

November 9, 2012

Brian Wootton, Hydrogeologist
Solid Waste Section
Division of Waste Management
1646 Mail Service Center
Raleigh, NC 27699-1646



RE: Installation of Landfill Gas Monitoring Probes
Dan Johnson Landfill Permit No. #97-02
Wilkes County, North Carolina
JOYCE Project No. 00356.1201.11 Task 02

Dear Mr. Lane:

On behalf of Wilkes County, Joyce Engineering Inc. (JOYCE), is submitting the enclosed boring logs and driller's records for three landfill gas monitoring probes, installed on October 9, 2012 at the Dan Johnson landfill. The three probes (GP-1, GP-2 and GP-3) were installed along the northern border of the landfill property and were advanced to depths of 24 feet, 27 feet and 34 feet, respectively. Screen depth ranged from four feet below grade to the bottom of the boring. Probes were constructed of 1-inch PVC. Boring logs and probe completion diagrams, driller well construction records, and a site map showing probe locations are attached.

Please feel free to contact me at (336) 323-0092 if you have any questions regarding this submittal.

Sincerely,
JOYCE ENGINEERING

A handwritten signature in blue ink, appearing to read "Larry Hine".

Larry Hine
Technical Consultant

Attachments: Boring Logs
Drillers Well Construction Logs
Dan Johnson Landfill Site Map

Cc: Kent Brandon, Wilkes County



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# _____
OTHER ASSOCIATED PERMIT#(if applicable) _____
SITE WELL ID #(if applicable) GP-1

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

Industrial/Commercial Agricultural Recovery Injection
Irrigation Other (list use) GAS PROBE
DATE DRILLED 10/09/12

4. WELL LOCATION:

122 LEWIS ROAD 28621
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)
CITY: ELKIN COUNTY SURRY
TOPOGRAPHIC / LAND SETTING: (check appropriate box)
 Slope Valley Flat Ridge Other _____
LATITUDE 36 ° 16 ' 19.7200 " DMS OR _____ DD
LONGITUDE 80 ° 55 ' 25.7500 " 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.)

DAN JOHNSON LANDFILL N/A
Facility Name Facility ID# (if applicable)
122 LEWIS ROAD
Street Address
ELKIN NC 28621
City or Town State Zip Code
WILKES COUNTY SOLID WASTE SERVICES
Contact Name
PO BOX 389
Mailing Address
ROARING RIVER NC 28669
City or Town State Zip Code

()
Area code Phone number

6. WELL DETAILS:

a. TOTAL DEPTH: 24.0 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>4.0</u> Ft.	<u>1 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>2.0</u> Ft.	<u>PORTLAND BENTONITE</u>	<u>SLURRY</u>
Top _____ Bottom _____ Ft.	_____	_____
Top _____ Bottom _____ Ft.	_____	_____

9. SCREEN: Depth	Diameter	Slot Size	Material
Top <u>4.0</u> Bottom <u>24.0</u> Ft.	<u>1.0 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>3.0</u> Bottom <u>24.0</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>
<u>12.0 / 24.0</u>	<u>TAN SILTY CLAY</u>
_____ / _____	_____
_____ / _____	_____
_____ / _____	_____
_____ / _____	_____
_____ / _____	_____
_____ / _____	_____
_____ / _____	_____
_____ / _____	_____

12. REMARKS:
BENTONITE SEAL FROM 2.0 TO 3.0 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 10/26/12
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

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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# _____
OTHER ASSOCIATED PERMIT#(if applicable) _____
SITE WELL ID #(if applicable) GP-2

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

Industrial/Commercial Agricultural Recovery Injection
Irrigation Other (list use) GAS PROBE
DATE DRILLED 10/09/12

4. WELL LOCATION:

122 LEWIS ROAD 28621
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)
CITY: ELKIN COUNTY: SURRY
TOPOGRAPHIC / LAND SETTING: (check appropriate box)
 Slope Valley Flat Ridge Other _____
LATITUDE 36 ° 16 ' 19.7200 " DMS OR _____ DD
LONGITUDE 80 ° 55 ' 25.7500 " DMS OR _____ DD
Latitude/longitude source: GPS Topographic map
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5. FACILITY (Name of the business where the well is located.)

