



March 24, 2015

083-9650614.200

Ms. Jaclynne Drummond  
Compliance Hydrogeologist  
North Carolina Department of Environment and Natural Resources  
Division of Waste Management – Solid Waste Section  
2090 US Highway 70  
Swannanoa, NC 28778  
828-296-4706

**RE: METHANE MONITORING RESULTS – FIRST QUARTERLY EVENT OF 2015  
CLOSED HENDERSON COUNTY LANDFILL, PERMIT NO. 45-01  
HENDERSON COUNTY, NORTH CAROLINA**

Dear Jackie:

Attached are the results from the March 17, 2015, first quarterly methane monitoring event conducted at the above-referenced facility. As shown on the attach Boundary Gas Probe Monitoring Log, there were detections of methane noted above the lower explosive limit (LEL) during this event at compliance monitoring points MP-6, TR-2, and TR-3 as there have been during previous events. Methane was detected below the lower explosive limit (LEL) during this event at compliance monitoring points MP-4 and MP-5. No methane was detected in the facility structures during this compliance monitoring event.

A Landfill Gas Remediation Plan – Phase 2 (Plan) was submitted to the North Carolina Department of Environment and Natural Resources (NC DENR) on January 6, 2015, to address the LEL exceedances and was subsequently approved on January 21, 2015. As specified in the Plan, the remaining gas extraction wells have been converted to allow for passive venting and a turbine vent has been attached to methane monitoring well MP-5. The County will install proposed methane monitoring wells MP-7, MP-8, and MP-9 and decommission TR-1 prior to the second quarterly methane monitoring event.

Please allow this letter report to act as the 7-day notification of methane exceedances as required by the North Carolina Solid Waste Management Regulations. If you have any questions or concerns, please contact us at 336-852-4903.

Sincerely,  
**GOLDER ASSOCIATES NC, INC.**

David "Dusty" Y. Reedy II, P.G.  
Senior Hydrogeologist

Rachel P. Kirkman, P.G.  
Associate and Senior Consultant

Attachment: Boundary Gas Probe Monitoring Log – March 17, 2015  
Methane Monitoring Location Map  
Calibration Record

Cc: Marcus Jones, P.E., Director of Engineering, Henderson County, 1 Historic Courthouse Square, Suite 6, Hendersonville, NC 28792. 828-694-6560. [majones@hendersoncountync.org](mailto:majones@hendersoncountync.org)  
(electronic copy)

Natalie Berry, P.E., Assistant County Engineer, Henderson County, 100 North King Street, Hendersonville, North Carolina 28792. 828-694-6521. [nberry@hendersoncountync.org](mailto:nberry@hendersoncountync.org)

Greg Wiggins, Operations Manager, Henderson County, 191 Transfer Station Drive,  
Hendersonville, North Carolina 28791. 828-694-7982. [gwiggins@hendersoncountync.org](mailto:gwiggins@hendersoncountync.org)

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**BOUNDARY PROBE MONITORING LOG**

