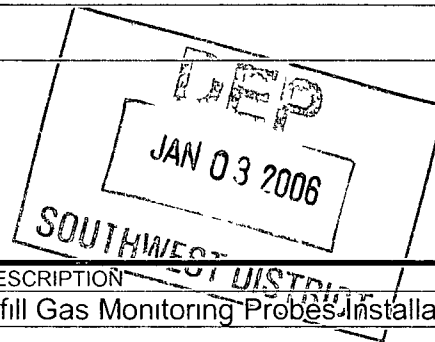


**SCS ENGINEERS**TO FDEPDATE January 3, 2006Temple Terrace, Florida 33637-0926 13251 N TeleconJOB NO 09204067 01Temple Terrace, Florida 33637-0926ATTENTION Susan PelzRe Citrus County Central Landfill

WE ARE SENDING YOU

LFG Probe Installation Construction☒ Attached ☐ Under separate cover via \_\_\_\_\_Certification☐ Shop drawings☐ Prints☐ Copy of letter☐ Change Order☐ The following items☐ Plans☐ Samples☐ Specifications☐ \_\_\_\_\_

COPIES	DATE	DESCRIPTION
4	1/3/06	Construction Certification Reports Landfill Gas Monitoring Probes Installation

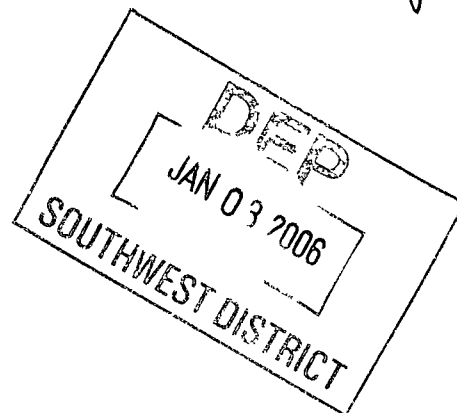
THESE ARE TRANSMITTED as check below

☒ For approval☐ Approved as submitted☐ Resubmit \_\_\_\_\_ Copies for approval☐ For your use☐ Approved as noted☐ Submit \_\_\_\_\_ Copies distribution☐ As requested☐ Returned for corrections☐ Return \_\_\_\_\_ Corrected prints☐ For review and comment☐ \_\_\_\_\_☐ FOR BIDS DUE \_\_\_\_\_ 20 \_\_\_\_\_☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS \_\_\_\_\_

COPY TO Susie MetcalfeSIGNED David H Penoyer, P E

290592  
enforcement  
file copy



**LANDFILL GAS MONITORING PROBES INSTALLATION  
CONSTRUCTION CERTIFICATION REPORT  
CITRUS COUNTY CENTRAL LANDFILL  
PERMIT NO. 21375-008-SO/01**

**Prepared for:**

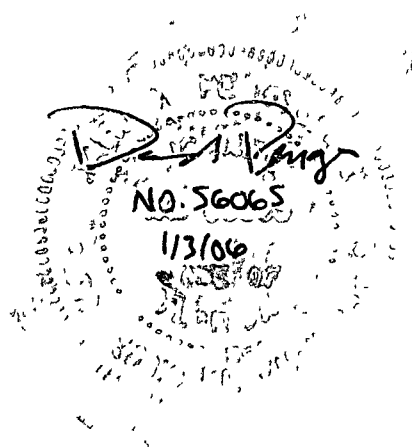
Citrus County Solid Waste Management Division  
P O Box 340  
Lecanto, Florida 34460  
(352) 527-7670

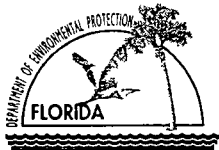
**Prepared by:**

SCS Engineers  
3012 U S Highway 301 North, Suite 700  
Tampa, Florida 33619  
(813) 621-0080  
Fax (813) 623-6757

Florida Board of Professional Engineers  
Certificate No 00004892

January 3, 2006  
File No 09204067 01





Florida Department of Environmental Protection  
Twin Towers Office Bldg • 2600 Blair Stone Road • Tallahassee, FL 32399-2400

DEP Form # 62 701.900(2)  
Form Title Certification of Construction Completion  
Effective Date May 19, 1994

DEP Application No. \_\_\_\_\_  
(Filled by DEP)

Certification of Construction Completion of a  
Solid Waste Management Facility

DEP Construction Permit No CONSENT AGREEMENT OGC NO 05-1078 County Citrus

Name of Project Landfill Gas Monitoring Probes Installation

Name of Owner Citrus County Board of County Commissioners

Name of Engineer SCS Engineers

Type of Project Installation of landfill gas monitoring probes

Cost Estimate \$ N/A Actual \$ N/A

Site Design Quantity N/A ton/day Site Acreage N/A Acres

Deviations from Plans and Application Approved by DEP None

Address and Telephone No of Site 230 West Gulf to Lake Highway, Lecanto, Florida 34461  
(352) 527-7670

Name(s) of Site Supervisor Susan J Metcalfe, P G

Date Site inspection is requested Earliest possible

This is to certify that, with the exception of any deviation noted above, the construction of the project has been completed in substantial accordance with the plans authorized by Construction

Permit No CONSENT AGREEMENT OGC NO 05-1078 Dated September 20, 2005

Date January 3, 2006

[Signature]  
Signature of Professional Engineer No. 56065

Page 1 of 1

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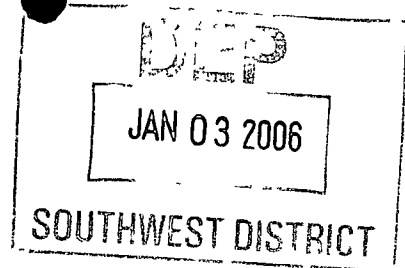
<u>Table</u>	<u>Page</u>
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### Attachments

- 1 Existing LFG Monitoring Probe Layout
- 2 Florida Division of Forestry – State Forest Use Permit
- 3 New Probe Installation Figures
- 4 Monitoring Probe Data
- 5 Initial LFG Monitoring Results



**SECTION A**  
**GENERAL INFORMATION**



On September 20, 2005, the Florida Department of Environmental Protection (FDEP), and the Citrus County Board of County Commissioners (County) entered into Consent Agreement (OGC File No 05-1078) pertaining to the Citrus County Central Landfill. The Consent Agreement addresses the monitored exceedances of groundwater standards, as well as exceedances of landfill gas (LFG) standards at the facility property boundary. This construction certification report describes the installation and initial monitoring of additional LFG probes required by the Consent Agreement.

The Citrus County Central Landfill is composed of a closed 60-acre landfill and an active 80-acre landfill. The facility is located off State Road 44, approximately three miles east of Lecanto, Florida at the following coordinates:

- Latitude 28 degrees, 51 minutes, and 8 seconds
- Longitude 82 degrees, 26 minutes, and 38 seconds

The facility currently operates under FDEP Solid Waste Operations Permit Number 21375-008-SO/01, which was issued on September 30, 2005.

**A.1 BACKGROUND**

To measure subsurface methane at the site, Citrus County had installed 62 permanent LFG probes at the perimeter and within the interior of the site. In addition, 13 interim monitoring probes were installed near the property boundary in October 2003 and July 2004. Of the 62 permanent probes, 60 probes surround the closed 60-acre landfill, with 29 of these permanent probes located to the east of the closed landfill, between the toe of the landfill and the main access road. The remaining two permanent probes are located to the south and to the east of the active landfill area. The 13 interim probes were installed along the eastern, western and southern sides of the facility perimeter to detect the extent of any offsite migration. Refer to Attachment 1 for a site map that includes the permanent and interim monitoring probe locations.

During routine monitoring and subsequent LFG migration investigations, SCS monitored the permanent and interim probes to determine the concentrations of explosive gas at the perimeter of the landfill. Rule 62-701.530(1)(a) of the Florida Administrative Code (F.A.C.) requires that the methane concentration at or beyond the landfill property boundary not exceed the lower explosive limit (LEL) (i.e., five percent methane by volume). The methane concentrations that exceeded the LEL have been reported to the FDEP and are part of the basis for the Consent Agreement.

