

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)).
- In accordance with NC General Statutes Chapter 89C and 89E and NC Solid Waste Management Rules 15A NCAC 13B, be sure to affix a seal to the bottom of this page, when applicable.
- 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):

Richardson Smith Gardner and Associates, Inc.

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

Name: Joan A. Smyth, P.G.

Phone: 919-828-0577 x122

E-mail: joan@rsgengineers.com

Facility name:	Facility Address:	Facility Permit #	NC Landfill Rule: (.0500 or .1600)	Actual sampling dates (e.g., October 20-24, 2006)
Avery County Closed MSW Landfill	Brushy Creek Road Spruce Pine, NC	06-01	.0500	September 29, 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 Methane gas monitoring data
 Groundwater monitoring data from private water supply wells Corrective action data (specify) _____
 Leachate monitoring data Other(specify) _____
 Surface water monitoring data

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.

Joan A. Smyth, P.G.

Senior Hydrogeologist

919-828-0577 x122

Facility Representative Name (Print)

Title

(Area Code) Telephone Number

Signature

11/19/09

Date

Affix NC Licensed Professional Geologist/Engineer Seal here:



Closed Avery County MSW Landfill

Ground Water Monitoring Report

September 2009 Semi-annual Monitoring Event

**Avery County Landfill
Newland, North Carolina
NC Solid Waste Permit # 06-01**

Prepared for:
Avery County Solid Waste
175 Linville St.
Newland, North Carolina 28657

November 2009



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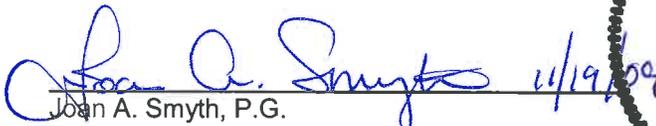
Fall 2009 Ground Water Monitoring Report

**Avery County Closed MSW Landfill
Newland, North Carolina
NC Solid Waste Permit # 06-01**

Prepared for:

**Avery County Solid Waste
175 Linville st.
Newland, North Carolina 28657**

RSG Project No. **Avery 09-2**


Joan A. Smyth, P.G.
Senior Hydrogeologist



November 2009



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**Avery County – MSW Landfill
Semi-annual Ground Water Monitoring Report
September 2009 Sampling Event**

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1.0 Introduction

Avery County is required to submit semi-annual ground water monitoring reports for the closed MSW landfill (permit # 06-01). This report, prepared by Richardson Smith Gardner and Associates, Inc (RSG), presents the results of the second semi-annual monitoring event for 2009. This event was performed to comply with the semi-annual monitoring schedule required by NC Solid Waste Regulations.

The ground water monitoring network for the MSW landfill includes three (3) ground water monitoring wells (MW-1, MW-2 & MW-3) and two surface water locations (SW-1 & SW-2). This report includes summaries of the field procedures and laboratory analyses for the MSW site. Also included are summary tables of the results and laboratory analytical reports.

2.0 Site Geology

The principal geologic units mapped in the immediate vicinity of the site include a mix of metamorphosed sedimentary and igneous rocks – termed *paragneiss* and *orthogneiss*, respectively – interlayered with contemporaneous schist, phyllite, and marble, later injected with various granitic intrusions, including plutons, pegmatites, and hydrothermal veins. Regional metamorphic grades in the region include kyanite-grade (high grade) and retrograde chlorite-biotite metamorphism (low grade). Major lithologic units near the site, from youngest to oldest, are:

Dqd - quartz diorite to granodiorite intrusive; contains biotite, muscovite and xenocrysts (included fragments of older rock units); Devonian age (390 MY); associated pegmatite veins are the target of the well-documented Spruce Pine mining district, which produced feldspars, mica, and quartz for various industries, along with emeralds and other gem stones;

Zabg - Gneiss of Alligator Back Formation; finely laminated to thin layered, contains massive gneiss and micaceous conglomerate; includes schist and phyllite; late Proterozoic age (750 MY);

Zaba - Amphibolite of Alligator Back Formation; equigranular, massive to well foliated, chiefly metamorphosed mafic rock; late Proterozoic age (750 MY); often occurring as large circular or elliptical areas marking plutonic stocks,¹ associated with pre-Appalachian rifting that formed an earlier ocean called Iapetus.²

Ybgg - biotite granitic gneiss; pinkish gray to light gray massive to well foliated; late to mid Proterozoic age (950-1250 my); associated with the Grenville *orogeny*. RSG has not performed any geologic investigation activities at this site, nor have we been able to locate any previous geologic studies for the site; therefore we can not provide more

¹ <http://www.1911encyclopedia.org/Amphibolite>

² Stewart and Roberson, Exploring the Geology of the Carolinas, University of North Carolina Press, 2007

detail regarding site geology.

