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Paper Report

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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):

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 x 221

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)
Washington Co. Closed MSW Landfill	718 Landfill Rd Roper, NC	94-01	.0500	March 8, 2011

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 x 221

Facility Representative Name (Print)

Title

(Area Code) Telephone Number

Affix NC Licensed/ Professional Geologist Seal

Signature

Date

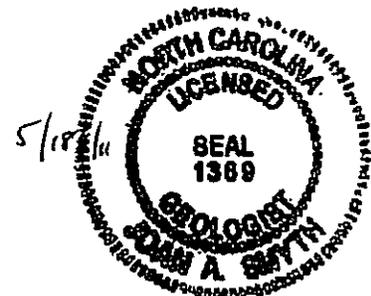
14 N. Boylan Avenue Raleigh, NC 27603

Facility Representative Address

C0828

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

Revised 6/2009



Washington County Closed MSW Landfill

Ground Water Monitoring Report

Spring 2011 Semi-annual Monitoring Event

**Washington County Closed MSW Landfill
Plymouth, North Carolina
NC Solid Waste Permit # 94-01-MSWLF-1980**

Prepared for:

Washington County
P.O. Box 1007
Plymouth, North Carolina 27962

May 2011



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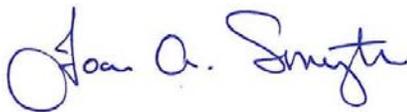
Spring 2011 Ground Water Monitoring Report

Washington County Closed MSW Landfill Washington, North Carolina NC Solid Waste Permit # 94-01 MSWLF-1980

Prepared for:

Washington County Solid Waste
P.O. Box 1007
Plymouth, North Carolina 27962

RSG Project No. **Wash 08-2**



Joan A. Smyth, P.G.
Senior Hydrogeologist



May 2011



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Washington County Closed MSW Landfill

**Semi-annual Ground Water Monitoring Report
Spring 2011 Event**

1.0 INTRODUCTION1

2.0 REGIONAL GEOLOGY1

3.0 SAMPLING PROCEDURES1

4.0 FIELD AND LABORATORY RESULTS1

 4.1 Laboratory Analysis.....1

 4.2 Field and Laboratory Results2

5.0 GROUND WATER CHARACTERIZATION.....2

6.0 CONCLUSIONS.....2

FIGURES

Figure 1 – Washington County Landfill Site Map

TABLES

- Table 1 – Groundwater Elevations
- Table 2 – Field Parameter Results
- Table 3 – Detected Inorganic Constituents
- Table 4 – Detected Organic Constituents

APPENDICES

Appendix A – Laboratory Analytical Reports

1.0 Introduction

The Washington County Closed MSW Landfill, operating under Solid Waste Permit #94-01-MSWLF-1980 is required to conduct semi-annual ground water monitoring events for water quality evaluation. This report presents the results of the first semi-annual monitoring event for 2011, conducted on March 8, 2011.

This report includes summaries of the field procedures, laboratory analyses, and ground water characterization. Also included are laboratory analytical reports and a potentiometric surface map.

2.0 Regional Geology

The Washington County Landfill is located near Roper North Carolina. According to the Geologic Map of North Carolina (1985) this site is underlain by Quaternary surficial deposits that include sands, gravel, clay, and peat that were deposited in marine, fluvial, eolian and lacustrine environments. These deposits are typical for a coastal plain environment.

3.0 Sampling Procedures

The sampling event, performed by Environment 1, Inc. on March 8, 2011 consisted of collecting samples from four (4) ground water wells (MW-1 through MW-4) 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 (North Carolina Department of Environment and Natural Resources, Division of Waste Management). 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.

All samples were collected in laboratory prepared containers for the specified analytical procedures. Ground water samples were properly preserved, placed on ice, and transported to the laboratory facility within the specified holding times for each analysis.

4.0 Field & Laboratory Results

4.1 Laboratory Analysis

The ground water samples were transported to Environment 1, Inc., a North Carolina certified laboratory (NC Wastewater ID #10). Laboratory analysis consisted of the full suite of RCRA Subtitle D Appendix I constituents. Parameters were reported at NC DWM Solid Waste Section Limits (SWSLs). Water table elevations at the time of monitoring are summarized in **Table 1**. The laboratory analytical report is included as **Appendix A**. No surface water samples are required for monitoring this site.

