May 25, 2010

Ms. Jaclynne Drummond
NCDENR Environmental Compliance
Solid Waste Section
1646 Mail Service Center
Raleigh, NC 27699-1646

Re: Spring 2010 Semiannual Groundwater Sampling Analytical Results
Winston-Salem Construction and Demolition (C&D) Landfill (No. 34-12)
Forsyth County, North Carolina
HDR Project No. 00162-138460-018

Dear Ms. Drummond:

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 results for the Spring 2010 monitoring period at the Old Salisbury Road C&D Landfill located in Forsyth County, North Carolina. A complete copy of the field data sheets and laboratory analysis is included on the enclosed CD.

Groundwater samples were collected from the following thirteen on-site detection monitoring wells between March 15 and 17, 2010.

MW-1R	MW-2R	MW-3R	MW-4R	MW-5R
MW-7	MW-8	MW-9	MW-10	MW-11
MW-12	MW-13	MW-14		

Groundwater samples were analyzed for the eight (8) Resource Conservation and Recovery Act (RCRA) metals and Appendix I volatile organic compounds (VOC's). In addition, two surface water samples were collected and analyzed for the same parameters. Upstream surface water (SW-1) and downstream surface water (SW-2) samples were obtained from the adjacent stream to the east. Field measurements of pH, specific conductance, temperature, dissolved oxygen, and oxidation-reduction potential were recorded during well purging. Groundwater monitoring well MW-1R is located hydraulically upgradient of the landfill and is considered as "background" for the site.

Barium was detected above the NCDENR Solid Waste Section Limits (SWSL) but below the 2L standard in samples from five wells, as shown on the attached Event Summary Table. The metal concentrations detected in the groundwater samples 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 detected during this period were below their respective 2L groundwater standards at all groundwater monitoring wells and surface water

HDR Engineering, Inc. of the Carolinas
440 S Church Street
Suite 1000
Charlotte, NC 28202-1919
Phone: (704) 338-6700
Fax: (704) 338-6760
www.hdrinc.com

sampling locations. The presence of these naturally occurring trace metals is attributed to background conditions.

One VOC (trichlorofluoromethane) was detected in the groundwater sample for MW-2R above the SWSL but below the 2L standard. Well MW-2R was resampled on April 16, 2010 for trichlorofluoromethane. The resampling confirmed the VOC detection. The detected levels (~22 ug/L) are well below the 2L standard of 2,000 ug/L. This VOC was also detected in the sample from well MW-13 at a similar level during the last event; however it was not detected in that well during this event. The Owner will continue to evaluate the detection of this compound in the upcoming semiannual sampling event.

Based on the data collected the existing groundwater monitoring well network at the landfill is adequate to provide representative groundwater quality data and release detection determination for the landfill.

The following attachments are provided for your reference:

- Environmental Monitoring Reporting Form
- Event Summary Table
- Historic Groundwater Detections
- Groundwater Elevation Contour Map with Monitoring Well Locations
- Compact disc (CD) with the following files
  - PDF of this report
  - Lab analytical data

If you have any questions or comments concerning the information summarized in this letter, or in the attached analytical data, please do not hesitate to contact me at (704) 338-6719.

Sincerely,

HDR Engineering, Inc. of the Carolinas

Eric A. Wright

NORTH CAROLINA PROFESSIONAL SEAL 19027 ENGINEER ERIC ALAN WRIGHT

5/25/10

Eric A. Wright, P.E.
Project Engineer

EAW/apb

Enclosures (5)

cc: Edward Gibson, PE, Winston-Salem City/County Utility Commission
Mike Plummer, PE, HDR

