Methane Migration Monitoring Report

Prepared for

Alamance County Inactive Closed MSWLF
Swepsonville, North Carolina

May 2010

Permit Number: 0101-MSWLF-1979
MESCO Project Number: G10072.0

Completed on May 13, 2010

Municipal Services Garner, NC
Engineering Company, P.A. Boone, NC

Municipal Engineering Services Company, P.A.
Garner, Boone and Morehead City, North Carolina

OPERATION/CONSTRUCTION MANAGERS
Municipal Services
CIVIL/SANITARY ENGINEERS
Engineering Company, P.A.

May 13, 2010

Mr. Greg Thomas
Solid Waste Director
Alamance County Landfill
2701 Austin Quarter Road
Graham, NC 27253
Telephone: (336) 376-8902
Fax: (336) 376-1302

Re: Methane Migration Monitoring Report
Alamance County Inactive Closed MSWLF-Swepsonville
Permit Number: 0101-MSWLF-1979

Dear Mr. Thomas:

A methane migration monitoring network was installed at the Inactive Closed Alamance County MSWLF-Swepsonville (0101-MSWLF-1979) by Municipal Engineering Services Company, P.A. (MESCO) personnel on March 30-31, 2010 and April 19, 2010. The monitoring system consisted of 21 methane probes surrounding the perimeter of the waste and at one on-site structure. MESCO personnel recorded methane levels on March 31, 2010 and again on April 19, 2010. This report contains a description of the monitoring network, monitoring procedures, summary of monitoring results, and findings. A site areal photographic with topographic contours and property boundaries, a schematic of the methane probes, certificates of instrument calibration, and a tabulation of recorded methane levels are also attached.

Methane Monitoring Network

A total of 21 methane probes were installed surrounding the perimeter of the closed landfill to record methane gas levels in the soil. The number and location of probes were based upon several factors such as proximity of off-site dwellings (receptors), subsurface soil stratigraphy, and hydrogeological barriers. A site aerial photograph depicting the monitoring system is attached as Plate 1. The methane probes were constructed by a NC-Certified Well Contractor (NCWC-3301-A) and consisted of 3/4 inch PVC screen and riser pipe. The probes were installed in a borehole with a filter pack around the screen and a bentonite clay seal over the filter to ground surface to prevent water infiltration. The methane probes were equipped with a cap and 1/4" tube and stopcock to facilitate connecting a gas monitoring instrument to accurately measure accumulated landfill gas. A schematic detail of the methane probes are presented in attached Plate 1.

Monitoring Procedures

MESCO personnel performed methane migration monitoring of the monitoring network on March 31, 2010 and again on April 19, 2010. Both monitoring events were performed in accordance with EPA Method 21 *Determination of Volatile Organic Compound Leaks* and per the monitoring procedure outlined in the NCDENR *Methane Monitoring Guidance document*. All methane readings were taken without purging utilizing a toxic vapor flame ionization detector (FID) which was calibrated to the manufacturers specifications with NIST standards. (Calibration certificates are attached.) Methane readings were taken from 21 methane probes (MP-1 through MP-21), an on-site structure (Structure 1), and five groundwater monitoring wells (MW-2, MW-4, MW-6, MW-7A, and MW-8B). Methane readings were taken during the afternoon and during a period of falling barometric pressure which are considered optimum conditions for detection of methane migrating from the landfill.

PO Box 97, Garner, North Carolina 27529 (919) 772-5393
PO Box 828, Morehead City, NC 28557 (252) 726-9481
PO Box 349, Boone, North Carolina 28607 (828) 262-1767

Monitoring Results

Methane readings from the probes and groundwater monitoring wells ranged from below ambient to 370 PPM on March 31, 2010 and between 0-486 PPM on April 19, 2010. No methane concentrations were detected in exceedance of the regulatory 50,000 PPM or 100% of the lower explosive limit limit (LEL) at probes or monitoring wells at the property boundary. Methane was not detected in concentrations above ambient within the lone on-site structure which is also in compliance of the applicable maximum limit of 12,500 PPM or 25% LEL within buildings.

Findings

The methane migration monitoring system as implemented is expected to sufficiently detect methane migration through the soil around the perimeter of the landfill. Methane gas was not found to be migrating at the landfill property boundary or accumulating within the on site structure in concentrations in exceedance of the applicable regulations during either of the two initial independent events. Haw Creek, a perennial stream which is the eastern and southern property boundary, serves as an effective hydrogeological barrier which limits the potential for methane migration from the majority of the closed facility.

Closing

If you have any questions regarding this report or any facet of the monitoring system please contact us by phone at (919) 772-5393 or by email at jpfohl@mesco.com.

Sincerely,
MUNICIPAL ENGINEERING SERVICES CO., P.A.

