satisfy the objectives of the investigation is provided in Section 4.

2 PHYSICAL CHARACTERISTICS OF THE STUDY AREA

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

2.1 Surface Features

The SHNPP is located approximately 1.6 miles east of the Town of New Hill, North Carolina. Access to the SHNPP is from Shearon Harris Road. The owner controlled area encompasses approximately 10,700 acres.

As previously discussed, the Cooling Tower Blowdown Line runs underground for approximately 2 miles from the Cooling Tower south to the edge of Harris Lake. The assessment area is on a peninsula which is surrounded by Harris Lake to the south, east, and west and bounded to the north by SHNPP. The most significant surface feature in the assessment area is the topographic low area/wetlands, situated along the blowdown line approximately midway between ARS#1 and ARS#2. There is an approximately 30-foot elevation change between ARS#1 and the topographic low to the south. In addition, a portion of Harris Lake is located east of manhole ARS#2.

The Site location is shown on **Figure 1**, and the Site Layout is depicted on **Figure 2**.

2.2 Geology

Regional and site-specific geology have been extensively evaluated by others during the safety analyses for Unit 1 and more recently for proposed Units 2 and 3. These reports indicate that the plant is underlain by the Upper Triassic Age Newark Supergroup. The group is characterized by siltstone and sandstone with subordinate amounts of claystone and conglomerated and igneous diabase intrusions. Additional information on regional and local geology can be found in the Final Safety Analysis Report (FSAR).

Site-specific geology observed in the area of the blowdown line is consistent with the regional geology. Soil borings encountered a thin layer of unconsolidated material

(overburden), underlain by a reddish-brown weathered siltstone bedrock (regolith) underlain by reddish-brown siltstone. A site-specific interpretation of the geology in the area has been developed by using boring logs from the previous and current assessment activities and is presented in cross-sections on **Figures 3 and 4**.

2.3 Groundwater Hydrology

Regional and site-specific groundwater hydrology have been extensively evaluated by others during the safety analyses for Unit 1 and more recently for proposed Units 2 and 3. These reports indicate that the groundwater hydrology within the plant area is relatively complex as a result of the influence of the main and auxiliary reservoirs and the nature of the parent rock. The previous groundwater studies have focused on the plant area, located to the north of this assessment area. The nearest previously existing monitoring well is MWA-12, which is located approximately 1,000 feet northeast of ARS#1. Historic groundwater elevation at this location was approximately 235 ft. MSL.

Two rounds of water level measurements were collected from the newly installed monitoring wells in October and November 2009 as discussed later in Section 3 of this report. The water level measurements collected in October 2009 and resulting elevations from both the newly installed monitoring wells and the existing monitoring wells are shown on the cross-sections presented as **Figures 3 and 4**. General observations regarding the assessment area groundwater are as follows:

- The water table aquifer is variable and is influenced by several factors including the the reservoirs (Harris Lake), topography and the slope of the bedrock.

- Shallow groundwater is influenced by the bedrock surface as shown in the cross-sections. Groundwater generally flows from to the south and east along the pipeline from the plant and is influenced by the finger of Harris Lake near monitoring well BDL-MW-9 and the Lake at BDL-MW-16 and Drop Structure B.

- The pipeline is below the water table for a significant length between BDL-MW-3 and ARS#4 and likely ARS#5.

- A deeper flow zone is present in the bedrock as evidenced by the observed water levels in BDL-MW-7 and BDL-MW-14.

3 ASSESSMENT ACTIVITIES AND FINDINGS

The planning of the assessment activities included conference calls and meetings with Progress Energy representatives and appropriate plant personnel. A scope of work to complete the assessment objectives was prepared by SSi and submitted to Progress Energy on May 4, 2009. Based on a review of the previous studies and planning meetings with Progress Energy personnel, the scope of work was finalized to include the installation of seven (7) permanent monitoring wells along the pipeline and to add the installation of three monitoring wells located within the vicinity of the plant to provide additional groundwater monitoring points not specifically related to the CTBL. It should be noted that two of the three wells installed at the plant area were installed in the general vicinity of the pipeline, and these results have been included in the pipeline assessment for that area.

The specific objective of each well is as follows:

Installed Well	Rationale
BDL-MW10	Installed south of the former plant-related settling basin.
BDL-MW11	Installed approximately 500 feet south of ARS#1 to evaluate and monitor groundwater near a low point in the pipeline that was not visually inspected.
BDL-MW12	Installed approximately 200 feet north of APM#1 to evaluate and monitor groundwater quality near a leaking joint in the pipeline that was identified and repaired during the pipeline inspection in April 2009.
BDL-MW13	Installed approximately 200 ft south of ARS#4 to evaluate and monitor groundwater quality near a portion of the pipeline that was not visually inspected.
BDL-MW14	Installed approximately 100 feet north of Drop Structure A to evaluate and monitor groundwater quality near a portion of the pipeline where stress cracks and a 15% deflection were noted.
BDL-MW15	Installed approximately 1,800 feet south of Drop Structure A to evaluate and monitor groundwater quality where stress cracks and deflections were noted.

BDL-MW16	Installed approximately 200 feet north of Drop Structure B to evaluate and monitor groundwater quality where stress cracks and deflections were noted.
GW-74	Installed near the plant, in the vicinity of a buried 3" radwaste pipeline that drains into the CTBL.
GW-75	Installed in the vicinity of the plant, east of the security building.
GW-76	Installed within the protected area of the plant.

Monitoring well installation was conducted from September 21, 2009 through October 2, 2009. Monitoring wells BDL-MW10 through BDL-MW16 were completed with above-ground protective casings and protective bollards were installed surrounding the wells. GW-74 through GW-76 were completed as flush mounts. These activities are described in detail below. The locations of the installed groundwater monitoring wells are shown on **Figure 2**.

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 discussed with respect to the USEPA drinking water standard of 20,000 pCi/L.

3.1 Assessment Activities

To accomplish the objectives of the assessment, several investigation activities were completed including: monitoring well installation, groundwater elevation measurements and groundwater sampling. The assessment methods and results are discussed in the following subsections.

3.1.1 Groundwater Monitoring Well Installation

The primary objective of the monitoring well installation was to further evaluate subsurface conditions and establish a network of monitoring wells along the CTBL to evaluate geology, hydrogeology and groundwater quality. To accomplish this objective monitoring wells were installed using air rotary drilling methods at the locations

illustrated on **Figure 2**. Cuttings were observed and boreholes were logged from cuttings. The screened interval for each monitoring well was selected to intersect the depth intervals where groundwater was observed. In cases where no groundwater was observed during drilling, the drilling was discontinued for a period and the open borehole was monitored for water infiltration. If no water infiltration was observed, the borehole was advanced further.

During the investigation, ten (10) groundwater monitoring wells were installed as shown on **Figure 2.** The general monitoring well installation procedures are summarized below.

- The depth for each of the wells was selected based on presence and depth of groundwater at each well location.
- The boreholes were advanced using a 6-inch rotary-air hammer. In the vicinity of the plant, an air-knife was used to open the borehole prior to drilling to avoid utilities.
- With the exception of GW-76, based on the observations during drilling, fifteen (15) or twenty (20) 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 well. A sufficient length of 2-inch ID, Schedule 40 PVC riser pipe was coupled to the screen to allow the PVC riser pipe to extend a minimum of two feet above the ground surface. Well screens were fitted with a nominal 2-inch solid (unslotted) bottom sediment trap. GW-76 was installed with five feet of 0.010-inch screen due to the immediate presence of water.
- The annular space around the well screens was backfilled with clean uniform sand (filter pack sieve #2). The filter pack was placed from the bottom of the well to a minimum of 2 feet above the top of the well screen. A minimum 2-foot-thick bentonite seal was placed above the sand and allowed to hydrate.
- Monitoring wells BDL-MW-10 through BDL-MW-16 were completed as stick-up wells, with lockable expansion plugs.

- Monitoring wells GW-74, GW-75, and GW-76 were completed as flush mounts, with lockable expansion plugs.
- A concrete pad was installed around each well, and protective bollards were installed around the well stick-ups.
- Boring logs were prepared for each monitoring well.

A summary of the monitoring well construction details is provided in **Table 1** and depicted in the Boring/Well Construction Logs included in **Appendix A**. NCDENR Well Construction Records are included in **Appendix B**.

3.1.2 Existing Monitoring Well Completion and Abandonment

During the field activities associated with the assessment, SSi reconstructed existing temporary monitoring wells to be permanent monitoring wells. Monitoring wells BDL-MW-1 through BDL-MW-3 and BDL-MW-5 through BDL-MW-9 were completed as stick-up wells by installing a locking protective outer casing and a concrete pad at ground surface. Protective bollards were also installed around the well stick-up.

Monitoring well BDL-MW-4 was abandoned.

3.1.2 Monitoring Well Surveying and Mapping

The monitoring well casings and ground elevations were surveyed and certified by a North Carolina Registered Land Surveyor (Smith and Smith). The survey was completed on October 20. Monitoring wells MW-1 through MW-9 were resurveyed because the top of the wells were modified to allow for the installation of the protective outer casing.

A survey map was produced that includes scale, benchmarks, North arrow, and the locations of monitoring wells. The survey map provided the information required to produce a site base map for this Assessment Report.

3.1.3 Groundwater Elevation Measurements

Groundwater elevation measurements were collected from the monitoring wells and used to provide data to interpret the potentiometric surface of the aquifer. Depth-to-water measurements were obtained from the ten monitoring wells prior to sampling on October 13 and November 9, 2009. Measurements were collected using a Solinst Level Indicator Probe capable of measuring depth to water within 0.01-foot accuracy.

3.1.3 Groundwater Sampling

Groundwater samples were obtained from the monitoring wells in October and November 2009. In addition, during the November sampling effort, a surface water sample was collected directly from Harris Lake at the shoreline near Drop Structure B (DS-B). Water samples were analyzed for tritium at Progress Energy's Harris Energy and Environmental Center Radiochemistry Laboratory to the same lower limit of detection as the NC Division of Radiation Protection (NCDRP) laboratory.

Prior to sampling, each monitoring well was purged in accordance with low-flow groundwater sampling procedures to assure collection of a representative groundwater sample. Groundwater purging and sampling was completed using a peristaltic pump (except as noted below), dedicated pump (flex) tubing, and dedicated down-hole polyethylene tubing at each monitoring well to eliminate the potential for cross-contamination between sampling points. Water quality measurements (temperature, conductivity, pH, and dissolved oxygen) were collected during the purging activities and recorded in the field logbook. Sample log forms are included as **Appendix C**. The procedure for monitoring well purging and sampling is generally as follows:

- The security cap was removed, and the depth to water in the well was determined with a water level meter. The depth to water was recorded in the field logbook.
- The dedicated down-hole tubing was lowered into the monitoring well, cut to the desired length, attached to the pre-cut flex tubing on the peristaltic pump, a

new section of poly tubing was inserted on the effluent side of the pump. 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 and transported to the designated disposal point.

It should be noted that for both the October and November sample rounds wells BDL-MW-14 and GW-74 were sampled using a dedicated disposable bailer. During the October sampling event, low-flow sampling was attempted at both wells using a low-flow submersible pump; however, the wells produced a significant amount of silt and the pump failed.

3.2 Groundwater Analytical Results

3.2.1 October 2009

SSi collected groundwater samples from the newly installed monitoring wells (BDL-MW-10 though BDL-MW-16 and GW-74 through GW-76) on October 13-15, 2009. All water samples from the wells (10 samples) were analyzed for tritium at the on-site radiological analytical laboratory. SHNPP personnel collected groundwater from the existing monitoring wells (BDL-MW-1 through BDL-MW-3 and BDL-MW-5 through

BDL-MW-9) on October 15, 2009. Analytical results are summarized in **Table 2**. **Figure 5** depicts the analytical results for tritium in the water samples.

Tritium was detected in groundwater from one (1) of the ten (10) newly installed monitoring wells. The lower limit of detection (LLD) for the analyses ranged from 235 pCi/L to 241 pCi/L. Tritium was detected in the groundwater sample from BDL-MW-16 at 5,870 pCi/L. Tritium was also detected in five (5) of the existing CTBL monitoring wells (BDL-MW-2, BDL-MW-3, BDL-MW-5, BDL-MW-6 and BDL-MW-7) at concentrations ranging from 326 pCi/L in BDL-MW-7 to 1,070 pCi/L in BDL-MW-5.

3.2.2 November 2009

SSi collected groundwater samples from the newly installed monitoring wells and a surface water sample from Harris Lake on November 9 and 10, 2009. All eleven (11) samples were analyzed for tritium at the on-site radiological analytical laboratory. SHNPP personnel collected groundwater from the existing monitoring wells (BDL-MW-1 through BDL-MW-3 and BDL-MW-5 through BDL-MW-9) on November 23, 2009. Analytical results are summarized in **Table 2**. **Figure 6** depicts the analytical results for tritium in the water samples.