Spring 2010 Event Summary Table

Old Salisbury Road C&D Landfill

March 15 through April 16, 2010

Standard			Value	Column Labels															
SWSL	2L	units	Row Labels	MW-1R	MW-2R	MW-3R	MW-4R	MW-5R	MW-7	MW-8	MW-9	MW-10	MW-11	MW-12	MW-13	MW-14	SW-1	SW-2	Equipment Blank	Trip Blank
			Mar-10																	
			µg/L																	
5	NE	µg/L	1,1,1,2-Tetrachloroethane																	
1	200	µg/L	1,1,1-Trichloroethane																	
3	0	µg/L	1,1,2,2-Tetrachloroethane																	
1	NE	µg/L	1,1,2-Trichloroethane																	
5	6	µg/L	1,1-Dichloroethane																	
1	0	µg/L	1,2,3-Trichloropropane																	
13	0	µg/L	1,2-Dibromo-3-chloropropane																	
1	0	µg/L	1,2-Dibromoethane (EDB)																	
5	20	µg/L	1,2-Dichlorobenzene																	
1	0	µg/L	1,2-Dichloroethane																	
1	1	µg/L	1,2-Dichloropropane																	
1	6	µg/L	1,4-Dichlorobenzene																	
100	4000	µg/L	2-Butanone (MEK)																	
50	NE	µg/L	2-Hexanone																	
100	NE	µg/L	4-Methyl-2-pentanone (MIBK)																	
100	6000	µg/L	Acetone																	
200	NE	µg/L	Acrylonitrile																	
10	10	µg/L	Arsenic			4		4.2	3.4					2.7			3.7			
100	700	µg/L	Barium	85.3	103	314	55.9	54.3	99.3	28.8	134	46.6	37.6	40.6	126	130	92.5	59.4		
1	1	µg/L	Benzene																	
3	NE	µg/L	Bromochloromethane																	
1	1	µg/L	Bromodichloromethane																	
3	4	µg/L	Bromoform																	
10	NE	µg/L	Bromomethane																	
1	2	µg/L	Cadmium			0.82														
100	700	µg/L	Carbon disulfide																	
1	0	µg/L	Carbon tetrachloride																	
3	50	µg/L	Chlorobenzene																	
10	3000	µg/L	Chloroethane																	
5	70	µg/L	Chloroform																	
1	3	µg/L	Chloromethane																	
10	10	µg/L	Chromium	1.4	1.2		1.3	5		1.4				2.4	1.7	3				
5	70	µg/L	cis-1,2-Dichloroethene																	
1	0	µg/L	cis-1,3-Dichloropropene																	
3	0	µg/L	Dibromochloromethane																	
10	NE	µg/L	Dibromomethane																	
1	600	µg/L	Ethylbenzene																	
10	NE	µg/L	Iodomethane																	
10	15	µg/L	Lead																	
5	500	µg/L	m&p-Xylene																	
0	1	µg/L	Mercury																	
10	20	µg/L	Silver	0.29	0.67	0.45		0.46	0.56		0.27		0.48	0.2	0.4	0.39	0.28	0.2		
5	7	µg/L	1,1-Dichloroethene																	
1	5	µg/L	Methylene Chloride																	
NE	NE	µg/L	o-Xylene																	
1	2000	µg/L	Trichlorofluoromethane		22.2															
10	20	µg/L	Selenium																	
1	70	µg/L	Styrene																	
1	1	µg/L	Tetrachloroethene																	
1	600	µg/L	Toluene																	
5	100	µg/L	trans-1,2-Dichloroethene																	
1	0	µg/L	trans-1,3-Dichloropropene																	
100	NE	µg/L	trans-1,4-Dichloro-2-butene																	
1	3	µg/L	Trichloroethene																	
50	NE	µg/L	Vinyl acetate																	
1	0	µg/L	Vinyl chloride																	
			µmhos/cm																	
			Field Specific Conductance	90	230	330	90	170	160	60	140	40	190	140	120	150	230	170		
			deg C																	
			Field Temperature	20.7	14.8	16.4	14.6	19.2	16.8	13.7	14.6	17.1	13.4	13	13.6	14.4	17.1	17.9		
			mg/L																	
			Oxygen, Dissolved	5.9	4.8	3.7	4.4	6.1	2.2	7.2	8.5	7.4	1.9	6.8	5.4	7.9	6.8	8.8		
			mV																	
			REDOX	262	191	31	262	260	213	303	309	300	-60	197	237	292	53	82		
			NTU																	
			Turbidity	2	4	6	45	3	2	7	6	2	13	31	11	29	8	13		
			Std. Units																	
			Field pH	5.74	5.31	5.61	5.56	5.96	5.55	5.21	5.32	5.18	5.97	5.73	5.5	5.35	7.05	6.77		
			Apr-10																	
			µg/L																	
1	2000	µg/L	Trichlorofluoromethane		21.9															
			µmhos/cm																	
			Field Specific Conductance		255															
			deg C																	
			Field Temperature		14.3															
			mg/L																	
			Oxygen, Dissolved		2.7															
			mV																	
			REDOX		-7															
			NTU																	
			Turbidity		2															
			Std. Units																	
			Field pH		5.46															

