



February 10, 2012

Ms. Deb Aja
NC Department of Environment and Natural Resources
Asheville Regional Office
2090 U.S. 70 Highway
Swannanoa, NC 28778

Dear Ms. Aja:

On behalf of Avery County, Richardson Smith Gardner & Associates (RSG) is hereby providing an update to the implementation of the Landfill Gas Management Plan, approved on February 10, 2011¹ for the closed MSW landfill. On November 21, 2011 five additional landfill gas monitoring wells were installed to monitor off-site properties adjacent to the closed Avery County MSW landfill. Three of these wells were installed on the Unimin Property, and two were installed on the Avery County Airport Authority property. One of the proposed locations on the Unimin property had to be relocated due to its proposed proximity to Brushy Creek Road and drill rig access difficulties in that general area. The installed well locations are shown on the attached **Figure 1**.

Landfill Gas Probe Installation

RSG personnel mobilized to the site on November 21, 2011 with Brian Thomas of Geologic Explorations, for the well installation. A track-mounted Geoprobe drill rig with hollow stem auger capabilities was used to install wells P-9, P-10, P-11, P-12, and P-13. In each instance, the Geoprobe sampler was used to collect soil samples every five feet to the depth of well installation. Upon completion of sampling, hollow stem augers were advanced to the approximate depth of groundwater (approximately 20 feet below grade) for well installation.

Each well consists of a 2-inch diameter PVC screened interval and solid riser pipe with sand pack, bentonite plug and grout in the annular space. Each well was completed with a slip well cap with monitoring port and outer steel casing. The landfill gas well installations are summarized in the below **Table 1**, while the boring logs and well completion records are included in **Attachment A**. These wells have been added to the monitoring well network and a revised LFG Management Plan has been prepared for the site in accordance with requirements outlined in the approval of the Landfill Gas Mitigation Plan dated February 10, 2011. The revised LFG Management Plan is included in **Attachment B** for your review.

Based upon the data reviewed to date, there is limited landfill gas encroachment on the adjacent properties. As these properties are mostly undeveloped and there has been no indication of landfill gas encroachment in nearby buildings, we request to return to quarterly monitoring for the wells both on and off-site.

¹ Letter from Jaelyne Drummond of NCDENR to Buddy Norris of Avery County dated February 10, 2011.

Table 1

MONITORING POINT	DATE INSTALLATION COMPLETE	BORING DEPTH (ft bg)	AUGER REFUSAL (ft bg)	DEPTH INTERVAL (ft bg)			
				SCREEN (ft)		BENTONITE PLUG (ft bg)	GROUTED INTERVAL(ft bg)
				INTERVAL	LENGTH		
P-9	11/21/2011	20.0	NA	5 - 20	15	3 - 4	0 - 3
P-10	11/21/2011	20.0	NA	5 - 20	15	3 - 4	0 - 3
P-11	11/21/2011	20.0	NA	5 - 20	15	3 - 4	0 - 3
P-12	11/21/2011	20.0	NA	5 - 20	15	3 - 4	0 - 3
P-13	11/21/2011	19.0	19	5 - 19	14	3 - 4	0 - 3

Note: Surveying of these monitoring point locations have not yet been completed. Records will be updated after this work is finished.

If you have any question or comments, please feel free to contact us by phone at (919) 828-0577 or by email below.

Sincerely,
Richardson Smith Gardner & Associates, Inc.



Don Misenheimer
 Project Scientist, ext. 224
 don@rsgengineers.com



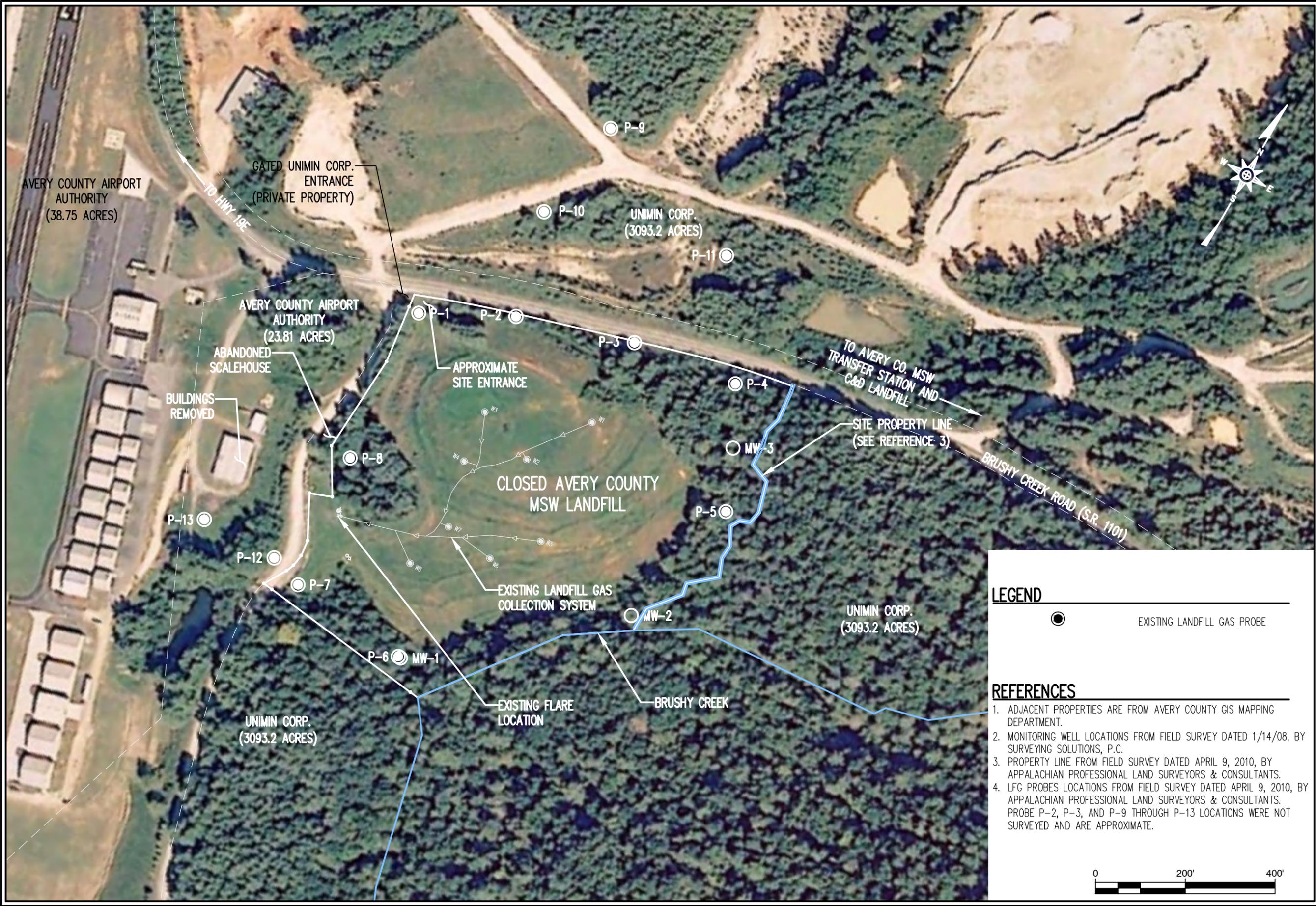
Joan A. Smyth, P.G.
 Senior Hydrogeologist ext. 221
 joan@rsgengineers.com

Cc: Mr. Henry "Buddy" Norris, Avery County Solid Waste Department
 Mr. Jaclynne Drummond - NCDENR
 Mr. Bill Wagner, NCDENR
 Mr. Stacey Smith, P.E. - RSG
 File

Figure

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G:\CAD\Avery County\Avery 10-2\sheets\AVERY-B0172.dwg - 12/2/2011 2:56 PM



LEGEND

● EXISTING LANDFILL GAS PROBE

REFERENCES

1. ADJACENT PROPERTIES ARE FROM AVERY COUNTY GIS MAPPING DEPARTMENT.
2. MONITORING WELL LOCATIONS FROM FIELD SURVEY DATED 1/14/08, BY SURVEYING SOLUTIONS, P.C.
3. PROPERTY LINE FROM FIELD SURVEY DATED APRIL 9, 2010, BY APPALACHIAN PROFESSIONAL LAND SURVEYORS & CONSULTANTS.
4. LFG PROBES LOCATIONS FROM FIELD SURVEY DATED APRIL 9, 2010, BY APPALACHIAN PROFESSIONAL LAND SURVEYORS & CONSULTANTS. PROBE P-2, P-3, AND P-9 THROUGH P-13 LOCATIONS WERE NOT SURVEYED AND ARE APPROXIMATE.



RICHARDSON SMITH GARDNER & ASSOCIATES
 NC LIC. NO. C-2828 (Engineering)
 www.rsgengineers.com
 14 N. Boylan Ave.
 Raleigh, N.C. 27603
 ph: 919-526-0577
 fax: 919-526-3899

FIGURE NO.	1	FILE NAME	AVERY-B0172
SCALE:	AS NOTED	PROJECT NO.	AVERY 11-6
CHECKED BY:	J.A.S.	DATE:	Dec. 2011
DRAWN BY:	C.T.J.		

TITLE:
**LANDFILL GAS MONITORING SYSTEM
 AVERY COUNTY CLOSED MSWLF
 SPRUCE PINE, NC**

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Attachment A

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FIELD BOREHOLE LOG

BOREHOLE NUMBER **P-9**

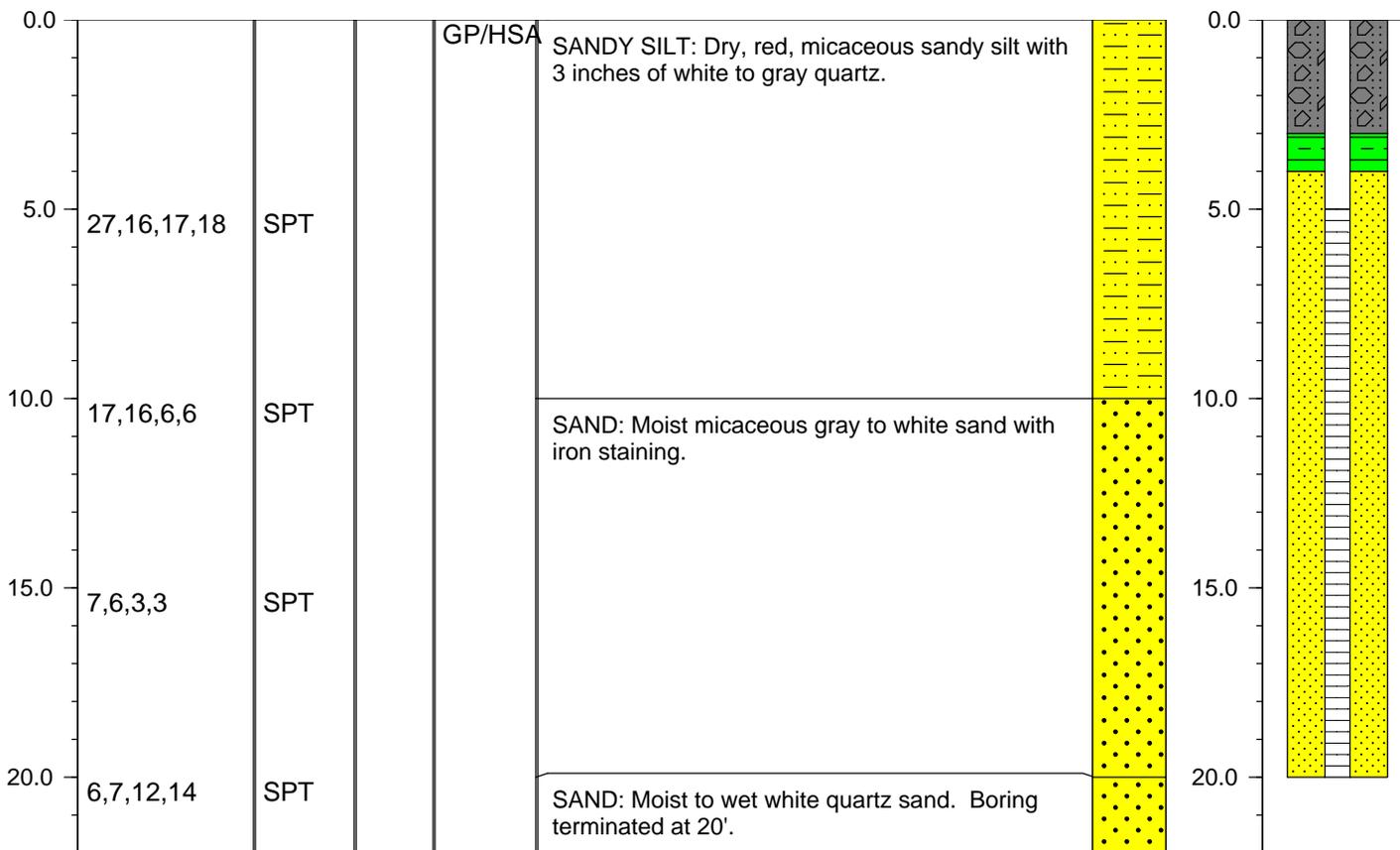
Page 1 of 1

PROJECT NAME: **Avery County C&D Landfill**
 LOCATION: **Ingalls, NC**
 DRILLING CO: **Geologic Exploration, Inc.**
 DRILLING METHOD: **Geoprobe/HSA**
 FIELD PARTY: **Brian Thomas**
 GEOLOGIST: **Don Misenheimer**
 DATE BEGUN: **11/21/11** COMPLETED: **11/21/11**

TOTAL DEPTH: **20**
 TOP OF CASING ELEV.: **GROUND ELEV.:**
 NORTHING: **0** EASTING: **0**

STATIC WATER LEVEL (BLS)		
Depth (ft)		
Time		
Date		

DEPTH Feet	BLOW COUNT Per 6"	SAMPLING METHOD	RECOVERY Inches	DRILL METHOD	DESCRIPTION	LITHOLOGY	DEPTH Feet	WELL INSTALLATION
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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) P-9

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

Industrial/Commercial Agricultural Recovery Injection

Irrigation Other (list use) _____

DATE DRILLED 11/21/11

4. WELL LOCATION:

2175 BRUSHY CREEK ROAD 28657

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

CITY: SPRUCE PINE COUNTY MITCHELL

TOPOGRAPHIC / LAND SETTING: (check appropriate box)

Slope Valley Flat Ridge Other _____

LATITUDE _____ " DMS OR _____ DD

LONGITUDE _____ " 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.)

AVERY COUNTY C&D LANDFILL N/A

Facility Name Facility ID# (if applicable)

2175 BRUSHY CREEK ROAD

Street Address

SPRUCE PINE

NC

28657

City or Town

State

Zip Code

UNIVERSITY OF NORTH CAROLINA

Contact Name

MUNICIPAL DRIVE

Mailing Address

CHAPEL HILL

NC

27599

City or Town

State

Zip Code

() _____

Area code Phone number

6. WELL DETAILS:

a. TOTAL DEPTH: 20.0 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 0.0 Bottom 5.0 Ft. 2 INCH SCH 40 PVC

Top _____ Bottom _____ Ft. _____ _____

Top _____ Bottom _____ Ft. _____ _____

8. GROUT: Depth Material Method

Top 0.0 Bottom 3.0 Ft. PORTLAND BENTONITE SLURRY

Top _____ Bottom _____ Ft. _____ _____

Top _____ Bottom _____ Ft. _____ _____

9. SCREEN: Depth Diameter Slot Size Material

Top 5.0 Bottom 20.0 Ft. 2.0 in. .010 in. PVC

Top _____ Bottom _____ Ft. _____ in. _____ in. _____

Top _____ Bottom _____ Ft. _____ in. _____ in. _____

10. SAND/GRAVEL PACK:

Depth Size Material

Top 4.0 Bottom 20.0 Ft. 20-40 FINE SILICA SAND

Top _____ Bottom _____ Ft. _____ _____

Top _____ Bottom _____ Ft. _____ _____

11. DRILLING LOG

Top Bottom Formation Description

0.0 / 5.0 TAN SILT/COBBLES

5.0 / 20.0 WHITE/GRAY PARTIALLY WEATHER

/ ROCK

/ _____

/ _____

/ _____

/ _____

/ _____

/ _____

/ _____

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 11/28/11
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

BRIAN THOMAS
PRINTED NAME OF PERSON CONSTRUCTING THE WELL



FIELD BOREHOLE LOG

BOREHOLE NUMBER **P-11**

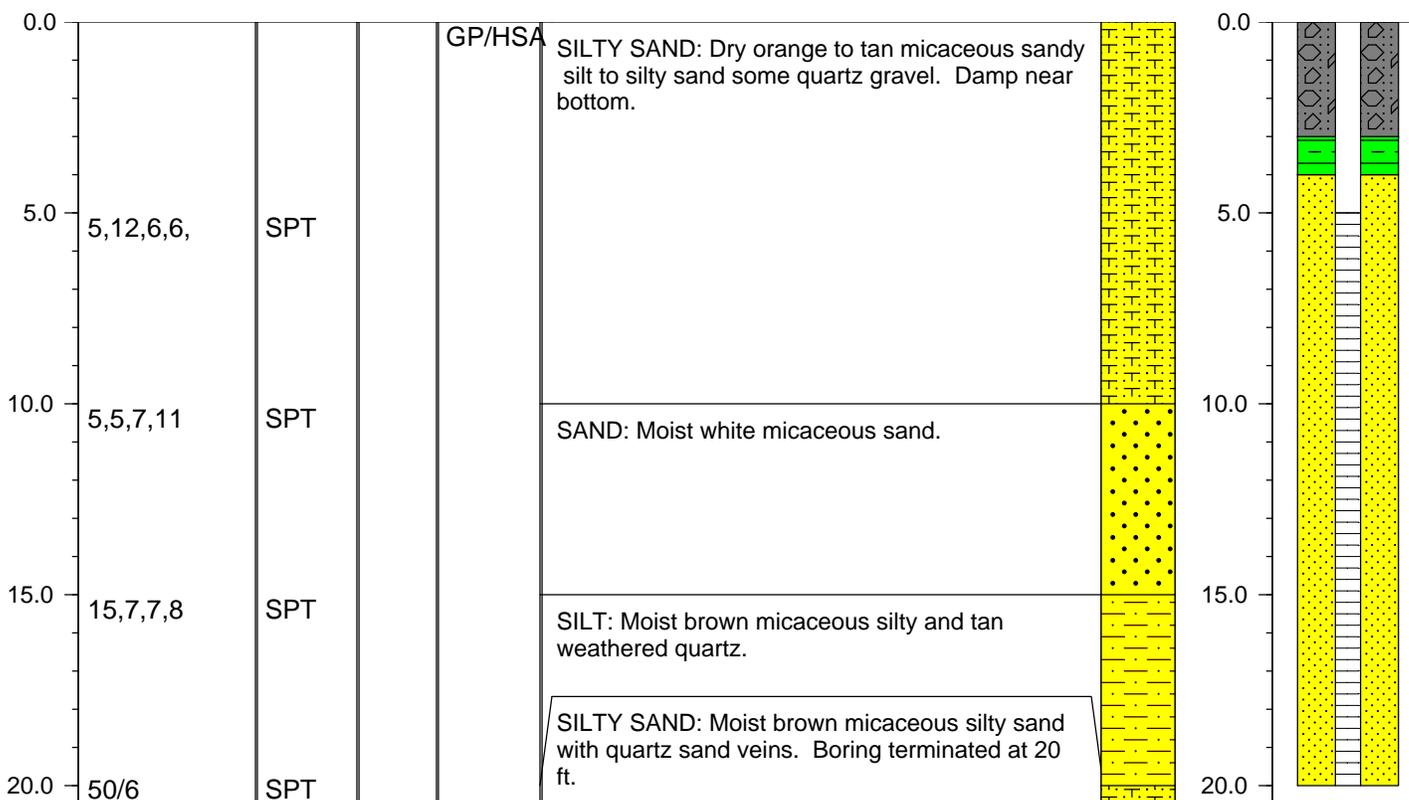
Page 1 of 1

PROJECT NAME: **Avery County C&D Landfill**
 LOCATION: **Ingalls, NC**
 DRILLING CO: **Geologic Exploration, Inc.**
 DRILLING METHOD: **Geoprobe/HSA**
 FIELD PARTY: **Brian Thomas**
 GEOLOGIST: **Don Misenheimer**
 DATE BEGUN: **11/21/11** COMPLETED: **11/21/11**

TOTAL DEPTH: **20**
 TOP OF CASING ELEV.: **GROUND ELEV.:**
 NORTHING: **0** EASTING: **0**

STATIC WATER LEVEL (BLS)		
Depth (ft)		
Time		
Date		

DEPTH Feet	BLOW COUNT Per 6"	SAMPLING METHOD	RECOVERY Inches	DRILL METHOD	DESCRIPTION	LITHOLOGY	DEPTH Feet	WELL INSTALLATION
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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) P-10

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

Industrial/Commercial Agricultural Recovery Injection

Irrigation Other (list use) _____

DATE DRILLED 11/21/11

4. WELL LOCATION:

2175 BRUSHY CREEK ROAD 28657

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

CITY: SPRUCE PINE COUNTY MITCHELL

TOPOGRAPHIC / LAND SETTING: (check appropriate box)

Slope Valley Flat Ridge Other _____

LATITUDE _____ " DMS OR _____ DD

LONGITUDE _____ " 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.)

AVERY COUNTY C&D LANDFILL N/A

Facility Name Facility ID# (if applicable)

2175 BRUSHY CREEK ROAD

Street Address

SPRUCE PINE

NC

28657

City or Town

State

Zip Code

UNIVERSITY OF NORTH CAROLINA

Contact Name

MUNICIPAL DRIVE

Mailing Address

CHAPEL HILL

NC

27599

City or Town

State

Zip Code

() _____
Area code Phone number

6. WELL DETAILS:

a. TOTAL DEPTH: 20.0 FEET

b. DOES WELL REPLACE EXISTING WELL? YES NO

c. WATER LEVEL Below Top of Casing: 19.0 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/ Material

Top 0.0 Bottom 5.0 Ft. 2 INCH SCH 40 PVC

Top _____ Bottom _____ Ft. _____

Top _____ Bottom _____ Ft. _____

8. GROUT: Depth Material Method

Top 0.0 Bottom 3.0 Ft. PORTLAND BENTONITE SLURRY

Top _____ Bottom _____ Ft. _____

Top _____ Bottom _____ Ft. _____

9. SCREEN: Depth Diameter Slot Size Material

Top 5.0 Bottom 20.0 Ft. 2.0 in. .010 in. PVC

Top _____ Bottom _____ Ft. _____ in. _____ in. _____

Top _____ Bottom _____ Ft. _____ in. _____ in. _____

10. SAND/GRAVEL PACK:

Depth Size Material

Top 4.0 Bottom 20.0 Ft. 20-40 FINE SILICA SAND

Top _____ Bottom _____ Ft. _____

Top _____ Bottom _____ Ft. _____

11. DRILLING LOG

Top Bottom Formation Description

0.0 / 4.0 TAN SILT/COBBLES

4.0 / 20.0 WHITE/GRAY PARTIALLY WEATHER

/ ROCK

/ _____

/ _____

/ _____

/ _____

/ _____

/ _____

/ _____

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 11/28/11
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

BRIAN THOMAS
PRINTED NAME OF PERSON CONSTRUCTING THE WELL



FIELD BOREHOLE LOG

BOREHOLE NUMBER **P-10**

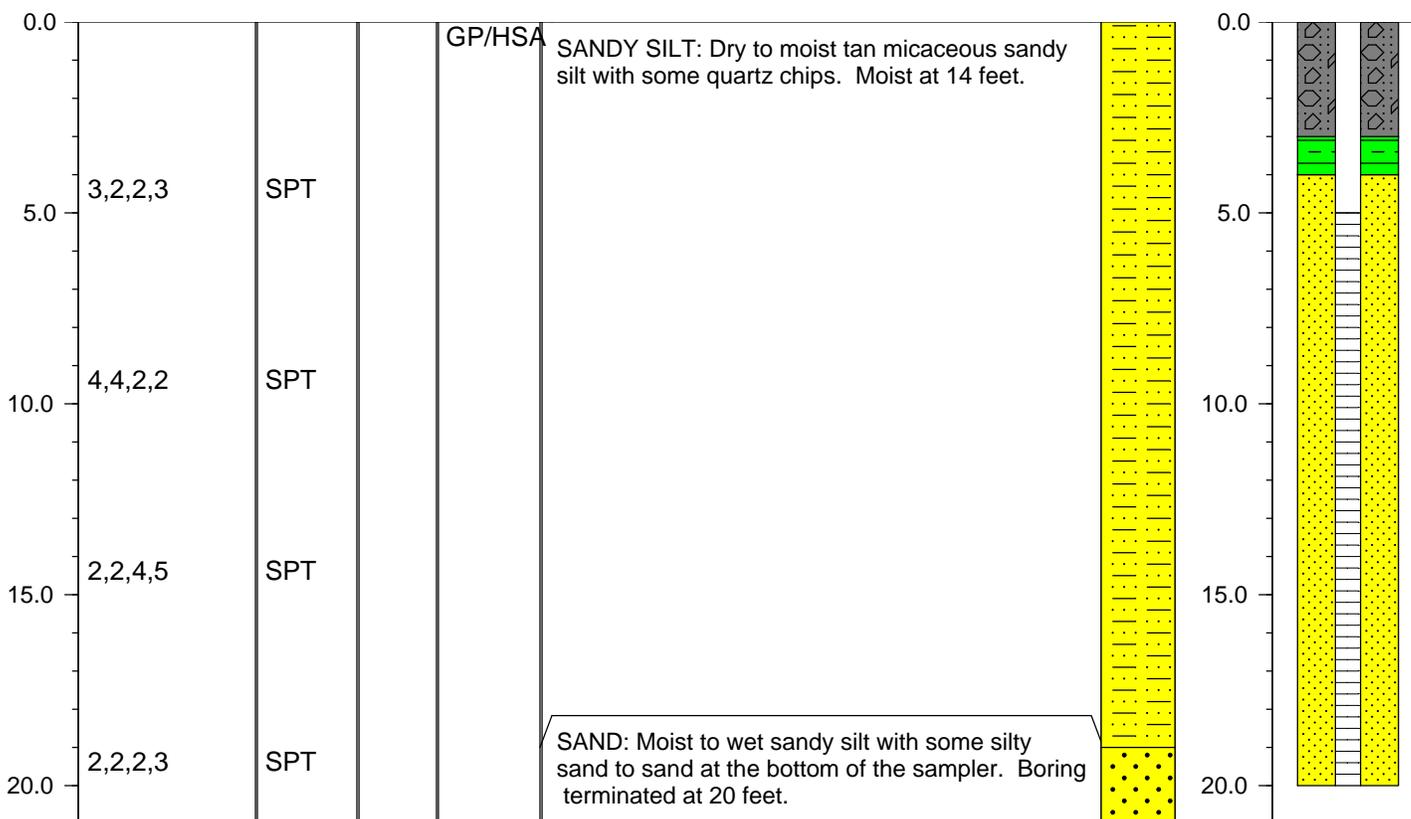
Page 1 of 1

PROJECT NAME: **Avery County C&D Landfill**
 LOCATION: **Ingalls, NC**
 DRILLING CO: **Geologic Exploration, Inc.**
 DRILLING METHOD: **Geoprobe/HSA**
 FIELD PARTY: **Brian Thomas**
 GEOLOGIST: **Don Misenheimer**
 DATE BEGUN: **11/21/11** COMPLETED: **11/21/11**

TOTAL DEPTH: **20**
 TOP OF CASING ELEV.: **GROUND ELEV.:**
 NORTHING: **0** EASTING: **0**

STATIC WATER LEVEL (BLS)		
Depth (ft)		
Time		
Date		

DEPTH Feet	BLOW COUNT Per 6"	SAMPLING METHOD	RECOVERY Inches	DRILL METHOD	DESCRIPTION	LITHOLOGY	DEPTH Feet	WELL INSTALLATION
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1. WELL CONTRACTOR:

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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) P-11

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

Industrial/Commercial Agricultural Recovery Injection

Irrigation Other (list use) _____

DATE DRILLED 11/21/11

4. WELL LOCATION:

2175 BRUSHY CREEK ROAD 28657

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

CITY: SPRUCE PINE COUNTY MITCHELL

TOPOGRAPHIC / LAND SETTING: (check appropriate box)

Slope Valley Flat Ridge Other _____

LATITUDE _____ " DMS OR _____ DD

LONGITUDE _____ " 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.)

