MECKLENBURG COUNTY

Land Use and Environmental Services Agency
Solid Waste Services
November 6, 2013

Jaclynne Drummond
North Carolina Department of Environment
and Natural Resources
Division of Waste Management
Groundwater Compliance Unit
Mail Service Center 1646
Raleigh, NC 27699-1646

Subject: Holbrooks Road Landfill Permit 60-02
Semi-annual Monitoring Results

Dear Ms. Drummond:

Mecklenburg County conducted semi-annual water quality monitoring at the closed Holbrooks Road Landfill in October 2013 in accordance with the approved sample and analysis plan dated March 27, 2003. This report details the results of that monitoring event. Laboratory analytical data, field-measured data table of values exceeding 2L standards and landfill gas monitoring data is contained on the electronic data deliverable submittal.

Samples were collected from fifteen (15) monitoring wells (HRW-7, HRW-8, HRW-9, HRW-10, HRW-11R, HRW-12, HRW-13, HRW-14, HRW-15, HRW-16, HRW-17, HRW-18, HRW-19, HRW-20 and HRW-21) and three (3) surface-water sampling locations (HRSW-2, HRSW-3 and HRSW-4). Samples were analyzed for metals and volatile organic compounds ("VOCs") listed in Appendix I of 40 CFR Part 258.54 "Detection monitoring program". Field measurements of temperature, pH, and specific conductivity were made at each sampling location using a calibrated instrument. Additionally, measurements of dissolved oxygen were made at each surface-water sampling location.

The electronic data deliverable package containing the monitoring data is labeled to reflect the units used for reporting. Surface water standards listed are the water quality standards established for freshwater classification for aquatic life as outlined in 15A NCAC 2B "Classification and Water Quality Standards Applicable to Surface Waters of North Carolina". Groundwater standards listed are the standards outlined in 15A NCAC 2L "Classification of Water Quality Standards applicable to the Groundwaters of North Carolina". If the sample is reported in parts per billion, then the standard is also reported in parts per billion.

Surface-water samples:
No VOCs were detected in any of the samples collected from the three surface-water sampling locations (HRSW-2, HRSW-4 and HRSW-3). Copper was detected all three sampling locations and vanadium was detected in one sampling location as shown in the following table.

Sample Location	Metal Constituent	Concentration	2b Standard
HRSW-2 upstream	Copper	2.4	7
HRSW-4 mid-stream	Copper	2.4	7
HRSW-3 downstream	Copper	4.0	7
HRSW-3 downstream	Vanadium	5.7	NS

All field-measured parameters were within the established regulatory limits. The following table summarizes field-measured parameters for surface water samples.

Sample Location	Temp. °C	pH S.U.	Specific Conductivity ms/cm	Dissolved Oxygen mg/l
HRSW-2 upstream	14.9	7.5	0. 221	7.90
HRSW-4 mid-stream	14.6	7.5	0. 216	8.40
HRSW-3 downstream	14.8	7.2	0. 227	7.72

Groundwater samples:
Barium, nickel, vanadium, cobalt, copper, cadmium and chromium were detected in various wells above the 2l standard. The standards for vanadium and cobalt were recently added and wells that have had no violations of the 2l standard in the past now currently have detections above the 2l standard. The following table summarizes metals detection for groundwater samples.

Well ID	As ug/l	Ba ug/l	Cd ug/l	Cr ug/l	Co ug/l	Cu ug/l	Pb ug/l	Ni ug/l	Se ug/l	Vn ug/l	Zn ug/l
HRW-7	-----	240	**36**	-----	**9.0**	13	-----	-----	-----	**12**	70
HRW-8	-----	110	-----	-----	**20**	12	-----	-----	-----	**17**	12
HRW-9	-----	290	-----	-----	-----	2.9	-----	-----	-----	-----	-----
HRW-10	-----	210	-----	-----	-----	4.5	-----	13	10	-----	-----
HRW-11R	------	280	-----	7.0	**14**	11	-----	19	9.7	8.7	13
HRW-12	-----	**770**	**2.4**	-----	**43**	650	-----	**160**	14	**5.5**	-----
HRW-13	-----	-----	-----	-----	-----	7.8	-----	-----	-----	**7.8**	14
HRW-14	-----	-----	-----	-----	------	29	-----	-----	-----	**32**	21
HRW-15	-----	-----	-----	-----	-----	8.1	-----	-----	-----	**7.7**	-----
HRW-16	-----	130	-----	-----	-----	3.8	-----	-----	-----	-----	-----
HRW-17	-----	-----	-----	-----	-----	7.1	-----	-----	-----	**5.9**	-----

