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June 30, 2008

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Attention: Mr. Gregory D. Robison, P.E.

Reference: **Site Characterization Report**
Groundwater Protection Initiative
Duke Energy McGuire Nuclear Station
Huntersville, North Carolina
S&ME Project 1264-06-724

Dear Mr. Robison:

S&ME, Inc. (S&ME) is pleased to present this Site Characterization Report for the Ground Water Protection Initiative at Duke Energy's McGuire Nuclear Station in Huntersville, North Carolina. Our Ground Water Protection Initiative activities were provided in accordance with our January 24, 2007 Proposal 07064, Duke Energy's authorization Contract 00080694, and our Professional Services Agreement 0233032.04/MI 1342 002 with Duke Energy.

This Site Characterization Report is comprised of two volumes that include discussion of the Ground Water Protection Initiative Project, site activities, and findings, with supporting tables, figures, and record documents in associated appendices. Conclusions include development and discussion of a Site Conceptual Hydrogeologic Model.

S&ME is honored to have supported Duke Energy on this important Ground Water Protection Initiative. We trust this information is responsive to your needs at this time. If you have questions regarding the Site Characterization Report or desire our assistance further, please do not hesitate to contact us.

Sincerely,
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1.0 INTRODUCTION AND PURPOSE

Water containing trace amounts of various radioactive materials is normally released from U.S. nuclear power plants under controlled, monitored conditions that meet conservative Nuclear Regulatory Commission (NRC) limits to protect public health and safety. Recently, several instances of unintended, abnormal releases of radioactive liquids to the environment were identified. Materials detected to date in groundwater around nuclear power plants include Tritium and Strontium 90 (NRC, 2007). Of these two materials, Strontium-90 is only associated with specific, isolated plant systems, such as the Spent Fuel Pool. Tritium is much more prevalent in plant systems than Strontium-90, and is thus considered a much better indicator of potential radioactive releases. As such, while Strontium-90 as a material is monitored by Duke Energy on a specific basis, tritium and potential sources of tritium are the focus of this Ground Water Protection Initiative.

In 2006, the Nuclear Energy Institute (NEI) announced the U.S. commercial nuclear power industry's unanimous approval of a voluntary initiative to improve the industry's management of groundwater protection issues. More specifically, the initiative addressed radiological releases to groundwater, with tritium (H_3) being the primary indicator. The initiative calls for the establishment of on-site groundwater monitoring programs at operating nuclear power plants (EPRI, 2007). To this end, Duke Energy, Devine Tarbell & Associates, Inc. (DTA) and S&ME, Inc. (S&ME) formed a collaborative team to design and install comprehensive groundwater monitoring well networks at Duke Energy's operating nuclear power fleet comprising McGuire Nuclear Station in Huntersville, North Carolina, Catawba Nuclear Station in York, South Carolina, and Oconee Nuclear Station in Seneca, South Carolina. The overriding purposes of the groundwater monitoring well networks are:

1. Establish post-construction hydrogeology of the operating nuclear plant site and develop a Site Conceptual Model for understanding groundwater presence and movement at the plant sites; and,
2. Establish site-specific monitoring well networks for groundwater protection monitoring comprising both near-field (nearer potential radiological tritium sources) and far-field (further from potential radiological tritium sources) well arrays.

This Ground Water Protection Initiative Site Characterization Report presents the implementation of and findings from the activities associated with the Ground Water Protection Initiative at the Duke Energy McGuire Nuclear Station (McGuire) in Huntersville, North Carolina. This report establishes the foundation for the Radiological Ground Water Protection Program at McGuire (NSD-517).

2.0 SITE DESCRIPTION

2.1 Site Location

McGuire is located in North Carolina, in the northwestern portion of Mecklenburg County, adjacent to Lake Norman. The McGuire site is approximately 5 miles west of Interstate I-77. Huntersville, North Carolina, the nearest town, is located approximately 6 miles to the east. The site is located at Latitude 35 degrees-25 minutes-59 seconds North and at Longitude 80 degrees-56 minutes-55 seconds West. The location of the site is shown on *Figure 1, Station Location and Property Map*.

2.2 Site Setting

McGuire lies in the Piedmont Physiographic Province. The Piedmont is a northeast trending zone that varies in width from about 80 to 120 miles. The site is bounded on the northwest by the Blue Ridge Province and on the southeast by the Atlantic Coastal Plain Province. The plateau generally slopes southeastward with an elevation range from about 1200 feet to 400 feet.

McGuire lies within a groundwater region that is part of the Piedmont Groundwater Province. Groundwater recharge in this area is derived entirely from infiltration of local precipitation. Groundwater recharge occurs in areas of higher topography (i.e., hilltops) and groundwater discharge occurs to areas of lower topography (i.e., valley creeks and streams).

McGuire is bounded to west by the Catawba River and to the north by the 32,510 acre Lake Norman. Lake Norman is impounded by Duke Power's Cowans Ford Dam hydroelectric station, which is located immediately west of the site and on the Catawba River channel. The plant property and off-site features are shown on *Figure 1, Station Location and Property Map*.

McGuire has a 2,500 foot radius Exclusion Zone covering approximately 450 acres, of this total area, there is approximately 291 acres of land. The remainder of the Exclusion Area includes portions of Lake Norman and the McGuire Discharge Canal. Within the Exclusion Zone there is approximately 145 acres of non-forested land. This non-forested land consists largely of generation and maintenance facilities, parking lots, roads, storage yards, and mowed grass. Included in this area is the 32.9 acre (13.3 ha) Standby Nuclear Service Water Pond and a 10.2 acre (4.1 ha) Wastewater Collection Basin. Young and mid-aged mixed hardwood-pine and pine-mixed hardwood communities dominate the majority of the 102 acres (41.0 ha) of the Exclusion Zone not occupied by plant structures or facilities. This acreage varies in elevation from 650 feet to 800 feet above mean sea level (msl).

Land use nearby McGuire is primarily comprised of residential development, with limited commercial development (e.g., schools, restaurants, service stations) and institutional (e.g., churches) development. Located near the major urban center of Charlotte, near major transportation routes (I-77 and I-85), and Lake Norman, the area around the McGuire plant is experiencing rapid change from a rural to a suburban environment.

2.2.1 Lake Norman

Lake Norman serves as the cooling water source for McGuire. Lake Norman is North Carolina's largest man-made lake and extends 34 miles in length between Lookout Shoals Lake and Mountain Island Lake. Lake Norman was formed from the impoundment of the Catawba River and achieved full pond in 1964.

Lookout Shoals Lake, Mountain Island Lake, and Lake Norman are part of the Catawba-Wateree Project, and are owned and operated by Duke Power, a division of Duke Energy and licensed by the Federal Energy Regulatory Commission (FERC) as FERC Project 2232. The Catawba-Wateree Project consists of 11 lakes on the Catawba River, which are operated for hydroelectric power. Lake Norman is the largest in the Catawba chain of lakes. The major tributaries for Lake Norman are the Catawba River, Lyle Creek, and Buffalo Shoals Creek.

Table T-1, Lake Norman Summary Data, below, provides a summary of selected data for Lake Norman.

TABLE T-1 LAKE NORMAN SUMMARY DATA	
Full Pond Elevation	760 feet (msl)
Maximum Drawdown	25 feet
Full Pond Surface Area	32,500 acres
Full Pond Volume	1.09 x 10 ⁶ acre-feet
Shoreline Length	520 miles
Mean Depth	33 feet
Maximum Depth	120 feet
Drainage Area	1800 square miles
Annual Mean Flow (at Cowans Ford Dam)	2670 cubic feet per second
Minimum Average Daily Flow (FERC)	311 cubic feet per second

In addition to serving the needs of the McGuire, Marshall, and Cowans Ford power plants, Lake Norman is a source of municipal drinking water for several cities in the region.

3.0 STATION DESCRIPTION

3.1 Overview of Primary Plant Building Construction

This section provides an overview description of McGuire and construction elements of the primary plant buildings of significance relative to groundwater movement and monitoring. Plant buildings and features are depicted on *Figure 3, Station Site Plan and Features*.

McGuire Unit 1 began commercial operation in June 1981; Unit 2 began commercial operation in March 1983.

The primary plant buildings at McGuire are comprised of two Reactor Buildings, one shared Auxiliary Building, two Diesel Generator Buildings, two Turbine Buildings, and one shared Service Building, collectively considered the "Power Block". Other shared support features include the water Intake Structure, the water Discharge Structure, Conventional Waste Water Treatment Ponds, the Standby Nuclear Service Water Pond, the Waste Water Collection Basin and the Radwaste Facility Building. In addition to these primary buildings and features, there are ancillary office buildings and other facilities at the site used by and for McGuire support staff.

Additionally, McGuire has operated two landfarms and two landfills on site. While not the subject of this site characterization effort, these locations are of interest for the overall radiological ground water protection program and are discussed briefly herein for completeness.

3.1.1 Reactor Buildings

McGuire Units 1 and 2 each employ a pressurized water reactor Nuclear Steam Supply System (NSSS) with four coolant loops which were furnished by Westinghouse Electric Corporation. In the reactor itself, control rods and boron are used to control the amount of nuclear fission. The primary cooling system for the reactor is known as the Reactor Coolant System. The Reactor Buildings house the Reactor Coolant System for each unit.

The Reactor Buildings are constructed on bedrock at elevation 717.0 feet msl (relative to a surrounding plant grade level of approximately 760 feet msl) with interior excavation as deep as elevation 688.4 feet msl.

The Reactor Building structure is part of the containment system that is designed to ensure that an acceptable upper limit of leakage of radioactive material is not exceeded under Design Basis Events.

A key component of interest in this Ground Water Protection Initiative is the fuel transfer tube which runs between the spent fuel pool in the Auxiliary Building and the containment fuel transfer canal (also called the refueling canal) in the Reactor Building. The fuel transfer penetration, a steel subcomponent of the Steel Containment portion of the Reactor Building, is provided for transfer of fuel to and from the fuel pool and the containment fuel transfer canal.

3.1.2 Auxiliary Building

The single Auxiliary Building surrounds the Unit 1 and Unit 2 Reactor Buildings, and houses the Radiation Control Area containing the reactor support systems, including the New Fuel Storage Facility and Spent Fuel Pool. Each unit at McGuire has a separate fuel handling facility that includes a New Fuel Storage Facility and a Spent Fuel Pool, located (approximately) in the northwest (Unit 1) and northeast (Unit 2) portions of the Auxiliary Building.

Key components of interest in this Ground Water Protection Initiative are sumps within the Auxiliary Building that may encounter leaking fluid and the spent fuel pool which operating experience has indicated to be the source of groundwater contamination at other utilities. The Auxiliary Building is supported by a reinforced concrete foundation mat that bears either directly on rock or on "fill" concrete. Positioned at the top of fill concrete below the foundation slabs, largely at elevation 712 feet msl, there is a grid of interconnected flow channels (refer to Section 3.1.6).

3.1.3 Diesel Generator Buildings

The two Diesel Generator Buildings are located west and east of Units 1 and 2, respectively. The diesel generators housed in each of these buildings provide off-line and back-up power for facility support systems. The Diesel Generator Building is supported by a reinforced concrete foundation mat that bears either directly on rock or on "fill" concrete. Positioned at the top of fill concrete below the foundation slabs, ranging between elevations 726 feet msl and 729.5 feet msl, there is a grid of interconnected flow channels (refer to Section 3.1.6).

3.1.4 Turbine Buildings

The two Turbine Buildings, located south of each Reactor Building, house the main turbines, electrical generators and the supporting equipment such as the main condensers and feedwater pumps. The Turbine Buildings are steel frame structures supported on reinforced concrete substructures. The Unit 1 Turbine Building (westernmost unit) is supported on deep foundations bearing on bedrock. The presence of the compressible soils, with variable depth, beneath the south and west portions of Unit 1 would allow excessive total and differential movements if soil-supported foundations were used. Drilled straight shaft caissons, end-bearing on the bedrock, were used. The Unit 2 Turbine Building (easternmost unit) is supported on a mat foundation bearing on the dense soils, partially weathered rock and rock.

3.1.5 Service Building

The single, shared Service Building is situated between the Turbine Buildings and houses support systems shared between Unit 1 and Unit 2. The southern portion of the Service Building is underlain by compacted soil and is supported on end bearing caissons.

3.1.6 Groundwater Drainage (WZ) System

Design and construction of the Reactor, Auxiliary, and Diesel Generator Buildings includes a dewatering system used to reduce the hydrostatic pressures on the foundations and foundation walls. A permanent groundwater drainage system is installed as shown on **Plate 1, Reactor Bldg. And Aux. Bldg. Groundwater Drainage System Sheet No. 1 (MC-1220-21) and Plate 2,**

Reactor Bldg. And Aux. Bldg. Groundwater Drainage System Sheet No. 2 (MC-1220-31) (Appendix A). The drainage system is designed to create and permanently maintain a normal groundwater level at or near the base of the foundation mat and basement walls, thus eliminating the uplift of hydrostatic forces. This groundwater drainage system consists of a waffle-like grid of underdrains, constructed integrally with the building foundation, and continuous exterior wall drains. Being constructed integrally with the foundations, the elevation of the groundwater drainage system varies, but is generally at elevation 717 feet msl underneath the Reactor Buildings, at elevation 712 feet msl for the Auxiliary Building, and between elevations 726 feet msl and 729.5 feet msl underneath the Diesel Generator Buildings. Likewise, the continuous exterior wall drains vary in elevation, but approximate the elevations of the foundation grid.

The foundation underdrains and the exterior wall drains discharge into three sumps located adjacent to the Auxiliary Building, described below in **Table T-2, Auxiliary Building WZ System Sump Summary**:

TABLE T-2 AUXILIARY BUILDINGS WZ SYSTEM SUMP SUMMARY			
	Sump A	Sump B	Sump C
Physical Location Description	Within Auxiliary Building, between column lines BB-CC and 51-52	Within Auxiliary Building, between column lines BB-CC and 61-62	Within Auxiliary Building, near column line RR between column lines 54 and 55
Size	10 ft x 10 ft x 15 ft deep	10 ft x 10 ft x 15 ft deep	17 ft x 17 ft x 12 ft deep
Bottom Elevation for Inlet Pipe and Wooden Drains	712 feet msl	712 feet msl	712 feet msl
Inlet Pipe Size	8 inch CMP	8 inch CMP	8 inch CMP
Bottom Sump Elevation	702 feet msl	702 feet msl	704 feet msl
Pump Discharge Elevation	713.3 feet msl	713.3 feet msl	716.3 feet msl

Groundwater Sumps A and B are used to collect normal groundwater and/or potentially contaminated groundwater. The groundwater or contaminated liquid collected in Sumps A or B would be pumped to the Turbine Building sumps (Sump A pumps to the Unit 1 Turbine Building Sump and Sump B pumps to the Unit 2 Turbine Building Sump). Normal sump discharges would then be pumped to the Conventional Waste Water Treatment System; contaminated sump discharges could be directed to the Liquid Waste Monitor and Disposal System. Groundwater or contaminated liquids collected in Sump C would be pumped to a free outfall at the storm drain system which discharges into the Standby Nuclear Service Water (SNSW) Pond. Typical flow from Sump C is on the order of 10 to 20 gpm. Inflow to the SNSW Pond is passed to the Waste Water Collection Basin through the SNSW Pond outlet facility.

Eleven permanent groundwater monitors are installed around the perimeter of the Auxiliary and Reactor Building exterior walls to monitor the groundwater level in the zoned wall filter. Seven interior monitors, instrumented through holes in the wall, are mounted inside the Auxiliary and Diesel Generator Building. One exterior groundwater monitor, instrumented in a drilled cased well, drilled into the zoned filter is located inside the Unit 2 Equipment Staging Building. Three

exterior monitors, instrumented in cased wells drilled into the zoned wall filter, are located outside the Reactor and Auxiliary Building. All eleven monitors provide three points of alarm to alert operators to a rise in groundwater.

3.1.7 Landfarms and Landfills

McGuire has operated two landfarms and two landfills on site. While not directly tied to the daily operation of McGuire and also not the subject of this site characterization effort, nonetheless these locations are of interest for the overall radiological ground water protection program.

Landfarm #1 is located next to the Catawba River, immediately downstream of Cowans Ford Dam. Landfarm #1 is closed and no longer used. Landfarm #2 is located near the transmission yard, south of highway NC-73. Landfarm #2 is also closed. Landfill #1 is located in the same area as Landfarm #1 and is closed. Landfill #2 is located south of the transmission yard, south of highway NC-73. The sludge from the Initial Holdup Pond is now de-watered and disposed of in Landfill #2, which is the only open site of the four mentioned here. Monitoring wells exist for both Landfill #1 and Landfill #2.

3.2 Overview of Plant Water Use

This section provides an overview description of water use at McGuire of significance relative to groundwater movement and monitoring.

3.2.1 Cooling and Service Water Systems

McGuire uses water from Lake Norman for cooling and process water. The average daily withdrawal from Lake Norman for the cooling water and other service water systems is 2626 million gallons per day (mgd). The average daily discharge via pass through to Lake Norman from McGuire is 2404 mgd. Combined average flows of 0.9819 mgd from the Conventional Wastewater Treatment System (0.3485 mgd) and the Waste Water Collection Basin (0.6334 mgd) is discharged to the Catawba River below the Cowan's Ford Dam.

3.2.1.1 Intake Structure

The Condenser Circulating Water (RC) System withdraws water from Lake Norman via the Condenser Circulating Water Intake Structure. This system, in turn, supplies water to other plant systems, including the Conventional Low Pressure Service Water System and the Fire Protection System jockey pumps. The Fire Protection System withdraws water from Lake Norman for plant fire protection. The Condenser Circulating Water Intake Structure houses the three main fire pumps.

The Condenser Circulating Water Intake Structure is located west of the McGuire Power Block and is a reinforced concrete structure built into the east embankment of Cowans Ford Dam. The RC Intake Structure is designed to withdraw water from the lake via normal and low level intake elevations. The low level intake cooling water portion of the RC System is designed to take cool water from the lower levels of Lake Norman and mix it with the warmer water at the Condenser Circulating Water Intake Structure during times of high lake water temperature.

3.2.1.2 Conventional Wastewater Treatment System (WC) Ponds

The Conventional Wastewater Treatment (WC) System receives all secondary side plant waste water (except sanitary sewage), monitors it for radioactivity, treats it through a system of ponds with chemical treatment and aeration capabilities and discharges it to the Catawba River at a quality equal to or better than applicable State and Federal Water Quality Standards. If radioactivity from any source approaches 10CFR20 limitations, it is handled in-plant as radioactive waste by the Liquid Waste Monitor and Disposal System and the Solid Waste Disposal System. *Table T-4, Conventional Wastewater Treatment System (WC) Ponds Summary* describes the WC System ponds:

TABLE T-4 CONVENTIONAL WASTEWATER TREATMENT SYSTEM (WC) PONDS SUMMARY		
Pond	Construction	Capacity (gallons)
Initial Holdup Pond	Concrete	200,000
Settling Ponds (2)	Bentonite Clay-lined	2,500,000 each
Final Holdup Pond	Concrete	1,000,000

Normally, inputs are received in the Initial Holdup Pond which provides a surge-dampening function to the settling ponds and also allows heavy solids to settle for periodic removal. From the Initial Holdup Pond flow is directed to the in-service settling ponds where chemical treatment, mixing, and aeration take place.

Treated water from the settling ponds is discharged directly to the Catawba River on a batch basis. Discharge to the Catawba River may be by gravity at a rate of approximately 200 gpm or be pumped at a discharge flow rate of 3,500 gpm under an approved National Pollution Discharge Elimination Systems permit.

3.2.1.3 Discharge Structure

The discharge structure is the terminus of the once-through Condenser Circulating Water (RC) System and is located northeast of the McGuire Power Block. This structure is designed to allow warm discharge water to float on the surface with a minimal amount of mixing. The service water and liquid radwaste systems discharge through this structure. This structure provides the primary outfall for the station discharges under an approved National Pollution Discharge Elimination System permit.

3.2.2 Standby Nuclear Service Water Pond

The McGuire Standby Nuclear Service Water Pond (SNSWP) is located in a shallow stream valley south of the center of the plant. The SNSWP provides an ultimate heat sink in the event of a loss of access to Lake Norman. In this function, the pond would supply cooling and service water to selected plant heat exchangers and other equipment required to bring the plant to a safe shutdown condition. The SNSWP is isolated from the plant service water during normal plant operations.

The SNSWP has a volume of approximately 550 ac-ft. and a surface area of approximately 32.9 acres at a full pond elevation of 740 feet msl. Normal operations maintain the water level in the

SNSWP between elevation 739.5 feet msl and 740 feet msl. The SNSWP has a net inflow from runoff and subsurface interflow.

3.2.3 Waste Water Collection Basin

The McGuire Waste Water Collection Basin is located immediately downstream of the Standby Nuclear Service Water Pond in the shallow stream valley south of the center of the plant. Inflow to the Standby Nuclear Service Water Pond is passed to the Waste Water Collection Basin through the Standby Nuclear Service Water Pond outlet facility.

Other inputs to the Waste Water Collection Basin include inflows from portions of the yard drain system, reverse osmosis unit reject flows, miscellaneous Administration Building drains and Condenser Circulating Water (RC) System un-watering flows.

The Waste Water Collection Basin is a 10.2 acre collection basin having a total capacity of approximately 40 million gallons with a maximum drawdown capacity of approximately 1.1 million gallons. Discharges from the basin range from 0 to 20,000 gpm. The outlet works of the Waste Water Collection Basin consist of a 66 inch pipe through the dam that discharges into a paved ditch downstream of the dam. This discharge mixes with the discharge from the Conventional Waste Water Treatment (WC) in a concrete apron and the combined flow is discharged to the Catawba River downstream of Cowans Ford Dam.

3.2.4 Domestic Water and Sanitary Waste

The Charlotte Mecklenburg Utilities Department supplies potable water used at McGuire. Sanitary wastes are discharged to Charlotte Mecklenburg Utilities Department facilities.

3.2.5 Groundwater Supply Wells

There are a total of six (6) groundwater supply wells at the McGuire site. A brief description of these wells and their usage is presented in **Table T-5, Groundwater Supply Wells Summary**. These wells supply water on a periodic basis to remote locations and for seasonal irrigation. As shown in **Table T-5, Groundwater Supply Wells Summary**, the average annual groundwater withdrawal rate from these wells is 50 gpm.

TABLE T-5 GROUNDWATER SUPPLY WELLS SUMMARY		
Well Location and Number of Wells	Description of Use	Average Annual Groundwater Withdrawal Rate
Picnic Area/Security Training Area (South of NC 73) 1 well	Supplies water to restrooms. Security uses area during week. Occasional site use of picnic area.	Seldom used
Switchyard (South of NC 73) 1 well	Supplies water to restroom, to water storage tank, and to landfill leachate pump seals on as-needed basis.	20 gpm
Lined Landfill Irrigation System 3 wells	Three wells supply irrigation water to lined landfill. Use is approximately 30 minutes to 60 minutes daily during growing season.	30 gpm
Total Average Annual Groundwater Withdrawal Rate		50 gpm

3.2.6 Groundwater Use Summary

Considering the foundation dewatering systems and groundwater supply wells, *Table T-6, Groundwater Use Summary*, provides a summary of groundwater use at McGuire.

TABLE T-6 GROUNDWATER USE SUMMARY	
Groundwater Flow from Reactor, Auxiliary, and Diesel Generator Building Dewatering System (Refer to Section 3.1.6)	20 gpm
Withdrawal Rate for Groundwater Supply Wells (Refer to Section 3.2.5)	50 gpm
Total Groundwater Use	70 gpm

3.2.7 Storm Water

Storm water from improved areas of McGuire is collected in a system of roof drains, a surface water collection system, and ditches arranged around the plant in such a way as to direct runoff away from the plant to natural drainage channels. The surface water collection system and other site physical features such as ditches and graded areas which permit free surface outflow are designed and constructed to protect all safety-related structures from flooding during a local probable maximum precipitation. The surface water collection system consists of catch basin inlets which are connected by corrugated metal pipes to form several networks. The surface water collection system, ditches and graded areas are all arranged to primarily direct storm water to the Standby Nuclear Service Water Pond and the Waste Water Collection Basin.

4.0 OVERVIEW OF STATION HYDROGEOLOGIC SETTING

4.1 Regional Physiographic Province

McGuire Nuclear Station is located in the Piedmont physiographic province (*Figure F-1*). The Piedmont province lies between the Coastal Plain province to the east and the Blue Ridge Mountain province to the west. The boundary between the Piedmont and Coastal Plain provinces is the “fall line” - the zone where the soft sedimentary rocks of the Coastal Plain give way to the harder, crystalline rocks of the Piedmont. The boundary between the Piedmont and Blue Ridge is the Blue Ridge scarp - a prominent topographic feature varying from about 1200 to 2500 feet high in the upper drainages of the Catawba-Wataeree system.

Elevations of the Piedmont province range from 220 to 600 feet in the eastern portion of the Piedmont and gradually rise to the west to about 1500 feet at the foot of the Blue Ridge scarp. Gently rolling, well-rounded hills and long low ridges underlain by saprolite developed on crystalline rocks characterize the Piedmont province. Local relief ranges up to about 200 feet. Mountainous remnants of erosion resistant rock stand above the rolling surfaces.

The vegetation of the Piedmont shows the impact of man’s activities on the land. Several centuries of logging, farming, grazing, and increasing urbanization have converted a once forested landscape into patches of pine and deciduous forest mixed with fields in varying kinds of cultivation and in varying stages of abandonment.

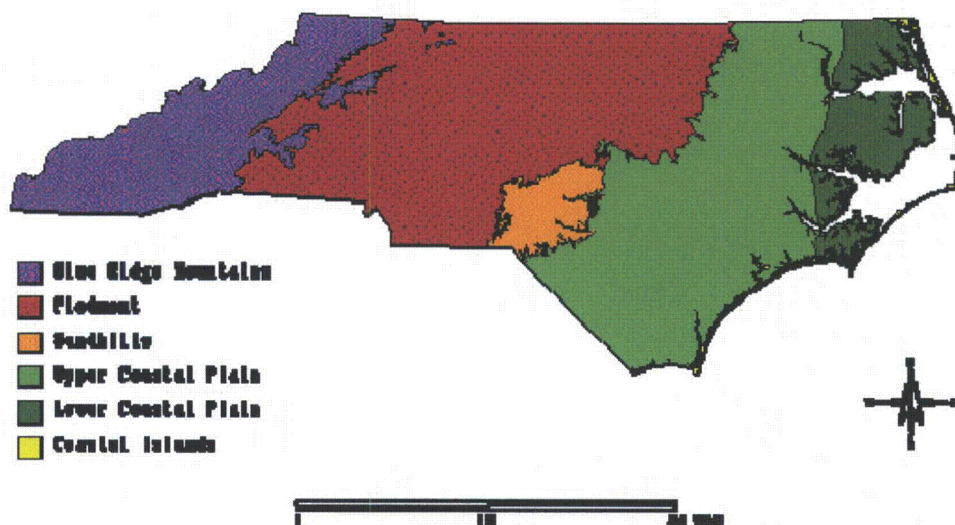


Figure F-1
Physiographic Provinces of North Carolina
(www.ncgia.ucsb.edu)

4.2 Regional Geology

The rocks of the southern crystalline Appalachians are divided based on similar rock types, structures, and aerial distribution into parallel geologic belts oriented in a southwest to northeast direction. From northwest to southeast the geologic belts crossing the Catawba-Wataree drainage basin are: Blue Ridge, Chauga, Inner Piedmont, Kings Mountain, Charlotte, and Carolina Slate belts. McGuire Nuclear Station is located in the Charlotte belt (*Figure F-2*).

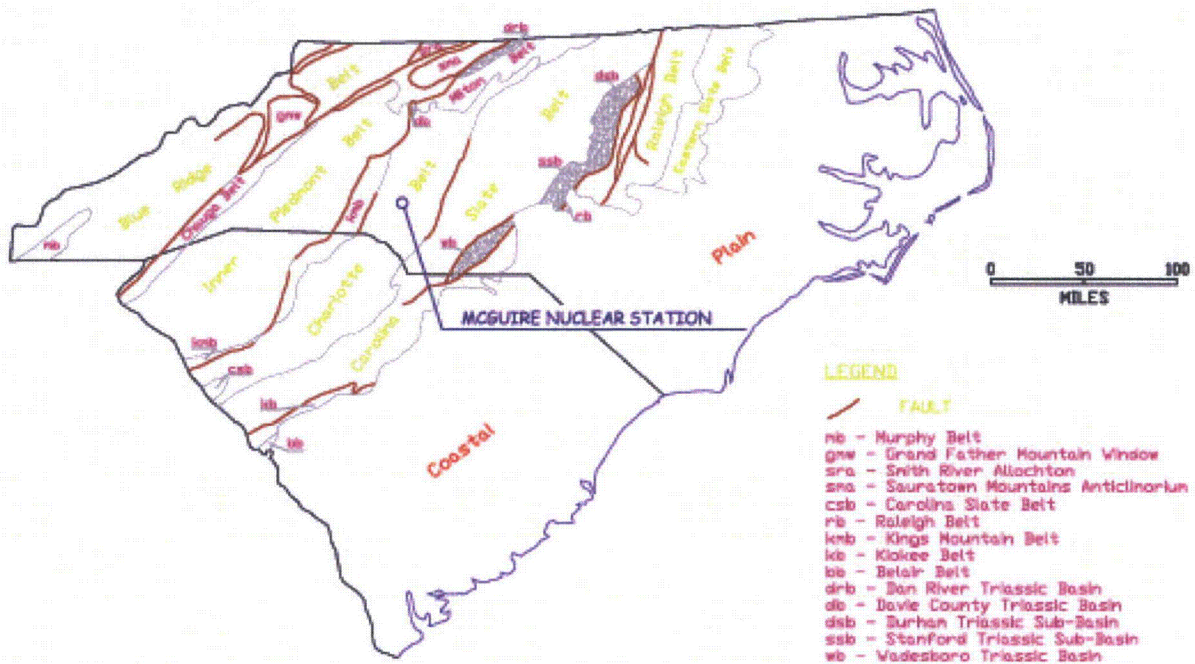


Figure F-2
 Geologic Belts of the Carolinas

The predominant rocks of the Charlotte belt are schists and gneisses of the amphibolite metamorphic facies intruded by a complex sequence of plutonic rocks. The plutonic rocks are extensive and compositions include granite, diorite, monzonite, gabbro, norite, and pyroxenite. The general structure of the belt is primarily a function of plutonic contacts.

4.3 Regional Hydrogeology

The hydrogeology of the Piedmont region is different from and has to be considered in a different way from conventional sedimentary aquifer systems (LeGrand, 1988). LeGrand (1988, 1989) has developed a conceptual groundwater model for the Piedmont Province (*Figure F-3*).

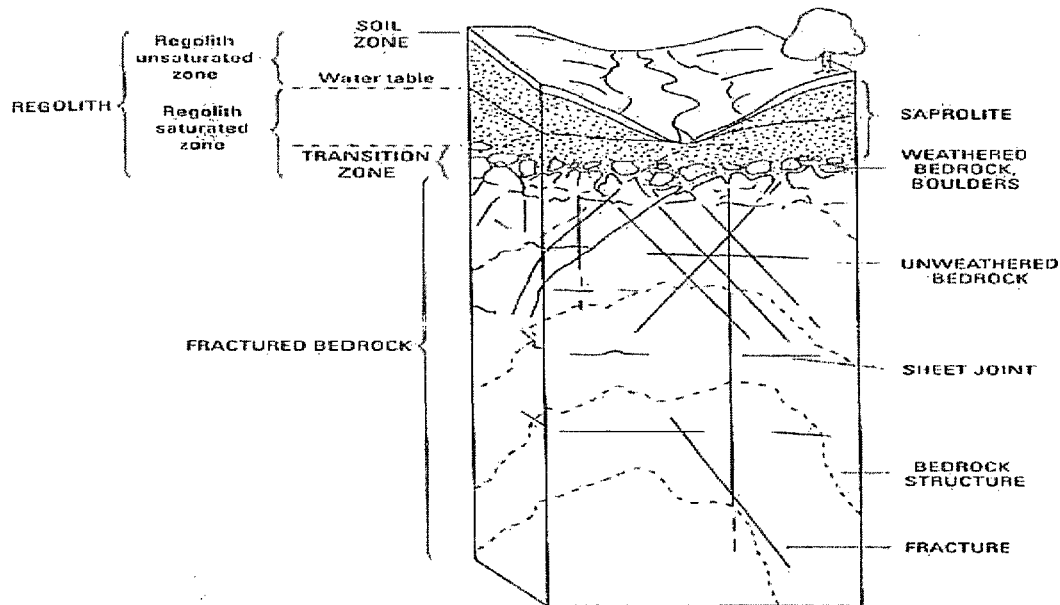


Figure F-3
Principle Components of Groundwater System in Piedmont Geologic Province
 (LeGrand, 2004)

In the Piedmont region, a thoroughly weathered and structureless material termed residuum occurs near the ground surface with the degree of weathering decreasing with depth. The residuum grades into a coarser-grained material that retains the structure of the parent bedrock and is termed saprolite. Beneath the saprolite, partially weathered bedrock occurs with depth until sound bedrock is encountered. This mantle of residual soil, saprolite, and weathered rock (regolith) is a special hydrogeologic unit that covers and crosses various types of rock (LeGrand, 1988). It provides an intergranular medium through which the recharge and discharge of water from fractured rock commonly occurs. A transition zone at the base of the regolith is present in many areas of the Piedmont (Harned and Daniel, 1989). In this zone the unconsolidated material grades into the bedrock. It consists of partially weathered bedrock and lesser amounts of saprolite. This zone may serve as a channel for rapid movement of groundwater toward the discharge points.

The fractured nonporous bedrock is the most abundant lithologic unit underlying the Piedmont region (LeGrand, 1988). It includes many different types of igneous and metamorphic rocks. The fractures control both the hydraulic conductivity and the storage capacity of the rock mass (Trainer, 1988). Fractures tend to be more extensive and permeable in homogenous aluminum-deficient rocks than in micaeous rocks (Randall and others, 1988). The latter are less brittle and their weathering products have a high clay content that tends to reduce fracture permeability (Randall and others, 1988). Fracture permeability tends to be greater in alkalic igneous rocks (granites/quartz diorites) than in calcic igneous rocks (gabbros/ultramafics/diorites) because

potassium and sodium-rich feldspars tend to produce about half as much clay as calcium-rich feldspars (Randall and others, 1988).

Groundwater occurs within the pore space of the residuum/saprolite and within fractures of the underlying bedrock. The residuum/saprolite is capable of storing water readily, but transmits it slowly. In contrast, the bedrock fracture system has a relatively low storage capacity but is capable of transmitting water readily where interconnecting fractures occur (*LeGrand, 2004*). The transition zone characteristics will exist between the two, but will commonly store and transmit groundwater readily. The hydraulic connection between the residuum/saprolite medium and bedrock medium will depend on the characteristics of the transition zone, a function of rock/soil type, amount of weathering, and degree (location/frequency) of fracturing within the bedrock.

LeGrand's (1988, 1989) conceptual model of the groundwater setting in the Piedmont incorporates the above two medium system into an entity that is useful for the description of groundwater conditions. That entity is the surface drainage basin that contains a perennial stream (*LeGrand, 1988*) (*Figure F-3*).

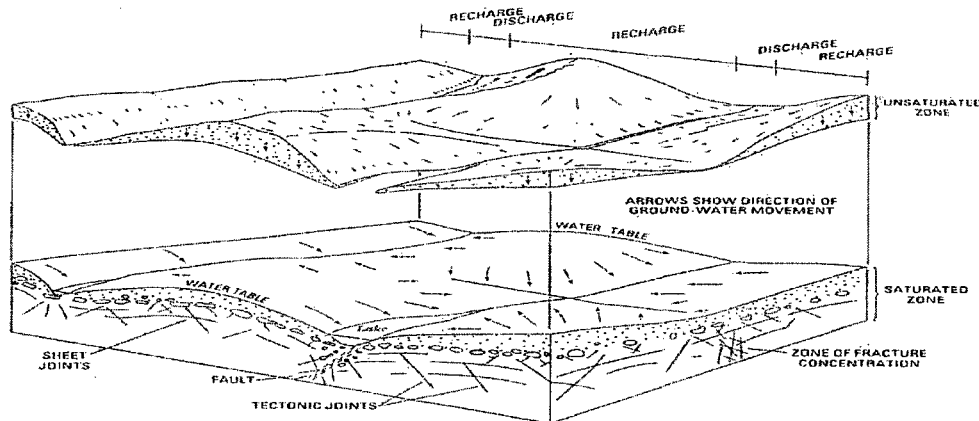


Figure F-4
Conceptual Groundwater Flow System in Piedmont Geologic Province
(*LeGrand, 2004*)

Each basin is similar to adjacent basins and the conditions are generally repetitive from basin to basin. Within a basin, movement of groundwater is generally restricted to the area extending from the drainage divides to a perennial stream (Slope-Aquifer System; *LeGrand, 1988, 1989*). Rarely does groundwater move beneath a perennial stream to another more distant stream (*LeGrand, 1989*).

Therefore, in most cases in the Piedmont, the groundwater system is a two medium system (*LeGrand, 1988*) restricted to the local drainage basin. The groundwater occurs in a system composed of two interconnected layers: residuum/saprolite and weathered rock overlying fractured crystalline rock. Typically, the residuum/saprolite is partly saturated and the water table fluctuates within it. Water movement is generally through the fractured bedrock. The

near-surface fractured crystalline rocks can form extensive aquifers. The character of such aquifers results from the combined effects of the rock type, fracture system, topography, and weathering. Topography exerts an influence on both weathering and the opening of fractures, while the weathering of the crystalline rock modifies both transmissive and storage characteristics.

Groundwater will migrate from areas of high hydraulic pressure, or recharge areas, to areas of low hydraulic pressure, or areas of discharge, through the pore space of the soil and through fractures in the bedrock. Typically in the Piedmont, topographically high areas (hilltops) correspond to recharge areas and topographically low areas (valley streams) correspond to discharge areas. The direction of groundwater flow is determined by the hydraulic gradient. The rate of groundwater movement in the saprolite is a function of the gradient, the hydraulic conductivity of the soil, and the effective porosity (a measure of the pore space interconnection). The rate of groundwater movement in the bedrock, although influenced by gradient, is most dependent upon the hydraulic conductivity and interconnectedness of the fracture system. Complex local geologic conditions cause wide differences in rates of flow, ranging from greater than one foot per day to less than one foot per century (*LeGrand, 2004*).

4.4 Site Geology

The physiography of the site is typical of that of the surrounding Piedmont Geological Province. The four major rock types appearing at the site are dark green meta-gabbro, light gray fine to medium grained granite, black and white fine grained diorite, and black and white coarse grained diorite. An examination of the rock cores at the site generally confirms the published geologic literature of the placement order and relative age of the rock types at the site and the previous findings of the UFSAR.

The geologic structure of the site is very old and complex. Due to the various episodes of igneous intrusions, the site area is typified by bodies of the various rock types highly interlayered both horizontally and vertically. Several minor shear zones, including slickensided surfaces, were noted in the core borings at the site both during this investigation and during the UFSAR investigation. An ancient flood plain or high level terrace, probably of the Catawba River, exists in the higher portions of the site.

The geologic history of the site is typical of that of the region. During the middle to late Paleozoic time, there were several periods of intrusion of granite and diorite which left only small amounts of the parent rock, meta-gabbro and mica schist, in the Charlotte Belt including the site area. The slickenside surface at the site was caused during one of the last episodes of intrusion. The last intrusive activity in the area was in the form of Triassic diabase and other mafic dikes like the one found at the site during previous studies for the UFSAR.

4.5 Site Groundwater

Groundwater recharge in the Piedmont province is derived entirely from infiltration of local precipitation. The surface materials in many locations are relatively impermeable, with the result that only 10 in. (25 cm) to 15 in. (38 cm) of the average 43 in. (108 cm) of annual precipitation percolate to the water table (*UFSAR*).

During McGuire site development, groundwater was generally encountered under water table conditions in the residual soil/saprolite and weathered rock that overlies less weathered rock. Preconstruction groundwater elevation along the northern boundary of the site coincides with the elevation of the surface of Lake Norman, and groundwater movement was generally to the south and southwest (*UFSAR*).

Since the bottom elevations of the structures are below the natural water table, McGuire construction incorporated foundation dewatering systems beneath the Reactor Building area to lower the water table. This underdrain system remains in service and results in a minimum groundwater level of about elevation 712 in the Reactor Building area and a depression of the water table with groundwater flow towards the Reactor Building and Auxiliary Building area from the northeast and west. Largely founded within the levels of weathered rock and bedrock, it was expected during development of this Ground Water Protection Initiative scope that the foundation dewatering systems of these buildings would have an impact on groundwater flow.

4.5.1 Site Hydrostratigraphic Units

Given (1) knowledge of the McGuire site from the *UFSAR* description and (2) experience in the Piedmont Geologic province, the following hydrostratigraphic units were selected for site characterization use on this project:

1. Fill (F) – Embankment material that has been either dumped or sluiced into place.
2. Alluvium (S) – Material deposited by stream action and consisting mainly of sandy silts and silty sands.
3. Soil/Saprolite (M1) – Soil and saprolite, primarily sandy silt and silty sand, developed by the in-place weathering of the underlying bedrock with Standard Penetration Resistance of $N < 100$.
4. Weathered Rock (M2) – Saprolite and weathered rock with Standard Penetration Resistance of $N > 100$ and/or Rock Core Recovery $< 50\%$.
5. Partially Weathered/Fractured Rock (WF) – Rock with Rock Core Recovery $> 50\%$ and Rock Quality Designation $< 50\%$.
6. Sound Rock (D) – Rock with Rock Core Recovery $> 85\%$ and Rock Quality Designation $> 50\%$.

5.0 SOURCE/SOURCE PATHWAY EVALUATION AND MONITORING LOCATIONS

5.1 Contaminants of Interest and Their Fate in the Environment

Water containing trace amounts of various radioactive materials is normally released from U.S. nuclear power plants under controlled, monitored conditions that meet conservative Nuclear Regulatory Commission (NRC) limits to protect public health and safety. Recently, several instances of unintended, abnormal releases of radioactive liquids to the environment were identified. Materials detected to date in groundwater around nuclear power plants include Tritium and Strontium 90 (NRC, 2007). Of these two materials, Strontium-90 is only associated with specific, isolated plant systems, such as the Spent Fuel Pool. Tritium is much more prevalent in plant systems than Strontium-90, and is thus considered a much better indicator of potential radioactive releases. As such, while Strontium-90 as a material is monitored by Duke Energy on a specific basis, tritium and potential sources of tritium are the focus of this Ground Water Protection Initiative.

As a background, the following section provides a brief overview of the properties, sources, and occurrence of tritium, and its fate in the environment.

5.1.1 Tritium

Tritium, H_3 , is a radioactive isotope of the element hydrogen. The most common form of tritium is in water, since both radioactive tritium and non-radioactive hydrogen readily bond with oxygen to form water. Tritium replaces one of the stable hydrogens in the water molecule H_2O . When this happens, the resulting water, called tritiated water (H^3HO or HTO), is radioactive. Tritiated water (not to be confused with heavy water) is chemically identical to normal water, i.e., colorless and odorless, and the tritium cannot be filtered out of the water (EPA, 2007; NRC, 2006, 2007).

Tritium is formed by natural and man-made processes. Tritium occurs naturally in the upper atmosphere when cosmic rays strike air molecules. It is also produced during nuclear weapons explosions, and commercially in nuclear reactors producing electricity. Most of the tritium produced in an electrical power reactor is as a byproduct of the absorption of neutrons by boron, which nuclear reactors use to help control the fission chain reaction (EPA, 2007; NRC, 2006, 2007).

Tritium that is formed in the atmosphere enters the groundwater as precipitation recharge. Tritium was produced by thermonuclear explosions that took place in the atmosphere, primarily between 1952 and 1969 (Drever, 1988). Tritium levels in rainwater are expressed as TU, tritium units¹. Although few tests were made prior to atmospheric testing, the natural occurring concentration of tritium in rainwater prior to atmospheric testing was taken to be about 10 TU. During the peak of atmospheric testing, in the 1960's the levels rose significantly, approaching 10^3 TU. Current values of tritium in rainwater are around 10 TU [Drever, 1988]. Average

¹ 1 TU = one tritium atom per 10^{18} hydrogen atoms.

tritium concentrations in rainwater in Charlotte averaged 93 pCi/L for the period 1986 to 2007. [USEPA RAD NET] The US EPA equates 1 TU as being approximately equal to 3.2 pico Curies per liter (pCi/L). The US EPA health standard for tritium is 20,000 pCi/L (~ 6250 TU) (NRC, 2006).

Tritium has a half-life of 12.3 years. As it undergoes radioactive decay, tritium emits a very low energy beta particle and transforms to stable, nonradioactive helium. (EPA, 2007).

5.1.1.1 K_d Values for Tritium

Since tritium readily combines with oxygen to form water, its behavior in aqueous systems is controlled by hydrologic processes and it migrates at essentially the same velocity as surface water and groundwater. Sorption processes are therefore not expected to be important relative to the movement of tritium through aqueous environments. Typically, a partition coefficient, K_d , of 0 ml/g is used to model the migration of tritium in soil and groundwater environments. (EPA, 1999).

5.2 Structures, Systems and Component Evaluation

Duke Energy staff from multiple plant disciplines, including Radiation Protection, Environment, Health and Safety, Engineering and Project Management, performed an evaluation of potential radiological (tritium) sources at McGuire. This evaluation consisted of a structured risk assessment as well as a review of relevant plant operating experience.

5.2.1 Risk Assessment Process

In order to focus on potential contaminated sources and source pathways to groundwater, a risk assessment was performed on the plant structures, systems and components (SSC). This risk assessment took into consideration four distinct aspects of these SSC and the environment in which they are located. The four distinct aspects are the hydro-geologic profile, the volume profile, the tritium profile and the engineering profile.

For the hydro-geologic profile, a value was assigned to the SSC based on the ease with which any liquid, contained within or directed by it, could reach groundwater. For example, a higher value was given to an SSC if no difficulty existed for any liquid, contained within or directed by it, to reach groundwater should a failure or leak occur. An example here is a buried pipe where its contents could easily reach groundwater if the contents escaped. In contrast, a component or system inside a building with lined sumps would receive a low ranking, since there would be little to no opportunity for any escaped contents to reach groundwater.

A similar ranking philosophy was used for the other profiles. For the volume profile, the amount of contained liquid volume determined the risk ranking. A higher volume equaled a higher risk ranking value. Large pipes and tanks received a higher volume profile ranking. For the tritium profile, the tritium concentration determined the risk ranking. Known tritium sources such as the spent fuel pool and several process water tanks containing radioactive liquids received higher tritium values.

For the engineering profile, the materials of construction, known aging issues and physical location that could affect the ability to inspect and maintain the SSC were included in the engineering profile logic. For example, a higher engineering profile risk ranking was given to buried piping and tanks.

The risk assessment algorithm consisted of multiplying the four independently determined profile values to establish an overall groundwater risk profile. The latter two profiles, the tritium profile and the engineering profile, were given more weight in this risk assessment than the former two. The final groundwater risk profile resulted in a rank ordering of plant SSC with those higher on the list considered to be more “risky” and thus of higher importance to the Ground Water Protection Project. Section 5.2.2 contains a summary of the plant SSC of higher importance for the purposes of this investigation.

5.2.2 Risk Assessment Results

In summary, the following plant structures, systems or components (SSC) emerged as exhibiting a higher risk of contributing unmonitored releases of tritium to the environment:

- Conventional Wastewater Treatment (WC) Ponds, including Initial Holdup Pond, Pond A, Pond B and the Final Holdup Pond.
- Waste Water Collection Basin
- Standby Nuclear Service Water Pond
- Auxiliary/Reactor Building SSC, including
 - Spent Fuel Pools, Unit 1 and Unit 2
 - Refueling Canals, Unit 1 and Unit 2
 - Waste Evaporator Feed Tank Sumps
- Radwaste Facility Building Sump
- Landfarms #1 and #2
- Landfill #1

Further details on the groundwater risk profile for these and all relevant SSC considered in this investigation are contained in Appendix B.

5.2.3 Operating Experience

In addition to the structured risk assessment of plant SSC, a review of operating experience was completed as part of the overall project investigation. The operating experience results were included in a letter dated August 3, 2006, from James R. Morris, Duke Energy, to the US Nuclear Regulatory Commission. Specific occurrences of inadvertent releases of radioactive liquids that had the potential to reach groundwater were noted as follows:

Events listed below are those which have been documented in accordance with 10 CFR 50.75(g) and had potential to reach groundwater; however, an actual release to groundwater may not have occurred.

- *March 1987*
Contaminated soil was recovered from a Unit 1 reactor make-up water storage tank (RMWST) rupture.
- *7/10/1992*
Soil and sludge were recovered as a result of a water spill in the area between Unit 2 refueling water storage tank (FWST) and the shield wall. The water was discharged into a spillway between standby nuclear service water pond (SNSWP) and the waste water collection basin (WWCB).
- *9/14/1998*
A leak occurred from Unit 1 reactor coolant drain tank (NCDT) through hydrogen storage (GB) instrument lines (1GB-9) into Unit 1 turbine building basement.
- *6/26/2003*
Tritium was identified in the Groundwater Drainage System (WZ) sump. This system collects the groundwater drainage from under the site and channels it into the WZ sumps. The effluent from these sumps is composited and analyzed monthly.
- *6/17/2004*
Documentation of tritium concentration which was greater than baseline values in two (2) temporary monitoring wells west of conventional waste (WC) holdup ponds.
- *6/7/2004*
Contamination was discovered in the pipe trench between the radwaste facility and the solidification pad.

This operating experience was also factored into the selection of additional monitoring well locations as discussed in Section 5.3.3.

5.3 Groundwater Protection Monitoring Well Location Selections

Locations and depths of the new groundwater protection monitoring wells were selected based on considering a collaboration of information and goals. Information available for the selection process comprised the following:

- Plant structures, systems and components (SSC) considered primary potential sources of tritium from a structured risk assessment and from relevant operating experience (Section 5.2);
- Master Conceptual Model of geology and hydrogeology in the Piedmont Geologic Province of North Carolina (*LeGrand, 2004*); and,
- Knowledge of site geology and hydrogeology from the Updated Final Safety Analysis Report (*UFSAR*).

Goals for the installed groundwater protection monitoring well system comprised providing the following:

- An exploration scheme that would provide hydrogeologic characterization of the operating plant site, including evaluation of the capture zone(s) of the subsurface drain system(s); and,
- A robust monitoring well network capable of providing early detection of tritium releases (near-field wells) and verifying no off-site migration (far-field wells).

Well locations were first spatially selected (1) in proximity to plant system tritium sources and/or (2) in nearby projected down-gradient groundwater flow directions from plant system tritium sources (i.e., near-field monitoring locations). Spatial distribution then considered additional locations that would (1) provide monitoring to confirm the absence of off-site migration (i.e., far-field monitoring locations) and/or (2) be helpful for site characterization. Following spatial distribution, consideration for well depths (vertical screen intervals) was considered. Shallower wells were utilized where shallow groundwater was expected, as first detection monitoring locations. Shallower wells were, in cases, omitted where it was expected that subsurface drains would have the water table depressed. Deeper wells (top of rock wells) were utilized where plant systems were deep and founded on bedrock (e.g., Reactor Buildings, Auxiliary Buildings, and Turbine Buildings), placing the well screen (sampling interval) nearer the level of potential tritium release. Combinations of shallow/top of rock and/or top of rock/deeper bedrock were utilized to monitor and characterize vertical components of groundwater flow.

Final Ground Water Protection Initiative well locations were subject to plant accessibility and overhead and underground system obstructions.

5.3.1 Existing Boring Information

In the early 1970s, Law Engineering Testing Co. prepared the Subsurface Conditions & Foundation Recommendations report for the McGuire Nuclear Station's Units 1 & 2. For record, Duke Energy requested that the Core Boring Records and Test Boring Records from the above report be preserved in this Ground Water Protection Initiative Site Characterization Report. To this end, S&ME has provided a digital (CD) record of this information in ***Appendix I – Historical Boring Records***. Locations of borings H-1 through H-100 and W-1 through W-11 would be provided in the McGuire Preliminary Safety Analysis Report (PSAR) or other record documents.

5.3.2 Existing Well Information

Early in the well location evaluation process, it was recognized that selected existing McGuire wells would be beneficial to the Ground Water Protection Initiative, these being four wells installed in the area of the Power Block (M-42, M-68, M-72, and M-76), two old Landfarm #1 wells (M-87 and M-89), one well installed north of the Wastewater Collection Basin (M-101), and one well installed southwest of the WC Basins (M-102).

Locations of the eight existing Ground Water Protection Initiative monitoring wells are portrayed on **Figure 4, Ground Water Protection Initiative Monitoring Wells**. A summary of installation details for the eight existing wells is provided in **Appendix C - Soil Test Boring Field Reports and Monitoring Well Installation Records for Selected Existing McGuire Wells**. Groundwater measurements and tritium concentrations from the above wells are considered within this report, as applicable.

5.3.3 Phase 1 Wells

Ultimately, an initial suite of 41 new groundwater protection monitoring wells (designated with the identification prefix "M") was selected for installation at McGuire.

Outside of the protected area 27 new Ground Water Protection Initiative monitoring wells were installed. There were 28 wells proposed outside of the protected area, however, location M-80 was drilled to 50 feet below land surface without encountering groundwater, and therefore, no well was installed in that location. Of the 27 wells installed outside of the protected area, 15 wells were designed to monitor the shallow water table groundwater occurring in the saprolite (and have no suffix to their designation); 10 were designed to monitor the groundwater occurring in the transition zone of highly fractured bedrock (and have the suffix "R"); and two were targeted to monitor groundwater present in the deeper less fractured/weathered bedrock (and have the suffix "DR").

Within the protected area, 13 monitoring wells were installed. Of the 13 wells located within the protected area, eight were targeted to monitor the shallow water table groundwater occurring in saprolite (and have no suffix to their designation); three were targeted to monitor groundwater occurring in the transition zone of highly fractured bedrock (and have the suffix "R"); and two were targeted to monitor groundwater present in the deeper less fractured/weathered bedrock (and have the suffix "DR").

Locations of the 40 Phase 1 Ground Water Protection Initiative monitoring wells are portrayed on **Figure 4, Ground Water Protection Initiative Monitoring Wells**. A summary of installation details for the 40 Phase 1 wells is provided in **Table 1, Monitoring Well Construction Summary**.

5.3.4 Phase 2 Wells

Duke Energy selected 11 additional well installation locations for Phase 2 work. Six locations were selected on the south side of North Carolina Highway 73 (NC-73) to fill in data gaps for the site characterization groundwater model. In response to tritium levels detected in the newly installed monitor well M-33 on the east side of the McGuire access road near NC-73, Duke Energy selected two additional groundwater monitoring well installation locations to assess the horizontal extent of tritium detected in well M-33. In response to tritium levels detected down gradient of the WC Basins, Duke Energy selected two additional groundwater monitoring well installation locations up gradient of the WC Basins to assess the horizontal and vertical extent of tritium detected. Also part of Phase 2 was the installation of monitoring well M-60 which replaced existing well W-26.

Locations of the 11 Phase 2 groundwater protection monitoring wells are portrayed on **Figure 4, Ground Water Protection Project Monitoring Wells**. A summary of installation details for the 11 Phase 2 wells is provided in **Table 1, Monitoring Well Construction Summary**.

5.3.5 Surface Water Sampling Locations

Duke Energy selected four surface water sampling points to be included in the Ground Water Protection Initiative at McGuire (MS-1, MS-2, MS-3, and MS-4). These surface water sampling points are natural springs located between the Power Block and the Catawba River.

Locations of the four surface water sampling points are portrayed on **Figure 4, Ground Water Protection Initiative Monitoring Wells**.

6.0 REGULATORY APPROVALS AND DOCUMENTATION

S&ME submitted a *Subsurface Investigation Application and Permit* to the North Carolina Department of Environmental and Natural Resources (Department) for the groundwater monitoring wells to be installed at McGuire Nuclear Station. A copy of the application is included in *Appendix D*.

In accordance with permit conditions, S&ME periodically submitted completed and signed Non residential well construction records (GW-1B) forms to Mecklenburg County Health Department and the NCDENR as selected sets of wells were constructed and surveyed. A copy of the five (5) *Non-Residential Well Construction Records – Submittals 1, 2, 3, 4, and 5* are included for reference and record in *Appendix D*.

7.0 FIELD METHODS FOR GROUNDWATER MONITORING WELL INSTALLATIONS

The following text provides a general overview of field methods utilized for groundwater monitoring well installations. Note that deviations from the general procedures discussed were, in instances, dictated by field conditions.

7.1 Preliminary Well Locations

Preliminary well locations were initially spatially estimated on site plans considering a collaboration of information including potential tritium sources, existing groundwater monitoring well locations, the Final Safety Analysis Report (UFSAR), and Piedmont Geologic Province geology. Vertical distribution, i.e., shallow wells, well pairs, and/or well triplets, were subsequently selected. Station and/or state plane coordinates of the initially selected well locations were identified and the locations were marked in the field on the ground using Global Positioning System (GPS) technology.

7.2 Utility Clearance and Final Well Locations

Duke Energy engineering and surveying personnel reviewed the initially selected well locations versus existing site plans with underground utility information and conducted underground utility surveys. Duke Energy surveyors identified an approximate 10 foot by 20 foot work area (room for drill rig access and orientation) in the vicinity of each initially selected well location that was free of underground and overhead interferences. They marked the clear work area on the ground in the field and surveyed its plant coordinates. Duke Energy utilized the surveyed work area to complete the plant modification package for the final well installations to occur within the cleared work areas.

7.3 Plant Access Training, Mobilization, Safety Orientation, and Security Access

Duke Energy and S&ME had coordinated personnel plant access training (PAT) earlier in the nuclear fleet project (2006). Duke Energy and S&ME coordinated mobilization of personnel, equipment, supplies, and materials to McGuire Nuclear Station on March 19, 2007. Safety orientation and security access occurred on March 20, 2007.

7.4 Soil Test Borings, Soil Classification, Soil Testing

S&ME began soil test borings for well installations on March 21, 2007. Soil test borings were generally drilled into the residual soil/saprolite using 4¼-inch inside diameter (nominal 8¼ outside diameter) hollow-stem augers and/or mud-rotary drilling using NW casing fronted with a nominal 4 7/8-inch diameter roller cone bit. Split-spoon sampling (ASTM D1586) was utilized to sample soils at approximate 5-foot intervals. Drilling and soil sampling at single well locations was advanced to a depth of approximately 50 feet below ground surface; exceptions included shallower auger refusal depths or groundwater encountered deeper than 50 feet below ground surface. Drilling and soil sampling at multiple well locations was continued to auger refusal.

Soil samples were photographed and visually classified in the field by the on-site geologist for origin, consistency/relative density, color, and soil type in accordance with the Unified Soil Classification System (ASTM D2487/D2488). A selected distribution of the soil samples (i.e., F, S, M1, M2) from across the site were transferred to S&ME's soil laboratories for grain size distribution (ASTM D422) and specific gravity testing (ASTM D854) to support estimation of soil porosity for groundwater flow rate calculations and modeling.

Soil Boring Logs portraying drilling depth, soil sample depths, blow counts (N-values), and soil classifications are included in **Appendix E**, arranged by well location. Also included are photographs of split-spoon soil samples, arranged by well location, for reference and record. A *Legend to Soil Classifications and Symbols* is included for reference.

7.5 Rock Coring and Classification

For the borings advanced into bedrock, drilling was continued with NQ (nominal 3-inch diameter) rock coring techniques (ASTM D2113) below auger/roller cone refusal. In general, a minimum of 20 feet of rock was cored at each rock well location for visual and manual classification. More rock was cored depending on fracture locations, groundwater level, and if additional depth was required for screen separation.

The on-site geologist photographed and visually classified the rock samples for color, weathering, fracturing, and rock type in accordance with Field Guide for Rock Core Logging and Fracture Analysis (*Midwest Geosciences*). Percent recovery and Rock Quality Designation (RQD) were calculated for each rock core interval.

Soil Boring Logs portraying rock core intervals, percent recovery, RQD, and rock classifications are included in **Appendix E**, arranged by well location. Also included are Rock Core Logs presenting a graphical presentation of the rock coring interval and photographs of the rock core samples, arranged by well location, for reference and record.

7.6 Permeability and Packer Testing

Open-hole falling head (OHFH) permeability tests and packer tests were conducted in the soil boreholes/rock coreholes and rising head permeability tests (slug tests) were performed in the completed monitoring wells. The goal of the in-situ permeability testing was to obtain a representation of the permeability/hydraulic conductivity across and within the various hydrostratigraphic units.

OHFH permeability tests were conducted at selected intervals in the soil/saprolite (M1) and/or weathered rock (M2) hydrostratigraphic units (above auger/roller cone refusal). The OHFH permeability tests in the soil/saprolite comprised drilling to the desired depth, removing drilling tools (as applicable), inserting and seating NW casing to the bottom of the borehole, and advancing a 2 15/16 roller bit 3± feet below the casing. The extended borehole and casing were then filled with water. The rate of water loss/seepage with time was measured using a pressure transducer and data-logger. Open-borehole permeability was computed from the raw field data within Excel computation sheets.

OHFH permeability tests were conducted at selected intervals in the partially weathered/fractured rock (WF) and sound rock (D) hydrogeologic units below auger/roller cone refusal. The OHFH permeability tests below refusal were generally conducted at the following location levels:

- One test within the first core interval (generally 5 feet or less); and,
- One test within the first and second core intervals combined (generally 10-feet or less).

The OHFH permeability tests in the partially weathered/fractured rock and sound rock comprised coring to the desired depth and removing the core barrel. The NW casing was left in place, seated at the top of rock. The corehole and casing were then filled with water. The rate of water loss with time was measured using a pressure transducer and data-logger. Open-borehole permeability was computed from the raw field data within Excel computation sheets.

Packer tests were performed within field selected corehole locations. Generally, two packer tests per boring were performed at intervals and pressures selected in the field by the on-site geologist. Intervals and pressures were selected based on in-situ corehole conditions (weathering, fracturing, etc.) and groundwater presence with the objective of evaluating groundwater movement in rock. Packer testing comprised testing a 5-foot incremental section of corehole, by lowering the packer assembly into the corehole to the predetermined depth. The packers were then pressurized and seated to seal the off the 5-foot interval to be tested.

The packer tests were conducted at three different effective pressures specified in the field by the on-site geologist. The test was started at the lowest pressure and advanced incrementally to the maximum allowable pressure, after which the pressure was reduced by the same decrements to the initial starting pressure. The total water intake in tenths of gallons for specified time intervals at each pressure was measured by a flowmeter. Permeability was computed from the raw field data within Excel computation sheets.

Open-hole falling head and packer test permeability data and calculations are provided in *Appendix E*, arranged by well location.

7.7 Well Construction

Monitoring wells were constructed of 2-inch I.D., NSF Grade PVC (meeting ASTM D-178S and F480) Schedule 40 flush-joint threaded casing and 0.01-inch machine slotted screen. Once the borehole/corehole was drilled, the on-site geologist selected the monitor depth(s) and approved the monitoring well construction based on site-specific hydrogeologic conditions and the following general criteria:

1. For shallow monitoring wells located above refusal, the saprolite groundwater monitoring well screen intervals were generally 15 feet in length and located so that the stabilized water table intersected the screen interval with approximately 10 feet of screen submerged beneath the water table. In areas where relatively shallow groundwater levels (i.e., less than 5 feet below land surface) were encountered, the top of the screen was placed at a depth of approximately 5 feet below land surface to allow adequate seal and to allow sufficient grout and concrete collar to secure the protective casing.

If the bottom of the shallow monitoring well's screened interval was located above the borehole termination depth, the interval below the screen elevation and bottom of boring was sealed using pelletized bentonite.

The annular space between the borehole wall and the well screen was backfilled with clean, well rounded, washed, high grade #1 silica sand. The sand pack was placed to approximately two feet above the slotted screen. At 1- to 2-foot pelletized bentonite seal was placed above the filter pack. The remainder of the annular space was filled with a cement/bentonite grout (neat cement) from the top of the bentonite seal to near ground surface.

2. For wells with their screen interval located below auger/roller cone refusal, the screen interval was selected based on in-situ conditions of the bedrock [e.g., most apparent groundwater bearing fracture(s)] and maintaining a separation interval (e.g., 20± feet) between adjacent shallow and deep monitor intervals. Well screens were generally 5 feet in length unless greater screened intervals were deemed necessary by the on-site geologist to allow more fractures to intersect the screened interval

If the bottom of the monitoring well's screened interval was located above the corehole termination depth, the interval below the screen elevation and bottom of boring was sealed using pelletized bentonite and capped with a minimum 1-foot thick sand layer.

