SMITH+GARDNER
ENGINEERS

ADDRESS 14 N. Boylan Avenue, Raleigh NC 27603 TEL 919.828.0577 WEB www.smithgardnerinc.com

May 6, 2014

Ms. Jaclynne Drummond
NCDENR DWM Solid Waste Section
1646 Mail Service Center
Raleigh, North Carolina 27699-1646

RE: **Operations, Monitoring, and Maintenance Report – April 2014**
Avery County Closed MSW Landfill
Spruce Pine, North Carolina

Dear Ms. Drummond:

Smith Gardner, Inc. (S+G) is pleased to present this report concerning the operation and maintenance (O&M) of the Avery County Closed MSW Landfill (Permit No. 06-01) Landfill Gas Collection and Control System (LFGCCS) and monitoring of the on- and off-site landfill gas probes for the April 2014 monitoring period. Mr. Don Misenheimer with S+G performed the site visit on April 16, 2014. Site visit details are provided below.

CURRENT STATUS

S+G previously identified the following items to be addressed for the LFGCCS to operate as designed:

1. **LFGCCS System:** An expansion of the LFGCCS system, as proposed in the *Annual Landfill Gas Monitoring Report*[1], was previously approved[2] by the division of Waste Management. Phase One of the expansion project has been completed and is currently being evaluated for effectiveness. A summary of this evaluation will be included in May 2014 system report with recommendations for additional work, if necessary.

LFG EXTRACTION WELL MONITORING PROGRAM

Monthly monitoring of the LFGCCS will continue and shall include the following items:

- CH_4, O_2, CO_2, and pressure monitoring at each extraction well head;
- CH_4, O_2, CO_2, and pressure monitoring at the flare station; and
- Adjustment of the LFGCCS to balance recovery and ensure safe system operation.

The County will maintain this LFGCCS and will continue to evaluate the effectiveness of increased LFG recovery from the waste mass in alleviating off-site LFG migration. Results

[1] *Annual Landfill Gas Monitoring Report,* Closed Avery County MSW Landfill. Submitted by Smith Gardner, Inc. , November 2012.

[2] Approval response letter, Closed Avery County MSW Landfill (Annual Landfill Gas Monitoring Report). Sent by Jaclynne Drummond, Solid Waste Section, November 15, 2012.

from monthly monitoring events will be reported in accordance with the approved LFG Monitoring Plan.

LFG EXTRACTION WELL MONITORING ACTIVITIES

S+G personnel performed the flare station and well field monitoring April 16, 2014. Initial measurements indicated there was approximately 38 to 39 inches of available vacuum at each of the LFG wells across the well field. The results from this event are summarized below. Recommended actions are underlined. Well field data and flare station data are provided in the attached **Table 1**.

LFG Extraction Well Field

- **W-1 through W-10**: S+G performed CH_4, O_2, CO_2, and pressure monitoring. No adjustments were made to the extraction well heads during this monitoring event.

  In general, liquid levels at the LFG extraction wells have slightly increased since 2011. Wells W-1 through W-4 continue to exhibit evidence that a majority of well perforations are partially or completely clogged. Liquid levels in newly installed wells W-9 and W-10 are at or just below the solid pipe, completely blocking all perforations. S+G will continue to evaluate this condition.

- **Orifice Plates:** S+G continues to evaluate orifice plate sizes at wells W-5, W-7, W-9, and W-10 during each site visit. As LFG flow potential at these locations is stable, the correct orifice plate sizes are currently installed.

Flare Station

- **Condensate Tank:** The condensate tank was observed during this site visit; the liquid was at an acceptable level. S+G will continue to monitor the liquid level of the condensate tank.

- **Filter Tank:** The filter tank was emptied during this site visit. S+G will continue to monitor the liquid level of the filter tank.

- **Flare operation**: Flare operation continues to be intermittent due to poor overall gas quality and low flow rate. S+G will continue to adjust the system to optimize gas flow and quality.

