

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):

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

Name: Joan Smyth, P.G. Phone: 919-828-0577 x 122  
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 C&D Landfill	Avery County Landfill 2175 Brushy Creek Road Spruce Pine, NC 28777	06-03	.0500	October 2, 2008

**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 Smyth, P.G. Senior Hydrogeologist 919-828-0577 x122  
 Facility Representative Name (Print) Title (Area Code) Telephone Number

Joan A. Smyth Signature 11/10/08 Date

Affix NC Licensed/ Professional Geologist/Engineer Seal here:



# Fall 2008 Ground Water Monitoring Report

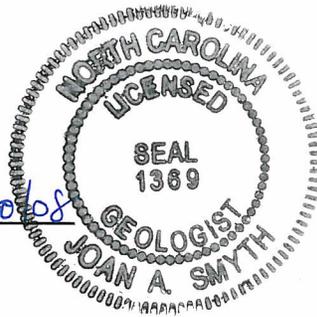
**Avery County C&D Landfill  
Newland, North Carolina  
NC Solid Waste Permit # 06-01**

Prepared for:

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

RSG Project No. **Avery 07-2**

  
Joan A. Smyth, P.G.  
Senior Hydrogeologist



**November 2008**



**RICHARDSON SMITH GARDNER & ASSOCIATES**  
Engineering and Geological Services  
14 N. Boylan Avenue  
Raleigh, North Carolina 27603

**Avery County C&D Landfill**  
**Ground Water Monitoring Report**

**October 2008 Semi-annual  
Monitoring Event**

**Avery County Landfill  
Newland, North Carolina  
NC Solid Waste Permit # 06-03**

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

**November 2008**



**Richardson Smith Gardner & Associates, Inc.**  
**Engineering and Geological Services**  
14 North Boylan Avenue  
Raleigh, North Carolina 27603

**Avery County C&D Landfill  
Semi-annual Ground Water Monitoring Report  
October 2008 Sampling Event**

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## 1.0 Introduction

The Avery County Landfill, currently operating under Solid Waste Permit # 06-03 (C&D) and 15A NCAC 13B.0544, is required to submit semi-annual ground water monitoring reports for C&D landfill. This report presents the results of the second semi-annual monitoring event for 2008. 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 C&D landfill includes four (4) ground water monitoring wells. This report includes summaries of the field procedures and laboratory analyses for the C&D site. Also included are summary tables of the results and laboratory analytical reports.

## 2.0 Sampling Procedures

The sampling event, performed by trained personnel from Richardson Smith Gardner & Associates (RSG) on October 2<sup>nd</sup> 2008, consisted of collecting samples from four (4) ground water wells (CDMW-1, CDMW-2, CDMW-3 and CDMW-4), shown in **Figure 1**. Monitoring well CDMW-4 was installed in November 2007 as an upgradient well. Previously no upgradient well for the site had been installed. This sampling was conducted in accordance with the approved site Water Quality Monitoring Plan<sup>1</sup>.

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.

## 3.0 Field and Laboratory Results

### 3.1 Laboratory Analysis

All samples were transported to the laboratory facility under proper chain of custody analyzed at the specified DWM Solid Waste Quantitation Limits (SWSLs)<sup>2</sup> for Appendix I and C&D landfill mandated constituents. The laboratory report is attached for your review as **Appendix A**.

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<sup>1</sup> Water Quality Monitoring Plan, GAI Associates, Inc., July 1996

<sup>2</sup> New Guidelines for Electronic Submittal of Environmental Monitoring Data Memo, NCDENR – Solid Waste Section, October 27, 2006

### 3.2 Field and Laboratory Results

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

Eleven (11) inorganic constituents (barium, beryllium, cobalt, copper, manganese, mercury, total chromium, lead, iron, vanadium and zinc) shown in **Table 3**, were detected above the SWSL in all four (4) monitoring wells. Of these, seven (7) constituents were detected at concentrations above their 2L standard:

- beryllium,
- cobalt,
- iron,
- lead,
- manganese,
- mercury, and
- vanadium.

**Table 3** summarizes the list of constituents detected. It should be noted that turbidity levels in the four monitoring wells were found to be elevated. These levels are indicative of suspended solids in the samples which can elevate inorganic results.

Constituents detected below the SWSL are denoted as “J” values and are also included in **Table 3**.