Jonathan Pfohl
Environmental Specialist

Enclosures

Alamance County Closed MSWLF – Swepsonville
Methane Monitoring Summary
Readings taken 3/31/10 & 4/19/10

Location	March 31, 2010			April 19, 2010		
	Methane Reading (PPM)	% Lower Explosive Limit (% LEL)	Comments	Methane Reading (PPM)	% LEL	Comments
MP-1	238	0.48	**<LEL**	210	0.42	**<LEL**
MP-2	28	0.06	**<LEL**	31	0.06	**<LEL**
MP-3	6	0.01	**<LEL**	7	0.01	**<LEL**
MP-4	0	0.00	**<LEL**	0	0.00	**<LEL**
MP-5	na			0	0.00	**<LEL**
MP-6	46	0.09	**<LEL**	52	0.10	**<LEL**
MP-7	370	0.74	**<LEL**	486	0.97	**<LEL**
MP-8	156	0.31	**<LEL**	210	0.42	**<LEL**
MP-9	8.38	0.02	**<LEL**	12	0.02	**<LEL**
MP-10	31	0.06	**<LEL**	31	0.06	**<LEL**
MP-11	6.96	0.01	**<LEL**	9	0.02	**<LEL**
MP-12	5.7	0.01	**<LEL**	8	0.02	**<LEL**
MP-13	19.1	0.04	**<LEL**	26	0.05	**<LEL**
MP-14	7.31	0.01	**<LEL**	22	0.04	**<LEL**
MP-15	13.26	0.03	**<LEL**	145	0.29	**<LEL**
MP-16	26.83	0.05	**<LEL**	31	0.06	**<LEL**
MP-17	6.63	0.01	**<LEL**	11	0.02	**<LEL**
MP-18	0	0.00	**<LEL**	0	0.00	**<LEL**
MP-19	0	0.00	**<LEL**	0	0.00	**<LEL**
MP-20	31	0.06	**<LEL**	76	0.15	**<LEL**
MP-21	na			0	0.00	**<LEL**
Structure 1	0	0.00	**<25% LEL**	0	0.00	**<25% LEL**
MW-2	207	0.41	**<LEL**	119	0.24	**<LEL**
MW-4	116	0.23	**<LEL**	46	0.09	**<LEL**
MW-6	0	0.00	**<LEL**	0	0.00	**<LEL**
MW-7A	68	0.14	**<LEL**	32	0.06	**<LEL**
MW-8B	0	0.00	**<LEL**	0	0.00	**<LEL**
Background	4.6	0.01	**<LEL**	3	0.01	**<LEL**

Notes:
50,000 parts per million (ppm) = 100% of LEL (maximum volume allowed at the property boundary)
12,500 ppm = 25% of LEL (maximum volume allowed within structures)
3/31/10 Event: Used TVA 1000 FID bench calibrated 3/31/10. Falling barometric pressure (29.99-29.93). Sunny & nice readings taken in afternoon
4/19/10 Event: Used Photovac FID bench calibrated 4/19/10. Falling barometric pressure (30.12-30.01). Sunny & nice readings taken in afternoon
na **n**ot **a**vailable
All Readings < background designated as 0.

Alamance County Inactive Closed MSWLF-Swepsonville
Methane Migration Monitoring Results

Date: 03/31/10
Technician: J. Pfohl (MESCO)
Instrument: TVA 1000 FID bench calibrated by Pine Environmental 3/31/10.
Weather:. Sunny & nice readings taken in afternoon. Falling barometric pressure 29.99-29.93

Location	Methane (PPM)	Location Description	Comments/Notes
MP-1	238	Probe	
MP-2	28	Probe	
MP-3	6	Probe	
MP-4	0	Probe	
MP-5	na	Probe	
MP-6	46	Probe	
MP-7	370	Probe	
MP-8	156	Probe	
MP-9	8.38	Probe	
MP-10	31	Probe	
MP-11	6.96	Probe	
MP-12	5.7	Probe	
MP-13	19.1	Probe	
MP-14	7.31	Probe	
MP-15	13.26	Probe	
MP-16	26.83	Probe	
MP-17	6.63	Probe	
MP-18	0	Probe	
MP-19	0	Probe	
MP-20	31	Probe	
Structure 1	0	Dilapidated Building	Uninhabitable Block building
MW-2	207	Water Monitoring Well	
MW-4	116	Water Monitoring Well	
MW-6	0	Water Monitoring Well	
MW-7A	68	Water Monitoring Well	
MW-8B	0	Water Monitoring Well	
Background	4.6	Ambient Downwind	

12,500 PPM = 25% of LEL which is required within structures
50,000 PPM = 100% of LEL which is required at the property boundary
BOLD = In exceedance of applicable Standard
All Readings < background designated as 0.
na=not available