To distinguish non detections (ND) from not sampled (NS), refer to complete laboratory analysis. This table represents both ND and NS as blanks.

Old Salisbury Road C&D Landfill - Historic Groundwater Detections

Highlighted cells are at or above the current standard. Blank cells indicate either NS or ND.

MCL SWSL	MCL 2L	Value	Jan-96	Oct-96	May-97	Oct-97	May-98	Nov-98	Jun-99	Nov-99	Jun-00	Dec-00	Jul-01	Nov-01	Apr-02	Dec-02	May-03	Nov-03	May-04	Aug-04	Nov-04	Jun-05	Nov-05	Apr-06	Nov-06	Apr-07	Nov-07	Mar-08	Dec-08	Mar-09	Sep-09	Mar-10	Apr-10
		µg/L																															
		MW-1R																															
10	10 µg/L	Arsenic												5.8																			
100	700 µg/L	Barium	224	180	100	290	100	160	150	130	110	150	87	280	130	100	120	460	96.3		95	48	78	82	94	81	105	90.3	85	74.3	92.8	85.3	
100	700 µg/L	Carbon disulfide	23					28																									
10	10 µg/L	Chromium		6	3	11	49	12	7.8	5.2		6.6	6.6	22	5	2.3	4.3		3.5		2							0.49	0.64	0.88	2	1.4	
10	15 µg/L	Lead	6			12								10				22															
0.2	1 µg/L	Mercury	1.8	0.2																													
1	5 µg/L	Methylene Chloride							13																								
10	20 µg/L	Selenium																				5.5											
10	20 µg/L	Silver																										0.43	0.62		0.48	0.29	
1	600 µg/L	Toluene												21																			
		MW-2R																															
100	4000 µg/L	2-Butanone (MEK)	86																														
10	10 µg/L	Arsenic						11																									
100	700 µg/L	Barium	350	160	200	340	190	1100	150	120	180	61	280	160	100	140	56	60	55		52	43	62	52	90	79	107	102	98.8	88.5	80.7	103	
1	2 µg/L	Cadmium			3											1.9																	
5	70 µg/L	Chloroform																											3.4				
10	10 µg/L	Chromium	12	9	4	43	34	210	7.8	14	3	3.9	16	16		2.1		2.2										0.79	0.5	1.6		1.2	
10	15 µg/L	Lead	26	8	14	31	19	68		6.9	6.5		8.9	7																			
0.2	1 µg/L	Mercury	0.4																				0.34										
1	5 µg/L	Methylene Chloride							13																								
10	20 µg/L	Silver			6																							0.93	1.2	0.58	0.68	0.67	
1	2000 µg/L	Trichlorofluoromethane																														22.2	21.9
		MW-3R																															
10	10 µg/L	Arsenic								5.9		31	18	8.4	7.4																	4	
100	700 µg/L	Barium	1230	790	800	620	860	1400		52	300	1500	950	400	370	13	220	200	270		340	300	300	290	230	310	273	293	231	252	289	314	
1	2 µg/L	Cadmium																							2							0.82	
100	700 µg/L	Carbon disulfide																												3.3	26.1		
10	10 µg/L	Chromium	9	20	28	16	25	77		24		100	50	19	15			2.3	3.7		2.3							0.63					
10	15 µg/L	Lead	15	15	27	26	32	39		40		80	53	35	21				14														
0.2	1 µg/L	Mercury	0.7			0.2																											
10	20 µg/L	Selenium																								24	18.1	4.9	11.8				
10	20 µg/L	Silver																										0.87	1.5	0.29	1	0.45	
		MW-4R																															
10	10 µg/L	Arsenic								7.5			5.6	12					9.2														
100	700 µg/L	Barium	595	720	280	650	850	2000	950	860	570	350	550	900	61	86	94	97	380		140	150	180	220	220	200	287	172	263	58.3	334	55.9	
1	2 µg/L	Cadmium	7																														
10	10 µg/L	Chromium	21	47		55	130	300	110	60		28	38	95		5	5.5	2.6	14									0.4	0.58	1.2	5.4	1.3	
10	15 µg/L	Lead	17	16	12	29	43	76	50	40	9.5	8.1	14	36		6	5.3		18												4.8		
0.2	1 µg/L	Mercury	1.7	0.3				0.21		0.36																							
1	5 µg/L	Methylene Chloride							10																								
10	20 µg/L	Silver			6																							0.94	2.6		2.4		

