



July 23, 2012

0839-650611.800

Ms. Jackie Drummond  
Department of Environment and Natural Resources  
Division of Waste Management  
Solid Waste Section  
217 West Jones Street  
Raleigh, North Carolina 27603

**RE: SUMMARY OF LANDFILL GAS MONITORING WELL INSTALLATION  
HENDERSON COUNTY CONSTRUCTION & DEMOLITION LANDFILL, PERMIT NO. 45-01  
HENDERSONVILLE, NORTH CAROLINA**

Dear Jackie:

On behalf of Henderson County, Golder Associates NC, Inc. (Golder) is submitting the enclosed letter report summarizing the installation of landfill gas monitoring wells at the closed Henderson County Construction and Demolition (C&D) Landfill in Hendersonville, North Carolina. The landfill gas monitoring wells were installed in accordance with the *Landfill Gas Monitoring Plan*, dated January 20, 2012, which was approved by the North Carolina Department of Environment and Natural Resources (NC DENR) in a letter dated March 15, 2012.

On April 24 and 25, 2012, a Golder geologist provided oversight for the installation of three landfill gas monitoring wells (LFG-101, LFG-102, and LFG-103) in accordance with 15A NCAC Subchapter 13B .0544(d)(2) and NC DENR's *Landfill Gas Monitoring Guidance* (November 2010). The landfill gas monitoring wells were installed by Geologic Exploration Inc. of Statesville, North Carolina using a Deidrich D-120 drilling rig utilizing 4.25-inch inner diameter (ID) hollow stem augers (HSAs). Samples were collected with 24-inch long split-spoon samplers on 5-foot centers for geologic description and standard penetration test (SPT) blow-counts. Drilling was continued until groundwater or bedrock was encountered. When groundwater was encountered, the water level was allowed to stabilize and the borehole was backfilled to construct the methane monitoring probes approximately 5 feet above stabilized groundwater levels.

The borings for LFG-101 and LFG-102 were terminated once groundwater was encountered. The water level in each boring was allowed to stabilize overnight before the wells were constructed. During the drilling of LFG-103, auger refusal was first encountered at 12 feet below ground surface (bgs), which was much shallower than estimated in the *Landfill Gas Monitoring Plan*. After a telephone conversation with you on April 25, 2012, the location of the well was moved approximately 100 feet and re-drilled. Auger refusal at the second boring was encountered at 18 feet bgs and the well was constructed. The original boring was backfilled with cuttings.

The methane monitoring probes were constructed with 2-inch schedule 40 polyvinyl-chloride (PVC) screen and riser pipe. The 0.010-inch slotted screen was installed from the bottom of each probe to 5 feet bgs. Concrete aprons and lockable aluminum protective casings were installed at each landfill gas monitoring well location. Sampling ports were installed on the top of each riser pipe. The probes were surveyed by McGill Associates, P.A. of Asheville, North Carolina on May 16, 2012. A sealed survey plat for the newly installed wells is provided as Attachment A.

A summary of landfill gas monitoring well drilling and construction data are provided on Table 1. Soil boring and well construction logs for the landfill gas monitoring wells and the Well Construction Records (Form GW-1B Rev. 2/09) are included as Attachment B. The locations of the newly installed landfill gas monitoring wells are shown on Drawing 1.

In accordance with the North Carolina Solid Waste Management Rules 15A NCAC 13B.0544 and the *Landfill Gas Monitoring Plan*, the landfill gas monitoring wells will be monitored quarterly for methane and



## TABLES

TABLE 1

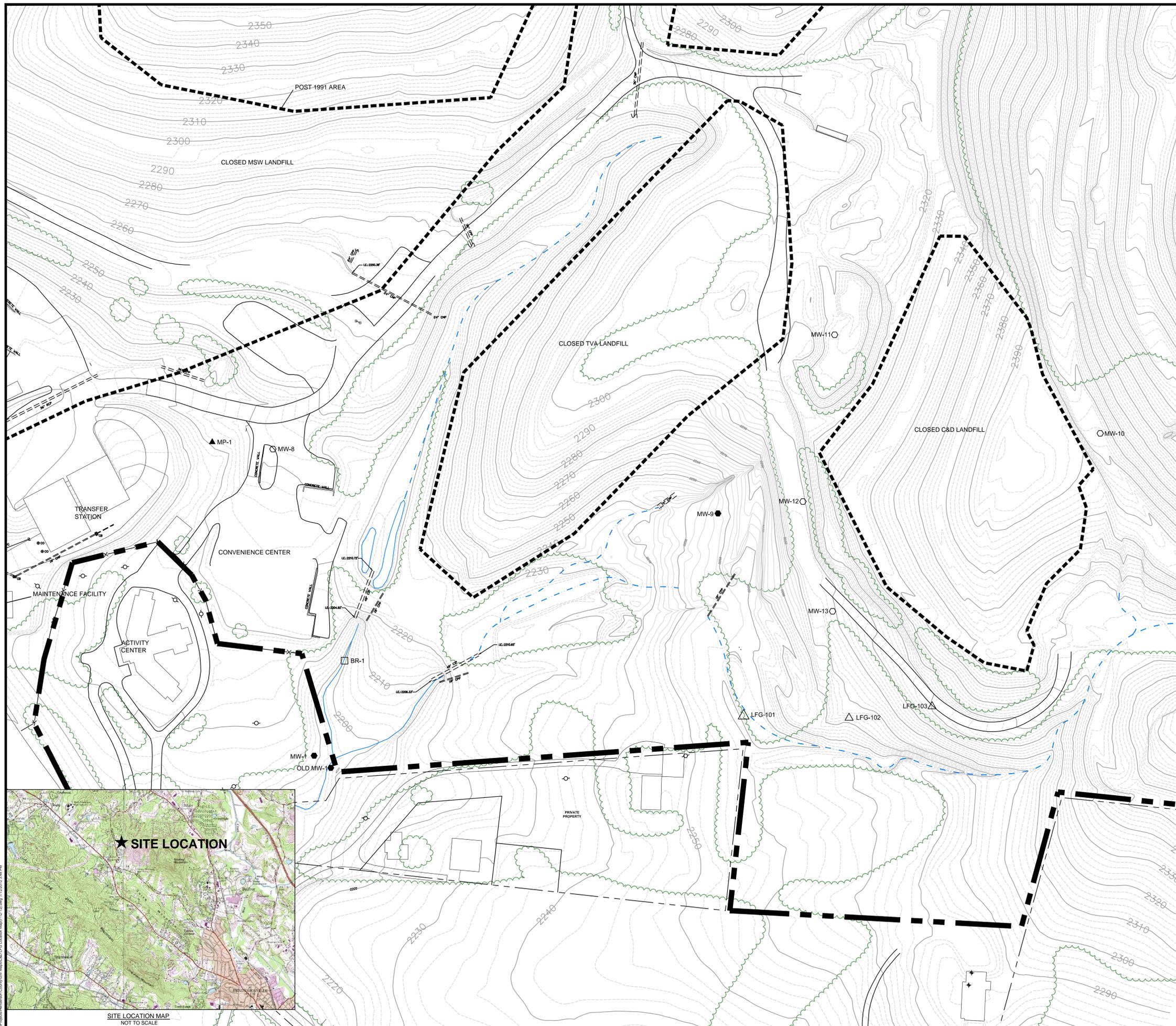
Summary of Landfill Gas Monitoring Well Construction Information  
Henderson County C&D Landfill, Permit No.45-01