Tritium was detected in groundwater from one (1) of the ten (10) newly installed monitoring wells sampled. The LLD ranged from 235 pCi/L to 241 pCi/L. Tritium was detected in the groundwater sample from BDL-MW-16 at 3,410 pCi/L. Tritium was detected in surface water sample from Harris Lake at 3,550 pCi/L. Tritium was also detected in five (5) of the existing CTBL monitoring wells (BDL-MW-2, BDL-MW-3, BDL-MW-5, BDL-MW-6 and BDL-MW-7) at concentrations ranging from 361 pCi/L in BDL-MW-6 to 1,180 pCi/L in BDL-MW-5.

Conclusions and recommendations are presented in Section 4.

3.3 Survey and Groundwater Elevation Data

The monitoring well casings and ground elevations were surveyed and certified by a North Carolina Registered Land Surveyor (Smith and Smith). The survey was completed on October 20.

Survey data and groundwater elevation measurements for the newly installed monitoring wells are presented in **Table 3.** Survey data and groundwater elevation measurements (as measured by SHNPP personnel) for existing monitoring wells are presented in **Table 4.**

Objective 1.3.a - placement of wells, 1.3b - installation of wells

4 SUMMARY AND CONCLUSIONS

The Cooling Tower Blowdown Line runs underground for approximately 2 miles from the cooling tower south to the edge of Harris Lake. A total of ten (10) new groundwater monitoring wells were installed as part of this scope of work. Seven (7) of the locations are situated along the length of the pipeline located between the plant and Drop Structure B at Harris Lake. Of these seven (7) locations, four (4) monitoring wells were installed at locations where the April 2009 pipeline inspection had identified defects in the pipeline and leakage from the pipeline was considered likely; and, three (3) monitoring wells were installed at locations where inspection of the pipeline could not be accomplished. The remaining three (3) groundwater monitoring wells were installed in the vicinity of the plant to provide additional groundwater monitoring points not directly related to the pipeline; however, two (2) of those three (3) wells were installed in the general vicinity of the pipeline.

4.1 Summary of Groundwater Conditions

Two rounds of groundwater samples were collected from the newly installed monitoring wells (10 samples) and the existing monitoring wells (8 samples) and one sample was obtained from Harris Lake during the second sampling round. All groundwater samples were submitted to the on-site radiological analytical laboratory for tritium analysis. Tritium results for the existing CTBL monitoring wells were consistent with those from the initial investigation in early 2009 and the ongoing monthly sampling effort. These results indicate the presence of a current and/or historic leak in the pipeline in the vicinity of ARS#2. Investigations have demonstrated that this area is a low point in the pipeline where leaked water from the pipeline might accumulate. With respect to the newly installed monitoring wells, tritium was detected in the groundwater samples from BDL-MW-16 at 5,870 pCi/L (October 2009) and 3,410 pCi/L (November 2009). None of the groundwater samples from the other newly installed monitoring wells exhibited tritium above the LLD. Because MW-16 was installed less than 800 feet from Harris Lake, a sample was obtained from the lake

during the second sampling round conducted in November. This sample exhibited tritium at 3,550 pCi/L.

Defects in the CTBL were identified in the vicinity of Drop Structure B during the April 2009 pipeline inspection and leakage from the pipeline may be a source of tritium impacts in this area; however, the similarity in results from this well and the lake imply a possible connection between the lake and shallow groundwater in the vicinity of Drop Structure B. As Harris Lake is manmade, it is possible that the lake discharges to groundwater in areas. Harris Lake elevations as recorded at the plant intake structure were provided by plant personnel for the time periods of both sampling rounds. These data indicate that the elevation of Harris Lake where measured was lower than the water table at MW-16 for both sampling rounds.

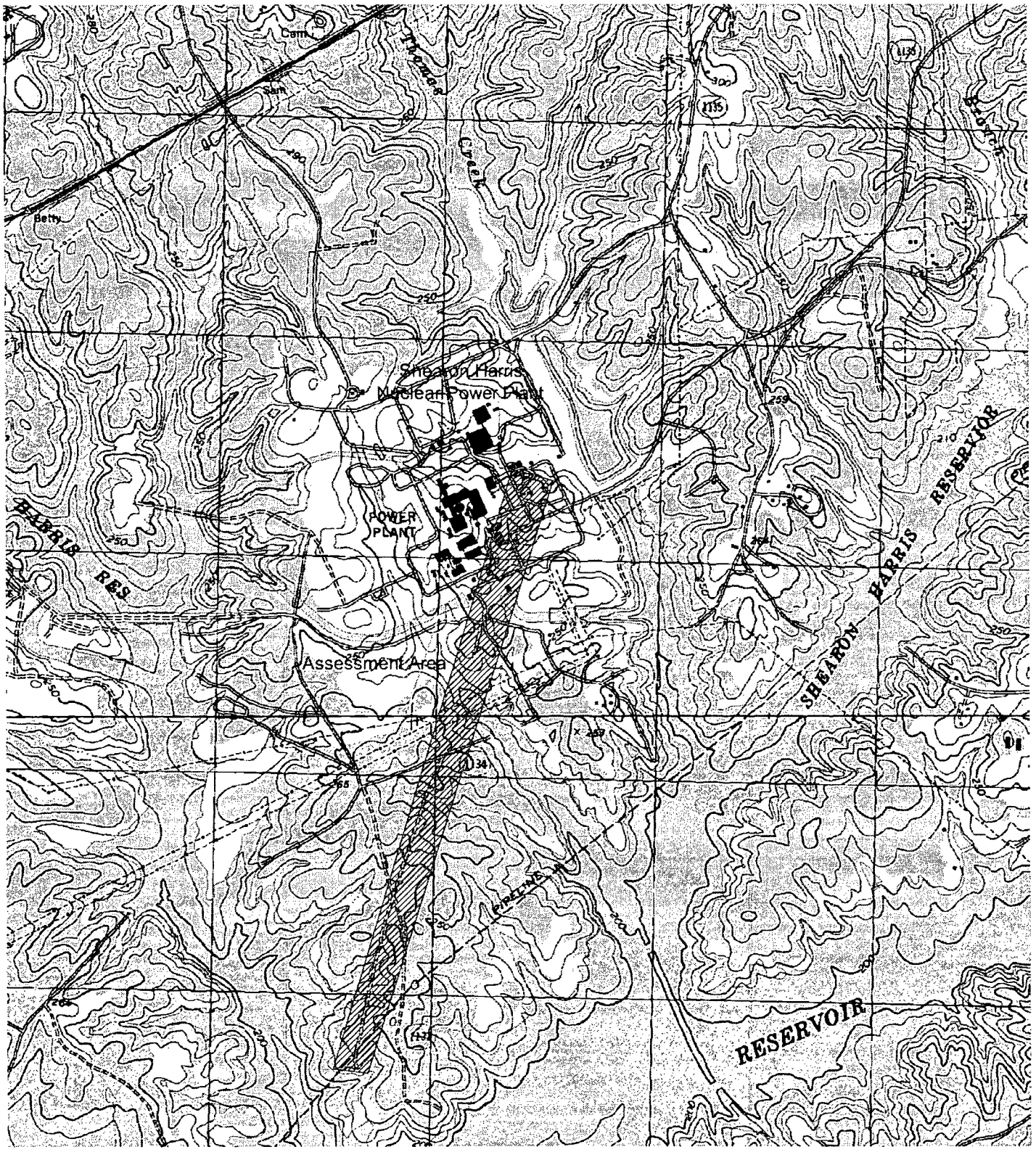
4.2 Conclusions

Based on the occurrence and distribution of tritium in the data presented above, it is concluded that groundwater in the vicinity of MW-16 has been impacted by tritium. This may be a result of leakage from the CTBL defects previously identified or discharge from Harris Lake. Groundwater impacts previously identified in the local area between ARS#1 and ARS#2 identified in the April 2009 Groundwater Assessment Report persist. No other areas of tritium-impacted groundwater have been identified as a result of this scope of work.

4.3 Recommendations

SSi recommends that the newly installed monitoring wells be added to the monthly sampling protocol as part of the site Groundwater Monitoring Program so that sufficient data can be accumulated to evaluate trends and seasonal effects. In addition, an evaluation of the hydrologic connection between Harris Lake and shallow groundwater should be performed to determine if impacted lake water is migrating to and impacting groundwater in the vicinity of MW-16 or elsewhere.

FIGURES



Quadrangle Location

0 2000 4000 Feet

N

Source: U.S.G.S. Topographic Map (7.5 minute)
New Hill & Cokesbury, NC quadrangles

Shearon Harris Nuclear Power Plant
New Hill, NC

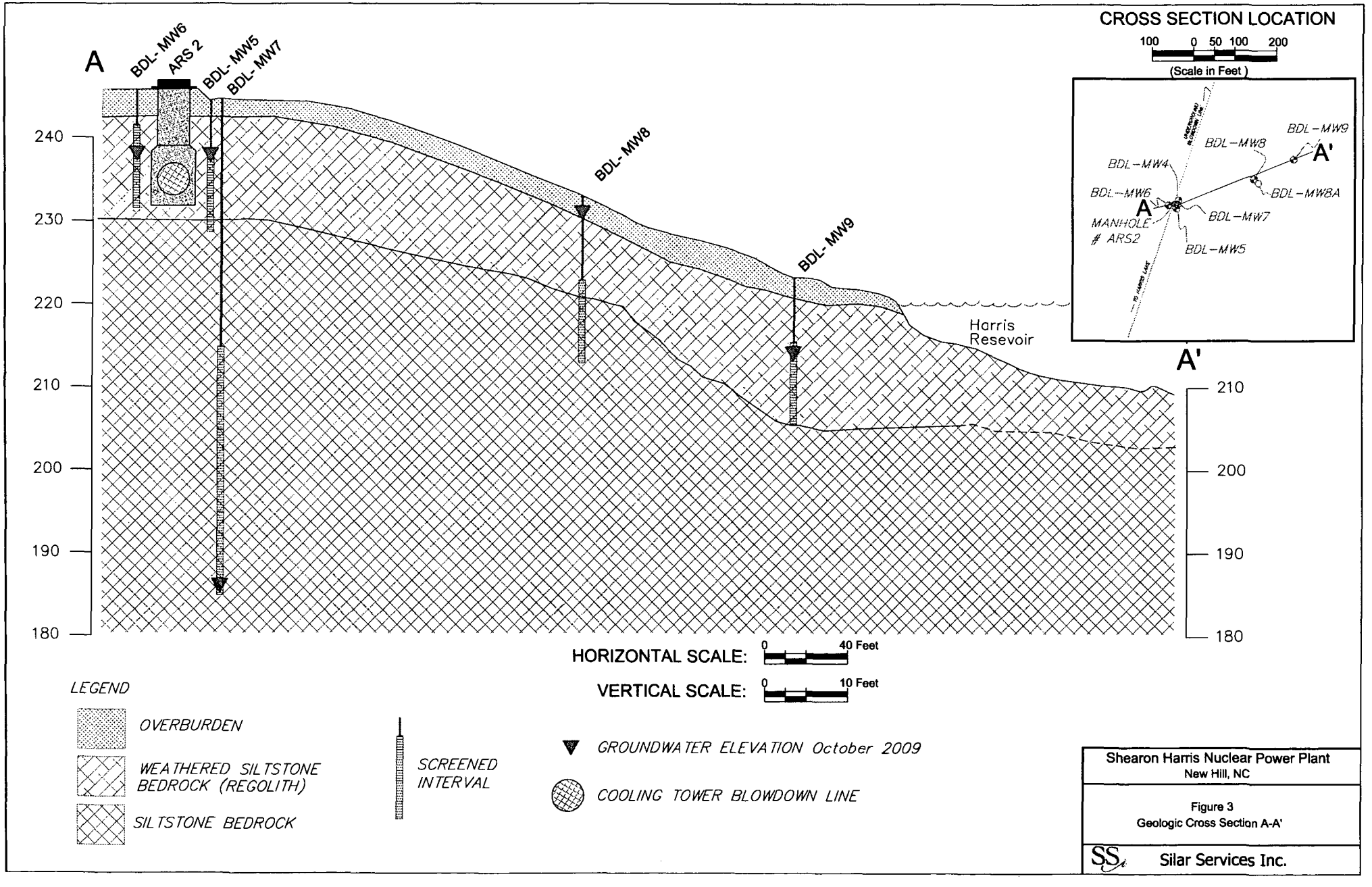
Figure 1
Site Location Map

SSi Silar Services Inc.

