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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.

Received OCT 2007 Solid Waste Section

Solid Waste Monitoring Data Submittal Information

Name of entity submitting data (laboratory, consultant, facility owner):

Mecklenburg County Land Use & Environmental Services

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

Name: Dennis F. Tyndall, P.G. Phone: (704) 336-5454

E-mail: Dennis.Tyndall@MecklenburgCountyNC.gov

Facility name:	Facility Address:	Facility Permit #	NC Landfill Rule: (.0500 or .1600)	Actual sampling dates (e.g., October 20-24, 2006)
Holbrooks Road Landfill	15401 Holbrooks Road	60-02	.0500	February 21, 2007 LFG March 20-21, 2007 WQ

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
☐ Groundwater monitoring data from private water supply wells
☐ Leachate monitoring data
☒ Surface water monitoring data
☒ Methane gas monitoring data
☐ Corrective action data (specify) _____
☐ Other(specify)

Notification attached?

☐ No. No groundwater or surface water standards or explosive methane gas limits 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.

Dennis F. Tyndall, P.G. — Facility Representative Name (Print)
Hydrogeologist — Title
(704) 336-5454 — (Area Code) Telephone Number

Signature: _____ Date: 02 OCT 2007

Affix NC Licensed/ Professional Geologist Seal

NORTH CAROLINA LICENSED SEAL 1845 GEOLOGIST DENNIS F. TYNDALL

Revised 10/2006

Holbrooks Rd. Landfill Permit 60-02 March 2007
Analytes in Excess of 2L Std.

Facility Permit	Well ID	SWS ID	CAS Number	Parameter	Result	2L Std.	Units	Cause/Significance
60-02	HRW-18	16	71-43-2	BENZENE	9	1	ug/L	Municipal landfill leachate/Landfil Gas Migration front transported VOC
60-02	HRW-18	201	79-01-6	TRICHLOROETHENE	4	2.8	ug/L	Municipal landfill leachate/Landfil Gas Migration front transported VOC
60-02	HRW-18	211	75-01-4	VINYL CHLORIDE	32	0.015	ug/L	Result of autochthonous microflora reductive dechlorination of PCE,TCE & cDCE
60-02	HRW-18	71	106-46-7	1,4-DICHLOROBENZENE	4	1.4	ug/L	Municipal landfill leachate/Landfil Gas Migration front transported VOC
60-02	HRW-18	75	75-34-3	1,1-DICHLOROETHANE	76	70	ug/L	Municipal landfill leachate/Landfil Gas Migration front transported VOC
60-02	HRW-7	201	79-01-6	TRICHLOROETHENE	12	2.8	ug/L	Municipal landfill leachate/Landfil Gas Migration front transported VOC
60-02	HRW-7	211	75-01-4	VINYL CHLORIDE	6	0.015	ug/L	Result of autochthonous microflora reductive dechlorination of PCE,TCE & cDCE
60-02	HRW-7	34	7440-43-9	CADMIUM BY ICP	6.7	1.75	ug/L	Desoprtion and mobilization of Cadmium resulting from Low pH
60-02	HRW-9	140	75-09-2	METHYLENE CHLORIDE	25	0.7	ug/L	Municipal landfill leachate/Landfil Gas Migration front transported VOC
60-02	HRW-9	16	71-43-2	BENZENE	3	1	ug/L	Municipal landfill leachate/Landfil Gas Migration front transported VOC
60-02	HRW-9	201	79-01-6	TRICHLOROETHENE	13	2.8	ug/L	Municipal landfill leachate/Landfil Gas Migration front transported VOC
60-02	HRW-9	192	127-18-4	TETRACHLOROETHENE	7	0.7	ug/L	Municipal landfill leachate/Landfil Gas Migration front transported VOC
60-02	HRW-9	211	75-01-4	VINYL CHLORIDE	12	0.015	ug/L	Result of autochthonous microflora reductive dechlorination of PCE,TCE & cDCE
60-02	HRW-9	71	106-46-7	1,4-DICHLOROBENZENE	5	1.4	ug/L	Municipal landfill leachate/Landfil Gas Migration front transported VOC
60-02	HRW-9	78	156-59-2	CIS-1,2- DICHLOROETHENE	74	70	ug/L	Result of autochthonous microflora reductive dechlorination of PCE,TCE

Field-Measured Parameters in Excess of 2L Std.