On July 8, 2005, SCS submitted a LFG Compliance Action Plan to FDEP presenting the steps the County would take to address the LEL exceedances at the property boundary. This action plan was incorporated into the Consent Agreement as Exhibit B and referenced in Paragraph 7

## **SECTION B**

### **PROBE INSTALLATION**

#### **B.1 DIVISION OF FORESTRY USE PERMIT**

Exhibit B and Paragraph 10 of the Consent Agreement address expanding the facility boundary to the west, east, and south into adjacent property owned by the Florida Division of Forestry (FDF). The FDF authorized a State Forest Use Permit (No. 239) to the County for installation of groundwater and LFG monitoring probes. A copy of this permit is included in Attachment of this report.

#### **B.2 PROBE INSTALLATION DETAILS**

In accordance with Exhibit B and Paragraph 9 of the Consent Agreement, SCS installed LFG monitoring probes GP-1 through GP-18 around the perimeter of the landfill in November and December of 2005. As shown on Figure 1 of Attachment 3, the perimeter monitoring probes were installed at the following locations:

- Northern property boundary – Probes GP-1 through GP-4
- Western property boundary – GP-5 through GP-8
- Southern property boundary – GP-9 through GP-15
- Eastern property boundary – GP-16 through GP-18

For probes that were installed using the direct-push installation method, SCS Engineers monitored for the presence of methane gas at approximately 10-foot intervals during probe installation. This monitoring was performed consistent with LFG monitoring procedures used for routine LFG monitoring events. The monitoring showed that methane was not detected in any of the probes. Refer to Attachment 4 for the data taken while the probes were drilled. Once all of the probes were completely installed, a round of monitoring was conducted. Refer to Attachment 5 for the monitoring results of the 18 probes.

##### **B.2.a Probe Construction**

In accordance with the provisions of Rule 62-701.530(2)(b), F.A.C., the monitoring probes were constructed at depths equal to the base of the landfilled waste. The 11 probes surrounding the closed 60-acre landfill (i.e., GP-1 through GP-11) are approximately 40 feet deep, which is equal to the maximum estimated depth of the closed landfill. Probes GP-12 through GP-18 were installed to depths of approximately 80 feet, which is consistent with the depth of waste in the active landfill footprint. The coordinates of the newly installed probes will be provided to FDEP with the first quarter monitoring data for 2006.

The new probes consist of 1-inch diameter schedule 40 PVC pipe. As shown on Figures 2 and 3 in Attachment 3, the LFG monitoring probes are comprised of slotted pipe that extends from five feet below ground surface (bgs) to the bottom of the borehole. Solid wall pipe extends from the top of the slotted pipe to ground surface. Two probe configurations were used.

- Above grade completions – Probes GP-2 and GP-3 were installed in 4-foot tall 6-inch by 6-inch lockable aluminum protective casings with approximately 3 75 feet of stick up above grade The casings are painted yellow
- At-grade completion - Probes GP-1 and GP-4 through GP-18 were installed in vaults that are flush with the ground surface

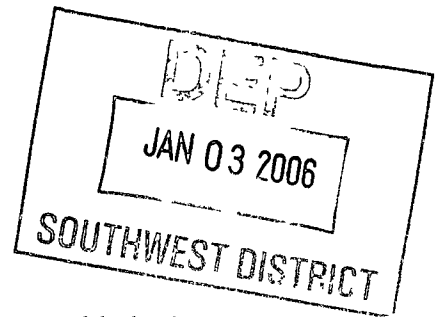
Each probe is fitted with a threaded cap and monitoring port Refer to Table 1 for the depth and configuration of each installed monitoring probe

**TABLE 1. LFG MONITORING PROBE SCHEDULE  
CENTRAL LANDFILL, CITRUS COUNTY, FLORIDA**

Probe ID	Borehole Depth (ft)	Solid-Wall Pipe Interval (ft bgs)	Slotted Pipe Interval (ft bgs)	Above or At-Grade Casing
GP-1	40	0 – 5	5 – 40	At grade
GP-2	40	0 – 5	5 – 40	Above
GP-3	40	0 – 5	5 – 40	Above
GP-4	40	0 – 5	5 – 40	At grade
GP-5	40	0 – 5	5 – 40	At grade
GP-6	40	0 – 5	5 – 40	At grade
GP-7	40	0 – 5	5 – 40	At grade
GP-8	40	0 – 5	5 – 40	At grade
GP-9	40	0 – 5	5 – 40	At grade
GP-10	40	0 – 5	5 – 40	At grade
GP-11	40	0 – 5	5 – 40	At grade
GP-12	80	0 – 5	5 – 80	At grade
GP-13	80	0 – 5	5 – 80	At grade
GP-14	80	0 – 5	5 – 80	At grade
GP-15	80	0 – 5	5 – 80	At grade
GP-16	80	0 – 5	5 – 80	At grade
GP-17	80	0 – 5	5 – 80	At grade
GP-18	80	0 – 5	5 – 80	At grade

Monitoring probes GP-1 through GP-13 and GP-15 were installed with a direct push rig with a two-inch retractable tip that made it possible to take gas composition readings at ten-foot intervals Probes GP-14 and GP-16 through GP-18 were installed with an augur rig because of difficulty in reaching the desired probed depth with the direct-push rig It was not possible to take gas composition readings during probe installation with the auguring machinery

**SECTION C**  
**CONCLUSIONS**



Based on the methane readings taken during installation of the probes, it is likely that any methane migrating offsite has reached equilibrium at some point between the landfill footprint and new probes, thus explaining why methane was not detected in the probes. Monitoring probes GP-1 through GP-18 will be monitored during the 2006 first quarter monitoring event, and the results of that monitoring plus the surveyed coordinates for the new probes will be submitted to FDEP as a supplement to this submittal. As stated below, the County will also monitor the existing monitoring probes during the first quarter monitoring event unless the County receives prior approval from FDEP to abandon the existing probes. Once the existing probes are abandoned, all future monitoring will be conducted only at the 18 new probes.

**C.1 ABANDONMENT OF EXISTING PROBES**

As stated in Paragraph 9 of the Consent Agreement, the existing monitoring probes will not be abandoned until a lease agreement has been submitted to FDEP and the new LFG monitoring probes have been installed. Exhibit B states that the existing probes will be abandoned in place, meaning that the valves will remain closed so as not to emit fugitive LFG. The County will continue to monitor the existing probes along with the 18 new probes until FDEP approves abandonment of the existing probes.

**C.2 MONITORED EXCEEDANCES**

**C.2.a Phase 2 LFG Compliance Action Plan**

Since the negotiations with the FDF for the lease agreement are proceeding well, it is anticipated that the new compliance boundary will be at the lease boundary. Therefore, based on the results obtained during installation of the gas probes and the initial round of monitoring, it is unlikely that Phase 2 and Phase 3 of the gas monitoring and control system will be required. However, in accordance with Paragraph 11c of the Consent Agreement, should the LFG monitoring results yield exceedances of the LEL, a passive venting system between the liner system and the property boundary shall be installed at impacted areas within 150 days of the monitored exceedance. The passive venting system is referred to as Phase 2 of the gas system in Exhibit B. The passive venting system will include screened piping to capture the LFG at depths determined by the geoprobe investigation. Upon completion of the passive venting system, the system will be monitored monthly.

Within 270 days of installation of the Phase 2 passive venting system, a Phase 2 LFG Compliance Action Plan Summary Report shall be submitted to FDEP. The report shall include the monthly gas monitoring data and outline further activities.

**C.2.b Phase 3 LFG Compliance Action Plan**

Paragraph 11d of the Consent Agreement addresses the Phase 3 LFG Compliance Action Plan.

Should the lease agreement not be obtained, or if future monitoring events show exceedances at the new compliance boundary, and after implementation of Phase 2, only then will Phase 3 be implemented. Should the Phase 2 passive venting system be deemed ineffective, a proposed gas management system plan shall be submitted to FDEP within 30 days of notification from FDEP.

Within 180 days of receiving FDEP approval for the Phase 3 LFG Compliance Action Plan, the system shall be installed and a Certification of Construction Completion Form submitted to FDEP.

Within 120 days of submitting the certification form to FDEP, a Phase 3 LFG Compliance Action Plan Summary Report shall be submitted to FDEP. The report shall include the monthly gas monitoring data and outline further activities.

If additional actions are required by FDEP, Exhibit B shall be revised and submitted to FDEP for review and approval. The revised Exhibit B will detail additional corrective actions to address LFG migration and include a schedule for implementation and completion of the activities.