LFG MONITORING WELL (PERIMETER) MONITORING PROGRAM

S+G personnel also performed monitoring of the perimeter LFG monitoring network. Monitoring wells P1, P3, P7 and P11 each measured over the 100% LEL or 5% by volume of CH_4, while all other wells, monitored this event, had no detectable concentrations of CH_4. Results of this monitoring event are included in **Attachment 1**. **Attachment 2** provides a

methane concentration graph over time for monitoring wells that have historically had methane present. The current well network will continue to be monitored and data will be reported to NCDENR and the County.

The next routine monitoring event is scheduled for May 2014. If you have any questions, or require additional information, please contact us at your earliest convenience at 919-828-0577 or by e-mail (address below).

Sincerely,
SMITH GARDNER, INC.

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

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

Attachments

CC: Buddy Norris – Avery County
Deb Aja – NCDENR
File

K:\Projects\Avery County (NC)\Avery-13-6 (LFG System Ops)\April 2014\Avery Co MSW LFG Monitoring Rpt_April 2014_.docx

THIS PAGE INTENTIONALLY LEFT BLANK

FIGURE

THIS PAGE INTENTIONALLY LEFT BLANK

LEGEND

- EXISTING LANDFILL GAS PROBE
- (4) OFFSITE STRUCTURE TO BE MONITORED

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.

0 200' 400'

PREPARED BY:

NC LIC. NO. C-0928 [ENGINEERING]

SMITH+GARDNER

14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577

DRAWN:	APPROVED:	SCALE:	FIGURE NO:	PREPARED BY:
K.C.B.	D.M.M.	AS SHOWN	1	

DATE:	PROJECT NO:	FILENAME:
Dec 2013	AVERY 13-6	AVERY-B0216

PREPARED FOR:

LANDFILL GAS MONITRO1NG SYSTEM
AVERY COUNTY CLOSED MSWLF
SPRUCE PINE, NORTH CAROLINA

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE

THIS PAGE INTENTIONALLY LEFT BLANK

SMITH+GARDNER

DATE: April 16, 2014
BY: DMM

TABLE 1
Avery County Closed MSW Landfill
Landfill Gas Collection and Control System Monitoring
April 2014

DataField CS - GEM Mode Data Output

Device ID	Date/Time mm/dd/yyyy	CH4 %	CO2 %	O2 %	Balance %	Adj. Temperature degF	Init. Static Pressure in H2O	Adj. Static Pressure in H2O	Adj. Diff. Pressure in H2O	Init. Flow Scfm	Adj. Flow Scfm	System Pressure in H2O
AVERY-W1	4/16/2014 8:15	64.7	31.1	1.8	2.4	51	-38.7	-38.6	0.007	3	4	-38.83
AVERY-W2	4/16/2014 8:22	56.2	32.4	0.9	10.5	52	-38.7	-38.7	-0.035	<<>>	<<>>	-38.87
AVERY-W3	4/16/2014 8:25	62.6	33.2	4.2	0	51	-38.6	-38.7	-0.033	<<>>	<<>>	-38.74
AVERY-W4	4/16/2014 8:31	20.1	25.1	0.2	54.6	50	-35.3	-35.3	-0.048	<<>>	<<>>	-38.52
AVERY-W5	4/16/2014 8:40	30	28.4	0.1	41.5	50	-37.9	-37.9	1.63	4	2	-38.71
AVERY-W6	4/16/2014 8:46	7.1	15.9	9.1	67.9	51	-10.9	-10.8	0.11	2	4	-38.68
AVERY-W7	4/16/2014 8:49	4.9	13.5	8.7	72.9	51	-3.4	-3.4	3.165	3	3	-38.89
AVERY-W8	4/16/2014 8:52	12.9	26.1	0.9	60.1	50	-14.2	-14.3	0.272	2	2	-38.68
Avery-W9	4/16/2014 8:17	12.8	18.8	6.1	62.3	51	-38.7	-38.5	-0.03	<<>>	<<>>	-38.5
AveryW10	4/16/2014 8:27	60.1	33.4	4	2.5	50	-38.6	-38.7	-0.035	2	<<>>	-38.44
Av-Flare	4/16/2014 8:56	28.8	24.1	2.1	45	N/A	1.4	N/A	N/A	22	N/A	N/A

The differential pressure measurement should be positive. A negative differential pressure indicates no gas flow. Negative differential pressure may be he result of dirt or water obstructing the pitot tube perforations. Overpulling by adjacent extractions wells may also result in negative pressure being displayed.

