

Perm/Co ID #	Date	Doc ID#
PC	11/19/03	DIN

34-12
11-4-03

November 25, 2003

Mr. Larry Rose
 North Carolina Department of Environment
 and Natural Resources (NCDENR)
 Division of Solid Waste Management
 Solid Waste Section
 P. O. Box 27687
 Raleigh, NC 27611-7687



Re: Fall 2003 Semiannual Groundwater Sampling Analytical
 and Landfill Gas Monitoring Results
 Winston-Salem Construction and Demolition (C&D) Landfill (No. 34-12)
 Forsyth County, North Carolina
 HDR Project No. 00162-3925-018

Dear Mr. Rose:

HDR Engineering, Inc. of the Carolinas (HDR), on behalf of the Winston-Salem City/County Utility Commission (the City), is hereby submitting the groundwater analytical and landfill gas monitoring results for the Fall 2003 monitoring period (July through December 2003) at the C&D Landfill (the Landfill) located in Forsyth County, North Carolina.

Groundwater samples were collected from on-site detection monitoring wells MW-1R, MW-2R, MW-3R, MW-4, MW-5R, MW-6R, MW-7, and MW-8 on November 4, 2003, for the eight Resource Conservation and Recovery Act (RCRA) metals and Appendix I volatile organic compound (VOC) analysis. Field measurements of pH, specific conductance, temperature, and redox potential (Eh) were recorded during pre-sampling well purging on field forms, which will be provided upon request. Based on past groundwater flow characteristics for the site, groundwater monitoring well MW-1R is hydraulically upgradient of the Landfill and, therefore, is considered as "background" for the site.

In addition, landfill gas monitoring was performed from the six permanent methane gas monitoring stations (MM-1 through MM-6) located around the perimeter of Phase I of the Landfill. Methane stations MM-2 and MM-4 are nested monitoring stations, while all other stations are constructed as a single monitoring point.

12-4-03

- Ed Gibson:

Plan to immediately resample
well MW-6R (acetone detected).
Will send report as soon as possible.

L. R.

Mr. Larry Rose
November 25, 2003
Page 2 of 2

The metal concentrations detected in the ground water monitoring wells are reflective of the naturally-occurring trace metals typically present in the saprolite of this region and consistent with historical sampling results from the site. The trace metal concentrations for this period were below their respective 2L groundwater standards at all groundwater monitoring wells with the exception of MW-1 and MW-7. Lead was detected slightly above its respective 2L groundwater standard at MW-1 and MW-7. Chromium was detected slightly above its respective 2L groundwater standard at MW-7. The presence of these trace metal detections is due to the slight lingering well turbidity in each well.

Acetone was the only VOC detected this period in the groundwater monitoring wells. It was detected in MW-6R at a concentration well below its 2L Standard. Acetone is commonly used in laboratories as a cleaning agent during equipment preparation. This increases the chance of erroneous results to occur compared to other 8260 constituents that are not commonly used in the laboratory setting. Therefore, this detection is suspect and will be verified during the next groundwater sampling event.

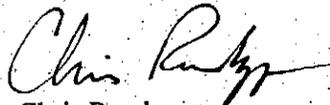
The Report of Laboratory Analysis for this sampling event at the Landfill is attached to this letter in electronic format. Table 1 is also attached to this report summarizing the results of all sampling events performed to date at the Landfill. The results of this recent sampling event indicate that the existing groundwater monitoring well network at the Landfill is adequate to provide representative groundwater quality data and release detection determination for the Landfill.

No trace of methane was detected in the on-site methane monitoring stations. A copy of the Perimeter Gas Probe Monitoring Field Data Form is attached to this submittal.

HDR is currently addressing comments on the construction permit application for Phases IV, V, and VI provided by NCDENR in a letter dated May 28, 2003.

If you have any questions or comments concerning the information summarized in this letter or in the attached analytical data report, please do not hesitate to contact me at (704) 338-6777.

