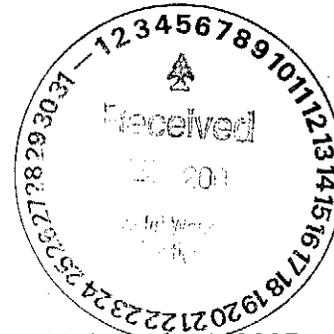


SCS ENGINEERS

January 30, 2007

File No. 02199312.01

Mr. Johnny Beal
Solid Waste Specialist
Wake County
PO Box 550
Raleigh, NC 27602



Subject: Landfill Gas Monitoring Probe Installation – January 10 through 11, 2007
North Wake County Landfill – Raleigh, North Carolina

Dear Johnny:

SCS Engineers, PC (SCS) is pleased to present the attached record documentation for the landfill gas (LFG) monitoring probes installed at the North Wake County Landfill (Solid Waste Permit No. 92-09). On January 10 through 11, 2007, Bedford Well Drilling installed nine LFG monitoring probes along portions of the east and west boundaries of the Unlined Closed Cell at the subject site. The LFG monitoring probes were installed in accordance with the Proposed Landfill Gas Monitoring Network Report, revised 4/11/06, and NCDENR's correspondence to Wake County, dated 10/25/06. Additional information regarding the basis for the probe locations and depth was included in SCS' memorandum, dated 1/4/07, which is attached for reference. The probes will be used to monitor subsurface LFG quality and pressure at the Facility Permit Boundary adjacent to the Unlined Closed Cell.

The new probe identified as M-6R serves as a replacement for probe M-6, which was destroyed by Mallinckrodt personnel during a brush clearing operation in August 2006. The new probe M-6R was relocated to the west to be within the chain-link fence as compared to the location of the former probe M-6. These 9 LFG monitoring probes are being incorporated into the LFG monitoring network and effectively replace the 104 temporary LFG monitoring probes, which were abandoned on January 10 through 12, 2007 in accordance with NCDENR guidelines. SCS' correspondence dated 1/25/07 documenting the temporary LFG monitoring probe abandonment was previously forwarded to the County and NCDENR.

The as-built locations for LFG monitoring probes M-19 through M-26 and M-6R were surveyed by TWT on 1/24/07, and the table developed by TWT presenting the coordinates and elevations for these probes is attached. Also, the well construction diagrams for the 9 new LFG monitoring probes are attached. A drawing of the surveyed as-built locations for the LFG monitoring probes based on the TWT survey data is also included.



SCS ENGINEERS

January 4, 2007
File No. 02199312.01

MEMORANDUM

TO: Johnny Beal, Wake County
Dan LaMontagne, Wake County

FROM: Bob Dick, SCS Engineers
Brandon King, SCS Engineers

SUBJECT: Installation of LFG Monitoring Probes and Decommissioning Temporary Geoprobes at the North Wake County Landfill – Raleigh, North Carolina

A network of permanent LFG monitoring probes around the Closed Landfill is required by 15 NCAC 13B .1626(4)(b) to monitor LFG migration. The number and location of these probes is dependent on several factors including local geology, depth of waste, and the size of the landfill. The Proposed Landfill Gas Monitoring Network Report dated April 11, 2006 documents the installation of 7 additional LFG monitoring probes per Figure 3 to be installed around the perimeter of the Closed Unlined Cell at the North Wake Landfill. After NCDENR approved the Plan, SCS evaluated the probe spacing in the northwest quadrant and is recommending the County install one additional monitoring well (for a total of 8) to provide better coverage where the waste footprint is nearest to the property line. In addition to these 8 new additional LFG monitoring probes, a replacement probe (M-6R) should be installed along the eastern property boundary. Mallinckrodt personnel destroyed LFG probe M-6 during a brush clearing operation in August 2006.

In accordance to the Gas Remediation Plan for the Closed North Wake Landfill dated November 2001 by Camp Dresser & McKee Inc., methane migrated through a severely weathered granite layer that is overlain by a reddish-brown clayey silt layer above the granite, which prevented the gas from migrating upward. The porous nature of the weathered granite allows a concise pathway for subsurface LFG migration. Based on the average depth to groundwater of about 30 feet along the western boundary and about 20 feet along the eastern boundary, we propose to install each of the 9 new wells to a depth of 40 feet maximum (or 3 feet below where groundwater is encountered).

We have attached a typical detail for the permanent LFG monitoring probes. The proposed LFG probe locations will be staked prior to drilling.

Please contact SCS if you have questions or require additional information.

Attach.