<<>> = measurement out of range of GEM 2000 meter. The reading was likely too low for measurement by the instrument.

This Page Intentionally Left Blank

ATTACHMENT 1

THIS PAGE INTENTIONALLY LEFT BLANK

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: 4.16.14 NC Landfill Rule (.0500 or .1600): .0500

Name and Position of Sample Collector: DON MISENHEIMER (S+W)

Type and Serial Number of Gas Meter: GEM 2000 #1095 Calibration Date of Gas Meter: 4.15.14

Date and Time of Field Calibration: 4.16.14 9:30.

Type of Field Calibration Gas (15/15 or 35/50): 15/15 Expiration Date of Field Calibration Gas Canister: 2016

Pump Rate of Gas Meter: 0.5 L/min

Ambient Air Temperature: 45° Barometric Pressure: 29.61 General Weather Conditions: Cloudy

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	760s	9:32a	760s	>100	>100	59.4	1.0	28.4	
P2	760s	9:34a	760s	0	0	0	21.2	0	
P3	760s	9:36a	760s	>100	>100	40.2	0.8	30.1	
P4	760s	9:38a	760s	0	0	0	18.7	2.3	
P5	760s	9:48a	760s	0	0	0	19.9	0.9	
P6	760s	9:54a	760s	0	0	0	20.1	1.1	
P7	760s	9:59a	760s	>100	>100	30.1	2.8	10.0	
P8	760s	10:04a	760s	0	0	0	20.0	1.6	
P9	760s	10:15a	760s	0	0	0	21.2	0.0	
P10	760s	10:17a	760s	0	0	0	20.1	0.2	

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.

Don M S+W
SIGNATURE

PROJECT SCIENTIST
TITLE

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: [SEE PAGE 1]

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	10:22a	760s	760s	>100	>100	52 ?	3.8	20.2	
P12	10:02a	760s	760s	0	0	0	19.9	4.1	
P13	10:36a	760s	760s	0	0	0	11.4	4.9	

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.

(S+G)

SIGNATURE

PROJECT SCIENTIST

TITLE

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: (SEE PAGE 1)

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	760s	10:38a	760s	0	0	0	21.3	0	
NW Corner	760s	10:40a	760s	0	0	0	21.2	0	
SE Corner	760s	10:42a	760s	0	0	0	21.2	0	
SW Corner	760s	10:44a	760s	0	0	0	21.2	0	
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

PROJECT SCIENTIST
TITLE

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: [SEE PAGE 1]

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	760s	10:46a	760s	0	0	0	21.3	0	
NW Corner	760s	10:48a	760s	0	0	0	21.2	0	
SE Corner	760s	10:50a	760s	0	0	0	21.2	0	
SW Corner	760s	10:52a	760s	0	0	0	21.2	0	
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.

(S+C)

SIGNATURE

PROJECT SCIENTIST

TITLE

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: [SEE PAGE 1]

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	760s	10:54a	760s	0	0	0	21.2	0	
NW Corner	760s	10:56a	760s	0	0	0	21.2	0	
SE Corner	760s	10:58a	760s	0	0	0	21.2	0	
SW Corner	760s	11:00a	760s	0	0	0	20	0	
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.

(S+W)

SIGNATURE

PROJECT SCIENTIST

TITLE

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: [SEE PAGE 1]

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	760s	11:02a	760s	0	0	0	21.3	0	
NW Corner	760s	11:04a	760s	0	0	0	21.2	0	
SE Corner	760s	11:06a	760s	0	0	0	21.3	0	
SW Corner	760s	11:08a	760s	0	0	0	21.2	0	
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.

