



April 11, 2014

Jeff Koerner, PE  
Program Administrator  
Office of Permitting and Compliance  
Division of Air Resource Management  
Florida Department of Environmental Protection  
2600 Blair Stone Road MS 5500  
Tallahassee, Florida 32399-2400

RE: Putnam County Central Landfill  
Amended Design Capacity Report and NMOC Emissions Rate Report  
Jones Edmunds Project No.: 16810-174-01  
WACS ID: 37570

Dear Mr. Koerner:

The Putnam County Sanitation Department (PCSD) owns and operates the Putnam County Central Landfill (PCCL). On January 13, 2014, the FDEP Solid Waste Section issued a solid waste permit to vertically and laterally expand the facility's Active Class I Phase II Landfill by 21.5 acres. The expansion is expected to be constructed beginning in January 2015 and will cause the facility to exceed the 2.5-million-megagram design capacity threshold. On behalf of the PCSD, Jones Edmunds & Associates, Inc. is providing the following information for PCCL:

1. An Amended Design Capacity Report in accordance with 40 CFR 60.757(a)(3).
2. Nonmethane Organic Compound (NMOC) Emission Rate Reports:
  - a. A NMOC Tier I Emission Rate Report in accordance with 40 CFR 60.754(a)(2).
  - b. A NMOC Tier II emission rate report in accordance with 40 CFR 60.757(b)(1).

#### **Amended Design Capacity Report**

This letter is being submitted as an Amended Design Capacity Report in accordance with 40 CFR 60.757(a)(3). Table 1 shows that the existing design capacity was approximately 2.0 million megagrams and that the expansion adds an additional 2.1 million megagrams of waste to the facility's design capacity.

Table 1 Proposed Design Capacity				
Landfill	Year Opened	Year Stopped Accepting Waste	Waste Mass [tn]	Waste Mass [Mg]
<b>Existing Design Capacity</b>				
Class I Phase I Landfill	1972	1991	407,337	369,455
Class I Phase II Landfill	1991	2016	1,472,528	1,335,583
Class III Landfill	1992	2005	270,850	245,661
<i>Subtotal</i>			<i>2,150,715</i>	<i>1,950,699</i>
Proposed Class I Phase II Landfill Expansion	2015	2044	2,282,500	2,070,228
<b>Total</b>			<b>4,433,215</b>	<b>4,020,926</b>

With this expansion, the facility has a total design capacity of approximately 4.0 million megagrams. We estimate that approximately 400,000 cubic yards of the landfill expansion capacity will be used to relocate in-place waste that is excavated from the Phase I Landfill mining project. However, the design capacity will still exceed the 2.5-million-megagram threshold. As a result, this site is subject to the NMOC emission rate calculation requirements of 40 CFR 60, Subpart WWW, and triggers a Tier I NMOC Emission rate report requirement, which is included below.

**NMOC Emission Rate Report (Tier I and Tier II)**

The design capacity expansion triggered the Tier I NMOC Emission Rate Report requirement, which is included below in accordance with 40 CFR 60.754(a)(2). Attachment 1 provides the LandGEM calculations showing the results of the Tier I NMOC calculations (based on the Clean Air Act [CAA] conventional NMOC emission factor of 4,000 NMOC parts per million by volume [ppmv] as hexane) for the three landfills and summed to determine the facility-wide NMOC emission rate. Table 2 summarizes the results. The peak NMOC emission rate based on the Tier I analysis during the next 5 years is 245 megagrams per year (Mg/yr) in 2019.

Table 2 Tier I NMOC Emission Rate 5-year Estimate [Mg/yr]					
Landfill	2015	2016	2017	2018	2019
Class I Phase I Landfill	18	17	17	16	15
Class I Phase II Landfill	180	187	193	199	205
Class III Landfill	31	30	28	27	25
<b>Total</b>	<b>229</b>	<b>234</b>	<b>238</b>	<b>242</b>	<b>245</b>

As Table 2 shows, the Tier I NMOC emissions calculations reveal that the PCCL emits more than 50 Mg/yr of NMOCs based on the CAA convention emission factors. Since the calculated NMOC emission rate is equal to or greater than 50 Mg/yr, PCSD will comply with 40 CFR

60.752(b)(2) or determine a site-specific NMOC concentration and recalculate in accordance with 40 CFR 60.757(b)(1).

The site-specific NMOC concentrations determined through Tier II sampling and analysis were used to recalculate the NMOC emission rate using the procedures provided in 40 CFR 60.754(a)(3). The annual NMOC emission rate was calculated for the three landfills and summed to determine the facility-wide NMOC emission rate. Attachment 1 provides the LandGEM Summary Reports for each landfill. Table 3 summarizes the results. The peak NMOC emission rate based on the Tier II analysis during the next 5 years is 7.9 Mg/yr in 2019.

Landfill	2015	2016	2017	2018	2019
Class I Phase I Landfill	0.5	0.5	0.5	0.4	0.4
Class I Phase II Landfill	6.2	6.4	6.6	6.8	7.0
Class III Landfill	0.6	0.6	0.5	0.5	0.5
<b>Total</b>	<b>7.3</b>	<b>7.5</b>	<b>7.6</b>	<b>7.7</b>	<b>7.9</b>

Based on the Tier II sampling and analysis and the NMOC emission rate calculation provided in this letter, the PCCL is not required to design, install, and operate a collection and control system in accordance with 40 CFR 60, Subpart WWW. These calculations demonstrate that the NMOC mass emission rates will be less than 50 Mg/yr in each of the next 5 consecutive years. PCSD is submitting this report as a periodic estimate of the emission rate and will conduct additional Tier II sampling and analysis before January 6, 2019, to determine the site-specific NMOC concentration in accordance with 40 CFR 60.754(a)(3)(iii).

In accordance with 40 CFR 60.752(c)(2), we are submitting an Initial Air Operation Permit Application for PCCL under separate cover concurrently with this letter.

If you have any questions or comments, please contact me at (352) 377-5821 or [hsboudreau@jonesedmunds.com](mailto:hsboudreau@jonesedmunds.com).

Sincerely,



Hal Boudreau, PE  
Project Manager

**ATTACHMENT 1**

**EMISSIONS REPORT  
(TIER I AND TIER II)**

# TECHNICAL MEMORANDUM



## PUTNAM COUNTY CENTRAL LANDFILL TITLE V PERMITTING

**TO:** Project File

**FROM:** Hal Boudreau, PE

**DATE:** April 11, 2014

**SUBJECT:** NMOC Emission Rate Report (Tier I and Tier II)

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The Putnam County Sanitation Department (PCSD) owns and operates the Putnam County Central Landfill (PCCL) near Palatka, Florida. The PCCL recently became subject to the Nonmethane Organic Compound (NMOC) emission rate calculation requirements of 40 CFR 60, Subpart WWW, with its 2014 landfill expansion permit when the facility's design capacity exceeded 2.5 million megagrams.

On behalf of the PCSD, Jones Edmunds & Associates, Inc. is submitting the results of recent Tier I NMOC emission rate calculations as well as Tier II sampling, analysis, and NMOC emission rate calculations for the PCCL.

### 1.0 BACKGROUND

The PCCL is comprised of the closed Class I Phase I landfill, the active Class I Phase II landfill, and the closed Class III landfill. Phase I is an unlined Class I landfill that accepted waste from 1972 until final closure was completed in September 1991. The site is separated from the active Phase II landfill by an access road. The approximately 100-acre site was closed with a clay cap. Reports by PCSD employees indicate that Phase I was originally operated as a trench-and-fill landfill; the size of the trenches was estimated to be approximately 50 feet wide and 10 feet deep on average, with approximately 20 feet of existing soil left in place between each trench. However, no survey data exist for these trenches, and a precise and reliable estimate of the total waste volume is not achievable. The Class I Phase II landfill is a lined facility that began accepting municipal solid waste in 1991 and is still active. The closed Class III landfill accepted a combination of processed tires, horticultural and yard waste, and industrial waste from approximately 1992 to 2005. The site was officially closed in 2007.

### 2.0 EMISSION RATE REPORT INPUT PARAMETERS

With the exception of the NMOC concentration, the same parameters were used for the Tier I and the Tier II NMOC emission rate calculations as discussed below.

## 2.1 LANDGEM PARAMETERS

US Environmental Protection Agency's Landfill Gas Emissions Model (LandGEM, Version 3.02) was used to calculate the NMOC emission rate. The LandGEM user input parameters include methane generation rate ( $k$ ), potential methane generation capacity ( $L_o$ ), NMOC concentration ( $C_{NMOC}$ ), methane content, and historical and projected waste acceptance rates. The parameters used in LandGEM were the Clean Air Act (CAA) inventory values as specified in 40 CFR 60.754(a)(1):

- $k = 0.05$  per year.
- $L_o = 170$  cubic meters per megagram.
- Methane content = 50%.

The Tier I analysis used the CAA conventional NMOC emission factor of 4,000 NMOC parts per million by volume (ppmv) as hexane. The Tier II sampling and analysis used site-specific NMOC concentrations for each landfill.

## 2.2 WASTE ACCEPTANCE RATES

### 2.2.1 Historic Waste Disposal

PCSD's historical waste acceptance data for each landfill were reviewed as part of the NMOC emission rate calculation. Scale records were not available for the life of the site, so population estimates were used for years when scale records were not available.

Jones Edmunds estimated the waste acceptance rates from 1972 to 2000 using the methodology provided in 40 CFR 98 Subpart HH-Municipal Solid Waste Landfills Section 98.343 'population projection' calculation method as prescribed below:

40 CFR Part 98.343(a)(4): For years prior to reporting for which waste disposal quantities are not readily available,  $W_x$  [Annual Waste Disposal] shall be estimated using one of the applicable methods in paragraphs (a)(4)(i) through (a)(4)(iii) of this section. You must determine which method is most applicable to the conditions and disposal history of your facility and use that method to estimate waste disposal quantities.

(a)(4)(ii): Use the estimated population served by the landfill each year, the values for national average per capita waste generation, and fraction of generated waste disposed of in solid waste disposal sites found in Table HH-2 of this subpart, and calculate the waste quantity landfilled using Equation HH-2 of this section.

The population estimates were based on US Census Data for Putnam County from 1970, 1980, 1990, and 2000; intermediate years were interpolated.

Historical waste acceptance rates from 2001 through 2013 are based on actual scale records. Table 1 summarizes historical waste acceptance rates based on these two methods.

Table 1 Historical Waste Disposal					
Estimate Source	Year	Waste Accepted (Short Tons/year)			
		Phase I	Phase II	Class III	Total
Population Based Waste Estimates (1972-2000)	1972	15,101	0	0	15,101
	1973	15,875	0	0	15,875
	1974	16,433	0	0	16,433
	1975	17,230	0	0	17,230
	1976	18,043	0	0	18,043
	1977	18,617	0	0	18,617
	1978	19,454	0	0	19,454
	1979	20,306	0	0	20,306
	1980	20,895	0	0	20,895
	1981	21,782	0	0	21,782
	1982	22,685	0	0	22,685
	1983	23,301	0	0	23,301
	1984	24,228	0	0	24,228
	1985	25,171	0	0	25,171
	1986	25,803	0	0	25,803
	1987	26,770	0	0	26,770
	1988	27,410	0	0	27,410
	1989	25,035	0	0	25,035
	1990	23,197	0	0	23,197
	1991	0	42,870	0	42,870
1992	0	24,273	7,811	32,084	
1993	0	24,764	7,969	32,734	
1994	0	23,255	7,483	30,738	
1995	0	20,609	6,632	27,242	
1996	0	20,159	12,974	33,133	
1997	0	20,270	13,046	33,317	
1998	0	22,131	14,243	36,374	
1999	0	21,936	14,118	36,054	
2000	0	24,201	15,576	39,777	
Actual Scale Records (2001-2013)	2001	0	35,741	16,126	51,867
	2002	0	38,951	12,792	51,744
	2003	0	58,061	45,491	103,552
	2004	0	75,820	62,780	138,600
	2005	0	57,110	33,808	90,918
	2006	0	99,174	0	99,174
	2007	0	97,254	0	97,254
	2008	0	86,890	0	86,890
	2009	0	77,143	0	77,143
	2010	0	72,433	0	72,433
	2011	0	74,524	0	74,524
	2012	0	70,760	0	70,760
	2013	0	66,670	0	66,670
	<b>Total In-Place</b>		<b>407,337</b>	<b>1,088,328</b>	<b>270,850</b>

## 2.2.2 Projected Waste Disposal

The projected waste acceptance rates for each landfill were estimated based on recent waste acceptance rates, an assumed annual growth rate, and the remaining capacity of each cell. The projected waste acceptance rates were calculated using typical values for apparent density for each landfill and an annual waste acceptance rate increase that is consistent with projected population growth. We estimated that approximately 400,000 cubic yards (CY) of the landfill

expansion capacity will be used to relocate in-place waste that is excavated from the Phase I landfill mining project, and that tonnage is not included in the projected waste disposal. The calculations and assumptions are provided in Exhibit 1 and summarized through 2044 in Table 2.

Table 2 Projected Waste Disposal					
Estimate Source	Year	Waste Accepted (Short Tons/year)			
		Phase I	Phase II	Class III	Total
Projected Waste Acceptance (2014-2044)	2014	0	70,129	0	70,129
	2015	0	70,259	0	70,259
	2016	0	70,483	0	70,483
	2017	0	70,708	0	70,708
	2018	0	70,934	0	70,934
	2019	0	71,161	0	71,161
	2020	0	71,389	0	71,389
	2021	0	71,617	0	71,617
	2022	0	71,846	0	71,846
	2023	0	72,075	0	72,075
	2024	0	72,306	0	72,306
	2025	0	72,537	0	72,537
	2026	0	72,769	0	72,769
	2027	0	73,002	0	73,002
	2028	0	73,235	0	73,235
	2029	0	73,469	0	73,469
	2030	0	73,704	0	73,704
	2031	0	73,939	0	73,939
	2032	0	74,176	0	74,176
	2033	0	74,413	0	74,413
	2034	0	74,651	0	74,651
	2035	0	74,889	0	74,889
	2036	0	75,129	0	75,129
	2037	0	75,369	0	75,369
	2038	0	75,610	0	75,610
	2039	0	75,852	0	75,852
	2040	0	76,094	0	76,094
	2041	0	76,337	0	76,337
	2042	0	76,581	0	76,581
	2043	0	76,826	0	76,826
	2044	0	30,909	0	30,909
<b>Total Projected</b>		<b>0</b>	<b>2,232,399</b>	<b>0</b>	<b>2,232,399</b>

### 3.0 TIER I ANALYSIS

The design capacity expansion triggered the Tier I NMOC emission rate report requirement, which is included below in accordance with 40 CFR 60.754(a)(2). Exhibit 2 provides the LandGEM calculations showing the results of the Tier I NMOC calculations (based on the CAA conventional NMOC emission factor of 4,000 NMOC ppmv as hexane) for the three landfills and summed to determine the facility-wide NMOC emission rate. Table 3 and Figure 1 summarize the results. The peak NMOC emission rate based on the Tier I analysis during the next 5 years is 245 megagrams per year (Mg/yr) in 2019.



Landfill	2015	2016	2017	2018	2019
Class I Phase I Landfill	18	17	17	16	15
Class I Phase II Landfill	180	187	193	199	205
Class III Landfill	31	30	28	27	25
<b>Total</b>	<b>229</b>	<b>234</b>	<b>238</b>	<b>242</b>	<b>245</b>

As Table 1 shows, the Tier I NMOC emissions calculations reveal that the PCCL emits more than 50 Mg/yr of NMOCs based on the CAA convention emission factors. Since the calculated NMOC emission rate is equal to or greater than 50 Mg/yr, PCSD will comply with 40 CFR 60.752(b)(2) or determine a site-specific NMOC concentration and recalculate in accordance with 40 CFR 60.757(b)(1).

#### 4.0 TIER II SAMPLING AND ANALYSIS

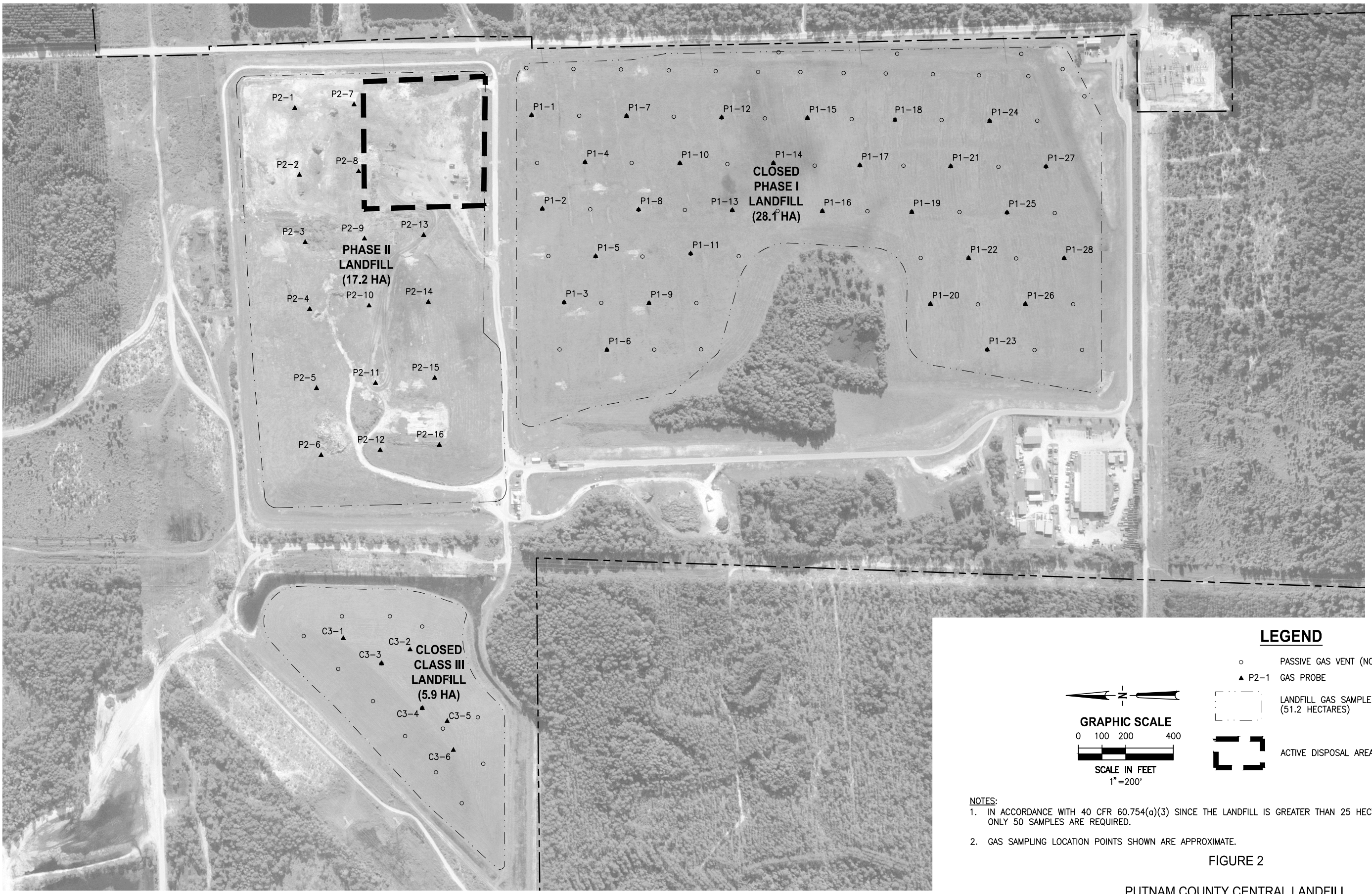
In accordance with 40 CFR 60.754(a)(2)(ii), PCSD elected to determine a site-specific NMOC concentration and recalculate the NMOC emissions rate. Tier II sampling and analysis were performed in accordance with 40 CFR 60.754(a)(3) at the PCCL by TRC Air Measurements.

#### 4.1 SAMPLING

Samples were obtained from 50 locations in the Class I Phase I landfill, Class I Phase II landfill, and Class III landfill from January 6, 2014, through January 13, 2014, and results were submitted to FDEP on February 27, 2014. Sample probes were installed in areas of the landfills that have retained waste for at least 2 years at a frequency of at least two sample probes per hectare. Figure 2 shows the probe locations, and Table 4 provides the landfill areas and number of samples. Since the total size of the landfill was greater than 25 hectares, a maximum total of 50 sample locations were selected for sampling in accordance with 40 CFR 60.754(a)(3).

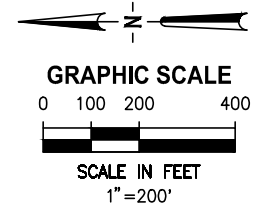
16810-174-01

LAST SAVED: 4/10/2014 7:20 PM BY: HSBOUDREAU PATH=\\JEACAD\DRAWING\16810 PUTNAM COUNTY\174 TITLE V PERMITTING SERVICES\FIGURES\16810174-FIG2.DWG PLOTTED: 4/10/2014 07:20 PM BY: HAL S. BOUDREAU



**LEGEND**

- PASSIVE GAS VENT (NO SAMPLE)
- ▲ P2-1 GAS PROBE
- LANDFILL GAS SAMPLE AREA (51.2 HECTARES)
- ▣ ACTIVE DISPOSAL AREA



- NOTES:**
1. IN ACCORDANCE WITH 40 CFR 60.754(a)(3) SINCE THE LANDFILL IS GREATER THAN 25 HECTARES ONLY 50 SAMPLES ARE REQUIRED.
  2. GAS SAMPLING LOCATION POINTS SHOWN ARE APPROXIMATE.

FIGURE 2

PUTNAM COUNTY CENTRAL LANDFILL

Landfill	Area [ha]	No. Sample Probes
Class I Phase I landfill	28.1	28
Class I Phase II landfill	17.2	16
Class III landfill	5.9	6
<b>Total</b>	<b>51.2</b>	<b>50</b>

Samples were collected in accordance with US Environmental Protection Agency Method 25C. Landfill gas was collected from three sample locations and combined into a composite sample. A total of 16 composite sample canisters from 48 sample locations were collected. An additional two samples were collected from individual (single point) sample locations. Canisters were analyzed by Air Technology Laboratories, Inc. according to Methods 3C and 25C. The results of these analyses are provided in the February 26, 2014, *Test Report Landfill Tier II Sampling for Landfill Gas NMOC Analysis*, prepared by TRC and provided in Exhibit 3. Table 5 provides the results of the Tier II sampling and analysis with the weighted average (based on number of samples per canister) and maximum NMOC concentration for each landfill.

Canister Sample Locations	NMOC [ppmv Hexane]	Weighted Average NMOC [ppmv Hexane]	Maximum NMOC [ppmv Hexane]	NMOC Permitting Value [ppmv Hexane]
<b>Class I – Phase I Landfill (28 Sample Locations)</b>				
Phase 1 6-3-2	57.4	85.6	111.5	112
Phase 1 4-8-23	Invalid			
Phase 1 26-21-15	Invalid			
Phase 1 27-25-22	99.3			
Phase 1 1-12-10	104.4			
Phase 1 5-7-9	79.7			
Phase 1 11-13-14	57.7			
Phase 1 17-16-19	90.5			
Phase 1 18-24-28	101.3			
Phase 1 20	111.5			
<b>Class I – Phase II Landfill (16 Sample Locations)</b>				
Phase 2 7-2-1	205.8	137.1	205.8	137
Phase 2 4-3-9	165			
Phase 2 11-5-6	128.7			
Phase 2 8-15-10	83.3			
Phase 2 12-14-13	117.8			
Phase 2 16	91.8			
<b>Class III Landfill (6 Sample Locations)</b>				
Class 3 2-4-3	91.3	77.8	91.3	78
Class 3 1-6-5	64.3			

Because the waste in the Phase I landfill area is 24 to 42 years old and was placed using a trench-and-fill method, we experienced significant problems getting a complete set of valid samples. First TRC tested the 77 existing passive vents in the Phase I and Class III landfills for samples and discovered that:

No landfill gas was being generated from these passive gas vents, potentially due to the old age of these sections.

Then sample probes were placed and tested for Nitrogen (N<sub>2</sub>) and Oxygen (O<sub>2</sub>) before sampling; however, as discussed in the Tier II testing report:

For six sample locations, the portable landfill gas analyzer indicated that either the N<sub>2</sub> concentration was less than 20% or that the O<sub>2</sub> concentration was less than 5% after placement of the probes. However, following the 24 hour stabilization period, the portable landfill gas analyzer indicated that no landfill gas was being generated from these locations.

Jones Edmunds and TRC spent over 1 week attempting to get a complete set of valid samples but were unable to get a complete set for the Phase I landfill:

Upon notification to FDEP, these samples were analyzed as per their directions. As noted in the Summary of Results section, the NMOC corrected results were negative and therefore, considered invalid samples.

Because of two invalid samples in the Phase I landfill as a result of the age and placement method of the waste, Jones Edmunds proposes using the maximum NMOC concentration found in the Phase I area of 112 parts per million (ppm) instead of the average of 85.6 ppm for conservative permitting purposes as shown in Table 5.

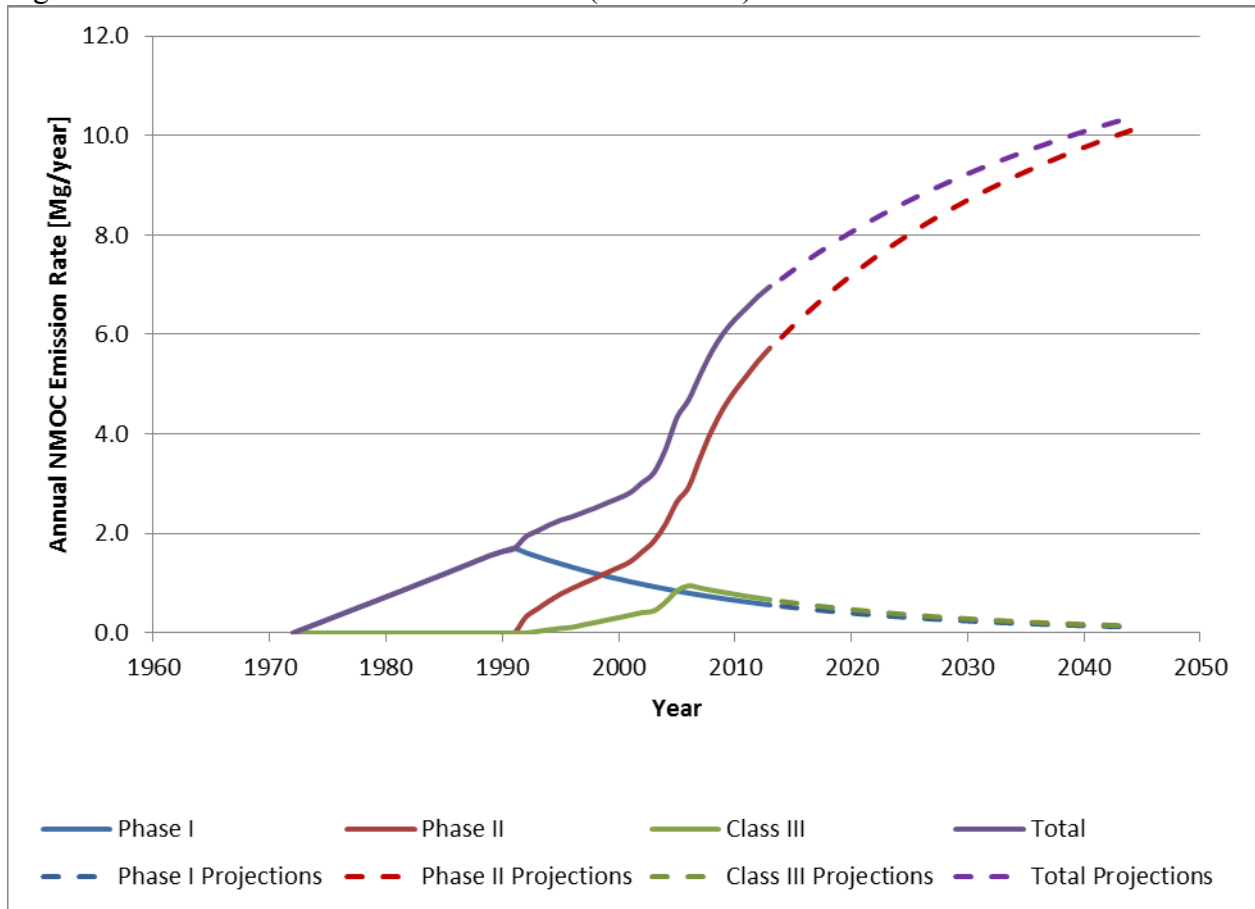
#### 4.2 EMISSION RATE CALCULATION

The site-specific NMOC concentrations determined through Tier II sampling and analysis were used to recalculate the NMOC emission rate using the procedures provided in 40 CFR 60.754(a)(3). The annual NMOC emission rate was calculated for the three landfills and summed to determine the facility-wide NMOC emission rate. Exhibit 4 provides the LandGEM Summary Reports for each landfill. Table 6 and Figure 3 summarize the results. The peak NMOC emission rate based on the Tier II analysis during the next 5 years is 7.9 Mg/yr in 2019.