Landfill Gas Monitoring Well Identification	Date Installed	Casing Diameter (inches)	Elevations		Total Depth Drilled		Groundwater Surface		Top of Bedrock		Screened Interval				Lithology of Screened Interval
			Ground Surface	TOC	Depth (ft bgs)	Elevation (ft AMSL)	Depth (ft bgs)	Elevation (ft AMSL)	Depth (ft bgs)	Elevation (ft AMSL)	Depth (ft bgs)		Elevation (ft AMSL)		
			ft AMSL								from	to	from	to	
LFG-101	04/25/12	2	2257.03	2259.72	26.5	2230.5	11.1	2245.9	NE	NE	5.0	10.0	2252.0	2247.0	Saprolite
LFG-102	04/25/12	2	2275.68	2278.61	41.5	2234.2	27.0	2248.7	NE	NE	5.0	22.0	2270.7	2253.7	Saprolite
LFG-103	04/25/12	2	2320.43	2323.26	18.0	2302.4	NE	NE	18	2302.43	5.0	18.0	2315.4	2302.4	Saprolite/PWR

Notes:

1. ft AMSL = feet above mean sea level
2. bgs = below ground surface
3. TOC = top of casing
4. PWR = partially weathered rock
5. NE = not encountered

**DRAWING**

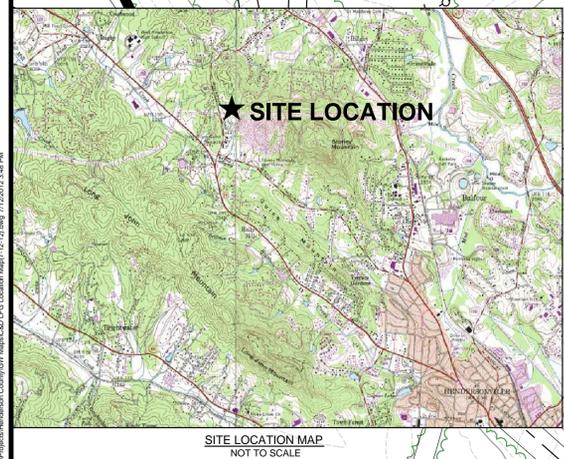


**LEGEND**

	EXISTING 10 FT. CONTOUR
	EXISTING 2 FT. CONTOUR
	PROPERTY LINE
	LIMITS OF WASTE
	STREAM
	TREELINE
	EXISTING ROAD
	TOPOGRAPHIC DIVIDING LINE (SEE NOTE 9)
	MW-8 MONITORING WELL AND IDENTIFICATION
	MW-1 NON COMPLIANCE MONITORING WELL AND IDENTIFICATION
	MP-6 METHANE MONITORING PROBE AND IDENTIFICATION
	BR-1 SURFACE WATER MONITORING POINT AND IDENTIFICATION
	LFG-101 LANDFILL GAS MONITORING WELL

- NOTES**
1. TOPOGRAPHIC CONTOUR INTERVAL = 2 FEET
  2. APPROVED WATER QUALITY MONITORING WELL NETWORK FOR THE C&D LANDFILL INCLUDES: MW-10, MW-11, MW-12, AND MW-13.
  3. COORDINATE SYSTEM IS N.C. STATE PLANE GRID.

- REFERENCES**
1. BASE MAP PROVIDED BY MCGILL ASSOCIATES IN 2011.
  2. LFG MONITORING WELLS LFG-101, LFG-102 AND LFG-103 SURVEYED BY MCGILL ASSOCIATES ON MAY 16, 2012.