Old Salisbury Road C&D Landfill - Historic Groundwater Detections

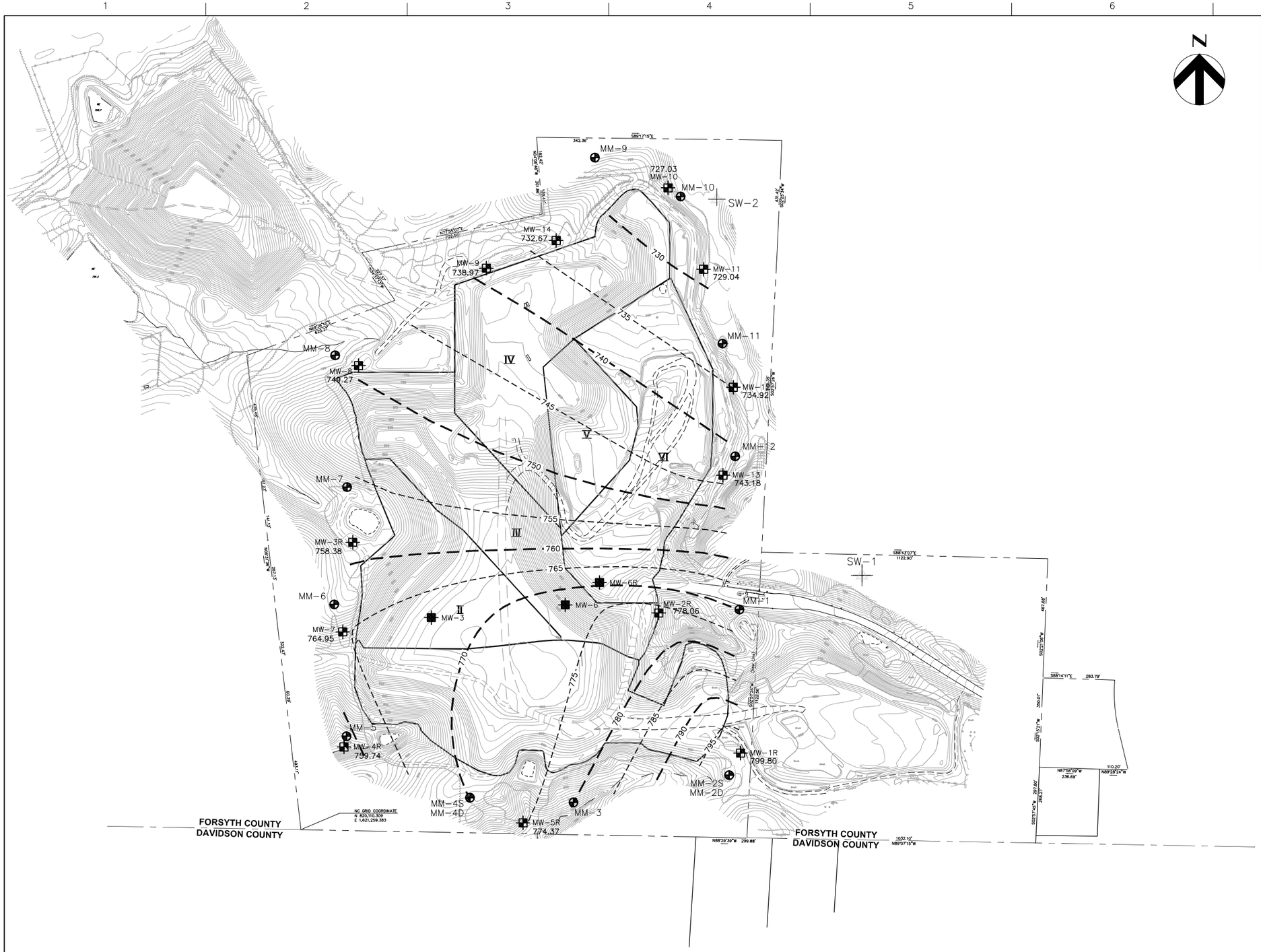
Highlighted cells are at or above the current standard. Blank cells indicate either NS or ND.

