QUARTERLY GROUNDWATER MONITORING REPORT
January – March 2008

BRUNSWICK NUCLEAR PLANT
STORM DRAIN STABILIZATION POND
SOUTHPORT, NORTH CAROLINA

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1.0 INTRODUCTION

1.1 PURPOSE OF REPORT

Silar Services Incorporated (SSi) has prepared this Quarterly Groundwater Monitoring Report to document the results of groundwater monitoring for the first quarter of 2008 for the Storm Drain Stabilization Pond (SDSP) area of the Brunswick Nuclear Plant (BNP) located in Southport, North Carolina. As a result of the detection of tritium in a nearby man-way in May, 2007, tritium was suspected to be leaching into the groundwater from the SDSP. The purpose of this report is to provide technical information and verification with respect to the nature and extent of tritium impacts to groundwater including: documentation of the effectiveness of environmental monitoring systems, identification of site conditions that may affect mitigation efforts, and verification and modification of the Conceptual Site Model (CSM) presented in the Groundwater Investigation Report (March 2008). The work was performed in general accordance with Proposal for Quarterly Groundwater Monitoring Support and Reporting (SSi, January 2008) the "Environmental Investigations Standard Operating Procedures and Quality Assurance Manual, 2001" (U.S. EPA), SSi and BNP Standard Operating Procedures, and the Site-Specific Health and Safety Plan.

The groundwater monitoring activities and evaluations presented in this report were generally conducted with the intent to meet the intent of industry guidance documents associated with the protection of groundwater resources from radiological materials, including the following:

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

As such, these documents are used to provide a basis for the evaluation of the SDSP area, and referenced throughout this report.

1.2 SITE BACKGROUND

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

1.2.1 Site Location

The Brunswick Nuclear Plant is located approximately 1.6-miles north of the City of Southport, Brunswick County, North Carolina, and is situated on approximately 1,200 acres of land. The SDSP is located approximately 1800-feet northeast of the power generation plant, and occupies approximate 60 acres of land. The general location of the SDSP is shown in **Figure 1-1**. A depiction of the layout of the SDSP is presented on **Figure 1-2**. Note that this figure contains reference to both "true north" and "plant north". Plant north is a convention established at the time of design and construction of the facility and is the common means of reckoning used at the BNP. Therefore, this report will use "plant north" as the basis for discussion and the term north should be taken to mean "plant north" throughout.

The SDSP is surrounded by the following features:

- **West**: Nancy's Creek marine estuary; and single-family residential properties beyond Nancy's Creek;
- **North:** Gum Log Branch marine estuary (a tributary to Nancy's Creek), and further to the north are additional made lands associated with the BNP including additional sediment dewatering basins;
- **East:** A recovery pond (northeast), and the cooling water intake canal (east); and,
- **South:** BNP lands, including an active power transmission line corridor, several materials storage buildings (southwest), a communications tower, and grassy and wooded areas (southwest) associated with the BNP.

1.2.2 Current Description of the Storm Drain Stabilization Pond

The SDSP consists of an unlined storm water retention pond that is used to retain, treat, and discharge surface water runoff originating from the BNP facility. The SDSP is located approximately 1800 feet north of the power generating facility, and receives storm water from the BNP. Storm water is pumped from the storm drain collection basin (SDCB) within the plant area through a 12-inch HDPE pipe to the pond, where the water is naturally retained, biologically treated, and then discharged via a managed outfall under a current National Pollutant Discharge Elimination System (NPDES) Permit NC0007064. The NPDES permit allows for the use of the pond to retain and treat surface water runoff to remove oil and grease and suspended solids. The

treated water is periodically discharged to the cooling water intake canal through a monitored outfall system at the southeastern corner of the SDSP.

The geographic area of the SDSP is defined by the presence of an elevated earthen berm. The topographic relief of the earthen berm is 12 to 15 feet higher than the surrounding topography on its southern and western sides, and approximately 15 to 22 feet higher in relief than areas to the north and east of the SDSP. The approximate surface area of the interior of the SDSP area is approximately 60 acres. The interior of the SDSP is approximately 5 to 10 feet deeper than the surrounding earthen berm, which provides significant water storage and retention capacity.

The interior area of the SDSP is generally a flat, open, vegetated area. A finger dike present near the discharge pipe on the southern edge of the SDSP promotes the flow of water to the west and then northeast within the SDSP. Vegetation in the SDSP consists of a thick vegetated monoculture consisting of phragmites, although there are several areas within the SDSP where open water is consistently present. The interior edge of the SDSP and exterior slope of the earthen berm is generally covered by woody vegetation, which provides a visual buffer from the surrounding area.

A maintained dirt access road is present along the centerline of the earthen berm, which provides access for security and visual inspections of the SDSP area. The top of the earthen berm is generally a minimum of 15 feet wide around the perimeter of the SDSP.

1.2.3 History of SDSP Operations and Radiological Input

The SDSP is a constructed surface feature that was originally designed and constructed to serve as a permeable sediment dewatering basin during the construction of the cooling water intake canal. After its use as a dewatering basin for the construction of the intake canal in the early 1970s, the dewatering basin was permitted for use as a storm water retention pond to receive and provide natural treatment of storm water collected from the storm drainage system installed within and around the BNP. The storm water in the SDSP is periodically discharged via a controlled release to the intake canal in accordance with a NPDES permit.

During the operational history of the plant, occasional releases of radiological materials within the nuclear power facility, including tritium and other radiological materials, resulted in the transport of radiological material from the generating plant area to the SDSP via the storm water conveyance systems.

As a result of the detection of tritium in a nearby man-way in May 2007, tritium was suspected to be leaching into the groundwater from the SDSP.

1.3 SITE-SPECIFIC HYDROGEOLOGY

Site-specific hydrogeology at the Site was evaluated in the Groundwater Investigation Report (GIR) which discussed the three distinct aquifers in the study area. Hydrogeological evaluation was completed to characterize the horizontal and vertical groundwater flow system between three aquifers in the vicinity of the SDSP, which include the following:

- *Shallow Surficial Aquifer:* The shallow surficial aquifer is an unconfined water-table aquifer;
- *Intermediate Aquifer (Quaternary/Tertiary Age):* The intermediate aquifer is a semi-confined aquifer unit that consists of the Quaternary-Tertiary Age aquifer and the Tertiary Age Castle Hayne Aquifer; and,
- *Deep Aquifer (Cretaceous Age):* The deep aquifer is a confined aquifer in the Peedee Formation.

1.3.1 Shallow Surficial Aquifer

A network of twenty-two (22) shallow monitoring wells (ESS-17C through ESS-28C, ESS-30C, ESS-31C, ESS-STAB, STR6, ESS-NC-1 through ESS-NC-5, and ESS-GLB-1) were installed into the shallow surficial sand aquifer during the GIR to evaluate the direction of groundwater flow, hydraulic characteristics, and environmental conditions in the shallow surficial aquifer at the Site. The shallow aquifer, which is generally encountered at a depth of approximately seven to ten feet bgs, extends to approximately -5 feet MSL and is approximately 15 feet thick. The aquifer exhibits unconfined, water table conditions, and is recharged directly through infiltration from precipitation.

The shallow aquifer is generally underlain by a low-permeability unit, which was encountered at all boreholes advanced at the Site. The low-permeability unit separates the shallow surficial aquifer and the intermediate aquifer that is below the low-permeability unit; however, there is some hydraulic and chemical exchange between the shallow and intermediate aquifers that occurs vertically through the low-permeability unit, as observed during well development/pumping (observed drawdown) and in chemical analytical results (tritium detections at ESS-17B, ESS-19B, and ESS-21B).

It is noted that the constructed depth of the bottom of the intake canal and the BNP foundation are deeper than the base of the low–permeability unit. At these areas, hydraulic separation does not exist between the shallow aquifer and intermediate aquifer. As such, the hydraulic head (static water level elevation) in each unit is an important factor that determines the fate and transport of water and chemical constituents to and from these units.

The vertical gradient between the shallow surficial aquifer and underlying intermediate aquifer is in the downward direction.

1.3.2 Intermediate Aquifer

A network of seven (7) intermediate monitoring wells (ESS-18B through ESS-25B) was installed into the intermediate aquifer during the GIR to evaluate the direction of groundwater flow, hydraulic characteristics, and environmental conditions in the intermediate aquifer at the Site. The top of the sand unit in the intermediate aquifer is generally encountered at a depth of approximately -20 feet MSL, and extends to approximately -50 feet MSL. The intermediate aquifer also includes the underlying Castle Hayne Aquifer. Since there is no confining unit separating the Castle Hayne Aquifer and the overlying sand unit from a groundwater flow perspective, these two units behave as a single aquifer. The combined thickness of the intermediate aquifer is approximately forty (40) feet thick, and extends to a depth of approximately -60 feet MSL. The aquifer exhibits semi-confined to confined conditions, and is recharged locally.

The intermediate aquifer is generally underlain by the low-permeability Peedee confining unit, which was encountered at ESS-24A at a depth of -60 feet MSL. The Peedee confining unit is considered a vertical hydraulic boundary between the intermediate (Tertiary Age Castle Hayne) aquifer and the deep (Peedee) aquifer that is below the low-permeability unit.

1.3.3 Deep (Peedee) Aquifer

One monitoring well (ESS-24A) was installed in the Peedee Aquifer during the GIR to evaluate (in conjunction with existing monitoring wells completed in the Peedee aquifer) the direction of groundwater flow, hydraulic characteristics, and environmental conditions in the deep aquifer at the Site. The Peedee confining unit is approximately thirty (30) feet thick at ESS-24A and limits the exchange of groundwater between the intermediate and deep aquifers. The Peedee Aquifer, which was encountered at a depth of approximately 107 feet bgs, is estimated to be approximately 440 feet thick (USGS, 2003), and is a confined aquifer. The aquifer is confined by the overlying Peedee confining unit and underlying Black Creek Confining Unit.

2.0 GROUNDWATER MONITORING ACTIVITIES

A monthly groundwater monitoring and sampling program was initiated in August 2007 for the SDSP area. The program consists of collecting water level measurements and groundwater samples from a network of monitoring stations in the vicinity of the SDSP. The USEPA low-flow sampling methodology (EPA/540/S-95/504, April 1996) was selected for the SDSP monitoring program to provide consistent, highly representative groundwater samples. A Geosmart dedicated low-flow groundwater sampling system was installed in each SDSP monitoring well (except the "marsh" wells – see below) in September 2007 to facilitate the collection of high-quality, representative samples in general accordance with the low-flow sampling methodology. The Geosmart pump systems were specifically constructed for each well, and include a dedicated bladder pump (installed at the approximate mid-point between the static hydraulic head and the base of each well or at mid-screen) and associated hardware. The dedicated bladder pumps were outfitted with a heavy duty Teflon® bladder, Teflon® sample and air-line tubing, and an integrated well cap, to facilitate ease of sample collection. Progress Energy (PE) and SSi developed a site-specific groundwater monitoring procedure (OE&RC-3250, Rev. 26) for the BNP and PE assumed responsibility for sample collection beginning in December 2007.

2.1 MONITORING NETWORK

Thirty-three (33) monitoring wells are utilized as part of the groundwater monitoring program for the SDSP. These include shallow, intermediate and deep groundwater monitoring networks as described below. Monitoring well locations for the shallow, intermediate and deep aquifers are depicted on **Figures 2-1 through 2-3**, respectively. Monitoring well construction details are provided in **Table 2-1**.

2.1.1 Shallow Groundwater Monitoring Well Network

The shallow groundwater monitoring well network consists of fourteen (14) shallow permanent monitoring wells (ESS-17C through ESS-24C, ESS-26C through ESS-28C, ESS-30C, ESS-31C and ESS-STAB) and one (1) temporary monitoring well (STR-6) installed in the vicinity of the

SDSP; and, one (1) additional shallow permanent monitoring well, ESS-25C installed on the opposite site of the cooling water intake canal.

In addition to these sixteen (16) shallow monitoring wells installed near the SDSP, six (6) shallow wells (ESS-NC-1 through ESS-NC-5, and ESS-GLB-1) were installed along the edge of Nancy's Creek and Gum Log Branch in the tidal marsh locations depicted on **Figure 2-1**. The six "marsh wells" are evaluated separately to identify and characterize potential releases of tritium from the shallow aquifer into Nancy's Creek and Gum Log Branch.

2.1.2 Intermediate Groundwater Monitoring Well Network

The intermediate groundwater monitoring well network consists of seven (7) intermediate groundwater monitoring wells (ESS-18B through ESS-22B, ESS-24B, and ESS-25B) installed to evaluate groundwater conditions associated with the intermediate aquifer that is separated from the shallow aquifer by a low-permeability unit. The location of the intermediate monitoring well network is depicted on **Figure 2-2**.

One existing intermediate well, ESS-17B (formerly referred to as ESS17), was selected for inclusion in the groundwater monitoring program for the SDSP area since its location and construction specification supported the evaluation of the intermediate aquifer.

2.1.3 Deep Groundwater Monitoring Well Network

The deep monitoring well network consists of one deep monitoring well (ESS-24A), installed during the GIR, and three (3) existing deep wells, ESS-13A (formerly referred to as C33A1), ESS-27A (formerly referred to as CT1), and ESS-17A (formerly referred to as C27A3). The three deep wells are constructed at an appropriate depth interval and spatially distributed to provide appropriate characterization of the groundwater conditions in the deep aquifer near the SDSP. Note that only groundwater elevation measurements and not analytical samples were collected from well ESS-13A as part of the investigation. The location of the deep monitoring wells is depicted on **Figure 2-3**.

2.1.4 Other Monitoring Points

Although not specifically included in the groundwater monitoring program, certain additional data that are periodically collected by Progress Energy are used to facilitate the discussion of the results of groundwater sampling. These include surface water samples collected from various waypoints within Nancy's Creek and Gum Log Branch These locations are shown on **Figure 2-1**. Data from these samples are not formally presented in this report since they were not collected as part of this program; however, as stated above, they are used for discussion purposes where appropriate. In addition, the BNP also collects meteorological and tide data at the facility and these data are also used where appropriate in the interpretation of groundwater data.

2.2 MONITORING PROCEDURES

This section describes the data collection activities.

2.2.1 Water Level Measurements

Depth-to-water measurements were recorded from all existing SDSP monitoring wells during the quarterly monitoring events in February and March 2008. Measurements were collected using a Keck ET Model 122 Water Level Indicator Probe capable of measuring depth to water within 0.01-foot accuracy. These measurements were used to provide data to map the potentiometric surface of the shallow, intermediate, and deep aquifer and the direction of groundwater flow in the water-bearing zones at the Site. The results are summarized in **Table 2-2**, and presented as potentiometric surface maps in Section 3.1.

2.2.2 Groundwater Sampling

Three monthly groundwater monitoring and sampling events were conducted in the first quarter of 2008. Groundwater samples were analyzed for tritium by Progress Energy in the laboratory at the Site. A consistent naming convention was established to ensure that all samples collected throughout the SDSP groundwater monitoring program would be given unique sample identification, as follows:

[ESS] – [Well I.D.] – [Date] As an example, the sample collected from monitoring well ESS-19B in February 2008 is named ESS-19B 2/14/08.

Prior to sampling, each well was purged using a low flow sampling technique to assure collection of a representative groundwater sample. Water quality measurements were collected during the purging activities. The procedure for well purging and sampling was generally as follows:

1. First, the security cap was removed, and the depth to water in the well was determined by sounding the well with a water level meter (Keck ET). The depth to water was recorded on a groundwater sample form.
2. The portable air compressor was connected to the air line port on the top of the well, the sample line was connected from the sample port on the well to the in-line water quality instrument (YSI MP556 with flow through cell), the air compressor was started, and purging of groundwater at the well was commenced.
3. An optimum pump rate was established and documented at each well on a well sampling form for each well. The groundwater quality parameters including temperature, conductivity and pH and depth to water were monitored and recorded at prescribed time intervals to determine when the water quality parameters had stabilized to within 10%.
4. Following the stabilization of the groundwater quality parameters, groundwater samples were collected from the wells and the sampling time was recorded on the groundwater sampling form.

Marsh wells were sampled using peristaltic pumps and dedicated tubing. Purge water was collected in dedicated purge water containers and transported to the SDSP. Groundwater monitoring logs from each of the sampling rounds are included as **Appendix A**.

3.0 FINDINGS OF THE FIRST QUARTER 2008 GROUNDWATER MONITORING

The following subsections present the results of groundwater samples collected during the first quarter of 2008 (January through March 2008).

The United States Environmental Protection Agency (USEPA) maximum contaminant level (MCL) for tritium is 20,000 pCi/L, which is a dose-based drinking water standard. The tritium MCL is generally used by State and Federal environmental regulators as the screening concentration for tritium identified in groundwater. The USEPA established a conservative groundwater radiological limit (standard) of 4 mrem (millirem) per year as a means to avoid future contamination of public water supplies due to controllable human activities. The MCL of 20,000 picocuries per liter (pCi/L) for tritium was thereby established in the 1970s to reflect the concentration of tritium that, if present in the drinking water consumed daily by humans throughout a calendar year, would result in an annual dose of tritium of 4 mrem/year. If other radioactive materials are present in the drinking water, the sum of the annual dose from all radionuclides is not permitted to exceed 4 mrem/year. The tritium standard assumes that no other radiological materials are present in the groundwater.

Updated intake calculations used by USEPA in the 1990s found that, based on improved intake models, the actual concentration of tritium in drinking water that, if consumed, would result in a dose of 4 mrem/year, is over 60,000 pCi/L; however, the drinking water standard remains unchanged.

3.1 GROUNDWATER ANALYTICAL RESULTS SUMMARY

Groundwater samples were collected from all of the SDSP wells during each of the three (3) monthly groundwater sampling events conducted in the first quarter of 2008. **Tables 3-1 through 3-4** present analytical results from the three (3) groundwater sampling events for the shallow aquifer, marsh wells, intermediate aquifer, and deep aquifer, respectively. The nature and extent of tritium identified in groundwater samples is discussed below.

3.1.1 Shallow Surficial Aquifer - Groundwater Analytical Results

There are currently fifteen (15) permanent shallow groundwater monitoring wells installed in the shallow surficial aquifer that are included in the groundwater monitoring program for the SDSP, as shown on **Figure 2-1**. The shallow wells are distributed around the SDSP to provide an appropriate spatial distribution of data points to complete the monitoring objectives.

Groundwater samples were collected from each of the fifteen (15) shallow groundwater monitoring wells during each of the three (3) monthly sampling events in the first quarter of 2008. The analytical results of the groundwater samples are presented in **Table 3-1**, and are depicted on **Figures 3-1 through 3-3** for the months of January 2008 through March 2008, respectively.

Tritium was detected in 14 of the 15 wells at least once during the three (3) rounds of sampling in the first quarter of 2008. Tritium was not detected above the detection limit (roughly 250 pCi/L) in groundwater samples from shallow monitoring well ESS-25C, located across the cooling water intake canal, during any of the sampling rounds. Detected concentrations of tritium in the remaining shallow monitoring wells during the quarter ranged from 370 pCi/L (ESS-31C in March 2008) to 750,900 pCi/L (ESS-22C in March 2008). Groundwater samples from seven (7) of the fifteen (15) shallow monitoring wells consistently exhibited tritium concentrations significantly above the USEPA MCL of 20,000 pCi/L indicated by **bold** text in **Table 3-1**. The highest concentrations of tritium in the shallow surficial aquifer observed during the first quarter of 2008 were in groundwater samples from monitoring wells ESS-22C, ESS-18C, ESS-19C, ESS-26C and ESS-STAB, which are located to the immediate west and southwest of the SDSP. Wells farther from the southwest perimeter of the pond exhibited lower concentrations of tritium (ESS-23C and ESS-27C). Groundwater samples from monitoring well ESS-28C, located approximately 600 feet southwest of ESS-26C) exhibited low or non-detect concentrations of tritium. Groundwater samples from monitoring wells farther north on the perimeter of the SDSP (ESS-17C and ESS-20C) exhibited tritium concentrations below the MCL of 20,000 pCi/L. Groundwater samples from monitoring wells beyond the southeast perimeter of the SDSP (ESS-21C, ESS-24C and ESS31C) exhibited tritium concentrations significantly

below the MCL of 20,000 pCi/L. The tritium concentration in the sample from monitoring well ESS-30C (on the southeast perimeter of the SDSP) in January 2008 exceeded the MCL. The concentrations in samples from this well collected in February and March 2008 were roughly an order of magnitude lower.

Water level measurements were collected from the shallow monitoring wells as described in Section 2.2.1, above. These data are presented in **Table 2-2** and provided the basis for the interpretation of horizontal flow in the shallow aquifer and vertical groundwater flow between the shallow aquifer and deeper aquifers at the Site.

Figure 3-4 and 3-5 illustrate the potentiometric surface of the shallow unconfined aquifer at the Site as measured during two events in the first quarter of 2008 (February and March). The direction of groundwater flow in the shallow unconfined aquifer is generally radial in the vicinity of the SDSP and is consistent between the rounds of water level measurements.

The spatial distribution of tritium in the shallow surficial aquifer indicates tritium is migrating radially (in all directions) from the SDSP in the shallow groundwater. The majority of tritium is being released from the SDSP to the west and southwest of the SDSP. This condition is believed to be caused by the configuration of the finger dyke, which directs water discharged into the SDSP to the western rim of the pond. Since a relatively small quantity of process water is discharged into the pond in comparison to the total volumetric capacity of the SDSP, the discharged water is believed to preferentially infiltrate the southwest and western area of the SDSP.

Figure 3-6 depicts concentrations trends in the shallow groundwater since the monitoring program was initiated in August 2007. For the wells that exhibited the greatest tritium impacts (ESS-18C, ESS-19C, ESS-22C, ESS-27C and ESS-STAB), concentrations have fluctuated since the beginning of the monitoring program with average concentrations ranging from a high of 651,680 pCi/L in December 2007 to a low of 445,200 pCi/L in February 2008. Concentrations of tritium in monitoring wells ESS-18C and ESS-19C have been the most consistent since the

monitoring program began. Concentrations in monitoring well ESS-22C have been the highest of any of these wells for the last five (5) months.

Concentrations in the remaining shallow wells in the shallow groundwater monitoring well network were relatively consistent.

3.1.2 Marsh Wells Groundwater Analytical Results

There are six (6) shallow monitoring wells installed along Nancy's Creek and Gum Log Branch at locations shown on **Figure 2-1**. The intent of the installation of the marsh wells was to install groundwater data points into the surficial sand aquifer sufficiently close to the creek to evaluate the potential discharge of tritiated groundwater to the creek. Each marsh well was installed in the tidal wetlands approximately five (5) feet from the edge of the creek.

Because the installation of these wells was completed by hand to minimize impact to the wetland, the maximum depth the wells were able to be installed was approximately eight (8) feet bgs. As a result, limited penetration (approximately 6-inches) into the surficial sand aquifer was accomplished, and the majority of the screened interval of the marsh wells intersects the silty marsh sediments, which are saturated by the brackish tidal water of Nancy's Creek and Gum Log Branch. Therefore, groundwater in these wells is likely diluted by the infiltration of surface water that saturates the marsh sediments. This is evidenced by the conductivity readings collected during groundwater purging activities, which were generally an order of magnitude higher in the marsh wells than the nearby shallow wells. As a result, the data from these wells is used primarily as a screening indicator to estimate the probability that a discharge of tritium to the creek may be occurring.

The groundwater analytical results for the marsh wells are presented in **Table 3-2**. Tritium was not detected in any of the marsh wells during the first of three (3) rounds of groundwater monitoring in the first quarter of 2008 (January 2008). For samples collected in February and March 2008, tritium was detected at concentrations slightly exceeding the limit of detection (250 pCi/L) in three (3) marsh wells (ESS-NC-1, ESS-NC-2 and ESS-NC-4). Detected concentrations ranged from 260 pCi/L to 326 pCi/L. Marsh wells ESS-NC-1, ESS-NC-2 and ESS-NC-4 are

located downgradient of the monitoring wells located on the west and southwest perimeter of the SDSP. Based on the detection of tritium, it is assumed that tritium is likely intermittently discharging to Nancy's Creek; however, due to the likelihood of dilution discussed above, the data collected in the marsh wells may be underestimating the concentration of tritium in groundwater that may be entering the creek. As stated in Section 2.1.4, a number of waypoints along Nancy's Creek are periodically sampled by Progress Energy (**Figure 2-1**). During the first quarter of 2008, fourteen (14) samples were collected from each of four (4) waypoints in the vicinity of the marsh wells. Several of these samples intermittently exhibited tritium at levels above the detection limit of approximately 250 pCi/L. These include Waypoints WP-52 (2 of 14 samples), WP-53 (3 of 14 samples), WP-55 (4 of 14 samples) and WP-57 (8 of 14 samples). Tritium detected in these samples ranged from 243 pCi/L (WP-52 on February 12, 2008) to 719 pCi/L (WP-55 on March 31, 2008).

3.1.3 Intermediate Aquifer - Groundwater Analytical Results

There are currently eight (8) intermediate groundwater monitoring wells that are included in the groundwater monitoring program for the SDSP, as shown on **Figure 2-2**. The intermediate wells are located around the SDSP to provide an appropriate spatial distribution of data points to complete the monitoring objectives.

Groundwater samples were collected from all eight (8) intermediate groundwater monitoring wells during each of the three (3) monthly sampling events in the first quarter of 2008. The analytical results of the groundwater samples are presented in **Table 3-3**, and are depicted on **Figure 3-7**.

Tritium was detected in only one (1) of the eight (8) wells during the three (3) rounds of sampling in the first quarter of 2008 (ESS-19B). Tritium has not been detected in intermediate wells ESS-18B, ESS-20B, ESS-22B, ESS-24B, and ESS-25B (which is located across the cooling water intake canal) during any of the events since the monitoring program began.

As shown in Table 3-3, Groundwater samples from monitoring well ESS-19B exhibited detected concentrations of tritium during all three (3) monthly events in the first quarter of 2008.

Water level measurements were collected from the intermediate monitoring wells as described in Section 2.2.1, above. These data are presented in **Table 2-2** and provided the basis for the interpretation of horizontal flow in the intermediate aquifer and vertical groundwater flow between the intermediate aquifer and deeper aquifers at the Site.

Figures 3-8 and 3-9 illustrate the potentiometric surface of the intermediate aquifer at the Site during the two (2) events in the first quarter of 2008. Unlike the shallow aquifer, which exhibits a radial groundwater flow pattern in the vicinity of the SDSP, the intermediate aquifer appears to flow in a relatively linear direction to the east toward the cooling water intake canal and the Atlantic Ocean. It is possible that groundwater in the intermediate aquifer flows to the west in the area of ESS-18B and ESS-19B at least periodically. It is known that the intermediate groundwater aquifer is tidally influenced and the potentiometric map from March 2008 indicates a possible reversal of flow direction in this area at low tide. No groundwater elevation data is present to the west of these monitoring points to refute or confirm this local flow direction. USGS information indicates a regional east groundwater flow in this unit.

Figure 3-10 depicts concentration trends in the intermediate groundwater since the monitoring program was initiated in August 2007. Data for tritium in monitoring well ESS-19B are relevant. A significant increase in the concentration of tritium observed in ESS-19B is apparent. As shown in **Figure 3-6**, concentrations of tritium in shallow ground water observed in monitoring well ESS-19C also displayed an increasing (although less pronounced) trend. This data is consistent with the apparent downward vertical gradient between the shallow and intermediate aquifers.

3.1.4 Deep Aquifer - Groundwater Analytical Results

There are currently three (3) relatively deep groundwater monitoring wells included in the SDSP monthly monitoring program. The location of these wells is depicted on **Figure 2-3.** These wells are installed in the Peedee Aquifer, which is a source of potable water to portions of Southport and Oak Island. The deep wells are located around the SDSP to provide an appropriate spatial distribution of data points in this aquifer to meet the monitoring objectives.

Groundwater samples were collected from each of the three (3) deep groundwater monitoring wells during the three (3) monthly sampling events in the first quarter of 2008. The analytical results of the groundwater samples are presented in **Table 3-4**.

Tritium was not detected in groundwater samples from any of the deep monitoring wells during the three (3) monthly sampling events in the first quarter of 2008.

The direction of groundwater flow is consistent and from east toward the Atlantic Ocean. Additionally, there do not appear to be any hydrologic influences on the deep aquifer resulting from the SDSP.

4.0 CONCLUSIONS

The groundwater monitoring activities provide sufficient data to confirm the conceptual site model (CSM) of the study area as described in the GIR. The source of tritium in groundwater in the study area is confirmed to be an ongoing, uncontrolled release from the SDSP. The uncontrolled release occurs through the direct leaching of tritiated surface water in the SDSP to the underlying shallow groundwater, which in turn transports tritium into the adjacent wetlands, surface water, and deeper intermediate aquifer via migration in groundwater. Tritium is present above applicable regulatory standards in shallow groundwater around the SDSP and has been detected in certain surface water samples collected by Progress Energy from the marine estuary. During the first quarter of 2008 tritium was identified a concentration exceeding the applicable regulatory standard in one intermediate well (ESS-19B), which is installed in the intermediate aquifer.

Tritium concentrations in the shallow monitoring wells located on the western and southwestern perimeter of the SDSP fluctuated during the period with a significant decrease observed in February 2008 followed by a lesser increase in March 2008. Remaining concentrations in the shallow aquifer remained relatively constant over the reporting period. SSi recommends that the data for future rounds of sampling be used to evaluate these concentration patterns. Overall, the well network for the shallow aquifer is currently sufficient to meet the objectives of the monitoring program.

Sporadic and minimal impact has been observed to date in groundwater collected from the marsh wells and the sporadic observations of tritium at waypoint locations in Nancy's Creek sampled by Progress Energy are of concern. The marsh well data from future rounds should be evaluated carefully. SSi recommends that future rounds of sampling from both the shallow and marsh wells be coordinated with Progress Energy's sampling of the waypoints as well as with the tide cycle.

For the intermediate aquifer, the increase in tritium activity measured at ESS-19B is a concern. This data is consistent with the downward vertical gradient between the shallow and intermediate aquifers. Tritium levels at monitoring well ESS-19B exceeded the USEPA MCL in March 2008.

SSi recommends that Progress Energy consider expanding the network of intermediate wells in order to better monitor this trend and potential migration within the intermediate aquifer and to gain a better understanding of the hydrogeology of the intermediate aquifer.

No impact has been observed to date in the deep aquifer. This is consistent with the current understanding of the hydrogeology of the site. The deep aquifer monitoring network is believed to be sufficient at this time and SSi recommends continuing the monthly monitoring program.