Well ID	As ug/l	Ba ug/l	Cd ug/l	Cr ug/l	Co ug/l	Cu ug/l	Pb ug/l	Ni ug/l	Se ug/l	Vn ug/l	Zn ug/l
HRW-18	-----	280	-----	-----	-----	-----	-----	5.2	-----	-----	-----
HRW-19	-----	-----	-----	-----	-----	3.7	-----	-----	-----	**7.8**	14
HRW-20	-----	-----	-----	-----	-----	-----	-----	-----	-----	**5.7**	-----
HRW-21	-----	-----	-----	-----	-----	2.4	-----	-----	-----	**5.9**	-----
2L Std.	10	700	2	10	1	1,000	15	100	20	0.3	1,000

Note: Results shown in bold exceed the 2L standard.

VOCs were detected in five monitoring wells; HRW-7, HRW-9, HRW-11R, HRW-12, and HRW-18. The following table summarizes VOC detections.

Well ID	Volatile Constituent	Concentration (ug/l)	2L Standard (ug/l)
HRW-7	Cis-1,2-Dichloroethene	7	70
	Trichloroethene	**5**	**3**
HRW-9	**Cis-1,2 Dichloroethene**	**89**	**70**
	Tetrachloroethene	**3**	**0.7**
	Trichloroethene	**6**	**3**
	Vinyl Chloride	**10**	**0.03**
	1,2-Dichlorobenzene	10	20
	1,4-Dichlorobenzene	**11**	**6**
	1,1-Dichloroethane	**43**	**6**
HRW-11R	Chlorobenzene	7	50
HRW-12	1,1-Dichloroethane	5	6
	1,4-Dichlorobenzene	3	6
	Chlorobenzene	8	50
HRW-18	**Benzene**	**27**	**1**
	Chloroethane	16	3,000
	1,1 Dichloroethane	**35**	**6**
	1,4 Dichlorobenzene	5	6
	Vinyl Chloride	**19**	**0.03**
	1,2-Dichloropropane	**3**	**0.6**

Note: Results shown in bold exceed the 2L standard.

Measurements of pH were more acidic than the 2L standard range of 6.5 to 8.5 standard units at locations HRW-7, HRW-8, HRW-9, HRW-11R, HRW-13, HRW-16, HRW-17 and HRW-20. Field- measured parameters for groundwater samples are summarized in the following table.

Sample Location	Temp. °C	PH	Specific Conductivity ms/cm
HRW-7	18.5	**6.1**	0.545
HRW-8	15.9	**5.8**	0.141
HRW-9	14.8	**6.3**	0.806
HRW-10	17.9	6.6	0.952
HRW-11R	16.8	**6.1**	1.559
HRW-12	15.5	6.6	2.246
HRW-13	16.9	**5.8**	0.373
HRW-14	14.9	6.6	0.218
HRW-15	14.8	6.9	0.188
HRW-16	16.3	**5.8**	0.162
HRW-17	15.0	**6.0**	0.181
HRW-18	16.9	6.7	1.271
HRW-19	15.7	6.9	0.310
HRW-20	15.5	**6.2**	0.201
HRW-21	16.3	6.6	0.571

Note: Results shown in bold are outside of the 2L standard range of 6.5 - 8.5 S.U.

Please contact me at amber.grzymski@mecklenburgcountync.gov or (704) 432-2478 if you have any questions regarding this report.

Sincerely,

Amber R. Grzymski, P.G.
Project Manager
Solid Waste Services

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):

Mecklenburg County Solid Waste Services

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

Name: Amber R. Grzymski, P.G. Phone: 704-432-2478

E-mail: Amber.Grzymski@mecklenburgcountync.gov

Facility name:	Facility Address:	Facility Permit #	NC Landfill Rule: (.0500 or .1600)	Actual sampling dates (e.g., October 20-24, 2006)
Holbrooks Road Landfill	15401 Holbrooks Road	60-02	.0500	October 8-9, 2013

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.

Amber R. Grzymski, P.G. — Facility Representative Name (Print)