AVERY COUNTY C&D LANDFILL N/A

Facility Name Facility ID# (if applicable)

2175 BRUSHY CREEK ROAD

Street Address

SPRUCE PINE

NC

28657

City or Town

State

Zip Code

UNIVERSITY OF NORTH CAROLINA

Contact Name

MUNICIPAL DRIVE

Mailing Address

CHAPEL HILL

NC

27599

City or Town

State

Zip Code

()

Area code Phone number

6. WELL DETAILS:

a. TOTAL DEPTH: 20.0 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 0.0 Bottom 5.0 Ft. 2 INCH SCH 40 PVC

Top _____ Bottom _____ Ft. _____ _____ _____

Top _____ Bottom _____ Ft. _____ _____ _____

8. GROUT: Depth Material Method

Top 0.0 Bottom 3.0 Ft. PORTLAND BENTONITE SLURRY

Top _____ Bottom _____ Ft. _____ _____ _____

Top _____ Bottom _____ Ft. _____ _____ _____

9. SCREEN: Depth Diameter Slot Size Material

Top 5.0 Bottom 20.0 Ft. 2.0 in. .010 in. PVC

Top _____ Bottom _____ Ft. _____ in. _____ in. _____

Top _____ Bottom _____ Ft. _____ in. _____ in. _____

10. SAND/GRAVEL PACK: Depth Size Material

Top 4.0 Bottom 20.0 Ft. 20-40 FINE SILICA SAND

Top _____ Bottom _____ Ft. _____ _____ _____

Top _____ Bottom _____ Ft. _____ _____ _____

11. DRILLING LOG Top Bottom Formation Description

0.0 / 5.0 TAN SILT/COBBLES

5.0 / 20.0 WHITE/GRAY PARTIALLY WEATHER

/ ROCK

/ _____

/ _____

/ _____

/ _____

/ _____

/ _____

/ _____

/ _____

/ _____

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 11/28/11

SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

BRIAN THOMAS

PRINTED NAME OF PERSON CONSTRUCTING THE WELL



FIELD BOREHOLE LOG

BOREHOLE NUMBER **P-12**

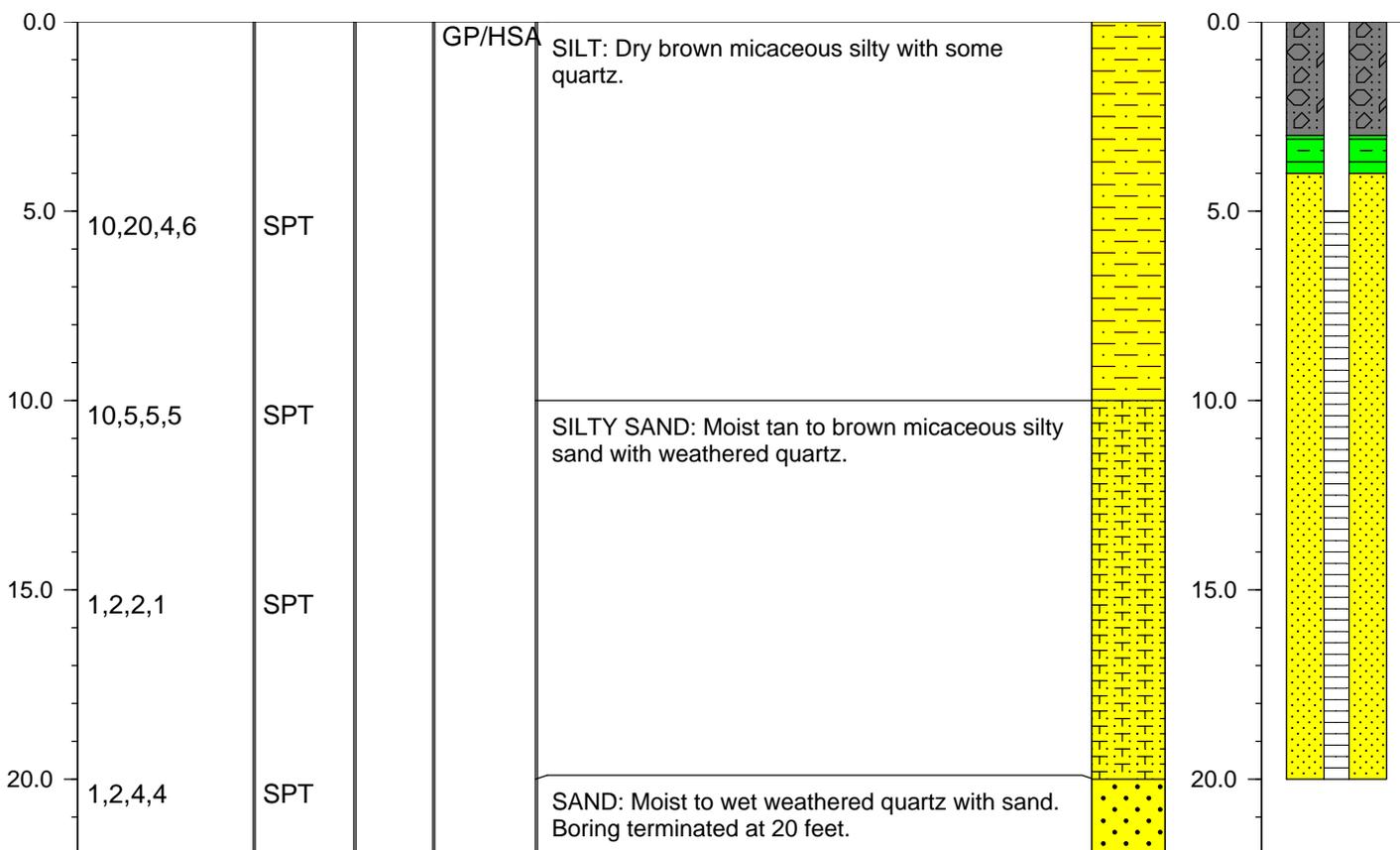
Page 1 of 1

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 LOCATION: **Ingalls, NC**
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 DRILLING METHOD: **Geoprobe/HSA**
 FIELD PARTY: **Brian Thomas**
 GEOLOGIST: **Don Misenheimer**
 DATE BEGUN: **11/21/11** COMPLETED: **11/21/11**

TOTAL DEPTH: **20**
 TOP OF CASING ELEV.: **GROUND ELEV.:**
 NORTHING: **0** EASTING: **0**

STATIC WATER LEVEL (BLS)		
Depth (ft)		
Time		
Date		

DEPTH Feet	BLOW COUNT Per 6"	SAMPLING METHOD	RECOVERY Inches	DRILL METHOD	DESCRIPTION	LITHOLOGY	DEPTH Feet	WELL INSTALLATION
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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) P-12

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

Industrial/Commercial Agricultural Recovery Injection

Irrigation Other (list use) _____

DATE DRILLED 11/21/11

4. WELL LOCATION:

2175 BRUSHY CREEK ROAD 28657

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

CITY: SPRUCE PINE

COUNTY MITCHELL

TOPOGRAPHIC / LAND SETTING: (check appropriate box)

Slope Valley Flat Ridge Other _____

LATITUDE _____ ° _____ ' _____ " DMS OR _____ DD

LONGITUDE _____ ° _____ ' _____ " 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.)

AVERY COUNTY C&D LANDFILL N/A

Facility Name

Facility ID# (if applicable)

2175 BRUSHY CREEK ROAD

Street Address

SPRUCE PINE

NC

28657

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Contact Name

MUNICIPAL DRIVE

Mailing Address

CHAPEL HILL

NC

27599

City or Town

State

Zip Code

(_____) _____

Area code Phone number

6. WELL DETAILS:

a. TOTAL DEPTH: 20.0 FEET

b. DOES WELL REPLACE EXISTING WELL? YES NO

c. WATER LEVEL Below Top of Casing: 17.0 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 0.0 Bottom 5.0 Ft. 2 INCH SCH 40 PVC

Top _____ Bottom _____ Ft. _____ _____ _____

Top _____ Bottom _____ Ft. _____ _____ _____

8. GROUT: Depth Material Method

Top 0.0 Bottom 3.0 Ft. PORTLAND BENTONITE SLURRY

Top _____ Bottom _____ Ft. _____ _____ _____

Top _____ Bottom _____ Ft. _____ _____ _____

9. SCREEN: Depth Diameter Slot Size Material

Top 5.0 Bottom 20.0 Ft. 2.0 in. .010 in. PVC

Top _____ Bottom _____ Ft. _____ in. _____ in. _____

Top _____ Bottom _____ Ft. _____ in. _____ in. _____

10. SAND/GRAVEL PACK:

Depth Size Material

Top 4.0 Bottom 20.0 Ft. 20-40 FINE SILICA SAND

Top _____ Bottom _____ Ft. _____ _____ _____

Top _____ Bottom _____ Ft. _____ _____ _____

11. DRILLING LOG

Top Bottom Formation Description

0.0 / 4.0

TAN SILT/COBBLES

4.0 / 20.0

WHITE/GRAY PARTIALLY WEATHER
ROCK

_____/_____
_____/_____
_____/_____
_____/_____
_____/_____
_____/_____
_____/_____
_____/_____
_____/_____
_____/_____

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 11/28/11
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

BRIAN THOMAS
PRINTED NAME OF PERSON CONSTRUCTING THE WELL



Richardson Smith Gardner & Assoc

14 North Boylan Avenue, Raleigh NC 27603
(919) 828-0577

FIELD BOREHOLE LOG

BOREHOLE NUMBER P-13

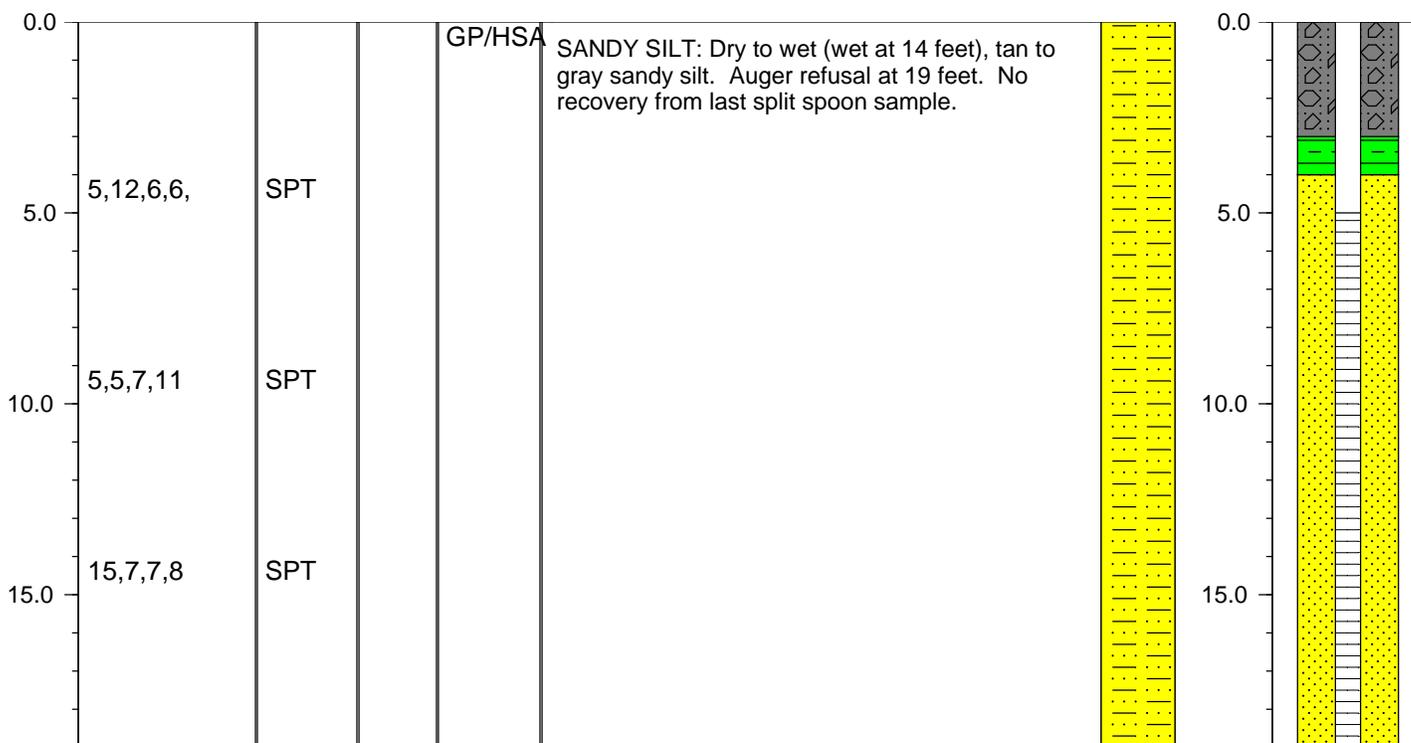
Page 1 of 1

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DRILLING CO: **Geologic Exploration, Inc.**
DRILLING METHOD: **Geoprobe/HSA**
FIELD PARTY: **Brian Thomas**
GEOLOGIST: **Don Misenheimer**
DATE BEGUN: **11/21/11** COMPLETED: **11/21/11**

TOTAL DEPTH: **20**
TOP OF CASING ELEV.: GROUND ELEV.:
NORTHING: **0** EASTING: **0**

STATIC WATER LEVEL (BLS)		
Depth (ft)		
Time		
Date		

DEPTH Feet	BLOW COUNT Per 6"	SAMPLING METHOD	RECOVERY Inches	DRILL METHOD	DESCRIPTION	LITHOLOGY	DEPTH Feet	WELL INSTALLATION
---------------	----------------------	-----------------	--------------------	--------------	-------------	-----------	---------------	----------------------





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) P-13

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

Industrial/Commercial Agricultural Recovery Injection

Irrigation Other (list use) _____

DATE DRILLED 11/21/11

4. WELL LOCATION:

2175 BRUSHY CREEK ROAD 28657

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

CITY: SPRUCE PINE

COUNTY MITCHELL

TOPOGRAPHIC / LAND SETTING: (check appropriate box)

Slope Valley Flat Ridge Other _____

LATITUDE _____ ° _____ ' _____ " DMS OR _____ DD

LONGITUDE _____ ° _____ ' _____ " 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.)

AVERY COUNTY C&D LANDFILL N/A

Facility Name

Facility ID# (if applicable)

2175 BRUSHY CREEK ROAD

Street Address

SPRUCE PINE

NC

28657

City or Town

State

Zip Code

UNIVERSITY OF NORTH CAROLINA

Contact Name

MUNICIPAL DRIVE

Mailing Address

CHAPEL HILL

NC

27599

City or Town

State

Zip Code

(_____) _____
Area code Phone number

6. WELL DETAILS:

a. TOTAL DEPTH: 19.0 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>19.0</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>19.0</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 SILT/COBBLES</u>
<u>4.0 / 19.0</u>	<u>WHITE/GRAY PARTIALLY 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 11/28/11
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

BRIAN THOMAS
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Attachment B

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LANDFILL GAS MANAGEMENT PLAN

**Avery County MSW Landfill
Ingalls, North Carolina
NC Solid Waste Permit No. 06-01**

Prepared for:



**Avery County
Newland, North Carolina**

Prepared by:



14 N. BOYLAN AVENUE
RALEIGH, NORTH CAROLINA 27603
NC LICENSE NO. C-0828 (ENGINEERING)

February 2012



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LANDFILL GAS MANAGEMENT PLAN

**Avery County MSW Landfill
Ingalls, North Carolina
NC Solid Waste Permit No. 06-01**

Prepared for:



**Avery County
Newland, North Carolina**

RSG Project No. **Avery-11-6**

A handwritten signature in blue ink, reading "Joan A. Smyth".

Joan A. Smyth, P.G.
Senior Hydrogeologist

A handwritten signature in blue ink, reading "Stacey A. Smith".

Stacey A. Smith, P.E.
Project Manager

February 2012



14 N. BOYLAN AVENUE
RALEIGH, NORTH CAROLINA 27603
NC LICENSE NO. C-0828 (ENGINEERING)



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**AVERY COUNTY LANDFILL
NC SOLID WASTE PERMIT NO. 06-01**

LANDFILL GAS MONITORING PLAN

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FIGURES

- Figure 1 Site Vicinity Map
- Figure 2 Site Plan
- Figure 3 LFG Monitoring Location Detail

APPENDICES

- Appendix A Closure Permit
- Appendix B Boring Logs
- Appendix C Selected Historical Active Gas Collection System Information
- Appendix E Monitoring Logs and Reporting Forms

LANDFILL GAS MONITORING PLAN

1.0 INTRODUCTION

1.1 Project Description

This Landfill Gas Monitoring Plan (Plan) has been prepared by Richardson Smith Gardner & Associates, Inc. (RSG) to present a comprehensive landfill gas (LFG) monitoring program at the closed Avery County MSW Landfill (NC Solid Waste Permit 06-01). The site is located on Brushy Creek Road in Ingalls, North Carolina as shown in **Figure 1**. The proposed plan presents the rationale for the monitoring program as well as necessary actions required by the Owner to protect and safeguard the area surrounding the landfill and to satisfy North Carolina Solid Waste Management Rules [13B.0503(2)(a)] for monitoring and controlling LFG.

At a minimum, these regulations require owners of landfills to ensure that the facility does not exceed:

- *25% of the lower explosive limit (LEL) or 1.25% CH₄ by volume in structures; and*
- *100% of the LEL or 5% CH₄ by volume at the facility property boundary.*

The Engineer has utilized the best available site data, practices, experience, and judgment to develop this plan. However, the program may require modifications and maintenance over time to accommodate changing landfill conditions, changing receptors in areas adjacent and around the landfill, or other conditions that cannot be fully anticipated. Maintenance suggestions are also included in this plan to assist in the identification of secondary conditions that may require updates to this Plan.

Uncontrolled migration of LFG can result in loss of property, loss of life, injury, vegetative damage and intolerable odors. The monitoring of landfills includes exposure to explosive gases. All operational and/or monitoring staff should be specifically trained in the management and response for situations such as fire or explosion, confined space, drilling, and overhead hazards, and possess and awareness of changing conditions around these sites.

1.2 Contact Information

In case of emergencies, or if questions arise during the implementation of this program, please contact the following:

1.2.1 Owner

Avery County
Avery County C&D Landfill (local site office)
2175 Brushy Creek Road
Newland, North Carolina 28657

Avery County Solid Waste Department
175 Linville Street
Newland, North Carolina 28657
Phone: (828) 737-5420

Mr. Henry "Buddy" Norris, Director
Cell: (828) 387-0071
email: buddy.norris@ncmail.net

1.2.2 Engineer

Richardson Smith Gardner & Associates, Inc.
14 N. Boylan Avenue
Raleigh, North Carolina 27603
Phone: (919) 828-0577

Ms. Joan A. Smyth, P.G., Senior Hydrogeologist
email: joan@rsgengineers.com
Mr. Stacey A. Smith, P.E., Project Manager
email: stacey@rsgengineers.com

1.2.3 Unimin Property

Unimin Corporation
107 Harris Mining Company Rd.
Spruce Pine, North Carolina 28777
Phone: (828) 766-6050

Mr. Bryan Roe, Unimin Corporation
Cell: (828) 467-2494

1.2.4 Avery County Airport Property

Avery County Airport Authority
400 Brushy Creek Road
Spruce Pine, North Carolina 28777
Phone: (828) 766-8187

Mr. Ryan Montague, Manager
Cell: (828) 467-1914

1.2.5 Solid Waste Regulatory Agency

NC Department of Environment and Natural Resources -Division of Waste Management:

Raleigh Central Office (RCO)
401 Oberlin Road, Suite 150
Raleigh, North Carolina 27605
Phone: (919) 508-8400

Ms. Jaclynne Drummond, Hydrogeologist II
email: jaclynne.drummond@ncdenr.gov

Asheville Regional Office (ARO)
2090 U.S. Highway 70
Swannanoa, North Carolina 28778
Phone: (828) 296-4500

Mr. Allen Gaither, Environmental Engineer II
email: allen.gaither@ncdenr.gov
Ms. Deborah Aja, Environmental Senior Specialist
email: deborah.aja@ncdenr.gov

1.2.6 Air Quality Regulatory Agency

NC Department of Environment and Natural Resources -Division of Air Quality:

Raleigh Regional Office
1628 Mail Service Center
Raleigh, North Carolina 27699
Phone: (919) 791-4200

Mr. Patrick Butler, Regional Supervisor

1.3 Existing Site Conditions

The Avery County Municipal Solid Waste (MSW) Landfill is a closed landfill located 0.6 miles Southeast of the intersection of Highway 19 East and Brushy Creek Road or 0.3 miles East from the Avery County Airport as shown in **Figure 1**. The facility operated from about 1970¹ until the time of its closure in 1993². The property is approximately 14.4 acres with horizontal waste limits of approximately 9.6 acres as shown in **Figure 2**.

¹ Feasibility Assessment for Landfill Gas Utilization Greenhouse Project at the Avery County MSW Landfill prepared by SCS Engineers dated September 1997.

² Correspondence dated December 9, 1993 from Joseph Seegars, Attorney for Avery County, documenting the date of closure on October 8, 1993.

1.3.1 Topography

The landfill site lies in a relative valley between Mill Ridge and Doe Hill Mountain as shown in **Figure 1**. Existing ground surface elevations vary from El. 2670 (feet) at the southern end and El. 2770 at the top of the closed MSW landfill. Currently, much of the surrounding area is undeveloped and wooded. The Unimin properties include mining operations.

1.3.2 Adjacent Areas

The landfill site borders the Avery County airport to the west and the Unimin Corporation on all other borders. Brushy Creek Road travels along the sites northern line. Brushy Creek flows along the southeast line of the site. The site is accessed from Brushy Creek Road. The Unimin Corporation property includes a private road along the northern line of the site and all Unimin property is prohibited for use by landfill site personnel without prior approval (for approval, see **Section 1.2.3**).

1.3.3 Site Soils Information

The native soil types at, and around the landfill are classified as the Chandler-Micaville complex and the Cullowhee loam. The Chandler-Micaville complex soils are excessively drained and are affected by soil creep in the upper solum above residuum from weathered mica gneiss or mica schist. The Cullowhee loam is found on slopes of 0% to 3%, which are the areas near the creek to the south and east of the site. These soils are somewhat poorly drained and are characterized as loamy alluvium over sandy and gravelly alluvium. Deeper soils in the area consist of silts and clayey silts. A discussion of site soil types observed during landfill gas well installation will be included with the final report and submitted with the landfill gas boring logs. Should any geologic features be observed to be different from those describe herein, this plan will be updated at that time to revise this section.

1.4 Regulatory Status

As previously mentioned, the Avery County Landfill operated between 1970 and was closed in 1993. A copy of the site permit and closure permit is provided as **Appendix A**. The Post Closure Permit, Condition No. 1 requires management of landfill gas. This plan has been prepared to satisfy this condition. Since the site was closed in 1993, it is regulated under 15A NCAC 13B .0500, Disposal Sites.

1.4.1 Federal Clean Air Act (CAA)

The EPA promulgated NSPS and Emission Guidelines (EG) for air emissions from municipal solid waste landfills³. These regulations were enacted under Section 111 of the Clean Air At Amendments of 1990 (CAAA).

³ EPA, Standard of Performance for Non-Stationary Point Sources and Guidelines for Control of Existing Sources, Final Rule, March 12, 1997.

The NSPS/EG air emission regulations are a comprehensive program targeted at quantifying and controlling the emissions of methane and other "greenhouse" to the atmosphere. The rules bring all new landfill construction and all very large existing sites under the regulatory authority of the EPA and EPA-Approved State Air Quality programs, such as that in North Carolina. The closed Avery County MSW Landfill is not regulated by the Subpart WWW-Standards of Performance for Municipal Solid Waste Landfill1 (NSPS), due to maximum design capacity less than 2.5 million megagrams (Mg).

1.4.2 Greenhouse Gas Reporting

On September 22, 2009, the EPA issued a final rule for mandatory reporting of greenhouse gases (GHGs) from large GHG emissions sources in the United States, including certain MSW landfills. According to the rule, if a site that accepted waste after January 1, 1980, but has less than 350,000 metric tons of waste, it does not have to report under this rule.

The Avery County Landfill reportedly has an estimated volume of waste in-place of approximately 249,000 tons⁴ which equals approximately 225,900 metric tons. However, Avery County did not install scales until 1991. 40 CFR Part 98.343(a)(3) acknowledges that if waste disposal quantities are not available, a few alternative methods must be used. RSG used methodology from Section 98.343(a)(3)(I) which assumes all prior year waste disposal quantities are the same as the waste quantity in the first reporting year, or in this case, the last year waste was accepted. The waste accepted in 1993 was 13,000 tons. Based on this volume, the method estimates a volume of waste in-place of approximately 312,000 tons or 283,000 metric tons. Therefore, due to its size, the closed Avery County MSW Landfill is not required to report under this rule.

2.0 MONITORING PROGRAM

2.1 LFG Monitoring Well Network

2.1.1 Introduction

The LFG monitoring well network for the Avery County landfill includes 13 LFG monitoring wells (P-1 through P-13) located both on and off the landfill property as shown on **Figure 2**. The perimeter LFG monitoring system is designed with monitoring wells located to intercept the potential migration of LFG .

2.1.2 LFG Monitoring Well Placement

The monitoring well locations have been evaluated based on the surrounding area conditions, soil types, location of waste on property, and nearby bodies of water. As described above:

⁴ Feasibility Assessment for Landfill Gas Utilization Greenhouse Project at the Avery County Landfill, prepared by SCS Engineers, dated September 1997.

- There are no residences located on surrounding properties;
- There are no structures on the surrounding Unimin property;
- The Avery County Airport property includes some structures; and
- Shallow groundwater in the vicinity of Brushy Creek (a perennial stream) to the southeast which will prevent the migration of LFG in this area.

These conclusions, as well as the documented migration of LFG onto the adjacent Unimin and Airport Authority properties directed the placement of LFG monitoring wells in the areas shown on **Figure 2**.

2.1.3 LFG Monitoring Well Construction

LFG monitoring wells P-1 and P-4 through P-8 were installed on March 22-23, 2010 using a Geoprobe™ rig and were constructed of one-inch diameter, manufactured PVC well screens with 10-slot per inch intake spacings. LFG monitoring wells P-2 and P-3 were installed on May 14, 2010 using a hand auger and were constructed of one-inch diameter, manufactured PVC well screens with 10-slot per inch intake spacings. LFG monitoring wells P-9 through P-13 (located on properties adjacent to the landfill) were installed on November 21, 2011 using a Geoprobe™ rig and were constructed of two-inch diameter, manufactured PVC well screens with 10-slot per inch intake spacings.

All LFG monitoring wells were completed with three (3) to five (5) feet of solid PVC riser pipe. A sand filter pack was placed around each screened interval, to a height of one (1) foot above the screen, and a hydrated bentonite plug of one (1) to two (2) feet in thickness was placed above the sand pack to seal each well. Wells were completed with a steel protective casing and a cement pad for surface protection as shown on **Figure 3**. Each well casing is distinguishable as a LFG monitoring well rather than an on-site ground water monitoring well, and are labeled P-1 through P-13. A “female” Colder® type quick-connect fitting is installed in each cap as a monitoring port. Boring logs for P-1 through P-13 are provided in **Appendix B** of this plan.

2.2 Airport Structure Monitoring

Avery County operates an airport to the west of the closed landfill site. There are several structures in relative close proximity to the landfill site. These structures are airplane hangers/storage areas constructed on concrete pads, having no foundations. The monitoring network will include the perimeter monitoring of six (6) of these structures shown numbered on **Figure 2**. There is a stormwater drainage system located between the rows of structures that will also be a part of the monitoring network. This LFG monitoring will include the following:

- monitoring the outside four corners of each structure;
- monitoring of any cracks/holes in each of the concrete pads;
- monitoring of space caused by gaps in the building structure and the concrete pads;
- monitoring of the conduit pipes and other similar features; and
- monitoring of any drainage grate or accessible subsurface pipe.

2.3 Active Landfill Gas System

Avery County operates an active LFG collection system on the closed landfill site. Recovered LFG is destroyed on-site through a flare system.

2.3.1 Overview

The original development of the site included eight (8) LFG extraction wells (W1 through W8) installed throughout the site. As of April 2011, all of these extraction wells are operational and connected through an HDPE header pipe to a control flare. The flare area includes the following⁵:

- 1 HP - 50 CFM regenerative blower;
- flame arrester;
- condensate trap and storage tank;
- open candle type flare; and
- valves and gauges; and

Selected historical sketches, details, and information is provided in **Appendix C**.

2.3.2 Monitoring

During the active collection of gas, the system requires periodic monitoring to keep up system efficiency, minimize surface emissions from the landfill area, and (in the case of subsurface migration monitoring) meet regulatory requirements. The active gas collection system will be monitored by representatives of Avery County at a frequency to ensure adjustment of the system to balance recovery and ensure safe operation. The system incorporates monitoring points at wellheads and the flare system to both monitor landfill gas quality and quantity. Each monitoring point is discussed in this section.

2.3.2.1 Wellhead Monitoring

At each wellhead, monitoring will be performed on a periodic basis for the following parameters (at a minimum):

- Gauge pressure in the gas collection header shall be negative, except as otherwise specified in the facility closure plan;
- Balance Gas (assumed to be nitrogen) shall be less than 20%, or Oxygen shall be less than 5% concentration; and
- Temperature shall not exceed 55°C (131°F).

⁵ Memorandum from Cindy McCoy, Natural Power, to Terry Woodruff, Energy Xchange, dated December 14, 2001 regarding the Avery County Landfill Blower Station.

2.3.2.2 *Flare System Monitoring*

At the flare system, monitoring will be performed by periodically to maintain efficient operations and shall include the following parameters (at a minimum):

- flame presence;
- flame arrester presence;
- condensate volumes;
- gas quality (i.e. %O₂, %CH₄, etc.); and
- valves are operable.

2.3.3 *Modifications*

In January 2009, four (4) LFG extraction wells (W-5, W-6, W-7 & W-8) were removed from the LFGCCS due to a fire that occurred in/near these wells, destroying the wellheads. On April 6-7, 2011, wellheads at these four (4) locations were replaced and reconnected to the LFGCCS. These newly installed wellheads were connected to the existing LFG header laterals using the same configuration previously used on-site.

The four (4) previously operational LFG wells (W-1, W-2, W-3 & W-4) were up-fit with new hardware and the connections to the LFG header laterals were re-worked. A Field Summary Report⁶ for these modifications was submitted on June 7, 2011.