Shearon Harris Nuclear Power Plant
New Hill, NC

Figure 2
Site Layout Map

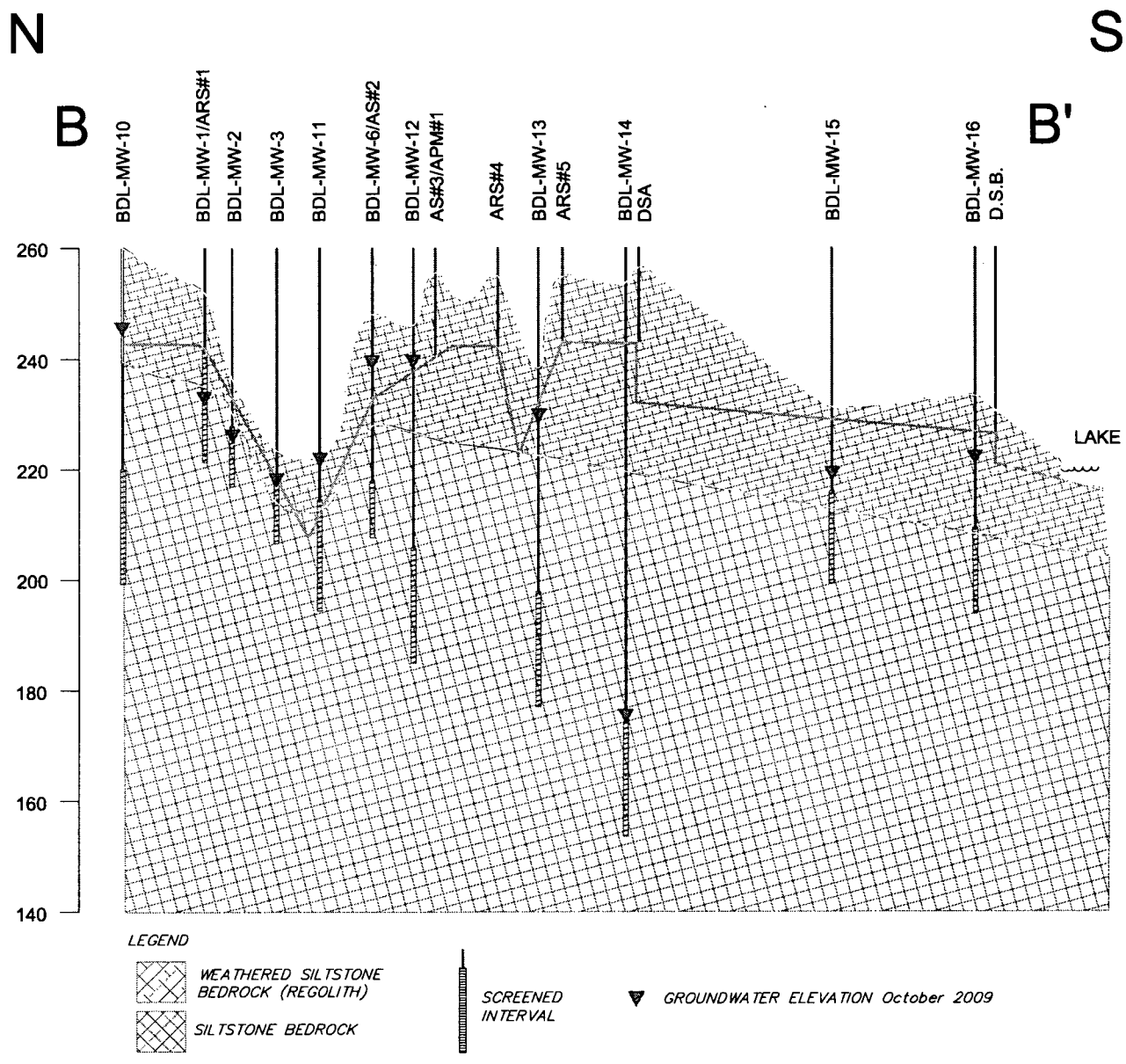
Silar Services Inc.



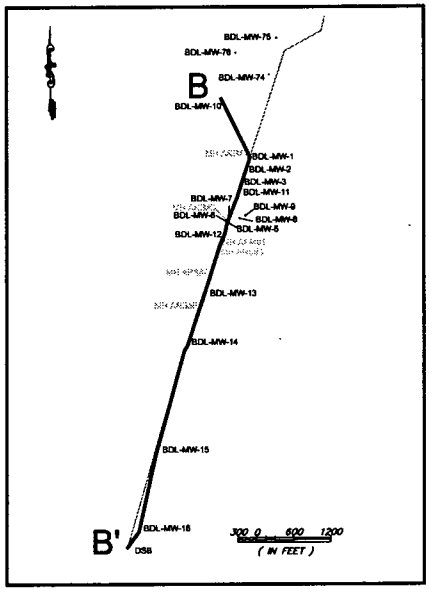
Shearon Harris Nuclear Power Plant
New Hill, NC

Figure 3
Geologic Cross Section A-A'

Silar Services Inc.



CROSS SECTION LOCATION



NOTE:
APPROXIMATELY 3-4 FEET OF UNCONSOLIDATED OVERBURDEN IS PRESENT THROUGHOUT THE AREA BUT NOT SHOWN

HORIZONTAL SCALE: 0 1,000 Feet

VERTICAL SCALE: 0 4 20 Feet

Shearon Harris Nuclear Power Plant
New Hill, NC

Figure 4
Geologic Cross Section B-B'

Silar Services Inc.

NOTES:

A/B - DENOTES DUPLICATE SAMPLE

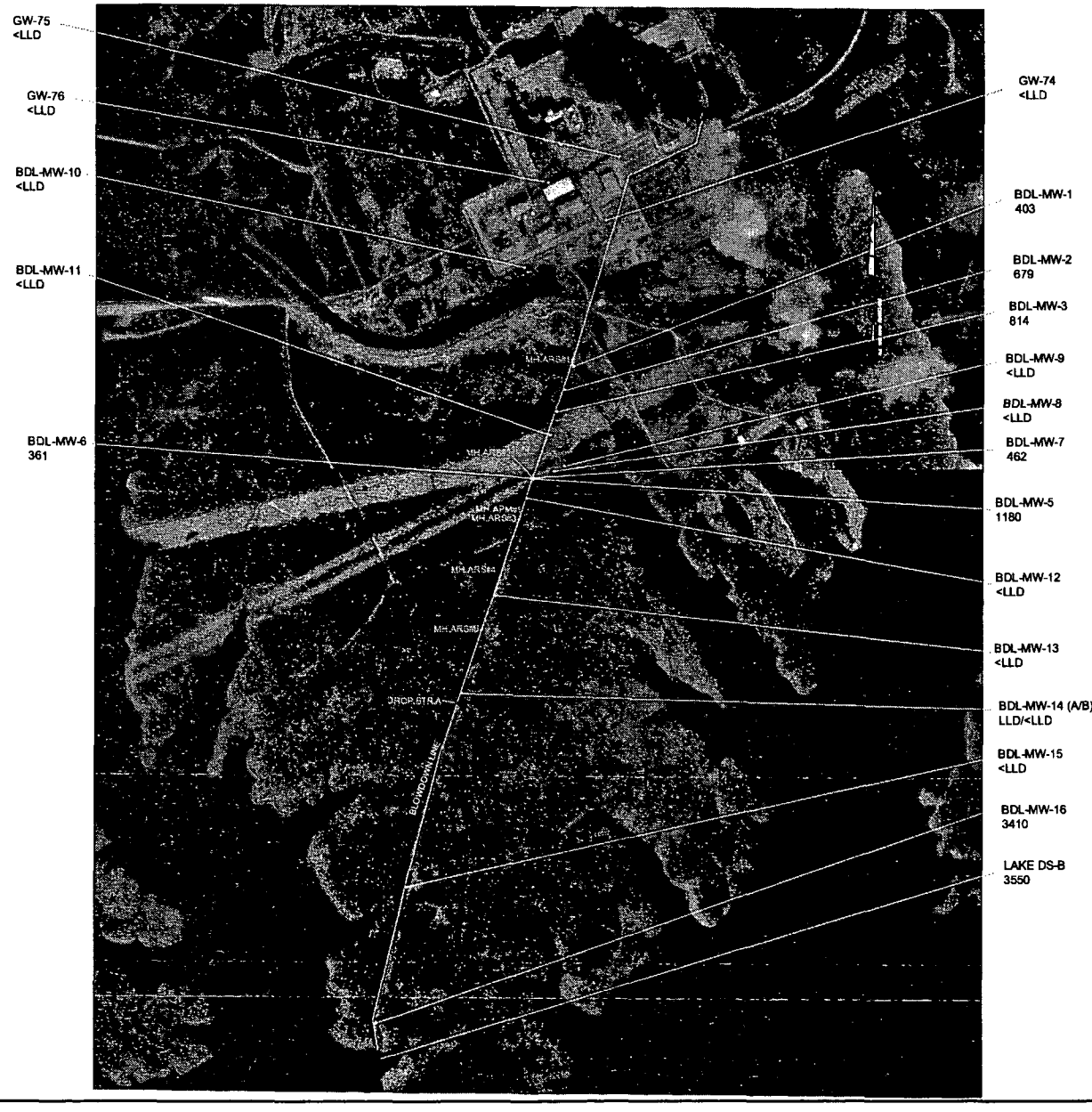
LLD - LOWER LIMIT OF DETECTION

TRITIUM RESULTS - pCi/Liter

Shearon Harris Nuclear Power Plant
New Hill, NC

Figure 5
Sample Results
October 2009

Silar Services Inc.



NOTES:

A/B - DENOTES DUPLICATE SAMPLE

LLD - LOWER LIMIT OF DETECTION

TRITIUM RESULTS - pCi/Liter

Shearon Harris Nuclear Power Plant
New Hill, NC

Figure 6
Sample Results
November 2009

Silar Services Inc.

TABLES

Table 1
Monitoring Well Construction Summary
Cooling Tower Blowdown Line Assessment
Shearon Harris Nuclear Power Plant, New Hill, North Carolina

Well ID.	Well 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)
BDL-MW10	60	263.13	260.41	60-40	60-20	20-17	17-0
BDL-MW11	27	225.05	222.12	27-7	27-5	5-1	1-0
BDL-MW12	60	249.36	246.24	60-40	60-25	25-20	20-0
BDL-MW13	60	240.93	238.1	60-40	60-25	25-22	22-0
BDL-MW14	98	256.21	253.06	98-78	98-73	73-65	65-0
BDL-MW15	30	234.41	231.47	30-15	30-13	13-10	10-0
BDL-MW16	40	236.9	234.05	40-25	40-23	23-20	20-0
GW-74	60	260.39	260.62	60-40	60-25	25-20	20-0
GW-75	50	259.86	260.1	50-30	50-25	25-20	20-0
GW-76	11	258.84	259.25	11-6	11-4	4-1	1-0

Notes:
bgs - Below Ground Surface
TOC - Top of Well Casing
MSL - Mean Sea Level
NA - Not Applicable
Survey data provided by Smith and Smith, accurate to 0.01 feet MSL

Table 2
Analytical Results - Water Samples
Cooling Tower Blowdown Line Assessment
Shearon Harris Nuclear Power Plant, New Hill, North Carolina

	October 2009			November 2009		
Sample Location	Sample Date	Tritium Result (pCi/liter)	Tritium LLD (pCi/liter)	Sample Date	Tritium Result (pCi/liter)	Tritium LLD (pCi/liter)
BDL-MW1	15-Oct-09	< LLD	241	23-Nov-09	**403±146**	NR
BDL-MW2	15-Oct-09	**529±151**	NR	23-Nov-09	**679±146**	NR
BDL-MW3	15-Oct-09	**588±151**	NR	23-Nov-09	**814±146**	NR
BDL-MW5	15-Oct-09	**1070±156**	NR	23-Nov-09	**1180±154**	NR
BDL-MW6	15-Oct-09	**473±151**	NR	23-Nov-09	**361±146**	NR
BDL-MW7	15-Oct-09	**326±151**	NR	23-Nov-09	**462±146**	NR
BDL-MW8	15-Oct-09	<LLD	241	23-Nov-09	< LLD	234
BDL-MW9	15-Oct-09	< LLD	241	23-Nov-09	< LLD	234
BDL-MW10	14-Oct-09	< LLD	241	9-Nov-09	< LLD	238
BDL-MW11	13-Oct-09	< LLD	236	9-Nov-09	< LLD	239
BDL-MW12	15-Oct-09	< LLD	236	9-Nov-09	< LLD	238
BDL-MW13	13-Oct-09	< LLD	236	9-Nov-09	< LLD	239
BDL-MW14(A/B)*	15-Oct-09	< LLD/<LLD	235/236	10-Nov-09	< LLD	239
BDL-MW15	15-Oct-09	< LLD	237	9-Nov-09	< LLD	239
BDL-MW16	15-Oct-09	**5870**	NR	9-Nov-09	**3410±175**	239
GW-74	15-Oct-09	< LLD	240	10-Nov-09	< LLD	238
GW-75	14-Oct-09	< LLD	241	9-Nov-09	< LLD	238
GW-76	14-Oct-09	< LLD	241	9-Nov-09	< LLD	238
Lake DS-B	-	Not Sampled	-	9-Nov-09	**3550±176**	238

* A/B denotes duplicate sample
LLD - Lower Limit of Detection
NR - Not Reported

Table 3
Survey Data and Water Level Measurements
Cooling Tower Blowdown Line Assessment
Shearon Harris Nuclear Power Plant, New Hill, North Carolina