In accordance with 40 CFR 60.754(a)(3)(iii), PCSD is required to retest the site-specific NMOC concentration every 5 years using the methods specified in that section. Additional Tier II sampling and analysis will be required by January 6, 2019.

Table 6 Tier II NMOC Rate 5-year Estimate [Mg/yr]						
Landfill	NMOC Permitting Value [ppmv Hexane]	Year				
		2015	2016	2017	2018	2019
Class I Phase I Landfill	112	0.5	0.5	0.5	0.4	0.4
Class I Phase II Landfill	137	6.2	6.4	6.6	6.8	7.0
Class III Landfill	78	0.6	0.6	0.5	0.5	0.5
<b>Total</b>		<b>7.3</b>	<b>7.5</b>	<b>7.6</b>	<b>7.7</b>	<b>7.9</b>

Figure 3 Tier II NMOC Emission Rate (1972–2044)



## 5.0 SUMMARY AND CONCLUSIONS

Based on the Tier II sampling and analysis and the NMOC emission rate calculation provided in this technical memo, the PCCL is not required to design, install, and operate a collection and control system in accordance with 40 CFR 60, Subpart WWW. These calculations demonstrate that the NMOC mass emission rates will be less than 50 megagrams per year in each of the next 5 consecutive years. PCSD is submitting this report as a periodic estimate of the emission rate and will conduct additional Tier II sampling and analysis before January 6, 2019, to determine the site-specific NMOC concentration in accordance with 40 CFR 60.754(a)(3)(iii).

## **EXHIBIT 1**

# **WASTE ACCEPTANCE RATES**



PROJECT NUMBER: 16810-174-01 SHEET: 1 OF 3  
 PROJECT NAME: PCCL TITLE V INITIAL APPLICATION  
 SUBJECT: WASTE ACCEPTANCE RATE CALCS  
 BY: HBOUDREAU DATE: 4/7/2014  
 CHECKED BY: SROQUE DATE: 4/11/2014

**Table 1: Historic Disposal Tonnages**

Year	WGR	%SWDS	Population (Pop)	Total Waste Accepted (metric ton)	Total Waste Accepted (short ton)	Putnam Central Landfill (short ton)			Huntington & Interlachen Landfill (short ton)	Source
						Phase I	Phase II	Class III		
1972	0.70	100	39,142	27,399	30,202	15,101	0	0	15,101	Based on Population Data
1973	0.71	100	40,568	28,803	31,750	15,875	0	0	15,875	Based on Population Data
1974	0.71	100	41,994	29,815	32,866	16,433	0	0	16,433	Based on Population Data
1975	0.72	100	43,420	31,262	34,460	17,230	0	0	17,230	Based on Population Data
1976	0.73	100	44,845	32,737	36,086	18,043	0	0	18,043	Based on Population Data
1977	0.73	100	46,271	33,778	37,234	18,617	0	0	18,617	Based on Population Data
1978	0.74	100	47,697	35,296	38,907	19,454	0	0	19,454	Based on Population Data
1979	0.75	100	49,123	36,842	40,612	20,306	0	0	20,306	Based on Population Data
1980	0.75	100	50,549	37,912	41,791	20,895	0	0	20,895	Based on Population Data
1981	0.76	100	52,001	39,521	43,564	21,782	0	0	21,782	Based on Population Data
1982	0.77	100	53,453	41,159	45,370	22,685	0	0	22,685	Based on Population Data
1983	0.77	100	54,905	42,277	46,602	23,301	0	0	23,301	Based on Population Data
1984	0.78	100	56,357	43,959	48,456	24,228	0	0	24,228	Based on Population Data
1985	0.79	100	57,810	45,670	50,342	25,171	0	0	25,171	Based on Population Data
1986	0.79	100	59,262	46,817	51,606	25,803	0	0	25,803	Based on Population Data
1987	0.80	100	60,714	48,571	53,540	26,770	0	0	26,770	Based on Population Data
1988	0.80	100	62,166	49,733	54,821	27,410	0	0	27,410	Based on Population Data
1989	0.85	84	63,618	45,423	50,070	25,035	0	0	25,035	Based on Population Data
1990	0.84	77	65,070	42,087	46,393	23,197	0	0	23,197	Based on Population Data
1991	0.78	76	65,605	38,891	42,870	0	42,870	0	0	Based on Population Data
1992	0.76	72	66,141	36,192	39,895	0	32,084	7811	0	Based on Population Data
1993	0.78	71	66,676	36,925	40,703	0	32,734	7969	0	Based on Population Data
1994	0.77	67	67,211	34,674	38,222	0	30,739	7483	0	Based on Population Data
1995	0.72	63	67,747	30,730	33,874	0	27,242	6632	0	Based on Population Data
1996	0.71	62	68,282	30,058	33,133	0	20,159	12974	0	Based on Population Data
1997	0.72	61	68,817	30,224	33,317	0	20,271	13046	0	Based on Population Data
1998	0.78	61	69,352	32,998	36,374	0	22,131	14243	0	Based on Population Data
1999	0.78	60	69,888	32,707	36,054	0	21,936	14118	0	Based on Population Data
2000	0.84	61	70,423	36,085	39,777	0	24,202	15575	0	Based on Population Data
2001	-	-	70,808	47,053	51,867	0	35,741	16,126	0	Based on Scale Records
2002	-	-	71,194	46,941	51,744	0	38,951	12,792	0	Based on Scale Records
2003	-	-	71,583	93,941	103,552	0	58,061	45,491	0	Based on Scale Records
2004	-	-	71,974	125,736	138,600	0	75,820	62,780	0	Based on Scale Records
2005	-	-	72,367	82,480	90,918	0	57,110	33,808	0	Based on Scale Records
2006	-	-	72,762	89,969	99,174	0	99,174	0	0	Based on Scale Records
2007	-	-	73,159	88,228	97,254	0	97,254	0	0	Based on Scale Records
2008	-	-	73,559	78,825	86,890	0	86,890	0	0	Based on Scale Records
2009	-	-	73,960	69,983	77,143	0	77,143	0	0	Based on Scale Records
2010	-	-	74,364	65,710	72,433	0	72,433	0	0	Based on Scale Records
2011	-	-	74,629	67,607	74,524	0	74,524	0	0	Based on Scale Records
2012	-	-	74,896	64,192	70,760	0	70,760	0	0	Based on Scale Records
2013	-	-	75,163	60,482	66,670	0	66,670	0	0	Based on Scale Records





PROJECT NUMBER: 16810-174-01 SHEET: 2 OF 3  
 PROJECT NAME: PCCL TITLE V INITIAL APPLICATION  
 SUBJECT: WASTE ACCEPTANCE RATE CALCS  
 BY: HBOUDREAU DATE: 4/7/2014  
 CHECKED BY: SROQUE DATE: 4/11/2014

**Table 2: Average Apparent Density**

Filling Period	Total Landfilled Density [lbs/CY]
1/01/1991 to 1/27/1995	889
1/27/1995 to 3/17/1998	1,023
3/17/1998 to 3/19/1999	1,419
3/20/1999 to 5/16/2000	1,385
5/16/2000 to 2/21/2001	1,418
2/21/2001 to 5/14/2002	1,361
5/14/2002 to 4/3/2003	1,259
4/3/2003 to 3/24/2004	1,340
3/24/2004 to 3/30/2005	1,244
3/30/2005 to 9/23/2006	915
9/23/2006 to 8/5/2007	949
8/5/2007 to 6/12/2008	1,325
9/10/2010 to 7/24/2011	937
6/3/2012 to 6/13/2013	1,117
<b>Avg Annual Density (1/1/91)</b>	<b>1,184</b>



PROJECT NUMBER: 16810-174-01 SHEET: 3 OF 3  
 PROJECT NAME: PCCL TITLE V INITIAL APPLICATION  
 SUBJECT: WASTE ACCEPTANCE RATE CALCS  
 BY: HBOUDREAU DATE: 4/7/2014  
 CHECKED BY: SROUQUE DATE: 4/10/2014

**Proposed Expansion Capacity Projections**

**Objective:** Calculate the tonnage projections and the anticipated lifespan for the Phase II landfill operations and the Phase I landfill mining cells.

**Data:**

Average Apparent Density =  $\gamma =$

BEBR Population Projections =

2012 Incoming County Waste Acceptance Rate =

2013 Remaining Disposal Volume (June 2013) =

Landfill Mining "Overs" Percentage by Volume =

0.55	Tons/CY =	1,100	lbs/CY	(Ref 1)
Medium				
70,000	Tons/Year (Rounded to nearest 1,000)			(Ref 2)
4,848,544	CY			(Ref 3)
30%	Phase II Landfill Waste Acceptance Rate/Phase I Landfill Excavation Rate			(Ref 4)

**Putnam County BEBR Population Projections**

Year	BEBR Population Projections (Reference 5)					
	Low	Percent Increase	Medium	Percent Increase	High	Percent Increase
2011	74,052		74,052		74,052	
2012	73,070	-1.3%	74,189	0.2%	75,307	1.7%
2013	72,100	-1.3%	74,325	0.2%	76,583	1.7%
2014	71,144	-1.3%	74,463	0.2%	77,880	1.7%
2015	70,200	-1.3%	74,600	0.2%	79,200	1.7%
2016	69,958	-0.3%	74,838	0.3%	79,888	0.9%
2017	69,718	-0.3%	75,078	0.3%	80,582	0.9%
2018	69,478	-0.3%	75,318	0.3%	81,282	0.9%
2019	69,238	-0.3%	75,558	0.3%	81,988	0.9%
2020	69,000	-0.3%	75,800	0.3%	82,700	0.9%

Note: 2011, 2015, and 2020 population data based on data from BEBR, all other years are interpolated.

**Putnam County Central Phase II Landfill Operations Lifespan**

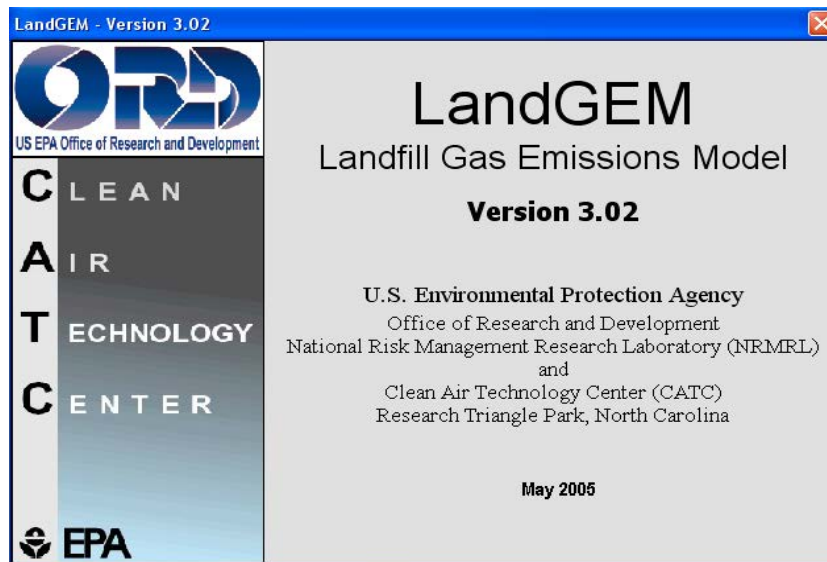
Calendar Year	Projected Growth Rate (%/yr)	Waste-Acceptance				Total Rate (CY/year)	Remaining Disposal Volume (CY)
		Incoming County Rate		Landfill Mining "Overs" Rate			
		(Tons/year)	(CY/year)	(Tons/year)	(CY/year)		
Jan - Jun 2013		35,000	63,636	0	0	63,636	4,848,544
Aug - Dec 2013		35,000	63,636	0	0	63,636	4,784,908
2014	0.2%	70,129	127,508	66,000	120,000	247,508	4,537,400
2015	0.2%	70,259	127,743	46,750	85,000	212,743	4,324,657
2016	0.3%	70,483	128,151	38,500	70,000	198,151	4,126,506
2017	0.3%	70,708	128,561	38,500	70,000	198,561	3,927,945
2018	0.3%	70,934	128,972	38,500	70,000	198,972	3,728,974
2019	0.3%	71,161	129,384	38,500	70,000	199,384	3,529,590
2020	0.3%	71,389	129,798	38,500	70,000	199,798	3,329,792
2021	0.3%	71,617	130,213	38,500	70,000	200,213	3,129,579
2022	0.3%	71,846	130,629	38,500	70,000	200,629	2,928,951
2023	0.3%	72,075	131,046	17,050	31,000	162,046	2,766,904
2024	0.3%	72,306	131,465	0	0	131,465	2,635,439
2025	0.3%	72,537	131,886	0	0	131,886	2,503,554
2026	0.3%	72,769	132,307	0	0	132,307	2,371,246
2027	0.3%	73,002	132,730	0	0	132,730	2,238,516
2028	0.3%	73,235	133,154	0	0	133,154	2,105,362
2029	0.3%	73,469	133,580	0	0	133,580	1,971,782
2030	0.3%	73,704	134,007	0	0	134,007	1,837,775
2031	0.3%	73,939	134,435	0	0	134,435	1,703,340
2032	0.3%	74,176	134,865	0	0	134,865	1,568,474
2033	0.3%	74,413	135,296	0	0	135,296	1,433,178
2034	0.3%	74,651	135,729	0	0	135,729	1,297,450
2035	0.3%	74,889	136,163	0	0	136,163	1,161,287
2036	0.3%	75,129	136,598	0	0	136,598	1,024,689
2037	0.3%	75,369	137,035	0	0	137,035	887,654
2038	0.3%	75,610	137,473	0	0	137,473	750,182
2039	0.3%	75,852	137,912	0	0	137,912	612,270
2040	0.3%	76,094	138,353	0	0	138,353	473,917
2041	0.3%	76,337	138,795	0	0	138,795	335,122
2042	0.3%	76,581	139,239	0	0	139,239	195,883
2043	0.3%	76,826	139,684	0	0	139,684	56,199
2044	0.3%	77,072	140,130	0	0	140,130	-83,931
<b>Total Lifespan from June 2013 (in years)</b>							<b>30.0</b>
<b>Anticipated Closure (Rounded up to nearest month)</b>							<b>May 2043</b>

**References:**

1. Historic average waste density in place for 2011, 2012, and 2013 capacity analysis reports.
2. 2012 Waste Quantity Tracking Annual Report by Putnam County Dated 7/2/2013 (Residential, Commercial, Industrial, Sludge).
3. 2013 Putnam County Central Landfill Capacity Analysis by Jones Edmunds Dated 7/10/2013 (June 2013).
4. Estimated based on engineering judgement
5. Projections of Florida Population by County, 2011-2040 by Bureau of Economic and Business Research (BEBR), Bulletin 162 (Revised), March 2012.

## **EXHIBIT 2**

### **TIER I CALCULATIONS**



## Summary Report

**Landfill Name or Identifier:** Tier I: PCCL Class I Phase I Landfill

**Date:** Wednesday, April 09, 2014

### Description/Comments:

#### About LandGEM:

First-Order Decomposition Rate Equation: 
$$Q_{CH_4} = \sum_{i=1}^n \sum_{j=0.1}^1 kL_o \left( \frac{M_i}{10} \right) e^{-kt_{ij}}$$

Where,

$Q_{CH_4}$  = annual methane generation in the year of the calculation ( $m^3/year$ )

$i$  = 1-year time increment

$n$  = (year of the calculation) - (initial year of waste acceptance)

$j$  = 0.1-year time increment

$k$  = methane generation rate ( $year^{-1}$ )

$L_o$  = potential methane generation capacity ( $m^3/Mg$ )

$M_i$  = mass of waste accepted in the  $i^{th}$  year ( $Mg$ )

$t_{ij}$  = age of the  $j^{th}$  section of waste mass  $M_i$  accepted in the  $i^{th}$  year (*decimal years*, e.g., 3.2 years)

LandGEM is based on a first-order decomposition rate equation for quantifying emissions from the decomposition of landfilled waste in municipal solid waste (MSW) landfills. The software provides a relatively simple approach to estimating landfill gas emissions. Model defaults are based on empirical data from U.S. landfills. Field test data can also be used in place of model defaults when available. Further guidance on EPA test methods, Clean Air Act (CAA) regulations, and other guidance regarding landfill gas emissions and control technology requirements can be found at <http://www.epa.gov/ttnatw01/landfill/landflpg.html>.

LandGEM is considered a screening tool — the better the input data, the better the estimates. Often, there are limitations with the available data regarding waste quantity and composition, variation in design and operating practices over time, and changes occurring over time that impact the emissions potential. Changes to landfill operation, such as operating under wet conditions through leachate recirculation or other liquid additions, will result in generating more gas at a faster rate. Defaults for estimating emissions for this type of operation are being developed to include in LandGEM along with defaults for conventional landfills (no leachate or liquid additions) for developing emission inventories and determining CAA applicability. Refer to the Web site identified above for future updates.

**Input Review**

## LANDFILL CHARACTERISTICS

Landfill Open Year	<b>1972</b>	
Landfill Closure Year (with 80-year limit)	<b>1990</b>	
Actual Closure Year (without limit)	<b>1990</b>	
Have Model Calculate Closure Year?	<b>No</b>	
Waste Design Capacity		<i>short tons</i>

## MODEL PARAMETERS

Methane Generation Rate, k	<b>0.050</b>	<i>year<sup>-1</sup></i>
Potential Methane Generation Capacity, L <sub>0</sub>	<b>170</b>	<i>m<sup>3</sup>/Mg</i>
NMOC Concentration	<b>4,000</b>	<i>ppmv as hexane</i>
Methane Content	<b>50</b>	<i>% by volume</i>

## GASES / POLLUTANTS SELECTED

Gas / Pollutant #1:	<b>Total landfill gas</b>
Gas / Pollutant #2:	<b>Methane</b>
Gas / Pollutant #3:	<b>Carbon dioxide</b>
Gas / Pollutant #4:	<b>NMOC</b>

## WASTE ACCEPTANCE RATES

Year	Waste Accepted		Waste-In-Place	
	(Mg/year)	(short tons/year)	(Mg)	(short tons)
1972	13,728	15,101	0	0
1973	14,432	15,875	13,728	15,101
1974	14,939	16,433	28,160	30,976
1975	15,664	17,230	43,099	47,409
1976	16,403	18,043	58,763	64,639
1977	16,924	18,617	75,166	82,683
1978	17,685	19,454	92,090	101,300
1979	18,460	20,306	109,776	120,753
1980	18,996	20,895	128,235	141,059
1981	19,802	21,782	147,231	161,954
1982	20,623	22,685	167,033	183,736
1983	21,183	23,301	187,656	206,421
1984	22,026	24,228	208,839	229,722
1985	22,883	25,171	230,864	253,951
1986	23,457	25,803	253,747	279,122
1987	24,336	26,770	277,204	304,925
1988	24,919	27,410	301,541	331,695
1989	22,759	25,035	326,459	359,105
1990	21,088	23,197	349,219	384,140
1991	0	0	370,306	407,337
1992	0	0	370,306	407,337
1993	0	0	370,306	407,337
1994	0	0	370,306	407,337
1995	0	0	370,306	407,337
1996	0	0	370,306	407,337
1997	0	0	370,306	407,337
1998	0	0	370,306	407,337
1999	0	0	370,306	407,337
2000	0	0	370,306	407,337
2001	0	0	370,306	407,337
2002	0	0	370,306	407,337
2003	0	0	370,306	407,337
2004	0	0	370,306	407,337
2005	0	0	370,306	407,337
2006	0	0	370,306	407,337
2007	0	0	370,306	407,337
2008	0	0	370,306	407,337
2009	0	0	370,306	407,337
2010	0	0	370,306	407,337
2011	0	0	370,306	407,337

## WASTE ACCEPTANCE RATES (Continued)

Year	Waste Accepted		Waste-In-Place	
	(Mg/year)	(short tons/year)	(Mg)	(short tons)
2012	0	0	370,306	407,337
2013	0	0	370,306	407,337
2014	0	0	370,306	407,337
2015	0	0	370,306	407,337
2016	0	0	370,306	407,337
2017	0	0	370,306	407,337
2018	0	0	370,306	407,337
2019	0	0	370,306	407,337
2020	0	0	370,306	407,337
2021	0	0	370,306	407,337
2022	0	0	370,306	407,337
2023	0	0	370,306	407,337
2024	0	0	370,306	407,337
2025	0	0	370,306	407,337
2026	0	0	370,306	407,337
2027	0	0	370,306	407,337
2028	0	0	370,306	407,337
2029	0	0	370,306	407,337
2030	0	0	370,306	407,337
2031	0	0	370,306	407,337
2032	0	0	370,306	407,337
2033	0	0	370,306	407,337
2034	0	0	370,306	407,337
2035	0	0	370,306	407,337
2036	0	0	370,306	407,337
2037	0	0	370,306	407,337
2038	0	0	370,306	407,337
2039	0	0	370,306	407,337
2040	0	0	370,306	407,337
2041	0	0	370,306	407,337
2042	0	0	370,306	407,337
2043	0	0	370,306	407,337
2044	0	0	370,306	407,337
2045	0	0	370,306	407,337
2046	0	0	370,306	407,337
2047	0	0	370,306	407,337
2048	0	0	370,306	407,337
2049	0	0	370,306	407,337
2050	0	0	370,306	407,337
2051	0	0	370,306	407,337

**Pollutant Parameters**

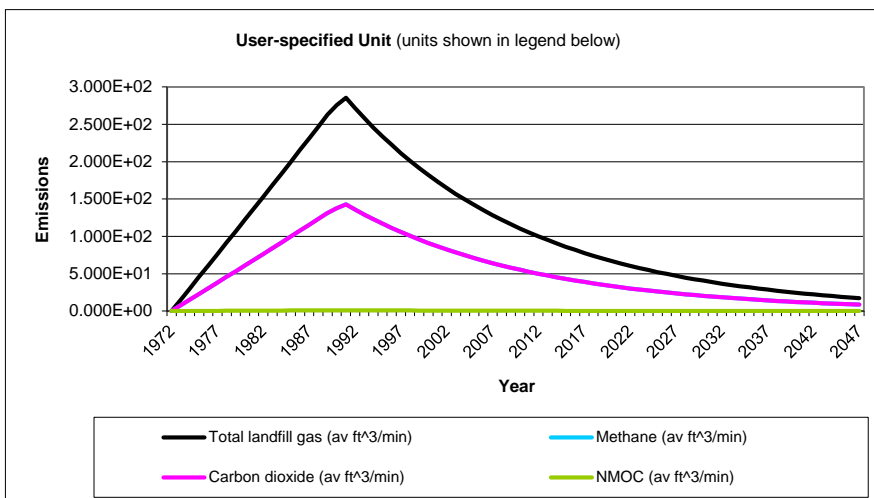
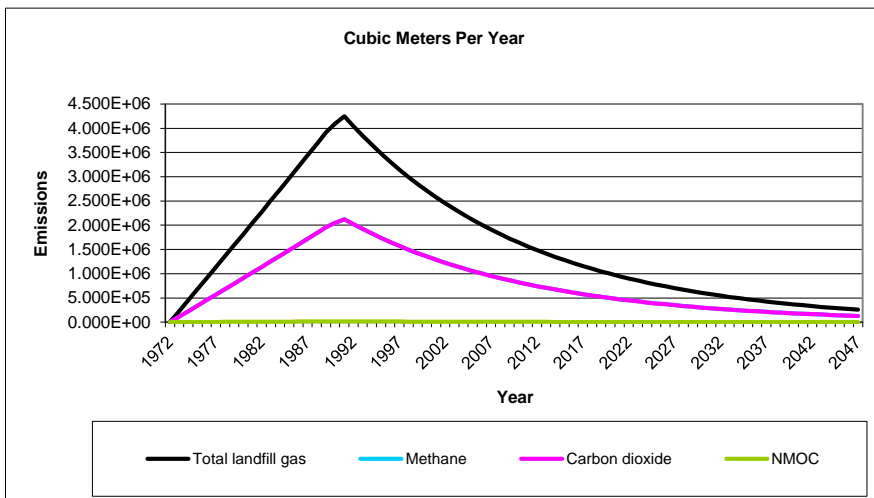
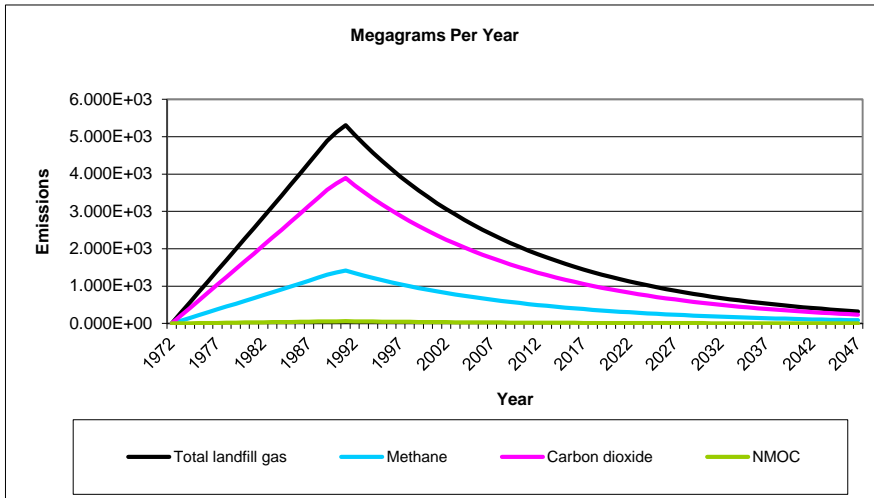
<b>Gas / Pollutant Default Parameters:</b>				<b>User-specified Pollutant Parameters:</b>	
	Compound	Concentration (ppmv)	Molecular Weight	Concentration (ppmv)	Molecular Weight
<b>Gases</b>	Total landfill gas		0.00		
	Methane		16.04		
	Carbon dioxide		44.01		
	NMOC	4,000	86.18		
<b>Pollutants</b>	1,1,1-Trichloroethane (methyl chloroform) - HAP	0.48	133.41		
	1,1,2,2-Tetrachloroethane - HAP/VOC	1.1	167.85		
	1,1-Dichloroethane (ethylidene dichloride) - HAP/VOC	2.4	98.97		
	1,1-Dichloroethene (vinylidene chloride) - HAP/VOC	0.20	96.94		
	1,2-Dichloroethane (ethylene dichloride) - HAP/VOC	0.41	98.96		
	1,2-Dichloropropane (propylene dichloride) - HAP/VOC	0.18	112.99		
	2-Propanol (isopropyl alcohol) - VOC	50	60.11		
	Acetone	7.0	58.08		
	Acrylonitrile - HAP/VOC	6.3	53.06		
	Benzene - No or Unknown Co-disposal - HAP/VOC	1.9	78.11		
	Benzene - Co-disposal - HAP/VOC	11	78.11		
	Bromodichloromethane - VOC	3.1	163.83		
	Butane - VOC	5.0	58.12		
	Carbon disulfide - HAP/VOC	0.58	76.13		
	Carbon monoxide	140	28.01		
	Carbon tetrachloride - HAP/VOC	4.0E-03	153.84		
	Carbonyl sulfide - HAP/VOC	0.49	60.07		
	Chlorobenzene - HAP/VOC	0.25	112.56		
	Chlorodifluoromethane	1.3	86.47		
	Chloroethane (ethyl chloride) - HAP/VOC	1.3	64.52		
	Chloroform - HAP/VOC	0.03	119.39		
	Chloromethane - VOC	1.2	50.49		
	Dichlorobenzene - (HAP for para isomer/VOC)	0.21	147		
	Dichlorodifluoromethane	16	120.91		
	Dichlorofluoromethane - VOC	2.6	102.92		
	Dichloromethane (methylene chloride) - HAP	14	84.94		
	Dimethyl sulfide (methyl sulfide) - VOC	7.8	62.13		
	Ethane	890	30.07		
	Ethanol - VOC	27	46.08		

**Pollutant Parameters (Continued)**

<i>Gas / Pollutant Default Parameters:</i>				<i>User-specified Pollutant Parameters:</i>	
	Compound	Concentration (ppmv)	Molecular Weight	Concentration (ppmv)	Molecular Weight
<b>Pollutants</b>	Ethyl mercaptan (ethanethiol) - VOC	2.3	62.13		
	Ethylbenzene - HAP/VOC	4.6	106.16		
	Ethylene dibromide - HAP/VOC	1.0E-03	187.88		
	Fluorotrichloromethane - VOC	0.76	137.38		
	Hexane - HAP/VOC	6.6	86.18		
	Hydrogen sulfide	36	34.08		
	Mercury (total) - HAP	2.9E-04	200.61		
	Methyl ethyl ketone - HAP/VOC	7.1	72.11		
	Methyl isobutyl ketone - HAP/VOC	1.9	100.16		
	Methyl mercaptan - VOC	2.5	48.11		
	Pentane - VOC	3.3	72.15		
	Perchloroethylene (tetrachloroethylene) - HAP	3.7	165.83		
	Propane - VOC	11	44.09		
	t-1,2-Dichloroethene - VOC	2.8	96.94		
	Toluene - No or Unknown Co-disposal - HAP/VOC	39	92.13		
	Toluene - Co-disposal - HAP/VOC	170	92.13		
	Trichloroethylene (trichloroethene) - HAP/VOC	2.8	131.40		
	Vinyl chloride - HAP/VOC	7.3	62.50		
	Xylenes - HAP/VOC	12	106.16		