Sincerely,



Chris Randazzo
Staff Geologist

CR/jvd

Attachments: Table 1 – Historical Groundwater Analytical Results
Perimeter Gas Probe Monitoring Field Data Form
Report of Laboratory Analysis (on floppy disk)
Groundwater and Methane Gas Monitoring Well Locations

cc: Edward Gibson, PE, Winston-Salem City/County Utility Commission (w/ hard copy of laboratory sheets)
File (w/ hard copy of laboratory sheets)

TABLE 1
 OLD SALISBURY ROAD
 HISTORICAL GROUNDWATER ANALYTICAL RESULTS

1/17/1996	ND	0.2240	ND	ND	0.0060	ND	ND	ND	23
10/24/1996	ND	0.1800	ND	0.0060	ND	0.0002	ND	ND	ND
5/13/1997	ND	0.1000	ND	0.0030	ND	ND	ND	ND	ND
10/30/1997	ND	0.2900	ND	0.0110	0.0120	ND	ND	ND	ND
5/5/1998	ND	0.1000	ND	0.0490	ND	ND	ND	ND	ND
11/5/1998	ND	0.1600	ND	0.0120	ND	ND	ND	ND	28
6/2/1999	ND	0.1500	ND	0.0078	ND	ND	ND	ND	19
11/19/1999	ND	0.1300	ND	0.0052	ND	ND	ND	ND	ND
6/5/2000	ND	0.1100	ND	ND	ND	ND	ND	ND	ND
12/14/2000	ND	0.1500	ND	0.0066	ND	~	ND	ND	ND
7/31/2001	ND	0.0870	ND	0.0066	ND	ND	ND	ND	ND
11/29/2001	0.0058	0.2800	ND	0.0220	0.0100	~	ND	ND	21
4/17/2002	ND	0.1300	ND	0.0050	ND	ND	ND	ND	ND
12/9/2002	ND	0.1000	ND	0.0023	ND	ND	ND	ND	ND
5/29/2003	ND	0.1200	ND	0.0043	ND	ND	ND	ND	ND
11/4/2003	ND	0.4600	ND	ND	ND	ND	ND	ND	ND
1/17/1996	ND	0.3500	ND	0.0120	ND	0.0004	ND	ND	86
10/24/1996	ND	0.1600	ND	0.0090	0.0080	ND	ND	ND	ND
5/13/1997	ND	0.2000	0.0030	0.0040	0.0140	ND	ND	0.0060	ND
10/30/1997	ND	0.3400	ND	0.0430	ND	ND	ND	ND	ND
5/5/1998	ND	0.1900	ND	0.0340	ND	ND	ND	ND	ND
11/5/1998	0.0110	1.1000	ND	0.2100	0.0080	ND	ND	ND	ND
6/2/1999	ND	0.1500	ND	0.0078	ND	ND	ND	ND	13
11/19/1999	ND	0.1200	ND	0.0140	0.0069	ND	ND	ND	ND
6/5/2000	ND	0.1800	ND	0.0030	0.0065	ND	ND	ND	ND
12/14/2000	ND	0.0610	ND	0.0039	ND	~	ND	ND	ND
7/31/2001	ND	0.2800	ND	0.0160	0.0089	ND	ND	ND	ND
11/29/2001	ND	0.1600	ND	0.0160	0.0070	~	ND	ND	ND
4/17/2002	ND	0.1000	ND	ND	ND	ND	ND	ND	ND
12/9/2002	ND	0.1400	0.0019	0.0021	ND	ND	ND	ND	ND
5/29/2003	ND	0.0560	ND	ND	ND	ND	ND	ND	ND
11/4/2003	ND	0.0600	ND	0.0022	ND	ND	ND	ND	ND

See footnotes at end of tables.