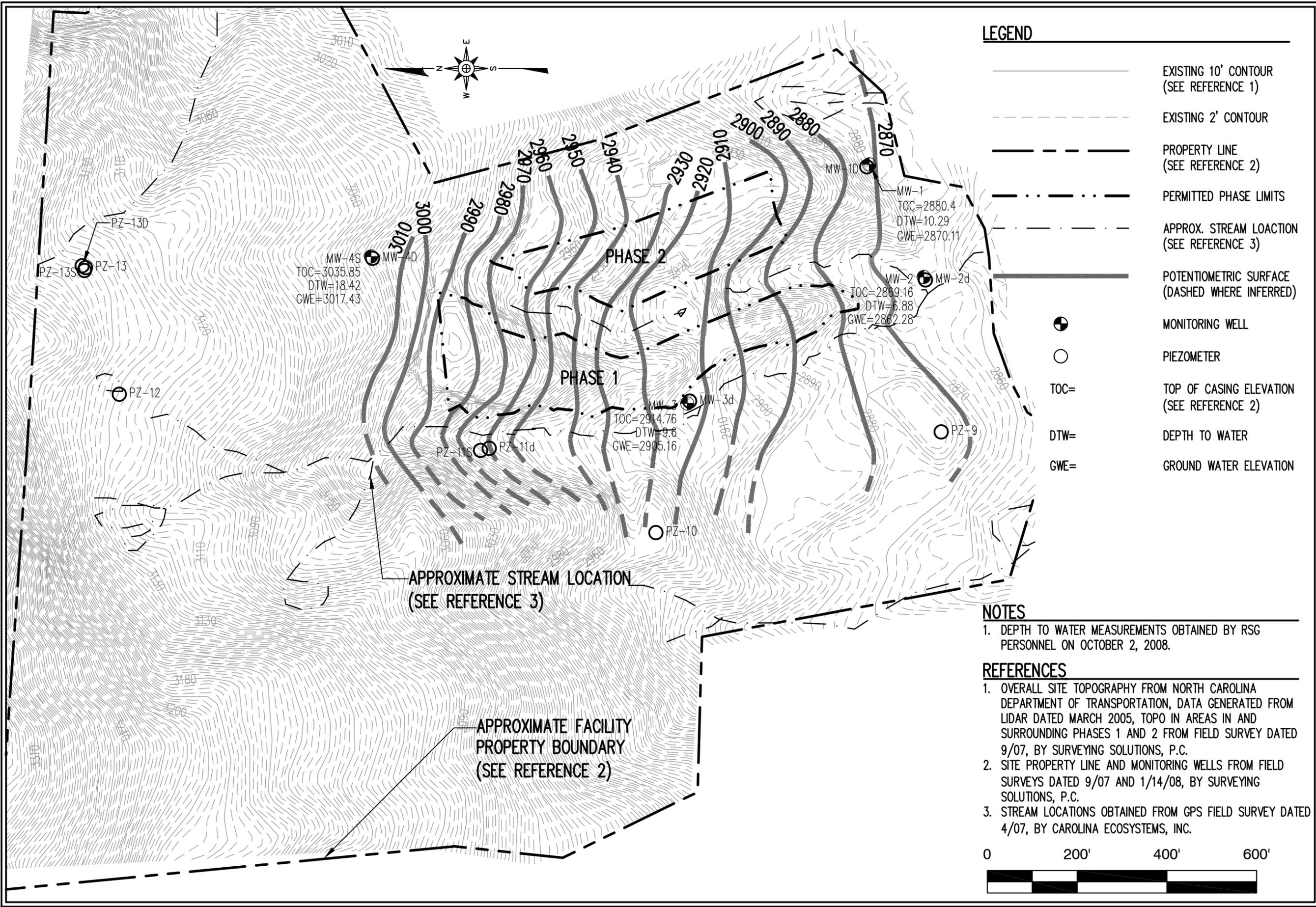
### 4.0 Ground Water Characterization

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 across most of the site. Hydraulic conductivity data is 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.

### 5.0 Conclusions

The results of this monitoring event indicate detectable levels of eleven (11) inorganic constituents. The inorganic constituents are likely due to suspended solids in the samples. This is evidenced by elevated turbidity readings in the samples. The next ground water monitoring event is scheduled for April 2009. A report will be submitted to NCDENR upon receipt of laboratory analyses.