5.0 REFERENCES

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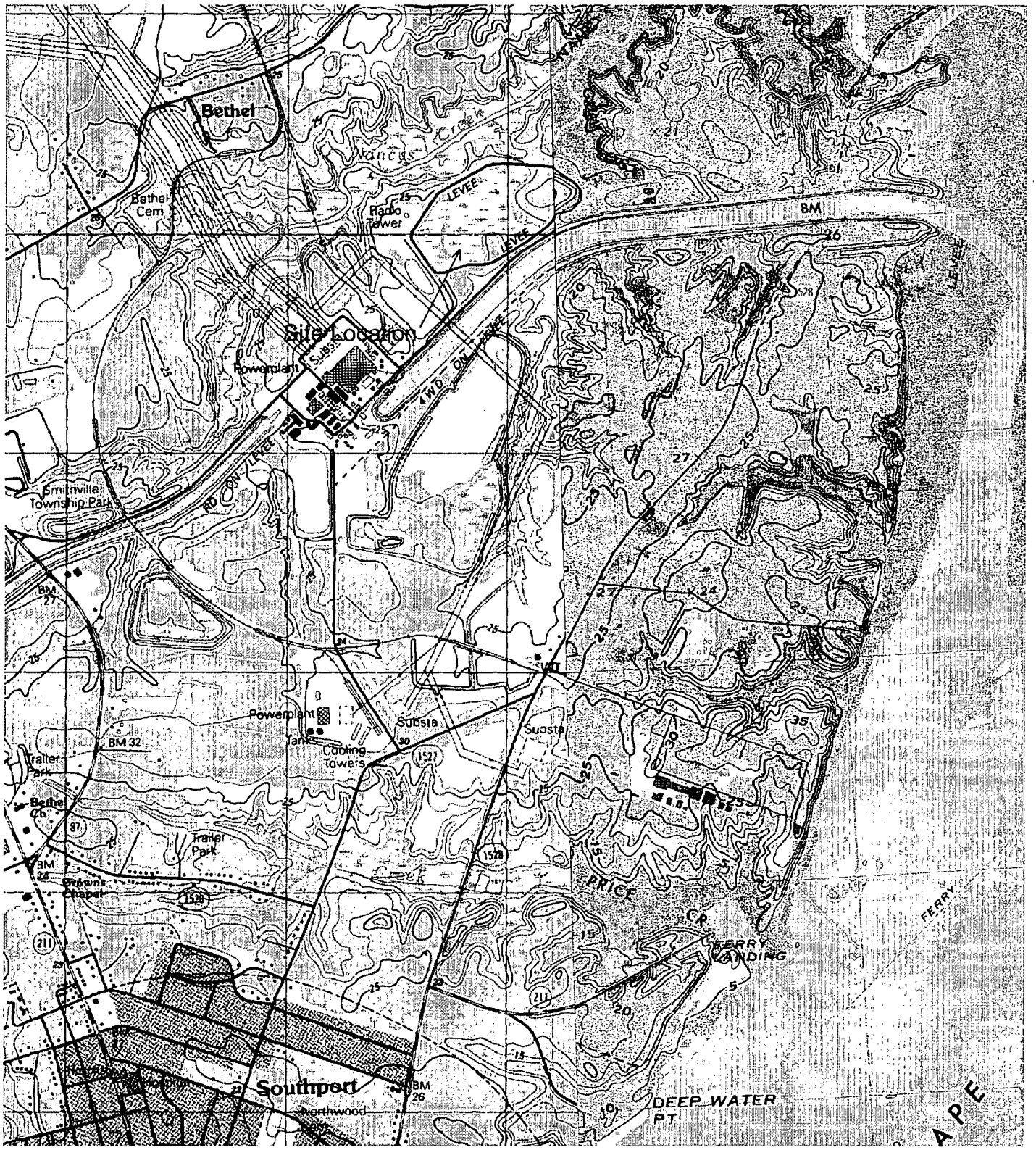
TABLES

FIGURES

APPENDIX A



Quadrangle Location

0 2000 4000 Feet

N

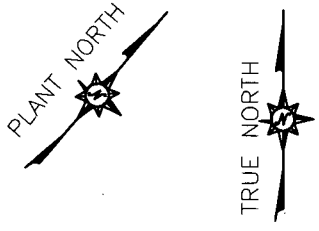
Source: U.S.G.S. Topographic Map (7.5 minute)
Southport & Kure Beach, NC quadrangles

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 1–1
Site Location Map

SSi Silar Services Inc.

Approximate scale: 1" = 600'



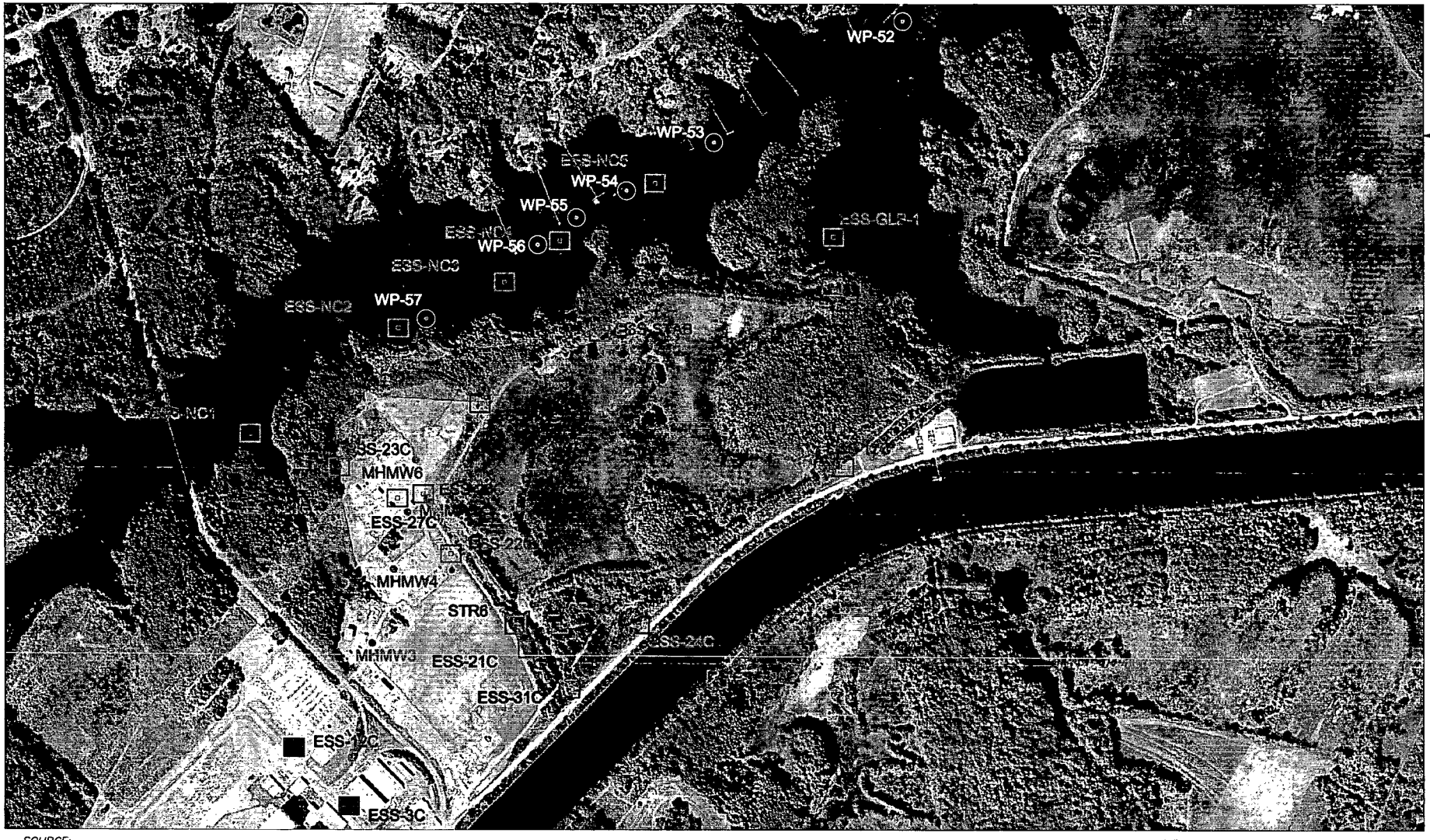
Source: Brunswick GIS

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 1-2

Site Layout Map

Silar Services Inc.



SOURCE:
McKim & Creed, June 15, 2007.

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

SCALE 1" = 500'

0 250 500 1000 1500

LEGEND:

- SHALLOW WELL
- EXISTING SHALLOW WELL
- MANHOLE
- WAYPOINT

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 2-1
Shallow Monitoring Well Location Map

Silar Services Inc.

F:\BNP\CW ANALYSIS\ANNUAL CW REPORT APRIL 2008\BNP_2-1 ANNUAL REPORT 2008.dwg

SOURCE:
McKim & Creed, June 15, 2007.

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

SCALE 1" = 500'

0 250 500 1000 1500

LEGEND:

INTERMEDIATE WELL

EXISTING INTERMEDIATE WELL

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 2-2

Intermediate Monitoring Well Location Map

Silar Services Inc.

SOURCE:
McKim & Creed, June 15, 2007.

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

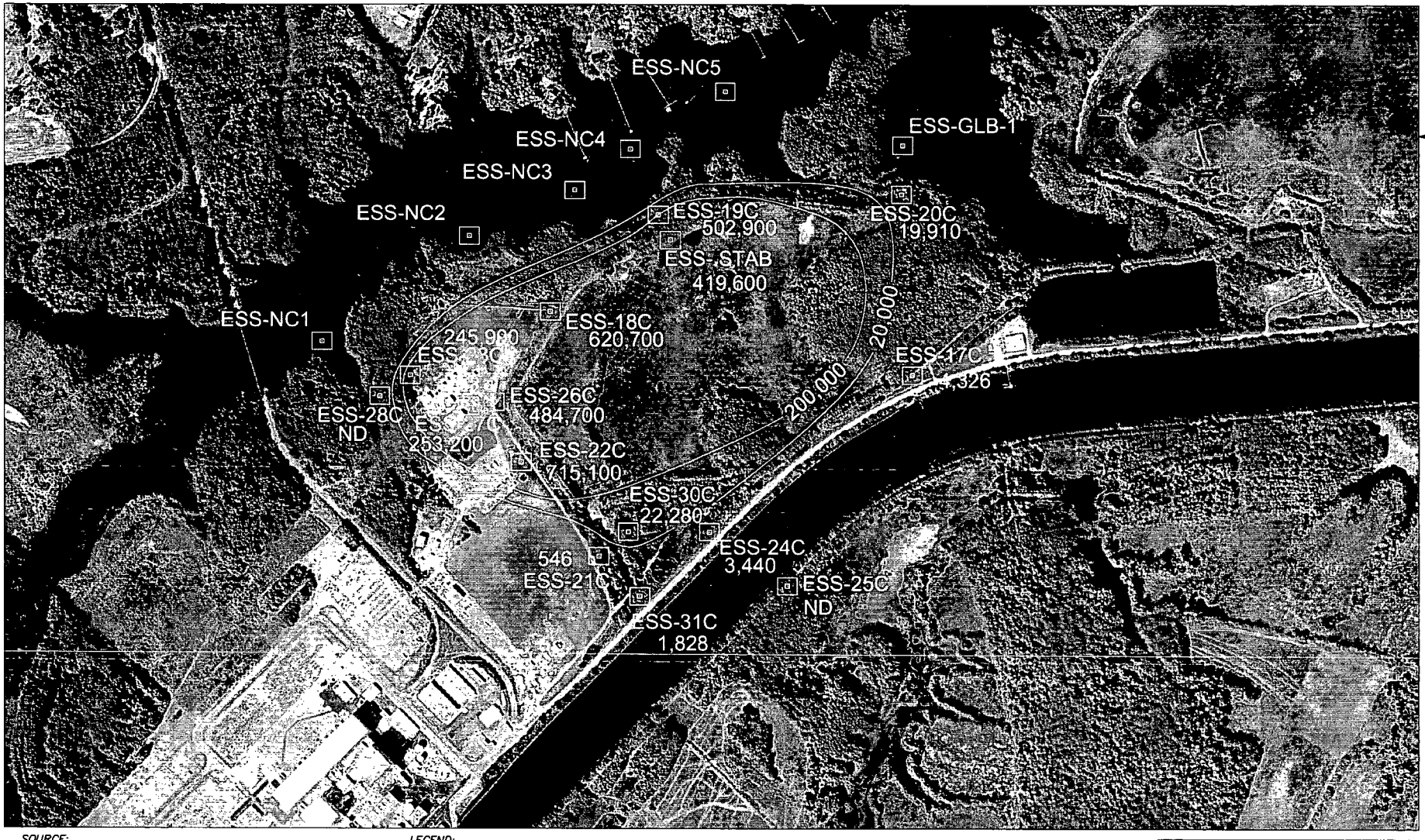
LEGEND:
DEEP WELL

SCALE 1" = 500'
0 250 500 1000 1500

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 2-3
Deep Monitoring Well Location Map

Silar Services Inc.



SOURCE:
McKim & Creed, June 15, 2007.

NOTES:
1. COORDINATES ARE BASED ON NC GRID NAD83
2. ELEVATIONS ARE BASED ON NGVD29.
3. RESULTS ARE pCi/L

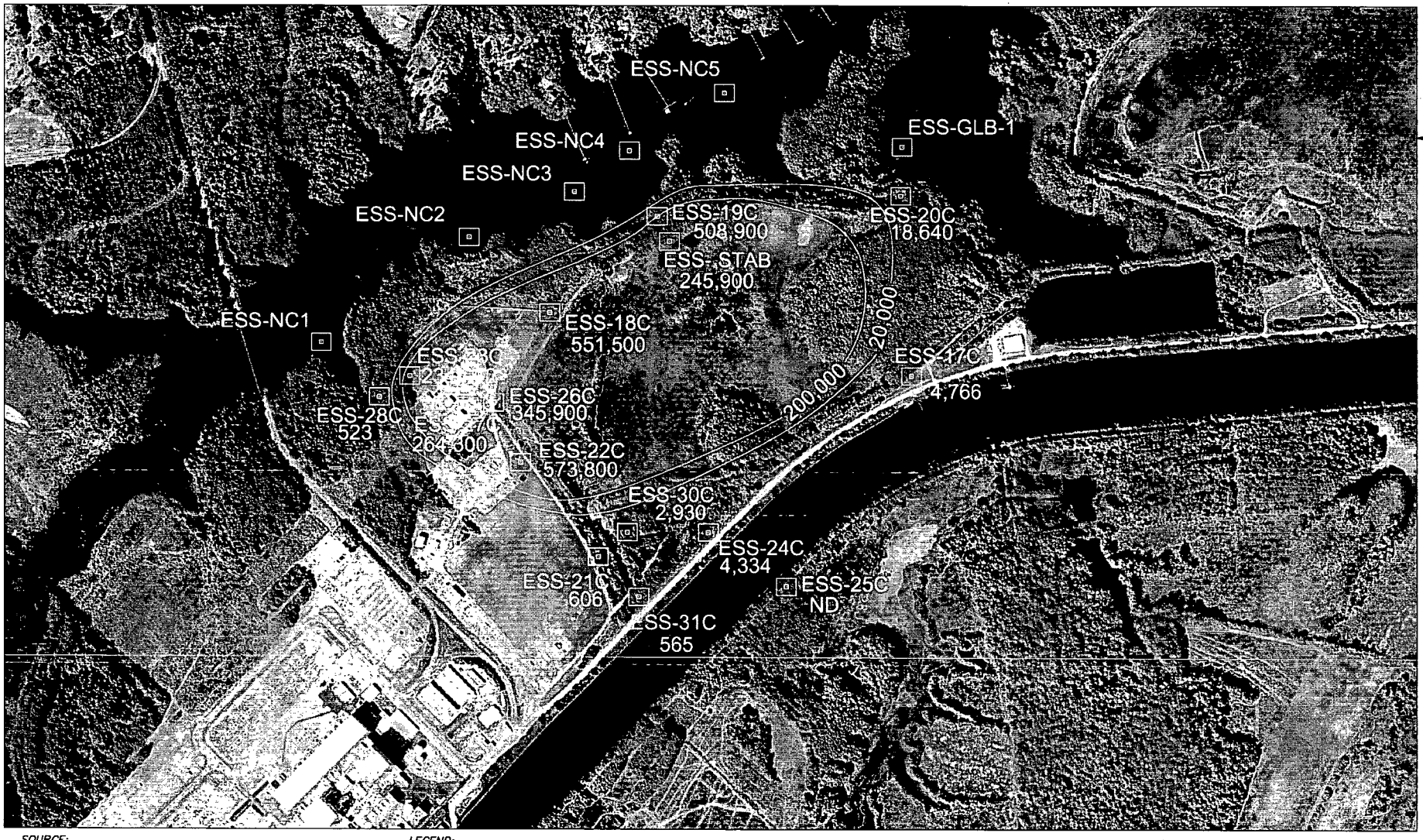
LEGEND:
- - - - ISOCONCENTRATION CONTOUR OF TRITIUM IN pCi/L

SCALE 1" = 500'
0 250 500 1000 1500

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 3-1
Shallow Aquifer Groundwater Results
January 2008

Silar Services Inc.



SOURCE:
McKim & Creed, June 15, 2007.

NOTES:
1. COORDINATES ARE BASED ON NC GRID NAD83
2. ELEVATIONS ARE BASED ON NGVD29.
3. RESULTS ARE pCi/L

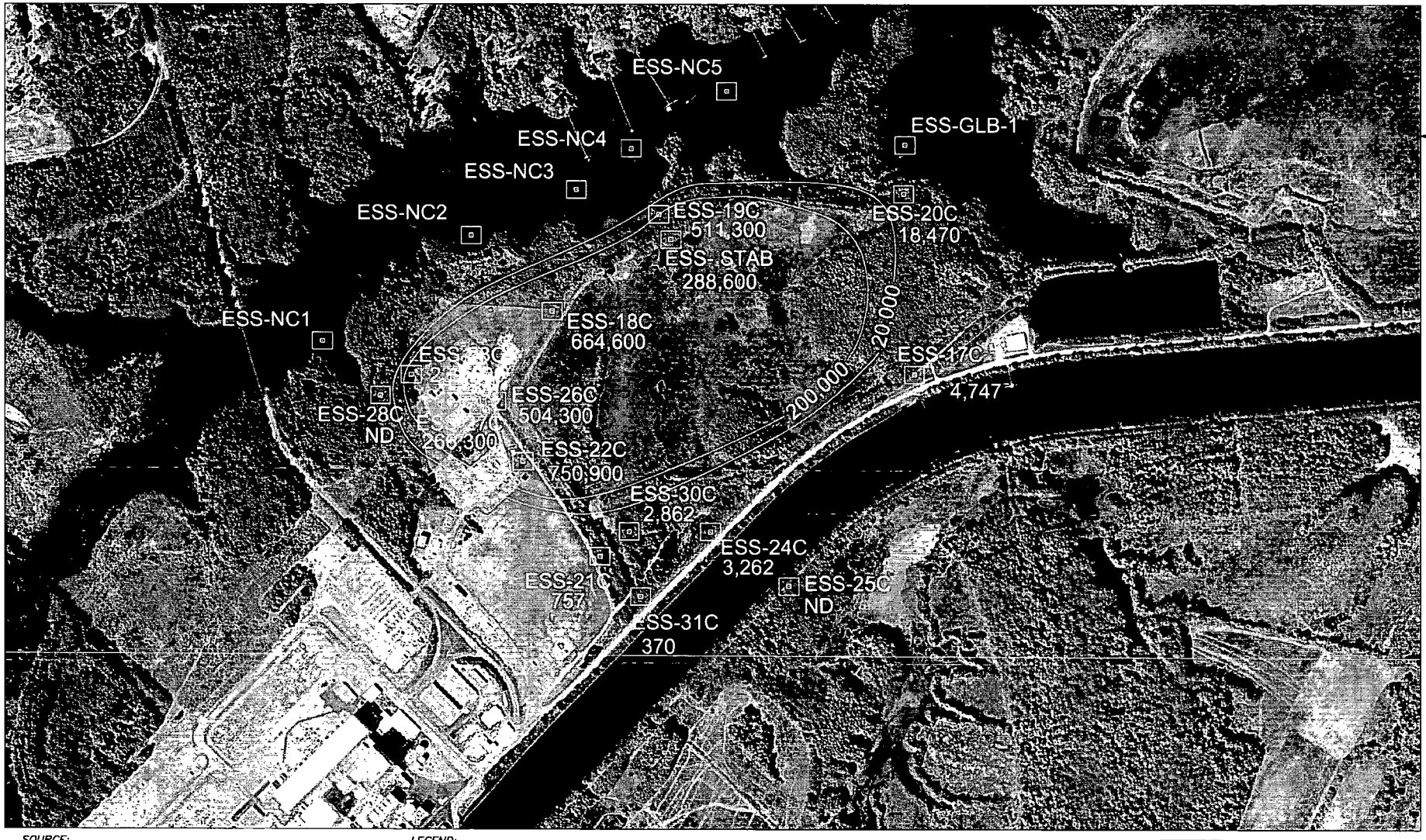
LEGEND:
ISOCONCENTRATION CONTOUR OF TRITIUM IN pCi/L

SCALE 1" = 500'
0 250 500 1000 1500

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 3-2
Shallow Aquifer Groundwater Results
February 2008

Silar Services Inc.



SOURCE:
McKim & Creed, June 15, 2007.

NOTES:
1. COORDINATES ARE BASED ON NC GRID NAD83
2. ELEVATIONS ARE BASED ON NGVD29.
3. RESULTS ARE pCi/L

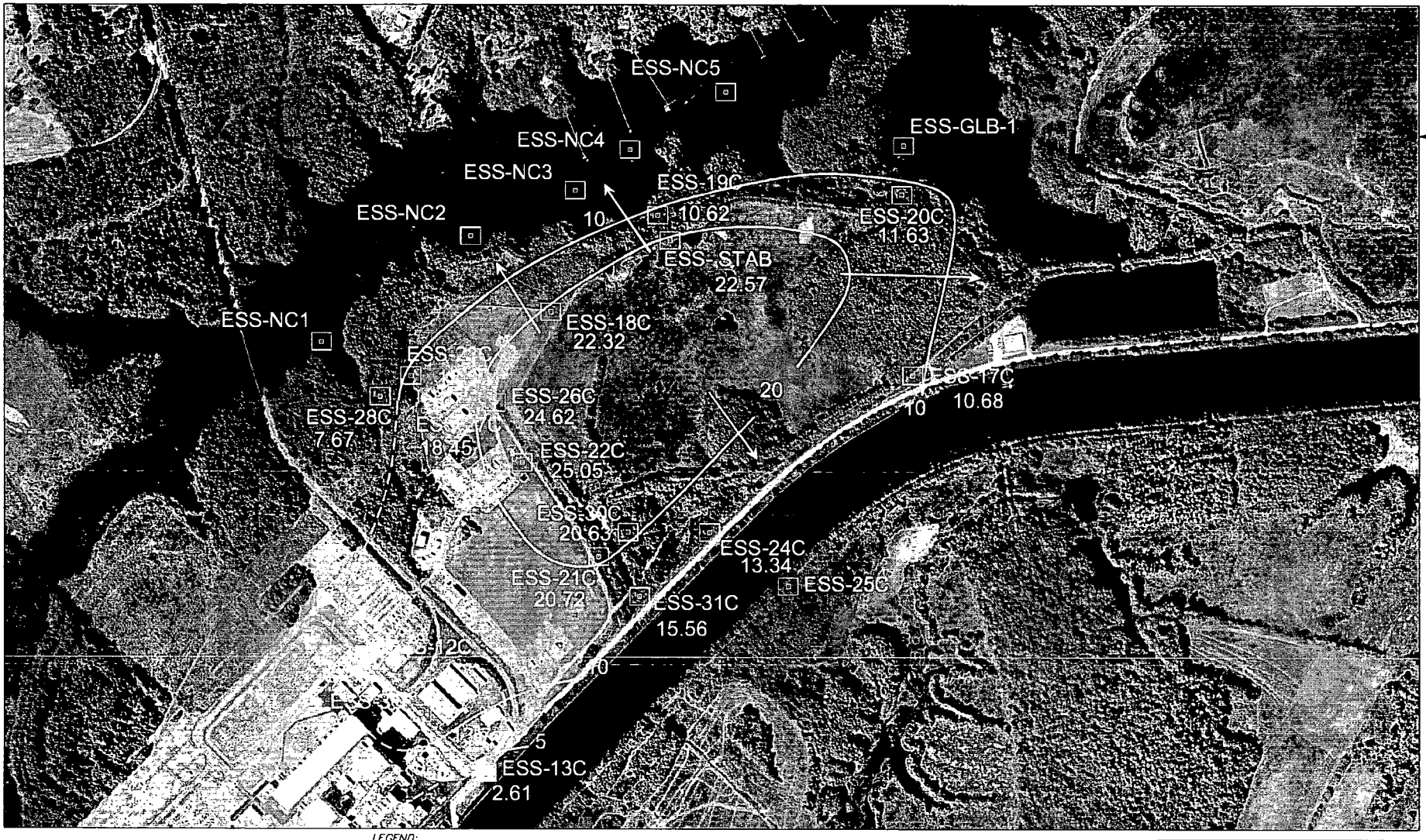
LEGEND:
ISOCONCENTRATION CONTOUR OF TRITIUM IN pCi/L

SCALE 1" = 500'
0 250 500 1000 1500

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 3-3
Shallow Aquifer Groundwater Results
March 2008

Silar Services Inc.



LEGEND:

SHALLOW WELL – NEW

SHALLOW WELL – EXISTING

GROUNDWATER FLOW DIRECTION

GROUNDWATER CONTOUR LINE (DASHED WHERE INFERRED)

2.1 ELEVATION MEAN SEA LEVEL

SOURCE:
McKim & Creed, June 15, 2007.

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

SCALE 1" = 500'

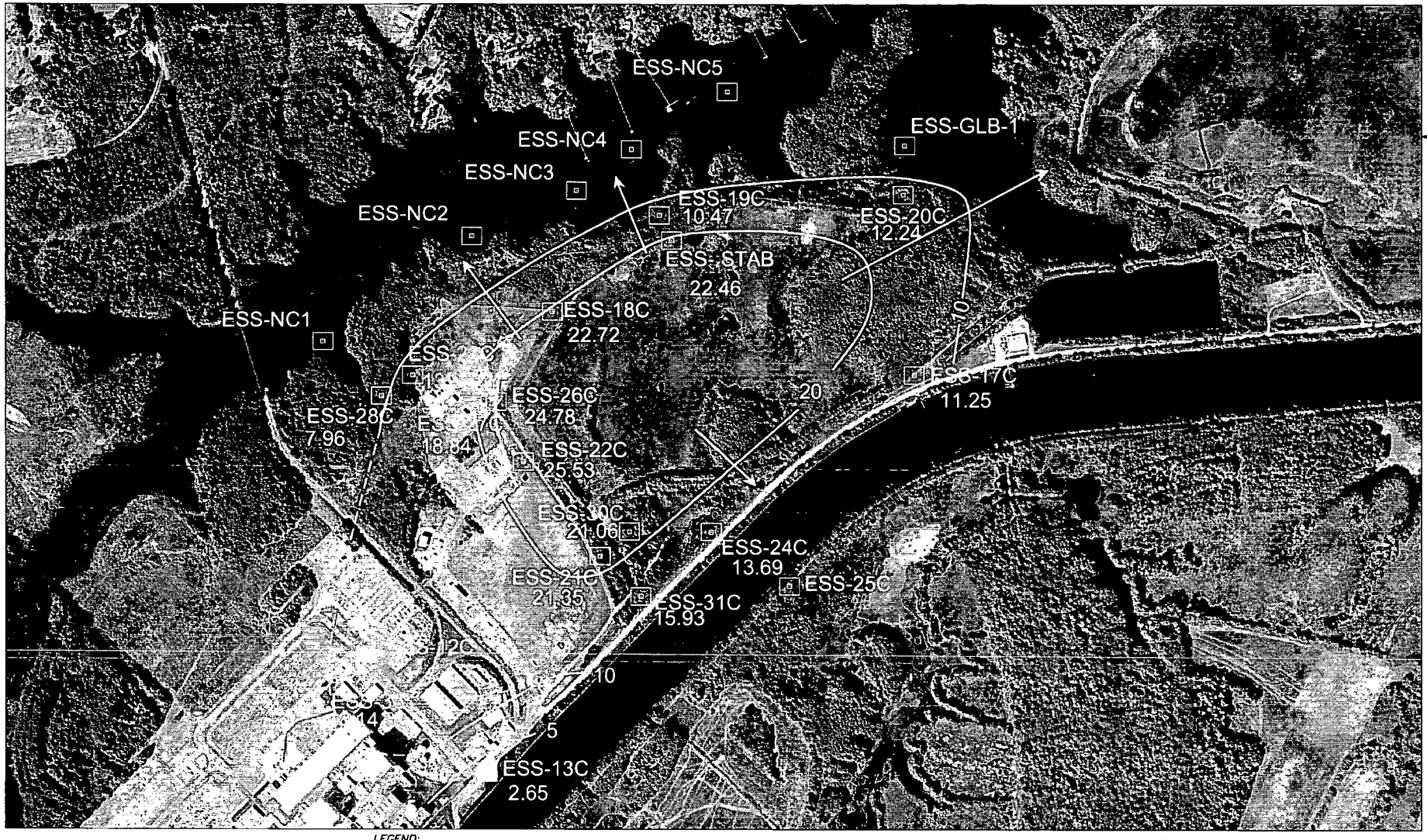
0 250 500 1000 1500

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure
Potentiometric Surface Map
Shallow Aquifer– February, 2008

Silar Services Inc.

D:\BNP\2008 First Qtr Monitoring\BNP_Feb _2008_S.dwg



LEGEND:

SHALLOW WELL – NEW

SHALLOW WELL – EXISTING

GROUNDWATER FLOW DIRECTION

GROUNDWATER CONTOUR LINE (DASHED WHERE INFERRED)

2.1 ELEVATION MEAN SEA LEVEL

SOURCE:
McKim & Creed, June 15, 2007.