3.0 Sampling Procedures

The sampling event was performed by trained personnel from RSG on September 29th 2009, and consisted of collecting samples from three (3) ground water wells, shown in **Figure 1**. Surface water samples were collected from two locations (SW-1 and SW-2) adjacent to the landfill. Field data sheets for the monitoring wells are included in **Appendix A** and a table of well information is available in **Appendix B**. No boring logs for these monitoring wells could be located during a file search at NCDENR.

Sampling methods followed the protocol outlined in the North Carolina Water Quality Monitoring Guidance Document for Solid Waste Facilities (NCDENR, DWM). The depth to water in each well was gauged prior to purging and sampling. Field measurements of pH, specific conductivity, and temperature were obtained from each well. Water table elevations and field parameter results are included in **Tables 1 and 2**, respectively.

All samples were collected by RSG personnel in laboratory prepared containers for the specified analytical procedures. Samples were collected using new factory sealed teflon bailers. Ground water samples were properly preserved, placed on ice, and transported to the laboratory facility (Environment 1, Inc.), within the specified holding times for each analysis.

4.0 Field and Laboratory Results

4.1 Laboratory Analysis

All samples were transported to the laboratory facility under proper chain of custody analyzed at the specified DWM Solid Waste Quantitation Limits³ for Appendix I constituents. The laboratory report is attached for your review as **Appendix C**.

4.2 Field and Laboratory Results

Ground water and field measurements are included in **Tables 1 & 2**. Detected constituents are presented in **Table 3**.

Four (4) inorganic constituents (barium, cobalt, copper and zinc) were detected in two (2) wells (SW-1, SW-2) above the SWSL, but below 2L or ground water protection (GWP) standards. No constituents were detected in any of the surface water samples.

Table 3 summarizes the list of constituents detected. Several inorganic and organic constituents were detected at concentrations below the SWSLs. These are listed as “J” values on **Table 3**.

³ New Guidelines for Electronic Submittal of Environmental Monitoring Data Memo, NCDENR – Solid Waste Section, October 27, 2006