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Facility Name Facility ID# (if applicable)
122 LEWIS ROAD
Street Address
ELKIN NC 28621
City or Town State Zip Code
WILKES COUNTY SOLID WASTE SERVICES
Contact Name
PO BOX 389
Mailing Address
ROARING RIVER NC 28669
City or Town State Zip Code

Area code Phone number

6. WELL DETAILS:

a. TOTAL DEPTH: 27.0 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>4.0</u> Ft.	<u>1 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>2.0</u> Ft.	<u>PORTLAND BENTONITE</u>	<u>SLURRY</u>
Top _____ Bottom _____ Ft.	_____	_____
Top _____ Bottom _____ Ft.	_____	_____

9. SCREEN: Depth	Diameter	Slot Size	Material
Top <u>4.0</u> Bottom <u>27.0</u> Ft.	<u>1.0 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>3.0</u> Bottom <u>27.0</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 / 11.0</u>	<u>RED SILTY CLAY</u>
<u>11.0 / 23.0</u>	<u>BROWN SILTY CLAY</u>
<u>23.0 / 27.0</u>	<u>TAN SILTY CLAY</u>
_____ / _____	_____
_____ / _____	_____
_____ / _____	_____
_____ / _____	_____
_____ / _____	_____
_____ / _____	_____
_____ / _____	_____

12. REMARKS:
BENTONITE SEAL FROM 2.0 TO 3.0 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 10/26/12
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

BRIAN THOMAS
PRINTED NAME OF PERSON CONSTRUCTING THE WELL



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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# _____

OTHER ASSOCIATED PERMIT#(if applicable) _____

SITE WELL ID #(if applicable) GP-3

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

Industrial/Commercial Agricultural Recovery Injection

Irrigation Other (list use) GAS PROBE

DATE DRILLED 10/09/12

4. WELL LOCATION:

122 LEWIS ROAD 28621
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

CITY: ELKIN COUNTY SURRY

TOPOGRAPHIC / LAND SETTING: (check appropriate box)

Slope Valley Flat Ridge Other _____

LATITUDE 36 ° 16 ' 19.7200 " DMS OR _____ DD

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Latitude/longitude source: GPS Topographic map

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Street Address

ELKIN NC 28621
City or Town State Zip Code

WILKES COUNTY SOLID WASTE SERVICES
Contact Name

PO BOX 389
Mailing Address

ROARING RIVER NC 28669
City or Town State Zip Code

Area code Phone number

6. WELL DETAILS:

a. TOTAL DEPTH: 35.0 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	Bottom	<u>0.0</u>	<u>4.0</u> Ft.	<u>1 INCH</u> <u>SCH 40</u>	<u>PVC</u>
Top	Bottom	_____	_____ Ft.	_____	_____
Top	Bottom	_____	_____ Ft.	_____	_____

8. GROUT:		Depth	Material	Method
Top	Bottom	<u>0.0</u> <u>2.0</u> Ft.	<u>PORTLAND BENTONITE</u>	<u>SLURRY</u>
Top	Bottom	_____	_____	_____
Top	Bottom	_____	_____	_____

9. SCREEN:		Depth	Diameter	Slot Size	Material
Top	Bottom	<u>4.0</u> <u>34.0</u> Ft.	<u>1.0</u> in.	<u>.010</u> in.	<u>PVC</u>
Top	Bottom	_____	_____ in.	_____ in.	_____
Top	Bottom	_____	_____ in.	_____ in.	_____

10. SAND/GRAVEL PACK:		Depth	Size	Material
Top	Bottom	<u>3.0</u> <u>34.0</u> Ft.	<u>20-40</u>	<u>FINE SILICA SAND</u>
Top	Bottom	_____	_____	_____
Top	Bottom	_____	_____	_____

11. DRILLING LOG		Formation Description
Top	Bottom	
<u>0.0</u>	<u>14.0</u>	<u>RED SILTY CLAY</u>
<u>14.0</u>	<u>26.0</u>	<u>BROWN SILTY CLAY</u>
<u>26.0</u>	<u>34.0</u>	<u>TAN SILTY CLAY</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

12. REMARKS:
BENTONITE SEAL FROM 2.0 TO 3.0 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 10/26/12
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

BRIAN THOMAS
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Dan Johnson Landfill Wilkes county, NC JOYCE Project No.356.1201.11 Task 02	Date Started	: 10/9/2012	Drilling Company	: Geologic Exploration
	Date Completed	: 10/9/2012	Northing Coord.	:
	Hole Diameter	: 4.25 inch	Westing Coord.	:
	Drilling Method	: Hollow Stem Augers	Survey By	:
	Sampling Method	:	Logged By	: Dan Girdner