TABLE 1
 OLD SALISBURY ROAD
 HISTORICAL GROUNDWATER ANALYTICAL RESULTS

	1/17/1996	ND	1.2300	ND	0.0090	0.0150	0.0007	ND	ND	ND
	10/24/1996	ND	0.7900	ND	0.0200	0.0150	ND	ND	ND	ND
	5/13/1997	ND	0.8000	ND	0.0280	0.0170	ND	ND	ND	ND
	10/30/1997	ND	0.6200	ND	0.0160	0.0160	0.0002	ND	ND	ND
	5/5/1998	ND	0.8600	ND	0.0250	0.0220	ND	ND	ND	ND
	11/5/1998	ND	1.4000	ND	0.0770	0.0580	ND	ND	ND	ND
	6/2/1999	~	~	~	~	~	~	~	~	ND
	11/19/1999	0.0059	0.0520	ND	0.0240	0.0100	ND	ND	ND	ND
	6/5/2000	ND	0.3000	ND	ND	ND	ND	ND	ND	ND
	12/14/2000	0.0310	1.5000	ND	0.1000	0.0800	~	ND	ND	ND
	7/31/2001	0.0180	0.9500	ND	0.0500	0.0580	ND	ND	ND	ND
	11/29/2001	0.0084	0.4000	ND	0.0190	0.0250	~	ND	ND	ND
	4/17/2002	0.0074	0.3700	ND	0.0150	0.0210	ND	ND	ND	ND
	12/9/2002	ND	0.0130	ND	ND	ND	ND	ND	ND	ND
	5/29/2003	ND	0.2200	ND	ND	ND	ND	ND	ND	ND
	11/4/2003	ND	0.2000	ND	0.0023	ND	ND	ND	ND	ND
MW-4B	1/17/1996	ND	0.5950	0.0070	0.0210	0.0170	0.0003	ND	ND	ND
	10/24/1996	ND	0.7200	ND	0.0470	0.0160	0.0003	ND	ND	ND
	5/13/1997	ND	0.2800	ND	ND	0.0120	ND	ND	0.0060	ND
	10/30/1997	ND	0.6500	ND	0.0550	0.0200	ND	ND	ND	ND
	5/5/1998	ND	0.8500	ND	0.1300	0.0300	ND	ND	ND	ND
	11/5/1998	ND	2.0000	ND	0.3050	0.0780	0.0002	ND	ND	ND
	6/2/1999	ND	0.9500	ND	0.1100	0.0500	ND	ND	ND	10
	11/19/1999	0.0075	0.8600	ND	0.0620	0.0460	0.0004	ND	ND	ND
	6/5/2000	ND	0.5700	ND	ND	0.0095	ND	ND	ND	ND
	12/14/2000	ND	0.3500	ND	0.0280	0.0081	~	ND	ND	ND
	7/31/2001	0.0056	0.5500	ND	0.0380	0.0140	ND	ND	ND	ND
	11/29/2001	0.0120	0.9000	ND	0.0910	0.0360	~	ND	ND	ND
	4/17/2002	ND	0.0610	ND	ND	ND	ND	ND	ND	ND
	12/9/2002	ND	0.0860	ND	0.0050	0.0060	ND	ND	ND	ND
	5/29/2003	ND	0.0940	ND	0.0055	0.0053	ND	ND	ND	ND
11/4/2003	ND	0.0970	ND	0.0026	ND	ND	ND	ND	ND	

See footnotes at end of tables.