**ATTACHMENT 1**

**EXISTING LFG MONITORING PROBE LAYOUT**

**ATTACHMENT 2**

**FLORIDA DIVISION OF FORESTRY – STATE FOREST USE PERMIT**



STATE OF FLORIDA  
DEPARTMENT OF AGRICULTURE & CONSUMER SERVICES  
DIVISION OF FORESTRY

Permit# 239

STATE FOREST USE PERMIT

CITRUS COUNTY SOLID WASTE MANAGEMENT DIVISION

NAME OF GROUP/INDIVIDUAL

has permission to use an area 300 linear feet from the boundary of the Citrus landfill

FACILITIES AND LOCATION

IN SECTIONS 1, 6 AND 12 OF TOWNSHIP 19 SOUTH, RANGE 18 EAST on the  
Withlacoochee State Forest. See attached maps:

From: October 5, 2005

To: January 5, 2006

ARRIVAL DATE

DEPARTURE DATE

Number in Group: \_\_\_\_\_

Person in charge of group: Susan Metcalfe

Address: P. O. Box 340

Lecanto, Florida 34460

Phone: 352-527-7670

Fax/Email: 352-527-7672

**Special Arrangement of Accommodations:** All Division of Forestry and Wildlife Management rules and regulations apply. Please call (352) 754-6896 to acquire or cancel your permit. For emergencies call our 24 hour Fire Dispatch office at (352) 754-6777 choose option 4

Citrus County Solid Waste Management division has permission to access the Withlacoochee State Forest for the purpose of installing and monitoring 18 gas and ground water monitoring wells adjacent To the Citrus County landfill facility. Prior to installation of the ground water monitoring wells the Citrus County Solid Waste Management Division should notify the Division so a trained Archeological Monitor may be on site during drilling operations. Contact Colleen Werner at 352-754-6777

The person or group granted this permit will be responsible for any damages to the facilities and /or furnishings as a result of their use of these facilities. Use all State Forest lands and facilities at your own risk

*Keith G. Mousel*

October 5, 2005

\_\_\_\_\_  
State Forest Officer

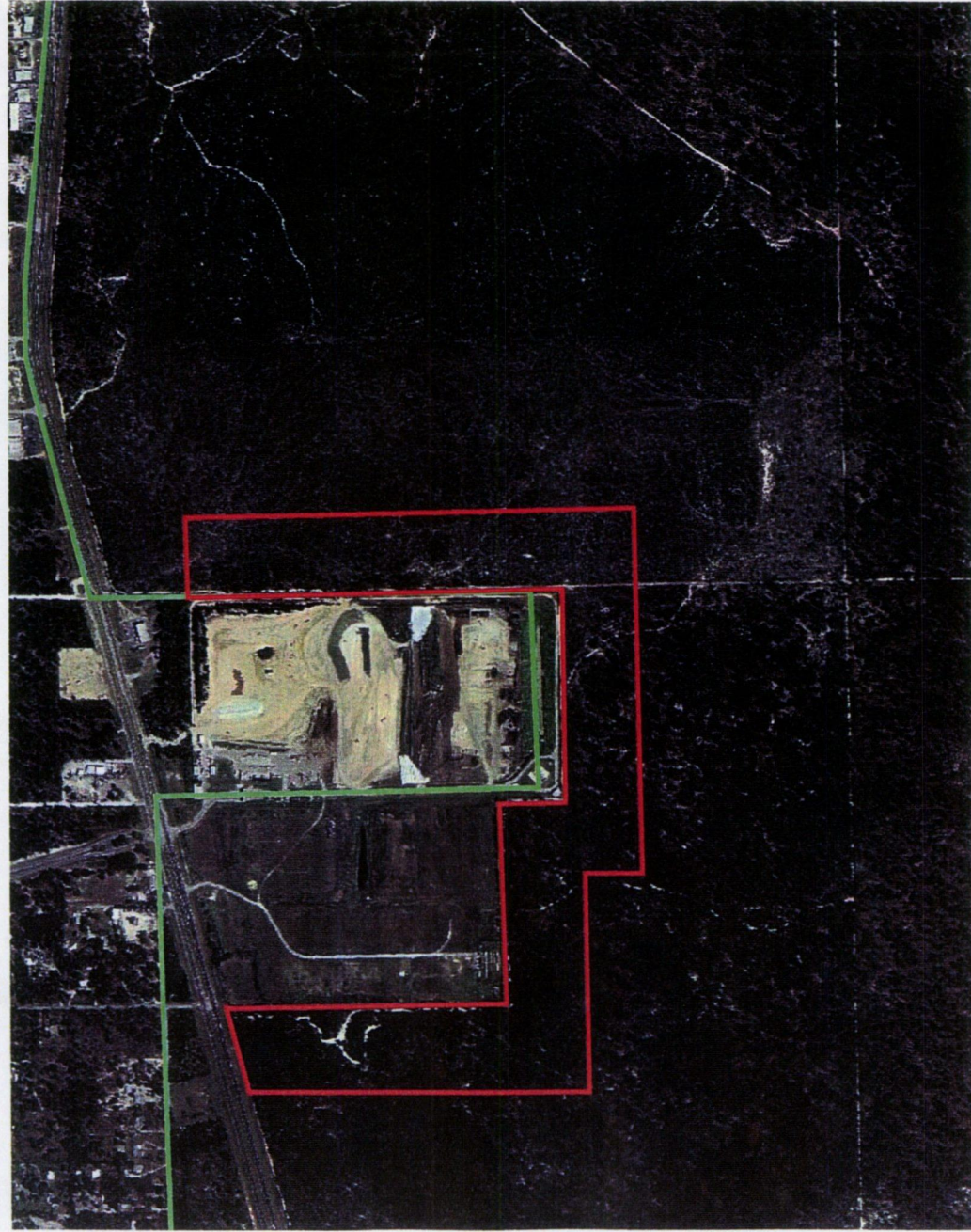
\_\_\_\_\_  
Date

Distribution \* RVC Permit Book, \*W-9, W-16, W-17, Park Ranger, Volunteer File

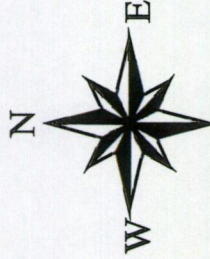


# Citrus Landfill

## Special Use Permit Map



Citrus sublease expansion1.shp  
Dof\_boundaries\_outline.shp



Section 1, 6, 12, Township 19 South, Range 18 east  
Citrus County, Florida  
Lecanto NW Quad

