

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	11/27/2007

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 Smyth
Signature

1/11/08
Date

Affix NC Licensed Professional Geologist/Engineer Seal here:



Avery County C&D Landfill

Ground Water Monitoring Report

**November 2007 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

January 2008



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

Fall 2007 Ground Water Monitoring Report

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

Prepared for:

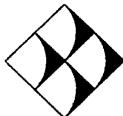
**Avery County Solid Waste
175 Linville st.
Newland, North Carolina 28657**

RSG Project No. **Avery 07-1**


Joan A. Smyth, P.G.
Senior Hydrogeologist



January 2008



RICHARDSON SMITH GARDNER & ASSOCIATES

Engineering and Geological Services

14 N. Boylan Avenue
Raleigh, North Carolina 27603

**Avery County C&D Landfill
Semi-annual Ground Water Monitoring Report
November 2007 Sampling Event**

1.0 INTRODUCTION1

2.0 SAMPLING PROCEDURES1

3.0 FIELD AND LABORATORY RESULTS1

3.1 Laboratory Analysis.....1

3.2 Field and Laboratory Results1

4.0 GROUND WATER CHARACTERIZATION.....2

5.0 CONCLUSIONS.....2

FIGURES

Figure 1 – Ground Water Potentiometric Map

TABLES

Table 1 – Ground Water Elevation Data

Table 2 – Field Parameter Results

Table 3 – Detected Constituents

APPENDICES

Appendix A – Laboratory Analytical Reports

1.0 Introduction

The Avery County Landfill, currently operating under Solid Waste Permit # 06-03 (C&D) 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 2007. 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 RSG on 11/27/2007, 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 Sampling and Analysis Plan.

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 Practical Quantitation Limits for Appendix I and C&D landfill mandated constituents. The laboratory report is attached for your review as **Appendix A**.

3.2 Field and Laboratory Results

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

presented in **Table 3**.

Nine (9) inorganic constituents (barium, beryllium, cobalt, copper, lead, manganese, total chromium, vanadium and zinc) shown in **Table 3**, were detected above the PQL in all four (4) monitoring wells. Of these, three (3) constituents: beryllium, cobalt and vanadium were found at concentrations above their 2L standard in CDMW-4. **Table 3** summarizes the list of constituents detected. Constituents detected below the PQL are denoted as “J” values and are also included in **Table 3**.