2.4 **Monitoring and Reporting**

Monitoring and reporting of LFG gas concentrations shall be performed in accordance with guidance by the Division of Waste Management document “Landfill Gas Monitoring Guidance” (<http://ncdenr.gov/web/wm/sw/envmonitoring>) and as outlined below.

2.4.1 *Frequency*

LFG monitoring will be completed on a quarterly basis. Before each monitoring event, permission to enter the Unimin site must be granted. Please see **Section 1.2.3** for contact information

2.4.2 *Personnel*

LFG monitoring will be performed by trained personnel knowledgeable of the LFG hazard and the use of explosive gas meters. This may be a hired professional, or designated site person. If site personnel are used, documentation of their training must be kept in the operational record of the landfill(s).

⁶ Well Re-Activation - Field Summary Report - Avery County Closed MSW Landfill, prepared by RSG Engineers, dated June 7, 2011.

2.4.3 Equipment

The County currently owns an RKI® GX 2003 combustible gas indicator⁷. This meter operates using the infra-red spectral property of methane (CH₄) to measure concentrations in air below the LEL. This meter is calibrated to methane. Gas meter information should be included with the meter or can be found at the manufacturer's website. The RKI® meter may be used in oxygen (O₂) deficient areas (less than 10% O₂) such that oxygen is not required for a chemical combustion of flammable gases within the meter. The RKI® GX 2003 or equivalent meter will be used for the LFG monitoring.

All monitoring equipment should be regularly calibrated in accordance with manufacturers specifications and operated only as instructed. The meter used for monitoring will have Tygon tubing, including a "male" Colder® type quick-connect (or equivalent) fitting, attached to the inlet.

2.4.4 Procedures

Each monitoring event should begin by calibrating the gas meter with a known calibration standard in accordance with manufacturer's recommendations and operated only as instructed.

Procedures for the LFG monitoring wells and airport structure monitoring locations should include the following:

- Check calibration date on the meter;
 - Perform "bump test" against known gas concentration;
 - Connect tubing to sample port on the monitoring well cap, without removing the cap (LFG monitoring wells only);
 - Record data on the monitoring log form provided in **Appendix D**; and
 - If less than 50% LEL, move to next monitoring location.
- * If explosive gas concentrations **equal to or greater than 50%** of the LEL at any of the LFG monitoring locations, personnel should implement Precautionary Action Plan located in **Section 2.2.5**.
- * IF EXPLOSIVE GAS CONCENTRATIONS EQUAL TO OR GREATER THAN 100% OF THE LEL AT ANY OF THE LFG MONITORING LOCATIONS, THE FOLLOWING ACTIONS SHALL BE TAKEN BY PERSONNEL:**
- (1) **Immediately** contact the Solid Waste Director.
 - (2) Recalibrate monitoring equipment and confirm results.
 - (3) If concentrations still exceed 100% LEL, Avery County and the Engineer will implement the Compliance Action Plan located in **Section 3.2**.
 - (4) Submit monitoring data to NCDENR for review.

⁷ Model GX-2003, www.rkiinstruments.com

2.4.5 *Precautionary Action Plan*

If explosive gas concentrations are **equal to or greater than 50%** of the LEL at any of the LFG monitoring locations, personnel should perform the following additional steps:

- Monitor gas pressure in each well (in inches of water) using magnehelic gauge or other appropriate metering device (LFG monitoring wells only);
- Monitor initial gas concentration through sampling port (LFG monitoring wells only);
- Open well cap and allow to stabilize for at least three (3) minutes (LFG monitoring wells only);
- Monitor gas concentration inside probe just below the top of casing (LFG monitoring wells only); and
- Evaluate surrounding areas for potential receptors to or signs of LFG migration. LFG can stress vegetation, can kill trees and grass by root asphyxiation. Note any areas of stressed/dead vegetation on the monitoring form.

Monitoring should be completed in this manner for all locations with concentrations equal to or greater than 50% LEL during all monitoring events. This information should be recorded, kept in the operating record and reported to the Solid Waste Director and to the Engineer for further evaluation.

2.4.6 *Record Keeping*

All readings will be documented on the LFG monitoring log form provided in **Appendix D**. The completed forms will be reviewed by the County Solid Waste Director following each monitoring event and placed in the landfill operating records. The monitoring logs will remain on file with other landfill records in the landfill office at the Avery County MSW Transfer Station and C&D Landfill at 2175 Brushy Creek Road **and** at the Solid Waste Director's Office in Newland. These readings should be available for review by NCDENR and EPA personnel upon request.

If readings above 100% LEL are measured, a copy of the LFG monitoring form and an Environmental Data Reporting Form also provided in **Appendix D** shall be submitted to NCDENR. A copy shall be kept in the landfill operating records.

2.5 **Maintenance**

In addition to the monitoring program, periodic maintenance and site observations shall be conducted to the program components as follows (at a minimum):

- Factory calibration of the gas meter;
- Maintaining access to monitoring wells and gas probes;
- Observing landfill cover conditions, potential erosion areas, landfill seeps, odors, etc.;

- Monitoring probe condition such as accessibility, operational locks, casing condition, etc.

Any deficiencies shall be noted on the monitoring forms and reported to the Solid Waste Director for repair or replacement as necessary.

3.0 CONTINGENCY PLAN

3.1 Introduction

In the event explosive gas concentrations exceed safe levels (>100% LEL), a contingency plan is recommended and warranted. The contingency plan includes the specific step by step actions that should be implemented to protect human health and the environment.

3.2 Compliance Action Plan

If explosive gas concentrations **equal to or greater than 100%** of the LEL in any of the LFG monitoring locations, the following actions shall be taken by personnel:

3.2.1 Immediate Action Plan

The Solid Waste Director shall take immediate action to ensure the protection of human health and safety as follows:

- (1) Determine potential receptors surrounding the site;
- (2) If warranted by the degree of intensity of the LFG concentration, check the LFG concentrations in structures of receptors surrounding the site, such as the greenhouse operation or other structures on the airport property;
- (3) If further warranted by the degree of intensity (>25% LEL) of the LFG concentration in structures, evacuate the area;
- (4) Contact the County Fire Marshal;
- (5) Notify verbally the County Manager and Waste Management Specialist in the Asheville Regional Office;
- (6) Investigate and identify the source(s) and conduit(s) for LFG migration that have caused the excessive readings (i.e. the path that the LFG is taking to the monitoring location);
- (7) Identify the extent of the LFG problem through additional monitoring wells or bar hole punch sampling methodology; and
- (8) As appropriate, begin to take corrective action to control the LFG levels in building(s) surrounding the landfill site.

3.2.2 Reporting and Documentation

Following the **Immediate Action Plan**, the County must take the following actions within seven (7) days:

- (1) Place documentation of the **Immediate Action Plan** in the operating records of the landfill; and,
- (2) Provide documentation of the **Immediate Action Plan** and a description of the steps taken to protect human health in writing to the Waste Management Specialist in the Asheville Regional Office.

It is also suggested that at this time, a plan be developed which:

- Describes the nature and extent of the problem; and
- Proposes future actions to access/remediate the problem.

3.2.3 Remediation Plan

In the event the prolonged explosive gas concentrations exist and as identified during the **Immediate Action Plan**, the County shall prepare and implement a Remediation Plan to mitigate the migration of landfill gas off property. Extensions may be granted by the Division of Waste Management upon written request and depending on severity of the situation.

FIGURES

APPENDIX A
CLOSURE PERMIT

APPENDIX B
BORING LOGS

APPENDIX C

WELL HEAD DETAILS AND SELECTED HISTORICAL ACTIVE GAS COLLECTION SYSTEM INFORMATION

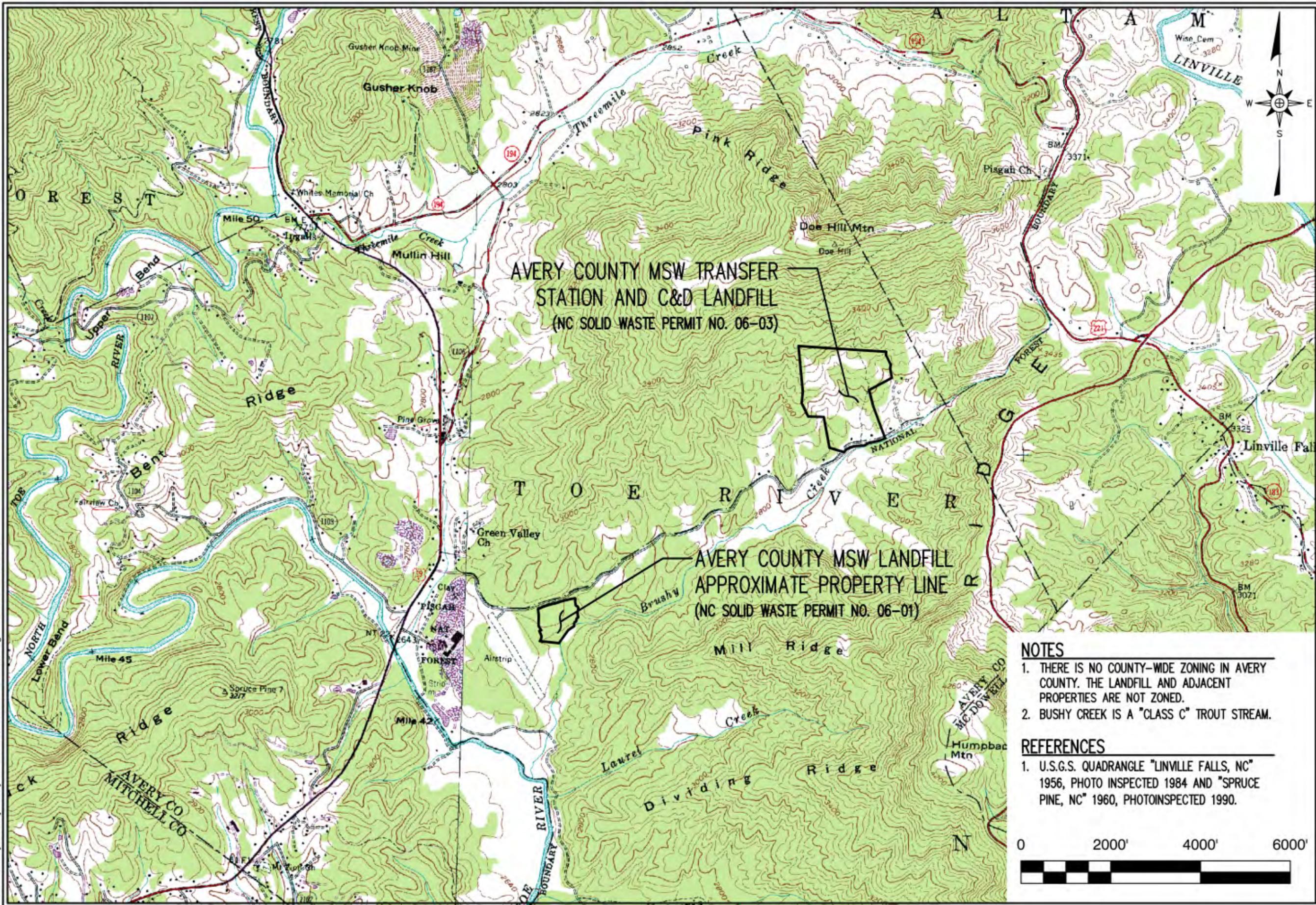
Please note that the historical information was obtained from NCDENR files and has not been documented for as-built conditions. However, the information appears to provide general information of the site system. Actual site verification is recommended.

APPENDIX D

MONITORING LOG AND REPORTING FORMS

FIGURES

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RICHARDSON SMITH GARDNER & ASSOCIATES
 www.rsgengineers.com
 14 N. Boylan Ave.
 Raleigh, N.C. 27603
 ph: 919-828-0877
 fax: 919-828-3899

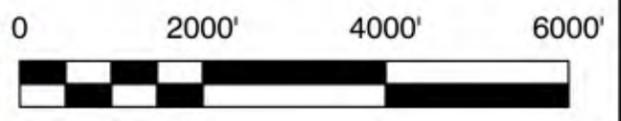
DRAWN BY:	W.R.B.	CHECKED BY:	S.A.S.	SCALE:	AS NOTED	FIGURE NO.:	1
DATE:	Jan. 2010	PROJECT NO.:	AVERY 09-8	FILE NAME:	AVERY-B0132		

NOTES

1. THERE IS NO COUNTY-WIDE ZONING IN AVERY COUNTY. THE LANDFILL AND ADJACENT PROPERTIES ARE NOT ZONED.
2. BUSHY CREEK IS A "CLASS C" TROUT STREAM.

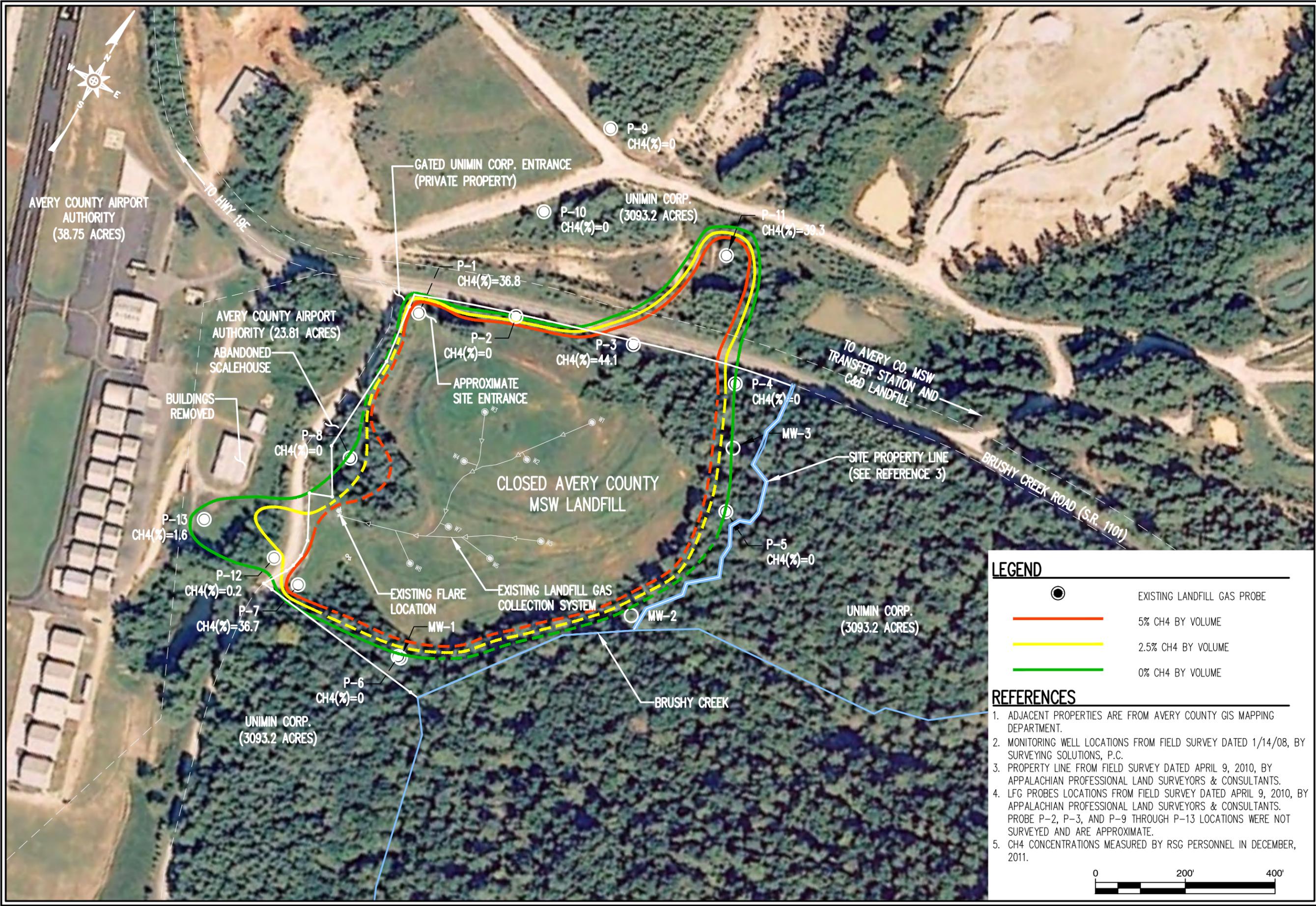
REFERENCES

1. U.S.G.S. QUADRANGLE "LINVILLE FALLS, NC" 1956, PHOTO INSPECTED 1984 AND "SPRUCE PINE, NC" 1960, PHOTOINSPECTED 1990.



AVERY COUNTY CLOSED MSWLF SITE VICINITY MAP

TITLE:



LEGEND

- EXISTING LANDFILL GAS PROBE
- 5% CH4 BY VOLUME
- 2.5% CH4 BY VOLUME
- 0% CH4 BY VOLUME

REFERENCES

1. ADJACENT PROPERTIES ARE FROM AVERY COUNTY GIS MAPPING DEPARTMENT.
2. MONITORING WELL LOCATIONS FROM FIELD SURVEY DATED 1/14/08, BY SURVEYING SOLUTIONS, P.C.
3. PROPERTY LINE FROM FIELD SURVEY DATED APRIL 9, 2010, BY APPALACHIAN PROFESSIONAL LAND SURVEYORS & CONSULTANTS.
4. LFG PROBES LOCATIONS FROM FIELD SURVEY DATED APRIL 9, 2010, BY APPALACHIAN PROFESSIONAL LAND SURVEYORS & CONSULTANTS. PROBE P-2, P-3, AND P-9 THROUGH P-13 LOCATIONS WERE NOT SURVEYED AND ARE APPROXIMATE.
5. CH4 CONCENTRATIONS MEASURED BY RSG PERSONNEL IN DECEMBER, 2011.

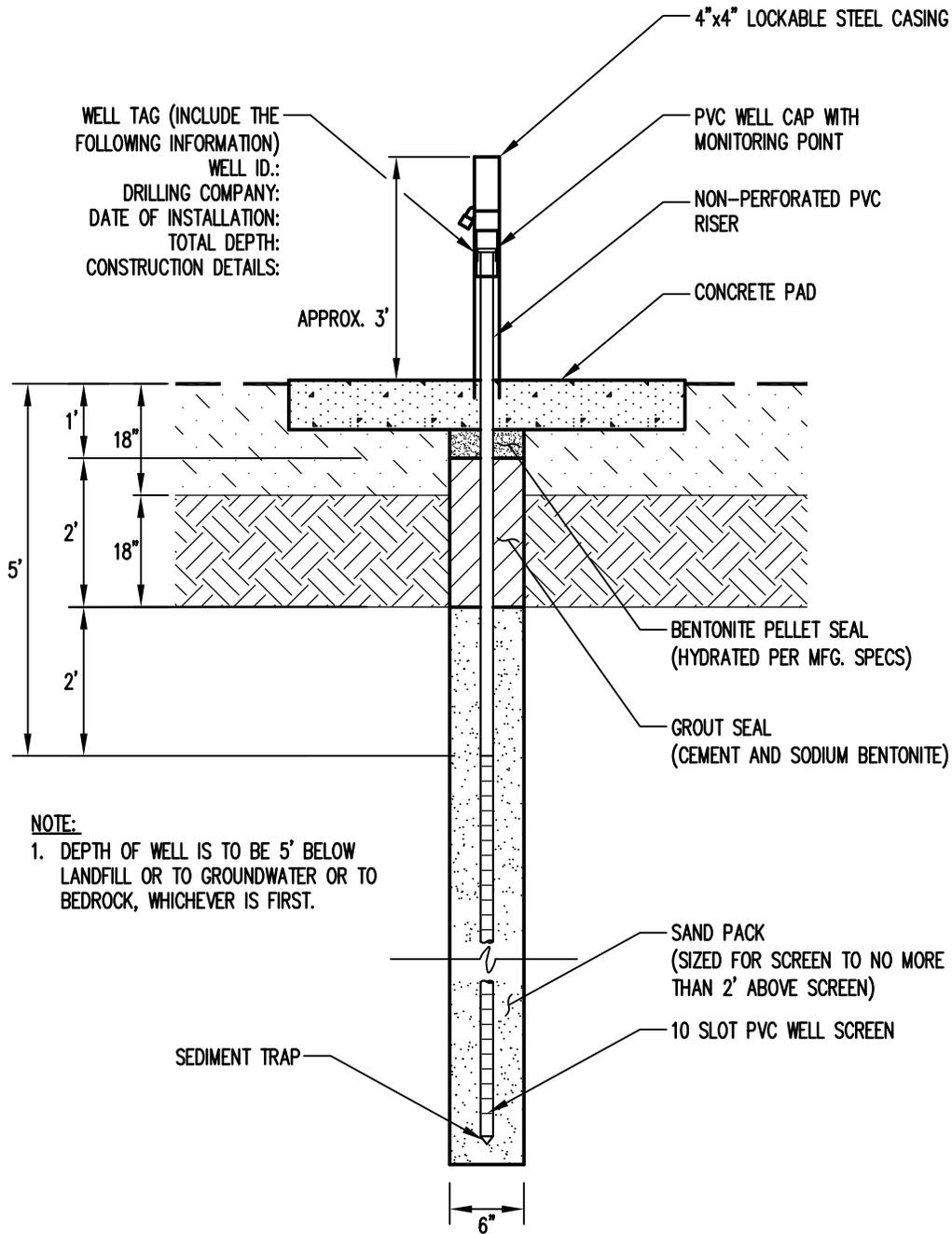


RICHARDSON SMITH GARDNER & ASSOCIATES
INC. LIC. NO. C-2828 (Engineering)
 www.rsgengineers.com

ph: 919-926-0577
 fax: 919-926-3899

FIGURE NO.	2	FILE NAME	AVERY-B0177
SCALE:	AS NOTED	PROJECT NO.	AVERY 11-6
CHECKED BY:	D.M.M.	DATE:	Jan. 2012
DRAWN BY:	W.R.B.		

TITLE:
LFG MONITORING WELL NETWORK
CH4 CONCENTRATIONS
AVERY COUNTY CLOSED MSWLF
SPRUCE PINE, NC



**AVERY COUNTY CLOSED MSWLF
 LFG MONITORING WELL DETAIL**



**RICHARDSON SMITH GARDNER
 & ASSOCIATES**

14 N. Boylan Ave.
 Raleigh, N.C. 27603

NC LIC. NO. C-0828 (Engineering)
www.rsgengineers.com

ph: 919-828-0577
 fax: 919-828-3899

SCALE:

DRAWN BY:

CHECKED BY:

DATE:

PROJECT NO.

FIGURE NO.

FILE NAME

AS SHOWN

C.T.J.

D.M.M.

Dec. 2011

AVERY 11-6

3

AVERY-A0174

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APPENDIX A
CLOSURE PERMIT

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State of North Carolina
Department of Environment,
Health and Natural Resources
Division of Solid Waste Management



James B. Hunt, Jr., Governor
Jonathan B. Howes, Secretary
William L. Meyer, Director

December 29, 1995

Randall Fletcher, County Manager
Avery County
P.O. Box 54
Newland, NC 28657

SUBJECT: Closure of the Avery County Landfill
Permit #06-01

Dear Mr. Fletcher:

The Solid Waste Section (the Section) has received and reviewed documentation submitted by your consultant, Municipal Engineering, on your behalf regarding the subject facility. Based on this documentation, the Section has determined that the subject facility has been closed in accordance with the applicable requirements. This determination may be rescinded should any of the documentation prove to be inaccurate.

The subject facility is considered closed subject to the attached post closure conditions. The owner of the facility, Avery County, is responsible for compliance with these conditions.

This closure shall become effective upon written notification by Avery County that the facility shall be maintained in compliance with the post closure conditions specified in this letter. Also, Rule .0510 states that when a disposal unit is closed, the permit to operate that unit is terminated and any future disposal operations will require approval by the Section.

POST CLOSURE CONDITIONS

1. **MANAGEMENT OF LANDFILL GAS:** The owner shall take the measures necessary to ensure that the closed site shall continue to meet the design standards for landfill gas found in Rule .0503(2)(a).
2. **MANAGEMENT OF SURFACE WATER:** The owner shall take the measures necessary to ensure that the closed site shall meet the requirements of Rule .0503(2)(c). In addition, the landfill unit shall be maintained such that surface water runoff occurs in a controlled manner, and surface water shall not be impounded over waste.
3. **AIR QUALITY:** The owner shall ensure that landfill units do not violate any applicable requirements developed under a State Implementation Plan approved or promulgated by the U.S. EPA Administrator pursuant to Section 110 of the Clean Air Act, as amended.
4. **FINAL COVER SYSTEM:** The integrity and effectiveness of the final cover system and any permanent erosion control devices must be maintained. This could include making repairs to the cover as necessary to correct the effects of settlement, subsidence, erosion, or other events.
5. **PROPOSED USES:** The owner shall submit a proposal for the Section's review and approval addressing post closure uses of the facility. Proposed post closure uses shall not violate any post closure conditions found in this letter. In particular, plans for post closure uses shall avoid possibilities for the entrapment of methane gas. Routine landfill gas monitoring within structures and at the facility boundary may not be sufficient to detect potentially dangerous situations.
6. **ONGOING SOLID WASTE MANAGEMENT ACTIVITIES:** Continuing solid waste management activities (e.g. yard waste composting, scrap tire collection, solid waste transfer) shall not violate any post closure conditions found in this letter, and must meet any other applicable requirements.
7. **RECORDATION:** The owner shall ensure that the recordation requirements for land disposal sites found in Rule .0204 are met.

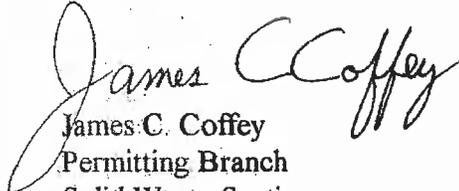
8. WATER QUALITY MONITORING AND REPORTING REQUIREMENTS:

- a. Groundwater quality at this facility is subject to the "Classifications and Water Quality Standards Applicable to the Groundwaters of North Carolina", 15A NCAC 2L. This includes, but is not limited to, the provisions for detection monitoring, assessment, and corrective action.
 - b. The permittee shall sample the detection monitoring wells and surface water sampling locations at a minimum on a semi-annual basis.
 - c. Water quality detection monitoring shall continue for a minimum of five years from the date of the Section's receipt of Avery County's notification that the facility will be maintained in compliance with the post-closure conditions specified in this letter. After five years the Section will determine if further monitoring is to be required.
 - d. Sampling equipment and methods shall conform to specifications in Attachment 1, "North Carolina Water Quality Monitoring Guidance Document for Solid Waste Facilities". The sampling parameters and methods shall be those found in Attachment 2, "Sampling and Analysis Requirements for Construction and Demolition Landfills and Closed Sanitary Landfills", or an alternate parameter list as approved by the Section.
 - e. The permittee shall maintain a record of all monitoring events and analytical data. Reports of the sampling events and analytical data shall be submitted to the Section in a timely manner.
 - f. The water quality monitoring system shall be upgraded for post closure monitoring purposes. Additional surface water monitoring sites shall be incorporated into the approved monitoring plan; the number and location to be approved by the Solid Waste Section. The sampling of these sites shall be included in the next scheduled sampling event.
-

Page Four
Avery County
Closure Letter

If there are questions regarding this closure letter, please call Janis McHargue in the Winston-Salem Regional Office at (910) 771-4600, or the Solid Waste Section at (919) 733-0692.

Sincerely,


James C. Coffey
Permitting Branch
Solid Waste Section

cc: Julian Foscue
Jan McHargue
Bobby Lutfy
Al Hetzell
Consultant
Central Files





North Carolina Department of Human Resources
 Division of Health Services
 P.O. Box 2091 • Raleigh, North Carolina 27602-2091

James G. Martin, Governor
 Phillip J. Kirk, Jr., Secretary

Ronald H. Levine, M.D., M.P.H.
 State Health Director

CERTIFIED COPY OF SOLID WASTE PERMIT

I do hereby certify that the attached PERMIT is an exact and true copy
 of Permit No. 6-01.

William L. Meyer

William L. Meyer, Head
 Solid & Hazardous Waste Management Branch
 Environmental Health Section

North Carolina

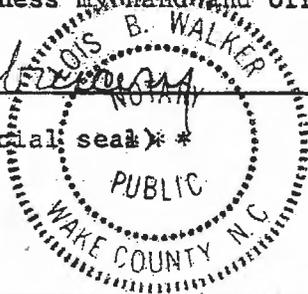
Wake County

I, Lois B Walker, a Notary Public for said
 County and State, do hereby certify that William L. Meyer,
 Head, Solid & Hazardous Waste Management Branch, Environmental Health Section
 personally appeared before me this day and acknowledged the due execution
 of the foregoing instrument.

Witness my hand and official seal, this the 9th day of

February, 1987.

(official seal) *



Lois B Walker

Notary Public

My commission expires 1-29, 1990.

ADDENDUM TO PERMIT NO. 6-01

DATE ISSUED 2/9/87

STATE OF NORTH CAROLINA

DEPARTMENT OF HUMAN RESOURCES

DIVISION OF HEALTH SERVICES

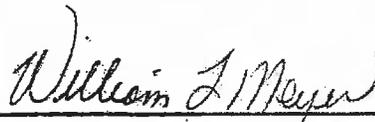
P.O. Box 2091 Raleigh 27602

SOLID WASTE PERMIT

Avery County is hereby issued a permit to
operate a Sanitary Landfill
located on S.R. 1101

in accordance with Article 9, Chapter 130A, of the General Statutes of North
Carolina and all rules promulgated thereunder and subject to the conditions set
forth in this permit. The facility is located on the below described property.