(5+6)

SIGNATURE

PROJECT SCIENTIST

TITLE

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: [SEE PAGE 1]

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	760s	11:10a	760s	0	0	0	21.3	0	
NW Corner	760s	11:12a	760s	0	0	0	21.2	0	
SE Corner	760s	11:14a	760s	0	0	0	21.2	0	
SW Corner	760s	11:16a	760s	0	0	0	21.3	0	
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

PROJECT SCIENTIST
TITLE

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: [SEE PAGE 1]

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	>60s	11:18a	>60s	0	0	0	21.2	0	
NW Corner	>60s	11:20a	>60s	0	0	0	21.2	0	
SE Corner	>60s	11:22a	>60s	0	0	0	21.3	0	
SW Corner	>60s	11:24a	>60s	0	0	0	21.3	0	
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.

(S+W)

SIGNATURE

PROJECT SCIENTIST

TITLE

THIS PAGE INTENTIONALLY LEFT BLANK

ATTACHMENT 2

THIS PAGE INTENTIONALLY LEFT BLANK

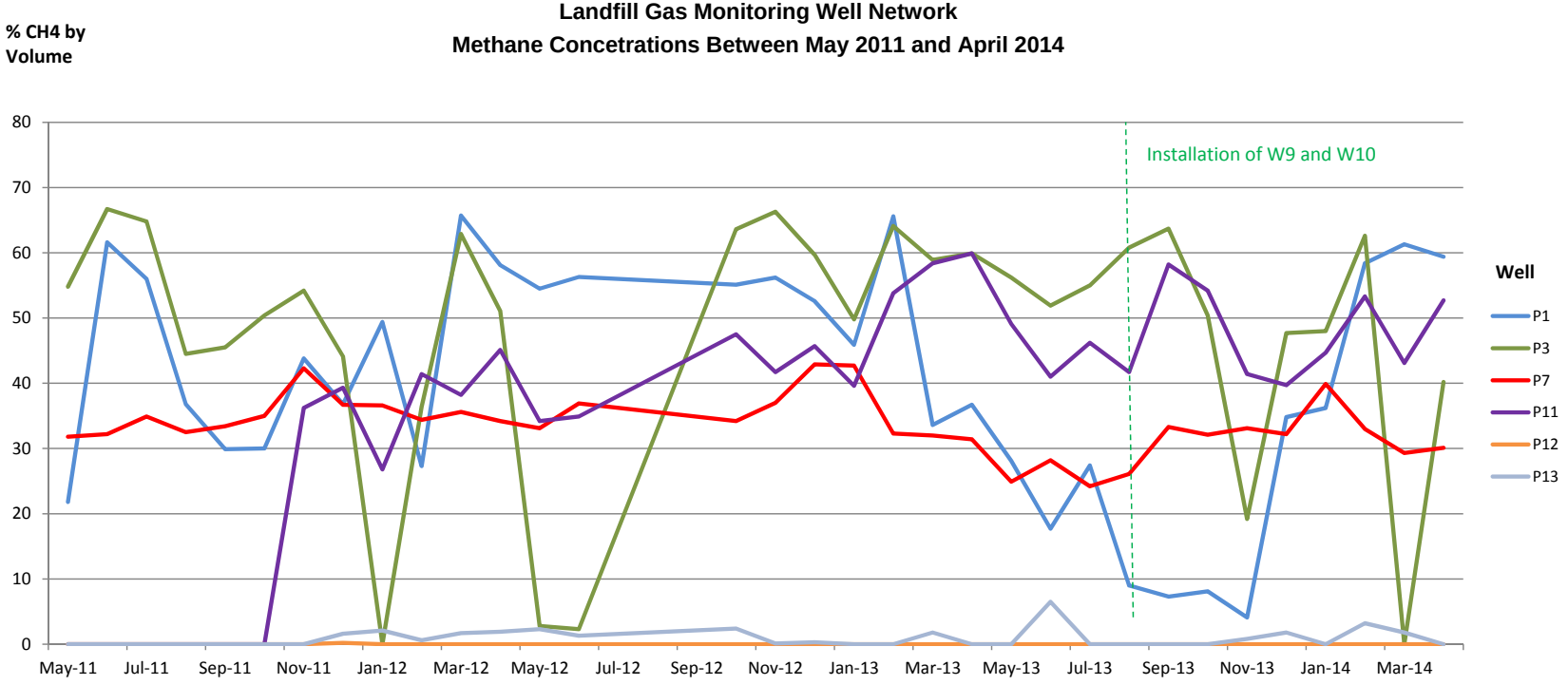
SMITH+GARDNER

DATE: April 29, 2014
BY: DMM

TABLE 1
Avery County Closed MSW Landfill
Landfill Gas Collection and Control System Monitoring
May 2011 - April 2014