4.0 Ground Water Characterization

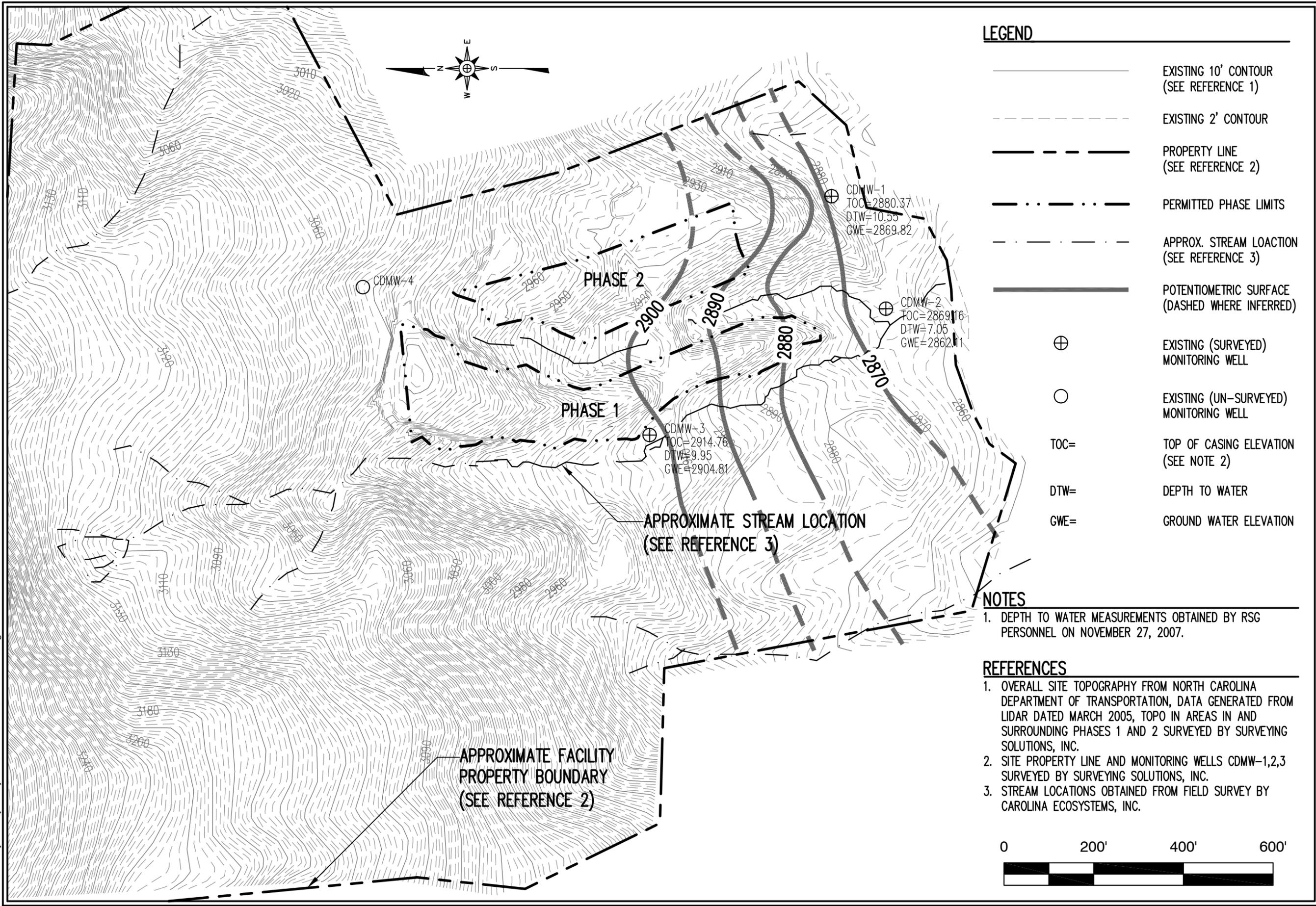
A potentiometric surface map was prepared from ground water elevation data collected during this sampling event. The data indicates that ground water is flowing generally to the south across most of the site. Hydraulic conductivity data was not available for these wells so ground water velocities could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

5.0 Conclusions

The results of this monitoring event indicate detectable levels of nine (9) inorganic constituents. The inorganic constituents are likely due to suspended solids in the samples. The next ground water monitoring event is scheduled for April 2008. A report will be submitted to NCDENR upon receipt of laboratory analyses.

Figures

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LEGEND

-  EXISTING 10' CONTOUR (SEE REFERENCE 1)
-  EXISTING 2' CONTOUR
-  PROPERTY LINE (SEE REFERENCE 2)
-  PERMITTED PHASE LIMITS
-  APPROX. STREAM LOCATION (SEE REFERENCE 3)
-  POTENTIOMETRIC SURFACE (DASHED WHERE INFERRED)
-  EXISTING (SURVEYED) MONITORING WELL
-  EXISTING (UN-SURVEYED) MONITORING WELL
- TOC= TOP OF CASING ELEVATION (SEE NOTE 2)
- DTW= DEPTH TO WATER
- GWE= GROUND WATER ELEVATION

NOTES

1. DEPTH TO WATER MEASUREMENTS OBTAINED BY RSG PERSONNEL ON NOVEMBER 27, 2007.

REFERENCES

1. OVERALL SITE TOPOGRAPHY FROM NORTH CAROLINA DEPARTMENT OF TRANSPORTATION, DATA GENERATED FROM LIDAR DATED MARCH 2005, TOPO IN AREAS IN AND SURROUNDING PHASES 1 AND 2 SURVEYED BY SURVEYING SOLUTIONS, INC.
2. SITE PROPERTY LINE AND MONITORING WELLS CDMW-1,2,3 SURVEYED BY SURVEYING SOLUTIONS, INC.
3. STREAM LOCATIONS OBTAINED FROM FIELD SURVEY BY CAROLINA ECOSYSTEMS, INC.