(See Attached)



William L. Meyer, Head
Solid & Hazardous Waste Management Branch
Environmental Health Section

BEGINNING on the mouth of a 16-inch culvert that is located South 67° 36' 03" East, 1147.31 feet from a PK nail in the centerline of the Northern end of Morrison Airport; thence running North 07° 20' 00" West, 26.81 feet to a point in the Southern right-of-way of N.C.S.R. 1101; thence running with said right-of-way line North 73° 22' 50" East, 737.45 feet to a point; thence leaving said road South 20° 53' 50" East, 55.27 feet to an iron at a 16-inch Poplar; thence South 20° 53' 50" East, 171.44 feet to an iron at a 14-inch White Pine; thence South 37° 59' 50" West, 241.90 feet to an iron at a 24-inch White Pine; thence South 36° 37' 50" West, 327.78 feet to an iron at a 14-inch Double Spanish Oak; thence South 54° 22' 20" West, 184.41 feet to an iron at a 14-inch Poplar; thence North 68° 48' 50" West, 242.40 feet to an iron; thence North 30° 48' 30" West, 112.99 feet to an iron at a 10-inch White Pine; thence North 03° 11' 50" East, 224.28 feet to an iron at a fence post; thence North 07° 20' 00" West, 131.84 feet to the point of beginning; containing 8.68 acres, according to a survey by William E. Arrowood, R.L.S. Number L-1510, dated February 27, 1986, and being Map Number 86A-146.

For Deed reference see that certain instrument dated February 28, 1986 and recorded the same date in Deed Book 171, Page 1107, Avery County Registry, wherein the above-described real property is excepted as being the property of Harris Mining Company, a North Carolina Corporation.

BEGINNING at a point found in 60' right-of-way margin of Brushy Creek Road, N.C.S.R. 1101 (gravel) and Branch; thence running with the line of said Branch, the following courses and distances: S 07° 32' 00" E 2.08 feet; S 14° 36' 20" W 36.06 feet; S 06° 47' 50" E 79.89 feet; S 68° 15' 40" E 48.04 feet; S 16° 52' 00" E 70.87 feet; S 11° 35' 00" W 29.70 feet; S 70° 31' 30" W 24.10 feet; S 28° 43' 20" W 23.31 feet; S 27° 24' 30" E 45.00 feet; S 06° 46' 10" W 30.46 feet; S 22° 28' 20" E 44.73 feet; S 48° 53' 30" W 74.07 feet; S 10° 47' 30" E 26.13 feet; S 38° 52' 10" W 86.38 feet; and S 01° 05' 40" W 55.95 feet to a point found in centerline of Brushy Creek; thence leaving the line of the Branch and with the line of Brushy Creek S 56° 11' 40" W 158.01 feet to a point; and S 36° 51' 30" W 351.48 feet to a point; thence leaving the line of Brushy Creek N 83° 22' 40" W 19.95 feet to a point; N 83° 22' 40" W 383.80 feet to a point; N 83° 22' 40" W 22.26 feet to a point at the edge of an existing dirt road lying Due West of the present landfill, said road running in a North-South direction, leading from N.C.S.R. 1101, Brushy Creek Road; thence running with the edge of said dirt road N 30° 41' 10" E 57.56 feet to a point; N 22° 31' 10" E 19.64 feet to a point; N 08° 34' 40" E 27.72 feet to a point; N 06° 43' 20" W 36.41 feet to a point; N 27° 40' 00" W 105.30 feet to a point; thence leaving the edge of said road N 69° 05' 20" E 51.56 feet to a point in the line of the existing Avery County Landfill site; thence running with the said line of the Avery County Landfill S 69° 48' 50" E 242.40 feet to a point; N 54° 22' 20" E 184.41 feet to a point; N 36° 37' 50" E 327.78 feet to a point; N 37° 59' 50" E 241.90 feet to a point; N 20° 53' 50" W 171.44 feet to a point; N 20° 53' 50" W 55.27 feet to a point found in the 60' right-of-way margin of Brushy Creek Road, N.C.S.R. 1101 (gravel); thence leaving the line of the existing Avery County Landfill site and with the margin of Brushy Creek Road, N.C.S.R. 1101 (gravel) N 73° 52' 40" E 128.81 feet to the point of beginning. Containing 6.02 acres, Toe River Township, Avery County, as surveyed and platted by Municipal Engineering Services Co., P.A. on October 22, 1986, Drawing No. 86-102.

SOLID WASTE PERMIT

Conditions of Permit:

1. This permit may be subject to review at an administrative hearing upon petition of anyone whose legal rights, privileges and duties may have been affected by the issuance thereof.
2. This permit shall not be effective unless the certified copy is filed in the register of deeds' office, in the grantor index under the name of the owner of the land in the county or counties in which the land is located. After recordation, the certified copy shall be returned to the Solid & Hazardous Waste Management Branch and shall have indicated on it the page and book number, date of recordation and registrar's seal.
3. When this property is sold, leased, conveyed or transferred, the deed or other instrument of transfer shall contain in the description section in no smaller type than that used in the body of the deed or instrument a statement that the property has been used as a sanitary landfill.
4. This solid waste disposal site is permitted to receive solid waste as defined in 10 NCAC 10G, .0101(36), except that hazardous waste, liquid waste and any other wastes that may pose a threat to the environment or public health are prohibited from disposal at this site unless prior authorization is obtained from the Division of Health Services.
5. This permit is for construction according to attached plans. Any modification or deviation from the approved plans shall be approved by the North Carolina Solid and Hazardous Waste Management Branch.
6. Ground water monitoring wells and monitoring requirements:
 - a. Three additional wells shall be installed at locations as shown on construction plans.
 - b. Installation shall conform to DHS well standard (Attachment 1).
 - c. A well completion record shall be submitted to DHS for each monitoring well constructed (Attachment 2).
 - d. The location of the monitoring wells shall be physically located in the field and approved by DHS prior to the well being constructed.
 - e. Ground water monitoring wells shall be constructed and sampled and conform to specifications outlined in the N.C. Water Quality Monitoring Guidance Document for Solid Waste Facilities. Complete specifications will be finalized in the document which will be provided by DHS.
 - ~~f. Surface water sampling shall be performed at the locations specified on the construction plans.~~
 - g. Avery County shall sample monitoring wells and surface waters, semi-annually, for the first year and annually thereafter.
 - h. A readily accessible unobstructed path shall be initially cleared and maintained so that 4-wheel drive vehicles may have access to the monitoring wells.

7. This facility shall conform to operating procedures in Rule .0505 of the Solid Waste Management Rules.
 8. Ground water quality at this facility is subject to the classification and remedial action provisions of 15 NCAC 2L (Attachment 3).
-

APPENDIX B
BORING LOGS

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FIELD BOREHOLE LOG

BOREHOLE NUMBER P-1

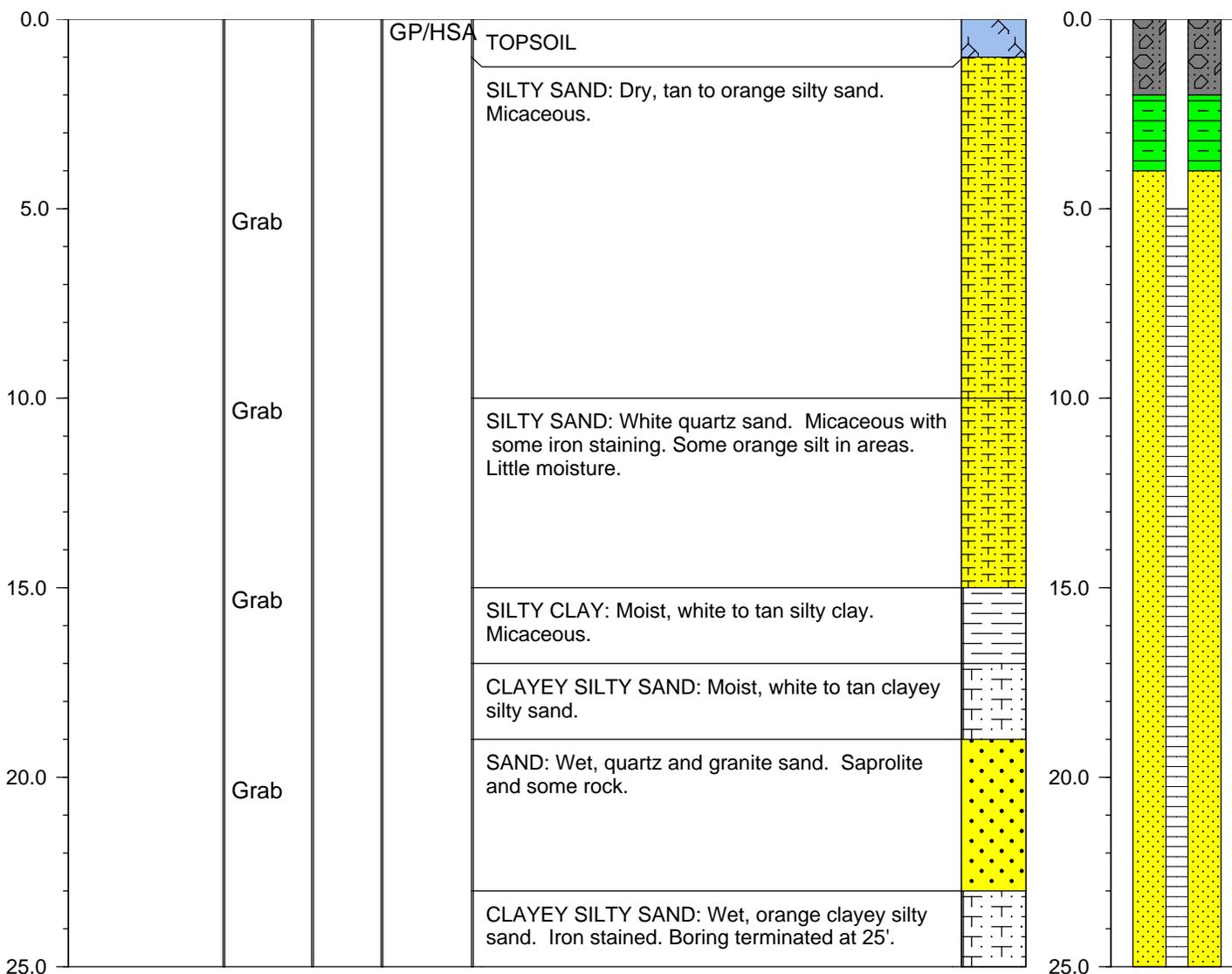
Page 1 of 1

PROJECT NAME: **Avery County C&D Landfill**
 LOCATION: **Ingalls, NC**
 DRILLING CO: **Mad Dawg Drilling Inc**
 DRILLING METHOD: **Geoprobe/HSA**
 FIELD PARTY: **Tom Whitehead**
 GEOLOGIST: **Don Misenheimer**
 DATE BEGUN: **3/22/10** COMPLETED: **3/22/10**

TOTAL DEPTH: **25**
 TOP OF CASING ELEV.: **2745.21** GROUND ELEV.: **2741.4**
 NORTHING: **1113858.2869** EASTING: **813368.775**

STATIC WATER LEVEL (BLS)		
Depth (ft)		
Time		
Date		

DEPTH Feet	BLOW COUNT Per 6"	SAMPLING METHOD	RECOVERY Inches	DRILL METHOD	DESCRIPTION	LITHOLOGY	DEPTH Feet	WELL INSTALLATION
---------------	----------------------	-----------------	--------------------	--------------	-------------	-----------	---------------	----------------------





NON RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2907-A

1. WELL CONTRACTOR:

Thomas Whitehead
Well Contractor (Individual) Name
Mad Dawg, Inc.
Well Contractor Company Name
PO Box 398
Street Address
Iron Station NC 28080
City or Town State Zip Code
(704) 732-0213
Area code Phone number

2. WELL INFORMATION:

WELL CONSTRUCTION PERMIT# N/A
OTHER ASSOCIATED PERMIT#(if applicable) N/A
SITE WELL ID #(if applicable) N/A

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

Industrial/Commercial Agricultural Recovery Injection
Irrigation Other (list use) _____

DATE DRILLED 3/22/10

4. WELL LOCATION:

2175 Brushy Creek Rd., 28777
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

CITY: Spruce Pine COUNTY Avery

TOPOGRAPHIC / LAND SETTING: (check appropriate box)

Slope Valley Flat Ridge Other _____

LATITUDE 36 35 56.5292 DMS OR 3X.XXXXXXXX DD

LONGITUDE 75 81 59.3936 DMS OR 7X.XXXXXXXX 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.)

Avery County MSWLF
Facility Name Facility ID# (if applicable)
2175 Brushy Creek Rd.
Street Address
Spruce Pine NC 28777
City or Town State Zip Code
Don Misenheimer / Smith Gardner
Contact Name
14 N. Boylan Ave.
Mailing Address
Raleigh NC 27603
City or Town State Zip Code

919 828-0577
Area code Phone number

6. WELL DETAILS:

a. TOTAL DEPTH: 25'
b. DOES WELL REPLACE EXISTING WELL? YES NO
c. WATER LEVEL Below Top of Casing: N/A FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 3.0 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 _____

f. DISINFECTION: Type N/A Amount _____

g. WATER ZONES (depth):
Top N/A Bottom _____ Top _____ Bottom _____
Top _____ Bottom _____ Top _____ Bottom _____
Top _____ Bottom _____ Top _____ Bottom _____

7. CASING: Depth	Diameter	Thickness/Weight	Material
Top <u>0</u> Bottom <u>5</u> Ft.	<u>1"</u>	<u>5lb. 80</u>	<u>PVC</u>
Top _____ Bottom _____ Ft.	_____	_____	_____
Top _____ Bottom _____ Ft.	_____	_____	_____

8. GROUT: Depth	Material	Method
Top <u>2</u> Bottom <u>4</u> Ft.	<u>Bentonite</u>	<u>Pour</u>
Top <u>0</u> Bottom <u>2</u> Ft.	<u>Portland</u>	<u>Pour</u>
Top _____ Bottom _____ Ft.	_____	_____

9. SCREEN: Depth	Diameter	Slot Size	Material
Top <u>5</u> Bottom <u>25</u> Ft.	<u>1 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</u> Bottom <u>25</u> Ft.	<u>Coarse</u>	<u>SAND</u>
Top _____ Bottom _____ Ft.	_____	_____
Top _____ Bottom _____ Ft.	_____	_____

11. DRILLING LOG

Top	Bottom	Formation Description
<u>0</u>	<u>16</u>	<u>Tan to red silty CLAY</u>
<u>16</u>	<u>25</u>	<u>Brown sandy CLAY</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

12. REMARKS:

P-1

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.

Thomas Whitehead 3/24/10
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

Thomas Whitehead
PRINTED NAME OF PERSON CONSTRUCTING THE WELL



FIELD BOREHOLE LOG

BOREHOLE NUMBER **P-2**

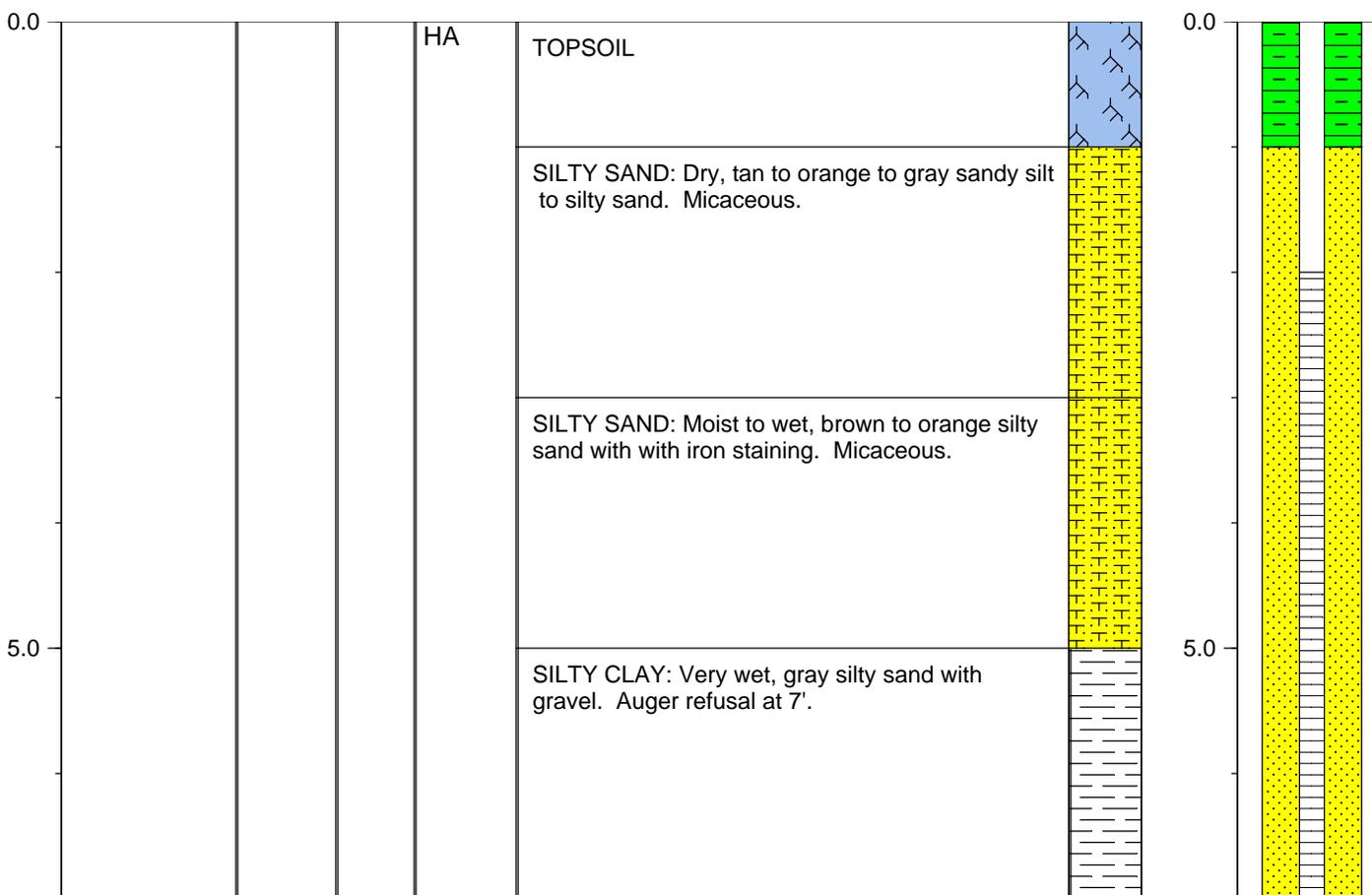
Page 1 of 1

PROJECT NAME: **Avery County C&D Landfill**
 LOCATION: **Ingalls, NC**
 DRILLING CO: **RSG**
 DRILLING METHOD: **HA**
 FIELD PARTY:
 GEOLOGIST: **Don Misenheimer**
 DATE BEGUN: **5/14/10** COMPLETED: **5/14/10**

TOTAL DEPTH: **7**
 TOP OF CASING ELEV.: GROUND ELEV.:
 NORTHING: **0** EASTING: **0**

STATIC WATER LEVEL (BLS)		
Depth (ft)		
Time		
Date		

DEPTH Feet	BLOW COUNT Per 6"	SAMPLING METHOD	RECOVERY Inches	DRILL METHOD	DESCRIPTION	LITHOLOGY	DEPTH Feet	WELL INSTALLATION
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FIELD BOREHOLE LOG

BOREHOLE NUMBER P-3

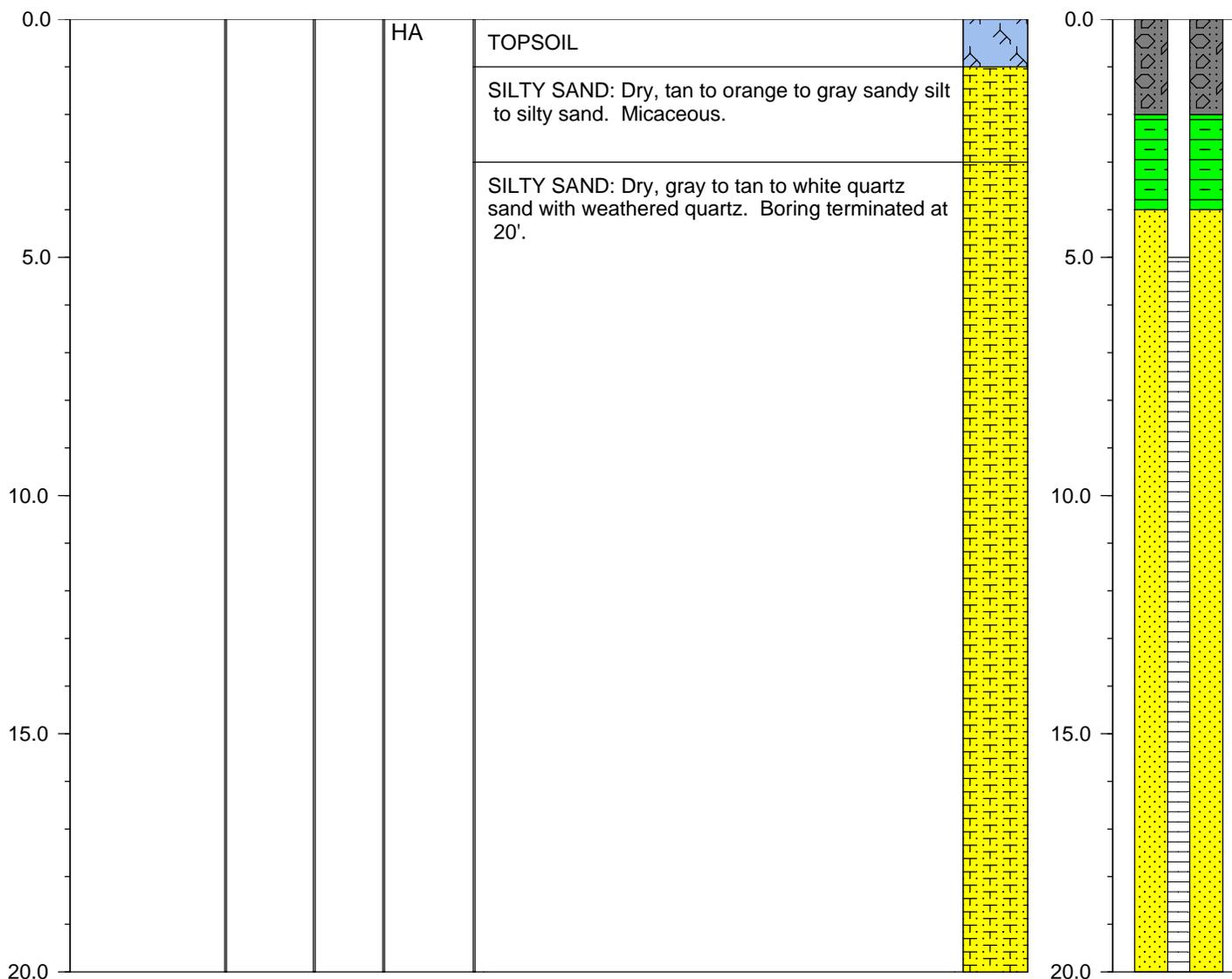
Page 1 of 1

PROJECT NAME: **Avery County C&D Landfill**
 LOCATION: **Ingalls, NC**
 DRILLING CO: **RSG**
 DRILLING METHOD: **HA**
 FIELD PARTY:
 GEOLOGIST: **Don Misenheimer**
 DATE BEGUN: **5/14/10** COMPLETED: **5/14/10**

TOTAL DEPTH: **20**
 TOP OF CASING ELEV.: GROUND ELEV.:
 NORTHING: **0** EASTING: **0**

STATIC WATER LEVEL (BLS)		
Depth (ft)		
Time		
Date		

DEPTH Feet	BLOW COUNT Per 6"	SAMPLING METHOD	RECOVERY Inches	DRILL METHOD	DESCRIPTION	LITHOLOGY	DEPTH Feet	WELL INSTALLATION
---------------	----------------------	-----------------	--------------------	--------------	-------------	-----------	---------------	----------------------



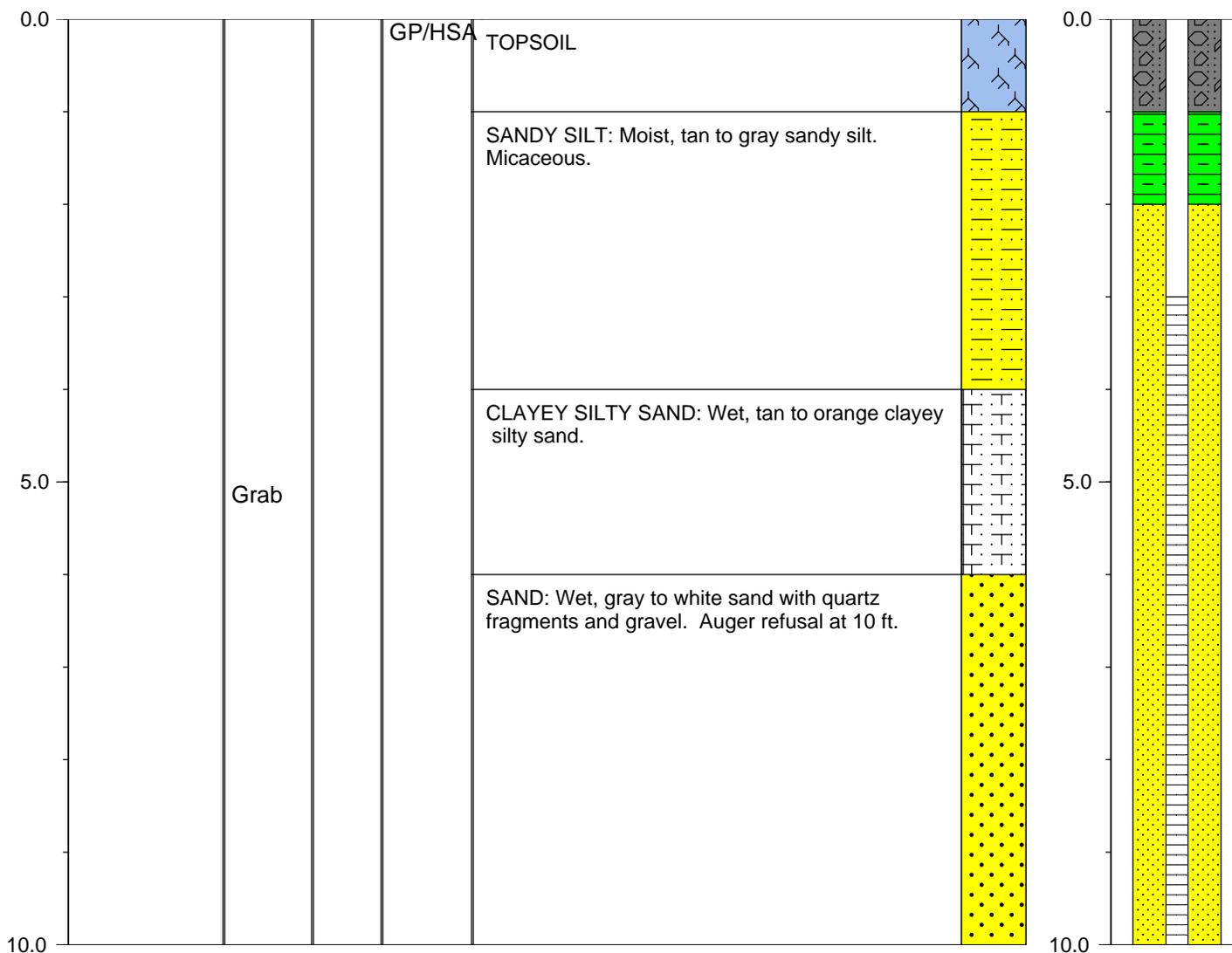


PROJECT NAME: **Avery County C&D Landfill**
LOCATION: **Ingalls, NC**
DRILLING CO: **Mad Dawg Drilling Inc**
DRILLING METHOD: **Geoprobe/HSA**
FIELD PARTY: **Tom Whitehead**
GEOLOGIST: **Don Misenheimer**
DATE BEGUN: **3/22/10** COMPLETED: **3/22/10**

TOTAL DEPTH: **10**
TOP OF CASING ELEV.: **2718.11** GROUND ELEV.: **2715**
NORTHING: **1114547.3624** EASTING: **813585.1344**

STATIC WATER LEVEL (BLS)		
Depth (ft)		
Time		
Date		

DEPTH Feet	BLOW COUNT Per 6"	SAMPLING METHOD	RECOVERY Inches	DRILL METHOD	DESCRIPTION	LITHOLOGY	DEPTH Feet	WELL INSTALLATION
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NON RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2907-A

1. WELL CONTRACTOR:

Thomas Whitehead
Well Contractor (Individual) Name

Mad Dawg, Inc.
Well Contractor Company Name

PO Box 398
Street Address

Iron Station NC 28080
City or Town State Zip Code

(704) 732-0213
Area code Phone number

2. WELL INFORMATION:

WELL CONSTRUCTION PERMIT# N/A

OTHER ASSOCIATED PERMIT#(if applicable) N/A

SITE WELL ID #(if applicable) N/A

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

Industrial/Commercial Agricultural Recovery Injection

Irrigation Other (list use) _____

DATE DRILLED 3/22/10

4. WELL LOCATION:

2175 Brushy Creek Rd., 28777
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

CITY: Spruce Pine COUNTY: Avery

TOPOGRAPHIC / LAND SETTING: (check appropriate box)

Slope Valley Flat Ridge Other _____

LATITUDE 36 35 56.5558 ° DMS OR 3X.XXXXXXXX DD

LONGITUDE 75 81 59.3047 ° DMS OR 7X.XXXXXXXX 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.)