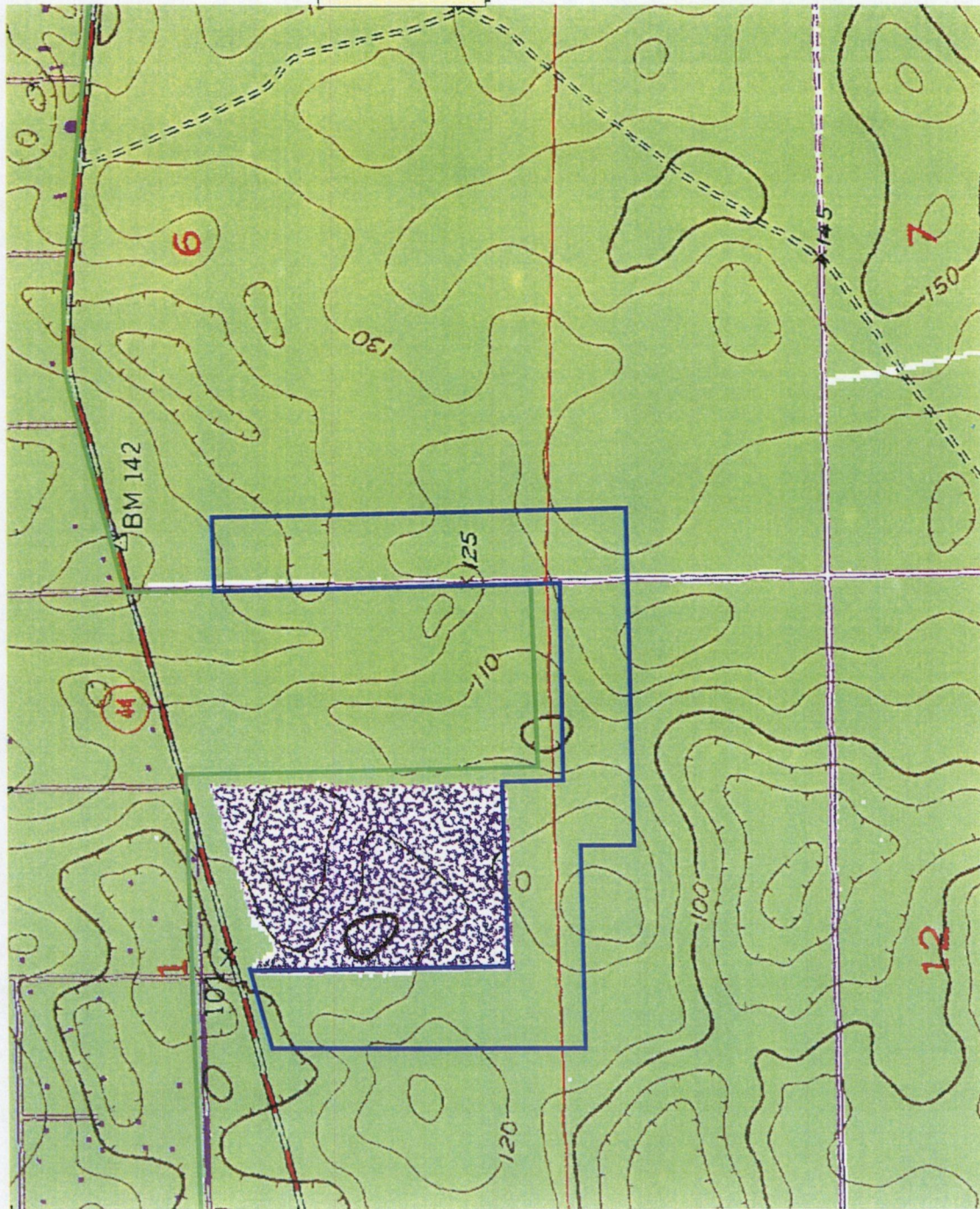
"This map is the product of the Department of Agriculture and Consumer Services, Division of Forestry. This map is for internal uses only and was produced with the intent of internal field communication, fire control, or forest land management. This map is not a parcel map (cadastral), nor is it a legal survey. There are no warranties made as to the fitness of this map for any unlisted purpose or reproduction at other than the original scale. Furthermore, no warranties, expressed or implied are provided for the data therein, its use, or its interpretation."

0.5 0 0.5 1 Miles



# Citrus Landfill

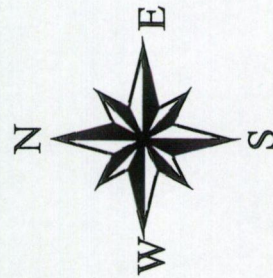
## Special Use Permit Map



"This map is the product of the Department of Agriculture and Consumer Services, Division of Forestry. This map is for internal uses only and was produced with the intent of internal field communication, fire control, or forest land management. This map is not a parcel map (cadastral), nor is it a legal survey. There are no warranties made as to the fitness of this map for any unlisted purpose or reproduction at other than the original scale. Furthermore, no warranties, expressed or implied are provided for the data therein, its use, or its interpretation."

Section 1, 6, 12, Township 19 South, Range 18 east  
Citrus County, Florida  
Lecanto NW Quad

Citrus sublease expansion1.shp  
Def\_boundaries\_outline.shp



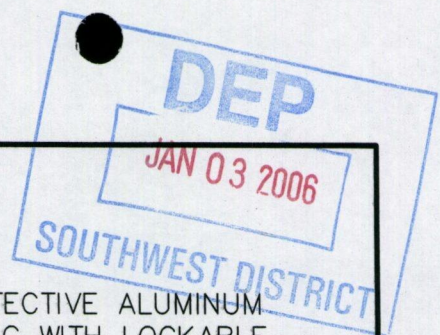
1 Miles

0.5

0

0.5





PAINT PROBE ID NO. ON  
OUTSIDE OF CASING WITH  
BLACK PAINT AND 2"  
STENCIL LETTERS

6"X6" PROTECTIVE ALUMINUM  
WELL CASING WITH LOCKABLE  
COVER, PAINTED "SAFETY  
YELLOW"

EXIST. GROUND  
SURFACE

GP-2

4'-0"

3'-9"±

6" CONC.

6" BENTONITE PLUG

3'-6"

SCREEN INTERVAL

(VARIES FROM 35'-75')

1/4" SCH. 80  
PVC LABCOCK  
VALVE  
THREADED INTO  
CAP

1" SCH. 40  
PVC  
THREADED  
FEMALE CAP

1" SCH. 40  
PVC FITTING  
(SOC X MPT)

1"Ø SCH. 40  
SOLID-WALL  
PVC PIPE

1"Ø SCH. 40 0.01" SLOTTED  
SCREEN

BOTTOM OF  
BOREHOLE EQUAL TO  
BOTTOM OF REFUSE  
IN LANDFILL AREA  
CLOSEST TO PROBE

2"Ø PILOT  
HOLE

NOTE:  
THIS CONFIGURATION USED  
FOR GP-2 AND GP-3 ONLY.

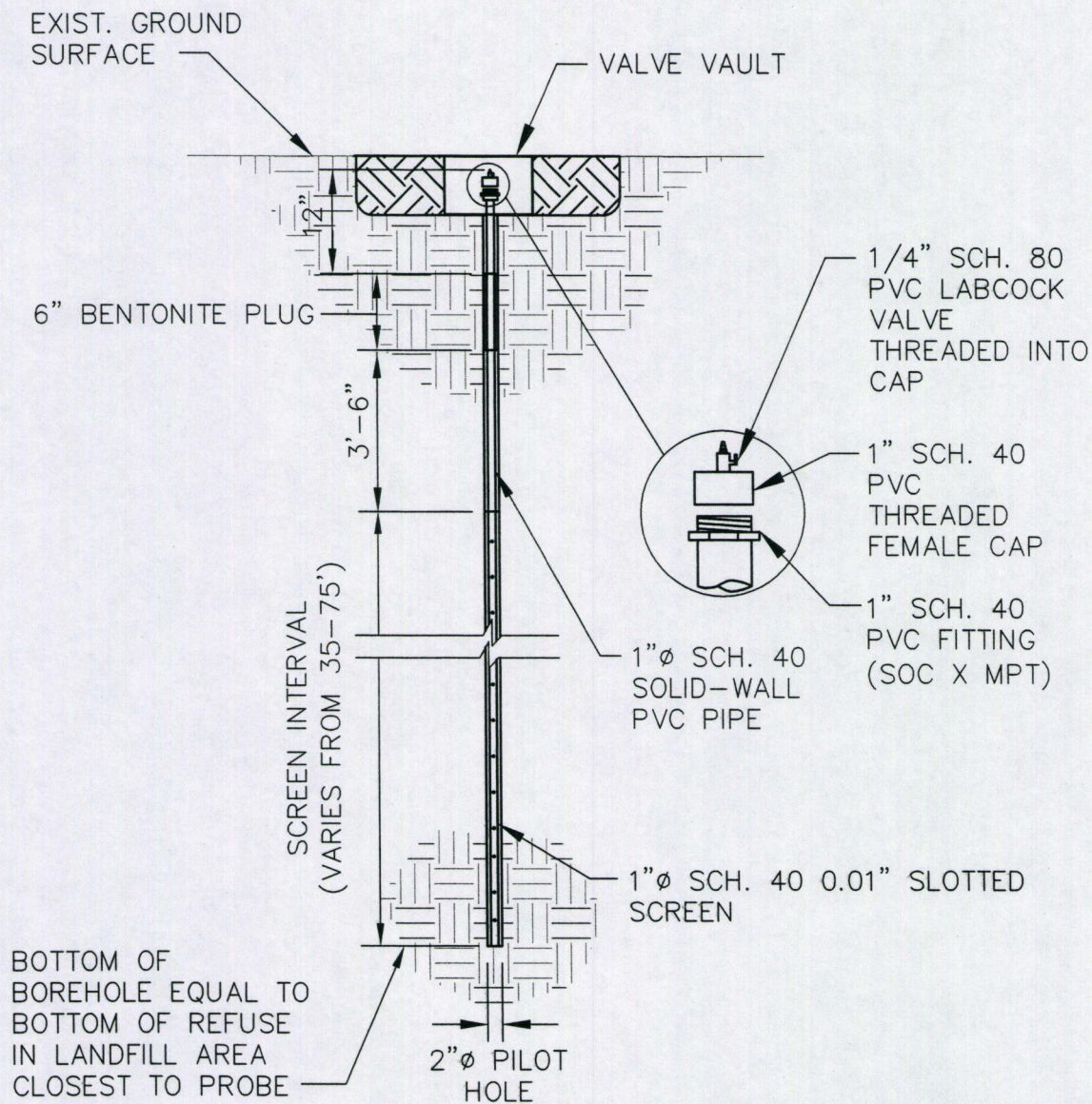
G:\PROJECT\Citrus\09204067.01\046701LFGProbe1.DWG Dec 29, 2005 - 9:29am Layout Name: Monitoring Probe Plan Bx 2226lek

SCS ENGINEERS

Figure 2. Above Grade LFG Monitoring Probe Detail, Central Landfill, Citrus County.



