LIESCH ENVIRONMENTAL SERVICES, INC. 6000 GISHOLT DRIVE, SUITE 203 MADISON, WI 53713 608/223-1532 FAX: 608/223-1534

January 14, 2005

Mr. Hank Kuehling
DNR - South Central Region
3911 Fish Hatchery Road
Fitchburg, WI 53711

RE: **Annual Operation and Maintenance Report**
Refuse Hideaway Landfill – Liesch Project #: 59056.00

Dear Mr. Kuehling:

The purpose of this letter report is to summarize operation and maintenance (O&M) activities performed by Liesch Environmental Services (Liesch) at the Refuse Hideaway Landfill (RHL) from **July 2003 through June 2004**. As monthly O&M reports were previously submitted, this Annual Report provides ranges for operating parameters and highlights changing trends or operating conditions.

SUMMARY

Highlights of O&M activities completed by Liesch during the 2003 – 2004 year included:

- The Blower/Flare System ran approximately 97% of the operating year.
- The Leachate Collection System ran for approximately 95% of the operating year.

BACKGROUND

Liesch began routine monitoring of the landfill on July 1, 2003. Prior to Liesch, SCS Field Services and Environmental Sampling Corporation had been monitoring the landfill since July 1, 1997.

LFG Recovery System

The Refuse Hideaway Landfill LFG Recovery System became operational in 1991. The LFG Recovery System consists of:

- Blower/Flare Station
- Collection System
- Monitoring Locations

The Blower/Flare Station includes one centrifugal LFG blower, an enclosed flare, a candlestick flare (used as a backup combustion unit), and associated controls and appurtenances. The Collection System consists of 13 extractions wells, four drip legs, and associated gas and pneumatic header piping. The Monitoring Locations include 11 wells located throughout the site and ambient air monitoring within nearby Speedway buildings. Proper operation of the Collection System is verified through testing of the extraction wells. LFG withdrawal rates at individual well are adjusted based on test results. Testing for subsurface gas migration is done at the monitoring locations. Operation of the Blower/Flare Station provides vacuum necessary to withdraw the gas from the landfill, which helps control surface emissions and subsurface migration. Odors and emissions are controlled by combustion of the gas at the flare.

Leachate Collection System

The current leachate collection system was installed in 1996 and is comprised of pneumatic pumps installed in eight of the existing LFG extraction wells. A compressor located at the Blower/Flare Station supplies compressed air for the pneumatic pumps. The collected leachate is stored onsite in a 25,000-gallon underground storage tank. Leachate is removed from the tank by a subcontractor and transported to the Madison Metropolitan Sewerage District (MMSD) for treatment and ultimate discharge.

TESTING EQUIPMENT

Gas composition and testing at RHL is performed using a Landfill Monitoring Systems (LMS) 40 Multi-gas analyzer. The LMS 40 measures methane, carbon dioxide, and oxygen as percent by volume.

Pressure testing is measured in inches of water using Dwyer magnehelic gauges. LFG flow and temperature are measured with an Extech Model 407123 Hot Wire Thermo-Anemometer. Combustion temperatures were obtained from flare control panel instrumentation.

Leachate level was measured in one of two ways:

- For the gas extraction wells that have a leachate extraction pump, leachate levels were obtained indirectly using a bubbler tube.
- For the gas extractions wells that do not contain a leachate extraction pump, leachate levels were measured using an electric water level meter.

ON-SITE ACTIVITIES

Site/system activities generally consisted of inspecting, monitoring, maintaining, and/or recording data at or from various valves, meters, or sampling ports.

Weekly activities included the following:

- Blower/Flare Control Panel
- Blower/Flare Station
- Leachate Tank
- Branch Monitoring Stations
- Flare Inlet Pipes
- Blower Inlet Pipe

Monthly activities consisted of the following:

- Extraction Wells
- Off-Site Gas Probes
- Well Pumps/Controls
- Branch Monitoring Stations
- Flare Inlet Pipes (includes bimonthly Gas Flow Measurements)
- Buried Control Valve
- Replace Compressor Oil
- Check Pneumatic System for Leaks
- Inspect/Tighten Drive Belts
- Surface Inspection
- Monthly Report (including summary tables of system operation)

Quarterly activities consisted of the following:

- CV1, CV2, Branch Valves
- Well Valves, Compressor Valves, Manual Valve (back-up flare)
- Manual Valve (ground flare)
- Inspect Compressed Air Filter
- Inspect Air Dryer Desiccant
- Blower

Annual activities consisted of the following:

- Well pumps
- Leachate Lines, Driplegs
- Cleanouts
- Tank Loadout Station
- Padlocks

System statistics for the operating year are summarized in **Table 1**:

- The average methane level at the blower was 35.6%.
- The average oxygen level at the blower was 2.1%
- 232,000 gallons of leachate were removed from the landfill using the Leachate Collection System.
    - Laboratory analysis of leachate samples indicated that all analyzed metal compounds were below permitted discharge levels (see **Table 3**).
    - Laboratory reports were submitted to Madison Metropolitan Sewerage District per permit requirements.

Note that a disconnected hose at MW-7 during May 2004 caused methane levels to be lower and oxygen levels to be higher than normal ranges.

Note that the increase in leachate collection levels in June 2004 was likely the result of the collection system being down for repairs for periods of time in April and May.

The following items were noted throughout the year and may require further attention:

1) Several of the leachate pump (compressed air) meters at individual well locations are not operating correctly. **Table 2** notes which meters are problematic.
    a. NOTE: condition does not significantly impact landfill operations.

2) Several of the air control valves at the individual well heads are inoperable and do not provide any control over air flows. **Table 2** notes which control valves are problematic.
    a. NOTE: condition makes it difficult to fine tune extraction rates and optimize methane capture and removal.

3) The hour meter on the leachate system air compressor works sporadically.
    a. NOTE: condition does not significantly impact landfill operations.

4) Both CV1 and CV2 are cracked/broken and inoperable.
    a. NOTE: condition makes it difficult to fine tune extraction rates and optimize methane capture and removal.

5) Two of the three main gas extraction header valves don't appear to have any influence on the system. It appears the valves are wide open and moving the valve controls 90 degrees has no

effect on vacuums or flows. Fortunately, flows and vacuums can be controlled to some extent at each well header.

a. NOTE: condition makes it difficult to fine tune extraction rates and optimize methane capture and removal.

6) Methane was detected periodically in the G-1, G-2, and G-11 well nests.
   a. NOTE: condition does not significantly impact landfill operations.

7) A visual inspection of the landfill cover was performed as part of monthly activities. This inspection revealed cow tracks on a few occasions along the southern face of the landfill.
   a. NOTE: condition does not significantly impact landfill operations.

The following items were also noted throughout the operating year:

1) Inconsistent flows and/or gas concentrations can fool the flame signal eye resulting in false flame failure alarms. Liesch experienced this 2-3 times a day since turning on the auto-dialer. While the auto-dialer sends an alarm, the flare is running. Liesch no longer has the auto-dialer call on flame failure alarms. The auto-dialer now calls twice per day to report its condition.

2) The faulty propane pressure gauge was replaced and the gas regulator was found to work just fine.

3) ESC had been incorrectly monitoring two gas probes over the past six years. We found the gas probes they were supposed to be monitoring and will continue to sample both sets of wells (correct and incorrect) until otherwise notified.

4) The flare re-start sequence is complicated by a continuously alarming high pilot gas pressure transducer and an inconsistent sparking mechanism. To restart the flare system we have to jump/bypass the transducer to allow the start-up sequence to proceed. The sparking mechanism appears to be working at this time.

5) The air compressor is slightly undersized for the environment and workload. However, a technician from Energetics said that monthly oil changes should allow the compressor to operate as needed for the foreseeable future.

CONCLUSIONS / RECOMMENDATIONS

The Refuse Hideaway Landfill was successfully maintained within normal system/site ranges for the July 2003 – June 2004 operating year. Given the problematic nature of several branch and extraction well valves, Liesch recommends inspecting, repairing, and/or replacing defective valves.

Feel free to call me at (608) 223-1532 if you have any questions.

Sincerely,

LIESCH ENVIRONMENTAL SERVICES, INC.