5.0 Ground Water Characterization

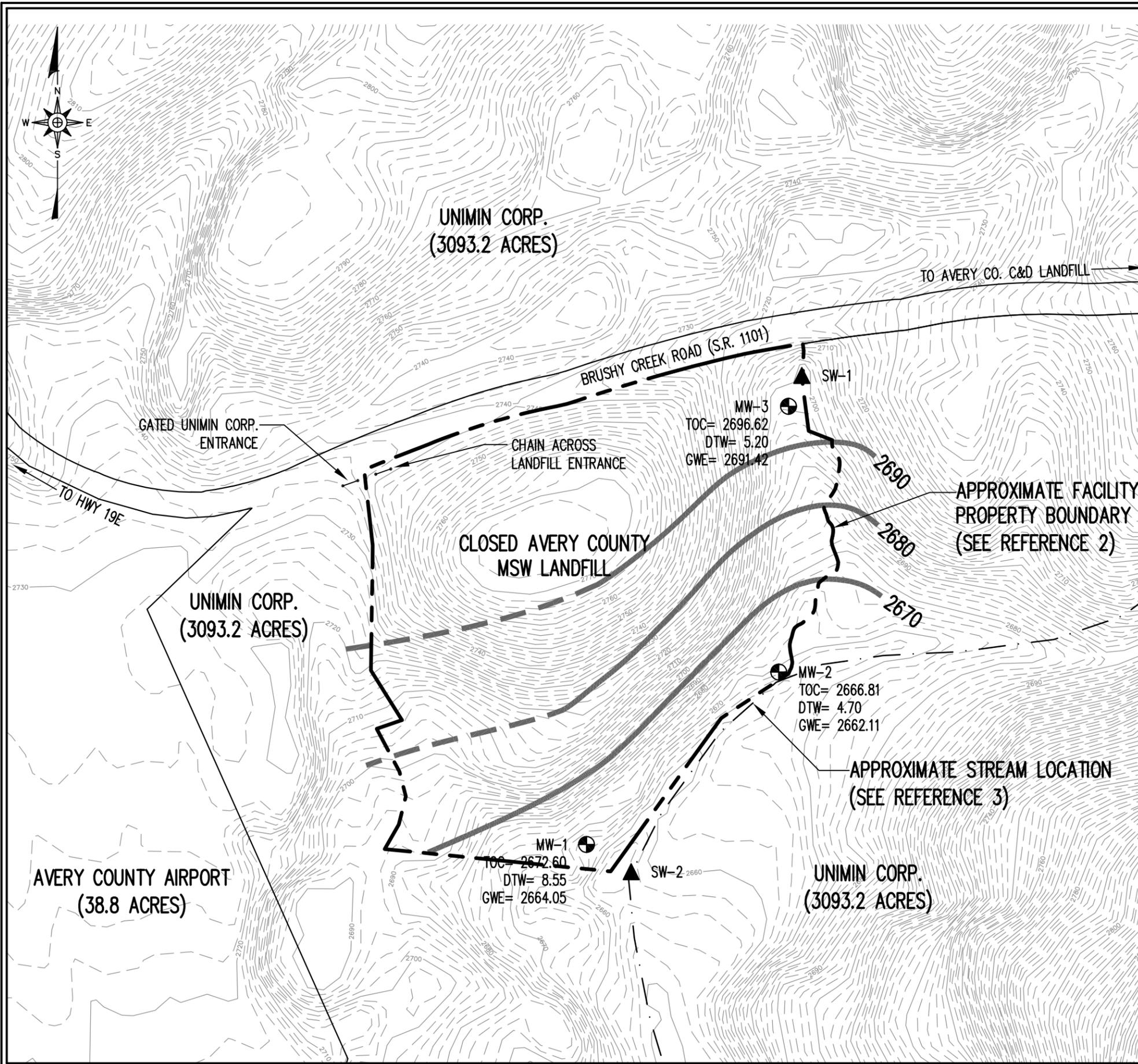
A potentiometric surface map was prepared from ground water elevation data collected during this sampling event. The data indicates that ground water is flowing generally to the south and southeast across most of the site. Hydraulic conductivity data was not available for these wells so ground water velocities could not be calculated. The potentiometric surface map (**Figure 1**) is also attached for your review.

6.0 Conclusions

The results of this monitoring event indicate detectable levels of four (4) inorganic constituents. None of these constituents were detected at concentrations above their respective 2L/GWP. The next ground water monitoring event is scheduled for March 2010. A report will be submitted to NCDENR upon receipt of laboratory analyses.

Figures

G:\CAD\Avery County\Avery 07-2\sheets\AVERY-B0115.dwg - 11/4/2009 2:16 PM



LEGEND

-  EXISTING 10' CONTOUR (SEE REFERENCE 1)
-  EXISTING 2' CONTOUR
-  PROPERTY LINE (SEE REFERENCE 2)
-  ADJACENT PROPERTY LINE
-  STREAM LOCATION (SEE REFERENCE 2)
-  POTENTIOMETRIC SURFACE (DASHED WHERE INFERRED)
-  EXISTING MONITORING WELL (SEE REFERENCE 3)
-  EXISTING SURFACE WATER MONITORING POINT (APPROXIMATE LOCATION)
- TOC= TOP OF CASING ELEVATION
- DTW= DEPTH TO WATER
- GWE= GROUND WATER ELEVATION

NOTES

1. DEPTH TO WATER MEASUREMENTS OBTAINED BY RSG PERSONNEL ON SEPTEMBER 29, 2009.

REFERENCES

1. OVERALL SITE TOPOGRAPHY FROM NORTH CAROLINA DEPARTMENT OF TRANSPORTATION, DATA GENERATED FROM LIDAR DATED MARCH 2005.
2. SITE PROPERTY LINE, ADJACENT PROPERTIES, AND STREAM LOCATIONS FROM AVERY COUNTY GIS MAPPING DEPARTMENT.
3. MONITORING WELL LOCATIONS FROM FIELD SURVEY DATED 1/14/08, BY SURVEYING SOLUTIONS, P.C.