SCS ENGINEERS

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NORTH WAKE COUNTY LANDFILL RALEIGH, NC

Project No. 02199312.01

LFG MONITORING WELL

M-19

Page 1 of 1

Depth in Feet	BORING LOG		SAMPLES	RECOVERED	PID	GROUNDWATER	USCS	DESCRIPTION	REMARKS
+1									
0									
-1		Concrete, Steel Cover							
2		Bentonite							
3								Mostly brown sandy clay (0-17 feet). No bedrock encountered.	
4									
5									
6									
7									
8									
9									
10									
11		Washed Aggregate							
12									
13		Perf. PVC (13 ft. total)							
14									
15									
16									
17									
18									Depth to Water = 16 feet
19									Terminated at 17 feet
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									

Drilling Company: Bedford Well Drilling
 Drilling Method: Air Rotary Auger
 Logged By: B. King

Date Started: 1/11/2007
 Date Ended: 1/11/2007
 Boring Diameter: 8-inch
 Well Diameter: 1.0-inch
 Casing Material: SCH 40 PVC

Time Started: NA
 Time Ended: NA
 Elevation: 237.4
 Total Depth: 17.0 feet

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NORTH WAKE COUNTY LANDFILL RALEIGH, NC

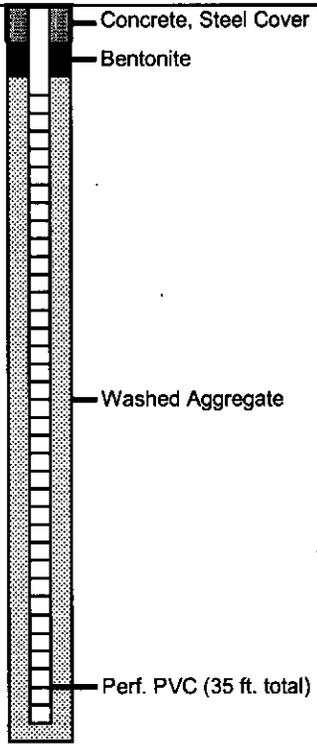
Project No. 02199312.01

LFG MONITORING WELL

M-20

Page 1 of 1

Depth in Feet	BORING LOG					DESCRIPTION	REMARKS
	SAMPLES	RECOVERED	PID	GROUNDWATER	USCS		
+2							
0							
-2							
4							
6						Brown sandy clay (0-9') to grey hard granite (9-15') to weathered granite (15-41.5').	
8							
10							
12							
14							
16							
18							
20							
22							
24							
26							
28							
30							
32							
34							
36							
38							
40							
42							
44							
46							
48							
50							
52							
54							
56							
58							
60							
62							
64							
66							
68							
70							



Depth to Water = Not Encountered
 Terminated at 41.5', well at 40 feet

Drilling Company: Bedford Well Drilling
 Drilling Method: Air Rotary Auger
 Logged By: B. King

Date Started: 1/10/2007
 Date Ended: 1/10/2007
 Boring Diameter: 8-inch
 Well Diameter: 1.0-inch
 Casing Material: SCH 40 PVC

Time Started: NA
 Time Ended: NA
 Elevation: 262.3
 Total Depth: 41.5 feet

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NORTH WAKE COUNTY LANDFILL RALEIGH, NC

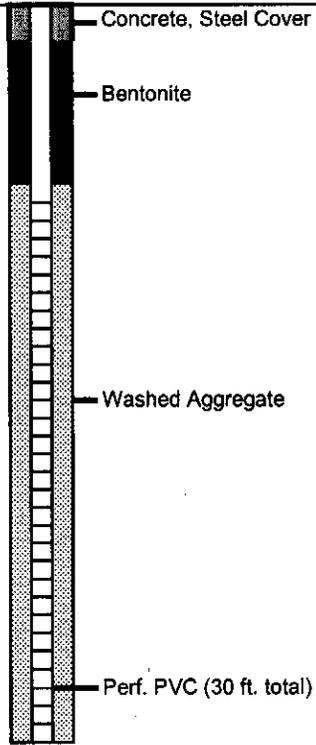
Project No. 02199312.01

LFG MONITORING WELL

M-21

Page 1 of 1

Depth in Feet	BORING LOG					DESCRIPTION	REMARKS
	SAMPLES	RECOVERED	PID	GROUNDWATER	USCS		
+2							
0							
-2							
4							
6							
8							
10							
12							
14							
16							
18							
20							
22							
24							
26							
28							
30							
32							
34							
36							
38							
40							
42							
44							
46							
48							
50							
52							
54							
56							
58							
60							
62							
64							
66							
68							
70							



Mostly brown and red sandy clay (0-41 feet). No bedrock encountered.