Brandon Nikolish
Staff Engineer

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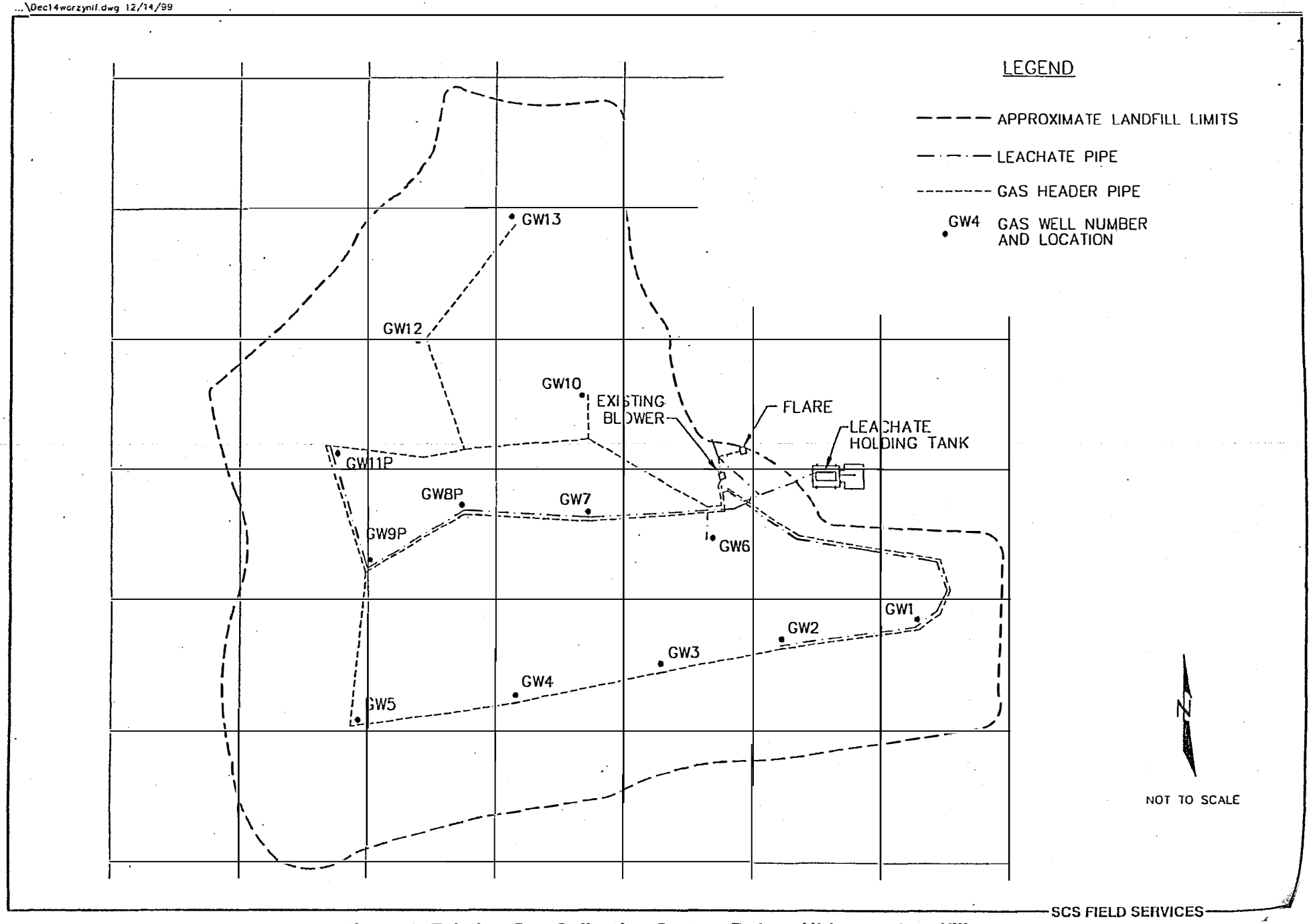