4.2 Field and Laboratory Results

The field parameter results are included in **Table 2**, while detected constituents are presented in **Tables 3 & 4**. One (1) inorganic constituent, barium (MW-2 & MW-3) was detected above the SWSL and shown in **Table 3**. No inorganic constituents were found to be above the 2L ground water standards.

Four (4) organic constituents, chloromethane (MW-1, MW-2, MW-3 & MW-4), 1,4-dichlorobenzene (MW-2 & MW-3), benzene (MW-3) and chlorobenzene (MW-2 & MW-3) were detected above the SWSL as shown in **Table 4**. Of these, benzene (MW-3) was found to be above the 2L ground water standards.

In the cover letter of the laboratory report from Environment 1 there is discussion of the detection of chloromethane in these wells. It is the laboratory manager's belief that these are false detects and not indicative of true groundwater conditions given the fact that the detections are close together in concentration and are found in every well.

Constituents detected below the SWSL are denoted as "J" values and are also included in **Tables 3 & 4**.

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 to the northeast. 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.

6.0 Conclusions

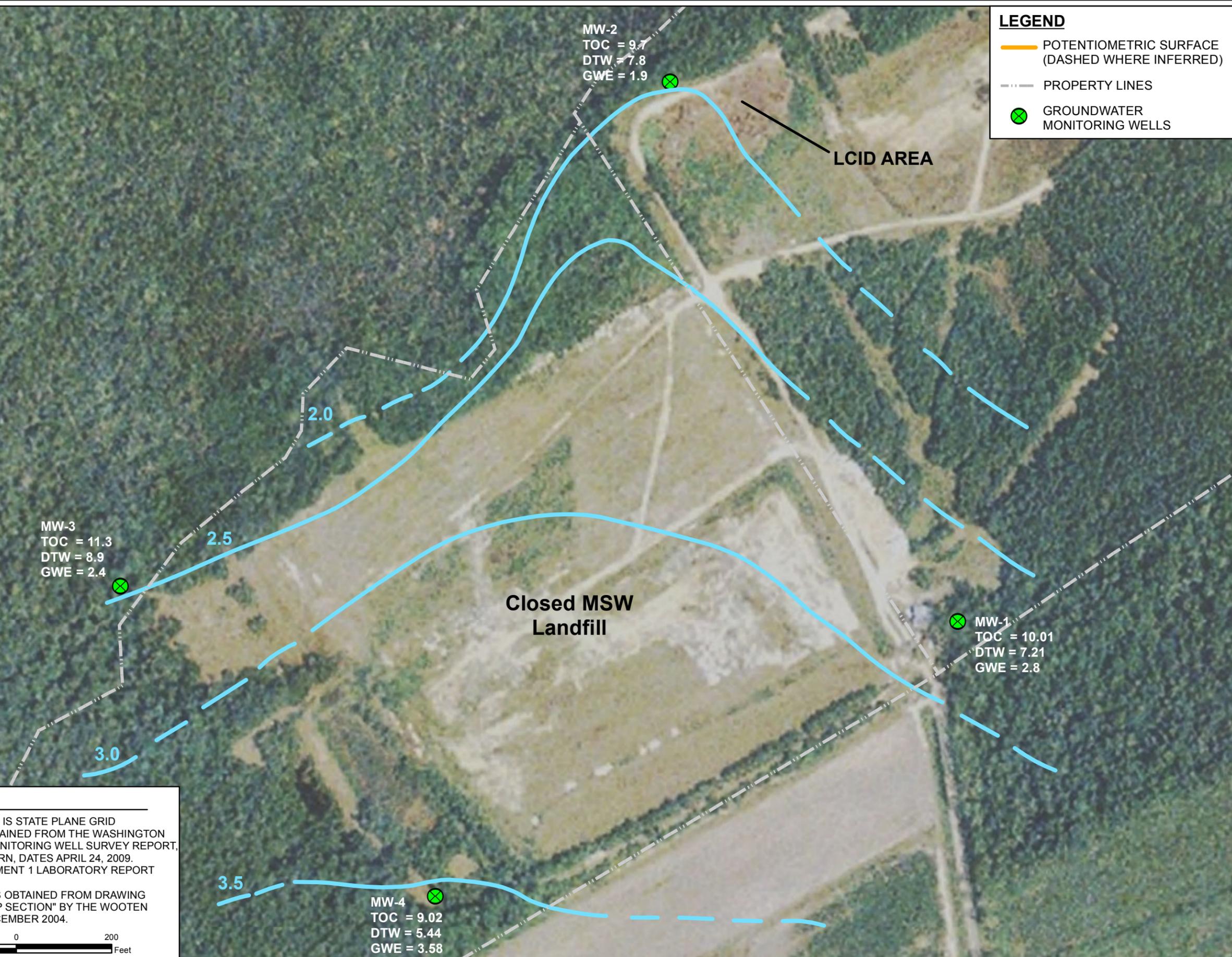
The data indicates relatively stable ground water quality at the Washington County Closed MSW Landfill. Chlorobenzene has historically increased in monitoring well MW-3, however, the data from the spring 2011 event may indicate a decreasing trend of the concentration of this constituent. Additionally, the concentrations of constituents detected in MW-2 over time indicate a decreasing trend for the past two monitoring events. The concentrations of other detected constituents have remained relatively stable. The next ground water monitoring event is scheduled for October 2011. Results will be reported upon completion of laboratory analysis.