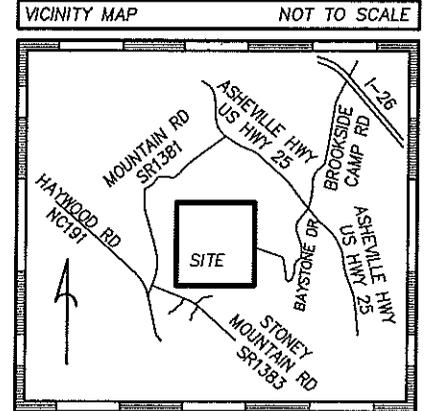
REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RW
PROJECT: HENDERSON COUNTY CLOSED C&D LANDFILL PERMIT # 45-01						
TITLE: LANDFILL GAS MONITORING WELL LOCATION MAP						
PROJECT No. 0839-650611.800			FILE No. C&D LFG Location Map-12-01		SCALE AS SHOWN REV. -	
DESIGN	DYR	7/12/12				
CADD	LKB	7/12/12				
CHECK						
REVIEW						
Golder Associates GREENSBORO, NC						<b>DWG. 1</b>

X:\Projects\Henderson County\GW Map\CD LFG Location Map\12-01.dwg 7/12/2012 3:48 PM

**ATTACHMENT A**  
**SURVEY PLAT**

# NOT FOR RECORDATION, CONVEYANCES, OR SALES

LANDFILL GAS MONITORING WELLS AS-BUILT SURVEY FOR:  
**HENDERSON COUNTY**  
STONEY MOUNTAIN ROAD LANDFILL  
HENDERSON COUNTY, NORTH CAROLINA



SURVEY PROJECT # 12-152  
MCGILL PROJECT # 12.00712

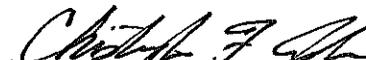
A Static GPS survey was conducted to establish a main control point (29007). A RTK base and rover survey was conducted to establish intermediate control points (28001 and 28002) near the wells. A conventional traverse points (40007, 40008 and 40021) was conducted from the intermediate control to locate the wells.

Static GPS control points were established for this survey using three Topcon Hiper GD static GPS receivers (dates of observations: December 9 - 10, 2009) and raw data from the Hendersonville CORS stations (NCHE) supplied by the National Geodetic Survey (NGS). A minimally constrained, least squares adjustment was performed at the 95% confidence level using Topcon Tools post processing software. NGS control point "Q-39" was held fixed at the published NAD83 (NSRS2007) horizontal coordinates and NGS control point "Cranston" was held fixed at the published NAVD88 orthometric height using geoid 03. Measurements were made to the referenced CORS stations and new control points set on site. Local accuracy was checked between the NGS CORS station listed above and NGS monuments Cranston and Q-39 in accordance with the Geospatial Positioning Accuracy Standards, Part 2: Standards for Geodetic Networks and found to meet the 2-Centimeter accuracy classification at the 95% confidence level both horizontally and vertically. The average combined scale factor for points on the project side is 0.999771422. This survey meets the requirements for a "AA" survey. Coordinates and distances for this site are in US survey feet.

POINT No.	NORTHERN	EASTERN	ELEVATION	DESCRIPTION	METHOD
28001	601438.66	958743.83	2313.36	CPNL	RTK
28002	601615.4	958592.67	2293.13	CPNL	RTK
29007	601964.44	957059.18	2217.42	RBSGPS	STATIC
40007	601363.03	958809.57	2323.57	LFG 103	CONVENTIONAL
40008	601347.01	958678.74	2278.85	LFG 102	CONVENTIONAL
40021	601350.56	958513.67	2259.85	LFG 101	CONVENTIONAL

RTK base and rover survey method:  
Class of survey: Class A  
Positional accuracy: 2 centimeters @ 95%  
Type of GPS field procedure: RTK (BASE AND ROVER)  
Dates of survey: May 15 & 16, 2012  
Datum/Epoch: NAD83(NSRS2007) NAVD88/ Epoch 2003.0  
Published/Fixed-control use: RTK base set @ 29007  
Geoid model: 2003  
Combined grid factor: 0.999771422  
Units: U.S. Survey Feet

I, Christopher F. Jordan, certify that this plat was drawn under my supervision from a conventional field traverse; that the ratio of precision as calculated meets or exceeds the requirements for a Class A survey; that this plat was prepared in accordance to the Standards of Practice for Land Surveying in North Carolina.

  
CHRISTOPHER F. JORDAN NC PLS L-4956      JULY 9, 2012  
DATE



SHEET 1 OF 2

 **McGill**  
ASSOCIATES  
55 BROAD STREET ASHEVILLE, NC 28806 PH. (828) 252-0575  
NC BOARD OF EXAMINERS CORPORATE LICENSE NO. C-0459

R:\Surveying\Surveying Dept\Jobs\2012\12-152 Henderson County Landfill MW's\DWG\MW Wells.dwg 7/12/2012 9:02 AM KALEENA

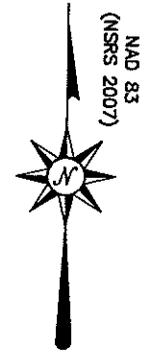
**LEGEND**

- △ CP/NL GPS RTK LFG
- LFG = LANDFILL GAS MONITORING WELLS
- PK/NL = PK NAIL SET IN CONCRETE
- TOC = TOP OF CASING

△ CP/NL GPS RTK  
28002

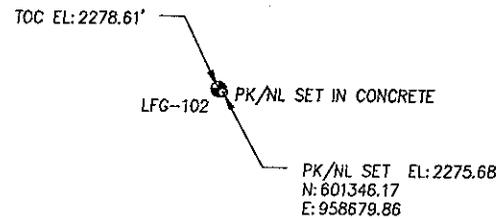
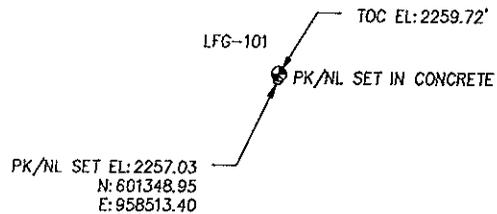
LANDFILL GAS MONITORING WELLS AS-BUILT SURVEY FOR:  
**HENDERSON COUNTY**  
STONEY MOUNTAIN ROAD LANDFILL  
HENDERSON COUNTY, NORTH CAROLINA