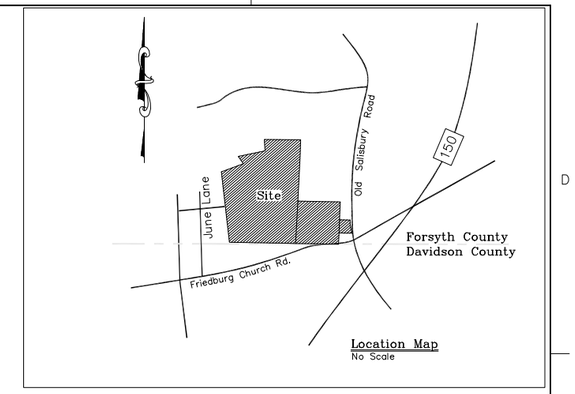
MCL SWSL	MCL 2L	Value	Jan-96	Oct-96	May-97	Oct-97	May-98	Nov-98	Jun-99	Nov-99	Jun-00	Dec-00	Jul-01	Nov-01	Apr-02	Dec-02	May-03	Nov-03	May-04	Aug-04	Nov-04	Jun-05	Nov-05	Apr-06	Nov-06	Apr-07	Nov-07	Mar-08	Dec-08	Mar-09	Sep-09	Mar-10	Apr-10
		MW-5R																															
100	6000 µg/L	Acetone						150																									
10	10 µg/L	Arsenic					5					5		7					5		5.1											4.2	
100	700 µg/L	Barium	1000	620	330	610	820	480	240	200	200	400	270	610	150	65	72	65	76		80	53	54	57	58	58	70.6	57.5	56.1	52.6	66.8	54.3	
1	2 µg/L	Cadmium															2.7																
100	700 µg/L	Carbon disulfide						25																									
1	3 µg/L	Chloromethane																					5.4										
10	10 µg/L	Chromium	96	43	70	16	170	96	38	29	8.1	82	49	140	23	7.4	9.5	8.7	7.3		14	5.6	3.5	6.2	6.2	6.4	8.4	5.6	5.3	5.2	8.6	5	
10	15 µg/L	Lead	19	20	14	31	69	29	16	8.2		7.6	7.6	13					5.1														
0.2	1 µg/L	Mercury	0.8																				0.4										
1	5 µg/L	Methylene Chloride							10																								
10	20 µg/L	Silver																										0.56	0.78	0.28	0.6	0.46	
		MW-6R																															
10	10 µg/L	Arsenic												16																			
100	700 µg/L	Barium	1400	590	300	260	360	160		59	82	41	62	530	180	41	24	25	28														
10	10 µg/L	Chromium	12	10	21	14	33	12		2.8		2.6	4.1	95	26	3.2		2.4	2.2														
10	15 µg/L	Lead	18	11	14	14	20				5.8			38	7.6																		
0.2	1 µg/L	Mercury	1.4																														
		MW-7																															
10	10 µg/L	Arsenic							9.8			45	16	17				8.6														3.4	
100	700 µg/L	Barium	1930	970	750	1800	1200	1300	960	390	360	2600	1300	1300	84	210	130	820	180		63	53	60	74	76	89	101	95.7	99	86.9	104	99.3	
100	700 µg/L	Carbon disulfide						9																							12.5		
10	10 µg/L	Chromium	28	21	180	410	430	350	190	62	2.5	580	210	270	6.8	32	17	150	26		4.4							7.3	0.91		0.65		
10	15 µg/L	Lead	17	6	23	53	38	36	30	12	8.7	65	26	36		6	5.3	24															
0.2	1 µg/L	Mercury	1.4	0.4		0.2																	0.24										
1	5 µg/L	Methylene Chloride							10																								
10	20 µg/L	Silver													2.6													0.66	0.96	0.42	0.88	0.56	
		MW-8																															
10	10 µg/L	Arsenic										89	46	36					6														
100	700 µg/L	Barium										4200	2600	2700	150	48	77	52	480		30	25	26	29	29	30	26.6	24	32.8	25	27.2	28.8	
10	10 µg/L	Chromium										240	92	94	23	2	3.8	3.2	28		2.4							0.42	0.97	0.78		1.4	
10	15 µg/L	Lead										400	210	150			6.7		41														
0.2	1 µg/L	Mercury																					0.26					0.1					
10	20 µg/L	Silver																									0.16	0.13	0.15		0.16		
		MW-9																															
100	700 µg/L	Barium																		240	95	85	100	100	140	140	117	124	124	173	128	134	
10	10 µg/L	Chromium																		14									0.47	7.6			
10	15 µg/L	Lead																		14													
10	20 µg/L	Silver																									0.32	0.22	0.36	0.18	0.32	0.27	
		MW-10																															
100	700 µg/L	Barium																		98	55	82	46	48	71	52	40.8	42	41.9	38.9	39.1	46.6	
100	700 µg/L	Carbon disulfide																													13		
10	10 µg/L	Chromium																		13										0.65			
10	15 µg/L	Lead																		6.8													
0.2	1 µg/L	Mercury																					0.2										
10	20 µg/L	Selenium																		6.2													
10	20 µg/L	Silver																													0.19		