**Graphs**



**Results**

Year	Total landfill gas			Methane		
	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)
1972	0	0	0	0	0	0
1973	2.850E+02	2.282E+05	1.533E+01	7.613E+01	1.141E+05	7.667E+00
1974	5.707E+02	4.570E+05	3.071E+01	1.524E+02	2.285E+05	1.535E+01
1975	8.530E+02	6.830E+05	4.589E+01	2.278E+02	3.415E+05	2.295E+01
1976	1.137E+03	9.101E+05	6.115E+01	3.036E+02	4.551E+05	3.058E+01
1977	1.422E+03	1.138E+06	7.649E+01	3.797E+02	5.692E+05	3.824E+01
1978	1.704E+03	1.364E+06	9.166E+01	4.551E+02	6.821E+05	4.583E+01
1979	1.988E+03	1.592E+06	1.069E+02	5.309E+02	7.958E+05	5.347E+01
1980	2.274E+03	1.821E+06	1.223E+02	6.074E+02	9.105E+05	6.117E+01
1981	2.557E+03	2.048E+06	1.376E+02	6.831E+02	1.024E+06	6.880E+01
1982	2.844E+03	2.277E+06	1.530E+02	7.596E+02	1.139E+06	7.650E+01
1983	3.133E+03	2.509E+06	1.686E+02	8.369E+02	1.254E+06	8.429E+01
1984	3.420E+03	2.739E+06	1.840E+02	9.136E+02	1.369E+06	9.201E+01
1985	3.711E+03	2.971E+06	1.996E+02	9.911E+02	1.486E+06	9.982E+01
1986	4.005E+03	3.207E+06	2.155E+02	1.070E+03	1.603E+06	1.077E+02
1987	4.296E+03	3.440E+06	2.312E+02	1.148E+03	1.720E+06	1.156E+02
1988	4.592E+03	3.677E+06	2.471E+02	1.227E+03	1.839E+06	1.235E+02
1989	4.885E+03	3.912E+06	2.628E+02	1.305E+03	1.956E+06	1.314E+02
1990	5.120E+03	4.100E+06	2.754E+02	1.368E+03	2.050E+06	1.377E+02
1991	5.308E+03	4.250E+06	2.856E+02	1.418E+03	2.125E+06	1.428E+02
1992	5.049E+03	4.043E+06	2.716E+02	1.349E+03	2.021E+06	1.358E+02
1993	4.803E+03	3.846E+06	2.584E+02	1.283E+03	1.923E+06	1.292E+02
1994	4.568E+03	3.658E+06	2.458E+02	1.220E+03	1.829E+06	1.229E+02
1995	4.346E+03	3.480E+06	2.338E+02	1.161E+03	1.740E+06	1.169E+02
1996	4.134E+03	3.310E+06	2.224E+02	1.104E+03	1.655E+06	1.112E+02
1997	3.932E+03	3.149E+06	2.116E+02	1.050E+03	1.574E+06	1.058E+02
1998	3.740E+03	2.995E+06	2.012E+02	9.991E+02	1.498E+06	1.006E+02
1999	3.558E+03	2.849E+06	1.914E+02	9.503E+02	1.424E+06	9.571E+01
2000	3.384E+03	2.710E+06	1.821E+02	9.040E+02	1.355E+06	9.104E+01
2001	3.219E+03	2.578E+06	1.732E+02	8.599E+02	1.289E+06	8.660E+01
2002	3.062E+03	2.452E+06	1.648E+02	8.180E+02	1.226E+06	8.238E+01
2003	2.913E+03	2.333E+06	1.567E+02	7.781E+02	1.166E+06	7.836E+01
2004	2.771E+03	2.219E+06	1.491E+02	7.401E+02	1.109E+06	7.454E+01
2005	2.636E+03	2.111E+06	1.418E+02	7.040E+02	1.055E+06	7.090E+01
2006	2.507E+03	2.008E+06	1.349E+02	6.697E+02	1.004E+06	6.745E+01
2007	2.385E+03	1.910E+06	1.283E+02	6.370E+02	9.549E+05	6.416E+01
2008	2.269E+03	1.817E+06	1.221E+02	6.060E+02	9.083E+05	6.103E+01
2009	2.158E+03	1.728E+06	1.161E+02	5.764E+02	8.640E+05	5.805E+01
2010	2.053E+03	1.644E+06	1.104E+02	5.483E+02	8.219E+05	5.522E+01
2011	1.953E+03	1.564E+06	1.051E+02	5.216E+02	7.818E+05	5.253E+01
2012	1.857E+03	1.487E+06	9.993E+01	4.961E+02	7.436E+05	4.997E+01
2013	1.767E+03	1.415E+06	9.506E+01	4.719E+02	7.074E+05	4.753E+01
2014	1.681E+03	1.346E+06	9.042E+01	4.489E+02	6.729E+05	4.521E+01
2015	1.599E+03	1.280E+06	8.601E+01	4.270E+02	6.401E+05	4.301E+01
2016	1.521E+03	1.218E+06	8.182E+01	4.062E+02	6.088E+05	4.091E+01
2017	1.447E+03	1.158E+06	7.783E+01	3.864E+02	5.792E+05	3.891E+01
2018	1.376E+03	1.102E+06	7.403E+01	3.675E+02	5.509E+05	3.702E+01
2019	1.309E+03	1.048E+06	7.042E+01	3.496E+02	5.240E+05	3.521E+01
2020	1.245E+03	9.970E+05	6.699E+01	3.326E+02	4.985E+05	3.349E+01
2021	1.184E+03	9.483E+05	6.372E+01	3.163E+02	4.742E+05	3.186E+01

**Results (Continued)**

Year	Total landfill gas			Methane		
	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)
2022	1.127E+03	9.021E+05	6.061E+01	3.009E+02	4.510E+05	3.031E+01
2023	1.072E+03	8.581E+05	5.766E+01	2.862E+02	4.290E+05	2.883E+01
2024	1.019E+03	8.162E+05	5.484E+01	2.723E+02	4.081E+05	2.742E+01
2025	9.696E+02	7.764E+05	5.217E+01	2.590E+02	3.882E+05	2.608E+01
2026	9.223E+02	7.386E+05	4.962E+01	2.464E+02	3.693E+05	2.481E+01
2027	8.774E+02	7.025E+05	4.720E+01	2.344E+02	3.513E+05	2.360E+01
2028	8.346E+02	6.683E+05	4.490E+01	2.229E+02	3.341E+05	2.245E+01
2029	7.939E+02	6.357E+05	4.271E+01	2.120E+02	3.178E+05	2.136E+01
2030	7.551E+02	6.047E+05	4.063E+01	2.017E+02	3.023E+05	2.031E+01
2031	7.183E+02	5.752E+05	3.865E+01	1.919E+02	2.876E+05	1.932E+01
2032	6.833E+02	5.471E+05	3.676E+01	1.825E+02	2.736E+05	1.838E+01
2033	6.500E+02	5.205E+05	3.497E+01	1.736E+02	2.602E+05	1.748E+01
2034	6.183E+02	4.951E+05	3.326E+01	1.651E+02	2.475E+05	1.663E+01
2035	5.881E+02	4.709E+05	3.164E+01	1.571E+02	2.355E+05	1.582E+01
2036	5.594E+02	4.480E+05	3.010E+01	1.494E+02	2.240E+05	1.505E+01
2037	5.321E+02	4.261E+05	2.863E+01	1.421E+02	2.131E+05	1.432E+01
2038	5.062E+02	4.053E+05	2.723E+01	1.352E+02	2.027E+05	1.362E+01
2039	4.815E+02	3.856E+05	2.591E+01	1.286E+02	1.928E+05	1.295E+01
2040	4.580E+02	3.668E+05	2.464E+01	1.223E+02	1.834E+05	1.232E+01
2041	4.357E+02	3.489E+05	2.344E+01	1.164E+02	1.744E+05	1.172E+01
2042	4.144E+02	3.319E+05	2.230E+01	1.107E+02	1.659E+05	1.115E+01
2043	3.942E+02	3.157E+05	2.121E+01	1.053E+02	1.578E+05	1.061E+01
2044	3.750E+02	3.003E+05	2.018E+01	1.002E+02	1.501E+05	1.009E+01
2045	3.567E+02	2.856E+05	1.919E+01	9.528E+01	1.428E+05	9.596E+00
2046	3.393E+02	2.717E+05	1.826E+01	9.063E+01	1.359E+05	9.128E+00
2047	3.228E+02	2.585E+05	1.737E+01	8.621E+01	1.292E+05	8.683E+00
2048	3.070E+02	2.458E+05	1.652E+01	8.201E+01	1.229E+05	8.259E+00
2049	2.920E+02	2.339E+05	1.571E+01	7.801E+01	1.169E+05	7.856E+00
2050	2.778E+02	2.225E+05	1.495E+01	7.420E+01	1.112E+05	7.473E+00
2051	2.643E+02	2.116E+05	1.422E+01	7.059E+01	1.058E+05	7.109E+00
2052	2.514E+02	2.013E+05	1.352E+01	6.714E+01	1.006E+05	6.762E+00
2053	2.391E+02	1.915E+05	1.286E+01	6.387E+01	9.573E+04	6.432E+00
2054	2.274E+02	1.821E+05	1.224E+01	6.075E+01	9.106E+04	6.119E+00
2055	2.164E+02	1.732E+05	1.164E+01	5.779E+01	8.662E+04	5.820E+00
2056	2.058E+02	1.648E+05	1.107E+01	5.497E+01	8.240E+04	5.536E+00
2057	1.958E+02	1.568E+05	1.053E+01	5.229E+01	7.838E+04	5.266E+00
2058	1.862E+02	1.491E+05	1.002E+01	4.974E+01	7.456E+04	5.009E+00
2059	1.771E+02	1.418E+05	9.530E+00	4.731E+01	7.092E+04	4.765E+00
2060	1.685E+02	1.349E+05	9.066E+00	4.501E+01	6.746E+04	4.533E+00
2061	1.603E+02	1.283E+05	8.623E+00	4.281E+01	6.417E+04	4.312E+00
2062	1.525E+02	1.221E+05	8.203E+00	4.072E+01	6.104E+04	4.101E+00
2063	1.450E+02	1.161E+05	7.803E+00	3.874E+01	5.807E+04	3.901E+00
2064	1.380E+02	1.105E+05	7.422E+00	3.685E+01	5.523E+04	3.711E+00
2065	1.312E+02	1.051E+05	7.060E+00	3.505E+01	5.254E+04	3.530E+00
2066	1.248E+02	9.995E+04	6.716E+00	3.334E+01	4.998E+04	3.358E+00
2067	1.187E+02	9.508E+04	6.388E+00	3.172E+01	4.754E+04	3.194E+00
2068	1.129E+02	9.044E+04	6.077E+00	3.017E+01	4.522E+04	3.038E+00
2069	1.074E+02	8.603E+04	5.780E+00	2.870E+01	4.302E+04	2.890E+00
2070	1.022E+02	8.184E+04	5.499E+00	2.730E+01	4.092E+04	2.749E+00
2071	9.721E+01	7.784E+04	5.230E+00	2.597E+01	3.892E+04	2.615E+00
2072	9.247E+01	7.405E+04	4.975E+00	2.470E+01	3.702E+04	2.488E+00

**Results (Continued)**

Year	Total landfill gas			Methane		
	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)
2073	8.796E+01	7.044E+04	4.733E+00	2.350E+01	3.522E+04	2.366E+00
2074	8.367E+01	6.700E+04	4.502E+00	2.235E+01	3.350E+04	2.251E+00
2075	7.959E+01	6.373E+04	4.282E+00	2.126E+01	3.187E+04	2.141E+00
2076	7.571E+01	6.063E+04	4.073E+00	2.022E+01	3.031E+04	2.037E+00
2077	7.202E+01	5.767E+04	3.875E+00	1.924E+01	2.883E+04	1.937E+00
2078	6.851E+01	5.486E+04	3.686E+00	1.830E+01	2.743E+04	1.843E+00
2079	6.516E+01	5.218E+04	3.506E+00	1.741E+01	2.609E+04	1.753E+00
2080	6.199E+01	4.964E+04	3.335E+00	1.656E+01	2.482E+04	1.668E+00
2081	5.896E+01	4.721E+04	3.172E+00	1.575E+01	2.361E+04	1.586E+00
2082	5.609E+01	4.491E+04	3.018E+00	1.498E+01	2.246E+04	1.509E+00
2083	5.335E+01	4.272E+04	2.870E+00	1.425E+01	2.136E+04	1.435E+00
2084	5.075E+01	4.064E+04	2.730E+00	1.356E+01	2.032E+04	1.365E+00
2085	4.827E+01	3.866E+04	2.597E+00	1.289E+01	1.933E+04	1.299E+00
2086	4.592E+01	3.677E+04	2.471E+00	1.227E+01	1.839E+04	1.235E+00
2087	4.368E+01	3.498E+04	2.350E+00	1.167E+01	1.749E+04	1.175E+00
2088	4.155E+01	3.327E+04	2.236E+00	1.110E+01	1.664E+04	1.118E+00
2089	3.952E+01	3.165E+04	2.127E+00	1.056E+01	1.582E+04	1.063E+00
2090	3.760E+01	3.011E+04	2.023E+00	1.004E+01	1.505E+04	1.011E+00
2091	3.576E+01	2.864E+04	1.924E+00	9.553E+00	1.432E+04	9.621E-01
2092	3.402E+01	2.724E+04	1.830E+00	9.087E+00	1.362E+04	9.151E-01
2093	3.236E+01	2.591E+04	1.741E+00	8.644E+00	1.296E+04	8.705E-01
2094	3.078E+01	2.465E+04	1.656E+00	8.222E+00	1.232E+04	8.281E-01
2095	2.928E+01	2.345E+04	1.575E+00	7.821E+00	1.172E+04	7.877E-01
2096	2.785E+01	2.230E+04	1.499E+00	7.440E+00	1.115E+04	7.493E-01
2097	2.649E+01	2.122E+04	1.425E+00	7.077E+00	1.061E+04	7.127E-01
2098	2.520E+01	2.018E+04	1.356E+00	6.732E+00	1.009E+04	6.780E-01
2099	2.397E+01	1.920E+04	1.290E+00	6.403E+00	9.598E+03	6.449E-01
2100	2.280E+01	1.826E+04	1.227E+00	6.091E+00	9.130E+03	6.134E-01
2101	2.169E+01	1.737E+04	1.167E+00	5.794E+00	8.685E+03	5.835E-01
2102	2.063E+01	1.652E+04	1.110E+00	5.511E+00	8.261E+03	5.551E-01
2103	1.963E+01	1.572E+04	1.056E+00	5.243E+00	7.858E+03	5.280E-01
2104	1.867E+01	1.495E+04	1.004E+00	4.987E+00	7.475E+03	5.022E-01
2105	1.776E+01	1.422E+04	9.555E-01	4.744E+00	7.110E+03	4.777E-01
2106	1.689E+01	1.353E+04	9.089E-01	4.512E+00	6.764E+03	4.544E-01
2107	1.607E+01	1.287E+04	8.646E-01	4.292E+00	6.434E+03	4.323E-01
2108	1.529E+01	1.224E+04	8.224E-01	4.083E+00	6.120E+03	4.112E-01
2109	1.454E+01	1.164E+04	7.823E-01	3.884E+00	5.822E+03	3.911E-01
2110	1.383E+01	1.108E+04	7.441E-01	3.694E+00	5.538E+03	3.721E-01
2111	1.316E+01	1.054E+04	7.079E-01	3.514E+00	5.268E+03	3.539E-01
2112	1.251E+01	1.002E+04	6.733E-01	3.343E+00	5.011E+03	3.367E-01

**Results (Continued)**

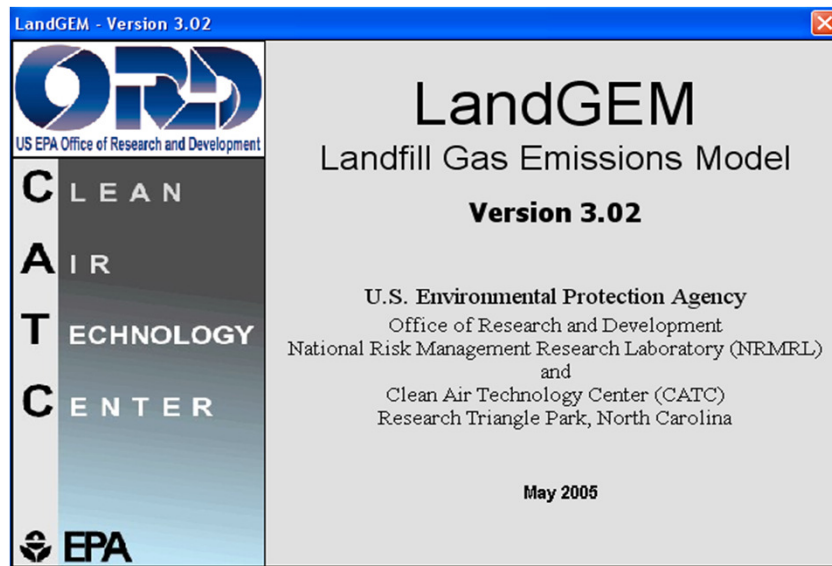
Year	Carbon dioxide			NMOC		
	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)
1972	0	0	0	0	0	0
1973	2.089E+02	1.141E+05	7.667E+00	3.272E+00	9.129E+02	6.133E-02
1974	4.183E+02	2.285E+05	1.535E+01	6.552E+00	1.828E+03	1.228E-01
1975	6.252E+02	3.415E+05	2.295E+01	9.793E+00	2.732E+03	1.836E-01
1976	8.330E+02	4.551E+05	3.058E+01	1.305E+01	3.640E+03	2.446E-01
1977	1.042E+03	5.692E+05	3.824E+01	1.632E+01	4.554E+03	3.060E-01
1978	1.249E+03	6.821E+05	4.583E+01	1.956E+01	5.457E+03	3.666E-01
1979	1.457E+03	7.958E+05	5.347E+01	2.282E+01	6.367E+03	4.278E-01
1980	1.667E+03	9.105E+05	6.117E+01	2.611E+01	7.284E+03	4.894E-01
1981	1.874E+03	1.024E+06	6.880E+01	2.936E+01	8.192E+03	5.504E-01
1982	2.084E+03	1.139E+06	7.650E+01	3.265E+01	9.109E+03	6.120E-01
1983	2.296E+03	1.254E+06	8.429E+01	3.597E+01	1.004E+04	6.743E-01
1984	2.507E+03	1.369E+06	9.201E+01	3.927E+01	1.095E+04	7.361E-01
1985	2.719E+03	1.486E+06	9.982E+01	4.260E+01	1.189E+04	7.986E-01
1986	2.935E+03	1.603E+06	1.077E+02	4.598E+01	1.283E+04	8.619E-01
1987	3.149E+03	1.720E+06	1.156E+02	4.933E+01	1.376E+04	9.246E-01
1988	3.365E+03	1.839E+06	1.235E+02	5.272E+01	1.471E+04	9.883E-01
1989	3.580E+03	1.956E+06	1.314E+02	5.609E+01	1.565E+04	1.051E+00
1990	3.752E+03	2.050E+06	1.377E+02	5.878E+01	1.640E+04	1.102E+00
1991	3.890E+03	2.125E+06	1.428E+02	6.094E+01	1.700E+04	1.142E+00
1992	3.700E+03	2.021E+06	1.358E+02	5.797E+01	1.617E+04	1.087E+00
1993	3.520E+03	1.923E+06	1.292E+02	5.514E+01	1.538E+04	1.034E+00
1994	3.348E+03	1.829E+06	1.229E+02	5.245E+01	1.463E+04	9.832E-01
1995	3.185E+03	1.740E+06	1.169E+02	4.989E+01	1.392E+04	9.352E-01
1996	3.029E+03	1.655E+06	1.112E+02	4.746E+01	1.324E+04	8.896E-01
1997	2.882E+03	1.574E+06	1.058E+02	4.514E+01	1.259E+04	8.462E-01
1998	2.741E+03	1.498E+06	1.006E+02	4.294E+01	1.198E+04	8.049E-01
1999	2.608E+03	1.424E+06	9.571E+01	4.085E+01	1.140E+04	7.657E-01
2000	2.480E+03	1.355E+06	9.104E+01	3.886E+01	1.084E+04	7.283E-01
2001	2.359E+03	1.289E+06	8.660E+01	3.696E+01	1.031E+04	6.928E-01
2002	2.244E+03	1.226E+06	8.238E+01	3.516E+01	9.809E+03	6.590E-01
2003	2.135E+03	1.166E+06	7.836E+01	3.344E+01	9.330E+03	6.269E-01
2004	2.031E+03	1.109E+06	7.454E+01	3.181E+01	8.875E+03	5.963E-01
2005	1.932E+03	1.055E+06	7.090E+01	3.026E+01	8.442E+03	5.672E-01
2006	1.837E+03	1.004E+06	6.745E+01	2.879E+01	8.031E+03	5.396E-01
2007	1.748E+03	9.549E+05	6.416E+01	2.738E+01	7.639E+03	5.133E-01
2008	1.663E+03	9.083E+05	6.103E+01	2.605E+01	7.266E+03	4.882E-01
2009	1.582E+03	8.640E+05	5.805E+01	2.478E+01	6.912E+03	4.644E-01
2010	1.504E+03	8.219E+05	5.522E+01	2.357E+01	6.575E+03	4.418E-01
2011	1.431E+03	7.818E+05	5.253E+01	2.242E+01	6.254E+03	4.202E-01
2012	1.361E+03	7.436E+05	4.997E+01	2.132E+01	5.949E+03	3.997E-01
2013	1.295E+03	7.074E+05	4.753E+01	2.028E+01	5.659E+03	3.802E-01
2014	1.232E+03	6.729E+05	4.521E+01	1.930E+01	5.383E+03	3.617E-01
2015	1.172E+03	6.401E+05	4.301E+01	1.835E+01	5.120E+03	3.440E-01
2016	1.114E+03	6.088E+05	4.091E+01	1.746E+01	4.871E+03	3.273E-01
2017	1.060E+03	5.792E+05	3.891E+01	1.661E+01	4.633E+03	3.113E-01
2018	1.008E+03	5.509E+05	3.702E+01	1.580E+01	4.407E+03	2.961E-01
2019	9.593E+02	5.240E+05	3.521E+01	1.503E+01	4.192E+03	2.817E-01
2020	9.125E+02	4.985E+05	3.349E+01	1.429E+01	3.988E+03	2.679E-01
2021	8.680E+02	4.742E+05	3.186E+01	1.360E+01	3.793E+03	2.549E-01

**Results (Continued)**

Year	Carbon dioxide			NMOC		
	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)
2022	8.256E+02	4.510E+05	3.031E+01	1.293E+01	3.608E+03	2.424E-01
2023	7.854E+02	4.290E+05	2.883E+01	1.230E+01	3.432E+03	2.306E-01
2024	7.471E+02	4.081E+05	2.742E+01	1.170E+01	3.265E+03	2.194E-01
2025	7.106E+02	3.882E+05	2.608E+01	1.113E+01	3.106E+03	2.087E-01
2026	6.760E+02	3.693E+05	2.481E+01	1.059E+01	2.954E+03	1.985E-01
2027	6.430E+02	3.513E+05	2.360E+01	1.007E+01	2.810E+03	1.888E-01
2028	6.116E+02	3.341E+05	2.245E+01	9.582E+00	2.673E+03	1.796E-01
2029	5.818E+02	3.178E+05	2.136E+01	9.114E+00	2.543E+03	1.708E-01
2030	5.534E+02	3.023E+05	2.031E+01	8.670E+00	2.419E+03	1.625E-01
2031	5.264E+02	2.876E+05	1.932E+01	8.247E+00	2.301E+03	1.546E-01
2032	5.008E+02	2.736E+05	1.838E+01	7.845E+00	2.189E+03	1.470E-01
2033	4.763E+02	2.602E+05	1.748E+01	7.462E+00	2.082E+03	1.399E-01
2034	4.531E+02	2.475E+05	1.663E+01	7.098E+00	1.980E+03	1.331E-01
2035	4.310E+02	2.355E+05	1.582E+01	6.752E+00	1.884E+03	1.266E-01
2036	4.100E+02	2.240E+05	1.505E+01	6.423E+00	1.792E+03	1.204E-01
2037	3.900E+02	2.131E+05	1.432E+01	6.110E+00	1.704E+03	1.145E-01
2038	3.710E+02	2.027E+05	1.362E+01	5.812E+00	1.621E+03	1.089E-01
2039	3.529E+02	1.928E+05	1.295E+01	5.528E+00	1.542E+03	1.036E-01
2040	3.357E+02	1.834E+05	1.232E+01	5.259E+00	1.467E+03	9.857E-02
2041	3.193E+02	1.744E+05	1.172E+01	5.002E+00	1.395E+03	9.376E-02
2042	3.037E+02	1.659E+05	1.115E+01	4.758E+00	1.327E+03	8.919E-02
2043	2.889E+02	1.578E+05	1.061E+01	4.526E+00	1.263E+03	8.484E-02
2044	2.748E+02	1.501E+05	1.009E+01	4.305E+00	1.201E+03	8.070E-02
2045	2.614E+02	1.428E+05	9.596E+00	4.095E+00	1.143E+03	7.677E-02
2046	2.487E+02	1.359E+05	9.128E+00	3.896E+00	1.087E+03	7.302E-02
2047	2.365E+02	1.292E+05	8.683E+00	3.706E+00	1.034E+03	6.946E-02
2048	2.250E+02	1.229E+05	8.259E+00	3.525E+00	9.834E+02	6.607E-02
2049	2.140E+02	1.169E+05	7.856E+00	3.353E+00	9.354E+02	6.285E-02
2050	2.036E+02	1.112E+05	7.473E+00	3.189E+00	8.898E+02	5.979E-02
2051	1.937E+02	1.058E+05	7.109E+00	3.034E+00	8.464E+02	5.687E-02
2052	1.842E+02	1.006E+05	6.762E+00	2.886E+00	8.051E+02	5.410E-02
2053	1.752E+02	9.573E+04	6.432E+00	2.745E+00	7.659E+02	5.146E-02
2054	1.667E+02	9.106E+04	6.119E+00	2.611E+00	7.285E+02	4.895E-02
2055	1.586E+02	8.662E+04	5.820E+00	2.484E+00	6.930E+02	4.656E-02
2056	1.508E+02	8.240E+04	5.536E+00	2.363E+00	6.592E+02	4.429E-02
2057	1.435E+02	7.838E+04	5.266E+00	2.248E+00	6.270E+02	4.213E-02
2058	1.365E+02	7.456E+04	5.009E+00	2.138E+00	5.965E+02	4.008E-02
2059	1.298E+02	7.092E+04	4.765E+00	2.034E+00	5.674E+02	3.812E-02
2060	1.235E+02	6.746E+04	4.533E+00	1.935E+00	5.397E+02	3.626E-02
2061	1.175E+02	6.417E+04	4.312E+00	1.840E+00	5.134E+02	3.449E-02
2062	1.117E+02	6.104E+04	4.101E+00	1.750E+00	4.883E+02	3.281E-02
2063	1.063E+02	5.807E+04	3.901E+00	1.665E+00	4.645E+02	3.121E-02
2064	1.011E+02	5.523E+04	3.711E+00	1.584E+00	4.419E+02	2.969E-02
2065	9.617E+01	5.254E+04	3.530E+00	1.507E+00	4.203E+02	2.824E-02
2066	9.148E+01	4.998E+04	3.358E+00	1.433E+00	3.998E+02	2.686E-02
2067	8.702E+01	4.754E+04	3.194E+00	1.363E+00	3.803E+02	2.555E-02
2068	8.278E+01	4.522E+04	3.038E+00	1.297E+00	3.618E+02	2.431E-02
2069	7.874E+01	4.302E+04	2.890E+00	1.234E+00	3.441E+02	2.312E-02
2070	7.490E+01	4.092E+04	2.749E+00	1.173E+00	3.273E+02	2.199E-02
2071	7.125E+01	3.892E+04	2.615E+00	1.116E+00	3.114E+02	2.092E-02
2072	6.777E+01	3.702E+04	2.488E+00	1.062E+00	2.962E+02	1.990E-02