SURVEY PROJECT # 12-152  
MCGILL PROJECT # 12.00712

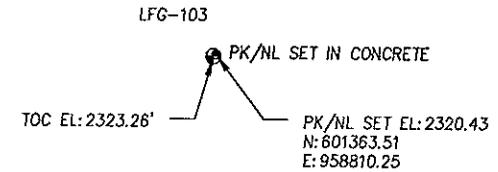


R: \Surveying\Surveying Dept\Jobs\2012\12-152 Henderson County Landfill MW's\DWG\MW Wells.dwg 7/12/2012 9:02 AM KALEENA

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CONVEYANCES, OR SALES**

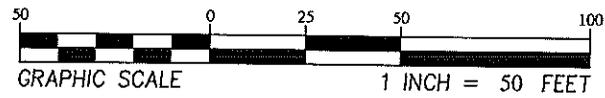


△ CP/NL SET GPS RTK  
28001



**SHEET 2 OF 2**

*Christopher F. Jordan*  
CHRISTOPHER F. JORDAN NC PLS L-4956 DATE JULY 9, 2012



**McGill ASSOCIATES**  
55 BROAD STREET ASHEVILLE, NC 28806 PH. (828) 252-0575  
NC BOARD OF EXAMINERS CORPORATE LICENSE NO. C-0459

**ATTACHMENT B**

**METHANE MONITORING WELL BORING AND WELL CONSTRUCTION LOGS AND WELL  
CONSTRUCTION RECORDS**

# RECORD OF BOREHOLE LFG-101

SHEET 1 of 1

PROJECT: Henderson Co. C&D Landfill  
 PROJECT NUMBER: 0839-650611.800  
 DRILLED DEPTH: 26.5 ft  
 LOCATION: Hendersonville, NC

DRILL RIG: Deidrich D-120  
 DATE STARTED: 4/24/12  
 DATE COMPLETED: 4/25/12

NORTHING: 601,349.0  
 EASTING: 958,513.4  
 GS ELEVATION: 2257.0 ft  
 TOC ELEVATION: 2259.7 ft

DEPTH W.L.: 11.1  
 DATE W.L.: 4/25/12  
 TIME W.L.: 8:10

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE			SAMPLES					MONITORING WELL/PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS	
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	NUMBER	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N			REC
0	2255	0.0 - 4.5 SAND, well graded, medium to fine grained, NP, tan, loose, dry	SW		2252.5						<p style="font-size: small;">Concrete Riser 3/8" Bentonite Pellets #2 Sand - 0.010" Slot</p>	<p><b>WELL CASING</b> Interval: -2.69'-5' Material: PVC Diameter: 2" Joint Type: Threaded</p> <p><b>SURFACE CASING</b> Interval: N/A Material: N/A Diameter: N/A</p> <p><b>WELL SCREEN</b> Interval: 5'-10' Material: PVC Diameter: 2" Slot Size: .010 End Cap: PVC</p> <p><b>FILTER PACK</b> Interval: 4'-26.5' Type: #2 Sand</p> <p><b>FILTER PACK SEAL</b> Interval: 2'-4' Type: 3/8" Bentonite Pellets</p> <p><b>ANNULUS SEAL</b> Interval: 0'-2' Type: Concrete</p> <p><b>WELL COMPLETION</b> Pad: 3'x3'x6" Protective Casing: 4" Aluminum</p> <p><b>DRILLING METHODS</b> Soil Drill: 4.25-inch ID HSA Rock Drill: N/A</p>
5	2250	4.5 - 5.5 SILT, trace coarse sand, NP, grey, loose, saturated	ML		4.5 2251.5		SPT	1-2-2-3	4	$\frac{2.0}{2.0}$		
		5.5 - 6.5 SILTY CLAY, some fine sand, medium plasticity, orange, soft, moist	CL		5.5 2250.5							
		6.5 - 9.5			6.5							
10		9.5 - 11.0 SILTY CLAY, trace coarse sand, low plasticity, orange, stiff, moist	CL		2247.5 9.5		SPT	1-3-7-9	10	$\frac{1.3}{2.0}$		
		11.0 - 11.5 SILTY SAND, fine grained, NP, white and black, relict foliation ~ horizontal, loose, moist	SM		2246.0 2245.5							
		11.5 - 14.5			11.5							
15		14.5 - 16.5 SILT, trace medium sand, NP, orange, relict foliation, loose, moist	ML		2242.5 14.5		SPT	6-7-7-10	14	$\frac{1.3}{2.0}$		
		16.5 - 19.5			2240.5 16.5							
20		19.5 - 21.5 SILT, some fine sand, NP, white and black, relict foliation dipping ~20 degrees, loose, moist	ML		2237.5 19.5		SPT	6-7-6-8	13	$\frac{2.0}{2.0}$		
		21.5 - 24.5			2235.5 21.5							
25		24.5 - 26.5 SILT, NP, orange-grey, loose, wet	ML		2232.5 24.5		SPT	4-4-6-8	10	$\frac{2.0}{2.0}$		
		Boring completed at 26.5 ft			2230.5							

BOREHOLE RECORD HENDERSON LFG WELLS.GPJ PIEDMONT.GDT 7/12/12

LOG SCALE: 1 in = 5.5 ft  
 DRILLING COMPANY: Geologic Exploration  
 DRILLER: Brian Thomas