TABLE 1
 OLD SALISBURY ROAD
 HISTORICAL GROUNDWATER ANALYTICAL RESULTS

1/17/1996	ND	1.0000	ND			0.0008	ND	ND	ND
10/24/1996	ND	0.6200	ND	0.0430		ND	ND	ND	ND
5/13/1997	ND	0.3300	ND	0.0200	0.0140	ND	ND	ND	ND
10/30/1997	ND	0.6100	ND	0.0160		ND	ND	ND	ND
5/5/1998	0.0050	0.8200	ND	0.0200	0.0300	ND	ND	ND	ND
11/5/1998	ND	0.4800	ND			ND	ND	ND	175
6/2/1999	ND	0.2400	ND	0.0380		ND	ND	ND	10
11/19/1999	ND	0.2000	ND	0.0290	0.0082	ND	ND	ND	ND
6/5/2000	ND	0.2000	ND	0.0081	ND	ND	ND	ND	ND
12/14/2000	0.0050	0.4000	ND		0.0076	~	ND	ND	ND
7/31/2001	ND	0.2700	ND	0.0490	0.0076	ND	ND	ND	ND
11/29/2001	0.0070	0.6100	ND		0.0130	~	ND	ND	ND
4/17/2002	ND	0.1500	ND	0.0230	ND	ND	ND	ND	ND
12/9/2002	ND	0.0650	ND	0.0074	ND	ND	ND	ND	ND
5/29/2003	ND	0.0720	0.0027	0.0095	ND	ND	ND	ND	ND
11/4/2003	ND	0.0650	ND	0.0087	ND	ND	ND	ND	ND
1/17/1996	ND	1.4000	ND	0.0120		ND	ND	ND	ND
10/24/1996	ND	0.5900	ND	0.0100	0.0110	ND	ND	ND	ND
5/13/1997	ND	0.3000	ND	0.0210	0.0140	ND	ND	ND	ND
10/30/1997	ND	0.2600	ND	0.0140	0.0140	ND	ND	ND	ND
5/5/1998	ND	0.3600	ND	0.0330	0.0200	ND	ND	ND	ND
11/5/1998	ND	0.1600	ND	0.0120	ND	ND	ND	ND	ND
6/2/1999	~	~	~	~	~	~	~	~	ND
11/19/1999	ND	0.0590	ND	0.0028	ND	ND	ND	ND	ND
6/5/2000	ND	0.0820	ND	ND	0.0058	ND	ND	ND	ND
12/14/2000	ND	0.0410	ND	0.0026	ND	~	ND	ND	ND
7/31/2001	ND	0.0620	ND	0.0041	ND	ND	ND	ND	ND
11/29/2001	0.0160	0.5300	ND	0.0250	0.0320	~	ND	ND	ND
4/17/2002	ND	0.1800	ND	0.0260	0.0076	ND	ND	ND	ND
12/9/2002	ND	0.0410	ND	0.0032	ND	ND	ND	ND	ND
5/29/2003	ND	0.0240	ND	ND	ND	ND	ND	ND	ND
11/4/2003	ND	0.0250	ND	0.0024	ND	ND	ND	ND	12

See footnotes at end of tables.

12-4-03
 Per Ed Gibson:
 Well to be
 resampled
 immediately.

TABLE 1
 OLD SALISBURY ROAD
 HISTORICAL GROUNDWATER ANALYTICAL RESULTS

1/17/1996	ND	1.9300	ND	0.0280			ND	ND	ND
10/24/1996	ND	0.9700	ND	0.0210	0.0060	0.0004	ND	ND	ND
5/13/1997	ND	0.7500	ND				ND	ND	ND
10/30/1997	ND	1.8000	ND			0.0002	ND	ND	ND
5/5/1998	ND	1.2000	ND				ND	ND	ND
11/5/1998	ND	1.3000	ND				ND	ND	9
6/2/1999	0.0098	0.9600	ND				ND	ND	10
11/19/1999	ND	0.3900	ND		0.0120		ND	ND	ND
6/5/2000	ND	0.3600	ND	0.0025	0.0087		ND	ND	ND
12/14/2000	0.0450		ND				~	ND	ND
7/31/2001	0.0160	1.3000	ND				ND	ND	ND
11/29/2001	0.0170	1.3000	ND				~	ND	ND
4/17/2002	ND	0.0840	ND	0.0068	ND		ND	0.0026	ND
12/9/2002	ND	0.2100	ND	0.0320	0.0060		ND	ND	ND
5/29/2003	ND	0.1300	ND	0.0170	0.0053		ND	ND	ND
11/4/2003	0.0086	0.8200	ND				ND	ND	ND
1/17/1996	~	~	~	~	~	~	~	~	~
10/24/1996	~	~	~	~	~	~	~	~	~
5/13/1997	~	~	~	~	~	~	~	~	~
10/30/1997	~	~	~	~	~	~	~	~	~
5/5/1998	~	~	~	~	~	~	~	~	~
11/5/1998	~	~	~	~	~	~	~	~	~
6/2/1999	~	~	~	~	~	~	~	~	~
11/19/1999	~	~	~	~	~	~	~	~	~
6/5/2000	~	~	~	~	~	~	~	~	~
12/14/2000	0.0450	0.2600	ND	0.0240	0.0002		~	ND	ND
7/31/2001	0.0460		ND	0.0320			ND	ND	ND
11/29/2001	0.0360		ND	0.0320			~	ND	ND
4/17/2002	ND	0.1500	ND	0.0230	ND		ND	ND	ND
12/9/2002	ND	0.0480	ND	0.0020	ND		ND	ND	ND
5/29/2003	ND	0.0770	ND	0.0038	0.0067		ND	ND	ND
11/4/2003	ND	0.0520	ND	0.0032	ND		ND	ND	ND