Facility Permit	Well ID	CAS Number	SWS ID	Parameter	Result	2L Std.	Units	Cause/Significance
60-02	HRW-7	320	320	pH (field)	6.21	6.5-8.5 SU	S.U.	Natural Occurance
60-02	HRW-8	320	320	pH (field)	6.30	6.5-8.5 SU	S.U.	Natural Occurance
60-02	HRW-16	320	320	pH (field)	5.99	6.5-8.5 SU	S.U.	Natural Occurance
60-02	HRW-18	320	320	pH (field)	6.47	6.5-8.5 SU	S.U.	Natural Occurance
60-02	HRW-19	320	320	pH (field)	6.39	6.5-8.5 SU	S.U.	Natural Occurance
60-02	HRW-21	320	320	pH (field)	6.48	6.5-8.5 SU	S.U.	Natural Occurance

= Result exceeds 2L Std.

NOTE: HRW-21 is background well

Holbrooks Road Landfill, Permit 60- 02 Methane Monitoring Data 2/21/2007

FACILITY PERMIT	WELL ID	SWS ID	CAS Number	PARAMETER	RESULT	UNITS	COLLECT DATE	Sampler
60-02	HP-1	329	329	LFG	58	% Gas	2/21/2007	D. Tyndall
60-02	HP-2	329	329	LFG	47	% Gas	2/21/2007	D. Tyndall
60-02	HP-3	329	329	LFG	48	% Gas	2/21/2007	D. Tyndall
60-02	HP-4	329	329	LFG	0	% Gas	2/21/2007	D. Tyndall
60-02	HP-8	329	329	LFG	56	% Gas	2/21/2007	D. Tyndall
60-02	HP-9	329	329	LFG	2	% Gas	2/21/2007	D. Tyndall
60-02	HP-10	329	329	LFG	0	% Gas	2/21/2007	D. Tyndall
60-02	HP-11	329	329	LFG	29	% Gas	2/21/2007	D. Tyndall
60-02	HP-13	329	329	LFG	7	% Gas	2/21/2007	D. Tyndall
60-02	HP-14	329	329	LFG	2	% Gas	2/21/2007	D. Tyndall
60-02	HP-15	329	329	LFG		% Gas	2/21/2007	D. Tyndall
60-02	HP-16R	329	329	LFG		% Gas	2/21/2007	D. Tyndall
60-02	HP-18R	329	329	LFG		% Gas	2/21/2007	D. Tyndall
60-02	HP-19R	329	329	LFG	0	% Gas	2/21/2007	D. Tyndall
60-02	HP-20R	329	329	LFG		% Gas	2/21/2007	D. Tyndall
60-02	HP-22R	329	329	LFG		% Gas	2/21/2007	D. Tyndall
60-02	HP-23R	329	329	LFG		% Gas	2/21/2007	D. Tyndall
60-02	HP-24	329	329	LFG	1	% Gas	2/21/2007	D. Tyndall
FACILITY PERMIT	TRENCH VENT ID	SWS ID	CAS Number	PARAMETER	RESULT	UNITS	COLLECT DATE	Sampler
60-02	V-1	329	329	LFG	3	% Gas	2/21/2007	D. Tyndall
60-02	V-2	329	329	LFG	9	% Gas	2/21/2007	D. Tyndall
60-02	V-3	329	329	LFG	36	% Gas	2/21/2007	D. Tyndall
60-02	V-4	329	329	LFG	20	% Gas	2/21/2007	D. Tyndall
60-02	V-5	329	329	LFG	12	% Gas	2/21/2007	D. Tyndall
60-02	V-6	329	329	LFG	6	% Gas	2/21/2007	D. Tyndall
60-02	V-7	329	329	LFG	0	% Gas	2/21/2007	D. Tyndall
60-02	V-8	329	329	LFG	0	% Gas	2/21/2007	D. Tyndall
60-02	V-9	329	329	LFG	0	% Gas	2/21/2007	D. Tyndall
Property Line Probe								
LFG = Landfill Gas								

MECKLENBURG COUNTY

Land Use and Environmental Services Agency

October 2, 2007

Jaclynne Drummond
North Carolina Department of Environment
and Natural Resources
Division of Waste Management
Groundwater Compliance Unit
Mail Service Center 1646
Raleigh, NC 27699-1646

Subject: Holbrooks Road Landfill Permit 60-02
Semi-annual Monitoring Results

Dear Ms. Drummond:

Mecklenburg County conducted semi-annual water quality monitoring at the closed Holbrooks Road Landfill in March 2007 in accordance with the approved sample and analysis plan dated March 27, 2003. This report details the results of that monitoring event. Laboratory data, field data, tables of values exceeding 2L standards and landfill gas data is contained on the electronic data deliverable submittal on this CD.