Figures



LEGEND

- POTENTIOMETRIC SURFACE (DASHED WHERE INFERRED)
- PROPERTY LINES
- GROUNDWATER MONITORING WELLS



MW-2
TOC = 9.7
DTW = 7.8
GWE = 1.9

LCID AREA

MW-3
TOC = 11.3
DTW = 8.9
GWE = 2.4

**Closed MSW
Landfill**

MW-1
TOC = 10.01
DTW = 7.21
GWE = 2.8

MW-4
TOC = 9.02
DTW = 5.44
GWE = 3.58

REFERENCES

1. COORDINATE SYSTEM IS STATE PLANE GRID
2. WELL LOCATIONS OBTAINED FROM THE WASHINGTON COUNTY LANDFILL MONITORING WELL SURVEY REPORT, PREPARED BY SANBORN, DATES APRIL 24, 2009.
3. DATA FROM ENVIRONMENT 1 LABORATORY REPORT DATED 3/24/11.
4. SITE PROPERTY LINES OBTAINED FROM DRAWING "PROPOSED CDLF CAP SECTION" BY THE WOOTEN COMPANY, DATED DECEMBER 2004.



RICHARDSON SMITH GARDNER
& ASSOCIATES
ENGINEERING & GEOLOGICAL SERVICES

DRAWN BY: D.M.M.	CHECKED BY: J.A.S.	SCALE: AS SHOWN	FIGURE NO. 1
DATE: MAY 2011		PROJECT NO. WASH 08-1	
FILE NAME Washington msw			

TITLE:
**WASHINGTON COUNTY
MSW LANDFILL
POTENTIOMETRIC SURFACE MAP
SPRING 2011**

Tables

Table 1
Groundwater Elevation Data
Washington County MSW Landfill
3/8/2011

Well	Northing	Easting	TOC Elevation (feet)	Water Level (feet)	GW Elev (feet)
MW-1	797426.27	2691416.85	10.01	7.21	2.8
MW-2	798555.67	2690813.33	9.7	7.8	1.9
MW-3	797500.35	2689659.95	11.3	8.9	2.4
MW-4	796852.09	2690320.91	9.02	5.44	3.58

Data from Environment 1 laboratory report dated 3/24/2011, ID# 6018.

Well locations and elevations provided by Sanborn, Charlotte, NC from field survey conducted on 4/8/09.

