



April 21, 2011

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

**RE: Landfill Gas Investigation
Chatham County Closed MSW Landfill
Pittsboro, North Carolina**

Dear Ms. Werner:

As you are aware, Richardson Smith Gardner and Associates, Inc. (RSG) is working with Chatham County to investigate the extent of landfill gas (LFG) migration at the County's closed MSW landfill. This investigation was undertaken in response to landfill gas concentrations that exceeded the lower explosive limit in five (5) probes (MP-9, MP-13, MP-14, MP-16, and MP-17) on-site. This investigation was completed on February 17 – 18, 2011. In previous correspondence¹, RSG submitted monitoring data collected in the permanent monitoring probes during this event. These data were collected in accordance with the Landfill Gas Monitoring Plan² for the site and NCDENR's Landfill Gas Monitoring Guidance³.

Investigation Area

RSG performed an investigation in the following areas:

- One probe south of MP-17 near the corner of the Animal Shelter;
- One probe south of MP-16 (along the road to the Animal Shelter);
- One probe south of MP-14;
- One probe south of MP-13; and
- One probe to the east of MP-9.

The permanent monitoring network and soil gas survey locations are shown on **Figure 1**.

Investigation Procedures

RSG personnel used a soil gas probe system to perform the preliminary investigation of the extent of LFG migration. This system utilizes 1/2-inch diameter metal rods that are driven into the subsurface either by a slide hammer, or by electric hammer drill. The bottom of the rod probe is fitted with a retractable tip that allows for air to move from the subsurface, through a tube to a monitoring instrument at the surface.

¹ E-Mail to Ms. Elizabeth Werner, NCDENR dated March 2, 2011 from Joan Smyth, P.G. of Richardson Smith Gardner and Assoc.

² Methane Monitoring Plan, Chatham County Landfill, Engineering and Environmental Science, May 2009.

³ Landfill Gas Monitoring Guidance, NCDENR, November 2010.

In all but one instance, approximately nine (9) feet of probe rod were driven into the subsurface prior to measuring methane concentrations. In one instance (the probe located directly south of MP-17), only seven (7) feet of probe rod were advanced due to difficulty in advancing the probe. A GEM 2000 was utilized to measure methane concentrations. No permanent monitoring probes were installed during this investigation. The locations of the soil gas survey probes are shown on **Figure 1**.

Results and Recommendations

All probes advanced as part of this soil gas survey found no detectable concentrations of methane. It should be noted that the permanent landfill gas monitoring probes along the south side of the landfill are located very close to the limits of waste, while probes located north and west of the landfill are placed at a more reasonable monitoring distance from the waste limits while still on Chatham County property. The proximal location of probes MP-9, MP-13, MP-14, MP-16 and MP-17 to the waste limits is likely the reason for the elevated readings detected. The soil vapor probes installed as part of this investigation indicate the landfill gas is not migrating a significant distance in the subsurface and remains on-site, adjacent to the waste.

Due to the large amount of land owned by Chatham County surrounding the landfill, as well as the location of surface water bodies and lack of sensitive receptors in the areas nearby the elevated readings, we recommend a net reduction of wells within the monitoring network. LFG monitoring probe MP-10 sufficiently monitors the area to the east of the landfill due to a surface water feature east of this well near the property line (Harlands Creek). Additionally, monitoring probes MP-16 and MP-17 were located inordinately close to one another and therefore can be replaced by one monitoring well (proposed MP-18). The proposed modifications to the landfill gas monitoring network are shown on **Figure 2**.

Recommendations

Based upon these findings RSG recommends the following:

1. Abandonment of landfill gas monitoring probes MP-9, MP-13, MP-14, MP-16 and MP-17.
2. Installation of two (2) permanent LFG monitoring probes: one located south of MP-16 and one probe located south of a point between MP-13 and MP-14. We believe these proposed locations, with the remaining existing locations will be sufficient to monitor the landfill property and protect sensitive receptors such as buildings, etc. The proposed monitoring network is shown on **Figure 2**.
3. Revision of the Chatham County LFG monitoring plan to include the new probes in the monitoring network and remove reference to the probes proposed for abandonment. Additionally, this plan will require the monitoring of buildings on-site as well as the animal shelter building. This revision will be compliant with NCDENR's landfill gas monitoring guidance (11/2010).

Ms Elizabeth Werner
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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,
Richardson Smith Gardner and Associates, Inc.



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Senior Hydrogeologist
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Attachments

CC: Dan LaMontagne – Chatham County
File

Figures



LEGEND

- EXISTING LANDFILL GAS PROBE (% METHANE) (SEE NOTE 1)
- SOIL GAS PROBE LOCATION (% METHANE) (SEE NOTE 1)
- METHANE CONCENTRATION (% CONCENTRATION)
- GIS PARCEL BOUNDARY