Date: 03/17/15

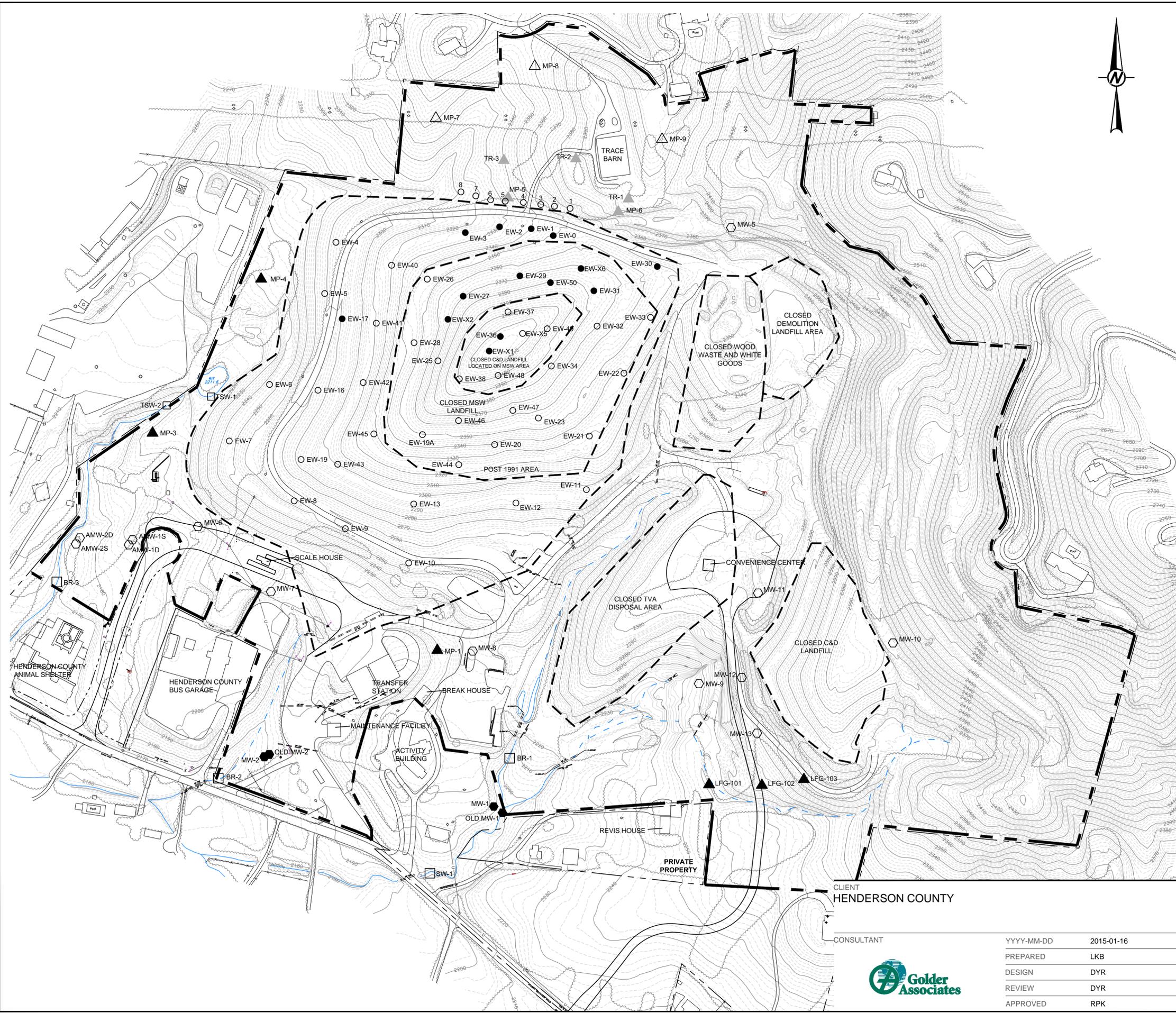
Project Name: Henderson County Landfill  
 Site Contact: Greg Wiggins  
 Starting Temperature: 70.0° F  
 Starting Barometric Pressure: 29.89 in.Hg  
 Monitoring Equipment: GEM 2000 plus

Project Number: 0839650614  
 Technician(s): Anna Stoddard/Dan Childress  
 End Temperature: 73.9° F  
 End Barometric Pressure: 29.87 in Hg