Depth in Feet	Surf. Elev.	Blow Count	% Rec.	USCS	DESCRIPTION	Well: GP-1 TOC Elev.:	Well Construction Information
0					Brown Silty CLAY		WELL CONSTRUCTION Date Compl. : 9/9/12 Hole Diameter(s) : 4.25-inch Drilling Method(s) : HS Auger Company Rep. : Brian Thomas WELL CASING Material : Schedule 40 PVC Diameter : 1-inch Joints : Threaded, flush Approx. Csg. Stickup : 2.5-feet WELL SCREEN Material : Schedule 40 PVC Diameter : 1-inch Joints : Threaded, flush Opening : 0.010 inch GRAVEL PACK Type : # 2 Sand WELL SCREEN SEAL Type : 3/8" Bentonite Pellets ANNULUS SEAL Type : Grout PROTECTIVE CSG. Type : 4 inch OD, steel WELL PAD Type : 2 x 2 feet, 6 inch thick
5				CL			
10					Tan Silty CLAY		
15							
20				CL			
25					Bottom of Boring		
30							
35							

Dan Johnson Landfill Wilkes county, NC JOYCE Project No.356.1201.11 Task 02	Date Started	: 10/9/2012	Drilling Company	: Geologic Exploration
	Date Completed	: 10/9/2012	Northing Coord.	:
	Hole Diameter	: 4.25 inch	Westing Coord.	:
	Drilling Method	: Hollow Stem Augers	Survey By	:
	Sampling Method	:	Logged By	: Dan Girdner

Depth in Feet	Surf. Elev.	Blow Count	% Rec.	USCS	DESCRIPTION	Well: GP-2 TOC Elev.:	Well Construction Information
0					Red Silty CLAY	<p>Grout (0'-11')</p> <p>Riser Pipe</p> <p>Bentonite Seal</p> <p>Sand Packing</p> <p>Screen</p>	WELL CONSTRUCTION Date Compl. : 9/9/12 Hole Diameter(s) : 4.25-inch Drilling Method(s) : HS Auger Company Rep. : Brian Thomas WELL CASING Material : Schedule 40 PVC Diameter : 1-inch Joints : Threaded, flush Approx. Csg. Stickup : 2.5-feet WELL SCREEN Material : Schedule 40 PVC Diameter : 1-inch Joints : Threaded, flush Opening : 0.010 inch GRAVEL PACK Type : # 2 Sand WELL SCREEN SEAL Type : 3/8" Bentonite Pellets ANNULUS SEAL Type : Grout PROTECTIVE CSG. Type : 4 inch OD, steel WELL PAD Type : 2 x 2 feet, 6 inch thick
5				CL			
11					Brown, silty CLAY		
15				CL			
22					CLAYEY SILT, Tan, silty CLAY		
25				CL			
30					Bottom of Boring		
35							

Dan Johnson Landfill Wilkes county, NC JOYCE Project No.356.1201.11 Task 02	Date Started	: 10/9/2012	Drilling Company	: Geologic Exploration
	Date Completed	: 10/9/2012	Northing Coord.	:
	Hole Diameter	: 4.25 inch	Westing Coord.	:
	Drilling Method	: Hollow Stem Augers	Survey By	:
	Sampling Method	:	Logged By	: Dan Girdner

Depth in Feet	Surf. Elev.	Blow Count	% Rec.	USCS	DESCRIPTION	Well: GP-3 TOC Elev.:	Well Construction Information
0					Red, Silty CLAY	<p>Grout (0'-11')</p> <p>Riser Pipe</p> <p>Bentonite Seal</p> <p>Sand Packing</p> <p>Screen</p>	WELL CONSTRUCTION Date Compl. : 9/9/12 Hole Diameter(s) : 4.25-inch Drilling Method(s) : HS Auger Company Rep. : Brian Thomas WELL CASING Material : Schedule 40 PVC Diameter : 1-inch Joints : Threaded, flush Approx. Csg. Stickup : 2.5-feet WELL SCREEN Material : Schedule 40 PVC Diameter : 1-inch Joints : Threaded, flush Opening : 0.010 inch GRAVEL PACK Type : # 2 Sand WELL SCREEN SEAL Type : 3/8" Bentonite Pellets ANNULUS SEAL Type : Grout PROTECTIVE CSG. Type : 4 inch OD, steel WELL PAD Type : 2 x 2 feet, 6 inch thick
5				CL			
15				SILTY SAND, Brown, silty CLAY			
20				CL			
25					Tan, silty CLAY		
30				CL			
35					Bottom of Boring		