Figures



**RICHARDSON SMITH GARDNER & ASSOCIATES**  
 www.rsgengineers.com  
 14 N. Boylan Ave. Raleigh, N.C. 27603  
 ph: 919-826-0577 fax: 919-826-3899

FIGURE NO.	1	FILE NAME	AVERY-B0062
SCALE:	AS SHOWN	PROJECT NO.	AVERY 07-2
CHECKED BY:		DATE:	Nov. 2008
DRAWN BY:	J.A.L.		

**TITLE:**  
 AVERY COUNTY  
 SOLID WASTE DEPARTMENT  
 AVERY COUNTY C&D LANDFILL  
 POTENTIOMETRIC MAP FALL '08

Tables

**Table 1**  
**Avery County C&D Landfill**  
**Ground Water Elevations**  
**10/2/2008**

<b>Well</b>	<b>Well Location Northing</b>	<b>Well Location Easting</b>	<b>TOC Elevation (feet)</b>	<b>Depth to Water (feet)</b>	<b>GW Elev (feet)</b>
CDMW-1	817312.18	1121257.85	2880.37	10.29	2870.08
CDMW-2	817190.86	1121007.60	2869.16	6.88	2862.28
CDMW-3	817717.60	1120726.57	2914.76	9.6	2905.16
CDMW-4	818421.66	1121053.03	3035.85	18.42	3017.43

Note: survey data from 9/07 and 1/14/08 by Surveying Solutions, P.C.

**Table 2**  
**Avery County C&D Landfill**  
**Field Parameters**  
**10/2/2008**

Well Identification #	Static Water Level (ft) (DTW)	Temperature (°Celsius)	Turbidity (NTU)	Specific Conductivity (uS/cm)	pH
CDMW-1	10.29	14	387	30	5.7
CDMW-2	6.88	13	105	110	6.0
CDMW-3	9.6	14	105	30	6.6
CDMW-4	18.42	13	532	10	6.8

- Note:**
1. pH measured th a 'Hanna" pH/EC/TDS Meter, type HI9811
  2. Water Levels measured with a Slope Indicator Water Level Meter
  3. Turbidity measured with a Hach 2100P turbidimeter and
  4. Temperature measured with a laboratory grade thermometer.
  5. Data Collected by field technician Clark Wipfield, RSG Engineers Inc.

**Table 3**  
**Avery County C&D Landfill**  
**Detected Inorganic and Organic Constituents**  
**10/2/2008**

Constituents	SWSL	2L	CDMW-1	CDMW-2	CDMW-3	CDMW-4
<b>Inorganic Constituents</b>						
Antimony	6	---	0.1 J	ND	ND	ND
Arsenic	10	50	0.7 J	0.2 J	0.4 J	0.6 J
Barium	100	2000	<b>400</b>	<b>114</b>	40.5 J	<b>186</b>
Beryllium	1	---	<b>1.5</b>	0.3 J	0.6 J	<b>3.2</b>
Cadmium	1	5	0.6 J	0.8 J	0.5 J	0.7 J
Cobalt	10	---	4.7 J	0.9 J	2.2 J	<b>36</b>
Copper	10	1000	<b>11</b>	2.3 J	4.6 J	<b>22</b>
Chromium, total	10	50	<b>13</b>	1.7 J	7.1 J	<b>47</b>
Iron	300	300	<b>40100</b>	<b>2260</b>	<b>7015</b>	<b>55725</b>
Lead	10	15	4.7 J	1.0 J	3.4 J	<b>23</b>
Manganese	50	---	<b>964</b>	<b>127</b>	<b>137</b>	<b>4340</b>
Mercury	0.2	1.1	0.08 J	0.04 J	<b>1.1</b>	ND
Nickel	50	100	8 J	2.2 J	4.0 J	18.8 J
Selenium	10	50	1.1 J	0.2 J	ND	0.4 J
Silver	10	17.5	0.1 J	0.1 J	0.1 J	0.1 J
Thallium	5	---	0.3 J	ND	0.1 J	0.5 J
Vanadium	25	---	24.8 J	2.4 J	10.3 J	<b>60</b>
Zinc	10	2100	<b>68</b>	<b>14</b>	<b>23</b>	<b>81</b>
<b>Organic Constituents</b>						
Chloroethane	10	2.8	ND	0.50 J	ND	ND
1,1-Dichloroethane	5	70	ND	0.60 J	ND	ND
Cis-1,2-Dichloroethene	5	70	ND	0.70 J	ND	ND
2-Butanone	100	---	ND	ND	ND	8.10 J
Trichloroethene	1	2.8	ND	0.50 J	ND	ND
Xylenes	5	530	ND	4.40 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.