Depth to Water = Not Encountered
 Terminated at 41.5', well at 41 feet

Drilling Company: Bedford Well Drilling
 Drilling Method: Air Rotary Auger
 Logged By: B. King

Date Started: 1/10/2007
 Date Ended: 1/10/2007
 Boring Diameter: 8-inch
 Well Diameter: 1.0-inch
 Casing Material: SCH 40 PVC

Time Started: NA
 Time Ended: NA
 Elevation: 264.9
 Total Depth: 41.5 feet

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NORTH WAKE COUNTY LANDFILL RALEIGH, NC

Project No. 02199312.01

LFG MONITORING WELL

M-22

Page 1 of 1

Depth in Feet	BORING LOG					DESCRIPTION	REMARKS
	SAMPLES	RECOVERED	PID	GROUNDWATER	USCS		
+2							
0							
-2							
4							
6						Mostly brown and red sandy clay (0-40 feet). No bedrock encountered.	
8							
10							
12							
14							
16							
18							
20							
22							
24							
26							
28							
30							
32							
34							
36							
38							
40							Depth to Water = 41.5 feet
42							Terminated at 43 feet
44							
46							
48							
50							
52							
54							
56							
58							
60							
62							
64							
66							
68							
70							

Drilling Company: Bedford Well Drilling

Drilling Method: Air Rotary Auger

Logged By: B. King

Date Started: 1/10/2007

Date Ended: 1/10/2007

Boring Diameter: 8-inch

Well Diameter: 1.0-inch

Casing Material: SCH 40 PVC

Time Started: NA

Time Ended: NA

Elevation: 269.7

Total Depth: 43.0 feet

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NORTH WAKE COUNTY LANDFILL RALEIGH, NC

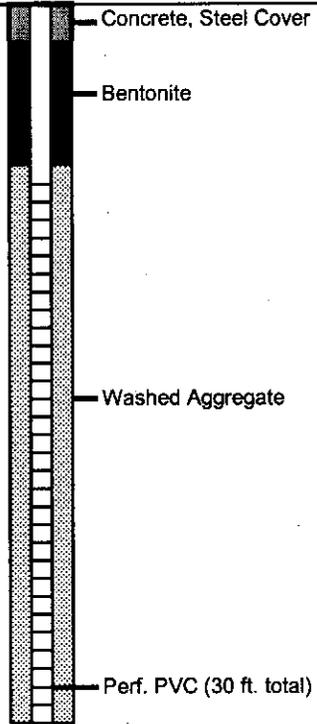
Project No. 02199312.01

LFG MONITORING WELL

M-23

Page 1 of 1

Depth in Feet	BORING LOG					DESCRIPTION	REMARKS
	SAMPLES	RECOVERED	PID	GROUNDWATER	USCS		
+2							
0							
-2							
4							
6							
8							
10							
12							
14							
16							
18							
20							
22							
24							
26							
28							
30							
32							
34							
36							
38							
40							
42							
44							
46							
48							
50							
52							
54							
56							
58							
60							
62							
64							
66							
68							
70							



Mostly brown and red sandy clay (0-40 feet). No bedrock encountered.

Depth to Water = Not Encountered
 Terminated at 40 feet

Drilling Company: Bedford Well Drilling
 Drilling Method: Air Rotary Auger
 Logged By: B. King

Date Started: 1/11/2007
 Date Ended: 1/11/2007
 Boring Diameter: 8-inch
 Well Diameter: 1.0-inch
 Casing Material: SCH 40 PVC

Time Started: NA
 Time Ended: NA
 Elevation: 268.6
 Total Depth: 40.0 feet

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NORTH WAKE COUNTY LANDFILL RALEIGH, NC

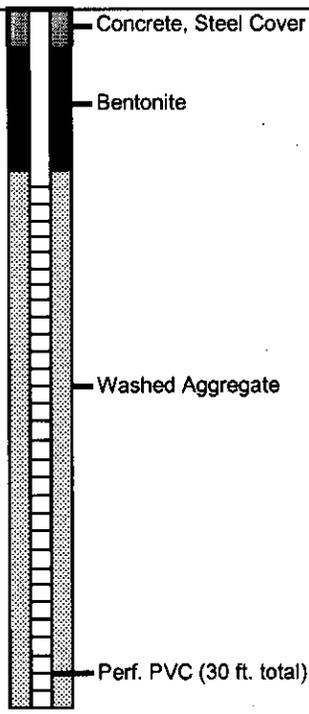
Project No. 02199312.01

LFG MONITORING WELL

M-24

Page 1 of 1

Depth in Feet	BORING LOG					DESCRIPTION	REMARKS
	SAMPLES	RECOVERED	PID	GROUNDWATER	USCS		
+2							
0							
-2							
4							
6							
8							
10							
12							
14							
16							
18							
20							
22							
24							
26							
28							
30							
32							
34							
36							
38							
40							
42							
44							
46							
48							
50							
52							
54							
56							
58							
60							
62							
64							
66							
68							
70							