**Results (Continued)**

Year	Carbon dioxide			NMOC		
	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)
2073	6.447E+01	3.522E+04	2.366E+00	1.010E+00	2.817E+02	1.893E-02
2074	6.132E+01	3.350E+04	2.251E+00	9.607E-01	2.680E+02	1.801E-02
2075	5.833E+01	3.187E+04	2.141E+00	9.138E-01	2.549E+02	1.713E-02
2076	5.549E+01	3.031E+04	2.037E+00	8.692E-01	2.425E+02	1.629E-02
2077	5.278E+01	2.883E+04	1.937E+00	8.268E-01	2.307E+02	1.550E-02
2078	5.021E+01	2.743E+04	1.843E+00	7.865E-01	2.194E+02	1.474E-02
2079	4.776E+01	2.609E+04	1.753E+00	7.482E-01	2.087E+02	1.402E-02
2080	4.543E+01	2.482E+04	1.668E+00	7.117E-01	1.985E+02	1.334E-02
2081	4.321E+01	2.361E+04	1.586E+00	6.770E-01	1.889E+02	1.269E-02
2082	4.111E+01	2.246E+04	1.509E+00	6.439E-01	1.796E+02	1.207E-02
2083	3.910E+01	2.136E+04	1.435E+00	6.125E-01	1.709E+02	1.148E-02
2084	3.719E+01	2.032E+04	1.365E+00	5.827E-01	1.626E+02	1.092E-02
2085	3.538E+01	1.933E+04	1.299E+00	5.542E-01	1.546E+02	1.039E-02
2086	3.365E+01	1.839E+04	1.235E+00	5.272E-01	1.471E+02	9.883E-03
2087	3.201E+01	1.749E+04	1.175E+00	5.015E-01	1.399E+02	9.401E-03
2088	3.045E+01	1.664E+04	1.118E+00	4.770E-01	1.331E+02	8.942E-03
2089	2.897E+01	1.582E+04	1.063E+00	4.538E-01	1.266E+02	8.506E-03
2090	2.755E+01	1.505E+04	1.011E+00	4.316E-01	1.204E+02	8.091E-03
2091	2.621E+01	1.432E+04	9.621E-01	4.106E-01	1.145E+02	7.697E-03
2092	2.493E+01	1.362E+04	9.151E-01	3.906E-01	1.090E+02	7.321E-03
2093	2.372E+01	1.296E+04	8.705E-01	3.715E-01	1.036E+02	6.964E-03
2094	2.256E+01	1.232E+04	8.281E-01	3.534E-01	9.859E+01	6.624E-03
2095	2.146E+01	1.172E+04	7.877E-01	3.362E-01	9.379E+01	6.301E-03
2096	2.041E+01	1.115E+04	7.493E-01	3.198E-01	8.921E+01	5.994E-03
2097	1.942E+01	1.061E+04	7.127E-01	3.042E-01	8.486E+01	5.702E-03
2098	1.847E+01	1.009E+04	6.780E-01	2.893E-01	8.072E+01	5.424E-03
2099	1.757E+01	9.598E+03	6.449E-01	2.752E-01	7.678E+01	5.159E-03
2100	1.671E+01	9.130E+03	6.134E-01	2.618E-01	7.304E+01	4.908E-03
2101	1.590E+01	8.685E+03	5.835E-01	2.490E-01	6.948E+01	4.668E-03
2102	1.512E+01	8.261E+03	5.551E-01	2.369E-01	6.609E+01	4.441E-03
2103	1.438E+01	7.858E+03	5.280E-01	2.253E-01	6.287E+01	4.224E-03
2104	1.368E+01	7.475E+03	5.022E-01	2.144E-01	5.980E+01	4.018E-03
2105	1.302E+01	7.110E+03	4.777E-01	2.039E-01	5.688E+01	3.822E-03
2106	1.238E+01	6.764E+03	4.544E-01	1.940E-01	5.411E+01	3.636E-03
2107	1.178E+01	6.434E+03	4.323E-01	1.845E-01	5.147E+01	3.458E-03
2108	1.120E+01	6.120E+03	4.112E-01	1.755E-01	4.896E+01	3.290E-03
2109	1.066E+01	5.822E+03	3.911E-01	1.669E-01	4.657E+01	3.129E-03
2110	1.014E+01	5.538E+03	3.721E-01	1.588E-01	4.430E+01	2.977E-03
2111	9.642E+00	5.268E+03	3.539E-01	1.511E-01	4.214E+01	2.831E-03
2112	9.172E+00	5.011E+03	3.367E-01	1.437E-01	4.009E+01	2.693E-03



## Summary Report

**Landfill Name or Identifier:** Tier I: PCCL Class I Phase II Landfill

**Date:** Friday, April 11, 2014

### Description/Comments:

#### About LandGEM:

First-Order Decomposition Rate Equation:

$$Q_{CH_4} = \sum_{i=1}^n \sum_{j=0.1}^1 kL_o \left( \frac{M_i}{10} \right) e^{-kt_{ij}}$$

Where,

$Q_{CH_4}$  = annual methane generation in the year of the calculation ( $m^3/year$ )

$i$  = 1-year time increment

$n$  = (year of the calculation) - (initial year of waste acceptance)

$j$  = 0.1-year time increment

$k$  = methane generation rate ( $year^{-1}$ )

$L_o$  = potential methane generation capacity ( $m^3/Mg$ )

$M_i$  = mass of waste accepted in the  $i^{th}$  year ( $Mg$ )

$t_{ij}$  = age of the  $j^{th}$  section of waste mass  $M_i$  accepted in the  $i^{th}$  year (*decimal years*, e.g., 3.2 years)

LandGEM is based on a first-order decomposition rate equation for quantifying emissions from the decomposition of landfilled waste in municipal solid waste (MSW) landfills. The software provides a relatively simple approach to estimating landfill gas emissions. Model defaults are based on empirical data from U.S. landfills. Field test data can also be used in place of model defaults when available. Further guidance on EPA test methods, Clean Air Act (CAA) regulations, and other guidance regarding landfill gas emissions and control technology requirements can be found at <http://www.epa.gov/ttnatw01/landfill/landflpg.html>.

LandGEM is considered a screening tool — the better the input data, the better the estimates. Often, there are limitations with the available data regarding waste quantity and composition, variation in design and operating practices over time, and changes occurring over time that impact the emissions potential. Changes to landfill operation, such as operating under wet conditions through leachate recirculation or other liquid additions, will result in generating more gas at a faster rate. Defaults for estimating emissions for this type of operation are being developed to include in LandGEM along with defaults for conventional landfills (no leachate or liquid additions) for developing emission inventories and determining CAA applicability. Refer to the Web site identified above for future updates.



## Input Review

### LANDFILL CHARACTERISTICS

Landfill Open Year	<b>1991</b>	
Landfill Closure Year (with 80-year limit)	<b>2044</b>	
Actual Closure Year (without limit)	<b>2044</b>	
Have Model Calculate Closure Year?	<b>No</b>	
Waste Design Capacity		<i>short tons</i>

### MODEL PARAMETERS

Methane Generation Rate, k	<b>0.050</b>	<i>year<sup>-1</sup></i>
Potential Methane Generation Capacity, L <sub>0</sub>	<b>170</b>	<i>m<sup>3</sup>/Mg</i>
NMOC Concentration	<b>4,000</b>	<i>ppmv as hexane</i>
Methane Content	<b>50</b>	<i>% by volume</i>

### GASES / POLLUTANTS SELECTED

Gas / Pollutant #1:	<b>Total landfill gas</b>
Gas / Pollutant #2:	<b>Methane</b>
Gas / Pollutant #3:	<b>Carbon dioxide</b>
Gas / Pollutant #4:	<b>NMOC</b>

### WASTE ACCEPTANCE RATES

Year	Waste Accepted		Waste-In-Place	
	(Mg/year)	(short tons/year)	(Mg)	(short tons)
1991	38,972	42,870	0	0
1992	22,066	24,273	38,972	42,870
1993	22,513	24,764	61,039	67,143
1994	21,141	23,255	83,552	91,907
1995	18,736	20,609	104,692	115,162
1996	18,326	20,159	123,428	135,771
1997	18,428	20,270	141,754	155,930
1998	20,119	22,131	160,182	176,200
1999	19,942	21,936	180,301	198,331
2000	22,001	24,201	200,242	220,266
2001	32,492	35,741	222,243	244,467
2002	35,410	38,951	254,735	280,209
2003	52,783	58,061	290,145	319,160
2004	68,927	75,820	342,928	377,221
2005	51,918	57,110	411,855	453,041
2006	90,158	99,174	463,774	510,151
2007	88,413	97,254	553,932	609,325
2008	78,990	86,890	642,345	706,579
2009	70,130	77,143	721,335	793,469
2010	65,848	72,433	791,465	870,612
2011	67,749	74,524	857,313	943,045
2012	64,327	70,760	925,063	1,017,569
2013	60,609	66,670	989,389	1,088,328
2014	63,754	70,129	1,049,999	1,154,999
2015	63,871	70,259	1,113,753	1,225,128
2016	64,076	70,483	1,177,624	1,295,386
2017	64,280	70,708	1,241,700	1,365,870
2018	64,486	70,934	1,305,980	1,436,578
2019	64,692	71,161	1,370,466	1,507,512
2020	64,899	71,389	1,435,158	1,578,674
2021	65,106	71,617	1,500,057	1,650,062
2022	65,314	71,846	1,565,163	1,721,679
2023	65,523	72,075	1,630,477	1,793,525
2024	65,733	72,306	1,696,001	1,865,601
2025	65,943	72,537	1,761,733	1,937,907
2026	66,154	72,769	1,827,676	2,010,444
2027	66,365	73,002	1,893,830	2,083,212
2028	66,577	73,235	1,960,195	2,156,214
2029	66,790	73,469	2,026,772	2,229,449
2030	67,004	73,704	2,093,562	2,302,918

## WASTE ACCEPTANCE RATES (Continued)

Year	Waste Accepted		Waste-In-Place	
	(Mg/year)	(short tons/year)	(Mg)	(short tons)
2031	67,218	73,939	2,160,565	2,376,622
2032	67,433	74,176	2,227,783	2,450,561
2033	67,648	74,413	2,295,215	2,524,737
2034	67,864	74,651	2,362,864	2,599,150
2035	68,081	74,889	2,430,728	2,673,801
2036	68,299	75,129	2,498,809	2,748,690
2037	68,517	75,369	2,567,108	2,823,819
2038	68,736	75,610	2,635,625	2,899,188
2039	68,956	75,852	2,704,362	2,974,798
2040	69,176	76,094	2,773,318	3,050,650
2041	69,398	76,337	2,842,494	3,126,744
2042	69,619	76,581	2,911,892	3,203,081
2043	69,842	76,826	2,981,511	3,279,662
2044	28,099	30,909	3,051,353	3,356,489
2045	0	0	3,079,453	3,387,398
2046	0	0	3,079,453	3,387,398
2047	0	0	3,079,453	3,387,398
2048	0	0	3,079,453	3,387,398
2049	0	0	3,079,453	3,387,398
2050	0	0	3,079,453	3,387,398
2051	0	0	3,079,453	3,387,398
2052	0	0	3,079,453	3,387,398
2053	0	0	3,079,453	3,387,398
2054	0	0	3,079,453	3,387,398
2055	0	0	3,079,453	3,387,398
2056	0	0	3,079,453	3,387,398
2057	0	0	3,079,453	3,387,398
2058	0	0	3,079,453	3,387,398
2059	0	0	3,079,453	3,387,398
2060	0	0	3,079,453	3,387,398
2061	0	0	3,079,453	3,387,398
2062	0	0	3,079,453	3,387,398
2063	0	0	3,079,453	3,387,398
2064	0	0	3,079,453	3,387,398
2065	0	0	3,079,453	3,387,398
2066	0	0	3,079,453	3,387,398
2067	0	0	3,079,453	3,387,398
2068	0	0	3,079,453	3,387,398
2069	0	0	3,079,453	3,387,398
2070	0	0	3,079,453	3,387,398

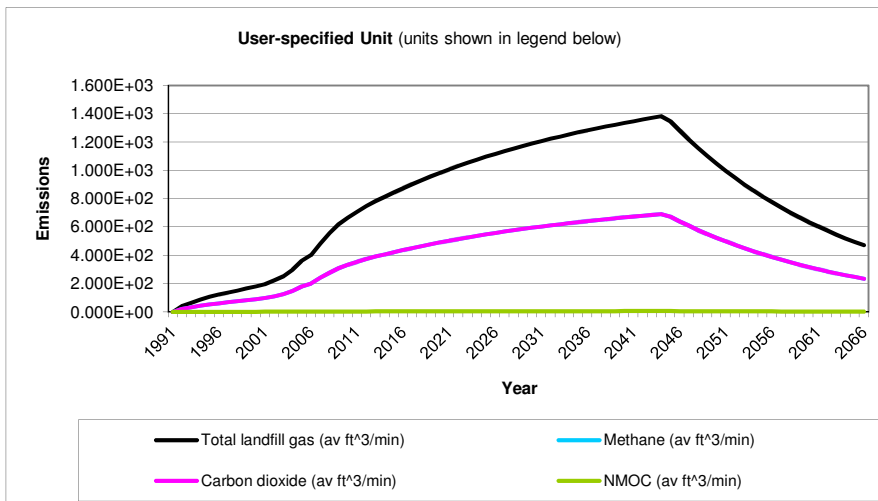
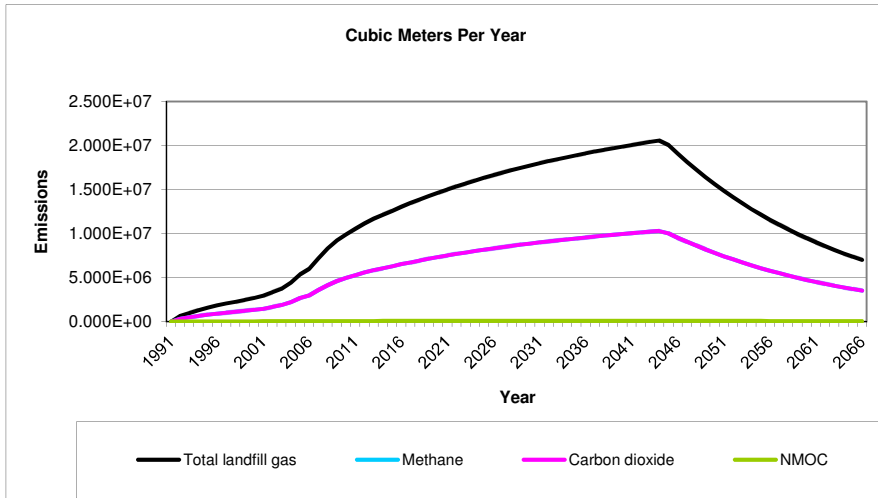
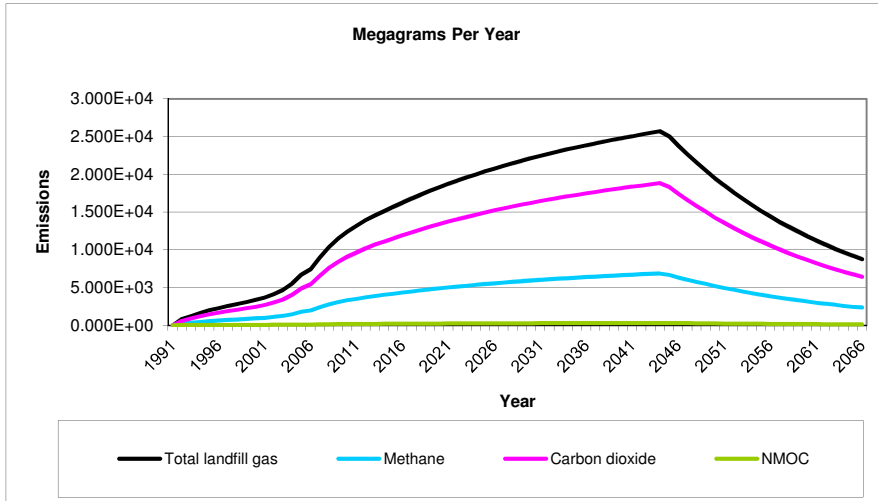
**Pollutant Parameters**

<b>Gas / Pollutant Default Parameters:</b>				<b>User-specified Pollutant Parameters:</b>	
	Compound	Concentration (ppmv)	Molecular Weight	Concentration (ppmv)	Molecular Weight
<b>Gases</b>	Total landfill gas		0.00		
	Methane		16.04		
	Carbon dioxide		44.01		
	NMOC	4,000	86.18		
<b>Pollutants</b>	1,1,1-Trichloroethane (methyl chloroform) - HAP	0.48	133.41		
	1,1,1,2,2-Tetrachloroethane - HAP/VOC	1.1	167.85		
	1,1-Dichloroethane (ethylidene dichloride) - HAP/VOC	2.4	98.97		
	1,1-Dichloroethene (vinylidene chloride) - HAP/VOC	0.20	96.94		
	1,2-Dichloroethane (ethylene dichloride) - HAP/VOC	0.41	98.96		
	1,2-Dichloropropane (propylene dichloride) - HAP/VOC	0.18	112.99		
	2-Propanol (isopropyl alcohol) - VOC	50	60.11		
	Acetone	7.0	58.08		
	Acrylonitrile - HAP/VOC	6.3	53.06		
	Benzene - No or Unknown Co-disposal - HAP/VOC	1.9	78.11		
	Benzene - Co-disposal - HAP/VOC	11	78.11		
	Bromodichloromethane - VOC	3.1	163.83		
	Butane - VOC	5.0	58.12		
	Carbon disulfide - HAP/VOC	0.58	76.13		
	Carbon monoxide	140	28.01		
	Carbon tetrachloride - HAP/VOC	4.0E-03	153.84		
	Carbonyl sulfide - HAP/VOC	0.49	60.07		
	Chlorobenzene - HAP/VOC	0.25	112.56		
	Chlorodifluoromethane	1.3	86.47		
	Chloroethane (ethyl chloride) - HAP/VOC	1.3	64.52		
	Chloroform - HAP/VOC	0.03	119.39		
	Chloromethane - VOC	1.2	50.49		
	Dichlorobenzene - (HAP for para isomer/VOC)	0.21	147		
	Dichlorodifluoromethane	16	120.91		
	Dichlorofluoromethane - VOC	2.6	102.92		
	Dichloromethane (methylene chloride) - HAP	14	84.94		
	Dimethyl sulfide (methyl sulfide) - VOC	7.8	62.13		
	Ethane	890	30.07		
	Ethanol - VOC	27	46.08		





**Graphs**



**Results**

Year	Total landfill gas			Methane		
	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)
1991	0	0	0	0	0	0
1992	8.091E+02	6.479E+05	4.353E+01	2.161E+02	3.239E+05	2.176E+01
1993	1.228E+03	9.831E+05	6.605E+01	3.279E+02	4.915E+05	3.303E+01
1994	1.635E+03	1.309E+06	8.798E+01	4.368E+02	6.547E+05	4.399E+01
1995	1.994E+03	1.597E+06	1.073E+02	5.327E+02	7.985E+05	5.365E+01
1996	2.286E+03	1.831E+06	1.230E+02	6.106E+02	9.153E+05	6.150E+01
1997	2.555E+03	2.046E+06	1.375E+02	6.825E+02	1.023E+06	6.873E+01
1998	2.813E+03	2.252E+06	1.513E+02	7.514E+02	1.126E+06	7.567E+01
1999	3.093E+03	2.477E+06	1.664E+02	8.263E+02	1.239E+06	8.322E+01
2000	3.356E+03	2.688E+06	1.806E+02	8.966E+02	1.344E+06	9.029E+01
2001	3.650E+03	2.922E+06	1.964E+02	9.748E+02	1.461E+06	9.818E+01
2002	4.146E+03	3.320E+06	2.231E+02	1.107E+03	1.660E+06	1.115E+02
2003	4.679E+03	3.747E+06	2.517E+02	1.250E+03	1.873E+06	1.259E+02
2004	5.547E+03	4.441E+06	2.984E+02	1.482E+03	2.221E+06	1.492E+02
2005	6.707E+03	5.371E+06	3.609E+02	1.791E+03	2.685E+06	1.804E+02
2006	7.458E+03	5.972E+06	4.012E+02	1.992E+03	2.986E+06	2.006E+02
2007	8.966E+03	7.179E+06	4.824E+02	2.395E+03	3.590E+06	2.412E+02
2008	1.036E+04	8.299E+06	5.576E+02	2.768E+03	4.149E+06	2.788E+02
2009	1.150E+04	9.207E+06	6.186E+02	3.071E+03	4.604E+06	3.093E+02
2010	1.239E+04	9.924E+06	6.668E+02	3.310E+03	4.962E+06	3.334E+02
2011	1.316E+04	1.053E+07	7.078E+02	3.514E+03	5.267E+06	3.539E+02
2012	1.392E+04	1.115E+07	7.490E+02	3.718E+03	5.574E+06	3.745E+02
2013	1.458E+04	1.167E+07	7.843E+02	3.894E+03	5.836E+06	3.921E+02
2014	1.512E+04	1.211E+07	8.137E+02	4.040E+03	6.055E+06	4.069E+02
2015	1.571E+04	1.258E+07	8.453E+02	4.196E+03	6.290E+06	4.226E+02
2016	1.627E+04	1.303E+07	8.754E+02	4.346E+03	6.514E+06	4.377E+02
2017	1.681E+04	1.346E+07	9.042E+02	4.489E+03	6.729E+06	4.521E+02
2018	1.732E+04	1.387E+07	9.319E+02	4.627E+03	6.935E+06	4.660E+02
2019	1.782E+04	1.427E+07	9.585E+02	4.759E+03	7.133E+06	4.793E+02
2020	1.829E+04	1.465E+07	9.840E+02	4.885E+03	7.323E+06	4.920E+02
2021	1.874E+04	1.501E+07	1.009E+03	5.007E+03	7.505E+06	5.043E+02
2022	1.918E+04	1.536E+07	1.032E+03	5.124E+03	7.680E+06	5.160E+02
2023	1.960E+04	1.570E+07	1.055E+03	5.236E+03	7.848E+06	5.273E+02
2024	2.001E+04	1.602E+07	1.076E+03	5.344E+03	8.010E+06	5.382E+02
2025	2.040E+04	1.633E+07	1.097E+03	5.448E+03	8.166E+06	5.487E+02
2026	2.077E+04	1.663E+07	1.117E+03	5.548E+03	8.316E+06	5.587E+02
2027	2.113E+04	1.692E+07	1.137E+03	5.644E+03	8.460E+06	5.684E+02
2028	2.148E+04	1.720E+07	1.156E+03	5.737E+03	8.599E+06	5.778E+02
2029	2.181E+04	1.747E+07	1.174E+03	5.826E+03	8.733E+06	5.868E+02
2030	2.213E+04	1.772E+07	1.191E+03	5.912E+03	8.862E+06	5.955E+02
2031	2.245E+04	1.797E+07	1.208E+03	5.996E+03	8.987E+06	6.038E+02
2032	2.275E+04	1.821E+07	1.224E+03	6.076E+03	9.107E+06	6.119E+02
2033	2.304E+04	1.845E+07	1.239E+03	6.154E+03	9.224E+06	6.197E+02
2034	2.332E+04	1.867E+07	1.255E+03	6.229E+03	9.336E+06	6.273E+02
2035	2.359E+04	1.889E+07	1.269E+03	6.301E+03	9.445E+06	6.346E+02
2036	2.385E+04	1.910E+07	1.283E+03	6.371E+03	9.550E+06	6.417E+02
2037	2.411E+04	1.930E+07	1.297E+03	6.439E+03	9.652E+06	6.485E+02
2038	2.435E+04	1.950E+07	1.310E+03	6.505E+03	9.751E+06	6.552E+02
2039	2.459E+04	1.969E+07	1.323E+03	6.569E+03	9.847E+06	6.616E+02
2040	2.483E+04	1.988E+07	1.336E+03	6.631E+03	9.940E+06	6.678E+02

**Results (Continued)**

Year	Total landfill gas			Methane		
	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)
2041	2.505E+04	2.006E+07	1.348E+03	6.691E+03	1.003E+07	6.739E+02
2042	2.527E+04	2.023E+07	1.360E+03	6.750E+03	1.012E+07	6.798E+02
2043	2.548E+04	2.041E+07	1.371E+03	6.807E+03	1.020E+07	6.855E+02
2044	2.569E+04	2.057E+07	1.382E+03	6.862E+03	1.029E+07	6.911E+02
2045	2.502E+04	2.003E+07	1.346E+03	6.683E+03	1.002E+07	6.731E+02
2046	2.380E+04	1.906E+07	1.280E+03	6.357E+03	9.529E+06	6.402E+02
2047	2.264E+04	1.813E+07	1.218E+03	6.047E+03	9.064E+06	6.090E+02
2048	2.153E+04	1.724E+07	1.159E+03	5.752E+03	8.622E+06	5.793E+02
2049	2.048E+04	1.640E+07	1.102E+03	5.472E+03	8.202E+06	5.511E+02
2050	1.949E+04	1.560E+07	1.048E+03	5.205E+03	7.802E+06	5.242E+02
2051	1.854E+04	1.484E+07	9.972E+02	4.951E+03	7.421E+06	4.986E+02
2052	1.763E+04	1.412E+07	9.486E+02	4.710E+03	7.059E+06	4.743E+02
2053	1.677E+04	1.343E+07	9.023E+02	4.480E+03	6.715E+06	4.512E+02
2054	1.595E+04	1.277E+07	8.583E+02	4.261E+03	6.387E+06	4.292E+02
2055	1.518E+04	1.215E+07	8.165E+02	4.054E+03	6.076E+06	4.082E+02
2056	1.444E+04	1.156E+07	7.767E+02	3.856E+03	5.780E+06	3.883E+02
2057	1.373E+04	1.100E+07	7.388E+02	3.668E+03	5.498E+06	3.694E+02
2058	1.306E+04	1.046E+07	7.027E+02	3.489E+03	5.230E+06	3.514E+02
2059	1.242E+04	9.949E+06	6.685E+02	3.319E+03	4.975E+06	3.342E+02
2060	1.182E+04	9.464E+06	6.359E+02	3.157E+03	4.732E+06	3.179E+02
2061	1.124E+04	9.002E+06	6.049E+02	3.003E+03	4.501E+06	3.024E+02
2062	1.069E+04	8.563E+06	5.754E+02	2.856E+03	4.282E+06	2.877E+02
2063	1.017E+04	8.146E+06	5.473E+02	2.717E+03	4.073E+06	2.737E+02
2064	9.676E+03	7.748E+06	5.206E+02	2.585E+03	3.874E+06	2.603E+02
2065	9.204E+03	7.370E+06	4.952E+02	2.459E+03	3.685E+06	2.476E+02
2066	8.755E+03	7.011E+06	4.711E+02	2.339E+03	3.505E+06	2.355E+02
2067	8.328E+03	6.669E+06	4.481E+02	2.225E+03	3.335E+06	2.240E+02
2068	7.922E+03	6.344E+06	4.262E+02	2.116E+03	3.172E+06	2.131E+02
2069	7.536E+03	6.034E+06	4.055E+02	2.013E+03	3.017E+06	2.027E+02
2070	7.168E+03	5.740E+06	3.857E+02	1.915E+03	2.870E+06	1.928E+02
2071	6.819E+03	5.460E+06	3.669E+02	1.821E+03	2.730E+06	1.834E+02
2072	6.486E+03	5.194E+06	3.490E+02	1.733E+03	2.597E+06	1.745E+02
2073	6.170E+03	4.941E+06	3.320E+02	1.648E+03	2.470E+06	1.660E+02
2074	5.869E+03	4.700E+06	3.158E+02	1.568E+03	2.350E+06	1.579E+02
2075	5.583E+03	4.470E+06	3.004E+02	1.491E+03	2.235E+06	1.502E+02
2076	5.310E+03	4.252E+06	2.857E+02	1.418E+03	2.126E+06	1.429E+02
2077	5.051E+03	4.045E+06	2.718E+02	1.349E+03	2.022E+06	1.359E+02
2078	4.805E+03	3.848E+06	2.585E+02	1.283E+03	1.924E+06	1.293E+02
2079	4.571E+03	3.660E+06	2.459E+02	1.221E+03	1.830E+06	1.230E+02
2080	4.348E+03	3.482E+06	2.339E+02	1.161E+03	1.741E+06	1.170E+02
2081	4.136E+03	3.312E+06	2.225E+02	1.105E+03	1.656E+06	1.113E+02
2082	3.934E+03	3.150E+06	2.117E+02	1.051E+03	1.575E+06	1.058E+02
2083	3.742E+03	2.997E+06	2.013E+02	9.996E+02	1.498E+06	1.007E+02
2084	3.560E+03	2.850E+06	1.915E+02	9.508E+02	1.425E+06	9.576E+01
2085	3.386E+03	2.711E+06	1.822E+02	9.045E+02	1.356E+06	9.109E+01
2086	3.221E+03	2.579E+06	1.733E+02	8.604E+02	1.290E+06	8.665E+01
2087	3.064E+03	2.453E+06	1.648E+02	8.184E+02	1.227E+06	8.242E+01
2088	2.914E+03	2.334E+06	1.568E+02	7.785E+02	1.167E+06	7.840E+01
2089	2.772E+03	2.220E+06	1.492E+02	7.405E+02	1.110E+06	7.458E+01
2090	2.637E+03	2.112E+06	1.419E+02	7.044E+02	1.056E+06	7.094E+01
2091	2.508E+03	2.009E+06	1.350E+02	6.700E+02	1.004E+06	6.748E+01