For the majority of the deep wells, no sand pack was placed within the annular space between the corehole and screen. To seal the monitored interval, a rubber k-packer assembly (manufactured by Western Rubber & Mfg., Part KPRR23, 2"X3" coupling) was installed above the screen which uses three rubber ribs to form a seal between the corehole and casing. To further reinforce the seal, an approximately 1- to 2-foot thick granular bentonite layer was placed above the k-packer. The remainder of the annular space was filled with a cement/bentonite grout (neat cement) from the top of the bentonite seal to near ground surface.

For the deep wells that did not use a k-packer, a Type III well was installed with a 6-inch outer casing installed to the top of rock and grouted in place. The annular space between the corehole wall and screen was backfilled with #2 filter sand. Generally a 2-foot pelletized bentonite seal was placed above the filter pack. The remainder of the annular space was filled with a cement/bentonite grout (neat cement) from the top of the bentonite seal to near ground surface.

Based on well location and McGuire requirements, either a 4" x 4" x 5' Enco Wheaton or a 6" x 6" x 5' Drilling Services, Inc. (DSI) steel protective casing with a locking cap, or an 8-inch steel manhole manufactured by IES Drilling Supplies, cast iron with Buna rubber seals was installed over the well's riser pipe. If a protective casing was installed, then it was sealed and immobilized in a concrete collar placed around the protective casing. The 6" x 6" x 5' DSI protective casing was used for Type III monitoring well installations. If a manhole was installed, in accordance with the Department's variance approval, the manhole was seated in a pea gravel collar to allow for drainage

of surface water away from the wall of the casing if it penetrates the manhole seal. Both protective casings and manholes were completed with a 2-foot square concrete pad sloping gently away from the well in all directions and inscribed with the well's identification number.

Each well location was affixed with a permanent well tag which includes at a minimum the following information:

- Well identification number;
- Driller registration number;
- Total depth of well;
- Depth of screen interval;
- Depth to groundwater following well completion; and,
- A warning that the well is not for water supply and that the groundwater may contain hazardous materials.

Well Logs presenting a graphical depiction of well construction details are included in *Appendix E*, arranged by well location.

7.8 Well Development

Following well installation, the monitoring wells were developed in order to remove clay, silt, sand and other fines which may have been introduced into the formation or sand pack during drilling and well installation, and to establish communication of the well with the aquifer. Well development was performed using a portable well pump and was performed as soon as possible after well construction. Development pumping continued until the water being removed was relatively clear and sediment free. At a minimum, 5 well volumes of water were pumped from the wells.

7.9 Slug Testing

Following monitoring well installation and development, slug tests were performed in each new groundwater monitoring well to evaluate the horizontal permeability or hydraulic conductivity of the subsurface materials surrounding the saturated portion of the screened interval. Slug tests were performed by removing a field specified amount of water from the well using a portable well pump. The well was then allowed to recharge as measurements of increasing water level with time were recorded using a pressure transducer and data logger. Rising head permeability was then computed from the field data using the Bouwer and Rice Graphical Method.

Slug test data and computations are included in *Appendix E*, arranged by well location.

7.10 Equipment Cleaning and Investigative Derived Waste Management

Prior to initial drilling activities, down-hole equipment was cleaned with high pressure hot water and allowed to dry. Cleaning was performed similarly between each soil test boring location.

During McGuire drilling activities, soil cuttings outside the Protected Area (PA) were spread in grassy areas on-site, while soil cuttings inside the PA were contained until Duke Energy's Radiation Protection (RP) group performed radiological testing and cleared soil for disposal. Inside the PA, soil was temporarily contained in a steel mud tub during mud rotary drilling, and

in a Bobcat® bucket during auger drilling. Composite soil samples were collected by S&ME every 25 feet in soil borings until refusal was achieved. RP retrieved the samples from S&ME for on-site analysis. Drilling operations were temporarily halted while on-site analysis was performed. Drilling activities continued after receiving verbal confirmation from RP. Ultimately, soil cuttings and drilling fluids collected in the mud tub or Bobcat® bucket were deposited into a roll-off filter container. Filter container soil was disposed of at the on-site McGuire Landfill.

Email documentation of soil transport and disposal are included in *Appendix F*.

Water generated from field activities such as rock core water, development water, and in-situ testing water, was allowed to filter through bails of wheat straw before entering yard drains.

7.11 Groundwater Monitoring Well Location Survey

Duke Energy surveyors surveyed the horizontal and vertical control locations of all newly installed Ground Water Protection Initiative monitoring wells. Additionally, Duke Energy provided survey documentation of the existing monitoring wells on site. Horizontal control is provided relative to North Carolina Grid NAD 83 and Plant Grid; vertical control is provided relative to NGVD 29. Survey documentation is duplicated in *Table 1*.

7.12 Groundwater Sample Collection

Duke Energy conducted Ground Water Protection Initiative sampling events concurrently with drilling activities in April 2007, May 2007, June 2007, August 2007, November 2007, and January 2008. The first and only synoptic (including all groundwater protection wells) sampling event to date was conducted in February 2008. Data obtained from the February 2008 sampling event is used in this report for tabulation and calculation purposes.

Sampling and purging equipment are chosen to ensure the material making up the equipment are compatible with the sample parameters and also comply with state and federal regulatory requirements for sampling. Samples are collected in accordance with Duke Energy Procedure 3175.0; Procedure for Groundwater Monitoring and Sample Collection, February 2006.

Groundwater for Duke Energy's Nuclear Ground Water Protection Initiative is collected by "Low Flow/Low Energy" methodology. Samples are collected using pneumatic bladder pumps and dedicated tubing. However, three wells are sampled using a peristaltic pump rather than a pneumatic pump (M-87, M-89, and M-72). M-87 and M-89 are old Landfarm wells in which historical pumping methods were continued, and M-72 is a ½-inch geoprobe well. For all wells, pumps are placed near the middle of the wetted well screen and flow rates are adjusted to match (where achievable) the groundwater recharge rate of the well. Purged water is passed through a flow-through chamber connected to a calibrated multi-parameter instrument for measurement of stabilization parameters. Sample collection begins when three consecutive readings collected at 5 minute intervals meet stabilization criteria between readings (temperature $\pm 10\%$, specific conductance $\pm 5\%$, pH ± 0.2 SU, ORP ± 10 mV, and DO $\pm 10\%$). Samples are collected into new sample containers supplied for the collection of groundwater samples by the laboratory. Samples are preserved at the time of collection with preservatives appropriate for the parameters to be

analyzed. A chain of custody program allows for the tracking of possession and handling of samples from the time of field collection through laboratory analysis and report preparation.

For reference and record, sample collection measurements for the February 2008 period of record sampling event is summarized in *Table 11, Sample Collection Measurements Summary*.

7.13 Groundwater Sample Analysis

The Duke Energy radiological environmental monitoring laboratory (EnRad Laboratories), located in Huntersville, NC, performs radiological analysis of environmental samples collected around the McGuire, Catawba and Oconee nuclear stations. This laboratory has an internal quality assurance program which monitors each type of instrumentation for reliability and accuracy. EnRad Laboratories uses National Institute of Standards and Technology (NIST) standards to establish and verify counting equipment efficiency calibrations. Control of samples and data are maintained in a secure laboratory environment. EnRad Laboratories participates in an extensive Duke Energy inter-laboratory comparison program. This program involves purchasing NIST traceable cross-check standards from an outside supplier and testing at four Duke Energy laboratories (EnRad, McGuire, Catawba and Oconee). EnRad Laboratories is audited by the Duke Energy Quality Assurance division and by the Nuclear Regulatory Commission to ensure compliance with Regulatory Guide 4.15, Selected Licensee Commitments, Technical Specifications and all Duke Energy required quality assurance procedures. EnRad Laboratories also participates in a split sampling program with the Bureau of Radiological Health of South Carolina's Department of Health and Environmental Control (DHEC) and with the North Carolina Department of Environment and Natural Resources (DENR).

For reference and record, Duke Energy's Radiological Data Reports for the February 2008 record monitoring event are included in *Appendix G*.

8.0 SUMMARY OF FINDINGS

This summary initially considers the findings from the 40 Phase 1 Ground Water Protection Initiative wells and one Phase 1 boring (M-80), and 11 Phase 2 Ground Water Protection Initiative wells, as well as, eight existing wells in the area of the Power Block, Landfarm #1 north of the Wastewater Collection Basin, and southwest of the WC Basins, as appropriate. The findings from this specific project are considered within the context of the historical site information (UFSAR) to develop the Site Conceptual Hydrogeologic Model, discussed in later sections.

8.1 Geologic Summary

8.1.1 Hydrostratigraphic Units

Of the 52 borings, 19 encountered man-placed fill (F) beneath varying surface improvements of asphalt, concrete, stone, or grass. The general fill composition varies from silty clay to clayey silt with occasions of gravel and concrete, possibly placed as working platforms during plant construction. The fill varied in depth from as shallow as 0 feet to as deep as 27 feet below ground surface (bls). The fill is deepest inside the Protected Area of the plant in borings adjacent to plant buildings, consistent with construction excavation and soil replacement. Outside the Protected Area, fill is deepest in borings located north of the WC basins in the area of M-92/92R and M-93/93R.

Alluvial (S), water-deposited, soil was encountered in seven borings. Alluvium is comprised of silty clay and clayey silt with variable occurrences of rock fragments and organic debris. The alluvium varied in depth from as shallow as 0 feet to as deep as 33 feet below ground surface (bls). Some alluvium on site was determined to be from relatively recent river channel deposits; however, most alluvium encountered was older, terrace alluvium, generally found in borings located on remnant stream terraces of the Catawba River.

Soil/saprolite (M1) was encountered in 49 boring locations. The soil/saprolite comprised silty sand and sandy silt with variable clay content. The top of soil/saprolite units was encountered as shallow as 0 feet to as deep as 33 feet bls. The bottom of the soil/saprolite units was observed 8 feet bls to 82.48 feet bls.

Weathered rock (M2) was encountered in 28 borings. The weathered rock was generally sampled as silty sand, and occasionally sandy silt. The top of the weathered rock units was encountered between 10.7 feet bls and 63 feet bls. The bottom of the weathered rock units was measured between 15 feet bls and 80.38 feet bls.

Partially weathered, fractured rock (WF) was encountered in 13 borings. The partially weathered, fractured rock was predominately sampled as medium-grained granite, with occurrences of fine-grained granite, coarse to medium to fine-grained quartz diorite, and medium-grained metagabbro. Mostly, the partially weathered, fractured rock was observed highly weathered and intensely fractured. The top of the weathered rock units was encountered

as shallow as 20.24 feet bls and as deep as 81.3 feet bls. The bottom of the weathered rock units was documented between 25.24 feet bls and 87.6 feet bls.

Sound rock (D) was encountered in 24 borings. The sound rock was predominately sampled as coarse to medium to fine-grained quartz diorite, with occurrences of coarse to medium to fine-grained granite, medium to fine-grained meta-quartz diorite, medium to fine-grained metagabbro, and fine-grained diorite. The sound rock was observed to be slightly to intensely fractured, and generally less weathered than the partially weathered, fractured rock. The top of the sound rock units was encountered between 18.7 feet bls and 87.6 feet bls. The bottom of the sound rock units was documented between 20.24 feet bls and 104.83 feet bls.

Refusal to auger or roller cone advancement was encountered in 33 borings at depths between 15 feet bls and 82.48 feet bls.

The above discussion of geology encountered in the project monitoring wells is relatively brief and general. It is largely derived from *Table 2, Hydrostratigraphic Units Summary*. Detailed geologic findings are presented in the documentation contained in *Appendix E. Figure 5, Hydrogeologic Cross-Section Locations*, portrays the locations of eight selected cross-sections graphically depicted on *Figure 6, Hydrogeologic Cross-Section A-A', B-B'*, *Figure 7 Hydrogeologic Cross-Section C-C' and D-D'*, *Figure 8 Hydrogeologic Cross-Section E-E' and F-F'*, and *Figure 9 Hydrogeologic Cross-Section G-G' and H-H'*.

8.1.2 Soil Porosity and Specific Yield

A total of 34 split-spoon soil samples from the McGuire borings were selected for particle size distribution analysis (ASTM D-422). Fetter (1994) and Bear (1972) diagrams were used to estimate porosity and specific yield, based on the soil sample's grain size distribution (reference). Soil samples were selected from various boring locations across the site, from various depths, and from the four hydrostratigraphic units yielding split-spoon soil samples - fill (F), alluvium (S), soil/saprolite (M1), and weathered rock (M2). Testing locations were distributed with the objective to obtain a representation of soil characteristics throughout the site in these hydrostratigraphic units.

Table 3, Soil Testing Summary (Soil Porosity and Specific Yield), presents a summary of the split-spoon sample locations, depths, hydrostratigraphic unit, percent particle size distribution, and estimated porosity and specific yield. While it is recognized that specific yield and effective porosity are not synonymous, in practice, they may be estimated to be approximately equal in value. That said, the assumed effective porosity of the fill (F) is 3.4 percent. The assumed effective porosity of the alluvium (S) is 3.7 percent. The assumed effective porosity of the soil/saprolite (M1) is 22.3 percent. The assumed effective porosity of the weathered rock (M2) is 27.0 percent.

Numerous references (Fetter, 1994; Freeze and Cherry, 1979; Legrand, 2004; Heath, 1998) document order of magnitude of porosity and/or specific yield consistent with those estimated above.

8.1.3 Partially Weathered/Fractured Rock and Sound Rock Secondary Porosity

Porosity (total and effective) of partially weathered/fractured rock (WF) and sound rock (D) hydrostratigraphic units are more problematic to measure and/or estimate than soil. Crystalline igneous and metamorphic rock given their matrix of interlocking crystals, are considered to have very low primary porosity/specific yield (LeGrand, 2004). Rather, secondary porosity results from weathering and fracturing of the matrix (Freeze and Cherry, 1979). The magnitude of secondary porosity is a function of the degree of weathering and density of fracturing, and is dependent on the interconnectedness of the same (LeGrand, 2004).

LeGrand, 2004, references “secondary porosity of crystalline bedrock...ranges from one to ten percent (Freeze and Cherry, 1979) but according to Daniel and Sharpless (1983), porosity values from one to three percent are more typical”. Taking secondary porosity to approximate effective porosity, we will estimate the secondary (effective) porosity of the WF unit between the above ranges. For the McGuire site, we will assume the secondary (effective) porosity of the partially weathered/fractured rock (WF) unit at approximately 6 percent and the secondary (effective) porosity of the sound rock (D) unit at approximately 2.5 percent.

For record, **Table 4, Secondary Porosity Summary (Partially Weathered/Fractured Rock and Sound Rock)**, summarizes the above assumptions for this Ground Water Protection Initiative.

8.2 Hydrogeologic Findings

8.2.1 Groundwater Occurrence and Flow

Groundwater levels were measured in the project monitoring wells during the February 2008 sampling event. Collectively, groundwater levels were measured approximately 5 to 52 feet bls, corresponding to an elevation range between 648 and 756 feet mean sea level (msl). The average depth to groundwater in the project monitoring wells is approximately 26 feet bls; the average elevation of groundwater across the project monitoring wells is approximately 717 feet msl.

Water level measurements from the project monitoring wells for the period of record are summarized in **Table 5, Groundwater Level Summary**.

Groundwater flows from areas of higher hydraulic head to areas of lower hydraulic head. The hydraulic head in the subsurface is established by plotting and contouring the groundwater elevations measured in the monitoring wells. The resulting contour map provides a two-dimensional depiction of the subsurface hydraulic head and is called a potentiometric surface (Freeze and Cherry, 1979). The slope of the potentiometric surface defines groundwater flow direction, perpendicular to the potentiometric surface contours.

Conventionally, individual potentiometric surface maps would be constructed using data from wells screened in similar hydrostratigraphic units, i.e., for soil/saprolite/weathered rock (M1/M2), partially weathered rock (WF), and sound rock (D), in as much as sufficient data is available for each unit.

As we began development of individual potentiometric surfaces, and identification of data for inclusion to each surface, it became apparent that hydrostratigraphic condition rather than hydrostratigraphic unit was the better criterion for selection of potentiometric surface data inclusion. This is best cataloged and presented in **Table 6, Hydrostratigraphic Units and Groundwater Conditions Summary** (a continuation of **Table 2**). What is observed is that two "R" series wells (M-34R and M-104R), targeted to monitor groundwater in the transition zone of partially weathered rock (WF), are actually screened in shallow sound rock (D), and exhibit water table type conditions, i.e., the shallow groundwater level exists within the well screen interval and/or slightly above the top of the well screen interval.

The above conditions are best considered in context of the Power Block groundwater dewatering system, constructed largely in partially weathered rock (WF) and sound rock (D) hydrostratigraphic units. It appears, and is rationale, that the groundwater dewatering system is functioning properly, and lowering the groundwater table conditions down into the level of the partially weathered rock (WF) and sound rock (D) hydrostratigraphic units.

Continuing the observations from **Table 6**, 30 no-suffix series wells, originally targeted to measure water table groundwater, conceived to be present in soil/saprolite/weathered rock (M1/M2), are actually screened in fill (F), alluvium (S), and/or soil/saprolite/weathered rock (M1/M2), and do in fact exhibit water table type conditions. That is, the groundwater level exists either within the well screen interval and/or slightly above of the top of the well screen interval.

Lastly, 19 "R" or "DR" series wells, targeted to monitor groundwater in the transition zone of partially weathered rock (WF) and/or sound rock (D), actually are screened in partially weathered rock (WF) and/or sound rock (D), and exhibit submerged monitoring well type conditions, i.e., the groundwater level is well above the top of the screened interval.

Therefore, potentiometric surface conditions at McGuire are best represented by treating 32 of the project monitoring wells (reference **Table 6**) as exhibiting water table groundwater conditions and 19 of the project monitoring wells (reference **Table 6**) as exhibiting submerged groundwater conditions.

As an additional check, to truth the function of the foundation dewatering system, we generated a shallow, water table groundwater potentiometric surface map. From **Figure 10, Groundwater Potentiometric Map – Shallow (Water Table) Wells Without Foundation Dewatering Data**, it appears the foundation dewatering system is creating very little variation within the groundwater contours; which is consistent with groundwater flow without a drain system. However, generation of a subsequent shallow groundwater potentiometric map using data from the perimeter french-drain elevations of the Power Block foundation dewatering systems (712, 717, and 726 msl), (**Figure 11, Groundwater Potentiometric Map – Shallow (Water Table) Wells With Foundation Dewatering Data**), indicates the foundation dewatering system is creating an increased horizontal gradient of the shallow groundwater table to the north, east and west of the Power Block. We consider **Figure 11** most representative of shallow water table groundwater flow conditions at McGuire, based on data available from the Ground Water Protection Initiative activities.

Based on the shallow, water table groundwater potentiometric surface, groundwater in the vicinity of the Power Block is being influenced by the foundation dewatering system. Groundwater in the vicinity of the Power Block is observed to flow from north to south driven by Lake Norman and the Discharge Canal in the north toward the Wastewater Collection Basin in the south to ultimately discharge to the Catawba River. Groundwater west of the Power Block is observed to flow from northeast to southwest driven from Lake Norman toward the Catawba River. Groundwater east of the Power Block is observed to flow northeast to south flowing toward the Standby Nuclear Service Water Pond, then to the Wastewater Collection Basin, to ultimately discharge into the Catawba River. As shown by the shallow groundwater potentiometric surface, the man made surface water features (Lake Norman, the Standby Nuclear Service Water Pond, and the Wastewater Collection Basin) are significant driving factors of groundwater flow on site as indicated by the increased horizontal gradients down gradient of these features.

We followed a similar approach for the deeper, submerged groundwater well conditions, with the exception of omitting surface water bodies which are better represented linked to shallower, water table groundwater conditions than deeper, submerged groundwater conditions. **Figure 12, Groundwater Potentiometric Map – Deeper Wells Without Foundation Dewatering Data** and **Figure 13, Groundwater Potentiometric Map – Deeper Wells With Foundation Dewatering Data** represent the two deeper groundwater scenarios. We consider **Figure 13** most representative of deeper, submerged groundwater flow conditions at McGuire, based on data available from the Ground Water Protection Initiative activities.

Based on the deeper, submerged groundwater potentiometric surface, deeper groundwater in the vicinity of the Power Block is being influenced by the foundation dewatering system. Comparison of the shallower, water table groundwater potentiometric surface to the deeper, submerged groundwater potentiometric surface reveals very similar flow conditions.

8.2.2 Groundwater Gradients

8.2.2.1 Horizontal Gradients

The horizontal gradient, or degree of slope, of the groundwater table has a directly proportional effect on the rate of groundwater flow (considered in Section 8.2.4, Groundwater Flow Rates). Gradient between specific points of interest will vary. For the purpose of this discussion, we will consider general gradient observations within selected regions of the site for an overall vantage.

Horizontal gradient measured west/southwest from the WC Ponds to the Catawba River is on the order of 0.07 feet per foot (ft/ft). Horizontal gradient southwest of the Power Block towards the WC Ponds and the Waste Water Collection Basin (WWCB) is on the order of 0.02 ft/ft. Southeast of the Power Block towards the Standby Nuclear Storage Water (SNSW) Pond, a gradient of on the order of 0.02 ft/ft is observed. Gradient measured south of Lake Norman and the Discharge Canal towards the Power Block is on the order of 0.07 ft/ft. Gradient south of the Discharge Canal towards the SNSW Pond is on the order of 0.02 ft/ft. Gradient south of the SNSW Pond is on the order of 0.007 ft/ft. Lastly, gradient measured southwest from the SNSW Pond is on the order of 0.05 ft/ft.

8.2.2.2 Vertical Gradients

The vertical gradients, or tendency for groundwater to migrate vertically upward or downward, can be estimated at the locations of the nine well pair installations. (Ideally, vertical gradients are best evaluated using point piezometers. But vertical gradients can be approximated from screened monitoring wells.) Using the approach established in Freeze and Cherry (1979), the vertical gradient between the wells in the pair can be estimated by the following equation:

$$G_v = [G_{Welev(MW-S)} - G_{Welev(MW-D)}] / [SSI_{(MW-S)} - SSI_{(MW-D)}]$$

Where:

- G_v = Vertical Gradient
- $G_{Welev(MW-S)}$ = Groundwater elevation in the shallower monitoring well
- $G_{Welev(MW-D)}$ = Groundwater elevation in the deeper monitoring well
- $SSI_{(MW-S)}$ = Mid-point elevation of the saturated screen interval in the shallower monitoring well
- $SSI_{(MW-D)}$ = Mid-point elevation of the saturated screen interval in the deeper monitoring well

Computed vertical gradients are summarized in **Table 7, Vertical Gradient Summary** and shown graphically on **Figure 17, Vertical Gradients**. *Vertical Gradient Calculation Sheets* are included in **Appendix H**.

Using this method, downward gradients exist at well pairs M-22/22R, M-48R/48DR, M-66/66R, M-70/70DR, M-91/91R, M-92/92R, M-95/95R, M-101/100R, M-103/103R, and M-104R/104DR. Upward gradients exits at well pairs M-20/20R, M-30/30R, M-34R/34DR, M-84/84R, M-93/93R, M-96/96R, and M-98/98R.

8.2.3 Hydraulic Conductivities

Hydraulic conductivity was measured by a combination of open-hole falling head (OHFH) tests, packer tests, and slug tests. Test results from the groundwater protection monitoring wells are summarized in **Table 8, Permeability Testing Summary (Open-Hole Falling Head, Packer, and Slug Testing)** and **Chart 8A, Mean Hydraulic Conductivity Chart**.

In addition to the data in **Table 8**, hydraulic conductivity test data was available from the UFSAR for hydrostratigraphic units partially weathered/fractured rock (WF) and sound rock (D). These additional UFSAR data were used in statistical computations of the mean hydraulic conductivities of each hydrostratigraphic units shown in **Table 8**.

In summary the following mean hydraulic conductivities are computed for the hydrostratigraphic units of this Ground Water Protection Initiative:

TABLE T-7 MEAN HYDRAULIC CONDUCTIVITY SUMMARY						
Hydrostratigraphic Unit	F	S	M1	M2	WF	D
	Hydraulic Conductivity (cm/sec)					
MEAN HYDRAULIC CONDUCTIVITY	2.26 E-04	2.74 E-04	1.54 E-04	3.88 E-05	1.11 E-04	4.08 E-05

Note: Above computations include data from Ground Water Protection Initiative wells, UFSAR wells, and Landfill #2 wells.

8.2.4 Groundwater Flow Rates

The groundwater flow velocity (V_x) can be estimated using the hydraulic conductivity measurements (K_{gm}), the estimated effective porosity of the medium (n_e), and the measured horizontal gradient (dh/dl) using the following variation of Darcy's Law (Fetter, 1994):

$$V_x = Q/A * n_e = K_{gm}/n_e * dh/dl$$

A very simplified evaluation of potential site-wide groundwater velocities is summarized in **Table 9, Groundwater Velocity Estimates Summary**. These computations consider the following:

1. the mean specific yield (~effective porosity) of the soil/saprolite (M1) and weathered rock (M2) hydrostratigraphic units discussed in Section 8.1.2 Soil Porosity and Specific Yield;
2. the assumed secondary porosity of the partially weathered/fractured rock (WF) and sound rock (D) hydrostratigraphic units discussed in Section 8.1.3 Partially Weathered/Fractured Rock and Sound Rock Secondary Porosity;
3. the horizontal groundwater gradients for the various selected regions of the site discussed in Section 8.2.2.1, Horizontal Gradients; and,
4. the mean hydraulic conductivities of the soil/saprolite (M1), weathered rock (M2), partially weathered/fractured rock (WF), and sound rock (D) hydrostratigraphic units discussed in Section 8.2.3 Hydraulic Conductivities.

We note that groundwater velocity computations are not considered for the fill (F) and alluvium (S) hydrostratigraphic units considering their relatively limited occurrence compared to the more predominant M1, M2, WF, and D hydrostratigraphic units.

In this very generalized summary, the mean groundwater velocity in the soil/saprolite and weathered rock hydrostratigraphic units is on the order of 20 feet per year. In the partially weathered/fractured rock unit, it is on the order of 43 feet per year. In the sound rock, it is on the order of 47 feet per year.

We raise caution to the above groundwater flow rate estimates on two fronts. The first is to recognize that the effective porosity for the soil/saprolite (M1) and weathered rock (M2) units can be estimated with more confidence than the secondary porosity for the partially weathered/fractured rock (WF) and sound rock (D) units. Second, recognize that this generalized evaluation of groundwater velocity was to provide an overall "feel" for potential groundwater flow rates at McGuire. These values should be used cautiously; more rigorous evaluation must be conducted for specific groundwater flow scenarios.

8.3 Groundwater Quality

Groundwater quality is discussed relative to the groundwater conditions established in Section 8.2.1, Groundwater Occurrence and Flow. That is, we consider groundwater quality monitored in the 32 project monitoring wells exhibiting shallow type groundwater conditions and

groundwater quality monitored in the 19 project wells exhibiting deeper type groundwater conditions.

Tritium concentrations in groundwater are summarized in *Table 10, Tritium in Groundwater Summary*.

8.3.1 Shallow Groundwater Condition Wells

Fourteen shallow wells (M-21, M-22, M-23, M-30, M-31, M-32, M-34R, M-35, M-55, M-60, M-62, M-94, M-96, and M-98) exhibited no detection of tritium during the February 2008 sampling event. Tritium concentrations in the remaining 24 shallow groundwater condition wells ranged from a minimum detection of 165 picocuries per liter (pCi/l) in well M-97 to a maximum detection of 10,700 pCi/l in well M-104R. No shallow condition groundwater samples exhibited tritium concentrations in excess of 20,000 pCi/l, the groundwater standard, during the February 2008 sampling event.

8.3.2 Deeper Groundwater Conditions Wells

Seven deeper wells (M-34DR, M-66R, M-70DR, M-92R, M-95R, M-96R and M-98R) exhibited no detection of tritium during the February 2008 sampling event. Tritium concentrations in the remaining 12 deeper groundwater condition wells ranged from a minimum detection of 208 picocuries per liter (pCi/l) in well M-30R and M-91R to a maximum detection of 6,930 pCi/l in well M-84R. No deeper condition groundwater samples exhibited tritium concentrations in excess of the 20,000 pCi/l groundwater standard during the February 2008 sampling event.

8.4 Site Conceptual Hydrogeologic Model

Findings from the initial site investigation during construction in the 1970's as documented in the PSAR, UFSAR, and this Ground Water Protection Initiative confirm the Site Conceptual Hydrogeologic Model of the McGuire Nuclear Station site to conform, expectedly, to the regional models established by LeGrand, et al. for the Piedmont Physiographic Province (Section 4.0, Station Hydrogeologic Setting). Noteworthy, however, are observed influences to the McGuire Site Conceptual Hydrogeologic Model noted below from plant construction.

The McGuire hydrogeology is consistent with LeGrand's (Section 4.2, Regional Hydrogeology), in that it comprises the two-medium system of regolith (residual soil, saprolite, weathered bedrock) underlain by fractured, nonporous bedrock. Most conventionally, groundwater occurs within the pore space of the residuum/saprolite and within fractures of the underlying bedrock. Groundwater exists in combination of pore space and/or fractures within the transition zone (partially weathered/fractured rock) occurring between the two.

The influence of the Power Block groundwater dewatering system construction at McGuire is observed in that it has lowered the groundwater table near the Power Block such that it exists deeper in the two-medium system than it would exist otherwise. That is, the water table near the Power Block is lowered by the groundwater dewatering system to occur near the level of the system in the underlying deeper fractured bedrock medium as opposed to the overlying shallower regolith. This lowering of the groundwater table produces steeper hydraulic gradients to the north, east and west of the Power Block. Further away from the Power Block,

groundwater occurrence is more conventional, i.e., the shallow water table exists in the regolith and deeper groundwater exists in the fractured bedrock.

The McGuire site drainage basin is consistent with LeGrand's surface drainage basin model (Slope-Aquifer System, Section 4.2), albeit also influenced by plant construction. Within the McGuire Nuclear Station site drainage basin, remnants of conventional Piedmont groundwater movement are observed from the direction of basin divides (south of Hwy 73 and east of the Station) to the Catawba River.

Groundwater levels at McGuire site are measured 5 to 52 feet below land surface (bls). The average depth to groundwater is approximately 26 feet bls; the average elevation of groundwater across the project monitoring wells is 717 feet mean sea level (msl), relative to plant subgrade of elevation $760 \pm$ feet msl. In very simplified terms, the average groundwater velocity in the soil/saprolite hydrostratigraphic unit is on the order of 20 feet per year. The average groundwater velocity in the weathered rock hydrostratigraphic unit is on the order of 4 feet per year. Groundwater velocity is estimated on the order of 43 feet per year in the partially weathered/fractured rock unit, and is estimated on the order of 47 feet per year in the sound rock unit. All of these will vary, the latter two in particular based on bedrock fracture characteristics.

9.0 CONCLUSIONS

Reconsidering Section 5.3, Ground Water Protection Initiative Monitoring Well Location Selections, the Ground Water Protection Initiative goals were the following:

- An exploration scheme that would provide hydrogeologic characterization of the operating plant site, including evaluation of the capture zone(s) of the subsurface drain system(s); and,
- A robust monitoring well network capable of providing early detection of tritium releases (near-field wells) and verifying no off-site migration (far-field wells).

In short, the Ground Water Protection Initiative well installations, testing, and Site Characterization Report accomplish the project goals. Hydrogeologic characterization, including capture zone(s) of the Power Block groundwater dewatering system, is well documented. Further, a network array of near-field and far-field wells is established at the site. Selected subset(s) of the near-field wells will provide for ongoing sentinel monitoring for radioactive materials in groundwater. Otherwise, all wells are available for incident and/or migration observations.

9.1 Data Gaps and Unknowns/Uncertainties

Based on the limited data in the southeast portion of the site (east of the SNSWP) and south of NC Hwy 73, it appears that groundwater is flowing in contradiction to LaGrands regional models away from the SNSWP and the WCB toward NC HWY 73. Based on site topography, south of NC Hwy 73 and southeast of the SNSWP is a topographic ridge which should create a hydrologic divide in the groundwater flow on site. Based on LaGrand's model, groundwater in the south and southeast corner should be flowing toward and discharging into the SNSWP and WCB from the ridgeline, which we believe to be valid. However, additional wells in the south and southeast would be needed to further investigate groundwater flow in these areas.

Even though there are data gaps in the groundwater flow patterns in the south and southeast portions of the site, there are sufficient groundwater monitoring wells to provide detection monitoring of any unplanned releases.

9.2 Groundwater Monitoring

The results presented here in this Site Characterization Report establish the foundation for the Radiological Ground Water Protection Initiative at the McGuire Nuclear Station. As augmented by these results, the enhanced groundwater monitoring under this Program, described in Nuclear System Directive (NSD) 517, will provide reasonable assurance that any unplanned releases of radioactive material to groundwater are discovered and properly managed.

10.0 QUALIFICATIONS

The hydrogeologic assessment activities were conducted, and this report was prepared, in accordance with generally accepted practices for projects of this type and applicable standards of our profession at the time this report was prepared. The analysis and findings submitted in this report are based on information available to S&ME at the time of this report and upon data obtained from subsurface exploration. The nature and extent of variations between boring and sampling locations may not be evident. Analysis and findings of this report are based on interpolation between data points and may not be representative of all subsurface conditions. Regardless of the thoroughness of a hydrogeologic assessment, there is always the possibility that conditions between borings are different from those at specific boring locations due to the variability of subsurface conditions.

It is our understanding that this report is for the sole purpose of providing a hydrogeologic evaluation of the site. This report has been prepared for the use of Duke Energy for specific application to this project. The party or parties involved in this specific evaluation, as authorized by the addressee, may rely upon this report. The use of this report by any third party or parties will be such party's sole risk, and S&ME disclaims liability for any such use or reliance by third parties. No other warranties are implied or expressed.

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TABLE 1
MONITORING WELL CONSTRUCTION SUMMARY
Duke Energy McGuire Nuclear Station
SAFE Project No: 1264-06-724



WELL ID	N.C. COORDINATES		PLANT COORDINATES		SURVEY ELEVATIONS		Water *	SURFACE COVER	PAD TYPE	PROTECTIVE CASING	CASING TYPE	CASING INTERVAL (ft-blk)	SCREEN TYPE	SCREEN INTERVAL (ft-blk)	GROUT TYPE	GROUT INTERVAL (ft-blk)	SEAL TYPE	SEAL INTERVAL (ft-blk)	FILTER PACK	FILTER PACK INTERVAL (ft-blk)	ABANDONMENT MATERIAL	ABANDONMENT INTERVAL (ft-blk)	TOTAL BOREHOLE DEPTH (ft)							
M-20	615970.12	1412551.31	411-73.85	25-22.50	705.99	709.03	38.00	Above Grade	2'x2' Concrete Pad	4"x4" Steel Casing	2" Sch. 40 PVC	-3.04	33.00	0.010 Slotted Sch. 40 PVC	33.00	48.00	Neat Cement	0	29	Bentonite	29.00	31.00	#1 Silica Sand	31.00	48.00	---	---	---	48.00	
M-20R	615968.41	1412559.10	411-73.49	24-21.98	705.17	708.17	35.68	Above Grade	2'x2' Concrete Pad	4"x4" Steel Casing	2" Sch. 40 PVC	-3.00	32.82	0.010 Slotted Sch. 40 PVC	32.82	67.92	Neat Cement	0.00	59.82	K-Packer/Bentonite	59.82	62.22	#2 Silica Sand	62.22	70.00	Bentonite	70.00	75.00	75.00	
M-21	615850.64	1420058.79	59-62.80	27-01.34	764.71	767.65	34.42	Above Grade	2'x2' Concrete Pad	4"x4" Steel Casing	2" Sch. 40 PVC	-2.94	30.00	0.010 Slotted Sch. 40 PVC	30.00	50.00	Neat Cement	0.00	24.00	Bentonite	24.00	27.00	#1 Silica Sand	27.00	50.20	Cave-in	50.20	50.50	50.50	
M-22	615962.21	1420926.76	67-68.88	30-86.16	786.71	789.33	49.86	Above Grade	2'x2' Concrete Pad	4"x4" Steel Casing	2" Sch. 40 PVC	-2.62	45.00	0.010 Slotted Sch. 40 PVC	45.00	60.00	Neat Cement	0.00	40.00	Bentonite	40.00	42.80	#1 Silica Sand	42.80	60.00	---	---	---	45.60	
M-22R	615964.67	1420932.85	67-62.43	30-89.46	786.82	789.42	50.54	Above Grade	2'x2' Concrete Pad	4"x4" Steel Casing	2" Sch. 40 PVC	-2.60	87.00	0.010 Slotted Sch. 40 PVC	87.00	92.00	Neat Cement	0.00	37.80	K-Packer/Bentonite	37.80	86.30	---	---	---	Bentonite	92.00	95.00	95.60	
M-23	616105.14	1422121.61	79-11.13	35-38.26	775.52	778.23	38.13	Above Grade	2'x2' Concrete Pad	4"x4" Steel Casing	2" Sch. 40 PVC	-2.71	32.00	0.010 Slotted Sch. 40 PVC	32.00	47.00	Neat Cement	0.00	26.80	Bentonite	26.80	29.40	#1 Silica Sand	29.40	48.50	Cave-in	48.50	50.90	50.90	
M-30	616149.04	1418875.19	47-42.77	28-30.04	733.46	736.50	44.76	Above Grade	2'x2' Concrete Pad	4"x4" Steel Casing	2" Sch. 40 PVC	-3.04	35.70	0.010 Slotted Sch. 40 PVC	35.70	50.70	Neat Cement	0.00	30.70	Bentonite	30.70	33.00	#1 Silica Sand	33.00	50.70	---	---	---	50.70	
M-30R	616151.07	1418878.67	47-45.74	28-32.76	733.80	736.90	45.00	Above Grade	2'x2' Concrete Pad	4"x4" Steel Casing	2" Sch. 40 PVC	-3.19	73.50	0.010 Slotted Sch. 40 PVC	73.50	78.50	Neat Cement	0.00	70.00	K-Packer/Bentonite	70.00	72.30	#2 Silica Sand	78.50	80.30	Bentonite	80.30	89.55	89.55	
M-31	617148.88	1421784.42	70-71.28	44-28.31	771.07	773.54	27.94	Above Grade	2'x2' Concrete Pad	4"x4" Steel Casing	2" Sch. 40 PVC	-2.47	25.00	0.010 Slotted Sch. 40 PVC	25.00	40.00	Neat Cement	0.00	20.00	Bentonite	20.00	22.60	#1 Silica Sand	22.60	40.00	Cave-in	40.00	50.80	50.80	
M-32	616192.73	1420992.67	68-02.05	33-25.01	790.13	793.11	52.29	Above Grade	2'x2' Concrete Pad	4"x4" Steel Casing	2" Sch. 40 PVC	-2.98	40.00	0.010 Slotted Sch. 40 PVC	40.00	55.00	Neat Cement	0.00	35.00	Bentonite	35.00	37.00	#1 Silica Sand	37.00	56.00	Cave-in	56.00	60.40	60.40	
M-33	616439.26	1422077.53	78-09.22	37-07.58	771.78	774.83	32.73	Above Grade	2'x2' Concrete Pad	4"x4" Steel Casing	2" Sch. 40 PVC	-3.05	23.00	0.010 Slotted Sch. 40 PVC	23.00	38.00	Neat Cement	0.00	19.00	Bentonite	19.00	21.00	#1 Silica Sand	21.00	38.00	Cave-in	38.00	49.80	49.80	
M-34R	617862.67	1421854.05	72-86.86	51-40.40	800.74	803.87	45.32	Above Grade	2'x2' Concrete Pad	4"x4" Steel Casing	2" Sch. 40 PVC	-2.93	56.80	0.010 Slotted Sch. 40 PVC	56.80	61.90	Neat Cement	0.00	40.00	K-Packer/Bentonite	40.00	56.10	#2 Silica Sand	61.90	63.00	Bentonite	63.00	65.00	65.00	
M-34DR	617862.71	1421859.05	72-81.74	51-41.51	800.94	804.14	45.42	Above Grade	2'x2' Concrete Pad	4"x4" Steel Casing	2" Sch. 40 PVC	-3.20	79.80	0.010 Slotted Sch. 40 PVC	79.80	89.90	Neat Cement	0.00	38.00	K-Packer/Bentonite	38.00	79.30	---	---	---	Cave-in	89.90	90.10	90.10	
M-35	616657.36	1422258.59	79-39.51	40-49.32	767.34	769.81	23.98	Above Grade	2'x2' Concrete Pad	4"x4" Steel Casing	2" Sch. 40 PVC	-2.47	15.80	0.010 Slotted Sch. 40 PVC	15.80	30.80	Neat Cement	0.00	9.00	Bentonite	9.00	13.00	#1 Silica Sand	13.00	30.80	Cave-in	30.80	31.10	85.10	
M-48	618348.88	1419795.83	51-72.71	51-73.80	760.39	760.17	18.67	At Grade	2'x2' Concrete Pad	8" Steel Manhole	2" Sch. 40 PVC	0.22	9.80	0.010 Slotted Sch. 40 PVC	9.80	16.80	Neat Cement	1.00	4.50	Bentonite	4.50	6.50	#1 Silica Sand	6.50	19.80	Cave-in	19.80	20.20	20.20	
M-48R	618344.05	1419797.42	51-74.87	51-71.37	760.33	760.20	21.26	At Grade	2'x2' Concrete Pad	8" Steel Manhole	2" Sch. 40 PVC	0.13	28.40	0.010 Slotted Sch. 40 PVC	29.40	34.40	Neat Cement	1.00	25.00	K-Packer/Bentonite	25.00	28.80	---	---	---	Cave-in	34.40	35.20	35.20	
M-48DR	618345.03	1419792.55	51-69.90	51-71.29	760.51	760.22	44.44	At Grade	2'x2' Concrete Pad	8" Steel Manhole	2" Sch. 40 PVC	0.29	79.00	0.010 Slotted Sch. 40 PVC	79.00	89.00	Neat Cement	1.00	75.00	K-Packer/Bentonite	75.00	78.20	---	---	---	Cave-in	89.00	90.30	90.30	
M-53	618524.13	1419732.89	50-73.17	53-33.47	760.57	760.32	15.62	At Grade	2'x2' Concrete Pad	8" Steel Manhole	2" Sch. 40 PVC	0.25	9.00	0.010 Slotted Sch. 40 PVC	9.00	23.00	Neat Cement	1.00	4.00	Bentonite	4.00	6.00	#1 Silica Sand	6.00	23.00	Cave-in	23.00	50.00	50.00	
M-55	618398.13	1420118.05	54-76.55	52-92.69	760.09	759.73	11.30	At Grade	2'x2' Concrete Pad	8" Steel Manhole	2" Sch. 40 PVC	0.36	5.00	0.010 Slotted Sch. 40 PVC	5.00	20.00	Neat Cement	1.00	2.00	Bentonite	2.00	4.00	#1 Silica Sand	4.00	21.00	Bentonite	21.00	50.00	50.00	
M-59	618145.20	1419859.92	62-78.40	49-90.46	760.03	759.68	26.15	At Grade	2'x2' Concrete Pad	8" Steel Manhole	2" Sch. 40 PVC	0.35	21.00	0.010 Slotted Sch. 40 PVC	21.00	36.00	Neat Cement	1.00	17.00	Bentonite	17.00	19.00	#1 Silica Sand	19.00	37.00	Bentonite	37.00	85.10	85.10	
M-60	618547.77	1420594.29	61-58.81	55-05.07	779.50	781.90	29.35	Above Grade	2'x2' Concrete Pad	4"x4" Steel Casing	2" Sch. 40 PVC	-2.40	34.00	0.010 Slotted Sch. 40 PVC	24.00	39.00	Neat Cement	0.00	18.00	Bentonite	18.00	21.80	#1 Silica Sand	21.80	39.00	Cave-in	39.00	39.80	39.80	
M-62	618190.58	1418879.14	43-10.56	48-25.30	760.37	760.23	27.23	At Grade	2'x2' Concrete Pad	8" Steel Manhole	2" Sch. 40 PVC	0.14	21.00	0.010 Slotted Sch. 40 PVC	21.00	36.00	Neat Cement	1.00	17.00	Bentonite	17.00	19.00	#1 Silica Sand	19.00	36.00	Cave-in	36.00	50.80	50.80	
M-64	618287.06	1419037.99	44-45.14	49-43.49	760.84	760.30	17.12	At Grade	2'x2' Concrete Pad	8" Steel Manhole	2" Sch. 40 PVC	0.54	13.00	0.010 Slotted Sch. 40 PVC	13.00	28.00	Neat Cement	1.00	2.00	Bentonite	2.00	10.00	#1 Silica Sand	13.00	28.00	Bentonite	29.00	50.10	50.10	
M-66	618279.85	1419154.88	45-60.72	49-71.17	760.43	760.09	17.86	At Grade	2'x2' Concrete Pad	8" Steel Manhole	2" Sch. 40 PVC	0.34	12.00	0.010 Slotted Sch. 40 PVC	12.00	27.00	Neat Cement	1.00	6.80	Bentonite	6.80	9.70	#1 Silica Sand	9.70	27.00	---	---	---	27.00	
M-66R	618275.33	1419153.22	45-60.22	49-68.54	760.47	760.12	22.59	At Grade	2'x2' Concrete Pad	8" Steel Manhole	2" Sch. 40 PVC	0.35	70.00	0.010 Slotted Sch. 40 PVC	70.00	75.80	Neat Cement	1.00	65.00	Bentonite	65.00	70.20	#2 Silica Sand	75.80	77.00	Bentonite	77.00	89.54	89.54	
M-67	618398.01	1419339.14	47-15.84	51-26.20	760.44	760.18	13.40	At Grade	2'x2' Concrete Pad	8" Steel Manhole	2" Sch. 40 PVC	0.28	6.00	0.010 Slotted Sch. 40 PVC	6.00	21.00	Neat Cement	1.00	1.50	Bentonite	1.50	4.00	#1 Silica Sand	4.00	21.00	---	---	---	21.00	
M-70R	618397.11	1419343.85	47-20.44	51-26.33	760.44	760.22	14.97	At Grade	2'x2' Concrete Pad	8" Steel Manhole	2" Sch. 40 PVC	0.22	55.45	0.010 Slotted Sch. 40 PVC	55.45	85.45	Neat Cement	1.00	13.00	Bentonite	13.00	53.50	#1 Silica Sand	53.50	65.45	---	---	---	65.45	
M-70DR	618395.66	1419348.36	47-25.11	51-26.06	760.42	760.19	15.12	At Grade	2'x2' Concrete Pad	8" Steel Manhole	2" Sch. 40 PVC	0.23	72.40	0.010 Slotted Sch. 40 PVC	72.40	77.40	Neat Cement	1.00	7.00	K-Packer/Bentonite	7.00	71.80	#2 Silica Sand	77.40	78.00	Cave-in	78.00	94.40	94.40	
M-80	---	---	---	---	737.20	---	---	Dry	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	Neat Cement	0.00	50.62	50.62
M-82	617107.09	1417702.79	33-02.79	35-15.55	675.23	678.38	26.30	Above Grade	2'x2' Concrete Pad	4"x4" Steel Casing	2" Sch. 40 PVC	-3.13	24.60	0.010 Slotted Sch. 40 PVC	24.60	34.60	Neat Cement	0.00	19.80	Bentonite	19.80	22.05	#1 Silica Sand	22.05	34.60	---	---	---	34.60	
M-84	617302.51	1417515.36	31-67.95	36-66.43	656.95	659.80	8.58	Above Grade	2'x2' Concrete Pad	4"x4" Steel Casing	2" Sch. 40 PVC	-2.85	5.00	0.010 Slotted Sch. 40 PVC	5.00	15.00	Neat Cement	0.00	3.00	Bentonite	3.00	4.00	#1 Silica Sand	4.00	15.00	---	---	---	15.00	
M-84R	617307.56	1417517.56	31-69.02	36-71.83	657.75	660.78	9.34	Above Grade	2'x2' Concrete Pad	4"x4" Steel Casing	4" & 2" Sch. 40 PVC	0.0 to 15.5	-3.03 to 20	0.010 Slotted Sch. 40 PVC	20.00	25.00	Neat Cement	0.00	15.00	Bentonite	15.00	18.70	#2 Silica Sand	18.70	28.50	---	---	---	28.50	
M-85	617625.79	1417456.58	30-41.47	38-69.69	659.50	662.72	6.16	Above Grade	2'x2' Concrete Pad	4"x4" Steel Casing	2" Sch. 40 PVC	-3.22	4.00	0.010 Slotted Sch. 40 PVC	4.00	14.00	Neat Cement	0.00	3.00	Bentonite	3.00	3.50	#1 Silica Sand	3.50	14.00	Bentonite	14.00	20.65	20.65	
M-91	617785.40	1418396.33	39-29.71	43-06.81	745.72	748.77	27.53	Above Grade	2'x2' Concrete Pad	4"x4" Steel Casing	2" Sch. 40 PVC	-3.05	24.00	0.010 Slotted Sch. 40 PVC	24.00	39.00	Neat Cement	0.00	20.00	Bentonite	20.00	22.00	#1 Silica Sand	22.00	39.00	---	---	---	39.00	
M-91R	617784.86	1418390.67	39-24.3	43-05.07	745.82	748.79	28.90	Above Grade	2'x2' Concrete Pad	4"x4" Steel Casing	2" Sch. 40 PVC	-2.87	53.00	0.010 Slotted Sch. 40 PVC	53.00	63.00	Neat Cement	0.00	22.40	K-Packer/Bentonite	22.40	52.70	#2 Silica Sand	63.00	64.00	Bentonite	64.00	69.80	69.80	
M-92	618111.93	1418264.92	37-27.32	46-17.27	728.41	731.35	4.76	Above Grade	2'x2' Concrete Pad	4"x4" Steel Casing	2" Sch. 40 PVC	-2.94	19.50	0.010 Slotted Sch. 40 PVC	19.50	34.50	Neat Cement	0.00	10.00	Bentonite	10.00	12.00	#1 Silica Sand	12.00	34.50	Cave-in	34.50	35.00	35.00	
M-92R	618110.36	1418259.68	37-22.73	46-14.66	728.31	731.37	6.23	Above Grade	2'x2' Concrete Pad	4"x4" Steel Casing	4" & 2" Sch. 40 PVC	0.0 to 58.4	-3.06 to 10	0.010 Slotted Sch. 40 PVC	70.00	75.00	Neat Cement	0.00	59.00	Bentonite	59.00	67.50	#2 Silica Sand	67.50	75.50	Bentonite	75.50	79.90	79.90	
M-93	617956.46	1418507.98	39-97.10	45-17.12	756.60	759.62	33.78	Above Grade	2'x2' Concrete Pad	4"x4" Steel Casing	2" Sch. 40 PVC	-2.62	39.90	0.010 Slotted Sch. 40 PVC	29.00	43.00	Neat Cement	0.00	21.75	Bentonite	21.75	25.20	#1 Silica Sand	25.20	43.00	---	---	---	43.00	
M-93R	617958.06	1418502.54	39-92.32	45-17.71	756.55																									

TABLE 2

HYDROSTRATIGRAPHIC UNITS SUMMARY

Duke Energy - McGuire Nuclear Station

S&ME Project No. 1264-06-724



WELL ID	FILL (F)		ALLUVIUM (S)		SOIL/SAPROLITE (M1)		WEATHERED ROCK (M2)		SOIL BORING TERMINATION	AUGER/ROLLER CONE REFUSAL	PARTIALLY WEATHERED / FRACTURED ROCK (WF)		SOUND ROCK (D)		CORING TERMINATION
	Top (ft-bls)	Bottom (ft-bls)	Top (ft-bls)	Bottom (ft-bls)	Top (ft-bls)	Bottom (ft-bls)	Top (ft-bls)	Bottom (ft-bls)	(ft-bls)	(ft-bls)	Top (ft-bls)	Bottom (ft-bls)	Top (ft-bls)	Bottom (ft-bls)	(ft-bls)
M-20					0	48			48						
M-20R					0	49.1	49.1	52.3		52.3			52.3	75	75
M-21					0	50.5			50.5						
M-22					0	59.3	59.3	60	60						
M-22R					0	59.3	59.3	72		72			72	95.6	95.6
M-23					0	50.9			50.9						
M-30					0	47.85	47.85	50.7	50.7						
M-30R					0	47.85	47.85	69.7		69.7	69.7	76.15	76.15	89.55	89.55
M-31					0	50.8			50.8						
M-32					0	56	56	60.4		60.4					
M-33					0	48.3	48.3	49.8	49.8						
M-34R					0	39.3	39.3	42.4		42.4	42.4	53.8	53.8	65	65
M-34DR					0	39.3	39.3	44.2		44.2	81.3	87.6	44.2 87.6	81.3 90.1	90.1
M-35					0	31.1				31.1					
M-48	0	20.2								20.2					
M-48R	0	20.6								20.6	20.6 30.2	27.3 35.2	27.3	30.2	35.2
M-48DR	0	21.6					36.4	37.65		21.6	30.45	36.4	21.6 37.65	30.45 90.3	90.3
M-53	0	13			13	43.2	43.2	50	50						
M-55	0	22			22	50			50						
M-59	0	23			23	34.3	34.3	36.4		36.4	36.4	37.95	37.95	85.1	85.1
M-60					0	39.1	39.1	39.8		39.8					
M-62	0	18			18	44.3	44.3	50.8	50.8						
M-64	0	13			13	50.1			50.1						
M-66	0	16			16	27			27						
M-66R	0	16			16	23	63	69		69	69	70.4	70.4	89.54	89.54
M-70	0	7			7	21			21						
M-70R	0	7			7	48	48	65.45		65.45					
M-70DR	0	7			7	48	48	65.55		65.55	65.55 76.89	74.49 78.49	74.49 78.49	76.89 94.49	94.49
M-80					0	13.5	13.5	18.89		18.89	20.24	25.24	18.89 25.24	20.24 50.62	50.62
M-82					0	31	31	34.6		34.6					
M-84					0	10.7	10.7	15		15					
M-84R					0	10.7	10.7	18.7		18.7			18.7	28.5	28.5

TABLE 2

HYDROSTRATIGRAPHIC UNITS SUMMARY

Duke Energy - McGuire Nuclear Station

S&ME Project No. 1264-06-724



WELL ID	FILL (F)		ALLUVIUM (S)		SOIL/SAPROLITE (M1)		WEATHERED ROCK (M2)		SOIL BORING TERMINATION	AUGER/ROLLER CONE REFUSAL	PARTIALLY WEATHERED / FRACTURED ROCK (WF)		SOUND ROCK (D)		CORING TERMINATION
	Top (ft-bls)	Bottom (ft-bls)	Top (ft-bls)	Bottom (ft-bls)	Top (ft-bls)	Bottom (ft-bls)	Top (ft-bls)	Bottom (ft-bls)	(ft-bls)	(ft-bls)	Top (ft-bls)	Bottom (ft-bls)	Top (ft-bls)	Bottom (ft-bls)	(ft-bls)
M-85					0	16.5	16.5	20.65		20.65					
M-91			8	13	0	8			39						
					13	39									
M-91R			8	13	0	8				52.5			52.5	69.8	69.8
					13	52.5									
M-92	0	23	23	33	33	35			35						
M-92R	0	23	23	33	33	58.4				58.4			58.4	79.9	79.9
M-93	0	27			27	43			43						
M-93R	0	27			27	82.48				82.48			82.48	104.83	104.83
M-94			0	23	23	44.1				44.1					
M-95			0	22.9	22.9	24			24						
M-95R			0	22.9	22.9	36.3	37.6			37.6	57.24	59.14	37.6 59.14	57.24 64.5	64.5
M-96	0	8.05			8.05	34			34						
M-96R	0	8.05			8.05	52.54	52.54	80.38		52.54 / 80.38			80.38	99.57	99.57
M-97					0	51.9				51.9			51.9	99.41	99.41
M-98					0	20	20	20.8		20.8			20.8	28	28
M-98R					0	20	20	22		22			22	49.7	49.7
M-100R					0	30	30	40.2		34.2			40.2	60	60
M-103					0	20	20	22	22						
M-103R					0	20	20	24.7		24.7	24.7	26.2	26.2	45	45
M-104R					0	38.25	38.25	39.8		39.8	39.8	45.14	45.14	52	60.04
												52	53.2	56	
												56	57.5	60.04	
M-104DR					0	36.7				36.7	42.5	43.8	36.7 43.8	42.5 80.28	80.28

	FILL (F)		ALLUVIUM (S)		SOIL/SAPROLITE (M1)		WEATHERED ROCK (M2)		SOIL BORING TERMINATION	AUGER/ROLLER CONE REFUSAL	PARTIALLY WEATHERED / FRACTURED ROCK (WF)		SOUND ROCK (D)		CORING TERMINATION
	Top (ft-bls)	Bottom (ft-bls)	Top (ft-bls)	Bottom (ft-bls)	Top (ft-bls)	Bottom (ft-bls)	Top (ft-bls)	Bottom (ft-bls)	(ft-bls)	(ft-bls)	Top (ft-bls)	Bottom (ft-bls)	Top (ft-bls)	Bottom (ft-bls)	(ft-bls)
Minimum =	0	7	0	13	0	8	10.7	15	21	15	20.24	25.24	18.7	20.24	28
Maximum =	0	27	23	33	33	82.48	63	80.38	60	82.48	81.3	87.6	87.6	104.83	104.83
Average =	0	16.9	8.9	23.0	7.3	38.1	37.4	43.7	42.5	41.4	47.9	52.2	48.9	66.9	72.1

Notes:

ft-bls = Feet below land surface

TABLE 3

SOIL LABORATORY TESTING SUMMARY

Duke Energy - McGuire Nuclear Station

S&ME Project No. 1264-06-724



Well ID	Sample Depth (ft-bls)	% Sand	% Silt	% Clay	% Total Porosity	% Specific Yield	Hydrostratigraphic Unit
M-48DR	9.6 to 11.1	34	30	36	48	3.2	F
M-59	9.3 to 10.8	22	26	52	49	0.9	F
M-62	14.3 to 15.8	43	35	23	45	7.5	F
M-93R	23.16 to 24.66	13	28	59	50	0.4	F
M-96R	2.9 to 4.4	32	42	25	46	5	F
Average=		28.8	32.2	39.0	47.6	3.4	F
Standard Deviation =					2.1	2.9	

M-92R	28.2 to 29.7	19	15	66	50	0.3	S
M-94	9.6 to 11.1	41	42	17	44.5	12	S
M-94	14.6 to 16.1	12	14	74	50	0.2	S
M-95R	7.82 to 9.32	35	33	33	48	3.8	S
M-95R	12.82 to 14.32	17	40	43	48	2	S
Average=		24.8	28.8	46.6	48.1	3.7	S
Standard Deviation =					2.2	4.9	

M-20R	9.1 to 10.6	40	43	18	45	11	M1
M-20R	39.1 to 40.6	68	29	2	43	27	M1
M-21	14.6 to 16.1	23	64	13	45	10	M1
M-23	29.4 to 30.9	38	57	5	44	18	M1
M-35	28.5 to 30	76	22	2	42.5	29	M1
M-53	38.2 to 39.7	60	37	3	43	24.5	M1
M-59	24.3 to 25.8	65	31	4	43	25	M1
M-60	34.1 to 35.6	73	24	3	43	27	M1
M-64	23.6 to 25.1	53	41	7	43.5	20	M1
M-93R	62.85 to 64.35	67	30	3	43	26	M1
M-94	39.6 to 41.1	42	51	7	44	18	M1
M-95R	27.82 to 29.32	62	33	5	43	24	M1
M-96R	47.9 to 49.4	77	21	2	42.5	28	M1
M-97	27.75 to 29.25	64	30	6	43	22.5	M1
M-103R	18.25 to 19.75	50	44	6	43.5	20	M1
M-104R	33.25 to 34.75	72	25	3	42.5	27.5	M1
Average=		58.1	36.4	5.6	43.3	22.3	M1
Standard Deviation =					0.8	5.8	

M-20R	49.1 to 50.6	74	24	2	42.5	29	M2
M-30R	52.85 to 54.35	71	26	3	42.5	27	M2
M-32	59.3 to 60.8	67	27	7	43	24	M2
M-70DR	53 to 59.5	75	22	3	42.5	28	M2
M-82	33.4 to 34.9	67	31	3	43	26	M2
M-100R	29.2 to 30.7	76	21	4	42.5	27.5	M2
M-104R	38.25 to 39.75	73	24	3	42.5	27.5	M2
Average=		71.9	25.0	3.6	42.6	27.0	M2
Standard Deviation =					0.2	1.6	

Notes:

ft-bls = feet below land surface

F = Fill

S = Alluvium

M1 = Soil/Saprolite

M2 = Weathered Rock

TABLE 4

SECONDARY POROSITY SUMMARY

Duke Energy - McGuire Nuclear Station

S&ME Project No. 1264-06-724



HYDROSTRATIGRAPHIC UNIT	SECONDARY POROSITY RANGE (%)	ASSUMED VALUE (%)
Partially Weathered/Fractured Rock (WF)	1 to 10	6
Sound Rock (D)	0.1 to 1.0	2.5

Notes:

Secondary porosity ranges for WF from Legrand, Harry E. Sr., A Master Conceptual Model for Hydrogeologic Site Characterization in the Piedmont and Mountain Regions of North Carolina 2004.

Secondary porosity ranges for D from Daniel, C. C., III and Dahlen, P. R., 2002, Preliminary Hydrogeologic Assessment and Study Plan for a Regional Groundwater Resource Investigation of the Blue Ridge and Piedmont Provinces of North Carolina U. S. Geological Survey, Water-Resources Investigations Report 02-4105, 60p.