Project Manager — Title

704-432-2478 — (Area Code) Telephone Number

Signature

11-6-2013 — Date

Affix NC Licensed/ Professional Geologist Seal

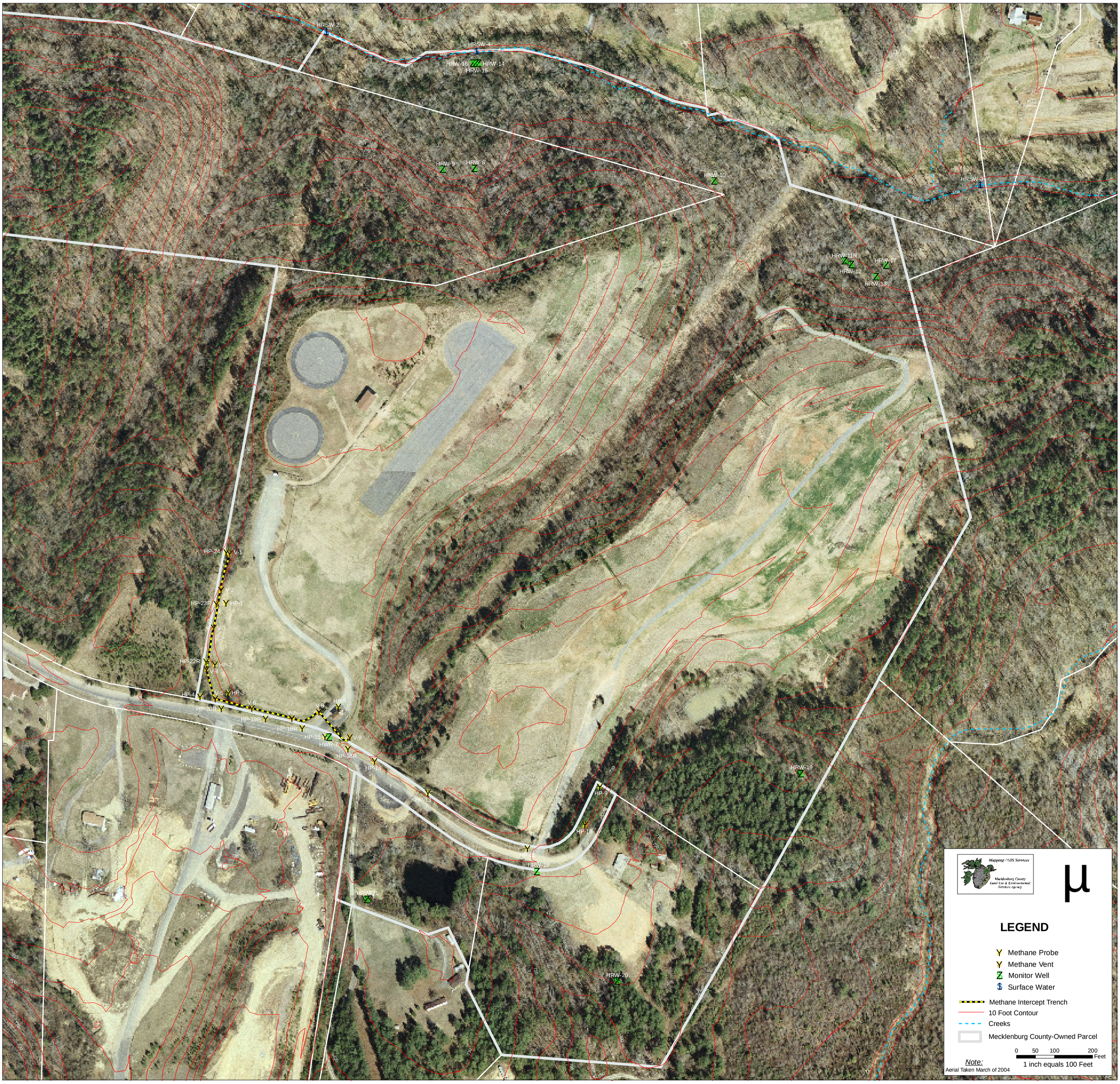
NORTH CAROLINA LICENSED SEAL 1877 GEOLOGIST AMBER RANGE GRZYMSKI

700 N Tryon Street, Charlotte, NC 28202

Facility Representative Address

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

Revised 6/2009


HRSW-2
HRSW-4
HRW-16
HRW-14
HRW-15
HRW-9
HRW-8
HRW-10
HRSW-3
HRW-11R
HRW-12
HRW-17
HRW-13
HP-24
V-1
V-2
HP-23R
HP-1
V-3
HP-22R
HP-2
V-4
HP-4
V-5
HP-3
V-6
HP-20R
V-7
V-8
HP-5
HP-19R
HP-18R
HP-15
HWR-7
V-9
HP-16R
HP-14
HP-13
HP-9
HP-10
HRW-19
HRW-18
HRW-21
HRW-20
Mapping / GIS Services
Mecklenburg County
Land Use & Environmental
Services Agency
LEGEND
Methane Probe
Methane Vent
Monitor Well
Surface Water
Methane Intercept Trench
10 Foot Contour
Creeks
Mecklenburg County-Owned Parcel
0 50 100 200 Feet
1 inch equals 100 Feet
Note:
Aerial Taken March of 2004