Table 2
Field Parameter Results
Washington County MSW Landfill
3/8/2011

Well	pH (Std units)	Spec Cond (umhos/cm)	Temp (celsius)	Static Water Level (feet)
MW-1	5.3	891	14	7.21
MW-2	6.5	1391	16	7.8
MW-3	6.2	571	14	8.9
MW-4	5.4	121	12	5.44

Note: PH measured with a 'Hanna" pH/EC/TDS Meter, type HI9811
Temperature measured with a laboratory grade thermometer.
Data from Environment 1 laboratory report dated 3/24/2011, ID# 6018.

Table 3
Detected Inorganic Constituents
Washington County Closed MSW Landfill
3/8/2011

Parameter	SWSL	2L	MW-1	MW-2	MW-3	MW-4
Arsenic	10	10	1.0 J	6.7 J	6.5 J	0.85 J
Barium	100	700	95.5 J	466	187	38.8 J
Cadmium	1	2	0.16 J	0.14 J	0.18 J	0.19 J
Total Chromium	10	10	ND	1.5 J	0.61 J	0.91 J
Lead	10	15	0.16 J	0.28 J	0.21 J	1.0 J
Selenium	10	20	1.9 J	0.81 J	0.66J	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 3/24/2011, ID# 6018.



By: DMM
Date: 3/30/2011

Table 4
Detected Organic Constituents
Washington County MSW Landfill
3/8/2011

Parameter	SWSL	2L or GWP Standard	MW-1	MW-2	MW-3	MW-4
Chloromethane	1	3	2.1	2	2.5	1.7
1,2-Dichlorobenzene	5	24	ND	ND	0.4 J	ND
1,4-Dichlorobenzene	1	6	ND	2.4	4.8	ND
Benzene	1	1	ND	0.7 J	2.3	ND
Chlorobenzene	3	50	ND	4	29.5	ND

Note: All results in ug/l (ppb)

- ND - Not detected at or above SWSL
- Shading - Levels above 2L standard or no 2L standard
- Bold Letters - Levels below 2L standard
- SWSL - Solid Waste Section Quantitation Limits
- J - Detected constituents below the SWSL limit.
- 2L - Groundwater Standards (15A NCAC 2L 0200).
- GWP - Groundwater Protection Standards.

Note: Data from Environment 1 laboratory report dated 3/24/2011, ID# 6018.
See attached cover letter for Environment 1 concerning Chloromethane

Appendix A

Laboratory Analytical Report

Environment 1, Incorporated

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

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

March 29, 2011

Ms. Joan Smyth
Richardson Smith Gardner
133 Spring Avenue
Fuquay Varina, NC 27526

Dear Joan,

Enclosed are the results for samples collected at the Washington county facilities on March 8, 2011. You will note that all well locations show detects for chloromethane. While there was no trip blank associated with the samples, the laboratory blank was negative for chloromethane. A review of past data shows sporadic detects of this compound over the last few years. Since the chloromethane values for this particular sampling event are very close together, it is my opinion that they false detects. I can only guess that the contamination was either atmospheric or they were contaminated during the vial filling process. While no trip blanks have been requested for past sampling events, we plan to include them in the future at no additional charge to the county. Please give me a call if you have any questions.

Best regards,



Steve Jones

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

ID#: 6018

WASHINGTON CO. LANDFILL
MR. CARL CRITCHER
P.O. BOX 1007
PLYMOUTH ,NC 27962

DATE COLLECTED: 03/08/11
DATE REPORTED : 03/24/11

REVIEWED BY: 