Samples were collected from eleven (11) monitoring wells (HRW-7, HRW-8, HRW-9, HRW-10, HRW-11R, HRW-13, HRW-16, HRW-18, HRW-19, HRW-20 and HRW-21) and three (3) surface-water sampling locations (HRSW-2, HRSW-3 and HRSW-4). Samples were analyzed for metals and volatile organic compounds ("VOCs") listed in Appendix I of 40 CFR Part 258.54 "Detection monitoring program". Field measurements of temperature, pH, and specific conductivity were made at each sampling location using a calibrated instrument. Additionally, measurements of dissolved oxygen were made at each surface-water sampling location.

The Excel spreadsheets containing the monitoring data are labeled to reflect the units that are used for reporting. Detection levels and applicable standards have been included for all sampling locations. Surface water standards listed are the water quality standards established for freshwater classification for aquatic life as outlined in 15A NCAC 2B "Classification and Water Quality Standards Applicable to Surface Waters of North Carolina". Groundwater standards listed are the standards outlined in 15A NCAC 2L "Classification of Water Quality Standards applicable to the Groundwaters of North Carolina". If the sample is reported in parts per billion, then the standard is also reported in parts per billion. Results exceeding water quality standards are highlighted in yellow for ease of identification.

Surface-water samples:
No metals or VOCs were detected in any of the samples collected from the three surface-water sampling locations (HRSW-2, HRSW-4 and HRSW-3). All field-measured parameters were within the established regulatory limits. The table below summarizes field-measured parameters for surface-water samples.

Sample Location	Temp. °C	pH S.U.	Specific Conductivity ms/cm	Dissolved Oxygen mg/l
HRSW-2 upstream	13.2	6.67	0. 183	12.9
HRSW-4 mid-stream	13.3	6.69	0. 180	14.7
HRSW-3 downstream	13.5	6.87	0.193	12.8

Groundwater samples:
Cadmium was detected above the 2L standard in the sample collected from HRW-7. Barium, Chromium, Cobalt Copper, Nickel, Selenium, Vanadium and Zinc were detected below the respective 2L standards. The table below summarizes metals detection for groundwater samples. Bolded values indicate a result in excess of the 2L standard.

Well ID	Ba ug/l	Cd ug/l	Cr ug/l	Co ug/l	Cu ug/l	Pb ug/l	Ni ug/l	Se ug/l	Vn ug/l	Zn ug/l
HRW-7	240	**6.7**	-----	6.9	8.6	-----	-----	-----	5.9	28
HRW-8	-----	-----	-----	5.5	10	-----	-----	-----	14	16
HRW-9	280	-----	-----	-----	7	-----	-----	-----	5.6	-----
HRW-10	180	-----	5.3	11	13	-----	18	7.3	25	18
HRW-11R	100	-----	-----		6	-----	6.1	-----	5.5	13
HRW-13	140	-----	15	9.2	36	-----	9.5	-----	27	35
HRW-16	170	-----	12	15	28	-----	7.8	-----	52	33
HRW-18	300	-----	-----	-----	-----	-----	7.1	-----	-----	-----
HRW-19	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
HRW-20	-----	-----	-----	-----	-----	-----	-----	-----	7.2	-----
HRW-21	-----	-----	-----	-----	-----	-----	-----	-----	5.3	-----
2L Std.	2,000	1.75	50	-----	1,000	15	100	50	-----	1,050

VOCs were detected in five monitoring wells; HRW-7, HRW-9, HRW-13, HRW-18 and HRW-20.

The number of VOCs detected in HRW-7 increased from two to three compared to the September 2006 monitoring results. Vinyl Chloride was detected for the first time in HRW-7. Trichloroethene and Vinyl Chloride exceeded the 2L standard. Cis-1,2-Dichloroethene was detected below the standard.