**Results (Continued)**

Year	Total landfill gas			Methane		
	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)
2092	2.386E+03	1.911E+06	1.284E+02	6.374E+02	9.554E+05	6.419E+01
2093	2.270E+03	1.818E+06	1.221E+02	6.063E+02	9.088E+05	6.106E+01
2094	2.159E+03	1.729E+06	1.162E+02	5.767E+02	8.644E+05	5.808E+01
2095	2.054E+03	1.645E+06	1.105E+02	5.486E+02	8.223E+05	5.525E+01
2096	1.954E+03	1.564E+06	1.051E+02	5.218E+02	7.822E+05	5.255E+01
2097	1.858E+03	1.488E+06	9.998E+01	4.964E+02	7.440E+05	4.999E+01
2098	1.768E+03	1.415E+06	9.511E+01	4.722E+02	7.077E+05	4.755E+01
2099	1.681E+03	1.346E+06	9.047E+01	4.491E+02	6.732E+05	4.523E+01
2100	1.599E+03	1.281E+06	8.606E+01	4.272E+02	6.404E+05	4.303E+01
2101	1.521E+03	1.218E+06	8.186E+01	4.064E+02	6.092E+05	4.093E+01
2102	1.447E+03	1.159E+06	7.787E+01	3.866E+02	5.795E+05	3.893E+01
2103	1.377E+03	1.102E+06	7.407E+01	3.677E+02	5.512E+05	3.703E+01
2104	1.310E+03	1.049E+06	7.046E+01	3.498E+02	5.243E+05	3.523E+01
2105	1.246E+03	9.975E+05	6.702E+01	3.327E+02	4.987E+05	3.351E+01
2106	1.185E+03	9.488E+05	6.375E+01	3.165E+02	4.744E+05	3.188E+01
2107	1.127E+03	9.026E+05	6.064E+01	3.011E+02	4.513E+05	3.032E+01
2108	1.072E+03	8.585E+05	5.769E+01	2.864E+02	4.293E+05	2.884E+01
2109	1.020E+03	8.167E+05	5.487E+01	2.724E+02	4.083E+05	2.744E+01
2110	9.701E+02	7.768E+05	5.220E+01	2.591E+02	3.884E+05	2.610E+01
2111	9.228E+02	7.390E+05	4.965E+01	2.465E+02	3.695E+05	2.483E+01
2112	8.778E+02	7.029E+05	4.723E+01	2.345E+02	3.515E+05	2.361E+01
2113	8.350E+02	6.686E+05	4.493E+01	2.230E+02	3.343E+05	2.246E+01
2114	7.943E+02	6.360E+05	4.273E+01	2.122E+02	3.180E+05	2.137E+01
2115	7.555E+02	6.050E+05	4.065E+01	2.018E+02	3.025E+05	2.033E+01
2116	7.187E+02	5.755E+05	3.867E+01	1.920E+02	2.877E+05	1.933E+01
2117	6.836E+02	5.474E+05	3.678E+01	1.826E+02	2.737E+05	1.839E+01
2118	6.503E+02	5.207E+05	3.499E+01	1.737E+02	2.604E+05	1.749E+01
2119	6.186E+02	4.953E+05	3.328E+01	1.652E+02	2.477E+05	1.664E+01
2120	5.884E+02	4.712E+05	3.166E+01	1.572E+02	2.356E+05	1.583E+01
2121	5.597E+02	4.482E+05	3.011E+01	1.495E+02	2.241E+05	1.506E+01
2122	5.324E+02	4.263E+05	2.865E+01	1.422E+02	2.132E+05	1.432E+01
2123	5.065E+02	4.055E+05	2.725E+01	1.353E+02	2.028E+05	1.362E+01
2124	4.818E+02	3.858E+05	2.592E+01	1.287E+02	1.929E+05	1.296E+01
2125	4.583E+02	3.670E+05	2.466E+01	1.224E+02	1.835E+05	1.233E+01
2126	4.359E+02	3.491E+05	2.345E+01	1.164E+02	1.745E+05	1.173E+01
2127	4.146E+02	3.320E+05	2.231E+01	1.108E+02	1.660E+05	1.115E+01
2128	3.944E+02	3.158E+05	2.122E+01	1.054E+02	1.579E+05	1.061E+01
2129	3.752E+02	3.004E+05	2.019E+01	1.002E+02	1.502E+05	1.009E+01
2130	3.569E+02	2.858E+05	1.920E+01	9.533E+01	1.429E+05	9.601E+00
2131	3.395E+02	2.718E+05	1.827E+01	9.068E+01	1.359E+05	9.133E+00

**Results (Continued)**

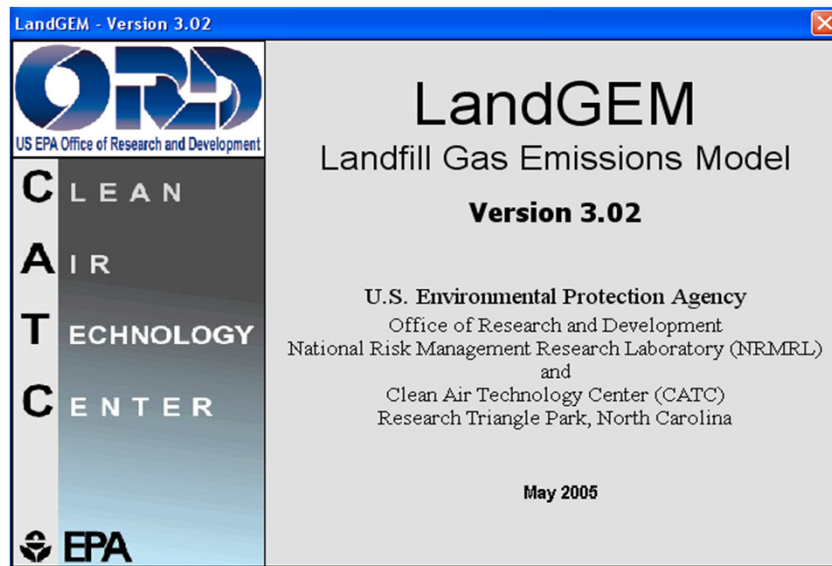
Year	Carbon dioxide			NMOC		
	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)
1991	0	0	0	0	0	0
1992	5.930E+02	3.239E+05	2.176E+01	9.289E+00	2.591E+03	1.741E-01
1993	8.998E+02	4.915E+05	3.303E+01	1.410E+01	3.932E+03	2.642E-01
1994	1.198E+03	6.547E+05	4.399E+01	1.877E+01	5.238E+03	3.519E-01
1995	1.462E+03	7.985E+05	5.365E+01	2.290E+01	6.388E+03	4.292E-01
1996	1.675E+03	9.153E+05	6.150E+01	2.625E+01	7.322E+03	4.920E-01
1997	1.872E+03	1.023E+06	6.873E+01	2.933E+01	8.184E+03	5.499E-01
1998	2.062E+03	1.126E+06	7.567E+01	3.230E+01	9.010E+03	6.054E-01
1999	2.267E+03	1.239E+06	8.322E+01	3.552E+01	9.908E+03	6.657E-01
2000	2.460E+03	1.344E+06	9.029E+01	3.854E+01	1.075E+04	7.224E-01
2001	2.675E+03	1.461E+06	9.818E+01	4.190E+01	1.169E+04	7.854E-01
2002	3.039E+03	1.660E+06	1.115E+02	4.760E+01	1.328E+04	8.923E-01
2003	3.429E+03	1.873E+06	1.259E+02	5.372E+01	1.499E+04	1.007E+00
2004	4.065E+03	2.221E+06	1.492E+02	6.368E+01	1.777E+04	1.194E+00
2005	4.915E+03	2.685E+06	1.804E+02	7.700E+01	2.148E+04	1.443E+00
2006	5.466E+03	2.986E+06	2.006E+02	8.562E+01	2.389E+04	1.605E+00
2007	6.571E+03	3.590E+06	2.412E+02	1.029E+02	2.872E+04	1.929E+00
2008	7.596E+03	4.149E+06	2.788E+02	1.190E+02	3.320E+04	2.230E+00
2009	8.427E+03	4.604E+06	3.093E+02	1.320E+02	3.683E+04	2.475E+00
2010	9.083E+03	4.962E+06	3.334E+02	1.423E+02	3.970E+04	2.667E+00
2011	9.642E+03	5.267E+06	3.539E+02	1.510E+02	4.214E+04	2.831E+00
2012	1.020E+04	5.574E+06	3.745E+02	1.598E+02	4.459E+04	2.996E+00
2013	1.068E+04	5.836E+06	3.921E+02	1.674E+02	4.669E+04	3.137E+00
2014	1.108E+04	6.055E+06	4.069E+02	1.736E+02	4.844E+04	3.255E+00
2015	1.151E+04	6.290E+06	4.226E+02	1.804E+02	5.032E+04	3.381E+00
2016	1.192E+04	6.514E+06	4.377E+02	1.868E+02	5.211E+04	3.501E+00
2017	1.232E+04	6.729E+06	4.521E+02	1.930E+02	5.383E+04	3.617E+00
2018	1.269E+04	6.935E+06	4.660E+02	1.989E+02	5.548E+04	3.728E+00
2019	1.306E+04	7.133E+06	4.793E+02	2.045E+02	5.706E+04	3.834E+00
2020	1.340E+04	7.323E+06	4.920E+02	2.100E+02	5.858E+04	3.936E+00
2021	1.374E+04	7.505E+06	5.043E+02	2.152E+02	6.004E+04	4.034E+00
2022	1.406E+04	7.680E+06	5.160E+02	2.202E+02	6.144E+04	4.128E+00
2023	1.437E+04	7.848E+06	5.273E+02	2.251E+02	6.279E+04	4.219E+00
2024	1.466E+04	8.010E+06	5.382E+02	2.297E+02	6.408E+04	4.306E+00
2025	1.495E+04	8.166E+06	5.487E+02	2.342E+02	6.533E+04	4.389E+00
2026	1.522E+04	8.316E+06	5.587E+02	2.385E+02	6.653E+04	4.470E+00
2027	1.549E+04	8.460E+06	5.684E+02	2.426E+02	6.768E+04	4.547E+00
2028	1.574E+04	8.599E+06	5.778E+02	2.466E+02	6.879E+04	4.622E+00
2029	1.599E+04	8.733E+06	5.868E+02	2.504E+02	6.986E+04	4.694E+00
2030	1.622E+04	8.862E+06	5.955E+02	2.541E+02	7.090E+04	4.764E+00
2031	1.645E+04	8.987E+06	6.038E+02	2.577E+02	7.190E+04	4.831E+00
2032	1.667E+04	9.107E+06	6.119E+02	2.612E+02	7.286E+04	4.895E+00
2033	1.688E+04	9.224E+06	6.197E+02	2.645E+02	7.379E+04	4.958E+00
2034	1.709E+04	9.336E+06	6.273E+02	2.677E+02	7.469E+04	5.018E+00
2035	1.729E+04	9.445E+06	6.346E+02	2.708E+02	7.556E+04	5.077E+00
2036	1.748E+04	9.550E+06	6.417E+02	2.739E+02	7.640E+04	5.133E+00
2037	1.767E+04	9.652E+06	6.485E+02	2.768E+02	7.722E+04	5.188E+00
2038	1.785E+04	9.751E+06	6.552E+02	2.796E+02	7.801E+04	5.241E+00
2039	1.802E+04	9.847E+06	6.616E+02	2.824E+02	7.877E+04	5.293E+00
2040	1.819E+04	9.940E+06	6.678E+02	2.850E+02	7.952E+04	5.343E+00

**Results (Continued)**

Year	Carbon dioxide			NMOC		
	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)
2041	1.836E+04	1.003E+07	6.739E+02	2.876E+02	8.024E+04	5.391E+00
2042	1.852E+04	1.012E+07	6.798E+02	2.901E+02	8.094E+04	5.438E+00
2043	1.868E+04	1.020E+07	6.855E+02	2.926E+02	8.162E+04	5.484E+00
2044	1.883E+04	1.029E+07	6.911E+02	2.949E+02	8.228E+04	5.529E+00
2045	1.834E+04	1.002E+07	6.731E+02	2.873E+02	8.014E+04	5.385E+00
2046	1.744E+04	9.529E+06	6.402E+02	2.732E+02	7.623E+04	5.122E+00
2047	1.659E+04	9.064E+06	6.090E+02	2.599E+02	7.251E+04	4.872E+00
2048	1.578E+04	8.622E+06	5.793E+02	2.472E+02	6.898E+04	4.635E+00
2049	1.501E+04	8.202E+06	5.511E+02	2.352E+02	6.561E+04	4.409E+00
2050	1.428E+04	7.802E+06	5.242E+02	2.237E+02	6.241E+04	4.194E+00
2051	1.358E+04	7.421E+06	4.986E+02	2.128E+02	5.937E+04	3.989E+00
2052	1.292E+04	7.059E+06	4.743E+02	2.024E+02	5.647E+04	3.794E+00
2053	1.229E+04	6.715E+06	4.512E+02	1.926E+02	5.372E+04	3.609E+00
2054	1.169E+04	6.387E+06	4.292E+02	1.832E+02	5.110E+04	3.433E+00
2055	1.112E+04	6.076E+06	4.082E+02	1.742E+02	4.861E+04	3.266E+00
2056	1.058E+04	5.780E+06	3.883E+02	1.657E+02	4.624E+04	3.107E+00
2057	1.006E+04	5.498E+06	3.694E+02	1.577E+02	4.398E+04	2.955E+00
2058	9.573E+03	5.230E+06	3.514E+02	1.500E+02	4.184E+04	2.811E+00
2059	9.106E+03	4.975E+06	3.342E+02	1.426E+02	3.980E+04	2.674E+00
2060	8.662E+03	4.732E+06	3.179E+02	1.357E+02	3.786E+04	2.543E+00
2061	8.239E+03	4.501E+06	3.024E+02	1.291E+02	3.601E+04	2.419E+00
2062	7.837E+03	4.282E+06	2.877E+02	1.228E+02	3.425E+04	2.301E+00
2063	7.455E+03	4.073E+06	2.737E+02	1.168E+02	3.258E+04	2.189E+00
2064	7.092E+03	3.874E+06	2.603E+02	1.111E+02	3.099E+04	2.082E+00
2065	6.746E+03	3.685E+06	2.476E+02	1.057E+02	2.948E+04	1.981E+00
2066	6.417E+03	3.505E+06	2.355E+02	1.005E+02	2.804E+04	1.884E+00
2067	6.104E+03	3.335E+06	2.240E+02	9.562E+01	2.668E+04	1.792E+00
2068	5.806E+03	3.172E+06	2.131E+02	9.096E+01	2.538E+04	1.705E+00
2069	5.523E+03	3.017E+06	2.027E+02	8.652E+01	2.414E+04	1.622E+00
2070	5.254E+03	2.870E+06	1.928E+02	8.230E+01	2.296E+04	1.543E+00
2071	4.997E+03	2.730E+06	1.834E+02	7.829E+01	2.184E+04	1.467E+00
2072	4.754E+03	2.597E+06	1.745E+02	7.447E+01	2.078E+04	1.396E+00
2073	4.522E+03	2.470E+06	1.660E+02	7.084E+01	1.976E+04	1.328E+00
2074	4.301E+03	2.350E+06	1.579E+02	6.738E+01	1.880E+04	1.263E+00
2075	4.092E+03	2.235E+06	1.502E+02	6.410E+01	1.788E+04	1.201E+00
2076	3.892E+03	2.126E+06	1.429E+02	6.097E+01	1.701E+04	1.143E+00
2077	3.702E+03	2.022E+06	1.359E+02	5.800E+01	1.618E+04	1.087E+00
2078	3.522E+03	1.924E+06	1.293E+02	5.517E+01	1.539E+04	1.034E+00
2079	3.350E+03	1.830E+06	1.230E+02	5.248E+01	1.464E+04	9.837E-01
2080	3.186E+03	1.741E+06	1.170E+02	4.992E+01	1.393E+04	9.357E-01
2081	3.031E+03	1.656E+06	1.113E+02	4.748E+01	1.325E+04	8.901E-01
2082	2.883E+03	1.575E+06	1.058E+02	4.517E+01	1.260E+04	8.467E-01
2083	2.743E+03	1.498E+06	1.007E+02	4.296E+01	1.199E+04	8.054E-01
2084	2.609E+03	1.425E+06	9.576E+01	4.087E+01	1.140E+04	7.661E-01
2085	2.482E+03	1.356E+06	9.109E+01	3.888E+01	1.085E+04	7.287E-01
2086	2.361E+03	1.290E+06	8.665E+01	3.698E+01	1.032E+04	6.932E-01
2087	2.245E+03	1.227E+06	8.242E+01	3.518E+01	9.814E+03	6.594E-01
2088	2.136E+03	1.167E+06	7.840E+01	3.346E+01	9.335E+03	6.272E-01
2089	2.032E+03	1.110E+06	7.458E+01	3.183E+01	8.880E+03	5.966E-01
2090	1.933E+03	1.056E+06	7.094E+01	3.028E+01	8.447E+03	5.675E-01
2091	1.838E+03	1.004E+06	6.748E+01	2.880E+01	8.035E+03	5.399E-01

**Results (Continued)**

Year	Carbon dioxide			NMOC		
	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)
2092	1.749E+03	9.554E+05	6.419E+01	2.740E+01	7.643E+03	5.135E-01
2093	1.663E+03	9.088E+05	6.106E+01	2.606E+01	7.270E+03	4.885E-01
2094	1.582E+03	8.644E+05	5.808E+01	2.479E+01	6.916E+03	4.647E-01
2095	1.505E+03	8.223E+05	5.525E+01	2.358E+01	6.578E+03	4.420E-01
2096	1.432E+03	7.822E+05	5.255E+01	2.243E+01	6.257E+03	4.204E-01
2097	1.362E+03	7.440E+05	4.999E+01	2.134E+01	5.952E+03	3.999E-01
2098	1.296E+03	7.077E+05	4.755E+01	2.030E+01	5.662E+03	3.804E-01
2099	1.232E+03	6.732E+05	4.523E+01	1.931E+01	5.386E+03	3.619E-01
2100	1.172E+03	6.404E+05	4.303E+01	1.836E+01	5.123E+03	3.442E-01
2101	1.115E+03	6.092E+05	4.093E+01	1.747E+01	4.873E+03	3.274E-01
2102	1.061E+03	5.795E+05	3.893E+01	1.662E+01	4.636E+03	3.115E-01
2103	1.009E+03	5.512E+05	3.703E+01	1.581E+01	4.410E+03	2.963E-01
2104	9.598E+02	5.243E+05	3.523E+01	1.503E+01	4.194E+03	2.818E-01
2105	9.129E+02	4.987E+05	3.351E+01	1.430E+01	3.990E+03	2.681E-01
2106	8.684E+02	4.744E+05	3.188E+01	1.360E+01	3.795E+03	2.550E-01
2107	8.261E+02	4.513E+05	3.032E+01	1.294E+01	3.610E+03	2.426E-01
2108	7.858E+02	4.293E+05	2.884E+01	1.231E+01	3.434E+03	2.307E-01
2109	7.475E+02	4.083E+05	2.744E+01	1.171E+01	3.267E+03	2.195E-01
2110	7.110E+02	3.884E+05	2.610E+01	1.114E+01	3.107E+03	2.088E-01
2111	6.763E+02	3.695E+05	2.483E+01	1.059E+01	2.956E+03	1.986E-01
2112	6.433E+02	3.515E+05	2.361E+01	1.008E+01	2.812E+03	1.889E-01
2113	6.120E+02	3.343E+05	2.246E+01	9.587E+00	2.675E+03	1.797E-01
2114	5.821E+02	3.180E+05	2.137E+01	9.119E+00	2.544E+03	1.709E-01
2115	5.537E+02	3.025E+05	2.033E+01	8.674E+00	2.420E+03	1.626E-01
2116	5.267E+02	2.877E+05	1.933E+01	8.251E+00	2.302E+03	1.547E-01
2117	5.010E+02	2.737E+05	1.839E+01	7.849E+00	2.190E+03	1.471E-01
2118	4.766E+02	2.604E+05	1.749E+01	7.466E+00	2.083E+03	1.400E-01
2119	4.534E+02	2.477E+05	1.664E+01	7.102E+00	1.981E+03	1.331E-01
2120	4.312E+02	2.356E+05	1.583E+01	6.756E+00	1.885E+03	1.266E-01
2121	4.102E+02	2.241E+05	1.506E+01	6.426E+00	1.793E+03	1.205E-01
2122	3.902E+02	2.132E+05	1.432E+01	6.113E+00	1.705E+03	1.146E-01
2123	3.712E+02	2.028E+05	1.362E+01	5.815E+00	1.622E+03	1.090E-01
2124	3.531E+02	1.929E+05	1.296E+01	5.531E+00	1.543E+03	1.037E-01
2125	3.359E+02	1.835E+05	1.233E+01	5.261E+00	1.468E+03	9.862E-02
2126	3.195E+02	1.745E+05	1.173E+01	5.005E+00	1.396E+03	9.381E-02
2127	3.039E+02	1.660E+05	1.115E+01	4.761E+00	1.328E+03	8.924E-02
2128	2.891E+02	1.579E+05	1.061E+01	4.528E+00	1.263E+03	8.488E-02
2129	2.750E+02	1.502E+05	1.009E+01	4.308E+00	1.202E+03	8.074E-02
2130	2.616E+02	1.429E+05	9.601E+00	4.098E+00	1.143E+03	7.681E-02
2131	2.488E+02	1.359E+05	9.133E+00	3.898E+00	1.087E+03	7.306E-02



## Summary Report

**Landfill Name or Identifier:** Tier I: PCCL Class III Landfill

**Date:** Friday, April 11, 2014

### Description/Comments:

#### About LandGEM:

First-Order Decomposition Rate Equation:

$$Q_{CH_4} = \sum_{i=1}^n \sum_{j=0.1}^1 kL_o \left( \frac{M_i}{10} \right) e^{-kt_{ij}}$$

Where,

$Q_{CH_4}$  = annual methane generation in the year of the calculation ( $m^3/year$ )

$i$  = 1-year time increment

$n$  = (year of the calculation) - (initial year of waste acceptance)

$j$  = 0.1-year time increment

$k$  = methane generation rate ( $year^{-1}$ )

$L_o$  = potential methane generation capacity ( $m^3/Mg$ )

$M_i$  = mass of waste accepted in the  $i^{th}$  year ( $Mg$ )

$t_{ij}$  = age of the  $j^{th}$  section of waste mass  $M_i$  accepted in the  $i^{th}$  year (*decimal years*, e.g., 3.2 years)

LandGEM is based on a first-order decomposition rate equation for quantifying emissions from the decomposition of landfilled waste in municipal solid waste (MSW) landfills. The software provides a relatively simple approach to estimating landfill gas emissions. Model defaults are based on empirical data from U.S. landfills. Field test data can also be used in place of model defaults when available. Further guidance on EPA test methods, Clean Air Act (CAA) regulations, and other guidance regarding landfill gas emissions and control technology requirements can be found at <http://www.epa.gov/ttnatw01/landfill/landflpg.html>.

LandGEM is considered a screening tool — the better the input data, the better the estimates. Often, there are limitations with the available data regarding waste quantity and composition, variation in design and operating practices over time, and changes occurring over time that impact the emissions potential. Changes to landfill operation, such as operating under wet conditions through leachate recirculation or other liquid additions, will result in generating more gas at a faster rate. Defaults for estimating emissions for this type of operation are being developed to include in LandGEM along with defaults for conventional landfills (no leachate or liquid additions) for developing emission inventories and determining CAA applicability. Refer to the Web site identified above for future updates.

**Input Review**

## LANDFILL CHARACTERISTICS

Landfill Open Year	<b>1992</b>	
Landfill Closure Year (with 80-year limit)	<b>2005</b>	
Actual Closure Year (without limit)	<b>2005</b>	
Have Model Calculate Closure Year?	<b>No</b>	
Waste Design Capacity		<i>short tons</i>

## MODEL PARAMETERS

Methane Generation Rate, k	<b>0.050</b>	<i>year<sup>-1</sup></i>
Potential Methane Generation Capacity, L <sub>0</sub>	<b>170</b>	<i>m<sup>3</sup>/Mg</i>
NMOC Concentration	<b>4,000</b>	<i>ppmv as hexane</i>
Methane Content	<b>50</b>	<i>% by volume</i>

## GASES / POLLUTANTS SELECTED

Gas / Pollutant #1:	<b>Total landfill gas</b>
Gas / Pollutant #2:	<b>Methane</b>
Gas / Pollutant #3:	<b>Carbon dioxide</b>
Gas / Pollutant #4:	<b>NMOC</b>

## WASTE ACCEPTANCE RATES

Year	Waste Accepted		Waste-In-Place	
	(Mg/year)	(short tons/year)	(Mg)	(short tons)
1992	7,101	7,811	0	0
1993	7,245	7,969	7,101	7,811
1994	6,803	7,483	14,346	15,780
1995	6,029	6,632	21,149	23,264
1996	11,795	12,974	27,178	29,896
1997	11,860	13,046	38,973	42,870
1998	12,949	14,243	50,833	55,917
1999	12,835	14,118	63,782	70,160
2000	14,160	15,576	76,616	84,278
2001	14,660	16,126	90,776	99,854
2002	11,630	12,792	105,436	115,980
2003	41,355	45,491	117,066	128,772
2004	57,072	62,780	158,421	174,263
2005	30,734	33,808	215,493	237,043
2006	0	0	246,228	270,850
2007	0	0	246,228	270,850
2008	0	0	246,228	270,850
2009	0	0	246,228	270,850
2010	0	0	246,228	270,850
2011	0	0	246,228	270,850
2012	0	0	246,228	270,850
2013	0	0	246,228	270,850
2014	0	0	246,228	270,850
2015	0	0	246,228	270,850
2016	0	0	246,228	270,850
2017	0	0	246,228	270,850
2018	0	0	246,228	270,850
2019	0	0	246,228	270,850
2020	0	0	246,228	270,850
2021	0	0	246,228	270,850
2022	0	0	246,228	270,850
2023	0	0	246,228	270,850
2024	0	0	246,228	270,850
2025	0	0	246,228	270,850
2026	0	0	246,228	270,850
2027	0	0	246,228	270,850
2028	0	0	246,228	270,850
2029	0	0	246,228	270,850
2030	0	0	246,228	270,850
2031	0	0	246,228	270,850

## WASTE ACCEPTANCE RATES (Continued)

Year	Waste Accepted		Waste-In-Place	
	(Mg/year)	(short tons/year)	(Mg)	(short tons)
2032	0	0	246,228	270,850
2033	0	0	246,228	270,850
2034	0	0	246,228	270,850
2035	0	0	246,228	270,850
2036	0	0	246,228	270,850
2037	0	0	246,228	270,850
2038	0	0	246,228	270,850
2039	0	0	246,228	270,850
2040	0	0	246,228	270,850
2041	0	0	246,228	270,850
2042	0	0	246,228	270,850
2043	0	0	246,228	270,850
2044	0	0	246,228	270,850
2045	0	0	246,228	270,850
2046	0	0	246,228	270,850
2047	0	0	246,228	270,850
2048	0	0	246,228	270,850
2049	0	0	246,228	270,850
2050	0	0	246,228	270,850
2051	0	0	246,228	270,850
2052	0	0	246,228	270,850
2053	0	0	246,228	270,850
2054	0	0	246,228	270,850
2055	0	0	246,228	270,850
2056	0	0	246,228	270,850
2057	0	0	246,228	270,850
2058	0	0	246,228	270,850
2059	0	0	246,228	270,850
2060	0	0	246,228	270,850
2061	0	0	246,228	270,850
2062	0	0	246,228	270,850
2063	0	0	246,228	270,850
2064	0	0	246,228	270,850
2065	0	0	246,228	270,850
2066	0	0	246,228	270,850
2067	0	0	246,228	270,850
2068	0	0	246,228	270,850
2069	0	0	246,228	270,850
2070	0	0	246,228	270,850
2071	0	0	246,228	270,850