Location ID	Northing	Easting	Latitude	Longitude	Well Depth (bgs)	TOC (MSL)	Ground Surface Elevation (MSL)	13-Oct-09		9-Nov-09	
								Depth to Water	Water Elevation (MSL)	Depth to Water	Water Elevation (MSL)
BDL-MW10	684,269.59	2,012,868.37	35°37'48"	78.57'24"	60	263.13	260.41	17.66	245.47	18.76	244.37
BDL-MW11	682,710.12	2,013,116.92	35°37'33"	78.57'21"	27	225.05	222.12	3.33	221.72	3.82	221.23
BDL-MW12	682,116.79	2,012,906.66	35°37'27"	78.57'23"	60	249.36	246.24	9.73	239.63	7.70	241.66
BDL-MW13	681,211.86	2,012,607.59	35°37'18"	78°57'27"	60	240.93	238.10	11.62	229.31	3.75	237.18
BDL-MW14	680,308.08	2,012,303.74	35°37'09"	78°57'30"	98	256.21	253.06	82.10	174.11	82.00	174.21
BDL-MW15	678,518.03	2,011,785.51	35°36'51"	78°57'37"	30	234.41	231.47	15.91	218.50	16.25	218.16
BDL-MW16	677,258.60	2,011,502.38	35°36'39"	78°57'40"	40	236.9	234.05	15.00	221.90	15.72	221.18
GW-74	684,706.48	2,013,633.67	35°37'52"	78°57'14"	60	260.39	260.62	50.45	209.94	26.12	234.27
GW-75	685,295.07	2,013,757.03	35°37'58"	78°57'13"	50	259.86	260.10	11.87	247.99	11.02	248.84
GW-76	685,054.67	2,013,091.91	35°37'56"	78°57'21"	11	258.84	259.25	6.65	252.19	7.18	251.66

Notes:
bgs - Below Ground Surface
TOC - Top of Well Casing
MSL - Mean Sea Level
NA - Not Applicable
Survey data provided by Smith and Smith

Table 4
Survey Data and Water Level Measurements
Monitoring Wells MW-1 Through MW-9
Cooling Tower Blowdown Line Assessment
Shearon Harris Nuclear Power Plant, New Hill, North Carolina

Location ID	Northing	Easting	Latitude	Longitude	Well Depth (bgs)	TOC (MSL)	Ground Surface Elevation (MSL)	15-Oct-09		23-Nov-09	
								Depth to Water	Water Elevation (MSL)	Depth to Water	Water Elevation (MSL)
BDL-MW1	683,346.18	2,013,326.48	35.37393387	78°57'19"	30.01	255.70	252.17	23.56	232.14	23.93	231.77
BDL-MW2	683,128.19	2,013,248.84	35.37371829	78°57'19"	19.34	239.30	236.69	14.02	225.28	13.98	225.32
BDL-MW3	682,926.54	2,013,180.17	35.37351887	78°57'20"	14.72	225.16	223.00	7.15	218.01	5.52	219.64
BDL-MW5	682,300.10	2,012,967.12	35.37289937	78°57'23"\	16.64	248.93	245.67	10.52	238.41	10.66	238.27
BDL-MW6	682,308.04	2,012,948.07	35.37290723	78°57'23"	14.02	249.76	246.34	10.71	239.05	8.00	241.76
BDL-MW7	682,308.69	2,012,970.56	35.37290787	78°57'23"	60.94	248.79	245.23	49.30	199.49	46.92	201.87
BDL-MW8	682,370.88	2,013,154.32	35.3729693	78°57'21"	20.33	235.91	233.24	6.00	229.91	3.70	232.21
BDL-MW9	682,417.63	2,013,249.71	35.37301549	78°57'19"	17.87	226.78	223.14	13.48	213.30	10.40	216.38

Notes:
bgs - Below Ground Surface
TOC - Top of Well Casing
MSL - Mean Sea Level
NA - Not Applicable
Survey data provided by Smith and Smith

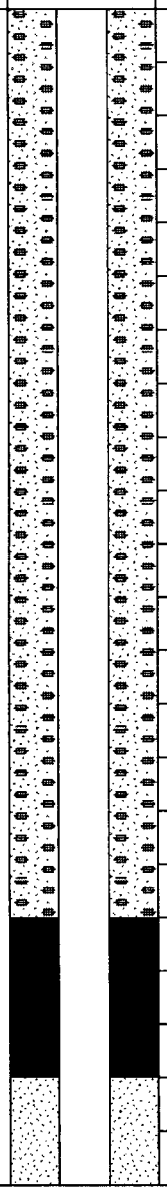
Appendix A

Boring Logs

BORING LOG

Drill Rig:	Rotary Air	Date Drilled:	9/28/09	Logged By:
Boring Dia:	6 Inches	Boring Number:	BDL-MW10	M Snyder

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
			5		Rd-brown silt
			10		
			15		
			20		brn-lt brn silt
					Red Siltstone



Completion Notes:

Ground Elevation 260.41 Casing Elevation 263.13

Site:

SHNPP Cooling Tower Blowdown Line

New Hill, NC

Project No.: SHNPP-1

BORING LOG

Drill Rig: Rotary Air	Date Drilled: 9/28/09	Logged By:
Boring Dia: 6 Inches	Boring Number: BDL-MW10	M Snyder

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
			25		
			30		
			35		
			40		

Completion Notes:

Ground Elevation 260.41 Casing Elevation 263.13

Site:

SHNPP Cooling Tower Blowdown Line

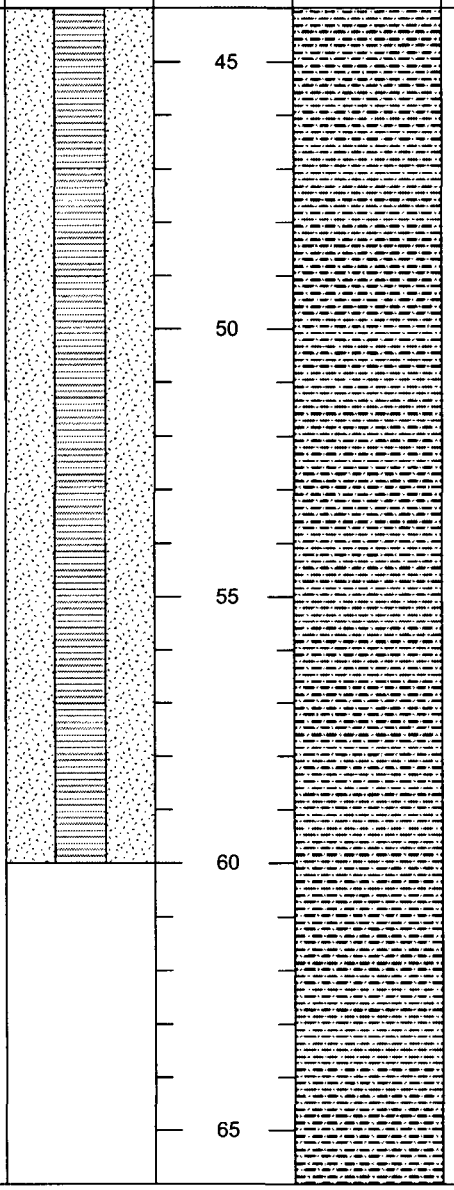
New Hill, NC

Project No.: SHNPP-1 | Page 2

BORING LOG

Drill Rig:	Rotary Air	Date Drilled:	9/28/09	Logged By:
Boring Dia:	6 Inches	Boring Number:	BDL-MW10	M Snyder

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
			45		
			50		
			55		
			60		
			65		



Completion Notes:

Ground Elevation 260.41 Casing Elevation 263.13

Site:

SHNPP Cooling Tower Blowdown Line

New Hill, NC

Project No.: SHNPP-1

BORING LOG

Drill Rig:	Rotary Air	Date Drilled:	9/28/09	Logged By:
Boring Dia:	6 Inches	Boring Number:	BDL-MW10	M Snyder

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
			70		
			75		
			80		
			85		

Completion Notes:

Ground Elevation 260.41 Casing Elevation 263.13

Site:

SHNPP Cooling Tower Blowdown Line

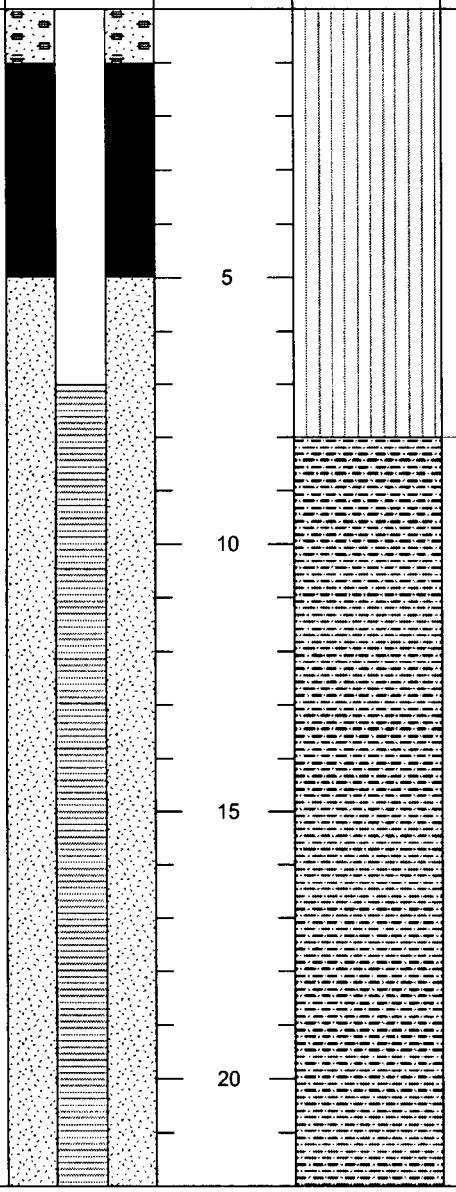
New Hill, NC

Project No.: SHNPP-1

BORING LOG

Drill Rig:	Rotary Air	Date Drilled:	9/30/09	Logged By:
Boring Dia:	6 Inches	Boring Number:	BDL-MW11	J Magee

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
			5		Rd-brown silt
			10		Rd Siltstone
			15		
			20		



Completion Notes:

Ground Elevation 222.12 Casing Elevation 225.05

Site:

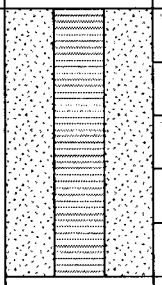
SHNPP Cooling Tower Blowdown Line

New Hill, NC

Project No.: SHNPP-1

BORING LOG

Drill Rig:	Rotary Air	Date Drilled:	9/30/09	Logged By:
Boring Dia:	6 Inches	Boring Number:	BDL-MW11	J Magee

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
			25 30 35 40		

Completion Notes:

Ground Elevation 222.12 Casing Elevation 225.05

Site:

SHNPP Cooling Tower Blowdown Line

New Hill, NC

Project No.: SHNPP-1

BORING LOG

Drill Rig: Rotary Air	Date Drilled: 9/24/09	Logged By:
Boring Dia: 6 Inches	Boring Number: BDL-MW12	M Snyder

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
			5		Rd-brown silt
			10		Red siltstone
			15		
			20		

Completion Notes:

Ground Elevation 246.12 Casing Elevation 249.36

Site:

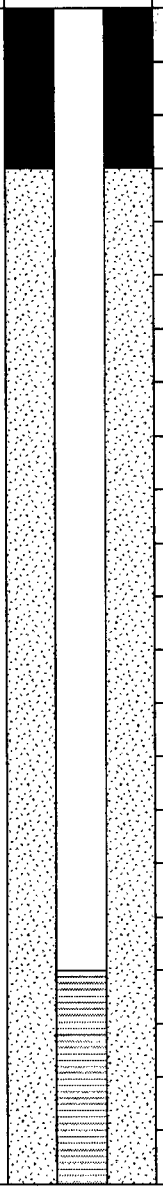
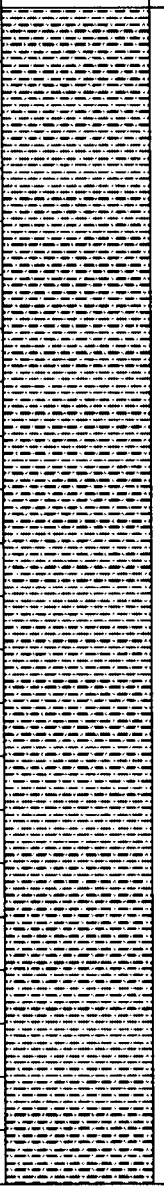
SHNPP Cooling Tower Blowdown Line

New Hill, NC

Project No.: SHNPP-1 | Page 1

BORING LOG

Drill Rig: Rotary Air	Date Drilled: 9/24/09	Logged By:
Boring Dia: 6 Inches	Boring Number: BDL-MW12	M Snyder

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					

Completion Notes:

Ground Elevation 246.12 Casing Elevation 249.36

Site:

SHNPP Cooling Tower Blowdown Line

New Hill, NC

Project No.: SHNPP-1

BORING LOG

Drill Rig:	Rotary Air	Date Drilled:	9/24/09	Logged By:
Boring Dia:	6 Inches	Boring Number:	BDL-MW12	M Snyder

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
			45		
			50		
			55		
			60		
			65		

Completion Notes:

Ground Elevation 246.12 Casing Elevation 249.36

Site:

SHNPP Cooling Tower Blowdown Line

New Hill, NC

Project No.: SHNPP-1

BORING LOG

Drill Rig:	Rotary Air	Date Drilled:	9/23/09	Logged By:
Boring Dia:	6 Inches	Boring Number:	BDL-MW13	M Snyder

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					Rd-brown silt
					Red siltstone
			5		
			10		
			15		
			20		

Completion Notes:

Ground Elevation 238.10 Casing Elevation 240.93

Site:

SHNPP Cooling Tower Blowdown Line

New Hill, NC

Project No.: SHNPP-1

BORING LOG

Drill Rig: Rotary Air	Date Drilled: 9/23/09	Logged By:
Boring Dia: 6 Inches	Boring Number: BDL-MW13	M Snyder

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
			25		
			30		
			35		
			40		

Completion Notes:

Ground Elevation 238.10 Casing Elevation 240.93

Site:

SHNPP Cooling Tower Blowdown Line

New Hill, NC

Project No.: SHNPP-1 | Page 2

BORING LOG

Drill Rig: Rotary Air	Date Drilled: 9/23/09	Logged By:
Boring Dia: 6 Inches	Boring Number: BDL-MW13	M Snyder

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
			45		
			50		
			55		
			60		
			65		

Completion Notes:

Ground Elevation 238.10 Casing Elevation 240.93

Site:

SHNPP Cooling Tower Blowdown Line

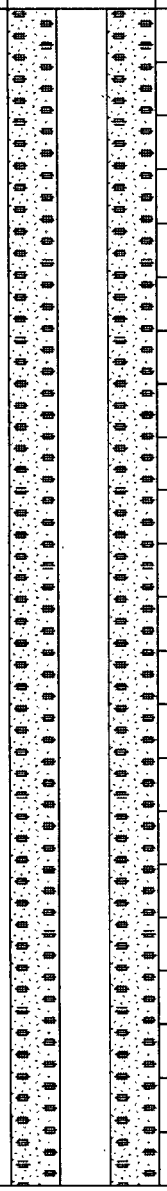
New Hill, NC

Project No.: SHNPP-1

BORING LOG

Drill Rig:	Rotary Air	Date Drilled:	9/24/09	Logged By:
Boring Dia:	6 Inches	Boring Number:	BDL-MW14	M Snyder

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					Rd-brown silt
					Red siltstone
			5		
			10		
			15		
			20		



Completion Notes:

Ground Elevation 253.06 Casing Elevation 256.21

Site:

SHNPP Cooling Tower Blowdown Line

New Hill, NC

Project No.: SHNPP-1

BORING LOG

Drill Rig: Rotary Air	Date Drilled: 9/24/09	Logged By:
Boring Dia: 6 Inches	Boring Number: BDL-MW14	M Snyder

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
			25		
			30		
			35		
			40		

Completion Notes:

Ground Elevation 253.06 Casing Elevation 256.21

Site:

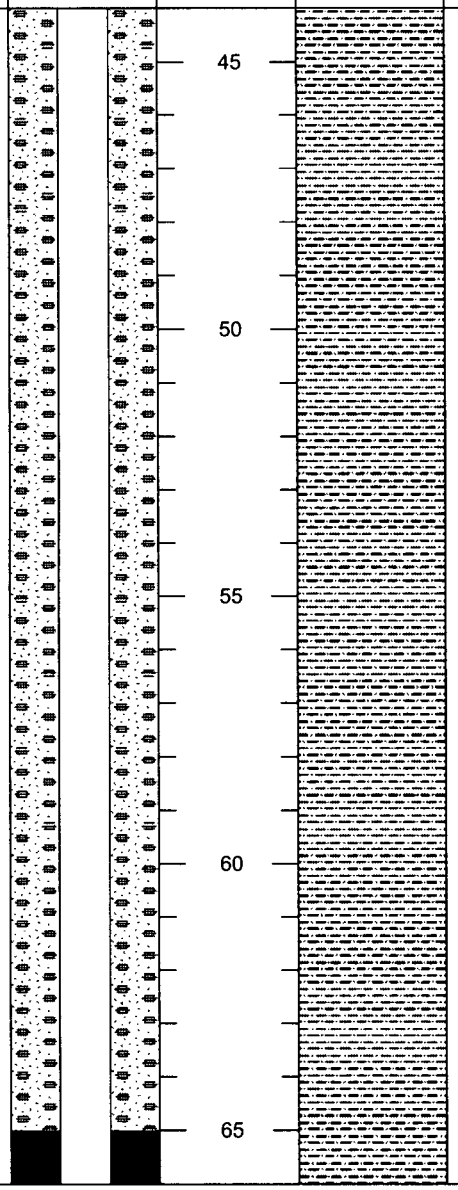
SHNPP Cooling Tower Blowdown Line

New Hill, NC

Project No.: SHNPP-1

BORING LOG

Drill Rig: Rotary Air	Date Drilled: 9/24/09	Logged By:
Boring Dia: 6 Inches	Boring Number: BDL-MW14	M Snyder

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
			45 50 55 60 65		

Completion Notes:

Ground Elevation 253.06 Casing Elevation 256.21

Site:

SHNPP Cooling Tower Blowdown Line

New Hill, NC

Project No.: SHNPP-1

BORING LOG

Drill Rig: Rotary Air	Date Drilled: 9/24/09	Logged By:
Boring Dia: 6 Inches	Boring Number: BDL-MW14	M Snyder

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
			70		
			75		
			80		
			85		

Completion Notes:

Ground Elevation 253.06 Casing Elevation 256.21

Site:

SHNPP Cooling Tower Blowdown Line

New Hill, NC

Project No.: SHNPP-1

BORING LOG

Drill Rig:	Rotary Air	Date Drilled:	9/24/09	Logged By:
Boring Dia:	6 Inches	Boring Number:	BDL-MW14	M Snyder

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
			90		
			95		
			100		
			105		

Completion Notes:

Ground Elevation 253.06 Casing Elevation 256.21

Site:

SHNPP Cooling Tower Blowdown Line

New Hill, NC

Project No.: SHNPP-1

BORING LOG

Drill Rig:	Rotary Air	Date Drilled:	9/24/09	Logged By:
Boring Dia:	6 Inches	Boring Number:	BDL-MW14	M Snyder

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
			115		
			120		
			125		
			130		

Completion Notes:

Ground Elevation 253.06 Casing Elevation 256.21

Site:

SHNPP Cooling Tower Blowdown Line

New Hill, NC

Project No.: SHNPP-1

BORING LOG

Drill Rig:	Rotary Air	Date Drilled:	9/24/09	Logged By:
Boring Dia:	6 Inches	Boring Number:	BDL-MW14	M Snyder

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
			135		
			140		
			145		
			150		

Completion Notes:

Ground Elevation 253.06 Casing Elevation 256.21

Site:

SHNPP Cooling Tower Blowdown Line

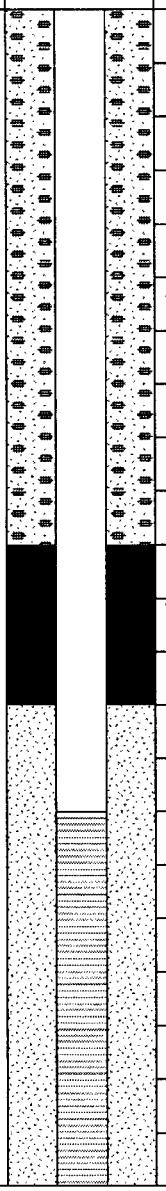
New Hill, NC

Project No.: SHNPP-1

BORING LOG

Drill Rig: Rotary Air	Date Drilled: 9/22/09	Logged By:
Boring Dia: 6 Inches	Boring Number: BDL-MW15	M Snyder

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					Rd-brown silt
					Red siltstone



Completion Notes:

Ground Elevation 231.47 Casing Elevation 234.41

Site:

SHNPP Cooling Tower Blowdown Line

New Hill, NC

Project No.: SHNPP-1 Page 1

BORING LOG

Drill Rig: Rotary Air	Date Drilled: 9/22/09	Logged By:
Boring Dia: 6 Inches	Boring Number: BDL-MW15	M Snyder

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
			25		
			30		
			35		
			40		

Completion Notes:

Ground Elevation 231.47 Casing Elevation 234.41

Site:

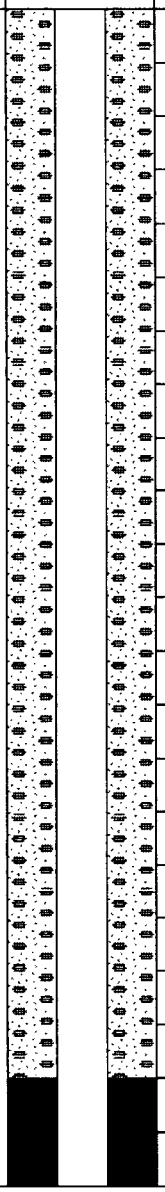
SHNPP Cooling Tower Blowdown Line

New Hill, NC

Project No.: SHNPP-1 Page 2

BORING LOG

Drill Rig: Rotary Air	Date Drilled: 9/22/09	Logged By:
Boring Dia: 6 Inches	Boring Number: BDL-MW16	M Snyder

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
			5 10 15 20		Rd-brown silt Red siltstone

Completion Notes:

Ground Elevation 234.05 Casing Elevation 236.90

Site:

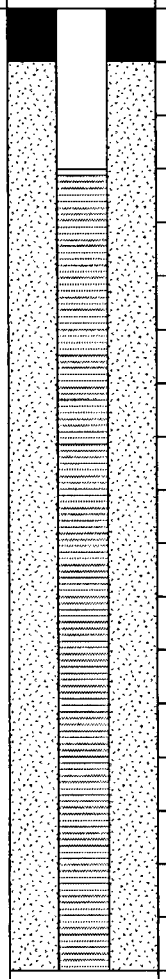
SHNPP Cooling Tower Blowdown Line

New Hill, NC

Project No.: SHNPP-1 | Page 1

BORING LOG

Drill Rig: Rotary Air	Date Drilled: 9/22/09	Logged By:
Boring Dia: 6 Inches	Boring Number: BDL-MW16	M Snyder

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
			25 30 35 40		

Completion Notes:

Ground Elevation 234.05 Casing Elevation 236.90

Site:

SHNPP Cooling Tower Blowdown Line

New Hill, NC

Project No.: SHNPP-1 Page 2

BORING LOG

Drill Rig:	Rotary Air	Date Drilled:	10/2/09	Logged By:
Boring Dia:	6 Inches	Boring Number:	GW-74	J Magee

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
			5		Rd-brown silt - (Air Knife to 15 ft.)
			10		
			15		
			20		Rd-br silt w/clay
					Rd Siltstone

Completion Notes:

Ground Elevation 260.62 Casing Elevation 260.39

Site:

SHNPP Cooling Tower Blowdown Line

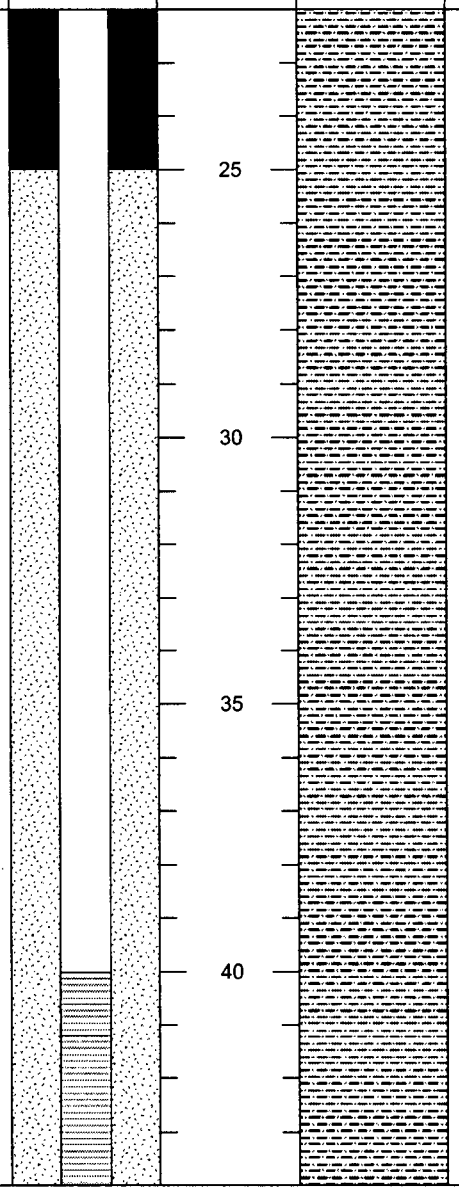
New Hill, NC

Project No.: SHNPP-1

BORING LOG

Drill Rig:	Rotary Air	Date Drilled:	10/2/09	Logged By:
Boring Dia:	6 Inches	Boring Number:	GW-74	J Magee