GA INSPECTOR: D. Reedy  
 CHECKED BY: R. Kirkman  
 DATE: 5/7/12



# RECORD OF BOREHOLE LFG-102

SHEET 1 of 1

PROJECT: Henderson Co. C&D Landfill  
 PROJECT NUMBER: 0839-650611.800  
 DRILLED DEPTH: 41.5 ft  
 LOCATION: Hendersonville, NC

DRILL RIG: Deidrich D-120  
 DATE STARTED: 4/24/12  
 DATE COMPLETED: 4/25/12

NORTHING: 601,346.2  
 EASTING: 958,679.9  
 GS ELEVATION: 2275.7 ft  
 TOC ELEVATION: 2278.6 ft

DEPTH W.L.: 27.0  
 DATE W.L.: 4/24/12  
 TIME W.L.: 16:15

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES					MONITORING WELL/PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS	
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	NUMBER	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N	REC			
0	2275	0.0 - 4.5 SILTY SAND, medium grained, NP, orange, loose, dry	SM									<p>Concrete Riser 3/8" Bentonite Pellets #2 Sand - 0.010" Slot Collapsed Soil</p>	<p><b>WELL CASING</b> Interval: -2.93'-5' Material: PVC Diameter: 2" Joint Type: Threaded</p> <p><b>SURFACE CASING</b> Interval: N/A Material: N/A Diameter: N/A</p> <p><b>WELL SCREEN</b> Interval: 5'-22' Material: PVC Diameter: 2" Slot Size: 0.010" End Cap: PVC</p> <p><b>FILTER PACK</b> Interval: 4'-27' Type: #2 Sand</p> <p><b>FILTER PACK SEAL</b> Interval: 2'-4' Type: 3/8" Bentonite Pellets</p> <p><b>ANNULUS SEAL</b> Interval: 0'-2' Type: Concrete</p> <p><b>WELL COMPLETION</b> Pad: 3"x3"x6" Protective Casing: 4" Aluminum</p> <p><b>DRILLING METHODS</b> Soil Drill: 4.25-inch ID HSA Rock Drill: N/A</p>
5	2270	4.5 - 6.5 SILTY SAND, fine grained, NP, orange-brown, loose, weathered mica, moist	SM		2271.2 4.5		SPT	2-4-4-6	8	2.0 2.0			
10	2265	6.5 - 9.5			2269.2 6.5								
		9.5 - 11.5 SILTY SAND, medium grained, NP, orange-brown, loose, thin clayey sand layers, moist	SM		2266.2 9.5		SPT	2-3-5-6	8	2.0 2.0			
		11.5 - 14.5			2264.2 11.5								
15	2260	14.5 - 16.5 CLAYEY SAND, coarse grained, medium plasticity, grey, firm	SC		2261.2 14.5		SPT	3-4-5-6	9	2.0 2.0			
		16.5 - 19.5			2259.2 16.5								
20	2255	19.5 - 21.5 SILTY SAND, coarse grained, some gravel, NP, grey, loose, moist	SM		2256.2 19.5		SPT	2-5-7-14	12	2.0 2.0			
		21.5 - 24.5			2254.2 21.5								
25	2250	24.5 - 26.5 sandy SILT, fine grained sand, NP, grey, orange, and black, relict foliation near horizontal, weathered mica, loose, moist	ML		2251.2 24.5		SPT	5-7-8-9	15	2.0 2.0			
		26.5 - 29.5			2249.2 26.5								
30	2245	29.5 - 30.5 sandy SILT, fine grained sand, NP, orange and black, relict foliation, weathered mica, loose, moist	ML		2246.2 29.5		SPT	3-13-4-6	17	2.0 2.0			
		30.5 - 31.0 sandy SILT, medium grained sand, NP, white, loose, moist	ML		2245.2 30.5								
		31.0 - 31.5 sandy SILT, medium grained sand, NP, orange and black, relict foliation, loose, moist	ML		2244.7 31.0								
35	2240	31.5 - 34.5 SILT, some fine grained sand, NP, grey and black, relict foliation, compact, moist	ML		2244.2 31.5		SPT	5-7-12-17	19	2.0 2.0			
		34.5 - 36.5 SILT, some fine grained sand, NP, grey and black, relict foliation, compact, moist			2241.2 34.5								
		36.5 - 39.5			2239.2 36.5								
40	2235	39.5 - 41.5 SILTY SAND, medium grained, trace clay, NP, grey, orange, and black, relict foliation compact, wet	SM		2236.2 39.5		SPT	5-11-15-20	26	2.0 2.0			
		Boring completed at 41.5 ft											
45					2234.2								

BOREHOLE RECORD HENDERSON LFG WELLS.GPJ PIEDMONT.GDT 7/12/12

LOG SCALE: 1 in = 5.5 ft  
 DRILLING COMPANY: Geologic Exploration  
 DRILLER: Brian Thomas

GA INSPECTOR: D. Reedy  
 CHECKED BY: R. Kirkman  
 DATE: 5/7/12



# RECORD OF BOREHOLE LFG-103

SHEET 1 of 1

PROJECT: Henderson Co. C&D Landfill  
 PROJECT NUMBER: 0839-650611.800  
 DRILLED DEPTH: 18.0 ft  
 LOCATION: Hendersonville, NC

