DENR USE ONLY: ☐ Paper Report ☐ Electronic Data - Email CD (data loaded: Yes / No) Doc/Event #:

NC DENR
Division of Waste Management - Solid Waste

Environmental Monitoring Reporting Form

Notice: This form and any information attached to it are "Public Records" as defined in NC General Statute 132-1. As such, these documents are available for inspection and examination by any person upon request (NC General Statute 132-6).

Instructions:

- **Prepare one form for each individually monitored unit.**
- **Please type or print legibly.**
- Attach a notification table with values that attain or exceed NC 2L groundwater standards or NC 2B surface water standards. The notification must include a preliminary analysis of the cause and significance of each value. (e.g. naturally occurring, off-site source, pre-existing condition, etc.).
- Attach a notification table of any groundwater or surface water values that equal or exceed the reporting limits.
- Attach a notification table of any methane gas values that attain or exceed explosive gas levels. This includes any structures on or nearby the facility (NCAC 13B .1629 (4)(a)(i).
- Send the original signed and sealed form, any tables, and Electronic Data Deliverable to: Compliance Unit, NCDENR-DWM, Solid Waste Section, 1646 Mail Service Center, Raleigh, NC 27699-1646.

Solid Waste Monitoring Data Submittal Information

Name of entity submitting data (laboratory, consultant, facility owner):

S&ME, Inc. (Consultant)

Contact for questions about data formatting. Include data preparer's name, telephone number and E-mail address:

Name: William M. Miller, PE Phone: 828-687-9080 Ext 315

E-mail: wmiller@smeinc.com

Facility name:	Facility Address:	Facility Permit #	NC Landfill Rule: (.0500 or .1600)	Actual sampling dates (e.g., October 20-24, 2006)
McGuire Nuclear Station Landfill #2	13339 Hagers Ferry Road Huntersville, NC 28078	60-04	.0500	June 2, 2009

Environmental Status: (Check all that apply)

☐ Initial/Background Monitoring ☒ Detection Monitoring ☐ Assessment Monitoring ☐ Corrective Action

Type of data submitted: (Check all that apply)

☒ Groundwater monitoring data from monitoring wells
☐ Groundwater monitoring data from private water supply wells
☒ Leachate monitoring data
☒ Surface water monitoring data
☐ Methane gas monitoring data
☐ Corrective action data (specify) _____
☐ Other(specify) _____

Notification attached?

☐ No. No groundwater or surface water standards were exceeded.
☒ Yes, a notification of values exceeding a groundwater or surface water standard is attached. It includes a list of groundwater and surface water monitoring points, dates, analytical values, NC 2L groundwater standard, NC 2B surface water standard or NC Solid Waste GWPS and preliminary analysis of the cause and significance of any concentration.
☐ Yes, a notification of values exceeding an explosive methane gas limit is attached. It includes the methane monitoring points, dates, sample values and explosive methane gas limits.

Certification

To the best of my knowledge, the information reported and statements made on this data submittal and attachments are true and correct. Furthermore, I have attached complete notification of any sampling values meeting or exceeding groundwater standards or explosive gas levels, and a preliminary analysis of the cause and significance of concentrations exceeding groundwater standards. I am aware that there are significant penalties for making any false statement, representation, or certification including the possibility of a fine and imprisonment.

William M. Miller, PE — Facility Representative Name (Print)

Senior Project Enginer — Title

828-687-9080 Ext 315 — (Area Code) Telephone Number

William M. Miller — Signature

July 31, 2009 — Date

Affix NC Licensed/ Professional Geologist Seal

NORTH CAROLINA PROFESSIONAL SEAL 17661 ENGINEER WILLIAM M. MILLER

44 Buck Shoals Rd Suite C-3, Arden NC 28704

Facility Representative Address

F-0176

NC PE Firm License Number (if applicable effective May 1, 2009)

Revised 6/2009

DUKE ENERGY MCGUIRE NUCLEAR STATION
LANDFILL #2 PERMIT #60-04
HUNTERSVILLE, NC
GROUNDWATER MONITORING REPORT
JUNE 2009 SAMPLING EVENT
S&ME Project No. 1411-09-047

Prepared For:

Prepared By:

S&ME, Inc.
44 Buck Shoals Road Suite C-3
Arden, North Carolina 28704

July 31, 2009

July 31, 2009

Ms. Jackie Drummond
North Carolina Department of Environment and Natural Resources
Division of Waste Management
Solid Waste Section
1646 Mail Service Center
Raleigh, North Carolina 27699-1646

Reference: **Semi-Annual Groundwater Monitoring Report**
Duke Energy Carolinas – McGuire Nuclear Station
Landfill #2 (Permit # 60-04)
Huntersville, North Carolina
S&ME Project 1411-09-047

Dear Ms. Drummond:

This report presents the semi-annual groundwater monitoring for the McGuire Nuclear Station Landfill #2 (Permit #60-04). The landfill is located at Duke Energy's McGuire Nuclear Station near Huntersville, North Carolina, in Mecklenburg County. Groundwater sampling for the landfill was performed on June 2, 2009. S&ME is submitting this report on the behalf of Duke Energy.

The Groundwater Monitoring Report for the sampling event includes a summary of the analytical results, a figure showing groundwater contours at the site, and preliminary evaluation of values in excess of the NCAC 2L groundwater standards. Also attached is the Environmental Monitoring Reporting Form. An EXCEL file containing the laboratory results in the Electronic Data Deliverable format will be sent to you by e-mail.

If you have questions or require additional information, please contact me at 828-687-9080.

Sincerely,

S&ME, Inc.

NORTH CAROLINA PROFESSIONAL SEAL 17661 ENGINEER WILLIAM M. MILLER

William M. Miller, P.E.
Senior Project Engineer

David Loftis, P.E.
Project Engineer

Senior review by John Whitehead

North Carolina Professional Engineering Firm License No. F-0176

cc: Mr. Andy Tinsley, Duke Energy
Mr. Joe Hack, Mecklenburg County Solid Waste Department
Mr. Dale Dusenberry, NCDENR Radiation Protection Section

TABLE OF CONTENTS

Page

1.0 BACKGROUND 1
2.0 SCOPE OF WORK 2
3.0 RESULTS 2
3.1 Site Groundwater Flow 2
3.2 Analytical Results 3

TABLES

Table 1: Field and Analytical Results
Table 2: Field Data Parameters
Table 3: Radiological Analytical Results

FIGURES

Figure 1: Site Map
Figure 2: Groundwater Surface Contours June 2009

Chain of Custody Form

1.0 BACKGROUND

The McGuire Nuclear Station Landfill #2 Permit #60-04 is located at the Duke Energy (Duke) McGuire Nuclear Station, in Mecklenburg County, North Carolina. The landfill is permitted to accept specified waste from McGuire Nuclear Station and non-hazardous waste from petroleum spills. The landfill was constructed with a synthetic liner and with a leachate collection and removal system. Leachate and stormwater are collected in a lined leachate collection basin and pumped to the McGuire Nuclear Station wastewater treatment system.

The landfill and nearby area is portrayed on Figure 1. The landfill is located south of NC Highway 73, north of Cashion Road, and to the west of Linderman Road. Cashion Road runs along a surface water divide, with surface water draining to the northwest and to the southeast. There is a surface water drainage feature to the northeast of the landfill draining to the northwest, toward a perennial, unnamed stream. Surface water sample location SW-1 is located in this stream, north of the landfill. The stream drains to the west to the Catawba River. Surface water sample location SW-2 is located in this stream, west of the landfill. A second surface water drainage feature is located the southwest of the landfill, draining to the northwest into the unnamed stream described above.

The monitoring system at the landfill consists of eleven (11) groundwater monitoring wells and two (2) surface water sample locations, as listed below.

Monitoring Wells:	MW-5
	MW-5A
	MW-6
	MW-6A
	MW-7
	MW-7A
	MW-8
	MW-8A
	MW-9
	MW-9A
	MW-10A
Surface Water Sample Locations	SW-1, SW-2

The locations of the wells and the surface water sample locations are shown on Figure 1.