G:\PROJECT\Citrus\09204067.01\046701LFGProbe2.dwg Dec 29, 2005 - 9:30am Layout Name: Monitoring Probe Plan Bx 2226lek



**NOTE:**  
THIS DETAIL PERTAINS TO PROBES  
GP-1 AND GP-4 THROUGH GP-13.

SCS ENGINEERS

Figure 3. At-Grade LFG Monitoring Probe Detail, Central Landfill, Citrus County.



**ATTACHMENT 4**  
**MONITORING PROBE DATA**

**TABLE 4-1**  
**GP-1 PROBE INSTALLATION**  
**LANDFILL GAS COMPLIANCE ACTION PLAN**  
**CENTRAL LANDFILL, CITRUS COUNTY**  
**November 14, 2004**

Project Name	<u>Citrus County LF Boreholes</u>	Weather	<u>Barometric Pressure 30.23</u>
Project No	<u>09204067.01</u>		<u>Temperature 68F</u>
Personnel	<u>J. Bever (SCS)</u>	Notes	
Method of Calibration	<u>calibration gas</u>		

Depth (ft)	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Comments
10	0.0	2.2	19.3	
20	0.0	5.9	14.4	
30	0.0	7.3	11.8	
40	0.0	2.6	18.0	

Notes

- 1 Pipe Length 40' of pipe was installed in ground at GP-1
- 2 Perforated Pipe Length Installed from 5' below grade to 40' below grade (see Note 4)
- 3 Solid Pipe Length Installed at grade to 5' below grade
- 4 The slotted pipe consists of 1" diameter SCH 40 PVC pipe with 0.01" slots screened at the factory
- 5 Probed installed with a direct-push rig

TABLE 4-2  
GP-2 PROBE INSTALLATION  
LANDFILL GAS COMPLIANCE ACTION PLAN  
CENTRAL LANDFILL, CITRUS COUNTY  
November 17, 2004

Project Name	<u>Citrus County LF Boreholes</u>	Weather	<u>Barometric Pressure 30.12,</u>
Project No	<u>09204067.01</u>		<u>Temperature 63F, Partly Cloudy</u>
Personnel	<u>J. Bever (SCS)</u>	Notes	
Method of Calibration	<u>calibration gas</u>		

Depth (ft)	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Comments
10	0.0	0.6	20.1	
20	0.0	4.6	13.9	
30	0.0	2.5	16.1	
40	0.0	0.2	18.6	

Notes

- 1 Pipe Length 40' of pipe was installed in ground at GP-2
- 2 Perforated Pipe Length Installed from 5' below grade to 40' below grade (see Note 4)
- 3 Solid Pipe Length Installed at 3' above grade to 5' below grade
- 4 The slotted pipe consists of 1" diameter SCH 40 PVC pipe with 0.01" slots screened at the factory
- 5 Probed installed with a direct-push rig

**TABLE 4-3**  
**GP-3 PROBE INSTALLATION**  
**LANDFILL GAS COMPLIANCE ACTION PLAN**  
**CENTRAL LANDFILL, CITRUS COUNTY**  
**November 17, 2004**

Project Name	<u>Citrus County LF Boreholes</u>	Weather	<u>Barometric Pressure 30 12,</u>
Project No	<u>09204067 01</u>		<u>Temperature 63F, Partly Cloudy</u>
Personnel	<u>J Bever (SCS)</u>	Notes	
Method of Calibration	<u>calibration gas</u>		

Depth (ft)	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Comments
10	0 0	0 6	20 3	
20	0 0	0 3	20 1	
30	0 0	0 2	20 1	
40	0 0	4 4	11 4	

Notes

- 1 Pipe Length 40' of pipe was installed in ground at GP-3
- 2 Perforated Pipe Length Installed from 5' below grade to 40' below grade (see Note 4)
- 3 Solid Pipe Length Installed at 3' above grade to 5' below grade
- 4 The slotted pipe consists of 1" diameter SCH 40 PVC pipe with 0 01" slots screened at the factory
- 5 Probed installed with a direct-push rig



**TABLE 4-4**  
**GP-4 PROBE INSTALLATION**  
**LANDFILL GAS COMPLIANCE ACTION PLAN**  
**CENTRAL LANDFILL, CITRUS COUNTY**  
**November 14, 2004**

Project Name	<u>Citrus County LF Boreholes</u>	Weather	<u>Barometric Pressure 30.23</u>
Project No	<u>09204067 01</u>		<u>Temperature 68F</u>
Personnel	<u>J Bever (SCS)</u>	Notes	
Method of Calibration	<u>calibration gas</u>		

Depth (ft)	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Comments
10	0.0	1.8	19.6	
20	0.0	3.5	17.9	
30	0.0	4.3	16.6	
40	0.0	4.2	16.6	

Notes

- 1 Pipe Length 40' of pipe was installed in ground at GP-4
- 2 Perforated Pipe Length Installed from 5' below grade to 40' below grade (see Note 4)
- 3 Solid Pipe Length Installed at grade to 5' below grade
- 4 The slotted pipe consists of 1" diameter SCH 40 PVC pipe with 0.01" slots screened at the factory
- 5 Probed installed with a direct-push rig

TABLE 4-5  
GP-5 PROBE INSTALLATION  
LANDFILL GAS COMPLIANCE ACTION PLAN  
CENTRAL LANDFILL, CITRUS COUNTY  
November 14, 2004

Project Name	<u>Citrus County LF Boreholes</u>	Weather	<u>Barometric Pressure 30.23</u>
Project No	<u>09204067.01</u>		<u>Temperature 68F</u>
Personnel	<u>J. Bever (SCS)</u>	Notes	
Method of Calibration	<u>calibration gas</u>		

Depth (ft)	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Comments
10	0.0	1.0	20.1	
20	0.0	1.9	18.7	
30	0.0	0.5	19.9	
40	0.0	0.7	19.1	

Notes

- 1 Pipe Length 40' of pipe was installed in ground at GP-5
- 2 Perforated Pipe Length Installed from 5' below grade to 40' below grade (see Note 4)
- 3 Solid Pipe Length Installed at grade to 5' below grade
- 4 The slotted pipe consists of 1" diameter SCH 40 PVC pipe with 0.01" slots screened at the factory
- 5 Probed installed with a direct-push rig

TABLE 4-6  
GP-6 PROBE INSTALLATION  
LANDFILL GAS COMPLIANCE ACTION PLAN  
CENTRAL LANDFILL, CITRUS COUNTY  
November 14, 2004

Project Name	<u>Citrus County LF Boreholes</u>	Weather	<u>Barometric Pressure 30.23</u>
Project No	<u>09204067.01</u>		<u>Temperature 68F</u>
Personnel	<u>J. Bever (SCS)</u>	Notes	
Method of Calibration	<u>calibration gas</u>		

Depth (ft)	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Comments
10	0.0	1.7	19.6	
20	0.0	3.7	17.2	
30	0.0	6.3	15.1	
40	0.0	6.4	14.3	

Notes

- 1 Pipe Length 40' of pipe was installed in ground at GP-6
- 2 Perforated Pipe Length Installed from 5' below grade to 40' below grade (see Note 4)
- 3 Solid Pipe Length Installed at grade to 5' below grade
- 4 The slotted pipe consists of 1" diameter SCH 40 PVC pipe with 0.01" slots screened at the factory
- 5 Probed installed with a direct-push rig