Alamance County Inactive Closed MSWLF-Swepsonville
Methane Migration Monitoring Results

Date: 04/19/10
Technician: J. Pfohl (MESCO)
Instrument: Photovac microFID bench calibrated 4/19/10 by Pine Environmental
Weather:. Sunny & nice readings taken in afternoon. Falling barometric pressure 30.12-30.01

Location	Methane (PPM)	Location Description	Comments/Notes
MP-1	210	Probe	
MP-2	31	Probe	
MP-3	7	Probe	
MP-4	0	Probe	
MP-5	0	Probe	
MP-6	52	Probe	
MP-7	486	Probe	
MP-8	210	Probe	
MP-9	12	Probe	
MP-10	31	Probe	
MP-11	9	Probe	
MP-12	8	Probe	
MP-13	26	Probe	
MP-14	22	Probe	
MP-15	145	Probe	
MP-16	31	Probe	
MP-17	11	Probe	
MP-18	0	Probe	
MP-19	0	Probe	
MP-20	76	Probe	
MP-21	0	Probe	Installed today between MP-5 & MP-6
Structure 1	0	Dilapidated Building	Uninhabitable Block building
MW-2	119	Water Monitoring Well	
MW-4	46	Water Monitoring Well	
MW-6	0	Water Monitoring Well	
MW-7A	32	Water Monitoring Well	
MW-8B	0	Water Monitoring Well	
Background	3	Ambient Downwind	

12,500 PPM = 25% of LEL which is required within structures
50,000 PPM = 100% of LEL which is required at the property boundary
BOLD = In exceedance of applicable Standard
All Readings < background designated as 0.
na=not available

Equipment Calibration and Repair Tracking System. Welcome: Hunter Poole

Calibration | Maintenance | Repairs | Reports

New Calibration | Equipment Testing | Calibration History | Tested Equipment History

Pine Number : 5965 **Start Date:** 03/28/10 **End Date:** 04/01/10 Go

Date: 3/31/2010 08:04 AM **Calibrated By:** John Paul Keon

Lot Number	Media	Concentration	Result
Lot 10669 (ISO 100ppm) Exp: 9-25-2010	Isobutylene	100 PPM	100 PPM
Lot 7257 (CH4 Methane 100 ppm) Exp: 5-7-2011	Methane	100 PPM	100 PPM

Pine Enviromental Service Inc. All right reserved.Ph (609)371-9663

Equipment Calibration and Repair Tracking System. Welcome: Hunter Poole

Calibration | Maintenance | Repairs | Reports

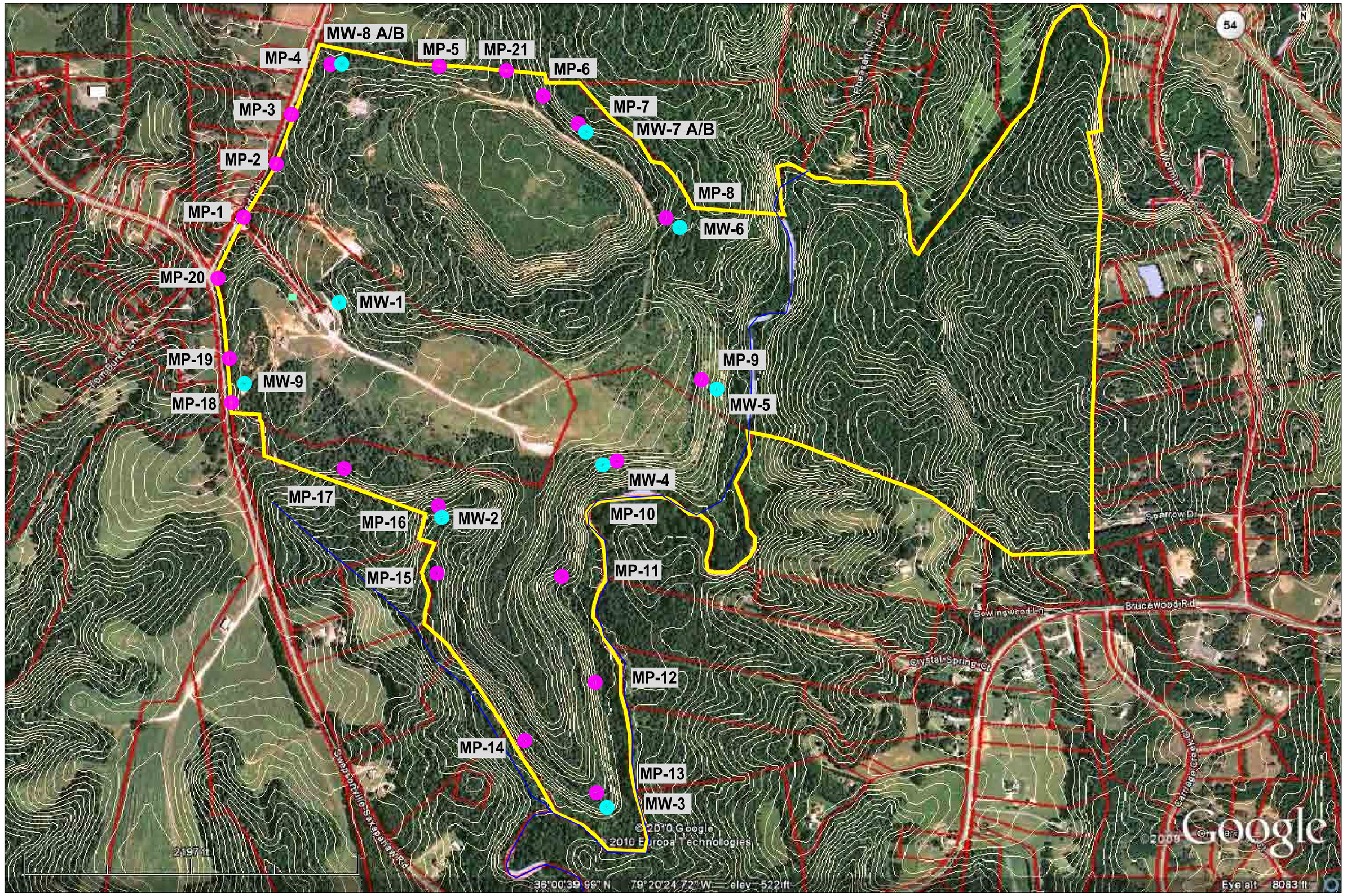
New Calibration | Equipment Testing | Calibration History | Tested Equipment History