PARAMETERS	MDL	SWSL	MW-1	MW-2	MW-3	MW-4	Analysis		Method
							Date	Analyst	Code
PH (field measurement), Units			5.3	6.5	6.2	5.4	03/08/11	RJH	SM4500HB
Arsenic, ug/l	0.10	10.0	1.0 J	6.7 J	6.5 J	0.85 J	03/22/11	LFJ	EPA200.8
Barium, ug/l	0.02	100.0	95.5 J	466	187	38.8 J	03/22/11	LFJ	EPA200.8
Cadmium, ug/l	0.02	1.0	0.16 J	0.14 J	0.18 J	0.19 J	03/22/11	LFJ	EPA200.8
Total Chromium, ug/l	0.04	10.0	--- U	1.5 J	0.61 J	0.91 J	03/22/11	LFJ	EPA200.8
Lead, ug/l	0.02	10.0	0.16 J	0.28 J	0.21 J	1.0 J	03/22/11	LFJ	EPA200.8
Mercury, ug/l	0.05	0.20	--- U	--- U	--- U	--- U	03/22/11	LFJ	EPA200.8
Selenium, ug/l	0.20	10.0	1.9 J	0.81 J	0.66 J	--- U	03/22/11	LFJ	EPA200.8
Silver, ug/l	0.02	10.0	--- U	--- U	--- U	--- U	03/22/11	LFJ	EPA200.8
Conductivity (at 25c), uMhos	1.0	1.0	891	1391	571	121	03/08/11	RJH	SM2510B
Temperature, °C			14	16	14	12	03/08/11	RJH	SM2550B
Static Water Level, feet			7.21	7.80	8.90	5.44	03/08/11	RJH	
Well Depth, feet			23.09	19.30	19.97	22.90	03/08/11	RJH	

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: WASHINGTON CO. LANDFILL
MR. CARL CRITCHER
P.O. BOX 1007
PLYMOUTH, NC 27962

CLIENT ID: 6018

ANALYST: MAO
DATE COLLECTED: 03/08/11
DATE ANALYZED: 03/15/11
DATE REPORTED: 03/24/11

Page: 1

REVIEWED BY: 

VOLATILE ORGANICS EPA METHOD 8260B

PARAMETERS, ug/l	MDL	SWSL	MW-1	MW-2	MW-3	MW-4
1. Chloromethane	0.77	1.0	2.10	2.00	2.50	1.70
2. Vinyl Chloride	0.63	1.0	--- U	--- U	--- U	--- U
3. Bromomethane	0.67	10.0	--- U	--- U	--- U	--- U
4. Chloroethane	0.48	10.0	--- U	--- U	--- U	--- U
5. Trichlorofluoromethane	0.24	1.0	--- U	--- U	--- U	--- U
6. 1,1-Dichloroethene	0.17	5.0	--- U	--- U	--- U	--- U
7. Acetone	9.06	100.0	--- U	--- U	--- U	--- U
8. Iodomethane	0.26	10.0	--- U	--- U	--- U	--- U
9. Carbon Disulfide	0.23	100.0	--- U	--- U	--- U	--- U
10. Methylene Chloride	0.64	1.0	--- U	--- U	--- U	--- U
11. trans-1,2-Dichloroethene	0.23	5.0	--- U	--- U	--- U	--- U
12. 1,1-Dichloroethane	0.20	5.0	--- U	--- U	--- U	--- U
13. Vinyl Acetate	0.20	50.0	--- U	--- U	--- U	--- U
14. Cis-1,2-Dichloroethene	0.25	5.0	--- U	--- U	--- U	--- U
15. 2-Butanone	2.21	100.0	--- U	--- U	--- U	--- U
16. Bromochloromethane	0.27	3.0	--- U	--- U	--- U	--- U
17. Chloroform	0.25	5.0	--- U	--- U	--- U	--- U
18. 1,1,1-Trichloroethane	0.19	1.0	--- U	--- U	--- U	--- U
19. Carbon Tetrachloride	0.22	1.0	--- U	--- U	--- U	--- U
20. Benzene	0.24	1.0	--- U	0.70 J	2.30	--- U
21. 1,2-Dichloroethane	0.27	1.0	--- U	--- U	--- U	--- U
22. Trichloroethene	0.23	1.0	--- U	--- U	--- U	--- U
23. 1,2-Dichloropropane	0.21	1.0	--- U	--- U	--- U	--- U
24. Bromodichloromethane	0.21	1.0	--- U	--- U	--- U	--- U
25. Cis-1,3-Dichloropropane	0.24	1.0	--- U	--- U	--- U	--- U
26. 4-Methyl-2-Pentanone	1.19	100.0	--- U	--- U	--- U	--- U
27. Toluene	0.23	1.0	--- U	--- U	--- U	--- U
28. trans-1,3-Dichloropropane	0.28	1.0	--- U	--- U	--- U	--- U
29. 1,1,2-Trichloroethane	0.25	1.0	--- U	--- U	--- U	--- U
30. Tetrachloroethene	0.17	1.0	--- U	--- U	--- U	--- U
31. 2-Hexanone	1.57	50.0	--- U	--- U	--- U	--- U
32. Dibromochloromethane	0.24	3.0	--- U	--- U	--- U	--- U
33. 1,2-Dibromoethane	0.26	1.0	--- U	--- U	--- U	--- U
34. Chlorobenzene	0.30	3.0	--- U	4.00	29.50	--- U
35. 1,1,1,2-Tetrachloroethane	0.22	5.0	--- U	--- U	--- U	--- U
36. Ethylbenzene	0.21	1.0	--- U	--- U	--- U	--- U
37. Xylenes	0.68	5.0	--- U	--- U	--- U	--- U
38. Dibromomethane	0.28	10.0	--- U	--- U	--- U	--- U
39. Styrene	0.19	1.0	--- U	--- U	--- U	--- U
40. Bromoform	0.20	3.0	--- U	--- U	--- U	--- U
41. 1,1,2,2-Tetrachloroethane	0.26	3.0	--- U	--- U	--- U	--- U
42. 1,2,3-Trichloropropane	0.43	1.0	--- U	--- U	--- U	--- U
43. 1,4-Dichlorobenzene	0.39	1.0	--- U	2.40	4.80	--- U
44. 1,2-Dichlorobenzene	0.32	5.0	0.40 J	--- U	0.40 J	--- U
45. 1,2-Dibromo-3-Chloropropane	0.34	13.0	--- U	--- U	--- U	--- U
46. Acrylonitrile	2.72	200.0	--- U	--- U	--- U	--- U
47. trans-1,4-Dichloro-2-Butene	0.42	100.0	--- U	--- U	--- U	--- U