The number of VOCs detected in HRW-9 increased from 9 to 10 compared with the September 2006 monitoring results. Benzene, Cis-1,2-Dichloroehten, 1,4-Dichlorobenzene, Methylene Chloride, Tetrachloroethene, Trichloroethene and Vinyl Chloride exceeded the 2L standard in the sample collected from HRW-9.

The number of VOCs detected in HRW-13 has declined significantly since September 2005. Trichloroethylene1,2-Dichloropropane had been consistently detected above the standard previously. No VOCs detected in HRW-13 this sampling event exceeded the 2L standards. 1,1-Dichloroethane, Chloroethane and Cis-1,2-Dichloroethene were detected below the standard.

The number of VOCs detected in HRW-18 increased from six to eight. Vinyl Chloride, Trichloroethene, Chloroethane and 1,4-Dichlorobenzene were detected above the 2L standard. Cis-1,2-Dichloroethene and Trichlorofluoromethane were detected below the standard.

1,1-Dichloroethane was detected below the 2L standard in the sample from HRW-20. This is the first detection of a VOC in HRW-20.

A summary of VOC's detected is provided in the table below. Bolded values indicate a result in excess of the 2L standard.

Well ID	Volatile Constituent	Concentration (ug/l)	2L Standard (ug/l)
HRW-7	**Trichloroethene**	**12**	**2.8**
	Cis-1,2-Dichloroethene	10	70
	Vinyl Chloride	**6**	**0.015**
HRW-9	**Cis-1,2 Dichloroethene**	**74**	**70**
	Methylene Chloride	**25**	**0.7**
	Tetrachloroethene	**7**	**0.7**
	Trichloroethene	**13**	**2.8**
	Trichlorofluoromethane	15	2,100
	Benzene	**3**	**1**
	Vinyl Chloride	**12**	**0.015**
	1,2-Dichlorobenzene	6	24
	1,4-Dichlorobenzene	**5**	**1.4**
	1,1-Dichloroethane	44	70
HRW-13	Chloroethane	6	70
	Cis-1,2-Dichloroethene	7	2,800
	1,1-Dichloroethane	24	70
HRW-18	**1,1-Dichloroethane**	**76**	**70**
	Benzene	**9**	**1**
	Cis-1,2-Dichloroethene	**6**	70
	Trichlorofluoromethane	**10**	2,100
	Vinyl Chloride	**32**	**0.015**
	Trichloroethene	**4**	**2.8**
	Chloroethane	12	2,800
	1,4 Dichlorobenzene	**4**	**1.4**
HRW-20	1,1-Dichloroethane	4	70

Measurements of pH were more acidic than the 2L standard range of 6.5 to 8.5 standard units at locations HRW-7, HRW-8, HRW-9, HRW-16, HRW-18, HRW-21 and background well HRW-21. Field- measured parameters for groundwater samples are summarized in the table below. Values exceeding the 2L standard for pH are shown in bold.

Sample Location	Temp. °C	PH	Specific Conductivity ms/cm
HRW-7	17.8	**6.21**	0.594
HRW-8	11.0	**6.30**	0.084
HRW-9	14.5	**5.98**	0.752
HRW-10	11.7	6.95	0.883
HRW-11R	13.0	6.64	0.324
HRW-13	11.0	6.53	0.297
HRW-16	11.2	**5.99**	0.097
HRW-18	16.6	**6.47**	1.268
HRW-19	15.6	**6.39**	0.264
HRW-20	15.5	6.70	0.152
HRW-21	16.0	**6.48**	0.467