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

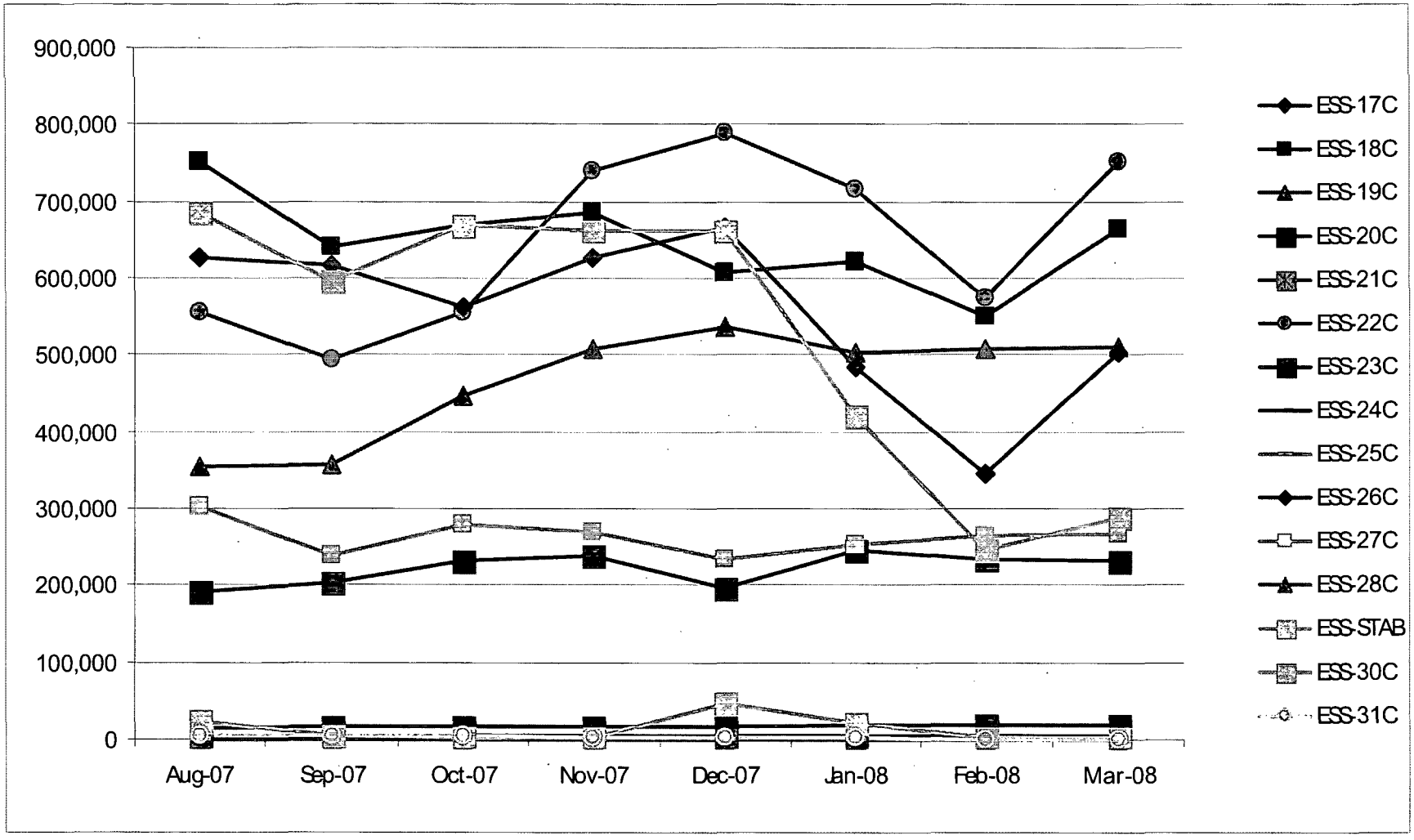
SCALE 1" = 500'

0 250 500 1000 1500

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 3-5
Potentiometric Surface Map
Shallow Aquifer– March 2008

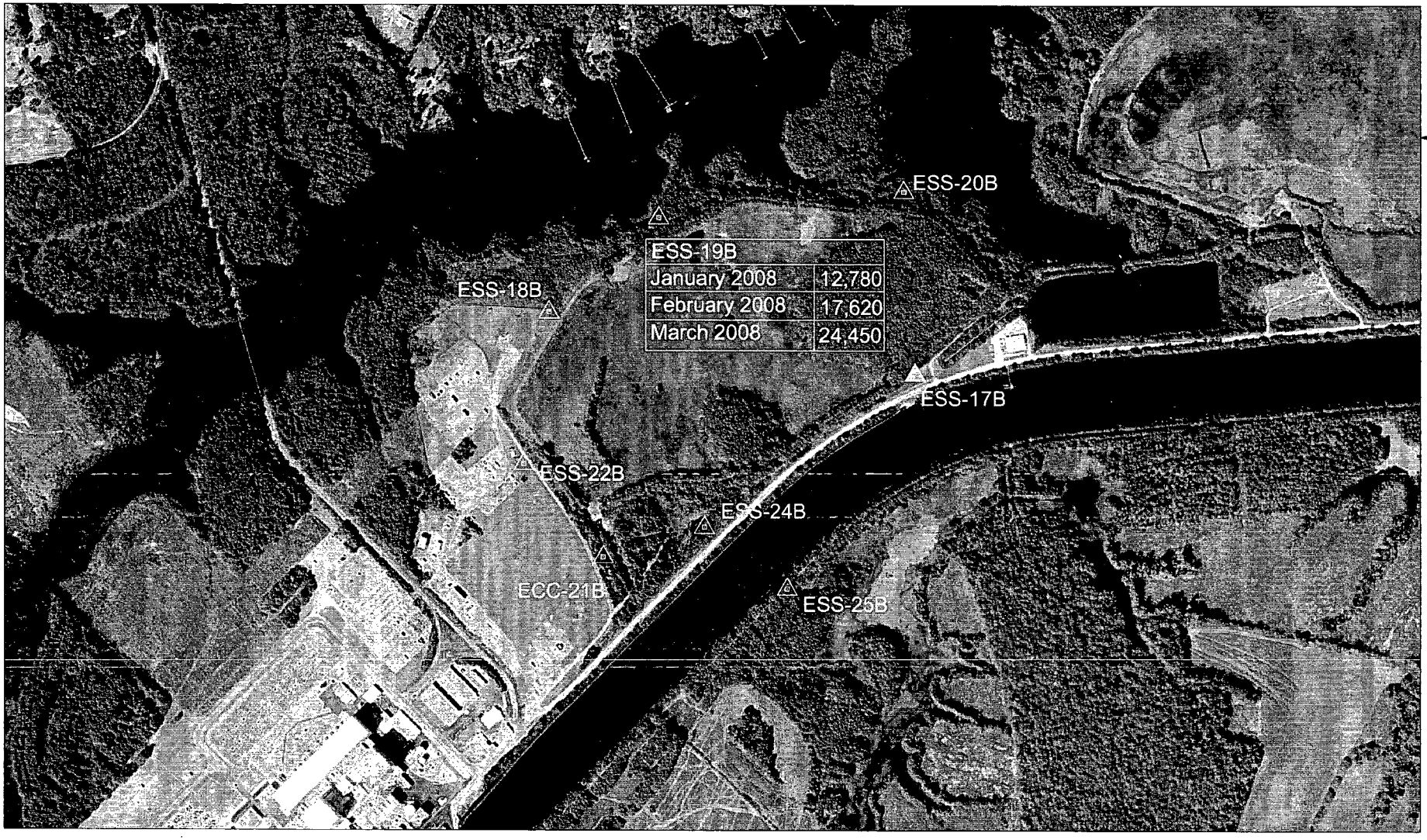
Silar Services Inc.



Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 3-6
Summary of Tritium Detected in Shallow Aquifer

Silar Services Inc.



SOURCE:
McKim & Creed, June 15, 2007.

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

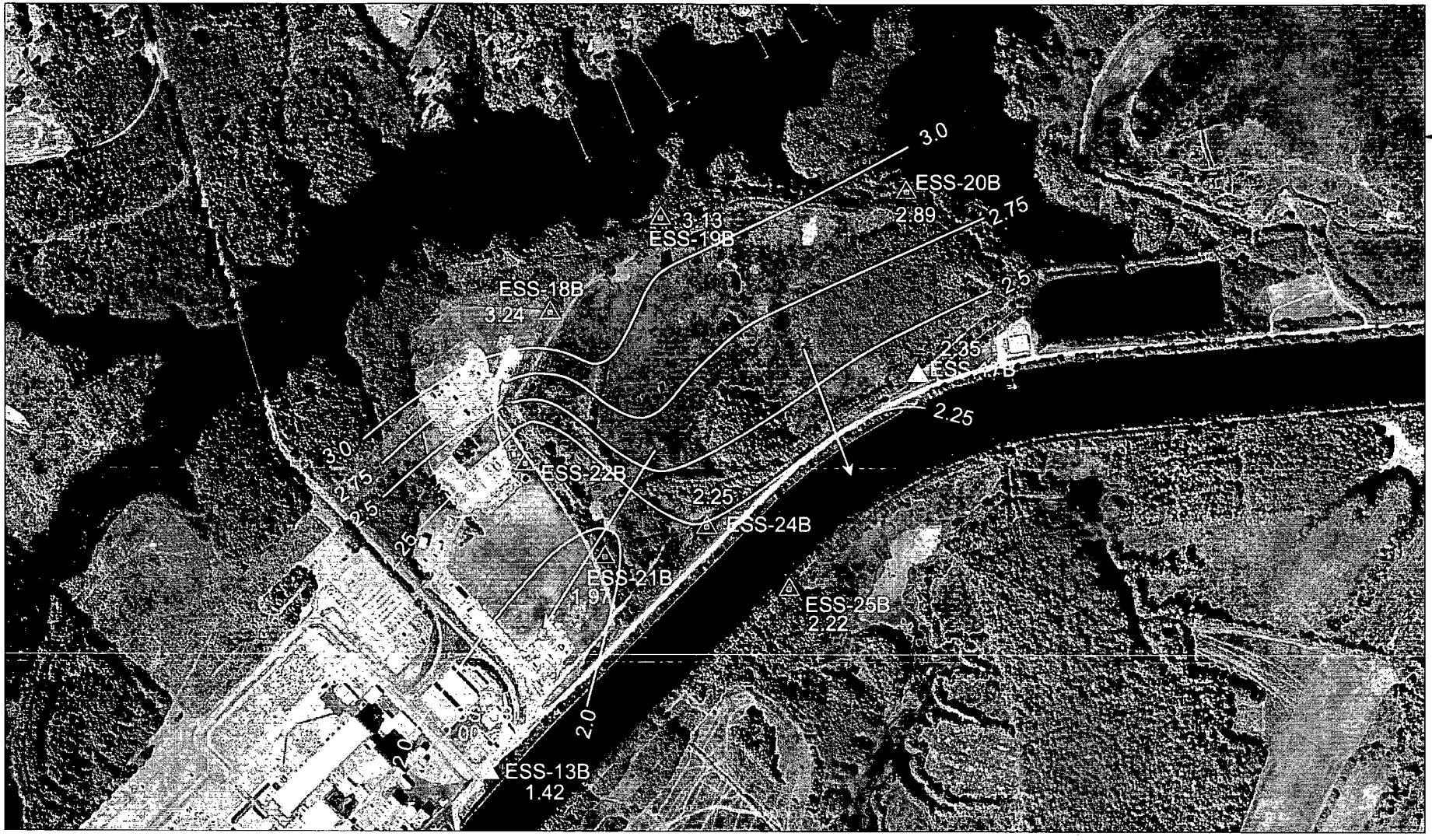
LEGEND:
RESULTS OF TRITIUM IN pCi/L
INTERMEDIATE WELL – NEW
INTERMEDIATE WELL – EXISTING

SCALE 1" = 500'
0 250 500 1000 1500

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 3-7
Intermediate Aquifer Groundwater Results

Silar Services Inc.



SOURCE:
McKim & Creed, June 15, 2007.

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

LEGEND:

INTERMEDIATE WELL – NEW

INTERMEDIATE WELL – EXISTING

GROUNDWATER FLOW DIRECTION

GROUNDWATER CONTOUR LINE (DASHED WHERE INFERRED)

2.1 ELEVATION MEAN SEA LEVEL

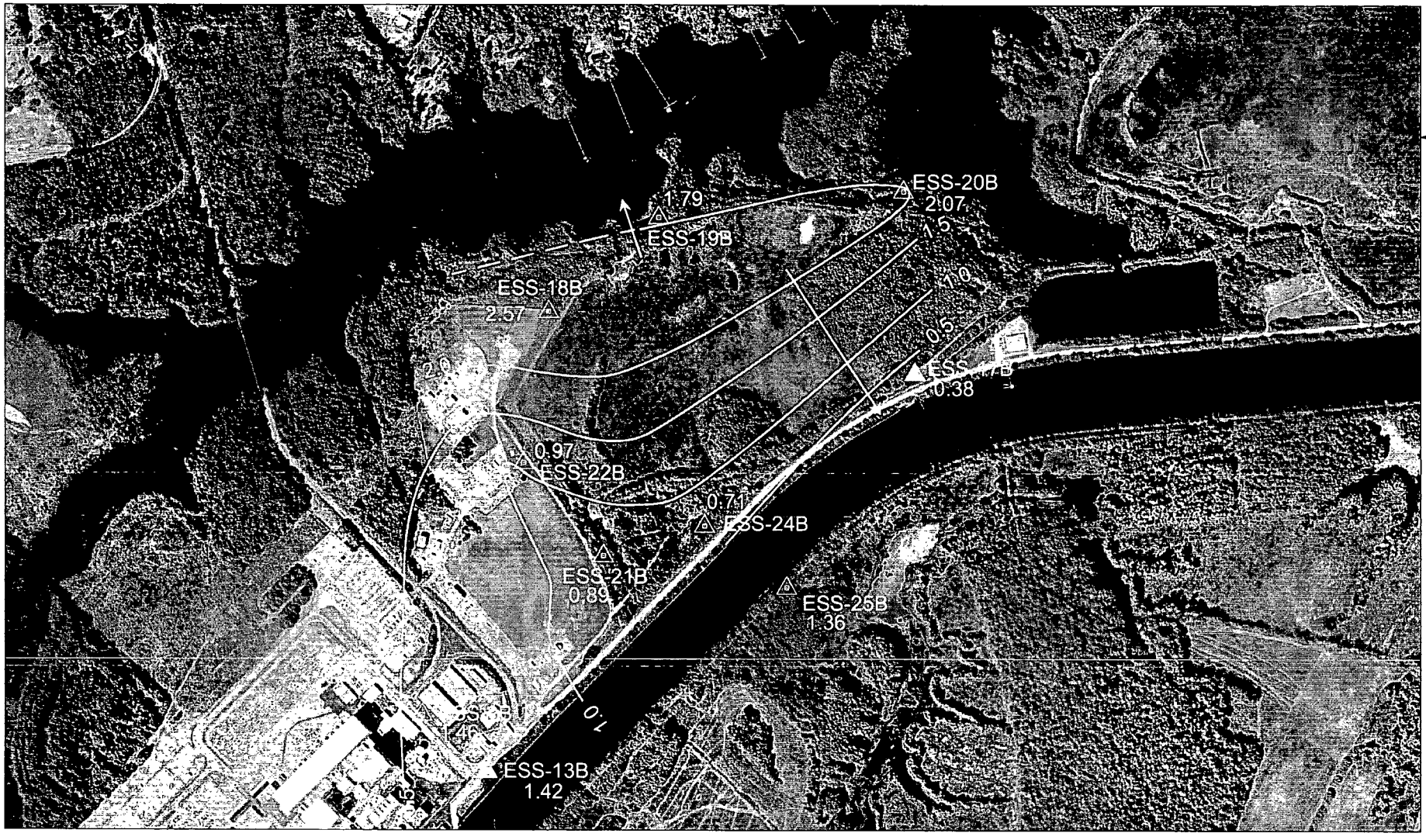
SCALE 1" = 500'

0 250 500 1000 1500

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 3-8
Potentiometric Surface Map
Intermediate Aquifer– February 2008

Silar Services Inc.



SOURCE:
McKim & Creed, June 15, 2007.

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

LEGEND:

INTERMEDIATE WELL – NEW

INTERMEDIATE WELL – EXISTING

GROUNDWATER FLOW DIRECTION

GROUNDWATER CONTOUR LINE (DASHED WHERE INFERRED)

2.1 ELEVATION MEAN SEA LEVEL

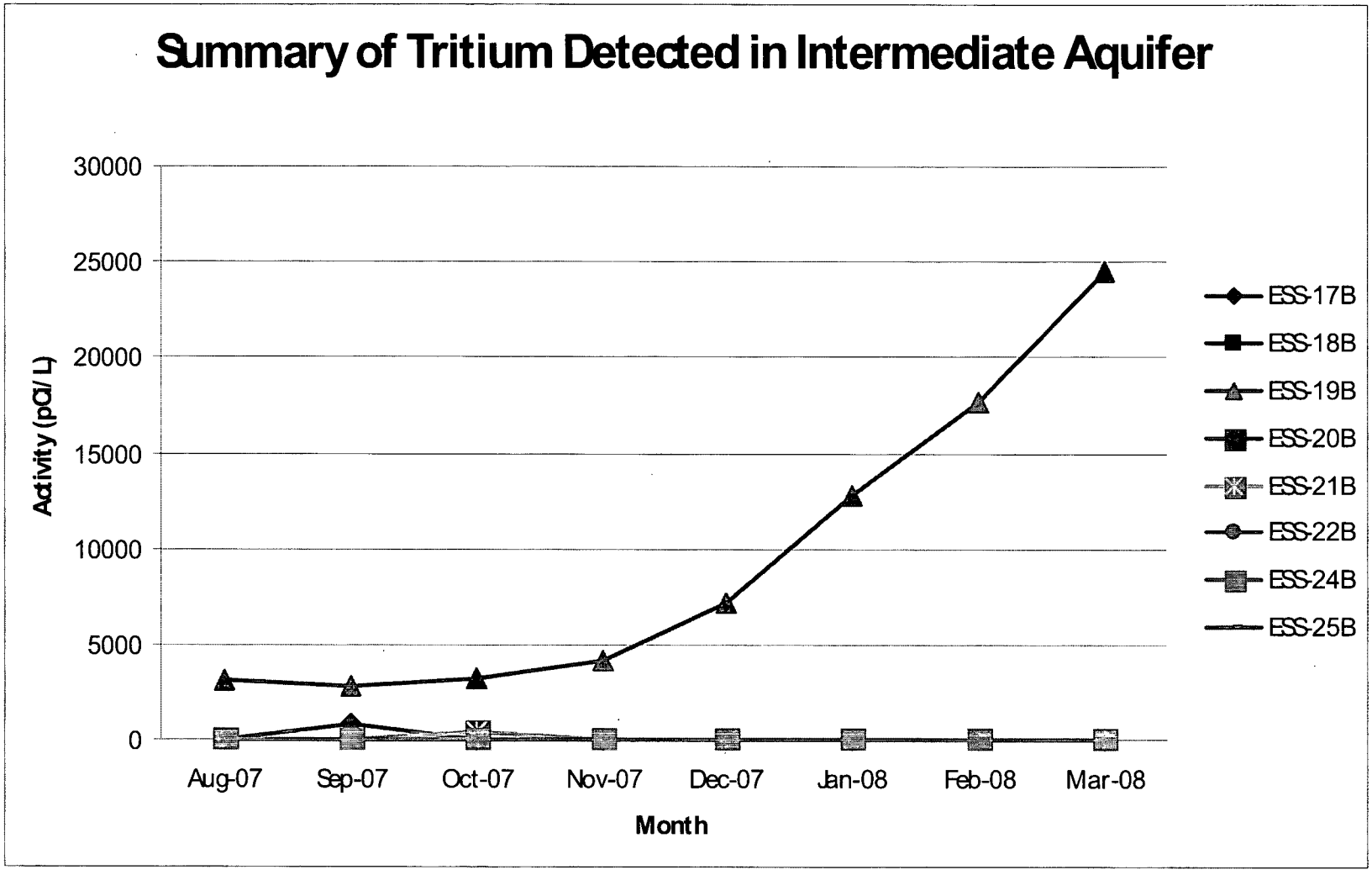
SCALE 1" = 500'

0 250 500 1000 1500

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 3–9
Potentiometric Surface Map
Intermediate Aquifer– March 2008

Silar Services Inc.



Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 3-10
Summary of Tritium Detected in Intermediate Aquifer

Silar Services Inc.

Table 3-1
Progress Energy - Brunswick Nuclear Plant
Storm Drain Stabilization Pond - Groundwater Monitoring Program
Summary of Tritium Concentration - Shallow Groundwater Aquifer
January - March 2008

Well I.D./Sample Date	Analytical Results (pCi/L)		
	Jan-08	**Feb-08**	**Mar-08**
ESS-17C	4,326	4,766	4,747
ESS-18C	**620,700**	**551,500**	**664,600**
ESS-19C	**502,900**	**508,900**	**511,300**
ESS-20C	19,910	18,640	18,470
ESS-21C	546	606	757
ESS-22C	**715,100**	**573,800**	**750,900**
ESS-23C	**245,900**	**234,400**	**230,500**
ESS-24C	3,440	4,334	3,262
ESS-25C	ND	ND	ND
ESS-26C	**484,700**	**345,900**	**504,300**
ESS-27C	**253,200**	**264,300**	**266,300**
ESS-28C	ND	523	ND
ESS-STAB	**419,600**	**245,900**	**288,600**
ESS-30C	**22,280**	2,930	2,862
ESS-31C	1,828	565	370

All samples analyzed by Progress Energy
pCi/L = picocuries per liter
ND = Not detected at lower limit of detection
Bold indicates the analytical result exceeds the drinking water standard (20,000 pCi/L) for tritium.

Table 3-2
Progress Energy - Brunswick Nuclear Plant
Storm Drain Stabilization Pond - Groundwater Monitoring Program
Summary of Tritium Concentrations - Marsh Wells
Januray - March 2008

Well I.D./Sample Date	Analytical Results (pCi/L)		
	Jan-08	Feb-08	Mar-08
ESS-NC-1	ND	294	284
ESS-NC-2	ND	260	285
ESS-NC-3	ND	ND	ND
ESS-NC-4	ND	326	266
ESS-NC-5	ND	ND	ND
ESS-GLB-1	ND	ND	ND

All samples analyzed by Progress Energy
pCi/L = picocuries per liter
ND = Not detected at lower limit of detection
Bold indicates the analytical result exceeds the drinking water standard (20,000 pCi/L) for tritium.

Table 3-3
Progress Energy - Brunswick Nuclear Plant
Storm Drain Stabilization Pond - Grounwater Monitoring Program
Summary of Tritium Concentrations - Intermediate Groundwater Aquifer
January - March 2008

Well I.D./Sample Date	Analytical Results (pCi/L)		
	Jan-08	Feb-08	Mar-08
ESS-17B	ND	ND	ND
ESS-18B	ND	ND	ND
ESS-19B	12,780	17,620	**24,450**
ESS-20B	ND	ND	ND
ESS-21B	ND	ND	ND
ESS-22B	ND	ND	ND
ESS-24B	ND	ND	ND
ESS-25B	ND	ND	ND

All samples analyzed by Progress Energy
pCi/L = picocuries per liter
ND = Not detected at lower limit of detection
Bold indicates the analytical result exceeds the drinking water standard (20,000 pCi/L) for tritium.

Table 3-4
Progress Energy - Brunswick Nuclear Plant
Storm Drain Stabilization Pond - Groundwater Monitoring Program
Summary of Tritium Concentrations - Deep Groundwater Aquifer
January - March 2008

Well I.D.	**Analytical Results (pCi/L)**		
Sample Date	**Jan-08**	**Feb-08**	**Mar-08**
ESS-24A	ND	ND	ND
ESS-17A	ND	ND	ND
ESS-27A	ND	ND	ND

All samples analyzed by Progress Energy
pCi/L = picocuries per liter
ND = Not detected at lower limit of detection
Bold indicates the analytical result exceeds the drinking water standard (20,000 pCi/L) for tritium.

ATTACHMENT 8
Page 1 of 1
Groundwater Monitoring Log

Groundwater Sample Identification: CSS - 17A

Sample Date: 1-14-08

Sample Analysis: H^3 Sampled by: TH/RMA

Time of Reading	Groundwater Quality Parameters			Depth to Water (feet)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1120	18.87	423	7.84	18.40	75
1125	18.77	416	7.67	18.38	N/A
1130	19.14	415	7.66	18.38	
Sample Time: 1135			Initial water level: 18.50		

Operability Check
Final Depth to Water: 18.38
Depth to Water (at time of 1st reading): 18.40
Drawdown (D): Ø

Bladder Pump Settings
Discharge Time: 17
Fill Time: 16
1 TURN

Casing Volume Purged (CVP) 1-25-08
2" Well: D x (613 ml): ~~Ø~~ NA
4" Well: D x (2468 ml): ~~NA~~ Ø
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (min. between 1st reading and sample time): 1125
GVP > CVP: (YES / NO)

CR# 080120

Tritium Result (µci/ml): < MDA Analysis Date: 1-15-08

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

ATTACHMENT 8
Page 1 of 1
Groundwater Monitoring Log

Groundwater Sample Identification: CSS 17B

Sample Date: 1-14-08

Sample Analysis: H3 Sampled by: TH/RM

Time of Reading	Groundwater Quality Parameters			Depth to Water (feet)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1053	19.42	510	7.47	18.28	75
1058	19.63	481	7.30	18.28	N/A
1103	19.64	475	7.28	18.24	
Sample Time: 1105			Initial water level: 18.05		

Operability Check
Final Depth to Water: 18.24
Depth to Water (at time of 1st reading): 18.28
Drawdown (D): Ø

Bladder Pump Settings
Discharge Time: 8
Fill Time: 13

Casing Volume Purged (CVP)
2" Well: D x (613 ml): Ø
4" Well: D x (2468 ml): N/A
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (min. between 1st reading and sample time): 900
GVP > CVP (YES / NO)

CR# 080120

Tritium Result (µci/ml): < MDA Analysis Date: 1-15-08

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

ATTACHMENT 8
Page 1 of 1
Groundwater Monitoring Log

Groundwater Sample Identification: CSS-17C

Sample Date: 1-14-08

Sample Analysis: H3 Sampled by: JH/KN

Time of Reading	Groundwater Quality Parameters			Depth to Water (feet)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1030	18.95	2222	6.47	10.68	150
1035	19.08	2203	6.36	10.68	N/A
1040	19.33	2232	6.31	10.73	
Sample Time: 1042			Initial water level: 9.97		

Operability Check
Final Depth to Water: 10.73
Depth to Water (at time of 1st reading): 10.68
Drawdown (D): 0.05

Bladder Pump Settings
Discharge Time: 6
Fill Time: 9

Casing Volume Purged (CVP)
2" Well: D x (613 ml): 30.7
4" Well: D x (2468 ml): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (min. between 1st reading and sample time): 1800
GVP > CVP: (YES / NO)

CR# 080146

Tritium Result (µci/ml): 4.326 E-6 Analysis Date: 1-19-08

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

ATTACHMENT 8
Page 1 of 1
Groundwater Monitoring Log

Groundwater Sample Identification: GSS 18B

Sample Date: 1-15-08

Sample Analysis: H3 Sampled by: TH/RM

Time of Reading	Groundwater Quality Parameters			Depth to Water (feet)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1028	14.72	592	8.42	23.3	100
1033	15.27	540	8.31	23.3	
1038	15.43	537	8.23	23.3	N/A
1043	15.69	535	8.15	23.3	
Sample Time: 1045			Initial water level: 23.28		

Operability Check
Final Depth to Water: 23.3
Depth to Water (at time of 1st reading): 23.3
Drawdown (D): Ø

Bladder Pump Settings
Discharge Time: 9
Fill Time: 8

Casing Volume Purged (CVP)
2" Well: D x (613 ml): Ø
4" Well: D x (2468 ml): N/A
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (min. between 1st reading and sample time): 1700
GVP > CVP: (YES / NO)

CR# 080123

Tritium Result (µci/ml): < MDA Analysis Date: 1-15-08

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

ATTACHMENT 8
Page 1 of 1
Groundwater Monitoring Log

Groundwater Sample Identification: GSS 18C

Sample Date: 1-15-08

Sample Analysis: H3 Sampled by: TH / RM

Time of Reading	Groundwater Quality Parameters			Depth to Water (feet)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1010	13.73	3349	7.94	4.63	275
1015	14.05	3270	7.89	4.68	N/A
1020	14.30	3328	7.71	4.70	
Sample Time: 1022			Initial water level: 4.23		

Operability Check
Final Depth to Water: 4.70
Depth to Water (at time of 1st reading): 4.63
Drawdown (D): 0.07

Bladder Pump Settings
Discharge Time: 8
Fill Time: 14

Casing Volume Purged (CVP)
2" Well: D x (613 ml): 42.9
4" Well: D x (2468 ml): N/A
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (min. between 1st reading and sample time): 3300
GVP > CVP: (YES / NO)

CR# 080143

Tritium Result (µci/ml): 6.207E-4 Analysis Date: 1-18-08

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

ATTACHMENT 8
Page 1 of 1
Groundwater Monitoring Log

Groundwater Sample Identification: ESS - 19B

Sample Date: 1-10-08

Sample Analysis: H^3 Sampled by: TH / RM

Time of Reading	Groundwater Quality Parameters			Depth to Water (feet)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0955	17.30	2721	7.01	12.60	200
1000	17.75	2525	6.82	12.60	N/A
1005	17.82	2522	6.80	12.60	
Sample Time: 1007			Initial water level: 12.58		

Operability Check
Final Depth to Water: 12.60
Depth to Water (at time of 1st reading): 12.60
Drawdown (D): Ø

Bladder Pump Settings
Discharge Time: 9
Fill Time: 8

Casing Volume Purged (CVP)
2" Well: D x (613 ml): Ø
4" Well: D x (2468 ml): N/A
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (min. between 1st reading and sample time): 2400
GVP > CVP (YES / NO)

CR# 080147

Tritium Result (µci/ml): 1.278 E-5 Analysis Date: 1-19-08

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

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Groundwater Monitoring Log

Groundwater Sample Identification: GSS - 19C

Sample Date: 1-10-08

Sample Analysis: H^3 Sampled by: TH/RM

Time of Reading	Groundwater Quality Parameters			Depth to Water (feet)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0935	16.89	5694	6.24	4.53	300
0940	17.24	5558	6.15	5.10	N/A
0945	17.39	5711	6.14	5.35	
Sample Time: 0947			Initial water level: 4.05		

Operability Check
Final Depth to Water: 5.35
Depth to Water (at time of 1st reading): 4.53
Drawdown (D): 0.82

Bladder Pump Settings
Discharge Time: 7
Fill Time: 13

Casing Volume Purged (CVP)
2" Well: D x (613 ml): 503
4" Well: D x (2468 ml): N/A
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (min. between 1st reading and sample time): 3600
GVP > CVP: (YES) NO)