Monitoring Location	Time	Time Pumped (sec)	% Methane (CH <sub>4</sub> )	% Carbon Dioxide (CO <sub>2</sub> )	% Oxygen (O <sub>2</sub> )	% Balance Gas	Initial % LEL	Stabilized % LEL	Hydrogen Sulfide (H <sub>2</sub> S, ppm)	Static Pressure (inches of H <sub>2</sub> O)
MP-1	15:39	60	0.0	1.4	18.0	80.6	0	0	1.0	not applicable
MP-3	15:05	60	0.0	0.6	19.7	79.7	0	0	0.0	not applicable
MP-4	15:09	60	0.3	20.8	0.4	78.5	6	6	1.0	not applicable
MP-5	15:14	60	0.3	0.3	20.2	79.2	6	6	0.0	not applicable
MP-6	15:33	60	6.1	9.1	6.8	78.0	122	122	0.0	not applicable
LFG-101	15:50	60	0.0	0.0	19.3	80.7	0	0	0.0	not applicable
LFG-102	15:46	60	0.0	2.8	14.7	82.5	0	0	0.0	not applicable
LFG-103	15:44	60	0.0	5.1	14.1	80.8	0	0	1.0	not applicable
TR-1	15:31	60	0.0	1.2	18.3	80.5	0	0	2.0	not applicable
TR-2	15:25	60	27.0	25.7	2.1	45.2	540	540	1.0	not applicable
TR-3	15:18	60	27.4	30.3	3.8	38.5	548	548	0.0	not applicable
Activity Building	14:45	200	0.0	0.0	20.6	79.4	0	0	0.0	not applicable
Animal Shelter	14:52	200	0.0	0.0	20.5	79.5	0	0	0.0	not applicable
Break House	14:34	200	0.0	0.0	20.7	79.3	0	0	0.0	not applicable
Bus Garage	14:49	200	0.0	0.0	20.5	79.5	0	0	0.0	not applicable
Convenience Center	14:36	200	0.0	0.0	20.6	79.4	0	0	0.0	not applicable
Maintenance Shop	14:41	200	0.0	0.0	20.6	79.4	0	0	0.0	not applicable
Scalehouse	14:57	200	0.0	0.1	20.3	79.6	0	0	0.0	not applicable
Trace Barn	15:29	200	0.0	0.0	20.1	79.9	0	0	0.0	not applicable

Completed by: *Anna Stoddard*



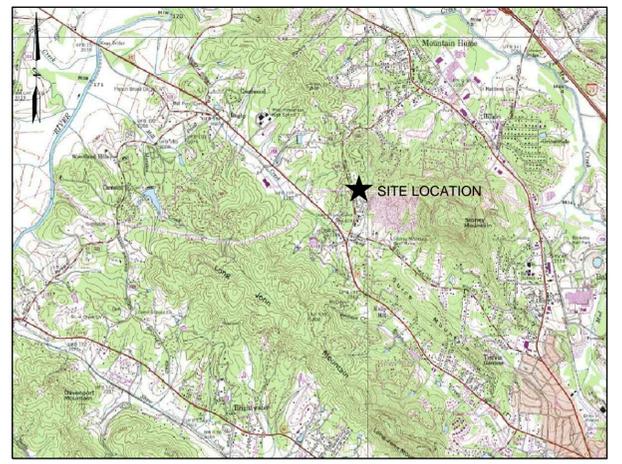


**LEGEND**

	EXISTING 10 FT. CONTOUR
	EXISTING 2 FT. CONTOUR
	PROPERTY LINE
	LIMITS OF WASTE
	STREAM
	BUFFER
	TREELINE
	EXISTING ROAD
	FENCE
	LFG COLLECTION PIPING
	COMPLIANCE MONITORING WELL
	NON COMPLIANCE MONITORING WELLS
	PROPOSED METHANE MONITORING WELLS
	METHANE MONITORING WELLS
	METHANE MONITORING WELLS PROPOSED TO BE REMOVED FROM MONITORING NETWORK
	SURFACE WATER MONITORING POINT
	LFG EXTRACTION WELL PROPOSED TO BE CONVERTED TO PASSIVE VENTING
	LFG EXTRACTION WELL CONVERTED TO PASSIVE VENTING WITH TURBINE

- NOTES**
1. TOPOGRAPHIC CONTOUR INTERVAL = 2 FEET
  2. COORDINATE SYSTEM IS N.C. STATE PLANE GRID.
  3. TOPOGRAPHIC DIVIDING LINE DIVIDES THE BASE MAP TOPOGRAPHIC CONTOURS FROM LANDSAT TOPOGRAPHIC CONTOURS. LANDSAT TOPOGRAPHIC CONTOURS HAVE A 5-CONTOUR INTERVAL.
  4. RECORDS WERE UNABLE TO BE LOCATED FOR LFG EXTRACTION WELLS EW-X1 THROUGH EW-X7 AND WERE GIVEN IDENTIFICATION NAMES UNTIL SUCH TIME THAT RECORDS ARE FOUND.

- REFERENCE**
1. BASE MAP PROVIDED BY CAMP DRESSER & McKEE FROM PREVIOUS WATER QUALITY MONITORING REPORTS.