Avery County MSWLF
Facility Name Facility ID# (if applicable)

2175 Brushy Creek Rd.
Street Address

Spruce Pine NC 28777
City or Town State Zip Code

Don Misenheimer / Richard Smith Gardner
Contact Name

14 W. Boylan Ave.
Mailing Address

Raleigh NC 27603
City or Town State Zip Code

919 828-0577
Area code Phone number

6. WELL DETAILS:

a. TOTAL DEPTH: 10

b. DOES WELL REPLACE EXISTING WELL? YES NO

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

d. TOP OF CASING IS 3.0 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 _____

f. DISINFECTION: Type N/A Amount _____

g. WATER ZONES (depth):
Top N/A Bottom _____ Top _____ Bottom _____
Top _____ Bottom _____ Top _____ Bottom _____
Top _____ Bottom _____ Top _____ Bottom _____

7. CASING: Depth Diameter Thickness/Weight Material
Top 0 Bottom 3 Ft. 1" 5lb. 80 PVC
Top _____ Bottom _____ Ft. _____ _____
Top _____ Bottom _____ Ft. _____ _____

8. GROUT: Depth Material Method
Top 1 Bottom 2 Ft. Bentonite Pour
Top 0 Bottom 1 Ft. Portland Pour
Top _____ Bottom _____ Ft. _____ _____

9. SCREEN: Depth Diameter Slot Size Material
Top 3 Bottom 10 Ft. 1 in. 1/16 in. PVC
Top _____ Bottom _____ Ft. _____ in. _____ in. _____
Top _____ Bottom _____ Ft. _____ in. _____ in. _____

10. SAND/GRAVEL PACK: Depth Size Material
Top 2 Bottom 10 Ft. Coarse SAND
Top _____ Bottom _____ Ft. _____ _____
Top _____ Bottom _____ Ft. _____ _____

11. DRILLING LOG		Formation Description
Top	Bottom	
<u>0</u>	<u>4</u>	<u>Tan silty CLAY</u>
<u>4</u>	<u>10</u>	<u>White sandy CLAY</u>
/	/	/
/	/	/
/	/	/
/	/	/
/	/	/
/	/	/
/	/	/
/	/	/

12. REMARKS: P-4

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.

Thomas Whitehead 3/24/10
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

Thomas Whitehead
PRINTED NAME OF PERSON CONSTRUCTING THE WELL



FIELD BOREHOLE LOG

BOREHOLE NUMBER P-5

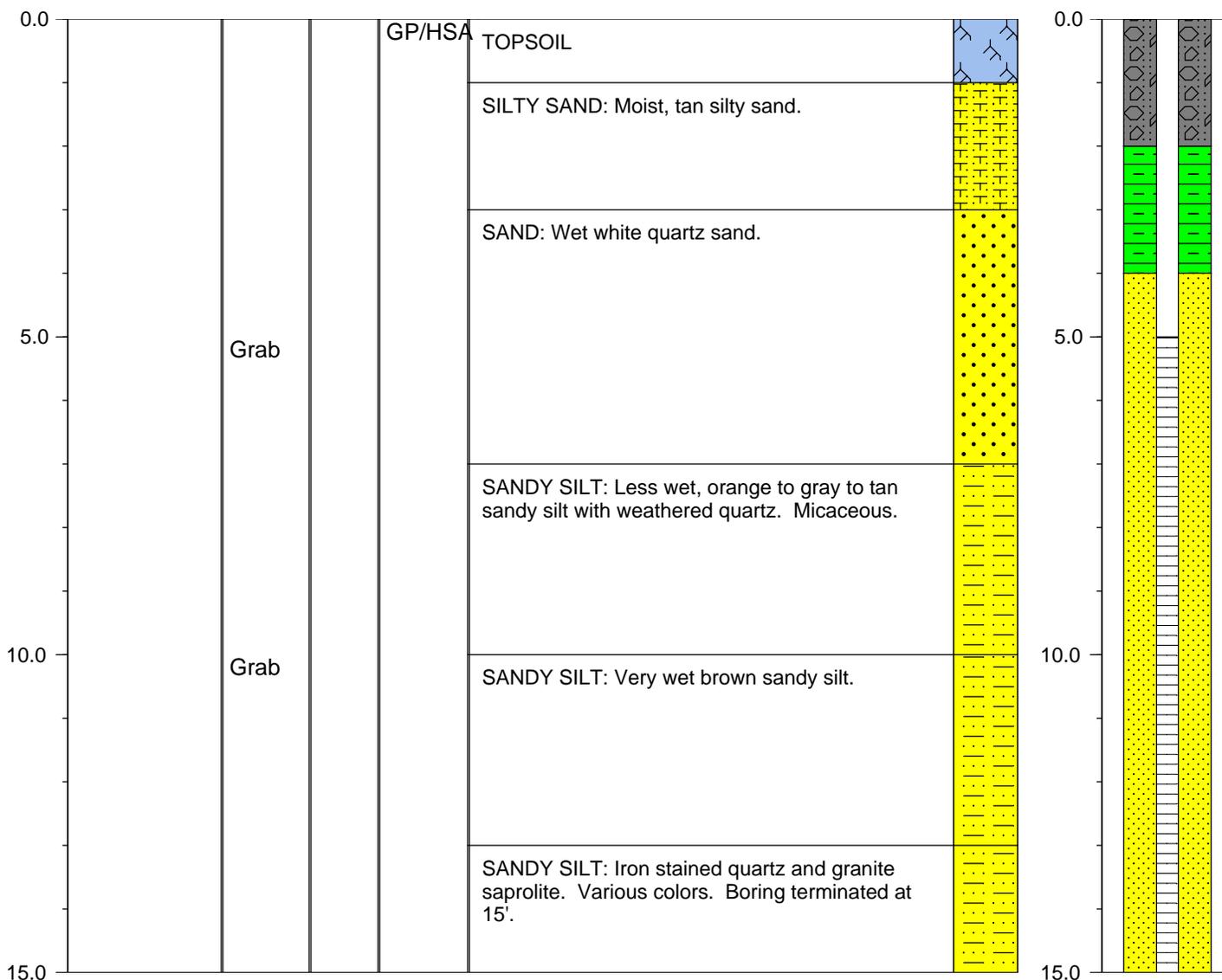
Page 1 of 1

PROJECT NAME: **Avery County C&D Landfill**
 LOCATION: **Ingalls, NC**
 DRILLING CO: **Mad Dawg Drilling Inc**
 DRILLING METHOD: **Geoprobe/HSA**
 FIELD PARTY: **Tom Whitehead**
 GEOLOGIST: **Don Misenheimer**
 DATE BEGUN: **3/22/10** COMPLETED: **3/22/10**

TOTAL DEPTH: **15**
 TOP OF CASING ELEV.: **2690.7** GROUND ELEV.: **2687.1**
 NORTHING: **1114671.1175** EASTING: **813328.5564**

STATIC WATER LEVEL (BLS)		
Depth (ft)		
Time		
Date		

DEPTH Feet	BLOW COUNT Per 6"	SAMPLING METHOD	RECOVERY Inches	DRILL METHOD	DESCRIPTION	LITHOLOGY	DEPTH Feet	WELL INSTALLATION
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NON RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2907-A

1. WELL CONTRACTOR:

Thomas Whitehead
Well Contractor (Individual) Name
Mad Dawg, Inc.
Well Contractor Company Name
PO Box 398
Street Address
Iron Station NC 28080
City or Town State Zip Code
(704) 732-0213
Area code Phone number

2. WELL INFORMATION:

WELL CONSTRUCTION PERMIT# N/A
OTHER ASSOCIATED PERMIT#(if applicable) N/A
SITE WELL ID #(if applicable) N/A

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

Industrial/Commercial Agricultural Recovery Injection
Irrigation Other (list use)

DATE DRILLED 3/22/10

4. WELL LOCATION:

2175 Brushy Creek Rd., 28777
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

CITY: Spruce Pine COUNTY Avery

TOPOGRAPHIC / LAND SETTING: (check appropriate box)

Slope Valley Flat Ridge Other

LATITUDE 36 35 56.49.25 " DMS OR 3X.XXXXXXXX DD

LONGITUDE 75 81 59.29.70 " DMS OR 7X.XXXXXXXX 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.)

Avery County MSWLF
Facility Name Facility ID# (if applicable)

2175 Brushy Creek Rd.

Spruce Pine NC 28777

City or Town State Zip Code

Contact Name Don Misenheimer / Richard Smith Gardner

14 W. Boylan Ave.

Mailing Address

Raleigh NC 27603

City or Town State Zip Code

919 828-0577

Area code Phone number

6. WELL DETAILS:

a. TOTAL DEPTH: 15'

b. DOES WELL REPLACE EXISTING WELL? YES NO

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

d. TOP OF CASING IS 3.0 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 _____

f. DISINFECTION: Type N/A Amount _____

g. WATER ZONES (depth):

Top N/A Bottom _____ Top _____ Bottom _____

Top _____ Bottom _____ Top _____ Bottom _____

Top _____ Bottom _____ Top _____ Bottom _____

7. CASING: Depth Diameter Thickness/Weight Material

Top 0 Bottom 5 Ft. 1" Sch. 80 PVC

Top _____ Bottom _____ Ft. _____

Top _____ Bottom _____ Ft. _____

8. GROUT: Depth Material Method

Top 2 Bottom 4 Ft. Bentonite Pour

Top 0 Bottom 2 Ft. Portland Pour

Top _____ Bottom _____ Ft. _____

9. SCREEN: Depth Diameter Slot Size Material

Top 5 Bottom 15 Ft. 1 in. #10 in. PVC

Top _____ Bottom _____ Ft. _____ in. _____

Top _____ Bottom _____ Ft. _____ in. _____

10. SAND/GRAVEL PACK:

Depth Size Material

Top 4 Bottom 15 Ft. Coarse SAND

Top _____ Bottom _____ Ft. _____

Top _____ Bottom _____ Ft. _____

11. DRILLING LOG

Top	Bottom	Formation Description
<u>0</u>	<u>7</u>	<u>Tan silty CLAY</u>
<u>7</u>	<u>15</u>	<u>Brown sandy CLAY</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

12. REMARKS: P-5

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.

Thomas Whitehead 3/24/10
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

Thomas Whitehead
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

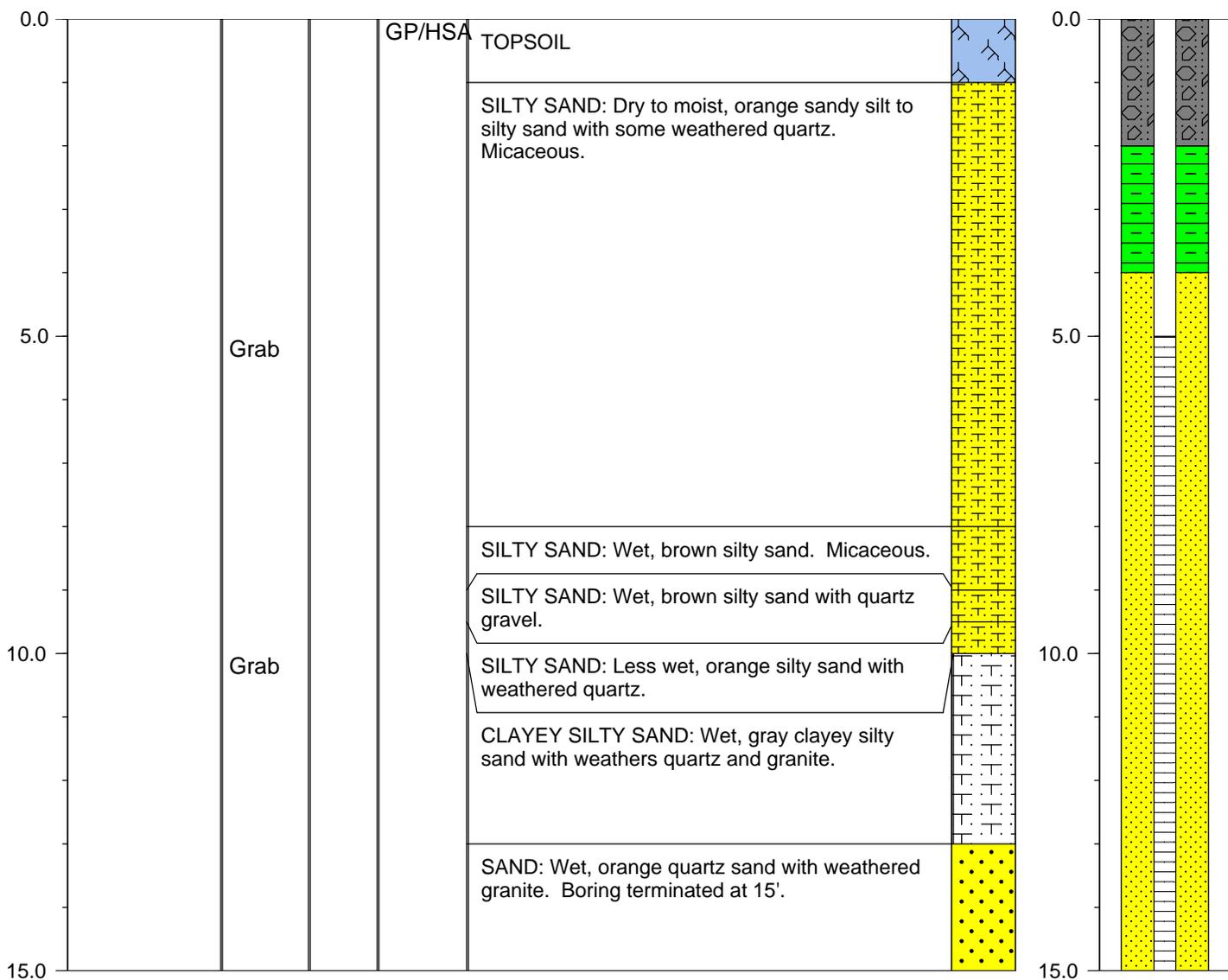


PROJECT NAME: **Avery County C&D Landfill**
 LOCATION: **Ingalls, NC**
 DRILLING CO: **Mad Dawg Drilling Inc**
 DRILLING METHOD: **Geoprobe/HSA**
 FIELD PARTY: **Tom Whitehead**
 GEOLOGIST: **Don Misenheimer**
 DATE BEGUN: **3/22/10** COMPLETED: **3/22/10**

TOTAL DEPTH: **15**
 TOP OF CASING ELEV.: **2674.37** GROUND ELEV.: **2671.3**
 NORTHING: **1114200.0565** EASTING: **812684.9059**

STATIC WATER LEVEL (BLS)		
Depth (ft)		
Time		
Date		

DEPTH Feet	BLOW COUNT Per 6"	SAMPLING METHOD	RECOVERY Inches	DRILL METHOD	DESCRIPTION	LITHOLOGY	DEPTH Feet	WELL INSTALLATION
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NON RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2907-A

1. WELL CONTRACTOR:

Thomas Whitehead
Well Contractor (Individual) Name

Mad Dawg, Inc.
Well Contractor Company Name

PO Box 398
Street Address

Iron Station NC 28080
City or Town State Zip Code

(704) 732-0213
Area code Phone number

2. WELL INFORMATION:

WELL CONSTRUCTION PERMIT# N/A

OTHER ASSOCIATED PERMIT#(if applicable) N/A

SITE WELL ID #(if applicable) N/A

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

Industrial/Commercial Agricultural Recovery Injection

Irrigation Other (list use) _____

DATE DRILLED 3/22/10

4. WELL LOCATION:

2175 Brushy Creek Rd., 28777
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

CITY: Spruce Pine COUNTY Avery

TOPOGRAPHIC / LAND SETTING: (check appropriate box)

Slope Valley Flat Ridge Other _____

LATITUDE 36 35 56.46.16 " DMS OR 3X.XXXXXXXX DD

LONGITUDE 75 81 59.35.26 " DMS OR 7X.XXXXXXXX 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.)

Avery County MSWLF
Facility Name Facility ID# (if applicable)

2175 Brushy Creek Rd.
Street Address

Spruce Pine NC 28777
City or Town State Zip Code

Don Misenheimer / Smith Gardner
Contact Name

14 N. Boylan Ave.
Mailing Address

Raleigh NC 27603
City or Town State Zip Code

(919) 828-0577
Area code Phone number

6. WELL DETAILS:

a. TOTAL DEPTH: 15'

b. DOES WELL REPLACE EXISTING WELL? YES NO

c. WATER LEVEL Below Top of Casing: N/A FT.
(Use "*" if Above Top of Casing)

d. TOP OF CASING IS 3.0 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 _____

f. DISINFECTION: Type N/A Amount _____

g. WATER ZONES (depth):

Top <u>N/A</u>	Bottom _____	Top _____	Bottom _____
Top _____	Bottom _____	Top _____	Bottom _____
Top _____	Bottom _____	Top _____	Bottom _____

7. CASING: Depth Diameter Thickness/Weight Material

Top <u>0</u>	Bottom <u>5</u>	Ft. <u>1"</u>	<u>Sch. 80</u>	<u>PVC</u>
Top _____	Bottom _____	Ft. _____	_____	_____
Top _____	Bottom _____	Ft. _____	_____	_____

8. GROUT: Depth Material Method

Top <u>2</u>	Bottom <u>4</u>	Ft. <u>Bentonite</u>	<u>Pour</u>
Top <u>0</u>	Bottom <u>2</u>	Ft. <u>Portland</u>	<u>Pour</u>
Top _____	Bottom _____	Ft. _____	_____

9. SCREEN: Depth Diameter Slot Size Material

Top <u>5</u>	Bottom <u>15</u>	Ft. <u>1 in.</u>	<u>1/16 in.</u>	<u>PVC</u>
Top _____	Bottom _____	Ft. _____	_____	_____
Top _____	Bottom _____	Ft. _____	_____	_____

10. SAND/GRAVEL PACK: Depth Size Material

Top <u>4</u>	Bottom <u>15</u>	Ft. <u>Coarse</u>	<u>SAND</u>
Top _____	Bottom _____	Ft. _____	_____
Top _____	Bottom _____	Ft. _____	_____

11. DRILLING LOG

Top	Bottom	Formation Description
<u>0</u>	<u>7</u>	<u>Red silty CLAY</u>
<u>7</u>	<u>15</u>	<u>White sandy CLAY</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

12. REMARKS: P-6

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.

Thomas Whitehead 3/24/10
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

Thomas Whitehead
PRINTED NAME OF PERSON CONSTRUCTING THE WELL



FIELD BOREHOLE LOG

BOREHOLE NUMBER P-7

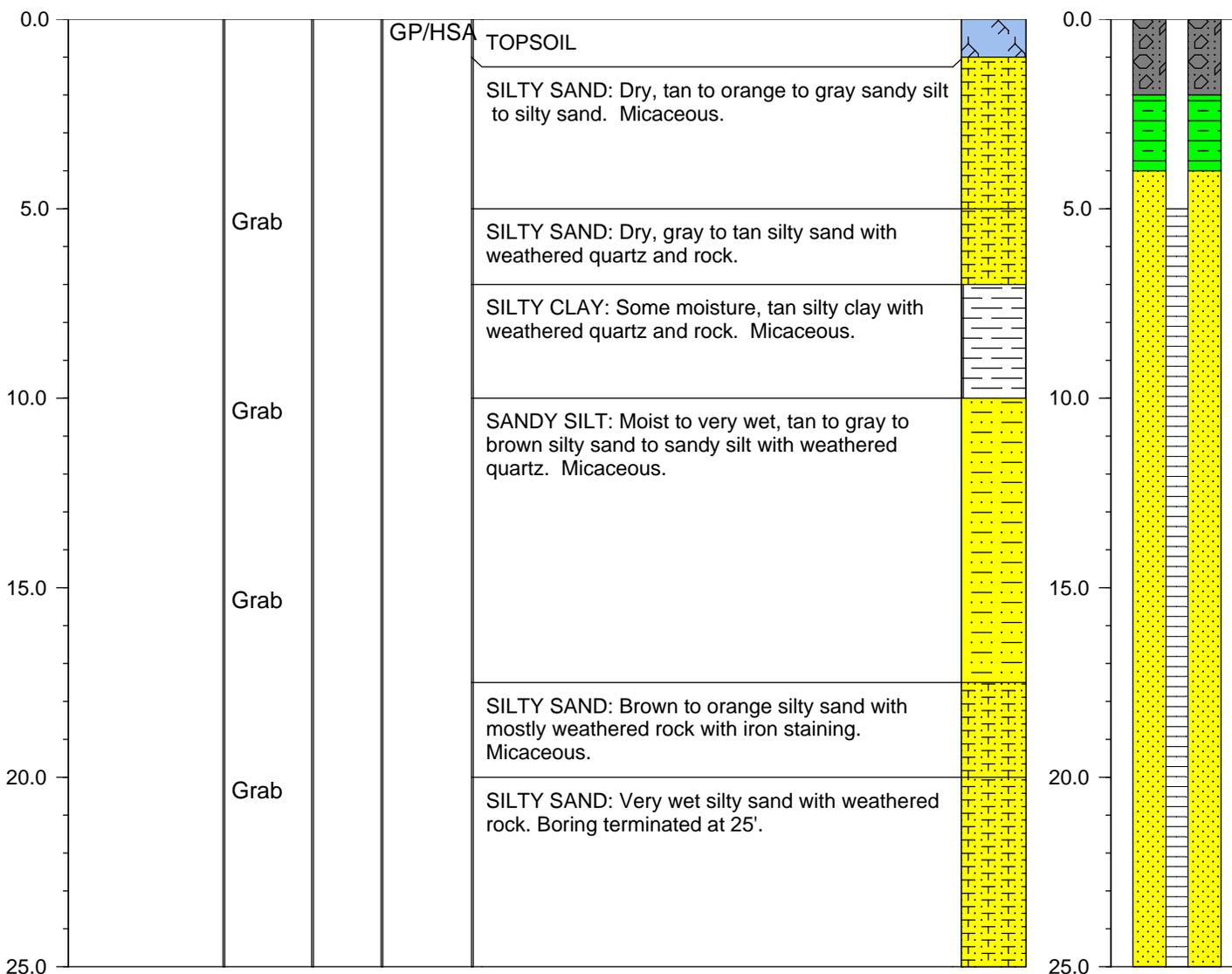
Page 1 of 1

PROJECT NAME: **Avery County C&D Landfill**
 LOCATION: **Ingalls, NC**
 DRILLING CO: **Mad Dawg Drilling Inc**
 DRILLING METHOD: **Geoprobe/HSA**
 FIELD PARTY: **Tom Whitehead**
 GEOLOGIST: **Don Misenheimer**
 DATE BEGUN: **3/22/10** COMPLETED: **3/22/10**

TOTAL DEPTH: **25**
 TOP OF CASING ELEV.: **2697.35** GROUND ELEV.: **2694.2**
 NORTHING: **1113927.4023** EASTING: **812711.6052**

STATIC WATER LEVEL (BLS)		
Depth (ft)		
Time		
Date		

DEPTH Feet	BLOW COUNT Per 6"	SAMPLING METHOD	RECOVERY Inches	DRILL METHOD	DESCRIPTION	LITHOLOGY	DEPTH Feet	WELL INSTALLATION
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NON RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2907-A

1. WELL CONTRACTOR:

Thomas Whitehead
Well Contractor (Individual) Name
Mad Dawg, Inc.
Well Contractor Company Name
PO Box 398
Street Address
Iron Station NC 28080
City or Town State Zip Code

(704) 732-0213
Area code Phone number

2. WELL INFORMATION:

WELL CONSTRUCTION PERMIT# N/A
OTHER ASSOCIATED PERMIT#(if applicable) N/A
SITE WELL ID #(if applicable) N/A

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

Industrial/Commercial Agricultural Recovery Injection
Irrigation Other (list use)

DATE DRILLED 3/22/10

4. WELL LOCATION:

2175 Brushy Creek Rd., 28777
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

CITY: Spruce Pine COUNTY Avery

TOPOGRAPHIC / LAND SETTING: (check appropriate box)

Slope Valley Flat Ridge Other

LATITUDE 36 35 56 . 47 . 11 " DMS OR 3X.XXXXXXXX DD

LONGITUDE 75 81 59 . 39 . 10 " DMS OR 7X.XXXXXXXX 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.)

Avery County MSWLF
Facility Name Facility ID# (if applicable)

2175 Brushy Creek Rd.
Street Address

Spruce Pine NC 28777
City or Town State Zip Code

Don Misenheimer / Richard Gardner
Contact Name

14 N. Boylan Ave.
Mailing Address

Raleigh NC 27603
City or Town State Zip Code

(919) 828-0577
Area code Phone number

6. WELL DETAILS:

a. TOTAL DEPTH: 25'

b. DOES WELL REPLACE EXISTING WELL? YES NO

c. WATER LEVEL Below Top of Casing: N/A FT.
(Use "*" if Above Top of Casing)

d. TOP OF CASING IS 3.0 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 _____

f. DISINFECTION: Type N/A Amount _____

g. WATER ZONES (depth):

Top N/A Bottom _____ Top _____ Bottom _____

Top _____ Bottom _____ Top _____ Bottom _____

Top _____ Bottom _____ Top _____ Bottom _____

7. CASING: Depth Diameter Thickness/Weight Material

Top 0 Bottom 5 Ft. 1" Sch. 80 PVC

Top _____ Bottom _____ Ft. _____ _____

Top _____ Bottom _____ Ft. _____ _____

8. GROUT: Depth Material Method

Top 2 Bottom 4 Ft. Bentonite Pour

Top 0 Bottom 2 Ft. Portland Pour

Top _____ Bottom _____ Ft. _____ _____

9. SCREEN: Depth Diameter Slot Size Material

Top 5 Bottom 25 Ft. 1 in. 4010 in. PVC

Top _____ Bottom _____ Ft. _____ in. _____ in.

Top _____ Bottom _____ Ft. _____ in. _____ in.

10. SAND/GRAVEL PACK:

Top 4 Bottom 25 Ft. Coarse SAND

Top _____ Bottom _____ Ft. _____ _____

Top _____ Bottom _____ Ft. _____ _____

11. DRILLING LOG

Top	Bottom	Formation Description
<u>0</u>	<u>15</u>	<u>Tan silty CLAY</u>
<u>15</u>	<u>25</u>	<u>Brown sandy CLAY</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

12. REMARKS:

P-7

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.

Thomas Whitehead 3/24/10
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

Thomas Whitehead
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

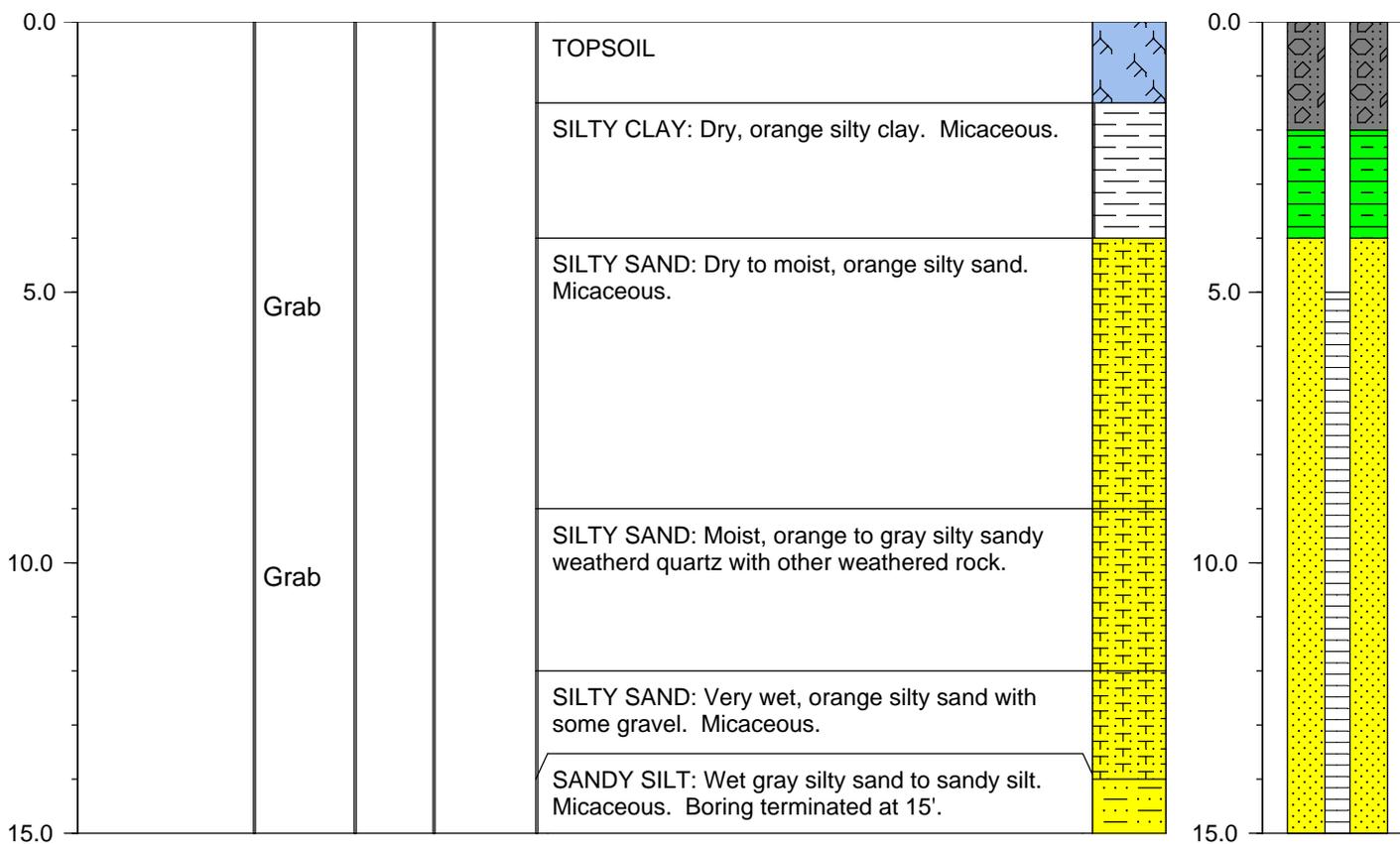


PROJECT NAME: **Avery County C&D Landfill**
LOCATION: **Ingalls, NC**
DRILLING CO: **Mad Dawg Drilling Inc**
DRILLING METHOD: **Geoprobe/HSA**
FIELD PARTY: **Tom Whitehead**
GEOLOGIST: **Don Misenheimer**
DATE BEGUN: **3/23/10** COMPLETED: **3/23/10**

TOTAL DEPTH: **15**
TOP OF CASING ELEV.: **2714.82** GROUND ELEV.: **2711.7**
NORTHING: **1113887.0742** EASTING: **813013.5919**

STATIC WATER LEVEL (BLS)		
Depth (ft)		
Time		
Date		

DEPTH Feet	BLOW COUNT Per 6"	SAMPLING METHOD	RECOVERY Inches	DRILL METHOD	DESCRIPTION	LITHOLOGY	DEPTH Feet	WELL INSTALLATION
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NON RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2907-A

1. WELL CONTRACTOR:

Thomas Whitehead
Well Contractor (Individual) Name
Mad Dawg, Inc.
Well Contractor Company Name
PO Box 398
Street Address
Iron Station NC 28080
City or Town State Zip Code
(704) 732-0213
Area code Phone number

2. WELL INFORMATION:

WELL CONSTRUCTION PERMIT# N/A
OTHER ASSOCIATED PERMIT#(if applicable) N/A
SITE WELL ID #(if applicable) N/A

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

Industrial/Commercial Agricultural Recovery Injection
Irrigation Other (list use) _____

DATE DRILLED 3/23/10

4. WELL LOCATION:

2175 Brushy Creek Rd., 28777
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

CITY: Spruce Pine COUNTY Avery

TOPOGRAPHIC / LAND SETTING: (check appropriate box)

Slope Valley Flat Ridge Other _____

LATITUDE 36° 56' 49.50" N DMS OR 3X.XXXXXXXXXX DD

LONGITUDE 75° 21' 59.20" W DMS OR 7X.XXXXXXXXXX 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.)