With the exception of well MW-10A, the wells are installed as well pairs with one shallow well and one deeper well adjacent to each other. The well with the "A" designation is the deepest of the pair of wells. Well pair MW-9 and MW-9A are installed adjacent to and downgradient from the Leachate Collection Basin. The remaining wells are installed adjacent to the landfill.

2.0 SCOPE OF WORK

To complete the scope of work, S&ME completed the following tasks:

- Received information provided by Duke on field sampling and measurement of groundwater elevations (performed by Duke) for monitoring wells MW-5, MW-5A, MW-6, MW-6A, MW-7, MW-7A, MW-8, MW-8A, MW-9, MW-9A, MW-10A. The samples were collected on June 2, 2009.
- Received information provided by Duke Energy of field sampling performed at surface water sample locations SW-1, SW-2, and a leachate sample collected at the outfall of the pipe conveying leachate from the landfill to the Leachate Collection Basin. The samples were collected on June 2, 2009.
- Reviewed the laboratory analytical results for the samples described above. These laboratory analyses were performed by a North Carolina certified laboratory, using State approved methods. These results were provided in both in paper format and in an EXCEL file. The EXCEL file was manipulated to conform to the format requirements of the NCDENR Electronic Data Deliverable template.
- Developed a groundwater flow contour map using map data and groundwater elevation data supplied by Duke.
- Provided a review to determine if analytical results exceed NC 2L groundwater standards.
- Provided a review to determine if analytical results meet or exceed the Solid Waste Section Limits (SWSLs)
- Prepared and submitted this Groundwater Monitoring Report to NCDENR and to Duke.

3.0 RESULTS

3.1 Site Groundwater Flow

Groundwater flow contours for the site are shown on Figure 2. These contours were developed using the groundwater elevations measured on June 2, 2009.

Cashion Road is located along a surface water divide at elevations ranging from approximately 748 feet to 740 feet. The unnamed stream where surface water sample locations SW-1 and SW-2 are located ranges in elevation from approximately 691 feet at or near SW-1 to approximate 650 near SW-2.

Groundwater flow beneath the landfill is generally from the south end of the landfill toward the surface water drainage features described above. Groundwater flow on the east side of the landfill is toward the surface water drainage feature located to the northeast of MW-6, MW-6A, and MW-10A.

3.2 Analytical Results

Water samples were collected from the following locations:

Monitoring Wells:	MW-5A MW-6, MW-6A MW-7, MW-7A MW-8, MW-8A MW-9, MW-9A MW-10A
Surface Water Sample Locations	SW-1, SW-2
Leachate	Outlet end of pipe conveying leachate from the landfill into the Leachate Collection Basin

A sample could not be collected at well MW-5 due to insufficient volume of water.

Samples were analyzed for the compounds listed in the sampling and analysis plan.[1] The analytical methods to be used for these compounds are also specified in the referenced sampling and analysis plan. The results of the laboratory analyses are summarized in Table 1.[2] A summary of the field data is found in Table 2.

Results from the groundwater samples collected from the monitoring wells were below the corresponding NCAC 2L groundwater quality standards with the exceptions noted below:

- pH – pH values below 6.5 were measured in groundwater samples from wells MW-5A, MW-6, MW-6A,MW-7, MW-9, MW-9A, and MW-10A. The measured pH values below 6.5 ranged from 5.3 (Standard Units) in MW-10A to 6.3 in MW-5A and MW-9A.

  The pH values measured in these wells are consistent with historic data at the site.

Analytical results for volatile organic compounds were below the laboratory reporting limits.

TPH-DRO (Diesel Range Organics) compounds were detected in groundwater samples from wells MW-5A and MW-7 at concentrations of 210 ug/L and 69 ug/L respectively. No NCAC 2L groundwater quality standards are established for TPH-DRO compounds.

No analytical results were measured at concentrations that meet or exceed the SWSLs.

[1] *McGuire Nuclear Station Landfill #2 Permit Number 60-04 Groundwater Monitoring Program Sampling and Analysis Plan, February 24, 2009.*
[2] Analytical results were provided by Duke Energy. Reference Pace Lab Report 9245667, dated June 18, 2009.

Table 3 presents the results of analysis for radiological constituents. These results were provided by Duke Energy. A copy of this report is submitted to the NCDENR Radiation Protection Section