**Pollutant Parameters**

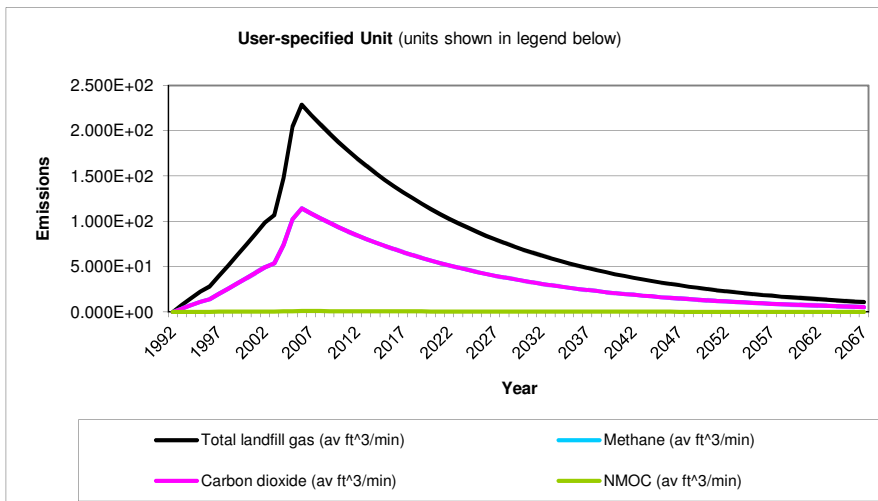
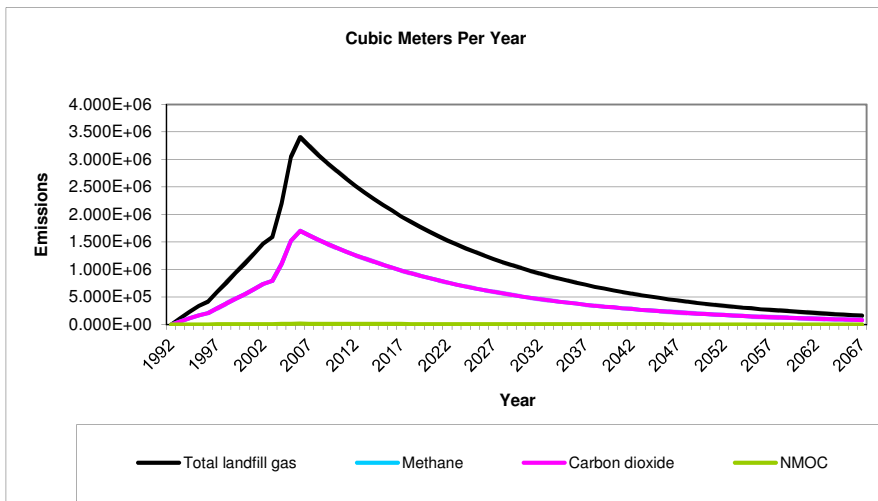
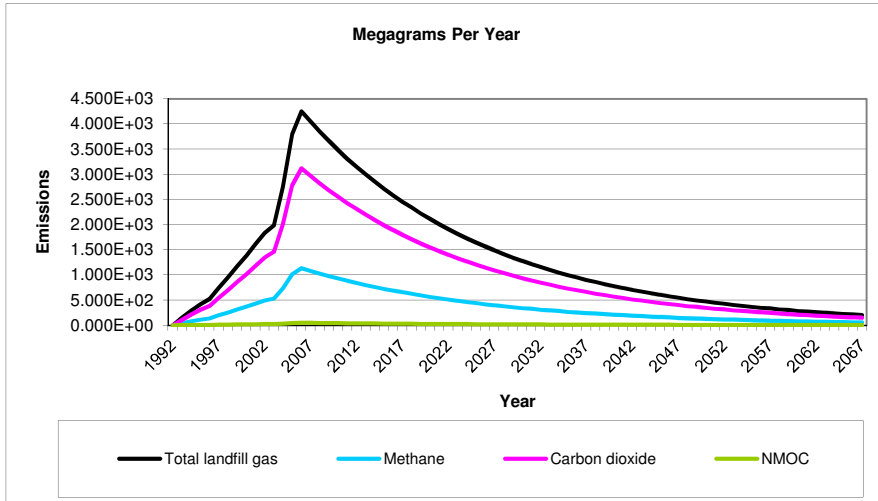
<b>Gas / Pollutant Default Parameters:</b>				<b>User-specified Pollutant Parameters:</b>	
	Compound	Concentration (ppmv)	Molecular Weight	Concentration (ppmv)	Molecular Weight
<b>Gases</b>	Total landfill gas		0.00		
	Methane		16.04		
	Carbon dioxide		44.01		
	NMOC	4,000	86.18		
<b>Pollutants</b>	1,1,1-Trichloroethane (methyl chloroform) - HAP	0.48	133.41		
	1,1,1,2-Tetrachloroethane - HAP/VOC	1.1	167.85		
	1,1-Dichloroethane (ethylidene dichloride) - HAP/VOC	2.4	98.97		
	1,1-Dichloroethene (vinylidene chloride) - HAP/VOC	0.20	96.94		
	1,2-Dichloroethane (ethylene dichloride) - HAP/VOC	0.41	98.96		
	1,2-Dichloropropane (propylene dichloride) - HAP/VOC	0.18	112.99		
	2-Propanol (isopropyl alcohol) - VOC	50	60.11		
	Acetone	7.0	58.08		
	Acrylonitrile - HAP/VOC	6.3	53.06		
	Benzene - No or Unknown Co-disposal - HAP/VOC	1.9	78.11		
	Benzene - Co-disposal - HAP/VOC	11	78.11		
	Bromodichloromethane - VOC	3.1	163.83		
	Butane - VOC	5.0	58.12		
	Carbon disulfide - HAP/VOC	0.58	76.13		
	Carbon monoxide	140	28.01		
	Carbon tetrachloride - HAP/VOC	4.0E-03	153.84		
	Carbonyl sulfide - HAP/VOC	0.49	60.07		
	Chlorobenzene - HAP/VOC	0.25	112.56		
	Chlorodifluoromethane	1.3	86.47		
	Chloroethane (ethyl chloride) - HAP/VOC	1.3	64.52		
	Chloroform - HAP/VOC	0.03	119.39		
	Chloromethane - VOC	1.2	50.49		
	Dichlorobenzene - (HAP for para isomer/VOC)	0.21	147		
	Dichlorodifluoromethane	16	120.91		
	Dichlorofluoromethane - VOC	2.6	102.92		
	Dichloromethane (methylene chloride) - HAP	14	84.94		
	Dimethyl sulfide (methyl sulfide) - VOC	7.8	62.13		
	Ethane	890	30.07		
	Ethanol - VOC	27	46.08		







**Graphs**



**Results**

Year	Total landfill gas			Methane		
	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)
1992	0	0	0	0	0	0
1993	1.474E+02	1.180E+05	7.931E+00	3.938E+01	5.902E+04	3.966E+00
1994	2.906E+02	2.327E+05	1.564E+01	7.763E+01	1.164E+05	7.818E+00
1995	4.177E+02	3.345E+05	2.247E+01	1.116E+02	1.672E+05	1.124E+01
1996	5.225E+02	4.184E+05	2.811E+01	1.396E+02	2.092E+05	1.406E+01
1997	7.419E+02	5.940E+05	3.991E+01	1.982E+02	2.970E+05	1.996E+01
1998	9.519E+02	7.622E+05	5.121E+01	2.543E+02	3.811E+05	2.561E+01
1999	1.174E+03	9.403E+05	6.318E+01	3.137E+02	4.702E+05	3.159E+01
2000	1.383E+03	1.108E+06	7.443E+01	3.695E+02	5.539E+05	3.722E+01
2001	1.610E+03	1.289E+06	8.662E+01	4.300E+02	6.446E+05	4.331E+01
2002	1.836E+03	1.470E+06	9.877E+01	4.903E+02	7.350E+05	4.938E+01
2003	1.988E+03	1.592E+06	1.069E+02	5.309E+02	7.958E+05	5.347E+01
2004	2.749E+03	2.201E+06	1.479E+02	7.344E+02	1.101E+06	7.396E+01
2005	3.800E+03	3.043E+06	2.044E+02	1.015E+03	1.521E+06	1.022E+02
2006	4.253E+03	3.405E+06	2.288E+02	1.136E+03	1.703E+06	1.144E+02
2007	4.045E+03	3.239E+06	2.176E+02	1.081E+03	1.620E+06	1.088E+02
2008	3.848E+03	3.081E+06	2.070E+02	1.028E+03	1.541E+06	1.035E+02
2009	3.660E+03	2.931E+06	1.969E+02	9.777E+02	1.466E+06	9.847E+01
2010	3.482E+03	2.788E+06	1.873E+02	9.300E+02	1.394E+06	9.366E+01
2011	3.312E+03	2.652E+06	1.782E+02	8.847E+02	1.326E+06	8.910E+01
2012	3.150E+03	2.523E+06	1.695E+02	8.415E+02	1.261E+06	8.475E+01
2013	2.997E+03	2.400E+06	1.612E+02	8.005E+02	1.200E+06	8.062E+01
2014	2.851E+03	2.283E+06	1.534E+02	7.614E+02	1.141E+06	7.669E+01
2015	2.712E+03	2.171E+06	1.459E+02	7.243E+02	1.086E+06	7.295E+01
2016	2.579E+03	2.065E+06	1.388E+02	6.890E+02	1.033E+06	6.939E+01
2017	2.454E+03	1.965E+06	1.320E+02	6.554E+02	9.824E+05	6.600E+01
2018	2.334E+03	1.869E+06	1.256E+02	6.234E+02	9.344E+05	6.279E+01
2019	2.220E+03	1.778E+06	1.194E+02	5.930E+02	8.889E+05	5.972E+01
2020	2.112E+03	1.691E+06	1.136E+02	5.641E+02	8.455E+05	5.681E+01
2021	2.009E+03	1.609E+06	1.081E+02	5.366E+02	8.043E+05	5.404E+01
2022	1.911E+03	1.530E+06	1.028E+02	5.104E+02	7.651E+05	5.140E+01
2023	1.818E+03	1.455E+06	9.779E+01	4.855E+02	7.277E+05	4.890E+01
2024	1.729E+03	1.385E+06	9.303E+01	4.618E+02	6.923E+05	4.651E+01
2025	1.645E+03	1.317E+06	8.849E+01	4.393E+02	6.585E+05	4.424E+01
2026	1.564E+03	1.253E+06	8.417E+01	4.179E+02	6.264E+05	4.209E+01
2027	1.488E+03	1.192E+06	8.007E+01	3.975E+02	5.958E+05	4.003E+01
2028	1.416E+03	1.134E+06	7.616E+01	3.781E+02	5.668E+05	3.808E+01
2029	1.347E+03	1.078E+06	7.245E+01	3.597E+02	5.391E+05	3.622E+01
2030	1.281E+03	1.026E+06	6.891E+01	3.421E+02	5.128E+05	3.446E+01
2031	1.218E+03	9.756E+05	6.555E+01	3.255E+02	4.878E+05	3.278E+01
2032	1.159E+03	9.281E+05	6.236E+01	3.096E+02	4.640E+05	3.118E+01
2033	1.102E+03	8.828E+05	5.932E+01	2.945E+02	4.414E+05	2.966E+01
2034	1.049E+03	8.397E+05	5.642E+01	2.801E+02	4.199E+05	2.821E+01
2035	9.976E+02	7.988E+05	5.367E+01	2.665E+02	3.994E+05	2.684E+01
2036	9.489E+02	7.598E+05	5.105E+01	2.535E+02	3.799E+05	2.553E+01
2037	9.026E+02	7.228E+05	4.856E+01	2.411E+02	3.614E+05	2.428E+01
2038	8.586E+02	6.875E+05	4.619E+01	2.293E+02	3.438E+05	2.310E+01
2039	8.167E+02	6.540E+05	4.394E+01	2.182E+02	3.270E+05	2.197E+01
2040	7.769E+02	6.221E+05	4.180E+01	2.075E+02	3.111E+05	2.090E+01
2041	7.390E+02	5.918E+05	3.976E+01	1.974E+02	2.959E+05	1.988E+01

**Results (Continued)**

Year	Total landfill gas			Methane		
	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)
2042	7.030E+02	5.629E+05	3.782E+01	1.878E+02	2.815E+05	1.891E+01
2043	6.687E+02	5.354E+05	3.598E+01	1.786E+02	2.677E+05	1.799E+01
2044	6.361E+02	5.093E+05	3.422E+01	1.699E+02	2.547E+05	1.711E+01
2045	6.050E+02	4.845E+05	3.255E+01	1.616E+02	2.422E+05	1.628E+01
2046	5.755E+02	4.609E+05	3.097E+01	1.537E+02	2.304E+05	1.548E+01
2047	5.475E+02	4.384E+05	2.946E+01	1.462E+02	2.192E+05	1.473E+01
2048	5.208E+02	4.170E+05	2.802E+01	1.391E+02	2.085E+05	1.401E+01
2049	4.954E+02	3.967E+05	2.665E+01	1.323E+02	1.983E+05	1.333E+01
2050	4.712E+02	3.773E+05	2.535E+01	1.259E+02	1.887E+05	1.268E+01
2051	4.482E+02	3.589E+05	2.412E+01	1.197E+02	1.795E+05	1.206E+01
2052	4.264E+02	3.414E+05	2.294E+01	1.139E+02	1.707E+05	1.147E+01
2053	4.056E+02	3.248E+05	2.182E+01	1.083E+02	1.624E+05	1.091E+01
2054	3.858E+02	3.089E+05	2.076E+01	1.030E+02	1.545E+05	1.038E+01
2055	3.670E+02	2.939E+05	1.974E+01	9.802E+01	1.469E+05	9.872E+00
2056	3.491E+02	2.795E+05	1.878E+01	9.324E+01	1.398E+05	9.391E+00
2057	3.321E+02	2.659E+05	1.787E+01	8.870E+01	1.329E+05	8.933E+00
2058	3.159E+02	2.529E+05	1.699E+01	8.437E+01	1.265E+05	8.497E+00
2059	3.005E+02	2.406E+05	1.617E+01	8.026E+01	1.203E+05	8.083E+00
2060	2.858E+02	2.289E+05	1.538E+01	7.634E+01	1.144E+05	7.688E+00
2061	2.719E+02	2.177E+05	1.463E+01	7.262E+01	1.088E+05	7.314E+00
2062	2.586E+02	2.071E+05	1.391E+01	6.908E+01	1.035E+05	6.957E+00
2063	2.460E+02	1.970E+05	1.324E+01	6.571E+01	9.849E+04	6.618E+00
2064	2.340E+02	1.874E+05	1.259E+01	6.250E+01	9.369E+04	6.295E+00
2065	2.226E+02	1.782E+05	1.198E+01	5.945E+01	8.912E+04	5.988E+00
2066	2.117E+02	1.695E+05	1.139E+01	5.655E+01	8.477E+04	5.696E+00
2067	2.014E+02	1.613E+05	1.084E+01	5.380E+01	8.064E+04	5.418E+00
2068	1.916E+02	1.534E+05	1.031E+01	5.117E+01	7.670E+04	5.154E+00
2069	1.822E+02	1.459E+05	9.805E+00	4.868E+01	7.296E+04	4.902E+00
2070	1.733E+02	1.388E+05	9.327E+00	4.630E+01	6.940E+04	4.663E+00
2071	1.649E+02	1.320E+05	8.872E+00	4.405E+01	6.602E+04	4.436E+00
2072	1.569E+02	1.256E+05	8.439E+00	4.190E+01	6.280E+04	4.220E+00
2073	1.492E+02	1.195E+05	8.027E+00	3.985E+01	5.974E+04	4.014E+00
2074	1.419E+02	1.136E+05	7.636E+00	3.791E+01	5.682E+04	3.818E+00
2075	1.350E+02	1.081E+05	7.264E+00	3.606E+01	5.405E+04	3.632E+00
2076	1.284E+02	1.028E+05	6.909E+00	3.430E+01	5.142E+04	3.455E+00
2077	1.222E+02	9.782E+04	6.572E+00	3.263E+01	4.891E+04	3.286E+00
2078	1.162E+02	9.305E+04	6.252E+00	3.104E+01	4.652E+04	3.126E+00
2079	1.105E+02	8.851E+04	5.947E+00	2.952E+01	4.425E+04	2.973E+00
2080	1.051E+02	8.419E+04	5.657E+00	2.808E+01	4.210E+04	2.828E+00
2081	1.000E+02	8.009E+04	5.381E+00	2.671E+01	4.004E+04	2.690E+00
2082	9.514E+01	7.618E+04	5.119E+00	2.541E+01	3.809E+04	2.559E+00
2083	9.050E+01	7.246E+04	4.869E+00	2.417E+01	3.623E+04	2.434E+00
2084	8.608E+01	6.893E+04	4.631E+00	2.299E+01	3.447E+04	2.316E+00
2085	8.188E+01	6.557E+04	4.406E+00	2.187E+01	3.278E+04	2.203E+00
2086	7.789E+01	6.237E+04	4.191E+00	2.081E+01	3.119E+04	2.095E+00
2087	7.409E+01	5.933E+04	3.986E+00	1.979E+01	2.966E+04	1.993E+00
2088	7.048E+01	5.644E+04	3.792E+00	1.883E+01	2.822E+04	1.896E+00
2089	6.704E+01	5.368E+04	3.607E+00	1.791E+01	2.684E+04	1.803E+00
2090	6.377E+01	5.107E+04	3.431E+00	1.703E+01	2.553E+04	1.716E+00
2091	6.066E+01	4.857E+04	3.264E+00	1.620E+01	2.429E+04	1.632E+00
2092	5.770E+01	4.621E+04	3.105E+00	1.541E+01	2.310E+04	1.552E+00

**Results (Continued)**

Year	Total landfill gas			Methane		
	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)
2093	5.489E+01	4.395E+04	2.953E+00	1.466E+01	2.198E+04	1.477E+00
2094	5.221E+01	4.181E+04	2.809E+00	1.395E+01	2.090E+04	1.405E+00
2095	4.967E+01	3.977E+04	2.672E+00	1.327E+01	1.988E+04	1.336E+00
2096	4.724E+01	3.783E+04	2.542E+00	1.262E+01	1.891E+04	1.271E+00
2097	4.494E+01	3.599E+04	2.418E+00	1.200E+01	1.799E+04	1.209E+00
2098	4.275E+01	3.423E+04	2.300E+00	1.142E+01	1.711E+04	1.150E+00
2099	4.066E+01	3.256E+04	2.188E+00	1.086E+01	1.628E+04	1.094E+00
2100	3.868E+01	3.097E+04	2.081E+00	1.033E+01	1.549E+04	1.041E+00
2101	3.679E+01	2.946E+04	1.980E+00	9.828E+00	1.473E+04	9.898E-01
2102	3.500E+01	2.803E+04	1.883E+00	9.348E+00	1.401E+04	9.415E-01
2103	3.329E+01	2.666E+04	1.791E+00	8.893E+00	1.333E+04	8.956E-01
2104	3.167E+01	2.536E+04	1.704E+00	8.459E+00	1.268E+04	8.519E-01
2105	3.012E+01	2.412E+04	1.621E+00	8.046E+00	1.206E+04	8.104E-01
2106	2.865E+01	2.295E+04	1.542E+00	7.654E+00	1.147E+04	7.708E-01
2107	2.726E+01	2.183E+04	1.466E+00	7.281E+00	1.091E+04	7.332E-01
2108	2.593E+01	2.076E+04	1.395E+00	6.926E+00	1.038E+04	6.975E-01
2109	2.466E+01	1.975E+04	1.327E+00	6.588E+00	9.874E+03	6.635E-01
2110	2.346E+01	1.879E+04	1.262E+00	6.266E+00	9.393E+03	6.311E-01
2111	2.232E+01	1.787E+04	1.201E+00	5.961E+00	8.935E+03	6.003E-01
2112	2.123E+01	1.700E+04	1.142E+00	5.670E+00	8.499E+03	5.711E-01
2113	2.019E+01	1.617E+04	1.086E+00	5.394E+00	8.085E+03	5.432E-01
2114	1.921E+01	1.538E+04	1.033E+00	5.131E+00	7.690E+03	5.167E-01
2115	1.827E+01	1.463E+04	9.830E-01	4.880E+00	7.315E+03	4.915E-01
2116	1.738E+01	1.392E+04	9.351E-01	4.642E+00	6.958E+03	4.675E-01
2117	1.653E+01	1.324E+04	8.895E-01	4.416E+00	6.619E+03	4.447E-01
2118	1.573E+01	1.259E+04	8.461E-01	4.201E+00	6.296E+03	4.230E-01
2119	1.496E+01	1.198E+04	8.048E-01	3.996E+00	5.989E+03	4.024E-01
2120	1.423E+01	1.139E+04	7.656E-01	3.801E+00	5.697E+03	3.828E-01
2121	1.354E+01	1.084E+04	7.282E-01	3.615E+00	5.419E+03	3.641E-01
2122	1.288E+01	1.031E+04	6.927E-01	3.439E+00	5.155E+03	3.464E-01
2123	1.225E+01	9.807E+03	6.589E-01	3.271E+00	4.904E+03	3.295E-01
2124	1.165E+01	9.329E+03	6.268E-01	3.112E+00	4.664E+03	3.134E-01
2125	1.108E+01	8.874E+03	5.962E-01	2.960E+00	4.437E+03	2.981E-01
2126	1.054E+01	8.441E+03	5.672E-01	2.816E+00	4.221E+03	2.836E-01
2127	1.003E+01	8.029E+03	5.395E-01	2.678E+00	4.015E+03	2.697E-01
2128	9.538E+00	7.638E+03	5.132E-01	2.548E+00	3.819E+03	2.566E-01
2129	9.073E+00	7.265E+03	4.882E-01	2.423E+00	3.633E+03	2.441E-01
2130	8.631E+00	6.911E+03	4.643E-01	2.305E+00	3.455E+03	2.322E-01
2131	8.210E+00	6.574E+03	4.417E-01	2.193E+00	3.287E+03	2.208E-01
2132	7.809E+00	6.253E+03	4.202E-01	2.086E+00	3.127E+03	2.101E-01

**Results (Continued)**

Year	Carbon dioxide			NMOC		
	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)
1992	0	0	0	0	0	0
1993	1.080E+02	5.902E+04	3.966E+00	1.692E+00	4.722E+02	3.173E-02
1994	2.130E+02	1.164E+05	7.818E+00	3.337E+00	9.309E+02	6.255E-02
1995	3.061E+02	1.672E+05	1.124E+01	4.795E+00	1.338E+03	8.989E-02
1996	3.829E+02	2.092E+05	1.406E+01	5.999E+00	1.674E+03	1.124E-01
1997	5.437E+02	2.970E+05	1.996E+01	8.517E+00	2.376E+03	1.597E-01
1998	6.976E+02	3.811E+05	2.561E+01	1.093E+01	3.049E+03	2.049E-01
1999	8.606E+02	4.702E+05	3.159E+01	1.348E+01	3.761E+03	2.527E-01
2000	1.014E+03	5.539E+05	3.722E+01	1.588E+01	4.431E+03	2.977E-01
2001	1.180E+03	6.446E+05	4.331E+01	1.848E+01	5.157E+03	3.465E-01
2002	1.345E+03	7.350E+05	4.938E+01	2.108E+01	5.880E+03	3.951E-01
2003	1.457E+03	7.958E+05	5.347E+01	2.282E+01	6.366E+03	4.278E-01
2004	2.015E+03	1.101E+06	7.396E+01	3.156E+01	8.806E+03	5.917E-01
2005	2.785E+03	1.521E+06	1.022E+02	4.363E+01	1.217E+04	8.178E-01
2006	3.117E+03	1.703E+06	1.144E+02	4.883E+01	1.362E+04	9.152E-01
2007	2.965E+03	1.620E+06	1.088E+02	4.644E+01	1.296E+04	8.706E-01
2008	2.820E+03	1.541E+06	1.035E+02	4.418E+01	1.233E+04	8.281E-01
2009	2.683E+03	1.466E+06	9.847E+01	4.202E+01	1.172E+04	7.877E-01
2010	2.552E+03	1.394E+06	9.366E+01	3.997E+01	1.115E+04	7.493E-01
2011	2.427E+03	1.326E+06	8.910E+01	3.803E+01	1.061E+04	7.128E-01
2012	2.309E+03	1.261E+06	8.475E+01	3.617E+01	1.009E+04	6.780E-01
2013	2.196E+03	1.200E+06	8.062E+01	3.441E+01	9.599E+03	6.449E-01
2014	2.089E+03	1.141E+06	7.669E+01	3.273E+01	9.131E+03	6.135E-01
2015	1.987E+03	1.086E+06	7.295E+01	3.113E+01	8.685E+03	5.836E-01
2016	1.890E+03	1.033E+06	6.939E+01	2.961E+01	8.262E+03	5.551E-01
2017	1.798E+03	9.824E+05	6.600E+01	2.817E+01	7.859E+03	5.280E-01
2018	1.711E+03	9.344E+05	6.279E+01	2.680E+01	7.476E+03	5.023E-01
2019	1.627E+03	8.889E+05	5.972E+01	2.549E+01	7.111E+03	4.778E-01
2020	1.548E+03	8.455E+05	5.681E+01	2.425E+01	6.764E+03	4.545E-01
2021	1.472E+03	8.043E+05	5.404E+01	2.306E+01	6.434E+03	4.323E-01
2022	1.400E+03	7.651E+05	5.140E+01	2.194E+01	6.120E+03	4.112E-01
2023	1.332E+03	7.277E+05	4.890E+01	2.087E+01	5.822E+03	3.912E-01
2024	1.267E+03	6.923E+05	4.651E+01	1.985E+01	5.538E+03	3.721E-01
2025	1.205E+03	6.585E+05	4.424E+01	1.888E+01	5.268E+03	3.540E-01
2026	1.147E+03	6.264E+05	4.209E+01	1.796E+01	5.011E+03	3.367E-01
2027	1.091E+03	5.958E+05	4.003E+01	1.709E+01	4.767E+03	3.203E-01
2028	1.037E+03	5.668E+05	3.808E+01	1.625E+01	4.534E+03	3.047E-01
2029	9.869E+02	5.391E+05	3.622E+01	1.546E+01	4.313E+03	2.898E-01
2030	9.387E+02	5.128E+05	3.446E+01	1.471E+01	4.103E+03	2.757E-01
2031	8.930E+02	4.878E+05	3.278E+01	1.399E+01	3.903E+03	2.622E-01
2032	8.494E+02	4.640E+05	3.118E+01	1.331E+01	3.712E+03	2.494E-01
2033	8.080E+02	4.414E+05	2.966E+01	1.266E+01	3.531E+03	2.373E-01
2034	7.686E+02	4.199E+05	2.821E+01	1.204E+01	3.359E+03	2.257E-01
2035	7.311E+02	3.994E+05	2.684E+01	1.145E+01	3.195E+03	2.147E-01
2036	6.954E+02	3.799E+05	2.553E+01	1.089E+01	3.039E+03	2.042E-01
2037	6.615E+02	3.614E+05	2.428E+01	1.036E+01	2.891E+03	1.943E-01
2038	6.293E+02	3.438E+05	2.310E+01	9.858E+00	2.750E+03	1.848E-01
2039	5.986E+02	3.270E+05	2.197E+01	9.377E+00	2.616E+03	1.758E-01
2040	5.694E+02	3.111E+05	2.090E+01	8.920E+00	2.488E+03	1.672E-01
2041	5.416E+02	2.959E+05	1.988E+01	8.485E+00	2.367E+03	1.590E-01