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
			25		
			30		
			35		
			40		



Completion Notes:

Ground Elevation 260.62 Casing Elevation 260.39

Site:

SHNPP Cooling Tower Blowdown Line

New Hill, NC

Project No.: SHNPP-1

BORING LOG

Drill Rig:	Rotary Air	Date Drilled:	10/2/09	Logged By:
Boring Dia:	6 Inches	Boring Number:	GW-74	J Magee

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
			45		
			50		
			55		
			60		
			65		

Completion Notes:

Ground Elevation 260.62 Casing Elevation 260.39

Site:

SHNPP Cooling Tower Blowdown Line

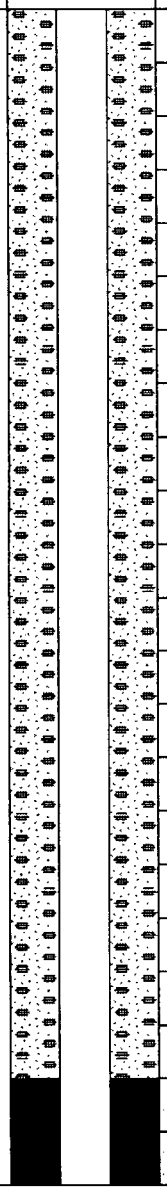
New Hill, NC

Project No.: SHNPP-1 Page 3

BORING LOG

Drill Rig:	Rotary Air	Date Drilled:	9/30/09	Logged By:
Boring Dia:	6 Inches	Boring Number:	GW-75	J Magee

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
			5		Rd-brown silt - (Air knife to 11ft.)
			10		Weathered rd Siltstone
			15		
			20		



Completion Notes:

Ground Elevation 260.10 Casing Elevation 259.86

Site:

SHNPP Cooling Tower Blowdown Line

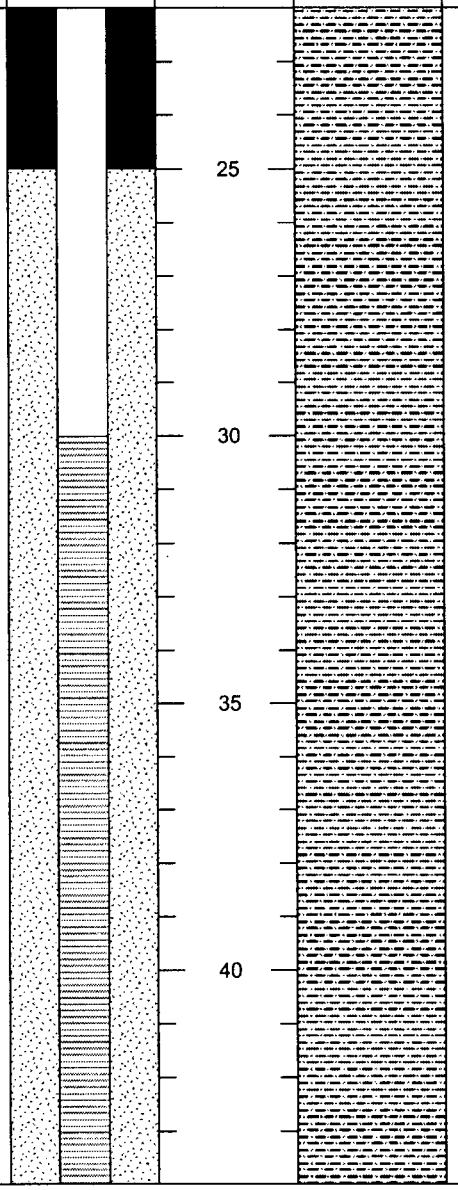
New Hill, NC

Project No.: SHNPP-1

BORING LOG

Drill Rig:	Rotary Air	Date Drilled:	9/30/09	Logged By:
Boring Dia:	6 Inches	Boring Number:	GW-75	J Magee

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
			25		
			30		
			35		
			40		



Completion Notes:

Ground Elevation 260.10 Casing Elevation 259.86

Site:

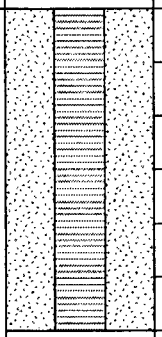
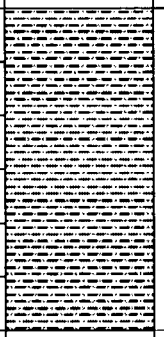
SHNPP Cooling Tower Blowdown Line

New Hill, NC

Project No.: SHNPP-1

BORING LOG

Drill Rig:	Rotary Air	Date Drilled:	9/30/09	Logged By:
Boring Dia:	6 Inches	Boring Number:	GW-75	J Magee

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
			45 50 55 60 65		

Completion Notes:

Ground Elevation 260.10 Casing Elevation 259.86

Site:

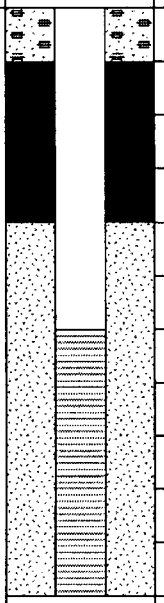
SHNPP Cooling Tower Blowdown Line

New Hill, NC

Project No.: SHNPP-1

BORING LOG

Drill Rig: Rotary Air	Date Drilled: 10/1/09	Logged By:
Boring Dia: 6 Inches	Boring Number: GW-76	J Magee

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
			5 10 15 20		Rd-brown silt - (Air knife to 6 ft.) Weathered rd Silt/Broken Rock

Completion Notes:

Ground Elevation 259.25 Casing Elevation 2258.84

Site:

SHNPP Cooling Tower Blowdown Line

New Hill, NC

Project No.: SHNPP-1 | Page 1

Appendix B

NCDENR Well Construction Records

NON RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2452

1. WELL CONTRACTOR:

JERRY WATKINS
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-10

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 09/28/09

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: NEW HILL COUNTY WAKE

SHEARON HARRIS ROAD 27562
(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 SHEARON HARRIS NUCLEAR PLANT

STREET ADDRESS SHEARON HARRIS ROAD

NEW HILL | NC | 27562
City or Town | State | Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS PO BOX 165

NEW HILL | NC | 27562
City or Town | State | Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 60.0 FEET

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

c. WATER LEVEL Below Top of Casing: 25.0 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 40.0	Ft.	2 INCH	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth			Material	Method
From 0.0	To 17.0	Ft.	Portland Bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth			Diameter		Slot Size		Material
From 40.0	To 60.0	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 20.0	To 60.0	Ft.	20-40	FINE SILICA SAND
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	18.0	RED SILT
18.0	20.0	YELLOW/ORANGE CLAY
20.0	80.0	RED MUDSTONE

11. REMARKS:

BENTONITE SEAL FROM 17.0 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.

SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE 10/26/09

JERRY WATKINS
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 # 2452

1. WELL CONTRACTOR:

JERRY WATKINS
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-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 09/30/09

TIME COMPLETED _____ AM ☐ PM ☐

3. WELL LOCATION:

CITY: NEW HILL COUNTY WAKE

SHEARON HARRIS ROAD 27562
(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 SHEARON HARRIS NUCLEAR PLANT

STREET ADDRESS SHEARON HARRIS ROAD

NEW HILL | NC | 27562
City or Town | State | Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS PO BOX 165

NEW HILL | NC | 27562
City or Town | State | Zip Code

(_____)-_____
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 27.0 FEET

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

c. **WATER LEVEL** Below Top of Casing: 3.0 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 1.0	Ft.	Portland Bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter		Slot Size		Material
From 7.0	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 5.0	To 27.0	Ft.	20-40	FINE SILICA SAND
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	8.0	RED SILT
8.0	27.0	RED MUDSTONE

11. REMARKS:

BENTONITE SEAL FROM 1.0 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.

Jerry R. Watkins — 10/26/09
SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE

JERRY WATKINS
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 # 2452

1. WELL CONTRACTOR:

JERRY WATKINS
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-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 09/24/09

TIME COMPLETED ____ AM ☐ PM ☐

3. WELL LOCATION:

CITY: NEW HILL COUNTY WAKE

SHEARON HARRIS ROAD 27562
(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 SHEARON HARRIS NUCLEAR PLANT

STREET ADDRESS SHEARON HARRIS ROAD

NEW HILL | NC | 27562
City or Town | State | Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS PO BOX 165

NEW HILL | NC | 27562
City or Town | State | Zip Code

(_____)-_____
Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 60.0 FEET

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

c. WATER LEVEL Below Top of Casing: 29.0 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 40.0	Ft.	2 INCH	SCH 40	PVC
From ____	To ____	Ft.			
From ____	To ____	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 20.0	Ft.	Portland Bentonite	SLURRY
From ____	To ____	Ft.		
From ____	To ____	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 40.0	To 60.0	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 25.0	To 60.0	Ft.	20-40	FINE SILICA SAND
From ____	To ____	Ft.		
From ____	To ____	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	6.0	YELLOW SANDY CLAY
6.0	60.0	RED MUDSTONE

11. REMARKS:

BENTONITE SEAL FROM 20.0 TO 25.0 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.

Jerry R. Watkins — 10/26/09
SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE

JERRY WATKINS
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 # 2452

1. WELL CONTRACTOR:

JERRY WATKINS
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-13

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 09/23/09

TIME COMPLETED _____ AM ☐ PM ☐

3. WELL LOCATION:

CITY: NEW HILL COUNTY WAKE

SHEARON HARRIS ROAD 27562
(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 SHEARON HARRIS NUCLEAR PLANT

STREET ADDRESS SHEARON HARRIS ROAD

NEW HILL | NC | 27562
City or Town | State | Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS PO BOX 165

NEW HILL | NC | 27562
City or Town | State | Zip Code

(_____)-_____
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 60.0 FEET

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

c. **WATER LEVEL** Below Top of Casing: 29.0 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 40.0	Ft.	2 INCH	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 22.0	Ft.	Portland Bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter		Slot Size		Material
From 40.0	To 60.0	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 25.0	To 60.0	Ft.	20-40	FINE SILICA SAND
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	2.0	ORANGE SANDY CLAY
2.0	60.0	RED MUDSTONE

11. REMARKS:

BENTONITE SEAL FROM 22.0 TO 25.0 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.

Jerry R. Watkins — 10/26/09
SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE

JERRY WATKINS
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 # 2452

1. WELL CONTRACTOR:

JERRY WATKINS
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-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 09/24/09

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: NEW HILL COUNTY WAKE

SHEARON HARRIS ROAD 27562
(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 SHEARON HARRIS NUCLEAR PLANT

STREET ADDRESS SHEARON HARRIS ROAD

NEW HILL | NC | 27562
City or Town | State | Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS PO BOX 165

NEW HILL | NC | 27562
City or Town | State | Zip Code

(_____)-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 98.0 FEET

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

c. **WATER LEVEL** Below Top of Casing: 80.0 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 78.0	Ft.	2 INCH	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 65.0	Ft.	Portland Bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter		Slot Size		Material
From 78.0	To 98.0	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 73.0	To 98.0	Ft.	20-40	FINE SILICA SAND
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	2.0	ORANGE SANDY CLAY
2.0	150.0	RED MUDSTONE

11. REMARKS:

BENTONITE SEAL FROM 65.0 TO 73.0 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.

Jerry R. Watkins — 10/26/09
SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE

JERRY WATKINS
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 # 2452

1. WELL CONTRACTOR:

JERRY WATKINS
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-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 09/22/09

TIME COMPLETED _____ AM ☐ PM ☐

3. WELL LOCATION:

CITY: NEW HILL COUNTY WAKE

SHEARON HARRIS ROAD 27562
(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 SHEARON HARRIS NUCLEAR PLANT

STREET ADDRESS SHEARON HARRIS ROAD

NEW HILL | NC | 27562
City or Town | State | Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS PO BOX 165

NEW HILL | NC | 27562
City or Town | State | Zip Code

(_____)-_____
Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 30.0 FEET

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

c. WATER LEVEL Below Top of Casing: 19.0 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.	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 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 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	3.0	RED SILT
3.0	30.0	RED MUDSTONE

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.