TABLE 5

GROUNDWATER LEVEL SUMMARY

Duke Energy - McGuire Nuclear Station

S&ME Project No. 1264-06-724



Well ID	Ground Surface Elevation (ft-msl)	Well Depth (ft-bls)	Date	Depth to Groundwater (ft-bls)	Water Level Elevation (ft-msl)	Water Column (ft)
M-20	705.99	48	2/21/2008	38.00	667.99	10
M-20R	706.17	67.92	2/21/2008	35.68	670.49	32.24
M-21	764.71	50	2/20/2008	34.42	730.29	15.58
M-22	786.71	60	2/20/2008	49.86	736.85	10.14
M-22R	786.82	92	2/20/2008	50.54	736.28	41.46
M-23	775.52	47	2/21/2008	38.13	737.39	8.87
M-30	733.46	50.7	2/20/2008	44.76	688.70	5.94
M-30R	733.80	78.5	2/20/2008	45.00	688.80	33.5
M-31	771.07	40	2/20/2008	27.94	743.13	12.06
M-32	790.13	55	2/21/2008	52.29	737.84	2.71
M-33	771.78	38	2/20/2008	32.73	739.05	5.27
M-34R	800.74	61.9	2/20/2008	45.32	755.42	16.58
M-34DR	800.94	89.9	2/20/2008	45.42	755.52	44.48
M-35	767.34	30.8	2/20/2008	23.98	743.36	6.82
M-48	760.39	19.8	2/18/2008	19.67	740.72	0.13
M-48R	760.33	34.4	2/18/2008	21.26	739.07	13.14
M-48DR	760.51	89	2/18/2008	44.44	716.07	44.56
M-53	760.57	23	2/18/2008	15.62	744.95	7.38
M-55	760.09	20	2/18/2008	11.30	748.79	8.7
M-59	760.03	36	2/18/2008	26.15	733.88	9.85
M-60	779.50	39	2/21/2008	29.35	750.15	9.65
M-62	760.37	36	2/18/2008	27.23	733.14	8.77
M-64	760.84	28	2/18/2008	17.12	743.72	10.88
M-66	760.43	27	2/18/2008	17.96	742.47	9.04
M-66R	760.47	75.8	2/18/2008	22.59	737.88	53.21
M-70	760.44	21	2/18/2008	13.40	747.04	7.6
M-70R	760.44	65.45	2/18/2008	14.97	745.47	50.48
M-70DR	760.42	77.4	2/18/2008	15.12	745.30	62.28

Notes:

Ground elevations surveyed by Duke Energy

ft-bls = Feet below land surface

ft-msl = Feet relative to mean sea level

TABLE 5
GROUNDWATER LEVEL SUMMARY
Duke Energy - McGuire Nuclear Station
S&ME Project No. 1264-06-724



Well ID	Ground Surface Elevation (ft-msl)	Well Depth (ft-bls)	Date	Depth to Groundwater (ft-bls)	Water Level Elevation (ft-msl)	Water Column (ft)
M-82	675.23	34.6	2/20/2008	26.30	648.93	8.3
M-84	656.95	15	2/19/2008	8.58	648.37	6.42
M-84R	657.75	25	2/19/2008	9.34	648.41	15.66
M-85	659.50	14	2/19/2008	6.16	653.34	7.84
M-91	745.72	39	2/19/2008	27.53	718.19	11.47
M-91R	745.92	63	2/19/2008	28.90	717.02	34.1
M-92	728.41	34.5	2/19/2008	4.76	723.65	29.74
M-92R	728.31	75	2/19/2008	6.23	722.08	68.77
M-93	756.60	43	2/19/2008	33.78	722.82	9.22
M-93R	756.55	93	2/19/2008	31.13	725.42	61.87
M-94	751.40	44.1	2/19/2008	32.61	718.79	11.49
M-95	731.65	24	2/21/2008	16.46	715.19	7.54
M-95R	731.65	44	2/21/2008	21.30	710.35	22.7
M-96	747.29	34	2/20/2008	25.44	721.85	8.56
M-96R	747.40	87	2/20/2008	24.46	722.94	62.54
M-97	747.78	26	2/20/2008	14.06	733.72	11.94
M-98	721.61	27	2/20/2008	13.69	707.92	13.31
M-98R	722.71	47.6	2/20/2008	14.09	708.62	33.51
M-100R	732.09	47	2/20/2008	29.31	702.78	17.69
M-103	695.34	22	2/19/2008	11.88	683.46	10.12
M-103R	696.00	36	2/19/2008	13.18	682.82	22.82
M-104R	714.56	47	2/19/2008	39.41	675.15	7.59
M-104DR	714.04	76	2/19/2008	40.92	673.12	35.08
Minimum =				4.76	648.37	
Maximum =				52.29	755.52	
Average =				26.36	717.35	

Notes:

Ground elevations surveyed by Duke Energy

ft-bls = Feet below land surface

ft-msl = Feet relative to mean sea level

TABLE 6
HYDROSTRATIGRAPHIC UNITS & GROUNDWATER CONDITIONS SUMMARY
Duke Energy - McGuire Nuclear Station
S&ME Project No. 1264-06-724

WELL ID	FILL (F)		ALLUVIUM (S)		SOIL/APROLITE (M1)		WEATHERED ROCK (M2)		SOIL BORING TERMINATION		AUGER/ROLLER CONE REFUSAL		PARTIALLY WEATHERED / FRACTURED ROCK (WF)		SOUND ROCK (D)		CORING TERMINATION
	Top (ft-bls)	Bottom (ft-bls)	Top (ft-bls)	Bottom (ft-bls)	Top (ft-bls)	Bottom (ft-bls)	Top (ft-bls)	Bottom (ft-bls)	(ft-bls)	(ft-bls)	(ft-bls)	(ft-bls)	Top (ft-bls)	Bottom (ft-bls)	Top (ft-bls)	Bottom (ft-bls)	
M-20					0	48			48								
M-20R					0	49.1	49.1	52.3			52.3				52.3	75	75
M-21					0	50.5											
M-22					0	59.3	59.3	60			60						
M-22R					0	59.3	59.3	72			72				72	95.8	95.8
M-23					0	50.9					50.9						
M-30					0	47.85	47.85	50.7			50.7						
M-30R					0	47.85	47.85	69.7			69.7		69.7	76.15	76.15	89.55	89.55
M-31					0	50.8					50.8						
M-32					0	56	56	60.4			60.4						
M-33					0	48.3	48.3	49.8			49.8						
M-34R					0	39.3	39.3	42.4			42.4		42.4	53.8	53.8	65	65
M-34DR					0	39.3	39.3	44.2			44.2		81.3	87.6	87.6	90.1	90.1
M-35					0	31.1					31.1						
M-48	0	20.2									20.2						
M-48R	0	20.6									20.6		20.6	27.3	27.3	30.2	35.2
M-48DR	0	21.6					36.4	37.65			21.6		30.45	36.4	21.6	30.45	90.3
M-53	0	13			13	43.2	43.2	50			50						
M-55	0	22			22	50					50						
M-59	0	23			23	34.3	34.3	36.4			36.4		36.4	37.95	37.95	85.1	85.1
M-60					0	39.1	39.1	39.8			39.8						
M-62	0	18			18	44.3	44.3	50.8			50.8						
M-64	0	13			13	50.1					50.1						
M-66	0	16			16	27					27						
M-68R	0	16			16	23	63	69			69		69	70.4	70.4	89.54	89.54
M-70	0	7			7	21					21						
M-70R	0	7			7	48	48	65.45			65.45		65.55	74.49	74.49	76.89	
M-70DR	0	7			7	48	48	65.55			65.55		76.89	76.49	76.49	84.49	94.49
M-80					0	13.5	13.5	18.89			18.89		20.24	25.24	25.24	50.82	50.82
M-82					0	31	31	34.6			34.6						
M-84					0	10.7	10.7	15			15						
M-84R					0	10.7	10.7	18.7			18.7				18.7	28.5	28.5
M-85					0	16.5	16.5	20.65			20.65						
M-91			8	13	0	8											
M-91R			8	13	13	39					39						
M-92	0	23	23	33	0	8					52.5				52.5	69.8	69.8
M-92R	0	23	23	33	33	58.4					58.4				58.4	79.9	79.9
M-93	0	27			27	43					43						
M-93R	0	27			27	82.48					82.48				82.48	104.83	104.83
M-94			0	23	23	44.1					44.1						
M-95			0	22.9	22.9	24					24						
M-95R			0	22.9	22.9	38.3	38.3	37.6			37.6		57.24	59.14	59.14	64.5	64.5
M-96	0	8.05			8.05	34					34						
M-96R	0	8.05			8.05	52.54	52.54	60.38			52.54 / 60.38		60.38	99.57	99.57		
M-97					0	51.9					51.9				51.9	99.41	99.41
M-98					0	20	20	20.8			20.8				20.8	28	28
M-98R					0	20	20	22			22				22	49.7	49.7
M-100R					0	35	35	40.2			40.2				40.2	60	60
M-103					0	20	20	22			22						
M-103R					0	20	20	24.7			24.7		24.7	28.2	28.2	45	45
M-104R					0	38.25	38.25	39.8			39.8		52	53.2	53.2	56	60.04
M-104DR					0	36.7					36.7		56	57.5	57.5	60.04	
													42.5	43.8	43.8	80.28	80.28

Notes:
ft-bls = Feet below land surface
--- = Boring was abandoned due to absence of water
--- = well screen located within this interval

SCREEN INTERVAL		GROUNDWATER LEVEL
Top (ft-bls)	Bottom (ft-bls)	
33	48	38.00
62.92	67.92	35.68
30	50	34.42
45	80	49.88
87	92	50.54
32	47	38.13
35.7	50.7	44.76
73.5	78.5	45.00
25	40	27.94
40	55	52.29
23	38	32.73
56.9	61.9	45.32
79.9	89.9	45.42
15.8	30.8	23.98
9.8	19.8	19.67
29.4	34.4	21.26
79	89	44.44
8	23	15.82
4	20	11.30
21	36	26.15
24	39	29.35
21	36	27.23
13	28	17.12
12	27	17.96
70.8	75.8	22.59
6	21	13.40
55.45	65.45	14.97
72.4	77.4	15.12
---	---	---
24.6	34.6	26.30
5	15	8.58
20	25	9.34
4	14	6.16
24	39	27.53
53	63	28.90
19.5	34.5	4.78
70	75	6.23
28	43	33.78
88	93	31.13
29.1	44.1	32.87
9	24	16.46
39	44	21.30
19	34	25.44
82	87	24.46
11	26	14.06
12	27	13.69
42.6	47.6	14.09
42	47	29.51
7	22	11.86
28	38	13.18
42	47	39.41
71	76	40.52

WATER LEVEL RELATIONSHIP TO TOP OF SCREEN	SCREENED UNIT	ACTS LIKE	TREATMENT IN SCR	
			GROUNDWATER	TRITIUM (H3)
5.00 below top of screen	M1	Shallow	Shallow	Shallow
27.24 above top of screen	Moderately Deep D	Deep	Deep	Deep
-4.42 below top of screen	M1	Shallow	Shallow	Shallow
4.98 below top of screen	M1/M2	Shallow	Shallow	Shallow
36.46 above top of screen	Moderately Deep D	Deep	Deep	Deep
-6.13 below top of screen	M1	Shallow	Shallow	Shallow
-9.06 below top of screen	M1/M2	Shallow	Shallow	Shallow
26.5 above top of screen	Shallow WF/D	Deep	Deep	Deep
-2.94 below top of screen	M1	Shallow	Shallow	Shallow
-12.29 below top of screen	M1	Shallow	Shallow	Shallow
-9.73 below top of screen	M1	Shallow	Shallow	Shallow
11.58 above top of screen	Shallow D	Shallow	Shallow	Shallow
34.48 above top of screen	Deep WF/D	Deep	Deep	Deep
-8.18 below top of screen	M1	Shallow	Shallow	Shallow
-9.87 below top of screen	F	Shallow	Shallow	Shallow
8.14 above top of screen	Shallow D/WF	Deep	Deep	Deep
34.56 above top of screen	Deep D	Deep	Deep	Deep
-7.62 below top of screen	F/M1	Shallow	Shallow	Shallow
-4.3 below top of screen	F	Shallow	Shallow	Shallow
-5.15 below top of screen	F/M1	Shallow	Shallow	Shallow
-5.35 below top of screen	M1	Shallow	Shallow	Shallow
-6.23 below top of screen	M1	Shallow	Shallow	Shallow
-4.12 below top of screen	M1	Shallow	Shallow	Shallow
-5.96 below top of screen	F/M1	Shallow	Shallow	Shallow
48.21 above top of screen	Shallow D	Deep	Deep	Deep
-7.4 below top of screen	F/M1	Shallow	Shallow	Shallow
40.48 above top of screen	M2	Deep	Deep	Deep
57.28 above top of screen	Shallow WF/D	Deep	Deep	Deep
---	---	---	---	---
-1.7 below top of screen	M1/M2	Shallow	Shallow	Shallow
-3.58 below top of screen	M1/M2	Shallow	Shallow	Shallow
10.66 above top of screen	Shallow D	Deep	Deep	Deep
-2.16 below top of screen	M1	Shallow	Shallow	Shallow
-3.53 below top of screen	M1	Shallow	Shallow	Shallow
24.1 above top of screen	Shallow D	Deep	Deep	Deep
14.74 above top of screen	F/S/M1	Shallow	Shallow	Shallow
63.77 above top of screen	Moderately Deep D	Deep	Deep	Deep
-5.76 below top of screen	M1	Shallow	Shallow	Shallow
56.87 above top of screen	Shallow D	Deep	Deep	Deep
-3.51 below top of screen	M1	Shallow	Shallow	Shallow
-7.46 below top of screen	S/M1	Shallow	Shallow	Shallow
17.7 above top of screen	Shallow D	Deep	Deep	Deep
-6.44 below top of screen	M1	Shallow	Shallow	Shallow
57.54 above top of screen	Shallow D	Deep	Deep	Deep
-3.06 below top of screen	M1	Shallow	Shallow	Shallow
-1.69 below top of screen	M1/M2/Shallow D	Shallow	Shallow	Shallow
28.51 above top of screen	Deep D	Deep	Deep	Deep
12.69 above top of screen	Shallow D	Deep	Deep	Deep
4.88 below top of screen	M1/M2	Shallow	Shallow	Shallow
12.82 above top of screen	Shallow WF/D	Deep	Deep	Deep
2.59 above top of screen	Shallow WF/D	Shallow	Shallow	Shallow
30.08 above top of screen	Deep D	Deep	Deep	Deep

TABLE 7

VERTICAL GRADIENTS SUMMARY

Duke Energy - McGuire Nuclear Station

S&ME Project No. 1264-06-724



WELL ID	DATE	Vertical Gradient (ft/ft)	DIRECTION
M-20 / M-20R	2/21/2008	-0.1124	Upward
M-22 / M-22R	2/20/2008	0.0165	Downward
M-30 / M-30R	2/20/2008	-0.0036	Upward
M-34R / M-34DR	2/20/2008	-0.0040	Upward
M-48R / M-48DR	2/18/2008	0.4430	Downward
M-66 / M-66R	2/18/2008	0.0904	Downward
M-70 / M-70DR	2/18/2008	0.0301	Downward
M-84 / M-84R	2/19/2008	-0.0040	Upward
M-91 / M-91R	2/19/2008	0.0477	Downward
M-92 / M-92R	2/19/2008	0.0344	Downward
M-93 / M-93R	2/19/2008	-0.0498	Upward
M-95 / M-95R	2/21/2008	0.2276	Downward
M-96 / M-96R	2/20/2008	-0.0199	Upward
M-98 / M-98R	2/20/2008	-0.0296	Upward
M-101 / M-100R	2/20/2008	0.0367	Downward
M-103 / M-103R	2/19/2008	0.0478	Downward
M-104R / M-104DR	2/19/2008	0.0688	Downward

Notes:

ft/ft = Feet per foot

TABLE 8
PERMEABILITY TESTING SUMMARY
Duke Energy - McGuire Nuclear Station
S&ME Project No. 1264-06-724



WELL ID	Ground Surface Elevation (ft-msl)	SCREEN INTERVAL		OPEN-HOLE FALLING HEAD					PACKER TESTS			SLUG TESTS (RISING HEAD)																
				Test Interval (ft-bls)		Geologic Unit			Test Interval (ft-bls)		Geologic Unit		Test Interval (ft-bls)		F		S		Geologic Unit		M1		WF		D			
		Depth (ft-bls)	Elevation (ft-msl)	M1	M2	WF	D		WF	D		M1	M2	WF	D													
M-20	705.99	33 to 48	672.99 to 657.99										33 to 48						5.99E-05									
M-20R	706.17	62.92 to 67.92	643.25 to 638.25										62.92 to 67.92													1.64E-05		
M-21	764.71	30 to 50	734.71 to 714.71										30 to 50						2.97E-04									
M-22	786.71	45 to 60	741.71 to 726.71										45 to 60						3.27E-04									
M-22R	786.82	87 to 92	699.82 to 694.82	54.5 to 57.5	1.33E-06								87 to 92													2.00E-04		
				71.6 to 75.6				4.40E-05																				
				71.6 to 80.6				2.38E-05																				
M-23	775.52	32 to 47	743.52 to 728.52	39.3 to 42.3	2.58E-05								32 to 47						8.23E-05									
M-30	733.46	35.7 to 50.7	697.76 to 682.76										35.7 to 50.7						4.65E-04									
M-30R	733.80	73.5 to 78.5	660.30 to 655.30	38.7 to 41.7	1.34E-05								73.5 to 78.5												2.16E-03			
				70.15 to 74.35				4.44E-05																				
M-31	771.07	25 to 40	746.07 to 731.07	35 to 38	5.99E-06								25 to 40						1.12E-03									
M-32	790.13	40 to 55	750.13 to 735.13										40 to 55					*										
M-33	771.78	23 to 38	748.78 to 733.78										23 to 38						1.41E-04									
M-34R	800.74	56.9 to 61.9	743.84 to 738.84	42.4 to 45				1.27E-04					56.9 to 61.9												7.33E-04	7.33E-04		
				42.4 to 50				2.72E-04																				
M-34DR	800.94	79.9 to 89.9	721.04 to 711.04										79.9 to 89.9											6.14E-05	6.14E-05			
M-35	767.34	15.8 to 30.8	751.54 to 736.54										15.8 to 30.8						3.45E-04									
M-48	760.39	9.8 to 19.8	750.59 to 740.59										9.8 to 19.8				*											
M-48R	760.33	29.4 to 34.4	730.93 to 725.93										29.4 to 34.4													**		
M-48DR	760.51	79 to 89	681.51 to 671.51						81.3 to 86.3		4.80E-05		79 to 89													1.13E-06		
M-53	760.57	8 to 23	752.57 to 737.57	19.4 to 22.5	4.82E-05								8 to 23						3.30E-04									
M-55	760.09	5 to 20	755.09 to 740.09										5 to 20				***											
M-59	760.03	21 to 36	739.03 to 724.03										21 to 36						1.08E-04									
M-60	779.50	24 to 39	755.50 to 740.50	31 to 34	8.73E-05								24 to 39						6.16E-04									
M-62	760.37	21 to 36	739.37 to 724.37	24.5 to 28.7	5.35E-05								21 to 36						1.82E-04									
M-64	760.84	13 to 28	747.84 to 732.84										13 to 28						2.47E-04									
M-66	760.43	12 to 27	748.43 to 733.43										12 to 27				5.37E-05		5.37E-05									
M-66R	760.47	70.8 to 75.8	689.67 to 684.67	48.7 to 51.7	3.07E-05								70.8 to 75.8													1.70E-06		
				69.54 to 74.54				1.02E-04																				
				69.54 to 79.54				1.89E-05																				
M-70	760.44	6 to 21	754.44 to 739.44										6 to 21						1.28E-03									
M-70R	760.44	55.45 to 65.45	704.99 to 694.99	49.2 to 52.2		1.03E-06							55.45 to 65.45										1.88E-04					
M-70DR	760.42	72.4 to 77.4	688.02 to 683.02	65.59 to 69.49				5.96E-06					72.4 to 77.4												8.22E-05	8.22E-05		
				65.59 to 74.49				1.80E-05																				
M-80	737.20	---	---										---				---		---									
M-82	675.23	24.6 to 34.6	650.63 to 640.63										24.6 to 34.6						2.54E-04									
M-84	656.95	5 to 15	651.95 to 641.95										5 to 15						1.38E-03									
M-84R	657.75	20 to 25	637.75 to 632.75	18.7 to 25.6				1.86E-03	20 to 25		1.10E-04		20 to 25														3.04E-03	
				18.7 to 28.5				2.03E-03																				
M-85	659.50	4 to 14	655.50 to 645.50										4 to 14						3.69E-04									



HYDROSTATIGRAPHIC UNIT	F	S	M1	M2	WF	D
	Hydraulic Conductivity (cm/sec)					
COUNT (GWP Wells)	2	2	38	5	14	40
MEAN (GWP Wells)	2.20E-04	2.74E-04	1.68E-04	3.40E-05	7.79E-05	6.04E-05
COUNT (GWP+UFSAR+Landfill #2 Wells)	2	2	43	7	17	45
MEAN (GWP+UFSAR+Landfill #2 Wells)	2.20E-04	2.74E-04	1.54E-04	3.41E-05	8.90E-05	4.08E-05

* Not enough water in well to perform rising head slug test
** Recharge too fast to pump water level down for rising head slug test
*** Slug test performed, but data is not retrievable from data logger

- Page 2 of 2

CHART 8A - Mean Hydraulic Conductivity
(GWP Wells, UFSAR Wells, Landfill #2 Wells)

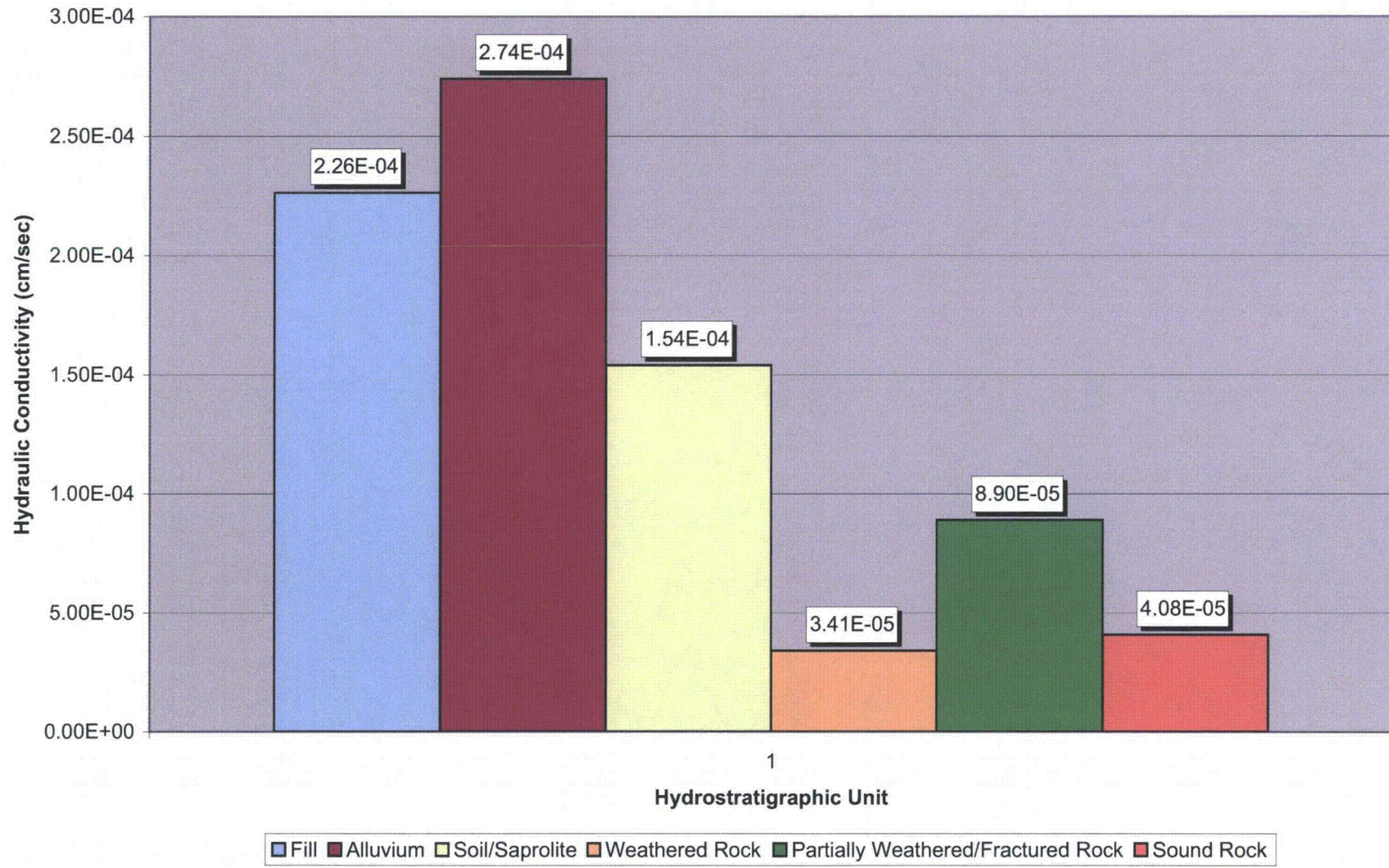


TABLE 9
GROUNDWATER VELOCITY ESTIMATES SUMMARY
Duke Energy - McGuire Nuclear Station
S&ME Project No. 1264-06-724



Hydrostratigraphic Unit	Mean Hydraulic Conductivity	Mean Effective Porosity	SITE REGION						
			WC Ponds to Catawba River	Units to WC Ponds & WWCB	Units to SNSW Pond	Lake Norman & Discharge Canal to Units	Discharge Canal to SNSW Pond	South of SNSW Pond	Southwest of SNSW Pond
			Horizontal Groundwater Gradient (ft/ft)						
M1	1.54E-04	0.223	0.07	0.02	0.02	0.07	0.02	0.007	0.05
M2	3.41E-05	0.270							
WF	8.90E-05	0.060							
D	4.08E-05	0.025							

Hydrostratigraphic Unit	Units	SITE REGION						
		WC Ponds to Catawba River	Units to WC Ponds & WWCB	Units to SNSW Pond	Lake Norman & Discharge Canal to Units	Discharge Canal to SNSW Pond	South of SNSW Pond	Southwest of SNSW Pond
		Estimated Groundwater Velocity						
M1	feet per year	50	14	14	50	14	5	36
M2	feet per year	9	3	3	9	3	1	7
WF	feet per day	0	0	0	0	0	0	0
D	feet per day	0	0	0	0	0	0	0

Hydrostratigraphic Unit	Units	Mean Groundwater Velocity
M1	feet per year	20
M2	feet per year	4
WF	feet per year	43
D	feet per year	47

Notes:

cm/sec = Centimeters per second

ft/ft = Feet per foot

Unit Conversion cm/sec to feet/year = * 1034775

TABLE 10
TRITIUM IN GROUNDWATER SUMMARY - (FEBRUARY 2008 SAMPLING EVENT)
Duke Energy - McGuire Nuclear Station
S&ME Project No. 1264-06-724



WELL ID	DATE	TRITIUM (pCi/L)
M-20	2/21/2008	577.0
M-20R	2/21/2008	495.0
M-21	2/20/2008	<68.8
M-22	2/20/2008	<91.0
M-22R	2/20/2008	442.0
M-23	2/21/2008	<30.6
M-30	2/20/2008	<11.1
M-30R	2/20/2008	208.0
M-31	2/20/2008	<106
M-32	2/21/2008	<44.0
M-33	Unavailable Sample - No Tests Performed	
M-34R	2/20/2008	<37.7
M-34DR	2/20/2008	<62.1
M-35	2/20/2008	<50.4
M-42	2/18/2008	970.0
M-48	Unavailable Sample - No Tests Performed	
M-48R	2/18/2008	785.0
M-48DR	2/18/2008	753.0
M-53	2/18/2008	1040.0
M-55	2/18/2008	<64.3
M-59	2/18/2008	845.0
M-60	2/21/2008	<60.6
M-62	2/18/2008	<66.8
M-64	2/18/2008	505.0
M-66	2/18/2008	563.0
M-66R	2/18/2008	<4.5
M-68	2/18/2008	1020.0
M-70	2/18/2008	345.0
M-70R	2/18/2008	273.0
M-70DR	2/18/2008	<92.5
M-72	2/18/2008	799.0
M-76	2/18/2008	936.0
M-82	2/20/2008	1880.0
M-84	2/19/2008	5560.0
M-84R	2/19/2008	6930.0
M-85	2/19/2008	1390.0
M-87	2/19/2008	258.0
M-89	2/19/2008	510.0
M-91	2/19/2008	342.0
M-91R	2/19/2008	208.0
M-92	2/19/2008	219.0
M-92R	2/19/2008	<26.8
M-93	2/19/2008	249.0
M-93R	2/19/2008	276.0
M-94	2/19/2008	<4.1
M-95	2/21/2008	385.0
M-95R	2/21/2008	<14.2
M-96	2/20/2008	<24.0
M-96R	2/20/2008	<50.7
M-97	2/20/2008	165.0
M-98	2/20/2008	<10.1
M-98R	2/20/2008	<58.2
M-100R	2/20/2008	393.0
M-101	2/20/2008	358.0
M-102	2/19/2008	7740.0
M-103	2/19/2008	2560.0
M-103R	2/19/2008	1740.0
M-104R	2/19/2008	10700.0
M-104DR	2/19/2008	6030.0
MS-1	2/20/2008	<11.5
MS-2	2/19/2008	985.0
MS-3	2/19/2008	800.0
MS-4	2/19/2008	601.0

Notes:

pCi/L = Picocuries per Liter

Concentrations exceed EPA groundwater tritium standard of 20,000 pCi/L.

TABLE 11

SAMPLE COLLECTION MEASUREMENTS SUMMARY - (FEBRUARY 2008 SAMPLING EVENT)

Duke Energy - McGuire Nuclear Station

S&ME Project No. 1264-06-724



WELL ID	DATE	WELL DEPTH (ft-bls)	DEPTH TO WATER (ft-bls)	WATER ELEVATION (ft-msl)	DEPTH TO PRODUCT (ft-bls)	ODOR	PURGE METHOD	AVG PUMP RATE (mL/min)	WELL VOLUME (gal)	EVAC VOLUME (gal)	EVAC (yes/no)	TEMP ° C	SPECIFIC CONDUCTANCE µmho/cm	pH (units)	TURBIDITY (NTU)	ORP (mV)	DO mg/L
M-20	2/21/2008	51.19	41.04	667.99	N/A	NA	LF	285	1.66	2	NO	13.2	97.7	6.16	14.4	403	5.58
M-20R	2/21/2008	70.93	38.68	670.49	N/A	NA	LF	220	5.26	6.75	NO	13.2	116.4	6.32	4.35	293	1.33
M-21	2/20/2008	53.16	37.36	730.29	N/A	NA	LF	150	2.58	0.75	NO	17.8	21.9	5.10	211	471	6.05
M-22	2/20/2008	63.11	52.48	736.85	N/A	NA	LF	425	1.73	2.25	NO	15.7	54.1	6.09	> 1000	399	8.67
M-22R	2/20/2008	94.77	52.74	736.68	N/A	NA	LF	360	6.86	3	NO	15.6	104.4	7.10	15.2	377	12.59
M-23	2/21/2008	49.96	40.84	737.39	N/A	NA	LF	350	1.49	1.25	NO	14.7	41.0	5.46	5.21	457	8.96
M-30	2/20/2008	53.92	47.80	688.70	N/A	NA	LF	250	1.00	1.5	NO	16.5	76.3	6.09	168	415	4.06
M-30R	2/20/2008	81.66	48.19	688.80	N/A	NA	LF	350	5.46	3.75	NO	16.2	116.1	7.29	81.7	296	11.71
M-31	2/20/2008	42.87	30.41	743.13	N/A	NA	LF	200	2.03	1	NO	16.7	69.7	6.16	363	427	9.81
M-32	2/21/2008	58.80	55.27	737.84	N/A	NA	CP	N/A	0.58	NA	YES	12.9	66.6	5.96	NA	294	4.85
M-33	2/20/2008	41.44	35.78	739.05	N/A	NA	LF		0.92	0	NO	N/A	N/A	N/A	N/A	N/A	N/A
M-34R	2/20/2008	65.60	48.25	755.42	N/A	NA	LF	300	2.83	2	NO	17.1	88.3	6.30	8.09	415	10.77
M-34DR	2/20/2008	93.30	48.62	755.52	N/A	NA	LF	150	7.29	2.25	NO	16.8	131.0	6.20	3.85	412	3.77
M-35	2/20/2008	33.28	28.45	743.36	N/A	NA	LF	170	1.11	1	NO	15.6	64.0	6.16	44.3	395	9.40
M-42	2/18/2008	36.14	27.58	734.69	N/A	NA	LF	170	5.59	1.25	NO	24.2	352.3	7.35	14.5	361	7.87
M-48	2/18/2008	19.56	19.45	740.72	N/A	NA	LF		0.02	0	NO	0.0	0.0	0.00	0	0	0.00
M-48R	2/18/2008	34.31	21.13	739.07	N/A	NA	LF	380	2.15	3.25	NO	20.6	61.1	6.06	17.2	338	3.73
M-48DR	2/18/2008	89.10	44.15	716.07	N/A	NA	LF	200	7.33	5.5	NO	20.4	116.8	6.87	13	272	2.18
M-53	2/18/2008	23.12	15.37	744.95	N/A	NA	LF	180	1.26	1.5	NO	21.4	32.0	5.08	171	707	6.33
M-55	2/18/2008	20.38	10.94	748.79	N/A	NA	LF	300	1.54	1.5	NO	21.2	19.0	4.59	34.1	432	7.16
M-59	2/18/2008	36.30	25.80	733.88	N/A	NA	LF	100	1.71	0.75	NO	23.0	75.6	6.08	64.2	361	4.48
M-60	2/21/2008	41.48	31.75	750.15	N/A	NA	LF	150	1.59	1.75	NO	13.4	167.5	5.84	423	424	8.00
M-62	2/18/2008	36.19	27.09	733.14	N/A	NA	LF	140	1.48	0.75	NO	17.8	69.0	5.36	207	449	7.35
M-64	2/18/2008	28.23	16.58	743.72	N/A	NA	LF	130	1.90	0.75	NO	18.5	40.0	5.20	>1000	449	7.85
M-66	2/18/2008	27.10	17.62	742.47	N/A	NA	LF	150	1.55	1	NO	17.6	42.0	4.95	359	396	8.16
M-66R	2/18/2008	75.78	22.24	737.88	N/A	NA	LF	210	8.73	8.75	NO	17.8	195.3	8.04	5.71	13	1.61
M-68	2/18/2008	43.39	25.08	734.79	N/A	NA	LF	130	2.99	1	NO	20.9	52.3	5.70	23.5	416	7.60
M-70	2/18/2008	21.27	13.14	747.04	N/A	NA	LF	185	1.33	0.75	NO	18.7	34.2	4.91	237	411	6.08
M-70R	2/18/2008	64.20	14.75	745.47	N/A	NA	LF	140	8.07	1	NO	17.7	97.2	6.95	275	280	15.33
M-70DR	2/18/2008	77.58	14.89	745.30	N/A	NA	LF	120	10.22	2.5	NO	18.4	143.1	6.81	21.9	255	1.00
M-72	2/18/2008	22.25	8.75	751.00	N/A	NA	CP	N/A	0.22	0.25	YES	20.9	38.7	4.45	88.4	479	2.02
M-76	2/18/2008	87.50	65.06	713.34	N/A	NA	LF	230	14.65	1.5	NO	22.4	162.2	6.33	84.3	321	0.38

Notes:

ft-bls = Feet below land surface

mL/min = Milliliters per minute

µmho/cm = Micro ohms per centimeter

NTU = Nephelometric turbidity units

mV = Millivolts

mg/L = Milligrams per liter

NA = Not analyzed

N/A = Not applicable

LF = Low flow

CP = Conventional purge (3 to 5 well volumes)

BP = No purge (HydraSleeve)

TABLE 11

SAMPLE COLLECTION MEASUREMENTS SUMMARY - (FEBRUARY 2008 SAMPLING EVENT)

Duke Energy - McGuire Nuclear Station

S&ME Project No. 1264-06-724



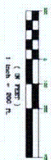
WELL ID	DATE	WELL DEPTH (ft-bls)	DEPTH TO WATER (ft-bls)	WATER ELEVATION (ft-msl)	DEPTH TO PRODUCT (ft-bls)	ODOR	PURGE METHOD	AVG PUMP RATE (mL/min)	WELL VOLUME (gal)	EVAC VOLUME (gal)	EVAC (yes/no)	TEMP ° C	SPECIFIC CONDUCTANCE µmho/cm	pH (units)	TURBIDITY (NTU)	ORP (mV)	DO mg/L
M-82	2/20/2008	37.48	29.43	648.93	N/A	NA	LF	200	1.31	1.5	NO	13.33	126.0	6.01	911	408	9.51
M-84	2/19/2008	17.78	11.43	648.37	N/A	NA	LF	275	1.04	1.25	NO	13.99	207.0	5.17	90	499	5.11
M-84R	2/19/2008	28.10	12.37	648.41	N/A	NA	LF	550	2.57	4.25	NO	15.16	250.0	5.92	10.5	446	5.20
M-85	2/19/2008	17.14	9.38	653.34	N/A	NA	LF	350	1.27	1.75	NO	13.34	115.0	5.91	115	452	4.64
M-87	2/19/2008	19.25	12.13	661.50	N/A	NA	LF	150	1.16	1.25	NO	13.41	290.0	6.48	21	124	0.22
M-89	2/19/2008	17.17	5.07	714.74	N/A	NA	LF	220	1.97	1.5	NO	14.54	27.2	4.98	8.04	464	1.17
M-91	2/19/2008	42.69	30.58	718.19	N/A	NA	LF	200	1.98	1.75	NO	16.15	30.0	5.57	> 1000	432	6.39
M-91R	2/19/2008	66.61	31.77	717.02	N/A	NA	LF	180	5.68	5.5	NO	14.81	103.2	7.39	20.4	360	9.18
M-92	2/19/2008	37.74	7.70	723.65	N/A	NA	LF	330	4.90	2.75	NO	16.50	164.4	6.58	103	69	0.15
M-92R	2/19/2008	78.82	9.29	722.08	N/A	NA	LF	110	11.34	14	NO	13.58	257.8	8.13	65	283	7.40
M-93	2/19/2008	46.39	36.70	722.82	N/A	NA	LF	225	1.58	2	NO	16.27	35.0	5.60	112	469	6.77
M-93R	2/19/2008	98.42	34.14	725.42	N/A	NA	LF	200	10.48	3.5	NO	13.05	158.0	7.01	58	300	11.50
M-94	2/19/2008	46.74	35.57	718.79	N/A	NA	LF	125	1.82	1	NO	15.94	31.0	5.52	10.2	368	5.89
M-95	2/21/2008	24.02	16.16	715.19	N/A	NA	LF	120	1.28	0.75	NO	18.23	219.1	6.21	32.8	162	5.00
M-95R	2/21/2008	43.72	15.58	710.35	N/A	NA	LF	220	4.59	2.5	NO	17.51	126.3	6.04	18.5	317	2.55
M-96	2/20/2008	37.42	28.42	721.85	N/A	NA	LF	170	1.47	1.75	NO	17.15	66.2	5.88	201	423	3.19
M-96R	2/20/2008	90.62	27.31	722.94	N/A	NA	LF	150	10.33	2.25	NO	16.19	122.3	7.25	79	341	15.24
M-97	2/20/2008	26.24	13.72	733.72	N/A	NA	LF	250	2.04	0.75	NO	18.83	90.5	6.73	>1000	387	9.43
M-98	2/20/2008	30.56	16.58	707.92	N/A	NA	LF	270	2.28	2	NO	16.74	119.3	7.28	872	267	8.96
M-98R	2/20/2008	50.80	17.31	708.62	N/A	NA	LF	200	5.46	7.25	NO	15.77	153.8	9.27	6	-26	0.33
M-100R	2/20/2008	49.80	32.27	702.78	N/A	NA	LF	290	2.96	1.25	NO	16.51	196.1	7.98	11.8	72	8.24
M-101	2/20/2008	44.50	31.95	703.26	N/A	NA	LF	285	2.05	2.5	NO	16.60	351.0	7.65	77.8	108	2.55
M-102	2/19/2008	60.40	42.18	681.73	N/A	NA	LF	425	2.97	2.25	NO	16.50	249.2	8.13	314	416	0.20
M-103	2/19/2008	25.30	15.16	683.46	N/A	NA	LF	330	1.65	1.75	NO	14.36	137.0	5.90	885	456	8.94
M-103R	2/19/2008	38.64	16.31	682.82	N/A	NA	LF	200	3.64	4	NO	14.83	221.0	9.17	47.1	374	2.57
M-104R	2/19/2008	53.92	42.43	675.15	N/A	NA	LF	180	1.87	1.25	NO	15.71	231.8	6.50	1.95	373	5.33
M-104DR	2/19/2008	78.98	43.94	673.12	N/A	NA	LF	200	5.72	1.25	NO	15.47	190.1	6.68	10.2	272	0.36
MS-1	2/20/2008	N/A	N/A	NA	N/A	NA	LF	NA	NA	1.25	NO	11.32	91.3	8.12	10.7	162	9.67
MS-2	2/19/2008	N/A	N/A	NA	N/A	NA	LF	NA	NA	1.25	NO	13.92	105.9	7.63	15.2	302	9.41
MS-3	2/19/2008	N/A	N/A	NA	N/A	NA	LF	NA	NA	1.25	NO	14.41	39.0	6.72	6.45	364	10.21
MS-4	2/19/2008	N/A	N/A	NA	N/A	NA	LF	NA	NA	1.25	NO	8.40	42.2	6.54	30.7	256	9.06

Notes:

ft-bls = Feet below land surface
 mL/min = Milliliters per minute
 µmho/cm = Micro ohms per centimeter
 NTU = Nephelometric turbidity units
 mV = Millivolts
 mg/L = Milligrams per liter

NA = Not analyzed
 N/A = Not applicable
 LF = Low flow
 CP = Conventional purge (3 to 5 well volumes)
 BP = No purge (HydraSleeve)





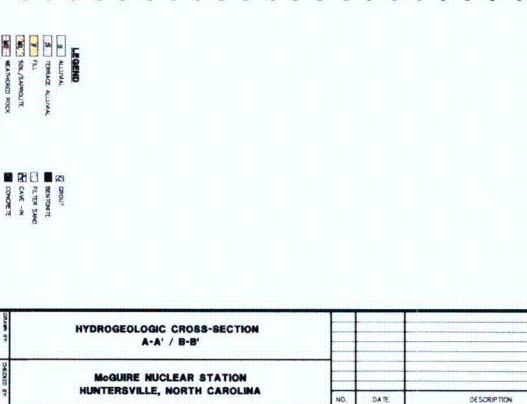
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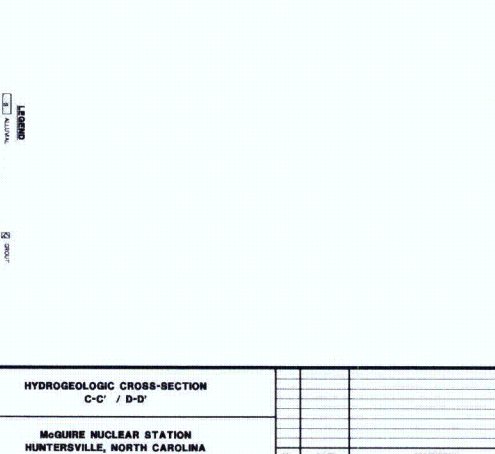
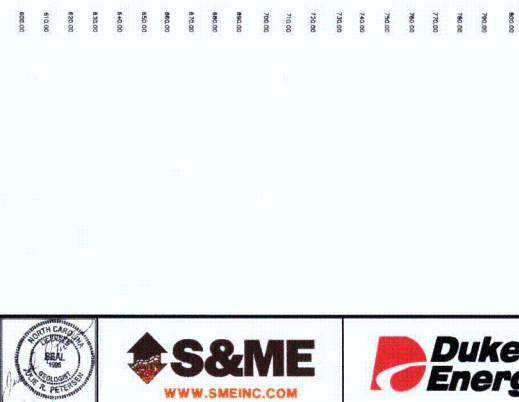
STATION SITE AND FEATURE PLAN

McGUIRE NUCLEAR STATION
HUNTERSVILLE, NORTH CAROLINA

NO.	DATE	DESCRIPTION	BY

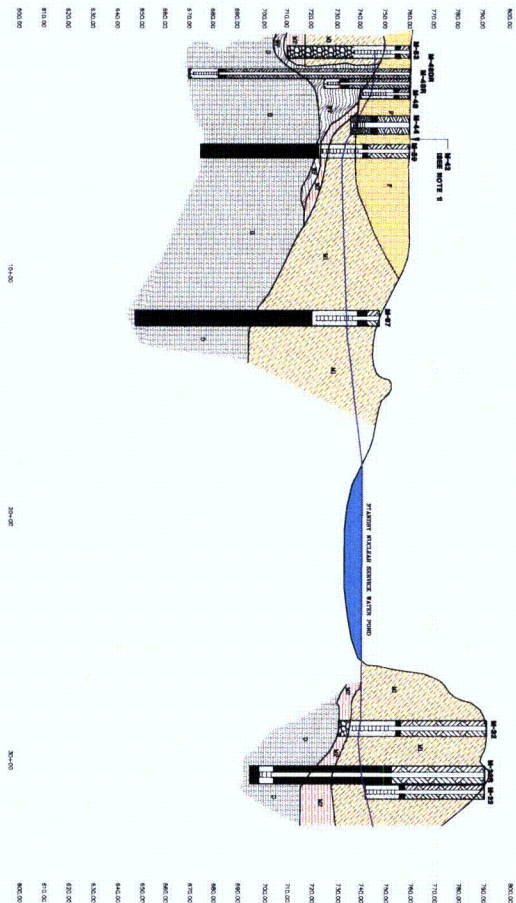
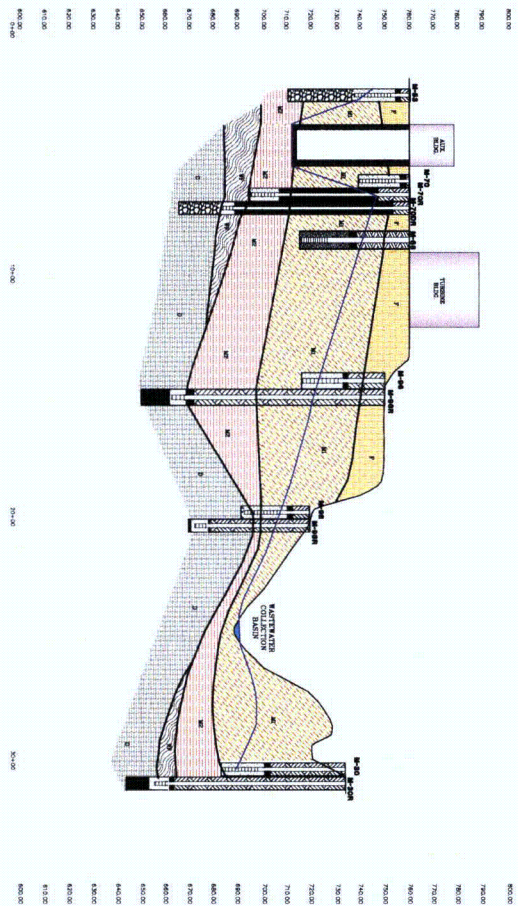






**HYDROGEOLOGIC
C-
McGUIRE N
HUNTERSVILL**





1. WELL INFORMATION NOT AVAILABLE AT TIME OF STUDY

— **DELEGATION** —

LEGEND

8	ALLUVIAL
5	TERRACE ALLUVIAL
7	FILL
6E	SOIL / MANGROVE
6E	WEATHERED ROCK
6E	PARTIALLY WEATHERED / FRACTURED ROCK

CONCRETE

**HYDROGEOLOGIC CROSS-SECTION
E-E' / F-F'**

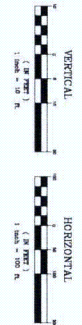
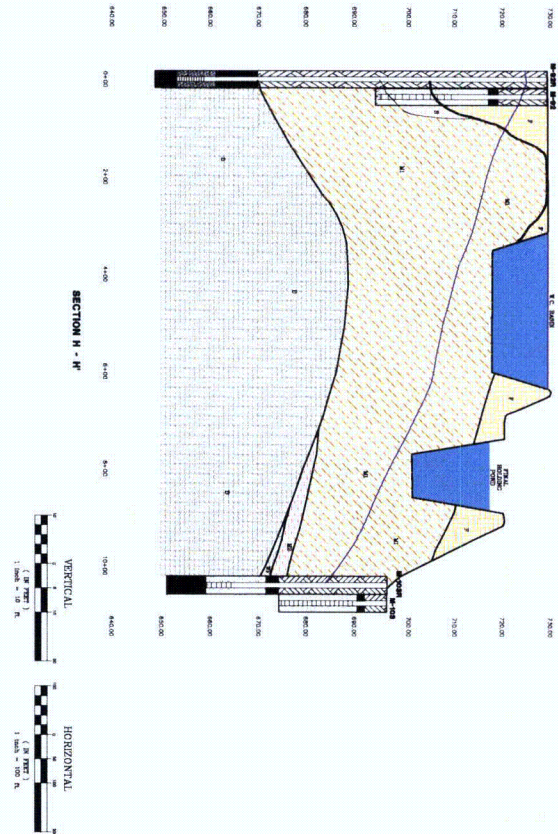
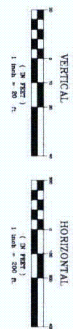
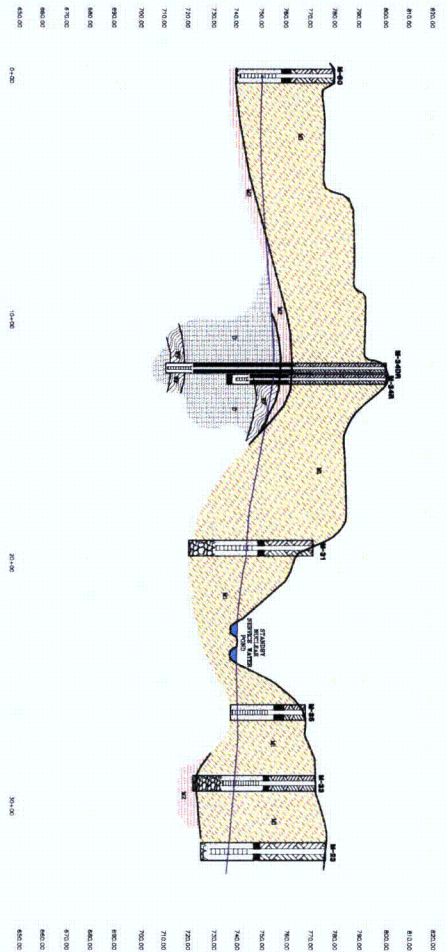
**McGUIRE NUCLEAR STATION
HUNTERVILLE, NORTH CAROLINA**

MOGUIRE NUCLEAR STATION
UNTERSVILLE, NORTH CAROLINA

MOGUIRE NUCLEAR STATION
UNTERSVILLE, NORTH CAROLINA

NO.	DATE	DESCRIPTION	BY
-----	------	-------------	----





- LEGEND**
- ALLUVIAL
 - SANDSTONE
 - LIMESTONE
 - CLAYSTONE
 - SANDSTONE
 - CLAYSTONE
 - CONCRETE
 - ROCK
 - CLAY
 - SAND
 - GRAVEL
 - COARSE SAND
 - FINE SAND
 - CLAY
 - CONCRETE



WELL NO.	DATE	WELL DEPTH	WELL TYPE	WELL STATUS
1001	2/1/2008	100.00	W	Active
1002	2/1/2008	100.00	W	Active
1003	2/1/2008	100.00	W	Active
1004	2/1/2008	100.00	W	Active
1005	2/1/2008	100.00	W	Active
1006	2/1/2008	100.00	W	Active
1007	2/1/2008	100.00	W	Active
1008	2/1/2008	100.00	W	Active
1009	2/1/2008	100.00	W	Active
1010	2/1/2008	100.00	W	Active
1011	2/1/2008	100.00	W	Active
1012	2/1/2008	100.00	W	Active
1013	2/1/2008	100.00	W	Active
1014	2/1/2008	100.00	W	Active
1015	2/1/2008	100.00	W	Active
1016	2/1/2008	100.00	W	Active
1017	2/1/2008	100.00	W	Active
1018	2/1/2008	100.00	W	Active
1019	2/1/2008	100.00	W	Active
1020	2/1/2008	100.00	W	Active

LEGEND

W - WATER WELL
 S - SURFACE WATER SAMPLING
 P - PUMPED WATER SAMPLING
 B - BOREHOLE LOCATION (NO WALL)
 0 - 0.000 VERTICAL GRADIENT (77.77)



14 15

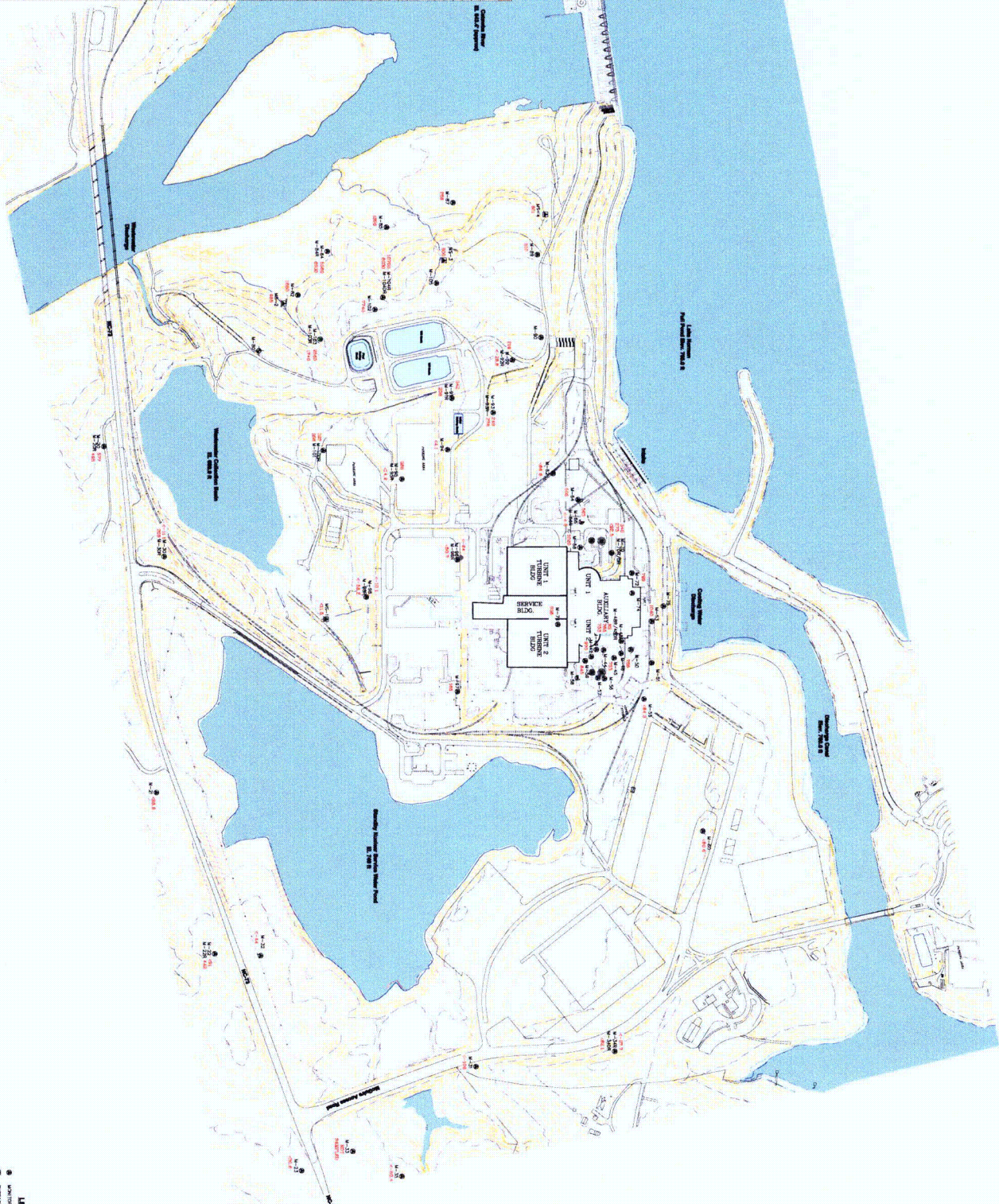
VERTICAL GRADIENTS
FEBRUARY 2008

McGUIRE NUCLEAR STATION
HUNTERVILLE, NORTH CAROLINA

NO.	DATE	DESCRIPTION	BY



WELL ID	DATE	TRITIUM (PPT)
W-1	2/22/99	40.1
W-2	2/22/99	41.3
W-3	2/22/99	46.1
W-4	2/22/99	46.1
W-5	2/22/99	50.8
W-6	2/22/99	50.8
W-7	2/22/99	50.8
W-8	2/22/99	50.8
W-9	2/22/99	50.8
W-10	2/22/99	50.8
W-11	2/22/99	50.8
W-12	2/22/99	50.8
W-13	2/22/99	50.8
W-14	2/22/99	50.8
W-15	2/22/99	50.8
W-16	2/22/99	50.8
W-17	2/22/99	50.8
W-18	2/22/99	50.8
W-19	2/22/99	50.8
W-20	2/22/99	50.8
W-21	2/22/99	50.8
W-22	2/22/99	50.8
W-23	2/22/99	50.8
W-24	2/22/99	50.8
W-25	2/22/99	50.8
W-26	2/22/99	50.8
W-27	2/22/99	50.8
W-28	2/22/99	50.8
W-29	2/22/99	50.8
W-30	2/22/99	50.8
W-31	2/22/99	50.8
W-32	2/22/99	50.8
W-33	2/22/99	50.8
W-34	2/22/99	50.8
W-35	2/22/99	50.8
W-36	2/22/99	50.8
W-37	2/22/99	50.8
W-38	2/22/99	50.8
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W-45	2/22/99	50.8
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W-62	2/22/99	50.8
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W-66	2/22/99	50.8
W-67	2/22/99	50.8
W-68	2/22/99	50.8
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W-73	2/22/99	50.8
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W-76	2/22/99	50.8
W-77	2/22/99	50.8
W-78	2/22/99	50.8
W-79	2/22/99	50.8
W-80	2/22/99	50.8
W-81	2/22/99	50.8
W-82	2/22/99	50.8
W-83	2/22/99	50.8
W-84	2/22/99	50.8
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W-86	2/22/99	50.8
W-87	2/22/99	50.8
W-88	2/22/99	50.8
W-89	2/22/99	50.8
W-90	2/22/99	50.8
W-91	2/22/99	50.8
W-92	2/22/99	50.8
W-93	2/22/99	50.8
W-94	2/22/99	50.8
W-95	2/22/99	50.8
W-96	2/22/99	50.8
W-97	2/22/99	50.8
W-98	2/22/99	50.8
W-99	2/22/99	50.8
W-100	2/22/99	50.8



LEGEND

- MONITORING WELL
- SERVICE WATER MAINS
- LOCATIONS (NO. 100)
- MONITORING WELL (NO. 100)
- MONITORING WELL (NO. 100)



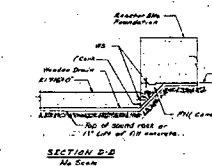
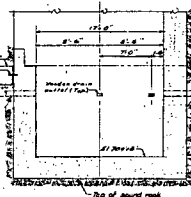
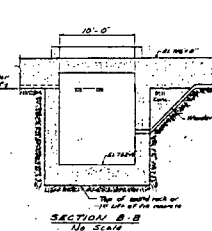
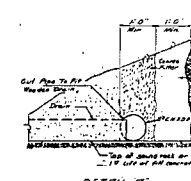
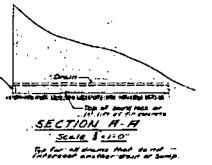
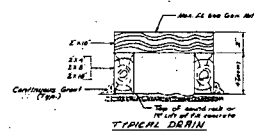
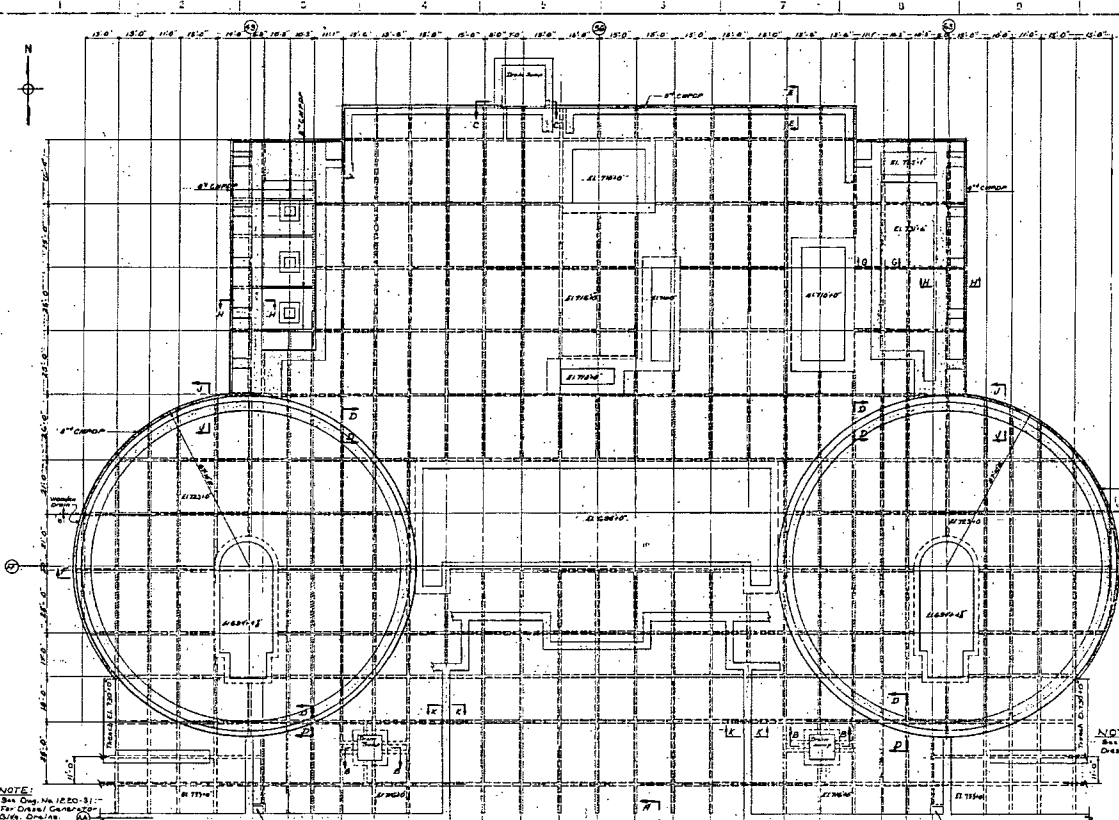
TRITIUM CONCENTRATIONS IN GROUNDWATER
FEBRUARY 2008

McGUIRE NUCLEAR STATION
HUNTERSVILLE, NORTH CAROLINA

NO. DATE DESCRIPTION BY

S&ME
www.smeinc.com

Duke Energy



NOTE: See Drawing No. 1220-31 for Details of Groundwater Drainage System.

Drainage System	Size	Amount of Material
1. Coarse	1/2"	100
	3/4"	100
	1"	100
	1 1/2"	100
	2"	100
	2 1/2"	100
	3"	100
	3 1/2"	100
	4"	100
	4 1/2"	100
	5"	100
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	6 1/2"	100
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	47 1/2"	100
	48"	100
	48 1/2"	100
	49"	100
	49 1/2"	100
	50"	100

GENERAL NOTES:

1. Groundwater Drainage System is to be fabricated in the field to fit the contour of the rock surface. Drainage is to be placed along the sides of the drain holes. Alternate in grading drain holes is to cover about 1/2" of side slope of rock surface (See Detail A) and grade the top surface of drain holes in the appropriate direction to flow.

2. Extreme care should be taken to insure that the drains are installed in the correct position and depth. The top of the drain holes should be 1/2" above the rock surface. The top of the drain holes should be 1/2" above the rock surface. The top of the drain holes should be 1/2" above the rock surface.

3. The top of the drain holes should be 1/2" above the rock surface. The top of the drain holes should be 1/2" above the rock surface. The top of the drain holes should be 1/2" above the rock surface.

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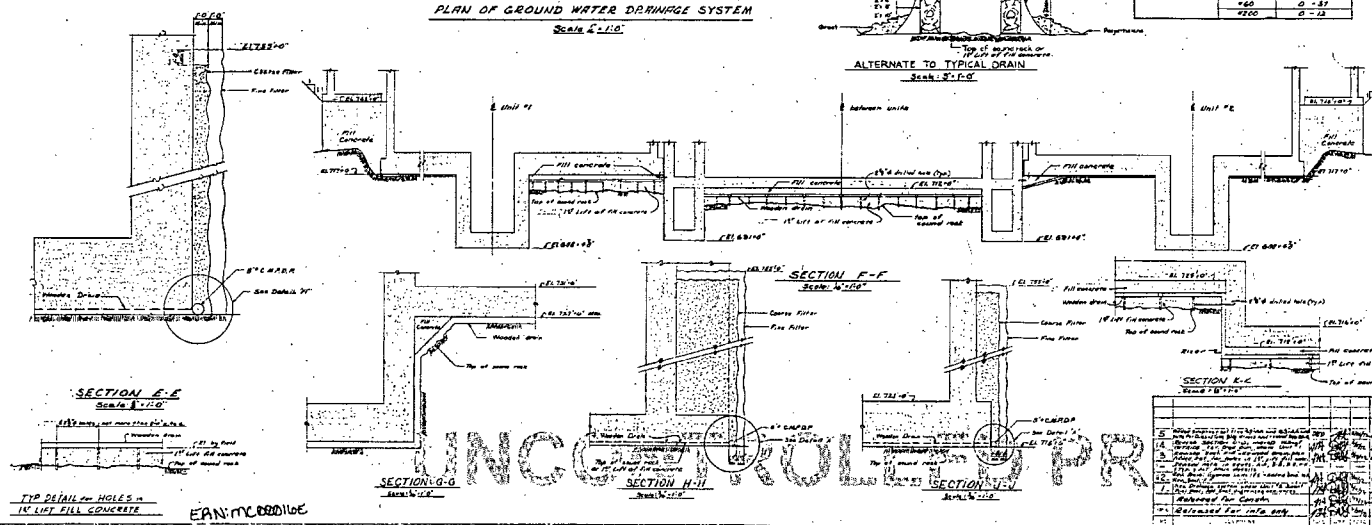
6. The top of the drain holes should be 1/2" above the rock surface. The top of the drain holes should be 1/2" above the rock surface. The top of the drain holes should be 1/2" above the rock surface.

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10. The top of the drain holes should be 1/2" above the rock surface. The top of the drain holes should be 1/2" above the rock surface. The top of the drain holes should be 1/2" above the rock surface.