Old Salisbury Road C&D Landfill - Historic Groundwater Detections

Highlighted cells are at or above the current standard. Blank cells indicate either NS or ND.

MCL SWSL	MCL 2L	Value	Jan-96	Oct-96	May-97	Oct-97	May-98	Nov-98	Jun-99	Nov-99	Jun-00	Dec-00	Jul-01	Nov-01	Apr-02	Dec-02	May-03	Nov-03	May-04	Aug-04	Nov-04	Jun-05	Nov-05	Apr-06	Nov-06	Apr-07	Nov-07	Mar-08	Dec-08	Mar-09	Sep-09	Mar-10	Apr-10
		MW-11																															
100	700 µg/L	Barium																		47	28	24	27	26	24	25	23.1	29.2	28.6	28.4	31.8	37.6	
10	10 µg/L	Chromium																		3.3	3.9												
10	20 µg/L	Selenium																											8.7				
10	20 µg/L	Silver																									0.39	0.41	0.79		0.5	0.48	
		MW-12																															
10	10 µg/L	Arsenic																														2.7	
100	700 µg/L	Barium																		74	77	50	77	55	66	31	47.3	60.5	57.9	34.5	38	40.6	
10	10 µg/L	Chromium																			2.1			4				1.8		2		2.4	
10	20 µg/L	Silver																									0.26	0.15	0.37		0.39	0.2	
		MW-13																															
5	7 µg/L	1,1-Dichloroethene																													19.8		
100	700 µg/L	Barium																		160	57	46	59	65	62	79	85.6	64.6	88.7	79.2	117	126	
10	10 µg/L	Chromium																		9.2	4.8			2				1.1	2.2	1.6	0.8	1.7	
10	15 µg/L	Lead																		11													
10	20 µg/L	Silver																										0.21	0.44		0.41	0.4	
1	2000 µg/L	Trichlorofluoromethane																													18.6		
		MW-14																															
10	10 µg/L	Arsenic																							8.3				7.3				
100	700 µg/L	Barium																		170	66	69	120	250	460	210	130	186	583	97.9	242	130	
10	10 µg/L	Chromium																		3.2			3.9	15	35	6.6	1.7	4.1	40.2	0.4	10.7	3	
10	15 µg/L	Lead																		8			5.9	13	23	5.2			26.2		7.2		
0.2	1 µg/L	Mercury																					0.44				0.1						
10	20 µg/L	Silver																									0.48	0.56	0.46		0.54	0.39	
		SW-1																															