RICHARDSON SMITH GARDNER & ASSOCIATES
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14 N. Boylan Ave. Raleigh, N.C. 27603
ph: 919-828-0577 fax: 919-828-3899

FIGURE NO.	1	FILE NAME	AVERY-B0011
SCALE:	AS SHOWN	PROJECT NO.	AVERY 07-1
CHECKED BY:		DATE:	Jan. 2008
DRAWN BY:	J.A.L.		

TITLE:
AVERY COUNTY
SOLID WASTE DEPARTMENT
AVERY COUNTY C&D LANDFILL
POTENTIOMETRIC MAP FALL 2007

Tables

Table 1
Avery County C&D Landfill
Ground Water Elevations
11/27/2007

Well	TOC Elevation (feet)	Depth to Water (feet)	GW Elev (feet)
CDMW-1	2880.37	10.55	2869.82
CDMW-2	2869.16	7.05	2862.11
CDMW-3	2914.76	9.95	2904.81
CDMW-4	na	17.94	na

Note:

TOC - Top of casing elevation. These elevations were surveyed by others to an arbitrary datum of 100 feet at MW-3.

Depth to Water - Measured from TOC.

GW Elev. - Ground water elevation in reference to the arbitrary TOC datum shown above.

na- Not available

Table 2
Avery County C&D Landfill
Field Parameters
11/27/2007

Well Identification #	Static Water Level (ft) * (DTW)	Temperature (°Celsius)	Turbidity (NTU)	Specific Conductivity (uS/cm)	pH
CDMW-1	10.55	13	13	30	5.4
CDMW-2	7.05	12	6.23	100	5.6
CDMW-3	9.95	13	95.5	30	5.9
CDMW-4	17.94	13	17.7	20	6.4

Table 3
Avery County C&D Landfill
Detected Inorganic and Organic Constituents
11/27/2007

Constituents	PQL	2L	CDMW-1	CDMW-2	CDMW-3	CDMW-4
Antimony	6	---	0.1 J	ND	0.1 J	0.1 J
Arsenic	10	50	0.7 J	ND	1.2 J	1..4 J
Barium	100	2000	298	143	169	298
Beryllium	1	---	1	0.4 J	1	5
Cadmium	1	5	0.4 J	0.1 J	0.2 J	0.5 J
Cobalt	10	---	3 J	1.7 J	5.6 J	18
Copper	10	1000	8.7 J	3.2 J	8.6 J	17
Lead	10	15	3 J	1.1 J	8 J	31
Manganese	50	---	289	193	376	5745
Mercury	0.2	1.1	0.09 J	0.08 J	3.27 J	0.04 J
Nickel	50	100	5.5 J	3.1 J	7.5 J	16.6 J
Selenium	10	50	1 J	0.4 J	0.7 J	0.9 J
Total Chromium	10	50	8.2 J	2.9 J	17	27
Vanadium	25	---	18.5 J	4.9 J	23.4 J	63
Thallium	5	---	0.2 J	ND	0.1 J	0.5 J
Zinc	10	2100	37	16	50	109
1,1-Dichloroethane	5	700	ND	0.9 J	ND	ND
Chloroethane	10	2800	ND	0.5 J	ND	ND
Chloromethane	1	---	ND	0.2 J	ND	ND
Cis-1,2-Dichloroethene	5	70	ND	0.5 J	ND	ND
Trichlorofluoromethane	1	2100	ND	0.4 J	ND	ND
Xylenes	5	530	ND	4.9 J	ND	ND

ND - Not detected at or above PQL
Shading - Levels above 2L standard or no 2L standard
Bold Letters - Constituent detected above PQL
J - Detected constituents below PQL limit