Appendix A

Laboratory Analytical Report

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

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

ID#: 6057

AVERY COUNTY C&D LANDFILL  
MS. JOAN SMYTH  
RICHARDSON SMITH GARDNER  
14 N. BOYLAN AVENUE  
RALEIGH ,NC 27603

DATE COLLECTED: 10/02/08  
DATE REPORTED : 10/27/08

REVIEWED BY: 

PARAMETERS	MDL	SWSL	CDMW-1	CDMW-2	CDMW-3	CDMW-4	Analysis	Method
							Date	Analyst
Total Alkalinity, mg/l	1.0	1.0	9	27	21	9	10/03/08	TR5B SM2320B
Chloride, mg/l	5.0	5.0	5	6	---	18	10/09/08	MJN SM4500-CLB
Total Dissolved Residue, mg/l	1.0	1.0	60	99	50	45	10/06/08	TRB SM2540C
Sulfate, mg/l	5.0	250.0	---	24.1 J	6.5 J	---	10/07/08	TRB SM4500-SO4E
Antimony, ug/l	0.08	6.0	0.1 J	---	---	---	10/09/08	LFJ EPA200.8
Arsenic, ug/l	0.07	10.0	0.7 J	0.2 J	0.4 J	0.6 J	10/09/08	LFJ EPA200.8
Barium, ug/l	0.34	100.0	400	114	40.5 J	186	10/09/08	LFJ EPA200.8
Beryllium, ug/l	0.17	1.0	1.5	0.3 J	0.6 J	3.2	10/09/08	LFJ EPA200.8
Cadmium, ug/l	0.04	1.0	0.6 J	0.8 J	0.5 J	0.7 J	10/09/08	LFJ EPA200.8
Cobalt, ug/l	2.53	10.0	4.7 J	0.9 J	2.2 J	36	10/09/08	LFJ EPA200.8
Copper, ug/l	2.24	10.0	11	2.3 J	4.6 J	22	10/09/08	LFJ EPA200.8
Total Chromium, ug/l	1.38	10.0	13	1.7 J	7.1 J	47	10/09/08	LFJ EPA200.8
Iron, ug/l	14.0	300.0	40100	2260	7015	55725	10/15/08	ADD SM3111B
Manganese, ug/l	0.50	50.0	964	127	137	4340	10/08/08	LFJ EPA200.7
Lead, ug/l	0.04	10.0	4.7 J	1.0 J	3.4 J	23	10/09/08	LFJ EPA200.8
Mercury, ug/l	0.13	0.20	0.08 J	0.04 J		---	10/09/08	LFJ EPA200.8
Mercury, ug/l	0.13	0.20			1.1		10/17/08	ADD EPA245.1
Nickel, ug/l	1.35	50.0	8 J	2.2 J	4.0 J	18.8 J	10/09/08	LFJ EPA200.8
Selenium, ug/l	0.14	10.0	1.1 J	0.2 J	---	0.4 J	10/09/08	LFJ EPA200.8
Silver, ug/l	2.32	10.0	0.1 J	0.1 J	0.1 J	0.1 J	10/09/08	LFJ EPA200.8
Thallium, ug/l	0.04	5.0	0.3 J	---	0.1 J	0.5 J	10/09/08	LFJ EPA200.8
Vanadium, ug/l	1.21	25.0	24.8 J	2.4 J	10.3 J	60	10/09/08	LFJ EPA200.8
Zinc, ug/l	1.86	10.0	68	14	23	81	10/09/08	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

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

CLIENT: AVERY COUNTY C&D LANDFILL  
MS. JOAN SMYTH  
RICHARDSON SMITH GARDNER  
14 N. BOYLAN AVENUE  
RALEIGH, NC 27603

CLIENT ID: 6057  
ANALYST: MAO  
DATE COLLECTED: 10/02/08  
DATE ANALYZED: 10/15/08  
DATE REPORTED: 10/27/08

Page: 1

REVIEWED BY: 