Figure 1. Existing Gas Collection System Refuse Hideaway Landfill

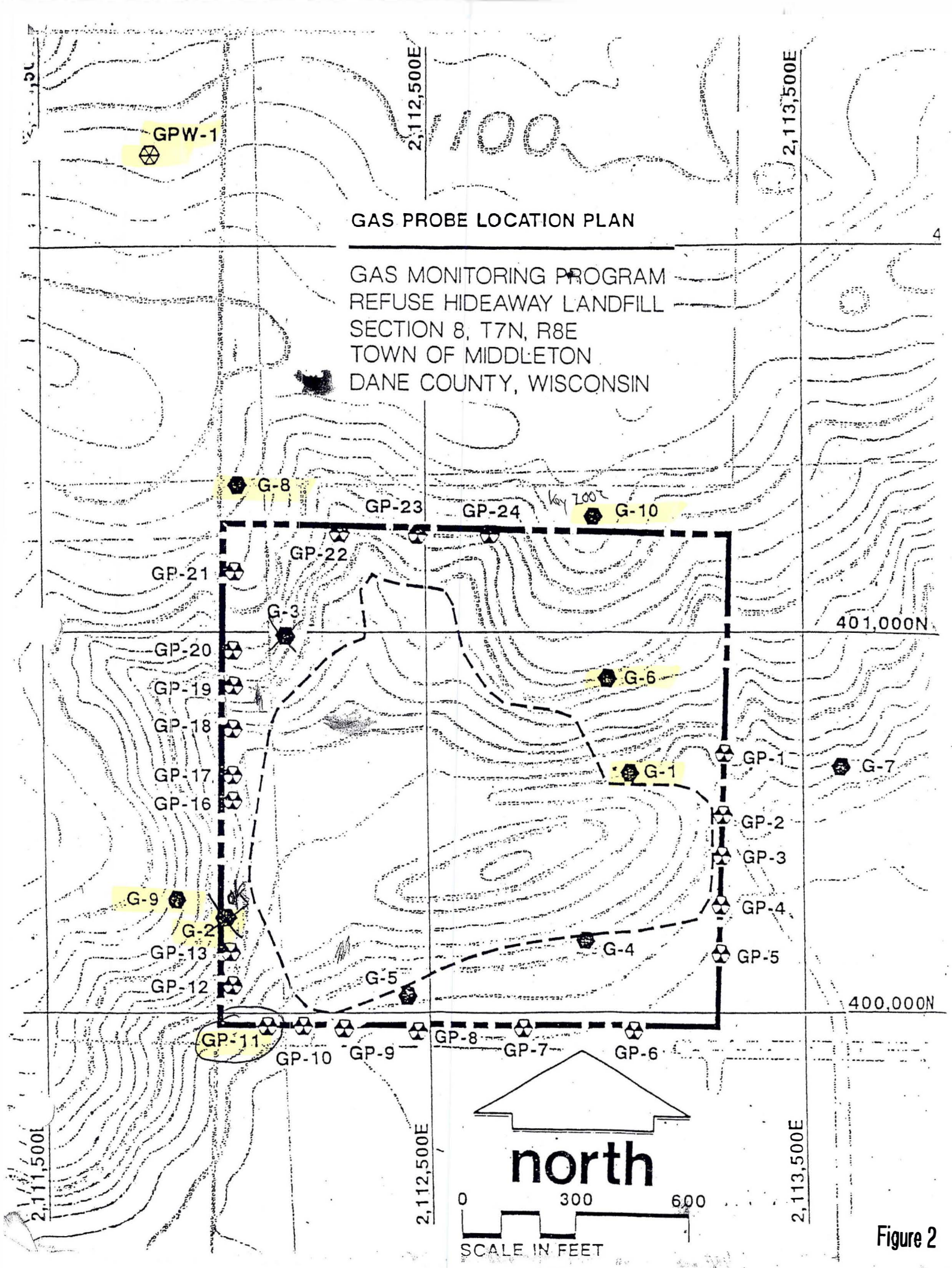
GAS PROBE LOCATION PLAN
GAS MONITORING PROGRAM
REFUSE HIDEAWAY LANDFILL
SECTION 8, T7N, R8E
TOWN OF MIDDLETON
DANE COUNTY, WISCONSIN
GPW-1
G-8
GP-23
GP-24
G-10
GP-22
GP-21
G-3
GP-20
GP-19
GP-18
GP-17
GP-16
G-6
G-1
GP-1
G-7
GP-2
GP-3
GP-4
GP-5
G-9
G-2
GP-13
GP-12
G-4
G-5
GP-11
GP-10
GP-9
GP-8
GP-7
GP-6
401,000N
400,000N
2,111,500E
2,112,500E
2,113,500E
north
0
300
600
SCALE IN FEET