**TABLE 4-7**  
**GP-7 PROBE INSTALLATION**  
**LANDFILL GAS COMPLIANCE ACTION PLAN**  
**CENTRAL LANDFILL, CITRUS COUNTY**  
**November 15, 2004**

Project Name	<u>Citrus County LF Boreholes</u>	Weather	<u>Barometric Pressure 30.18</u>
Project No	<u>09204067.01</u>		<u>Temperature 71F</u>
Personnel	<u>J. Bever (SCS)</u>	Notes	
Method of Calibration	<u>calibration gas</u>		

Depth (ft)	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Comments
10	0.0	0.9	20.5	
20	0.0	2.7	17.7	
30	0.0	4.0	19.3	
40	0.0	1.0	19.3	

Notes

- 1 Pipe Length 40' of pipe was installed in ground at GP-7
- 2 Perforated Pipe Length Installed from 5' below grade to 40' below grade (see Note 4)
- 3 Solid Pipe Length Installed at grade to 5' below grade
- 4 The slotted pipe consists of 1" diameter SCH 40 PVC pipe with 0.01" slots screened at the factory
- 5 Probed installed with a direct-push rig

TABLE 4-8  
GP-8 PROBE INSTALLATION  
LANDFILL GAS COMPLIANCE ACTION PLAN  
CENTRAL LANDFILL, CITRUS COUNTY  
November 15, 2004

Project Name	<u>Citrus County LF Boreholes</u>	Weather	<u>Barometric Pressure 30.18</u>
Project No	<u>09204067.01</u>		<u>Temperature 71F</u>
Personnel	<u>J. Bever (SCS)</u>	Notes	
Method of Calibration	<u>calibration gas</u>		

Depth (ft)	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Comments
10	0.0	0.9	20.3	
20	0.0	1.4	19.9	
30	0.0	1.6	19.2	
40	0.0	1.2	19.3	

Notes

- 1 Pipe Length 40' of pipe was installed in ground at GP-8
- 2 Perforated Pipe Length Installed from 5' below grade to 40' below grade (see Note 4)
- 3 Solid Pipe Length Installed at grade to 5' below grade
- 4 The slotted pipe consists of 1" diameter SCH 40 PVC pipe with 0.01" slots screened at the factory
- 5 Probed installed with a direct-push rig

TABLE 4-9  
GP-9 PROBE INSTALLATION  
LANDFILL GAS COMPLIANCE ACTION PLAN  
CENTRAL LANDFILL, CITRUS COUNTY  
November 15, 2004

Project Name	<u>Citrus County LF Boreholes</u>	Weather	<u>Barometric Pressure 30.18</u>
Project No	<u>09204067.01</u>		<u>Temperature 71F</u>
Personnel	<u>J. Bever (SCS)</u>	Notes	
Method of Calibration	<u>calibration gas</u>		

Depth (ft)	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Comments
10	0.0	0.6	20.5	
20	0.0	0.6	19.7	
30	0.0	1.9	18.9	
40	0.0	2.3	18.5	

Notes

- 1 Pipe Length 40' of pipe was installed in ground at GP-9
- 2 Perforated Pipe Length Installed from 5' below grade to 40' below grade (see Note 4)
- 3 Solid Pipe Length Installed at grade to 5' below grade
- 4 The slotted pipe consists of 1" diameter SCH 40 PVC pipe with 0.01" slots screened at the factory
- 5 Probed installed with a direct-push rig

TABLE 4-10  
GP-10 PROBE INSTALLATION  
LANDFILL GAS COMPLIANCE ACTION PLAN  
CENTRAL LANDFILL, CITRUS COUNTY  
November 15, 2004

Project Name	<u>Citrus County LF Boreholes</u>	Weather	<u>Barometric Pressure 30.18</u>
Project No	<u>09204067.01</u>		<u>Temperature 71F</u>
Personnel	<u>J. Bever (SCS)</u>	Notes	
Method of Calibration	<u>calibration gas</u>		

Depth (ft)	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Comments
10	0.0	1.8	18.6	
20	0.0	6.3	13.4	
30	0.0	7.7	12.1	
40	0.0	8.5	11.0	

Notes

- 1 Pipe Length 40' of pipe was installed in ground at GP-10
- 2 Perforated Pipe Length Installed from 5' below grade to 40' below grade (see Note 4)
- 3 Solid Pipe Length Installed at grade to 5' below grade
- 4 The slotted pipe consists of 1" diameter SCH 40 PVC pipe with 0.01" slots screened at the factory
- 5 Probed installed with a direct-push rig

**TABLE 4-11**  
**GP-11 PROBE INSTALLATION**  
**LANDFILL GAS COMPLIANCE ACTION PLAN**  
**CENTRAL LANDFILL, CITRUS COUNTY**  
**November 15, 2004**

Project Name	<u>Citrus County LF Boreholes</u>	Weather	<u>Barometric Pressure 30.18</u>
Project No	<u>09204067.01</u>		<u>Temperature 71F</u>
Personnel	<u>J. Bever (SCS)</u>	Notes	
Method of Calibration	<u>calibration gas</u>		

Depth (ft)	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Comments
10	0.0	0.9	19.7	
20	0.0	0.9	19.1	
30	0.0	2.3	14.4	
40	0.0	1.4	15.8	

Notes

- 1 Pipe Length 40' of pipe was installed in ground at GP-11
- 2 Perforated Pipe Length Installed from 5' below grade to 40' below grade (see Note 4)
- 3 Solid Pipe Length Installed at grade to 5' below grade
- 4 The slotted pipe consists of 1" diameter SCH 40 PVC pipe with 0.01" slots screened at the factory
- 5 Probed installed with a direct-push rig



**TABLE 4-12**  
**GP-12 PROBE INSTALLATION**  
**LANDFILL GAS COMPLIANCE ACTION PLAN**  
**CENTRAL LANDFILL, CITRUS COUNTY**  
**November 15, 2004**

Project Name	<u>Citrus County LF Boreholes</u>	Weather	<u>Barometric Pressure 30.18</u>
Project No	<u>09204067.01</u>		<u>Temperature 71F</u>
Personnel	<u>J. Bever (SCS)</u>	Notes	
Method of Calibration	<u>calibration gas</u>		

Depth (ft)	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Comments
10	0.0	0.9	20.2	
20	0.0	0.5	20.2	
30	0.0	1.5	18.7	
40	0.0	0.9	19.2	
50	0.0	0.8	19.4	
60	0.0	0.4	20.2	
70	0.0	0.4	20.2	
80	0.0	1.0	19.7	

Notes

- 1 Pipe Length 80' of pipe was installed in ground at GP-12
- 2 Perforated Pipe Length Installed from 5' below grade to 80' below grade (see Note 4)
- 3 Solid Pipe Length Installed at grade to 5' below grade
- 4 The slotted pipe consists of 1" diameter SCH 40 PVC pipe with 0.01" slots screened at the factory
- 5 Probed installed with a direct-push rig

**TABLE 4-13**  
**GP-13 PROBE INSTALLATION**  
**LANDFILL GAS COMPLIANCE ACTION PLAN**  
**CENTRAL LANDFILL, CITRUS COUNTY**  
**December 7, 2005**

Project Name	<u>Citrus County LF Boreholes</u>	Weather	<u>Barometric Pressure 30.12</u>
Project No	<u>09204067.01</u>		<u>Temperature 56F, Cloudy</u>
Personnel	<u>J. Bever (SCS)</u>	Notes	
Method of Calibration	<u>calibration gas</u>		

Depth (ft)	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Comments
10	0.0	0.6	20.8	
20	0.0	0.2	20.9	
30	0.0	0.2	20.7	
40	0.0	0.3	20.3	
50	0.0	0.2	18.9	
60	0.0	0.2	19.5	
70	--	--	--	No data obtained for these depths
80	--	--	--	

Notes

- 1 Pipe Length 80' of pipe was installed in ground at GP-13
- 2 Perforated Pipe Length Installed from 5' below grade to 80' below grade (see Note 4)
- 3 Solid Pipe Length Installed at grade to 5' below grade
- 4 The slotted pipe consists of 1" diameter SCH 40 PVC pipe with 0.01" slots screened at the factory
- 5 Probed installed with a direct-push rig

TABLE 4-14  
GP-14 PROBE INSTALLATION  
LANDFILL GAS COMPLIANCE ACTION PLAN  
CENTRAL LANDFILL, CITRUS COUNTY  
November 14, 2004