**SITE LOCATION MAP**  
NOT TO SCALE

<b>PROJECT</b>			
HENDERSON COUNTY CLOSED MSW AND C&D LANDFILL			
PERMIT # 45-01			
<b>TITLE</b>			
LANDFILL GAS EXTRACTION SYSTEM LAYOUT AND			
PROPOSED METHANE MONITORING NETWORK			
PROJECT No.	PHASE	Rev.	DRAWING
0839650614	100	1	1

CLIENT	HENDERSON COUNTY
CONSULTANT	
DATE	2015-01-16
PREPARED BY	LKB
DESIGNED BY	DYR
REVIEWED BY	DYR
APPROVED BY	RPK



Path: \\gremcbo\CAD\Projects\08396506 - Henderson\ENVIRONMENTAL\_A\_LFG Remediation Plan Phase 2\_1 File Name: 0839650614.dwg

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI D



# INSTRUMENT CALIBRATION REPORT

Pine Environmental Services, LLC.

8411 Garvey Drive, Suite 113  
Raleigh, NC 27614  
Toll-free: (866) 646-PINE (7463)

## Pine Environmental Services, Inc.

**Instrument ID** 15452  
**Description** Gem 2000+  
**Calibrated** 3/11/2015 5:32:46PM

<b>Manufacturer</b> CES Landtec	<b>State Certified</b>
<b>Model Number</b> GEM2000+	<b>Status</b> Pass
<b>Serial Number/ Lot Number</b> GM12541/10	<b>Temp °C</b> 22
<b>Location</b> North Carolina	<b>Humidity %</b> 56
<b>Department</b>	

### Calibration Specifications

				<b>Range Acc %</b>	<b>0.0000</b>		
				<b>Reading Acc %</b>	<b>3.0000</b>		
				<b>Plus/Minus</b>	<b>0.00</b>		
<u>Nom In Val / In Val</u>	<u>In Type</u>	<u>Out Val</u>	<u>Out Type</u>	<u>Fnd As</u>	<u>Lft As</u>	<u>Dev%</u>	<u>Pass/Fail</u>
<b>Group # 1</b> <b>Group Name</b> Methane <b>Stated Accy</b> Pct of Reading							
50.00 / 50.00	%Volume	50.00	%Volume	50.00	50.00	0.00%	Pass
<b>Group # 2</b> <b>Group Name</b> Carbon Dioxide <b>Stated Accy</b> Pct of Reading							
35.00 / 35.00	%Volume	35.00	%Volume	35.00	35.00	0.00%	Pass
<b>Group # 3</b> <b>Group Name</b> Oxygen <b>Stated Accy</b> Pct of Reading							
20.90 / 20.90	%Volume	20.90	%Volume	20.90	20.90	0.00%	Pass
<b>Group # 4</b> <b>Group Name</b> Carbon Monoxide <b>Stated Accy</b> Pct of Reading							
50.00 / 50.00	PPM	50.00	PPM	50.00	50.00	0.00%	Pass
<b>Group # 5</b> <b>Group Name</b> Hydrogen Sulfide <b>Stated Accy</b> Pct of Reading							
25.00 / 25.00	PPM	25.00	PPM	25.00	25.00	0.00%	Pass

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Toll-free: (866) 646-PINE (7463)

## **Pine Environmental Services, Inc.**

**Instrument ID** 15452  
**Description** Gem 2000+  
**Calibrated** 3/11/2015 5:32:46PM

<u>Test Instruments Used During the Calibration</u>					<u>(As Of Cal Entry Date)</u>	
<u>Test Standard ID</u>	<u>Description</u>	<u>Manufacturer</u>	<u>Model Number</u>	<u>Serial Number / Lot Number</u>	<u>Last Cal Date / Opened Date</u>	<u>Next Cal Date / Expiration Date</u>
NC 4 GAS 50/50/25/20.9 5-10-15	NC 4 GAS MIX LOT CAO-412.4	Airgas	GP 12089	CAO-412-4		5/22/2015
NC 50/35 CO2 LOT 1027FB12 11/16	NC 50 CH4/35 CO2	American Gas Group	GP 12126			11/30/2016

### Notes about this calibration

**Calibration Result** Calibration Successful  
**Who Calibrated** Brian Duke

All instruments are calibrated by Pine Environmental Services, LLC. according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

**Notify Pine Environmental Services, LLC. of any defect within 24 hours of receipt of equipment  
Please call 866-960-7463 for Technical Assistance**