DRILL RIG: Deidrich D-120  
 DATE STARTED: 4/25/12  
 DATE COMPLETED: 4/25/12

NORTHING: 601,363.5  
 EASTING: 958,810.3  
 GS ELEVATION: 2320.4 ft  
 TOC ELEVATION: 2323.3 ft

DEPTH W.L.: N/A  
 DATE W.L.: N/A  
 TIME W.L.: N/A

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES					MONITORING WELL/PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	NUMBER	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N	REC		
					DEPTH (ft)							
0	2320	0.0 - 5.0 SILTY SAND, coarse grained, some asphalt gravel, NP, light brown, loose, dry	SM									<p><b>WELL CASING</b> Interval: -2.83'-5' Material: PVC Diameter: 2" Joint Type: Threaded</p> <p><b>SURFACE CASING</b> Interval: N/A Material: N/A Diameter: N/A</p> <p><b>WELL SCREEN</b> Interval: 5'-18' Material: PVC Diameter: 2" Slot Size: 0.010" End Cap: PVC</p> <p><b>FILTER PACK</b> Interval: 4'-18' Type: #2 Sand</p> <p><b>FILTER PACK SEAL</b> Interval: 2'-4" Type: 3/8" Bentonite Pellets</p> <p><b>ANNULUS SEAL</b> Interval: 0'-2' Type: Concrete</p> <p><b>WELL COMPLETION</b> Pad: 3"x3"x6" Protective Casing: 4" Aluminum</p> <p><b>DRILLING METHODS</b> Soil Drill: 4.25-inch ID HSA Rock Drill: N/A</p>
5	2315	5.0 - 9.5 SILTY SAND, medium grained, trace clay, NP, orange, compact, moist	SM		2315.4							
10	2310	9.5 - 11.5 SILTY SAND, medium grained, trace pebbles, NP, white and black, relict foliation, compact, moist	SM		2310.9							
		11.5 - 14.5			2308.9		SPT	10-9-50/2	34	1.0 2.0		
					2305.9							
15	2305	14.5 - 15.5 Partially Weathered Rock, SILTY SAND, fine grained, some gravel, NP, light grey, compact, dry	SM		14.5		SPT	14-50/2	50/2	0.5 2.0		
		15.5 - 18.0 Auger refusal at 18'			2304.9							
		Boring completed at 18.0 ft			2302.4							
20	2300											
25	2295											
30	2290											
35	2285											
40	2280											
45												

BOREHOLE RECORD HENDERSON LFG WELLS.GPJ PIEDMONT.GDT 7/12/12

LOG SCALE: 1 in = 5.5 ft  
 DRILLING COMPANY: Geologic Exploration  
 DRILLER: Brian Thomas

GA INSPECTOR: D. Reedy  
 CHECKED BY: R. Kirkman  
 DATE: 5/7/12





# NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2581

### 1. WELL CONTRACTOR:

BRIAN THOMAS

Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC

Well Contractor Company Name

176 COMMERCE BLVD

Street Address

STATESVILLE

NC

28625

City or Town

State

Zip Code

(704) 872-7686

Area code Phone number

### 2. WELL INFORMATION:

WELL CONSTRUCTION PERMIT# N/A

OTHER ASSOCIATED PERMIT#(if applicable)

SITE WELL ID #(if applicable) LFG-101

### 3. WELL USE (Check One Box) Monitoring Municipal/Public

Industrial/Commercial  Agricultural  Recovery  Injection

Irrigation  Other  (list use) LANDFILL GAS

DATE DRILLED 04/24/12

### 4. WELL LOCATION:

802 STONEY MOUNTAIN ROAD 28791

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

CITY: HENDERSONVILLE COUNTY HENDERSON

TOPOGRAPHIC / LAND SETTING: (check appropriate box)

Slope  Valley  Flat  Ridge  Other

LATITUDE 35 ° 21 ' 7.0300 " DMS OR DD

LONGITUDE 82 ° 29 ' 36.9900 " DMS OR DD

Latitude/longitude source:  GPS  Topographic map

(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

### 5. FACILITY (Name of the business where the well is located.)

HENDERSON COUNTY LANDFILL

N/A

Facility Name

Facility ID# (if applicable)

802 STONEY MOUNTAIN ROAD

Street Address

HENDERSONVILLE

NC

28791

City or Town

State

Zip Code

HENDERSON COUNTY LANDFILL

Contact Name

802 STONEY MOUNTAIN ROAD

Mailing Address

HENDERSONVILLE

NC

28791

City or Town

State

Zip Code

( )  
Area code Phone number

### 6. WELL DETAILS:

a. TOTAL DEPTH: 10.0 FEET

b. DOES WELL REPLACE EXISTING WELL? YES  NO

c. WATER LEVEL Below Top of Casing: DRY FT.  
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.5 FT. Above Land Surface\*

\*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): N/A METHOD OF TEST N/A

f. DISINFECTION: Type N/A Amount N/A

g. WATER ZONES (depth):

Top \_\_\_\_\_ Bottom \_\_\_\_\_ Top \_\_\_\_\_ Bottom \_\_\_\_\_

Top \_\_\_\_\_ Bottom \_\_\_\_\_ Top \_\_\_\_\_ Bottom \_\_\_\_\_

Top \_\_\_\_\_ Bottom \_\_\_\_\_ Top \_\_\_\_\_ Bottom \_\_\_\_\_

7. CASING: Depth	Diameter	Thickness/Weight	Material
Top <u>0.0</u> Bottom <u>5.0</u> Ft.	<u>2 INCH</u>	<u>SCH 40</u>	<u>PVC</u>
Top _____ Bottom _____ Ft.	_____	_____	_____
Top _____ Bottom _____ Ft.	_____	_____	_____

8. GROUT: Depth	Material	Method
Top <u>0.0</u> Bottom <u>3.0</u> Ft.	<u>PORTLAND BENTONITE</u>	<u>SLURRY</u>
Top _____ Bottom _____ Ft.	_____	_____
Top _____ Bottom _____ Ft.	_____	_____