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DRAWN BY:	C.T.J.	CHECKED BY:	J.A.S.
SCALE:	AS SHOWN	FIGURE NO.:	1
PROJECT NO.:	AVERY 09-2	FILE NAME:	AVERY-B0115
DATE:	Nov. 2009		

TITLE:
 AVERY COUNTY
 SOLID WASTE DEPARTMENT
 AVERY COUNTY MSW LANDFILL
 POTENTIOMETRIC MAP FALL '09

Tables



By: KBS

Date: 11/5/2009

Table 1
Avery County MSW Landfill
Ground Water Elevation Data
9/29/2009

Well	Well location Northing	Well location Easting	TOC Elevation (feet)	Depth to Water (feet)	GW Elev (feet)
MW-1	812705.6749	1114262.085	2672.6	8.55	2664.05
MW-2	813030.7307	1114625.494	2666.81	4.70	2662.11
MW-3	813531.8988	1114643.917	2696.62	5.20	2691.42

Water level measurements by RSG personnel.

Table 2
Avery County MSW Landfill
Field Parameters
9/29/2009

Well Identification #	Temperature (°Celsius)	Turbidity (NTU)	Specific Conductivity (uS/cm)	pH
MW-1	13	nm	238	6.7
MW-2	12	nm	90	6.6
MW-3	14	nm	180	6.7
SW-1	14.5	nm	90	7.5
SW-2	12	nm	40	7.3

- Note:**
1. pH measured with a 'Hanna" pH/EC/TDS Meter, type HI9811
 2. Water Levels measured with a Slope Indicator Water Level Meter
 3. Turbidity not measured due to meter malfunction.
 4. Temperature measured with a laboratory grade thermometer.
 5. Data Collected by Don Misenheimer & Britt Ransom of RSG Engineers Inc.
 6. nm = Not Measured

Table 3
Avery County MSW Landfill
Detected Inorganic and Organic Constituents
9/29/2009

Constituents	SWSL	2L or GWP Standards	MW-1	MW-2	MW-3	SW-1	SW-2
Antimony	6	1.4	ND	0.1 J	ND	0.5 J	0.1 J
Arsenic	10	50	0.4 J	0.4 J	1.4 J	0.2 J	ND
Barium	100	2000	133	28.5 J	40.9 J	21.8 J	15.6 J
Beryllium	1	4	ND	0.1 J	0.1 J	0.1 J	ND
Cadmium	1	5	0.3 J	0.3 J	0.1 J	0.2 J	ND
Cobalt	10	70	18	1.7 J	2.9 J	0.8 J	0.7 J
Copper	10	1000	1.6 J	31	1.1 J	1.1 J	1.1 J
Lead	10	15	0.4 J	4.1 J	0.4 J	2.2 J	0.9 J
Nickel	50	100	2.1 J	0.9 J	1.1 J	0.7 J	0.8 J
Selenium	10	50	0.4 J	ND	ND	ND	ND
Total Chromium	10	50	ND	1.1 J	0.2 J	0.4 J	0.3 J
Thallium	5	0.28	0.1 J	0.1 J	ND	0.1 J	ND
Vanadium	25	3.5	0.4 J	1.5 J	0.5 J	1.2 J	0.8 J
Zinc	10	2100	25	4.1 J	8.8 J	13.1	4.1 J
Silver	10	17.5	ND	ND	ND	0.1 J	ND
Acetone	100	700	ND	1.9 J	60.60 J	2.7 J	ND
1,4-Dichlorobenzene	1	75	0.5 J	ND	0.8 J	ND	ND
1,1-Dichloroethane	5	70	0.2 J	ND	ND	ND	0.2 J
Benzene	1	1	0.3 J	ND	0.2 J	ND	ND
Chloroethane	10	2800	0.3 J	ND	ND	ND	0.7 J
Cis-1,2-Dichloroethene	5	70	0.5 J	ND	0.5 J	ND	ND
Vinyl Chloride	1	0.015	ND	ND	0.6 J	ND	ND

SWSL - Solid Waste Quantitation Limit
 ND - Not detected at or above SWSL
 Shading - Levels above 2L standard or no 2L standard
 Bold Letters - Constituent detected above SWSL
 J - Detected constituents below SWSL limit

All SWSLs, 2L Standards and Results are in ug/l.

Data from Environment 1 laboratory report dated 10/27/2009, ID# 6056.