REFERENCE DRAWINGS

Drawing No.	Description
1220-31	Groundwater Drainage System
1220-32	Groundwater Drainage System
1220-33	Groundwater Drainage System
1220-34	Groundwater Drainage System
1220-35	Groundwater Drainage System
1220-36	Groundwater Drainage System
1220-37	Groundwater Drainage System
1220-38	Groundwater Drainage System
1220-39	Groundwater Drainage System
1220-40	Groundwater Drainage System
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1220-95	Groundwater Drainage System
1220-96	Groundwater Drainage System
1220-97	Groundwater Drainage System
1220-98	Groundwater Drainage System
1220-99	Groundwater Drainage System
1220-100	Groundwater Drainage System

TOP DETAIL - HOLES - 1/2" DIA. FILL CONCRETE

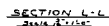
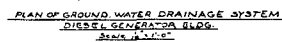
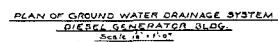
ENCLOSURE

UNCLASSIFIED

REACTOR BLDG. AND AUX. BLDG.
GROUND WATER DRAINAGE SYS.
SHEET NO. 1

MC 1220-21

M-43

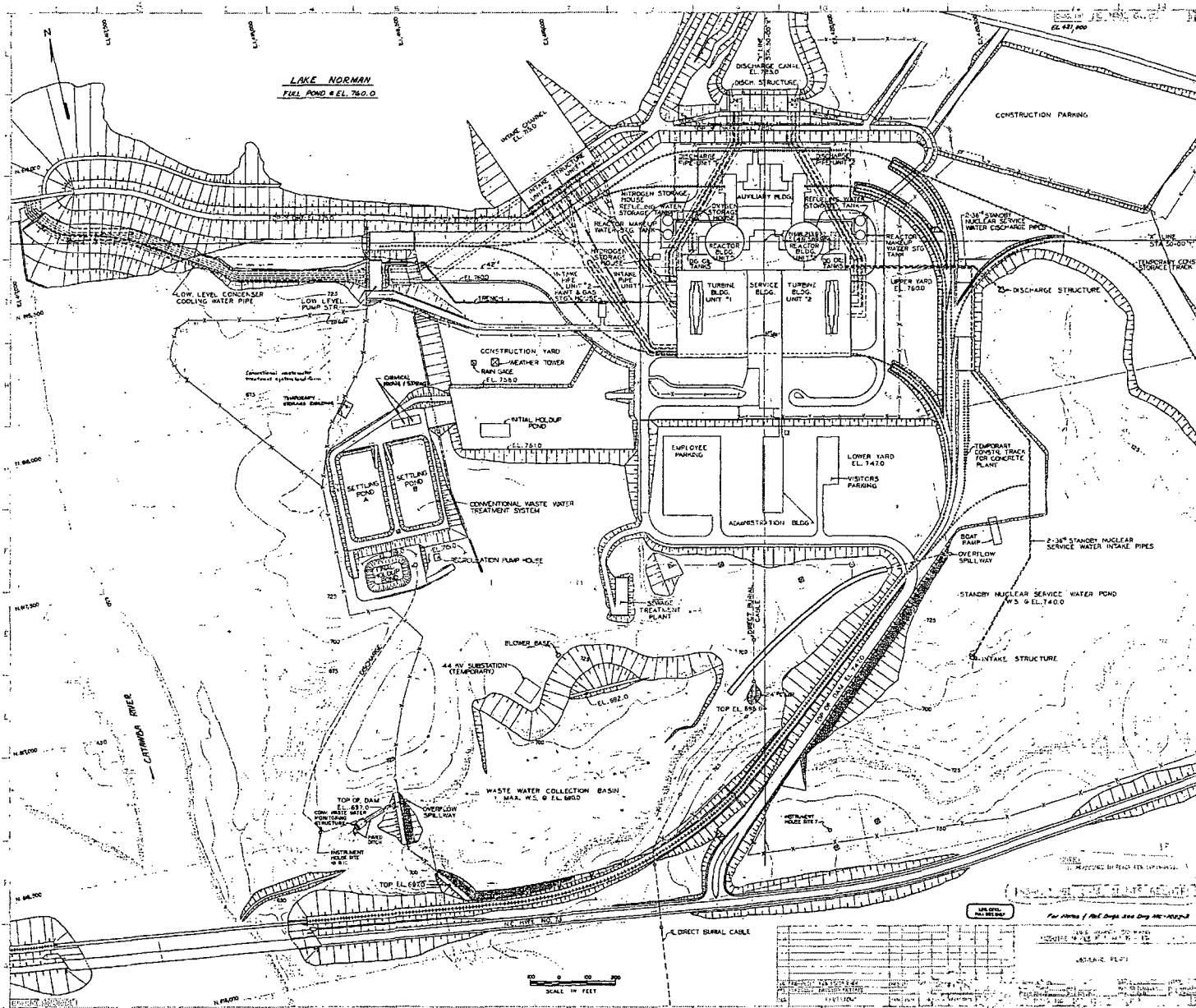


UNCONTROLLED PRINT

For General Notes, Reference Drawings, and Sections Not Shown on This Drawing, See: Dwg. MC-1220-21.

		DATE PROJECT STARTED		06/06/88	
		LOCATION OF PROJECT		REACTOR BLDG. AND AUX. BLDG.	
		PROJECT DESCRIPTION		GROUND WATER DRAINAGE SYSTEM	
		SHEET NO.		2	
Released for Construction		DATE		06/24/88	
		BY		MC-1220-31	

• EAN: mC000160



Appendix B

Source and Source Pathway Risk Assessment

B.1 Determining Groundwater Risk Profile

In order to focus on potential contaminated sources and source pathways to groundwater, a risk assessment was performed on the plant structures, systems and components (SSC). This risk assessment took into consideration four distinct aspects of these SSC and the environment in which they are located. The four distinct aspects are the hydro-geologic profile, the volume profile, the tritium profile and the engineering profile.

The risk assessment algorithm consisted of multiplying the four independently determined profile values to establish an overall groundwater risk profile. The latter two profiles, the tritium profile and the engineering profile, were given more weight in this risk assessment than the former two. The final groundwater risk profile resulted in a rank ordering of plant SSC with those higher on the list considered to be more “risky” and thus of higher importance to the Groundwater Monitoring Protection Project. Section 5.2.2 contains a summary of the plant SSC of higher importance for the purposes of this investigation.

Groundwater Risk Profile			
Profile	Profile Value	Weight	Formula
Hydro-geologic (HG)	Section B.1.1	1	Groundwater Risk (GW) Profile = Sum(Profile*Weight)/Sum(Weight)
Volume (V)	Section B.1.2	1	
Tritium (H3)	Section B.1.3	2	
Engineering (E)	Section B.1.4	2	
		Sum	6

B.1.1 Hydro-Geology Profile:

Judgments on the hydro-geologic profile were done by the Duke hydro-geologic subject matter expert. Hydro-geology profile risk ranking ranged from 1 to 5, with a higher value indicating that the structure, system, or component (SSC) has a higher risk of reaching groundwater if the contents escaped and/or discharging offsite.

Profile Definition

- 5- Located in or at groundwater
- 4- Located above groundwater but below land surface
- 3- Located at land surface on exposed soil
- 2- Located at land surface on improved surface
- 1- Facility buildings / roofs / gaseous systems (leaks self-evident)

B.1.2 Volume Profile

Judgments on the volume profile were done by the Duke Project Team as a part of developing the initial SSC listing.

Profile Definition using static liquid volume of SSC in cubic feet

- 5 – 1 million or greater cubic feet
- 4 – 100,000 to 1 million cubic feet
- 3 – 10,000 to 100,000 cubic feet
- 2 – 100 to 10000 cubic feet
- 1 – less than 100 cubic feet

B.1.3 Tritium Profile

Judgments on the tritium profile for each SSC were done by the Duke Radiation Protection subject matter experts with the criteria being the concentration and volume of contaminated water. Also considered was the change in tritium over time.

Profile Definition using tritium concentration approximations for each range (pCi/l)

- 5 – 1,000,000 pCi/l
- 4 – 500,000 pCi/l
- 3 – 1,000 pCi/l
- 2 – 10 pCi/l
- 1 – <MDA (0.25 pCi/l)

B.1.4 Engineering Profile

Judgments of the engineering profile for each SSC were done by various plant engineering experts. The following standard was used to rank the risk of groundwater contamination which could result from failure of a specific SSC, with 5 being the highest risk of contamination and 1 being the lowest risk of contamination.

- Buildings, walls, roofs, parking lots areas, pads, ramps - - risk = 1
- Sumps, trenches, catch basins, wells, pits, manholes - - risk = 4 without maintenance rating, = 3 with maintenance rating (note that the existence of a maintenance rating was identified to the project team by plant maintenance)
- Conduit - - risk = 1
- Gaseous system and components - failure of gaseous system and components is self-evident and does not contaminate groundwater - - risk = 1
- Piping systems and components inside a building - leaks contained by building sumps - - risk = 1
- Direct buried piping
 - risk = 5 for lines known to have some leakage
 - risk = 4 without maintenance rating
 - risk = 3 with maintenance rating

- risk = 2 for drinking water lines and newly replaced polyethylene lines (Catawba)
- Ponds are end points
 - risk = 5 for active ponds
 - risk = 4 for inactive ponds
- Tanks
 - risk = 1 for tanks in buildings where overflow/failure captured by building sump
 - risk = 1 for tanks outside with catch basins where overflow/failure captured by basin
 - risk = 3 for tanks outside without catch basins, but with a maintenance rating on spreadsheet
 - risk = 4 for tanks / cooling towers outside without catch basins and no maintenance rating on spreadsheet

B.1.5 Results

A full listing of the McGuire SSC Groundwater Risk Profiles is provided in Table B-1.

Table B-1
McGuire Nuclear Station
Groundwater Monitoring Protection Project
Final Source and Source Pathway Risk Assessment Results

SSC	Description	Vol	Plant	H3	Engg	HG	GW	Comments
RN	SNSWPond	5	3	2	5	5	4	Total pond = 500 ac-ft Collected at boat ramp
RN	SNSWPond	5	4	2	5	5	4	Total pond = 500 ac-ft Collected at boat ramp
WC	Waste Wtr Collection Basin	5	4	2	5	5	4	
WC	WC-Final Hld Pond	4	4	3	5	5	4	Use Well -RPMW-102, ~ 100 feet south west of Settling Pond "A"
WC	WC-Pond A	4	4	3	5	5	4	Use Well -RPMW-102, ~ 100 feet south west of Settling Pond "A"
WC	WC-Pond B	4	4	3	5	5	4	Use Well -RPMW-102, ~ 100 feet south west of Settling Pond "A"
RC	Discharge Canal	5	6	2	5	5	4	REMP Location 128, Discharge Canal Surface Water
	Lake Norman - CF Dam	5	7	2	5	5	4	REMP Location 131, Cowan's Ford Dam Surface Water
	Lake Norman - N Meck Pit	5	7	2	5	5	4	REMP Location 101, N. Meck. Drinking Water Plant
	Catawba River - Mt. Isind	5	8	2	5	5	4	REMP Location 132, Charlotte Drinking Water Plant, Mountain Island Lake
WC	WC-Int Hld Pond	3	4	3	5	5	4	Use Well -RPMW-102, ~ 100 feet south west of Settling Pond "A"
WT	Landfarm #1 - Closed - Site Side, West of	5	4	2	5	4	4	Sewage waste
IW	Landfill #1 - Closed	5	5	1	5	5	4	Construction waste
WT	Landfarm #2 - Closed	5	5	2	5	4	4	Fenced in, waste=sewage and waste oil clean up
KF	Spent Fuel Pool U-1	3	0	4	2	5	4	SFP
KF	Spent Fuel Pool U-2	3	0	4	2	5	4	SFP
WL	WEFT Sump A	2	0	4	4	4	4	
WL	WEFT Sump B	2	0	4	4	4	4	
	Radwaste Facility Bldg Sump	2	1	4	4	4	4	2-50K gallon steel tanks in building
WZ	Turbine Bldg U1 - Drain Box (12' X 12')	2	0	3	3	5	3	Sumps flooded in 2000, crack in U2 RC piping at edge of building.
WZ	Turbine Bldg U1 - wooden drain	2	0	3	3	5	3	
WZ	Turbine Bldg U2 - Drain Box (12' X 12')	2	0	3	3	5	3	Sumps flooded in 2000, crack in U2 RC piping at edge of building.
WZ	Turbine Bldg U2- wooden drain	2	0	3	3	5	3	
WZ	Turbine Bld U1 - French Drain	2	1	3	3	5	3	
WZ	Turbine Bld U2 - French Drain	2	2	3	3	5	3	
WZ	Turbine Bldg U1 - sump piping (to south of	3	4	3	3	4	3	
WZ	Turbine Bldg U2 - sump piping (to south of	3	4	3	3	4	3	
WZ	WZ-Wooden Drain	2	0	3	3	5	3	2000 - PIP 1999-13-66, Flood out WZ, smell like kerosene (Bob Johnson)
WZ	WZ-Wooden Drain	2	0	3	3	5	3	2001 - PIP 1999-13-66, Flood out WZ, smell like kerosene (Bob Johnson)
RC	CCW - Discharge Piping U1	4	1	2	3	4	3	Pipe inspection / 5 years, (Brian Lukowski) REMF Location 128, Discharge Canal Surface Water
RC	CCW - Intake piping 9.3' U1&U2	4	1	2	3	4	3	Pipe inspection / 5 years, (Brian Lukowski) REMF Location 131, Cowan's Ford Dam Surface Water
RC	CCW - Discharge Piping U2	4	2	2	3	4	3	Pipe inspection / 5 years, (Brian Lukowski) REMF Location 128, Discharge Canal Surface Water
RC	LLC-piping after Pump	4	4	2	3	4	3	Pipe inspection / 5 years, (Brian Lukowski)
RC	LLC-piping to Pump	4	4	2	3	4	3	Pipe inspection / 5 years, (Brian Lukowski)
CF	Main Feedwater U-1	4	0	3	2	4	3	Some exposure outside to Dog House, if leak to Turbine Sump or WZ Sump A or B.
CF	Main Feedwater U-2	4	0	3	2	4	3	Some exposure outside to Dog House, if leak to Turbine Sump or WZ Sump A or B.
WL	Floor Drain Tank (FDT) Sump Tank	2	0	3	4	4	3	Concrete
WZ	WZ-Sump B	2	0	3	4	4	3	10'X10', to turbine bldg sump to Initial hold up pond
WZ	WZ-Sump C	2	0	3	4	4	3	1999 - PIP 1999-13-66, Flood out WZ, smell like kerosene (Bob Johnson), to yard drain to SNSWP
FW	Refueling Water supply piping U1	2	1	4	3	4	3	In Refueling Piping Trench
RC	CCW - Intake piping 11' U1&U2	3	1	2	4	4	3	Pipe inspection / 5 years, (Brian Lukowski) REMF Location 131, Cowan's Ford Dam Surface Water
RC	CCW - Intake piping 13' U1&U2	3	1	2	4	4	3	Pipe inspection / 5 years, (Brian Lukowski) REMF Location 131, Cowan's Ford Dam Surface Water
RC	CCW - Intake piping 18.5' U1&U2	3	1	2	4	4	3	Pipe inspection / 5 years, (Brian Lukowski) REMF Location 131, Cowan's Ford Dam Surface Water
RC	LLC-Intake	3	1	2	4	4	3	Pipe inspection / 5 years, (Brian Lukowski) REMF Location 131
RC	LLC-piping after Pump	3	1	2	4	4	3	Pipe inspection / 5 years, (Brian Lukowski) REMF Location 131
WY	Perf CMP pipe	2	1	2	5	4	3	
WY	Railroad Track drain	2	1	2	5	4	3	
WY	Yard Drainage	3	1	2	4	4	3	
WZ	French Drain pipe, CMPDP U1 Rx Bldg	2	1	2	5	4	3	
FW	Refueling Water supply piping U2	2	2	4	3	4	3	In Refueling Piping Trench
WY	Perf CMP pipe	2	2	2	5	4	3	
WY	Railroad Track drain	2	2	2	5	4	3	
WY	Yard Drainage	3	2	2	4	4	3	
WZ	French Drain pipe, CMPDP U2 Rx Bldg	2	2	2	5	4	3	
WY	Railroad Track drain	2	3	2	5	4	3	
WY	Yard Drainage	3	3	2	4	4	3	
WT	Sewage Treatment Lagoon - Closed	2	4	2	5	4	3	Use WT effluent sample
WY	Yard Drainage	3	4	2	4	4	3	Runs from TB to LL intake
IW	Landfill #2 - Lined	5	5	2	1	5	3	
WZ	WZ-Sump A	2	0	3	3	4	3	10'X10', to turbine bldg sump to Initial hold up pond
WC	WC - buried pipe to effluent from final pond	2	4	3	3	4	3	
WP	Turbine Bldg Sump- U1	2	0	3	2	5	3	
WP	Turbine Bldg Sump- U2	2	0	3	2	5	3	
FW	Refueling Pipe Trench	1	1	4	4	3	3	Sample: North of U-1 Rx. Bldg. between Radwaste Facility and Solid. Pad
FW	Refueling Water sump piping U1	1	1	4	3	4	3	
NB	Rx Makeup Water Storage Tank U-1	3	1	4	2	3	3	RMWST
RY	Fire Protection Piping	2	1	2	4	4	3	Exterior piping ductile iron w/ cement coating
WP	Turbine Bldg Sump pipe to IHUP	2	1	3	3	4	3	
WY	Waste Oil Tank	2	1	1	4	5	3	Ops owner
FW	Refueling Pipe Trench	1	2	4	4	3	3	Sample: North of U-1 Rx. Bldg. between Radwaste Facility and Solid. Pad
FW	Refueling Water sump piping U2	1	2	4	3	4	3	

Table B-1
McGuire Nuclear Station
Groundwater Monitoring Protection Project
Final Source and Source Pathway Risk Assessment Results

SSC	Description	Vol	Plant	H3	Engg	HG	GW	Comments
NB	Rx Makeup Water Storage Tank U-2	3	2	4	2	3	3	RMWST
RN	SNSWP-Intake piping	3	2	2	3	4	3	Inspected w/ additional inspections in 2007 and 2008 planned (Ann Milton), sample collected at boat ramp
RY	Fire Protection Piping	2	2	2	4	4	3	Exterior piping ductile iron w/ cement coating
RY	Fire Protection Piping	2	3	2	4	4	3	Exterior piping ductile iron w/ cement coating
WY	Perf CMP pipe	1	3	2	5	4	3	
WY	Transformer Stations	2	3	2	5	3	3	
RN	Aux Nuc Ser Wtr	3	4	2	3	4	3	Well locations can assist in inspection of RN leakage from plant to low level intake (Ann Milton).
RN	SNSWP - Ditch	3	4	2	4	3	3	Collected at boat ramp
RN	SNSWP-Intake piping	3	4	2	3	4	3	Inspected w/ additional inspections in 2007 and 2008 planned (Ann Milton), sample collected at boat ramp
RY	Fire Protection Piping	2	4	2	4	4	3	Exterior piping ductile iron w/ cement coating (Kent Davis)
WC	WC piping	2	4	3	3	4	3	Use Well -RPMW-102, ~ 100 feet south west of Settling Pond "A"
WC	WC piping	2	4	3	3	4	3	Use Well -RPMW-102, ~ 100 feet south west of Settling Pond "A"
WT	WT Effluent	1	4	2	5	4	3	Collected at lift station near old sewage treatment plant
WY	Yard Drainage	2	4	2	4	4	3	Old Yard south of MOC
WY	Yard Drainage	2	4	2	4	4	3	MOC Parking & Yard to SNSWP
WY	Yard Drainage	2	4	2	4	4	3	??? Discharge into ditch behind abandoned parking lot, south of lower lot - 2-3 pipes
WY	Yard Drainage	2	4	2	4	4	3	??? Discharge at LL intake - 2-3 pipes
	On-site Well -#31	1	4	1	5	5	3	To east of main access road
WY	Switch Yard septic drainfield	2	5	1	5	4	3	
YD	Ballfield - GW well	1	5	1	5	5	3	
WY	Yard Drainage	2	6	2	4	4	3	Number discharge into lake.
	GW Well#2 - not used	1	6	1	5	5	3	Between Training Simulator Building & lake
WL	WEFT Tank	2	0	4	1	4	3	U2 Aux Bldg EI-716
NC	Rx. Coolant U-1	4	0	5	1	1	3	
NC	Rx. Coolant U-2	4	0	5	1	1	3	
WL	Floor Drain Tank (FDT) Sump - A	2	0	3	2	4	3	Recirculates WL water, sump could leak to Groundwater, normal flow to Floor Drain to RC. EI-710
WL	Floor Drain Tank (FDT) Sump - B	2	0	3	2	4	3	Recirculates WL water, sump could leak to Groundwater, normal flow to Floor Drain to RC. EI-710
WP	Turbine Bldg Sump pipe to ext of bldg	2	0	3	2	4	3	
FW	Fueling Water Storage Tank U-1	3	1	4	2	2	3	FWST
RN	Aux Nuc Ser Wtr	2	1	2	3	4	3	Well locations can assist in inspection of RN leakage from plant to low level intake (Ann Milton).
WC	WC piping	1	1	3	3	4	3	Use Well -RPMW-102, ~ 100 feet south west of Settling Pond "A"
WL	IRF - Pipe Trench & Sumps	1	1	3	3	4	3	
WT/SS	Sewage System	2	1	2	3	4	3	Use WT effluent sample
WY	Aux Bldg Exterior Roof	3	1	2	5	1	3	Use Aux Bldg Security Shack A/C sample
WY	Svsc Bldg Exterior Roof	3	1	2	5	1	3	Sample: North of U-1 Rx. Bldg. between Radwaste Facility and Solid. Pad
WY	Trash Compactor	2	1	2	5	2	3	
WY	Turbine Bldg 2 Exterior Roof	3	1	2	5	1	3	Use Aux Bldg Security Shack A/C sample
WY	Wash Pad	2	1	2	5	2	3	
FW	Fueling Water Storage Tank U-2	3	2	4	2	2	3	FWST
RN	SNSWP-Discharge Piping	2	2	2	3	4	3	Inspected w/ additional inspections in 2007 and 2008 planned (Ann Milton), sample collected at boat ramp
WT/SS	Sewage Lift Station	2	2	2	3	4	3	Use WT effluent sample
WT/SS	Sewage System	2	2	2	3	4	3	Use WT effluent sample
WY	Aux Bldg Exterior Roof	3	2	2	5	1	3	Use Aux Bldg Security Shack A/C sample
WY	North Admin Bldg Roof	3	2	2	5	1	3	Use Aux Bldg Security Shack A/C sample
WY	Parking Lot	2	2	2	5	2	3	
WY	Svsc Bldg Exterior Roof	3	2	2	5	1	3	Sample: North of U-1 Rx. Bldg. between Radwaste Facility and Solid. Pad
WY	Transfer Station Apron	2	2	2	5	2	3	
WY	Turbine Bldg 1 Exterior Roof	3	2	2	5	1	3	Use Aux Bldg Security Shack A/C sample
WY	Warehouse Area	2	2	1	5	3	3	
RN	SNSWP - Discharge Piping	2	3	2	3	4	3	Inspected w/ additional inspections in 2007 and 2008 planned (Ann Milton), sample collected at boat ramp
RN	SNSWP - Ditch	2	3	2	4	3	3	Collected at boat ramp
RN	SNSWP-Intake piping	2	3	2	3	4	3	Inspected w/ additional inspections in 2007 and 2008 planned (Ann Milton), sample collected at boat ramp
WT/SS	Sewage System	2	3	2	3	4	3	Use WT effluent sample
WY	Admin Bldg Roof	3	3	2	5	1	3	Use Aux Bldg Security Shack A/C sample
WY	Parking Lot	2	3	2	5	2	3	
WT/IW	Ind. Waste Pipe	2	4	2	3	4	3	
WT/SS	Sanitary Pipe (Hwy73 to SS9)	2	4	2	3	4	3	
WT/SS	Sanitary Pipe (SS9 to City)	2	4	2	3	4	3	
WY	Employee Parking	3	4	1	5	2	3	
IW	Landfill #2 - Leachate Pond	3	5	2	1	5	3	
SS	Ballfield - septic drainfield	1	5	1	5	4	3	
WY	Switch Yard - 500KV & 250KV	2	5	1	5	3	3	Drain to creek to lake
WT/IW	Ind. Waste Pipe	2	6	2	3	4	3	
WT/SS	Sanitary Pipe (SS1 to SS5)	2	6	2	3	4	3	
WY	Parking Lot	2	6	2	5	2	3	
CA	CA Tank	4	1	3	2	1	3	OPS - Owner, added ~2002
WO	Diesel Fuel Oil Tank (UG)	2	1	1	2	5	3	
WY	Hot Machine Shop Roof	2	1	2	5	1	3	
WY	Reactor Bldg 1 Exterior Roof	2	1	2	5	1	3	Use Aux Bldg Security Shack A/C sample
WY	Solidification Pad-RW	1	1	2	5	2	3	

Table B-1
McGuire Nuclear Station
Groundwater Monitoring Protection Project
Final Source and Source Pathway Risk Assessment Results

SSC	Description	Vol	SSC	H3	Engg	HG	GW	Comments
WY	Waste Solid. Bldg Roof	2	1	2	5	1	3	
	Radwaste Facility Tanks	4	1	3	2	1	3	2-50K gallon steel tanks in building
	Tank Roof - CA U1	2	1	2	5	1	3	
	Tank Roof - FWST U1	2	1	2	5	1	3	
	Tank Roof - RMWST U1	2	1	2	5	1	3	
CA	CA Tank	4	2	3	2	1	3	OPS - Owner, added ~2003
WO	Diesel Fuel Oil Tank (UG)	2	2	1	2	5	3	
WY	Hot Machine Shop Roof	2	2	2	5	1	3	
WY	Office Shop Bldg Roof	2	2	2	5	1	3	Use Aux Bldg Security Shack A/C sample
WY	Reactor Bldg 2 Exterior Roof	2	2	2	5	1	3	Use Aux Bldg Security Shack A/C sample
	Tank Roof - CA U2	2	2	2	5	1	3	
	Tank Roof - FWST U2	2	2	2	5	1	3	
	Tank Roof - RMWST U2	2	2	2	5	1	3	
WY	Gas Pumps	1	3	2	4	3	3	Removed
WY	Machine Shop Roof	2	3	2	5	1	3	
WY	Security Trench	1	3	1	5	3	3	
IW	Landfill #2 - pipe (poly) to Initial Holdup Pond	2	4	2	2	4	3	
IW	Landfill #2 - pipe (poly) to Initial Holdup Pond	2	5	2	2	4	3	
IW	Leachate Pipe (poly)	2	5	2	2	4	3	
WY	Parking Lot	1	5	2	5	2	3	
	Firing Range	1	5	1	5	3	3	
WY	Energy Explorium Roof	3	6	1	5	1	3	
WY	Training & Office Roof	3	6	1	5	1	3	
VP	Cont. Purge Vent-1	1	1	2	5	1	2	
WY	Cable Trench	1	1	1	4	3	2	
WY	Radwaste Facility Roof	1	1	2	5	1	2	
WY	Standby Shutdown Fac Roof	1	1	2	5	1	2	
WY	Transporter Strg Bldg Roof	2	1	1	5	1	2	
YD	Drinking Water Piping	2	1	1	2	4	2	
VP	Cont. Purge Vent-2	1	2	2	5	1	2	
WY	Cable Trench	1	2	1	4	3	2	
WY	EQ Staging Bldg Roof	2	2	1	5	1	2	
WY	Radiographic Shooting Vault	1	2	2	5	1	2	
YD	Drinking Water Piping	2	2	1	2	4	2	
WY	Conduit Bank	1	3	1	4	3	2	
WY	QA Shooting Vault	1	3	2	5	1	2	
YD	Drinking Water Piping	2	3	1	2	4	2	
WY	Cable Trench	1	4	1	4	3	2	
WY	Storm Trench	1	4	1	4	3	2	
YD	Drinking Water Piping	2	4	1	2	4	2	
IW	Garage pipe to landfill pump	2	5	1	2	4	2	
SS	Garage sanitary pipe	1	5	2	2	4	2	
YD	Drinking Water Piping	2	6	1	2	4	2	
NS	NS / ND Sump - Aux Bldg		0	4		4	2	
WL	Floor Drain Tank (FDT) Sump D		0	4		4	2	In U2 CA Pump Room, EI-716
WL	Staging Bldg Sump		0	4		4	2	
WZ	French Drains -U1 Diesel Gen. Bldg		1	3		5	2	
WZ	French Drains - U2 Diesel Gen. Bldg		2	3		5	2	
WY	Caustic Soda & Sulfuric Acid Unld'g	1	3	1	4	2	2	
WY	Chemical Mixing & Strg Roof	1	4	1	5	1	2	
SS	Bathhouse	1	5	1	5	1	2	
WL	Floor Drain Tank (FDT) Sump C		0	3		4	2	In U1 CA Pump Room, EI-716
	Refueling Canal		0	4	3		2	
WL	Decon Eq Sump		0	2		4	2	EL 760'
WL	Laundry Hot Shower Tank (LHST) Sump		0	2		4	2	LHST - Laundry Hot Shower Tank EL 760'
	Fuel Transfer Tube	2	0		4		2	
WL	WL Trench 733'		0	2		3	1	
	In Core Room U1		0	4		1	1	Dry, if leak from Core, lowest elevation
	In Core Room U2		0	4		1	1	Dry, if leak from Core, lowest elevation
	Dry Cast Storage - Full	2	1	1		2	1	
	Dry Cast Storage - Empty	2	2	1		2	1	
	OSF Roof	2	2	2		1	1	
WU	Condensor Drain U1		0				0	
WU	Condensor Drain U2		0				0	
	Floor Drain Tank		0					
	Waste Drain Header (WDT)		0					
	WMT A & B		0					
	IRF - Sump		1					IRF - Interim Radwaste Facility

Duke Energy - McGuire Nuclear Station
Existing Well ID Renumbering Reference Table
S&ME Project No. 1264-06-724



Original Well ID	Renumbered Well ID*
T-1	M-58
T-2	M-57
T-3	M-56
T-5	M-44
T-6	M-45
T-7	M-46
T-10	M-51
T-13	M-50
T-14	M-72
W-1	M-90
W-2	M-89
W-4	M-87
W-5	M-105
W-15	M-75
W-22	M-74
W-42	M-42
W-43	M-43
W-44	M-68
RPMW-1	M-101
RPMW-2	M-102

* - Wells were renumbered as part of the Ground Water Protection Initiative Project at McGuire Nuclear Station

XC: DEMS
Ret: RJW

DUKE POWER COMPANY
NUCLEAR PRODUCTION DEPARTMENT
P.O. BOX 33189, 422 SOUTH CHURCH STREET
CHARLOTTE, N.C. 28242
(704) 373-4011

JRH-WJM-DHS-R

December 22, 1988

Dr. Eric J. Klingel
Regional Hydrogeologic Supervisor
Department of Natural Resources and
Community Development
Mooresville Regional Office
P.O. Box 950
Mooresville, N.C. 28115

RECEIVED ENVIRONMENTAL/ADMINISTRATIVE SECTION DEC 27 1988 CENTRAL RECORDS/DIVISION USE NO ATTACHMENT TO FILE FILE NO. ENV-0311
--

SUBJECT: McGuire Nuclear Station
Monitoring Well Permit
No. 59-0667-WM-0183 Well #W-44
File: MC-216.14

Dear Dr. Klingel:

As required by the subject permit, attached is the completed GW-1 for the groundwater monitoring well #W-44 located at McGuire Nuclear Station.

Also, as required by the permit, listed below are the results of the water quality analysis performed on this well.

<u>Date</u>	<u>Parameter</u>	<u>Results</u>
10/31/88	tritium	<350 pCi/liter
11/7/88	tritium	<350 pCi/liter
11/14/88	tritium	<350 pCi/liter

Please note that tritium was the only parameter for which an analysis was conducted.

If you have any questions please contact Tami Story (704) 373-7016 or Mitch Griggs at (704) 373-7080.

Sincerely,

RT Simril/lyg

R.T. Simril, Technical System Manager
Nuclear Environmental Compliance

TRS/77/rhm

Attachment

bc: R.P. Michael
R.J. Waldrop
D.W. Phillips
M.L. Birch

W.T. Horton
M.C. Griggs
Staff (route)
MC-2002.02-13

Quad. No. _____ Serial No. _____
 Lat. _____ Long. _____ Pc _____
 Minor Basin _____
 Basin Code _____
 Header Ent. _____ GW-1 Ent. _____

DRILLING CONTRACTOR DUKE POWER CO.
DRILLER REGISTRATION NUMBER 921

STATE WELL CONSTRUCTION
PERMIT NUMBER: 59-0667-WM-0183

- | Depth | | DRILLING LOG |
|-------|----|-----------------------|
| From | To | Formation Description |

- SEE ATTACHED FORM
M-26C

- If additional space is needed use back of form.

14. REMARKS:

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

H A Jones

11-14-88

THIS BORING DRILLED
WITH ACKER AD-II 19727DUKE POWER COMPANY
CONSTRUCTION DEPARTMENT
PROJECT MCGUIRE

PAGE 1 OF 2

46 + 92.526 "X"
49 + 64.438 "Y"

TOP OF PIPE EL. 759.80

SOIL TEST BORING FIELD REPORT

JOB NO. N/ASTARTING TIME N/AJOB NAME GROUND WATER MONITOR WELLGROUND SURFACE ELEV. 760.00HRS. DRILLING N/A HRS. MOVING N/ADATE 10-26-88WEATHER P.C. - COOLINSPECTOR S. TATUMBORING NO. W-44

SAMPLING				SCALE	UD	SOIL CLASSIFICATION AND REMARKS
1ST 6"	2ND 6"	3RD 6"				
				0		
						CHEMIST FROM MCGUIRE NUCLEAR STATION
						RETAINED SAMPLE
1	4.2'	3	5	6	5	
	5.7'					
2	9.2'	5	6	7	10	
	10.7'					
3	14.2'	5	6	7	15	
	15.7'					
4	19.2'	3	4	11	20	
	20.7'					NO RECOVERY, WENT BACK IN AND TRIED TO RETRIEVE
						SAMPLE, STILL NO RECOVERY
5	24.2'	4	4	5	25	
	25.7'					
6	29.2'	3	3	5	30	
	30.7'					
7	34.2'	3	3	8	35	
	35.7'					
8	39.2'	6	9	14	40	
	40.7'					

BORING TERMINATED @ 44.9'BORING REFUSAL @ 44.9'WATER TOB DEPTH N/AWATER 24 HR. DEPTH N/AWATER LOSSES N/ACASING SIZE N/A LENGTH N/A

METHOD OF ADVANCING BORING

DEPTH

POWER AUGER

0.0' TO 44.9'

HAND CHOP: W/MUD. W/WATER

TO

ROTARY DRILL: W/MUD. W/WATER

TO

DIAMOND CORE

TO

+ STANDARD PENETRATION RESISTANCE IS SUM OF BLOWS FOR 2ND 6" AND 3RD 6" TO DRIVE
1-3/8" I.D., 2" O.D. SPLIT BARREL SAMPLER WITH 140 POUND HAMMER FALLING 30 INCHES

**DUKE POWER COMPANY
CONSTRUCTION DEPARTMENT
PROJECT McGUIRE**

SOIL TEST BORING FIELD REPORT

JOB NO. N/A

STARTING TIME N/A

GROUND SURFACE ELEV. NA

JOB NAME GROUND WATER MONITORING WELL

HRS. DRILLING N/A HRS. MOVING N/A

DATE 10-26-88

WEATHER P.C. - COOL

INSPECTOR S. TATUM

BORING NO. W-44

SAMPLING			SCALE	UD	SOIL CLASSIFICATION AND REMARKS
	1ST 6"	2ND 6"			
			40		
9	44.2'	50 ± 5"	45		AUGER REFUSAL @ 44.9'
	44.6'				BORING TERMINATED @ 44.9'
			50		
			55		
			60		
			65		
			70		
			75		
			80		

BORING TERMINATED @ 44.9'

BORING REFUSAL @ 44.9'

WATER TOB DEPTH 43.0' 2:45 P.M. 10-26-88*

WATER 24 HR: DEPTH 25.37' 8:30 A.M. 10-27-88*

WATER LOSSES N/A

CASING SIZE N/A LENGTH N/A

METHOD OF ADVANCING BORING	DEPTH
POWER AUGER	0.0' TO 44.9'
HAND CHOP: W/MUD: W/WATER	TO
ROTARY DRILL: W/MUD: W/WATER	TO
DIAMOND CORE	TO

+ STANDARD PENETRATION RESISTANCE IS SUM OF BLOWS FOR 2ND 6" AND 3RD 6" TO DRIVE 1-3/8" I.D., 2" O.D. SPLIT BARREL SAMPLER WITH 140 POUND HAMMER FALLING 30 INCHES

* 44.9' BORING DEPTH



June 15, 2005

Duke Energy
P.O. Box 1006
Charlotte, North Carolina 28201

ATTENTION: Mr. D. Edwin M. Sullivan, P.E.

Reference: **NCDENR WELL CONSTRUCTION RECORDS
FOR RPMW-101 AND RPMW-102
McGuire Nuclear Station
Huntersville, North Carolina
S&ME Project No. 1264-05-349**

Dear Mr. Sullivan:

S&ME, Inc. (S&ME) has completed the drilling and installation of two groundwater monitoring wells at the McGuire Nuclear Station. We are pleased to distribute the attached and completed North Carolina Department of Environment and Natural Resources (NCDENR) *Well Construction Records (GW-1 Rev. 09/2004)* for reference and record.

S&ME appreciates this and every opportunity we have to be of service to Duke Energy. We trust this information is responsive to your needs at this time. Should you have questions, require additional information, or desire our assistance further, please do not hesitate to give us a call.

Sincerely,

S&ME, Inc.

Scott E. Dacus, P.G.
Project Geologist

Larry Armstrong, P.E.
Senior Engineer/Project Manager

cc: NCDENR, Division of Water Quality, Attn: Information Management

Attachments: *Well Construction Record for RPMW-101*
Well Construction Record for RPMW-102

S:\ENVIRON\2005\PROJECTS\6405349\NCDENR Well Construction Records (GW-1).doc

S&ME, Inc.
155 Tradd Street
Spartanburg, South Carolina 29301

(864) 574-2360
(864) 576-8730 fax
(864) 232-8987 Greenville

www.smeinc.com

WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR (INDIVIDUAL) NAME (print) Bill Cole CERTIFICATION # 2244
 WELL CONTRACTOR COMPANY NAME S&ME, Inc. PHONE # 844 574-2360
 STATE WELL CONSTRUCTION PERMIT# _____ ASSOCIATED WQ PERMIT# _____
 (if applicable) (if applicable)

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐
 Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use _____

2. WELL LOCATION:
 Nearest Town: Huntersville County Mecklenburg
McGuire Nuclear Station
 (Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Topographic/Land setting
☐ Ridge ☐ Slope ☐ Valley ☒ Flat
 (check appropriate box)

Latitude/longitude of well location

N35/25/48.93 W80/57/5.45

(degrees/minutes/seconds)

Latitude/longitude source: ☐ GPS ☒ Topographic map
 (check box)

3. OWNER: Duke Power Company
 Address 12700 Hagers Ferry Road
 (Street or Route No.)
Huntersville NC 28078
 City or Town State Zip Code
(980) 373-3719
 Area code- Phone number

DEPTH

From	To
0	18.5
18.5	24.8
24.8	25.0
25.0	33.5
33.5	42.0
42.0	

DRILLING LOG

Formation Description

slty clay
 clayey silt
 sand
 sandy silt
 sand
 refusal to hollow stem
 augers

4. DATE DRILLED 5/23 & 5/24/05

5. TOTAL DEPTH: 42 feet

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

7. STATIC WATER LEVEL Below Top of Casing: 31.64 FT.
 (Use "+" if Above Top of Casing)

8. TOP OF CASING IS 2.64 FT. Above Land Surface*
 *Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.

9. YIELD (gpm): _____ METHOD OF TEST _____

10. WATER ZONES (depth): _____

11. DISINFECTION: Type _____ Amount _____

12. CASING: Wall Thickness or Weight/l't. Material

Depth	Diameter	Material
From <u>2.64</u> als To <u>22</u> Ft. <u>2</u> in. Sch 40 PVC		
From _____ To _____ Ft. _____		
From _____ To _____ Ft. _____		

13. GROUT: Depth Material Method

From <u>0</u> To <u>18</u> Ft. <u>Portland Cement</u> Tremie	
From _____ To _____ Ft. _____	

14. SCREEN: Depth Diameter Slot Size Material

From <u>22</u> To <u>42</u> Ft. <u>2</u> in. <u>0.01</u> in. PVC	
From _____ To _____ Ft. _____ in. _____ in. _____	

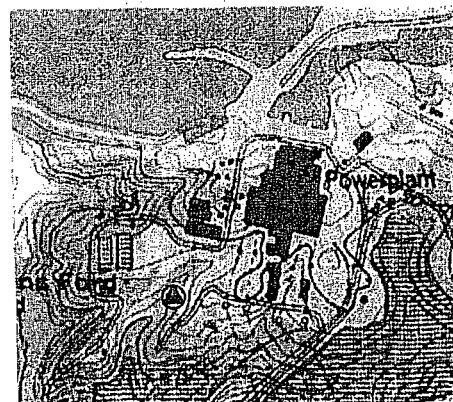
15. SAND/GRAVEL PACK: Depth Size Material

From <u>20</u> To <u>42</u> Ft. <u>#1</u> sand	
From _____ To _____ Ft. _____	

16. REMARKS: RPMW - 101

LOCATION SKETCH

Show direction and distance in miles from at least two State Roads or County Roads. Include the road numbers and common road names.



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

William C. Cole 6-15-05
 SIGNATURE OF PERSON CONSTRUCTING THE WELL DATE

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

GW-1 REV. 09/2004

WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR (INDIVIDUAL) NAME (print) Bill Cole CERTIFICATION # 2244
WELL CONTRACTOR COMPANY NAME S&M, Inc. PHONE # 864 574-2360
STATE WELL CONSTRUCTION PERMIT# _____ ASSOCIATED WQ PERMIT# _____
(if applicable) (if applicable)

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐
Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use _____

2. WELL LOCATION:
Nearest Town: Huntersville County Mecklenburg
McGuire Nuclear Station
(Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Topographic/Land setting
☐ Ridge ☒ Slope ☐ Valley ☐ Flat
(check appropriate box)

Latitude/longitude of well location
N35/25/51.16 W80/57/15.13
(degrees/minutes/seconds)

3. OWNER: Duke Power Company
Address 12700 Hagers Ferry Road
(Street or Route No.)
Huntersville NC 28078
City or Town State Zip Code
(980)-373-3719
Area code- Phone number

Latitude/longitude source: ☐ GPS ☒ Topographic map
(check box)

DEPTH		DRILLING LOG
From	To	Formation Description
0	8.5	silt
8.5	13.5	silty sand
13.5	28.5	sandy silt
28.5	58.5	silty sand
58.5		refusal to hollow stem augers

4. DATE DRILLED 5/24 & 5/25/05
5. TOTAL DEPTH: 58.5 feet
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing: 41.32 FT.
(Use "+" if Above Top of Casing)

8. TOP OF CASING IS 2.32 FT. Above Land Surface*
*Top of casing terminated at/or below land surface requires a
variance in accordance with 15A NCAC 2C.0118.

9. YIELD (gpm): _____ METHOD OF TEST _____

10. WATER ZONES (depth): _____

11. DISINFECTION: Type _____ Amount _____

12. CASING:
Depth Diameter Wall Thickness Material
From 2.32 als To 33.5 Ft. 2 in Sch 40 PVC
From _____ To _____ Ft. _____
From _____ To _____ Ft. _____

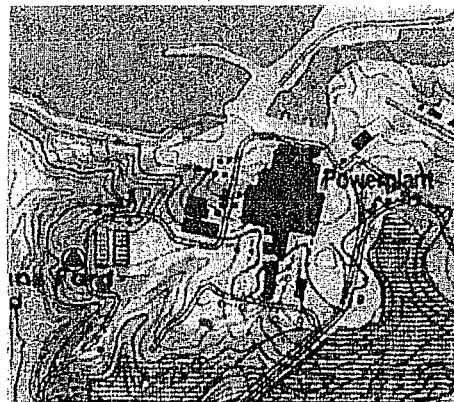
13. GROUT: Depth Material Method
From 0 To 29.5 Ft. Portland Cement Tremie
From _____ To _____ Ft. _____

14. SCREEN: Depth Diameter Slot Size Material
From 33.5 To 58.5 Ft. 2 in. 0.01 in. PVC
From _____ To _____ Ft. _____ in. _____ in. _____

15. SAND/GRAVEL PACK:
Depth Size Material
From 31.5 To 58.5 Ft. #1 sand
From _____ To _____ Ft. _____

16. REMARKS: RPMW - 102

LOCATION SKETCH
Show direction and distance in miles from at least
two State Roads or County Roads. Include the road
numbers and common road names.



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

William C. Cole

SIGNATURE OF PERSON CONSTRUCTING THE WELL

6-15-05

DATE

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

GW-1 REV. 09/2004



LAW ENGINEERING

GEOTECHNICAL, ENVIRONMENTAL
& CONSTRUCTION MATERIALS
CONSULTANTS

June 10, 1987

Duke Power Company
Civil-Environmental Division
P. O. Box 33189
Charlotte, North Carolina 28242

Attention: Mr. D. E. M. Sullivan

Subject: Ground-Water Monitoring Wells
McGuire Nuclear Station Landfarm
Lake Norman, North Carolina
Law Job No. CHW 5838

Gentlemen:

As authorized by Mill Power Supply Company Contract Order No. 7130860348 dated December 19, 1986, Law Engineering has installed ground-water monitoring wells at the McGuire Nuclear Station Landfarm at Lake Norman, North Carolina. Following is a brief description of the installation procedures. Test Boring Records and Monitoring Well Installation Records are attached.

Five soil test borings were made at the site at locations designated by Duke Power and identified as W-1 through W-5. The borings were drilled by utilizing hollow stem auger drilling methods. Soil sampling and penetration testing were performed in general accordance with ASTM D 1586. At regular intervals, soil samples were obtained with a standard 1.4-inch I. D., 2-inch O. D., split-tube sampler. The sampler was first seated 6 inches to penetrate any loose cuttings, and then driven an additional 12 inches with blows of a 140-pound hammer falling 30 inches. The number of hammer blows required to drive the sampler the final 12 inches was recorded and is designated the "penetration resistance".

Representative portions of the soil samples, thus obtained, were placed in glass jars and transported to the laboratory. In the laboratory, the samples were examined by a geologist to verify the driller's field classifications. Test Boring Records are attached, showing the soil descriptions and penetration resistances.

Petroleum was not detected in the soil samples, soil (drill) cuttings or ground water at the boring locations. This conclusion is based on visual examination (lack of stains) and (lack of) odor.

Ground-water monitoring wells were installed in borings W-1, W-2, W-4 and W-5. A monitoring well was not installed in boring W-3 because refusal was repeatedly encountered before the necessary depth was reached by the drill rig.

501 MINUET LANE
CHARLOTTE, NC 28210
704-523-2022

Duke Power Company
Law Job No. CHW 5838
June 10, 1987

-2-

Reference elevations for the monitoring wells had not been determined prior to the completion of this report. Enclosed is a map that shows the approximate locations of the monitoring wells W-1, W-2, W-4 and W-5 as well as the location of boring W-3.

Thank you for the opportunity to provide our professional geotechnical services during this phase of your project. Please contact us when we can be of further service or if you have any questions concerning this report.

Very truly yours,

LAW ENGINEERING

Nathan D. Williams
Nathan D. Williams
Staff Geologist *see*

Jimmy N. Smith
Jimmy N. Smith, P.E.
Senior Geotechnical Engineer
Registered, N.C. 7964

Attachments

NDW/JNS:ava

Quad. No. _____ Serial No. _____
 Lat. _____ Long. _____ Pc _____
 Minor Basin _____
 Basin Code _____
 Header Ent. _____ GW-1 Ent. _____

DRILLING CONTRACTOR Law Engineering
DRILLER REGISTRATION NUMBER 332

STATE WELL CONSTRUCTION
PERMIT NUMBER:

- County: Mecklenburg

[illegible]

If additional space is needed use back of form.

LOCATION SKETCH

(Show direction and distance from at least two State Roads, or other map reference points)

See Attached Location Sketch

7. YIELD (gpm): _____ METHOD OF TEST _____
WATER ZONES (depth): See Attached Monitoring Well
Installation Records

- CHLORINATION: Type _____ Amount _____

CASING:

Depth	Diameter	Wall Thickness or Weight/Ft.	Material
From _____ To _____ Ft. _____			
From _____ To _____ Ft. _____			
From _____ To _____ Ft. _____			

GROUT:

Depth	Material	Method
From _____ To _____ Ft. _____		
From _____ To _____ Ft. _____		

12. SCREEN:

Depth		Diameter		Slot Size	Material
From _____	To _____	Ft. _____	in. _____	in. _____	_____
From _____	To _____	Ft. _____	in. _____	in. _____	_____
From _____	To _____	Ft. _____	in. _____	in. _____	_____

13. GRAVEL PACK:

Depth		Size	Material
From _____	To _____	Ft. _____	_____
From _____	To _____	Ft. _____	_____

- REMARKS: _____

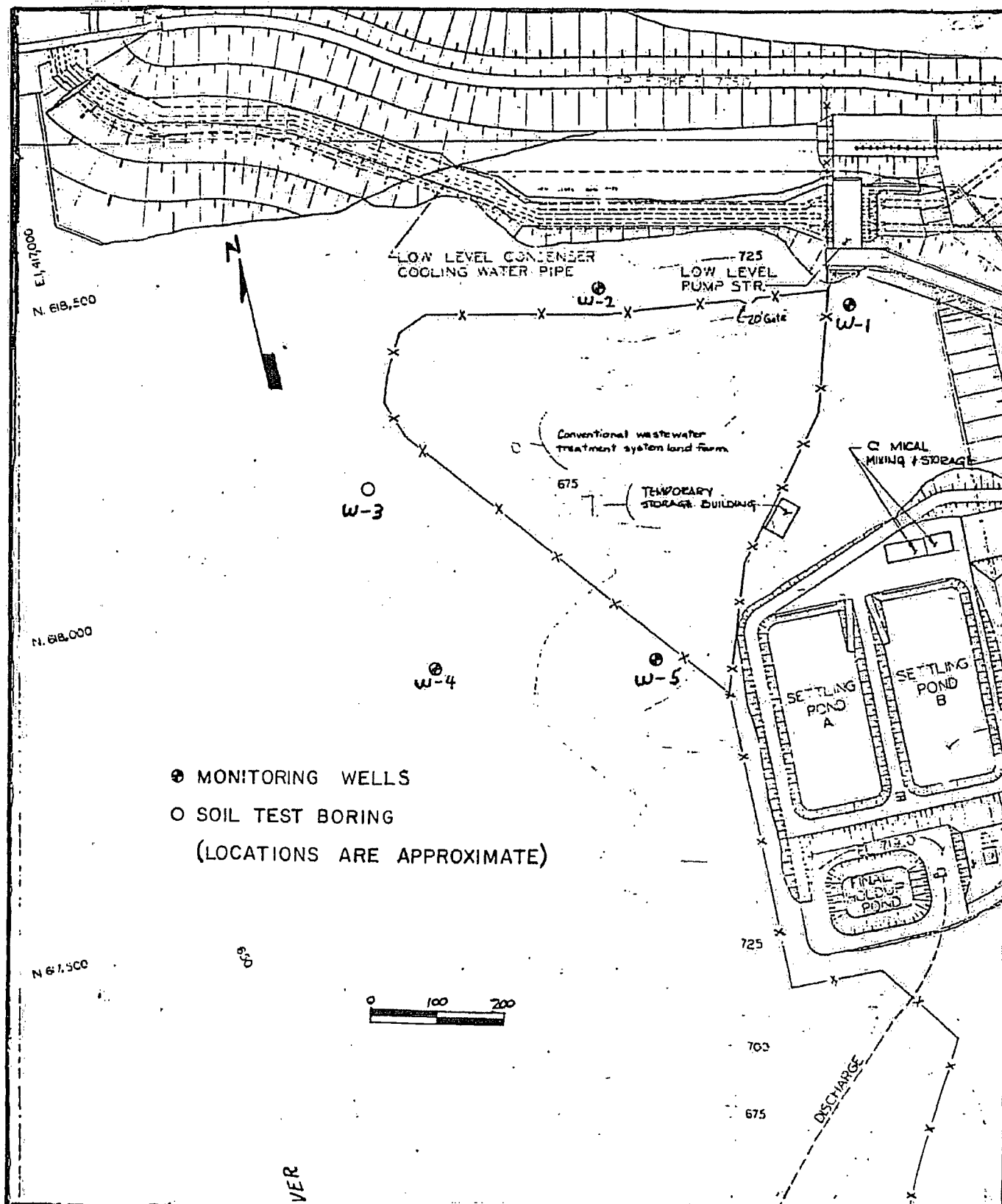
I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Law Engineering, Inc.

6/9/87

SIGNATURE OF CONTRACTOR OR AGENT

DATE _____



DUKE POWER CO.
 MCGUIRE NUCLEAR
 STATION



LAW ENGINEERING TESTING
 COMPANY
 CHARLOTTE, NORTH CAROLINA

MONITORING WELL &
 SOIL TEST BORING
 LOCATIONS

KEY TO CLASSIFICATIONS AND SYMBOLS

CORRELATION OF PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY

	<u>No. of Blows, N</u>	<u>Relative Density*</u>
Sands	0 - 4	Very Loose
	5 - 10	Loose
	11 - 20	Firm
	21 - 30	Very Firm
	31 - 50	Dense
	51+	Very Dense
		<u>Consistency*</u>
Silts and Clays	0 - 1	Very Soft
	2 - 4	Soft
	5 - 8	Firm
	9 - 15	Stiff
	16 - 30	Very Stiff
	31+	Hard

SYMBOLS



- Undisturbed Sample (UD) Recovered

50=2"

- Number of Blows (50) to Drive the Spoon a Number of Inches (2)

BQ, NX, NQ, NW

- Core Barrel Sizes Which Obtain Cores 1-7/16, 2-1/8 Inches, 1-7/8 Inches, 2-1/16 Inches in Diameter, Respectively

65%

- Percentage (65) of Rock Core Recovered (Compared to Cored Length)

RQD

- Rock Quality Designation - Percentage of Recovered Cored Length Consisting of Moderately Hard or Better Core Segments 4 or More Inches Long



- Water Table Approximately 24 Hours or More After Drilling

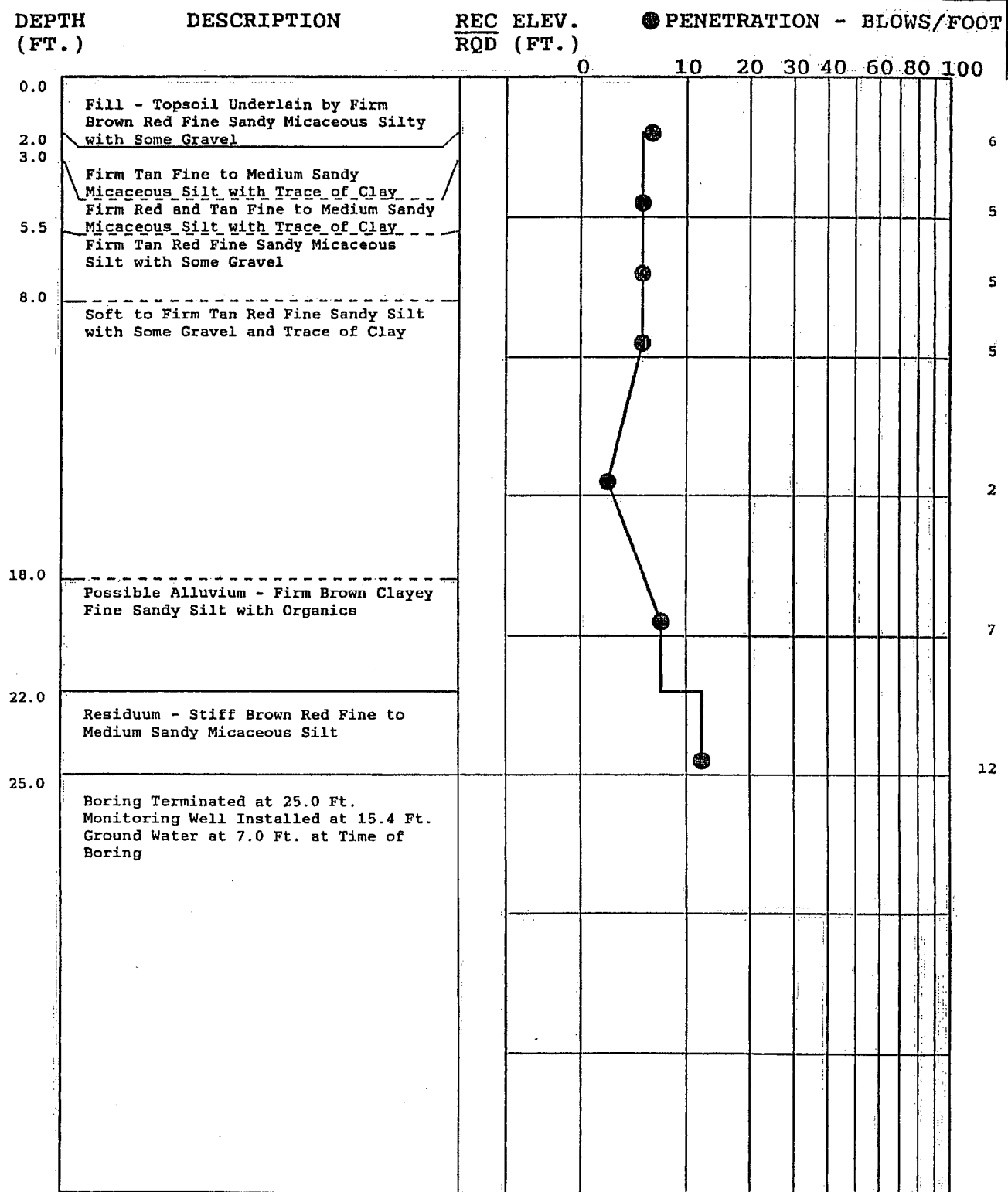


- Water Table Approximately at Time of Drilling (Within 1 Hour)



- Loss of Drilling Fluid

*Terminology may be altered if presence of gravel, cobbles or boulders interferes with accurate measurement of standard penetration resistances

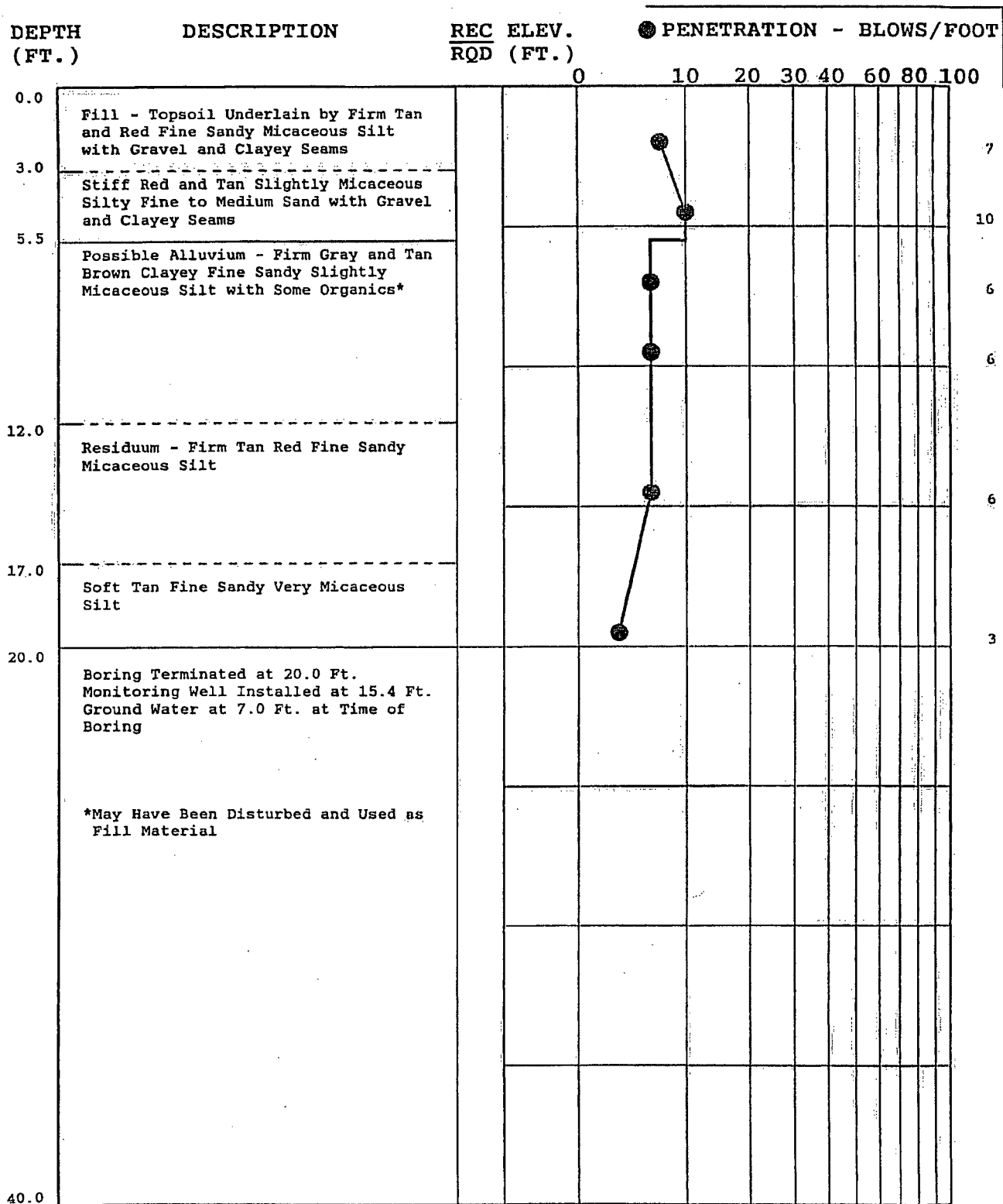


TEST BORING RECORD


BORING NUMBER W-1
 DATE DRILLED 4-30-87
 PROJECT NUMBER CHW 5838
 PROJECT MCGUIRE NUCLEAR STA
 PAGE 1 OF 1

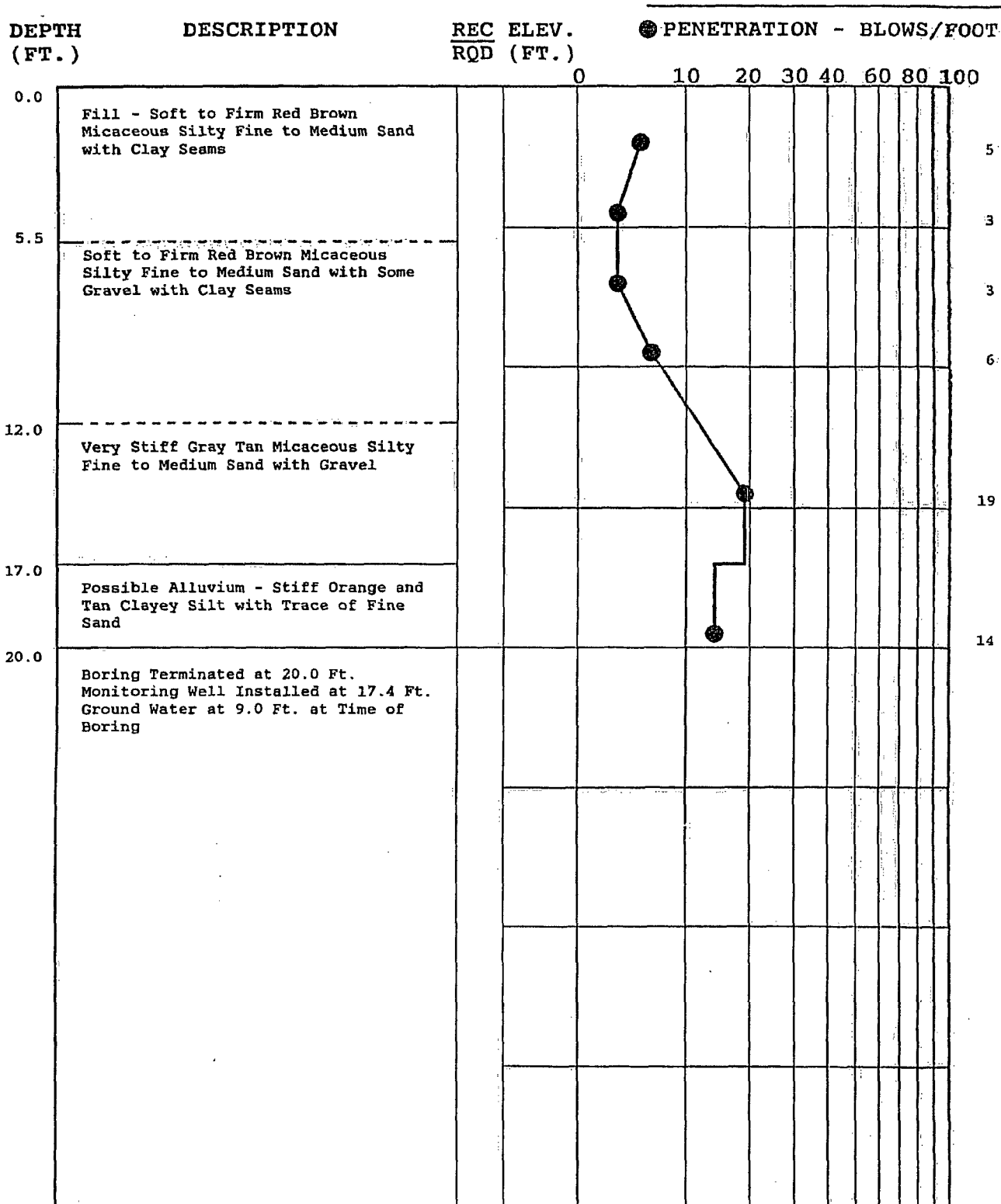
SEE KEY SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS USED ABOVE