9. SCREEN: Depth	Diameter	Slot Size	Material
Top <u>5.0</u> Bottom <u>10.0</u> Ft.	<u>2.0 in.</u>	<u>.010 in.</u>	<u>PVC</u>
Top _____ Bottom _____ Ft.	_____ in.	_____ in.	_____
Top _____ Bottom _____ Ft.	_____ in.	_____ in.	_____

10. SAND/GRAVEL PACK: Depth	Size	Material
Top <u>4.0</u> Bottom <u>10.0</u> Ft.	<u>20-40</u>	<u>FINE SILICA SAND</u>
Top _____ Bottom _____ Ft.	_____	_____
Top _____ Bottom _____ Ft.	_____	_____

11. DRILLING LOG	Formation Description
Top _____ Bottom _____	_____
<u>0.0 / 7.0</u>	<u>BROWN SILTY CLAY</u>
<u>7.0 / 17.0</u>	<u>TAN SILTY CLAY</u>
<u>17.0 / 25.0</u>	<u>TAN SILTY CLAY/PARTIAL WEATHER ROCK</u>
_____ / _____	_____
_____ / _____	_____
_____ / _____	_____
_____ / _____	_____
_____ / _____	_____
_____ / _____	_____
_____ / _____	_____

12. REMARKS:  
BENTONITE SEAL FROM 3.0 TO 4.0 FEET

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Brian Thomas 05/01/12  
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

BRIAN THOMAS  
PRINTED NAME OF PERSON CONSTRUCTING THE WELL



# NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2581

### 1. WELL CONTRACTOR:

BRIAN THOMAS  
 Well Contractor (Individual) Name  
GEOLOGIC EXPLORATION, INC  
 Well Contractor Company Name  
176 COMMERCE BLVD  
 Street Address  
STATESVILLE NC 28625  
 City or Town State Zip Code

(704) 872-7686  
 Area code Phone number

### 2. WELL INFORMATION:

WELL CONSTRUCTION PERMIT# N/A  
 OTHER ASSOCIATED PERMIT#(if applicable) \_\_\_\_\_  
 SITE WELL ID #(if applicable) LFG-102

3. WELL USE (Check One Box) Monitoring  Municipal/Public   
 Industrial/Commercial  Agricultural  Recovery  Injection   
 Irrigation  Other  (list use) LANDFILL GAS  
 DATE DRILLED 04/24/12

### 4. WELL LOCATION:

802 STONEY MOUNTAIN ROAD 28791  
 (Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

CITY: HENDERSONVILLE COUNTY HENDERSON

TOPOGRAPHIC / LAND SETTING: (check appropriate box)  
 Slope  Valley  Flat  Ridge  Other \_\_\_\_\_

LATITUDE 35 ° 21 ' 7.1800 " DMS OR \_\_\_\_\_ DD  
 LONGITUDE 82 ° 29 ' 33.5200 " DMS OR \_\_\_\_\_ DD

Latitude/longitude source:  GPS  Topographic map  
 (location of well must be shown on a USGS topo map and attached to this form if not using GPS)

### 5. FACILITY (Name of the business where the well is located.)

HENDERSON COUNTY LANDFILL N/A  
 Facility Name Facility ID# (if applicable)

802 STONEY MOUNTAIN ROAD  
 Street Address

HENDERSONVILLE NC 28791  
 City or Town State Zip Code

HENDERSON COUNTY LANDFILL  
 Contact Name

802 STONEY MOUNTAIN ROAD  
 Mailing Address

HENDERSONVILLE NC 28791  
 City or Town State Zip Code

( ) \_\_\_\_\_  
 Area code Phone number

### 6. WELL DETAILS:

a. TOTAL DEPTH: 22.0 FEET  
 b. DOES WELL REPLACE EXISTING WELL? YES  NO   
 c. WATER LEVEL Below Top of Casing: DRY FT.  
 (Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.5 FT. Above Land Surface\*  
 \*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): N/A METHOD OF TEST N/A

f. DISINFECTION: Type N/A Amount N/A

g. WATER ZONES (depth):  
 Top \_\_\_\_\_ Bottom \_\_\_\_\_ Top \_\_\_\_\_ Bottom \_\_\_\_\_  
 Top \_\_\_\_\_ Bottom \_\_\_\_\_ Top \_\_\_\_\_ Bottom \_\_\_\_\_  
 Top \_\_\_\_\_ Bottom \_\_\_\_\_ Top \_\_\_\_\_ Bottom \_\_\_\_\_

7. CASING: Depth	Diameter	Thickness/Weight	Material
Top <u>0.0</u> Bottom <u>5.0</u> Ft.	<u>2 INCH</u>	<u>SCH 40</u>	<u>PVC</u>
Top _____ Bottom _____ Ft.	_____	_____	_____
Top _____ Bottom _____ Ft.	_____	_____	_____

8. GROUT: Depth	Material	Method
Top <u>0.0</u> Bottom <u>3.0</u> Ft.	<u>PORTLAND BENTONITE</u>	<u>SLURRY</u>
Top _____ Bottom _____ Ft.	_____	_____
Top _____ Bottom _____ Ft.	_____	_____

9. SCREEN: Depth	Diameter	Slot Size	Material
Top <u>5.0</u> Bottom <u>22.0</u> Ft.	<u>2.0 in.</u>	<u>.010 in.</u>	<u>PVC</u>
Top _____ Bottom _____ Ft.	_____ in.	_____ in.	_____
Top _____ Bottom _____ Ft.	_____ in.	_____ in.	_____

10. SAND/GRAVEL PACK: Depth	Size	Material
Top <u>4.0</u> Bottom <u>22.0</u> Ft.	<u>20-40</u>	<u>FINE SILICA SAND</u>
Top _____ Bottom _____ Ft.	_____	_____
Top _____ Bottom _____ Ft.	_____	_____