Figure 2

TABLE 1
REFUSE HIDEAWAY LANDFILL

OPERATING PARAMETERS SUMMARY
July 2003 - June 2004

	July 03	Aug 03	Sept 03	Oct 03	Nov 03	Dec 03	Jan 04	Feb 04	Mar 04	Apr 04	May 04	June 04	Ave.	Min.	Max.
% Methane at Blower	40.6	40.8	36.2	34.1	39.4	37.4	33.2	34.4	35	33.9	24.6	37.6	35.6	24.6	40.8
% Oxygen at Blower	1.7	1.8	2.7	1.4	1	1.7	2.4	2.1	1.3	1	7.6	1	2.1	1	7.6
Leachate Collected (gallons)	9660	9354	9739	9778	19804	28913	19395	19717	13947	28716	9665	53520	14890.7	9354	53520
												TOTAL	232208		

		Ave.	Min.	Max.
% Methane	GW1	18.6	12.4	44.5
Levels at Extraction	GW2	37.3	28.5	51
Wells	GW3	48.2	34	57
	GW4 (1)	39.7	24	58
	GW5 (1)	54.4	34	68
	GW6	34.6	23.5	52
	GW7 (1)	43.6	36	49.5
	GW8 (1)	53.9	47.5	61
	GW9 (1)	61.6	53	66
	GW10	28.3	18	44.5
	GW11 (1	56.4	36	70
	GW12 (1	42.0	32	50.5
	GW13 (1	41.2	26	50

		Ave.	Min.	Max.
Flow (cfm)	GW1	26.9	1.8	41.0
Levels at Extraction	GW2	21.5	2.8	49.5
Wells	GW3	23.3	8.3	45.0
	GW4 (1)	13.8	6.0	19.4
	GW5 (1)	33.7	17.3	55.4
	GW6	10.7	4.2	16.9
	GW7 (1)	58.8	20.3	107.1
	GW8 (1)	43.0	7.5	69.8
	GW9 (1)	61.3	30.0	76.5
	GW10	12.3	3.8	19.1
	GW11 (1)	60.0	21.0	83.3
	GW12 (1)	19.8	4.9	31.5
	GW13 (1)	39.1	0.0	69.8

	Ave.	Min.	Max.
LFG Blower (%)	97.1	80	100
LFG Hours per month	709.9	out of ~ 720 hours	
Leachate Compressor (%)	94.6	60	100

TABLE 2
REFUSE HIDEAWAY LANDFILL

PROBLEMATIC SYSTEM COMPONENTS
July 2003 - June 2004

	Problematic air flow control valve	Problematic air flow counter
GW1		
GW2		
GW3		
GW4 (1)		Yes
GW5 (1)		Yes
GW6		
GW7 (1)	Yes	
GW8 (1)	Yes	Yes
GW9 (1)	Yes	Yes
GW10	Yes	Yes
GW11 (1)	Yes	Yes
GW12 (1)		Yes
GW13 (1)	Yes	Yes
South Branch	Yes	
Central Branch	Yes	
North Branch	Yes	
Compressor Meter		Yes
CV1 and CV2	Yes	

Table 3
Leachate Tank Laboratory Analytical Results
Refuse Hideaway Landfill
Middleton, Wisconsin

	PARAMETER										
DATE	Cadmium (ug/L)	Total Chromium (ug/L)	Hexavalent Chromium (ug/L)	Copper (ug/L)	Lead (ug/L)	Mercury (ug/L)	Nickel (ug/L)	Selenium (ug/L)	Silver (ug/L)	Zinc (ug/L)	Cyanide (ug/L)
Permitted Levels	250	10000	500	1500	5000	20	2000	300	3000	8000	100
9/30/2003	<0.88	54		8	<2.2	<0.030	150	<8.0	<1.8	54	
10/9/2003			<260000								5.8
2/23/2004	<0.53	30	<270	24	<1.3	<0.030	93	<4.8	6.5	40	16

Notes

Results in **bold** indicate levels above permit limitations.
Blank cell indicates parameter not analyzed.
mg/l = parts per million
ug/l = parts per billion
J = Analyte detected between limit of detection and limit of quantitation.