**Results (Continued)**

Year	Carbon dioxide			NMOC		
	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)
2042	5.152E+02	2.815E+05	1.891E+01	8.071E+00	2.252E+03	1.513E-01
2043	4.901E+02	2.677E+05	1.799E+01	7.677E+00	2.142E+03	1.439E-01
2044	4.662E+02	2.547E+05	1.711E+01	7.303E+00	2.037E+03	1.369E-01
2045	4.434E+02	2.422E+05	1.628E+01	6.947E+00	1.938E+03	1.302E-01
2046	4.218E+02	2.304E+05	1.548E+01	6.608E+00	1.843E+03	1.239E-01
2047	4.012E+02	2.192E+05	1.473E+01	6.286E+00	1.754E+03	1.178E-01
2048	3.817E+02	2.085E+05	1.401E+01	5.979E+00	1.668E+03	1.121E-01
2049	3.631E+02	1.983E+05	1.333E+01	5.687E+00	1.587E+03	1.066E-01
2050	3.453E+02	1.887E+05	1.268E+01	5.410E+00	1.509E+03	1.014E-01
2051	3.285E+02	1.795E+05	1.206E+01	5.146E+00	1.436E+03	9.646E-02
2052	3.125E+02	1.707E+05	1.147E+01	4.895E+00	1.366E+03	9.176E-02
2053	2.972E+02	1.624E+05	1.091E+01	4.656E+00	1.299E+03	8.728E-02
2054	2.827E+02	1.545E+05	1.038E+01	4.429E+00	1.236E+03	8.303E-02
2055	2.690E+02	1.469E+05	9.872E+00	4.213E+00	1.175E+03	7.898E-02
2056	2.558E+02	1.398E+05	9.391E+00	4.008E+00	1.118E+03	7.513E-02
2057	2.434E+02	1.329E+05	8.933E+00	3.812E+00	1.064E+03	7.146E-02
2058	2.315E+02	1.265E+05	8.497E+00	3.626E+00	1.012E+03	6.798E-02
2059	2.202E+02	1.203E+05	8.083E+00	3.450E+00	9.624E+02	6.466E-02
2060	2.095E+02	1.144E+05	7.688E+00	3.281E+00	9.154E+02	6.151E-02
2061	1.992E+02	1.088E+05	7.314E+00	3.121E+00	8.708E+02	5.851E-02
2062	1.895E+02	1.035E+05	6.957E+00	2.969E+00	8.283E+02	5.565E-02
2063	1.803E+02	9.849E+04	6.618E+00	2.824E+00	7.879E+02	5.294E-02
2064	1.715E+02	9.369E+04	6.295E+00	2.687E+00	7.495E+02	5.036E-02
2065	1.631E+02	8.912E+04	5.988E+00	2.556E+00	7.129E+02	4.790E-02
2066	1.552E+02	8.477E+04	5.696E+00	2.431E+00	6.782E+02	4.557E-02
2067	1.476E+02	8.064E+04	5.418E+00	2.312E+00	6.451E+02	4.334E-02
2068	1.404E+02	7.670E+04	5.154E+00	2.200E+00	6.136E+02	4.123E-02
2069	1.336E+02	7.296E+04	4.902E+00	2.092E+00	5.837E+02	3.922E-02
2070	1.270E+02	6.940E+04	4.663E+00	1.990E+00	5.552E+02	3.731E-02
2071	1.208E+02	6.602E+04	4.436E+00	1.893E+00	5.282E+02	3.549E-02
2072	1.150E+02	6.280E+04	4.220E+00	1.801E+00	5.024E+02	3.376E-02
2073	1.093E+02	5.974E+04	4.014E+00	1.713E+00	4.779E+02	3.211E-02
2074	1.040E+02	5.682E+04	3.818E+00	1.629E+00	4.546E+02	3.054E-02
2075	9.894E+01	5.405E+04	3.632E+00	1.550E+00	4.324E+02	2.905E-02
2076	9.412E+01	5.142E+04	3.455E+00	1.474E+00	4.113E+02	2.764E-02
2077	8.953E+01	4.891E+04	3.286E+00	1.402E+00	3.913E+02	2.629E-02
2078	8.516E+01	4.652E+04	3.126E+00	1.334E+00	3.722E+02	2.501E-02
2079	8.101E+01	4.425E+04	2.973E+00	1.269E+00	3.540E+02	2.379E-02
2080	7.706E+01	4.210E+04	2.828E+00	1.207E+00	3.368E+02	2.263E-02
2081	7.330E+01	4.004E+04	2.690E+00	1.148E+00	3.203E+02	2.152E-02
2082	6.972E+01	3.809E+04	2.559E+00	1.092E+00	3.047E+02	2.047E-02
2083	6.632E+01	3.623E+04	2.434E+00	1.039E+00	2.899E+02	1.948E-02
2084	6.309E+01	3.447E+04	2.316E+00	9.883E-01	2.757E+02	1.853E-02
2085	6.001E+01	3.278E+04	2.203E+00	9.401E-01	2.623E+02	1.762E-02
2086	5.709E+01	3.119E+04	2.095E+00	8.943E-01	2.495E+02	1.676E-02
2087	5.430E+01	2.966E+04	1.993E+00	8.507E-01	2.373E+02	1.595E-02
2088	5.165E+01	2.822E+04	1.896E+00	8.092E-01	2.257E+02	1.517E-02
2089	4.913E+01	2.684E+04	1.803E+00	7.697E-01	2.147E+02	1.443E-02
2090	4.674E+01	2.553E+04	1.716E+00	7.322E-01	2.043E+02	1.372E-02
2091	4.446E+01	2.429E+04	1.632E+00	6.965E-01	1.943E+02	1.305E-02
2092	4.229E+01	2.310E+04	1.552E+00	6.625E-01	1.848E+02	1.242E-02



**Results (Continued)**

Year	Carbon dioxide			NMOC		
	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)
2093	4.023E+01	2.198E+04	1.477E+00	6.302E-01	1.758E+02	1.181E-02
2094	3.827E+01	2.090E+04	1.405E+00	5.994E-01	1.672E+02	1.124E-02
2095	3.640E+01	1.988E+04	1.336E+00	5.702E-01	1.591E+02	1.069E-02
2096	3.462E+01	1.891E+04	1.271E+00	5.424E-01	1.513E+02	1.017E-02
2097	3.294E+01	1.799E+04	1.209E+00	5.159E-01	1.439E+02	9.671E-03
2098	3.133E+01	1.711E+04	1.150E+00	4.908E-01	1.369E+02	9.200E-03
2099	2.980E+01	1.628E+04	1.094E+00	4.668E-01	1.302E+02	8.751E-03
2100	2.835E+01	1.549E+04	1.041E+00	4.441E-01	1.239E+02	8.324E-03
2101	2.697E+01	1.473E+04	9.898E-01	4.224E-01	1.178E+02	7.918E-03
2102	2.565E+01	1.401E+04	9.415E-01	4.018E-01	1.121E+02	7.532E-03
2103	2.440E+01	1.333E+04	8.956E-01	3.822E-01	1.066E+02	7.165E-03
2104	2.321E+01	1.268E+04	8.519E-01	3.636E-01	1.014E+02	6.815E-03
2105	2.208E+01	1.206E+04	8.104E-01	3.459E-01	9.649E+01	6.483E-03
2106	2.100E+01	1.147E+04	7.708E-01	3.290E-01	9.178E+01	6.167E-03
2107	1.998E+01	1.091E+04	7.332E-01	3.129E-01	8.730E+01	5.866E-03
2108	1.900E+01	1.038E+04	6.975E-01	2.977E-01	8.305E+01	5.580E-03
2109	1.808E+01	9.874E+03	6.635E-01	2.832E-01	7.900E+01	5.308E-03
2110	1.719E+01	9.393E+03	6.311E-01	2.693E-01	7.514E+01	5.049E-03
2111	1.636E+01	8.935E+03	6.003E-01	2.562E-01	7.148E+01	4.803E-03
2112	1.556E+01	8.499E+03	5.711E-01	2.437E-01	6.799E+01	4.568E-03
2113	1.480E+01	8.085E+03	5.432E-01	2.318E-01	6.468E+01	4.346E-03
2114	1.408E+01	7.690E+03	5.167E-01	2.205E-01	6.152E+01	4.134E-03
2115	1.339E+01	7.315E+03	4.915E-01	2.098E-01	5.852E+01	3.932E-03
2116	1.274E+01	6.958E+03	4.675E-01	1.995E-01	5.567E+01	3.740E-03
2117	1.212E+01	6.619E+03	4.447E-01	1.898E-01	5.295E+01	3.558E-03
2118	1.153E+01	6.296E+03	4.230E-01	1.805E-01	5.037E+01	3.384E-03
2119	1.096E+01	5.989E+03	4.024E-01	1.717E-01	4.791E+01	3.219E-03
2120	1.043E+01	5.697E+03	3.828E-01	1.634E-01	4.558E+01	3.062E-03
2121	9.920E+00	5.419E+03	3.641E-01	1.554E-01	4.335E+01	2.913E-03
2122	9.436E+00	5.155E+03	3.464E-01	1.478E-01	4.124E+01	2.771E-03
2123	8.976E+00	4.904E+03	3.295E-01	1.406E-01	3.923E+01	2.636E-03
2124	8.538E+00	4.664E+03	3.134E-01	1.338E-01	3.732E+01	2.507E-03
2125	8.122E+00	4.437E+03	2.981E-01	1.272E-01	3.550E+01	2.385E-03
2126	7.726E+00	4.221E+03	2.836E-01	1.210E-01	3.376E+01	2.269E-03
2127	7.349E+00	4.015E+03	2.697E-01	1.151E-01	3.212E+01	2.158E-03
2128	6.990E+00	3.819E+03	2.566E-01	1.095E-01	3.055E+01	2.053E-03
2129	6.650E+00	3.633E+03	2.441E-01	1.042E-01	2.906E+01	1.953E-03
2130	6.325E+00	3.455E+03	2.322E-01	9.909E-02	2.764E+01	1.857E-03
2131	6.017E+00	3.287E+03	2.208E-01	9.426E-02	2.630E+01	1.767E-03
2132	5.723E+00	3.127E+03	2.101E-01	8.966E-02	2.501E+01	1.681E-03

**EXHIBIT 3**

**TIER II NMOC EMISSIONS FACTORS**



# TEST REPORT

## LANDFILL TIER II SAMPLING

For  
**LANDFILL GAS NMOC ANALYSIS**

From the  
**PHASE 1 LANDFILL, PHASE 2 LANDFILL, & THE CLASS 3 LANDFILL**

In service at the  
**PUTMAN COUNTY CENTRAL LANDFILL**

Located in  
**PALATKA, PUTNAM COUNTY, FLORIDA**

Prepared for the  
**PUTNAM COUNTY BOARD OF COUNTY COMMISSIONERS**

Test Completion Date: January 13, 2014  
Report Submittal Date: February 26, 2014

This Report Includes 133 Total Pages Including Cover

TRC Project No. 204287.0000.0000

## TABLE 2 Summary of Results

Company: Jones Edmunds  
 Facility: Putnam County Central Landfill  
 Location: Palatka, Florida  
 Sampling Technicians: RPO, DEB, MRE

Date/ Start Time Collected	Lab ID Number	Sample Description	Canister Sample ID No.	Field CH <sub>4</sub> (% vol)	O <sub>2</sub> (% vol) dry basis	N <sub>2</sub> (% vol) dry basis	CH <sub>4</sub> (% vol) dry basis	CO <sub>2</sub> (% vol) dry basis	N <sub>2</sub> (% vol) wet basis	NMOC* (ppmv as C) wet basis	NMOC (ppmv as C) dry, N <sub>2</sub> corr	NMOC <sup>†</sup> (ppmv as C <sub>6</sub> ) dry, N <sub>2</sub> corr
<b>Phase I Landfill Section (28 Sample Locations)</b>												
01/09/14 12:25	1	Phase 1 6-3-2	8T018	43.2	2.026	22.018	46.361	29.595	21.574	243.1	344.3	<b>57.4</b>
01/09/14 11:16	2	Phase 1 4-8-23	8T027	0.1	21.336	77.873	0.334	0.457	76.099	50.5	Invalid	<b>Invalid</b>
01/09/14 13:57	3	Phase 1 26-21-15	8T019	0.1	21.789	78.172	< 0.015	< 0.024	76.024	21.2	Invalid	<b>Invalid</b>
01/09/14 15:10	4	Phase 1 27-25-22	8T001	41.5	0.458	17.846	49.448	32.248	17.439	450.2	595.7	<b>99.3</b>
01/09/14 11:18	8	Phase 1 1-12-10	8T010	40.7	3.571	28.441	43.223	24.765	27.967	393.6	626.3	<b>104.4</b>
01/09/14 10:45	9	Phase 1 5-7-9	8T004	46.6	1.678	25.156	45.546	27.620	24.711	319.9	478.4	<b>79.7</b>
01/09/14 12:10	10	Phase 1 11-13-14	8T021	51.1	2.916	23.953	51.194	21.937	23.470	235.9	345.9	<b>57.7</b>
01/09/14 13:13	11	Phase 1 17-16-19	8T036	62.2	0.202	3.369	66.646	29.783	3.297	509	543.2	<b>90.5</b>
01/09/14 13:55	12	Phase 1 18-24-28	8T002	48.3	0.390	10.771	53.426	35.413	10.475	510	608.0	<b>101.3</b>
01/13/14 11:40	15	Phase 1 20	8T033	57.5	< 0.081	3.478	57.545	38.897	3.393	624	669.1	<b>111.5</b>
<b>Phase 1 Landfill Section Averages</b>				<b>37.8</b>	<b>5.83</b>	<b>30.938</b>	<b>40.219</b>	<b>23.015</b>	<b>30.234</b>	<b>315.2</b>	<b>513.4</b>	<b>85.6</b>
<b>Phase 2 Landfill Section (16 Sample Locations)</b>												
01/09/14 07:44	5	Phase 2 7-2-1	8T025	59.2	< 0.020	0.305	57.011	42.664	0.301	1214.2	1234.7	<b>205.8</b>
01/09/14 07:40	6	Phase 2 4-3-9	8T007	58.4	0.164	0.616	59.412	39.808	0.609	970.7	990.2	<b>165.0</b>
01/08/14 13:43	7	Phase 2 11-5-6	8T031	55.8	< 0.022	0.221	63.885	35.872	0.218	759.5	772.2	<b>128.7</b>
01/09/14 08:35	13	Phase 2 8-15-10	8T038	56.1	0.663	2.371	58.705	38.261	2.326	475.4	499.5	<b>83.3</b>
01/08/14 16:30	14	Phase 2 12-14-13	8T034	58.5	1.273	4.544	56.585	37.598	4.486	657.3	706.5	<b>117.8</b>
01/13/14 11:20	16	Phase 2 16	8T037	64.3	< 0.082	0.721	63.244	35.953	0.703	532.1	550.5	<b>91.8</b>
<b>Phase 2 Landfill Section Averages</b>				<b>58.0</b>	<b>0.407</b>	<b>1.556</b>	<b>59.377</b>	<b>38.660</b>	<b>1.53</b>	<b>797.7</b>	<b>822.5</b>	<b>137.1</b>
<b>Class 3 Landfill Section (6 Sample Locations)</b>												
01/09/14 09:10	17	Class 3 2-4-3	8T013	47.3	0.873	14.635	50.543	33.950	14.36	437	547.7	<b>91.3</b>
01/13/14 10:42	18	Class 3 1-6-5	8T005	48.7	1.323	16.953	49.850	31.875	16.54	295	385.9	<b>64.3</b>
<b>Class 3 Landfill Section Averages</b>				<b>48.0</b>	<b>1.098</b>	<b>15.794</b>	<b>50.197</b>	<b>32.913</b>	<b>15.45</b>	<b>366.4</b>	<b>466.8</b>	<b>77.8</b>

\*Uncorrected NMOC sample concentrations are reported above as ppmv as Carbon on a wet basis and uncorrected for LFG nitrogen or oxygen content. Samples were collected into 8 liter SUMMA passivated stainless steel canisters.

†NMOC emissions reported as ppmv as hexane are corrected for moisture content and normalized LFG nitrogen content as per PA Method 25C equations. While the lab data adjusted some samples for oxygen content instead of nitrogen content using modified EPA Method 3C equations, TRC found the difference in the alternate correction to be negligible and revised the results to the reference equations.

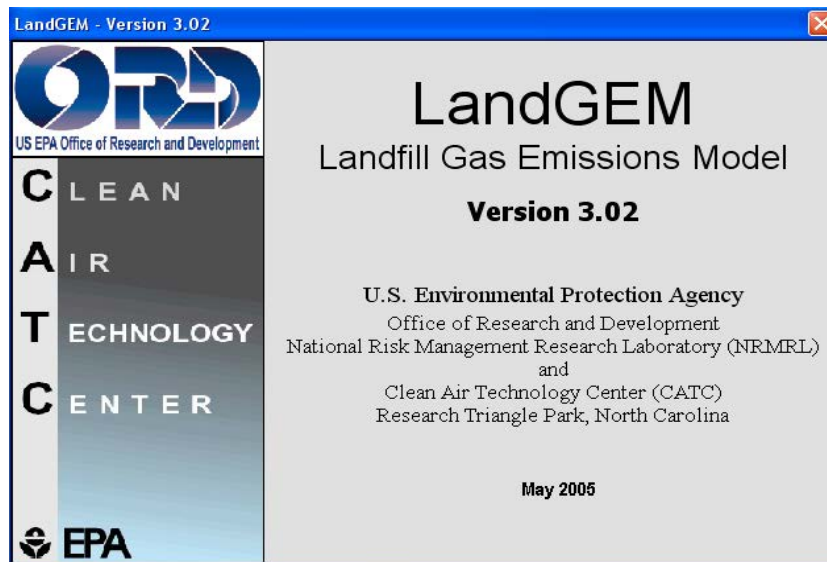
< = Concentration Below Report Limit [RL]

Phase II and Class III Average NMOC Concentration used because no Invalid Samples

Phase I Maximum NMOC Concentration used because of Invalid Samples

**EXHIBIT 4**

**TIER II CALCULATIONS**



## Summary Report

**Landfill Name or Identifier:** Tier II: PCCL Class I Phase I Landfill

**Date:** Wednesday, April 09, 2014

### Description/Comments:

#### About LandGEM:

First-Order Decomposition Rate Equation: 
$$Q_{CH_4} = \sum_{i=1}^n \sum_{j=0.1}^1 kL_o \left( \frac{M_i}{10} \right) e^{-kt_{ij}}$$

Where,

$Q_{CH_4}$  = annual methane generation in the year of the calculation ( $m^3/year$ )

$i$  = 1-year time increment

$n$  = (year of the calculation) - (initial year of waste acceptance)

$j$  = 0.1-year time increment

$k$  = methane generation rate ( $year^{-1}$ )

$L_o$  = potential methane generation capacity ( $m^3/Mg$ )

$M_i$  = mass of waste accepted in the  $i^{th}$  year ( $Mg$ )

$t_{ij}$  = age of the  $j^{th}$  section of waste mass  $M_i$  accepted in the  $i^{th}$  year (*decimal years*, e.g., 3.2 years)

LandGEM is based on a first-order decomposition rate equation for quantifying emissions from the decomposition of landfilled waste in municipal solid waste (MSW) landfills. The software provides a relatively simple approach to estimating landfill gas emissions. Model defaults are based on empirical data from U.S. landfills. Field test data can also be used in place of model defaults when available. Further guidance on EPA test methods, Clean Air Act (CAA) regulations, and other guidance regarding landfill gas emissions and control technology requirements can be found at <http://www.epa.gov/ttnatw01/landfill/landflpg.html>.

LandGEM is considered a screening tool — the better the input data, the better the estimates. Often, there are limitations with the available data regarding waste quantity and composition, variation in design and operating practices over time, and changes occurring over time that impact the emissions potential. Changes to landfill operation, such as operating under wet conditions through leachate recirculation or other liquid additions, will result in generating more gas at a faster rate. Defaults for estimating emissions for this type of operation are being developed to include in LandGEM along with defaults for conventional landfills (no leachate or liquid additions) for developing emission inventories and determining CAA applicability. Refer to the Web site identified above for future updates.

**Input Review**

LANDFILL CHARACTERISTICS

Landfill Open Year **1972**  
 Landfill Closure Year (with 80-year limit) **1990**  
 Actual Closure Year (without limit) **1990**  
 Have Model Calculate Closure Year? **No**  
 Waste Design Capacity *short tons*

MODEL PARAMETERS

Methane Generation Rate, k **0.050** *year<sup>-1</sup>*  
 Potential Methane Generation Capacity, L<sub>0</sub> **170** *m<sup>3</sup>/Mg*  
 NMOC Concentration **112** *ppmv as hexane*  
 Methane Content **50** *% by volume*

GASES / POLLUTANTS SELECTED

Gas / Pollutant #1: **Total landfill gas**  
 Gas / Pollutant #2: **Methane**  
 Gas / Pollutant #3: **Carbon dioxide**  
 Gas / Pollutant #4: **NMOC**

WASTE ACCEPTANCE RATES

Year	Waste Accepted		Waste-In-Place	
	(Mg/year)	(short tons/year)	(Mg)	(short tons)
1972	13,728	15,101	0	0
1973	14,432	15,875	13,728	15,101
1974	14,939	16,433	28,160	30,976
1975	15,664	17,230	43,099	47,409
1976	16,403	18,043	58,763	64,639
1977	16,924	18,617	75,166	82,683
1978	17,685	19,454	92,090	101,300
1979	18,460	20,306	109,776	120,753
1980	18,996	20,895	128,235	141,059
1981	19,802	21,782	147,231	161,954
1982	20,623	22,685	167,033	183,736
1983	21,183	23,301	187,656	206,421
1984	22,026	24,228	208,839	229,722
1985	22,883	25,171	230,864	253,951
1986	23,457	25,803	253,747	279,122
1987	24,336	26,770	277,204	304,925
1988	24,919	27,410	301,541	331,695
1989	22,759	25,035	326,459	359,105
1990	21,088	23,197	349,219	384,140
1991	0	0	370,306	407,337
1992	0	0	370,306	407,337
1993	0	0	370,306	407,337
1994	0	0	370,306	407,337
1995	0	0	370,306	407,337
1996	0	0	370,306	407,337
1997	0	0	370,306	407,337
1998	0	0	370,306	407,337
1999	0	0	370,306	407,337
2000	0	0	370,306	407,337
2001	0	0	370,306	407,337
2002	0	0	370,306	407,337
2003	0	0	370,306	407,337
2004	0	0	370,306	407,337
2005	0	0	370,306	407,337
2006	0	0	370,306	407,337
2007	0	0	370,306	407,337
2008	0	0	370,306	407,337
2009	0	0	370,306	407,337
2010	0	0	370,306	407,337
2011	0	0	370,306	407,337

## WASTE ACCEPTANCE RATES (Continued)

Year	Waste Accepted		Waste-In-Place	
	(Mg/year)	(short tons/year)	(Mg)	(short tons)
2012	0	0	370,306	407,337
2013	0	0	370,306	407,337
2014	0	0	370,306	407,337
2015	0	0	370,306	407,337
2016	0	0	370,306	407,337
2017	0	0	370,306	407,337
2018	0	0	370,306	407,337
2019	0	0	370,306	407,337
2020	0	0	370,306	407,337
2021	0	0	370,306	407,337
2022	0	0	370,306	407,337
2023	0	0	370,306	407,337
2024	0	0	370,306	407,337
2025	0	0	370,306	407,337
2026	0	0	370,306	407,337
2027	0	0	370,306	407,337
2028	0	0	370,306	407,337
2029	0	0	370,306	407,337
2030	0	0	370,306	407,337
2031	0	0	370,306	407,337
2032	0	0	370,306	407,337
2033	0	0	370,306	407,337
2034	0	0	370,306	407,337
2035	0	0	370,306	407,337
2036	0	0	370,306	407,337
2037	0	0	370,306	407,337
2038	0	0	370,306	407,337
2039	0	0	370,306	407,337
2040	0	0	370,306	407,337
2041	0	0	370,306	407,337
2042	0	0	370,306	407,337
2043	0	0	370,306	407,337
2044	0	0	370,306	407,337
2045	0	0	370,306	407,337
2046	0	0	370,306	407,337
2047	0	0	370,306	407,337
2048	0	0	370,306	407,337
2049	0	0	370,306	407,337
2050	0	0	370,306	407,337
2051	0	0	370,306	407,337



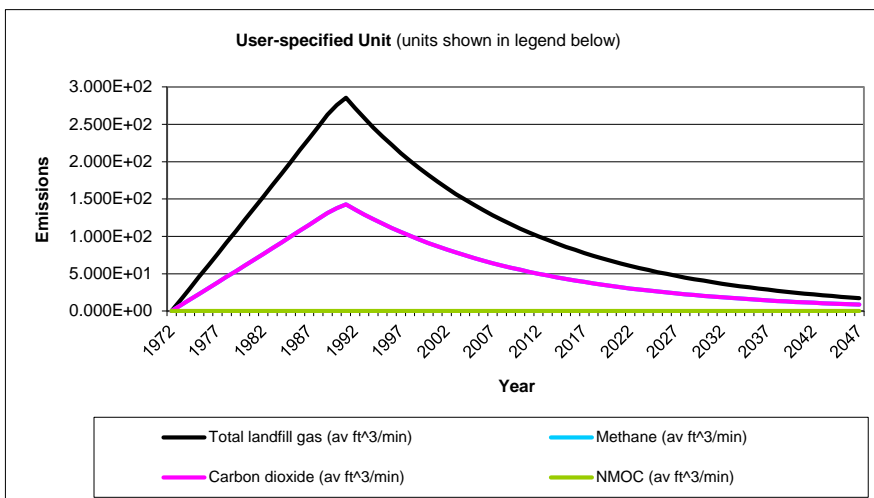
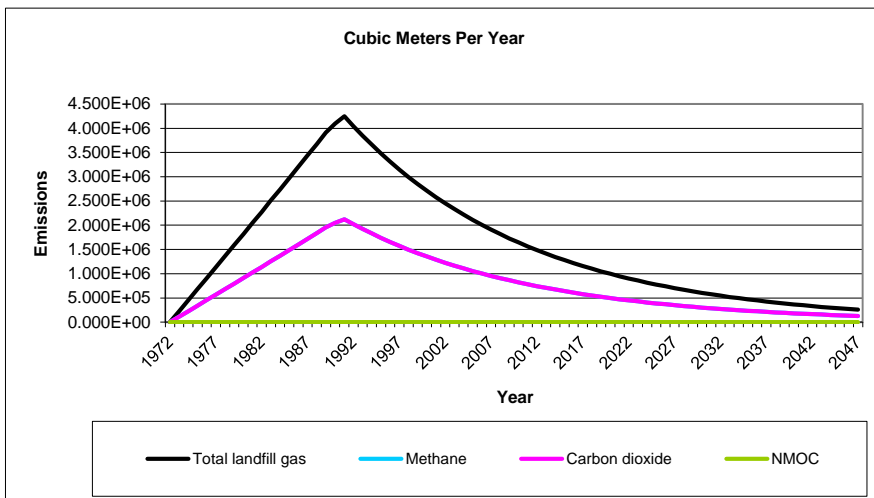
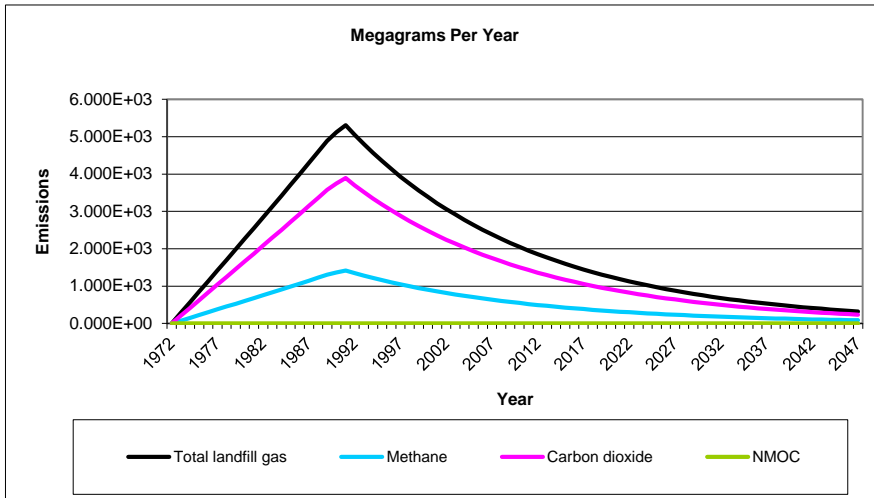
**Pollutant Parameters**

<b>Gas / Pollutant Default Parameters:</b>				<b>User-specified Pollutant Parameters:</b>	
	Compound	Concentration (ppmv)	Molecular Weight	Concentration (ppmv)	Molecular Weight
<b>Gases</b>	Total landfill gas		0.00		
	Methane		16.04		
	Carbon dioxide		44.01		
	NMOC	4,000	86.18		
<b>Pollutants</b>	1,1,1-Trichloroethane (methyl chloroform) - HAP	0.48	133.41		
	1,1,2,2- Tetrachloroethane - HAP/VOC	1.1	167.85		
	1,1-Dichloroethane (ethylidene dichloride) - HAP/VOC	2.4	98.97		
	1,1-Dichloroethene (vinylidene chloride) - HAP/VOC	0.20	96.94		
	1,2-Dichloroethane (ethylene dichloride) - HAP/VOC	0.41	98.96		
	1,2-Dichloropropane (propylene dichloride) - HAP/VOC	0.18	112.99		
	2-Propanol (isopropyl alcohol) - VOC	50	60.11		
	Acetone	7.0	58.08		
	Acrylonitrile - HAP/VOC	6.3	53.06		
	Benzene - No or Unknown Co-disposal - HAP/VOC	1.9	78.11		
	Benzene - Co-disposal - HAP/VOC	11	78.11		
	Bromodichloromethane - VOC	3.1	163.83		
	Butane - VOC	5.0	58.12		
	Carbon disulfide - HAP/VOC	0.58	76.13		
	Carbon monoxide	140	28.01		
	Carbon tetrachloride - HAP/VOC	4.0E-03	153.84		
	Carbonyl sulfide - HAP/VOC	0.49	60.07		
	Chlorobenzene - HAP/VOC	0.25	112.56		
	Chlorodifluoromethane	1.3	86.47		
	Chloroethane (ethyl chloride) - HAP/VOC	1.3	64.52		
	Chloroform - HAP/VOC	0.03	119.39		
	Chloromethane - VOC	1.2	50.49		
	Dichlorobenzene - (HAP for para isomer/VOC)	0.21	147		
	Dichlorodifluoromethane	16	120.91		
	Dichlorofluoromethane - VOC	2.6	102.92		
	Dichloromethane (methylene chloride) - HAP	14	84.94		
	Dimethyl sulfide (methyl sulfide) - VOC	7.8	62.13		
	Ethane	890	30.07		
	Ethanol - VOC	27	46.08		