LAW ENGINEERING



SEE KEY SHEET FOR EXPLANATION OF
SYMBOLS AND ABBREVIATIONS USED ABOVE

TEST BORING RECORD	
BORING NUMBER	W-2
DATE DRILLED	4-30-87
PROJECT NUMBER	CHW 5838
PROJECT	MCGUIRE NUCLEAR STA
PAGE 1 OF 1	
 LAW ENGINEERING	

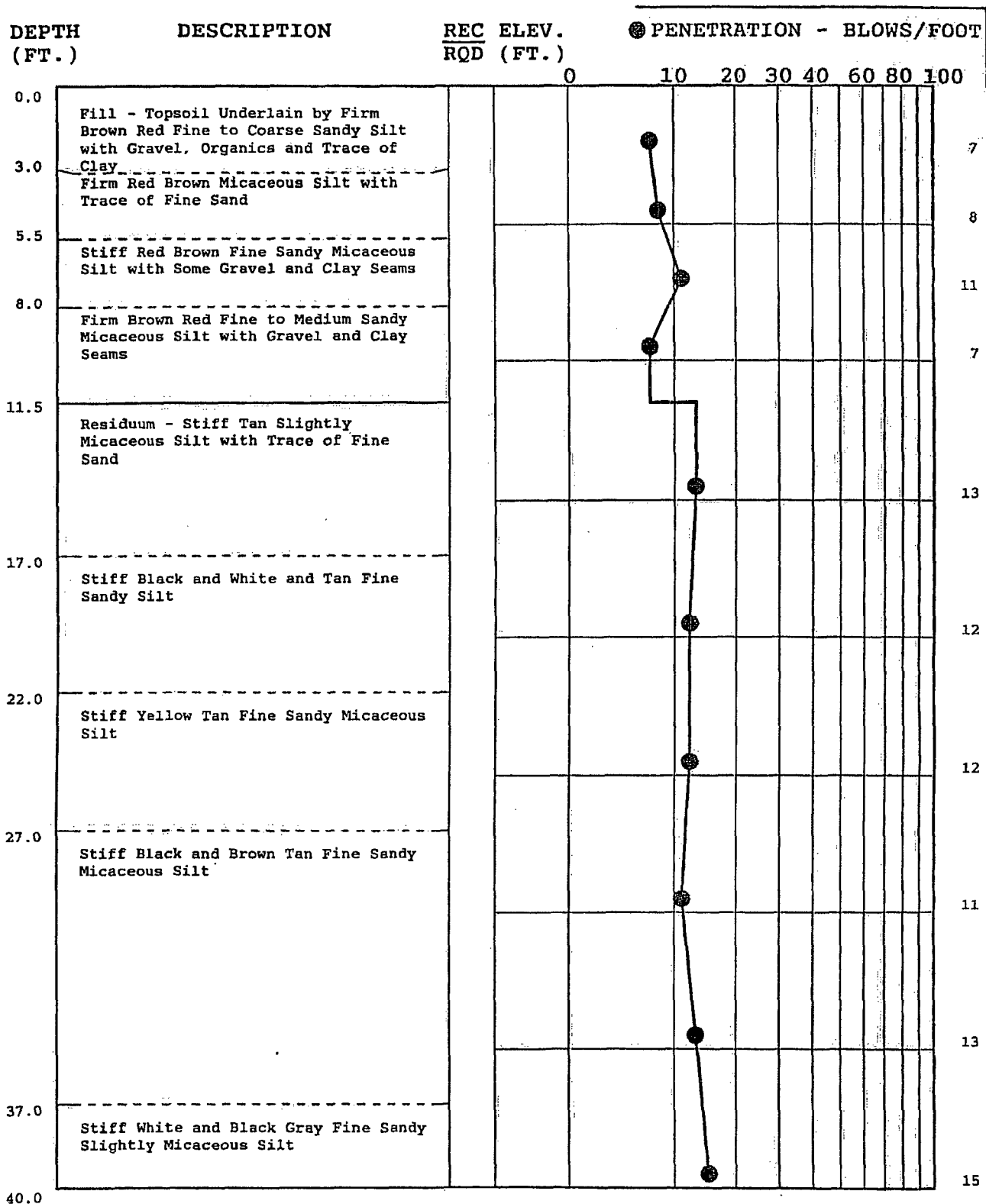


TEST BORING RECORD

BORING NUMBER W-4
 DATE DRILLED 5-1-87
 PROJECT NUMBER CHW 5838
 PROJECT MCGUIRE NUCLEAR STA
 PAGE 1 OF 1

SEE KEY SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS USED ABOVE

 LAW ENGINEERING



TEST BORING RECORD

BORING NUMBER W-5
 DATE DRILLED 4-30-87
 PROJECT NUMBER CHW 5838
 PROJECT MCGUIRE NUCLEAR STA
 PAGE 1 OF 2

SEE KEY SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS USED ABOVE

LAW ENGINEERING

SEE KEY SHEET FOR EXPLANATION OF
SYMBOLS AND ABBREVIATIONS USED ABOVE

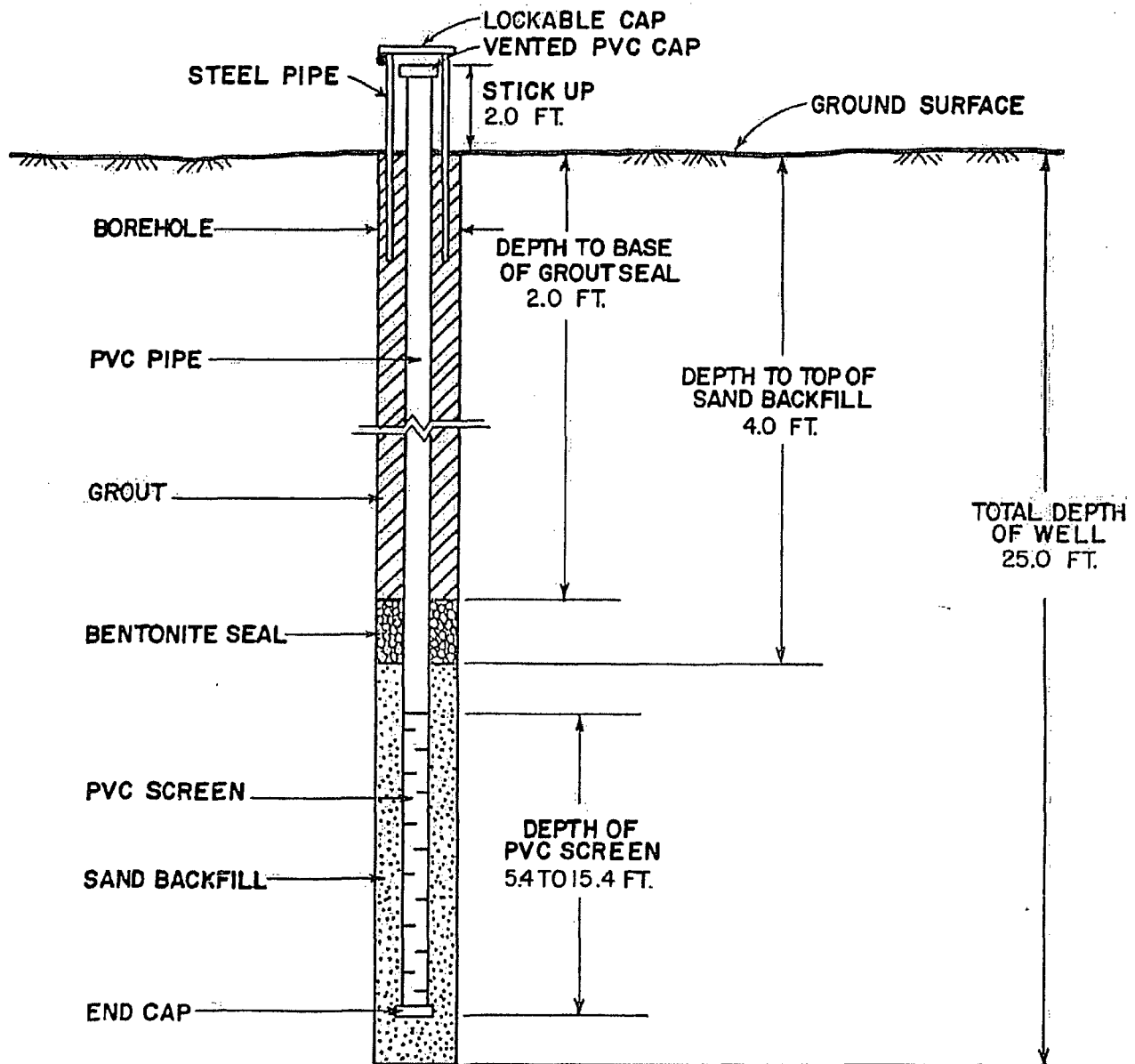
TEST BORING RECORD

BORING NUMBER W-5
DATE DRILLED 4-30-87
PROJECT NUMBER CHW 5838
PROJECT MCGUIRE NUCLEAR STA
PAGE 2 OF 2

 **LAW ENGINEERING**

MONITORING WELL INSTALLATION RECORD

JOB NAME McGUIRE NUCLEAR STATION JOB NUMBER CHW-5838
WELL NUMBER W-1 GROUND SURFACE ELEVATION _____
LOCATION 35 FT. EAST OF WASTEWATER TREATMENT LANDFARM
INSTALLATION DATE 4-30-87



DUKE POWER COMPANY

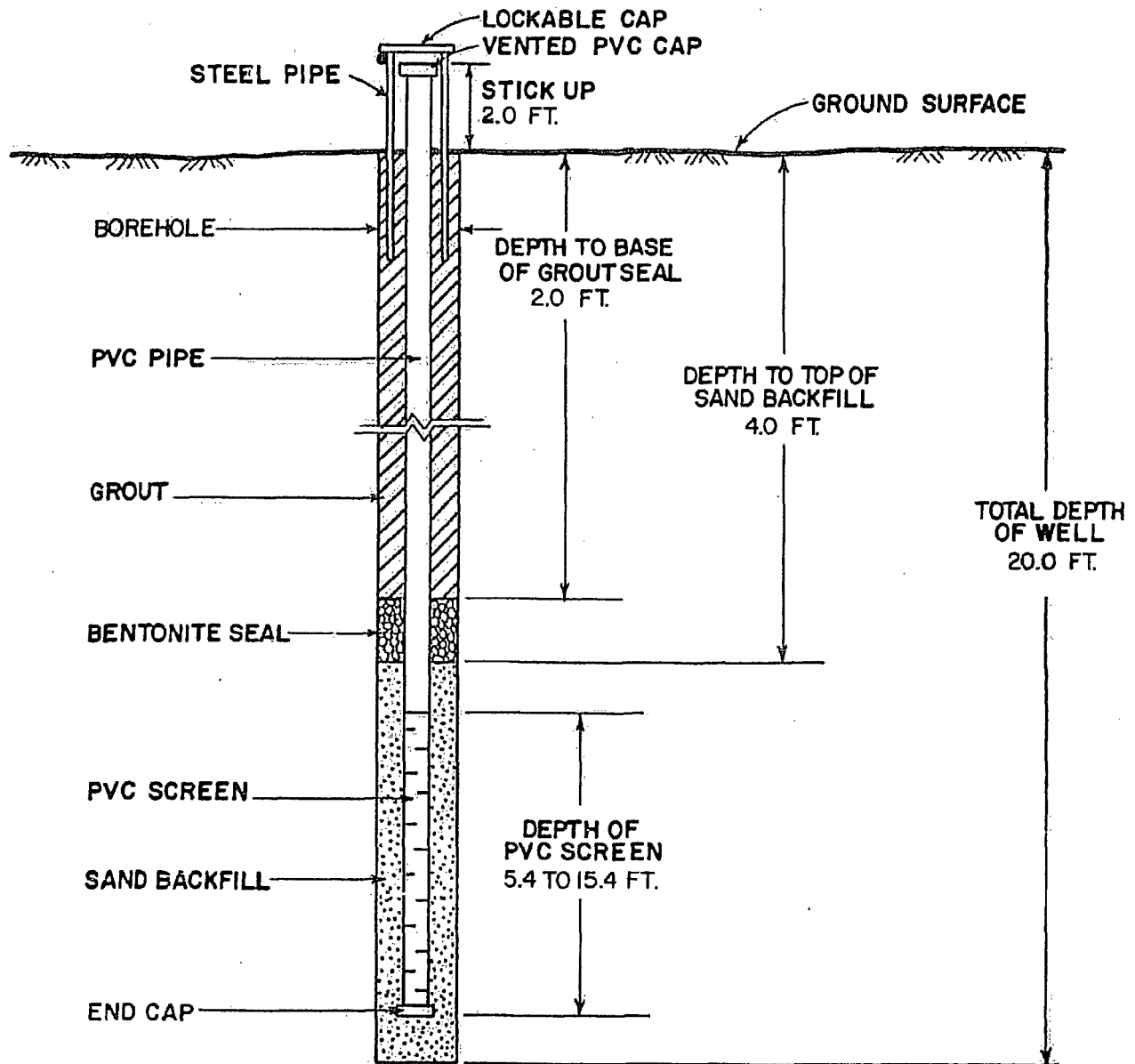


LAW ENGINEERING TESTING
COMPANY
CHARLOTTE, NORTH CAROLINA

MONITORING WELL
INSTALLATION RECORD

MONITORING WELL INSTALLATION RECORD

JOB NAME Mc GUIRE NUCLEAR STATION JOB NUMBER CHW-5838
WELL NUMBER W-2 GROUND SURFACE ELEVATION _____
LOCATION 40 FT. NORTH OF WASTEWATER TREATMENT LANDFARM
INSTALLATION DATE 4-30-87



DUKE POWER COMPANY

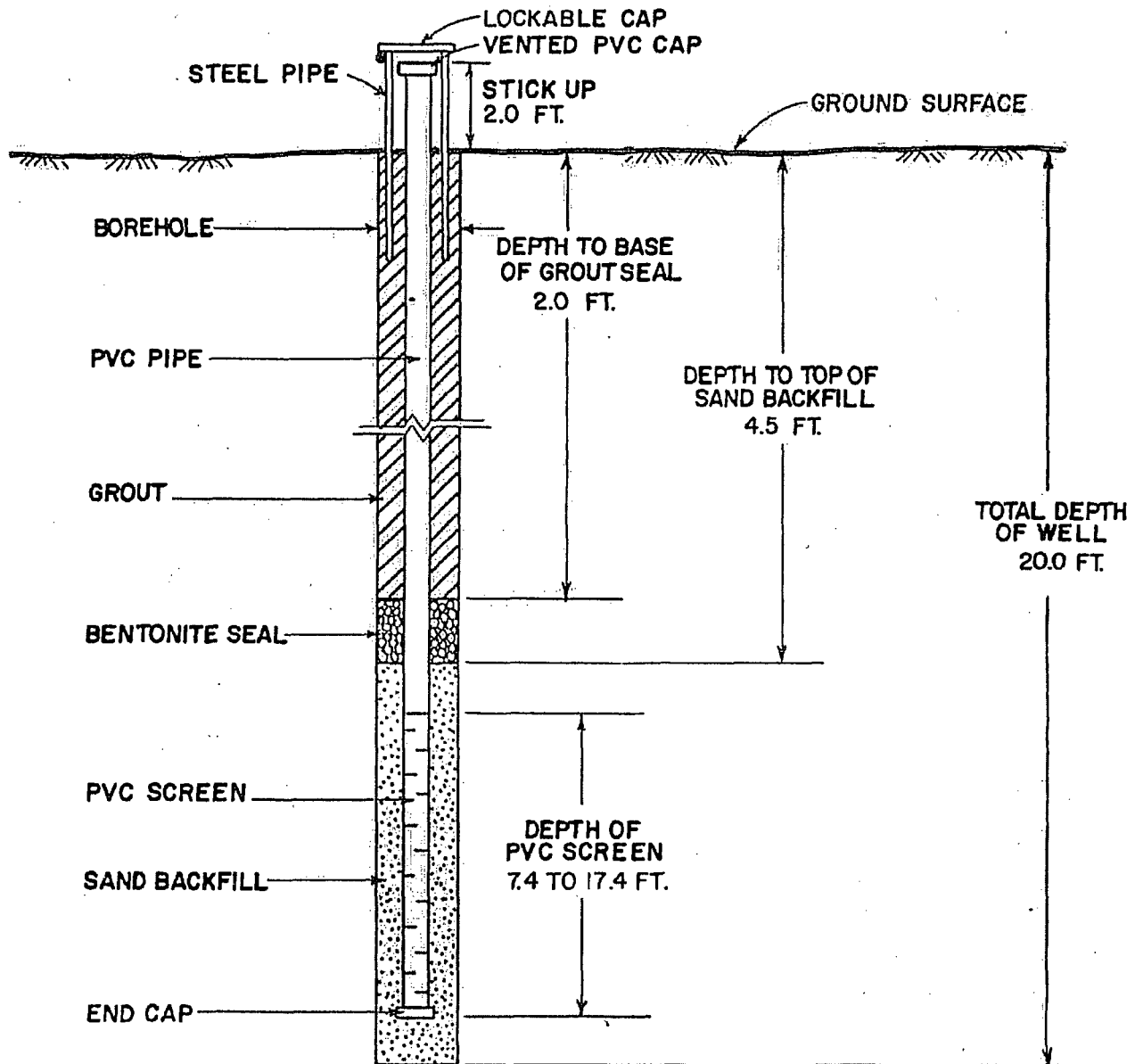


LAW ENGINEERING TESTING
COMPANY
CHARLOTTE, NORTH CAROLINA

MONITORING WELL
INSTALLATION RECORD

MONITORING WELL INSTALLATION RECORD

JOB NAME McGUIRE NUCLEAR STATION JOB NUMBER CHW-5838
WELL NUMBER W-4 GROUND SURFACE ELEVATION _____
LOCATION 250 FT. SOUTHWEST OF WASTEWATER TREATMENT LANDFARM
INSTALLATION DATE 5-1-87



DUKE POWER COMPANY

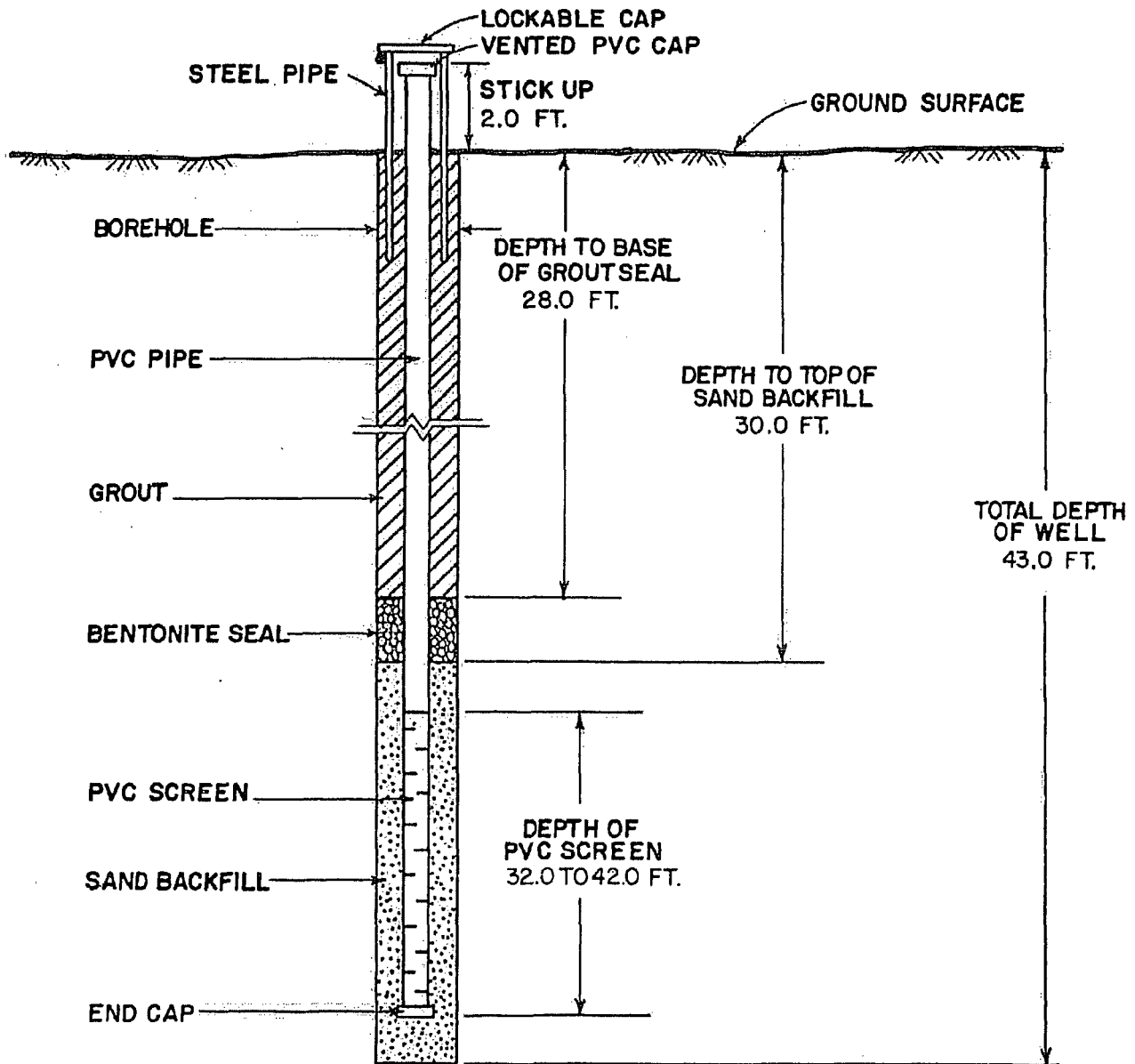


LAW ENGINEERING TESTING
COMPANY
CHARLOTTE, NORTH CAROLINA

MONITORING WELL
INSTALLATION RECORD

MONITORING WELL INSTALLATION RECORD

JOB NAME McGUIRE NUCLEAR STATION JOB NUMBER CHW-5838
WELL NUMBER W-5 GROUND SURFACE ELEVATION _____
LOCATION 20 FT. SOUTHWEST OF WASTEWATER TREATMENT LANDFARM
INSTALLATION DATE 4-30-87



DUKE POWER COMPANY



LAW ENGINEERING TESTING
COMPANY
CHARLOTTE, NORTH CAROLINA

MONITORING WELL
INSTALLATION RECORD



Duke Energy Corporation
EHS Services
13339 Hagers Ferry Road
Huntersville, NC 28078

October 7, 2004

N.C. Department of Environment and Natural Resources
Division of Water Quality
Groundwater Section

RE: Well Construction Records (Form GW-1)

Attached, please find Well Construction Records for twelve (12) monitoring wells/piezometers installed at Duke Power's McGuire Nuclear Site between September 23, 2004 and October 4, 2004. Each of these wells was installed using Geoprobe® direct push methods with pre-packed wells screens. A diagram of typical well construction is included. The primary purpose of these wells is for monitoring groundwater elevations in the shallow aquifer at the site.

If you have any questions concerning these wells, please contact me at 704.875.5228.

Thank You,

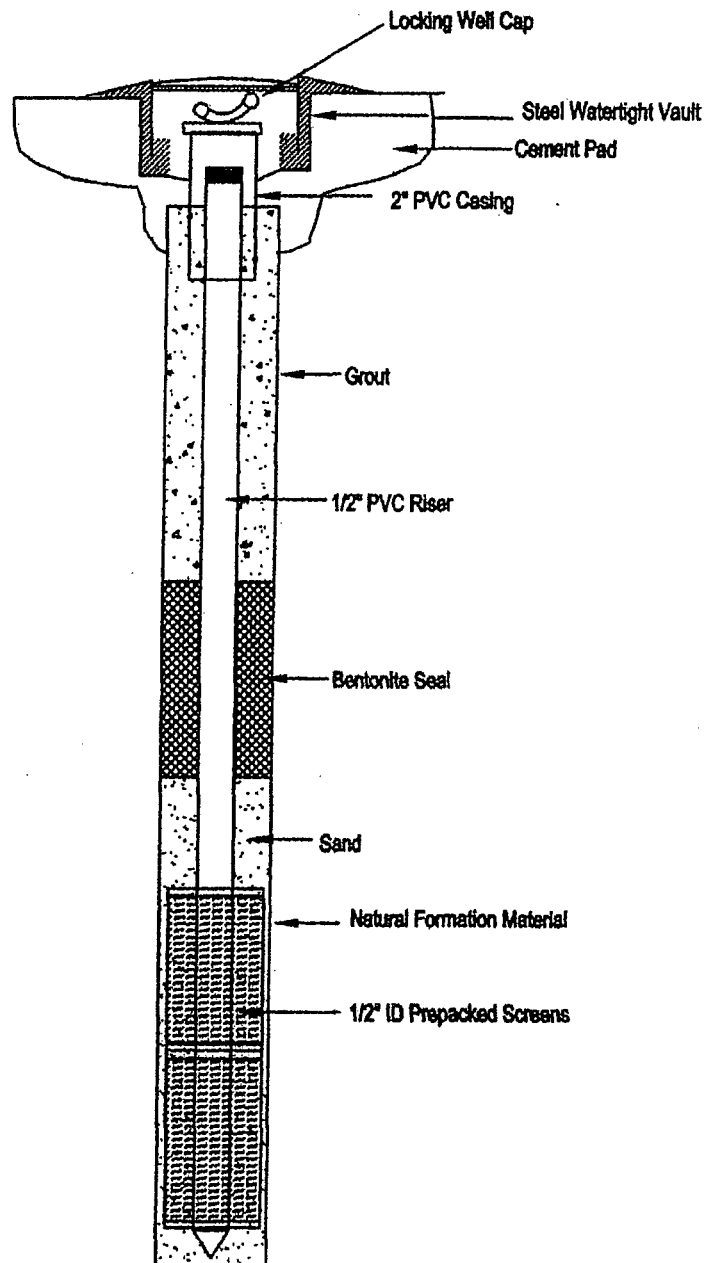
A handwritten signature in black ink, appearing to read 'Tim Hunsucker', written in a cursive style.

Tim Hunsucker, Scientist
Duke Power Company
PC & EHS, Chemical/Physical

attachments

cc: Victor Thompson, Duke Power
Michael, Phillips, Duke Power

McGuire Nuclear Station Typical Geoprobe Well Construction



WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR (INDIVIDUAL) NAME (print) Timothy S. Hunsucker CERTIFICATION # 2864

WELL CONTRACTOR COMPANY NAME Duke Power Company PHONE # (704) 875-5228

STATE WELL CONSTRUCTION PERMIT# NA ASSOCIATED WQ PERMIT# NA
(if applicable) (if applicable)

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐
Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use Piezometer

2. WELL LOCATION:
Nearest Town: Huntersville County Mecklenburg
McGuire Nuclear Station / NC Highway 73 West, 28078
(Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Topographic/Land setting
☐ Ridge ☐ Slope ☐ Valley ☒ Flat
(check appropriate box)
Latitude/longitude of well location
35, 25, 57.84 N / 80, 54, 52.58 W
(degrees/minutes/seconds)

3. OWNER: Duke Power Company
Address 422 South Church Street
(Street or Route No.)
Charlotte, N.C. 28242
City or Town State Zip Code

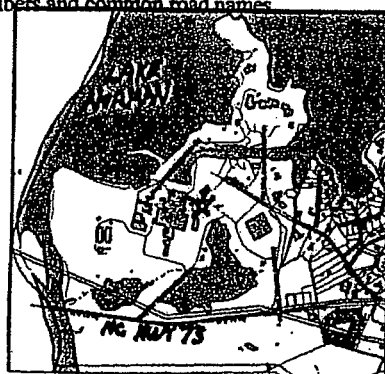
Latitude/longitude source: ☐ GPS ☐ Topographic map
(check box)

Area code- Phone number
4. DATE DRILLED 9/29/04
5. TOTAL DEPTH: 24.07 (bgs)
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing: 17.05 FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS ** - 0.35 FT. Above Land Surface*
*Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.
9. YIELD (gpm): NA METHOD OF TEST NA
10. WATER ZONES (depth): NA

DEPTH DRILLING LOG
From To Formation Description
Well T-1 NA - Well installed using
direct push methods. No
cores or cuttings were
collected.

11. DISINFECTION: Type NA Amount NA
12. CASING: Wall Thickness
From To Depth Diameter or Weight/Ft. Material
From -0.35' To 15.07' Ft. 0.5" Sch. 80 PVC
From To To Ft. Sch. 80 PVC
From To To Ft. Sch. 80 PVC
13. GROUT: Depth Material Method
From 6" To 11.2' Ft. cement grout pumped / bottom up
From 11.2' To 13.0' Ft. granular bentonite
14. SCREEN: Depth Diameter Slot Size Material
From 15.07' To 24.07' Ft. 0.5" in. 0.01 in. PVC*
From To To Ft. in. in. in.
15. SAND/GRAVEL PACK: Depth Size Material
From 13.0' To 24.07' Ft. 20/40 mesh silica sand
From To To Ft. Size Material

LOCATION SKETCH
Show direction and distance in miles from at least two State Roads or County Roads. Include the road numbers and common road names



16. REMARKS: *Screens are Geoprobe type prepacked screens (0.5" ID X 1.4" OD) **Flush mount installation in water-tight vault.

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

Timothy S. Hunsucker 10/7/04
SIGNATURE OF PERSON CONSTRUCTING THE WELL DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days. GW-1 REV. 07/2001

WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR (INDIVIDUAL) NAME (print) Timothy S. Hunsucker CERTIFICATION # 2664
 WELL CONTRACTOR COMPANY NAME Duke Power Company PHONE # (704) 875-5228
 STATE WELL CONSTRUCTION PERMIT# NA ASSOCIATED WQ PERMIT# NA
 (if applicable) (if applicable)

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐
 Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use Piezometer

2. WELL LOCATION:

Nearest Town: Huntersville County Mecklenburg
McGuire Nuclear Station / NC Highway 78 West, 28078
 (Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Topographic/Land setting
☐ Ridge ☐ Slope ☐ Valley ☒ Flat
 (check appropriate box)

Latitude/longitude of well location
36.25, 59.77 N / 80.56, 59.24 W
 (degrees/minutes/seconds)

3. OWNER: Duke Power Company
 Address 422 South Church Street
 (Street or Route No.)
Charlotte, N.C. 28242
 City or Town State Zip Code

Latitude/longitude source: ☐ GPS ☐ Topographic map
 (check box)

DEPTH

From To

DRILLING LOG

Formation Description

NA - Well installed using

direct push methods. No

cores or cuttings were

collected.

Area code- Phone number

4. DATE DRILLED 9/29/04

5. TOTAL DEPTH: 19.63 (bgs)

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

7. STATIC WATER LEVEL Below Top of Casing: 11.37 FT.

(Use "+" if Above Top of Casing)

8. TOP OF CASING IS -0.41 FT. Above Land Surface*

*Top of casing terminated at/or below land surface requires a
 variance in accordance with 15A NCAC 2C .0118.

9. YIELD (gpm): NA METHOD OF TEST NA

10. WATER ZONES (depth): NA

11. DISINFECTION: Type NA Amount NA

12. CASING: Wall Thickness

From	To	Depth	Diameter	or Weight/Ft.	Material
From <u>-0.41'</u>	To <u>13.63'</u>	Ft. <u>0.5"</u>		Sch. 80	PVC

From	To	Depth	Diameter	or Weight/Ft.	Material
From	To	Depth	Diameter	or Weight/Ft.	Material

13. GROUT: Depth Material Method

From <u>6"</u>	To <u>9.5'</u>	Ft. <u>cement grout</u>	pumped / bottom up
----------------	----------------	-------------------------	--------------------

From <u>9.5'</u>	To <u>11.7'</u>	Ft. <u>granular bentonite</u>	
------------------	-----------------	-------------------------------	--

14. SCREEN: Depth Diameter Slot Size Material

From <u>13.63'</u>	To <u>19.63'</u>	Ft. <u>0.5" in.</u>	<u>0.01 in.</u>	<u>PVC*</u>
--------------------	------------------	---------------------	-----------------	-------------

From	To	Depth	Diameter	Slot Size	Material
------	----	-------	----------	-----------	----------

15. SAND/GRAVEL PACK:

From	To	Depth	Size	Material
From <u>11.7'</u>	To <u>19.63'</u>	Ft. <u>20/40 mesh</u>	<u>silica sand</u>	

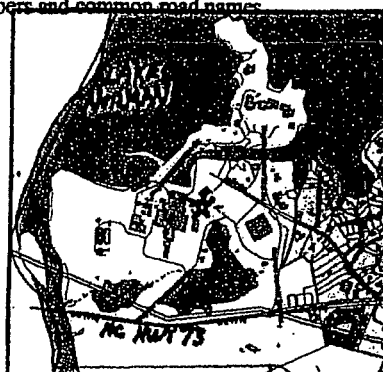
From	To	Depth <th>Size</th> <th>Material</th>	Size	Material
------	----	---------------------------------------	------	----------

16. REMARKS: *Screens are Geoprobe type prepacked screens (0.5" ID X 1.4" OD) **Flush mount installation in water-tight vault.

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

Timothy S. Hunsucker SIGNATURE OF PERSON CONSTRUCTING THE WELL DATE 10/7/04

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mall Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days. GW-1 REV. 07/2001



WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR (INDIVIDUAL) NAME (print) Timothy S. Hunsucker CERTIFICATION # 2864

WELL CONTRACTOR COMPANY NAME Duke Power Company PHONE # (704) 875-5228

STATE WELL CONSTRUCTION PERMIT# NA ASSOCIATED WQ PERMIT# NA
(if applicable) (if applicable)

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐
Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use Piezometer

2. WELL LOCATION:

Nearest Town: Huntersville County Mecklenburg
McGuire Nuclear Station / NC Highway 73 West, 28078
(Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Topographic/Land setting
☐ Ridge ☐ Slope ☐ Valley ☒ Flat
(check appropriate box)

Latitude/longitude of well location
39,28,59.37 N / 80,56,51.99 W
(degrees/minutes/seconds)

3. OWNER: Duke Power Company
Address 422 South Church Street
(Street or Route No.)

Charlotte, N.C. 28242
City or Town State Zip Code

()
Area code- Phone number

4. DATE DRILLED 9/28/04
5. TOTAL DEPTH: 24.12 (bgs)

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

7. STATIC WATER LEVEL Below Top of Casing: 20.23 FT.
(Use "+" if Above Top of Casing)

8. TOP OF CASING IS -0.45 FT. Above Land Surface*
*Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.

9. YIELD (gpm): NA METHOD OF TEST NA

10. WATER ZONES (depth): NA

11. DISINFECTION: Type NA Amount NA

12. CASING: Wall Thickness

From	To	Depth	Diameter	or Weight/Ft.	Material
From -0.45'	To 18.12'	Ft.	0.5"	Sch. 80	PVC
From	To	Ft.			
From	To	Ft.			

13. GROUT: Depth Material Method
From 6" To 13.42' Ft. cement grout pumped / bottom up
From 13.42' To 15.82' Ft. granular bentonite

14. SCREEN: Depth Diameter Slot Size Material
From 18.12' To 24.12' Ft. 0.5" in. 0.01 in. PVC*
From To Ft. in. in.

15. SAND/GRAVEL PACK: Depth Size Material
From 15.82' To 24.12' Ft. 20/40 mesh silica sand
From To Ft.

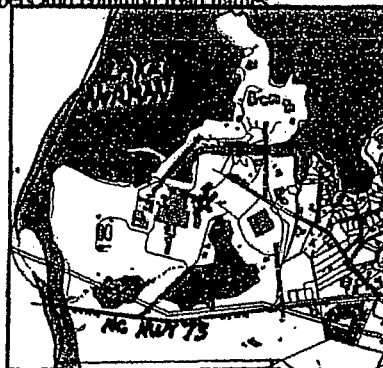
Latitude/longitude source: ☐ GPS ☐ Topographic map
(check box)

DEPTH DRILLING LOG
From To Formation Description

Well T-5 NA - Well installed using direct push methods. No cores or cuttings were collected.

LOCATION SKETCH

Show direction and distance in miles from at least two State Roads or County Roads. Include the road numbers and common road names.



16. REMARKS: *Screens are Geoprobe type prepacked screens (0.5" ID X 1.4" OD) **Flush mount installation in water-tight vault.

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

Timothy S. Hunsucker 10/7/04
SIGNATURE OF PERSON CONSTRUCTING THE WELL DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days. GW-1 REV. 07/2001

WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR (INDIVIDUAL) NAME (print) Timothy S. Hunsucker CERTIFICATION # 2864

WELL CONTRACTOR COMPANY NAME Duke Power Company PHONE # (704) 875-5228

STATE WELL CONSTRUCTION PERMIT# NA ASSOCIATED WQ PERMIT# NA
(if applicable) (if applicable)

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐
Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use Piezometer

2. WELL LOCATION:

Nearest Town: Huntersville County Mecklenburg
McGuire Nuclear Station / NC Highway 73 West, 28078
(Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Topographic/Land setting
☐ Ridge ☐ Slope ☐ Valley ☒ Flat
(check appropriate box)

Latitude/longitude of well location
35, 23, 57.43 N / 80, 56, 51.77 W
(degrees/minutes/seconds)

Latitude/longitude source: ☐ GPS ☐ Topographic map
(check box)

3. OWNER: Duke Power Company
Address 422 South Church Street
(Street or Route No.)
Charlotte, N.C. 28242
City or Town State Zip Code

Area code- Phone number
()-

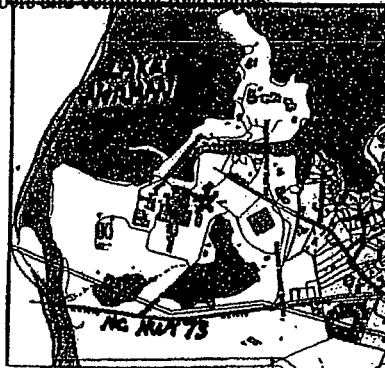
4. DATE DRILLED 10/4/04
5. TOTAL DEPTH: 18.65 (bgs)
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing: DRY FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS ** - 0.45 FT. Above Land Surface*
*Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.
9. YIELD (gpm): NA METHOD OF TEST NA
10. WATER ZONES (depth): NA

DEPTH		DRILLING LOG
From	To	Formation Description
Well T-6		NA - Well installed using direct push methods. No cores or cuttings were collected.

11. DISINFECTION: Type NA Amount NA
12. CASING: Wall Thickness
From -0.45' To 15.65' Ft. 0.5" Sch. 80 Material PVC
From To Ft.
From To Ft.
13. GROUT: Depth Material Method
From 6" To 10.85' Ft. cement grout pumped / bottom up
From 10.85' To 13.25' Ft. granular bentonite
14. SCREEN: Depth Diameter Slot Size Material
From 15.65' To 18.65' Ft. 0.5" in. 0.01 in. PVC*
From To Ft.
15. SAND/GRAVEL PACK: Depth Size Material
From 13.25' To 18.65' Ft. 20/40 mesh silica sand
From To Ft.

LOCATION SKETCH

Show direction and distance in miles from at least two State Roads or County Roads. Include the road numbers and common road names.



16. REMARKS: *Screens are Geoprobe type prepacked screens (0.5" ID X 1.4" OD) **Flush mount installation in water-tight vault.

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

Timothy S. Hunsucker SIGNATURE OF PERSON CONSTRUCTING THE WELL 10/7/04 DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days. GW-1 REV. 07/2001

WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR (INDIVIDUAL) NAME (print) Timothy S. Hunsucker CERTIFICATION # 2664

WELL CONTRACTOR COMPANY NAME Duke Power Company PHONE # (704) 875-5228

STATE WELL CONSTRUCTION PERMIT# NA ASSOCIATED WQ PERMIT# NA
(if applicable) (if applicable)

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐
Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use Piezometer

2. WELL LOCATION:

Nearest Town: Huntersville County Mecklenburg
McGuire Nuclear Station / NC Highway 73 West, 28078
(Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Topographic/Land setting
☐ Ridge ☐ Slope ☐ Valley ☒ Flat
(check appropriate box)

Latitude/longitude of well location
35,26,0.18 N / 80,56,51.58 W
(degrees/minutes/seconds)

Latitude/longitude source: ☐ GPS ☐ Topographic map
(check box)

3. OWNER: Duke Power Company
Address 422 South Church Street
(Street or Route No.)

Charlotte, N.C. 28242
City or Town State Zip Code

()
Area code- Phone number

4. DATE DRILLED 9/24/04
5. TOTAL DEPTH: 18.78 (bgs)

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

7. STATIC WATER LEVEL Below Top of Casing: DRY FT.
(Use "+" if Above Top of Casing)

8. TOP OF CASING IS -0.38 FT. Above Land Surface*
*Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C.0118.

9. YIELD (gpm): NA METHOD OF TEST NA

10. WATER ZONES (depth): NA

11. DISINFECTION: Type NA Amount NA

12. CASING: Wall Thickness

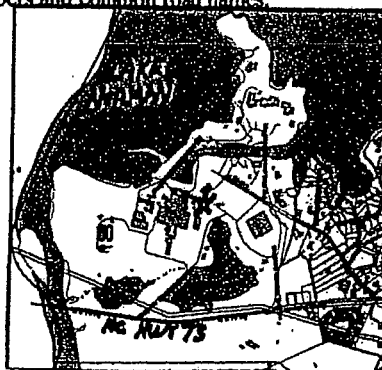
From	To	Depth	Diameter	or Weight/Ft.	Material
From <u>-0.38'</u>	To <u>12.78'</u>	Ft.	<u>0.5"</u>	<u>Sch. 80</u>	<u>PVC</u>
From <u> </u>	To <u> </u>	Ft.	<u> </u>	<u> </u>	<u> </u>
From <u> </u>	To <u> </u>	Ft.	<u> </u>	<u> </u>	<u> </u>

13. GROUT: Depth Material Method
From 6" To 8.42' Ft. cement grout pumped / bottom up
From 8.42' To 10.82' Ft. granular bentonite

14. SCREEN: Depth Diameter Slot Size Material
From 12.78' To 18.78' Ft. 0.5" in. 0.01 in. PVC*
From To Ft.

15. SAND/GRAVEL PACK: Depth Size Material
From 10.82' To 18.78' Ft. 20/40 mesh silica sand
From To Ft.

LOCATION SKETCH
Show direction and distance in miles from at least two State Roads or County Roads. Include the road numbers and common road names.



16. REMARKS: *Screens are Geoprobe type prepacked screens (0.5" ID X 1.4" OD) **Flush mount installation in water-tight vault.

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

Timothy S. Hunsucker 9/27/04
SIGNATURE OF PERSON CONSTRUCTING THE WELL DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mall Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days. GW-1 REV. 07/2001

WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR (INDIVIDUAL) NAME (print) Timothy S. Hunsucker CERTIFICATION # 2664

WELL CONTRACTOR COMPANY NAME Duke Power Company PHONE # (704) 875-5228

STATE WELL CONSTRUCTION PERMIT# NA ASSOCIATED WQ PERMIT# NA
(if applicable) (if applicable)

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐
Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use Piezometer

2. WELL LOCATION:

Nearest Town: Huntersville County Mecklenburg
McGuire Nuclear Station / NC Highway 73 West, 28078
(Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Topographic/Land setting
☐ Ridge ☐ Slope ☐ Valley ☒ Flat
(check appropriate box)

Latitude/longitude of well location
35,25,58.28 N / 80,56,51.54 W
(degrees/minutes/seconds)

Latitude/longitude source: ☐ GPS ☐ Topographic map
(check box)

3. OWNER: Duke Power Company
Address 422 South Church Street
(Street or Route No.)

Charlotte, N.C. 28242
City or Town State Zip Code

() -
Area code- Phone number

4. DATE DRILLED 10/4/04

5. TOTAL DEPTH: 24.0 (bgs)

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

7. STATIC WATER LEVEL Below Top of Casing: 22.91 FT.
(Use "+" if Above Top of Casing)

8. TOP OF CASING IS ** - 0.39 FT. Above Land Surface*
*Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.

9. YIELD (gpm): NA METHOD OF TEST NA

10. WATER ZONES (depth): NA

11. DISINFECTION: Type NA Amount NA

12. CASING: Wall Thickness

From	To	Depth	Diameter	Wall Thickness or Weight/Ft.	Material
From <u>-0.39'</u>	To <u>18.0'</u>	Ft.	<u>0.5"</u>	<u>Sch. 80</u>	<u>PVC</u>
From <u> </u>	To <u> </u>	Ft.	<u> </u>	<u> </u>	<u> </u>
From <u> </u>	To <u> </u>	Ft.	<u> </u>	<u> </u>	<u> </u>

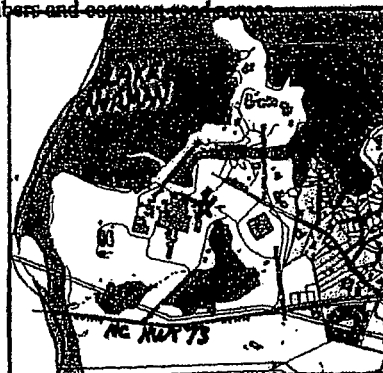
13. GROUT: Depth Material Method
From 6" To 13.7' Ft. cement grout pumped / bottom up
From 13.7' To 16.1' Ft. granular bentonite

14. SCREEN: Depth Diameter Slot Size Material
From 18.0' To 24.0' Ft. 0.5" in. 0.01 in. PVC*
From To Ft. in. in.

15. SAND/GRAVEL PACK: Depth Size Material
From 16.1' To 24.0' Ft. 20/40 mesh silica sand
From To Ft.

LOCATION SKETCH

Show direction and distance in miles from at least two State Roads or County Roads. Include the road numbers and names.



16. REMARKS: *Screens are Geoprobe type prepacked screens (0.5" ID X 1.4" OD) **Flush mount installation in water-tight vault.

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

Timothy S. Hunsucker SIGNATURE OF PERSON CONSTRUCTING THE WELL 10/7/04 DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mall Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days. GW-1 REV. 07/2001

WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR (INDIVIDUAL) NAME (print) Timothy S. Hunsucker CERTIFICATION # 2664

WELL CONTRACTOR COMPANY NAME Duke Power Company PHONE # (704) 875-5228

STATE WELL CONSTRUCTION PERMIT# NA ASSOCIATED WQ PERMIT# NA
(if applicable) (if applicable)

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐
Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use Piezometer

2. WELL LOCATION:

Nearest Town: Huntersville County Mecklenburg
McGuire Nuclear Station / NC Highway 73 West, 28078
(Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Topographic/Land setting
☐ Ridge ☐ Slope ☐ Valley ☒ Flat
(check appropriate box)

Latitude/longitude of well location
35,26,00.57 N / 80,56,50.44 W
(degrees/minutes/seconds)

3. OWNER: Duke Power Company
Address 422 South Church Street
(Street or Route No.)

Charlotte, N.C. 28242
City or Town State Zip Code

() Area code- Phone number

4. DATE DRILLED 9/23/04

5. TOTAL DEPTH: 20.23 (bgs)

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

7. STATIC WATER LEVEL Below Top of Casing: 16.24 FT.
(Use "+" if Above Top of Casing)

8. TOP OF CASING IS ** - 0.31 FT. Above Land Surface*

*Top of casing terminated at/er below land surface requires a variance in accordance with 15A NCAC 2C .0118.

9. YIELD (gpm): NA METHOD OF TEST NA

10. WATER ZONES (depth): NA

11. DISINFECTION: Type NA Amount NA

12. CASING: Wall Thickness

From	To	Depth	Diameter	or Weight/Ft.	Material
From <u>-0.31'</u>	To <u>11.23'</u>	Ft.	<u>0.5"</u>	<u>Sch. 80</u>	<u>PVC</u>
From <u> </u>	To <u> </u>	Ft.	<u> </u>	<u> </u>	<u> </u>
From <u> </u>	To <u> </u>	Ft.	<u> </u>	<u> </u>	<u> </u>

13. GROUT: Depth Material Method
From 6" To 7.13' Ft. cement grout pumped / bottom up
From 7.13' To 9.53' Ft. granular bentonite

14. SCREEN: Depth Diameter Slot Size Material
From 11.23' To 20.23' Ft. 0.5" in. 0.01 in. PVC*
From To Ft.

15. SAND/GRAVEL PACK: Depth Size Material
From 9.53' To 20.23' Ft. 20/40 mesh silica sand
From To Ft.

16. REMARKS: *Screens are Geoprobe type prepacked screens (0.5" ID X 1.4" OD) **Flush mount installation in water-tight vault.

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

Timothy S. Hunsucker 10/7/04
SIGNATURE OF PERSON CONSTRUCTING THE WELL DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days. GW-1 REV. 07/2001

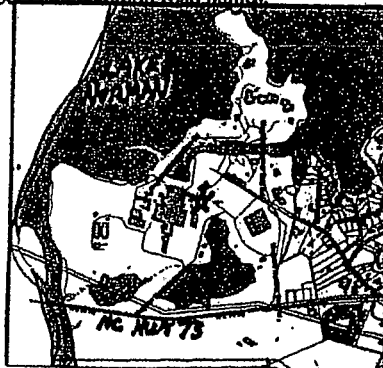
Latitude/longitude source: ☐ GPS ☐ Topographic map
(check box)

DEPTH DRILLING LOG
From To Formation Description

Well T-9 NA - Well installed using direct push methods. No cores or cuttings were collected.

LOCATION SKETCH

Show direction and distance in miles from at least two State Roads or County Roads. Include the road numbers and common road names.



WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR (INDIVIDUAL) NAME (print) Timothy S. Hunsucker CERTIFICATION # 2684

WELL CONTRACTOR COMPANY NAME Duke Power Company PHONE # (704) 875-5228

STATE WELL CONSTRUCTION PERMIT# NA ASSOCIATED WQ PERMIT# NA
(if applicable) (if applicable)

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐
Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use Piezometer

2. WELL LOCATION:

Nearest Town: Huntersville County Mecklenburg
McGuire Nuclear Station / NC Highway 73 West, 28078
(Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Topographic/Land setting
☐ Ridge ☐ Slope ☐ Valley ☒ Flat
(check appropriate box)

Latitude/longitude of well location
35,26,1.65 N / 80,56,50.66 W
(degrees/minutes/seconds)

Latitude/longitude source: ☐ GPS ☐ Topographic map
(check box)

3. OWNER: Duke Power Company
Address 422 South Church Street
(Street or Route No.)

Charlotte, N.C. 28242
City or Town State Zip Code

()
Area code- Phone number

4. DATE DRILLED 9/23/04
5. TOTAL DEPTH: 20.01 (bgs)

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

7. STATIC WATER LEVEL Below Top of Casing: 14.49 FT.
(Use "+" if Above Top of Casing)

8. TOP OF CASING IS -0.28 FT. Above Land Surface*

*Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.

9. YIELD (gpm): NA METHOD OF TEST NA

10. WATER ZONES (depth): NA

11. DISINFECTION: Type NA Amount NA

12. CASING: Wall Thickness

From	To	Depth	Diameter	or Weight/Ft.	Material
From <u>-0.28'</u>	To <u>11.01'</u>	Ft.	<u>0.5"</u>	Sch. 80	PVC
From <u> </u>	To <u> </u>	Ft.	<u> </u>	<u> </u>	<u> </u>
From <u> </u>	To <u> </u>	Ft.	<u> </u>	<u> </u>	<u> </u>

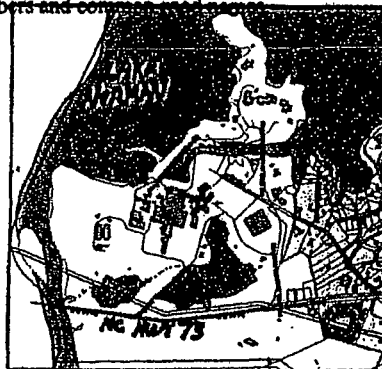
13. GROUT: Depth Material Method
From 6' To 7.61' Ft. cement grout pumped / bottom up
From 7.61' To 9.01' Ft. granular bentonite

14. SCREEN: Depth Diameter Slot Size Material
From 11.01' To 20.01' Ft. 0.5" in. 0.01 in. PVC*
From To Ft. in. in.

15. SAND/GRAVEL PACK: Depth Size Material
From 9.01' To 20.01' Ft. 20/40 mesh silica sand
From To Ft.

LOCATION SKETCH

Show direction and distance in miles from at least two State Roads or County Roads. Include the road numbers and compass rose.



16. REMARKS: *Screens are Geoprobe type prepacked screens (0.5" ID X 1.4" OD) **Flush mount installation in water-tight vault.

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

Timothy S. Hunsucker 10/7/04
SIGNATURE OF PERSON CONSTRUCTING THE WELL DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days. GW-1 REV. 07/2001

WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR (INDIVIDUAL) NAME (print) Timothy S. Hunsucker CERTIFICATION # 2664

WELL CONTRACTOR COMPANY NAME Duke Power Company PHONE # (704) 875-5228

STATE WELL CONSTRUCTION PERMIT# NA ASSOCIATED WQ PERMIT# NA
(if applicable) (if applicable)

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐
Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use Piezometer

2. WELL LOCATION:

Nearest Town: Huntersville County Mecklenburg
McGuire Nuclear Station / NC Highway 73 West, 28078
(Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Topographic/Land setting
☐ Ridge ☐ Slope ☐ Valley ☒ Flat
(check appropriate box)

Latitude/longitude of well location
35, 26, 2.08 N / 80, 56, 53.08 W
(degrees/minutes/seconds)

Latitude/longitude source: ☐ GPS ☐ Topographic map
(check box)

3. OWNER: Duke Power Company
Address 422 South Church Street
(Street or Route No.)
Charlotte, N.C. 28242
City or Town State Zip Code

Area code- Phone number
() _____

4. DATE DRILLED 9/23/04

5. TOTAL DEPTH: 18.74' (bgs)

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

7. STATIC WATER LEVEL Below Top of Casing: 12.42 FT.
(Use "+" if Above Top of Casing)

8. TOP OF CASING IS -0.32 FT. Above Land Surface*

*Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.

9. YIELD (gpm): NA METHOD OF TEST NA

10. WATER ZONES (depth): NA

11. DISINFECTION: Type NA Amount NA

12. CASING: Wall Thickness

From	To	Depth	Diameter	or Weight/Ft.	Material
From <u>-0.32'</u>	To <u>9.74'</u>	<u>Fl.</u>	<u>0.5"</u>	<u>Sch. 80</u>	<u>PVC</u>
From _____	To _____	<u>Ft.</u>	_____	_____	_____
From _____	To _____	<u>Ft.</u>	_____	_____	_____

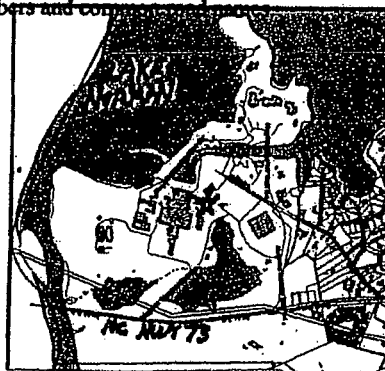
13. GROUT: Depth Material Method
From 6" To 5.64' Ft. cement grout pumped / bottom up
From 5.64' To 7.84' Ft. granular bentonite

14. SCREEN: Depth Diameter Slot Size Material
From 9.74' To 18.74' Ft. 0.5" in. 0.01 in. PVC*
From _____ To _____ Ft. _____ in. _____ in. _____

15. SAND/GRAVEL PACK: Depth Size Material
From 7.84' To 18.74' Ft. 20/40 mesh silica sand
From _____ To _____ Ft. _____

LOCATION SKETCH

Show direction and distance in miles from at least two State Roads or County Roads. Include the road numbers and compass bearings.



16. REMARKS: *Screens are Geoprobe type prepacked screens (0.5" ID X 1.4" OD) **Flush mount installation in water-tight vault.

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

Timothy S. Hunsucker 10/7/04
SIGNATURE OF PERSON CONSTRUCTING THE WELL DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days. GW-1 REV. 07/2001

WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR (INDIVIDUAL) NAME (print) Timothy S. Hunsucker CERTIFICATION # 2664

WELL CONTRACTOR COMPANY NAME Duke Power Company PHONE # (704) 875-5228

STATE WELL CONSTRUCTION PERMIT# NA ASSOCIATED WQ PERMIT# NA
(if applicable) (if applicable)

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐
Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use Piezometer

2. WELL LOCATION:

Nearest Town: Huntersville County Mecklenburg
McGuire Nuclear Station / NC Highway 73 West, 28078
(Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Topographic/Land setting
☐ Ridge ☐ Slope ☐ Valley ☒ Flat
(check appropriate box)

Latitude/longitude of well location
35,26,0.32 N / 80,56,52.40 W
(degrees/minutes/seconds)

Latitude/longitude source: ☐ GPS ☐ Topographic map
(check box)

3. OWNER: Duke Power Company
Address 422 South Church Street
(Street or Route No.)
Charlotte, N.C. 28242
City or Town State Zip Code

Area code- Phone number

4. DATE DRILLED 9/23/04

5. TOTAL DEPTH: 21.75' (bgs)

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

7. STATIC WATER LEVEL Below Top of Casing: 21.01 FT.
(Use "+" if Above Top of Casing)

8. TOP OF CASING IS ** - 0.31 FT. Above Land Surface*

*Top of casing terminated at/or below land surface requires a
variance in accordance with 15A NCAC 2C .0118.

9. YIELD (gpm): NA METHOD OF TEST NA

10. WATER ZONES (depth): NA

11. DISINFECTION: Type NA Amount NA

12. CASING: Wall Thickness

Depth	Diameter	or Weight/Ft.	Material
From <u>-0.31'</u> To <u>15.75'</u>	<u>0.5"</u>	<u>Sch. 80</u>	<u>PVC</u>
From <u> </u> To <u> </u>	<u> </u>	<u> </u>	<u> </u>
From <u> </u> To <u> </u>	<u> </u>	<u> </u>	<u> </u>

13. GROUT: Depth Material Method

Depth	Material	Method
From <u>6"</u> To <u>10.7'</u>	<u>cement grout</u>	<u>pumped / bottom up</u>
From <u>10.7'</u> To <u>13.0'</u>	<u>granular bentonite</u>	<u> </u>

14. SCREEN: Depth Diameter Slot Size Material

Depth	Diameter	Slot Size	Material
From <u>15.75'</u> To <u>21.75'</u>	<u>0.5" in.</u>	<u>0.01 in.</u>	<u>PVC*</u>
From <u> </u> To <u> </u>	<u> </u>	<u> </u>	<u> </u>

15. SAND/GRAVEL PACK:

Depth	Size	Material
From <u>13.0'</u> To <u>21.75'</u>	<u>20/40 mesh</u>	<u>silica sand</u>
From <u> </u> To <u> </u>	<u> </u>	<u> </u>

DEPTH From To

Well T-12

DRILLING LOG

Formation Description

NA - Well installed using

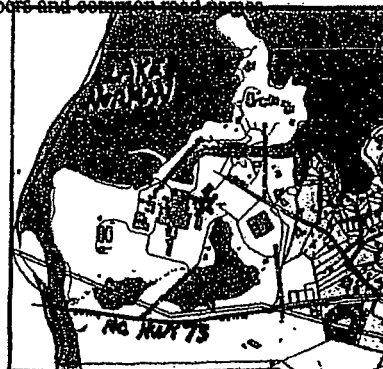
direct push methods. No

cores or cuttings were

collected.

LOCATION SKETCH

Show direction and distance in miles from at least
two State Roads or County Roads. Include the road
numbers and common road names.



16. REMARKS: *Screens are Geoprobe type prepacked screens (0.5" ID X 1.4" OD) **Flush mount installation in water-tight vault.

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

Timothy S. Hunsucker 10/7/04
SIGNATURE OF PERSON CONSTRUCTING THE WELL DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mall Service Center - Raleigh, NC
27699-1636 Phone No. (919) 733-3221, within 30 days.

GW-1 REV. 07/2001

WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR (INDIVIDUAL) NAME (print) Timothy S. Hunsucker CERTIFICATION # 2684
 WELL CONTRACTOR COMPANY NAME Duke Power Company PHONE # (704) 875-5228
 STATE WELL CONSTRUCTION PERMIT# NA ASSOCIATED WQ PERMIT# NA
 (if applicable) (if applicable)

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐
 Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use Piezometer

2. WELL LOCATION:

Nearest Town: Huntersville County Mecklenburg
McGuire Nuclear Station / NC Highway 73 West, 28078
 (Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Topographic/Land setting
☐ Ridge ☐ Slope ☐ Valley ☒ Flat
 (check appropriate box)

Latitude/longitude of well location
35,26,0.74 N / 80,56,51.71 W
 (degrees/minutes/seconds)

3. OWNER: Duke Power Company
 Address 422 South Church Street
 (Street or Route No.)
Charlotte, N.C. 28242
 City or Town State Zip Code

Latitude/longitude source: ☐ GPS ☒ Topographic map
 (check box)

Area code- Phone number

4. DATE DRILLED 8/23/04
 5. TOTAL DEPTH: 14.85' (bgs)
 6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
 7. STATIC WATER LEVEL Below Top of Casing: DRY FT.
 (Use "+" if Above Top of Casing)

DEPTH
 From To
 Well T-13
 DRILLING LOG
 Formation Description
 NA - Well installed using
 direct push methods. No
 cores or cuttings were
 collected.

8. TOP OF CASING IS ** - 0.30 FT. Above Land Surface*
 *Top of casing terminated at/or below land surface requires a
 variance in accordance with 15A NCAC 2C.0118.

9. YIELD (gpm): NA METHOD OF TEST NA
 10. WATER ZONES (depth): NA

11. DISINFECTION: Type NA Amount NA
 12. CASING: Wall Thickness

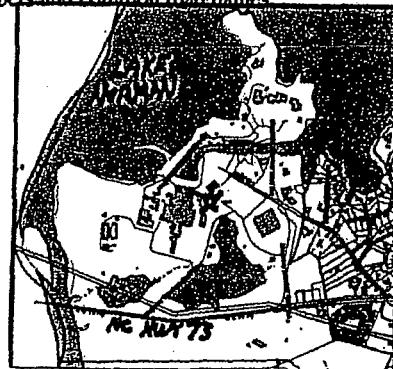
From	To	Depth	Diameter	or Weight/Ft.	Material
From -0.30'	To 11.85'	Ft.	0.5"	Sch. 80	PVC
From	To	Ft.			
From	To	Ft.			

13. GROUT: Depth Material Method
 From 6" To 7.95' Ft. cement grout pumped / bottom up
 From 7.95' To 8.65' Ft. granular bentonite

14. SCREEN: Depth Diameter Slot Size Material
 From 11.85' To 14.85' Ft. 0.5" in. 0.01 in. PVC*
 From To Ft. in. in.

15. SAND/GRAVEL PACK: Depth Size Material
 From 9.85' To 14.85' Ft. 20/40 mesh silica sand
 From To Ft.

LOCATION SKETCH
 Show direction and distance in miles from at least
 two State Roads or County Roads. Include the road
 numbers and common road names



16. REMARKS: *Screens are Geoprobe type prepacked screens (0.5" ID X 1.4" OD) **Flush mount installation in water-tight vault.

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

Timothy S. Hunsucker 10/9/04
 SIGNATURE OF PERSON CONSTRUCTING THE WELL DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC
 27699-1636 Phone No. (919) 733-3221, within 30 days. GW-1 REV. 07/2001

WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR (INDIVIDUAL) NAME (print) Timothy S. Hunsucker CERTIFICATION # 2684

WELL CONTRACTOR COMPANY NAME Duke Power Company PHONE # (704) 875-5228

STATE WELL CONSTRUCTION PERMIT# NA ASSOCIATED WQ PERMIT# NA
(if applicable) (if applicable)

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐
Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use Plazometer

2. WELL LOCATION:

Nearest Town: Huntersville County Mecklenburg
McGuire Nuclear Station / NC Highway 73 West, 28078
(Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Topographic/Land setting
☐ Ridge ☐ Slope ☐ Valley ☒ Flat
(check appropriate box)

Latitude/longitude of well location
35, 26, 1.68 N / 80, 56, 566 W
(degrees/minutes/seconds)

Latitude/longitude source: ☐ GPS ☐ Topographic map
(check box)

3. OWNER: Duke Power Company
Address 422 South Church Street
(Street or Route No.)

Charlotte, N.C. 28242
City or Town State Zip Code

()
Area code- Phone number

4. DATE DRILLED 10/4/04

5. TOTAL DEPTH: 22.25' (bgs)

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

7. STATIC WATER LEVEL Below Top of Casing: 5.61 FT.
(Use "+" if Above Top of Casing)

8. TOP OF CASING IS ** - 0.31 FT. Above Land Surface*
*Top of casing terminated at/ or below land surface requires a variance in accordance with 15A NCAC 2C .0118.

9. YIELD (gpm): NA METHOD OF TEST NA

10. WATER ZONES (depth): NA

11. DISINFECTION: Type NA Amount NA

12. CASING: Wall Thickness

From	To	Depth	Diameter	or Weight/Ft.	Material
From -0.31'	To 16.25'	Ft.	0.5"	Sch. 80	PVC
From	To	Ft.			
From	To	Ft.			