## VOLATILE ORGANICS EPA METHOD 8260B

PARAMETERS, ug/l	MDL	SWSL	CDMW-1	CDMW-2	CDMW-3	CDMW-4
1. Chloromethane	0.18	1.0	--- U	--- U	--- U	--- U
2. Vinyl Chloride	0.34	1.0	--- U	--- U	--- U	--- U
3. Bromomethane	0.26	10.0	--- U	--- U	--- U	--- U
4. Chloroethane	0.29	10.0	--- U	0.50 J	--- U	--- U
5. Trichlorofluoromethane	0.13	1.0	--- U	--- U	--- U	--- U
6. 1,1-Dichloroethene	0.14	5.0	--- U	--- U	--- U	--- U
7. Acetone	1.21	100.0	--- U	--- U	--- U	--- U
8. Iodomethane	0.12	10.0	--- U	--- U	--- U	--- U
9. Carbon Disulfide	0.14	100.0	--- U	--- U	--- U	--- U
10. Methylene Chloride	0.14	1.0	--- U	--- U	--- U	--- U
11. trans-1,2-Dichloroethene	0.13	5.0	--- U	--- U	--- U	--- U
12. 1,1-Dichloroethane	0.16	5.0	--- U	0.60 J	--- U	--- U
13. Vinyl Acetate	0.20	50.0	--- U	--- U	--- U	--- U
14. Cis-1,2-Dichloroethene	0.14	5.0	--- U	0.70 J	--- U	--- U
15. 2-Butanone	0.85	100.0	--- U	--- U	--- U	8.10 J
16. Bromochloromethane	0.11	3.0	--- U	--- U	--- U	--- U
17. Chloroform	0.13	5.0	--- U	--- U	--- U	--- U
18. 1,1,1-Trichloroethane	0.11	1.0	--- U	--- U	--- U	--- U
19. Carbon Tetrachloride	0.13	1.0	--- U	--- U	--- U	--- U
20. Benzene	0.16	1.0	--- U	--- U	--- U	--- U
21. 1,2-Dichloroethane	0.12	1.0	--- U	--- U	--- U	--- U
22. Trichloroethene	0.13	1.0	--- U	0.50 J	--- U	--- U
23. 1,2-Dichloropropane	0.17	1.0	--- U	--- U	--- U	--- U
24. Bromodichloromethane	0.13	1.0	--- U	--- U	--- U	--- U
25. Cis-1,3-Dichloropropene	0.17	1.0	--- U	--- U	--- U	--- U
26. 4-Methyl-2-Pentanone	0.68	100.0	--- U	--- U	--- U	--- U
27. Toluene	0.13	1.0	--- U	--- U	--- U	--- U
28. trans-1,3-Dichloropropene	0.14	1.0	--- U	--- U	--- U	--- U
29. 1,1,2-Trichloroethane	0.20	1.0	--- U	--- U	--- U	--- U
30. Tetrachloroethene	0.16	1.0	--- U	--- U	--- U	--- U
31. 2-Hexanone	1.00	50.0	--- U	--- U	--- U	--- U
32. Dibromochloromethane	0.14	3.0	--- U	--- U	--- U	--- U
33. 1,2-Dibromoethane	0.13	1.0	--- U	--- U	--- U	--- U
34. Chlorobenzene	0.13	3.0	--- U	--- U	--- U	--- U
35. 1,1,1,2-Tetrachloroethane	0.14	5.0	--- U	--- U	--- U	--- U
36. Ethylbenzene	0.16	1.0	--- U	--- U	--- U	--- U
37. Xylenes	0.48	5.0	--- U	4.40 J	--- U	--- U
38. Dibromomethane	0.17	10.0	--- U	--- U	--- U	--- U
39. Styrene	0.16	1.0	--- U	--- U	--- U	--- U
40. Bromoform	0.11	3.0	--- U	--- U	--- U	--- U
41. 1,1,2,2-Tetrachloroethane	0.16	3.0	--- U	--- U	--- U	--- U
42. 1,2,3-Trichloropropane	0.06	1.0	--- U	--- U	--- U	--- U
43. 1,4-Dichlorobenzene	0.21	1.0	--- U	--- U	--- U	--- U
44. 1,2-Dichlorobenzene	0.13	5.0	--- U	--- U	--- U	--- U
45. 1,2-Dibromo-3-Chloropropane	0.26	13.0	--- U	--- U	--- U	--- U
46. Acrylonitrile	1.49	200.0	--- U	--- U	--- U	--- U
47. trans-1,4-Dichloro-2-Butene	0.14	100.0	--- U	--- U	--- U	--- U

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