Appendix A

Field Data Sheets

Groundwater Monitoring Well Inspection Checklist

This checklist is provided to inform our clients about the health and maintenance of their groundwater monitoring wells. This checklist provides no information pertaining to groundwater quality, but focuses on the physical characteristics of the well and its vicinity.

Site: AVERY MSW Date: 9/28/09
 Well ID: MW-1 Initials: AD

Please mark the appropriate box for the following areas of concern. If you answer NO, please explain in the comment box.

		YES	NO
1. Well Vicinity			
A.	Well is assessable and surrounding area is safe for employees.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
B.	Vicinity is free of potential contaminants.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
C.	Dead trees, etc. not in danger of falling and damaging wells.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
D.	Well is in the same location as on field maps.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
E.			
Comments/ items addressed or to be addressed: <p style="text-align: center;"><i>o.k.</i></p>			

		YES	NO
2. Concrete Apron and Steel Case			
A.	Concrete apron is present and in good condition.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
B.	Steel case is present and upright.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
C.	Steel case is not movable and cemented in.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
D.	Steel case lid opens and closes correctly with no gaps. Lock can be easily applied.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
E.	Well tag is present with pertinent information.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
F.	Well numbers are prominently displayed (Reflective address numbers, etc.).	<input checked="" type="checkbox"/>	<input type="checkbox"/>
G.	No evidence of tampering is present.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
H.	Lock operates properly.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
I.			
Comments/ items addressed or to be addressed: <p style="text-align: center;"><i>no well tag</i></p>			

		YES	NO
3. PVC Riser			
A.	Monitoring cap is present and provides a tight seal.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
B.	Riser is of appropriate height (has not been cut off too low within the steel case).	<input checked="" type="checkbox"/>	<input type="checkbox"/>
C.	Riser is not loose/ easily moved.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
D.	Riser does not appear cracked, broken, or brittle.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
E.	No visual sign of external contamination entering well through riser.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
F.			
Comments/ items addressed or to be addressed: <p style="text-align: center;"><i>o.k.</i></p>			

Groundwater Monitoring Well Inspection Checklist

This checklist is provided to inform our clients about the health and maintenance of their groundwater monitoring wells. This checklist provides no information pertaining to groundwater quality, but focuses on the physical characteristics of the well and its vicinity.

Site: AVERY MSW Date: 9/28/09
 Well ID: MW-2 Initials: AD

Please mark the appropriate box for the following areas of concern. If you answer NO, please explain in the comment box.

	YES	NO
1. Well Vicinity		
A. Well is assessable and surrounding area is safe for employees.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
B. Vicinity is free of potential contaminants.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
C. Dead trees, etc. not in danger of falling and damaging wells.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
D. Well is in the same location as on field maps.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
E.	<input type="checkbox"/>	<input type="checkbox"/>
Comments/ items addressed or to be addressed: <i>o.k.</i>		

	YES	NO
2. Concrete Apron and Steel Case		
A. Concrete apron is present and in good condition.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
B. Steel case is present and upright.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
C. Steel case is not movable and cemented in.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
D. Steel case lid opens and closes correctly with no gaps. Lock can be easily applied.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
E. Well tag is present with pertinent information.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
F. Well numbers are prominently displayed (Reflective address numbers, etc.).	<input checked="" type="checkbox"/>	<input type="checkbox"/>
G. No evidence of tampering is present.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
H. Lock operates properly.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
I.	<input type="checkbox"/>	<input type="checkbox"/>
Comments/ items addressed or to be addressed: <i>if concrete apron is present, it appears to be buried no well tag present</i>		

	YES	NO
3. PVC Riser		
A. Monitoring cap is present and provides a tight seal.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
B. Riser is of appropriate height (has not been cut off too low within the steel case).	<input checked="" type="checkbox"/>	<input type="checkbox"/>
C. Riser is not loose/ easily moved.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
D. Riser does not appear cracked, broken, or brittle.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
E. No visual sign of external contamination entering well through riser.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
F.	<input type="checkbox"/>	<input type="checkbox"/>
Comments/ items addressed or to be addressed: <i>ok</i>		

Groundwater Monitoring Well Inspection Checklist

This checklist is provided to inform our clients about the health and maintenance of their groundwater monitoring wells. This checklist provides no information pertaining to groundwater quality, but focuses on the physical characteristics of the well and its vicinity.