Avery County MSWLF
Facility Name Facility ID# (if applicable)
2175 Brushy Creek Rd.
Street Address
Spruce Pine NC 28777
City or Town State Zip Code
Don Misenheimer / Richard Gardner
Contact Name
14 N. Boylan Ave.
Mailing Address
Raleigh NC 27603
City or Town State Zip Code

919 828-0577
Area code Phone number

6. WELL DETAILS:

a. TOTAL DEPTH: 15'
b. DOES WELL REPLACE EXISTING WELL? YES NO
c. WATER LEVEL Below Top of Casing: N/A FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 3.0 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 _____

f. DISINFECTION: Type N/A Amount _____

g. WATER ZONES (depth):
Top N/A Bottom _____ Top _____ Bottom _____
Top _____ Bottom _____ Top _____ Bottom _____
Top _____ Bottom _____ Top _____ Bottom _____

7. CASING: Depth 5 Diameter 1" Thickness/Weight 80 Material PVC
Top 0 Bottom 5 Ft. 1" 80 PVC
Top _____ Bottom _____ Ft. _____ _____
Top _____ Bottom _____ Ft. _____ _____

8. GROUT: Depth 4 Material Bentonite Method Pour
Top 2 Bottom 4 Ft. Bentonite Pour
Top 0 Bottom 2 Ft. Portland Pour
Top _____ Bottom _____ Ft. _____ _____

9. SCREEN: Depth 5 Diameter 1 in. Slot Size .010 in. Material PVC
Top 5 Bottom 15 Ft. 1 in. .010 in. PVC
Top _____ Bottom _____ Ft. _____ in. _____ in. _____
Top _____ Bottom _____ Ft. _____ in. _____ in. _____

10. SAND/GRAVEL PACK: Depth 4 Size Coarse Material SAND
Top 4 Bottom 15 Ft. Coarse SAND
Top _____ Bottom _____ Ft. _____
Top _____ Bottom _____ Ft. _____

11. DRILLING LOG		Formation Description
Top	Bottom	
0	6	Red silty CLAY
6	15	Tan sandy CLAY
/	/	/
/	/	/
/	/	/
/	/	/
/	/	/
/	/	/
/	/	/
/	/	/

12. REMARKS: P-8

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.

Thomas Whitehead 3/24/10
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

Thomas Whitehead
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

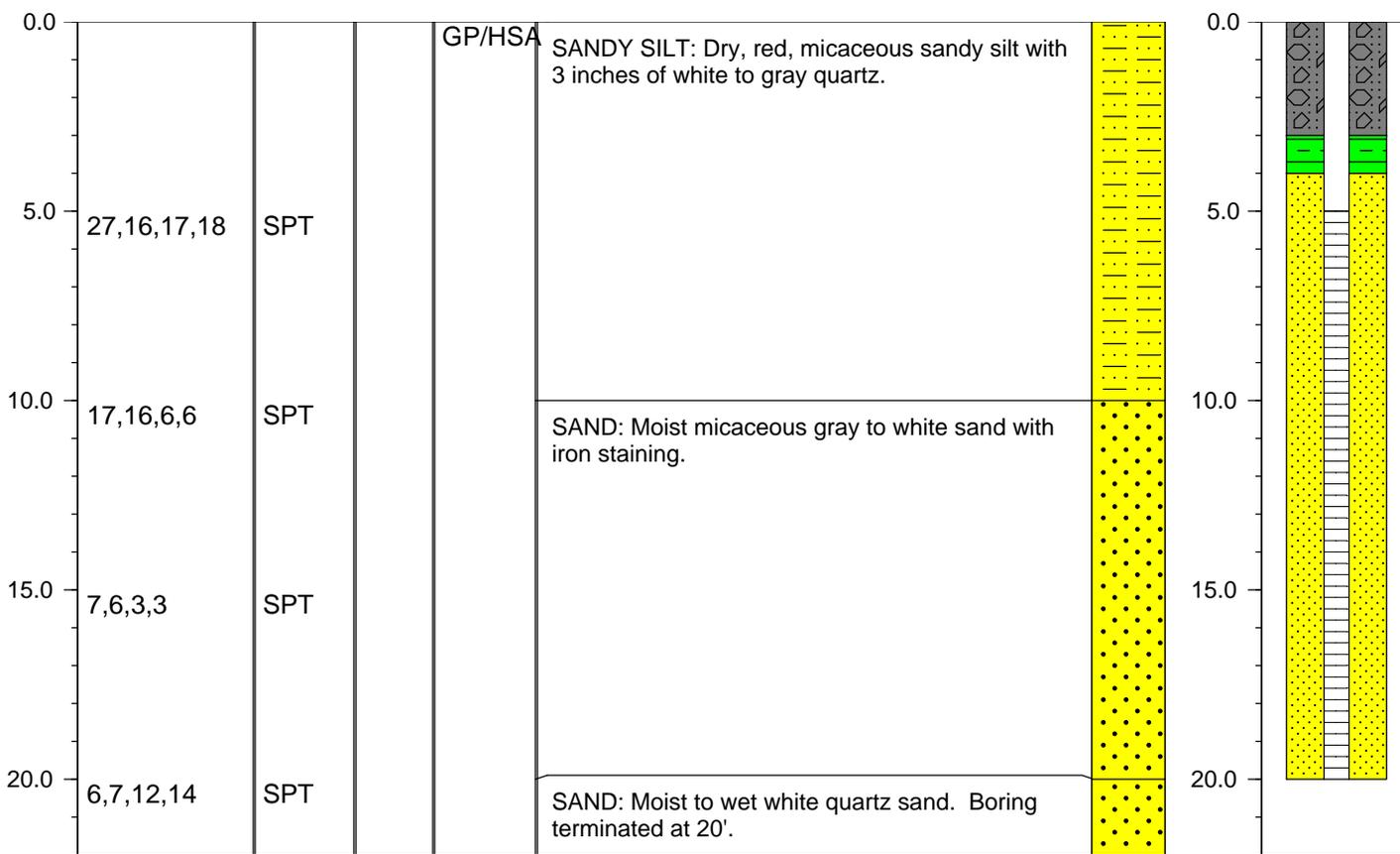


PROJECT NAME: **Avery County C&D Landfill**
LOCATION: **Ingalls, NC**
DRILLING CO: **Geologic Exploration, Inc.**
DRILLING METHOD: **Geoprobe/HSA**
FIELD PARTY: **Brian Thomas**
GEOLOGIST: **Don Misenheimer**
DATE BEGUN: **11/21/11** COMPLETED: **11/21/11**

TOTAL DEPTH: **20**
TOP OF CASING ELEV.: GROUND ELEV.:
NORTHING: **0** EASTING: **0**

STATIC WATER LEVEL (BLS)		
Depth (ft)		
Time		
Date		

DEPTH Feet	BLOW COUNT Per 6"	SAMPLING METHOD	RECOVERY Inches	DRILL METHOD	DESCRIPTION	LITHOLOGY	DEPTH Feet	WELL INSTALLATION
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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) P-9

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

Industrial/Commercial Agricultural Recovery Injection

Irrigation Other (list use) _____

DATE DRILLED 11/21/11

4. WELL LOCATION:

2175 BRUSHY CREEK ROAD 28657

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

CITY: SPRUCE PINE COUNTY MITCHELL

TOPOGRAPHIC / LAND SETTING: (check appropriate box)

Slope Valley Flat Ridge Other _____

LATITUDE _____ " DMS OR _____ DD

LONGITUDE _____ " 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.)

EVERY COUNTY C&D LANDFILL N/A

Facility Name Facility ID# (if applicable)

2175 BRUSHY CREEK ROAD

Street Address

SPRUCE PINE

NC

28657

City or Town

State

Zip Code

Buddy Norris

Contact Name

175 Linville Street

Mailing Address

Newland, NC 28657

City or Town

State

Zip Code

() _____

Area code Phone number

6. WELL DETAILS:

a. TOTAL DEPTH: 20.0 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 0.0 Bottom 5.0 Ft. 2 INCH SCH 40 PVC

Top _____ Bottom _____ Ft. _____ _____ _____

Top _____ Bottom _____ Ft. _____ _____ _____

8. GROUT: Depth Material Method

Top 0.0 Bottom 3.0 Ft. PORTLAND BENTONITE SLURRY

Top _____ Bottom _____ Ft. _____ _____ _____

Top _____ Bottom _____ Ft. _____ _____ _____

9. SCREEN: Depth Diameter Slot Size Material

Top 5.0 Bottom 20.0 Ft. 2.0 in. .010 in. PVC

Top _____ Bottom _____ Ft. _____ in. _____ in. _____

Top _____ Bottom _____ Ft. _____ in. _____ in. _____

10. SAND/GRAVEL PACK:

Depth Size Material

Top 4.0 Bottom 20.0 Ft. 20-40 FINE SILICA SAND

Top _____ Bottom _____ Ft. _____ _____ _____

Top _____ Bottom _____ Ft. _____ _____ _____

11. DRILLING LOG

Top Bottom Formation Description

0.0 / 5.0 TAN SILT/COBBLES

5.0 / 20.0 WHITE/GRAY PARTIALLY WEATHER

/ ROCK

/ _____

/ _____

/ _____

/ _____

/ _____

/ _____

/ _____

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 11/28/11
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

BRIAN THOMAS
PRINTED NAME OF PERSON CONSTRUCTING THE WELL



FIELD BOREHOLE LOG

BOREHOLE NUMBER **P-10**

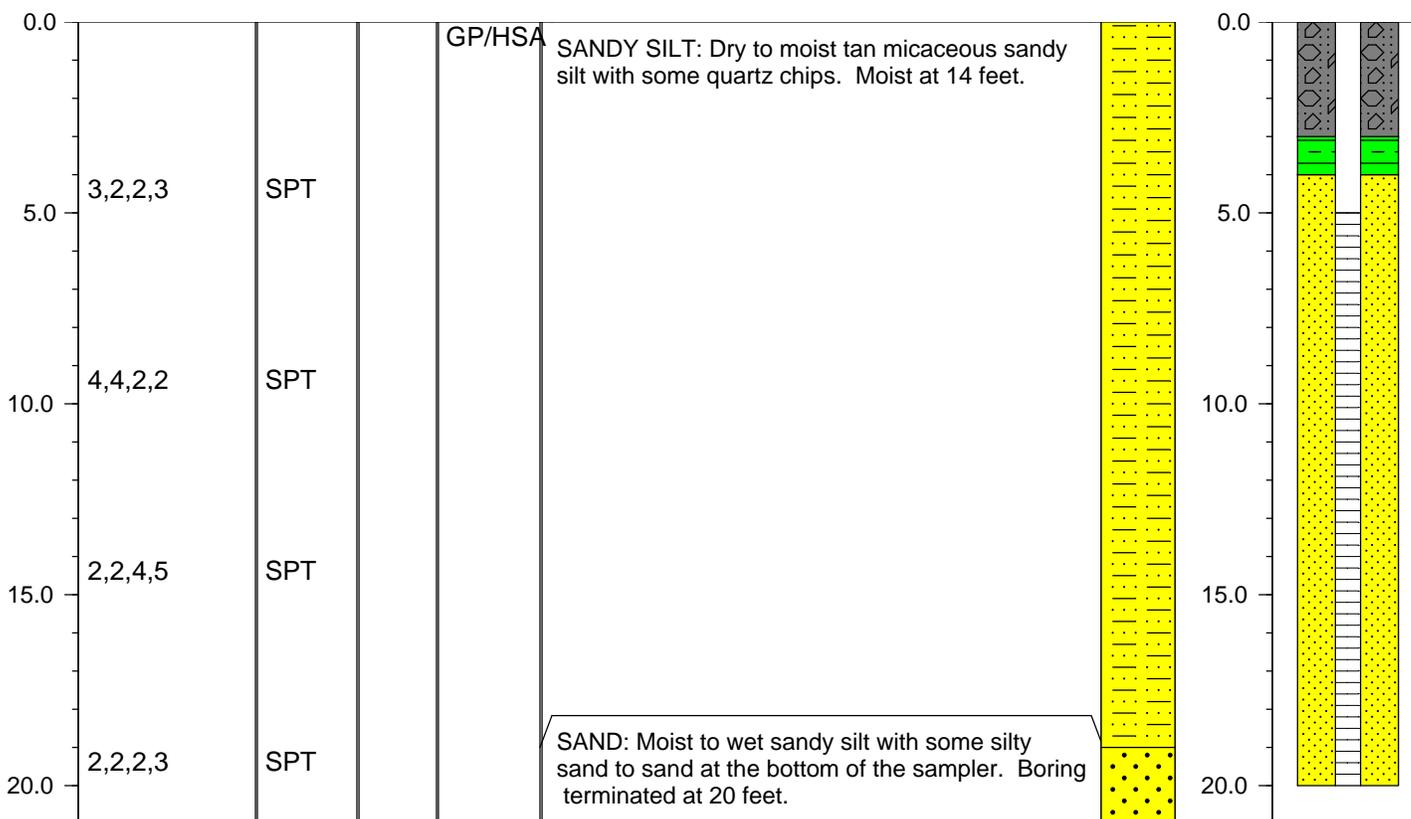
Page 1 of 1

PROJECT NAME: **Avery County C&D Landfill**
 LOCATION: **Ingalls, NC**
 DRILLING CO: **Geologic Exploration, Inc.**
 DRILLING METHOD: **Geoprobe/HSA**
 FIELD PARTY: **Brian Thomas**
 GEOLOGIST: **Don Misenheimer**
 DATE BEGUN: **11/21/11** COMPLETED: **11/21/11**

TOTAL DEPTH: **20**
 TOP OF CASING ELEV.: **GROUND ELEV.:**
 NORTHING: **0** EASTING: **0**

STATIC WATER LEVEL (BLS)		
Depth (ft)		
Time		
Date		

DEPTH Feet	BLOW COUNT Per 6"	SAMPLING METHOD	RECOVERY Inches	DRILL METHOD	DESCRIPTION	LITHOLOGY	DEPTH Feet	WELL INSTALLATION
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***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) P-10

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

Industrial/Commercial Agricultural Recovery Injection
 Irrigation Other (list use) _____
DATE DRILLED 11/21/11

4. WELL LOCATION:

2175 BRUSHY CREEK ROAD 28657
 (Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)
 CITY: SPRUCE PINE COUNTY MITCHELL
 TOPOGRAPHIC / LAND SETTING: (check appropriate box)
 Slope Valley Flat Ridge Other _____
 LATITUDE _____ " DMS OR _____ DD
 LONGITUDE _____ " 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.)

AVERY COUNTY C&D LANDFILL N/A
 Facility Name Facility ID# (if applicable)
2175 BRUSHY CREEK ROAD
 Street Address
SPRUCE PINE NC 28657
 City or Town State Zip Code
Buddy Norris
 Contact Name
175 Linville Stree
 Mailing Address
Newland, NC 28657
 City or Town State Zip Code

() _____
 Area code Phone number

6. WELL DETAILS:

a. **TOTAL DEPTH:** 20.0 FEET
 b. **DOES WELL REPLACE EXISTING WELL?** YES NO
 c. **WATER LEVEL** Below Top of Casing: 19.0 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 0.0 Bottom 5.0 Ft. 2 INCH SCH 40 PVC
 Top _____ Bottom _____ Ft. _____ _____
 Top _____ Bottom _____ Ft. _____ _____

8. **GROUT:** Depth Material Method
 Top 0.0 Bottom 3.0 Ft. PORTLAND BENTONITE SLURRY
 Top _____ Bottom _____ Ft. _____ _____
 Top _____ Bottom _____ Ft. _____ _____

9. **SCREEN:** Depth Diameter Slot Size Material
 Top 5.0 Bottom 20.0 Ft. 2.0 in. .010 in. PVC
 Top _____ Bottom _____ Ft. _____ in. _____ in. _____
 Top _____ Bottom _____ Ft. _____ in. _____ in. _____

10. **SAND/GRAVEL PACK:** Depth Size Material
 Top 4.0 Bottom 20.0 Ft. 20-40 FINE SILICA SAND
 Top _____ Bottom _____ Ft. _____ _____
 Top _____ Bottom _____ Ft. _____ _____

11. DRILLING LOG	Formation Description
Top Bottom	
0.0 / 4.0	TAN SILT/COBBLES
4.0 / 20.0	WHITE/GRAY PARTIALLY WEATHER ROCK
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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 11/28/11
 SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

BRIAN THOMAS
 PRINTED NAME OF PERSON CONSTRUCTING THE WELL



FIELD BOREHOLE LOG

BOREHOLE NUMBER **P-11**

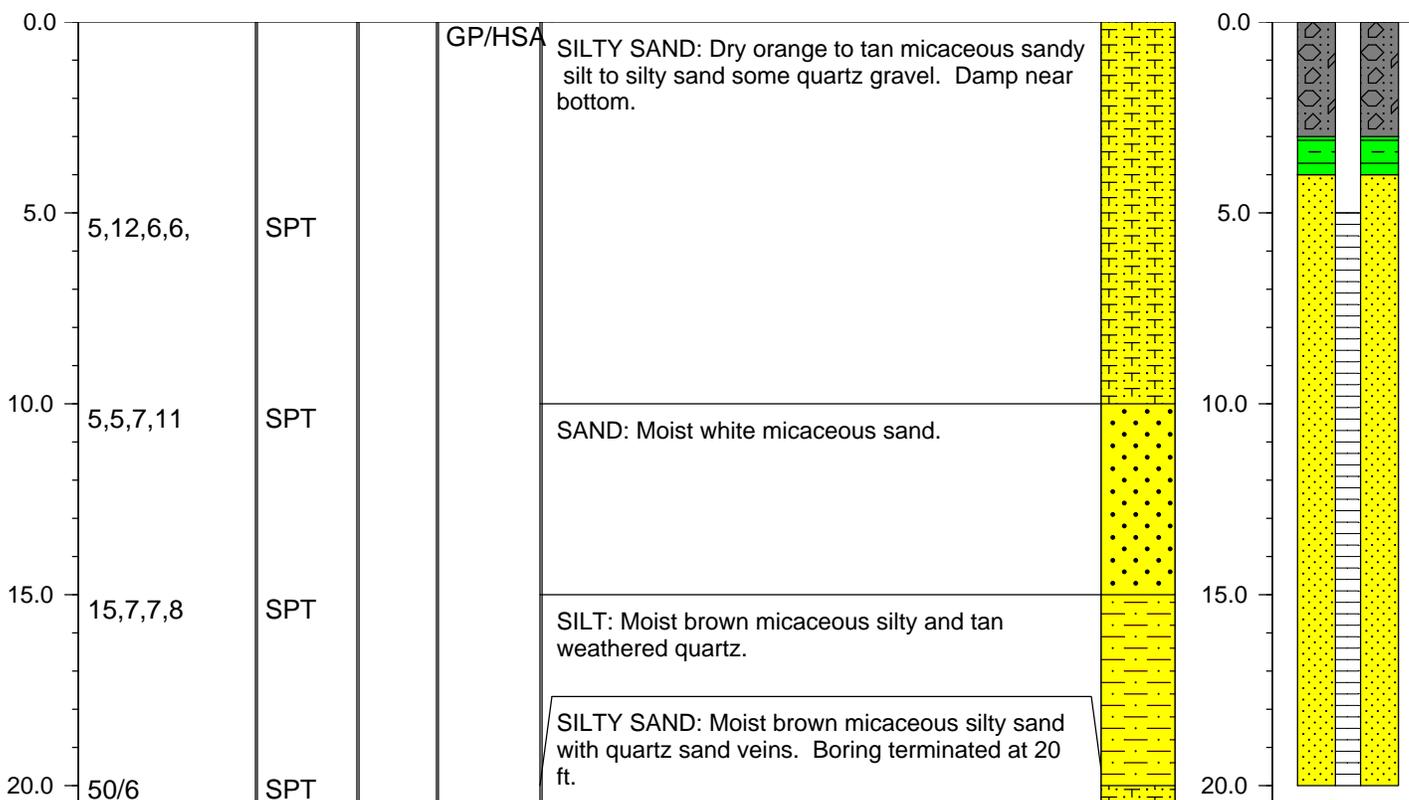
Page 1 of 1

PROJECT NAME: **Avery County C&D Landfill**
 LOCATION: **Ingalls, NC**
 DRILLING CO: **Geologic Exploration, Inc.**
 DRILLING METHOD: **Geoprobe/HSA**
 FIELD PARTY: **Brian Thomas**
 GEOLOGIST: **Don Misenheimer**
 DATE BEGUN: **11/21/11** COMPLETED: **11/21/11**

TOTAL DEPTH: **20**
 TOP OF CASING ELEV.: **GROUND ELEV.:**
 NORTHING: **0** EASTING: **0**

STATIC WATER LEVEL (BLS)		
Depth (ft)		
Time		
Date		

DEPTH Feet	BLOW COUNT Per 6"	SAMPLING METHOD	RECOVERY Inches	DRILL METHOD	DESCRIPTION	LITHOLOGY	DEPTH Feet	WELL INSTALLATION
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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) P-11

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

Industrial/Commercial Agricultural Recovery Injection

Irrigation Other (list use) _____

DATE DRILLED 11/21/11

4. WELL LOCATION:

2175 BRUSHY CREEK ROAD 28657

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

CITY: SPRUCE PINE COUNTY MITCHELL

TOPOGRAPHIC / LAND SETTING: (check appropriate box)

Slope Valley Flat Ridge Other _____

LATITUDE _____ ° _____ ' _____ " DMS OR _____ DD

LONGITUDE _____ ° _____ ' _____ " DMS OR _____ DD

Latitude/longitude source: GPS Topographic map

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

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

AVERY COUNTY C&D LANDFILL N/A

Facility Name Facility ID# (if applicable)

2175 BRUSHY CREEK ROAD

Street Address

SPRUCE PINE

NC

28657

City or Town

State

Zip Code

Buddy Norris

Contact Name

175 Linville St.

Mailing Address

Newland, NC 28657

City or Town

State

Zip Code

()

Area code Phone number

6. WELL DETAILS:

a. TOTAL DEPTH: 20.0 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 0.0 Bottom 5.0 Ft. 2 INCH SCH 40 PVC

Top _____ Bottom _____ Ft. _____ _____ _____

Top _____ Bottom _____ Ft. _____ _____ _____

8. GROUT: Depth Material Method

Top 0.0 Bottom 3.0 Ft. PORTLAND BENTONITE SLURRY

Top _____ Bottom _____ Ft. _____ _____ _____

Top _____ Bottom _____ Ft. _____ _____ _____

9. SCREEN: Depth Diameter Slot Size Material

Top 5.0 Bottom 20.0 Ft. 2.0 in. .010 in. PVC

Top _____ Bottom _____ Ft. _____ in. _____ in. _____

Top _____ Bottom _____ Ft. _____ in. _____ in. _____

10. SAND/GRAVEL PACK: Depth Size Material

Top 4.0 Bottom 20.0 Ft. 20-40 FINE SILICA SAND

Top _____ Bottom _____ Ft. _____ _____ _____

Top _____ Bottom _____ Ft. _____ _____ _____

11. DRILLING LOG Top Bottom Formation Description

0.0 / 5.0 TAN SILT/COBBLES

5.0 / 20.0 WHITE/GRAY PARTIALLY WEATHER

/ ROCK

/ _____

/ _____

/ _____

/ _____

/ _____

/ _____

/ _____

/ _____

/ _____

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 11/28/11
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

BRIAN THOMAS
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

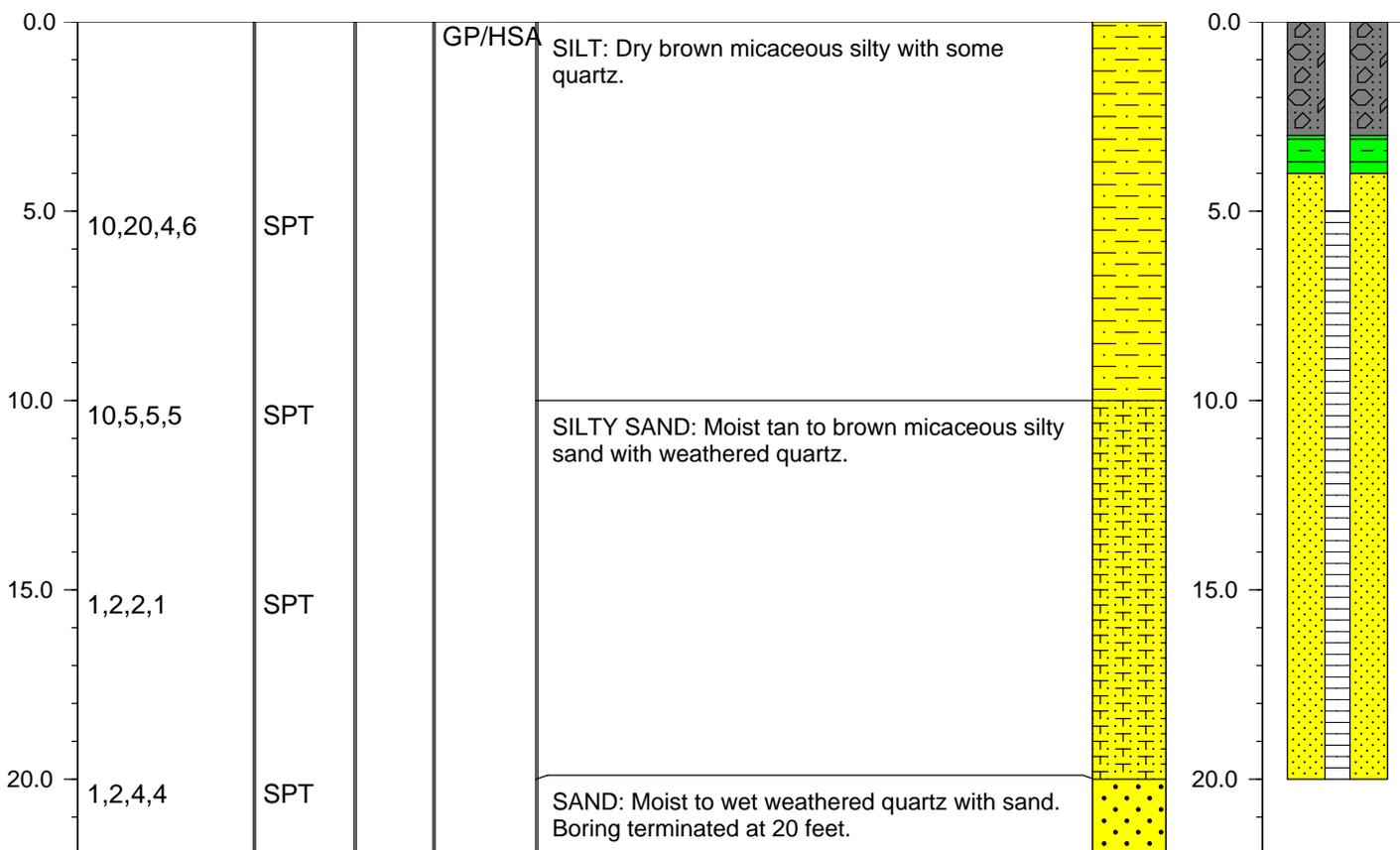


PROJECT NAME: **Avery County C&D Landfill**
LOCATION: **Ingalls, NC**
DRILLING CO: **Geologic Exploration, Inc.**
DRILLING METHOD: **Geoprobe/HSA**
FIELD PARTY: **Brian Thomas**
GEOLOGIST: **Don Misenheimer**
DATE BEGUN: **11/21/11** COMPLETED: **11/21/11**

TOTAL DEPTH: **20**
TOP OF CASING ELEV.: **GROUND ELEV.:**
NORTHING: **0** EASTING: **0**

STATIC WATER LEVEL (BLS)		
Depth (ft)		
Time		
Date		

DEPTH Feet	BLOW COUNT Per 6"	SAMPLING METHOD	RECOVERY Inches	DRILL METHOD	DESCRIPTION	LITHOLOGY	DEPTH Feet	WELL INSTALLATION
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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) P-12

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

Industrial/Commercial Agricultural Recovery Injection

Irrigation Other (list use)

DATE DRILLED 11/21/11

4. WELL LOCATION:

2175 BRUSHY CREEK ROAD 28657

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

CITY: SPRUCE PINE

COUNTY MITCHELL

TOPOGRAPHIC / LAND SETTING: (check appropriate box)

Slope Valley Flat Ridge Other

LATITUDE _____ ° _____ ' _____ " DMS OR _____ DD

LONGITUDE _____ ° _____ ' _____ " 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.)