NOTE

1. DATA COLLECTED 2/17 AND 2/18/11.

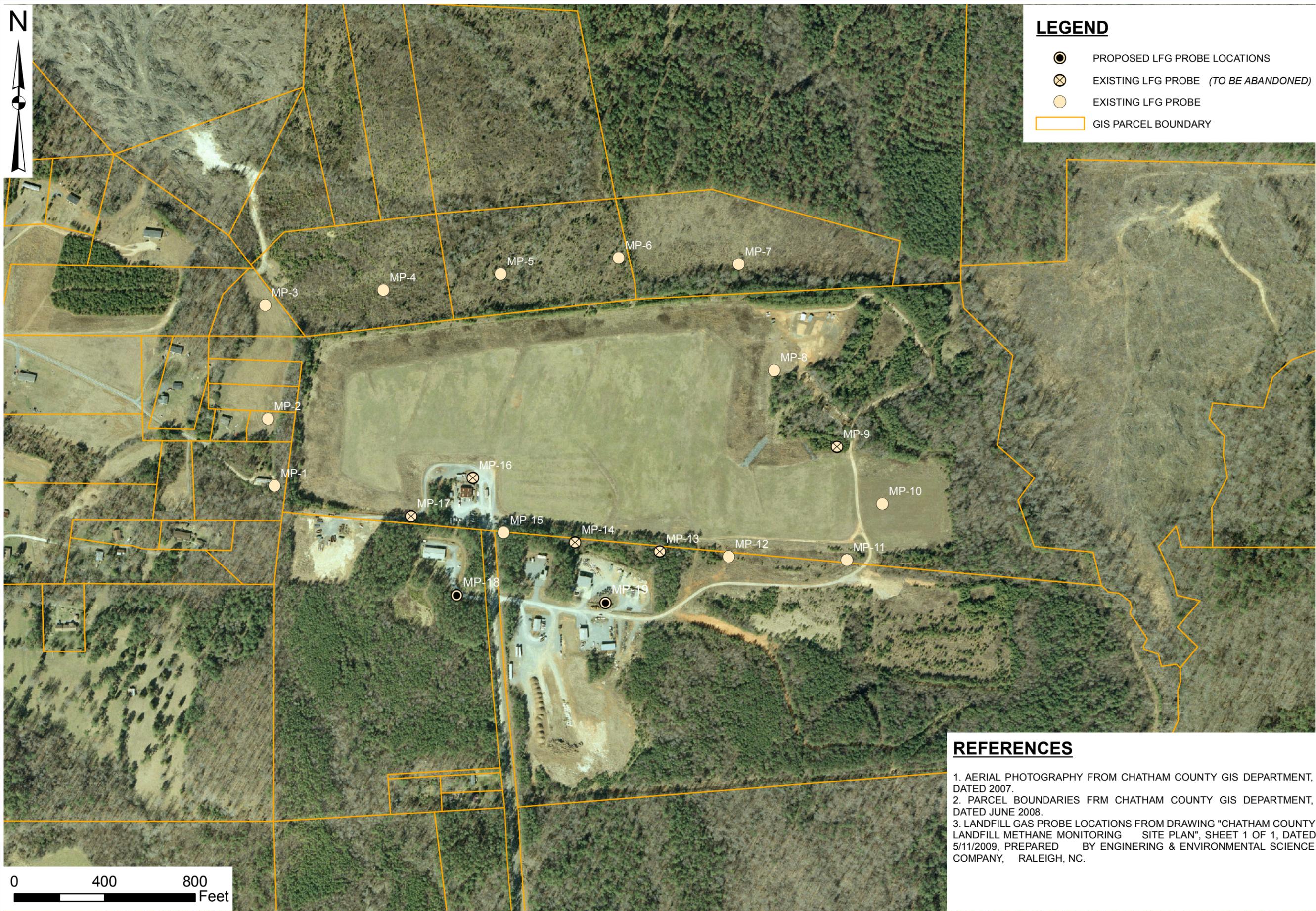
REFERENCES

1. AERIAL PHOTOGRAPHY FROM CHATHAM COUNTY GIS DEPARTMENT, DATED 2007
2. PARCEL BOUNDARIES FRM CHATHAM COUNTY GIS DEPARTMENT, DATED JUNE 2008.
3. LANDFILL GAS PROBE LOCATIONS FROM DRAWING "CHATHAM COUNTY LANDFILL METHANE MONITORING SITE PLAN", SHEET 1 OF 1, DATED 5/11/2009, PREPARED BY ENGINEERING & ENVIRONMENTAL SCIENCE COMPANY, RALEIGH, NC.



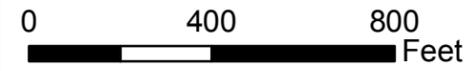
FIGURE NO.	1	FILE NAME	CHATHAM-B0024
SCALE:	AS SHOWN	PROJECT NO.	CHATHAM 10-1
CHECKED BY:	J.A.S.	DATE:	MAR. 2011
DRAWN BY:	C.T.J.		

TITLE: **LFG MONITORING PROBE LOCATIONS**
CLOSED CHATHAM COUNTY
MSW LANDFILL
PITTSBORO, NORTH CAROLINA



LEGEND

- PROPOSED LFG PROBE LOCATIONS
- ⊗ EXISTING LFG PROBE (TO BE ABANDONED)
- EXISTING LFG PROBE
- ▭ GIS PARCEL BOUNDARY



REFERENCES

1. AERIAL PHOTOGRAPHY FROM CHATHAM COUNTY GIS DEPARTMENT, DATED 2007.
2. PARCEL BOUNDARIES FRM CHATHAM COUNTY GIS DEPARTMENT, DATED JUNE 2008.
3. LANDFILL GAS PROBE LOCATIONS FROM DRAWING "CHATHAM COUNTY LANDFILL METHANE MONITORING SITE PLAN", SHEET 1 OF 1, DATED 5/11/2009, PREPARED BY ENGINEERING & ENVIRONMENTAL SCIENCE COMPANY, RALEIGH, NC.



FIGURE NO.	2	FILE NAME	CHATHAM-B0025
SCALE:	AS SHOWN	PROJECT NO.	CHATHAM 10-1
CHECKED BY:	J.A.S.	DATE:	MAR. 2011
DRAWN BY:	C.T.J.		

TITLE:
LFG MONITORING PROPOSED NETWORK
CLOSED CHATHAM COUNTY
MSW LANDFILL
PITTSBORO, NORTH CAROLINA