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

Appendix A

Laboratory Analytical Report

Environment 1, Incorporated

REC'D JAN 1 2008

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

ID#: 6057

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

DATE COLLECTED: 11/27/07
DATE REPORTED : 12/31/07

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	8	26	23	45	11/29/07	TRB	SM2330B
Chloride, mg/l	5.0	5.0	11	10	7	13	11/30/07	MDM	SM4500-CLB
Total Dissolved Residue, mg/l	1.0	1.0	56	101	56	54	11/30/07	TRB	SM2540C
Sulfate, mg/l	5.0	250.0	--- U	16.5 J	--- U	7.3 J	12/04/07	TRB	SM4500-SO4E
Antimony, ug/l	0.05	6.0	0.1 J	--- U	0.1 J	0.1 J	12/05/07	CMF	EPA200.8
Arsenic, ug/l	0.47	10.0	0.7 J	--- U	1.2 J	1.4 J	12/05/07	CMF	EPA200.8
Barium, ug/l	0.34	100.0	298	143	169	298	12/05/07	CMF	EPA200.8
Beryllium, ug/l	0.17	1.0	1	0.4 J	1	5	12/05/07	CMF	EPA200.8
Cadmium, ug/l	0.06	1.0	0.4 J	0.1 J	0.2 J	0.5 J	12/05/07	CMF	EPA200.8
Cobalt, ug/l	2.53	10.0	3.0 J	1.7 J	5.6 J	18	12/05/07	CMF	EPA200.8
Copper, ug/l	2.24	10.0	8.7 J	3.2 J	8.6 J	17	12/05/07	CMF	EPA200.8
Total Chromium, ug/l	1.38	10.0	8.2 J	2.9 J	17	27	12/05/07	CMF	EPA200.8
Iron, ug/l	12.0	300.0	19450	5218	22200	104360	12/26/07	ADD	SM3111B
Manganese, ug/l	0.50	50.0	289	193	376	5745	12/12/07	LFJ	EPA200.7
Lead, ug/l	0.07	10.0	3.0 J	1.1 J	8.0 J	31	12/05/07	CMF	EPA200.8
Mercury, ug/l	0.13	0.20	0.09 J	0.08 J	3.27	0.04 J	12/05/07	CMF	EPA200.8
Nickel, ug/l	1.35	50.0	5.5 J	3.1 J	7.5 J	16.6 J	12/05/07	CMF	EPA200.8
Selenium, ug/l	0.35	10.0	1.0 J	0.4 J	0.7 J	0.9 J	12/05/07	CMF	EPA200.8
Silver, ug/l	2.32	10.0	--- U	--- U	--- U	--- U	12/05/07	CMF	EPA200.8
Thallium, ug/l	0.07	5.0	0.2 J	--- U	0.1 J	0.5 J	12/05/07	CMF	EPA200.8
Vanadium, ug/l	1.21	25.0	18.5 J	4.9 J	23.4 J	63	12/05/07	CMF	EPA200.8
Zinc, ug/l	1.86	10.0	37	16	50	109	12/05/07	CMF	EPA200.8

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

Laboratory Analyses — Environmental Consultants

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

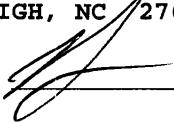
P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

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: 11/27/07
DATE REPORTED: 12/31/07

Page: 1

REVIEWED BY: 

VOLATILE ORGANICS EPA METHOD 8260B

PARAMETERS, ug/l	Date Analyzed:		12/04/07	12/04/07	12/03/07	12/03/07
	MDL	SWSL	CDMW-1	CDMW-2	CDMW-3	CDMW-4
1. Chloromethane	0.18	1.0	--- U	0.20 J	--- 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	0.40 J	--- 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	0.90 J	--- U	--- U
13. Vinyl Acetate	0.20	5.0	--- U	--- U	--- U	--- U
14. Cis-1,2-Dichloroethene	0.14	5.0	--- U	0.50 J	--- U	--- U
15. 2-Butanone	0.85	100.0	--- U	--- U	--- U	--- U
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	--- U	--- 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	4.90 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.