AVERY COUNTY C&D LANDFILL N/A

Facility Name

Facility ID# (if applicable)

2175 BRUSHY CREEK ROAD

Street Address

SPRUCE PINE

NC

28657

City or Town

State

Zip Code

Buddy Norris

Contact Name

175 Linville St.

Mailing Address

Newland, NC 28657

City or town

State

Zip Code

(_____) _____

Area code Phone number

6. WELL DETAILS:

a. TOTAL DEPTH: 20.0 FEET

b. DOES WELL REPLACE EXISTING WELL? YES NO

c. WATER LEVEL Below Top of Casing: 17.0 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 0.0 Bottom 5.0 Ft. 2 INCH SCH 40 PVC

Top _____ Bottom _____ Ft. _____ _____

Top _____ Bottom _____ Ft. _____ _____

8. GROUT: Depth Material Method

Top 0.0 Bottom 3.0 Ft. PORTLAND BENTONITE SLURRY

Top _____ Bottom _____ Ft. _____ _____

Top _____ Bottom _____ Ft. _____ _____

9. SCREEN: Depth Diameter Slot Size Material

Top 5.0 Bottom 20.0 Ft. 2.0 in. .010 in. PVC

Top _____ Bottom _____ Ft. _____ in. _____ in. _____

Top _____ Bottom _____ Ft. _____ in. _____ in. _____

10. SAND/GRAVEL PACK:

Depth Size Material

Top 4.0 Bottom 20.0 Ft. 20-40 FINE SILICA SAND

Top _____ Bottom _____ Ft. _____ _____

Top _____ Bottom _____ Ft. _____ _____

11. DRILLING LOG

Top Bottom Formation Description

0.0 / 4.0

TAN SILT/COBBLES

4.0 / 20.0

WHITE/GRAY PARTIALLY WEATHER
ROCK

_____/_____

_____/_____

_____/_____

_____/_____

_____/_____

_____/_____

_____/_____

_____/_____

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 11/28/11
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

BRIAN THOMAS
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

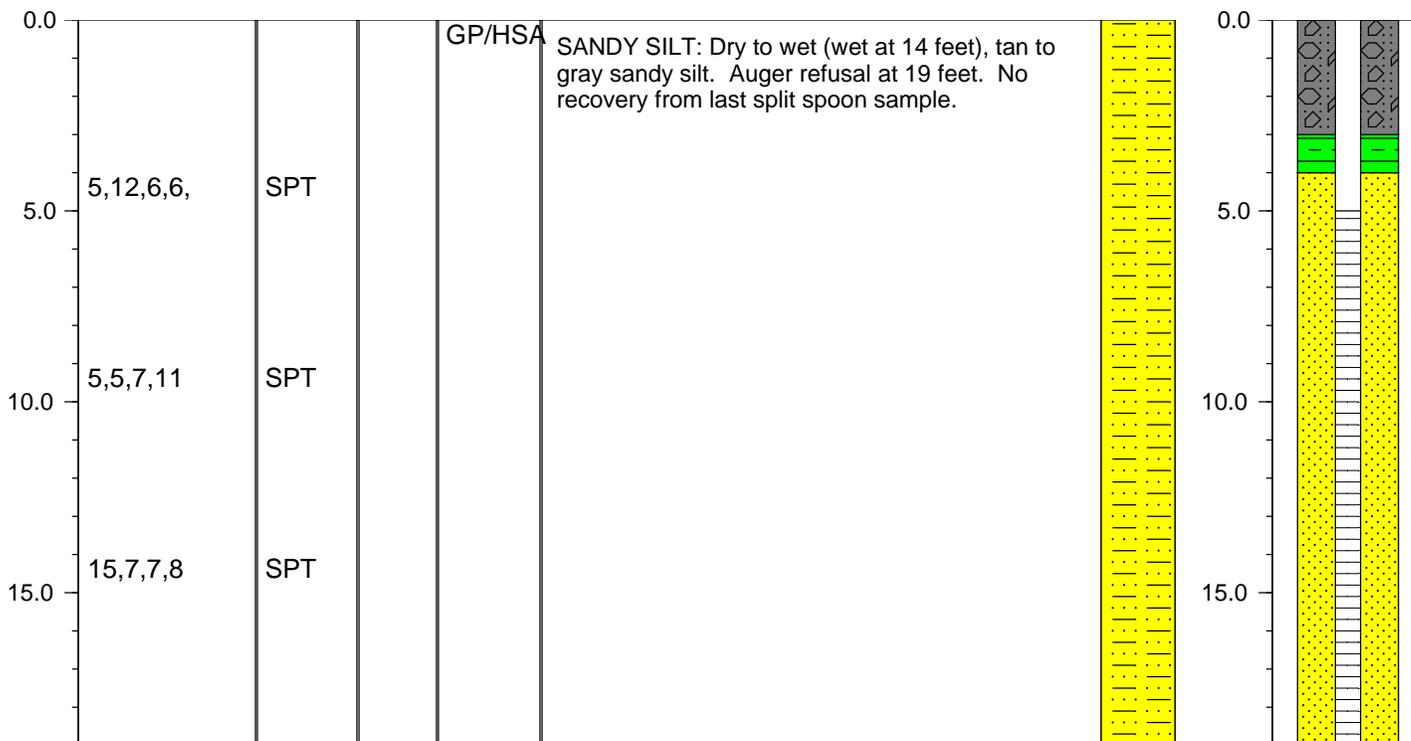


PROJECT NAME: **Avery County C&D Landfill**
 LOCATION: **Ingalls, NC**
 DRILLING CO: **Geologic Exploration, Inc.**
 DRILLING METHOD: **Geoprobe/HSA**
 FIELD PARTY: **Brian Thomas**
 GEOLOGIST: **Don Misenheimer**
 DATE BEGUN: **11/21/11** COMPLETED: **11/21/11**

TOTAL DEPTH: **20**
 TOP OF CASING ELEV.: **GROUND ELEV.:**
 NORTHING: **0** EASTING: **0**

STATIC WATER LEVEL (BLS)		
Depth (ft)		
Time		
Date		

DEPTH Feet	BLOW COUNT Per 6"	SAMPLING METHOD	RECOVERY Inches	DRILL METHOD	DESCRIPTION	LITHOLOGY	DEPTH Feet	WELL INSTALLATION
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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) P-13

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

Industrial/Commercial Agricultural Recovery Injection

Irrigation Other (list use)

DATE DRILLED 11/21/11

4. WELL LOCATION:

2175 BRUSHY CREEK ROAD 28657

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

CITY: SPRUCE PINE

COUNTY MITCHELL

TOPOGRAPHIC / LAND SETTING: (check appropriate box)

Slope Valley Flat Ridge Other

LATITUDE ° ' " DMS OR DD

LONGITUDE ° ' " 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.)

AVERY COUNTY C&D LANDFILL N/A

Facility Name

Facility ID# (if applicable)

2175 BRUSHY CREEK ROAD

Street Address

SPRUCE PINE

NC

28657

City or Town

State

Zip Code

Buddy Norris

Contact Name

175 Linville St.

Mailing Address

Newland, NC 28657

City or Town

State

Zip Code

()

Area code Phone number

6. WELL DETAILS:

a. TOTAL DEPTH: 19.0 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>	Fl. <u>2 INCH</u>	<u>SCH 40 PVC</u>
Top	<u> </u>	Bottom <u> </u>	Ft. <u> </u>	<u> </u>
Top	<u> </u>	Bottom <u> </u>	Ft. <u> </u>	<u> </u>

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

9. SCREEN:	Depth	Diameter	Slot Size	Material
Top	<u>5.0</u>	Bottom <u>19.0</u>	Fl. <u>2.0 in.</u>	<u>.010 in. PVC</u>
Top	<u> </u>	Bottom <u> </u>	Ft. <u> </u>	<u> </u>
Top	<u> </u>	Bottom <u> </u>	Ft. <u> </u>	<u> </u>

10. SAND/GRAVEL PACK:	Depth	Size	Material
Top	<u>4.0</u>	Bottom <u>19.0</u>	Ft. <u>20-40</u> <u>FINE SILICA SAND</u>
Top	<u> </u>	Bottom <u> </u>	Ft. <u> </u> <u> </u>
Top	<u> </u>	Bottom <u> </u>	Ft. <u> </u> <u> </u>

11. DRILLING LOG	Top	Bottom	Formation Description
	<u>0.0</u>	<u>4.0</u>	<u>TAN SILT/COBBLES</u>
	<u>4.0</u>	<u>19.0</u>	<u>WHITE/GRAY PARTIALLY WEATHER ROCK</u>
	<u> </u>	<u> </u>	<u> </u>
	<u> </u>	<u> </u>	<u> </u>
	<u> </u>	<u> </u>	<u> </u>
	<u> </u>	<u> </u>	<u> </u>
	<u> </u>	<u> </u>	<u> </u>
	<u> </u>	<u> </u>	<u> </u>
	<u> </u>	<u> </u>	<u> </u>
	<u> </u>	<u> </u>	<u> </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 11/28/11
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

BRIAN THOMAS
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

APPENDIX C

WELL HEAD DETAILS AND SELECTED HISTORICAL ACTIVE GAS COLLECTION SYSTEM INFORMATION

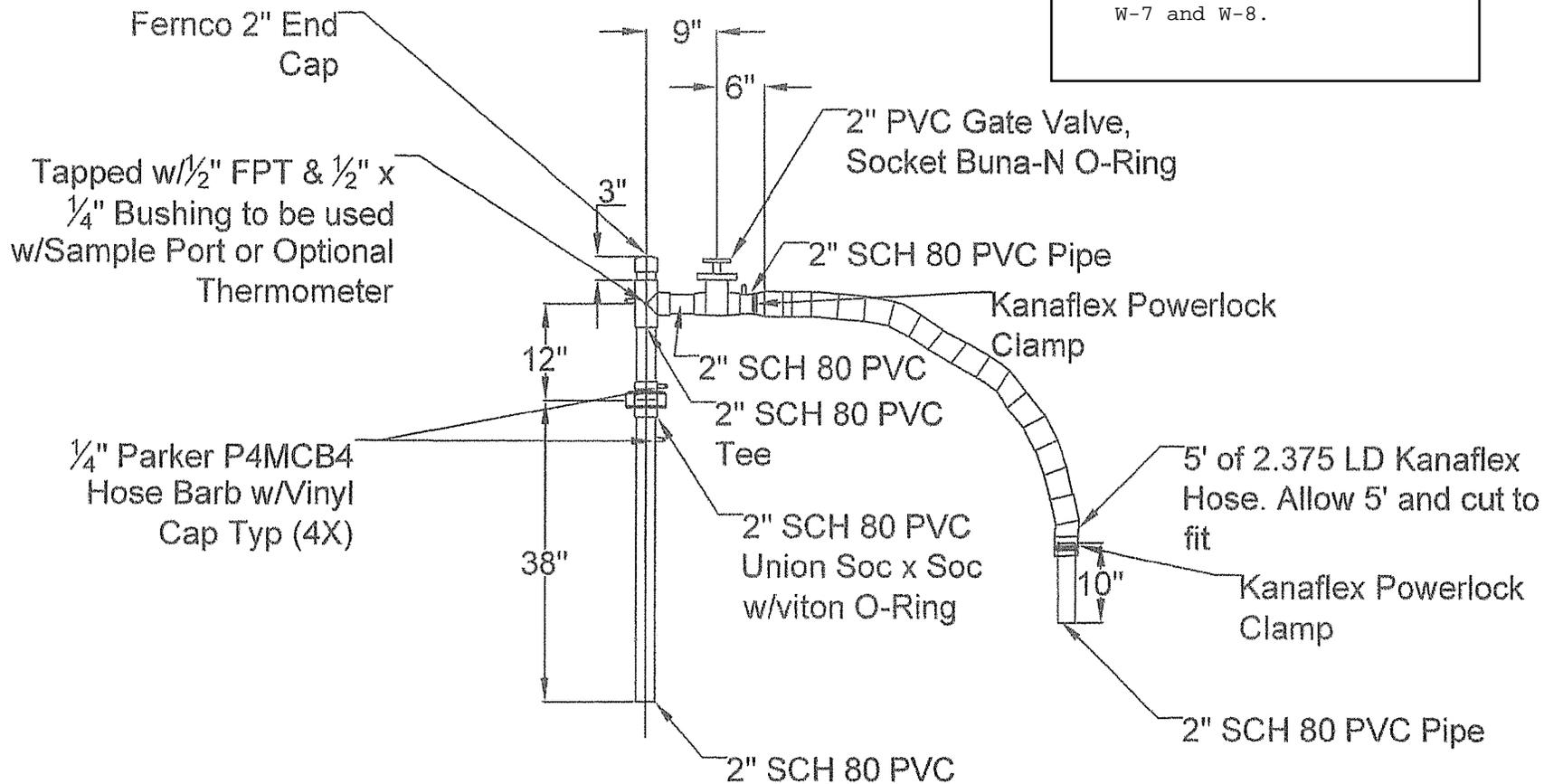
Please note that the historical information was obtained from NCDENR files and has not been documented for as-built conditions. However, the information appears to provide general information of the site system. Actual site verification is recommended.

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Side View

Figure 1

This type wellhead was installed at W-5, W-6 W-7 and W-8.



No.	Description	Rev. By	Date
	Orifice Plates Included		
	.25 Bore, .50 Bore, .75 Bore, 1.0 Bore, 1.25 Bore, 1.50 Bore		
		Whitey	5/26/09

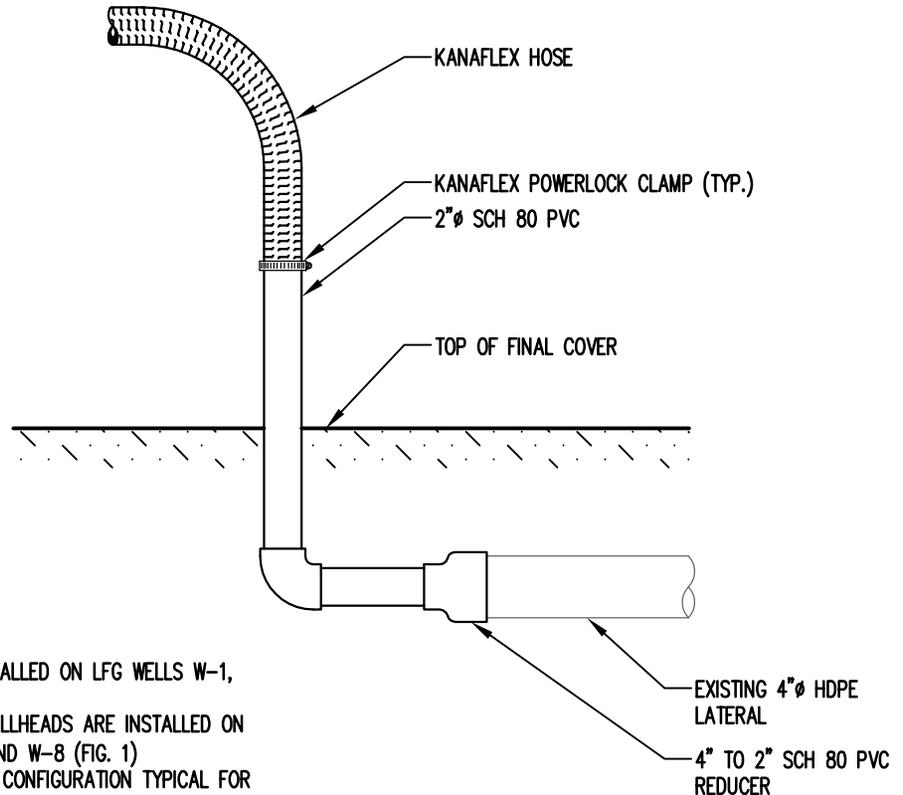
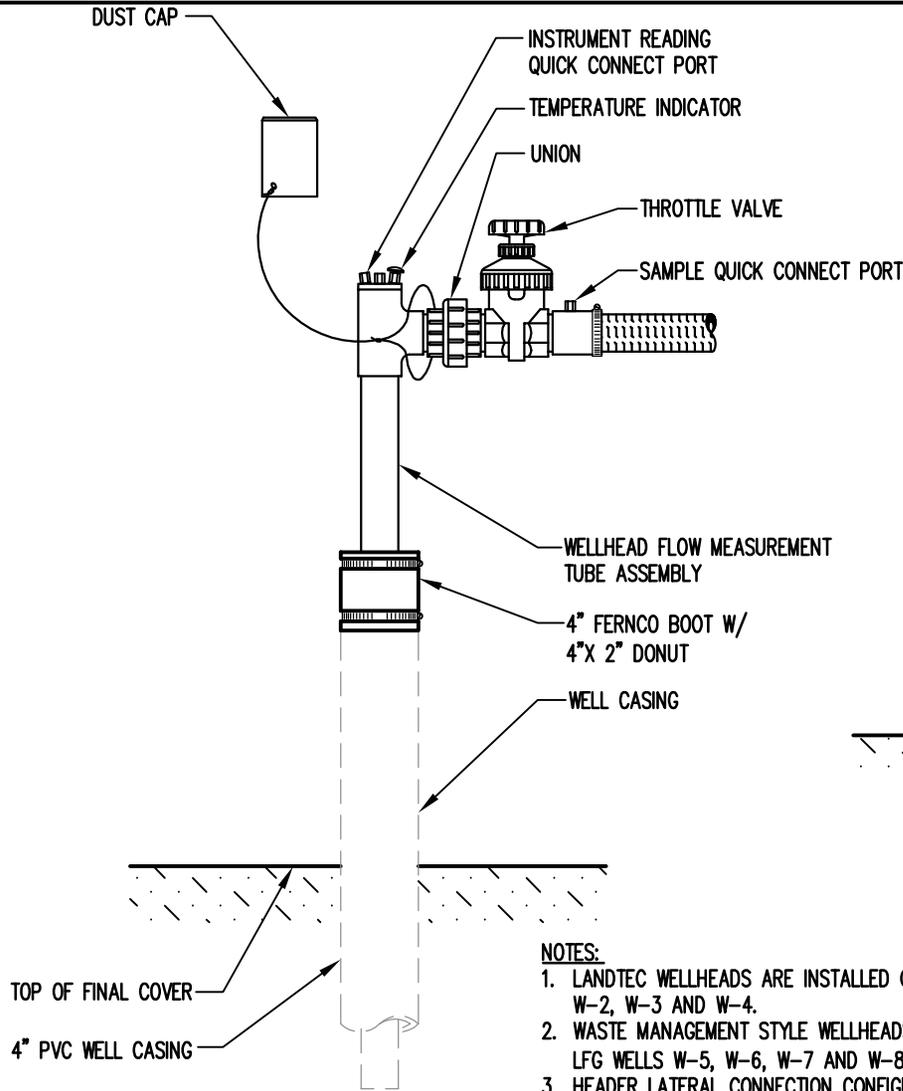
WM Style Well Head

DATE: Whitey 5/26/09

REVISED: 5/26/09

PROJECT NO: 52609-007

SCALE: A



NOTES:

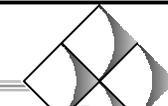
1. LANDTEC WELLHEADS ARE INSTALLED ON LFG WELLS W-1, W-2, W-3 AND W-4.
2. WASTE MANAGEMENT STYLE WELLHEADS ARE INSTALLED ON LFG WELLS W-5, W-6, W-7 AND W-8 (FIG. 1)
3. HEADER LATERAL CONNECTION CONFIGURATION TYPICAL FOR ALL EIGHT (8) LFG WELLS.

LANDTEC WELLHEAD
(SEE NOTES 1 AND 2)

HEADER LATERAL CONNECTION
(SEE NOTE 3)

LANDFILL GAS EXTRACTION WELLHEAD
AND HEADER LATERAL CONNECTION
AVERY COUNTY MSW LANDFILL
SPRUCE PINE, NC

DRAWN BY: J.A.L.	CHECKED BY: D.M.M.	SCALE: AS SHOWN	FIGURE NO. 2
DATE: May. 2011	PROJECT NO. AVERY 11-3	FILE NAME VERTICAL WELLHEAD	



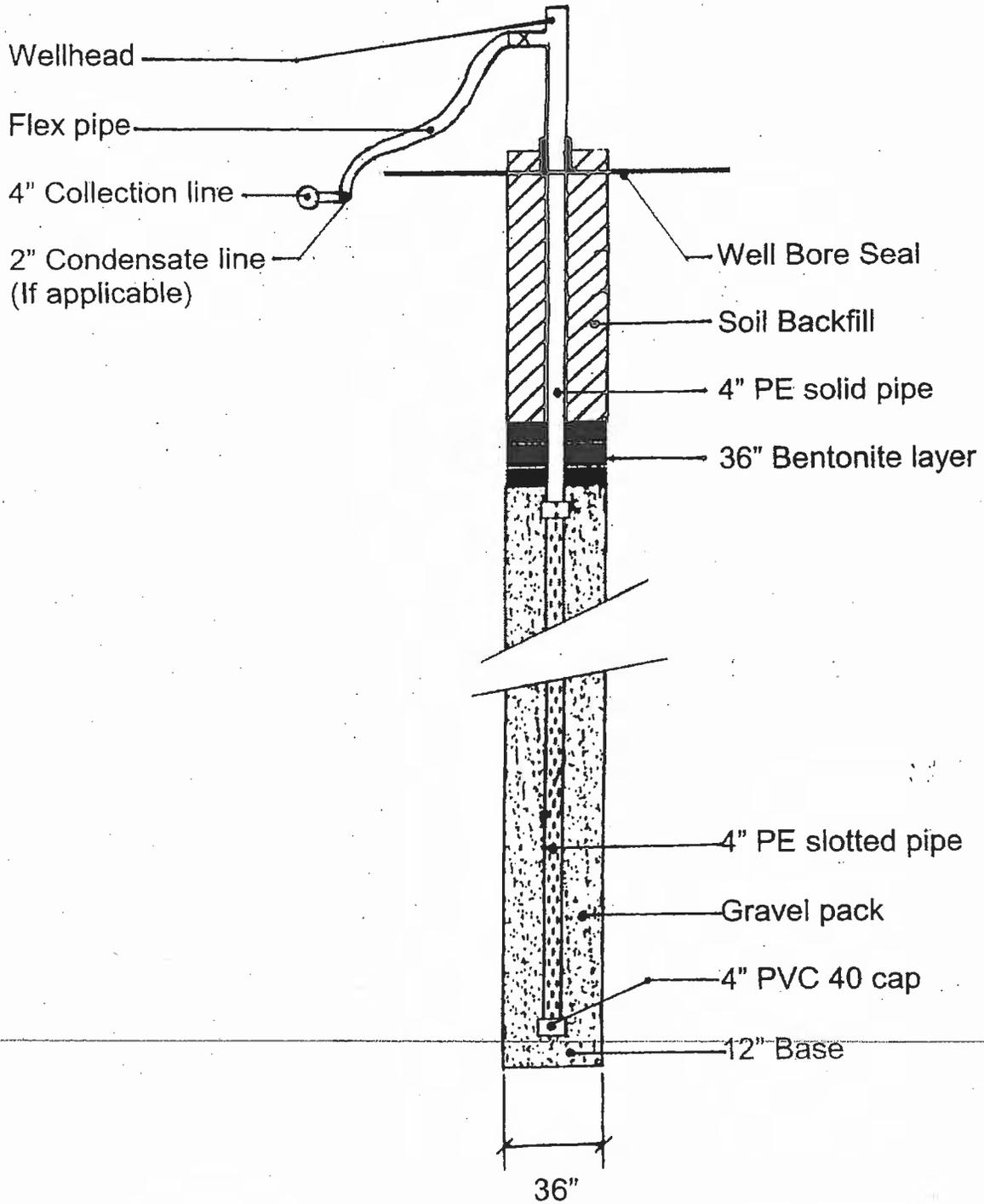
RICHARDSON SMITH GARDNER & ASSOCIATES

14 N. Boylan Ave.
Raleigh, N.C. 27603

NC LIC. NO. C-0828 (Engineering)
www.rsgengineers.com

ph: 919-828-0577
fax: 919-828-3899

Avery County Landfill Extraction Well Schematic



Excavation Detail

Backfill Detail

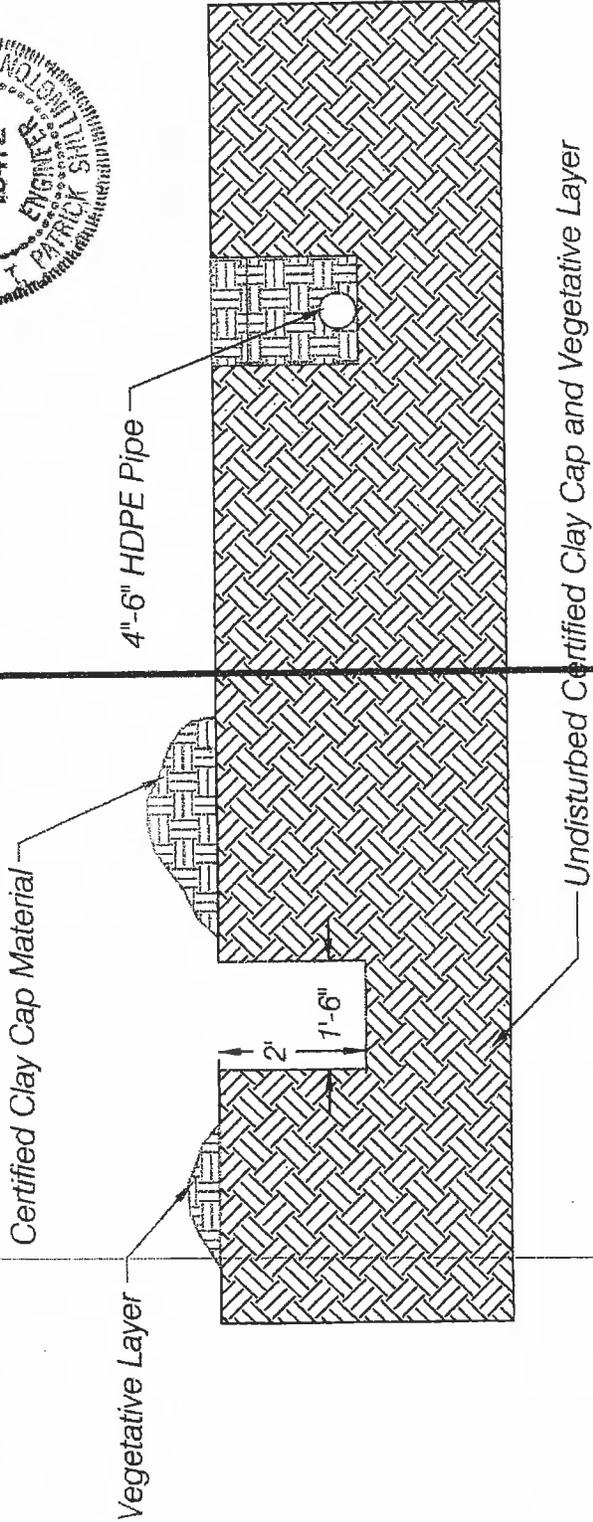
- General Notes**
1. The vegetative soil is separated from the clay cap material during excavation.
 2. The clay is backfilled and compacted around the pipe.
 3. Vegetative layer is then placed on top of the clay and compacted.
 4. Any additional cover materials will be delivered by Avery County, only as needed.