CR# 080143

Tritium Result (µci/ml): 5.029 E-4 Analysis Date: 1-18-08

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

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Groundwater Monitoring Log

Groundwater Sample Identification: GSS -20C

Sample Date: 1-10-08

Sample Analysis: H3 Sampled by: TH/RM

Time of Reading	Groundwater Quality Parameters			Depth to Water (feet)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1025	17.04	1819	6.35	4.82	300
1030	17.30	1803	6.22	5.05	N/A
1035	17.31	1799	6.20	5.27	
		N/A			
Sample Time: 1037			Initial water level: 4.40		

Operability Check
Final Depth to Water: 5.27
Depth to Water (at time of 1st reading): 4.82
Drawdown (D): 0.45

Bladder Pump Settings
Discharge Time: 6
Fill Time: 12

Casing Volume Purged (CVP)
2" Well: D x (613 ml): 275.9
4" Well: D x (2468 ml): N/A
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (min. between 1st reading and sample time): 3600
GVP > CVP: (YES) NO)

CR# 080143

Tritium Result (µci/ml): 1.991E-5 Analysis Date: 1-18-08

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

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Groundwater Monitoring Log

Groundwater Sample Identification: E-55-21B

Sample Date: 1-15-08

Sample Analysis: H3 Sampled by: TH/RM

Time of Reading	Groundwater Quality Parameters			Depth to Water (feet)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0840	15.87	380	8.77	28.23	250
0845	16.51	369	8.68	28.25	N/A
0850	16.60	367	8.35	28.30	
Sample Time: 0852			Initial water level: 28.18		

Operability Check
Final Depth to Water: 28.30
Depth to Water (at time of 1st reading): 28.23
Drawdown (D): 0.07

Bladder Pump Settings
Discharge Time: 9
Fill Time: 13

Casing Volume Purged (CVP)
2" Well: D x (613 ml): 42.91
4" Well: D x (2468 ml): N/A
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (min. between 1st reading and sample time): 3000
GVP > CVP: (YES) / NO)

CR # 080123

Tritium Result (µci/ml): < MDA Analysis Date: 1-15-08

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

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Groundwater Monitoring Log

Groundwater Sample Identification: GSS 91C

Sample Date: 1-15-08

Sample Analysis: H3 Sampled by: TH/RM

Time of Reading	Groundwater Quality Parameters			Depth to Water (feet)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0814	17.41	1276	6.41	10.78	125
0819	16.62	1328	6.51	10.78	N/A
0824	16.72	1348	6.51	10.78	
Sample Time: 0825			Initial water level: 10.7		

Operability Check
Final Depth to Water: 10.78
Depth to Water (at time of 1st reading): 10.78
Drawdown (D): Ø

Bladder Pump Settings
Discharge Time: 10
Fill Time: 16

Casing Volume Purged (CVP)
2" Well: D x (613 ml): Ø
4" Well: D x (2468 ml): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (min. between 1st reading and sample time): 1500
GVP > CVP: (YES) / NO)

CR# 080123

Tritium Result (µci/ml): ~~5.547~~ 5.457 E-7 1-25-08 Analysis Date: 1-15-08

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

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Groundwater Monitoring Log

Groundwater Sample Identification: ESS - 22B

Sample Date: 1-15-08

Sample Analysis: H3 Sampled by: TH/RM

Time of Reading	Groundwater Quality Parameters			Depth to Water (feet)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0930	16.04	778	10.79	29.62	75
0935	15.50	784	10.65	29.60	N/A
0940	15.08	799	10.71	29.60	
Sample Time: 0942			Initial water level: 29.62		

Operability Check
Final Depth to Water: 29.60
Depth to Water (at time of 1st reading): 29.62
Drawdown (D): Ø

Bladder Pump Settings
Discharge Time: 10
Fill Time: 17

Casing Volume Purged (CVP)
2" Well: D x (613 ml): Ø
4" Well: D x (2468 ml): N/A
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (min. between 1st reading and sample time): 900
GVP > CVP: (YES) / NO)

CR # 080123

Tritium Result (µci/ml): < MDA Analysis Date: 1-15-08

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

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Groundwater Monitoring Log

Groundwater Sample Identification: GSS 22C

Sample Date: 1-15-08

Sample Analysis: H^3 Sampled by: TH/RM

Time of Reading	Groundwater Quality Parameters			Depth to Water (feet)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0909	14.04	4635	7.93	6.34	125
0914	14.73	4757	8.16	6.35	N/A
0919	14.89	4836	7.87	6.37	
Sample Time: 0921			Initial water level: 6.25		

Operability Check
Final Depth to Water: 6.37
Depth to Water (at time of 1st reading): 6.34
Drawdown (D): 0.03

Bladder Pump Settings
Discharge Time: 7
Fill Time: 16

Casing Volume Purged (CVP)
2" Well: D x (613 ml): 18.4
4" Well: D x (2468 ml): N/A
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (min. between 1st reading and sample time): 1500
GVP > CVP: (YES / NO)

CR # 080144

Tritium Result (µci/ml): 7.151E-01 Analysis Date: 1-18-08

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

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Groundwater Monitoring Log

Groundwater Sample Identification: ESS- 23C

Sample Date: 1-11-08

Sample Analysis: H^3 Sampled by: TH/RM

Time of Reading	Groundwater Quality Parameters			Depth to Water (feet)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0900	19.46	2214	4.85	14.74	200
0905	19.79	2353	5.25	14.96	N/A
0910	19.68	2362	5.27	14.97	
Sample Time: 0912			Initial water level: 14.35		

Operability Check
Final Depth to Water: 14.97
Depth to Water (at time of 1st reading): 14.74
Drawdown (D): 0.23

Bladder Pump Settings
Discharge Time: 8
Fill Time: 15

Casing Volume Purged (CVP)
2" Well: D x (613 ml): 141.0
4" Well: D x (2468 ml): N/A
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (min. between 1st reading and sample time): 2400
GVP > CVP: (YES / NO)

CRF# 080144

Tritium Result (µci/ml): 2.459 E-4 Analysis Date: 1-18-08

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

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Groundwater Monitoring Log

Groundwater Sample Identification: ESS - 24A

Sample Date: 1-14-08

Sample Analysis: H3 Sampled by: TH/KW

Time of Reading	Groundwater Quality Parameters			Depth to Water (feet)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1327	16.83	657	10.62	19.50	200
1332	17.46	576	10.73	19.54	N/A
1337	17.60	567	10.74	19.44	
1342	17.63	565	10.76	19.42	
Sample Time: 1345			Initial water level: 18.92		

Operability Check
Final Depth to Water: 19.42
Depth to Water (at time of 1st reading): 19.50
Drawdown (D): Ø

Bladder Pump Settings
Discharge Time: 24
Fill Time: 15
1 min

Casing Volume Purged (CVP)
2" Well: D x (613 ml): Ø
4" Well: D x (2468 ml): N/A
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (min. between 1st reading and sample time): 3600
GVP > CVP: (YES / NO)

CR# 080120

Tritium Result (µci/ml): < MDA Analysis Date: 1-15-08

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

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Groundwater Monitoring Log

Groundwater Sample Identification: 1-SS 24B

Sample Date: 1-14-08

Sample Analysis: H3 Sampled by: TH/RW

Time of Reading	Groundwater Quality Parameters			Depth to Water (feet)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1350	16.48	1369	11.62	18.03	195
1355	17.09	1526	11.70	18.10	
1400	17.19	1626	11.74	18.11	
1405	17.19	1641	11.75	18.14	
Sample Time: 1407			Initial water level: 18.02		

Operability Check
Final Depth to Water: 18.14
Depth to Water (at time of 1st reading): 18.03
Drawdown (D): 0.11

Bladder Pump Settings
Discharge Time: 11
Fill Time: 12

Casing Volume Purged (CVP)
2" Well: D x (613 ml): 67.4
4" Well: D x (2468 ml): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (min. between 1st reading and sample time): 2975
GVP > CVP: (YES / NO)

CR # 080120

Tritium Result (µci/ml): < MDA Analysis Date: 1-15-08

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

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Groundwater Monitoring Log

Groundwater Sample Identification: CSS - 24C

Sample Date: 1-14-08

Sample Analysis: H^3 Sampled by: JH / KM

Time of Reading	Groundwater Quality Parameters			Depth to Water (feet)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1300	17.95	4772	6.13	6.98	150
1305	17.80	4845	6.01	6.98	N/A
1310	18.05	4853	5.78	6.95	
Sample Time: 1312			Initial water level: 6.47		

Operability Check
Final Depth to Water: 6.95
Depth to Water (at time of 1st reading): 6.95
Drawdown (D): Ø

Bladder Pump Settings
Discharge Time: 7
Fill Time: 15

Casing Volume Purged (CVP)
2" Well: D x (613 ml): Ø
4" Well: D x (2468 ml): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (min. between 1st reading and sample time): 1800
GVP > CVP: (YES / NO)

CR#080147

Tritium Result (µci/ml): 3.440 E-6 Analysis Date: 1-19-08

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

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Groundwater Monitoring Log

Groundwater Sample Identification: CSS - 25B

Sample Date: 1-16-08

Sample Analysis: H3 Sampled by: TH/RM

Time of Reading	Groundwater Quality Parameters			Depth to Water (feet)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0925	15.29	2500	6.96	15.51	250
0930	15.10	2496	7.22	11/4/08 15.62	N/A
0935	15.62	2421	7.15	15.70	
N/A	N/A	N/A	N/A	N/A	
Sample Time: 0937			Initial water level: 15.08		

Operability Check
Final Depth to Water: 15.70
Depth to Water (at time of 1st reading): 15.51
Drawdown (D): 0.19

Bladder Pump Settings
Discharge Time: 8
Fill Time: 14

Casing Volume Purged (CVP)
2" Well: D x (613 ml): 116.5
4" Well: D x (2468 ml): N/A
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (min. between 1st reading and sample time): 3000
GVP > CVP: (YES) / NO)

CR# 080161

Tritium Result (µci/ml): < MDA Analysis Date: 1-21-08

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

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Groundwater Monitoring Log

Groundwater Sample Identification: ESS 25C

Sample Date: 1-16-08

Sample Analysis: H3 Sampled by: TH/RM

Time of Reading	Groundwater Quality Parameters			Depth to Water (feet)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0943	15.43	1750	6.32	*	200
0948	15.60	1772	6.30	*	N/A
0953	15.88	1778	6.29	*	↓
N/A	N/A	N/A	N/A	N/A	↓
↓	↓	↓	↓	↓	↓
↓	↓	↓	↓	↓	↓
↓	↓	↓	↓	↓	↓
↓	↓	↓	↓	↓	↓
Sample Time: 0955			Initial water level: *		

Operability Check
Final Depth to Water: N/A
Depth to Water (at time of 1st reading): ↓
Drawdown (D): ↓

Bladder Pump Settings
Discharge Time: 7
Fill Time: 15

Casing Volume Purged (CVP)
2" Well: D x (613 ml): N/A
4" Well: D x (2468 ml): ↓
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (min. between 1st reading and sample time): 2400

*GVP > CVP: (YES / NO)

(CAP 050161 LEVEL 1-16-08 TH)

* UNABLE TO OBTAIN ~~LEVEL~~ - water level below top of screen/intake casing.

Tritium Result (µci/ml): < MDA Analysis Date: 1-21-08

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

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Groundwater Monitoring Log

Groundwater Sample Identification: GSS- 27A

Sample Date: 1-11-08

Sample Analysis: H3 Sampled by: TH/RM

Time of Reading	Groundwater Quality Parameters			Depth to Water (feet)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0827	19.49	355	7.70	29.17	200
0832	19.62	365	7.34	29.17	N/A
0837	19.61	366	7.30	29.17	
Sample Time: 0839			Initial water level: 29.15		

Operability Check
Final Depth to Water: 29.17
Depth to Water (at time of 1st reading): 29.17
Drawdown (D): Ø

Bladder Pump Settings
Discharge Time: 25
Fill Time: 15
1 TURN

Casing Volume Purged (CVP) 1-25-08 ~~Ø~~
2" Well: D x (613 ml): ~~Ø~~ NA
4" Well: D x (2468 ml): ~~N/A~~ Ø
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (min. between 1st reading and sample time): 2400
GVP > CVP: (YES) NO)

CR# 080120

Tritium Result (µci/ml): < MDA Analysis Date: 1-15-08

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

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Groundwater Monitoring Log

Groundwater Sample Identification: GSS - 28C

Sample Date: 1-11-08

Sample Analysis: H^3 Sampled by: TH/RM

Time of Reading	Groundwater Quality Parameters			Depth to Water (feet)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0923	17.44	1268	5.67	12.55	250
0928	17.59	1253	5.92	12.69	N/A
0933	17.98	1252	5.89	12.77	
Sample Time: 0935			Initial water level: 12.41		

Operability Check
Final Depth to Water: 12.77
Depth to Water (at time of 1st reading): 12.55
Drawdown (D): 0.22

Bladder Pump Settings
Discharge Time: 8
Fill Time: 16

Casing Volume Purged (CVP)
2" Well: D x (613 ml): 135
4" Well: D x (2468 ml): Ø
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (min. between 1st reading and sample time): 3000
GVP > CVP: (YES / NO)

CR#080120

Tritium Result (µci/ml): < MDA Analysis Date: 1-15-08

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

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Groundwater Monitoring Log

Groundwater Sample Identification: GSS - 30C

Sample Date: 1-10-08

Sample Analysis: H^3 Sampled by: TH/RM

Time of Reading	Groundwater Quality Parameters			Depth to Water (feet)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1240	19.16	1961	6.04	7.88	300
1245	18.84	1863	6.14	8.18	N/A
1250	18.92	1871	6.15	8.40	
Sample Time: 1252			Initial water level: 7.17		

Operability Check
Final Depth to Water: 8.40
Depth to Water (at time of 1st reading): 7.88
Drawdown (D): 0.52

Bladder Pump Settings
Discharge Time: 7
Fill Time: 17

Casing Volume Purged (CVP)
2" Well: D x (613 ml): 318.8
4" Well: D x (2468 ml): N/A
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (min. between 1st reading and sample time): 3600
GVP > CVP: (YES / NO)

CR# 080133

Tritium Result (µci/ml): 2.228 E-5 Analysis Date: 1-16-08

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

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Groundwater Monitoring Log

Groundwater Sample Identification: GSS - 31C

Sample Date: 1-10-08

Sample Analysis: H^3 Sampled by: TH / RM

Time of Reading	Groundwater Quality Parameters			Depth to Water (feet)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1303	19.76	1371	6.27	8.90	125
1308	19.87	1021	6.48	9.20	
1313	19.95	1015	6.48	9.06	N/A
1318	20.03	1035	6.44	9.10	
		N/A			
Sample Time: 1320			Initial water level: 8.55		

Operability Check
Final Depth to Water: 9.10
Depth to Water (at time of 1st reading): 8.90
Drawdown (D): 0.20

Bladder Pump Settings
Discharge Time: 8
Fill Time: 15

Casing Volume Purged (CVP)
2" Well: D x (613 ml): 122.6
4" Well: D x (2468 ml): N/A
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (min. between 1st reading and sample time): 2125
GVP > CVP: (YES / NO)

CR# 080147

Tritium Result (µci/ml): 1.828 E-6 Analysis Date: 1-19-08

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

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Groundwater Monitoring Log

Groundwater Sample Identification: ESS – STAB

Sample Date: 1-10-08

Sample Analysis: H^3 Sampled by: TH/RM

Time of Reading	Groundwater Quality Parameters			Depth to Water (feet)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0906	17.89	2571	7.05	16.80	275
0911	18.30	2345	6.69	17.10	N/A
0916	18.27	2390	6.68	17.55	
Sample Time: 0918			Initial water level: 16.31		

Operability Check
Final Depth to Water: 17.55
Depth to Water (at time of 1st reading): 16.80
Drawdown (D): 0.75

Bladder Pump Settings
Discharge Time: 8
Fill Time: 16

Casing Volume Purged (CVP)
2" Well: D x (613 ml): 460
4" Well: D x (2468 ml): N/A
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (min. between 1st reading and sample time): 3300
GVP > CVP (YES / NO)

CR# 080144

Tritium Result (µci/ml): 4.156E-4 Analysis Date: 1-18-08

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

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Groundwater Monitoring Log

Groundwater Sample Identification: GSS NC-1

Sample Date: 1-9-08

Sample Analysis: H^3 Sampled by: TH/RM

Time of Reading	Groundwater Quality Parameters			Depth to Water (feet)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0930	14.7	42,660	7.09	3.80	120
0935	14.9	42,737	7.03	4.22	N/A
0940	14.9	42,716	7.03	4.25	
Sample Time: 0943			Initial water level: 2.5 ft.		

Operability Check
Final Depth to Water: 4.25
Depth to Water (at time of 1st reading): 3.80'
Drawdown (D): 0.45

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

Casing Volume Purged (CVP)
2" Well: D x (613 ml): 276
4" Well: D x (2468 ml): N/A
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (min. between 1st reading and sample time): 1560
GVP > CVP: (YES / NO)

CR# 080086

* Peristaltic pump used

Tritium Result (µci/ml): < MDA Analysis Date: 1-10-08

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

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Groundwater Monitoring Log

Groundwater Sample Identification: ESS NC-2

Sample Date: 1-9-08

Sample Analysis: H3 Sampled by: TH/RM

Time of Reading	Groundwater Quality Parameters			Depth to Water (feet)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1000	14.02	44,490	7.05	2.91	130
1005	14.11	44,354	6.97	2.94	N/A
1010	13.94	44,356	6.96	2.96	
Sample Time: 1012			Initial water level: 2.42		

Operability Check
Final Depth to Water: 2.96
Depth to Water (at time of 1st reading): 2.91
Drawdown (D): 0.05

Bladder Pump Settings
Discharge Time: NA *
Fill Time: ↓

Casing Volume Purged (CVP)
2" Well: D x (613 ml): 31
4" Well: D x (2468 ml): N/A
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (min. between 1st reading and sample time): 1560
GVP > CVP: (YES / NO)

* Peristaltic pump used CR# 080086

Tritium Result (µci/ml): < MDA Analysis Date: 1-9-08

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

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Groundwater Monitoring Log

Groundwater Sample Identification: CSS- NC -3

Sample Date: 1- 9- 08

Sample Analysis: H3 Sampled by: TH/RM

Time of Reading	Groundwater Quality Parameters			Depth to Water (feet)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1020	15.52	45430	6.87	3.80	130
1025	15.56	45464	6.82	3.90	N/A
1030	15.62	45468	6.81	3.98	
Sample Time: 1033			Initial water level: 2.45		

Operability Check
Final Depth to Water: 3.98
Depth to Water (at time of 1st reading): 3.80
Drawdown (D): 0.18

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

Casing Volume Purged (CVP)
2" Well: D x (613 ml): 110
4" Well: D x (2468 ml): N/A
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (min. between 1st reading and sample time): 1690
GVP > CVP: (YES / NO)

* Peristaltic pump used. CR# 080086

Tritium Result (µci/ml): < MDA Analysis Date: 1-9-08

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

ATTACHMENT 8
Page 1 of 1
Groundwater Monitoring Log

Groundwater Sample Identification: CSS - NC - 4

Sample Date: 1-9-08

Sample Analysis: H^3 Sampled by: TH/RM

Time of Reading	Groundwater Quality Parameters			Depth to Water (feet)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1038	16.48	37535	6.84	2.81	140
1043	16.50	37542	6.78	2.74	N/A
1048	16.52	37838	6.76	2.84	
Sample Time: 1050			Initial water level: 2.61		

Operability Check
Final Depth to Water: 2.84
Depth to Water (at time of 1st reading): 2.81
Drawdown (D): 0.03

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

Casing Volume Purged (CVP)
2" Well: D x (613 ml): 18
4" Well: D x (2468 ml): N/A
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (min. between 1st reading and sample time): 1680
GVP > CVP: (YES) NO)

* Peristaltic pump used. CR# 080086

Tritium Result (µci/ml): < MDA Analysis Date: 1-15-08

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

ATTACHMENT 8
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Groundwater Monitoring Log

Groundwater Sample Identification: GSS NC-5

Sample Date: 1-9-08

Sample Analysis: H^3 Sampled by: TH/RM

Time of Reading	Groundwater Quality Parameters			Depth to Water (feet)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1055	16.20	32,983	6.93	2.30	150
1100	15.67	33,300	6.90	2.64	N/A
1105	15.96	33132	6.89	2.72	
Sample Time: 1107			Initial water level: 1.80		

Operability Check
Final Depth to Water: 2.72
Depth to Water (at time of 1st reading): 2.30
Drawdown (D): 0.42

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

Casing Volume Purged (CVP)
2" Well: D x (613 ml): 257
4" Well: D x (2468 ml): N/A
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (min. between 1st reading and sample time): 1800
GVP > CVP: (YES / NO)

* Peristaltic pump used CR# 080086

Tritium Result (µci/ml): < MDA Analysis Date: 1-10-08

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

ATTACHMENT 8
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Groundwater Monitoring Log

Groundwater Sample Identification: ESS - GLB - 1

Sample Date: 1 - 9 - 08

Sample Analysis: H^3 Sampled by: TH/RM

Time of Reading	Groundwater Quality Parameters			Depth to Water (feet)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1123	16.61	44,640	6.66	4.05	150
1128	16.89	44,586	6.62	4.12	N/A
1133	16.99	44,599	6.63	4.28	
Sample Time: 1135			Initial water level: 3.30		

Operability Check
Final Depth to Water: 4.28
Depth to Water (at time of 1st reading): 4.05
Drawdown (D): 0.23

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

Casing Volume Purged (CVP)
2" Well: D x (613 ml): 141
4" Well: D x (2468 ml): N/A
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (min. between 1st reading and sample time): 1800
GVP > CVP: (YES) / NO)

* Peristaltic pump used. CR # 080086

Tritium Result (µci/ml): < MDA Analysis Date: 1-10-08

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

Verified 2/11/08 - 2/18/08
TH

ATTACHMENT 12
Page 1 of 1
Calibration and Verification Data Sheet

Multi-Meter Probe SN 07G100510

pH 4.00 Buffer Lot Number 4706061 Exp. Date 5/2009
pH 7.00 Buffer Lot Number 4704013 Exp. Date 3/2009
pH 10.00 Buffer Lot Number 4702044 Exp. Date 7/2008

Date	Calibration				Verification		*	
	pH 7.00 Buffer		pH 4.00 Buffer		pH 10.00 Buffer		P/F	Name
	Actual	Indicated	Actual	Indicated	Actual	Indicated		
2/11/08	7.00	7.00	4.00	4.00	10.00	10.06	P	T. Harris
2/12/08	7.00	7.00	4.00	4.00	10.00	10.03	P	T. Harris
2/13/08	7.00	7.00	4.00	4.00	10.00	10.04	P	T. Harris
2/14/08	7.00	7.00	4.00	4.00	10.00	10.03	P	T. Harris
2/15/08	7.00	7.00	4.00	4.00	10.00	10.03	P	T. Harris
2/18/08	7.00	7.00	4.00	4.00	10.00	10.07	P	T. Harris
NA								

*Verification passes if difference between actual and indicated is ≤ 0.1

Conductivity Calibration Standard Lot Number 2708222 Exp. Date 7/2008
Conductivity Verification Standard Lot Number 2707421 Exp. Date 7/2008

Date	Conductivity Calibration Standard		Conductivity Verification Standard		** P/F	Name
	Actual	Indicated	Actual	Indicated		
2/11/08	1413 µS/cm	1413 µS/cm	200 µS/cm	193 µS/cm	P	T. Harris
2/12/08	1413 µS/cm	1413 µS/cm	200 µS/cm	197 µS/cm	P	T. Harris
2/13/08	1413 µS/cm	1413 µS/cm	200 µS/cm	196 µS/cm	P	T. Harris
2/14/08	1413 µS/cm	1413 µS/cm	200 µS/cm	197 µS/cm	P	T. Harris
2/15/08	1413 µS/cm	1413 µS/cm	200 µS/cm	199 µS/cm	P	T. Harris
2/18/08	1413 µS/cm	1413 µS/cm	200 µS/cm	202 µS/cm	P	T. Harris
NA						

**Verification passes if difference be actual and indicated is ≤ 5%.

Comments: N/A

Reviewed by M. McGuire Date 3-11-08

verified 2/1/08 TH To 2/8/0

ATTACHMENT 12
Page 1 of 1
Calibration and Verification Data Sheet

Multi-Meter Probe SN 07G100510

pH 4.00 Buffer Lot Number 4706061 Exp. Date 5/2009
pH 7.00 Buffer Lot Number 4704013 Exp. Date 3/2009
pH 10.00 Buffer Lot Number 4702044 Exp. Date 7/2008

Date	Calibration				Verification		*	
	pH 7.00 Buffer		pH 4.00 Buffer		pH 10.00 Buffer		P/F	Name
	Actual	Indicated	Actual	Indicated	Actual	Indicated		
2/1/08	7.00	7.00	4.00	4.00	10.00	9.96	P	T. Harris
2/4/08	7.00	7.00	4.00	4.00	10.00	10.04	P	T. Harris
2/5/08	7.00	7.00	4.00	4.00	10.00	10.02	P	T. Harris
~~2/6/08~~	~~7.00~~	~~7.00~~	~~4.00~~	~~4.00~~	~~10.00~~	~~10.06~~	~~P~~	~~T. Harris~~ 2/11/08
				N				
				A				

*Verification passes if difference between actual and indicated is ≤ 0.1

Conductivity Calibration Standard Lot Number 2708222 Exp. Date 7/2008
Conductivity Verification Standard Lot Number 2707421 Exp. Date 7/2008

Date	Conductivity Calibration Standard		Conductivity Verification Standard		** P/F	Name
	Actual	Indicated	Actual	Indicated		
2/1/08	1413 µS/cm	1413 µS/cm	200 µS/cm	201 µS/cm	P	T. Harris
2/4/08	1413 µS/cm	1413 µS/cm	200 µS/cm	194 µS/cm	P	T. Harris
2/5/08	1413 µS/cm	1413 µS/cm	200 µS/cm	198 µS/cm	P	T. Harris
~~2/6/08~~	~~1413 µS/cm~~	~~1413 µS/cm~~	~~200 µS/cm~~	~~193 µS/cm~~	~~P~~	~~T. Harris~~ TH 2/11/08
			N			
			A			

**Verification passes if difference be actual and indicated is ≤ 5%.

Comments: N A

Reviewed by M. McGann Date 3-11-08

ATTACHMENT 8
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Groundwater Monitoring Log

Groundwater Sample Identification: ESS-31C

Sample Date: 2/13/08

Sample Analysis: H^3 Sampled by: T. Harris/R. Meaves

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1014	17.72	1012	7.31	NA	150
1019	17.54	892	6.88	↓	NA ↓
1024	17.48	813	6.87		
1029	17.40	789	6.82		
1034	17.39	786	6.77		
Sample Time: 1036			Initial water level: NA		

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

Bladder Pump Settings
Discharge Time: 8
Fill Time: 15
1/2 TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): NA *
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): TH 2/13 ~~NA~~ 3300
GVP > CVP: (YES / NO) *
Comments: UNABLE TO OBTAIN LINER DUE TO pump HOUSING

N/A

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): 5.652E-7
Count Room No.: 080403

Reviewed by: M. McGuire
Environmental Supervisor or Designee
Review Date: 3-9-08

ATTACHMENT 8
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Groundwater Monitoring Log

Groundwater Sample Identification: ESS GLB-1

Sample Date: 2/12/08

Sample Analysis: H3 Sampled by: T. HARRIS / R. MORRIS

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1242	15.91	38838	6.66	4.10	100
1247	16.40	38875	6.67	4.15	NA
1252	16.50	38907	6.68	4.25	↓
Sample Time: 1254			Initial water level: 3.30		

NA

Operability Check (Indication in ft)
a-Final Depth to Water: 4.25
b-Depth to Water (at time of 1st reading): 4.10
a-b=Drawdown (D): 0.15

Bladder Pump Settings
Discharge Time: NA
Fill Time: NA

PERISTALTIC PUMP

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 91.95
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 1200
GVP > CVP: (YES / NO)
Comments: NA

Gamma Result (µci/ml): ~~< MDA~~ NA TH 2/21/08
Tritium Result (µci/ml): < MDA

Count Room No.: 080427

Reviewed by: M. McGuire
Environmental Supervisor or Designee

Review Date: 3-9-08

ATTACHMENT 8
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Groundwater Monitoring Log

Groundwater Sample Identification: ESS NC-1

Sample Date: 2/12/08

Sample Analysis: H^3 Sampled by: T. HARRIS / R. MCFARLANE

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1042	14.73	33094	6.84	5.30	125
1047	14.88	33238	6.86	5.80	NA
1052	14.82	33331	6.88	6.00	↓
			NA		
			NA		
Sample Time: 1054			Initial water level: 3.50		

Operability Check (Indication in ft)
a-Final Depth to Water: 6.00
b-Depth to Water (at time of 1st reading): 5.30
a-b=Drawdown (D): 0.70

Bladder Pump Settings
Discharge Time: NA
Fill Time: NA

PERISTALTIC PUMP

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 429
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 1500
GVP > CVP: (YES / NO)
Comments: NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): 2.939 E-7

Count Room No.: 080427

Reviewed by: M. McGuin
Environmental Supervisor or Designee

Review Date: 3-9-08

ATTACHMENT 8
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Groundwater Monitoring Log

Groundwater Sample Identification: CSS NC-2

Sample Date: 2/12/08

Sample Analysis: H^3 Sampled by: T. Harris / R. Means

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1322	14.59	35168	6.92	3.20	150
1327	14.66	35138	6.80	3.30	NA
1332	14.82	34861	6.79	3.45	↓
			NA		
Sample Time: 1334			Initial water level: 2.60		

Operability Check (Indication in ft)
a-Final Depth to Water: 3.45
b-Depth to Water (at time of 1st reading): 3.20
a-b=Drawdown (D): 0.25

Bladder Pump Settings
Discharge Time: NA
Fill Time: NA
PERISTALTIC PUMP

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 153.25
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 1800
GVP > CVP (YES / NO)
Comments: NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): 2.599 E-7

Count Room No.: 080427

Reviewed by: M. McGuire
Environmental Supervisor or Designee

Review Date: 3-9-08

ATTACHMENT 8
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Groundwater Monitoring Log

Groundwater Sample Identification: ESS NC 3

Sample Date: 2/12/08

Sample Analysis: H3 Sampled by: T. Harris/R. Moore

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1340	15.54	35888	6.68	3.60	125
1345	15.84	35909	6.68	3.75	NA
1350	16.11	35914	6.67	3.75	✓
Sample Time: 1352			Initial water level: 2.70		