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

Environment 1, Inc.
 P.O. Box 7085, 114 Oakmont Dr.
 Greenville, NC 27858

Phone (252) 756-6208 • Fax (252) 756-0633

CLIENT: 6018 Week: 13

WASHINGTON CO. LANDFILL
 MR. CARL CRITCHER
 P.O. BOX 1007
 PLYMOUTH NC 27962

(252) 793-5615

CHAIN OF CUSTODY RECORD

SAMPLE LOCATION	COLLECTION		TOTAL CHLORINE, mg/l OR ug/l AT COLLECTION	TEMPERATURE, °C AT COLLECTION	# OF CONTAINERS	DISINFECTION		Field pH	Metals	Conductivity	Temperature	Field Parameter	EPA 8260B	8260 Dup. 1	8260 Dup. 2	CHLORINE NEUTRALIZED AT COLLECTION	pH CHECK (LAB)	CONTAINER TYPE, P/G	CHEMICAL PRESERVATION
	DATE	TIME				CHLORINE	UV												
MW-1	03	08 11	14	14	5	<input type="checkbox"/>	<input type="checkbox"/>	A	A	A	A								
MW-2	03	08 11	16	14	4	<input type="checkbox"/>	<input type="checkbox"/>	P	A	A	A								
MW-3	03	08 11	14	14	4	<input type="checkbox"/>	<input type="checkbox"/>	P	A	A	A								
MW-4	03	08 11	12	12	4	<input type="checkbox"/>	<input type="checkbox"/>	A	A	A	A								
RELINQUISHED BY (SIG.) (SAMPLER)			RECEIVED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME	COMMENTS:												
[Signature]			[Signature]	03/08/11	[Signature]	3/8/2011	SAMPLER MUST BE MAINTAINED DURING SHIPMENT/DELIVERY												
RELINQUISHED BY (SIG.)			RECEIVED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME	SAMPLER MUST BE MAINTAINED DURING SHIPMENT/DELIVERY												
[Signature]			[Signature]		[Signature]		SAMPLER MUST BE MAINTAINED DURING SHIPMENT/DELIVERY												

PLEASE READ Instructions for completing this form on the reverse side.

Sampler must place a "C" for composite sample or a "G" for Grab sample in the blocks above for each parameter requested.

No 221693