Project Name	<u>Citrus County LF Boreholes</u>	Weather	<u>Barometric Pressure 30.12</u>
Project No	<u>09204067.01</u>		<u>Temperature 56F, Cloudy</u>
Personnel	<u>J. Bever (SCS)</u>	Notes	
Method of Calibration	<u>calibration gas</u>		

Depth (ft)	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Comments
10	--	--	--	No data obtained during auguring of probe
20	--	--	--	
30	--	--	--	
40	--	--	--	
50	--	--	--	
60	--	--	--	
70	--	--	--	
80	--	--	--	

Notes

- 1 Pipe Length 80' of pipe was installed in ground at GP-14
- 2 Perforated Pipe Length Installed from 5' below grade to 80' below grade (see Note 4)
- 3 Solid Pipe Length Installed at grade to 5' below grade
- 4 The slotted pipe consists of 1" diameter SCH 40 PVC pipe with 0.01" slots screened at the factory
- 5 Probe installed with a auger machine

**TABLE 4-15**  
**GP-15 PROBE INSTALLATION**  
**LANDFILL GAS COMPLIANCE ACTION PLAN**  
**CENTRAL LANDFILL, CITRUS COUNTY**  
**December 7, 2004**

Project Name	<u>Citrus County LF Boreholes</u>	Weather	<u>Barometric Pressure 30.12</u>
Project No	<u>09204067.01</u>		<u>Temperature 56F, Cloudy</u>
Personnel	<u>J. Bever (SCS)</u>	Notes	
Method of Calibration	<u>calibration gas</u>		

Depth (ft)	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Comments
10	0.0	0.2	20.5	
20	0.0	0.2	20.5	
30	0.0	0.2	20.4	
40	0.0	0.2	20.2	
50	0.0	0.2	19.9	
60	0.0	0.2	19.9	
70	0.0	0.2	19.3	
80	0.0	0.1	18.9	

Notes

- 1 Pipe Length 80' of pipe was installed in ground at GP-15
- 2 Perforated Pipe Length Installed from 5' below grade to 80' below grade (see Note 4)
- 3 Solid Pipe Length Installed at grade to 5' below grade
- 4 The slotted pipe consists of 1" diameter SCH 40 PVC pipe with 0.01" slots screened at the factory
- 5 Probed installed with a direct-push rig

TABLE 4-16  
GP-16 PROBE INSTALLATION  
LANDFILL GAS COMPLIANCE ACTION PLAN  
CENTRAL LANDFILL, CITRUS COUNTY  
December 22, 2005

Project Name	<u>Citrus County LF Boreholes</u>	Weather	<u>Barometric Pressure 30.25</u>
Project No	<u>09204067 01</u>		<u>Temperature 44F, Clear</u>
Personnel	<u>J. Bever (SCS)</u>	Notes	
Method of Calibration	<u>calibration gas</u>		

Depth (ft)	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Comments
10	--	--	--	No data obtained during auguring of probe
20	--	--	--	
30	--	--	--	
40	--	--	--	
50	--	--	--	
60	--	--	--	
70	--	--	--	
80	--	--	--	

Notes

- 1 Pipe Length 80' of pipe was installed in ground at GP-16
- 2 Perforated Pipe Length Installed from 5' below grade to 80' below grade (see Note 4)
- 3 Solid Pipe Length Installed at grade to 5' below grade
- 4 The slotted pipe consists of 1" diameter SCH 40 PVC pipe with 0.01" slots screened at the factory
- 5 Probe installed with a auger machine

TABLE 4-17  
GP-17 PROBE INSTALLATION  
LANDFILL GAS COMPLIANCE ACTION PLAN  
CENTRAL LANDFILL, CITRUS COUNTY  
December 8, 2005

Project Name	<u>Citrus County LF Boreholes</u>	Weather	<u>Barometric Pressure 30.31</u>
Project No	<u>09204067.01</u>		<u>Temperature 60F, Cloudy/Rain</u>
Personnel	<u>J. Bever (SCS)</u>	Notes	
Method of Calibration	<u>calibration gas</u>		

Depth (ft)	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Comments
10	--	--	--	No data obtained during auguring of probe
20	--	--	--	
30	--	--	--	
40	--	--	--	
50	--	--	--	
60	--	--	--	
70	--	--	--	
80	--	--	--	

Notes

- 1 Pipe Length 80' of pipe was installed in ground at GP-17
- 2 Perforated Pipe Length Installed from 5' below grade to 80' below grade (see Note 4)
- 3 Solid Pipe Length Installed at grade to 5' below grade
- 4 The slotted pipe consists of 1" diameter SCH 40 PVC pipe with 0.01" slots screened at the factory
- 5 Probe installed with a auger machine

**TABLE 4-18**  
**GP-18 PROBE INSTALLATION**  
**LANDFILL GAS COMPLIANCE ACTION PLAN**  
**CENTRAL LANDFILL, CITRUS COUNTY**  
**December 22, 2005**

Project Name	<u>Citrus County LF Boreholes</u>	Weather	<u>Barometric Pressure 30.25</u>
Project No	<u>09204067.01</u>		<u>Temperature 44F, Clear</u>
Personnel	<u>J. Bever (SCS)</u>	Notes	
Method of Calibration	<u>calibration gas</u>		

Depth (ft)	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Comments
10	--	--	--	No data obtained during auguring of probe
20	--	--	--	
30	--	--	--	
40	--	--	--	
50	--	--	--	
60	--	--	--	
70	--	--	--	
80	--	--	--	

Notes

- 1 Pipe Length 80' of pipe was installed in ground at GP-18
- 2 Perforated Pipe Length Installed from 5' below grade to 80' below grade (see Note 4)
- 3 Solid Pipe Length Installed at grade to 5' below grade
- 4 The slotted pipe consists of 1" diameter SCH 40 PVC pipe with 0.01" slots screened at the factory
- 5 Probe installed with a auger machine

**ATTACHMENT 5**  
**INITIAL LFG MONITORING RESULTS**



**TABLE 5-1**  
**LANDFILL GAS COMPLIANCE ACTION Plan**  
**CENTRAL LANDFILL, CITRUS COUNTY**

Project Name	Citrus County Central Landfill	Date	December 9, 2005
Project No	09204067 01	Weather	68° F
Personnel	I Bever (SCS)	Comments	
Method of Calibration	calibration gas		

Well No	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Balance (%)	Pressure (in-w.c.)	Comments
GP-1	0.0	2.3	18.4	79.3	0.0	
GP-2	0.0	0.3	20.3	79.4	0.0	
GP-3	0.0	0.4	20.4	79.2	0.0	
GP-4	0.0	1.6	19.5	78.9	0.0	
GP-5	0.0	0.9	20.2	78.9	0.0	
GP-6	0.0	1.6	19.2	79.2	0.0	
GP-7	0.0	0.6	20.9	78.5	0.0	
GP-8	0.0	0.7	20.1	79.2	0.0	
GP-9	0.0	0.9	20	79.1	0.0	
GP-10	0.0	4.6	14.6	80.8	0.0	
GP-11	0.0	1.8	19.6	78.6	0.0	
GP-12	0.0	1.3	19.6	79.1	0.0	
GP-13	0.0	0.9	18.1	81	0.0	
GP-14	0.0	0.7	19.8	79.5	0.0	
GP-15	0.0	0.8	20.3	78.9	0.0	
GP-16	0.0	0.4	20.5	79.1	0.0	Readings taken on Dec 22 2005
GP-17	0.0	0.3	20.9	78.8	0.0	
GP-18	0.0	0.9	20	79.1	0.0	Readings taken on Dec 22 2005

Notes

- 1 % Lower Explosive Limit (LEL) of methane (CH<sub>4</sub>) is 5%
- 2 CH<sub>4</sub> at the landfill property boundary can not exceed the LEL of 5% CH<sub>4</sub> per Rule 62-701.530(1)(b), FAC

F:\PROJECT\Citrus\09204067 01\Installation Monitoring Logs\1stRoundData.xls\Tables