Site: AVERY MSW Date: 9/28/09
 Well ID: MW-3 Initials: MD

Please mark the appropriate box for the following areas of concern. If you answer NO, please explain in the comment box.

		YES	NO
1. Well Vicinity			
A. Well is assessable and surrounding area is safe for employees.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Vicinity is free of potential contaminants.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. Dead trees, etc. not in danger of falling and damaging wells.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. Well is in the same location as on field maps.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments/ items addressed or to be addressed: <p style="text-align: center; font-size: 1.2em;">ok</p>			

		YES	NO
2. Concrete Apron and Steel Case			
A. Concrete apron is present and in good condition.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Steel case is present and upright.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. Steel case is not movable and cemented in.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. Steel case lid opens and closes correctly with no gaps. Lock can be easily applied.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E. Well tag is present with pertinent information.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
F. Well numbers are prominently displayed (Reflective address numbers, etc.).	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
G. No evidence of tampering is present.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
H. Lock operates properly.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments/ items addressed or to be addressed: <p style="text-align: center; font-size: 1.2em;">no well tag</p>			

		YES	NO
3. PVC Riser			
A. Monitoring cap is present and provides a tight seal.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Riser is of appropriate height (has not been cut off too low within the steel case).	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. Riser is not loose/ easily moved.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. Riser does not appear cracked, broken, or brittle.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E. No visual sign of external contamination entering well through riser.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
F.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments/ items addressed or to be addressed: <p style="text-align: center; font-size: 1.2em;">o.k.</p>			

Appendix B

Monitoring Well Information

Appendix B
Avery County MSW Landfill
Monitoring Well Information

Well	Well location Northing	Well location Easting	TOC Elevation (feet)	Depth to Water (feet)	Depth to Bottom (feet)	Assumed Screen Interval
MW-1	812705.6749	1114262.085	2672.6	8.35	23.37	10' - 20'
MW-2	813030.7307	1114625.494	2666.81	4.61	14.37	4' - 14'
MW-3	813531.8988	1114643.917	2696.62	5.14	15.37	4' - 14'

Depth to Water and Depth to Bottom measured from the Top of Casing.

No boring logs or well records for these wells are available, therefore, the screened interval is assumed based upon field measurements.

Appendix C

Laboratory Analytical Report

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

ID#: 6056

AVERY COUNTY LANDFILL (OLD)
MS. JOAN SMYTH
RICHARDSON SMITH GARDNER
14 N. BOYLAN AVENUE
RALEIGH , NC 27603

DATE COLLECTED: 09/29/09
DATE REPORTED : 10/27/09

REVIEWED BY: 

PARAMETERS	MDL	MW-1 SWSL	MW-2	MW-3	SW-1	SW-2	Analysis		Method
							Date	Analyst	
Antimony, ug/l	0.06	6.0	--- U	0.1 J	--- U	0.5 J	0.1 J	10/08/09 Lfj	EPA200.8
Arsenic, ug/l	0.17	10.0	0.4 J	0.4 J	1.4 J	0.2 J	--- U	10/08/09 Lfj	EPA200.8
Barium, ug/l	0.04	100.0	133	28.5 J	40.9 J	21.8 J	15.6 J	10/08/09 Lfj	EPA200.8
Beryllium, ug/l	0.06	1.0	--- U	0.1 J	0.1 J	0.1 J	--- U	10/08/09 Lfj	EPA200.8
Cadmium, ug/l	0.04	1.0	0.3 J	0.3 J	0.1 J	0.2 J	--- U	10/08/09 Lfj	EPA200.8
Cobalt, ug/l	0.02	10.0	18	1.7 J	2.9 J	0.8 J	0.7 J	10/08/09 Lfj	EPA200.8
Copper, ug/l	0.04	10.0	1.6 J	31	1.1 J	1.1 J	1.1 J	10/08/09 Lfj	EPA200.8
Total Chromium, ug/l	0.10	10.0	--- U	1.1 J	0.2 J	0.4 J	0.3 J	10/08/09 Lfj	EPA200.8
Lead, ug/l	0.04	10.0	0.4 J	4.1 J	0.4 J	2.2 J	0.9 J	10/08/09 Lfj	EPA200.8
Nickel, ug/l	0.04	50.0	2.1 J	0.9 J	1.1 J	0.7 J	0.8 J	10/08/09 Lfj	EPA200.8
Selenium, ug/l	0.12	10.0	0.4 J	--- U	--- U	--- U	--- U	10/08/09 Lfj	EPA200.8
Silver, ug/l	0.04	10.0	--- U	--- U	--- U	0.1 J	--- U	10/08/09 Lfj	EPA200.8
Thallium, ug/l	0.03	5.0	0.1 J	0.1 J	--- U	0.1 J	--- U	10/08/09 Lfj	EPA200.8
Vanadium, ug/l	0.28	25.0	0.4 J	1.5 J	0.5 J	1.2 J	0.8 J	10/08/09 Lfj	EPA200.8
Zinc, ug/l	0.14	10.0	25	4.1 J	8.8 J	13.1	4.1 J	10/08/09 Lfj	EPA200.8