Terry R. Watkins — 10/26/09
SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE

JERRY WATKINS
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 # 2452

1. WELL CONTRACTOR:

JERRY WATKINS
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-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 09/22/09

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: NEW HILL COUNTY WAKE

SHEARON HARRIS ROAD 27562
(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 SHEARON HARRIS NUCLEAR PLANT

STREET ADDRESS SHEARON HARRIS ROAD

NEW HILL | NC | 27562
City or Town | State | Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS PO BOX 165

NEW HILL | NC | 27562
City or Town | State | Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 40.0 FEET

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

c. **WATER LEVEL** Below Top of Casing: 19.0 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 25.0	Ft. 2 INCH		SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 20.0	Ft. Portland Bentonite		SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter	Slot Size	Material
From 25.0	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 23.0	To 40.0	Ft. 20-40		FINE SILICA SAND
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	6.0	ORANGE CLAY
6.0	40.0	RED MUDSTONE

11. REMARKS:

BENTONITE SEAL FROM 20.0 TO 23.0 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.

Jerry R. Watkins — 10/26/09
SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE

JERRY WATKINS
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 # 2452

1. WELL CONTRACTOR:

JERRY WATKINS
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) GW-74

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 10/02/09

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: NEW HILL COUNTY WAKE

SHEARON HARRIS ROAD 27562
(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 SHEARON HARRIS NUCLEAR PLANT

STREET ADDRESS SHEARON HARRIS ROAD

NEW HILL | NC | 27562
City or Town | State | Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS PO BOX 165

NEW HILL | NC | 27562
City or Town | State | Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 60.0 FEET

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

c. **WATER LEVEL** Below Top of Casing: 25.0 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 40.0	Ft.	2 INCH	SCH 40	PVC
From ___	To ___	Ft.			
From ___	To ___	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 20.0	Ft.	Portland Bentonite	SLURRY
From ___	To ___	Ft.		
From ___	To ___	Ft.		

8. SCREEN:

	Depth		Diameter		Slot Size		Material
From 40.0	To 60.0	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 25.0	To 60.0	Ft.	20-40	FINE SILICA SAND
From ___	To ___	Ft.		
From ___	To ___	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	15.0	AIR KNIFE
15.0	18.0	RED SILT
18.0	20.0	ORANGE CLAY
20.0	60.0	RED MUDSTONE

11. REMARKS:

BENTONITE SEAL FROM 20.0 TO 25.0 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.

Jerry R. Watkins — 10/26/09
SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE

JERRY WATKINS
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 # 2452

1. WELL CONTRACTOR:

JERRY WATKINS
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) GW-75

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 09/30/09

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: NEW HILL COUNTY WAKE

SHEARON HARRIS ROAD 27562
(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 SHEARON HARRIS NUCLEAR PLANT

STREET ADDRESS SHEARON HARRIS ROAD

NEW HILL | NC | 27562
City or Town | State | Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS PO BOX 165

NEW HILL | NC | 27562
City or Town | State | Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 50.0 FEET

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

c. **WATER LEVEL** Below Top of Casing: 25.0 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 30.0	Ft.	2 INCH	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0.0	To 20.0	Ft.	Portland Bentonite	SLURRY
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter		Slot Size		Material
From 30.0	To 50.0	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 25.0	To 50.0	Ft.	20-40	FINE SILICA SAND
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	11.0	AIR KNIFE
11.0	50.0	RED SILT

11. REMARKS:

BENTONITE SEAL FROM 20.0 TO 25.0 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.

Jerry R. Watkins — 10/26/09
SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE

JERRY WATKINS
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 # 2452

1. WELL CONTRACTOR:

JERRY WATKINS
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) GW-76

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 10/02/09

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: NEW HILL COUNTY WAKE

SHEARON HARRIS ROAD 27562
(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 SHEARON HARRIS NUCLEAR PLANT

STREET ADDRESS SHEARON HARRIS ROAD

NEW HILL | NC | 27562
City or Town | State | Zip Code

CONTACT PERSON PROGRESS ENERGY

MAILING ADDRESS PO BOX 165

NEW HILL | NC | 27562
City or Town | State | Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 11.0

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:

	Depth		Diameter	Thickness/ Weight	Material
From 0.0	To 6.0	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 6.0	To 11.0	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 4.0	To 11.0	Ft. 20-40		FINE SILICA SAND
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0.0	6.0	AIR KNIFE
6.0	11.0	RED SILT/BROKEN UP ROCK

11. REMARKS:

BENTONITE SEAL FROM 1.0 TO 4.0 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 10/26/09

JERRY WATKINS
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

Sample Log Forms

Groundwater Monitoring Log

Groundwater Sample Identification: CTBD - MW11

Sample Date: 10-13-09

Sample Analysis: Tritium Sampled by: DE / MS

Beg. Purge 15:35 Time of Reading	Groundwater Quality Parameters: Temperature (°C)	Conductivity (µS/cm)	pH (pH units)	Depth to Water (ft)	Flow Rate (ml/min)
1ST 15:45	21.62	588	7.69	5.19	200
* See 552 logbook for	Intermediate	Readings		*	
16:10	20.97	573	7.31	5.55	150
16:15	20.96	572	7.30	5.55	150
16:20	20.95	573	7.42	5.55	150
Sample Time: 16:20			Initial water level: 3.33'		

See logbook

Operability Check (Indication in ft)
a-Final Depth to Water: 5.55
b-Depth to Water (at time of 1st reading): 3.33
a-b=Drawdown (D): 2.22

Bladder Pump Settings
Discharge Time: N/A
Fill Time: N/A

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 1360 ml
4" Well: D x (2468 ml/ft):
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 6750 + 45 min x 150 ml =
GVP > CVP: (YES) NO)
Comments:

Gamma Result (µci/ml):
Tritium Result (µci/ml): Count Room No.:

Reviewed by: Review Date:
Environmental Supervisor or Designee

Groundwater Monitoring Log

Groundwater Sample Identification: CTBD - mw12

Sample Date: 10-15-09

Sample Analysis: Tritium Sampled by: Don Edwards / M. Snyder

Begin Purge 8:05 Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0810	15.88	802	8.2	10.94	225
* See SS; Logbook for Intermediate Readings *					
0835	15.40	784	8.00	13.10	105
0840	15.15	784	8.04	13.29	105
0845	15.16	785	7.99	13.44	105
Sample Time: 0845			Initial water level: 9.36		

Operability Check (Indication in ft)
a-Final Depth to Water: 13.44
b-Depth to Water (at time of 1st reading): 9.36
a-b=Drawdown (D): 4.08

Bladder Pump Settings
Discharge Time: _____
Fill Time: _____

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 2501
4" Well: D x (2468 ml/ft): _____
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): _____
GVP > CVP: (YES) / NO)
Comments: (10×225) + (15×123) + (20×105)
2250 + 1845 = 2108
6195 = GVP

Gamma Result (µci/ml): _____
Tritium Result (µci/ml): _____ Count Room No.: _____

Reviewed by: _____ Review Date: _____
Environmental Supervisor or Designee

Groundwater Monitoring Log

Groundwater Sample Identification: CTBD - MW 13

Sample Date: 10-13-09

Sample Analysis: Tritium Sampled by: D. Edwards / M. Snyder

16:50 Begin Purge	Groundwater Quality Parameters				
Time of Reading	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)	Depth to Water (ft)	Flow Rate (ml/min)
16:55	20.07	2364	7.33	12.4	200
* See SSI Logbook for Intermediate Readings *					
17:30	19.92	2432	6.42	16.10	80
17:35	19.99	2431	6.42	16.50	75
17:40	20.04	2430	6.39	16.75	75
Sample Time: 17:40			Initial water level: 11.63		

Operability Check (Indication in ft)
a-Final Depth to Water: 16.75
b-Depth to Water (at time of 1st reading): 11.63
a-b=Drawdown (D): 5.12

Bladder Pump Settings
Discharge Time: NA
Fill Time: _____

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 3139
4" Well: D x (2468 ml/ft): _____

Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 5550 = GVP

GVP > CVP: (YES) / NO)

Comments: (10×175) + (10×125) + (10×100) + (10×80) + (10×75) =
1750 + 1250 + 1000 + 800 + 750 5550

Gamma Result (µci/ml): _____
Tritium Result (µci/ml): _____ Count Room No.: _____

Reviewed by: _____ Review Date: _____
Environmental Supervisor or Designee

Groundwater Monitoring Log

Groundwater Sample Identification: CTBD-MW14A / CTBD MW14B

Sample Date: 10-15-09

Sample Analysis: Tritium Sampled by: D. Edwards / M. Snyder

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
14.17	Begin Purge				
14.24	Water to surface @				400
14:30	17.53	448	10.03	84.5	400
14:35	18:19	516	10.02	85.4	200
14:40 — Pump stops working					
Sample Time: 14:24(A) 14:35(B)			Initial water level: 81.40		

Operability Check (Indication in ft)
a-Final Depth to Water: 85.4
b-Depth to Water (at time of 1st reading): _____
a-b=Drawdown (D): _____

Bladder Pump Settings
Discharge Time: _____
Fill Time: _____

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): _____
4" Well: D x (2468 ml/ft): _____

Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): _____

GVP > CVP: (YES / NO)

Comments: Well needs to be developed
Purge water is full of silt.
Clogged pump

Gamma Result (µci/ml): _____
Tritium Result (µci/ml): _____
Count Room No.: _____

Reviewed by: _____ Review Date: _____
Environmental Supervisor or Designee

Groundwater Monitoring Log

Groundwater Sample Identification: CTBD - MW 15

Sample Date: 10-15-09

Sample Analysis: Tritium Sampled by: D. Edwards / M. Snyder

0927 Begin Purge Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
10:35	16.53	619	6.45	15.92	250
* See SSi Logbook for Intermediate Readings *					
10:50	16.42	609	6.31	15.94	230
10:55	16.43	609	6.38	15.95	230
11:00	16.43	608	6.30	15.95	230
Sample Time: 11:00			Initial water level: 15.90		

Operability Check (Indication in ft)
a-Final Depth to Water: 15.95
b-Depth to Water (at time of 1st reading) 15.90
a-b=Drawdown (D): 0.05

Bladder Pump Settings
Discharge Time: /
Fill Time: /

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 35
4" Well: D x (2468 ml/ft):

Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time):

GVP > CVP: (YES / NO)

Comments: (10 × 250) + (10 × 240) + (15 × 230)
2500 + 2400 + 3450
8350 = GVP

Gamma Result (µci/ml):
Tritium Result (µci/ml):
Count Room No.:

Reviewed by: Review Date:
Environmental Supervisor or Designee

Groundwater Monitoring Log

Groundwater Sample Identification: CTDB-MW16

Sample Date: 10-15-09

Sample Analysis: Tritium Sampled by: D. Edwards / T. Silan

0913 Begin Purge Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0915	16.59	839	6.67	15.24	235
* See SSi Logbook for Intermediate Readings *					
10:00	17.26	572	6.42	15.86	
10:05	17.25	554	6.52	15.86	
10:10	17.18	549	6.47	15.86	
Sample Time: 1010			Initial water level: 14.58		

Operability Check (Indication in ft)
a-Final Depth to Water: 15.86
b-Depth to Water (at time of 1st reading): 14.58
a-b=Drawdown (D): 1.28

Bladder Pump Settings
Discharge Time: _____
Fill Time: _____

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 785
4" Well: D x (2468 ml/ft): _____

Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): _____

GVP > CVP: (YES / NO)

Comments: $(10\times235)+(10\times215)+(15\times195)+(10\times185)+(15\times180)$
$2350 + 2150 + 4275 + 1850 + 2700$
$13325 = GVP$

Gamma Result (µci/ml): _____
Tritium Result (µci/ml): _____ Count Room No.: _____

Reviewed by: _____ Review Date: _____
Environmental Supervisor or Designee

Groundwater Monitoring Log

Groundwater Sample Identification: MW 10 (GW73)

Sample Date: 10-13-09

Sample Analysis: Tritium Sampled by: D. Edwards / M. Snyder

Begin Pump 0850 Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0900	17.45	1612	6.15	18.63	175
* See SS: Logbook for Intermediate Readings *					
0930	16.58	1545	6.78	20.61	70
0935	16.52	1542	6.80	20.70	70
0940	16.42	1537	6.80	20.77	70
Sample Time: 0940			Initial water level: 17.70		

Operability Check (Indication in ft)
a-Final Depth to Water: 20.77
b-Depth to Water (at time of 1st reading): 17.70
a-b=Drawdown (D): 3.07

Bladder Pump Settings
Discharge Time: _____
Fill Time: _____

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 1882
4" Well: D x (2468 ml/ft): _____

Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): _____

GVP > CVP: (YES) / NO)

Comments: (150 x 20) + (30 x 70)
3000 + 2100 = 5100 = GVP

Gamma Result (µci/ml): _____
Tritium Result (µci/ml): _____
Count Room No.: _____

Reviewed by: _____ Review Date: _____
Environmental Supervisor or Designee

Groundwater Monitoring Log

Groundwater Sample Identification: GW 74

Sample Date: 10-15-09

Sample Analysis: Tritium Sampled by: D. Edwards / M. Snyder

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
2 1-Liter Bailers were withdrawn from the well					
The sample was collected from the second bailer					
Sample Time: 15:40			Initial water level: 50.40		

Operability Check (Indication in ft)
a-Final Depth to Water: 53.5
b-Depth to Water (at time of 1st reading):
a-b=Drawdown (D):

Bladder Pump Settings
Discharge Time:
Fill Time:

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft):
4" Well: D x (2468 ml/ft):
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time):
GVP > CVP: (YES / NO)
Comments: Well needs to be developed - purge water full of silt. Removed ≈ 2 gallons water from well with Bailer then Removed > 2 gallons water from well with pump. Silt build up clogged pump.