Operability Check (Indication in ft)
a-Final Depth to Water: 3.75
b-Depth to Water (at time of 1st reading): 3.60
a-b=Drawdown (D): 0.15

Bladder Pump Settings
Discharge Time: NA
Fill Time: NA
PERISTALTIC PUMP

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 91.95
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 1500
GVP > CVP (YES / NO)
Comments: NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): < MDA

Count Room No.: 080427

Reviewed by: M. McGuire
Environmental Supervisor or Designee

Review Date: 3-9-08

ATTACHMENT 8
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Groundwater Monitoring Log

Groundwater Sample Identification: ESS NC-4

Sample Date: 2/12/08

Sample Analysis: H3 Sampled by: T. Harris / R. Means

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1355	16.08	32258	6.63	2.80	100
1400	16.42	32324	6.58	2.90	NA
1405	16.10	32432	6.54	3.15	↓
Sample Time: 1407			Initial water level: 2.50		

NA

Operability Check (Indication in ft)
a-Final Depth to Water: 3.15
b-Depth to Water (at time of 1st reading): 2.80
a-b=Drawdown (D): 0.35

Bladder Pump Settings
Discharge Time: NA
Fill Time: NA
PERISTALTIC pump

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 214.55
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 1200
GVP > CVP: (YES) / NO)
Comments: NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): 3.225E-7

Count Room No.: 080427

Reviewed by: M. McKee
Environmental Supervisor or Designee

Review Date: 3-9-08

ATTACHMENT 8
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Groundwater Monitoring Log

Groundwater Sample Identification: ESS - NC-5

Sample Date: 2/12/08

Sample Analysis: H3 Sampled by: T. Harris/R. Means

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1415	15.50	30488	6.69	2.65	150
1420	15.45	30405	6.70	2.90	NA
1425	15.54	30343	6.66	3.40	↓
			NA		
Sample Time: 1427			Initial water level: 1.80		

Operability Check (Indication in ft)
a-Final Depth to Water: 3.40
b-Depth to Water (at time of 1st reading): 2.65
a-b=Drawdown (D): 0.75

Bladder Pump Settings
Discharge Time: NA
Fill Time: NA

PERISTALTIC PUMP

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 459.75
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 1800
GVP > CVP: (YES / NO)
Comments: NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): < MDA

Count Room No.: 080427

Reviewed by: M. McGow
Environmental Supervisor or Designee

Review Date: 3-9-08

ATTACHMENT 8
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Groundwater Monitoring Log

Groundwater Sample Identification: ESS-Stab

Sample Date: 2/11/08

Sample Analysis: H3 Sampled by: T. Harris / R. Meares

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0909	15.42	2225	6.48	16.18	300
0914	16.04	2150	6.54	16.54	NA
0919	15.99	2142	6.53	16.73	↓
			NA		
Sample Time: 0921			Initial water level: 15.98		

Operability Check (Indication in ft)
a-Final Depth to Water: 16.73
b-Depth to Water (at time of 1st reading): 16.18
a-b=Drawdown (D): 0.55

Bladder Pump Settings
Discharge Time: 8
Fill Time: 16
½ turn

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 337.15
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 3600
GVP > CVP: (YES / NO)
Comments: NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): 2.459E-4

Count Room No.: 080377

Reviewed by: M. McKeon
Environmental Supervisor or Designee

Review Date: 3-9-08

ATTACHMENT 8
Page 1 of 1
Groundwater Monitoring Log

Groundwater Sample Identification: GSS-17A

Sample Date: 2/11/08

Sample Analysis: H^3 Sampled by: T. HARRIS / R. MCNAMEES

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1320	16.68	390	7.60	18.62	125
1325	16.96	391	7.50	18.64	NA
1330	17.19	392	7.46	18.66	↓
			NA		
Sample Time: 1332			Initial water level: 18.38		

Operability Check (Indication in ft) 2-11-08 RM
a-Final Depth to Water: ~~18.62~~ 18.66
b-Depth to Water (at time of 1st reading): 18.62
a-b=Drawdown (D): 0.04

Bladder Pump Settings
Discharge Time: 17
Fill Time: 10
1 TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): NA
4" Well: D x (2468 ml/ft): 98.72
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 1500
GVP > CVP: (YES / NO)
Comments: NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): <MDA

Count Room No.: 080395

Reviewed by: M. McGhee
Environmental Supervisor or Designee

Review Date: 3-9-08

ATTACHMENT 8
Page 1 of 1
Groundwater Monitoring Log

Groundwater Sample Identification: ESS 17B

Sample Date: 2/11/08

Sample Analysis: H3 Sampled by: T. Harris
R. Meares

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1400	17.35	457	7.51	18.51	125
1405	17.65	455	7.47	18.53	NA ↓
1410	17.81	452	7.44	18.54	
			NA		
Sample Time: 1412			Initial water level: 18.15		

Operability Check (Indication in ft)
a-Final Depth to Water: 18.54
b-Depth to Water (at time of 1st reading): 18.51
a-b=Drawdown (D): 0.03

Bladder Pump Settings
Discharge Time: 8
Fill Time: 13
½ turn

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 18.39
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 1500
GVP > CVP: (YES / NO)
Comments: NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): < MDA

Count Room No.: 080395

Reviewed by: M. M[illegible]
Environmental Supervisor or Designee

Review Date: 3-9-08

ATTACHMENT 8
Page 1 of 1
Groundwater Monitoring Log

Groundwater Sample Identification: ESS 17C

Sample Date: 2/11/08

Sample Analysis: H3 Sampled by: T. Harris
R. Meares

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1340	17.62	2092	6.57	10.52	125
1345	17.24	2005	6.32	10.48	NA
1350	16.88	2130	6.40	10.40	↓
Sample Time: 1352			Initial water level: 9.73		

N/A

Operability Check (Indication in ft)
a-Final Depth to Water: 10.40
b-Depth to Water (at time of 1st reading): 10.52
a-b=Drawdown (D): Ø

Bladder Pump Settings
Discharge Time: 6
Fill Time: 9
½ turn

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): Ø
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 1500
GVP > CVP: (YES / NO)
Comments: N/A

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): 4.766E-6
Count Room No.: 080395

Reviewed by: M. McGuire
Environmental Supervisor or Designee
Review Date: 3-9-08

ATTACHMENT 8
Page 1 of 1
Groundwater Monitoring Log

Groundwater Sample Identification: ESS-18B

Sample Date: 2/14/08

Sample Analysis: H3 Sampled by: T. Harris / R. Means

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1438	15.40	586	7.77	23.08	100
1443	15.95	519	7.54	23.05	NA
1448	15.86	513	7.43	23.00	
1453	15.80	513	7.41	23.00	
NA					
Sample Time: 1455			Initial water level: 23.10		

Operability Check (Indication in ft)
a-Final Depth to Water: 23.00
b-Depth to Water (at time of 1st reading): 23.08
a-b=Drawdown (D): Ø

Bladder Pump Settings
Discharge Time: 11
Fill Time: 12
1/2 TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): Ø
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 1700
GVP > CVP: (YES / NO)
Comments: NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): <MDA

Count Room No.: 080445

Reviewed by: M. Meyer
Environmental Supervisor or Designee

Review Date: 3-9-08

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Groundwater Monitoring Log

Groundwater Sample Identification: CSS-18C

Sample Date: 2/14/08

Sample Analysis: H^3 Sampled by: T. Havis / R. Meares

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1420	14.51	3154	6.70	3.84	150
1425	14.27	3090	6.67	3.82	NA
1430	14.27	2953	6.71	3.86	✓
Sample Time: 1432			Initial water level: 3.53		

Operability Check (Indication in ft)
a-Final Depth to Water: 3.86
b-Depth to Water (at time of 1st reading): 3.84
a-b=Drawdown (D): 0.02

Bladder Pump Settings
Discharge Time: 7
Fill Time: 13
1/2 TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 12.26
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 1800
GVP > CVP: (YES / NO)
Comments: NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): 5.515E-4

Count Room No.: 080403

Reviewed by: M. McGillen
Environmental Supervisor or Designee

Review Date: 3-9-08

ATTACHMENT 8
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Groundwater Monitoring Log

Groundwater Sample Identification: ESS - 19B

Sample Date: 2/11/08

Sample Analysis: H3 Sampled by: T. HARRIS / R. MCFARLES

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0934	15.81	2321	6.98	12.98	150
0939	14.77	2330	6.92	12.80	NA
0944	14.33	2257	6.83	12.70	↓
Sample Time: 0946			Initial water level: 12.98		

NA

Operability Check (Indication in ft)
a-Final Depth to Water: 12.70
b-Depth to Water (at time of 1st reading): 12.98
a-b=Drawdown (D): 4

Bladder Pump Settings
Discharge Time: 9
Fill Time: 8
1/2 TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 4
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 1800
GVP > CVP: (YES) / NO)
Comments: NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): 1.762E-5

Count Room No.: 080395

Reviewed by: M. McGuire
Environmental Supervisor or Designee

Review Date: 3-9-08

ATTACHMENT 8

Groundwater Monitoring Log

Groundwater Sample Identification: ESS 19C

Sample Date: 2/11/08

Sample Analysis: H^3 Sampled by: T. HARRIS / R. MEARES

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0955	13.57	5258	6.10	4.55	200
1000	14.31	5378	6.07	4.68	NA
1005	14.63	5405	6.03	4.80	↓
			NA		
Sample Time: 1007			Initial water level: 4.17		

Operability Check (Indication in ft)
a-Final Depth to Water: 4.80
b-Depth to Water (at time of 1st reading): 4.55
a-b=Drawdown (D): 0.25

Bladder Pump Settings
Discharge Time: 7
Fill Time: 13
1/2 TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 153.25
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 2400
GVP > CVP: (YES / NO)
Comments: NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): 5.089E-4

Count Room No.: 080378

Reviewed by: M. Mellon
Environmental Supervisor or Designee

Review Date: 3-9-08

ATTACHMENT 8
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Groundwater Monitoring Log

Groundwater Sample Identification: ESS - 20B

Sample Date: 2/11/08

Sample Analysis: H3 Sampled by: T. Harris / R. Meaus

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1055	16.15	426	8.01	14.19	75
1100	16.48	409	7.69	14.18	NA
1105	16.14	414	7.72	14.16	↓
Sample Time: 1107			Initial water level: 14.22		

NA

Operability Check (Indication in ft)
a-Final Depth to Water: 14.16
b-Depth to Water (at time of 1st reading): 14.19
a-b=Drawdown (D): 0

Bladder Pump Settings
Discharge Time: 8
Fill Time: 11
1/2 turn

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 0
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 900
GVP > CVP: (YES) / NO)
Comments:

NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): <MDA

Count Room No.: 080395

Reviewed by: M. McGee
Environmental Supervisor or Designee

Review Date: 3-9-08

ATTACHMENT 8
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Groundwater Monitoring Log

Groundwater Sample Identification: GSS 20C

Sample Date: 2/11/08

Sample Analysis: H3 Sampled by: T. HARRIS / R. MCCARES

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1023	13.98	1725	6.27	4.63	175
1028	13.93	1704	6.14	4.68	N/A
1033	14.09	1699	6.12	4.76	
Sample Time: 1035			Initial water level: 4.25		

Operability Check (Indication in ft)
a-Final Depth to Water: 4.76
b-Depth to Water (at time of 1st reading): 4.63
a-b=Drawdown (D): 0.13

Bladder Pump Settings
Discharge Time: 6
Fill Time: 12
1/2 TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 79.69
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 2100
GVP > CVP: (YES / NO)
Comments: N/A

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): 1.864E-5
Count Room No.: 080378

Reviewed by: M. McCoy
Environmental Supervisor or Designee
Review Date: 3-9-08

ATTACHMENT 8
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Groundwater Monitoring Log

Groundwater Sample Identification: ESS- 21B

Sample Date: 2/13/08

Sample Analysis: H^3 Sampled by: T. HARRIS / R. MCSMILLS

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1320	18.27	391	8.08	26.77	100
1325	18.38	375	8.17	26.78	NA
1330	18.42	356	8.14	26.79	↓
1335	18.47	353	8.03	26.78	
					NA
Sample Time: 1337			Initial water level: 26.75		

Operability Check (Indication in ft)
a-Final Depth to Water: 26.78
b-Depth to Water (at time of 1st reading): 26.77
a-b=Drawdown (D): 0.01

Bladder Pump Settings
Discharge Time: 9
Fill Time: 13
1/2 TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 6.13
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 1700
GVP > CVP: (YES / NO)
Comments: NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): <MDA
Count Room No.: 080443

Reviewed by: M. McGee
Environmental Supervisor or Designee
Review Date: 3-9-08

ATTACHMENT 8
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Groundwater Monitoring Log

Groundwater Sample Identification: CSS- 21 C

Sample Date: 2/13/08

Sample Analysis: H3 Sampled by: T. Harris/R. Moore

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1340	18.15	1210	6.59	9.50	250
1345	18.34	1340	6.49	9.50	NA
1350	18.42	1360	6.50	9.50	
1355	18.45	1368	6.46	9.52	
NA					
Sample Time:	1357		Initial water level:	9.36	

Operability Check (Indication in ft)
a-Final Depth to Water: 9.52
b-Depth to Water (at time of 1st reading): 9.50
a-b=Drawdown (D): 0.02 2/13/08

Bladder Pump Settings
Discharge Time: 10
Fill Time: 16
1/2 TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 12.26
4" Well: D x (2468 ml/ft): NA
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: NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): 6.063E-7

Count Room No.: 080457

Reviewed by: M. McKinn
Environmental Supervisor or Designee

Review Date: 3-9-08

ATTACHMENT 8
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Groundwater Monitoring Log

Groundwater Sample Identification: GSS-225

Sample Date: 2/13/08

Sample Analysis: H3 Sampled by: T. Harris/R. Means

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1425	18.10	733	11.17	28.42	75
1430	18.31	710	11.13	28.42	NA
1435	18.26	743	11.12	28.42	↓
Sample Time: 1437			Initial water level: 28.42		

Operability Check (Indication in ft)
a-Final Depth to Water: 28.42
b-Depth to Water (at time of 1st reading): 28.42
a-b=Drawdown (D): Ø

Bladder Pump Settings
Discharge Time: 10
Fill Time: 17
1/2 TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): Ø
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 900
GVP > CVP: (YES) NO)
Comments: NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): <MDA

Count Room No.: 080443

Reviewed by: M. McCoy
Environmental Supervisor or Designee

Review Date: 3-9-08

ATTACHMENT 8
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Groundwater Monitoring Log

Groundwater Sample Identification: GSS-22C

Sample Date: 2/13/08

Sample Analysis: H^3 Sampled by: T. Harris/R. Means

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1403	16.84	4357	6.19	5.36	100
1408	16.91	4081	6.20	5.38	NA
1413	16.89	4056	6.22	5.34	↓
			NA		
Sample Time: 1415			Initial water level: 5.30		

Operability Check (Indication in ft)
a-Final Depth to Water: 5.34
b-Depth to Water (at time of 1st reading): 5.36
a-b=Drawdown (D): ∅

Bladder Pump Settings
Discharge Time: 7
Fill Time: 16
½ TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): ∅
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 1200
GVP > CVP: (YES) / NO)
Comments: NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): 5.738E-4

Count Room No.: 080403

Reviewed by: M. McEllen
Environmental Supervisor or Designee

Review Date: 3-9-08

ATTACHMENT 8
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Groundwater Monitoring Log

Groundwater Sample Identification: CSS 23C

Sample Date: 2/14/08

Sample Analysis: H^3 Sampled by: T. Harris/M. Means

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1139	18.55	2170	5.45	13.79	100
1144	17.90	2363	5.85	13.78	NA
1149	17.70	2381	5.88	13.78	
1154	18.07	2390	5.90	13.78	
NA					
Sample Time: 1156			Initial water level: 13.50		

Operability Check (Indication in ft)
a-Final Depth to Water: 13.78
b-Depth to Water (at time of 1st reading): 13.79
a-b=Drawdown (D): ∅

Bladder Pump Settings
Discharge Time: 8
Fill Time: 15
1/2 turn

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): ∅
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 1700
GVP > CVP: (YES) / NO)
Comments: NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): 2.344E-4

Count Room No.: 080428

Reviewed by: M. McGee
Environmental Supervisor or Designee

Review Date: 3-9-08

ATTACHMENT 8
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Groundwater Monitoring Log

Groundwater Sample Identification: ESS-30C

Sample Date: 2/13/08

Sample Analysis: H^3 Sampled by: T. Harris / R. Meares

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1040	16.28	1788	6.12	5.92	150
1045	16.56	1841	5.58	5.95	ok
1050	16.58	1863	5.54	5.97	
1055	16.63	1873	5.51	5.98	✓
NA					→
Sample Time:	1057		Initial water level:	5.55	

Operability Check (Indication in ft)
a-Final Depth to Water: 5.98
b-Depth to Water (at time of 1st reading): 5.92
a-b=Drawdown (D): 0.06

Bladder Pump Settings
Discharge Time: 7
Fill Time: 17
1/2 TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 36.78
4" Well: D x (2468 ml/ft): N/A
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 2550
GVP > CVP (YES / NO)
Comments: N/A

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): 2.930E-6
Count Room No.: 080403

Reviewed by: M. McCoy
Environmental Supervisor or Designee
Review Date: 3-9-08

ATTACHMENT 8
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Groundwater Monitoring Log

Groundwater Sample Identification: ESS-24A

Sample Date: 2/13/08

Sample Analysis: H^3 Sampled by: T. Harris / R. Meaux

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0930	17.40	515	10.78	19.47	150
0935	17.76	502	10.75	19.45	NA
0940	18.14	498	10.74	19.47	↓
Sample Time: 0942			Initial water level: 19.02		

Operability Check (Indication in ft)
a-Final Depth to Water: 19.47
b-Depth to Water (at time of 1st reading): 19.47
a-b=Drawdown (D): Ø

Bladder Pump Settings
Discharge Time: 24
Fill Time: 15
1 TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): Ø
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 1800
GVP > CVP (YES) NO)
Comments: NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): < MDA

Count Room No.: 080445

Reviewed by: M. McGuire
Environmental Supervisor or Designee

Review Date: 3-9-08

ATTACHMENT 8
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Groundwater Monitoring Log

Groundwater Sample Identification: GSS-24B

Sample Date: 2/13/08

Sample Analysis: H3 Sampled by: T. Harris / R. Meaves

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0947	17.20	1377	11.71	18.29	150
0952	18.36	1432	11.73	18.19	NA
0957	18.37	1514	11.75	18.19	
1002	18.33	1548	11.75	18.18	
NA					
Sample Time: 1004			Initial water level: 18.20		

Operability Check (Indication in ft)
a-Final Depth to Water: 18.18
b-Depth to Water (at time of 1st reading): 18.29
a-b=Drawdown (D): Ø

Bladder Pump Settings
Discharge Time: 11
Fill Time: 12

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): Ø
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 2550
GVP > CVP: (YES) / NO)
Comments: NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): <MDA

Count Room No.: 080445

Reviewed by: M. McGolin
Environmental Supervisor or Designee

Review Date: 3-9-08

ATTACHMENT 8
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Groundwater Monitoring Log

Groundwater Sample Identification: ESS-24C

Sample Date: 2/13/08

Sample Analysis: H^3 Sampled by: T. Harris
R. Means

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0905	16.32	4720	4.20	5.15	125
0910	16.29	4621	4.95	5.16	NA
0915	16.24	4611	5.09	5.18	↓
Sample Time: 0917			Initial water level: 4.96		

Operability Check (Indication in ft)
a-Final Depth to Water: 5.18
b-Depth to Water (at time of 1st reading): 5.15
a-b=Drawdown (D): 0.03

Bladder Pump Settings
Discharge Time: 7
Fill Time: 15

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 18.39
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 1500
GVP > CVP: (YES) / NO)
Comments: NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): 4.334E-6

Count Room No.: 080403

Reviewed by: M. McKeon
Environmental Supervisor or Designee

Review Date: 3-9-08

ATTACHMENT 8
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Groundwater Monitoring Log

Groundwater Sample Identification: ESS - 25B

Sample Date: 2/18/08

Sample Analysis: H^3 Sampled by: T. Harris / R. Means

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1240	17.51	2310	7.35	15.00	100
1245	17.54	2381	7.26	15.00	NA
1300	17.54	2369	7.36	15.00	↓
			N		
			A		
Sample Time: 1302			Initial water level: 14.62		

Operability Check (Indication in ft)
a-Final Depth to Water: 15.00
b-Depth to Water (at time of 1st reading): 15.00
a-b=Drawdown (D): Ø

Bladder Pump Settings
Discharge Time: 8
Fill Time: 14
1/2 TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): Ø
4" Well: D x (2468 ml/ft): N/A
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 1200
GVP > CVP: (YES / NO)
Comments: N/A

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): < MDA

Count Room No.: 080457

Reviewed by: M. McCall
Environmental Supervisor or Designee

Review Date: 3-9-08

ATTACHMENT 8
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Groundwater Monitoring Log

Groundwater Sample Identification: ESS - 25C

Sample Date: 2/18/08

Sample Analysis: H^3 Sampled by: T. Harris / R. Meares

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1308	17.18	2145	6.71	*	125
1313	16.98	2013	6.46	*	NA
1318	16.98	1986	6.41	*	↓
			NA		
Sample Time: 1320			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): NA

Bladder Pump Settings
Discharge Time: 10
Fill Time: 18
1/2 TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): *
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): TH 2/18 ~~1200~~ 1500
GVP > CVP: (YES / NO) *
Comments: * NO LEVEL AVAILABLE DUE TO PUMP HOUSING.
NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): < MDA
Count Room No.: 080457

Reviewed by: M. McSolu
Environmental Supervisor or Designee
Review Date: 3-9-08

ATTACHMENT 8
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Groundwater Monitoring Log

Groundwater Sample Identification: C-55 26C

Sample Date: 2/13/08

Sample Analysis: H3 Sampled by: T. Harris / R. Means

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1444	15.55	3639	6.85	NA	125
1449	15.58	3550	6.59		NA
1454	15.56	3512	6.55		
		NA			
Sample Time: 1456			Initial water level: NA *		

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

Bladder Pump Settings
Discharge Time: 4
Fill Time: 25
1/2 TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): NA *
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 1500 ~~NA~~ TH 2/13/08
GVP > CVP: (YES / NO) *
Comments: * NO LOWER AVALABLE DUE TO PUMP HOUSING

NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): 3.459E-4

Count Room No.: 080403

Reviewed by: M. McGowan
Environmental Supervisor or Designee

Review Date: 3-9-08

ATTACHMENT 8
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Groundwater Monitoring Log

Groundwater Sample Identification: ESS-27A

Sample Date: 2/14/08

Sample Analysis: H^3 Sampled by: T. Harris / R Medus

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1120	17.99	334	7.53	29.10	175
1125	18.18	345	7.37	29.10	NA
1130	18.26	349	7.37	29.10	
			N		
			A		
Sample Time: 1132			Initial water level: 29.09		

Operability Check (Indication in ft)
a-Final Depth to Water: 29.10
b-Depth to Water (at time of 1st reading): 29.10
a-b=Drawdown (D): Ø

Bladder Pump Settings
Discharge Time: 25
Fill Time: 15
1 TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): NA
4" Well: D x (2468 ml/ft): Ø
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 2100
GVP > CVP: (YES / NO)
Comments: NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): < MDA

Count Room No.: 080445

Reviewed by: M. McKoon
Environmental Supervisor or Designee

Review Date: 3-9-08

ATTACHMENT 8
Page 1 of 1
Groundwater Monitoring Log

Groundwater Sample Identification: ESS - 28C

Sample Date: 2/14/08

Sample Analysis: H3 Sampled by: T. Harris / R. Means

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1200	16.00	1238	6.05	11.88	125
1205	15.93	1258	6.05	11.90	NA
1210	15.70	1348	6.04	11.90	
			NA		
Sample Time: 1212			Initial water level: 11.65		

Operability Check (Indication in ft)
a-Final Depth to Water: 11.90
b-Depth to Water (at time of 1st reading): 11.88
a-b=Drawdown (D): 0.02

Bladder Pump Settings
Discharge Time: 8
Fill Time: 16
1/2 TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 12.26
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 1500
GVP > CVP (YES / NO)
Comments: NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): 5.253E-7

Count Room No.: 080444

Reviewed by: M. McGuire
Environmental Supervisor or Designee

Review Date: 3-9-08

ATTACHMENT 8
Page 1 of 1
Groundwater Monitoring Log

Groundwater Sample Identification: CSS - 27C

Sample Date: 2/14/08

Sample Analysis: H3 Sampled by: T. Harris / R. Meares

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1355	20.16	2164	6.50	NA *	50
1400	20.44	2208	6.47		NA
1405	20.51	2231	6.47		
		A			
Sample Time: 1407			Initial water level: 7.96		

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

Bladder Pump Settings
Discharge Time: 7
Fill Time: 15
1/2 TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): NA *
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 600
GVP > CVP: (YES / NO) *
Comments: * WATER LEVEL BELOW PUMP CASING (dropped below casing after pumping began even though flow rate was minimal).

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): 2.643E-4

Count Room No.: 080428

Reviewed by: M. M[illegible]
Environmental Supervisor or Designee

Review Date: 3-9-08

ATTACHMENT 12
Page 1 of 1
Calibration and Verification Data Sheet

Multi-Meter Probe SN 07G100510

pH 4.00 Buffer Lot Number 4706061 Exp. Date 5/2009
pH 7.00 Buffer Lot Number 4709137 Exp. Date 8/2009
pH 10.00 Buffer Lot Number 4702044 Exp. Date 7/2008

Date	Calibration				Verification		*	
	pH 7.00 Buffer		pH 4.00 Buffer		pH 10.00 Buffer		P/F	Name
	Actual	Indicated	Actual	Indicated	Actual	Indicated		
3/12/08	7.00	7.00	4.00	4.00	10.00	10.02	P	T. Harris
3/14/08	7.00	7.00	4.00	4.00	10.00	10.03	P	T. Harris
3/17/08	7.00	7.00	4.00	4.00	10.00	10.03	P	T. Harris
3/18/08	7.00	7.00	4.00	4.00	10.00	10.04	P	T. Harris
3/19/08	7.00	7.00	4.00	4.00	10.00	10.03	P	T. Harris
3/20/08	7.00	7.00	4.00	4.00	10.00	10.05	P	T. Harris
3/21/08	7.00	7.00	4.00	4.00	10.00	10.03	P	T. Harris

*Verification passes if difference between actual and indicated is ≤ 0.1

Conductivity Calibration Standard Lot Number 2707421 Exp. Date 7/2008
Conductivity Verification Standard Lot Number 2708222 Exp. Date 7/2008

Date	Conductivity Calibration Standard		Conductivity Verification Standard		** P/F	Name
	Actual	Indicated	Actual	Indicated		
3/12/08	1413 µS/cm	1413 µS/cm	200 µS/cm	198 µS/cm	P	T. Harris
3/14/08	1413 µS/cm	1413 µS/cm	200 µS/cm	199 µS/cm	P	T. Harris
3/17/08	1413 µS/cm	1413 µS/cm	200 µS/cm	196 µS/cm	P	T. Harris
3/18/08	1413 µS/cm	1413 µS/cm	200 µS/cm	192 µS/cm	P	T. Harris
3/19/08	1413 µS/cm	1413 µS/cm	200 µS/cm	193 µS/cm	P	T. Harris
3/20/08	1413 µS/cm	1413 µS/cm	200 µS/cm	196 µS/cm	P	T. Harris
3/21/08	1413 µS/cm	1413 µS/cm	200 µS/cm	202 µS/cm	P	T. Harris

**Verification passes if difference be actual and indicated is ≤ 5%.

Comments: NA

Reviewed by M. McGuire Date 4-7-08

ATTACHMENT 8
Page 1 of 1
Groundwater Monitoring Log

Groundwater Sample Identification: FSS-19B

Sample Date: 3/21/08

Sample Analysis: H^3 γ Sampled by: T. Harris / R. Means

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0943	16.45	2296	6.86	12.24	200
0948	16.60	2282	6.86	12.24	N/A
0953	16.69	2265	6.87	12.24	↓
N/A					↓
Sample Time: 0955 - H^3 0956 γ			Initial water level: 12.23		

Operability Check (Indication in ft)
a-Final Depth to Water: 12.24
b-Depth to Water (at time of 1st reading): 12.24
a-b=Drawdown (D): ∅

Bladder Pump Settings
Discharge Time: 9
Fill Time: 8
1/2 TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): ∅
4" Well: D x (2468 ml/ft): N/A
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 2400
GVP > CVP: (YES) NO)
Comments: resample standing H_2O 1.465E-4 H^3
sampled for H^3 & γ
post @ 1000 2.409E-5 H^3

Gamma Result (µci/ml): <MDA NDA
Tritium Result (µci/ml): 2.543E-5

H^3
Count Room No.: 080858
γ 080859

Reviewed by: M. McGoun
Environmental Supervisor or Designee

Review Date: 4-7-08

ATTACHMENT 8
Page 1 of 1
Groundwater Monitoring Log

Groundwater Sample Identification: CFSS 19C

Sample Date: 3/17/08

Sample Analysis: H^3 Sampled by: T. Harris / R. Meaco

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0915	14.12	5138	7.49	4.50	132
0920	14.00	5555	7.25	4.50	NA
0925	14.00	5648	7.14	4.50	
0930	14.09	5630	7.10	4.50	
NA	—			→	↓
Sample Time: 0932			Initial water level: 4.0		

Operability Check (Indication in ft)
a-Final Depth to Water: 4.50
b-Depth to Water (at time of 1st reading): 4.50
a-b=Drawdown (D): Ø

Bladder Pump Settings
Discharge Time: 7
Fill Time: 13
1/2 TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): Ø
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 2244
GVP > CVP (YES / NO)
Comments:
NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): 5.113E-4

Count Room No.: 080776

Reviewed by: M. McGann
Environmental Supervisor or Designee

Review Date: 4-7-08

ATTACHMENT 8
Page 1 of 1
Groundwater Monitoring Log

Groundwater Sample Identification: CSS-18B

Sample Date: 3/14/08

Sample Analysis: H3 Sampled by: T. Hanno
R. Means

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1028	17.56	510	7.64	23.15	140
1033	17.28	508	7.62	23.13	NA
1038	17.25	506	7.61	23.14	
NA					
Sample Time: 1040			Initial water level: 23.07		

Operability Check (Indication in ft)
a-Final Depth to Water: 23.14
b-Depth to Water (at time of 1st reading): 23.15
a-b=Drawdown (D): Ø

Bladder Pump Settings
Discharge Time: 11
Fill Time: 12
½ TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): Ø
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 1680
GVP > CVP: (YES / NO)
Comments:
NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): < MDA NDA