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Incorporated

Drinking Water ID: 37715

Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

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CLIENT: AVERY COUNTY LANDFILL (OLD)
MS. JOAN SMYTH
RICHARDSON SMITH GARDNER
14 N. BOYLAN AVENUE
RALEIGH, NC 27603

CLIENT ID: 6056
ANALYST: MAO
DATE COLLECTED: 09/29/09
DATE ANALYZED: 10/12/09
DATE REPORTED: 10/27/09

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REVIEWED BY: 

VOLATILE ORGANICS EPA METHOD 8260B

PARAMETERS, ug/l	MDL	SWSL	MW-1	MW-2	MW-3	SW-1	SW-2	
1. Chloromethane	0.18	1.0	---	U	---	U	---	U
2. Vinyl Chloride	0.34	1.0	---	U	---	U	---	U
3. Bromomethane	0.26	10.0	---	U	---	U	---	U
4. Chloroethane	0.29	10.0	0.30	J	---	U	---	U
5. Trichlorofluoromethane	0.13	1.0	---	U	---	U	---	U
6. 1,1-Dichloroethene	0.14	5.0	---	U	---	U	---	U
7. Acetone	1.21	100.0	---	U	1.90	J	60.60	J
8. Iodomethane	0.12	10.0	---	U	---	U	---	U
9. Carbon Disulfide	0.14	100.0	---	U	---	U	---	U
10. Methylene Chloride	0.14	1.0	---	U	---	U	---	U
11. trans-1,2-Dichloroethene	0.13	5.0	---	U	---	U	---	U
12. 1,1-Dichloroethane	0.16	5.0	0.20	J	---	U	---	U
13. Vinyl Acetate	0.20	50.0	---	U	---	U	---	U
14. Cis-1,2-Dichloroethene	0.14	5.0	0.50	J	---	U	---	U
15. 2-Butanone	0.85	100.0	---	U	---	U	---	U
16. Bromochloromethane	0.11	3.0	---	U	---	U	---	U
17. Chloroform	0.13	5.0	---	U	---	U	---	U
18. 1,1,1-Trichloroethane	0.11	1.0	---	U	---	U	---	U
19. Carbon Tetrachloride	0.13	1.0	---	U	---	U	---	U
20. Benzene	0.16	1.0	0.30	J	---	U	---	U
21. 1,2-Dichloroethane	0.12	1.0	---	U	---	U	---	U
22. Trichloroethene	0.13	1.0	---	U	---	U	---	U
23. 1,2-Dichloropropane	0.17	1.0	---	U	---	U	---	U
24. Bromodichloromethane	0.13	1.0	---	U	---	U	---	U
25. Cis-1,3-Dichloropropene	0.17	1.0	---	U	---	U	---	U
26. 4-Methyl-2-Pentanone	0.68	100.0	---	U	---	U	---	U
27. Toluene	0.13	1.0	---	U	---	U	---	U
28. trans-1,3-Dichloropropene	0.14	1.0	---	U	---	U	---	U
29. 1,1,2-Trichloroethane	0.20	1.0	---	U	---	U	---	U
30. Tetrachloroethene	0.16	1.0	---	U	---	U	---	U
31. 2-Hexanone	1.00	50.0	---	U	---	U	---	U
32. Dibromochloromethane	0.14	3.0	---	U	---	U	---	U
33. 1,2-Dibromoethane	0.13	1.0	---	U	---	U	---	U
34. Chlorobenzene	0.13	3.0	---	U	---	U	---	U
35. 1,1,1,2-Tetrachloroethane	0.14	5.0	---	U	---	U	---	U
36. Ethylbenzene	0.16	1.0	---	U	---	U	---	U
37. Xylenes	0.48	5.0	---	U	---	U	---	U
38. Dibromomethane	0.17	10.0	---	U	---	U	---	U
39. Styrene	0.16	1.0	---	U	---	U	---	U
40. Bromoform	0.11	3.0	---	U	---	U	---	U
41. 1,1,2,2-Tetrachloroethane	0.16	3.0	---	U	---	U	---	U
42. 1,2,3-Trichloropropane	0.06	1.0	---	U	---	U	---	U
43. 1,4-Dichlorobenzene	0.21	1.0	0.50	J	---	U	---	U
44. 1,2-Dichlorobenzene	0.13	5.0	---	U	---	U	---	U
45. 1,2-Dibromo-3-Chloropropane	0.26	13.0	---	U	---	U	---	U
46. Acrylonitrile	1.49	200.0	---	U	---	U	---	U
47. trans-1,4-Dichloro-2-Butene	0.14	100.0	---	U	---	U	---	U