Mostly red clay (0-25 feet).
 Grey granite (25-40 feet)

Depth to Water = Not Encountered
 Terminated at 40 feet

Drilling Company: Bedford Well Drilling
 Drilling Method: Air Rotary Auger
 Logged By: B. King

Date Started: 1/11/2007
 Date Ended: 1/11/2007
 Boring Diameter: 8-inch
 Well Diameter: 1.0-inch
 Casing Material: SCH 40 PVC

Time Started: NA
 Time Ended: NA
 Elevation: 272.0
 Total Depth: 40.0 feet

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NORTH WAKE COUNTY LANDFILL RALEIGH, NC

LFG MONITORING WELL

M-25

Page 1 of 1

Project No. 02199312.01

Depth in Feet	BORING LOG					DESCRIPTION	REMARKS
	SAMPLES	RECOVERED	PID	GROUNDWATER	USCS		
+1							
0							
-1							
2							
3						Mostly brown sandy clay (0-20 feet). No bedrock encountered.	
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							Depth to Water = 18 feet
19							
20							Terminated at 20 feet
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							

Drilling Company: Bedford Well Drilling
 Drilling Method: Air Rotary Auger
 Logged By: B. King

Date Started: 1/11/2007
 Date Ended: 1/11/2007
 Boring Diameter: 8-Inch
 Well Diameter: 1.0-inch
 Casing Material: SCH 40 PVC

Time Started: NA
 Time Ended: NA
 Elevation: 230.0
 Total Depth: 20.0 feet

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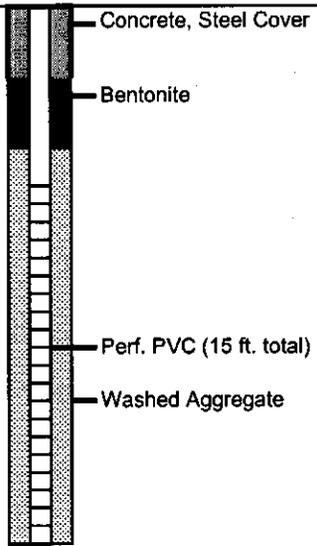
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LFG MONITORING WELL

M-26

Page 1 of 1

Depth in Feet	BORING LOG					DESCRIPTION	REMARKS
	SAMPLES	RECOVERED	PID	GROUNDWATER	USCS		
+1							
0							
-1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							Depth to Water = 13 feet
14							
15							Terminated at 15 feet
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							



Mostly brown sandy clay (0-15 feet). No bedrock encountered.

Depth to Water = 13 feet
 Terminated at 15 feet

Drilling Company: Bedford Well Drilling
 Drilling Method: Air Rotary Auger
 Logged By: B. King

Date Started: 1/11/2007
 Date Ended: 1/11/2007
 Boring Diameter: 8-inch
 Well Diameter: 1.0-inch
 Casing Material: SCH 40 PVC

Time Started: NA
 Time Ended: NA
 Elevation: 227.0
 Total Depth: 15.0 feet

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NORTH WAKE COUNTY LANDFILL RALEIGH, NC