Pine Number : 10397 **Start Date:** 04/18/10 **End Date:** 04/19/10 Go

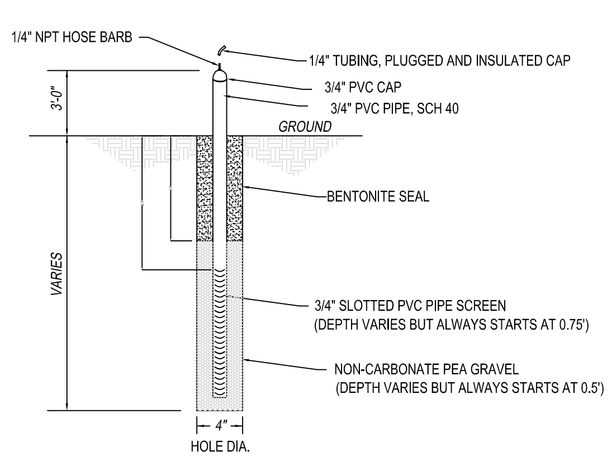
Date:4/19/2010 07:45 AM **Calibrated By:**Hunter Poole

Lot Number	Media	Concentration	Result
Lot 7257 (CH4 Methane) Exp: 5-7-2011	Methane	100 PPM	100 PPM

Pine Enviromental Service Inc. All right reserved.Ph (609)371-9663



NOTE:
CONTOURS TAKE FROM ALAMANCE COUNTY GIS WEB SITE.
AERIAL MAP IS FROM GOOGLE. ALL LOCATIONS ARE APPROXIMATE.



SINGLE METHANE GAS MONITORING PROBE

N.T.S.

LEGEND

	ALAMANCE COUNTY PROPERTY
MP-1	APPROXIAMTE METHANE PROBE LOCATION
MW-1	APPROXIMATE WATER MONITORING WELL LOCATION
	STRUCTURE (DILAPIDATED)
	HAW CREEK (METHANE MIGRATION BARRIER)

GRAPHIC SCALE

800 0 400 800 1600 3200

(IN FEET)
1 inch = 800 ft.

LICENSE NUMBER: C-0281
Municipal Services
P.O. BOX 97 GARNER, N.C. 27529
(919) 772-3393
Engineering Company, P.A.
P.O. BOX 349 BOONE, N.C. 28607
(828) 262-1767
P.O. BOX 828 MOREHEAD CITY, N.C. 28557
(252) 726-9481

CLOSED MUNICIPAL SOLID WASTE LANDFILL FACILITY
ALAMANCE COUNTY
SWEPSONVILLE, NORTH CAROLINA

DATE	BY	REV.	DESCRIPTION

METHANE MONITORING PROBE LOCATIONS

SCALE:	1" = 800'
DATE:	5/6/2010
DRWN. BY:	M. GERMAN
CHKD. BY:	J. PFOHL
PROJECT NUMBER	G10072
DRAWING NO.	PLATE 1
SHEET NO.	1 OF 1