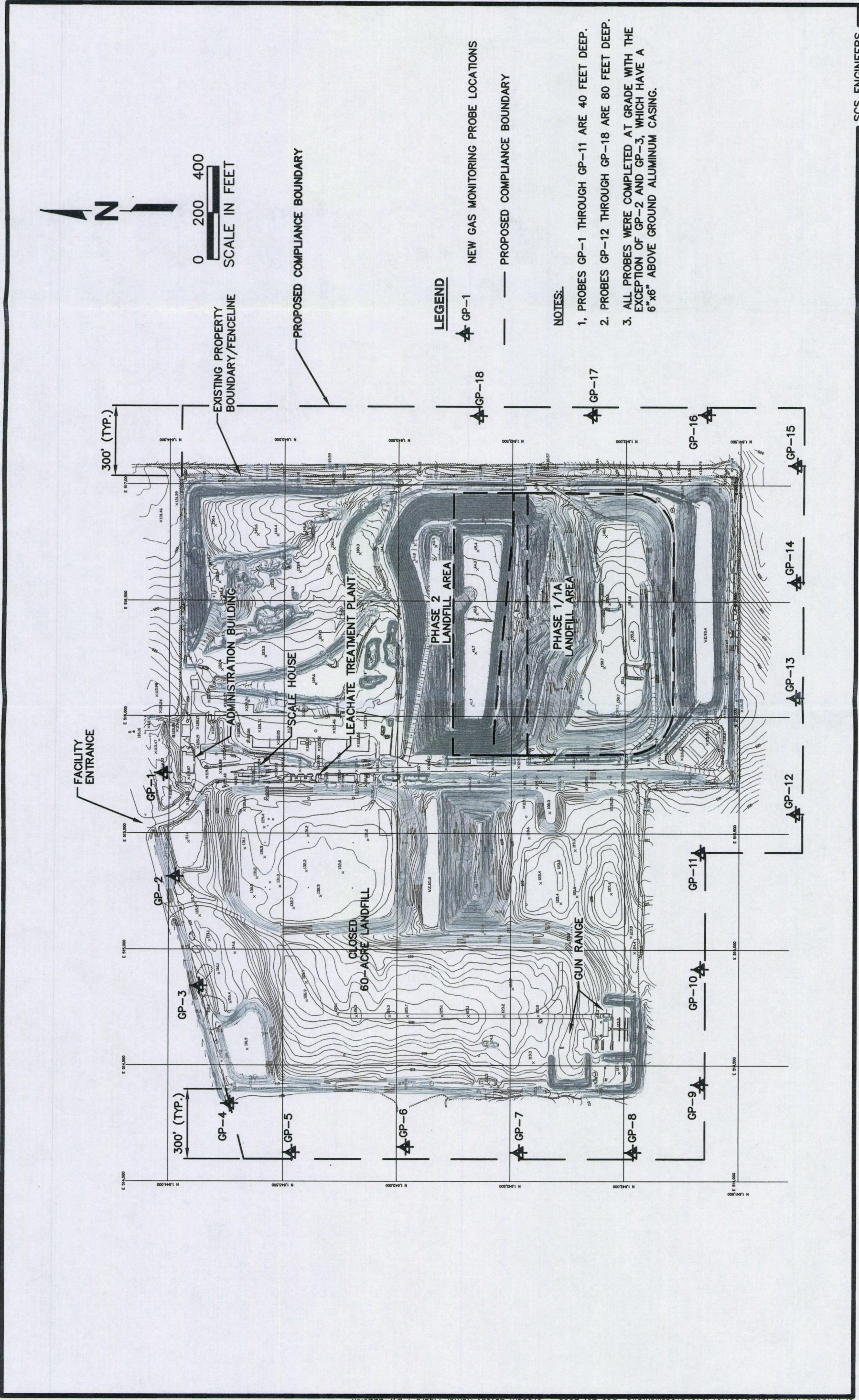
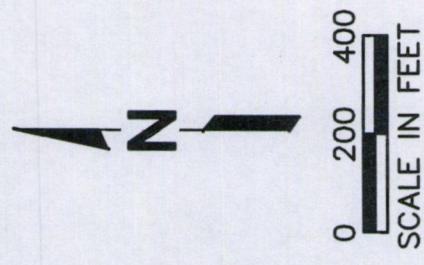


Figure 1. Landfill Gas Monitoring Probe Locations, Central Landfill, Citrus County, Florida.





**LEGEND**

- GS-C3S EXISTING LFG MONITORING PROBE
- GS-2E INTERIM LFG MONITORING PROBE INSTALLED 10/7/03 TO 10/9/03
- GS-1W INTERIM LFG MONITORING PROBE INSTALLED THE WEEK OF JULY 12, 2004

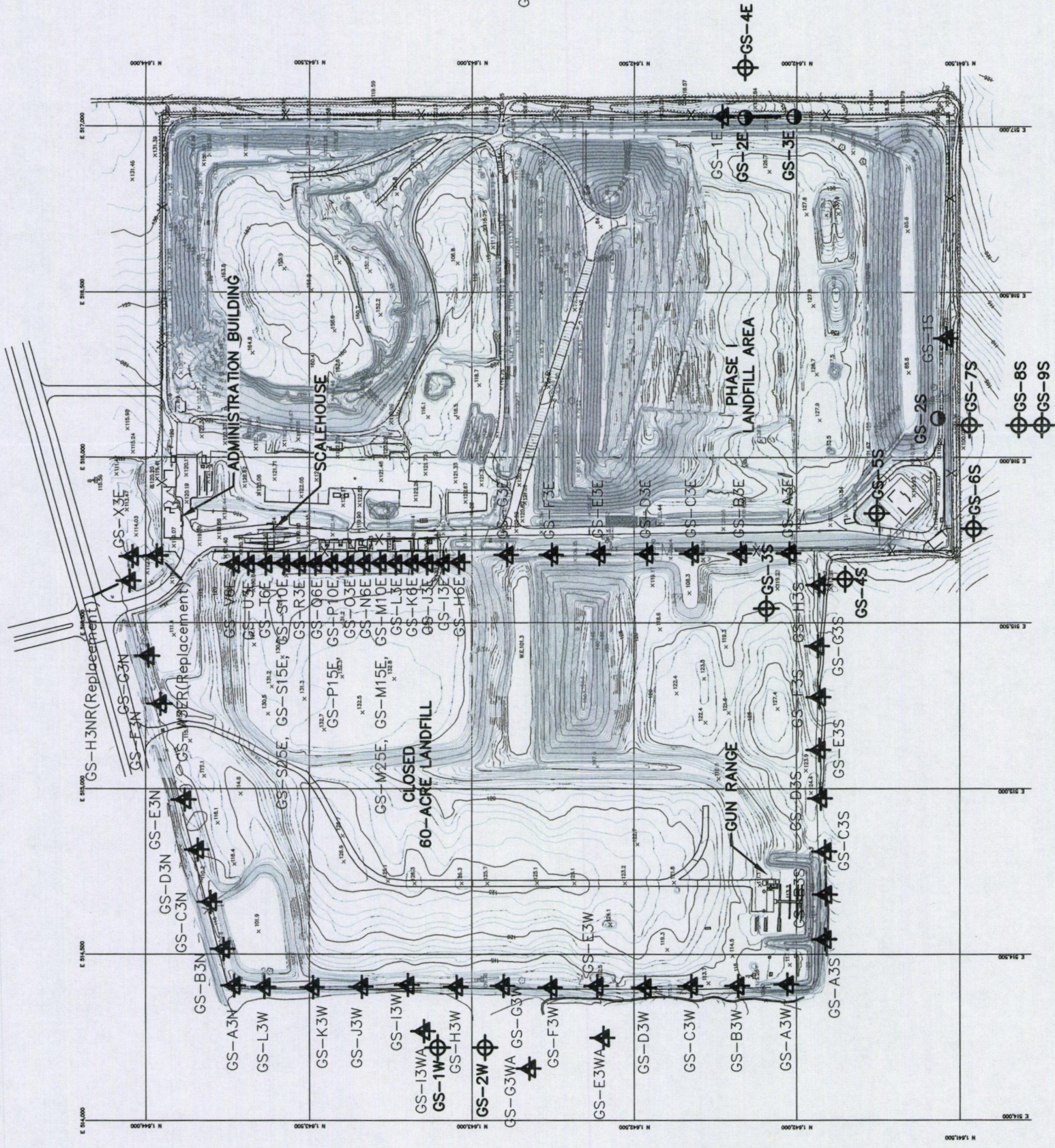


Figure 1. Existing Landfill Gas Monitoring Probe Locations, Central Landfill, Citrus County, Florida