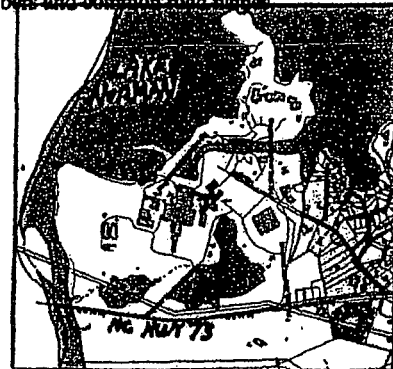
13. GROUT: Depth Material Method
From 6" To 11.55' Ft. cement grout pumped / bottom up
From 11.55' To 13.75' Ft. granular bentonite

14. SCREEN: Depth Diameter Slot Size Material
From 16.25' To 22.25' Ft. 0.5" in. 0.01 in. PVC*
From To Ft. in. in. in.

15. SAND/GRAVEL PACK: Depth Size Material
From 13.75' To 22.25' Ft. 20/40 mesh silica sand
From To Ft.

LOCATION SKETCH

Show direction and distance in miles from at least two State Roads or County Roads. Include the road numbers and common road names.



16. REMARKS: *Screens are Geoprobe type prepacked screens (0.5" ID X 1.4" OD) **Flush mount installation in water-tight vault.

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

Timothy S. Hunsucker 10/7/04
SIGNATURE OF PERSON CONSTRUCTING THE WELL DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days. GW-1 REV. 07/2001



May 7, 2007

Mecklenburg County Health Department
Land Use & Environmental Service Agency
Groundwater & Wastewater Services
700 North Tryon Street, Suite 211
Charlotte, North Carolina 28202

Reference: **NON-RESIDENTIAL WELL CONSTRUCTION RECORDS – SUBMITTAL #1**
McGUIRE NUCLEAR STATION
12700 Hagers Ferry Road
Huntersville, North Carolina
Well Application Permit No. 70000752
S&ME Project No. 1264-06-724

Ladies and Gentlemen:


On behalf of Duke Energy, S&ME, Inc. (S&ME) is submitting the enclosed *Monitor Well Registration* form and completed/signed *Non-Residential Well Construction Records* for the following seven (7) groundwater monitoring wells installed at the McGuire Nuclear Station (MNS) site:

- M-82
- M-84
- M-84R
- M-85
- M-103
- M-103R
- M-104R.

Duke Energy is voluntarily installing groundwater monitoring wells at MNS as part of a site-wide hydrogeologic evaluation. S&ME will submit these *Non-Residential Well Construction Records* on a periodic basis as well installations are completed, this being the first submittal (i.e., *Submittal #1*).

On behalf of Duke Energy, S&ME thanks you for your receipt of these records. Should you have any questions or need additional information, please contact us.

Sincerely,
S&ME, Inc.


Scott E. Dacus, P.G.
Project Geologist


Larry Armstrong, P.E.
Senior Engineer/Project Director

enclosures

cc: Messrs. Steve LeRoy, Ed Sullivan, Tim Hunsucker; Duke Energy

S:\ENVIRON\2006\1264 Projects\6406724 McGuire Nuclear Groundwater Study\NCDENR Well Records\meck co well records submittal 1.doc

Mecklenburg County
Land Use & Environmental Service Agency
Groundwater & Wastewater Services
700 N. Tryon St., Suite 211
Charlotte, NC 28202
Phone: (704) 336-5103
Fax: (704) 336-6894



Form 1-07
Rev. 1-07

Monitor Well Registration

Is this Registration for a well or wells that existed prior to January 01, 2005? No

Enter your Subsurface Investigation Permit #: 70000752

Date Well Installation Began: 3/21/07

Date Well Installation Complete: 4/4/07

Site/Contact Information

Name of Site: McGuire Nuclear Station
Site Address: 12700 Hagers Ferry Road
Site Tax Parcel ID: 00119103

Bill to Owner/Agent Name: Duke Energy/Michael Phillips

Owner/Agent Address: Mail Code MG01EM
12700 Hagers Ferry Rd.
Owner/Agent Phone #: Huntersville NC 28078
Driller Certification #: 704-875-4675
3439-62717

Type of Registration

This registration is for (check all that apply):

- ☒ Unregistered Permanent Monitor Wells
☐ Temporary Monitor Wells

☐ Yearly Update of Permanent Monitor Wells

The following information must be completed for each tax parcel on which monitor wells have been installed:

On-Site Monitor Wells		Tax Parcel #		Tax Parcel #		Tax Parcel #	
Type of Well	# Present	Type of Well	# Present	Type of Well	# Present	Type of Well	# Present
Temporary*		Temporary*		Temporary*		Temporary*	
Permanent	7	Permanent		Permanent		Permanent	
Sparge		Sparge		Sparge		Sparge	
Vapor Extraction		Vapor Extraction		Vapor Extraction		Vapor Extraction	
Recovery		Recovery		Recovery		Recovery	
Injection		Injection		Injection		Injection	
Vapor Monitoring		Vapor Monitoring		Vapor Monitoring		Vapor Monitoring	
Piezometer		Piezometer		Piezometer		Piezometer	
Groundwater Standard Exceeded?		Groundwater Standard Exceeded?		Groundwater Standard Exceeded?		Groundwater Standard Exceeded?	

Tax Parcel #		Tax Parcel #		Tax Parcel #		Tax Parcel #	
Type of Well	# Present	Type of Well	# Present	Type of Well	# Present	Type of Well	# Present
Temporary*		Temporary*		Temporary*		Temporary*	
Permanent		Permanent		Permanent		Permanent	
Sparge		Sparge		Sparge		Sparge	
Vapor Extraction		Vapor Extraction		Vapor Extraction		Vapor Extraction	
Recovery		Recovery		Recovery		Recovery	
Injection		Injection		Injection		Injection	
Vapor Monitoring		Vapor Monitoring		Vapor Monitoring		Vapor Monitoring	
Piezometer		Piezometer		Piezometer		Piezometer	
Groundwater Standard Exceeded?		Groundwater Standard Exceeded?		Groundwater Standard Exceeded?		Groundwater Standard Exceeded?	

*Selection of Temporary Well requires monitor well abandonment forms also be filed. Failure to file abandonment forms will result in the well being considered permanent and cause the well owner to be billed the appropriate fee.



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg SC 29301

City or Town State Zip Code

(864) 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-82

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 3/21/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY: Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☒ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35 25' 47.66" N

LONGITUDE 80 57' 17.35" W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 34.60 ft

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

c. WATER LEVEL Below Top of Casing: 25.37 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 3.0 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/Weight	Material
From 3.0 ALS To 24.60 BLS	2 inches	Sch 40	PVC
From To	Ft.		
From To	Ft.		

7. GROUT:

Depth	Material	Method
From 0 To 19.80	Portland	Tremie
From To	Ft.	
From To	Ft.	

8. SCREEN:

Depth	Diameter	Slot Size	Material
From 24.60 To 34.60	2 in.	0.010 in.	PVC
From To	Ft.	in.	in.
From To	Ft.	in.	in.

9. SAND/GRAVEL PACK:

Depth	Size	Material
From 22.05 To 34.60	#1	Filter Sand
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	9	fine sandy silt
9	34.6	micaceous, silty sand and sandy silt
34.6		refusal to roller cone drill bit

11. REMARKS:

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE

Justin Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

NON RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little
Well Contractor (Individual) Name

S&ME, Inc.
Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard
Charlotte NC 28273
City or Town State Zip Code

(704) - 523-4726
Area code - Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-84
STATE WELL PERMIT#(if applicable)
DWQ or OTHER PERMIT #(if applicable) 70000752

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

DATE DRILLED 3/29/07
TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg
McGuire Nuclear Station
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

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

LATITUDE 35° 25' 49.55" N
LONGITUDE 80° 57' 19.67" W
Latitude/longitude source: ☒ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

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

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

FACILITY ID #(if applicable)
NAME OF FACILITY McGuire Nuclear Station
STREET ADDRESS 12700 Hagers Ferry Road
Huntersville NC 28078
City or Town State Zip Code

CONTACT PERSON Michael Phillips
MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd
Huntersville NC 28078
City or Town State Zip Code

(704) - 875-4675
Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 15.00 ft
b. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
c. WATER LEVEL Below Top of Casing: 7.60 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 3.0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST
f. DISINFECTION: Type Amount
g. WATER ZONES (depth):
From To From To
From To From To
From To From To

6. CASING:

Depth	Diameter	Thickness/ Weight	Material
From 3.0 ALS To 5.00 BLS Ft.	2 inches	Sch 40	PVC
From To Ft.			
From To Ft.			

7. GROUT:

Depth	Material	Method
From 0 To 3.00 Ft.	Portland	Tremie
From To Ft.		
From To Ft.		

8. SCREEN:

Depth	Diameter	Slot Size	Material
From 5.00 To 15.00 Ft.	2 in.	0.010 in.	PVC
From To Ft.			
From To Ft.			

9. SAND/GRAVEL PACK:

Depth	Size	Material
From 4.00 To 15.00 Ft.	#1	Filter Sand
From To Ft.		
From To Ft.		

10. DRILLING LOG

From	To	Formation Description
0	9	fine to med sandy silty clay
9	15	fine to med sandy clayey silt and silty sand

11. REMARKS:

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

Signature of Certified Well Contractor: Jay A. Little DATE: 4-26-07
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte NC 28273

City or Town State Zip Code

(704) 523-4726

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-84R

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 3/22/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY: Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☒ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35 25' 49.60" N

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

LONGITUDE 80 57' 19.64" W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 28.50 ft

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

c. WATER LEVEL Below Top of Casing: 20.34 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 3.0 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/Weight	Material
From 3.0 ALS To 20.00 BLS	2 inches	Sch 40	PVC
From To	Ft.		
From To	Ft.		

7. GROUT:

Depth	Material	Method
From 0 To 15.00	Portland	Tremie
From To	Ft.	
From To	Ft.	

8. SCREEN:

Depth	Diameter	Slot Size	Material
From 20.00 To 25.00	2 in.	0.010 in.	PVC
From To	Ft.	in.	in.
From To	Ft.	in.	in.

9. SAND/GRAVEL PACK:

Depth	Size	Material
From 18.70 To 28.50	#2	Filter Sand
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	9	fine to med sandy silty clay
9	15	fine to med sandy clayey silt and silty sand
15	18.7	silty fine to coarse sand w/ rock fragments - saprolite
18.7		refusal to roller cone drill bit
18.7	28.5	sound rock - granite

11. REMARKS:

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

Jay A. Little 4-26-07
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

Jay A. Little
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg SC 29301

City or Town State Zip Code

(864) 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-85

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 3/23/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

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

LATITUDE 35 25' 52.74" N

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

LONGITUDE 80 57' 20.45" W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 14.00 ft

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

c. WATER LEVEL Below Top of Casing: 5.10 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 3.0 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

From	Depth	To	Diameter	Thickness/Weight	Material
3.0	ALS	4.00	BLS	2 inches	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

From	Depth	To	Material	Method
0		3.00	Portland	Tremie
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

From	Depth	To	Diameter	Slot Size	Material
4.00		14.00	2 in.	0.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

From	Depth	To	Size	Material
3.50		14.00	#2	Filter Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0	8.5	fine to med sandy silty clay
8.5	20.65	fine to med sandy silt
20.65		refusal to roller cone drill bit

11. REMARKS:

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR 4-27-07
DATE

Justin Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL



NON RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little
Well Contractor (Individual) Name
S&ME, Inc.
Well Contractor Company Name
STREET ADDRESS 9751 Southern Pine Boulevard
Charlotte NC 28273
City or Town State Zip Code

(704) 523-4726

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-103
STATE WELL PERMIT #(if applicable)
DWQ or OTHER PERMIT #(if applicable) 70000752
WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use)
DATE DRILLED 4/4/07
TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY: Mecklenburg
McGuire Nuclear Station
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)
TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☒ Ridge ☐ Other
(check appropriate box)
LATITUDE 35 25' 48.29" N
LONGITUDE 80 57' 14.67" W
May be in degrees, minutes, seconds or in a decimal format

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

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

FACILITY ID #(if applicable)
NAME OF FACILITY McGuire Nuclear Station
STREET ADDRESS 12700 Hagers Ferry Road
Huntersville NC 28078
City or Town State Zip Code
CONTACT PERSON Michael Phillips
MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd
Huntersville NC 28078
City or Town State Zip Code
(704) 875-4675
Area code - Phone number

5. WELL DETAILS:

- a. TOTAL DEPTH: 22.00 ft
b. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
c. WATER LEVEL Below Top of Casing: 12.00 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 3.0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

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

6. CASING:

Depth	Diameter	Thickness/	Weight	Material
From 3.0 ALS To 7.00 BLS Ft.	2 inches	Sch 40		PVC
From To Ft.				
From To Ft.				

7. GROUT:

Depth	Material	Method
From 0 To 4.50 Ft.	Portland	Tremie
From To Ft.		
From To Ft.		

8. SCREEN:

Depth	Diameter	Slot Size	Material
From 7.00 To 22.00 Ft.	2 in.	0.010 in.	PVC
From To Ft.			
From To Ft.			

9. SAND/GRAVEL PACK:

Depth	Size	Material
From 6.00 To 22.00 Ft.	#1	Filter Sand
From To Ft.		
From To Ft.		

10. DRILLING LOG

From	To	Formation Description
0	7.5	fine sandy clayey silt and fine to med sandy silty clay - saprolite
7.5	22	silty fine to med sand - saprolite and weathered rock

11. REMARKS:

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

Jay A. Little 4-26-07
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

JAY A. LITTLE
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



NON RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte

NC

28273

City or Town

State

Zip Code

(704) 523-4726

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-103R

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 3/29/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY: Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

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

LATITUDE 35 25' 48.33" N

LONGITUDE 80 57' 14.39" W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville

NC

28078

City or Town

State

Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville

NC

28078

City or Town

State

Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 37.00 ft

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

c. WATER LEVEL Below Top of Casing: 11.06 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 3.0 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/Weight	Material
From 3.0 ALS To 25.00 BLS Ft.	2 inches	Sch 40	PVC
From To Ft.			
From To Ft.			

7. GROUT:

Depth	Material	Method
From 0 To 22.20 Ft.	Portland	Tremie
From To Ft.		
From To Ft.		

8. SCREEN:

Depth	Diameter	Slot Size	Material
From 26.00 To 36.00 Ft.	2 in.	0.010 in.	PVC
From To Ft.			
From To Ft.			

9. SAND/GRAVEL PACK:

Depth	Size	Material
From 24.70 To 37.00 Ft.	#2	Filter Sand
From To Ft.		
From To Ft.		

10. DRILLING LOG

From	To	Formation Description
0	7.5	fine sandy clayey silt and fine to med sandy silty clay - saprolite
7.5	24.7	silty fine to med sand - saprolite and weathered rock
24.7		refusal to roller cone drill bit
24.7	45	weathered rock and sound rock - fine grained granite

11. REMARKS:

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

Jay A. Little 4-26-07
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

JAY A. LITTLE
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



NON RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg SC 29301

City or Town State Zip Code

(864) 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-104R

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 3/26/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☒ Ridge ☐ Other

(check appropriate box)

LATITUDE 35 25' 51.86" N

LONGITUDE 80 57' 16.20" W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 47.00 ft

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

c. WATER LEVEL Below Top of Casing: 37.40 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 3.0 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth).

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/Weight	Material
From 0 ALS To 39.8 BLS	4 inches	Sch 40	PVC
From 3.0 ALS To 42.00	2 inches	Sch 40	PVC
From To	Ft.		

7. GROUT: Depth Material Method

From 0 To 39.80 Ft. Portland Tremie

From To Ft. Fl.

From To Ft. Fl.

8. SCREEN: Depth Diameter Slot Size Material

From 42.00 To 47.00 Ft. 2 in. 0.010 in. PVC

From To Ft. in. in.

From To Ft. in. in.

9. SAND/GRAVEL PACK:

Depth	Size	Material
From 41.00 To 47.00	Fl. #2	Filter Sand
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	8	fine to med sandy silty clay
8	39.8	silty fine to med/coarse sand
39.8		refusal to roller cone drill bit
39.8	60.04	weathered and sound rock -
		coarse grained granite

11. REMARKS:

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR 4-27-07
DATE

Justin Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



May 7, 2007

North Carolina Department of Environment and Natural Resources
Division of Water Quality
1617 Mail Service Center
Raleigh, North Carolina 27699-1617

ATTN: Information Management

Reference: **NON-RESIDENTIAL WELL CONSTRUCTION RECORDS - SUBMITTAL #1**
McGUIRE NUCLEAR STATION
12700 Hagers Ferry Road
Huntersville, North Carolina
S&ME Project No. 1264-06-724

Ladies and Gentlemen:


On behalf of Duke Energy, S&ME, Inc. (S&ME) is submitting the enclosed completed and signed *Non-Residential Well Construction Records* for the following seven (7) groundwater monitoring wells installed at the McGuire Nuclear Station (MNS) site:

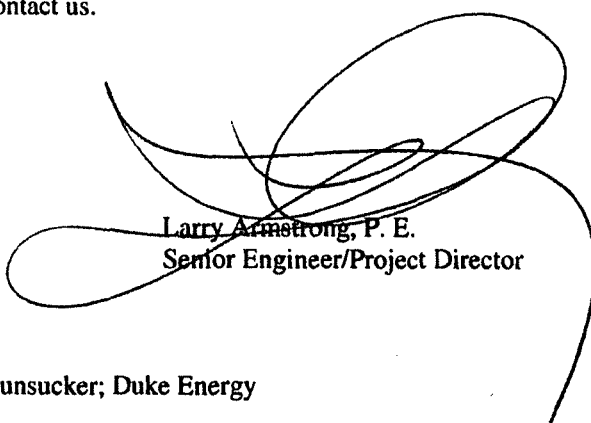
- M-82
- M-84
- M-84R
- M-85
- M-103
- M-103R
- M-104R.

Duke Energy is voluntarily installing groundwater monitoring wells at MNS as part of a site-wide hydrogeologic evaluation. S&ME will submit these *Non-Residential Well Construction Records* on a periodic basis as well installations are completed, this being the first submittal (i.e., *Submittal #1*).

On behalf of Duke Energy, S&ME thanks you for your receipt of these records. Should you have any questions or need additional information, please contact us.

Sincerely,
S&ME, Inc.


Scott E. Dacus, P.G.
Project Geologist


Larry Armstrong, P. E.
Senior Engineer/Project Director

enclosures

cc: Messrs. Steve LeRoy, Ed Sullivan, Tim Hunsucker; Duke Energy

S:\ENVIRON\2006\1264 Projects\6406724 McGuire Nuclear Groundwater Study\NCDENR Well Records\ncdenr well records submittal L.doc



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg SC 29301

City or Town State Zip Code

(864) 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-82

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 3/21/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY: Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☒ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35 25' 47.66" N

LONGITUDE 80 57' 17.35" W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 34.60 ft

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

c. WATER LEVEL Below Top of Casing: 25.37 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 3.0 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/	Material
From To	From To	Weight	
3.0 ALS	24.60 BLS	Sch 40	PVC
From To	From To	From To	From To
From To	From To	From To	From To

7. GROUT:

Depth	Material	Method	
From To	From To	From To	
0	19.80	Portland	Tremie
From To	From To	From To	From To
From To	From To	From To	From To

8. SCREEN:

Depth	Diameter	Slot Size	Material
From To	From To	From To	From To
24.60	34.60	2 in.	0.010 in. PVC
From To	From To	From To	From To
From To	From To	From To	From To

9. SAND/GRAVEL PACK:

Depth	Size	Material
From To	From To	From To
22.05	34.60	#1 Filter Sand
From To	From To	From To
From To	From To	From To

10. DRILLING LOG

From	To	Formation Description
0	9	fine sandy silt
9	34.6	micaceous, silty sand and sandy silt
34.6		refusal to roller cone drill bit

11. REMARKS:

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE

PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



NON RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte

NC

28273

City or Town

State

Zip Code

(704) 523-4726

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-84

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 3/28/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY: Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☒ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35 25' 49.55" N

LONGITUDE 80 57' 19.67" W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville

NC

28078

City or Town

State

Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville

NC

28078

City or Town

State

Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 15.00 ft

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

c. WATER LEVEL Below Top of Casing: 7.60 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 3.0 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/	Weight	Material
From 3.0 ALS To 5.00 BLS Ft.	2 inches	Sch 40		PVC
From To Ft.				
From To Ft.				

7. GROUT: Depth Material Method

Depth	Material	Method
From 0 To 3.00 Ft.	Portland	Tremie
From To Ft.		
From To Ft.		

8. SCREEN: Depth Diameter Slot Size Material

Depth	Diameter	Slot Size	Material
From 5.00 To 15.00 Ft.	2 in.	0.010 in.	PVC
From To Ft.			
From To Ft.			

9. SAND/GRAVEL PACK:

Depth	Size	Material
From 4.00 To 15.00 Ft.	#1	Filter Sand
From To Ft.		
From To Ft.		

10. DRILLING LOG

From	To	Formation Description
0	9	fine to med sandy silty clay
9	15	fine to med sandy clayey silt and silty sand

11. REMARKS:

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

Signature of Certified Well Contractor: Jay A. Little DATE: 4-26-07

PRINTED NAME OF PERSON CONSTRUCTING THE WELL: Jay A. Little

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

Form GW-1b
Rev. 7/05



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte

NC

28273

City or Town

State

Zip Code

(704) 523-4726

Area code - Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-84R

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 3/22/07

TIME COMPLETED 5:00

AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville

COUNTY: Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☒ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35 25' 49.60" N

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

LONGITUDE 80 57' 19.64" W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville

NC

28078

City or Town

State

Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville

NC

28078

City or Town

State

Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 28.50 ft

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

c. WATER LEVEL Below Top of Casing: 20.34 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 3.0 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/Weight	Material
From 3.0 ALS To 20.00 BLS	2 inches	Sch 40	PVC
From To	Ft.		
From To	Ft.		

7. GROUT:

Depth	Material	Method
From 0 To 15.00	Portland	Tremie
From To	Ft.	
From To	Ft.	

8. SCREEN:

Depth	Diameter	Slot Size	Material
From 20.00 To 25.00	2 in.	0.010 in.	PVC
From To	Ft.	in.	in.
From To	Ft.	in.	in.

9. SAND/GRAVEL PACK:

Depth	Size	Material
From 18.70 To 28.50	#2	Filter Sand
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	9	fine to med sandy silty clay
9	15	fine to med sandy clayey silt and silty sand
15	18.7	silty fine to coarse sand w/ rock fragments - saprolite
18.7		refusal to roller cone drill bit
18.7	28.5	sound rock - granite

11. REMARKS:

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE 4-26-07

PRINTED NAME OF PERSON CONSTRUCTING THE WELL JAY A. LITTLE

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

Form GW-1b
Rev. 7/05



NON RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg SC 29301

City or Town State Zip Code

(864) 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-85

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 3/23/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

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

LATITUDE 35 25' 52.74" N

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

LONGITUDE 80 57' 20.45" W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 14.00 ft

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

c. WATER LEVEL Below Top of Casing: 5.10 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 3.0 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/	Weight	Material
From 3.0 ALS To 4.00 BLS	Ft. 2 inches	Sch 40		PVC
From To	Ft.			
From To	Ft.			

7. GROUT:

Depth	Material	Method
From 0 To 3.00	Ft. Portland	Tremie
From To	Ft.	
From To	Ft.	

8. SCREEN:

Depth	Diameter	Slot Size	Material
From 4.00 To 14.00	Ft. 2 in.	0.010 in.	PVC
From To	Ft.	in.	
From To	Ft.	in.	

9. SAND/GRAVEL PACK:

Depth	Size	Material
From 3.50 To 14.00	Ft. #2	Filter Sand
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	8.5	fine to med sandy silty clay
8.5	20.65	fine to med sandy silt
20.65		refusal to roller cone drill bit

11. REMARKS:

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE

Justin Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



NON RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte

NC

28273

City or Town

State

Zip Code

(704) 523-4726

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-103

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 4/4/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY: Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☒ Ridge ☐ Other

(check appropriate box)

LATITUDE 35 25' 48.29" N

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

LONGITUDE 80 57' 14.67" W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville

NC

28078

City or Town

State

Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville

NC

28078

City or Town

State

Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 22.00 ft

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

c. WATER LEVEL Below Top of Casing: 12.00 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 3.0 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/Weight	Material
From 3.0 ALS To 7.00 ELS	Ft. 2 inches	Sch 40	PVC
From To	Ft.		
From To	Ft.		

7. GROUT:

Depth	Material	Method
From 0 To 4.50	Ft. Portland	Tremie
From To	Ft.	
From To	Ft.	

8. SCREEN:

Depth	Diameter	Slot Size	Material
From 7.00 To 22.00	Ft. 2 in.	0.010 in.	PVC
From To	Ft.	in.	in.
From To	Ft.	in.	in.

9. SAND/GRAVEL PACK:

Depth	Size	Material
From 6.00 To 22.00	Ft. #1	Filter Sand
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	7.5	fine sandy clayey silt and fine to med
		sandy silty clay - saprolite
7.5	22	silty fine to med sand - saprolite and
		weathered rock

11. REMARKS:

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

Jay A. Little 4-26-07
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

JAY A. LITTLE
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



NON RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood
Well Contractor (Individual) Name
S&ME, Inc.
Well Contractor Company Name
STREET ADDRESS 155 Tradd Street
Spartanburg SC 29301
City or Town State Zip Code
(864) 574-2360
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-104R
STATE WELL PERMIT #(if applicable)
DWQ or OTHER PERMIT #(if applicable) 70000752
WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use)
DATE DRILLED 3/26/07
TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg
McGuire Nuclear Station
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)
TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☒ Ridge ☐ Other
(check appropriate box)
LATITUDE 35 25' 51.86" N
LONGITUDE 80 57' 16.20" W
Latitude/longitude source: ☒ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

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

FACILITY ID #(if applicable)
NAME OF FACILITY McGuire Nuclear Station
STREET ADDRESS 12700 Hagers Ferry Road
Huntersville NC 28078
City or Town State Zip Code
CONTACT PERSON Michael Phillips
MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd
Huntersville NC 28078
City or Town State Zip Code
(704) 875-4675
Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 47.00 ft
b. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
c. WATER LEVEL Below Top of Casing: 37.40 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 3.0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

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

6. CASING:
Depth Diameter Thickness/Weight Material
From 0 ALS To 39.8 ALS Ft. 4 inches Sch 40 PVC
From 3.0 ALS To 42.00 Ft. 2 inches Sch 40 PVC
From To Ft.

7. GROUT: Depth Material Method
From 0 To 39.80 Ft. Portland Tremie
From To Ft.
From To Ft.

8. SCREEN: Depth Diameter Slot Size Material
From 42.00 To 47.00 Ft. 2 in. 0.010 in. PVC
From To Ft. in. in.
From To Ft. in. in.

9. SAND/GRAVEL PACK:
Depth Size Material
From 41.00 To 47.00 Ft. #2 Filter Sand
From To Ft.
From To Ft.

10. DRILLING LOG
From To Formation Description
0 8 fine to med sandy silty clay
8 39.8 silty fine to med/coarse sand
39.8 refusal to roller cone drill bit
39.8 60.04 weathered and sound rock -
coarse grained granite

11. REMARKS:

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR 4-27-07
DATE

Justin Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



June 13, 2007

Mecklenburg County Health Department
Land Use & Environmental Service Agency
Groundwater & Wastewater Services
700 North Tryon Street, Suite 211
Charlotte, North Carolina 28202

Reference: **NON-RESIDENTIAL WELL CONSTRUCTION RECORDS – SUBMITTAL #2**
McGUIRE NUCLEAR STATION
12700 Hagers Ferry Road
Huntersville, North Carolina
Well Application Permit No. 70000752
S&ME Project No. 1264-06-724

Ladies and Gentlemen:

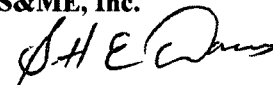
On behalf of Duke Energy, S&ME, Inc. (S&ME) is submitting the enclosed *Monitor Well Registration* form and completed/signed *Non-Residential Well Construction Records* for the following twelve (12) groundwater monitoring wells installed at the McGuire Nuclear Station (MNS) site:

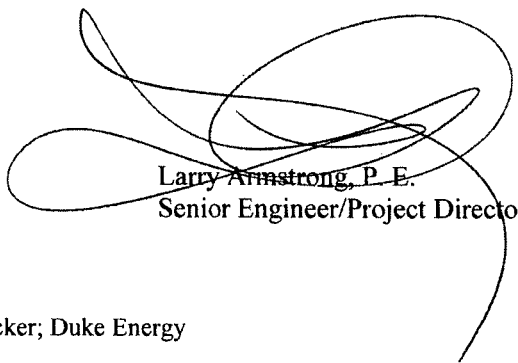
- | | | | |
|---------|---------|---------|-----------|
| • M-92 | • M-93R | • M-96 | • M-98 |
| • M-92R | • M-95 | • M-96R | • M-98R |
| • M-93 | • M-95R | • M-97 | • M-100R. |

Duke Energy is voluntarily installing groundwater monitoring wells at MNS as part of a site-wide hydrogeologic evaluation. S&ME will continue to submit these *Non-Residential Well Construction Records* on a periodic basis as well installations are completed, this being the second submittal (i.e., *Submittal #2*).

On behalf of Duke Energy, S&ME thanks you for your receipt of these records. Should you have any questions or need additional information, please contact us.

Sincerely,
S&ME, Inc.


Scott E. Dacus, P.G.
Project Geologist


Larry Armstrong, P.E.
Senior Engineer/Project Director

enclosures

cc: Messrs. Steve LeRoy, Ed Sullivan, Tim Hunsucker; Duke Energy

S:\ENVIRON\2006\1264 Projects\6406724 McGuire Nuclear Groundwater Study\NCDENR Well Records\meck co well records submittal 2.doc



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte NC 28273

City or Town State Zip Code

(704) 523-4726

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-92

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 4/17/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY: Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☒ Ridge ☐ Other

(check appropriate box)

LATITUDE 35 25' 57.70" N

LONGITUDE 80 57' 10.80" W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 34.50 ft

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

c. WATER LEVEL Below Top of Casing: 6.99 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.94 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/ Weight	Material
From 2.94 ALS To 19.50 BLS	Ft. 2 inches	Sch 40	PVC
From To	Ft.		
From To	Ft.		

7. GROUT:

Depth	Material	Method
From 0 To 10.00	Ft. Portland	Tremie
From To	Ft.	
From To	Ft.	

8. SCREEN:

Depth	Diameter	Slot Size	Material
From 19.50 To 34.50	Ft. 2 in.	0.010 in.	PVC
From To	Ft. in.	in.	
From To	Ft. in.	in.	

9. SAND/GRAVEL PACK:

Depth	Size	Material
From 12.00 To 34.50	Ft. #1	Filter Sand
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	26	fine sandy silty clay - fill
26	34	fine sandy silty clay, with organics- alluvium
34	35	fine sandy silty clay - saprolite

11. REMARKS:

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

Jay A. Little
SIGNATURE OF CERTIFIED WELL CONTRACTOR

6-1-07
DATE

JAY A. Little
PRINTED NAME OF PERSON CONSTRUCTING THE WELL



***Non RESIDENTIAL* WELL CONSTRUCTION RECORD**
North Carolina Department of Environment and Natural Resources- Division of Water Quality
WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte NC 28273
City or Town State Zip Code

(704) 523-4726

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-92R

STATE WELL PERMIT #(if applicable) _____

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use) _____

DATE DRILLED 4/6/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☒ Ridge ☐ Other _____

(check appropriate box)

LATITUDE 35 25' 57.69" N

LONGITUDE 80 57' 10.86" W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable) _____

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078
City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078
City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 75.00 ft

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

c. WATER LEVEL Below Top of Casing: 10.19 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 3.06 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): _____ METHOD OF TEST _____

f. DISINFECTION: Type _____ Amount _____

g. WATER ZONES (depth):

From _____ To _____ From _____ To _____

From _____ To _____ From _____ To _____

From _____ To _____ From _____ To _____

6. CASING:

From	Depth	To	Diameter	Weight	Thickness/	Material
From <u>3.06</u> ALS	To <u>70.00</u> BLS	Ft.	<u>2 inches</u>	<u>Sch 40</u>		<u>PVC</u>
From <u>0</u>	To <u>58.4</u> BLS	Ft.	<u>4 inches</u>	<u>Sch 40</u>		<u>PVC</u>
From _____	To _____	Ft.	_____	_____		_____

7. GROUT:

From	Depth	To	Material	Method
From <u>0</u>	To <u>59.00</u>	Ft.	<u>Portland</u>	<u>Tremie</u>
From _____	To _____	Ft.	_____	_____
From _____	To _____	Ft.	_____	_____

8. SCREEN:

From	Depth	To	Diameter	Slot Size	Material
From <u>70.00</u>	To <u>75.00</u>	Ft.	<u>2 in.</u>	<u>0.010 in.</u>	<u>PVC</u>
From _____	To _____	Ft.	_____ in.	_____ in.	_____
From _____	To _____	Ft.	_____ in.	_____ in.	_____

9. SAND/GRAVEL PACK:

From	Depth	To	Size	Material
From <u>67.50</u>	To <u>75.50</u>	Ft.	<u>#2</u>	<u>Filter Sand</u>
From _____	To _____	Ft.	_____	_____
From _____	To _____	Ft.	_____	_____

10. DRILLING LOG

From	To	Formation Description
<u>0</u>	<u>26</u>	<u>fine sandy silty clay - fill</u>
<u>26</u>	<u>34</u>	<u>fine sandy silty clay, with organics- alluvium</u>
<u>34</u>	<u>35</u>	<u>fine sandy silty clay - saprolite</u>
<u>35</u>	<u>58.4</u>	<u>silty coarse to fine sand - granitic</u>
<u>58.4</u>	<u>79.9</u>	<u>coarse grained to fine grained granite and quartz diorite</u>

11. REMARKS:

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

Jay A. Little
SIGNATURE OF CERTIFIED WELL CONTRACTOR

6-1-07
DATE

Jay A. Little
PRINTED NAME OF PERSON CONSTRUCTING THE WELL



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg SC 29301

City or Town State Zip Code

(864) 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-93

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 4/19/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY: Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35 25' 56.21" N

LONGITUDE 80 57' 07.84" W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 43.00 ft

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

c. WATER LEVEL Below Top of Casing: 38.75 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.92 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

From	Depth	To	Diameter	Thickness/	Weight	Material
0	ALS	28.0 BLS	2 inches	Sch 40		PVC
From	To	Ft.				
From	To	Ft.				

7. GROUT:

From	Depth	To	Material	Method
0		21.75	Portland	Tremie
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

From	Depth	To	Diameter	Slot Size	Material
28.00		43.00	2 in.	0.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

From	Depth	To	Size	Material
25.20		43.00	#2	Filter Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0	17.8	fine to med sandy silty clay - fill
17.8	18.2	concrete
18.2	22	slightly clayey fine to med sandy silt - fill
22	27	fine sandy silty clay - fill
27	37	slightly clayey fine sandy silt - saprolite
37	43	silty fine to med sand - saprolite

11. REMARKS:

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR

5/25/07
DATE

Justin Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL



Non RESIDENTIAL WELL CONSTRUCTION RECORD
North Carolina Department of Environment and Natural Resources- Division of Water Quality
WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg SC 29301

City or Town State Zip Code

(864) 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-93R

STATE WELL PERMIT #(if applicable) _____

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use) _____

DATE DRILLED 4/10/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

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

LATITUDE 35 25' 56.23" N

LONGITUDE 80 57' 07.89" W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable) _____

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 93.00 ft

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

c. WATER LEVEL Below Top of Casing: 35.96 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 3.01 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): _____ METHOD OF TEST _____

f. DISINFECTION: Type _____ Amount _____

g. WATER ZONES (depth):

From _____ To _____ From _____ To _____

From _____ To _____ From _____ To _____

From _____ To _____ From _____ To _____

6. CASING:

From	Depth	To	Diameter	Weight	Thickness/	Material
From <u>3.01</u>	<u>ALS</u>	To <u>88.0</u>	<u>2</u> inches	<u>Sch 40</u>		<u>PVC</u>
From <u>0</u>	<u>To</u>	<u>50.45</u>	<u>4</u> inches	<u>Sch 40</u>		<u>PVC</u>
From _____	<u>To</u>	_____	_____	_____		_____

7. GROUT:

From	Depth	To	Material	Method
From <u>0</u>	<u>To</u>	<u>86</u> BLS	<u>Portland</u>	<u>Tremie</u>
From _____	<u>To</u>	_____	_____	_____
From _____	<u>To</u>	_____	_____	_____

8. SCREEN:

From	Depth	To	Diameter	Slot Size	Material
From <u>88.00</u>	<u>To</u>	<u>93.00</u>	<u>2</u> in.	<u>0.010</u> in.	<u>PVC</u>
From _____	<u>To</u>	_____	_____ in.	_____ in.	_____
From _____	<u>To</u>	_____	_____ in.	_____ in.	_____

9. SAND/GRAVEL PACK:

From	Depth	To	Size	Material
From _____	<u>To</u>	_____	_____	_____
From _____	<u>To</u>	_____	_____	_____
From _____	<u>To</u>	_____	_____	_____

10. DRILLING LOG

From	To	Formation Description
<u>0</u>	<u>17.8</u>	<u>fine to med sandy silty clay - fill</u>
<u>17.8</u>	<u>18.2</u>	<u>concrete</u>
<u>18.2</u>	<u>22</u>	<u>slightly clayey fine to med sandy silt - fill</u>
<u>22</u>	<u>27</u>	<u>fine sandy silty clay - fill</u>
<u>27</u>	<u>37</u>	<u>slightly clayey fine sandy silt - saprolite</u>
<u>37</u>	<u>43.5</u>	<u>silty fine to med sand - saprolite</u>
<u>43.5</u>	<u>48.5</u>	<u>fine sandy silt - saprolite</u>
<u>48.5</u>	<u>82.48</u>	<u>silty fine to med sand - saprolite</u>
<u>82.48</u>	<u>104.83</u>	<u>fine to medium grained granite and quartz diorite</u>
_____	_____	_____
_____	_____	_____

11. REMARKS:

K-packer and bentonite placed at 86 to 87.5 ft BLS to seal well;
no sand/gravel pack placed below K-packer/bentonite

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

Justin Millwood
SIGNATURE OF CERTIFIED WELL CONTRACTOR

5/25/07
DATE

Justin Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg SC 29301

City or Town State Zip Code

(864) 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-95

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 4/25/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35 25' 51.01" N

LONGITUDE 80 57' 04.87" W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 24.00 ft

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

c. WATER LEVEL Below Top of Casing: 14.40 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 0.30 BLS FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/ Weight	Material
From 0.30 BLS To 9.0 BLS	Ft. 2 inches	Sch 40	PVC
From To	Ft.		
From To	Ft.		

7. GROUT:

Depth	Material	Method
From 0 To 5.00	Ft. Portland	Tremie
From To	Ft.	
From To	Ft.	

8. SCREEN:

Depth	Diameter	Slot Size	Material
From 9.00 To 24.00	Ft. 2 in.	0.010 in.	PVC
From To	Ft. in.	in.	
From To	Ft. in.	in.	

9. SAND/GRAVEL PACK:

Depth	Size	Material
From 7.00 To 24.00	Ft. #1	Filter Sand
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	0.5	asphalt
0.5	8	fine sandy silty clay - alluvium
8	11	silty clay - alluvium
11	11.5	WOOD
11.5	14	clayey silt - alluvium
14	17	silty clay - alluvium
17	23	silty clay - saprolite
23	24	silty fine to coarse sand (granitic) - saprolite

11. REMARKS:

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE 5-25-07

Justin Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg SC 29301

City or Town State Zip Code

(864) 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-95R

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 4/24/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35 25' 51.00" N

LONGITUDE 80 57' 04.81" W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 44.00 ft

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

c. WATER LEVEL Below Top of Casing: 14.54 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 0.16 BLS FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

From	Depth	To	Diameter	Weight	Thickness/	Material
0.16 BLS	39.0 BLS	Ft.	2 inches	Sch 40		PVC
From	To	Ft.				
From	To	Ft.				

7. GROUT:

From	Depth	To	Material	Method
0	20.00	Ft.	Portland	Tremie
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

From	Depth	To	Diameter	Slot Size	Material
39.00	44.00	Ft.	2 in.	0.010 in.	PVC
From	To	Ft.			
From	To	Ft.			

9. SAND/GRAVEL PACK:

From	Depth	To	Size	Material
44	45	Ft.	#2	Filter Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0	0.5	asphalt
0.5	8	fine sandy silty clay - alluvium
8	11	silty clay - alluvium
11	11.5	wood
11.5	14	clayey silt - alluvium
14	17	silty clay - alluvium
17	23	silty clay - saprolite
23	27	silty fine to coarse sand (granitic) - saprolite
27	32	fine to med sandy silt (schistose) - saprolite
32	36.5	silty fine sand (granitic) - saprolite
36.5	64.5	med to coarse granite and quartz diorite

11. REMARKS:

- bentonite placed below well from 45 to 64.5 ft BLS
- K-packer placed at 36.8 to 38.3 ft BLS; bentonite seal placed
at 20 to 36.8 ft BLS; no sand/gravel pack below K-packer

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR

5-25-07
DATE

Justin Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg SC 29301
City or Town State Zip Code

(864) 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-96R

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 4/26/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35 25' 52.97" N

LONGITUDE 80 56' 59.33" W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078
City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078
City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 87.00 ft

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

c. WATER LEVEL Below Top of Casing: 26.6 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.85 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/ Weight	Material
From 2.85 ALS To 82.0 BLS	2 inches	Sch 40	PVC
From To	Ft.		
From To	Ft.		

7. GROUT: Depth Material Method

Depth	Material	Method
From 0 To 78.00	Portland	Tremie
From To	Ft.	
From To	Ft.	

8. SCREEN: Depth Diameter Slot Size Material

Depth	Diameter	Slot Size	Material
From 82.00 To 87.00	2 in.	0.010 in.	PVC
From To	Ft.	in.	
From To	Ft.	in.	

9. SAND/GRAVEL PACK:

Depth	Size	Material
From 87 To 88.00	#2	Filter Sand
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	8	fine sandy clayey silt - fill
8	12	fine sandy clayey silt - saprolite
12	47	slightly clayey fine sandy silt - saprolite
47	52.5	silty fine to med sand - saprolite
52.5	80	silty fine to coarse sand (granitic) - weathered rock
80	99.57	fine to coarse grained quartz diorite

11. REMARKS:

- bentonite placed below well from 88 to 99.57 ft BLS
- K-packer placed at 79.8 to 81.3 ft BLS; bentonite seal placed at 78 to 79.8 ft BLS; no sand/gravel pack below K-packer

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR

5-25-07
DATE

Justin Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg SC 29301

City or Town State Zip Code

(864) 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-97

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 5/8/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY: Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35 25' 51.65" N

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

LONGITUDE 80 56' 51.19" W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 26.00 ft

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

c. WATER LEVEL Below Top of Casing: 12.70 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 0.34 BLS FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/Weight	Material
From 0.34 BLS To 11.0 BLS	Ft. 2 inches	Sch 40	PVC
From To	Ft.		
From To	Ft.		

7. GROUT: Depth Material Method

Depth	Material	Method
From 0.54 To 5.00	Ft. Portland	Tremie
From To	Ft.	
From To	Ft.	

8. SCREEN: Depth Diameter Slot Size Material

Depth	Diameter	Slot Size	Material
From 11.00 To 26.00	Ft. 2 in.	0.010 in.	PVC
From To	Ft. in.	in.	
From To	Ft. in.	in.	

9. SAND/GRAVEL PACK:

Depth	Size	Material
From 9.00 To 27.50	Ft. #2	Filter Sand
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	0.5	asphalt over gravel
0.5	13.5	slightly clayey silt - saprolite
13.5	22	silt - saprolite
22	42	slightly clayey silty sand - saprolite
42	51.9	slightly clayey sandy silt - saprolite
51.9		refusal to roller cone drill bit
51.9	99.40	fine to medium grained diorite/ quartz diorite

11. REMARKS:

bentonite placed below sand pack from 27.5 ft to 99.40 ft

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

Justin Millwood 6-8-07
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

Justin Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL



***Non RESIDENTIAL* WELL CONSTRUCTION RECORD**

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte

NC

28273

City or Town

State

Zip Code

(704) 523-4726

Area code - Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-98

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 5/2/07

TIME COMPLETED 5:00

AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville

COUNTY: Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☒ Ridge ☐ Other

(check appropriate box)

LATITUDE 35 25' 48.07" N

LONGITUDE 80 56' 58.06" W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville

NC

28078

City or Town

State

Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville

NC

28078

City or Town

State

Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 27.00 ft

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

c. WATER LEVEL Below Top of Casing: 16.39 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.89 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/Weight	Material
From 2.89 ALS To 12.0 BLS	2 inches	Sch 40	PVC
From To	Ft.		
From To	Ft.		

7. GROUT: Depth Material Method

Depth	Material	Method
From 0 To 7.00	Portland	Tremie
From To	Ft.	
From To	Ft.	

8. SCREEN: Depth Diameter Slot Size Material

Depth	Diameter	Slot Size	Material
From 12.00 To 27.00	2 in.	0.010 in.	PVC
From To	in.	in.	
From To	in.	in.	

9. SAND/GRAVEL PACK:

Depth	Size	Material
From 9.00 To 27.00	#1	Filter Sand
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	4.25	fine to med sandy silt - saprolite
4.25	8	silty fine to med sand - saprolite
8	13	fine sandy silt - saprolite
13	20	silty fine to med sand - saprolite
20	20.75	silty fine to med sand - weathered rock
20.75	28	medium grained quartz diorite/granite - sound rock

11. REMARKS:

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

Jay A. Little 6-12-07
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

JAY A. LITTLE
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte NC 28273

City or Town State Zip Code

(704) 523-4726

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-98R

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 4/25/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY: Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☒ Ridge ☐ Other

(check appropriate box)

LATITUDE 35 25' 48.12" N

LONGITUDE 80 56' 58.10" W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 47.60 ft

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

c. WATER LEVEL Below Top of Casing: 19.52 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 3.22 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/Weight	Material
From 3.22 ALS To 42.6 BLS	2 inches	Sch 40	PVC
From To	Ft.		
From To	Ft.		

7. GROUT:

Depth	Material	Method
From 0 To 40.80	Portland	Tremie
From To	Ft.	
From To	Ft.	

8. SCREEN:

Depth	Diameter	Slot Size	Material
From 42.60 To 47.60	2 in.	0.010 in.	PVC
From To	Ft.	in.	in.
From To	Ft.	in.	in.

9. SAND/GRAVEL PACK:

Depth	Size	Material
From 47.60 To 48.60	#1	Filter Sand
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	4.25	fine to med sandy silt - saprolite
4.25	8	silty fine to med sand - saprolite
8	13	fine sandy silt - saprolite
13	20	silty fine to med sand - saprolite
20	20.75	silty fine to med sand - weathered rock
20.75	49.7	medium grained quartz diorite/granite - sound rock

11. REMARKS:

- K-packer placed at 41.65 to 41.9 ft BLS; bentonite seal placed at 40.8 to 41.65 ft BLS

- bentonite placed below well from 48.6 to 49.7 ft BLS

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

Jay A. Little 6-12-07
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

Jay A. Little
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte NC 28273

City or Town State Zip Code

(704) 523-4726

Area code - Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-100R

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 4/24/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☒ Ridge ☐ Other

(check appropriate box)

LATITUDE 35 25' 47.38" N

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

LONGITUDE 80 57' 07.53" W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 47.00 ft

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

c. WATER LEVEL Below Top of Casing: 31.38 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.96 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Weight	Material
From 2.96 ALS To 42.0 BLS	2 inches	Sch 40	PVC
From To	Ft.		
From To	Ft.		

7. GROUT:

Depth	Material	Method
From 0 To 30.00	Portland	Tremie
From To	Ft.	
From To	Ft.	

8. SCREEN:

Depth	Diameter	Slot Size	Material
From 42.00 To 47.00	2 in.	0.010 in.	PVC
From To	Ft.	in.	
From To	Ft.	in.	

9. SAND/GRAVEL PACK:

Depth	Size	Material
From 47.00 To 50.00	#1	Filter Sand
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	0.5	gravel
0.5	30	sandy silty clay
30	40.25	fine to coarse sand - weathered rock (granitic)
40.25	60.0	fine grained granite - sound rock

11. REMARKS:

- K-packer placed at 41.25 to 41.5 ft BLS; bentonite seal placed at 30.0 to 41.25 ft BLS

- bentonite placed below well from 50.0 to 60.0 ft BLS

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

Jay A. Little 6-12-07
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

JAY A. LITTLE
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



LETTER OF TRANSMITTAL

S&ME, Inc.
155 Tradd Street
Spartanburg, South Carolina 29301
(864) 574-2360
Fax (864) 576-8730

Mecklenburg County Health Department

Land Use & Environmental Service Agency

Groundwater & Wastewater Services

DATE	07/18/07	JOB NO.	1264-06-724
ATTENTION	Shawna Caldwell		
RE:	Monitor Well Registration Form		
McGuire Nuclear Station			
Well Application Permit No. 70000752			

WE ARE SENDING YOU ☒ Attached ☐ Under separate cover via _____ the following items:
☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications
☐ Copy of letter ☐ Report ☐ CD ☒ **Monitor Well Registration**

COPIES	DATE	NO.	DESCRIPTION
1	7/18/07		Mecklenburg County Monitor Well Registration

THESE ARE TRANSMITTED as checked below:

- ☐ For approval
☒ For your use
☐ As requested
☐ For review and comment ☐ _____
☐ FOR BIDS DUE _____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS **Based on our July 16, 2007 telephone conversation, S&ME (on behalf of Duke Energy) is submitting the Monitor Well Registration Form which was omitted from the June 13, 2007 Non-Residential Well Construction Records-Submittal #2 for McGuire Nuclear Station.**

COPY TO **Messrs. Steve LeRoy, Ed Sullivan, Tim Hunsucker; Duke Energy**

SIGNED _____

IF ENCLOSURES ARE NOT AS NOTED, PLEASE NOTIFY US AT ONCE.

This Letter of Transmittal and the documents accompanying this Letter of Transmittal contain information from S&ME, Inc., which is confidential and legally privileged. The information is intended only for the use of the individual or entity named on the Letter of Transmittal. If you are not the intended recipient, you are hereby notified that any disclosure, copying, distribution or the taking of any action in reliance on these documents is strictly prohibited.

Mecklenburg County
Land Use & Environmental Service Agency
Groundwater & Wastewater Services
700 N. Tryon St., Suite 211
Charlotte, NC 28202
Phone: (704) 336-5103
Fax: (704) 336-6894



Staff Use Only
Date Received: _____

Monitor Well Registration

Is this Registration for a well or wells that existed prior to January 01, 2005? No

Enter your Subsurface Investigation Permit #: 70000752

Date Well Installation Began: 4-6-07

Date Well Installation Complete: 5-8-07

Site/Contact Information

Name of Site: McGuire Nuclear Station

Site Address: 12700 Hagers Ferry Road

Site Tax Parcel ID: 00119103

Bill to Owner/Agent Name: Duke Energy / Michael Phillips

Owner/Agent Address: Mail Code MG01EM 12700 Hagers Ferry Rd.
Huntersville, NC 28078

Owner/Agent Phone #: 704-875-4675

Driller Certification #: 3439 & 2717

Type of Registration

This registration is for (check all that apply):

☒ Unregistered Permanent Monitor Wells

☐ Yearly Update of Permanent Monitor Wells

☐ Temporary Monitor Wells

The following information must be completed for each tax parcel on which monitor wells have been installed:

On-Site Monitor Wells		Tax Parcel #		Tax Parcel #		Tax Parcel #	
Type of Well	# Present	Type of Well	# Present	Type of Well	# Present	Type of Well	# Present
Temporary*		Temporary*		Temporary*		Temporary*	
Permanent	12	Permanent		Permanent		Permanent	
Sparge		Sparge		Sparge		Sparge	
Vapor Extraction		Vapor Extraction		Vapor Extraction		Vapor Extraction	
Recovery		Recovery		Recovery		Recovery	
Injection		Injection		Injection		Injection	
Vapor Monitoring		Vapor Monitoring		Vapor Monitoring		Vapor Monitoring	
Piezometer		Piezometer		Piezometer		Piezometer	
Groundwater Standard Exceeded?		Groundwater Standard Exceeded?		Groundwater Standard Exceeded?		Groundwater Standard Exceeded?	

Tax Parcel #		Tax Parcel #		Tax Parcel #		Tax Parcel #	
Type of Well	# Present	Type of Well	# Present	Type of Well	# Present	Type of Well	# Present
Temporary*		Temporary*		Temporary*		Temporary*	
Permanent		Permanent		Permanent		Permanent	
Sparge		Sparge		Sparge		Sparge	
Vapor Extraction		Vapor Extraction		Vapor Extraction		Vapor Extraction	
Recovery		Recovery		Recovery		Recovery	
Injection		Injection		Injection		Injection	
Vapor Monitoring		Vapor Monitoring		Vapor Monitoring		Vapor Monitoring	
Piezometer		Piezometer		Piezometer		Piezometer	
Groundwater Standard Exceeded?		Groundwater Standard Exceeded?		Groundwater Standard Exceeded?		Groundwater Standard Exceeded?	

*Selection of Temporary Well requires monitor well abandonment forms also be filed. Failure to file abandonment forms will result in the well being considered permanent and cause the well owner to be billed the appropriate fee.



June 13, 2007

North Carolina Department of Environment and Natural Resources
Division of Water Quality
1617 Mail Service Center
Raleigh, North Carolina 27699-1617

ATTN: Information Management

Reference: **NON-RESIDENTIAL WELL CONSTRUCTION RECORDS – SUBMITTAL #2**
McGUIRE NUCLEAR STATION
12700 Hagers Ferry Road
Huntersville, North Carolina
S&ME Project No. 1264-06-724

Ladies and Gentlemen:


On behalf of Duke Energy, S&ME, Inc. (S&ME) is submitting the enclosed completed and signed *Non-Residential Well Construction Records* for the following twelve (12) groundwater monitoring wells installed at the McGuire Nuclear Station (MNS) site:

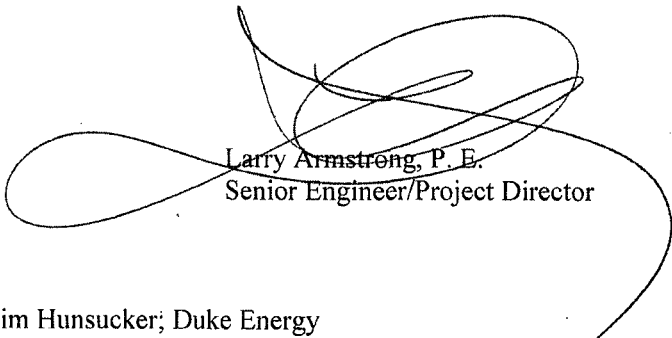
- | | | | |
|---------|---------|---------|----------|
| • M-92 | • M-93R | • M-96 | • M-98 |
| • M-92R | • M-95 | • M-96R | • M-98R |
| • M-93 | • M-95R | • M-97 | • M-100R |

Duke Energy is voluntarily installing groundwater monitoring wells at MNS as part of a site-wide hydrogeologic evaluation. S&ME will continue to submit these *Non-Residential Well Construction Records* on a periodic basis as well installations are completed, this being the second submittal (i.e., *Submittal #2*).

On behalf of Duke Energy, S&ME thanks you for your receipt of these records. Should you have any questions or need additional information, please contact us.

Sincerely,
S&ME, Inc.

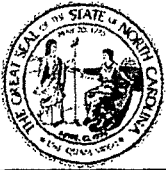

Scott E. Dacus, P.G.
Project Geologist


Larry Armstrong, P. E.
Senior Engineer/Project Director

enclosures

cc: Messrs. Steve LeRoy, Ed Sullivan, Tim Hunsucker; Duke Energy

S:\ENVIRON\2006\1264 Projects\6406724 McGuire Nuclear Groundwater Study\NCDENR Well Records\ncdenr well records submittal 2.doc



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte NC 28273

City or Town State Zip Code

(704) 523-4726

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-92

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 4/17/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☒ Ridge ☐ Other

(check appropriate box)

LATITUDE 35 25' 57.70" N

LONGITUDE 80 57' 10.80" W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 34.50 ft

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

c. WATER LEVEL Below Top of Casing: 6.99 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.94 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/Weight	Material
From 2.94 ALS To 19.50 BLS	2 inches	Sch 40	PVC
From To	Ft.		
From To	Ft.		

7. GROUT: Depth Material Method

Depth	Material	Method
From 0 To 10.00	Portland	Tremie
From To	Ft.	
From To	Ft.	

8. SCREEN: Depth Diameter Slot Size Material

Depth	Diameter	Slot Size	Material
From 19.50 To 34.50	2 in.	0.010 in.	PVC
From To	Ft.	in.	
From To	Ft.	in.	

9. SAND/GRAVEL PACK:

Depth	Size	Material
From 12.00 To 34.50	#1	Filter Sand
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	26	fine sandy silty clay - fill
26	34	fine sandy silty clay, with organics-alluvium
34	35	fine sandy silty clay - saprolite

11. REMARKS:

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

Jay A. Little 6-1-07
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

JAY A. Little
PRINTED NAME OF PERSON CONSTRUCTING THE WELL



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte NC 28273

City or Town State Zip Code

(704) 523-4726

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-92R

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 4/6/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY: Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

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

LATITUDE 35 25' 57.69" N

LONGITUDE 80 57' 10.86"W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 75.00 ft

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

c. WATER LEVEL Below Top of Casing: 10.19 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 3.06 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/Weight	Material
From 3.06 ALS To 70.00 BLS	2 inches	Sch 40	PVC
From 0 To 58.4 BLS	4 inches	Sch 40	PVC
From To	Ft.		

7. GROUT: Depth Material Method

From 0 To 59.00 Ft. Portland Tremie

From To Ft.

From To Ft.

8. SCREEN: Depth Diameter Slot Size Material

From 70.00 To 75.00 Ft. 2 in. 0.010 in. PVC

From To Ft. in. in.

From To Ft. in. in.

9. SAND/GRAVEL PACK:

Depth	Size	Material
From 67.50 To 75.50	#2	Filter Sand
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

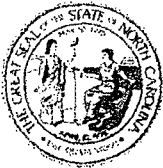
From	To	Formation Description
0	26	fine sandy silty clay - fill
26	34	fine sandy silty clay, with organics- alluvium
34	35	fine sandy silty clay - saprolite
35	58.4	silty coarse to fine sand - granitic
58.4	79.9	coarse grained to fine grained granite and quartz diorite

11. REMARKS:

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

Jay C. Little 6-1-07
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

Jay A. Little
PRINTED NAME OF PERSON CONSTRUCTING THE WELL



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg SC 29301
City or Town State Zip Code

(864) 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-93

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 4/19/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35 25' 56.21" N

LONGITUDE 80 57' 07.84" W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078
City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078
City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 43.00 ft

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

c. WATER LEVEL Below Top of Casing: 38.75 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.92 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

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

6. CASING:

From	Depth	To	Diameter	Thickness/	Material
0	ALS	28.0	BLS	2 inches	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

From	Depth	To	Material	Method
0		21.75	Portland	Tremie
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

From	Depth	To	Diameter	Slot Size	Material
28.00		43.00	2 in.	0.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

From	Depth	To	Size	Material
25.20		43.00	#2	Filter Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0	17.8	fine to med sandy silty clay - fill
17.8	18.2	concrete
18.2	22	slightly clayey fine to med sandy silt - fill
22	27	fine sandy silty clay - fill
27	37	slightly clayey fine sandy silt - saprolite
37	43	silty fine to med sand - saprolite

11. REMARKS:

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

Justin Millwood
SIGNATURE OF CERTIFIED WELL CONTRACTOR

5/25/07
DATE

Justin Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL



NON RESIDENTIAL WELL CONSTRUCTION RECORD
North Carolina Department of Environment and Natural Resources- Division of Water Quality
WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg SC 29301

City or Town State Zip Code

(864) - 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-93R

STATE WELL PERMIT #(if applicable) _____

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use) _____

DATE DRILLED 4/10/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other _____

(check appropriate box)

LATITUDE 35 25' 56.23" N

LONGITUDE 80 57' 07.89" W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable) _____

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) - 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 93.00 ft

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

c. WATER LEVEL Below Top of Casing: 35.96 FT.

(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 3.01 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): _____ METHOD OF TEST _____

f. DISINFECTION: Type _____ Amount _____

g. WATER ZONES (depth):

From _____ To _____ From _____ To _____

From _____ To _____ From _____ To _____

From _____ To _____ From _____ To _____

6. CASING:

From	Depth	To	Diameter	Weight	Material
From <u>3.01</u>	<u>ALS</u>	To <u>88.0</u>	<u>2</u> inches	<u>Sch 40</u>	<u>PVC</u>
From <u>0</u>		To <u>50.45</u>	<u>4</u> inches	<u>Sch 40</u>	<u>PVC</u>
From _____		To _____			

7. GROUT:

From	Depth	To	Material	Method
From <u>0</u>		To <u>86</u>	<u>BLS</u>	<u>Portland</u>
From _____		To _____		<u>Tremie</u>
From _____		To _____		

8. SCREEN:

From	Depth	To	Diameter	Slot Size	Material
From <u>88.00</u>		To <u>93.00</u>	<u>2</u> in.	<u>0.010</u> in.	<u>PVC</u>
From _____		To _____			
From _____		To _____			

9. SAND/GRAVEL PACK:

From	Depth	To	Size	Material
From _____		To _____		
From _____		To _____		
From _____		To _____		

10. DRILLING LOG

From	To	Formation Description
<u>0</u>	<u>17.8</u>	<u>fine to med sandy silty clay - fill</u>
<u>17.8</u>	<u>18.2</u>	<u>concrete</u>
<u>18.2</u>	<u>22</u>	<u>slightly clayey fine to med sandy silt - fill</u>
<u>22</u>	<u>27</u>	<u>fine sandy silty clay - fill</u>
<u>27</u>	<u>37</u>	<u>slightly clayey fine sandy silt - saprolite</u>
<u>37</u>	<u>43.5</u>	<u>silty fine to med sand - saprolite</u>
<u>43.5</u>	<u>48.5</u>	<u>fine sandy silt - saprolite</u>
<u>48.5</u>	<u>82.48</u>	<u>silty fine to med sand - saprolite</u>
<u>82.48</u>	<u>104.83</u>	<u>fine to medium grained granite and quartz diorite</u>
_____	_____	_____
_____	_____	_____

11. REMARKS:

K-packer and bentonite placed at 86 to 87.5 ft BLS to seal well;
no sand/gravel pack placed below K-packer/bentonite

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

Justin Millwood
SIGNATURE OF CERTIFIED WELL CONTRACTOR

5/25/07
DATE

Justin Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg SC 29301

City or Town State Zip Code

(864) 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-95

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 4/25/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35 25' 51.01" N

LONGITUDE 80 57' 04.87" W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 24.00 ft

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

c. WATER LEVEL Below Top of Casing: 14.40 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 0.30 BLS FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

From	Depth	To	Diameter	Weight	Material
0.30 BLS		9.0 BLS	2 inches	Sch 40	PVC

7. GROUT:

From	Depth	To	Material	Method
0		5.00	Portland	Tremie

8. SCREEN:

From	Depth	To	Diameter	Slot Size	Material
9.00		24.00	2 in.	0.010 in.	PVC

9. SAND/GRAVEL PACK:

From	Depth	To	Size	Material
7.00		24.00	#1	Filter Sand

10. DRILLING LOG

From	To	Formation Description
0	0.5	asphalt
0.5	8	fine sandy silty clay - alluvium
8	11	silty clay - alluvium
11	11.5	wood
11.5	14	clayey silt - alluvium
14	17	silty clay - alluvium
17	23	silty clay - saprolite
23	24	silty fine to coarse sand (granitic) - saprolite

11. REMARKS:

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR

5-25-07
DATE

Justin Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg SC 29301

City or Town State Zip Code

(864) 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-95R

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 4/24/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35 25' 51.00" N

LONGITUDE 80 57' 04.81" W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 44.00 ft

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

c. WATER LEVEL Below Top of Casing: 14.54 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 0.16 BLS FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

From	Depth	To	Diameter	Weight	Material
0.16 BLS	39.0 BLS	Ft.	2 inches	Sch 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

From	Depth	To	Material	Method
0	20.00	Ft.	Portland	Tremie
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

From	Depth	To	Diameter	Slot Size	Material
39.00	44.00	Ft.	2 in.	0.010 in.	PVC
From	To	Ft.			
From	To	Ft.			