11. DRILLING LOG	Formation Description
Top _____ Bottom <u>0.0 / 12.0</u>	<u>BROWN SILTY CLAY</u>
Top <u>12.0 / 21.0</u> Bottom _____	<u>TAN SILTY CLAY</u>
Top <u>21.0 / 40.0</u> Bottom _____	<u>TAN SILTY CLAY/PARTIAL WEATHER</u>
Top _____ Bottom _____	<u>ROCK</u>
Top _____ Bottom _____	_____

12. REMARKS:  
BENTONITE SEAL FROM 3.0 TO 4.0 FEET

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.  
Brian Thomas 05/01/12  
 SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

BRIAN THOMAS  
 PRINTED NAME OF PERSON CONSTRUCTING THE WELL



# NON RESIDENTIAL WELL CONSTRUCTION RECORD

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 Well Contractor (Individual) Name  
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 Well Contractor Company Name  
**176 COMMERCE BLVD**  
 Street Address  
**STATESVILLE NC 28625**  
 City or Town State Zip Code

(704) 872-7686  
 Area code Phone number

### 2. WELL INFORMATION:

WELL CONSTRUCTION PERMIT# N/A  
 OTHER ASSOCIATED PERMIT#(if applicable) \_\_\_\_\_  
 SITE WELL ID #(if applicable) LFG-103

3. WELL USE (Check One Box) Monitoring  Municipal/Public   
 Industrial/Commercial  Agricultural  Recovery  Injection   
 Irrigation  Other  (list use) LANDFILL GAS  
 DATE DRILLED 04/24/12

### 4. WELL LOCATION:

802 STONEY MOUNTAIN ROAD 28791  
 (Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

CITY: ENDERSONVILLE COUNTY ENDERSON

TOPOGRAPHIC / LAND SETTING: (check appropriate box)

Slope  Valley  Flat  Ridge  Other \_\_\_\_\_

LATITUDE 35 ° 21 ' 7.2300 " DMS OR \_\_\_\_\_ DD

LONGITUDE 82 ° 29 ' 33.3800 " DMS OR \_\_\_\_\_ DD

Latitude/longitude source:  GPS  Topographic map  
 (location of well must be shown on a USGS topo map and attached to this form if not using GPS)

### 5. FACILITY (Name of the business where the well is located.)

ENDERSON COUNTY LANDFILL N/A  
 Facility Name Facility ID# (if applicable)

802 STONEY MOUNTAIN ROAD  
 Street Address  
ENDERSONVILLE NC 28791  
 City or Town State Zip Code

ENDERSON COUNTY LANDFILL  
 Contact Name

802 STONEY MOUNTAIN ROAD  
 Mailing Address  
ENDERSONVILLE NC 28791  
 City or Town State Zip Code

( ) \_\_\_\_\_  
 Area code Phone number

### 6. WELL DETAILS:

a. TOTAL DEPTH: 18.0 FEET  
 b. DOES WELL REPLACE EXISTING WELL? YES  NO   
 c. WATER LEVEL Below Top of Casing: DRY FT.  
 (Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.5 FT. Above Land Surface\*  
 \*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): N/A METHOD OF TEST N/A

f. DISINFECTION: Type N/A Amount N/A

### g. WATER ZONES (depth):

Top _____	Bottom _____	Top _____	Bottom _____
Top _____	Bottom _____	Top _____	Bottom _____
Top _____	Bottom _____	Top _____	Bottom _____

7. CASING: Depth	Diameter	Thickness/Weight	Material
Top <u>0.0</u> Bottom <u>5.0</u> Ft.	<u>2 INCH</u>	<u>SCH 40</u>	<u>PVC</u>
Top _____ Bottom _____ Ft.	_____	_____	_____
Top _____ Bottom _____ Ft.	_____	_____	_____

8. GROUT: Depth	Material	Method
Top <u>0.0</u> Bottom <u>3.0</u> Ft.	<u>PORTLAND BENTONITE</u>	<u>SLURRY</u>
Top _____ Bottom _____ Ft.	_____	_____
Top _____ Bottom _____ Ft.	_____	_____

9. SCREEN: Depth	Diameter	Slot Size	Material
Top <u>5.0</u> Bottom <u>18.0</u> Ft.	<u>2.0 in.</u>	<u>.010 in.</u>	<u>PVC</u>
Top _____ Bottom _____ Ft.	_____ in.	_____ in.	_____
Top _____ Bottom _____ Ft.	_____ in.	_____ in.	_____

10. SAND/GRAVEL PACK: Depth	Size	Material
Top <u>4.0</u> Bottom <u>18.0</u> Ft.	<u>20-40</u>	<u>FINE SILICA SAND</u>
Top _____ Bottom _____ Ft.	_____	_____
Top _____ Bottom _____ Ft.	_____	_____

11. DRILLING LOG	Formation Description
Top _____ Bottom _____	_____
<u>0.0 / 4.0</u>	<u>TAN SILTY CLAY</u>
<u>4.0 / 18.0</u>	<u>WHITE/TAN SILTY CLAY/PARTIALLY WEATHERED ROCK</u>
_____ / _____	_____
_____ / _____	_____
_____ / _____	_____
_____ / _____	_____
_____ / _____	_____
_____ / _____	_____
_____ / _____	_____
_____ / _____	_____

12. REMARKS:  
BENTONITE SEAL FROM 3.0 TO 4.0 FEET

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Brian Thomas 05/01/12  
 SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

BRIAN THOMAS  
 PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit within 30 days of completion to: Division of Water Quality - Information Processing, 1617 Mail Service Center, Raleigh, NC 27699-161, Phone : (919) 807-6300

Form GW-1b Rev. 2/09