Count Room No.: 080845

Reviewed by: M. Mizgan
Environmental Supervisor or Designee

Review Date: 4-7-08

ATTACHMENT 8
Page 1 of 1
Groundwater Monitoring Log

Groundwater Sample Identification: GSS-18C

Sample Date: 3/14/08

Sample Analysis: H^3 Sampled by: T. Harris / R. Meares

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1047	14.49	3264	7.12	3.65	260
1052	14.36	3260	7.14	3.76	NA
1057	14.35	3266	7.15	3.86	
NA					
Sample Time: 1059			Initial water level: 3.00		

Operability Check (Indication in ft)
a-Final Depth to Water: 3.86
b-Depth to Water (at time of 1st reading): 3.65
a-b=Drawdown (D): 0.21

Bladder Pump Settings
Discharge Time: 8
Fill Time: 14
1/2 TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 128.73
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 3120
GVP > CVP: (YES) / NO)
Comments:

NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): 6.646E-4

Count Room No.: 080776

Reviewed by: M. McGhee
Environmental Supervisor or Designee

Review Date: 4-7-08

ATTACHMENT 8
Page 1 of 1
Groundwater Monitoring Log

Groundwater Sample Identification: GSS 20B

Sample Date: 3/17/08

Sample Analysis: H^3 Sampled by: T. Harris/R. Means

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0945	16.15	446	8.45	14.08	150
0950	15.79	431	8.23	14.10	
0955	15.73	423	8.12	14.10	NA
NA					
Sample Time: 0957			Initial water level: 14.05		

Operability Check (Indication in ft)
a-Final Depth to Water: 14.10
b-Depth to Water (at time of 1st reading): 14.08
a-b=Drawdown (D): 0.02

Bladder Pump Settings
Discharge Time: 9
Fill Time: 8
1/2 TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 12.26
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 1800
GVP > CVP: (YES / NO)
Comments:
NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): < MDA NDA

Count Room No.: 080846

Reviewed by: M. McGee
Environmental Supervisor or Designee

Review Date: 4-7-08

ATTACHMENT 8
Page 1 of 1
Groundwater Monitoring Log

Groundwater Sample Identification: CSS - 20C

Sample Date: 3/17/08

Sample Analysis: H3 Sampled by: T. Harris / R. Means

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1002	14.55	1715	6.78	3.66	160
1007	14.51	1704	6.67	3.63	
1012	14.38	1708	6.59	3.65	NA
NA					
Sample Time: 1014			Initial water level: 3.00		

Operability Check (Indication in ft)
a-Final Depth to Water: 3.65
b-Depth to Water (at time of 1st reading): 3.66
a-b=Drawdown (D): Ø

Bladder Pump Settings
Discharge Time: 7
Fill Time: 13
1/2 TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): Ø
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 1920
GVP > CVP (YES / NO)
Comments:
NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): 1.847E-5
Count Room No.: 080776

Reviewed by: M. McGuin
Environmental Supervisor or Designee
Review Date: 4-7-08

ATTACHMENT 8
Page 1 of 1
Groundwater Monitoring Log

Groundwater Sample Identification: ESS-21B

Sample Date: 3/14/08

Sample Analysis: H^3 Sampled by: T. Harris / R. Means

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0820	18.47	350	9.12	27.93	75
0825	18.17	351	9.34	27.94	NA
0830	17.98	351	9.43	27.96	
NA					
Sample Time: 0832			Initial water level: 28.22		

Operability Check (Indication in ft)
a-Final Depth to Water: 27.96
b-Depth to Water (at time of 1st reading): 27.93
a-b=Drawdown (D): 0.03

Bladder Pump Settings
Discharge Time: 9
Fill Time: 13
½ TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 18.39
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 900
GVP > CVP (YES / NO)
Comments:
NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): < MDA NDA

Count Room No.: 080845

Reviewed by: M. McGann
Environmental Supervisor or Designee

Review Date: 4-7-08

ATTACHMENT 8
Page 1 of 1
Groundwater Monitoring Log

Groundwater Sample Identification: GSS-21C

Sample Date: 3/14/08

Sample Analysis: H^3 Sampled by: T. Harris / R. Mesa

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0845	17.39	1458	6.95	9.24	110
0850	17.15	1467	6.80	9.08	NA
0855	17.08	1475	6.83	9.00	
NA					
Sample Time: 0857			Initial water level: 8.89		

Operability Check (Indication in ft)
a-Final Depth to Water: 9.00
b-Depth to Water (at time of 1st reading): 9.24
a-b=Drawdown (D): Ø

Bladder Pump Settings
Discharge Time: 10
Fill Time: 16
1/2 TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): Ø
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 1320
GVP > CVP: (YES / NO)
Comments:

NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): 7.566 E-7

Count Room No.: 080845

Reviewed by: M. McGuire
Environmental Supervisor or Designee

Review Date: 4-7-08

ATTACHMENT 8
Page 1 of 1
Groundwater Monitoring Log

Groundwater Sample Identification: GSS-22B

Sample Date: 3/14/08

Sample Analysis: H^3 Sampled by: T. Harris / R. Meares

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0905	17.88	804	11.36	29.45	125
0910	18.28	954	11.57	29.47	NA
0915	18.20	941	11.58	29.51	
0920	18.21	875	11.48	29.50	
NA				→	↓
Sample Time: 0922			Initial water level: 29.46		

Operability Check (Indication in ft)
a-Final Depth to Water: 29.50
b-Depth to Water (at time of 1st reading): 29.45
a-b=Drawdown (D): 0.05

Bladder Pump Settings
Discharge Time: 10
Fill Time: 17
½ TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 30.65
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 2125
GVP > CVP: (YES / NO)
Comments:
NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): < MDA NDA

Count Room No.: 080845

Reviewed by: M. McGann
Environmental Supervisor or Designee

Review Date: 4-7-08

ATTACHMENT 8
Page 1 of 1
Groundwater Monitoring Log

Groundwater Sample Identification: CFSS-17A

Sample Date: 3/12/08

Sample Analysis: H3 Sampled by: T. HARRIS / R. MCDANIELS

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0803	15.59	419	7.92	19.34	75
0808	16.21	402	7.76	19.35	NA
0813	16.46	401	7.70	19.37	
NA					
Sample Time: 0815			Initial water level: 19.21		

Operability Check (Indication in ft)
a-Final Depth to Water: 19.37
b-Depth to Water (at time of 1st reading): 19.34
a-b=Drawdown (D): 0.03

Bladder Pump Settings
Discharge Time: 17
Fill Time: 10
1 TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): NA
4" Well: D x (2468 ml/ft): 74.04
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 900
GVP > CVP: (YES / NO)
Comments:

NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): <MDA NDA

Count Room No.: 080768

Reviewed by: M. McKown
Environmental Supervisor or Designee

Review Date: 4-7-08

ATTACHMENT 8
Page 1 of 1
Groundwater Monitoring Log

Groundwater Sample Identification: ESS - 17B

Sample Date: 3/12/08

Sample Analysis: H^3 Sampled by: T. Harris/R. Means

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0825	17.34	457	7.66	20.1	100
0830	17.02	464	7.60	19.98	NA
0835	17.21	463	7.57	19.97	
NA					
Sample Time: 0837			Initial water level: 19.59		

Operability Check (Indication in ft)
a-Final Depth to Water: 19.97
b-Depth to Water (at time of 1st reading): 20.1
a-b=Drawdown (D): Ø

Bladder Pump Settings
Discharge Time: 8
Fill Time: 13
1/2 TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): Ø
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 1200
GVP > CVP (YES / NO)
Comments:
NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): <MDA NDA

Count Room No.: 080768

Reviewed by: M. McKinn
Environmental Supervisor or Designee

Review Date: 4-7-08

ATTACHMENT 8
Page 1 of 1
Groundwater Monitoring Log

Groundwater Sample Identification: ESS-17C

Sample Date: 3/12/08

Sample Analysis: H^3 Sampled by: T. Harris / R. Meeks

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0845	17.64	2071	6.59	10.15	200
0850	17.62	2108	6.52	10.16	NA
0855	17.73	2218	6.52	10.31	
NA					
Sample Time: 0857			Initial water level: 9.10		

Operability Check (Indication in ft)
a-Final Depth to Water: 10.31
b-Depth to Water (at time of 1st reading): 10.15
a-b=Drawdown (D): 0.16

Bladder Pump Settings
Discharge Time: 6
Fill Time: 9
1/2 TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 98.08
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): ~~120~~ 2400 3/12/08
GVP > CVP: (YES / NO)
Comments:

NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): 4.747E-6

Count Room No.: 080768

Reviewed by: M. McGlynn
Environmental Supervisor or Designee

Review Date: 4-7-08

ATTACHMENT 8
Page 1 of 1
Groundwater Monitoring Log

Groundwater Sample Identification: ESS-19B

Sample Date: 3/17/08

Sample Analysis: H^3 Sampled by: T. Harris / R. Means

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0850	16.03	2337	10.03	12.50	125
0855	15.44	2380	9.04	12.52	NA
0900	15.29	2381	8.76	12.52	↓
0905	15.34	2375	8.46	12.52	↓
NA →				→	↓
Sample Time: 0907			Initial water level: 12.46		

Operability Check (Indication in ft)
a-Final Depth to Water: 12.52
b-Depth to Water (at time of 1st reading): 12.50
a-b=Drawdown (D): 0.02

Bladder Pump Settings
Discharge Time: 9
Fill Time: 8
1/2 TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 12.26
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 2125
GVP > CVP (YES) / NO)
Comments:
NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): 2.445E-5

Count Room No.: 080776

Reviewed by: M. McGann
Environmental Supervisor or Designee

Review Date: 4-7-08

ATTACHMENT 8
Page 1 of 1
Groundwater Monitoring Log

Groundwater Sample Identification: ESS-22C

Sample Date: 3/14/08

Sample Analysis: H3 Sampled by: T. Harris / R. Means

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0936	16.43	4608	6.98	5.20	200
0941	16.46	4817	6.55	5.24	NA
0946	16.47	4858	6.66	5.25	
NA					
Sample Time: 0948			Initial water level: 5.06		

Operability Check (Indication in ft)
a-Final Depth to Water: 5.25
b-Depth to Water (at time of 1st reading): 5.20
a-b=Drawdown (D): 0.05

Bladder Pump Settings
Discharge Time: 7
Fill Time: 16
½ TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 30.65
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 2400
GVP > CVP: (YES) / NO)
Comments:
NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): 7.5090E-4

Count Room No.: 080777

Reviewed by: M. McGlohn
Environmental Supervisor or Designee

Review Date: 4-7-08

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Groundwater Monitoring Log

Groundwater Sample Identification: GSS - 23C

Sample Date: 3/14/08

Sample Analysis: H^3 Sampled by: T. Harris / R. Meaves

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1413	18.22	2398	6.58	13.29	55
1418	18.34	2433	6.54	13.12	NA
1423	18.68	2439	6.47	12.97	
NA					
Sample Time: 1425			Initial water level: 12.73		

Operability Check (Indication in ft)
a-Final Depth to Water: 12.97
b-Depth to Water (at time of 1st reading): 13.29
a-b=Drawdown (D): Ø

Bladder Pump Settings
Discharge Time: 8
Fill Time: 15
½ TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): Ø
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 660
GVP > CVP: (YES / NO)
Comments:

NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): 2.305 E-4

Count Room No.: 080777

Reviewed by: M. McGahan
Environmental Supervisor or Designee

Review Date: 4-7-08

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Groundwater Monitoring Log

Groundwater Sample Identification: CSS -24A

Sample Date: 3/12/08

Sample Analysis: H3 Sampled by: T. Harris/R. Meares

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0940	17.42	532	10.49	20.05	225
0945	17.96	498	10.65	20.00	NA
0950	18.00	509	10.75	20.02	
NA					
Sample Time: 0952			Initial water level: 19.50		

Operability Check (Indication in ft)
a-Final Depth to Water: 20.02
b-Depth to Water (at time of 1st reading): 20.05
a-b=Drawdown (D): Ø

Bladder Pump Settings
Discharge Time: 24
Fill Time: 15
1 TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): Ø
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 2700
GVP > CVP: (YES) / NO)
Comments:

NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): < MDA NOA

Count Room No.: 080770

Reviewed by: M. McGann
Environmental Supervisor or Designee

Review Date: 4-7-08

ATTACHMENT 8
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Groundwater Monitoring Log

Groundwater Sample Identification: CSS- 24B

Sample Date: 3/12/08

Sample Analysis: H^3 Sampled by: T. Harris / R. Means

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1002	17.65	1576	11.71	19.27	100
1007	17.50	1616	11.83	19.15	NA
1012	17.50	1625	11.93	19.15	
NA					
Sample Time: 1014			Initial water level: 19.25		

Operability Check (Indication in ft)
a-Final Depth to Water: 19.15
b-Depth to Water (at time of 1st reading): 19.27
a-b=Drawdown (D): Ø

Bladder Pump Settings
Discharge Time: 8
Fill Time: 14
1/2 TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): Ø
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 1200
GVP > CVP: (YES / NO)
Comments:

NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): < MDA NOA

Count Room No.: 080770

Reviewed by: M. McGann
Environmental Supervisor or Designee

Review Date: 4-7-08

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Groundwater Monitoring Log

Groundwater Sample Identification: ESS- 24C

Sample Date: 3/12/08

Sample Analysis: H^3 Sampled by: T. Harris / R. Means

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0908	15.92	4445	3.64	4.85	175
0913	16.01	4000	5.33	4.90	NA
0918	16.03	3859	5.93	4.96	
0923	16.02	3677	6.01	5.10	
0928	16.12	3593	6.06	5.10	
Sample Time: 0930			Initial water level: 4.67		

Operability Check (Indication in ft)
a-Final Depth to Water: 5.10
b-Depth to Water (at time of 1st reading): 4.85
a-b=Drawdown (D): 0.25

Bladder Pump Settings
Discharge Time: 7
Fill Time: 15
1/2 TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 153.25
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 3850
GVP > CVP: (YES) / NO)
Comments:
NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): 3.262E-6

Count Room No.: 080769

Reviewed by: M. McGlynn
Environmental Supervisor or Designee

Review Date: 4-7-08

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Groundwater Monitoring Log

Groundwater Sample Identification: ESS-25B

Sample Date: 3/12/08

Sample Analysis: H3 Sampled by: T. Harris / R. Means

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1333	17.92	2545	7.93	14.63	90
1338	17.55	2599	8.11	14.60	NA
1343	17.55	2616	8.05	14.62	
NA					
Sample Time: 1345			Initial water level: 14.36		

Operability Check (Indication in ft)
a-Final Depth to Water: 14.62
b-Depth to Water (at time of 1st reading): 14.63
a-b=Drawdown (D): Ø

Bladder Pump Settings
Discharge Time: 8
Fill Time: 14
1/2 Turn

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): Ø
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 1080
GVP > CVP: (YES / NO)
Comments:

NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): < MDA NDA

Count Room No.: 080770

Reviewed by: M. McGlum
Environmental Supervisor or Designee

Review Date: 4-7-08

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Groundwater Monitoring Log

Groundwater Sample Identification: ESS-25C

Sample Date: 3/12/08

Sample Analysis: H3 Sampled by: T. Harris
R. Meares

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1355	16.33	1745	7.69	*	75
1400	16.54	1776	7.81	*	NA
1405	16.59	1800	7.80	*	
NA					
Sample Time: 1407			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): NA

Bladder Pump Settings
Discharge Time: 10
Fill Time: 18
1/2 TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): NA
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 900
GVP > CVP: (YES / NO) NA
Comments:
* UNABLE TO OBTAIN LEVEL DUE TO HOUSING.
NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): < MDA NDA

Count Room No.: 080770

Reviewed by: M. McFarlane
Environmental Supervisor or Designee

Review Date: 4-7-08

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Groundwater Monitoring Log

Groundwater Sample Identification: GSS-26C

Sample Date: 3/14/08

Sample Analysis: H^3 Sampled by: T. Harris / R. Meaves

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1006	15.35	3535	7.20	5.77	180
1011	15.31	3390	7.13	6.05	NA
1016	15.29	3386	7.15	6.25	
NA					
Sample Time: 1018			Initial water level: 4.83		

Operability Check (Indication in ft)
a-Final Depth to Water: 6.25
b-Depth to Water (at time of 1st reading): 5.77
a-b=Drawdown (D): 0.48

Bladder Pump Settings
Discharge Time: 4
Fill Time: 25
1/2 TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 294.24
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 2160
GVP > CVP: (YES / NO)
Comments:
NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): 5.043E-4

Count Room No.: 080777

Reviewed by: M. McGlam
Environmental Supervisor or Designee

Review Date: 4-7-08

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Groundwater Monitoring Log

Groundwater Sample Identification: CSS- 27A

Sample Date: 3/14/08

Sample Analysis: H^3 Sampled by: T. Harris / R. Meaks

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1340	20.05	397	8.21	28.67	310
1345	20.05	368	7.89	28.68	NA
1350	19.88	364	7.86	28.67	
NA					
Sample Time: 1352			Initial water level: 28.65		

Operability Check (Indication in ft)
a-Final Depth to Water: 28.67
b-Depth to Water (at time of 1st reading): 28.67
a-b=Drawdown (D): Ø

Bladder Pump Settings
Discharge Time: 25
Fill Time: 15
1 TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): NA
4" Well: D x (2468 ml/ft): Ø
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 3720
GVP > CVP: (YES) / NO)
Comments:

NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): < MDA NDA

Count Room No.: 080845

Reviewed by: M. McGlen
Environmental Supervisor or Designee

Review Date: 4-7-08

ATTACHMENT 8
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Groundwater Monitoring Log

Groundwater Sample Identification: ESS- 27C

Sample Date: 3/18/08

Sample Analysis: H^3 Sampled by: T. Harris / K. Means

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1349	20.52	2134	6.36	9.78	100
1354	20.53	2282	6.42	9.92	
1359	20.37	2399	6.51	10.00	NA
1404	20.39	2395	6.51	9.60	
NA					
Sample Time: 1406			Initial water level: 9.60		

Operability Check (Indication in ft)
a-Final Depth to Water: 9.60
b-Depth to Water (at time of 1st reading): 9.78
a-b=Drawdown (D): Ø

Bladder Pump Settings
Discharge Time: 7
Fill Time: 15
1/2 TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): Ø
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 1700
GVP > CVP (YES / NO)
Comments:
NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): 2.663E-4

Count Room No.: 080848

Reviewed by: M. McKinn
Environmental Supervisor or Designee

Review Date: 4-7-08

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Groundwater Monitoring Log

Groundwater Sample Identification: ESS- 28C

Sample Date: 3/14/08

Sample Analysis: H3 Sampled by: T. Harris / R. Means

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1438	16.35	1370	6.83	12.04	65
1443	16.60	1374	6.65	11.90	NA
1448	16.82	1443	6.43	11.90	
NA					
Sample Time: 1450			Initial water level: 11.38		

Operability Check (Indication in ft)
a-Final Depth to Water: 11.90
b-Depth to Water (at time of 1st reading): 12.04
a-b=Drawdown (D): Ø

Bladder Pump Settings
Discharge Time: 8
Fill Time: 16
½ TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): Ø
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 780
GVP > CVP: (YES / NO)
Comments:
NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): < MDA NDA

Count Room No.: 080845

Reviewed by: M. McKoon
Environmental Supervisor or Designee

Review Date: 4-7-08

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Groundwater Monitoring Log

Groundwater Sample Identification: ESS - 30C

Sample Date: 3/12/08

Sample Analysis: H3 Sampled by: T. Harris / R. Meaco

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1443	16.91	1692	7.48	6.05	120
1448	17.98	1645	6.90	5.80	NA
1453	17.70	1641	6.37	5.83	
NA					
Sample Time: 1455			Initial water level: 5.36		

Operability Check (Indication in ft)
a-Final Depth to Water: 5.83
b-Depth to Water (at time of 1st reading): 6.05
a-b=Drawdown (D): ∅

Bladder Pump Settings
Discharge Time: 7
Fill Time: 17
1/2 TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): ∅
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 1440
GVP > CVP (YES) / NO)
Comments:

NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): 2.862 E-6

Count Room No.: 080769

Reviewed by: M. McGauer
Environmental Supervisor or Designee

Review Date: 4-7-08

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Groundwater Monitoring Log

Groundwater Sample Identification: GSS-31C

Sample Date: 3/12/08

Sample Analysis: H^3 Sampled by: T. Harris / R. Meaus

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
1027	16.39	738	9.02	7.00	100
1032	16.43	716	8.74	6.97	
1037	16.36	704	8.33	7.00	
N/A					
Sample Time: 1039			Initial water level: 6.89		

Operability Check (Indication in ft)
a-Final Depth to Water: 7.00
b-Depth to Water (at time of 1st reading): 7.00
a-b=Drawdown (D): Ø

Bladder Pump Settings
Discharge Time: 8
Fill Time: 15
1/2 TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): Ø
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 1200
GVP > CVP (YES / NO)
Comments:
N/A

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): 3.700 E-7

Count Room No.: 080769

Reviewed by: M. Merkum
Environmental Supervisor or Designee

Review Date: 4-7-08

ATTACHMENT 8
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Groundwater Monitoring Log

Groundwater Sample Identification: CSS-STAB

Sample Date: 3/17/08

Sample Analysis: H3 Sampled by: T. Harris/R. Meares

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0820	14.27	2326	6.61	15.87	175
0825	14.44	2408	6.79	15.86	NA
0830	14.47	2426	6.92	15.86	
NA					
Sample Time: 0832			Initial water level: 15.76		

Operability Check (Indication in ft)
a-Final Depth to Water: 15.86
b-Depth to Water (at time of 1st reading): 15.87
a-b=Drawdown (D): ∅

Bladder Pump Settings
Discharge Time: 8
Fill Time: 16
1/2 TURN

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): ∅
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 2100
GVP > CVP (YES / NO)
Comments:
NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): 2.886E-4
Count Room No.: 080776

Reviewed by: M. McGuire
Environmental Supervisor or Designee
Review Date: 4-7-08

ATTACHMENT 8
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Groundwater Monitoring Log

Groundwater Sample Identification: CSS GLB-1

Sample Date: 3/19/08

Sample Analysis: H^3 Sampled by: T. Harris / R. Means

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0752	15.82	37455	6.59	3.18	125
0757	15.78	37766	6.75	3.16	NA
0802	15.91	37020	6.81	3.12	
NA					
Sample Time: 0805			Initial water level: 2.51		

Operability Check (Indication in ft)
a-Final Depth to Water: 3.12
b-Depth to Water (at time of 1st reading): 3.18
a-b=Drawdown (D): Ø

Bladder Pump Settings
Discharge Time:
Fill Time: NA
PERISTALTIC PUMP USED

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): Ø
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 1500
GVP > CVP: (YES) / NO)
Comments:
NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): < MDA NDA
Count Room No.: 080863

Reviewed by: M. McGann
Environmental Supervisor or Designee
Review Date: 4-7-08

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Groundwater Monitoring Log

Groundwater Sample Identification: ESS NC-1

Sample Date: 3/19/08

Sample Analysis: H^3 Sampled by: T. Harris / R. Means

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0822	15.76	27731	6.91	3.14	155
0827	15.88	27450	6.97	3.56	
0832	15.97	27322	7.00	3.80	NA
NA					
Sample Time: 0834			Initial water level: 1.91		

Operability Check (Indication in ft)
a-Final Depth to Water: 3.80
b-Depth to Water (at time of 1st reading): 3.14
a-b=Drawdown (D): 0.66

Bladder Pump Settings
Discharge Time: NA
Fill Time:
PERISTALTIC pump USED

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 404.58
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 1860
GVP > CVP: (YES / NO)
Comments:
NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): 2.838E-7

Count Room No.: 080863

Reviewed by: M. McGann
Environmental Supervisor or Designee

Review Date: 4-7-08

ATTACHMENT 8
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Groundwater Monitoring Log

Groundwater Sample Identification: ESS NIC-2

Sample Date: 3/19/08

Sample Analysis: H3 Sampled by: T. Harris / K. Means

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0845	15.00	27596	7.02	2.44	100
0850	15.42	27484	7.04	2.51	NA
0855	15.56	27016	7.03	2.55	
NA					
Sample Time: 0857			Initial water level: 1.96		

Operability Check (Indication in ft)
a-Final Depth to Water: 2.55
b-Depth to Water (at time of 1st reading): 2.44
a-b=Drawdown (D): 0.11

Bladder Pump Settings
Discharge Time: / NA
Fill Time:

PERISTALTIC PUMP USED

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 67.43
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 1200
GVP > CVP (YES / NO)
Comments:
NA

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): 2.847E-7

Count Room No.: 080863

Reviewed by: M. McGowan
Environmental Supervisor or Designee

Review Date: 4-7-08

ATTACHMENT 8
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Groundwater Monitoring Log

Groundwater Sample Identification: CSS NC 3

Sample Date: 3/19/08

Sample Analysis: H3 Sampled by: T. Harris / R. Means

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0904	15.54	29042	6.89	2.95	100
0909	16.02	28945	6.90	3.05	
0914	16.46	29018	6.93	3.25	
NA					
Sample Time: 0916			Initial water level: 2.04		

Operability Check (Indication in ft)
a-Final Depth to Water: 3.25
b-Depth to Water (at time of 1st reading): 2.95
a-b=Drawdown (D): 0.30

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

PERISTALTIC PUMP USED

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 183.9
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 1200
GVP > CVP: (YES) / NO)
Comments:

N/A

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): <MDA NDA

Count Room No.: 080863

Reviewed by: M. McGlynn
Environmental Supervisor or Designee

Review Date: 4-7-08

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Groundwater Monitoring Log

Groundwater Sample Identification: ESS NC-4

Sample Date: 3/19/08

Sample Analysis: H3 Sampled by: T. Harris / R. Means

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0925	16.93	27433	6.78	2.45	100
0930	17.30	27145	6.74	2.44	N/A
0935	17.40	26452	6.76	2.48	
N/A					
Sample Time: 0937			Initial water level: 1.92		

Operability Check (Indication in ft)
a-Final Depth to Water: 2.48
b-Depth to Water (at time of 1st reading): 2.45
a-b=Drawdown (D): 0.03

Bladder Pump Settings
Discharge Time:
Fill Time: NA
PERISTALTIC PUMP USED

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 18.39
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 1200
GVP > CVP: (YES / NO)
Comments:
N/A

Gamma Result (µci/ml): NA
Tritium Result (µci/ml): 2.656E-7
Count Room No.: 080863

Reviewed by: M. McGee
Environmental Supervisor or Designee
Review Date: 4-7-08

ATTACHMENT 8
Page 1 of 1
Groundwater Monitoring Log

Groundwater Sample Identification: ESS – NC – 5

Sample Date: 3/19/08

Sample Analysis: H^3 Sampled by: T. Harris / R. Means

Time of Reading	Groundwater Quality Parameters			Depth to Water (ft)	Flow Rate (ml/min)
	Temperature (°C)	Conductivity (µS/cm)	pH (pH units)		
0950	17.21	30339	7.01	2.25	100
0955	17.26	30454	7.00	2.58	NA
1000	17.48	30465	6.98	2.96	
NA					
Sample Time: 1002			Initial water level: 1.25		

Operability Check (Indication in ft)
a-Final Depth to Water: 2.96
b-Depth to Water (at time of 1st reading): 2.25
a-b=Drawdown (D): 0.71

Bladder Pump Settings
Discharge Time: /
Fill Time: NA
PERISTALTIC PUMP USED

Casing Volume Purged (CVP)
2" Well: D x (613 ml/ft): 435.23
4" Well: D x (2468 ml/ft): NA
Groundwater Volume Purged (GVP)
Final Flow Rate (ml/min) x Purge Time (minutes between 1st reading and sample time): 1200
GVP > CVP: (YES / NO)
Comments:
NA

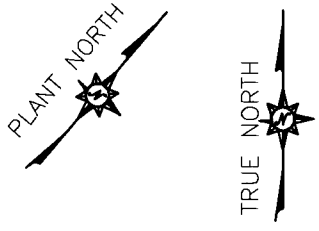
Gamma Result (µci/ml): NA
Tritium Result (µci/ml): <MDA NDA

Count Room No.: 080863

Reviewed by: M. McGlynn
Environmental Supervisor or Designee

Review Date: 4-7-08

Approximate scale: 1" = 600'



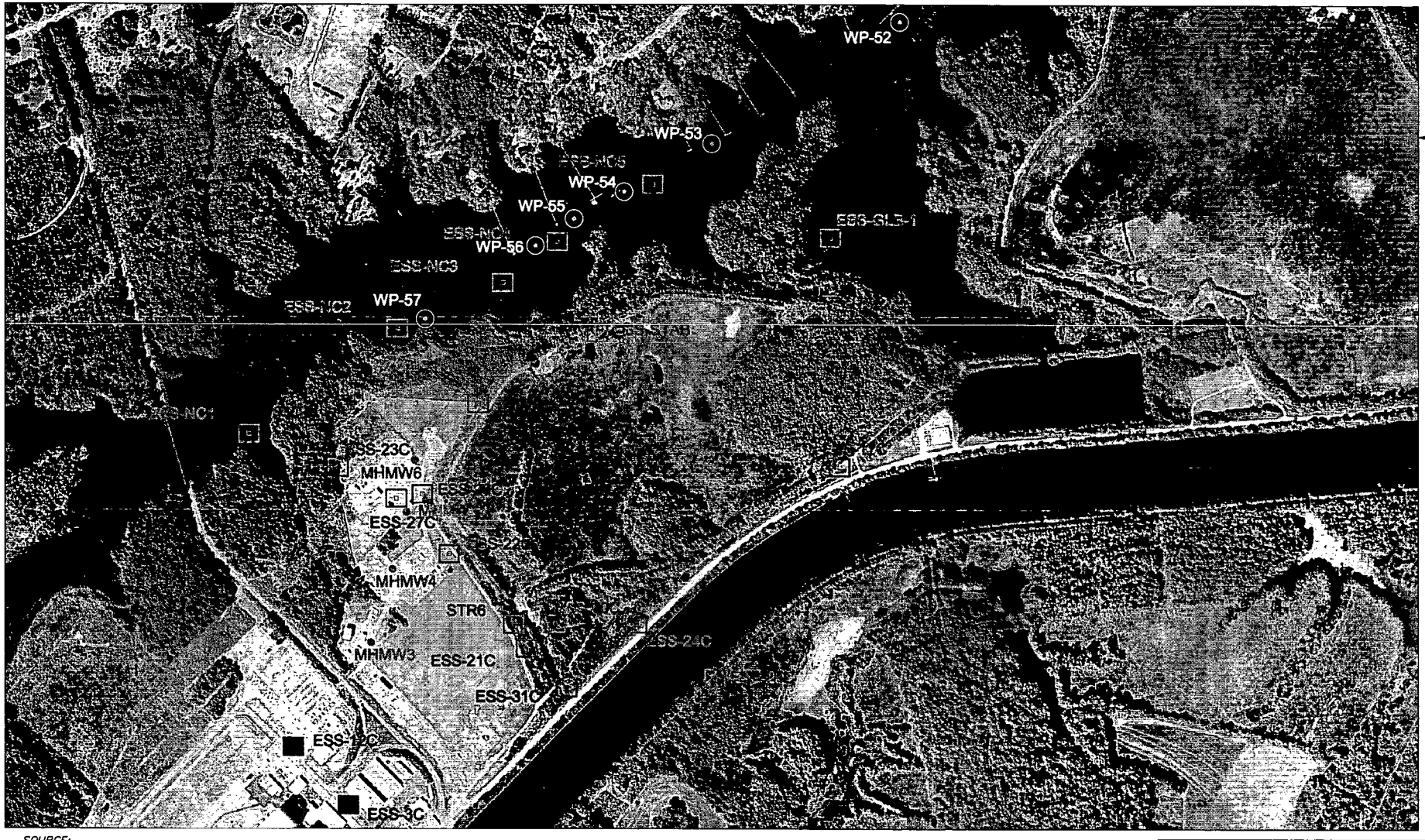
Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 1-2

Site Layout Map

Source: Brunswick GIS

Silar Services Inc.