DATE	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13
May-11	21.8	0	54.8	0	0	0	31.8	0	NA	NA	NA	NA	NA
Jun-11	61.6	0	66.7	0	0	0	32.2	0	NA	NA	NA	NA	NA
Jul-11	56	0	64.8	0	0	0	34.9	0	NA	NA	NA	NA	NA
Aug-11	36.8	0	44.5	0	0	0	32.5	0	NA	NA	NA	NA	NA
Sep-11	29.9	0	45.5	0	0	0	33.4	0	NA	NA	NA	NA	NA
Oct-11	30	0	50.4	0	0	0	35	0	NA	NA	NA	NA	NA
Nov-11	43.8	0	54.2	0	0	0	42.3	0	0	0	36.2	0	0
Dec-11	36.8	0	44.1	0	0	0	36.7	0	0	0	39.3	0.2	1.6
Jan-12	49.4	0	0	0	0	0	36.6	0	0	0	26.8	0	2.1
Feb-12	27.3	0	36.4	0	0	0	34.4	0	0	0	41.4	0	0.6
Mar-12	65.7	0	62.9	0	0	0	35.6	0	0	0	38.2	0	1.7
Apr-12	58.1	0	51.1	0	0	0	34.2	0	0	0	45.1	0	1.9
May-12	54.5	0	2.8	0	0	0	33.1	0	0	0	34.2	0	2.3
Jun-12	56.3	0	2.3	0	0	0	36.9	0	0	0	34.9	0	1.3
Oct-12	55.1	0	63.6	0	0	0	34.2	0	0	0	47.5	0	2.4
Nov-12	56.2	0	66.3	0	0	0	37	0	0	0	41.7	0	0.1
Dec-12	52.6	0	59.7	0	0	0	42.9	0	0	0	45.7	0	0.3
Jan-13	45.9	0	49.8	0	0	0	42.7	0	0	0	39.6	0	0
Feb-13	65.6	0	64.1	0	0	0	32.3	0	0	0	53.8	0	0
Mar-13	33.6	0	58.9	0	0	0	32	0	0	0	58.4	0	1.8
Apr-13	36.7	0	59.9	0	0	0	31.4	0	0	0	59.9	0	0
May-13	28.1	0	56.2	0	0	0	24.9	0	0	0	49.1	0	0
Jun-13	17.7	0	51.9	0	0	0	28.2	0	0	0	41	0	6.5
Jul-13	27.4	0	55	0	0	0	24.2	0	0	0	46.2	0	0
Aug-13	9	0	60.8	0	0	0	26.1	0	0	0	41.7	0	0
Sep-13	7.3	0	63.7	0	0	0	33.3	0	0	0	58.2	0	0
Oct-13	8.1	0	50.4	0	0	0	32.1	0	0	0	54.2	0	0
Nov-13	4.1	0	19.2	0	0	0	33.1	0	0	0	41.4	0	0.8
Dec-13	34.8	0	47.7	0	0	0	32.2	0	0	0	39.7	0	1.8
Jan-14	36.2	0	48	0	0	0	39.9	0	0	0	44.7	0	0
Feb-14	58.4	0	62.6	0	0	0	33	0	0	0	53.3	0	3.2
Mar-14	61.3	0	0	0	0	0	29.3	0	0	0	43.1	0	1.8
Apr-14	59.4	0	40.2	0	0	0	30.1	0	0	0	52.7	0	0

SMITH+GARDNER

By: DMM
Date: 4/29/2014

Avery County MSW Landfill
Landfill Gas Monitoring Well Network
Methane Concetrations Between May 2011 and April 2014