No.	Revision/Issue	Date
	Drawn: CRM	

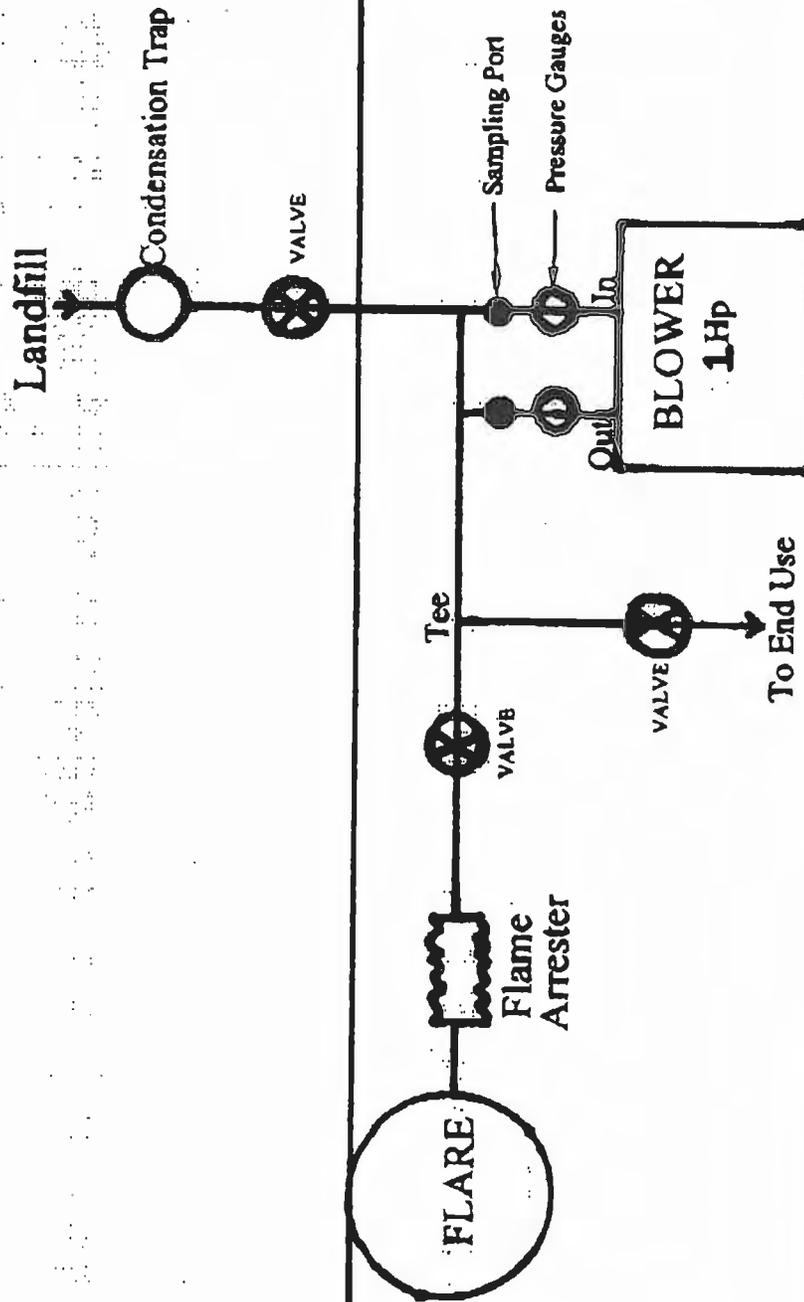


ACLF
EXCAVATION DETAIL

ACLF	NO SCALE
06/23/00	



1#



Skid

E2S Engineering & Construction 17000 W. 10th Ave. Denver, CO 80202 303.440.1100	Blower & Flare System Schematic	1/1/18
	Natural Power, Inc.	1

REGENAIR® R4 Series



MODELS R4110-2/R4310A-2
 (52" H₂O MAX. PRESSURE, 92 CFM OPEN FLOW)
 (48" H₂O MAX. VACUUM, 88 CFM OPEN FLOW)

PRODUCT FEATURES

- Oilless operation
- TEFC motor mounted
- Can be mounted in any plane
- Rugged construction/low maintenance
- Can be operated with no air flow through unit
- Class B Insulation on motors
- Automatic restart thermal protection on single phase motors

COMMON MOTOR OPTIONS

- ★ • 115/208-230V, 60 Hz; 110/220-240V, 50 Hz, single phase
- ★ • 208-230/460V, 60 Hz; 190-220/380-415V, 50 Hz, three phase
- 575V, 60 Hz, three phase

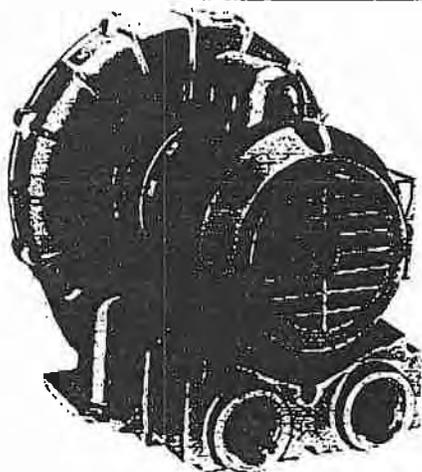
RECOMMENDED ACCESSORIES

- Pressure gauge AJ498
- Filter AJ128D (pressure)
- Vacuum gauge AJ497
- In-line filter AJ151D (vacuum)
- Muffler AJ121D
- Relief valve AG258
- Nema motor starter size - 0/00 (R4110-2), 00/00 (R4310A-2), for 60 Hz operation
- Moisture separator RMS160 (vacuum)

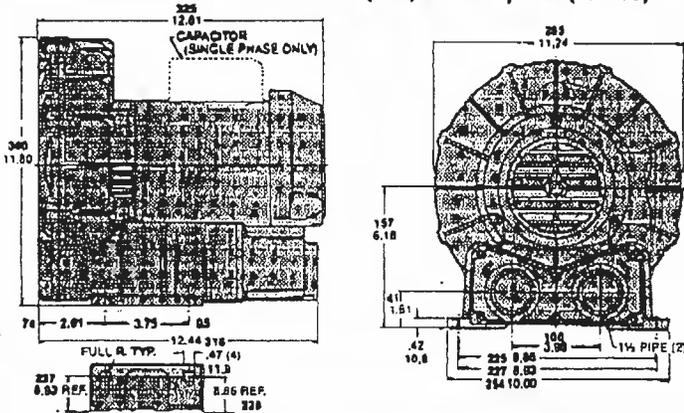
Various brand name motors are used on any model at the discretion of Gast Mfg. Corp.

Important Notice:

Pictorial, performance and dimensional data is subject to change without notice.



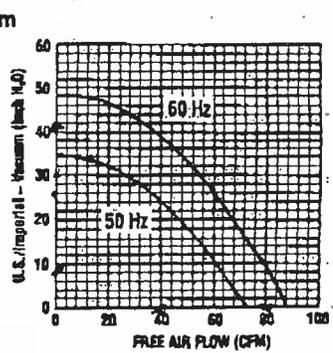
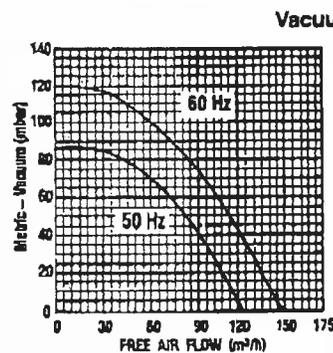
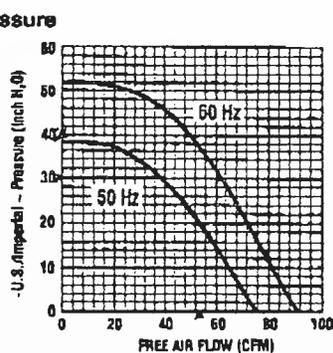
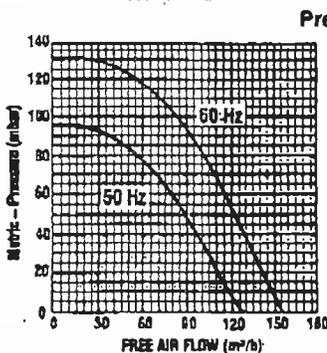
Product Dimensions Metric (mm) U.S. Imperial (inches)



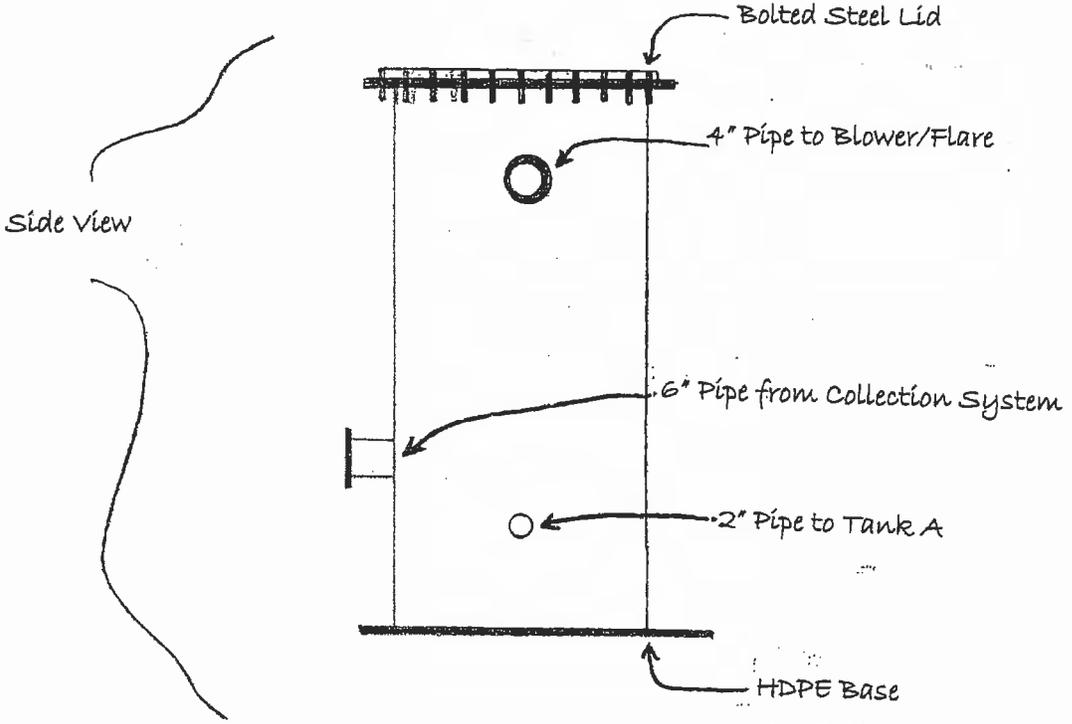
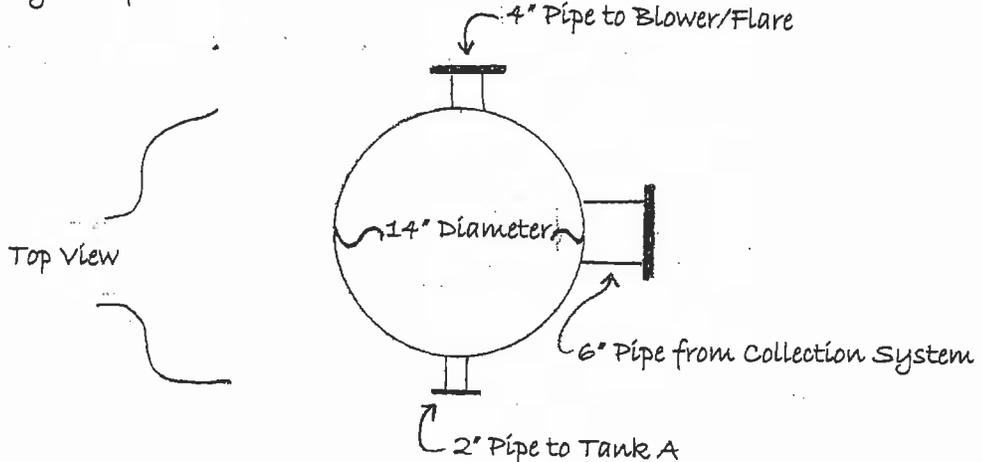
Product Specifications

Model Number	Motor Specs	Full Load Amps	Locked Rotor Amps	HP	RPM	Max Vac "H ₂ O	Max Pressure "H ₂ O	Max Flow cfm	Net Wt. lbs.	Net Wt. kg
R4110-2	110/220-240-50-1	9.0/4.5-5.7	31.2 @ 230V	0.6	2850	34	85	74	41	18.6
	115/208-230-60-1	9.8/5.2-4.9		1.0	3450	48	120	92	156	71
R4310A-2	190-220/380-415-50-3	2.6-3.3/1.3-1.4	26.5 @ 230V	0.6	2850	34	85	74	41	18.6
	208-230/460-60-3	3.4-3.2/1.6		1.0	3450	48	120	92	156	71

Product Performance (Metric U.S. Imperial)



Sketch of
Condensate Knockout Trap
For Avery County Landfill



~Not to Scale~

Overall Notes

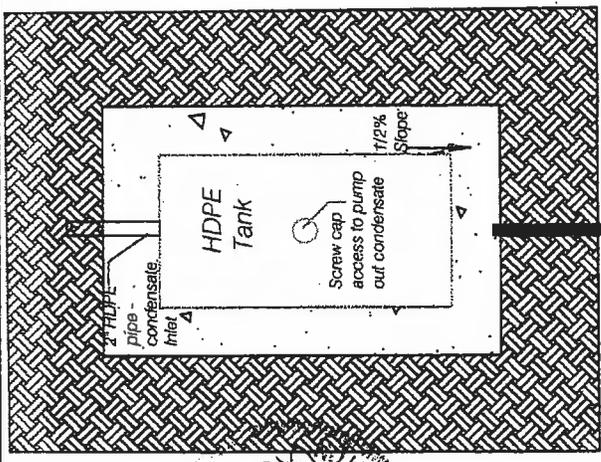
1. Foundation design for less than 2,000 lbs./sq. ft.
2. 3000 PSI concrete to be used, slump 3-5" with air content between 4-6%.
3. Slope concrete surface 1/2% to drain rainwater from containment basin.
4. Containment area to be sized to fit around each tank to specifications.

Drawn: CRM
Designed: TPS
Check: []
Date: []

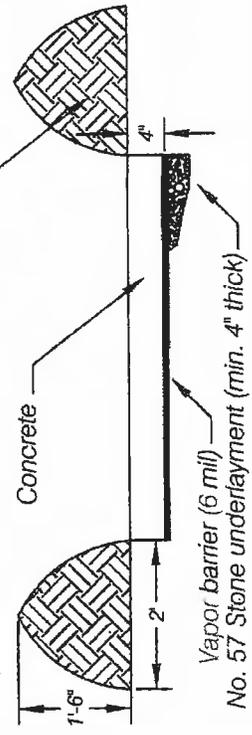


Project Name and Address
 Avery County Landfill
 Condensate Tanks
 & Pads

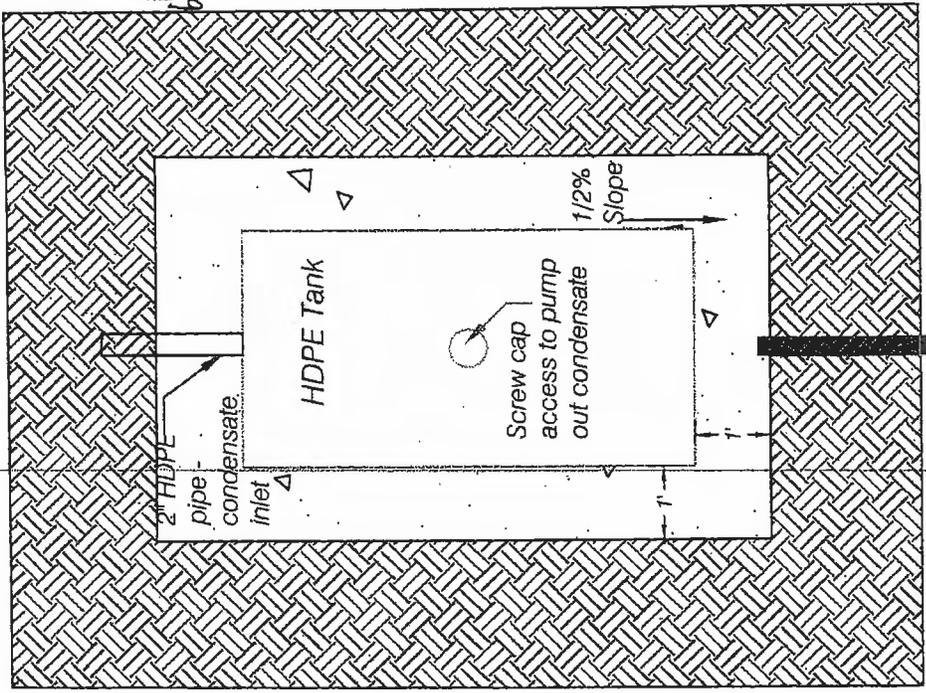
Project: ACLF
Date: 06/23/00
Scale: NO SCALE



~35 Gallon tank near main road~



Concrete pad to be 1' wider than tank on all sides
 Earthen containment berm to be 2' wider than pad on all sides



~225 Gallon tank near blower station~

2" PVC SCH 40 Drain pipe
 2" Valve

APPENDIX D

MONITORING LOG AND REPORTING FORMS

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NC Division of Waste Management - Solid Waste Section

Landfill Gas Monitoring Data 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).

Facility Name: Avery County Closed MSW Landfill Permit Number: 06-01

Date of Sampling: _____ NC Landfill Rule (.0500 or .1600): .0500

Name and Position of Sample Collector: _____

Type and Serial Number of Gas Meter: _____ Calibration Date of Gas Meter: _____

Date and Time of Field Calibration: _____

Type of Field Calibration Gas (15/15 or 35/50): _____ Expiration Date of Field Calibration Gas Canister: _____

Pump Rate of Gas Meter: _____

Ambient Air Temperature: _____ Barometric Pressure: _____ General Weather Conditions: _____

Instructions: Under "Location or LFG Well" identify the monitoring wells or describe the location for other tests (e.g., inside buildings). A drawing showing the location of test must be attached. Report methane readings in both % LEL and % methane by volume. A reading in percent methane by volume can be converted to % LEL as follows: % methane by volume = % LEL/20

Location or LFG Well ID	Sample Tube Purge	Time	Time Pumped (s)	Initial %LEL	Stabilized %LEL	%CH4 by Volume	%O2	%CO2	Notes
P1									
P2									
P3									
P4									
P5									
P6									
P7									
P8									
P9									
P10									

If your facility has more gas monitoring locations than there is room on this form, please attach additional sheets listing the same information as contained on this form.

Certification

To the best of my knowledge, the information reported and statements made on this data submittal and attachments are true and correct. I am aware that there are significant penalties for making any false statement, representation, or certification including the possibility of a fine and imprisonment.

SIGNATURE

TITLE

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Name and Position of Sample Collector: _____

Type and Serial Number of Gas Meter: _____ Calibration Date of Gas Meter: _____

Date and Time of Field Calibration: _____

Type of Field Calibration Gas (15/15 or 35/50): _____ Expiration Date of Field Calibration Gas Canister: _____

Pump Rate of Gas Meter: _____

Ambient Air Temperature: _____ Barometric Pressure: _____ General Weather Conditions: _____

Instructions: Under "Location or LFG Well" identify the monitoring wells or describe the location for other tests (e.g., inside buildings). A drawing showing the location of test must be attached. Report methane readings in both % LEL and % methane by volume. A reading in percent methane by volume can be converted to % LEL as follows: % methane by volume = % LEL/20

Location or LFG Well ID	Sample Tube Purge	Time	Time Pumped (s)	Initial %LEL	Stabilized %LEL	%CH4 by Volume	%O2	%CO2	Notes
P11									
P12									
P13									

If your facility has more gas monitoring locations than there is room on this form, please attach additional sheets listing the same information as contained on this form.

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SIGNATURE

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Name and Position of Sample Collector: _____

Type and Serial Number of Gas Meter: _____ Calibration Date of Gas Meter: _____

Date and Time of Field Calibration: _____

Type of Field Calibration Gas (15/15 or 35/50): _____ Expiration Date of Field Calibration Gas Canister: _____

Pump Rate of Gas Meter: _____

Ambient Air Temperature: _____ Barometric Pressure: _____ General Weather Conditions: _____

Instructions: Under "Location or LFG Well" identify the monitoring wells or describe the location for other tests (e.g., inside buildings). A drawing showing the location of test must be attached. Report methane readings in both % LEL and % methane by volume. A reading in percent methane by volume can be converted to % LEL as follows: % methane by volume = % LEL/20

Location or LFG Well ID	Sample Tube Purge	Time	Time Pumped (s)	Initial %LEL	Stabilized %LEL	%CH4 by Volume	%O2	%CO2	Notes
AVERY COUNTY AIRPORT STRUCTURE #1									
NE Corner									
NW Corner									
SE Corner									
SW Corner									
ADD ANY ADDITIONAL LOCATIONS AT OR NEAR STRUCTURE WITH METHANE PRESENT BELOW OR ON ADDITIONAL SHEETS									

If your facility has more gas monitoring locations than there is room on this form, please attach additional sheets listing the same information as contained on this form.

Certification

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Facility Name: Avery County Closed MSW Landfill Permit Number: 06-01

Date of Sampling: _____ NC Landfill Rule (.0500 or .1600): .0500

Name and Position of Sample Collector: _____

Type and Serial Number of Gas Meter: _____ Calibration Date of Gas Meter: _____

Date and Time of Field Calibration: _____

Type of Field Calibration Gas (15/15 or 35/50): _____ Expiration Date of Field Calibration Gas Canister: _____

Pump Rate of Gas Meter: _____

Ambient Air Temperature: _____ Barometric Pressure: _____ General Weather Conditions: _____

Instructions: Under "Location or LFG Well" identify the monitoring wells or describe the location for other tests (e.g., inside buildings). A drawing showing the location of test must be attached. Report methane readings in both % LEL and % methane by volume. A reading in percent methane by volume can be converted to % LEL as follows: % methane by volume = % LEL/20

Location or LFG Well ID	Sample Tube Purge	Time	Time Pumped (s)	Initial %LEL	Stabilized %LEL	%CH4 by Volume	%O2	%CO2	Notes
AVERY COUNTY AIRPORT STRUCTURE #2									
NE Corner									
NW Corner									
SE Corner									
SW Corner									
ADD ANY ADDITIONAL LOCATIONS AT OR NEAR STRUCTURE WITH METHANE PRESENT BELOW OR ON ADDITIONAL SHEETS									

If your facility has more gas monitoring locations than there is room on this form, please attach additional sheets listing the same information as contained on this form.

Certification

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SIGNATURE

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Facility Name: Avery County Closed MSW Landfill Permit Number: 06-01

Date of Sampling: _____ NC Landfill Rule (.0500 or .1600): .0500

Name and Position of Sample Collector: _____

Type and Serial Number of Gas Meter: _____ Calibration Date of Gas Meter: _____

Date and Time of Field Calibration: _____

Type of Field Calibration Gas (15/15 or 35/50): _____ Expiration Date of Field Calibration Gas Canister: _____

Pump Rate of Gas Meter: _____

Ambient Air Temperature: _____ Barometric Pressure: _____ General Weather Conditions: _____

Instructions: Under "Location or LFG Well" identify the monitoring wells or describe the location for other tests (e.g., inside buildings). A drawing showing the location of test must be attached. Report methane readings in both % LEL and % methane by volume. A reading in percent methane by volume can be converted to % LEL as follows: % methane by volume = % LEL/20

Location or LFG Well ID	Sample Tube Purge	Time	Time Pumped (s)	Initial %LEL	Stabilized %LEL	%CH4 by Volume	%O2	%CO2	Notes
AVERY COUNTY AIRPORT STRUCTURE #3									
NE Corner									
NW Corner									
SE Corner									
SW Corner									
ADD ANY ADDITIONAL LOCATIONS AT OR NEAR STRUCTURE WITH METHANE PRESENT BELOW OR ON ADDITIONAL SHEETS									

If your facility has more gas monitoring locations than there is room on this form, please attach additional sheets listing the same information as contained on this form.

Certification

To the best of my knowledge, the information reported and statements made on this data submittal and attachments are true and correct. I am aware that there are significant penalties for making any false statement, representation, or certification including the possibility of a fine and imprisonment.

SIGNATURE

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Facility Name: Avery County Closed MSW Landfill Permit Number: 06-01

Date of Sampling: _____ NC Landfill Rule (.0500 or .1600): .0500

Name and Position of Sample Collector: _____

Type and Serial Number of Gas Meter: _____ Calibration Date of Gas Meter: _____

Date and Time of Field Calibration: _____

Type of Field Calibration Gas (15/15 or 35/50): _____ Expiration Date of Field Calibration Gas Canister: _____

Pump Rate of Gas Meter: _____

Ambient Air Temperature: _____ Barometric Pressure: _____ General Weather Conditions: _____

Instructions: Under "Location or LFG Well" identify the monitoring wells or describe the location for other tests (e.g., inside buildings). A drawing showing the location of test must be attached. Report methane readings in both % LEL and % methane by volume. A reading in percent methane by volume can be converted to % LEL as follows: % methane by volume = % LEL/20

Location or LFG Well ID	Sample Tube Purge	Time	Time Pumped (s)	Initial %LEL	Stabilized %LEL	%CH4 by Volume	%O2	%CO2	Notes
AVERY COUNTY AIRPORT STRUCTURE #4									
NE Corner									
NW Corner									
SE Corner									
SW Corner									
ADD ANY ADDITIONAL LOCATIONS AT OR NEAR STRUCTURE WITH METHANE PRESENT BELOW OR ON ADDITIONAL SHEETS									

If your facility has more gas monitoring locations than there is room on this form, please attach additional sheets listing the same information as contained on this form.

Certification

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SIGNATURE

TITLE

NC Division of Waste Management - Solid Waste Section

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Facility Name: Avery County Closed MSW Landfill Permit Number: 06-01

Date of Sampling: _____ NC Landfill Rule (.0500 or .1600): .0500

Name and Position of Sample Collector: _____

Type and Serial Number of Gas Meter: _____ Calibration Date of Gas Meter: _____

Date and Time of Field Calibration: _____

Type of Field Calibration Gas (15/15 or 35/50): _____ Expiration Date of Field Calibration Gas Canister: _____

Pump Rate of Gas Meter: _____

Ambient Air Temperature: _____ Barometric Pressure: _____ General Weather Conditions: _____

Instructions: Under "Location or LFG Well" identify the monitoring wells or describe the location for other tests (e.g., inside buildings). A drawing showing the location of test must be attached. Report methane readings in both % LEL and % methane by volume. A reading in percent methane by volume can be converted to % LEL as follows: % methane by volume = % LEL/20

Location or LFG Well ID	Sample Tube Purge	Time	Time Pumped (s)	Initial %LEL	Stabilized %LEL	%CH4 by Volume	%O2	%CO2	Notes
AVERY COUNTY AIRPORT STRUCTURE #5									
NE Corner									
NW Corner									
SE Corner									
SW Corner									
ADD ANY ADDITIONAL LOCATIONS AT OR NEAR STRUCTURE WITH METHANE PRESENT BELOW OR ON ADDITIONAL SHEETS									

If your facility has more gas monitoring locations than there is room on this form, please attach additional sheets listing the same information as contained on this form.

Certification

To the best of my knowledge, the information reported and statements made on this data submittal and attachments are true and correct. I am aware that there are significant penalties for making any false statement, representation, or certification including the possibility of a fine and imprisonment.

SIGNATURE

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NC Division of Waste Management - Solid Waste Section

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Facility Name: Avery County Closed MSW Landfill Permit Number: 06-01

Date of Sampling: _____ NC Landfill Rule (.0500 or .1600): .0500

Name and Position of Sample Collector: _____

Type and Serial Number of Gas Meter: _____ Calibration Date of Gas Meter: _____

Date and Time of Field Calibration: _____

Type of Field Calibration Gas (15/15 or 35/50): _____ Expiration Date of Field Calibration Gas Canister: _____

Pump Rate of Gas Meter: _____

Ambient Air Temperature: _____ Barometric Pressure: _____ General Weather Conditions: _____

Instructions: Under "Location or LFG Well" identify the monitoring wells or describe the location for other tests (e.g., inside buildings). A drawing showing the location of test must be attached. Report methane readings in both % LEL and % methane by volume. A reading in percent methane by volume can be converted to % LEL as follows: % methane by volume = % LEL/20

Location or LFG Well ID	Sample Tube Purge	Time	Time Pumped (s)	Initial %LEL	Stabilized %LEL	%CH4 by Volume	%O2	%CO2	Notes
AVERY COUNTY AIRPORT STRUCTURE #6									
NE Corner									
NW Corner									
SE Corner									
SW Corner									
ADD ANY ADDITIONAL LOCATIONS AT OR NEAR STRUCTURE WITH METHANE PRESENT BELOW OR ON ADDITIONAL SHEETS									

If your facility has more gas monitoring locations than there is room on this form, please attach additional sheets listing the same information as contained on this form.

Certification

To the best of my knowledge, the information reported and statements made on this data submittal and attachments are true and correct. I am aware that there are significant penalties for making any false statement, representation, or certification including the possibility of a fine and imprisonment.

SIGNATURE

TITLE

DENR USE ONLY:

Paper Report

Electronic Data - Email CD (data loaded: Yes / No)

Doc/Event #:

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.

Solid Waste Monitoring Data Submittal Information

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

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

Name: _____ Phone: _____

E-mail: _____

Facility name:

Facility Address:

Facility Permit #

NC Landfill Rule:
(.0500 or .1600)

Actual sampling dates (e.g.,
October 20-24, 2006)

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

Notification attached?

- No. No groundwater or surface water standards 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.

Facility Representative Name (Print)

Title

(Area Code) Telephone Number

Affix NC Licensed/ Professional Geologist Seal

Signature

Date

Facility Representative Address

NC PE Firm License Number (if applicable effective May 1, 2009)

Revised 6/2009

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