Project No. 02199312.01

LFG MONITORING WELL

M-6R

Page 1 of 1

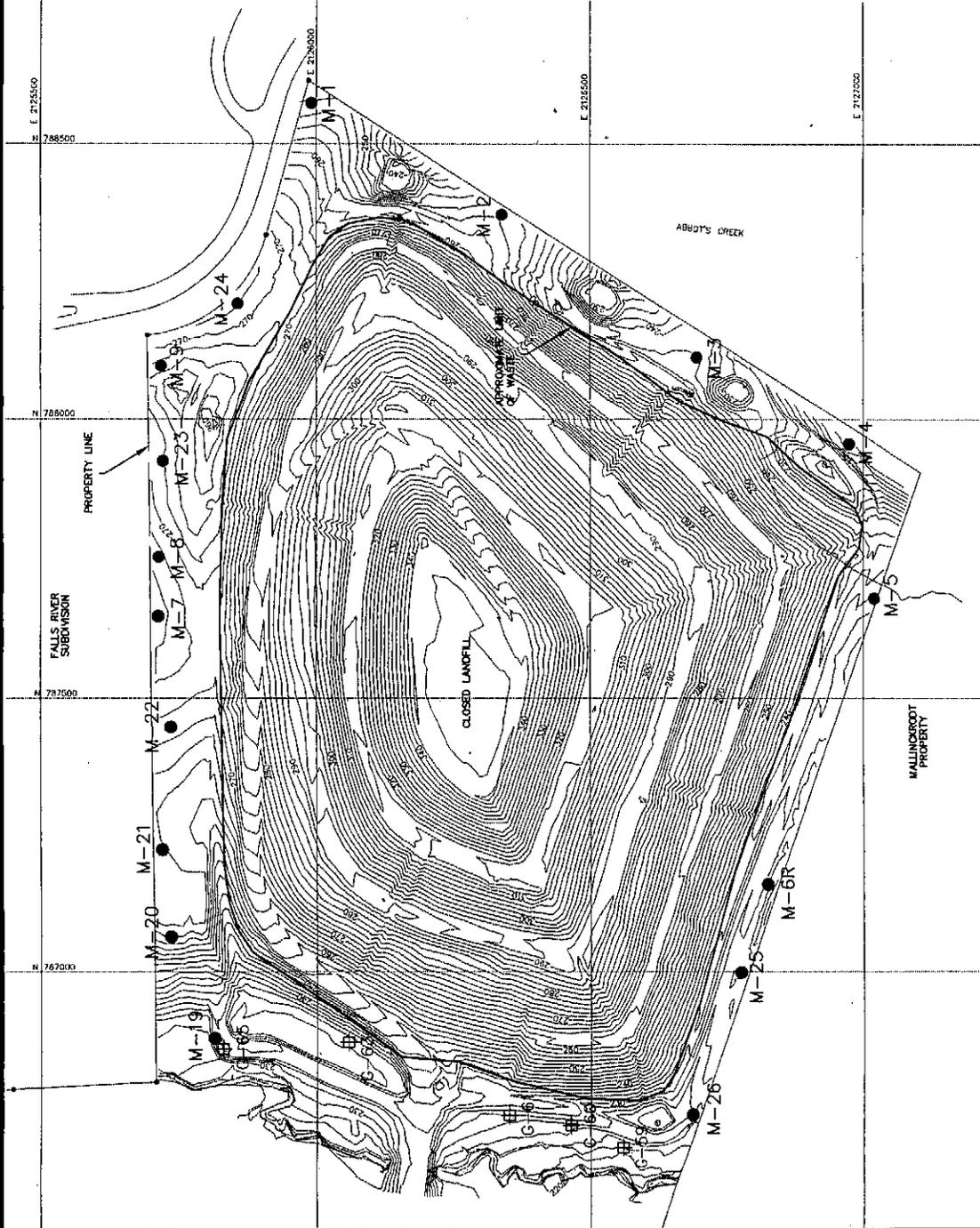
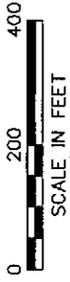
Depth in Feet	BORING LOG					DESCRIPTION	REMARKS
	SAMPLES	RECOVERED	PID	GROUNDWATER	USCS		
+1							
0							
-1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							Depth to Water = 20 feet
21							
22							
23							
24							
25							Terminated at 25 feet
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							

Drilling Company: Bedford Well Drilling
 Drilling Method: Air Rotary Auger
 Logged By: B. King

Date Started: 1/11/2007
 Date Ended: 1/11/2007
 Boring Diameter: 8-inch
 Well Diameter: 1.0-inch
 Casing Material: SCH 40 PVC

Time Started: NA
 Time Ended: NA
 Elevation: 230.8
 Total Depth: 25.0 feet

DRAWN BY: DBK DATE: 1/30/07 FILE NAME: 02199312.01



LEGEND

- M-7 PERMANENT LFG MONITORING PROBE
- ⊕ G-52 TEMPORARY LFG MONITORING PROBE

1. THIS DRAWING ILLUSTRATES THE LFG MONITORING PROBE NETWORK FOLLOWING INSTALLATION OF 8 NEW PERMANENT MONITORING PROBES AND REPLACEMENT OF 1 EXISTING PERMANENT MONITORING PROBE DURING JANUARY 2007.

2. TOPOGRAPHIC AND PHYSICAL FEATURES SHOWN IN THE CLOSED LANDFILL ARE REFERENCED FROM FIELD SURVEY PERFORMED BY TAYLOR WISEMAN TAYLOR ON 3/5/2002.

SCS ENGINEERS

DRAWING I - LFG MONITORING PROBE NETWORK - CLOSED CELL - NORTH WAKE COUNTY LANDFILL (SOLID WASTE PERMIT NO. 92-09) - RALEIGH, NC