Gamma Result (µci/ml):
Tritium Result (µci/ml):
Count Room No.:

Reviewed by:
Environmental Supervisor or Designee
Review Date:

Groundwater Monitoring Log

Groundwater Sample Identification: GW75

Sample Date: 10-14-09

Sample Analysis: Tritium Sampled by: D. Edwards / M. Snyder

Begin Purge 11:45	Groundwater Quality Parameters				
Time of Reading	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)	Depth to Water (ft)	Flow Rate (ml/min)
11:50	20.08	1072	7.09	12.05	175
1230	17.51	996	7.17	12.80	75
1235	17.47	994	7.16	12.86	75
1240	17.26	989	7.02	12.90	75
Sample Time: 12:40			Initial water level: 11.48		

Operability Check (Indication in ft)
a-Final Depth to Water: 12.90
b-Depth to Water (at time of 1st reading): 11.48
a-b=Drawdown (D): 0.52

Bladder Pump Settings
Discharge Time: _____
Fill Time: _____

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 319
4" Well: D x (2468 ml/ft): _____

Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): _____

GVP > CVP: (YES) / NO)

Comments: (5 x 175) + (10 x 125) + (15 x 85) + (10 x 80) + (15 x 75)
875 + 1250 + 1275 + 800 + 1125
5325 = GVP

Gamma Result (µci/ml): _____
Tritium Result (µci/ml): _____

Count Room No.: _____

Reviewed by: _____ Review Date: _____
Environmental Supervisor or Designee

Groundwater Monitoring Log

Groundwater Sample Identification: GW 76

Sample Date: 10-14-09

Sample Analysis: Tritium Sampled by: D. Edwards / M. Snyder

1535 begin Purge Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1540	21.00	780	6.95	6.65	225
* See SS Logbook for Intermediate Readings *					
1625	24.08	1132	6.75	6.61	275
1630	24.16	1141	6.72	6.61	275
1635	24.08	1143	6.69	6.61	275
Sample Time: 1635			Initial water level: 6.65		

Operability Check (Indication in ft)
a-Final Depth to Water: 6.61
b-Depth to Water (at time of 1st reading): 6.65
a-b=Drawdown (D): 0.04

Bladder Pump Settings
Discharge Time: N/A
Fill Time: N/A

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 25
4" Well: D x (2468 ml/ft):
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time):
GVP > CVP: (YES / NO)
Comments: (25 x 225) + (35 x 275)
5625 + 9625
15250 = GVP

Gamma Result (µci/ml):
Tritium Result (µci/ml):
Count Room No.:

Reviewed by: Review Date:
Environmental Supervisor or Designee

Groundwater Monitoring Log

Groundwater Sample Identification: MW 10

Sample Date: 11-9-09

Sample Analysis: Tritium Sampled by: MS / DE

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1415/1420	20.24/20.70	1.523/1.530	6.65/6.76	19.62/20.00	95/80
1425	21.09	1.537	6.73	20.17	65
1430	21.33	1.534	6.73	20.32	65
1435	21.40	1.546	6.72	20.42	65
1440	21.33	1.545	6.71	20.59	65
Sample Time: 14.40			Initial water level: 18.76		

Operability Check (Indication in ft)
a-Final Depth to Water: 20.59
b-Depth to Water (at time of 1st reading): 19.62
a-b=Drawdown (D): 0.97

Bladder Pump Settings
Discharge Time: _____
Fill Time: _____

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 594
4" Well: D x (2468 ml/ft): _____
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 1625
GVP > CVP: (YES) / NO)
Comments: _____

Gamma Result (µci/ml): _____
Tritium Result (µci/ml): _____ Count Room No.: _____

Reviewed by: _____ Review Date: _____
Environmental Supervisor or Designee

Groundwater Monitoring Log

Groundwater Sample Identification: MW11

Sample Date: Nov 9, 2009

Sample Analysis: Tritium Sampled by: MS / DE

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
07:55	17.27	0.505	7.65	5.15	180
08:00	17.87	0.511	7.59	5.50	175
08:05	17.76	0.510	7.60	5.70	150
08:10	17.98	0.512	7.56	5.88	150
08:15	17.97	0.512	7.59	5.98	150
Sample Time: 0815			Initial water level: 3.82		

Operability Check (Indication in ft)
a-Final Depth to Water: 5.98
b-Depth to Water (at time of 1st reading): 5.15
a-b=Drawdown (D): .83

Bladder Pump Settings
Discharge Time: N/A
Fill Time:

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 509
4" Well: D x (2468 ml/ft):
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 2075
GVP > CVP: (YES / NO)
Comments: (180×5) + (175×5) + (150×2) =
900 + 875 + 300 = 2075

Gamma Result (µci/ml):
Tritium Result (µci/ml):
Count Room No.:

Reviewed by: Review Date:
Environmental Supervisor or Designee

Groundwater Monitoring Log

Groundwater Sample Identification: MW12

Sample Date: 11-9-09

Sample Analysis: Tritium Sampled by: MS/DE

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1055/1100	18.13/18.28	0.813/0.810	7.82/7.91	8.65/8.98	150/95
1105/1110	18.37/18.42	0.806/0.807	7.94/7.96	9.18/9.60	100/100
1115	18.48	0.807	7.96	9.88	100
1120	18.57	0.809	7.97	10.15	95
1125	18.62	0.811	7.98	10.35	95
Sample Time: 11:25			Initial water level: 7.70		

Operability Check (Indication in ft)
a-Final Depth to Water: 10.35
b-Depth to Water (at time of 1st reading): 8.65
a-b=Drawdown (D):

Bladder Pump Settings
Discharge Time:
Fill Time: N/A

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 1042
4" Well: D x (2468 ml/ft):
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 2850
GVP > CVP: (YES) / NO)
Comments:

Gamma Result (µci/ml):
Tritium Result (µci/ml):
Count Room No.:

Reviewed by: Review Date:
Environmental Supervisor or Designee

Groundwater Monitoring Log

Groundwater Sample Identification: MW 13

Sample Date: 11/9/09

Sample Analysis: Tritium Sampled by: MS/DE

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0835	16.78	2,151	6.96	4.63	150
0840	16.68	2.163	6.94	4.99	80
0845	16.66	2.163	6.73	5.59	80
0850	16.69	2.171	6.69	5.85	80
0855	16.74	2.171	6.66	6.34	80
Sample Time: 0855			Initial water level: 3.75		

Operability Check (Indication in ft)
a-Final Depth to Water: 6.34
b-Depth to Water (at time of 1st reading): 6.96
a-b=Drawdown (D): 0.62

Bladder Pump Settings
Discharge Time: N/A
Fill Time: N/A

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 380
4" Well: D x (2468 ml/ft): _____
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 1600
GVP > CVP: (YES / NO)
Comments: _____

Gamma Result (µci/ml): _____
Tritium Result (µci/ml): _____ Count Room No.: _____

Reviewed by: _____ Review Date: _____
Environmental Supervisor or Designee

Groundwater Monitoring Log

Groundwater Sample Identification: MW 14

Sample Date: 11-09-09 @ 09:30

Sample Analysis: Tritium Sampled by: MS/DE

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
Sample Time:			Initial water level:		

Operability Check (Indication in ft)
a-Final Depth to Water: _____
b-Depth to Water (at time of 1st reading): _____
a-b=Drawdown (D): _____

Bladder Pump Settings
Discharge Time: _____
Fill Time: _____

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): _____
4" Well: D x (2468 ml/ft): _____
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): _____
GVP > CVP: (YES / NO)
Comments: Sampled w/ Bailer prior to well development activities

Gamma Result (µci/ml): _____
Tritium Result (µci/ml): _____

Count Room No.: _____

Reviewed by: _____ Review Date: _____
Environmental Supervisor or Designee

Groundwater Monitoring Log

Groundwater Sample Identification: MW 15

Sample Date: 11/9/09

Sample Analysis: Tritium Sampled by: LS/DE

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1015	17.24	0.614	6.62	16.27	220
1020	17.26	0.612	6.49	16.27	215
1025	17.25	0.611	6.46	16.27	210
1030	17.25	0.607	6.46	16.27	200
1035	17.29	0.605	6.44	16.27	200
Sample Time: 1035			Initial water level: 16.25		

Operability Check (Indication in ft)
a-Final Depth to Water: 16.27
b-Depth to Water (at time of 1st reading): 16.27
a-b=Drawdown (D): -0-

Bladder Pump Settings
Discharge Time:
Fill Time: 10/9

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): -0-
4" Well: D x (2468 ml/ft):

Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 4020
GVP > CVP: (YES) / NO)
Comments:

Gamma Result (µci/ml):
Tritium Result (µci/ml):
Count Room No.:

Reviewed by: Review Date:
Environmental Supervisor or Designee

Groundwater Monitoring Log

Groundwater Sample Identification: MW 16

Sample Date: 11-9-09

Sample Analysis: Tritium Sampled by: MS/DE

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0930	17.24	0.872	6.76	16.33	180
0935	17.81	0.879	6.70	16.54	175
0940	17.89	0.875	6.68	16.67	175
0945	17.95	0.867	6.68	16.73	175
0950	18.01	0.841	6.67	16.79	170
0955	17.96	0.809	6.66	16.80	170
Sample Time: 0955			Initial water level: 15.72		

Operability Check (Indication in ft)
a-Final Depth to Water: 16.80
b-Depth to Water (at time of 1st reading): 16.33
a-b=Drawdown (D): 0.47

Bladder Pump Settings
Discharge Time: N/A
Fill Time:

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 288
4" Well: D x (2468 ml/ft):
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 4250
GVP > CVP: (YES / NO)
Comments:

Gamma Result (µci/ml):
Tritium Result (µci/ml):
Count Room No.:

Reviewed by: Review Date:
Environmental Supervisor or Designee

Groundwater Monitoring Log

Groundwater Sample Identification: GW 74

Sample Date: 11-10-09

Sample Analysis: Tritium Sampled by: MS/DE

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
		N/A			
Sample Time:			Initial water level:		

Operability Check (Indication in ft)
a-Final Depth to Water: _____
b-Depth to Water (at time of 1st reading): _____
a-b=Drawdown (D): _____

Bladder Pump Settings
Discharge Time: _____
Fill Time: _____

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): _____
4" Well: D x (2468 ml/ft): _____
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): _____
GVP > CVP: (YES / NO)
Comments: Well sampled w/ Bailer prior to Conducting Well Development

Gamma Result (µci/ml): _____
Tritium Result (µci/ml): _____
Count Room No.: _____

Reviewed by: _____ Review Date: _____
Environmental Supervisor or Designee

Groundwater Monitoring Log

Groundwater Sample Identification: GW75

Sample Date: 11-09-09

Sample Analysis: Tritium Sampled by: MS/DE

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
16:15/1620	23.30/2339	1.070/1,076	7.45/7.36	12.06/12.16	95/95
16:25	23,38	1,080	7.34	12.28	95
16:30	23.37	1,081	7.33	12,40	95
16:35	23,33	1,082	7,33	12.50	95
16:40	23.30	1,081	7.33	12.56	90
Sample Time: 16:40			Initial water level: 11.02		

Operability Check (Indication in ft)
a-Final Depth to Water: 12.56
b-Depth to Water (at time of 1st reading): 12.06
a-b=Drawdown (D): 0.50

Bladder Pump Settings
Discharge Time: /
Fill Time: N/A

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 306
4" Well: D x (2468 ml/ft): _____
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 2250
GVP > CVP: (YES) / NO)
Comments: _____

Gamma Result (µci/ml): _____
Tritium Result (µci/ml): _____ Count Room No.: _____

Reviewed by: _____ Review Date: _____
Environmental Supervisor or Designee

Groundwater Monitoring Log

Groundwater Sample Identification: GW76

Sample Date: 11-9-09

Sample Analysis: Tritium Sampled by: MS/DE

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
15:40	23.96	1.067	7.00	7.19	310
15:45	23.83	1.090	6.99	7.19	310
15:50	23.93	1.093	6.99	7.19	310
15:55	23.93	1.093	6.98	7.19	310
Sample Time: 15:55			Initial water level: 7.19		

Operability Check (Indication in ft)
a-Final Depth to Water: 7.19
b-Depth to Water (at time of 1st reading): 7.19
a-b=Drawdown (D): -0-

Bladder Pump Settings
Discharge Time: N/A
Fill Time: N/A

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): -0-
4" Well: D x (2468 ml/ft): _____
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 4650
GVP > CVP: (YES / NO)
Comments: _____

Gamma Result (µci/ml): _____
Tritium Result (µci/ml): _____ Count Room No.: _____

Reviewed by: _____ Review Date: _____
Environmental Supervisor or Designee