9. SAND/GRAVEL PACK:

From	Depth	To	Size	Material
44	45	Ft.	#2	Filter Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0	0.5	asphalt
0.5	8	fine sandy silty clay - alluvium
8	11	silty clay - alluvium
11	11.5	wood
11.5	14	clayey silt - alluvium
14	17	silty clay - alluvium
17	23	silty clay - saprolite
23	27	silty fine to coarse sand (granitic) - saprolite
27	32	fine to med sandy silt (schistose) - saprolite
32	36.5	silty fine sand (granitic) - saprolite
36.5	64.5	med to coarse granite and quartz diorite

11. REMARKS:

- bentonite placed below well from 45 to 64.5 ft BLS
- K-packer placed at 36.8 to 38.3 ft BLS; bentonite seal placed
at 20 to 36.8 ft BLS; no sand/gravel pack below K-packer

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR

5-25-07
DATE

Justin Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg SC 29301
City or Town State Zip Code

(864) 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-96

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 5/4/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35 25' 52.96" N

LONGITUDE 80 56' 59.27" W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078
City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078
City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 34.00 ft

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

c. WATER LEVEL Below Top of Casing: 26.73 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.98 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

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

6. CASING:

From	Depth	To	Diameter	Weight	Material
2.98	ALS	19.0	BLS	2 inches	Sch 40
From	To	Ft.			PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

From	Depth	To	Material	Method
0	To	15.00	Ft. Portland	Tremie
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

From	Depth	To	Diameter	Slot Size	Material
19.00	To	34.00	Ft. 2 in.	0.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

From	Depth	To	Size	Material
17.00	To	34.00	Ft. #1	Filter Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0	8	fine sandy clayey silt - fill
8	12	fine sandy clayey silt - saprolite
12	34	slightly clayey fine sandy silt - saprolite

11. REMARKS:

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR

5-25-07
DATE

Justin Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg SC 29301
City or Town State Zip Code

(864) 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-96R

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 4/26/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

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

LATITUDE 35 25' 52.97" N

LONGITUDE 80 56' 59.33" W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078
City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078
City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 87.00 ft

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

c. WATER LEVEL Below Top of Casing: 26.6 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.85 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

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

6. CASING:

Depth	Diameter	Thickness/	Material
From To	Ft. inches	Weight Sch 40	
From 2.85 ALS To 82.0 BLS	Ft. 2		PVC
From To	Ft. inches		
From To	Ft. inches		

7. GROUT:

Depth	Material	Method
From To	Ft.	
From 0 To 78.00	Portland	Tremie
From To	Ft.	
From To	Ft.	

8. SCREEN:

Depth	Diameter	Slot Size	Material
From To	Ft. in.	in.	
From 82.00 To 87.00	Ft. 2	0.010 in.	PVC
From To	Ft. in.	in.	
From To	Ft. in.	in.	

9. SAND/GRAVEL PACK:

Depth	Size	Material
From To	Ft. #2	
From 87 To 88.00	Ft. #2	Filter Sand
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	8	fine sandy clayey silt - fill
8	12	fine sandy clayey silt - saprolite
12	47	slightly clayey fine sandy silt - saprolite
47	52.5	silty fine to med sand - saprolite
52.5	80	silty fine to coarse sand (granitic) - weathered rock
80	99.57	fine to coarse grained quartz diorite

11. REMARKS:

- bentonite placed below well from 88 to 99.57 ft BLS
- K-packer placed at 79.8 to 81.3 ft BLS; bentonite seal placed at 78 to 79.8 ft BLS; no sand/gravel pack below K-packer

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE 5-25-07

Justin Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg SC 29301

City or Town State Zip Code

(864) - 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-97

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 5/8/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35 25' 51.65" N

LONGITUDE 80 56' 51.19" W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) - 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 26.00 ft

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

c. WATER LEVEL Below Top of Casing: 12.70 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 0.34 BLS FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

From	Depth	To	Diameter	Weight	Material
0.34 BLS	11.0 BLS	Ft.	2 inches	Sch 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

From	Depth	To	Material	Method
0.54	5.00	Ft.	Portland	Tremie
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

From	Depth	To	Diameter	Slot Size	Material
11.00	26.00	Ft.	2 in.	0.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

From	Depth	To	Size	Material
9.00	27.50	Ft.	#2	Filter Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0	0.5	asphalt over gravel
0.5	13.5	slightly clayey silt - saprolite
13.5	22	silt - saprolite
22	42	slightly clayey silty sand - saprolite
42	51.9	slightly clayey sandy silt - saprolite
51.9		refusal to roller cone drill bit
51.9	99.40	fine to medium grained diorite/ quartz diorite

11. REMARKS:

bentonite placed below sand pack from 27.5 ft to 99.40 ft

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE

Justin Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte

NC

28273

City or Town

State

Zip Code

(704) 523-4726

Area code - Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-98

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 5/2/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

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

LATITUDE 35 25' 48.07" N

LONGITUDE 80 56' 58.06" W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville

NC

28078

City or Town

State

Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville

NC

28078

City or Town

State

Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 27.00 ft

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

c. WATER LEVEL Below Top of Casing: 16.39 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.89 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/Weight	Material
From 2.89 ALS To 12.0 BLS	2 inches	Sch 40	PVC
From To	Ft.		
From To	Ft.		

7. GROUT:

Depth	Material	Method
From 0 To 7.00	Portland	Tremie
From To	Ft.	
From To	Ft.	

8. SCREEN:

Depth	Diameter	Slot Size	Material
From 12.00 To 27.00	2 in.	0.010 in.	PVC
From To	Ft.	in.	in.
From To	Ft.	in.	in.

9. SAND/GRAVEL PACK:

Depth	Size	Material
From 9.00 To 27.00	#1	Filter Sand
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	4.25	fine to med sandy silt - saprolite
4.25	8	silty fine to med sand - saprolite
8	13	fine sandy silt - saprolite
13	20	silty fine to med sand - saprolite
20	20.75	silty fine to med sand - weathered rock
20.75	28	medium grained quartz diorite/granite - sound rock

11. REMARKS:

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

Signature of Certified Well Contractor: Jay A. Little DATE: 6-12-07

PRINTED NAME OF PERSON CONSTRUCTING THE WELL: JAY A. LITTLE

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

Form GW-1b
Rev. 7/05



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte NC 28273

City or Town State Zip Code

(704) 523-4726

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-98R

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 4/25/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY: Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

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

LATITUDE 35 25' 48.12" N

LONGITUDE 80 56' 58.10" W

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

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 47.60 ft

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

c. WATER LEVEL Below Top of Casing: 19.52 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 3.22 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/Weight	Material
From 3.22 ALS To 42.6 BLS	2 inches	Sch 40	PVC
From To	Ft.		
From To	Ft.		

7. GROUT:

Depth	Material	Method
From 0 To 40.80	Portland	Tremie
From To	Ft.	
From To	Ft.	

8. SCREEN:

Depth	Diameter	Slot Size	Material
From 42.60 To 47.60	2 in.	0.010 in.	PVC
From To	Ft.	in.	
From To	Ft.	in.	

9. SAND/GRAVEL PACK:

Depth	Size	Material
From 47.60 To 48.60	#1	Filter Sand
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	4.25	fine to med sandy silt - saprolite
4.25	8	silty fine to med sand - saprolite
8	13	fine sandy silt - saprolite
13	20	silty fine to med sand - saprolite
20	20.75	silty fine to med sand - weathered rock
20.75	49.7	medium grained quartz diorite/granite - sound rock

11. REMARKS:

- K-packer placed at 41.65 to 41.9 ft BLS; bentonite seal placed at 40.8 to 41.65 ft BLS

- bentonite placed below well from 48.6 to 49.7 ft BLS

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

Jay A. Little 6-12-07
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

Jay A. Little
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



NON RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte

NC

28273

City or Town

State

Zip Code

(704) 523-4726

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-100R

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 4/24/07

TIME COMPLETED 5:00

AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville

COUNTY: Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☒ Ridge ☐ Other

(check appropriate box)

LATITUDE 35 25' 47.38" N

LONGITUDE 80 57' 07.53" W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville

NC

28078

City or Town

State

Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville

NC

28078

City or Town

State

Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 47.00 ft

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

c. WATER LEVEL Below Top of Casing: 31.38 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.96 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/Weight	Material
From 2.96 ALS To 42.0 BLS	2 inches	Sch 40	PVC
From To	Ft.		
From To	Ft.		

7. GROUT:

Depth	Material	Method
From 0 To 30.00	Portland	Tremie
From To	Ft.	
From To	Ft.	

8. SCREEN:

Depth	Diameter	Slot Size	Material
From 42.00 To 47.00	2 in.	0.010 in.	PVC
From To	Ft.	in.	
From To	Ft.	in.	

9. SAND/GRAVEL PACK:

Depth	Size	Material
From 47.00 To 50.00	#1	Filter Sand
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	0.5	gravel
0.5	30	sandy silty clay
30	40.25	fine to coarse sand - weathered rock (granitic)
40.25	60.0	fine grained granite - sound rock

11. REMARKS:

- K-packer placed at 41.25 to 41.5 ft BLS; bentonite seal placed at 30.0 to 41.25 ft BLS

- bentonite placed below well from 50.0 to 60.0 ft BLS

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

Signature of Certified Well Contractor: Jay A. Little DATE: 6-12-07

PRINTED NAME OF PERSON CONSTRUCTING THE WELL: JAY A. LITTLE

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

Form GW-1b Rev. 7/05



July 31, 2007

Mecklenburg County Health Department
Land Use & Environmental Service Agency
Groundwater & Wastewater Services
700 North Tryon Street, Suite 211
Charlotte, North Carolina 28202

Reference: **NON-RESIDENTIAL WELL CONSTRUCTION RECORDS – SUBMITTAL #3**
McGUIRE NUCLEAR STATION
12700 Hagers Ferry Road
Huntersville, North Carolina
Well Application Permit No. 70000752
S&ME Project No. 1264-06-724

Ladies and Gentlemen:

On behalf of Duke Energy, S&ME, Inc. (S&ME) is submitting the enclosed *Monitor Well Registration* form and completed/signed *Non-Residential Well Construction Records* for the following six (6) groundwater monitoring wells installed at the McGuire Nuclear Station (MNS) site:

- M-30
- M-30R
- M-32
- M-33
- M-34DR
- M-34R.

Duke Energy is voluntarily installing groundwater monitoring wells at MNS as part of a site-wide hydrogeologic evaluation. S&ME will submit these *Non-Residential Well Construction Records* on a periodic basis as well installations are completed, this being the third submittal (i.e., *Submittal #3*).

On behalf of Duke Energy, S&ME thanks you for your receipt of these records. Should you have any questions or need additional information, please contact us.

Sincerely,
S&ME, Inc.

Mary Beth Cline, E.I.T.
Staff Professional

Larry Armstrong, P. E.
Senior Engineer/Project Director

enclosures

cc: Messrs. Steve LeRoy, Ed Sullivan, Tim Hunsucker; Duke Energy

S:\ENVIRON2006\1264 Projects\6406724 McGuire Nuclear Groundwater Study\NCDENR Well Records\neck co well records submittal 3.doc

Mecklenburg County
Land Use & Environmental Service Agency
Groundwater & Wastewater Services
700 N. Tryon St., Suite 211
Charlotte, NC 28202
Phone: (704) 336-5103
Fax: (704) 336-6894



Staff Use Only
Date Received: _____

Monitor Well Registration

Is this Registration for a well or wells that existed prior to January 01, 2005? No

Enter your Subsurface Investigation Permit #: 70000752

Date Well Installation Began: 5-03-07

Date Well Installation Complete: 5-17-07

Site/Contact Information

Name of Site: McGuire Nuclear Station

Site Address: 12700 Hagers Ferry Road

Site Tax Parcel ID: 00119103

Bill to Owner/Agent Name: Duke Energy / Michael Phillips

Owner/Agent Address: Mail Code MG01EM 12700 Hagers Ferry Rd.
Huntersville, NC 28078

Owner/Agent Phone #: 704-875-4675

Driller Certification #: 3439 & 2717

Type of Registration

This registration is for (check all that apply):

☒ Unregistered Permanent Monitor Wells

☐ Yearly Update of Permanent Monitor Wells

☐ Temporary Monitor Wells

The following information must be completed for each tax parcel on which monitor wells have been installed:

On-Site Monitor Wells		Tax Parcel #		Tax Parcel #		Tax Parcel #	
Type of Well	# Present	Type of Well	# Present	Type of Well	# Present	Type of Well	# Present
Temporary*		Temporary*		Temporary*		Temporary*	
Permanent	6	Permanent		Permanent		Permanent	
Sparge		Sparge		Sparge		Sparge	
Vapor Extraction		Vapor Extraction		Vapor Extraction		Vapor Extraction	
Recovery		Recovery		Recovery		Recovery	
Injection		Injection		Injection		Injection	
Vapor Monitoring		Vapor Monitoring		Vapor Monitoring		Vapor Monitoring	
Piezometer		Piezometer		Piezometer		Piezometer	
Groundwater Standard Exceeded?		Groundwater Standard Exceeded?		Groundwater Standard Exceeded?		Groundwater Standard Exceeded?	

Tax Parcel #		Tax Parcel #		Tax Parcel #		Tax Parcel #	
Type of Well	# Present	Type of Well	# Present	Type of Well	# Present	Type of Well	# Present
Temporary*		Temporary*		Temporary*		Temporary*	
Permanent		Permanent		Permanent		Permanent	
Sparge		Sparge		Sparge		Sparge	
Vapor Extraction		Vapor Extraction		Vapor Extraction		Vapor Extraction	
Recovery		Recovery		Recovery		Recovery	
Injection		Injection		Injection		Injection	
Vapor Monitoring		Vapor Monitoring		Vapor Monitoring		Vapor Monitoring	
Piezometer		Piezometer		Piezometer		Piezometer	
Groundwater Standard Exceeded?		Groundwater Standard Exceeded?		Groundwater Standard Exceeded?		Groundwater Standard Exceeded?	

*Selection of Temporary Well requires monitor well abandonment forms also be filed. Failure to file abandonment forms will result in the well being considered permanent and cause the well owner to be billed the appropriate fee.



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg SC 29301

City or Town State Zip Code

(864) 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-30

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 5/17/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY: Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35° 25' 38.41" N

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

LONGITUDE 80° 57' 02.96" W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 50.70 feet

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

c. WATER LEVEL Below Top of Casing: 45.63 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 3.04 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/	Material
From To	2 inches	Weight	
		Sch 40	PVC
From 3.04 ALS To 35.70			
From To			
From To			

7. GROUT:

Depth	Material	Method
From 0 To 30.70	Ft. Portland	Tremie
From To	Ft.	
From To	Ft.	

8. SCREEN:

Depth	Diameter	Slot Size	Material
From 35.70 To 50.70	Ft. 2 in.	0.010 in.	PVC
From To	Ft. in.	in.	
From To	Ft. in.	in.	

9. SAND/GRAVEL PACK:

Depth	Size	Material
From 33.00 To 50.70	Ft. #1	Filter Sand
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	13.5	slightly sandy, clayey, silt - saprolite
13.5	22	silty fine sand - saprolite
22	27	silty medium to fine sand - saprolite
27	32	slightly sandy, silt - saprolite
32	42	clayey, silt - saprolite
42	47.8	slightly sandy, silt - saprolite
47.8	50.7	silty, medium to fine sand - saprolite

11. REMARKS:

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR

7/27/07
DATE

Justin Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg SC 29301

City or Town State Zip Code

(864) 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-30R

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 5/14/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35° 25' 38.43" N

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

LONGITUDE 80° 57' 02.92" W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 78.50 feet

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

c. WATER LEVEL Below Top of Casing: 46.07 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 3.19 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/	Material
From To	Ft. 2 inches	Weight Sch 40	PVC
From 3.19 ALS To 73.50	Ft.		
From To	Ft.		
From To	Ft.		

7. GROUT:

Depth	Material	Method
From To	Ft. Neat Cement	Tremie
From 0 To 70.00	Ft.	
From To	Ft.	
From To	Ft.	

8. SCREEN:

Depth	Diameter	Slot Size	Material
From To	Ft. 2 in.	0.010 in.	PVC
From 73.50 To 78.50	Ft.		
From To	Ft.		
From To	Ft.		

9. SAND/GRAVEL PACK:

Depth	Size	Material
From To	Ft. #2	Filter Sand
From 78.50 To 80.30	Ft.	
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	13.5	slightly sandy, clayey, silt - saprolite
13.5	22	silty fine sand - saprolite
22	27	silty medium to fine sand - saprolite
27	32	slightly sandy, silt - saprolite
32	42	clayey, silt - saprolite
42	47.8	slightly sandy, silt - saprolite
47.8	69.7	silty, medium to fine sand - saprolite
69.7	76.1	medium grained granite - weathered rock
76.1	89.55	medium grained quartz diorite

11. REMARKS:

- bentonite placed below well from 80.30 to 89.55 ft BLS

- K-packer placed at 71.45 to 72.95 ft BLS; bentonite seal placed at

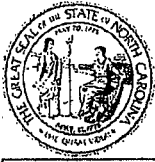
70.00 to 71.45 feet BLS; no sand/gravel pack below K-packer.

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR

7/27/07
DATE

Justin Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little
Well Contractor (Individual) Name
S&ME, Inc.
Well Contractor Company Name
STREET ADDRESS 9751 Southern Pine Boulevard
Charlotte NC 28273
City or Town State Zip Code
(704) 523-4726
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID # (if applicable) M-32
STATE WELL PERMIT# (if applicable)
DWQ or OTHER PERMIT # (if applicable) 70000752
WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use)
DATE DRILLED 05/03/07
TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg
McGuire Nuclear Station
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)
TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)
LATITUDE 35° 25' 39.25" N
LONGITUDE 80° 56' 37.39" W
May be in degrees, minutes, seconds or in a decimal format

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

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

FACILITY ID # (if applicable)
NAME OF FACILITY McGuire Nuclear Station
STREET ADDRESS 12700 Hagers Ferry Road
Huntersville NC 28078
City or Town State Zip Code
CONTACT PERSON Michael Phillips
MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd
Huntersville NC 28078
City or Town State Zip Code
(704) 875-4675
Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 55.00 ft
b. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
c. WATER LEVEL Below Top of Casing: 54.09 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.98 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

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

6. CASING:

Depth	Diameter	Thickness/Weight	Material
From 2.98ALS To 40.00 BLS	Ft. 2 Inches	Sch 40	PVC
From To	Ft.		
From To	Ft.		

7. GROUT:

Depth	Material	Method
From 0 To 35.00	Ft. Neat Cement	Tremie
From To	Ft.	
From To	Ft.	

8. SCREEN:

Depth	Diameter	Slot Size	Material
From 40.00 To 55.00	Ft. 2 in.	0.010 in.	PVC
From To	Ft. in.	in.	
From To	Ft. in.	in.	

9. SAND/GRAVEL PACK:

Depth	Size	Material
From 37.00 To 56.00	Ft. #1	Filter Sand
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	6	fine sandy clayey silt - saprolite
6	12	silty fine sand - saprolite
12	17	clayey fine sand - saprolite
17	23	silty medium to fine sand - saprolite
23	42	silty fine sand - saprolite
42	47	silty medium to fine sand - saprolite
47	53	slightly clayey silty fine sand - saprolite
53	56	slightly sandy silt - saprolite
56	60.4	silty coarse to fine sand - weathered rock

11. REMARKS:

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

Jay A. Little 7-27-07
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

Jay A. Little
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little
Well Contractor (Individual) Name

S&ME, Inc.
Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte NC 28273
City or Town State Zip Code

(704) 523-4726
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID # (if applicable) M-33

STATE WELL PERMIT # (if applicable)

DWQ or OTHER PERMIT # (if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 05/11/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

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

LATITUDE 35° 25' 41.90" N

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

LONGITUDE 80° 56' 24.34" W

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

4. FACILITY: Is the name of the business where the well is located.

FACILITY ID # (if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078
City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd
Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 38.00 ft

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

c. WATER LEVEL Below Top of Casing: 30.57 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 3.05 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/	Weight	Material
From 3.05 ALS To 23.00 BLS	Ft. 2 inches	Sch 40		PVC
From To	Ft.			
From To	Ft.			

7. GROUT: Depth Material Method

Depth	Material	Method
From 0 To 19.00	Ft. Neat Cement	Tremie
From To	Ft.	
From To	Ft.	

8. SCREEN: Depth Diameter Slot Size Material

Depth	Diameter	Slot Size	Material
From 23.00 To 38.00	Ft. 2 in.	0.010 in.	PVC
From To	Ft. in.	in.	
From To	Ft. in.	in.	

9. SAND/GRAVEL PACK:

Depth	Size	Material
From 21.00 To 38.00	Ft. #1	Filter Sand
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	7	silty clay - saprolite
7	8.7	slightly clayey fine sandy silt - saprolite
8.7	9	silty clay - saprolite
9	12	slightly clayey fine sandy silt - saprolite
12	22	fine sandy silt - saprolite
22	27	clayey fine sandy silt - saprolite
27	34.4	slightly clayey fine sandy silt - saprolite
34.4	37	fine sandy silt - saprolite
37	48.3	silty medium to fine sand - saprolite
48.3	49.8	silty medium to fine sand - weathered rock

11. REMARKS:

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

Jay A. Little 7-27-07
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

Jay A. Little
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte NC 28273

City or Town State Zip Code

(704) 523-4726

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-34R

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 05/14/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY: Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35° 25' 55.94" N

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

LONGITUDE 80° 56' 27.38" W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code- Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 61.90 ft

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

c. WATER LEVEL Below Top of Casing: 45.33 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.93 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/	Material
From 2.93 ALS To 55.90 BLS	2 inches	Sch 40	PVC
From To	Ft.		
From To	Ft.		

7. GROUT:

Depth	Material	Method
From 0 To 40.00	Neat Cement	Tremie
From To	Ft.	
From To	Ft.	

8. SCREEN:

Depth	Diameter	Slot Size	Material
From 56.90 To 61.90	2 in.	0.010 in.	PVC
From To	Ft.	in.	in.
From To	Ft.	in.	in.

9. SAND/GRAVEL PACK:

Depth	Size	Material
From To	Ft.	
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	9.8	silty medium to fine sand - saprolite
9.8	13	silty medium to fine sand - saprolite
13	33	fine sandy silt - saprolite
33	39.3	silty medium to fine sand - saprolite
39.3	42.4	silty coarse to fine sand - weathered rock
42.4	65	fine grained granite and quartz diorite

11. REMARKS:

- K-packer placed at 55.25 to 56.75 ft BLS; bentonite seal placed at

40 to 55.25; sand placed from 61.9 to 63 feet BLS

- bentonite placed below well from 63 to 65 ft BLS

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

Jay A. Little 7-27-07
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

Jay A. Little
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



NON RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte NC 28273

City or Town State Zip Code

(704) 523-4726

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-34DR

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 05/17/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY: Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35° 25' 55.94" N

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

LONGITUDE 80° 56' 27.31" W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 89.90 ft

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

c. WATER LEVEL Below Top of Casing: 45.97 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 3.20 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth Diameter Thickness/
From 3.20 ALS To 79.90 BLS Ft. 2 inches Weight
Sch 40 Material
PVC

From To Ft. Material

From To Ft. Material

7. GROUT:

Depth Material Method

From 0 To 38.00 Ft. Neat Cement Tremie

From To Ft. Material

From To Ft. Material

8. SCREEN:

Depth Diameter Slot Size Material

From 79.90 To 89.90 Ft. 2 in. 0.010 in. PVC

From To Ft. in. in.

From To Ft. in. in.

9. SAND/GRAVEL PACK:

Depth Size Material

From To Ft. Material

From To Ft. Material

From To Ft. Material

10. DRILLING LOG

From To Formation Description

0	13	silty medium to fine sand - saprolite
13	33	fine sandy silt - saprolite
33	39.3	silty medium to fine sand - saprolite
39.3	44.2	silty coarse to fine sand - saprolite
44.2	90.10	coarse grained to fine grained granite and quartz doris

11. REMARKS:

K-packer placed at 78.45 to 79.95 ft BLS; bentonite seal placed at
38 to 78.45; no sand/gravel pack below K-packer

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

Jay A. Little 7-27-07
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

Jay A. Little
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



July 31, 2007

North Carolina Department of Environment and Natural Resources
Division of Water Quality
1617 Mail Service Center
Raleigh, North Carolina 27699-1617

ATTN: Information Management

Reference: **NON-RESIDENTIAL WELL CONSTRUCTION RECORDS – SUBMITTAL #3**
McGUIRE NUCLEAR STATION
12700 Hagers Ferry Road
Huntersville, North Carolina
S&ME Project No. 1264-06-724

Ladies and Gentlemen:

On behalf of Duke Energy, S&ME, Inc. (S&ME) is submitting the enclosed completed and signed *Non-Residential Well Construction Records* for the following six (6) groundwater monitoring wells installed at the McGuire Nuclear Station (MNS) site:

- M-30
- M-30R
- M-32
- M-33
- M-34R
- M-34DR.

Duke Energy is voluntarily installing groundwater monitoring wells at MNS as part of a site-wide hydrogeologic evaluation. S&ME will submit these *Non-Residential Well Construction Records* on a periodic basis as well installations are completed, this being the third submittal (i.e., *Submittal #3*).

On behalf of Duke Energy, S&ME thanks you for your receipt of these records. Should you have any questions or need additional information, please contact us.

Sincerely,
S&ME, Inc.

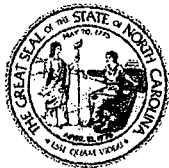
Mary Beth Cline, E.I.T.
Staff Professional

enclosures

cc: Messrs. Steve LeRoy, Ed Sullivan, Tim Hunsucker; Duke Energy

Larry Armstrong, P. E.
Senior Engineer/Project Director

S:\ENVIRON\2006\1264 Projects\6406724 McGuire Nuclear Groundwater Study\NCDENR Well Records\ncdenr well records submittal 3.doc



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg SC 29301
City or Town State Zip Code

(864) 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-30

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 5/17/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35° 25' 38.41" N

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

LONGITUDE 80° 57' 02.96" W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078
City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Road

Huntersville NC 28078
City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 50.70 feet

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

c. WATER LEVEL Below Top of Casing: 45.63 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 3.04 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

From	Depth	To	Diameter	Thickness/	Weight	Material
3.04	ALS	35.70	2 inches	Sch 40		PVC
From	To	Ft.				
From	To	Ft.				

7. GROUT:

From	Depth	To	Material	Method
0		30.70	Portland	Tremie
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

From	Depth	To	Diameter	Slot Size	Material
35.70		50.70	2 in.	0.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

9. SAND/GRAVEL PACK:

From	Depth	To	Size	Material
33.00		50.70	#1	Filter Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0	13.5	slightly sandy, clayey, silt - saprolite
13.5	22	silty fine sand - saprolite
22	27	silty medium to fine sand - saprolite
27	32	slightly sandy, silt - saprolite
32	42	clayey, silt - saprolite
42	47.8	slightly sandy, silt - saprolite
47.8	50.7	silty, medium to fine sand - saprolite

11. REMARKS:

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR

7/27/07
DATE

PRINTED NAME OF PERSON CONSTRUCTING THE WELL



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg SC 29301

City or Town State Zip Code

(864) 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-30R

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 5/14/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35° 25' 38.43" N

LONGITUDE 80° 57' 02.92" W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 78.50 feet

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

c. WATER LEVEL Below Top of Casing: 46.07 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 3.19 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/	Material
From To	Ft. inches	Weight Sch 40	PVC
From 3.19 ALS To 73.50	Ft. 2		
From To	Ft.		
From To	Ft.		

7. GROUT:

Depth	Material	Method
From To	Ft.	
From 0 To 70.00	Ft. Neat Cement	Tremie
From To	Ft.	
From To	Ft.	

8. SCREEN:

Depth	Diameter	Slot Size	Material
From To	Ft. in.	in.	
From 73.50 To 78.50	Ft. 2	0.010 in.	PVC
From To	Ft. in.	in.	
From To	Ft. in.	in.	

9. SAND/GRAVEL PACK:

Depth	Size	Material
From To	Ft. #2	Filter Sand
From 78.50 To 80.30	Ft. #2	Filter Sand
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	13.5	slightly sandy, clayey, silt - saprolite
13.5	22	silty fine sand - saprolite
22	27	silty medium to fine sand - saprolite
27	32	slightly sandy, silt - saprolite
32	42	clayey, silt - saprolite
42	47.8	slightly sandy, silt - saprolite
47.8	69.7	silty, medium to fine sand - saprolite
69.7	76.1	medium grained granite - weathered rock
76.1	89.55	medium grained quartz diorite

11. REMARKS:

- bentonite placed below well from 80.30 to 89.55 ft BLS

- K-packer placed at 71.45 to 72.95 ft BLS; bentonite seal placed at

70.00 to 71.45 feet BLS; no sand/gravel pack below K-packer.

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR

7/27/07
DATE

PRINTED NAME OF PERSON CONSTRUCTING THE WELL



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte NC 28273

City or Town State Zip Code

(704) 523-4726

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-32

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 05/03/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35° 26' 39.25" N

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

LONGITUDE 80° 56' 37.39" W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code M001EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 55.00 ft

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

c. WATER LEVEL Below Top of Casing: 54.09 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.98 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

From	Depth	To	Diameter	Thickness/	Weight	Material
2.98	ALS	40.00	BLS	2 inches	Sch 40	PVC
From	To	From	To	From	To	From
From	To	From	To	From	To	From

7. GROUT: Depth Material Method

From	Depth	To	Material	Method
0	To	35.00	Neat Cement	Tremie
From	To	From	To	From
From	To	From	To	From

8. SCREEN: Depth Diameter Slot Size Material

From	Depth	To	Diameter	Slot Size	Material
40.00	To	55.00	2 in.	0.010 in.	PVC
From	To	From	To	From	To
From	To	From	To	From	To

9. SAND/GRAVEL PACK:

From	Depth	To	Size	Material
37.00	To	56.00	#1	Filter Sand
From	To	From	To	From
From	To	From	To	From

10. DRILLING LOG

From	To	Formation Description
0	6	fine sandy clayey silt - saprolite
6	12	silty fine sand - saprolite
12	17	clayey fine sand - saprolite
17	23	silty medium to fine sand - saprolite
23	42	silty fine sand - saprolite
42	47	silty medium to fine sand - saprolite
47	53	slightly clayey silty fine sand - saprolite
53	58	slightly sandy silt - saprolite
56	60.4	silty coarse to fine sand - weathered rock

11. REMARKS:

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

Jay A. Little 7-27-07
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

Jay A. Little
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



Non RESIDENTIAL WELL CONSTRUCTION RECORD
North Carolina Department of Environment and Natural Resources- Division of Water Quality
WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little
Well Contractor (Individual) Name
S&ME, Inc.
Well Contractor Company Name
STREET ADDRESS 9751 Southern Pine Boulevard
Charlotte NC 28273
City or Town State Zip Code
(704) 523-4726
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(If applicable) M-33
STATE WELL PERMIT #(If applicable)
DWQ or OTHER PERMIT #(If applicable) 70000752
WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use)
DATE DRILLED 05/11/07
TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg
McGuire Nuclear Station
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)
TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)
LATITUDE 35° 25' 41.90" N
LONGITUDE 80° 55' 24.34" W
Latitude/longitude source: ☒ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY: Is the name of the business where the well is located.

FACILITY ID #(If applicable)
NAME OF FACILITY McGuire Nuclear Station
STREET ADDRESS 12700 Hagers Ferry Road
Huntersville NC 28078
City or Town State Zip Code
CONTACT PERSON Michael Phillips
MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd
Huntersville NC 28078
City or Town State Zip Code
(704) 875-4675
Area code - Phone number

5. WELL DETAILS:

- a. TOTAL DEPTH: 38.00 ft
b. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
c. WATER LEVEL Below Top of Casing: 30.57 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 3.05 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

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

6. CASING:

Depth	Diameter	Thickness/Weight	Material
From 3.05 ALS To 23.00 BLS	2 inches	Sch 40	PVC
From To	Ft.		
From To	Ft.		

7. GROUT:

Depth	Material	Method
From 0 To 19.00	Neat Cement	Tremie
From To	Ft.	
From To	Ft.	

8. SCREEN:

Depth	Diameter	Slot Size	Material
From 23.00 To 38.00	2 in.	0.010 in.	PVC
From To	Ft.	in.	
From To	Ft.	in.	

9. SAND/GRAVEL PACK:

Depth	Size	Material
From 21.00 To 38.00	#1	Filter Sand
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

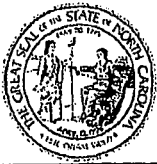
From	To	Formation Description
0	7	silty clay - saprolite
7	8.7	slightly clayey fine sandy silt - saprolite
8.7	9	silty clay - saprolite
9	12	slightly clayey fine sandy silt - saprolite
12	22	fine sandy silt - saprolite
22	27	clayey fine sandy silt - saprolite
27	34.4	slightly clayey fine sandy silt - saprolite
34.4	37	fine sandy silt - saprolite
37	48.3	silty medium to fine sand - saprolite
48.3	49.8	silty medium to fine sand - weathered rock

11. REMARKS:

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

Jay A. Little 7-27-07
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

Jay A. Little
PRINTED NAME OF PERSON CONSTRUCTING THE WELL



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte NC 28273

City or Town State Zip Code

(704) 523-4726

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-34R

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 05/14/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35° 25' 55.94" N

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

LONGITUDE 80° 58' 27.38" W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 61.90 ft

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

c. WATER LEVEL Below Top of Casing: 45.33 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.93 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

From	Depth	To	Diameter	Thickness/	Weight	Material
From 2.93	ALS	To 56.90	BLS	2 inches	Sch 40	PVC
From	To	Ft.				
From	To	Ft.				

7. GROUT:

From	Depth	To	Material	Method
From 0	To 40.00	Ft.	Neat Cement	Tremie
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

From	Depth	To	Diameter	Slot Size	Material
From 56.90	To 61.90	Ft.	2 in.	0.010 in.	PVC
From	To	Ft.			
From	To	Ft.			

9. SAND/GRAVEL PACK:

From	Depth	To	Size	Material
From	To	Ft.		
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0	9.8	silty medium to fine sand - saprolite
9.8	13	silty medium to fine sand - saprolite
13	33	fine sandy silt - saprolite
33	39.3	silty medium to fine sand - saprolite
39.3	42.4	silty coarse to fine sand - weathered rock
42.4	65	fine grained granite and quartz diorite

11. REMARKS:

- K-packer placed at 55.25 to 56.75 ft BLS; bentonite seal placed at

40 to 55.25; sand placed from 61.9 to 63 feet BLS

- bentonite placed below well from 63 to 65 ft BLS

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

Jay A. Little 7-27-07
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

JAY A. LITTLE
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



Non RESIDENTIAL WELL CONSTRUCTION RECORD
North Carolina Department of Environment and Natural Resources- Division of Water Quality
WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little
Well Contractor (Individual) Name

S&ME, Inc.
Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte NC 28273
City or Town State Zip Code

(704) 523-4726
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-34DR

STATE WELL PERMIT #(if applicable) _____

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use) _____

DATE DRILLED 05/17/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

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

LATITUDE 35° 25' 55.94" N

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

LONGITUDE 80° 56' 27.31" W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable) _____

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078
City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078
City or Town State Zip Code

(704) 875-4675
Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 89.90 ft

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

c. WATER LEVEL Below Top of Casing: 45.97 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 3.20 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): _____ METHOD OF TEST _____

f. DISINFECTION: Type _____ Amount _____

g. WATER ZONES (depth):

From _____ To _____ From _____ To _____

From _____ To _____ From _____ To _____

From _____ To _____ From _____ To _____

6. CASING:

From	Depth	To	Diameter	Thickness/	Weight	Material
From <u>3.20</u>	ALS	To <u>79.90</u>	BLS	Ft. <u>2</u>	inches <u>Sch 40</u>	<u>PVC</u>
From _____	To _____	Ft. _____	_____	_____	_____	_____
From _____	To _____	Ft. _____	_____	_____	_____	_____

7. GROUT:

From	Depth	To	Material	Method
From <u>0</u>	To <u>38.00</u>	Ft. <u>Neat Cement</u>	<u>Tremie</u>	
From _____	To _____	Ft. _____	_____	_____
From _____	To _____	Ft. _____	_____	_____

8. SCREEN:

From	Depth	To	Diameter	Slot Size	Material
From <u>79.90</u>	To <u>89.90</u>	Ft. <u>2</u>	in. <u>0.010</u>	in. <u>PVC</u>	
From _____	To _____	Ft. _____	_____	_____	_____
From _____	To _____	Ft. _____	_____	_____	_____

9. SAND/GRAVEL PACK:

From	Depth	To	Size	Material
From _____	To _____	Ft. _____	_____	_____
From _____	To _____	Ft. _____	_____	_____
From _____	To _____	Ft. _____	_____	_____

10. DRILLING LOG

From	To	Formation Description
<u>0</u>	<u>13</u>	<u>silty medium to fine sand - saprolite</u>
<u>13</u>	<u>33</u>	<u>fine sandy silt - saprolite</u>
<u>33</u>	<u>39.3</u>	<u>silty medium to fine sand - saprolite</u>
<u>39.3</u>	<u>44.2</u>	<u>silty coarse to fine sand - saprolite</u>
<u>44.2</u>	<u>90.10</u>	<u>coarse grained to fine grained granite and quartz doris</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

11. REMARKS:

K-packer placed at 78.45 to 79.95 ft BLS; bentonite seal placed at
38 to 78.45; no sand/gravel pack below K-packer

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

Jay A. Little 7-27-07
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

Jay A. Little
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



August 6, 2007

Mecklenburg County Health Department
Land Use & Environmental Service Agency
Groundwater & Wastewater Services
700 North Tryon Street, Suite 211
Charlotte, North Carolina 28202

Reference: **NON-RESIDENTIAL WELL CONSTRUCTION RECORDS - SUBMITTAL #4**
McGUIRE NUCLEAR STATION
12700 Hagers Ferry Road
Huntersville, North Carolina
Well Application Permit No. 70000752
S&ME Project No. 1264-06-724

Ladies and Gentlemen:

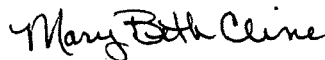
On behalf of Duke Energy, S&ME, Inc. (S&ME) is submitting the enclosed *Monitor Well Registration* form and completed/signed *Non-Residential Well Construction Records* for the following fifteen (15) groundwater monitoring wells installed at the McGuire Nuclear Station (MNS) site:

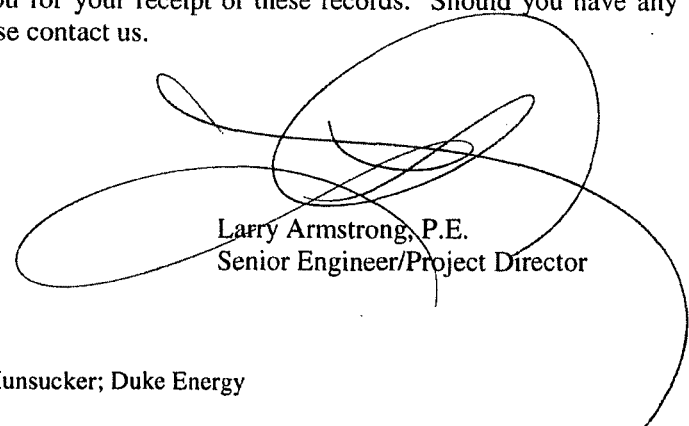
- | | | | |
|----------|--------|---------|------------|
| • M-48 | • M-55 | • M-66 | • M-70DR |
| • M-48R | • M-59 | • M-66R | • M-94 |
| • M-48DR | • M-62 | • M-70 | • M-104DR. |
| • M-53 | • M-64 | • M-70R | |

Duke Energy is voluntarily installing groundwater monitoring wells at MNS as part of a site-wide hydrogeologic evaluation. S&ME will continue to submit these *Non-Residential Well Construction Records* on a periodic basis as well installations are completed, this being the fourth submittal (i.e., *Submittal #4*).

On behalf of Duke Energy, S&ME thanks you for your receipt of these records. Should you have any questions or need additional information, please contact us.

Sincerely,
S&ME, Inc.


Mary Beth Cline, E.I.T.
Staff Professional


Larry Armstrong, P.E.
Senior Engineer/Project Director

enclosures

cc: Messrs. Steve LeRoy, Ed Sullivan, Tim Hunsucker; Duke Energy

S:\ENVIRON\2006\1264 Projects\6406724 McGuire Nuclear Groundwater Study\NCDENR Well Records\meck co well records submittal 4.doc

Mecklenburg County
Land Use & Environmental Service Agency
Groundwater & Wastewater Services
700 N. Tryon St., Suite 211
Charlotte, NC 28202
Phone: (704) 336-5103
Fax: (704) 336-6894



Staff Use Only
Date Received: _____

Monitor Well Registration

Is this Registration for a well or wells that existed prior to January 01, 2005? No

Enter your Subsurface Investigation Permit #: 70000752

Date Well Installation Began: 5-24-07

Date Well Installation Complete: 7-10-07

Site/Contact Information

Name of Site: McGuire Nuclear Station

Site Address: 12700 Hagers Ferry Road

Site Tax Parcel ID: 00119103

Bill to Owner/Agent Name: Duke Energy / Michael Phillips

Owner/Agent Address: Mail Code MG01EM 12700 Hagers Ferry Rd.
Huntersville, NC 28078

Owner/Agent Phone #: 704-875-4675

Driller Certification #: 3439 & 2717

Type of Registration

This registration is for (check all that apply):

☒ Unregistered Permanent Monitor Wells

☐ Yearly Update of Permanent Monitor Wells

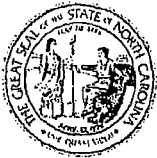
☐ Temporary Monitor Wells

The following information must be completed for each tax parcel on which monitor wells have been installed:

On-Site Monitor Wells		Tax Parcel #		Tax Parcel #		Tax Parcel #	
Type of Well	# Present	Type of Well	# Present	Type of Well	# Present	Type of Well	# Present
Temporary*		Temporary*		Temporary*		Temporary*	
Permanent	14	Permanent		Permanent		Permanent	
Sparge		Sparge		Sparge		Sparge	
Vapor Extraction		Vapor Extraction		Vapor Extraction		Vapor Extraction	
Recovery		Recovery		Recovery		Recovery	
Injection		Injection		Injection		Injection	
Vapor Monitoring		Vapor Monitoring		Vapor Monitoring		Vapor Monitoring	
Piezometer		Piezometer		Piezometer		Piezometer	
Groundwater Standard Exceeded?		Groundwater Standard Exceeded?		Groundwater Standard Exceeded?		Groundwater Standard Exceeded?	

Tax Parcel #		Tax Parcel #		Tax Parcel #		Tax Parcel #	
Type of Well	# Present	Type of Well	# Present	Type of Well	# Present	Type of Well	# Present
Temporary*		Temporary*		Temporary*		Temporary*	
Permanent		Permanent		Permanent		Permanent	
Sparge		Sparge		Sparge		Sparge	
Vapor Extraction		Vapor Extraction		Vapor Extraction		Vapor Extraction	
Recovery		Recovery		Recovery		Recovery	
Injection		Injection		Injection		Injection	
Vapor Monitoring		Vapor Monitoring		Vapor Monitoring		Vapor Monitoring	
Piezometer		Piezometer		Piezometer		Piezometer	
Groundwater Standard Exceeded?		Groundwater Standard Exceeded?		Groundwater Standard Exceeded?		Groundwater Standard Exceeded?	

*Selection of Temporary Well requires monitor well abandonment forms also be filed. Failure to file abandonment forms will result in the well being considered permanent and cause the well owner to be billed the appropriate fee.



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte NC 28273

City or Town State Zip Code

(704) 523-4726

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-48R

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/20/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY: Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35° 26' 00.30" N

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

LONGITUDE 80° 56' 52.34" W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 34.4 ft

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

c. WATER LEVEL Below Top of Casing: 19.32 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 0.13 BLS FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

From	To	Depth	Diameter	Thickness/	Material
				Weight	
				Sch 40	
From 0.13 BLS	To 29.10 BLS	Ft.	2 inches		PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

From	To	Depth	Material	Method
From 0	To 25.00	Ft.	Neat Cement	Tremie
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

From	To	Depth	Diameter	Slot Size	Material
From 29.40	To 34.40	Ft.	2 in.	0.010 in.	PVC
From	To	Ft.			
From	To	Ft.			

9. SAND/GRAVEL PACK:

From	To	Depth	Size	Material
From	To	Ft.		
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0	1	Gravel
1	3.5	Silt-fill
3.5	6	Gravel
6	14	fine sandy, clayey, silt - fill
14	20.6	clayey, medium to fine sandy - fill
20.6	27.3	coarse-grained quartz diorite - partially weathered rock
27.3	30.2	coarse-grained quartz diorite - sound rock
30.2	35.2	coarse-grained quartz diorite - partially weathered rock

11. REMARKS:

K-packer placed at 28.69 to 28.71 ft bls; bentonite seal placed at 25.00 to 28.69 ft bls; no sand/gravel pack below k-packer.

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte NC 28273

City or Town State Zip Code

(704) 523-4726

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-48DR

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/18/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35° 26' 00.31" N

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

LONGITUDE 80° 56' 52.40" W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 89.00 ft

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

c. WATER LEVEL Below Top of Casing: 20.42 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 0.29 BLS FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING: Depth Diameter Thickness/ Weight Material
From 0.29 BLS To 79.00 BLS Ft. 2 inches Sch 40 PVC
From To Ft. in. in. lb/ft
From To Ft. in. in. lb/ft

7. GROUT: Depth Material Method
From 0 To 75.00 Ft. Neat Cement Tremie
From To Ft. in. in. lb/ft
From To Ft. in. in. lb/ft

8. SCREEN: Depth Diameter Slot Size Material
From 79.00 To 89.00 Ft. 2 in. 0.010 in. PVC
From To Ft. in. in. lb/ft
From To Ft. in. in. lb/ft

9. SAND/GRAVEL PACK: Depth Size Material
From To Ft. in. in. lb/ft
From To Ft. in. in. lb/ft
From To Ft. in. in. lb/ft

10. DRILLING LOG
From To Formation Description
0 1 Gravel
1 3.5 Silt-fill
3.5 6 Gravel
6 14 fine sandy, clayey, silt - fill
14 21.6 clayey, medium to fine sand - fill
21.6 90.3 coarse grained to fine grained quartz dolite,
granite, and meta gabbro

11. REMARKS:

- K-packer placed at 78.09 to 78.11 ft BLS; bentonite seal placed at 75.00
to 78.09 ft bsl; no sand/gravel pack below k-packer.

- Cave-in from 89.00 to 90.30 ft BLS.

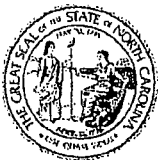
I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH
15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS
RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Signature of Certified Well Contractor Date

Printed Name of Person Constructing the Well

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

Form GW-1b
Rev. 7/05



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte NC 28273

City or Town State Zip Code

(704) 523-4726

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-53

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 05/29/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35° 26' 02.07" N

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

LONGITUDE 80° 56' 53.16" W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 23.00 ft

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

c. WATER LEVEL Below Top of Casing: 14.52 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 0.25 BLS FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

From	To	Depth	Diameter	Thickness/Weight	Material
0.25 BLS	8.00 BLS	Ft.	2 inches	Sch 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

From	To	Depth	Material	Method
0	4.00	Ft.	Neat Cement	Tremie
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

From	To	Depth	Diameter	Slot Size	Material
8.00	23.00	Ft.	2 in.	0.010 in.	PVC
From	To	Ft.			
From	To	Ft.			

9. SAND/GRAVEL PACK:

From	To	Depth	Size	Material
6.00	23.00	Ft.	# 1	Filter Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0	1	Asphalt
1	13	fine sandy, silty, clay - possible fill
13	27	fine sandy, silt - saprolite
27	33.7	silty, fine sand - saprolite
33.7	43.2	silty, medium to fine sand - saprolite
43.2	48.2	silty, coarse to fine sand - weathered rock
48.2	50	fine sandy, silt - weathered rock

11. REMARKS:

Bentonite placed below well from 23.00 to 50.00 feet BLS.

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

Signature of Certified Well Contractor: Jay Little DATE: 8-7-07

PRINTED NAME OF PERSON CONSTRUCTING THE WELL: Jay Little

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

Form GW-1b Rev. 7/05



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg SC 29301

City or Town State Zip Code

(864) 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-55

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 6/7/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35° 26' 00.89" N

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

LONGITUDE 80° 56' 48.48" W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 20 feet

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

c. WATER LEVEL Below Top of Casing: 9.48 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 0.36 BLS FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/	Material
From To	2 inches	Weight	
		Sch 40	PVC
From 0.36 BLS To 5			
From To			
From To			

7. GROUT:

Depth	Material	Method
From 0 To 2.00	Neat Cement	Tremie
From To		
From To		

8. SCREEN:

Depth	Diameter	Slot Size	Material
From 5.00 To 20.00	2 in.	0.010 in.	PVC
From To			
From To			

9. SAND/GRAVEL PACK:

Depth	Size	Material
From 4.00 To 21.00	#1	Filter Sand
From To		
From To		

10. DRILLING LOG

From	To	Formation Description
0	0.25	Asphalt
0.25	22	Clayey, silt - fill
22	27	silt - saprolite
27	32	fine sandy, silt - saprolite
32	39.2	silt - saprolite
39.2	40	silty, medium to fine sand - saprolite
40	44.8	fine sandy silt - saprolite
44.8	45	coarse to fine sand - saprolite
45	50	silty, fine sand - saprolite

11. REMARKS:

Bentonite placed below well from 21.00 to 50.00 feet BLS.

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR 8/7/07 DATE

Justin Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte NC 28273

City or Town State Zip Code

(704) 523-4726

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-59

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/01/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

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

LATITUDE 35° 25' 58.34" N

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

LONGITUDE 80° 56' 51.54" W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 36.00 ft

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

c. WATER LEVEL Below Top of Casing: 24.27 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 0.27 BLS FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

From	To	Depth	Diameter	Thickness/Weight	Material
0.27 BLS	21.00 BLS	21.00	2 inches	Sch 40	PVC
From	To	Depth	Diameter	Thickness/Weight	Material
From	To	Depth	Diameter	Thickness/Weight	Material

7. GROUT:

From	To	Depth	Material	Method
0	17.00	17.00	Neat Cement	Tremie
From	To	Depth	Material	Method
From	To	Depth	Material	Method

8. SCREEN:

From	To	Depth	Diameter	Slot Size	Material
21.00	36.00	36.00	2 in.	0.010 in.	PVC
From	To	Depth	Diameter	Slot Size	Material
From	To	Depth	Diameter	Slot Size	Material

9. SAND/GRAVEL PACK:

From	To	Depth	Size	Material
19.00	37.00	37.00	# 1	Filter Sand
From	To	Depth	Size	Material
From	To	Depth	Size	Material

10. DRILLING LOG

From	To	Formation Description
0	1	Gravel
1	23	slightly sandy, silty, clay - fill
23	34.3	silty, coarse to fine sand - saprolite
34.3	36.4	silty, fine sand - weathered rock
36.4	37.9	quartz diorite with intermittent granite - partially weathered rock
37.9	85.1	quartz diorite, granite, meta diorite, meta quartz diorite, and diorite - sound rock

11. REMARKS:

Bentonite placed below well from 37.00 to 85.10 feet BLS.

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

Signature of Certified Well Contractor: Jay Little DATE: 8-7-07

PRINTED NAME OF PERSON CONSTRUCTING THE WELL: Jay Little

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

Form GW-1b Rev. 7/05



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte NC 28273

City or Town State Zip Code

(704) 523-4726

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-62

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 05/24/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35° 25' 58.60" N

LONGITUDE 80° 57' 03.40" W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 36.00 ft

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

c. WATER LEVEL Below Top of Casing: 25.37 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 0.14 BLS FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

From	To	Depth	Diameter	Thickness/	Weight	Material
0.14 BLS	21.00 BLS	21.00	2 inches	Sch 40		PVC
From	To	Depth	Diameter	Thickness/	Weight	Material
From	To	Depth	Diameter	Thickness/	Weight	Material

7. GROUT:

From	To	Depth	Material	Method
0	17.00	17.00	Neat Cement	Tremie
From	To	Depth	Material	Method
From	To	Depth	Material	Method

8. SCREEN:

From	To	Depth	Diameter	Slot Size	Material
21.00	36.00	36.00	2 in.	0.010 in.	PVC
From	To	Depth	Diameter <td>Slot Size<td>Material</td></td>	Slot Size <td>Material</td>	Material
From	To	Depth	Diameter <td>Slot Size<td>Material</td></td>	Slot Size <td>Material</td>	Material

9. SAND/GRAVEL PACK:

From	To	Depth	Size	Material
19.00	36.00	36.00	#1	Filter Sand
From	To	Depth	Size <td>Material</td>	Material
From	To	Depth	Size <td>Material</td>	Material

10. DRILLING LOG

From	To	Formation Description
0	2	Gravel
2	3	Concrete
3	13	Silty fine sand with clay layers-fill
13	18	silty clay with silty sand layers-fill
18	23	fine sandy silty clay-saprolite
23	27	slightly sandy silt-saprolite
27	44.3	silty fine sand - saprolite
44.3	50.8	silty fine sand- weathered rock

11. REMARKS:

- Bentonite placed below well from 36 to 50.8 ft BLS.

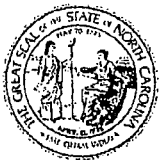
I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Jay Little 8-7-07
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

Jay Little
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg SC 29301

City or Town State Zip Code

(864) 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-66

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/04/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35° 25' 59.54" N

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

LONGITUDE 80° 57' 00.09" W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 27.00 ft

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

c. WATER LEVEL Below Top of Casing: 14.76 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 0.34 BLS - FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

From	To	Depth	Diameter	Thickness/Weight	Material
0.34 BLS	12.00 BLS	11.66	2 inches	Sch 40	PVC
From	To	Depth	Diameter	Thickness/Weight	Material
From	To	Depth	Diameter	Thickness/Weight	Material

7. GROUT:

From	To	Depth	Material	Method
0	6.80	6.80	Neat Cement	Tremie
From	To	Depth	Material	Method
From	To	Depth	Material	Method

8. SCREEN:

From	To	Depth	Diameter	Slot Size	Material
12.00	27.00	15.00	2 in.	0.010 in.	PVC
From	To	Depth	Diameter <td>Slot Size</td> <td>Material</td>	Slot Size	Material
From	To	Depth	Diameter <td>Slot Size</td> <td>Material</td>	Slot Size	Material

9. SAND/GRAVEL PACK:

From	To	Depth	Size	Material
9.70	27.00	17.30	#1	Filter Sand
From	To	Depth <td>Size<td>Material</td></td>	Size <td>Material</td>	Material
From	To	Depth <td>Size<td>Material</td></td>	Size <td>Material</td>	Material

10. DRILLING LOG

From	To	Formation Description
0	0.3	gravel
0.3	11	silty, clay interlayered with fine sandy silt - fill
11	16	clayey, silt - fill
16	27	slightly clayey, fine sandy, silt - saprolite

11. REMARKS:

- Bentonite seal placed from 6.80 to 9.70 ft BLS.

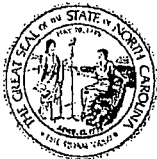
I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR 8/7/07 DATE

Justin M. Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg SC 29301

City or Town State Zip Code

(864) 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-66R

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/04/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY: Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35° 25' 59.49" N

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

LONGITUDE 80° 57' 00.11" W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 75.80 ft

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

c. WATER LEVEL Below Top of Casing: 48.61 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 0.35 BLS FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

From	Depth	To	Diameter	Thickness/	Weight	Material
				Sch 40		
From 0.35 BLS	To 70.80 BLS	Ft.	2 inches			PVC
From	To	Ft.				
From	To	Ft.				

7. GROUT:

From	Depth	To	Material	Method
From 0	To 65.00	Ft.	Neat Cement	Tremie
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

From	Depth	To	Diameter	Slot Size	Material
From 70.80	To 75.80	Ft.	2 in.	0.010 in.	PVC
From	To	Ft.			
From	To	Ft.			

9. SAND/GRAVEL PACK:

From	Depth	To	Size	Material
From	To	Ft.		
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0	0.3	gravel
0.3	11	silty, clay interlayered with fine sandy, silt - fill
11	16	clayey, silt - fill
16	40	slightly clayey, fine sandy, silt - saprolite
40	48.3	slightly clayey, silt - saprolite
48.3	52	silt - saprolite
52	63	silty, medium to fine sand - saprolite
63	69	silty, medium to fine sand - weathered rock
69	70.4	coarse grained quartz diorite - partially weathered rock
70.4	89.54	coarse to fine grained quartz diorite and meta gabbro - sound rock

11. REMARKS:

- K-packer placed at 70.09 to 70.11 feet BLS; bentonite seal placed at 65.00 to 70.09 ft b/s; sand pack placed below well from 75.80 to 77.00 ft BLS.
- Bentonite placed below well 77.00 to 89.54 feet BLS.

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR 8/7/07 DATE

Justin Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



NON RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg SC 29301

City or Town State Zip Code

(864) 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-70R

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/18/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

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

LATITUDE 35° 26' 00.73" N

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

LONGITUDE 80° 56' 57.83" W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 65.45 ft

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

c. WATER LEVEL Below Top of Casing: 12.41 FT.
(Use "*" if Above Top of Casing)

d. TOP OF CASING IS 0.22 BLS FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/	Weight	Material
From To	2 inches	Sch 40		
From 0.22 BLS To 55.45 BLS				PVC
From To				
From To				

7. GROUT:

Depth	Material	Method
From 0 To 13.00	Neat Cement	Tremie
From To		
From To		

8. SCREEN:

Depth	Diameter	Slot Size	Material
From 54.45 To 65.45	2 in.	0.010 in.	PVC
From To			
From To			

9. SAND/GRAVEL PACK:

Depth	Size	Material
From 53.50 To 65.45	#1	Filter Sand
From To		
From To		

10. DRILLING LOG

From	To	Formation Description
0	0.5	asphalt
0.5	7	slightly sandy, clayey, silt - fill
7	27	slightly clayey, medium to fine sandy, silt - saprolite
27	28.6	coarse sand - saprolite
28.6	32	slightly clayey, fine sandy, silt - saprolite
32	48	fine sandy, silt - saprolite
48	48.7	fine sandy, silt - weathered rock
48.7	65.45	silty, coarse to fine sand - weathered rock

11. REMARKS:

- Bentonite seal placed from 13 to 53.50 ft BLS.

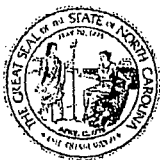
I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH
15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS
RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE 8/7/07

Justin Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg SC 29301

City or Town State Zip Code

(864) 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-70DR

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/13/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY: Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35° 26' 00.72" N

LONGITUDE 80° 56' 57.78" W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 77.40 ft

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

c. WATER LEVEL Below Top of Casing: 12.97 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 0.23 BLS FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/Weight	Material
From 0.23 BLS To 72.40 BLS	2 inches	Sch 40	PVC
From To	Ft.		
From To	Ft.		

7. GROUT:

Depth	Material	Method
From 0 To 7.00	Neat Cement	Tremie
From To	Ft.	
From To	Ft.	

8. SCREEN:

Depth	Diameter	Slot Size	Material
From 72.40 To 77.40	2 in.	0.010 in.	PVC
From To	Ft.	in.	
From To	Ft.	in.	

9. SAND/GRAVEL PACK:

Depth	Size	Material
From To	Ft.	
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	4	asphalt with gravel base
4	7	slightly sandy, clayey, silt - fill
7	27	slightly clayey, medium to fine sandy, silt - saprolite
27	28.6	coarse sand - saprolite
28.6	32	slightly clayey, fine sandy, silt - saprolite
32	48	fine sandy, silt - saprolite
48	48.7	fine sandy, silt - weathered rock
48.7	65.55	silty, coarse to fine sand - weathered rock
65.55	74.5	medium grained meta gabbro - weathered rock
74.5	76.9	medium grained quartz diorite - sound rock
76.9	78.5	medium grained meta gabbro - weathered rock
78.5	94.94	fine and medium grained meta gabbro and quartz diorite - sound rock

11. REMARKS:

- K-packer placed at 71.69 to 71.71 feet BLS; bentonite seal placed at

7.00 to 71.69 ft BLS; sand placed below well from 77.40 to 77.80 ft BLS.

- Bentonite placed below well from 77.80 to 78.00 ft BLS.

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR

8/7/07
DATE

Justin Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little
Well Contractor (Individual) Name

S&ME, Inc.
Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard
Charlotte NC 28273
City or Town State Zip Code

(704) 523-4726
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-94
STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/28/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY: Mecklenburg

McGuire Nuclear Station
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)
TOPOGRAPHIC / LAND SETTING:

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

LATITUDE 35° 25' 53.57" N

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

LONGITUDE 80° 57' 06.09" W

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078
City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078
City or Town State Zip Code

(704) 875-4675
Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 44.10 ft

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

c. WATER LEVEL Below Top of Casing: 35.43 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.96 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING: Depth Diameter Thickness/
From 2.08ALS To 29.10 BLS Ft. 2 inches Weight
From To Ft. Sch 40 Material
From To Ft. PVC

7. GROUT: Depth Material Method
From 0 To 24.00 Ft. Neat Cement Tremie
From To Ft.
From To Ft.

8. SCREEN: Depth Diameter Slot Size Material
From 29.10 To 44.10 Ft. 2 in. 0.010 in. PVC
From To Ft. in. in.
From To Ft. in. in.

9. SAND/GRAVEL PACK: Depth Size Material
From 27.00 To 44.10 Ft. #1 Filter Sand
From To Ft.
From To Ft.

10. DRILLING LOG

From	To	Formation Description
0	9	fine sandy, silt - alluvium
9	14	clayey, silt - alluvium
14	19	silty, clay - alluvium
19	19.2	fine sandy, silt - alluvium
19.2	23	medium to fine sandy, clay - alluvium
23	29	slightly clayey, fine sandy, silt - saprolite
29	35.5	coarse to fine sandy, silt - saprolite
35.5	44.1	fine sandy, silt - saprolite

11. REMARKS:

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

Signature of Certified Well Contractor DATE 8-7-07

PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg SC 29301

City or Town State Zip Code

(864) 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-104DR

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 07/10/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35 25' 51.88" N

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

LONGITUDE 80 57' 16.24" W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 76.00 ft

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

c. WATER LEVEL Below Top of Casing: 42.51 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 3.02 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

From	To	Depth	Diameter	Thickness/	Weight	Material
3.02 ALS	71.00 BLS	Ft.	2 inches	Sch 40		PVC

7. GROUT:

From	To	Depth	Material	Method

8. SCREEN:

From	To	Depth	Diameter	Slot Size	Material
71.00	76.00	Ft.	2 in.	0.010 in.	PVC

9. SAND/GRAVEL PACK:

From	To	Depth	Size	Material

10. DRILLING LOG

From	To	Formation Description
0	8	medium to fine sandy silty clay
8	36.70	silty fine to med/coarse sand
36.70		refusal to roller cone drill bit
36.70	80.28	weathered and sound rock-coarse grained granite

11. REMARKS:

- K-packer placed at 70.29 to 70.31 ft BLS; bentonite seal placed at 0 to 70.29 ft BLS; sand/filler pack placed below well from 76.00 to 77.50 ft BLS.
- Bentonite placed below well from 77.50 to 80.28 feet BLS.

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR 8/7/07
DATE

Justin Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



August 6, 2007

North Carolina Department of Environment and Natural Resources
Division of Water Quality
1617 Mail Service Center
Raleigh, North Carolina 27699-1617

ATTN: Information Management

Reference: **NON-RESIDENTIAL WELL CONSTRUCTION RECORDS – SUBMITTAL #4**
McGUIRE NUCLEAR STATION
12700 Hagers Ferry Road
Huntersville, North Carolina
S&ME Project No. 1264-06-724

Ladies and Gentlemen:

On behalf of Duke Energy, S&ME, Inc. (S&ME) is submitting the enclosed completed and signed *Non-Residential Well Construction Records* for the following fifteen (15) groundwater monitoring wells installed at the McGuire Nuclear Station (MNS) site:

- | | | | |
|----------|--------|---------|------------|
| • M-48 | • M-55 | • M-66 | • M-70DR |
| • M-48R | • M-59 | • M-66R | • M-94 |
| • M-48DR | • M-62 | • M-70 | • M-104DR. |
| • M-53 | • M-64 | • M-70R | |

Duke Energy is voluntarily installing groundwater monitoring wells at MNS as part of a site-wide hydrogeologic evaluation. S&ME will continue to submit these *Non-Residential Well Construction Records* on a periodic basis as well installations are completed, this being the fourth submittal (i.e., *Submittal #4*).

On behalf of Duke Energy, S&ME thanks you for your receipt of these records. Should you have any questions or need additional information, please contact us.

Sincerely,
S&ME, Inc.