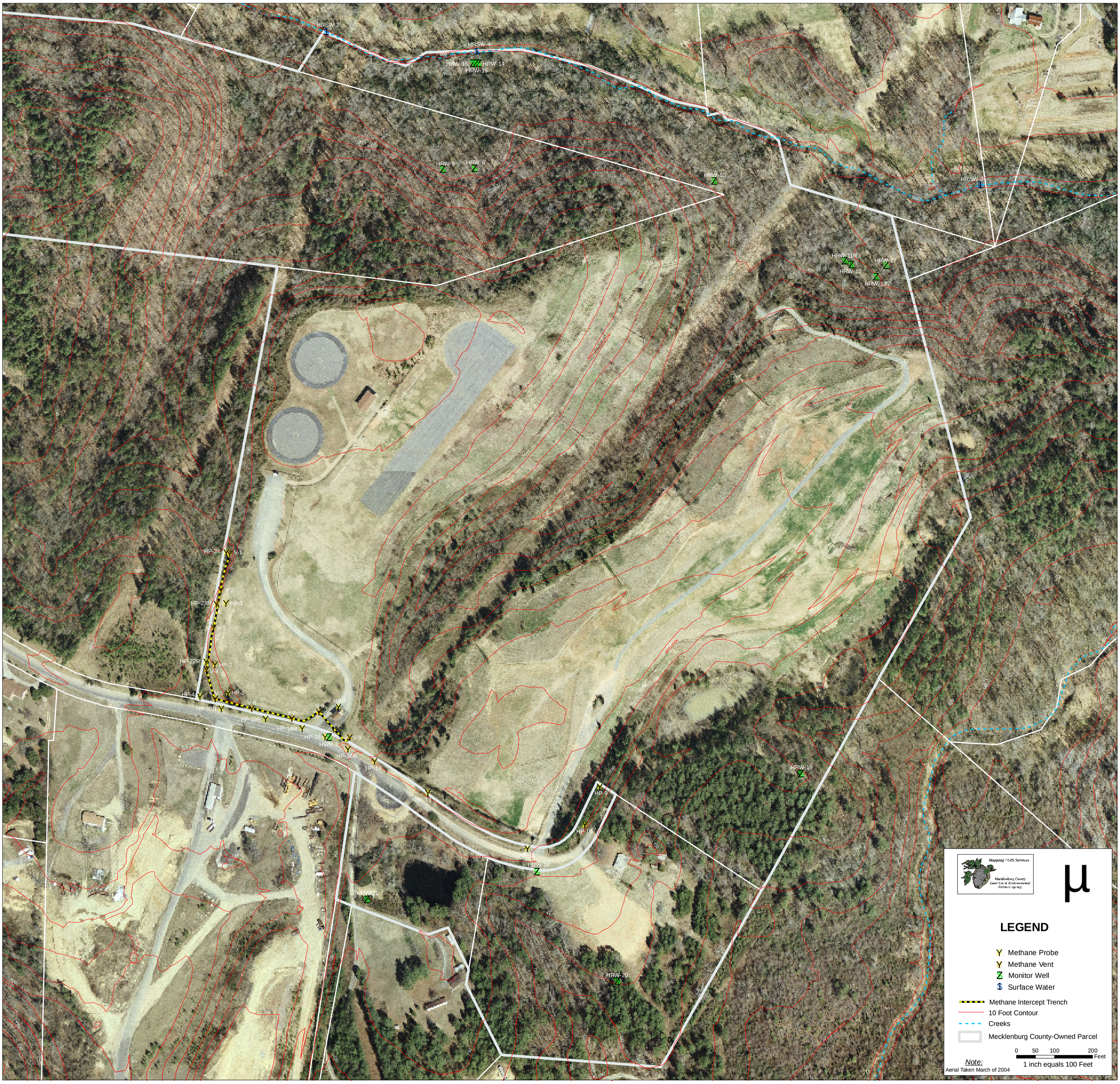
Please call me at (704) 336-5454 if you have any questions regarding this report.

Sincerely,

Dennis F. Tyndall

Dennis F. Tyndall, P.G.
Hydrogeologist
Groundwater Program

cc: Abmer Lindon, P.G., Mecklenburg County LUESA, Solid Waste
Geoff Burdick, Mecklenburg County LUESA, Solid Waste


HRSW-2
HRSW-4
HRW-16
HRW-14
HRW-15
HRW-9
HRW-8
HRW-10
HRSW-3
HRW-11R
HRW-12
HRW-17
HRW-13
HP-24
V-1
V-2
HP-23R
HP-1
V-3
HP-22R
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V-7
HP-19R
V-8
HP-5
HP-18R
HP-15
HWR-7
V-9
HP-16R
HP-14
HP-13
HP-9
HP-10
HRW-19
HRW-18
HRW-21
HRW-20
Mapping / GIS Services
Mecklenburg County
Land Use & Environmental
Services Agency
LEGEND
Methane Probe
Methane Vent
Monitor Well
Surface Water
Methane Intercept Trench
10 Foot Contour
Creeks
Mecklenburg County-Owned Parcel
0 50 100 200 Feet
1 inch equals 100 Feet
Note:
Aerial Taken March of 2004