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P.O. BOX 7085, 114 OAKMONT DRIVE
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RALEIGH, NC 27603
CLIENT ID: 6056

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DATE COLLECTED: 09/29/09
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 REVIEWED BY: 
VOLATILE ORGANICS
EPA METHOD 8260B

PARAMETERS, ug/l	MDL	SWSL	Trip Blank
1. Chloromethane	0.18	1.0	--- U
2. Vinyl Chloride	0.34	1.0	--- U
3. Bromomethane	0.26	10.0	--- U
4. Chloroethane	0.29	10.0	--- U
5. Trichlorofluoromethane	0.13	1.0	--- U
6. 1,1-Dichloroethene	0.14	5.0	--- U
7. Acetone	1.21	100.0	--- U
8. Iodomethane	0.12	10.0	--- U
9. Carbon Disulfide	0.14	100.0	--- U
10. Methylene Chloride	0.14	1.0	--- U
11. trans-1,2-Dichloroethene	0.13	5.0	--- U
12. 1,1-Dichloroethane	0.16	5.0	--- U
13. Vinyl Acetate	0.20	50.0	--- U
14. Cis-1,2-Dichloroethene	0.14	5.0	--- U
15. 2-Butanone	0.85	100.0	--- U
16. Bromochloromethane	0.11	3.0	--- U
17. Chloroform	0.13	5.0	--- U
18. 1,1,1-Trichloroethane	0.11	1.0	--- U
19. Carbon Tetrachloride	0.13	1.0	--- U
20. Benzene	0.16	1.0	--- U
21. 1,2-Dichloroethane	0.12	1.0	--- U
22. Trichloroethene	0.13	1.0	--- U
23. 1,2-Dichloropropane	0.17	1.0	--- U
24. Bromodichloromethane	0.13	1.0	--- U
25. Cis-1,3-Dichloropropene	0.17	1.0	--- U
26. 4-Methyl-2-Pentanone	0.68	100.0	--- U
27. Toluene	0.13	1.0	--- U
28. trans-1,3-Dichloropropene	0.14	1.0	--- U
29. 1,1,2-Trichloroethane	0.20	1.0	--- U
30. Tetrachloroethene	0.16	1.0	--- U
31. 2-Hexanone	1.00	50.0	--- U
32. Dibromochloromethane	0.14	3.0	--- U
33. 1,2-Dibromoethane	0.13	1.0	--- U
34. Chlorobenzene	0.13	3.0	--- U
35. 1,1,1,2-Tetrachloroethane	0.14	5.0	--- U
36. Ethylbenzene	0.16	1.0	--- U
37. Xylenes	0.48	5.0	--- U
38. Dibromomethane	0.17	10.0	--- U
39. Styrene	0.16	1.0	--- U
40. Bromoform	0.11	3.0	--- U
41. 1,1,2,2-Tetrachloroethane	0.16	3.0	--- U
42. 1,2,3-Trichloropropane	0.06	1.0	--- U
43. 1,4-Dichlorobenzene	0.21	1.0	--- U
44. 1,2-Dichlorobenzene	0.13	5.0	--- U
45. 1,2-Dibromo-3-Chloropropane	0.26	13.0	--- U
46. Acrylonitrile	1.49	200.0	--- U
47. trans-1,4-Dichloro-2-Butene	0.14	100.0	--- U