SOURCE:
McKim & Creed, June 15, 2007.

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

SCALE 1" = 500'

0 250 500 1000 1500

LEGEND:

- SHALLOW WELL
- EXISTING SHALLOW WELL
- MANHOLE
- WAYPOINT

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 2-1
Shallow Monitoring Well Location Map

Silar Services Inc.

F:\BNP\GW ANALYSIS\ANNUAL GW REPORT APRIL 2008\BNP_2-1 ANNUAL REPORT 2008.dwg

SOURCE:
McKim & Creed, June 15, 2007.

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

SCALE 1" = 500'

0 250 500 1000 1500

LEGEND:

INTERMEDIATE WELL

EXISTING INTERMEDIATE WELL

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 2-2
Intermediate Monitoring Well Location Map

Silar Services Inc.

SOURCE:
McKim & Creed, June 15, 2007.

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

LEGEND:
DEEP WELL

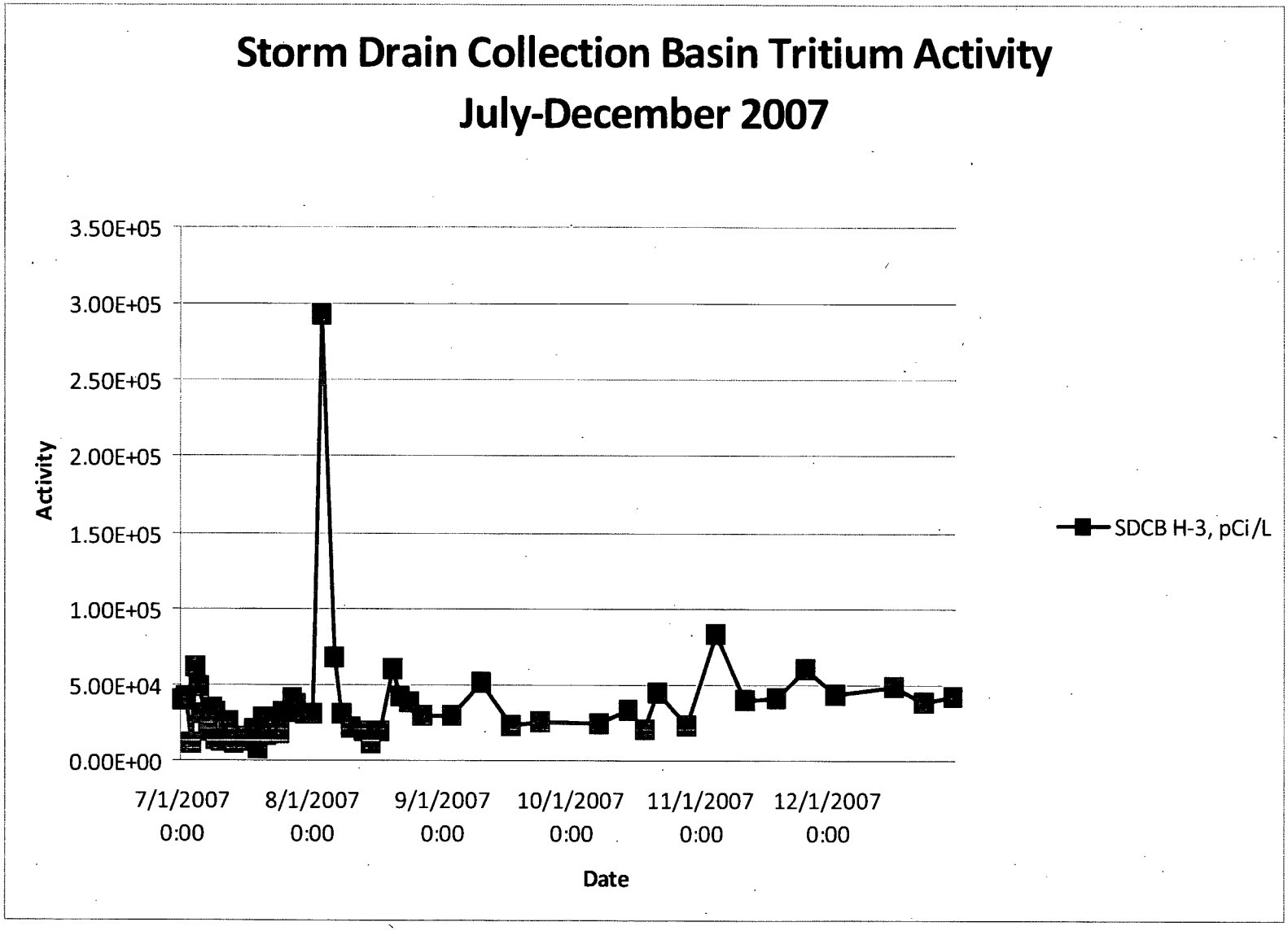
SCALE 1" = 500'

0 250 500 1000 1500

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 2-3
Deep Monitoring Well Location Map

Silar Services Inc.

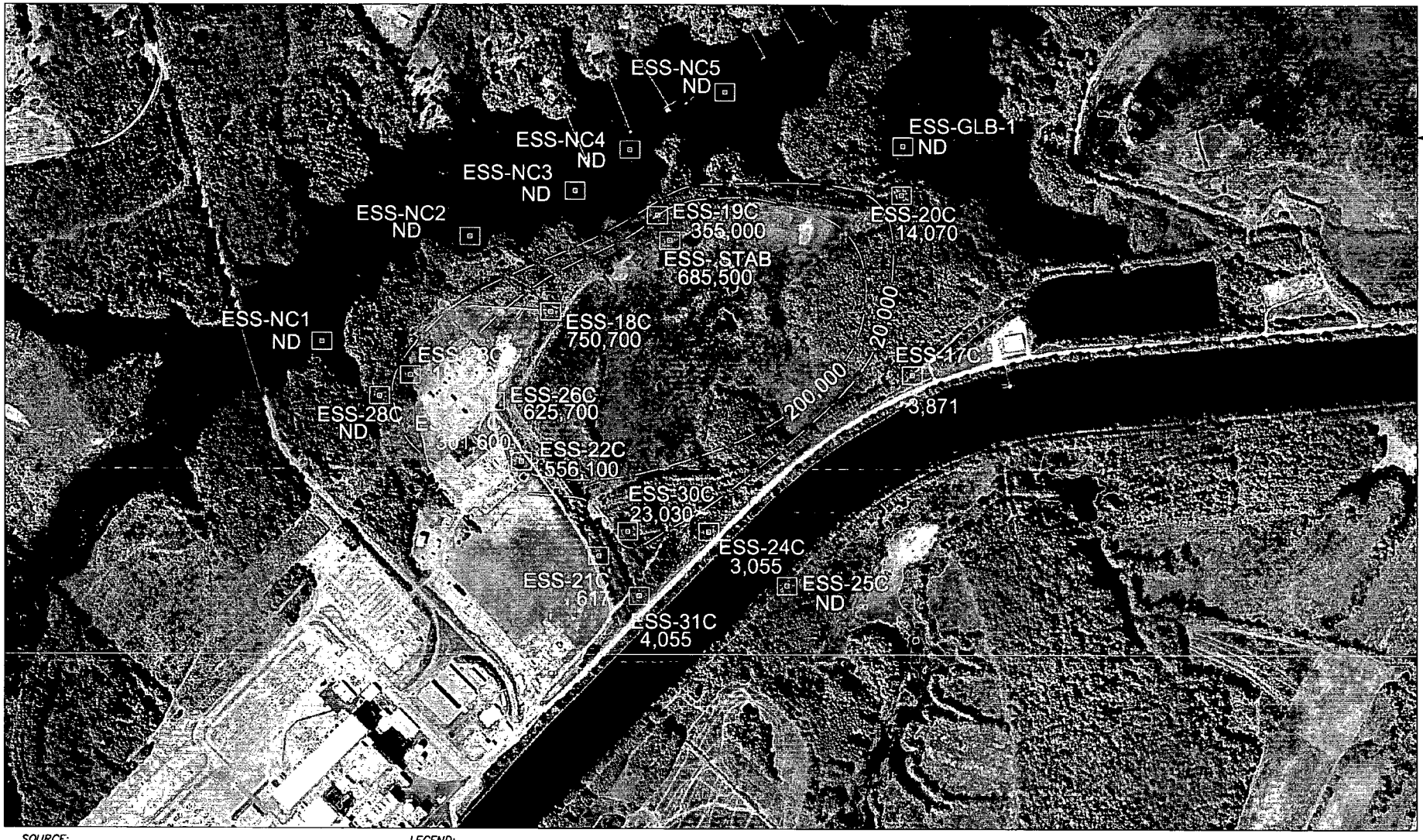


Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 3-1

Storm Drain Collection Basin Tritium Activity

Silar Services Inc.



SOURCE:
McKim & Creed, June 15, 2007.

NOTES:
1. COORDINATES ARE BASED ON NC GRID NAD83
2. ELEVATIONS ARE BASED ON NGVD29.
3. RESULTS ARE pCi/L

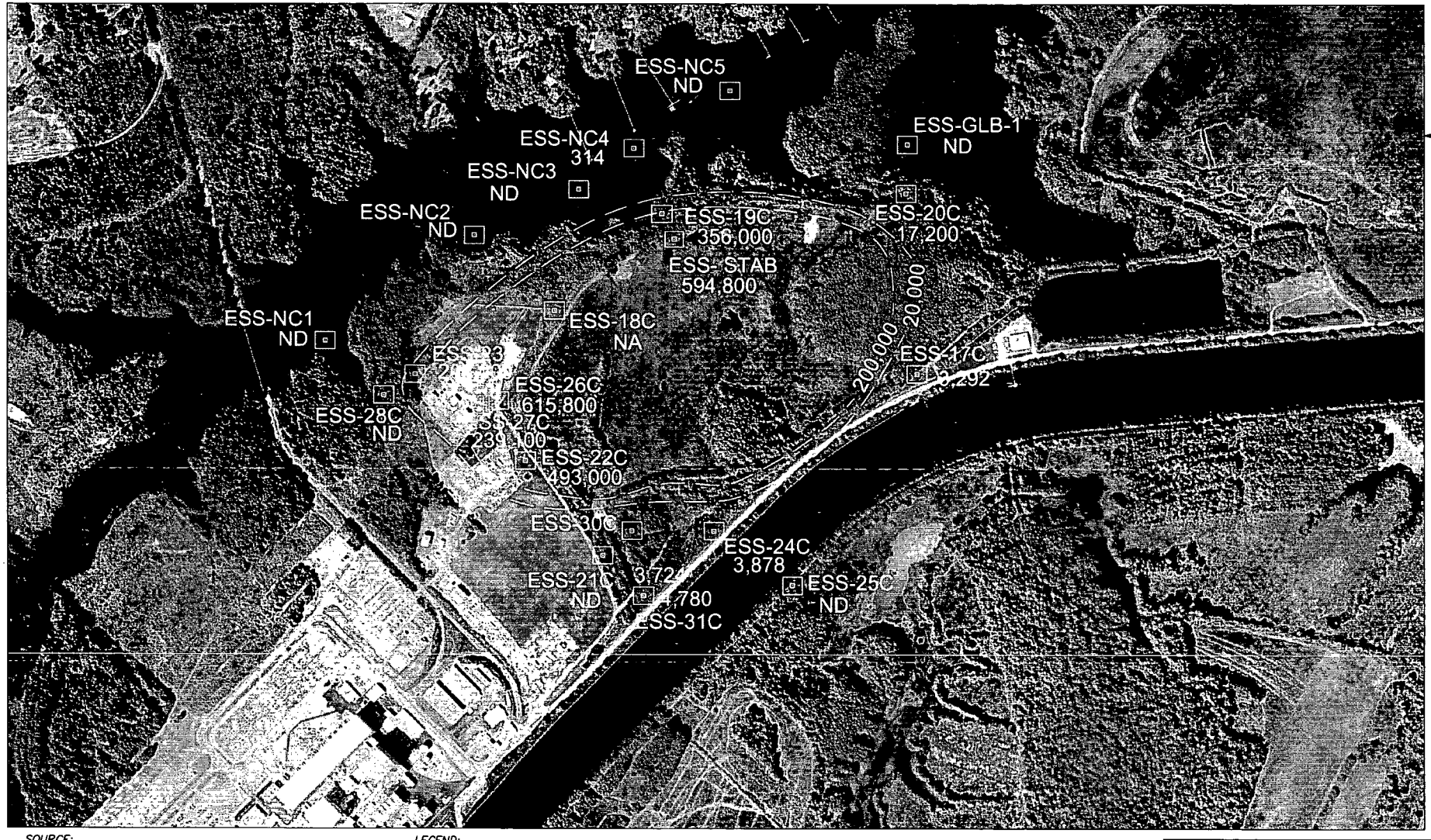
LEGEND:
—— —·— ISOCONCENTRATION CONTOUR OF TRITIUM IN pCi/L

SCALE 1" = 500'
0 250 500 1000 1500

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 3-2
Shallow Aquifer Groundwater Results
August 2007

Silar Services Inc.



SOURCE:
McKim & Creed, June 15, 2007.

NOTES:
1. COORDINATES ARE BASED ON NC GRID NAD83
2. ELEVATIONS ARE BASED ON NGVD29.
3. RESULTS ARE pCi/L

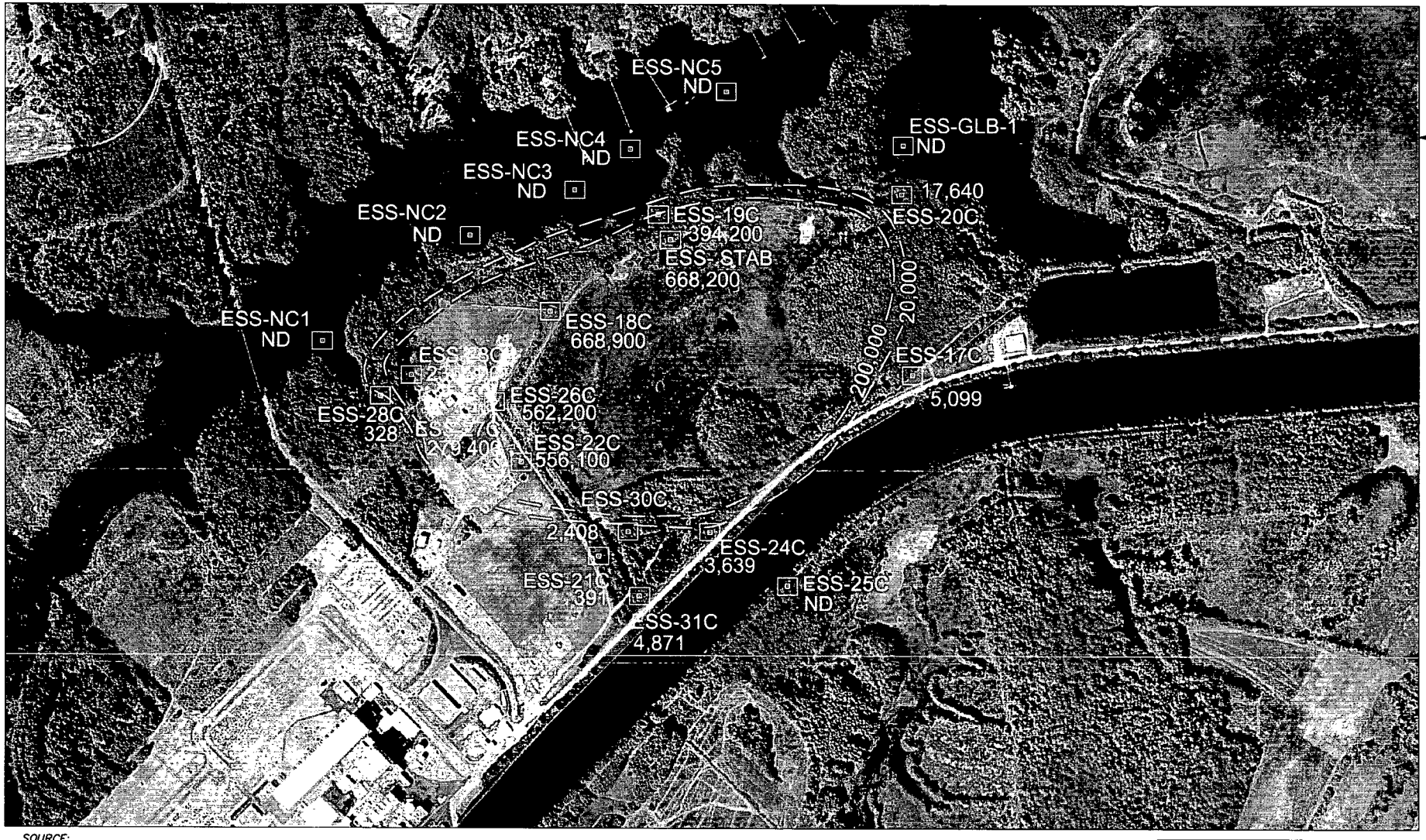
LEGEND:
— — — ISOCONCENTRATION CONTOUR OF TRITIUM IN pCi/L

SCALE 1" = 500'
0 250 500 1000 1500

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 3-3
Shallow Aquifer Groundwater Results
September 2007

Silar Services Inc.



SOURCE:
McKim & Creed, June 15, 2007.

NOTES:
1. COORDINATES ARE BASED ON NC GRID NAD83
2. ELEVATIONS ARE BASED ON NGVD29.
3. RESULTS ARE pCi/L

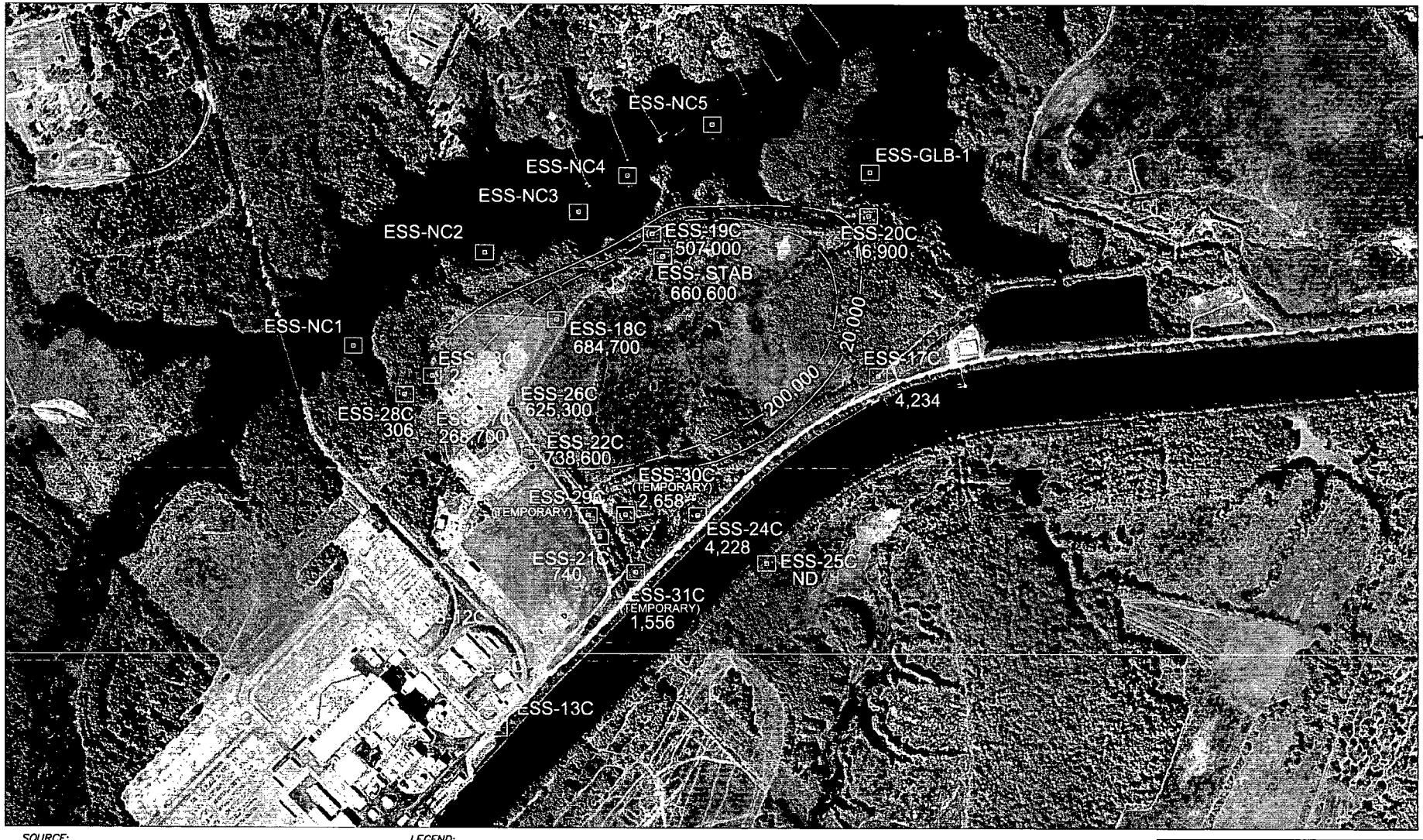
LEGEND:
ISOCONCENTRATION CONTOUR OF TRITIUM IN pCi/L

SCALE 1" = 500'
0 250 500 1000 1500

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 3-4
Shallow Aquifer Groundwater Results
October 2007

Silar Services Inc.



SOURCE:
McKim & Creed, June 15, 2007.

NOTES:
1. COORDINATES ARE BASED ON NC GRID NAD83
2. ELEVATIONS ARE BASED ON NGVD29.
3. RESULTS ARE pCi/L

LEGEND:
ISOCONCENTRATION CONTOUR OF TRITIUM IN pCi/L

SCALE 1" = 500'
0 250 500 1000 1500

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 3-5
Shallow Aquifer Groundwater Results
November 2007

Silar Services Inc.

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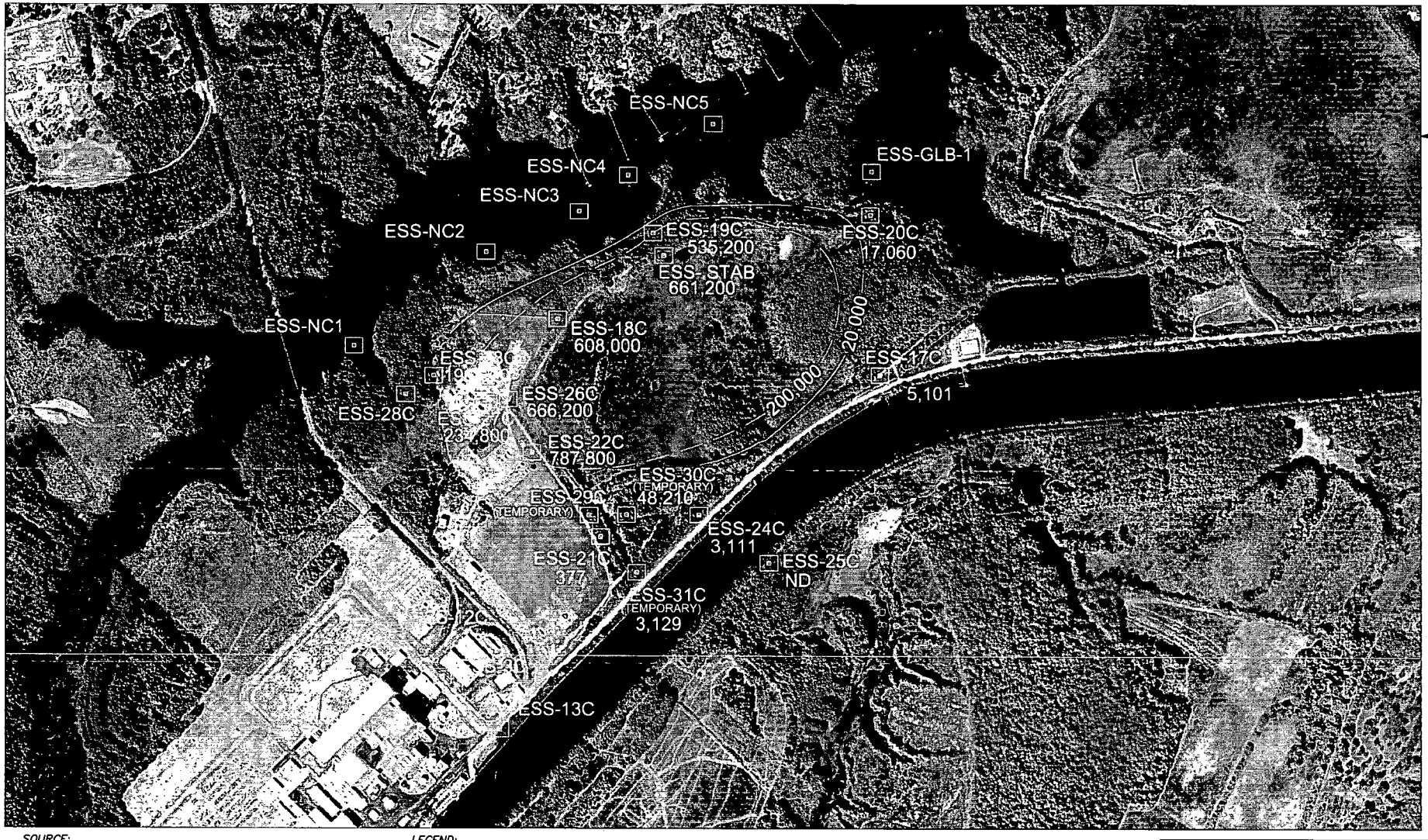


SOURCE:
McKim & Creed, June 15, 2007.

NOTES:
1. COORDINATES ARE BASED ON NC GRID NAD83
2. ELEVATIONS ARE BASED ON NGVD29.
3. RESULTS ARE pCi/L

LEGEND:
ISOCONCENTRATION CONTOUR OF TRITIUM IN pCi/L

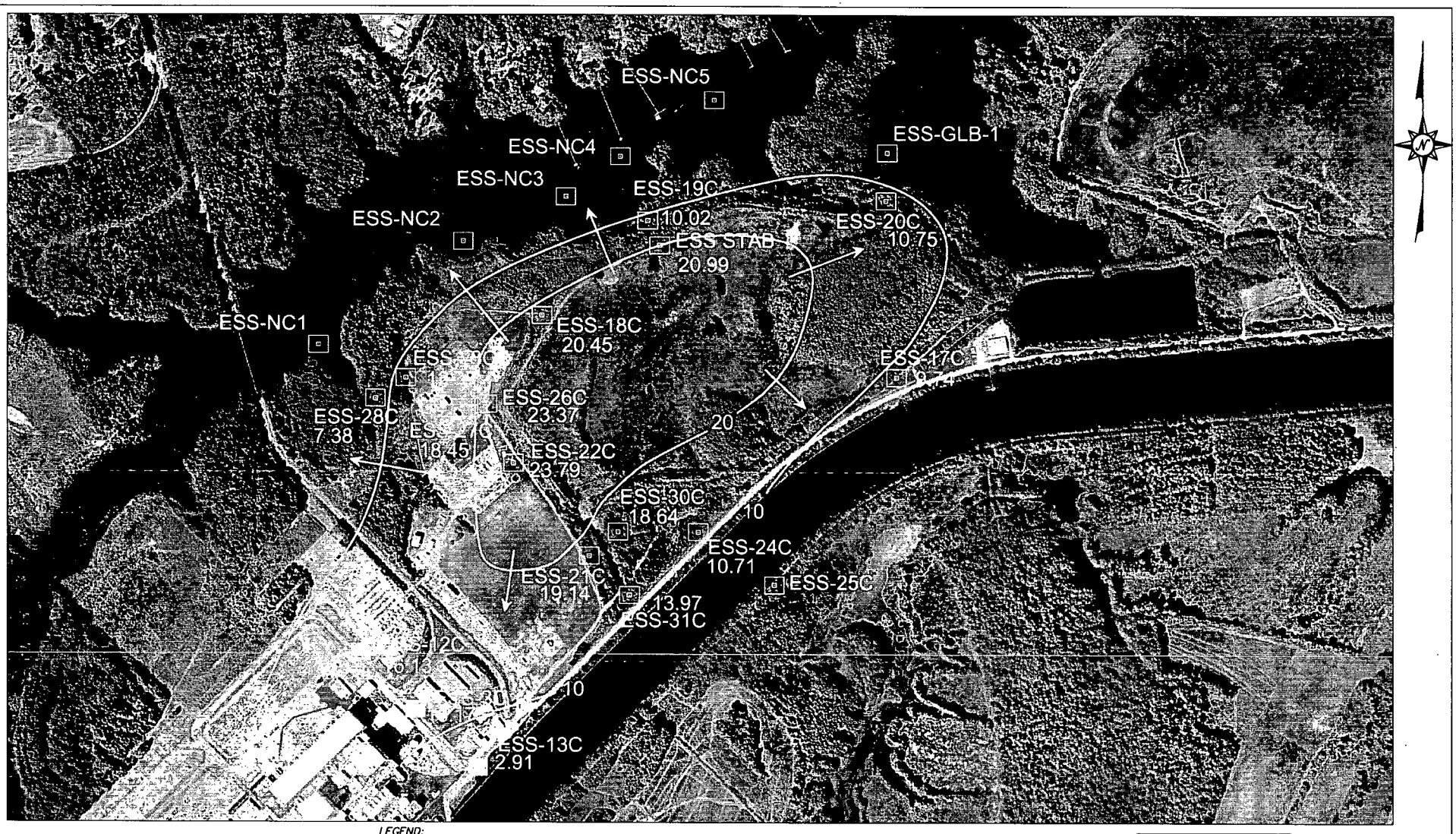
SCALE 1" = 500'
0 250 500 1000 1500

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 3-6
Shallow Aquifer Groundwater Results
December 2007

Silar Services Inc.