Mary Beth Cline, E.I.T.
Staff Professional

Larry Armstrong, P. E.
Senior Engineer/Project Director

enclosures

cc: Messrs. Steve LeRoy, Ed Sullivan, Tim Hunsucker; Duke Energy

S:\ENVIRON2006\1264 Projects\6406724 McGuire Nuclear Groundwater Study\NCDENR Well Records\ncdenr well records submittal 4.doc



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte NC 28273

City or Town State Zip Code

(704) 523-4726

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-48R

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/20/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35° 26' 00.30" N

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

LONGITUDE 80° 56' 52.34" W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 34.4 ft

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

c. WATER LEVEL Below Top of Casing: 19.32 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 0.13 BLS FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

From	Depth	To	Diameter	Thickness/	Weight	Material
0.13 BLS	29.40 BLS		2 inches	Sch 40		PVC
From	To					
From	To					

7. GROUT:

From	Depth	To	Material	Method
0	25.00		Neat Cement	Tremie
From	To			
From	To			

8. SCREEN:

From	Depth	To	Diameter	Slot Size	Material
29.40	34.40		2 in.	0.010 in.	PVC
From	To				
From	To				

9. SAND/GRAVEL PACK:

From	Depth	To	Size	Material
From	To			
From	To			

10. DRILLING LOG

From	To	Formation Description
0	1	Gravel
1	3.5	Silt-fill
3.5	6	Gravel
6	14	fine sandy, clayey, silt - fill
14	20.6	clayey, medium to fine sandy - fill
20.6	27.3	coarse-grained quartz diorite - partially weathered rock
27.3	30.2	coarse-grained quartz diorite - sound rock
30.2	35.2	coarse-grained quartz diorite - partially weathered rock

11. REMARKS:

K-packer placed at 28.69 to 28.71 ft bls; bentonite seal placed at 25.00
to 28.69 ft bls; no sand/gravel pack below k-packer.

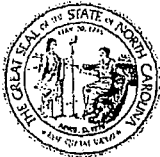
I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH
15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS
RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Jay Little 8-7-07
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

Jay Little
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte NC 28273

City or Town State Zip Code

(704) 523-4726

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-48DR

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/18/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35° 26' 00.31" N

LONGITUDE 80° 56' 52.40" W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 89.00 ft

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

c. WATER LEVEL Below Top of Casing: 20.42 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 0.29 BLS FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

From	To	Depth	Diameter	Thickness/	Weight	Material
0.29 BLS	79.00 BLS	78.71	2 inches	Sch 40		PVC
From	To	Depth	Diameter	Thickness/	Weight	Material
From	To	Depth	Diameter	Thickness/	Weight	Material

7. GROUT:

From	To	Depth	Material	Method
0	75.00	75.00	Neat Cement	Tremie
From	To	Depth	Material	Method
From	To	Depth	Material	Method

8. SCREEN:

From	To	Depth	Diameter	Slot Size	Material
79.00	89.00	89.00	2 in.	0.010 in.	PVC
From	To	Depth	Diameter <td>Slot Size</td> <td>Material</td>	Slot Size	Material
From	To	Depth	Diameter <td>Slot Size</td> <td>Material</td>	Slot Size	Material

9. SAND/GRAVEL PACK:

From	To	Depth	Size	Material
From	To	Depth	Size	Material
From	To	Depth	Size	Material

10. DRILLING LOG

From	To	Formation Description
0	1	Gravel
1	3.5	Silt-fill
3.5	6	Gravel
6	14	fine sandy, clayey, silt - fill
14	21.6	clayey, medium to fine sand - fill
21.6	90.3	coarse grained to fine grained quartz dolite, granite, and meta gabbro

11. REMARKS:

- K-packer placed at 78.09 to 78.11 ft BLS; bentonite seal placed at 75.00 to 78.09 ft BLS; no sand/gravel pack below k-packer.

- Cave-in from 89.00 to 90.30 ft BLS.

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte

NC

28273

City or Town

State

Zip Code

(704) 523-4726

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-53

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 05/29/07

TIME COMPLETED 5:00

AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY: Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35° 26' 02.07" N

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

LONGITUDE 80° 56' 53.16" W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville

NC

28078

City or Town

State

Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville

NC

28078

City or Town

State

Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 23.00 ft

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

c. WATER LEVEL Below Top of Casing: 14.52 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 0.25 BLS FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

From	To	Depth	Diameter	Thickness/	Weight	Material
From 0.25 BLS	To 8.00 BLS	Ft.	2 inches	Sch 40		PVC
From	To	Ft.				
From	To	Ft.				

7. GROUT:

From	To	Depth	Material	Method
From 0	To 4.00	Ft.	Neat Cement	Tremie
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

From	To	Depth	Diameter	Slot Size	Material
From 8.00	To 23.00	Ft.	2 in.	0.010 in.	PVC
From	To	Ft.			
From	To	Ft.			

9. SAND/GRAVEL PACK:

From	To	Depth	Size	Material
From 6.00	To 23.00	Ft.	# 1	Filter Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0	1	Asphalt
1	13	fine sandy, silty, clay - possible fill
13	27	fine sandy, silt - saprolite
27	33.7	silty, fine sand - saprolite
33.7	43.2	silty, medium to fine sand - saprolite
43.2	48.2	silty, coarse to fine sand - weathered rock
48.2	50	fine sandy, silt - weathered rock

11. REMARKS:

Bentonite placed below well from 23.00 to 50.00 feet BLS.

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

Jay Little 05-29-07
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

Jay Little
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg SC 29301

City or Town State Zip Code

(864) 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-55

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 6/7/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35° 26' 00.89" N

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

LONGITUDE 80° 56' 48.48" W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code- Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 20 feet

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

c. WATER LEVEL Below Top of Casing: 9.48 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 0.36 BLS FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/	Weight	Material
From To	From To	From To	From To	From To
0.36 BLS To 5	2 inches	Sch 40		PVC
From To	From To	From To	From To	From To
From To	From To	From To	From To	From To

7. GROUT:

Depth	Material	Method
From To	From To	From To
0 To 2.00	Neat Cement	Tremie
From To	From To	From To
From To	From To	From To

8. SCREEN:

Depth	Diameter	Slot Size	Material
From To	From To	From To	From To
5.00 To 20.00	2 in.	0.010 in.	PVC
From To	From To	From To	From To
From To	From To	From To	From To

9. SAND/GRAVEL PACK:

Depth	Size	Material
From To	From To	From To
4.00 To 21.00	#1	Filter Sand
From To	From To	From To
From To	From To	From To

10. DRILLING LOG

From	To	Formation Description
0	0.25	Asphalt
0.25	22	Clayey, silt - fill
22	27	silt - saprolite
27	32	fine sandy, silt - saprolite
32	39.2	silt - saprolite
39.2	40	silty, medium to fine sand - saprolite
40	44.8	fine sandy silt - saprolite
44.8	45	coarse to fine sand - saprolite
45	50	silty, fine sand - saprolite

11. REMARKS:

Bentonite placed below well from 21.00 to 50.00 feet BLS.

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR Justin Millwood DATE 8/7/07

PRINTED NAME OF PERSON CONSTRUCTING THE WELL Justin Millwood

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

Form GW-1b
Rev. 7/05



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte NC 28273

City or Town State Zip Code

(704) 523-4726

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-59

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 08/01/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY: Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35° 25' 58.34" N

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

LONGITUDE 80° 56' 51.54" W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 36.00 ft

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

c. WATER LEVEL Below Top of Casing: 24.27 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 0.27 BLS FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/	Material
From 0.27 BLS To 21.00 BLS	2 inches	Weight Sch 40	PVC
From To	Ft.		
From To	Ft.		

7. GROUT:

Depth	Material	Method
From 0 To 17.00	Neat Cement	Tremie
From To	Ft.	
From To	Ft.	

8. SCREEN:

Depth	Diameter	Slot Size	Material
From 21.00 To 36.00	2 in.	0.010 in.	PVC
From To	Ft.	in.	
From To	Ft.	in.	

9. SAND/GRAVEL PACK:

Depth	Size	Material
From 19.00 To 37.00	# 1	Filter Sand
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	1	Gravel
1	23	slightly sandy, silty, clay - fill
23	34.3	silty, coarse to fine sand - saprolite
34.3	36.4	silty, fine sand - weathered rock
36.4	37.9	quartz diorite with intermittent granite - partially weathered rock
37.9	85.1	quartz diorite, granite, meta diorite, meta quartz diorite, and diorite - sound rock

11. REMARKS:

Bentonite placed below well from 37.00 to 85.10 feet BLS.

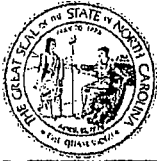
I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Jay Little 8-7-07
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

Jay Little
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte NC 28273

City or Town State Zip Code

(704) 523-4726

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-62

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 05/24/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY: Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

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

LATITUDE 35° 25' 58.60" N

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

LONGITUDE 80° 57' 03.40" W

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 36.00 ft

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

c. WATER LEVEL Below Top of Casing: 25.37 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 0.14 BLS FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/	Material
From To	From To	Weight	
0.14 BLS	21.00 BLS	Sch 40	PVC
From To	From To		
From To	From To		

7. GROUT:

Depth	Material	Method
From To	From To	From To
0	17.00	Neat Cement Tremie
From To	From To	From To
From To	From To	From To

8. SCREEN:

Depth	Diameter	Slot Size	Material
From To	From To	From To	From To
21.00	36.00	2 in.	0.010 in. PVC
From To	From To	From To	From To
From To	From To	From To	From To

9. SAND/GRAVEL PACK:

Depth	Size	Material
From To	From To	From To
19.00	36.00	#1 Filter Sand
From To	From To	From To
From To	From To	From To

10. DRILLING LOG

From	To	Formation Description
0	2	Gravel
2	3	Concrete
3	13	Silty fine sand with clay layers-fill
13	18	silty clay with silty sand layers-fill
18	23	fine sandy silty clay-saprolite
23	27	slightly sandy silt-saprolite
27	44.3	silty fine sand - saprolite
44.3	50.8	silty fine sand- weathered rock

11. REMARKS:

- Bentonite placed below well from 36 to 50.8 ft BLS.

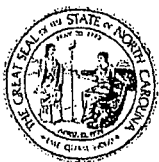
I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH
15A NCAC 2C. WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS
RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE 8-7-07

PRINTED NAME OF PERSON CONSTRUCTING THE WELL Jay Little

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

Form GW-1b
Rev. 7/05



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg SC 29301

City or Town State Zip Code

(864) 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-64

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 5/25/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY: Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35° 25' 59.59" N

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

LONGITUDE 80° 57' 01.50" W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 28.00 ft

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

c. WATER LEVEL Below Top of Casing: 14.04 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 0.54 BLS FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/	Material
From 0.54 BLS To 13.00 BLS	2 inches	Weight 40	PVC
From To	Ft.		
From To	Ft.		

7. GROUT:

Depth	Material	Method
From 0 To 2.00	Neat Cement	Tremie
From To	Ft.	
From To	Ft.	

8. SCREEN:

Depth	Diameter	Slot Size	Material
From 13.00 To 28.00	2 in.	0.010 in.	PVC
From To	Ft.	in.	
From To	Ft.	in.	

9. SAND/GRAVEL PACK:

Depth	Size	Material
From 10.00 To 29.00	#1	Filter Sand
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	0.4	gravel
0.4	13	silty, clay - fill
13	48.2	slightly sandy, silt-saprolite
48.2	50.1	silt with medium to fine sand lenses - saprolite

11. REMARKS:

- Bentonite placed below well from 29.00 to 50.10 ft BLS.

- Bentonite seal placed 2.00 to 10.00 ft BLS.

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg SC 29301

City or Town State Zip Code

(864) 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-66

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/04/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35° 25' 59.54" N

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

LONGITUDE 80° 57' 00.09" W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 27.00 ft

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

c. WATER LEVEL Below Top of Casing: 14.76 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 0.34 BLS FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/	Material
From To	From To	Weight	
		Sch 40	
From 0.34 BLS To 12.00 BLS	2 inches		PVC
From To	Ft.		
From To	Ft.		

7. GROUT:

Depth	Material	Method
From To		
From 0 To 6.80	Neat Cement	Tremie
From To	Ft.	
From To	Ft.	

8. SCREEN:

Depth	Diameter	Slot Size	Material
From To	From To		
From 12.00 To 27.00	2 in.	0.010 in.	PVC
From To	Ft.	in.	
From To	Ft.	in.	

9. SAND/GRAVEL PACK:

Depth	Size	Material
From To	From To	
From 9.70 To 27.00	#1	Filter Sand
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	0.3	gravel
0.3	11	silty, clay interlayered with fine sandy silt - fill
11	16	clayey, silt - fill
16	27	slightly clayey, fine sandy, silt - saprolite

11. REMARKS:

- Bentonite seal placed from 6.80 to 9.70 ft BLS.

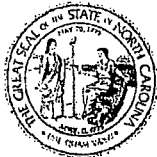
I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH
15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS
RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR 8/7/07 DATE

Justin M. Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg SC 29301

City or Town State Zip Code

(864) 574-2360

Area code - Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-66R

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/04/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SURFACE:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35° 25' 59.49" N

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

LONGITUDE 80° 57' 00.11" W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 75.80 ft

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

c. WATER LEVEL Below Top of Casing: 48.61 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 0.35 BLS FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

From	Depth	To	Diameter	Thickness/	Weight	Material
0.35 BLS	70.80 BLS	Ft.	2 inches	Sch 40		PVC
From	To	Ft.				
From	To	Ft.				

7. GROUT:

From	Depth	To	Material	Method
0	65.00	Ft.	Neat Cement	Tremie
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

From	Depth	To	Diameter	Slot Size	Material
70.80	75.80	Ft.	2 in.	0.010 in.	PVC
From	To	Ft.			
From	To	Ft.			

9. SAND/GRAVEL PACK:

From	Depth	To	Size	Material
From	To	Ft.		
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0	0.3	gravel
0.3	11	silty, clay interlayered with fine sandy, silt - fill
11	16	clayey, silt - fill
16	40	slightly clayey, fine sandy, silt - saprolite
40	48.3	slightly clayey, silt - saprolite
48.3	52	silt - saprolite
52	63	silty, medium to fine sand - saprolite
63	69	silty, medium to fine sand - weathered rock
69	70.4	coarse grained quartz diorite- partially weathered rock
70.4	89.54	coarse to fine grained quartz diorite and meta gabbro- sound rock

11. REMARKS:

- K-packer placed at 70.09 to 70.11 feet BLS; bentonite seal placed at 65.00 to 70.09 ft bsl; sand pack placed below well from 75.80 to 77.00 ft BLS.
- Bentonite placed below well 77.00 to 89.54 feet BLS.

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR Justin Millwood DATE 8/7/07

PRINTED NAME OF PERSON CONSTRUCTING THE WELL Justin Millwood

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

Form GW-1b
Rev. 7/05



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood
Well Contractor (Individual) Name

S&ME, Inc.
Well Contractor Company Name

STREET ADDRESS 155 Tradd Street
Spartanburg SC 29301
City or Town State Zip Code

(864) 574-2360
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-70

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/19/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

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

LATITUDE 35° 26' 00.74" N

LONGITUDE 80° 56' 57.89" W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 21.00 ft

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

c. WATER LEVEL Below Top of Casing: 11.19 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 0.26 BLS FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING: Depth Diameter Thickness/Weight Material
From 0.26 BLS To 6.00 BLS Ft. 2 inches Sch 40 PVC
From To Ft.
From To Ft.

7. GROUT: Depth Material Method
From 0 To 1.50 Ft. Neat Cement Tremie
From To Ft.
From To Ft.

8. SCREEN: Depth Diameter Slot Size Material
From 6.00 To 21.00 Ft. 2 in. 0.010 in. PVC
From To Ft. in. in.
From To Ft. in. in.

9. SAND/GRAVEL PACK: Depth Size Material
From 4.00 To 21.00 Ft. #1 Filter Sand
From To Ft.
From To Ft.

10. DRILLING LOG
From To Formation Description
0 0.5 asphalt
0.5 7 slightly sandy, clayey, silt - fill
7 21 slightly clayey, medium to fine sandy, silt - saprolite

11. REMARKS:

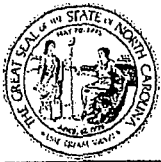
I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR 8/7/07 DATE

Justin Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg SC 29301

City or Town State Zip Code

(864) 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-70R

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/18/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

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

LATITUDE 35° 26' 00.73" N

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

LONGITUDE 80° 56' 57.83" W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 65.45 ft

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

c. WATER LEVEL Below Top of Casing: 12.41 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 0.22 BLS FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/	Material
From 0.22 BLS To 55.45 BLS	2 Inches	Weight 40	PVC
From To	Ft.		
From To	Ft.		

7. GROUT:

Depth	Material	Method
From 0 To 13.00	Neat Cement	Tremie
From To	Ft.	
From To	Ft.	

8. SCREEN:

Depth	Diameter	Slot Size	Material
From 54.45 To 65.45	2 in.	0.010 in.	PVC
From To	Ft.	in.	
From To	Ft.	in.	

9. SAND/GRAVEL PACK:

Depth	Size	Material
From 53.50 To 65.45	#1	Filter Sand
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	0.5	asphalt
0.5	7	slightly sandy, clayey, silt - fill
7	27	slightly clayey, medium to fine sandy, silt - saprolite
27	28.6	coarse sand - saprolite
28.6	32	slightly clayey, fine sandy, silt - saprolite
32	48	fine sandy, silt - saprolite
48	48.7	fine sandy, silt - weathered rock
48.7	65.45	silly, coarse to fine sand - weathered rock

11. REMARKS:

- Bentonite seal placed from 13 to 53.50 ft BLS.

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR 8/7/07
DATE

Justin Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood
Well Contractor (Individual) Name
S&ME, Inc.
Well Contractor Company Name
STREET ADDRESS 155 Tradd Street
Spartanburg SC 29301
City or Town State Zip Code

(864) 574-2360
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-70DR
STATE WELL PERMIT #(if applicable)
DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other (list use)

DATE DRILLED 06/13/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

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

LATITUDE 35° 26' 00.72" N

LONGITUDE 80° 56' 57.78" W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 77.40 ft

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

c. WATER LEVEL Below Top of Casing: 12.97 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 0.23 BLS FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/	Material
From 0.23 BLS To 72.40 BLS	2 inches	Weight Sch 40	PVC
From To	Fl.		
From To	Fl.		

7. GROUT:

Depth	Material	Method
From 0 To 7.00	Neat Cement	Tremie
From To	Fl.	
From To	Fl.	

8. SCREEN:

Depth	Diameter	Slot Size	Material
From 72.40 To 77.40	2 in.	0.010 in.	PVC
From To	Fl.	in.	
From To	Fl.	in.	

9. SAND/GRAVEL PACK:

Depth	Size	Material
From To	Fl.	
From To	Fl.	
From To	Fl.	

10. DRILLING LOG

From	To	Formation Description
0	4	asphalt with gravel base
4	7	slightly sandy, clayey, silt - fill
7	27	slightly clayey, medium to fine sandy, silt - saprolite
27	28.6	coarse sand - saprolite
28.6	32	slightly clayey, fine sandy, silt - saprolite
32	48	fine sandy, silt - saprolite
48	48.7	fine sandy, silt - weathered rock
48.7	65.55	slty, coarse to fine sand - weathered rock
65.55	74.5	medium grained meta gabbro - weathered rock
74.5	76.9	medium grained quartz diorite - sound rock
76.9	78.5	medium grained meta gabbro - weathered rock
78.5	94.94	fine and medium grained meta gabbro and quartz diorite - sound rock

11. REMARKS:

- K-packer placed at 71.69 to 71.71 feet BLS; bentonite seal placed at
7.00 to 71.69 ft BLS; sand placed below well from 77.40 to 77.80 ft BLS.
- Bentonite placed below well from 77.80 to 78.00 ft BLS.

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

Justin Millwood
SIGNATURE OF CERTIFIED WELL CONTRACTOR 8/7/07 DATE

Justin Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte NC 28273
City or Town State Zip Code

(704) 523-4726

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-94

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 06/28/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

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

LATITUDE 35° 25' 53.57" N

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

LONGITUDE 80° 57' 06.09" W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078
City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078
City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 44.10 ft

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

c. WATER LEVEL Below Top of Casing: 35.43 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.96 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/	Weight	Material
From 2.96 ALG To 29.10 BLG	2 Inches	Sch 40		PVC
From To	Ft.			
From To	Ft.			

7. GROUT:

Depth	Material	Method
From 0 To 24.00	Neat Cement	Tremie
From To	Ft.	
From To	Ft.	

8. SCREEN:

Depth	Diameter	Slot Size	Material
From 29.10 To 44.10	2 in.	0.010 in.	PVC
From To	Ft.	in.	in.
From To	Ft.	in.	in.

9. SAND/GRAVEL PACK:

Depth	Size	Material
From 27.00 To 44.10	#1	Filter Sand
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	9	fine sandy, silt - alluvium
9	14	clayey, silt - alluvium
14	19	silty, clay - alluvium
19	19.2	fine sandy, silt - alluvium
19.2	23	medium to fine sandy, clay - alluvium
23	29	slightly clayey, fine sandy, silt - saprolite
29	35.5	coarse to fine sandy, silt - saprolite
35.5	44.1	fine sandy, silt - saprolite

11. REMARKS:

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE

PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



February 4, 2008

Mecklenburg County Health Department
Land Use & Environmental Service Agency
Groundwater & Wastewater Services
700 North Tryon Street, Suite 211
Charlotte, North Carolina 28202

Reference: **Non-Residential Well Construction Records – Submittal #5**
McGuire Nuclear Station
12700 Hagers Ferry Road
Huntersville, North Carolina
Well Application Permit No. 70000752
S&ME Project No. 1264-06-724

Ladies and Gentlemen:

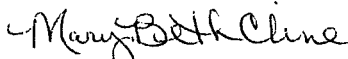
On behalf of Duke Energy, S&ME, Inc. (S&ME) is submitting the enclosed *Monitor Well Registration* form and completed/signed *Non-Residential Well Construction Records* for the following eleven (11) groundwater monitoring wells installed at the McGuire Nuclear Station (MNS) site:

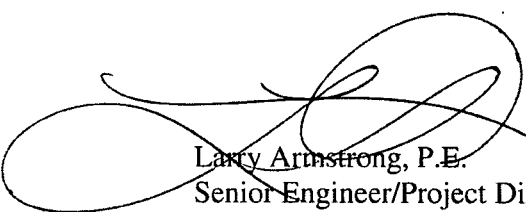
- | | | | |
|---------|---------|--------|----------|
| • M-20 | • M-22 | • M-31 | • M-91 |
| • M-20R | • M-22R | • M-35 | • M-91R. |
| • M-21 | • M-23 | • M-60 | |

Duke Energy has voluntarily installed groundwater monitoring wells at MNS as part of a site-wide hydrogeologic evaluation. As of this writing, the above eleven (11) wells represent the last planned wells for this project at MNS. Therefore, we anticipate this submittal (*Submittal #5*) to be the last for this project.

On behalf of Duke Energy, S&ME thanks you for your receipt of these records. Should you have any questions or need additional information, please contact us.

Sincerely,
S&ME, Inc.


Mary Beth Cline, E.I.T.
Staff Professional


Larry Armstrong, P.E.
Senior Engineer/Project Director

enclosures

cc: Messrs. Greg Robison, Ed Sullivan, Tim Hunsucker; Duke Energy

S:\ENVIRON\2006\1264 Projects\6406724 McGuire Nuclear Groundwater Study\NCDENR Well Records\meck co well records submittal 5.doc

Mecklenburg County
Land Use & Environmental Service Agency
Groundwater & Wastewater Services
700 N. Tryon St., Suite 211
Charlotte, NC 28202
Phone: (704) 336-5103
Fax: (704) 336-6894



Staff Use Only
Date Received: _____

Monitor Well Registration

Is this Registration for a well or wells that existed prior to January 01, 2005? No

Enter your Subsurface Investigation Permit #: 70000752

Date Well Installation Began: 11-27-07

Date Well Installation Complete: 01-08-08

Site/Contact Information

Name of Site: McGuire Nuclear Station

Site Address: 12700 Hagers Ferry Road

Site Tax Parcel ID: 00119103

Bill to Owner/Agent Name: Duke Energy / Michael Phillips

Owner/Agent Address: Mail Code MG01EM 12700 Hagers Ferry Rd.

Owner/Agent Phone #: 704-875-4675

Driller Certification #: 3439 & 2717

Type of Registration

This registration is for (check all that apply):

- ☒ Unregistered Permanent Monitor Wells
☐ Temporary Monitor Wells

☐ Yearly Update of Permanent Monitor Wells

The following information must be completed for each tax parcel on which monitor wells have been installed:

On-Site Monitor Wells		Tax Parcel #		Tax Parcel #		Tax Parcel #	
Type of Well	# Present	Type of Well	# Present	Type of Well	# Present	Type of Well	# Present
Temporary*		Temporary*		Temporary*		Temporary*	
Permanent	11	Permanent		Permanent		Permanent	
Sparge		Sparge		Sparge		Sparge	
Vapor Extraction		Vapor Extraction		Vapor Extraction		Vapor Extraction	
Recovery		Recovery		Recovery		Recovery	
Injection		Injection		Injection		Injection	
Vapor Monitoring		Vapor Monitoring		Vapor Monitoring		Vapor Monitoring	
Piezometer		Piezometer		Piezometer		Piezometer	
Groundwater Standard Exceeded?		Groundwater Standard Exceeded?		Groundwater Standard Exceeded?		Groundwater Standard Exceeded?	

Tax Parcel #		Tax Parcel #		Tax Parcel #		Tax Parcel #	
Type of Well	# Present	Type of Well	# Present	Type of Well	# Present	Type of Well	# Present
Temporary*		Temporary*		Temporary*		Temporary*	
Permanent		Permanent		Permanent		Permanent	
Sparge		Sparge		Sparge		Sparge	
Vapor Extraction		Vapor Extraction		Vapor Extraction		Vapor Extraction	
Recovery		Recovery		Recovery		Recovery	
Injection		Injection		Injection		Injection	
Vapor Monitoring		Vapor Monitoring		Vapor Monitoring		Vapor Monitoring	
Piezometer		Piezometer		Piezometer		Piezometer	
Groundwater Standard Exceeded?		Groundwater Standard Exceeded?		Groundwater Standard Exceeded?		Groundwater Standard Exceeded?	

*Selection of Temporary Well requires monitor well abandonment forms also be filed. Failure to file abandonment forms will result in the well being considered permanent and cause the well owner to be billed the appropriate fee.



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte

NC

28273

City or Town

State

Zip Code

(704) 523-4726

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-20

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 12/11/07

TIME COMPLETED 5:00

AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY: Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☒ Ridge ☐ Other

(check appropriate box)

LATITUDE 35 25' 36.52" N

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

LONGITUDE 80 57' 10.43"W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville

NC

28078

City or Town

State

Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville

NC

28078

City or Town

State

Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 48.00 ft

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

c. WATER LEVEL Below Top of Casing: 41.17 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.96 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Weight	Material
From 2.96 ALS To 33.00 BLS	Ft. 2 inches	Sch 40	PVC
From To	Ft.		
From To	Ft.		

7. GROUT:

Depth	Material	Method
From 0 To 29.00	Ft. Portland	Tremie
From To	Ft.	
From To	Ft.	

8. SCREEN:

Depth	Diameter	Slot Size	Material
From 33.00 To 48.00	Ft. 2 in.	0.010 in.	PVC
From To	Ft. in.	in.	
From To	Ft. in.	in.	

9. SAND/GRAVEL PACK:

Depth	Size	Material
From 31.00 To 48.00	Ft. #1	Filter Sand
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	0.3	grass/rootmat/topsoil
0.3	13.0	fine sandy silty clay
13.0	17.0	slightly clayey fine sandy silt
17.0	23.0	silty fine sand
23.0	37.0	slightly micaceous fine sandy silt
37.0	49.0	micaceous silty fine sand
49.0	52.3	micaceous silty fine sand-weathered rock
	52.3	roller cone bit refusal

11. REMARKS:

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

Jay A. Little 2-11-08
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

Jay A. Little
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



NON RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte

NC

28273

City or Town

State

Zip Code

(704) - 523-4726

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-20R

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 12/10/07

TIME COMPLETED 5:00

AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☒ Ridge ☐ Other

(check appropriate box)

LATITUDE 35 25' 36.50" N

LONGITUDE 80 57' 10.36"W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville

NC

28078

City or Town

State

Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville

NC

28078

City or Town

State

Zip Code

(704) - 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 67.49 ft

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

c. WATER LEVEL Below Top of Casing: 38.97 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.94 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/ Weight	Material
From 2.94 ALS To 62.49 BLS	2 inches	Sch 40	PVC
From To	Ft.		
From To	Ft.		

7. GROUT: Depth Material Method

Depth	Material	Method
From 0 To 59.92	Portland	Tremie
From To	Ft.	
From To	Ft.	

8. SCREEN: Depth Diameter Slot Size Material

Depth	Diameter	Slot Size	Material
From 62.49 To 67.49	2 in.	0.010 in.	PVC
From To	Ft.	in.	
From To	Ft.	in.	

9. SAND/GRAVEL PACK:

Depth	Size	Material
From To	Ft.	
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	0.3	grass/rootmat/topsoil
0.3	13.0	fine sandy silty clay
13.0	17.0	slightly clayey fine sandy silt
17.0	23.0	silty fine sand
23.0	37.0	slightly micaceous fine sandy silt
37.0	49.0	micaceous silty fine sand
49.0	52.3	micaceous silty fine sand-weathered rock
52.3	75.0	medium to coarse grained quartz diorite

11. REMARKS:

- bentonite placed below well from 70.0 to 75 ft BLS; sand placed at 67.49 to 70 ft BLS

- K-packer placed at 61.92 to 62.09 ft BLS; bentonite seal placed at
59.92 to 61.92 ft BLS; no sand/gravel pack below K-packer

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

Jay A. Little 2-4-08
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

Jay A. Little
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte NC 28273

City or Town State Zip Code

(704) 523-4726

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-21

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 12/12/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

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

LATITUDE 35 25' 35.69" N

LONGITUDE 80 56' 48.59"W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 50.00 ft

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

c. WATER LEVEL Below Top of Casing: 38.77 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.94 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/Weight	Material
From 2.94 ALS To 30.00 BLS	2 inches	Sch 40	PVC
From To	Ft.		
From To	Ft.		
From To	Ft.		

7. GROUT:

Depth	Material	Method
From 0 To 24.00	Portland	Tremie
From To	Ft.	
From To	Ft.	

8. SCREEN:

Depth	Diameter	Slot Size	Material
From 30.00 To 50.00	2 in.	0.010 in.	PVC
From To	Ft.	in.	
From To	Ft.	in.	

9. SAND/GRAVEL PACK:

Depth	Size	Material
From 27.00 To 50.20	#1	Filter Sand
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	40.38	clayey silt
40.38	50.50	micaceous silty sand

11. REMARKS:

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE

PRINTED NAME OF PERSON CONSTRUCTING THE WELL



NON RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg

SC

29301

City or Town

State

Zip Code

(864) 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-22

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 12/7/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY: Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☒ Ridge ☐ Other

(check appropriate box)

LATITUDE 35° 25' 36.96" N

LONGITUDE 80° 56' 38.11" W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville

NC

28078

City or Town

State

Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Road

Huntersville

NC

28078

City or Town

State

Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 60.00 feet

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

c. WATER LEVEL Below Top of Casing: 52.40 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.74 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

From	Depth	To	Diameter	Thickness/	Weight	Material
From 2.74 ALS	To 45.00	Ft.	2 inches	Sch 40		PVC
From	To	Ft.				
From	To	Ft.				

7. GROUT: Depth Material Method

From	Depth	To	Material	Method
From 0	To 42.80	Ft.	Portland	Tremie
From	To	Ft.		
From	To	Ft.		

8. SCREEN: Depth Diameter Slot Size Material

From	Depth	To	Diameter	Slot Size	Material
From 45.00	To 60.00	Ft.	2 in.	0.010 in.	PVC
From	To	Ft.			
From	To	Ft.			

9. SAND/GRAVEL PACK:

From	Depth	To	Size	Material
From 42.8	To 60.0	Ft.	#1	Filter Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0	7.0	sandy clayey silt
7.0	18.0	silty sand
18.0	33.0	micaceous silty sand
33.0	44.5	sandy silt
44.5	49.0	micaceous silt - saprolite
49.0	59.3	micaceous sandy silt - saprolite
59.3	72.0	micaceous silty sand - partially weathered rock
	72.0	auger refusal

11. REMARKS:

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

Signature of Certified Well Contractor: Justin Millwood
DATE: 1/31/08

PRINTED NAME OF PERSON CONSTRUCTING THE WELL
Justin Millwood



NON RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood
Well Contractor (Individual) Name
S&ME, Inc.
Well Contractor Company Name
STREET ADDRESS 155 Tradd Street
Spartanburg SC 29301
City or Town State Zip Code

(864) 574-2360
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-22R
STATE WELL PERMIT #(if applicable)
DWQ or OTHER PERMIT #(if applicable) 70000752

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

DATE DRILLED 12/6/07
TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg
McGuire Nuclear Station
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

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

LATITUDE 35° 25' 36.99" N
LONGITUDE 80° 56' 38.06" W

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

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

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

FACILITY ID #(if applicable)
NAME OF FACILITY McGuire Nuclear Station
STREET ADDRESS 12700 Hagers Ferry Road
Huntersville NC 28078
City or Town State Zip Code
CONTACT PERSON Michael Phillips
MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Road
Huntersville NC 28078
City or Town State Zip Code

(704) 875-4675
Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 92.00 feet
b. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
c. WATER LEVEL Below Top of Casing: 52.69 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.64 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

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

6. CASING: Depth Diameter Thickness/Weight Material
From 2.64 ALS To 87.00 Ft. 2 inches Sch 40 PVC
From To Ft. in. in. lb/ft
From To Ft. in. in. lb/ft

7. GROUT: Depth Material Method
From 0 To 37.80 Ft. Neat Cement Tremie
From To Ft. in. in. lb/ft
From To Ft. in. in. lb/ft

8. SCREEN: Depth Diameter Slot Size Material
From 87.00 To 92.0 Ft. 2 in. 0.010 in. PVC
From To Ft. in. in. lb/ft
From To Ft. in. in. lb/ft

9. SAND/GRAVEL PACK: Depth Size Material
From To Ft. in. in. lb/ft
From To Ft. in. in. lb/ft
From To Ft. in. in. lb/ft

10. DRILLING LOG
From To Formation Description
0 7.0 sandy clayey silt
7.0 18.0 silty sand
18.0 33.0 micaceous silty sand
33.0 44.5 sandy silt
44.5 49.0 micaceous silt - saprolite
49.0 59.3 micaceous sandy silt - saprolite
59.3 72.0 micaceous silty sand - partially weathered rock
72.0 95.6 medium to coarse grained quartz diorite

11. REMARKS:
- bentonite placed below well from 92.0 to 95.6 ft BLS
- K-packer placed at 86.0 to 86.3 ft BLS; bentonite seal placed at
37.8 to 86.0 feet BLS; no sand/gravel pack below K-packer.

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

Signature of Certified Well Contractor 1/31/08
DATE

Justin Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL



NON RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg

SC

29301

City or Town

State

Zip Code

(864) - 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-31

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 11/28/07

TIME COMPLETED 5:00 AM ☒ PM ☐

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

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

LATITUDE 35° 25' 48.86" N

LONGITUDE 80° 56' 28.05" W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville

NC

28078

City or Town

State

Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Road

Huntersville

NC

28078

City or Town

State

Zip Code

(704) - 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 40.00 feet

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

c. WATER LEVEL Below Top of Casing: 31.43 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.33 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

From	Depth	To	Diameter	Thickness/	Material
2.33 ALS	25.00	Ft.	2 inches	Sch 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

From	Depth	To	Material	Method
0	20.00	Ft.	Portland	Tremie
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

From	Depth	To	Diameter	Slot Size	Material
25.00	40.00	Ft.	2 in.	0.010 in.	PVC
From	To	Ft.			
From	To	Ft.			

9. SAND/GRAVEL PACK:

From	Depth	To	Size	Material
22.60	40.00	Ft.	#1	Filter Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0	4.0	micaceous clayey silt
4.0	13.0	very micaceous silty fine sand
13.0	30.7	very micaceous silty fine to med sand - saprolite
30.7	44.0	very micaceous fine to coarse sandy silt - saprolite
44.0	50.8	very micaceous silty sand - saprolite

11. REMARKS:

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR 1/31/08

Justin Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL



NON RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg SC 29301

City or Town State Zip Code

(864) 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-35

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 12/12/07

TIME COMPLETED 5:00 AM ☒ PM ☐

3. WELL LOCATION:

CITY: Huntersville COUNTY: Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☒ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35° 25' 44.09" N

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

LONGITUDE 80° 56' 22.20" W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 30.80 feet

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

c. WATER LEVEL Below Top of Casing: 25.47 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.47 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/Weight	Material
From 2.74 ALS To 15.80 Ft.	2 inches	Sch 40	PVC
From To	Ft.		
From To	Ft.		

7. GROUT:

Depth	Material	Method
From 0 To 9.00 Ft.	Portland	Tremie
From To	Ft.	
From To	Ft.	

8. SCREEN:

Depth	Diameter	Slot Size	Material
From 15.80 To 30.80 Ft.	2 in.	0.010 in.	PVC
From To	Ft.	in.	in.
From To	Ft.	in.	in.

9. SAND/GRAVEL PACK:

Depth	Size	Material
From 13.00 To 30.80 Ft.	#1	Filter Sand
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	0.3	leaves, root mat, topsoil
0.3	19.5	silty clay
19.5	23.5	fine sandy silty clay
23.5	29.8	micaceous silt - saprolite
29.8	31.1	fine to medium sandy silt
	31.1	auger refusal

11. REMARKS:

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR 1/31/08 DATE

Justin Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



NON RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg SC 29301

City or Town State Zip Code

(864) 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-60

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 11/27/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY: Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☒ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35° 26' 02.52" N

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

LONGITUDE 80° 56' 39.68" W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 39.00 feet

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

c. WATER LEVEL Below Top of Casing: 31.55 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.19 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

From	Depth	To	Diameter	Thickness/	Material
From 2.19 ALS	To 24.00	Ft.	2 inches	Weight Sch 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

From	Depth	To	Material	Method
From 0	To 18.00	Ft.	Portland	Tremie
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

From	Depth	To	Diameter	Slot Size	Material
From 24.00	To 39.00	Ft.	2 in.	0.010 in.	PVC
From	To	Ft.			
From	To	Ft.			

9. SAND/GRAVEL PACK:

From	Depth	To	Size	Material
From 21.60	To 39.00	Ft.	#1	Filter Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0	0.2	root mat/topsoil
0.2	7.0	micaceous clayey silt
7.0	10.2	silty fine sand - saprolite
10.2	33.0	micaceous fine sandy silt - saprolite
33.0	39.8	micaceous silty fine to med sand - saprolite
39.8		auger refusal

11. REMARKS:

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR 1/31/08 DATE

Justin Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

NON RESIDENTIAL WELL CONSTRUCTION RECORD
North Carolina Department of Environment and Natural Resources- Division of Water Quality
WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little
Well Contractor (Individual) Name
S&ME, Inc.
Well Contractor Company Name
STREET ADDRESS 9751 Southern Pine Boulevard
Charlotte NC 28273
City or Town State Zip Code
(704) 523-4726
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-91
STATE WELL PERMIT #(if applicable)
DWQ or OTHER PERMIT #(if applicable) 70000752
WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use)
DATE DRILLED 1/8/08
TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg
McGuire Nuclear Station
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)
TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☐ Flat ☒ Ridge ☐ Other
(check appropriate box)
LATITUDE 35 25' 54.30" N
LONGITUDE 80 57' 09.13"W
Latitude/longitude source: ☒ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

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

FACILITY ID #(if applicable)
NAME OF FACILITY McGuire Nuclear Station
STREET ADDRESS 12700 Hagers Ferry Road
Huntersville NC 28078
City or Town State Zip Code
CONTACT PERSON Michael Phillips
MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd
Huntersville NC 28078
City or Town State Zip Code
(704) 875-4675
Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 39.00 ft
b. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
c. WATER LEVEL Below Top of Casing: 31.55 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 3.05 FT. Above Land Surface*
 *Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): _____ METHOD OF TEST _____

f. DISINFECTION: Type _____ Amount _____

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

6. CASING:

Depth	Diameter	Thickness/	Material
From <u>3.05</u> ALS To <u>24.00</u> BLS	Ft. <u>2</u> inches	Weight <u>Sch 40</u>	<u>PVC</u>
From _____ To _____	Ft. _____	_____	_____
From _____ To _____	Ft. _____	_____	_____

7. GROUT: Depth _____ Material _____ Method _____

Depth	Material	Method
From <u>0</u> To <u>20.00</u>	Ft. <u>Portland</u>	<u>Tremie</u>
From _____ To _____	Ft. _____	_____
From _____ To _____	Ft. _____	_____

8. SCREEN: Depth _____ Diameter _____ Slot Size _____ Material _____

Depth	Diameter	Slot Size	Material
From <u>24.00</u> To <u>39.00</u>	Ft. <u>2</u> in.	<u>0.010</u> in.	<u>PVC</u>
From _____ To _____	Ft. _____ in.	_____ in.	_____
From _____ To _____	Ft. _____ in.	_____ in.	_____

9. SAND/GRAVEL PACK:

Depth	Size	Material
From <u>22.00</u> To <u>39.00</u>	Ft. <u>#1</u>	<u>Filter Sand</u>
From _____ To _____	Ft. _____	_____
From _____ To _____	Ft. _____	_____

10. DRILLING LOG

From	To	Formation Description
<u>0</u>	<u>0.3</u>	<u>grass. root mat</u>
<u>0.3</u>	<u>8.0</u>	<u>micaceous sandy clayey silt</u>
<u>8.0</u>	<u>13.0</u>	<u>alluvium-micaceous silty clay</u>
<u>13.0</u>	<u>18.0</u>	<u>micaceous clayey silt</u>
<u>18.0</u>	<u>28.0</u>	<u>mottled micaceous silt</u>
<u>28.0</u>	<u>39.0</u>	<u>fine sandy silt</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

11. REMARKS:

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

Jay A Little 2-4-08
 SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

Jay A Little
 PRINTED NAME OF PERSON CONSTRUCTING THE WELL



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte NC 28273

City or Town State Zip Code

(704) 523-4726

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-91R

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 1/2/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☒ Ridge ☐ Other

(check appropriate box)

LATITUDE 35 25' 54.30" N

LONGITUDE 80 57' 09.20" W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 63.00 ft

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

c. WATER LEVEL Below Top of Casing: 44.47 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.87 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/	Material
From To	Ft.	Weight	
		Sch 40	
From 2.87ALS To 53.00 BLS	2 inches		PVC
From To	Ft.		
From To	Ft.		

7. GROUT:

Depth	Material	Method
From To	Ft.	
From 0 To 22.40	Portland	Tremie
From To	Ft.	
From To	Ft.	

8. SCREEN:

Depth	Diameter	Slot Size	Material
From To	Ft.	in.	
From 53.00 To 63.00	2	0.010	PVC
From To	Ft.	in.	
From To	Ft.	in.	

9. SAND/GRAVEL PACK:

Depth	Size	Material
From To	Ft.	
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	0.3	grass, rootmat
0.3	8.0	micaceous sandy clayey silt
8.0	13.0	alluvium-micaceous silty clay
13.0	18.0	micaceous clayey silt
18.0	28.0	mottled micaceous silt
28.0	52.5	micaceous fine sandy silt
52.5	69.8	refusal to roller cone bit
		medium grained quartz diorite
		with fractures

11. REMARKS:

- bentonite placed below well from 64.0 to 69.8 ft BLS; sand placed at 63.0 to 64.0 ft BLS
- K-packer placed at 52.5 to 52.7 ft BLS; bentonite seal placed at
22.4 to 52.5 ft BLS; no sand/gravel pack below K-packer

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE 2-4-08

PRINTED NAME OF PERSON CONSTRUCTING THE WELL
Jay A. Little



February 4, 2008

North Carolina Department of Environment and Natural Resources
Division of Water Quality
1617 Mail Service Center
Raleigh, North Carolina 27699-1617

Reference: **Non-Residential Well Construction Records – Submittal #5**
McGuire Nuclear Station
12700 Hagers Ferry Road
Huntersville, North Carolina
S&ME Project No. 1264-06-724

Ladies and Gentlemen:

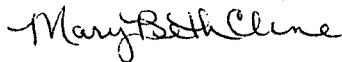
On behalf of Duke Energy, S&ME, Inc. (S&ME) is submitting the enclosed completed and signed *Non-Residential Well Construction Records* for the following eleven (11) groundwater monitoring wells installed at the McGuire Nuclear Station (MNS) site:

- | | | | |
|---------|---------|--------|----------|
| • M-20 | • M-22 | • M-31 | • M-91 |
| • M-20R | • M-22R | • M-35 | • M-91R. |
| • M-21 | • M-23 | • M-60 | |

Duke Energy has voluntarily installed groundwater monitoring wells at MNS as part of a site-wide hydrogeologic evaluation. As of this writing, the above eleven (11) wells represent the last planned wells for this project at MNS. Therefore, we anticipate this submittal (*Submittal #5*) to be the last for this project.

On behalf of Duke Energy, S&ME thanks you for your receipt of these records. Should you have any questions or need additional information, please contact us.

Sincerely,
S&ME, Inc.

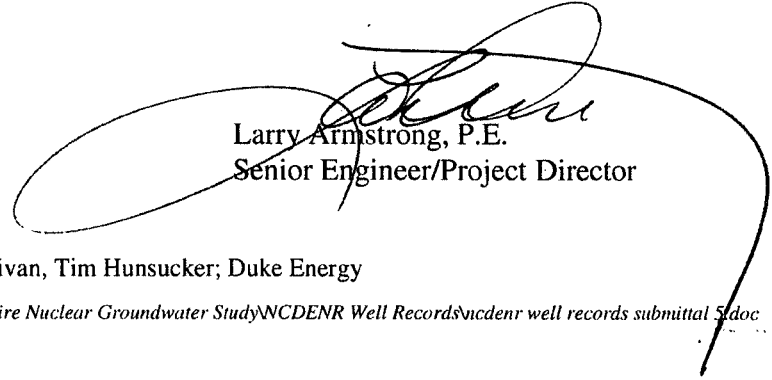


Mary Beth Cline, E.I.T.
Staff Professional

enclosures

cc: Messrs. Greg Robison, Ed Sullivan, Tim Hunsucker; Duke Energy

S:\ENVIRON\2006\1264 Projects\6406724 McGuire Nuclear Groundwater Study\NCDENR Well Records\ncdenr well records submittal 5.doc


Larry Armstrong, P.E.
Senior Engineer/Project Director



NON RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte

NC

28273

City or Town State

Zip Code

(704) 523-4726

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-20

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 12/11/07

TIME COMPLETED 5:00

AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville

COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☒ Ridge ☐ Other

(check appropriate box)

LATITUDE 35 25' 36.52" N

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

LONGITUDE 80 57' 10.43" W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville

NC

28078

City or Town

State

Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville

NC

28078

City or Town

State

Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 48.00 ft

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

c. WATER LEVEL Below Top of Casing: 41.17 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.96 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/Weight	Material
From 2.96 ALS To 33.00 BLS	2 inches	Sch 40	PVC
From To	Ft.		
From To	Ft.		

7. GROUT:

Depth	Material	Method
From 0 To 29.00	Portland	Tremie
From To	Ft.	
From To	Ft.	

8. SCREEN:

Depth	Diameter	Slot Size	Material
From 33.00 To 48.00	2 in.	0.010 in.	PVC
From To	Ft.	in.	
From To	Ft.	in.	

9. SAND/GRAVEL PACK:

Depth	Size	Material
From 31.00 To 48.00	#1	Filter Sand
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	0.3	grass/rootmat/topsoil
0.3	13.0	fine sandy silty clay
13.0	17.0	slightly clayey fine sandy silt
17.0	23.0	silty fine sand
23.0	37.0	slightly micaceous fine sandy silt
37.0	49.0	micaceous silty fine sand
49.0	52.3	micaceous silty fine sand-weathered rock
	52.3	roller cone bit refusal

11. REMARKS:

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

Jay A. Little 2-11-08
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

Jay A. Little
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte

NC

28273

City or Town

State

Zip Code

(704) 523-4726

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-20R

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 12/10/07

TIME COMPLETED 5:00

AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville

COUNTY: Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☒ Ridge ☐ Other

(check appropriate box)

LATITUDE 35 25' 36.50" N

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

LONGITUDE 80 57' 10.36"W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville

NC

28078

City or Town

State

Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville

NC

28078

City or Town

State

Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 67.49 ft

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

c. WATER LEVEL Below Top of Casing: 38.97 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.94 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/ Weight	Material
From 2.94 ALS To 62.49 BLS	2 inches	Sch 40	PVC
From To	Ft.		
From To	Ft.		

7. GROUT: Depth Material Method

Depth	Material	Method
From 0 To 59.92	Portland	Tremie
From To	Ft.	
From To	Ft.	

8. SCREEN: Depth Diameter Slot Size Material

Depth	Diameter	Slot Size	Material
From 62.49 To 67.49	2 in.	0.010 in.	PVC
From To	Ft.	in.	
From To	Ft.	in.	

9. SAND/GRAVEL PACK:

Depth	Size	Material
From To	Ft.	
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	0.3	grass/rootmat/topsoil
0.3	13.0	fine sandy silty clay
13.0	17.0	slightly clayey fine sandy silt
17.0	23.0	silty fine sand
23.0	37.0	slightly micaceous fine sandy silt
37.0	49.0	micaceous silty fine sand
49.0	52.3	micaceous silty fine sand-weathered rock
52.3	75.0	medium to coarse grained quartz diorite

11. REMARKS:

- bentonite placed below well from 70.0 to 75 ft BLS; sand placed at 67.49 to 70 ft BLS

- K-packer placed at 61.92 to 62.09 ft BLS; bentonite seal placed at
59.92 to 61.92 ft BLS; no sand/gravel pack below K-packer

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE

PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte

NC

28273

City or Town

State

Zip Code

(704) 523-4726

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-21

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other (list use)

DATE DRILLED 12/12/07

TIME COMPLETED 5:00

AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville

COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☒ Ridge ☐ Other

(check appropriate box)

LATITUDE 35 25' 35.69" N

LONGITUDE 80 56' 48.59"W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville

NC

28078

City or Town

State

Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville

NC

28078

City or Town

State

Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 50.00 ft

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

c. WATER LEVEL Below Top of Casing: 38.77 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.94 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

From	Depth	To	Diameter	Thickness/	Weight	Material
From 2.88 ALS	To 30.00 BLS	Ft.	2 inches	Sch 40		PVC
From	To	Ft.				
From	To	Ft.				

7. GROUT:

From	Depth	To	Material	Method
From 0	To 24.00	Ft.	Portland	Tremie
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

From	Depth	To	Diameter	Slot Size	Material
From 30.00	To 50.00	Ft.	2 in.	0.010 in.	PVC
From	To	Ft.			
From	To	Ft.			

9. SAND/GRAVEL PACK:

From	Depth	To	Size	Material
From 27.00	To 50.20	Ft.	#1	Filter Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0	40.38	clayey silt
40.38	50.50	micaceous silty sand

11. REMARKS:

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

Signature of Certified Well Contractor: Jay G. Little
DATE: 1-4-08

PRINTED NAME OF PERSON CONSTRUCTING THE WELL
Jay G. Little

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

Form GW-1b
Rev. 7/05



NON RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg SC 29301

City or Town State Zip Code

(864) 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-22

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 12/7/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY: Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☒ Ridge ☐ Other

(check appropriate box)

LATITUDE 35° 25' 36.96" N

LONGITUDE 80° 56' 38.11" W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 60.00 feet

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

c. WATER LEVEL Below Top of Casing: 52.40 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.74 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/	Material
From To	Ft. inches	Weight Sch 40	
From 2.74 ALS To 45.00	Ft. 2		PVC
From To	Ft.		
From To	Ft.		

7. GROUT:

Depth	Material	Method
From To	Ft.	
From 0 To 42.80	Ft. Portland	Tremie
From To	Ft.	
From To	Ft.	

8. SCREEN:

Depth	Diameter	Slot Size	Material
From To	Ft. in.	in.	
From 45.00 To 60.00	Ft. 2	0.010	PVC
From To	Ft. in.	in.	
From To	Ft. in.	in.	

9. SAND/GRAVEL PACK:

Depth	Size	Material
From To	Ft. #	
From 42.8 To 60.0	Ft. #1	Filter Sand
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	7.0	sandy clayey silt
7.0	18.0	silty sand
18.0	33.0	micaceous silty sand
33.0	44.5	sandy silt
44.5	49.0	micaceous silt - saprolite
49.0	59.3	micaceous sandy silt - saprolite
59.3	72.0	micaceous silty sand - partially weathered rock
	72.0	auger refusal

11. REMARKS:

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR 1/31/08 DATE

Justin Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL



NON RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg

SC

29301

City or Town

State

Zip Code

(864) 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-22R

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 12/6/07

TIME COMPLETED 5:00

AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville

COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other

(check appropriate box)

LATITUDE 35° 25' 36.99" N

LONGITUDE 80° 56' 38.06" W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville

NC

28078

City or Town

State

Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Road

Huntersville

NC

28078

City or Town

State

Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 92.00 feet

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

c. WATER LEVEL Below Top of Casing: 52.69 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.64 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

From	Depth	To	Diameter	Thickness/	Material
				Weight	
				Sch 40	PVC
From 2.64 ALS	To 87.00	Ft.	2 inches		
From	To	Ft.			
From	To	Ft.			

7. GROUT:

From	Depth	To	Material	Method
From 0	To 37.80	Ft.	Neat Cement	Tremie
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

From	Depth	To	Diameter	Slot Size	Material
From 87.00	To 92.0	Ft.	2 in.	0.010 in.	PVC
From	To	Ft.			
From	To	Ft.			

9. SAND/GRAVEL PACK:

From	Depth	To	Size	Material
From	To	Ft.		
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0	7.0	sandy clayey silt
7.0	18.0	silty sand
18.0	33.0	micaceous silty sand
33.0	44.5	sandy silt
44.5	49.0	micaceous silt - saprolite
49.0	59.3	micaceous sandy silt - saprolite
59.3	72.0	micaceous silty sand - partially weathered rock
72.0	95.6	medium to coarse grained quartz diorite

11. REMARKS:

- bentonite placed below well from 92.0 to 95.6 ft BLS
- K-packer placed at 86.0 to 86.3 ft BLS; bentonite seal placed at
37.8 to 86.0 feet BLS; no sand/gravel pack below K-packer.

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR 1/31/08 DATE

Justin Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL



NON RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood
Well Contractor (Individual) Name
S&ME, Inc.
Well Contractor Company Name
STREET ADDRESS 155 Tradd Street
Spartanburg SC 29301
City or Town State Zip Code

(864) 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-23

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 11/29/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

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

LATITUDE 35° 25' 39.20" N

LONGITUDE 80° 56' 23.74" W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 47.00 feet

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

c. WATER LEVEL Below Top of Casing: 40.64 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.70 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

From	Depth	To	Diameter	Thickness/	Material
				Weight	
			2 inches	Sch 40	PVC
From 2.70 ALS	To 32.00	Ft.			
From	To	Ft.			
From	To	Ft.			

7. GROUT:

From	Depth	To	Material	Method
From 0	To 26.80	Ft.	Portland	Tremie
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

From	Depth	To	Diameter	Slot Size	Material
From 32.00	To 47.00	Ft.	2 in.	0.010 in.	PVC
From	To	Ft.			
From	To	Ft.			

9. SAND/GRAVEL PACK:

From	Depth	To	Size	Material
From 29.4	To 48.5	Ft.	#1	Filter Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0	0.3	topsoil/grass/rootmat
0.3	7.0	clayey silt
7.0	15.0	micaceous clayey fine sandy silt
15.0	27.0	sandy clayey silt
27.0	50.9	micaceous silt - saprolite

11. REMARKS:

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

Justin Millwood 1/3/08
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

Justin Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL



NON RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg SC 29301

City or Town State Zip Code

(864) 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-31

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 11/28/07

TIME COMPLETED 5:00 AM ☒ PM ☐

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

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

LATITUDE 35° 25' 48.86" N

LONGITUDE 80° 56' 28.05" W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 40.00 feet

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

c. WATER LEVEL Below Top of Casing: 31.43 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.33 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

From	Depth	To	Diameter	Thickness/	Material
From 2.33 ALS	To 25.00	Ft.	2 inches	Sch 40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

From	Depth	To	Material	Method
From 0	To 20.00	Ft.	Portland	Tremie
From	To	Ft.		
From	To	Ft.		

8. SCREEN:

From	Depth	To	Diameter	Slot Size	Material
From 25.00	To 40.00	Ft.	2 in.	0.010 in.	PVC
From	To	Ft.			
From	To	Ft.			

9. SAND/GRAVEL PACK:

From	Depth	To	Size	Material
From 22.60	To 40.00	Ft.	#1	Filter Sand
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0	4.0	micaceous clayey silt
4.0	13.0	very micaceous silty fine sand
13.0	30.7	very micaceous silty fine to med sand - saprolite
30.7	44.0	very micaceous fine to coarse sandy silt - saprolite
44.0	50.8	very micaceous silty sand - saprolite

11. REMARKS:

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE 1/31/08

PRINTED NAME OF PERSON CONSTRUCTING THE WELL
Justin Millwood



NON RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 155 Tradd Street

Spartanburg SC 29301

City or Town State Zip Code

(864) 574-2360

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-35

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 12/12/07

TIME COMPLETED 5:00 AM ☒ PM ☐

3. WELL LOCATION:

CITY: Huntersville COUNTY: Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

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

LATITUDE 35° 25' 44.09" N

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

LONGITUDE 80° 56' 22.20" W

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Road

Huntersville NC 28078

City or Town State Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 30.80 feet

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

c. WATER LEVEL Below Top of Casing: 25.47 FT. (Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.47 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/Weight	Material
From 2.74 ALS To 15.80 Ft.	2 inches	Sch 40	PVC
From To Ft.			
From To Ft.			

7. GROUT:

Depth	Material	Method
From 0 To 9.00 Ft.	Portland	Tremie
From To Ft.		
From To Ft.		

8. SCREEN:

Depth	Diameter	Slot Size	Material
From 15.80 To 30.80 Ft.	2 in.	0.010 in.	PVC
From To Ft.			
From To Ft.			

9. SAND/GRAVEL PACK:

Depth	Size	Material
From 13.00 To 30.80 Ft.	#1	Filter Sand
From To Ft.		
From To Ft.		

10. DRILLING LOG

From	To	Formation Description
0	0.3	leaves, root mat, topsoil
0.3	19.5	silty clay
19.5	23.5	fine sandy silty clay
23.5	29.8	micaceous silt - saprolite
29.8	31.1	fine to medium sandy silt
31.1		auger refusal

11. REMARKS:

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

SIGNATURE OF CERTIFIED WELL CONTRACTOR 1/31/08 DATE

Justin Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



NON RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 3439

1. WELL CONTRACTOR:

Justin Millwood
Well Contractor (Individual) Name
S&ME, Inc.
Well Contractor Company Name
STREET ADDRESS 155 Tradd Street
Spartanburg SC 29301
City or Town State Zip Code

(864) 574-2360
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-60
STATE WELL PERMIT #(if applicable)
DWQ or OTHER PERMIT #(if applicable) 70000752

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

DATE DRILLED 11/27/07

TIME COMPLETED 5:00 AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville COUNTY Mecklenburg
McGuire Nuclear Station
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)
TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☒ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE 35° 26' 02.52" N

LONGITUDE 80° 56' 39.68" W

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

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

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

FACILITY ID #(if applicable)
NAME OF FACILITY McGuire Nuclear Station
STREET ADDRESS 12700 Hagers Ferry Road
Huntersville NC 28078
City or Town State Zip Code
CONTACT PERSON Michael Phillips
MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Road
Huntersville NC 28078
City or Town State Zip Code
(704) 875-4675
Area code - Phone number

5. WELL DETAILS:

- a. TOTAL DEPTH: 39.00 feet
b. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
c. WATER LEVEL Below Top of Casing: 31.55 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.19 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require
a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

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

6. CASING: Depth Diameter Thickness/ Weight Material
From 2.19 ALS To 24.00 Ft. 2 inches Sch 40 PVC
From To Ft. in. in. in.
From To Ft. in. in. in.

7. GROUT: Depth Material Method
From 0 To 18.00 Ft. Portland Tremie
From To Ft. in. in. in.
From To Ft. in. in. in.

8. SCREEN: Depth Diameter Slot Size Material
From 24.00 To 39.00 Ft. 2 in. 0.010 in. PVC
From To Ft. in. in. in.
From To Ft. in. in. in.

9. SAND/GRAVEL PACK: Depth Size Material
From 21.60 To 39.00 Ft. #1 Filter Sand
From To Ft. in. in. in.
From To Ft. in. in. in.

10. DRILLING LOG

From	To	Formation Description
0	0.2	root mat/topsoil
0.2	7.0	micaceous clayey silt
7.0	10.2	silty fine sand - saprolite
10.2	33.0	micaceous fine sandy silt - saprolite
33.0	39.8	micaceous silty fine to med sand - saprolite
39.8		auger refusal

11. REMARKS:

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

Justin Millwood 1/31/08
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE
Justin Millwood
PRINTED NAME OF PERSON CONSTRUCTING THE WELL



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte

NC

28273

City or Town

State

Zip Code

(704) 523-4726

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-91

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 1/8/08

TIME COMPLETED 5:00

AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville

COUNTY: Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☒ Ridge ☐ Other

(check appropriate box)

LATITUDE 35 25' 54.30" N

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

LONGITUDE 80 57' 09.13"W

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville

NC

28078

City or Town

State

Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville

NC

28078

City or Town

State

Zip Code

(704) 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 39.00 ft

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

c. WATER LEVEL Below Top of Casing: 31.55 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 3.05 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/Weight	Material
From 3.05 ALS To 24.00 BLS	2 inches	Sch 40	PVC
From To	Ft.		
From To	Ft.		

7. GROUT:

Depth	Material	Method
From 0 To 20.00	Portland	Tremie
From To	Ft.	
From To	Ft.	

8. SCREEN:

Depth	Diameter	Slot Size	Material
From 24.00 To 39.00	2 in.	0.010 in.	PVC
From To	Ft.	in.	
From To	Ft.	in.	

9. SAND/GRAVEL PACK:

Depth	Size	Material
From 22.00 To 39.00	#1	Filter Sand
From To	Ft.	
From To	Ft.	

10. DRILLING LOG

From	To	Formation Description
0	0.3	grass, root mat
0.3	8.0	micaceous sandy clayey silt
8.0	13.0	alluvium-micaceous silty clay
13.0	18.0	micaceous clayey silt
18.0	28.0	mottled micaceous silt
28.0	39.0	fine sandy silt

11. REMARKS:

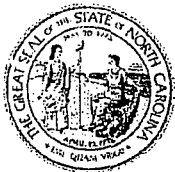
I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Jay A. Little 2-4-08
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

Jay A. Little
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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

Form GW-1b
Rev. 7/05



Non RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2717

1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Boulevard

Charlotte

NC

28273

City or Town

State

Zip Code

(704) - 523-4726

Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) M-91R

STATE WELL PERMIT #(if applicable)

DWQ or OTHER PERMIT #(if applicable) 70000752

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

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 1/2/07

TIME COMPLETED 5:00

AM ☐ PM ☒

3. WELL LOCATION:

CITY: Huntersville

COUNTY Mecklenburg

McGuire Nuclear Station

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☒ Ridge ☐ Other

(check appropriate box)

LATITUDE 35 25' 54.30" N

LONGITUDE 80 57' 09.20" W

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

Latitude/longitude source: ☒ GPS ☐ Topographic map

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

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

FACILITY ID #(if applicable)

NAME OF FACILITY McGuire Nuclear Station

STREET ADDRESS 12700 Hagers Ferry Road

Huntersville

NC

28078

City or Town

State

Zip Code

CONTACT PERSON Michael Phillips

MAILING ADDRESS Mail Code MG01EM, 12700 Hagers Ferry Rd

Huntersville

NC

28078

City or Town

State

Zip Code

(704) - 875-4675

Area code - Phone number

5. WELL DETAILS:

a. TOTAL DEPTH: 63.00 ft

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

c. WATER LEVEL Below Top of Casing: 44.47 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.87 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):

From To From To

From To From To

From To From To

6. CASING:

Depth	Diameter	Thickness/	Material
From To	2 inches	Weight Sch 40	PVC
From 2.87ALS To 53.00 BLS			
From To			
From To			

7. GROUT:

Depth	Material	Method
From To		
From 0 To 22.40	Portland	Tremie
From To		
From To		

8. SCREEN:

Depth	Diameter	Slot Size	Material
From To			
From 53.00 To 63.00	2 in.	0.010 in.	PVC
From To			
From To			

9. SAND/GRAVEL PACK:

Depth	Size	Material
From To		
From To		
From To		

10. DRILLING LOG

From	To	Formation Description
0	0.3	grass rootmat
0.3	8.0	micaceous sandy clayey silt
8.0	13.0	alluvium-micaceous silty clay
13.0	18.0	micaceous clayey silt
18.0	28.0	mottled micaceous silt
28.0	52.5	micaceous fine sandy silt
	52.5	refusal to roller cone bit
52.5	69.8	medium grained quartz diorite with fractures

11. REMARKS:

- bentonite placed below well from 64.0 to 69.8 ft BLS; sand placed at 63.0 to 64.0 ft BLS
- K-packer placed at 52.5 to 52.7 ft BLS; bentonite seal placed at 22.4 to 52.5 ft BLS; no sand/gravel pack below K-packer

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

Signature of Jay A. Little
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE 2-4-08

Jay A. Little
PRINTED NAME OF PERSON CONSTRUCTING THE WELL