ND - Non Detect

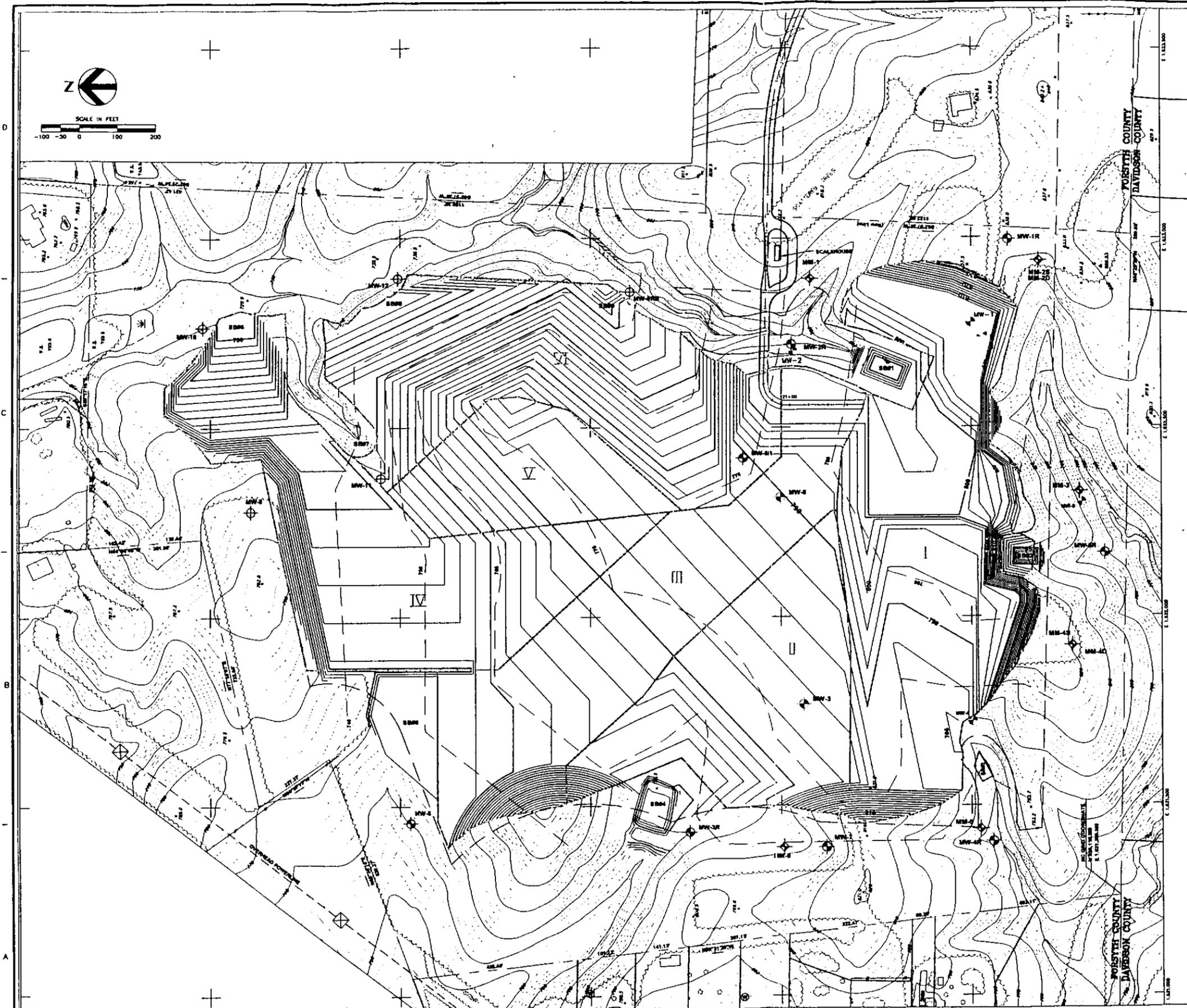
~ - Not Sampled

All metals in ppm, all VOCs in ppb.