C:\Temp\e-mail\BNP\BNP_3-6 ANNUAL REPORT 2008.dwg



LEGEND:

- SHALLOW WELL – NEW
- SHALLOW WELL – EXISTING
- GROUNDWATER FLOW DIRECTION
- GROUNDWATER CONTOUR LINE (DASHED WHERE INFERRED)
- 2.1 ELEVATION MEAN SEA LEVEL

SOURCE:
McKim & Creed, June 15, 2007.

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

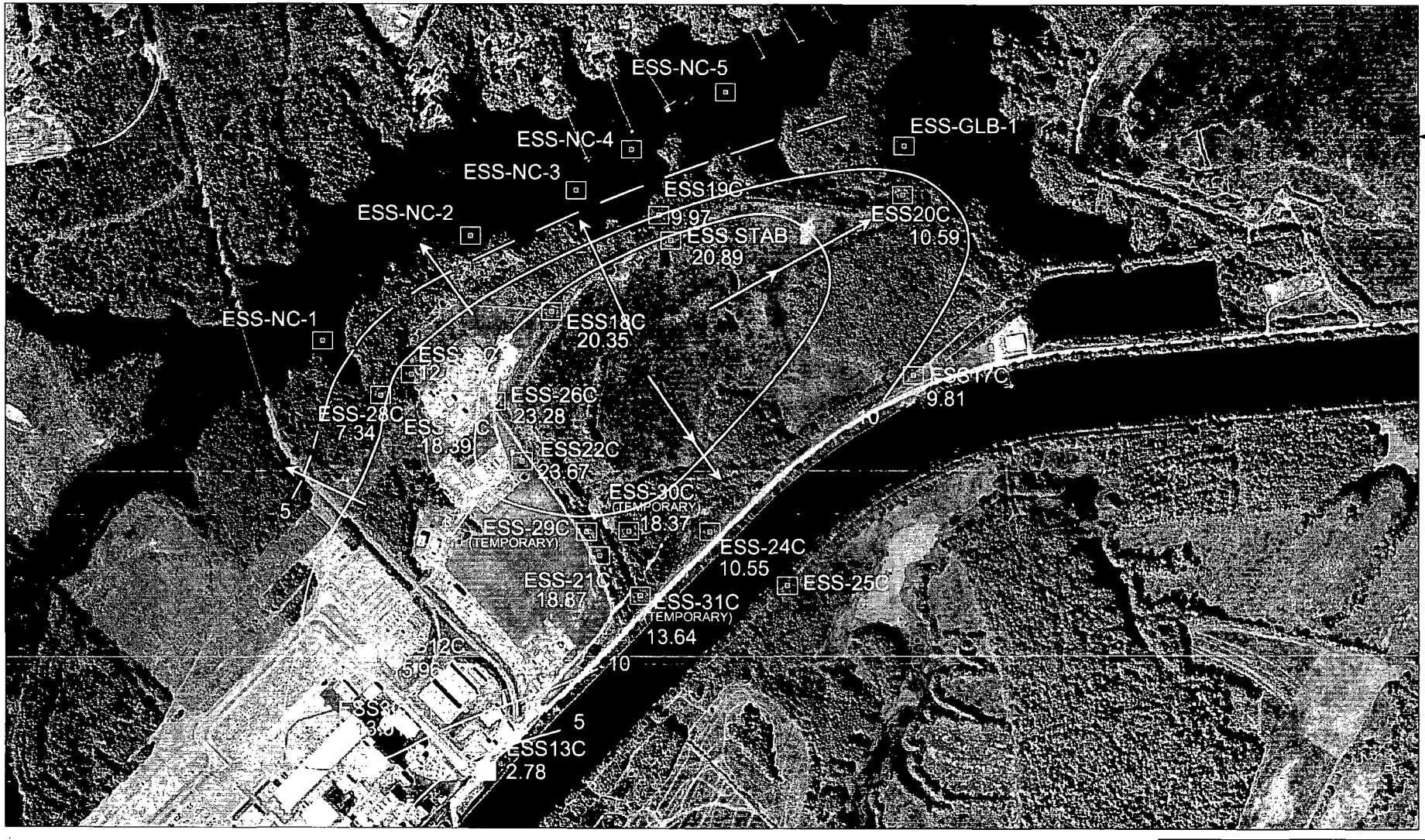
SCALE 1" = 500'

0 250 500 1000 1500

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 3-7
Potentiometric Surface Map
Shallow Aquifer– October 2, 2007

Silar Services Inc.



LEGEND:

SHALLOW WELL – NEW

SHALLOW WELL – EXISTING

SCALE 1" = 500'

0 250 500 1000 1500

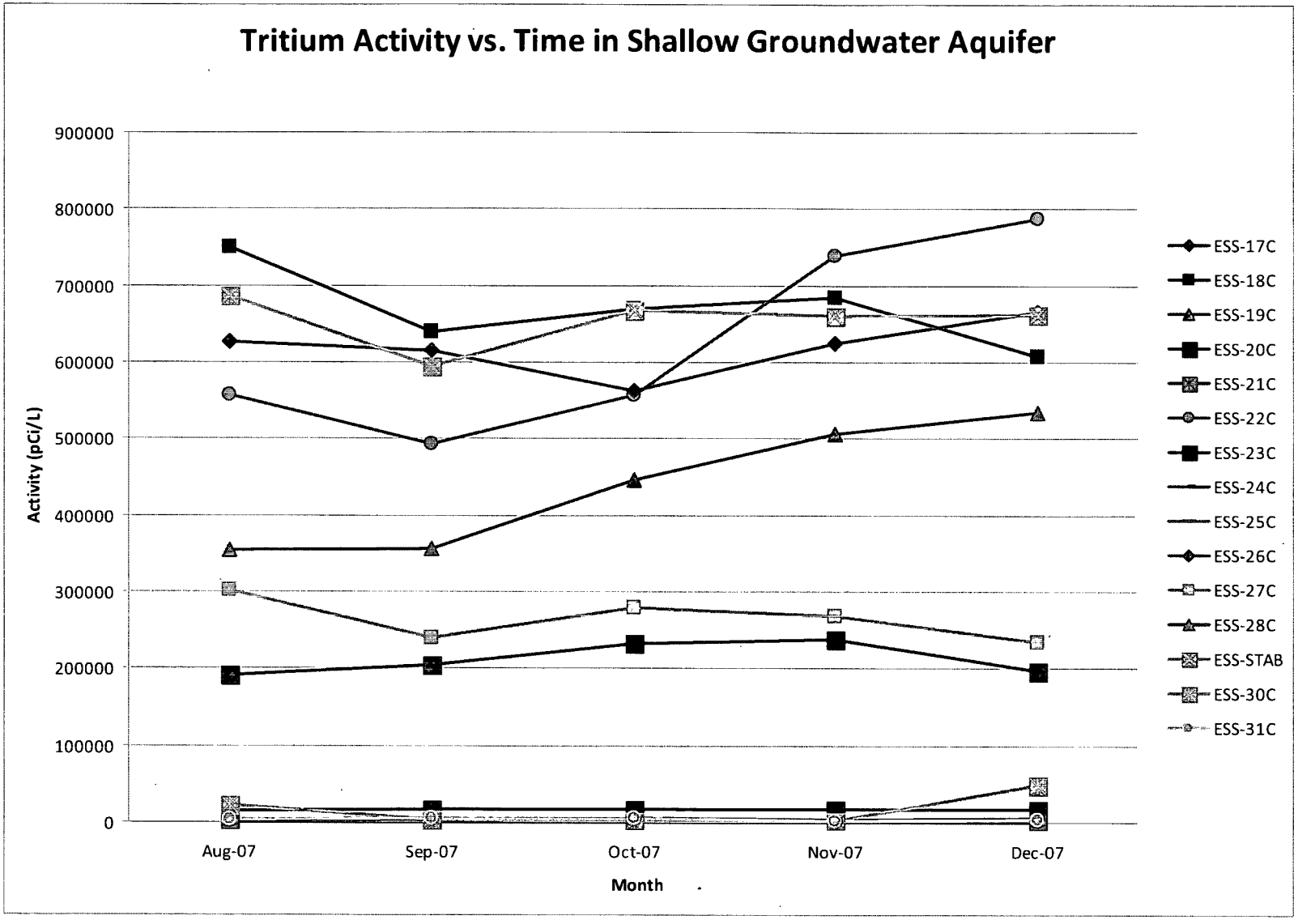
SOURCE:
McKim & Creed, June 15, 2007.

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

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 3-8
Potentiometric Surface Map
Shallow Aquifer– October 16, 2007

Silar Services Inc.



Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 3-9
Tritium Activity vs. Time in Shallow Groundwater Aquifer

Silar Services Inc.

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SOURCE:
McKim & Creed, June 15, 2007.

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

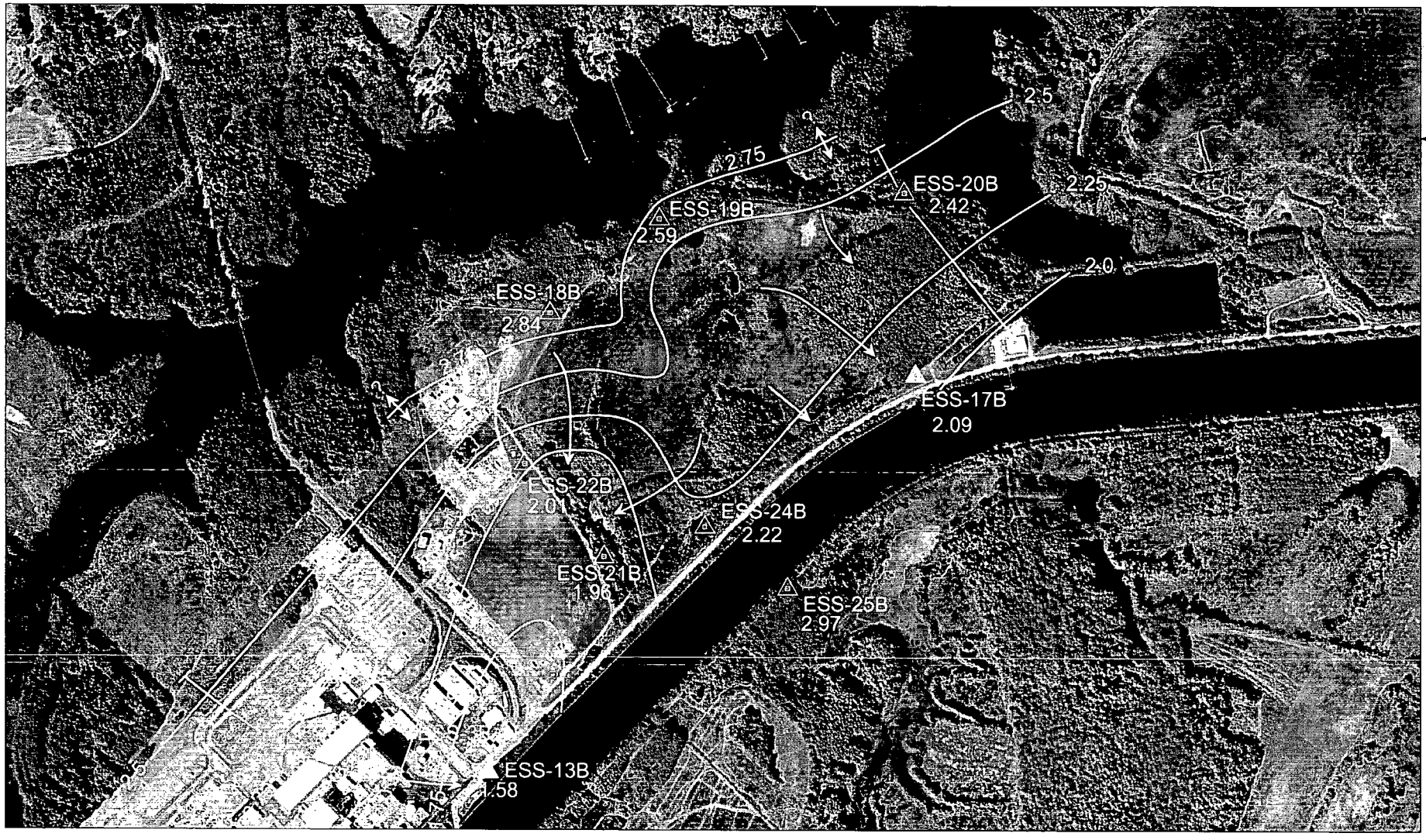
LEGEND:
RESULTS OF TRITIUM IN pCi/L
INTERMEDIATE WELL – NEW
INTERMEDIATE WELL – EXISTING

SCALE 1" = 500'
0 250 500 1000 1500

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 3–10
Intermediate Aquifer Groundwater Results

Silar Services Inc.



SOURCE:
McKim & Creed, June 15, 2007.

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

LEGEND:

INTERMEDIATE WELL – NEW

INTERMEDIATE WELL – EXISTING

GROUNDWATER FLOW DIRECTION

GROUNDWATER CONTOUR LINE (DASHED WHERE INFERRED)

2.1 ELEVATION MEAN SEA LEVEL

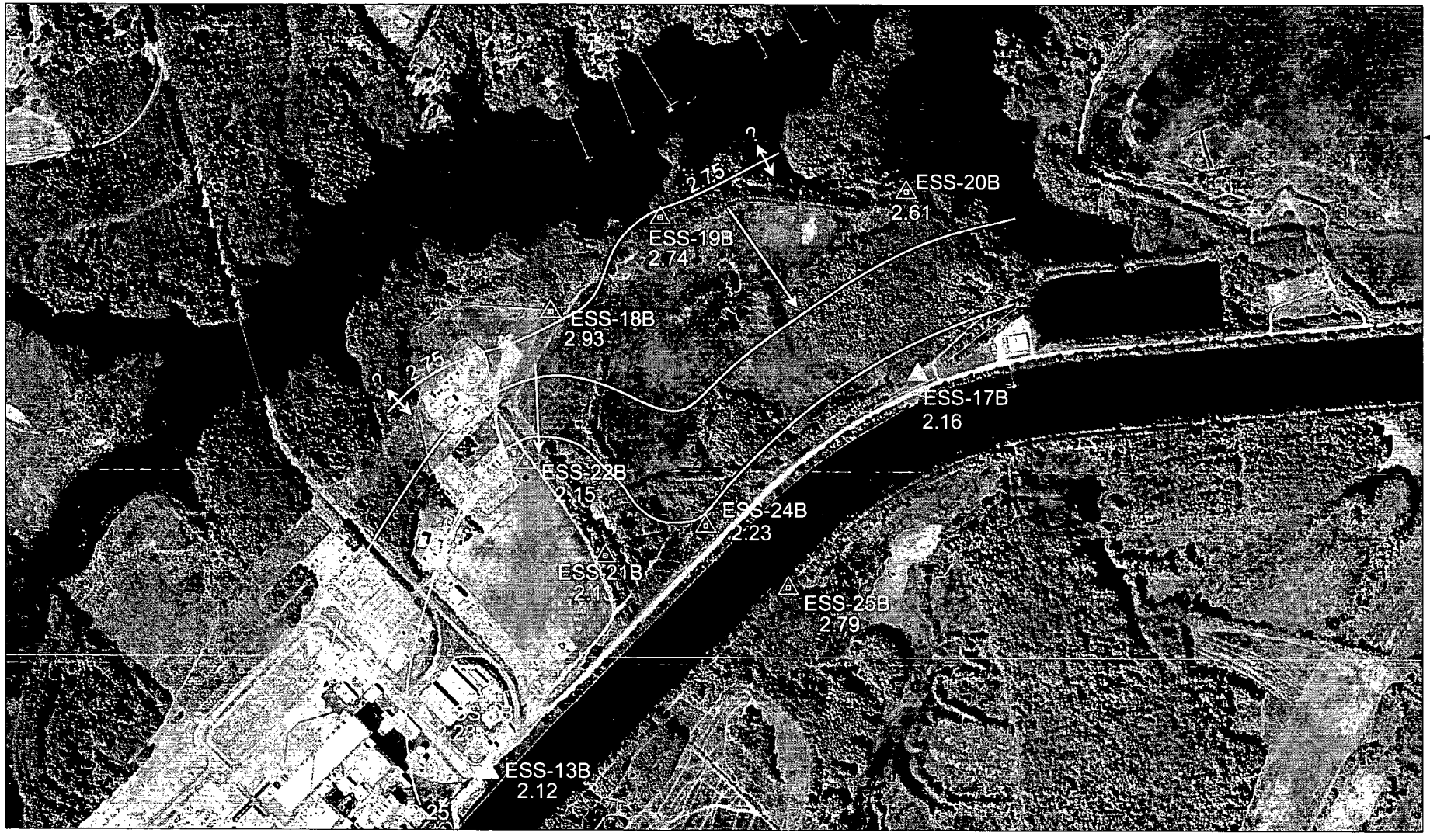
SCALE 1" = 500'

0 250 500 1000 1500

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 3–11
Potentiometric Surface Map
Intermediate Aquifer– October 2, 2007

Silar Services Inc.



SOURCE:
McKim & Creed, June 15, 2007.

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

LEGEND:

INTERMEDIATE WELL – NEW

INTERMEDIATE WELL – EXISTING

GROUNDWATER FLOW DIRECTION

GROUNDWATER CONTOUR LINE (DASHED WHERE INFERRED)

2.1 ELEVATION MEAN SEA LEVEL

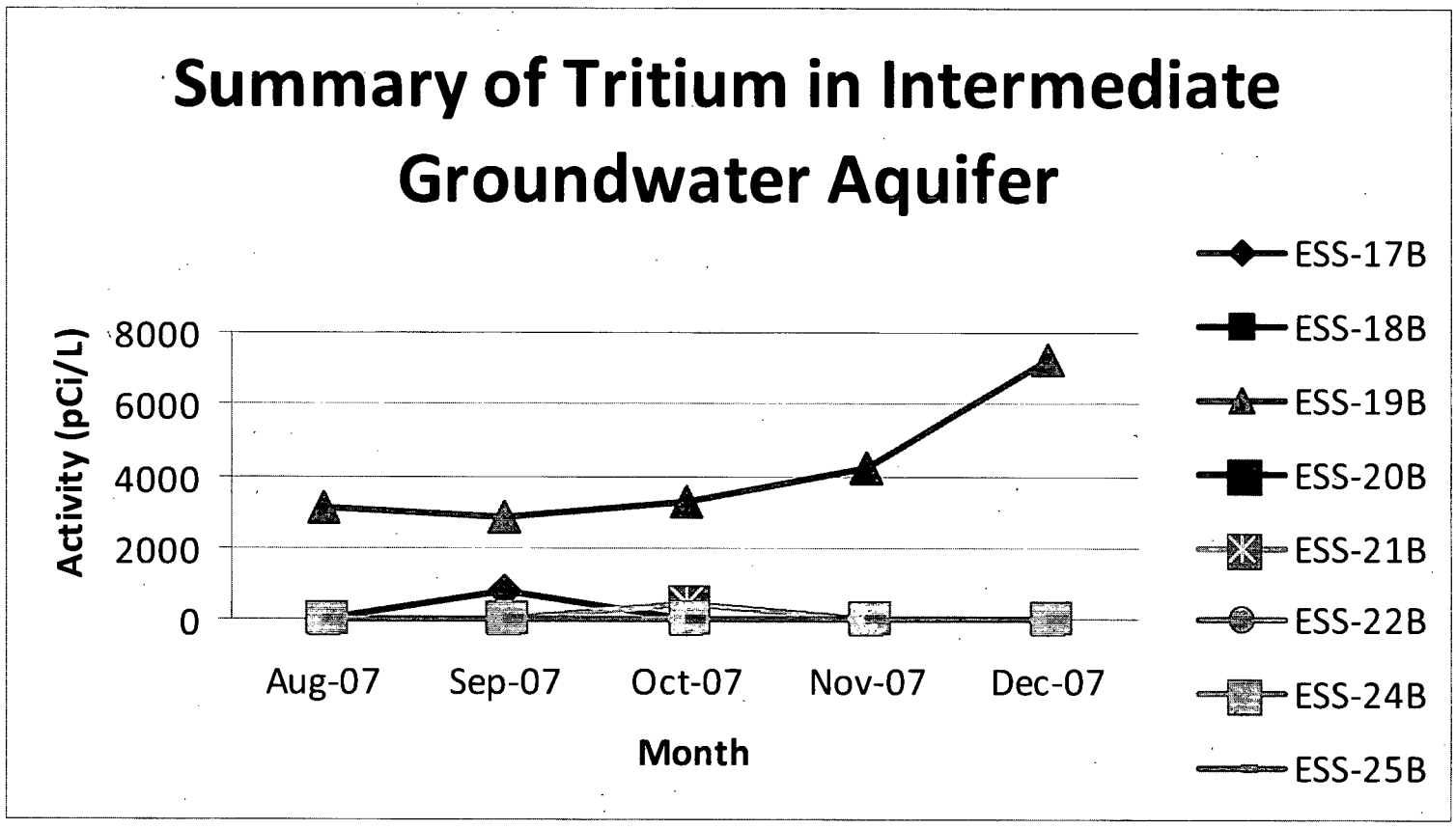
SCALE 1" = 500'

0 250 500 1000 1500

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 3-12
Potentiometric Surface Map
Intermediate Aquifer– October 16, 2007

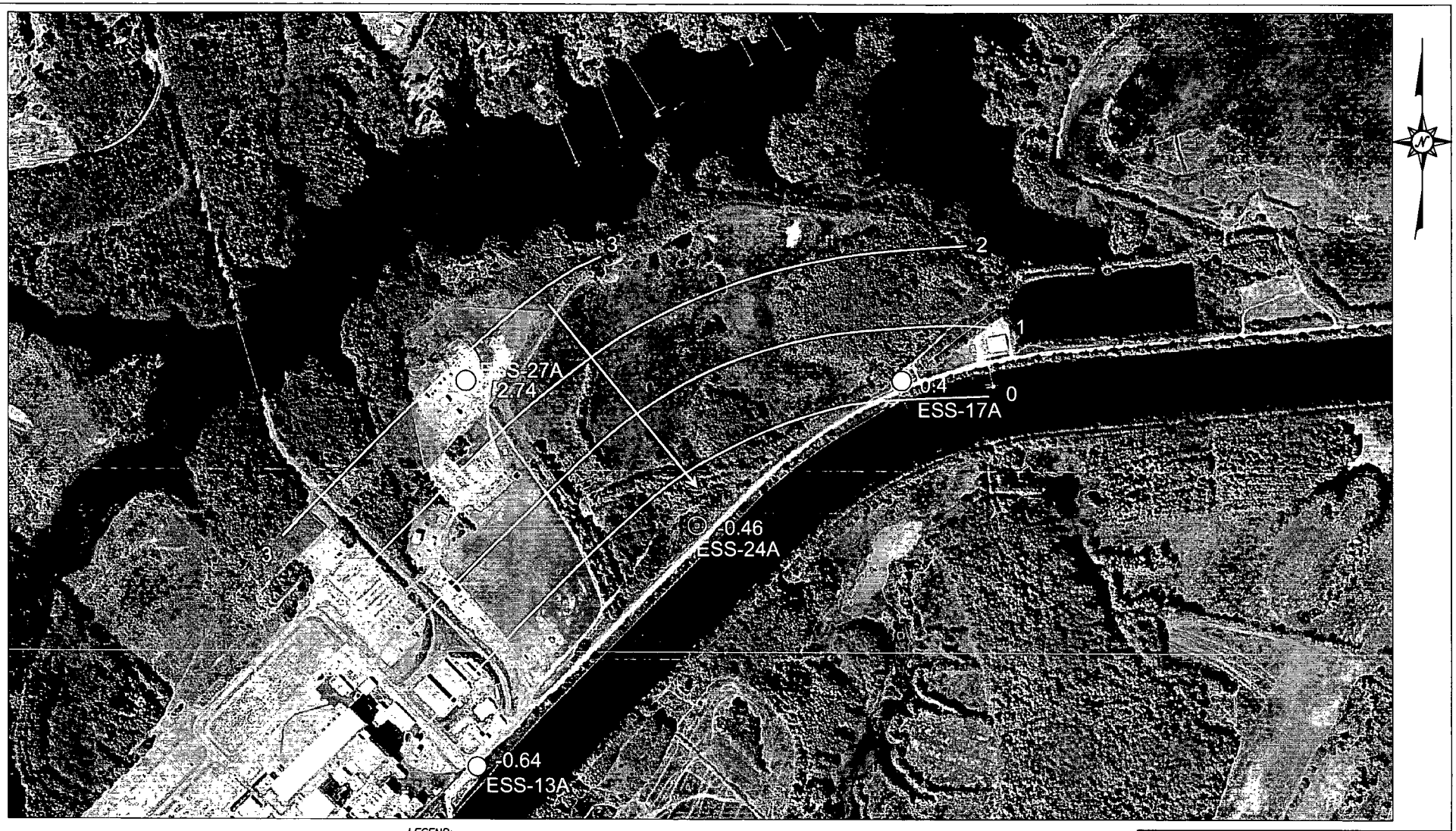
Silar Services Inc.



Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 3-13
Tritium Activity vs. Time
in Intermediate Groundwater Aquifer

Silar Services Inc.



SOURCE:
McKim & Creed, June 15, 2007.

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

LEGEND:

- DEEP WELL – NEW
- DEEP WELL – EXISTING
- GROUNDWATER FLOW DIRECTION
- GROUNDWATER CONTOUR LINE (DASHED WHERE INFERRED)
- **2.1** ELEVATION MEAN SEA LEVEL

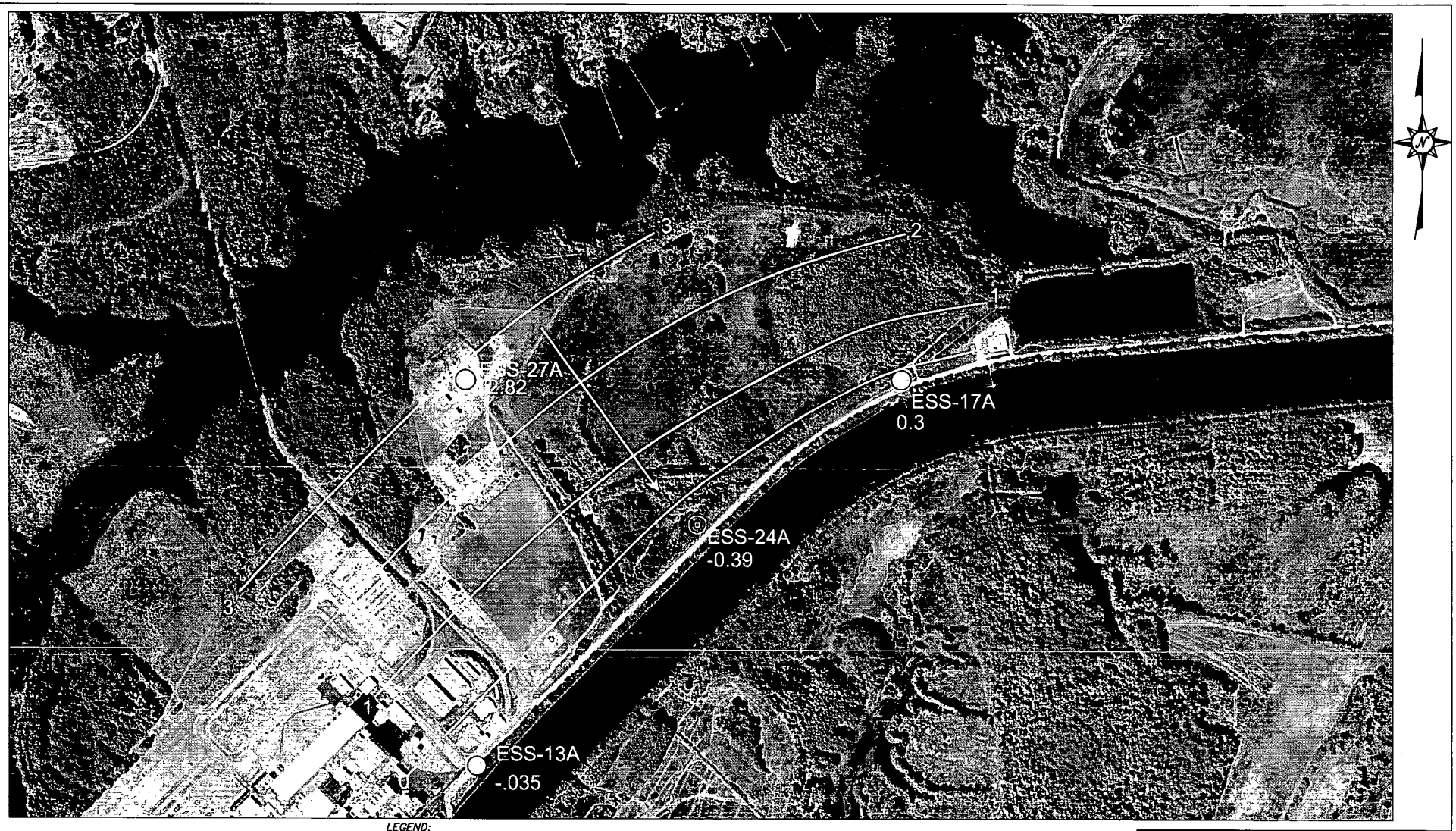
SCALE 1" = 500'

0 250 500 1000 1500

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 3–14
Potentiometric Surface Map
Deep Aquifer– October 2, 2007

Silar Services Inc.



LEGEND:

DEEP WELL – NEW

DEEP WELL – EXISTING

GROUNDWATER FLOW DIRECTION

GROUNDWATER CONTOUR LINE (DASHED WHERE INFERRED)

2.1 ELEVATION MEAN SEA LEVEL

SCALE 1" = 500'

0 250 500 1000 1500

SOURCE:
McKim & Creed, June 15, 2007.

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

Progress Energy
Brunswick Nuclear Plant
Southport, NC

Figure 3-15
Potentiometric Surface Map
Deep Aquifer– October 16, 2007

Silar Services Inc.