100	6000 µg/L	Acetone																									22.7						
10	10 µg/L	Arsenic																		20		23										3.7	
100	700 µg/L	Barium																		500	53	750	73	120	54	88	70.3	79.7	78.2	45.6	77.7	92.5	
10	10 µg/L	Chromium																		36	3.2	52		4.2			0.61	1.2	0.67	0.61			
10	15 µg/L	Lead																		38		57									17.5		
0.2	1 µg/L	Mercury																					1.1										
10	20 µg/L	Silver																									0.51	0.37	0.39		0.62	0.28	
		SW-2																															
10	10 µg/L	Arsenic																								5.5							
100	700 µg/L	Barium																		63	65	47	51	150	44	300	49.4	50.6	50.6	46.3	52.1	59.4	
10	10 µg/L	Chromium																						4.7		17				0.42			
10	15 µg/L	Lead																						7.6		11							
0.2	1 µg/L	Mercury																													0.08		
10	20 µg/L	Selenium																								21							
10	20 µg/L	Silver																									0.26	0.26	0.5		0.36	0.2	





Location Map
No Scale

LEGEND

- EXISTING CONTOURS
- PROPERTY BOUNDARY
- COUNTY LINE
- PROPOSED PHASING BOUNDARY
- SWAMP, STANDING WATER
- STREAM
- MONITORING WELLS (MW & OW) — PROPOSED, EXISTING, ABANDONED
- METHANE PROBES (MM)
- SW-# SURFACE WATER
- 730 GROUNDWATER INDEX CONTOURS
- 735 GROUNDWATER INTERMEDIATE CONTOURS

NOTES

1. AERIAL TOPOGRAPHIC SURVEY PROVIDED BY BRADY SURVEYING COMPANY. DATE OF PHOTOGRAPH IS JANUARY 1, 2009.
2. PROPERTY SURVEY TAKEN FROM DATA SUPPLIED BY BRADY SURVEYING, INC. DATED MARCH 14, 1994.
3. GROUNDWATER ELEVATIONS MEASURED ON MARCH 15, 16 AND 17, 2010.
4. MSL– MEAN SEA LEVEL

HDR Engineering, Inc.

ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	M.D. PLUMMER, P.E.
	E.A. WRIGHT, P.E.
	J. GAUL
PROJECT NUMBER	00000013625.018

OLD SALISBURY ROAD C & D LANDFILL

WINSTON-SALEM NORTH CAROLINA

GROUNDWATER CONTOURS AND MONITORING LOCATIONS

0 1" 2"

FILENAME	00D–02.dwg
SCALE	1"=200'

SHEET 00D-02

C:\pwworking\tpa\d0131119\00D-02.dwg, Layout1, 5/14/2010 1:04:39 PM, jgaul