Highlighted cells indicate exceedances in 2L Standards.

**PERIMETER GAS PROBE MONITORING
FIELD DATA FORM**

Date: 11/4/2003	Inspector: C.Randazzo	Site Name: Old Salisbury Road C&D Landfill	Instrument: GEM-500		
Temperature @ Start: <u>65°F</u>		Weather: Sunny	Legend: T = Trace CO ₂ = Carbon Dioxide W = Water NA = No reading taken LEL = Lower explosive limit		
Temperature @ End: <u>70°F</u>		Barometric Pressure: <u>NA</u>			
MM #	Time	Methane (%)	CO ₂ (%)	Oxygen (%)	Remarks
1	1630	0	5.5	15.1	
2S	1500	0	1.1	19.3	
2D	1505	0	1.2	18.4	
3	1400	0	0.3	20.4	
4S	1015	0	0.0	21.2	
4D	1020	0	0.0	21.2	
5	1255	0	0.0	20.7	
6	1025	0	3.4	17.1	



- LEGEND**
- 780 — PROPOSED CONTOURS
 - 810 — EXISTING CONTOURS
 - - - - - PROPERTY BOUNDARY
 - - - - - COUNTY LINE
 - ~ ~ ~ ~ ~ STREAM
 - - - - - POTENTIAL EXTENT OF WASTE
 - - - - - PROPOSED PHASING BOUNDARY
 - - - - - SEASONAL HIGH GROUND-WATER CONTOURS
 - ⊕ EXISTING GROUND-WATER MONITORING WELL
 - ⊕ EXISTING METHANE GAS MONITORING PROBE
 - ⊕ PROPOSED GROUND-WATER MONITORING WELL ("R" - DENOTES REPLACEMENT WELL)
 - ⊕ ABANDONED MONITORING WELLS
 - ⊕ PRIVATE WATER SUPPLY WELL
 - SB#2 SEDIMENTATION BASIN

- NOTES**
1. TOPOGRAPHIC INFORMATION PROVIDED BY CARTOGRAPHIC AERIAL MAPPING DATED NOVEMBER 12, 1993.
 2. PROPERTY SURVEY TAKEN FROM DATA SUPPLIED BY BRADY SURVEYING, INC. DATED MARCH 15, 1994.
 3. THIS DRAWING SHOWS ABANDONED, EXISTING AND PROPOSED MONITORING WELLS, AND METHANE GAS MONITORING PROBES.
 4. S - DEPICTS SHALLOW
D - DEPICTS DEEP

HDR
 HDR Engineering, Inc.
 of the Carolinas
 Suite 1400
 128 S. Tryon Street
 Charlotte, NC 28203-5001
 (704) 338-1000

A2	ADDED METHANE GAS PROBES MM-1 TO MM-8	9/22/99	CRH
A1	ADDED MW-SR, MW-B, AND MW-SR	8/18/99	CRH
A	ISSUED FOR APPROVAL		

Project Manager
 J.C. HOADING, P.E.
 Designer
 C.A. WRIGHT, P.E.
 Checker
 J. GAA

**OLD SALISBURY ROAD
 CONSTRUCTION AND DEMOLITION LANDFILL
 PHASE II AND III
 CONSTRUCTION PLAN APPLICATION**
 WINSTON-SALEM NORTH CAROLINA

**EXIST. AND PROP. GROUND-WATER
 MONITORING WELL AND
 METHANE GAS PROBE LOCATIONS**

APRIL 1999
 1"=100'
 0167-090-018
 C-5
 A2