**Pollutant Parameters (Continued)**

<i>Gas / Pollutant Default Parameters:</i>				<i>User-specified Pollutant Parameters:</i>	
	Compound	Concentration (ppmv)	Molecular Weight	Concentration (ppmv)	Molecular Weight
<b>Pollutants</b>	Ethyl mercaptan (ethanethiol) - VOC	2.3	62.13		
	Ethylbenzene - HAP/VOC	4.6	106.16		
	Ethylene dibromide - HAP/VOC	1.0E-03	187.88		
	Fluorotrichloromethane - VOC	0.76	137.38		
	Hexane - HAP/VOC	6.6	86.18		
	Hydrogen sulfide	36	34.08		
	Mercury (total) - HAP	2.9E-04	200.61		
	Methyl ethyl ketone - HAP/VOC	7.1	72.11		
	Methyl isobutyl ketone - HAP/VOC	1.9	100.16		
	Methyl mercaptan - VOC	2.5	48.11		
	Pentane - VOC	3.3	72.15		
	Perchloroethylene (tetrachloroethylene) - HAP	3.7	165.83		
	Propane - VOC	11	44.09		
	t-1,2-Dichloroethene - VOC	2.8	96.94		
	Toluene - No or Unknown Co-disposal - HAP/VOC	39	92.13		
	Toluene - Co-disposal - HAP/VOC	170	92.13		
	Trichloroethylene (trichloroethene) - HAP/VOC	2.8	131.40		
	Vinyl chloride - HAP/VOC	7.3	62.50		
	Xylenes - HAP/VOC	12	106.16		

**Graphs**



**Results**

Year	Total landfill gas			Methane		
	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)
1972	0	0	0	0	0	0
1973	2.850E+02	2.282E+05	1.533E+01	7.613E+01	1.141E+05	7.667E+00
1974	5.707E+02	4.570E+05	3.071E+01	1.524E+02	2.285E+05	1.535E+01
1975	8.530E+02	6.830E+05	4.589E+01	2.278E+02	3.415E+05	2.295E+01
1976	1.137E+03	9.101E+05	6.115E+01	3.036E+02	4.551E+05	3.058E+01
1977	1.422E+03	1.138E+06	7.649E+01	3.797E+02	5.692E+05	3.824E+01
1978	1.704E+03	1.364E+06	9.166E+01	4.551E+02	6.821E+05	4.583E+01
1979	1.988E+03	1.592E+06	1.069E+02	5.309E+02	7.958E+05	5.347E+01
1980	2.274E+03	1.821E+06	1.223E+02	6.074E+02	9.105E+05	6.117E+01
1981	2.557E+03	2.048E+06	1.376E+02	6.831E+02	1.024E+06	6.880E+01
1982	2.844E+03	2.277E+06	1.530E+02	7.596E+02	1.139E+06	7.650E+01
1983	3.133E+03	2.509E+06	1.686E+02	8.369E+02	1.254E+06	8.429E+01
1984	3.420E+03	2.739E+06	1.840E+02	9.136E+02	1.369E+06	9.201E+01
1985	3.711E+03	2.971E+06	1.996E+02	9.911E+02	1.486E+06	9.982E+01
1986	4.005E+03	3.207E+06	2.155E+02	1.070E+03	1.603E+06	1.077E+02
1987	4.296E+03	3.440E+06	2.312E+02	1.148E+03	1.720E+06	1.156E+02
1988	4.592E+03	3.677E+06	2.471E+02	1.227E+03	1.839E+06	1.235E+02
1989	4.885E+03	3.912E+06	2.628E+02	1.305E+03	1.956E+06	1.314E+02
1990	5.120E+03	4.100E+06	2.754E+02	1.368E+03	2.050E+06	1.377E+02
1991	5.308E+03	4.250E+06	2.856E+02	1.418E+03	2.125E+06	1.428E+02
1992	5.049E+03	4.043E+06	2.716E+02	1.349E+03	2.021E+06	1.358E+02
1993	4.803E+03	3.846E+06	2.584E+02	1.283E+03	1.923E+06	1.292E+02
1994	4.568E+03	3.658E+06	2.458E+02	1.220E+03	1.829E+06	1.229E+02
1995	4.346E+03	3.480E+06	2.338E+02	1.161E+03	1.740E+06	1.169E+02
1996	4.134E+03	3.310E+06	2.224E+02	1.104E+03	1.655E+06	1.112E+02
1997	3.932E+03	3.149E+06	2.116E+02	1.050E+03	1.574E+06	1.058E+02
1998	3.740E+03	2.995E+06	2.012E+02	9.991E+02	1.498E+06	1.006E+02
1999	3.558E+03	2.849E+06	1.914E+02	9.503E+02	1.424E+06	9.571E+01
2000	3.384E+03	2.710E+06	1.821E+02	9.040E+02	1.355E+06	9.104E+01
2001	3.219E+03	2.578E+06	1.732E+02	8.599E+02	1.289E+06	8.660E+01
2002	3.062E+03	2.452E+06	1.648E+02	8.180E+02	1.226E+06	8.238E+01
2003	2.913E+03	2.333E+06	1.567E+02	7.781E+02	1.166E+06	7.836E+01
2004	2.771E+03	2.219E+06	1.491E+02	7.401E+02	1.109E+06	7.454E+01
2005	2.636E+03	2.111E+06	1.418E+02	7.040E+02	1.055E+06	7.090E+01
2006	2.507E+03	2.008E+06	1.349E+02	6.697E+02	1.004E+06	6.745E+01
2007	2.385E+03	1.910E+06	1.283E+02	6.370E+02	9.549E+05	6.416E+01
2008	2.269E+03	1.817E+06	1.221E+02	6.060E+02	9.083E+05	6.103E+01
2009	2.158E+03	1.728E+06	1.161E+02	5.764E+02	8.640E+05	5.805E+01
2010	2.053E+03	1.644E+06	1.104E+02	5.483E+02	8.219E+05	5.522E+01
2011	1.953E+03	1.564E+06	1.051E+02	5.216E+02	7.818E+05	5.253E+01
2012	1.857E+03	1.487E+06	9.993E+01	4.961E+02	7.436E+05	4.997E+01
2013	1.767E+03	1.415E+06	9.506E+01	4.719E+02	7.074E+05	4.753E+01
2014	1.681E+03	1.346E+06	9.042E+01	4.489E+02	6.729E+05	4.521E+01
2015	1.599E+03	1.280E+06	8.601E+01	4.270E+02	6.401E+05	4.301E+01
2016	1.521E+03	1.218E+06	8.182E+01	4.062E+02	6.088E+05	4.091E+01
2017	1.447E+03	1.158E+06	7.783E+01	3.864E+02	5.792E+05	3.891E+01
2018	1.376E+03	1.102E+06	7.403E+01	3.675E+02	5.509E+05	3.702E+01
2019	1.309E+03	1.048E+06	7.042E+01	3.496E+02	5.240E+05	3.521E+01
2020	1.245E+03	9.970E+05	6.699E+01	3.326E+02	4.985E+05	3.349E+01
2021	1.184E+03	9.483E+05	6.372E+01	3.163E+02	4.742E+05	3.186E+01

**Results (Continued)**

Year	Total landfill gas			Methane		
	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)
2022	1.127E+03	9.021E+05	6.061E+01	3.009E+02	4.510E+05	3.031E+01
2023	1.072E+03	8.581E+05	5.766E+01	2.862E+02	4.290E+05	2.883E+01
2024	1.019E+03	8.162E+05	5.484E+01	2.723E+02	4.081E+05	2.742E+01
2025	9.696E+02	7.764E+05	5.217E+01	2.590E+02	3.882E+05	2.608E+01
2026	9.223E+02	7.386E+05	4.962E+01	2.464E+02	3.693E+05	2.481E+01
2027	8.774E+02	7.025E+05	4.720E+01	2.344E+02	3.513E+05	2.360E+01
2028	8.346E+02	6.683E+05	4.490E+01	2.229E+02	3.341E+05	2.245E+01
2029	7.939E+02	6.357E+05	4.271E+01	2.120E+02	3.178E+05	2.136E+01
2030	7.551E+02	6.047E+05	4.063E+01	2.017E+02	3.023E+05	2.031E+01
2031	7.183E+02	5.752E+05	3.865E+01	1.919E+02	2.876E+05	1.932E+01
2032	6.833E+02	5.471E+05	3.676E+01	1.825E+02	2.736E+05	1.838E+01
2033	6.500E+02	5.205E+05	3.497E+01	1.736E+02	2.602E+05	1.748E+01
2034	6.183E+02	4.951E+05	3.326E+01	1.651E+02	2.475E+05	1.663E+01
2035	5.881E+02	4.709E+05	3.164E+01	1.571E+02	2.355E+05	1.582E+01
2036	5.594E+02	4.480E+05	3.010E+01	1.494E+02	2.240E+05	1.505E+01
2037	5.321E+02	4.261E+05	2.863E+01	1.421E+02	2.131E+05	1.432E+01
2038	5.062E+02	4.053E+05	2.723E+01	1.352E+02	2.027E+05	1.362E+01
2039	4.815E+02	3.856E+05	2.591E+01	1.286E+02	1.928E+05	1.295E+01
2040	4.580E+02	3.668E+05	2.464E+01	1.223E+02	1.834E+05	1.232E+01
2041	4.357E+02	3.489E+05	2.344E+01	1.164E+02	1.744E+05	1.172E+01
2042	4.144E+02	3.319E+05	2.230E+01	1.107E+02	1.659E+05	1.115E+01
2043	3.942E+02	3.157E+05	2.121E+01	1.053E+02	1.578E+05	1.061E+01
2044	3.750E+02	3.003E+05	2.018E+01	1.002E+02	1.501E+05	1.009E+01
2045	3.567E+02	2.856E+05	1.919E+01	9.528E+01	1.428E+05	9.596E+00
2046	3.393E+02	2.717E+05	1.826E+01	9.063E+01	1.359E+05	9.128E+00
2047	3.228E+02	2.585E+05	1.737E+01	8.621E+01	1.292E+05	8.683E+00
2048	3.070E+02	2.458E+05	1.652E+01	8.201E+01	1.229E+05	8.259E+00
2049	2.920E+02	2.339E+05	1.571E+01	7.801E+01	1.169E+05	7.856E+00
2050	2.778E+02	2.225E+05	1.495E+01	7.420E+01	1.112E+05	7.473E+00
2051	2.643E+02	2.116E+05	1.422E+01	7.059E+01	1.058E+05	7.109E+00
2052	2.514E+02	2.013E+05	1.352E+01	6.714E+01	1.006E+05	6.762E+00
2053	2.391E+02	1.915E+05	1.286E+01	6.387E+01	9.573E+04	6.432E+00
2054	2.274E+02	1.821E+05	1.224E+01	6.075E+01	9.106E+04	6.119E+00
2055	2.164E+02	1.732E+05	1.164E+01	5.779E+01	8.662E+04	5.820E+00
2056	2.058E+02	1.648E+05	1.107E+01	5.497E+01	8.240E+04	5.536E+00
2057	1.958E+02	1.568E+05	1.053E+01	5.229E+01	7.838E+04	5.266E+00
2058	1.862E+02	1.491E+05	1.002E+01	4.974E+01	7.456E+04	5.009E+00
2059	1.771E+02	1.418E+05	9.530E+00	4.731E+01	7.092E+04	4.765E+00
2060	1.685E+02	1.349E+05	9.066E+00	4.501E+01	6.746E+04	4.533E+00
2061	1.603E+02	1.283E+05	8.623E+00	4.281E+01	6.417E+04	4.312E+00
2062	1.525E+02	1.221E+05	8.203E+00	4.072E+01	6.104E+04	4.101E+00
2063	1.450E+02	1.161E+05	7.803E+00	3.874E+01	5.807E+04	3.901E+00
2064	1.380E+02	1.105E+05	7.422E+00	3.685E+01	5.523E+04	3.711E+00
2065	1.312E+02	1.051E+05	7.060E+00	3.505E+01	5.254E+04	3.530E+00
2066	1.248E+02	9.995E+04	6.716E+00	3.334E+01	4.998E+04	3.358E+00
2067	1.187E+02	9.508E+04	6.388E+00	3.172E+01	4.754E+04	3.194E+00
2068	1.129E+02	9.044E+04	6.077E+00	3.017E+01	4.522E+04	3.038E+00
2069	1.074E+02	8.603E+04	5.780E+00	2.870E+01	4.302E+04	2.890E+00
2070	1.022E+02	8.184E+04	5.499E+00	2.730E+01	4.092E+04	2.749E+00
2071	9.721E+01	7.784E+04	5.230E+00	2.597E+01	3.892E+04	2.615E+00
2072	9.247E+01	7.405E+04	4.975E+00	2.470E+01	3.702E+04	2.488E+00

**Results (Continued)**

Year	Total landfill gas			Methane		
	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)
2073	8.796E+01	7.044E+04	4.733E+00	2.350E+01	3.522E+04	2.366E+00
2074	8.367E+01	6.700E+04	4.502E+00	2.235E+01	3.350E+04	2.251E+00
2075	7.959E+01	6.373E+04	4.282E+00	2.126E+01	3.187E+04	2.141E+00
2076	7.571E+01	6.063E+04	4.073E+00	2.022E+01	3.031E+04	2.037E+00
2077	7.202E+01	5.767E+04	3.875E+00	1.924E+01	2.883E+04	1.937E+00
2078	6.851E+01	5.486E+04	3.686E+00	1.830E+01	2.743E+04	1.843E+00
2079	6.516E+01	5.218E+04	3.506E+00	1.741E+01	2.609E+04	1.753E+00
2080	6.199E+01	4.964E+04	3.335E+00	1.656E+01	2.482E+04	1.668E+00
2081	5.896E+01	4.721E+04	3.172E+00	1.575E+01	2.361E+04	1.586E+00
2082	5.609E+01	4.491E+04	3.018E+00	1.498E+01	2.246E+04	1.509E+00
2083	5.335E+01	4.272E+04	2.870E+00	1.425E+01	2.136E+04	1.435E+00
2084	5.075E+01	4.064E+04	2.730E+00	1.356E+01	2.032E+04	1.365E+00
2085	4.827E+01	3.866E+04	2.597E+00	1.289E+01	1.933E+04	1.299E+00
2086	4.592E+01	3.677E+04	2.471E+00	1.227E+01	1.839E+04	1.235E+00
2087	4.368E+01	3.498E+04	2.350E+00	1.167E+01	1.749E+04	1.175E+00
2088	4.155E+01	3.327E+04	2.236E+00	1.110E+01	1.664E+04	1.118E+00
2089	3.952E+01	3.165E+04	2.127E+00	1.056E+01	1.582E+04	1.063E+00
2090	3.760E+01	3.011E+04	2.023E+00	1.004E+01	1.505E+04	1.011E+00
2091	3.576E+01	2.864E+04	1.924E+00	9.553E+00	1.432E+04	9.621E-01
2092	3.402E+01	2.724E+04	1.830E+00	9.087E+00	1.362E+04	9.151E-01
2093	3.236E+01	2.591E+04	1.741E+00	8.644E+00	1.296E+04	8.705E-01
2094	3.078E+01	2.465E+04	1.656E+00	8.222E+00	1.232E+04	8.281E-01
2095	2.928E+01	2.345E+04	1.575E+00	7.821E+00	1.172E+04	7.877E-01
2096	2.785E+01	2.230E+04	1.499E+00	7.440E+00	1.115E+04	7.493E-01
2097	2.649E+01	2.122E+04	1.425E+00	7.077E+00	1.061E+04	7.127E-01
2098	2.520E+01	2.018E+04	1.356E+00	6.732E+00	1.009E+04	6.780E-01
2099	2.397E+01	1.920E+04	1.290E+00	6.403E+00	9.598E+03	6.449E-01
2100	2.280E+01	1.826E+04	1.227E+00	6.091E+00	9.130E+03	6.134E-01
2101	2.169E+01	1.737E+04	1.167E+00	5.794E+00	8.685E+03	5.835E-01
2102	2.063E+01	1.652E+04	1.110E+00	5.511E+00	8.261E+03	5.551E-01
2103	1.963E+01	1.572E+04	1.056E+00	5.243E+00	7.858E+03	5.280E-01
2104	1.867E+01	1.495E+04	1.004E+00	4.987E+00	7.475E+03	5.022E-01
2105	1.776E+01	1.422E+04	9.555E-01	4.744E+00	7.110E+03	4.777E-01
2106	1.689E+01	1.353E+04	9.089E-01	4.512E+00	6.764E+03	4.544E-01
2107	1.607E+01	1.287E+04	8.646E-01	4.292E+00	6.434E+03	4.323E-01
2108	1.529E+01	1.224E+04	8.224E-01	4.083E+00	6.120E+03	4.112E-01
2109	1.454E+01	1.164E+04	7.823E-01	3.884E+00	5.822E+03	3.911E-01
2110	1.383E+01	1.108E+04	7.441E-01	3.694E+00	5.538E+03	3.721E-01
2111	1.316E+01	1.054E+04	7.079E-01	3.514E+00	5.268E+03	3.539E-01
2112	1.251E+01	1.002E+04	6.733E-01	3.343E+00	5.011E+03	3.367E-01

**Results (Continued)**

Year	Carbon dioxide			NMOC		
	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)
1972	0	0	0	0	0	0
1973	2.089E+02	1.141E+05	7.667E+00	9.162E-02	2.556E+01	1.717E-03
1974	4.183E+02	2.285E+05	1.535E+01	1.835E-01	5.118E+01	3.439E-03
1975	6.252E+02	3.415E+05	2.295E+01	2.742E-01	7.650E+01	5.140E-03
1976	8.330E+02	4.551E+05	3.058E+01	3.654E-01	1.019E+02	6.849E-03
1977	1.042E+03	5.692E+05	3.824E+01	4.570E-01	1.275E+02	8.567E-03
1978	1.249E+03	6.821E+05	4.583E+01	5.477E-01	1.528E+02	1.027E-02
1979	1.457E+03	7.958E+05	5.347E+01	6.390E-01	1.783E+02	1.198E-02
1980	1.667E+03	9.105E+05	6.117E+01	7.310E-01	2.039E+02	1.370E-02
1981	1.874E+03	1.024E+06	6.880E+01	8.221E-01	2.294E+02	1.541E-02
1982	2.084E+03	1.139E+06	7.650E+01	9.142E-01	2.550E+02	1.714E-02
1983	2.296E+03	1.254E+06	8.429E+01	1.007E+00	2.810E+02	1.888E-02
1984	2.507E+03	1.369E+06	9.201E+01	1.099E+00	3.067E+02	2.061E-02
1985	2.719E+03	1.486E+06	9.982E+01	1.193E+00	3.328E+02	2.236E-02
1986	2.935E+03	1.603E+06	1.077E+02	1.287E+00	3.592E+02	2.413E-02
1987	3.149E+03	1.720E+06	1.156E+02	1.381E+00	3.853E+02	2.589E-02
1988	3.365E+03	1.839E+06	1.235E+02	1.476E+00	4.118E+02	2.767E-02
1989	3.580E+03	1.956E+06	1.314E+02	1.571E+00	4.381E+02	2.944E-02
1990	3.752E+03	2.050E+06	1.377E+02	1.646E+00	4.591E+02	3.085E-02
1991	3.890E+03	2.125E+06	1.428E+02	1.706E+00	4.760E+02	3.198E-02
1992	3.700E+03	2.021E+06	1.358E+02	1.623E+00	4.528E+02	3.042E-02
1993	3.520E+03	1.923E+06	1.292E+02	1.544E+00	4.307E+02	2.894E-02
1994	3.348E+03	1.829E+06	1.229E+02	1.469E+00	4.097E+02	2.753E-02
1995	3.185E+03	1.740E+06	1.169E+02	1.397E+00	3.897E+02	2.619E-02
1996	3.029E+03	1.655E+06	1.112E+02	1.329E+00	3.707E+02	2.491E-02
1997	2.882E+03	1.574E+06	1.058E+02	1.264E+00	3.526E+02	2.369E-02
1998	2.741E+03	1.498E+06	1.006E+02	1.202E+00	3.354E+02	2.254E-02
1999	2.608E+03	1.424E+06	9.571E+01	1.144E+00	3.191E+02	2.144E-02
2000	2.480E+03	1.355E+06	9.104E+01	1.088E+00	3.035E+02	2.039E-02
2001	2.359E+03	1.289E+06	8.660E+01	1.035E+00	2.887E+02	1.940E-02
2002	2.244E+03	1.226E+06	8.238E+01	9.844E-01	2.746E+02	1.845E-02
2003	2.135E+03	1.166E+06	7.836E+01	9.364E-01	2.612E+02	1.755E-02
2004	2.031E+03	1.109E+06	7.454E+01	8.908E-01	2.485E+02	1.670E-02
2005	1.932E+03	1.055E+06	7.090E+01	8.473E-01	2.364E+02	1.588E-02
2006	1.837E+03	1.004E+06	6.745E+01	8.060E-01	2.249E+02	1.511E-02
2007	1.748E+03	9.549E+05	6.416E+01	7.667E-01	2.139E+02	1.437E-02
2008	1.663E+03	9.083E+05	6.103E+01	7.293E-01	2.035E+02	1.367E-02
2009	1.582E+03	8.640E+05	5.805E+01	6.937E-01	1.935E+02	1.300E-02
2010	1.504E+03	8.219E+05	5.522E+01	6.599E-01	1.841E+02	1.237E-02
2011	1.431E+03	7.818E+05	5.253E+01	6.277E-01	1.751E+02	1.177E-02
2012	1.361E+03	7.436E+05	4.997E+01	5.971E-01	1.666E+02	1.119E-02
2013	1.295E+03	7.074E+05	4.753E+01	5.680E-01	1.585E+02	1.065E-02
2014	1.232E+03	6.729E+05	4.521E+01	5.403E-01	1.507E+02	1.013E-02
2015	1.172E+03	6.401E+05	4.301E+01	5.139E-01	1.434E+02	9.633E-03
2016	1.114E+03	6.088E+05	4.091E+01	4.889E-01	1.364E+02	9.163E-03
2017	1.060E+03	5.792E+05	3.891E+01	4.650E-01	1.297E+02	8.717E-03
2018	1.008E+03	5.509E+05	3.702E+01	4.423E-01	1.234E+02	8.291E-03
2019	9.593E+02	5.240E+05	3.521E+01	4.208E-01	1.174E+02	7.887E-03
2020	9.125E+02	4.985E+05	3.349E+01	4.002E-01	1.117E+02	7.502E-03
2021	8.680E+02	4.742E+05	3.186E+01	3.807E-01	1.062E+02	7.136E-03

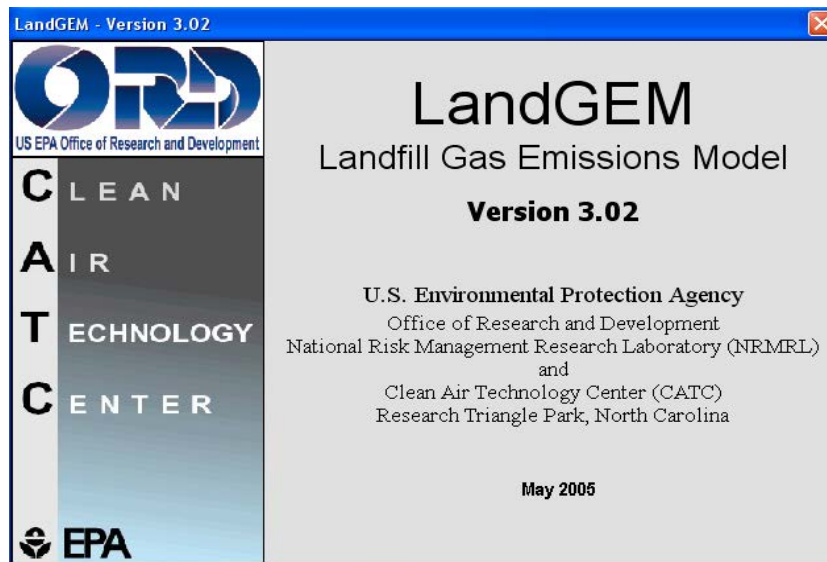
**Results (Continued)**

Year	Carbon dioxide			NMOC		
	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)
2022	8.256E+02	4.510E+05	3.031E+01	3.622E-01	1.010E+02	6.788E-03
2023	7.854E+02	4.290E+05	2.883E+01	3.445E-01	9.611E+01	6.457E-03
2024	7.471E+02	4.081E+05	2.742E+01	3.277E-01	9.142E+01	6.142E-03
2025	7.106E+02	3.882E+05	2.608E+01	3.117E-01	8.696E+01	5.843E-03
2026	6.760E+02	3.693E+05	2.481E+01	2.965E-01	8.272E+01	5.558E-03
2027	6.430E+02	3.513E+05	2.360E+01	2.820E-01	7.869E+01	5.287E-03
2028	6.116E+02	3.341E+05	2.245E+01	2.683E-01	7.485E+01	5.029E-03
2029	5.818E+02	3.178E+05	2.136E+01	2.552E-01	7.120E+01	4.784E-03
2030	5.534E+02	3.023E+05	2.031E+01	2.428E-01	6.772E+01	4.550E-03
2031	5.264E+02	2.876E+05	1.932E+01	2.309E-01	6.442E+01	4.329E-03
2032	5.008E+02	2.736E+05	1.838E+01	2.197E-01	6.128E+01	4.117E-03
2033	4.763E+02	2.602E+05	1.748E+01	2.089E-01	5.829E+01	3.917E-03
2034	4.531E+02	2.475E+05	1.663E+01	1.988E-01	5.545E+01	3.726E-03
2035	4.310E+02	2.355E+05	1.582E+01	1.891E-01	5.274E+01	3.544E-03
2036	4.100E+02	2.240E+05	1.505E+01	1.798E-01	5.017E+01	3.371E-03
2037	3.900E+02	2.131E+05	1.432E+01	1.711E-01	4.772E+01	3.207E-03
2038	3.710E+02	2.027E+05	1.362E+01	1.627E-01	4.540E+01	3.050E-03
2039	3.529E+02	1.928E+05	1.295E+01	1.548E-01	4.318E+01	2.901E-03
2040	3.357E+02	1.834E+05	1.232E+01	1.472E-01	4.108E+01	2.760E-03
2041	3.193E+02	1.744E+05	1.172E+01	1.401E-01	3.907E+01	2.625E-03
2042	3.037E+02	1.659E+05	1.115E+01	1.332E-01	3.717E+01	2.497E-03
2043	2.889E+02	1.578E+05	1.061E+01	1.267E-01	3.536E+01	2.376E-03
2044	2.748E+02	1.501E+05	1.009E+01	1.205E-01	3.363E+01	2.260E-03
2045	2.614E+02	1.428E+05	9.596E+00	1.147E-01	3.199E+01	2.149E-03
2046	2.487E+02	1.359E+05	9.128E+00	1.091E-01	3.043E+01	2.045E-03
2047	2.365E+02	1.292E+05	8.683E+00	1.038E-01	2.895E+01	1.945E-03
2048	2.250E+02	1.229E+05	8.259E+00	9.870E-02	2.753E+01	1.850E-03
2049	2.140E+02	1.169E+05	7.856E+00	9.388E-02	2.619E+01	1.760E-03
2050	2.036E+02	1.112E+05	7.473E+00	8.931E-02	2.491E+01	1.674E-03
2051	1.937E+02	1.058E+05	7.109E+00	8.495E-02	2.370E+01	1.592E-03
2052	1.842E+02	1.006E+05	6.762E+00	8.081E-02	2.254E+01	1.515E-03
2053	1.752E+02	9.573E+04	6.432E+00	7.687E-02	2.144E+01	1.441E-03
2054	1.667E+02	9.106E+04	6.119E+00	7.312E-02	2.040E+01	1.371E-03
2055	1.586E+02	8.662E+04	5.820E+00	6.955E-02	1.940E+01	1.304E-03
2056	1.508E+02	8.240E+04	5.536E+00	6.616E-02	1.846E+01	1.240E-03
2057	1.435E+02	7.838E+04	5.266E+00	6.293E-02	1.756E+01	1.180E-03
2058	1.365E+02	7.456E+04	5.009E+00	5.986E-02	1.670E+01	1.122E-03
2059	1.298E+02	7.092E+04	4.765E+00	5.694E-02	1.589E+01	1.067E-03
2060	1.235E+02	6.746E+04	4.533E+00	5.417E-02	1.511E+01	1.015E-03
2061	1.175E+02	6.417E+04	4.312E+00	5.152E-02	1.437E+01	9.658E-04
2062	1.117E+02	6.104E+04	4.101E+00	4.901E-02	1.367E+01	9.187E-04
2063	1.063E+02	5.807E+04	3.901E+00	4.662E-02	1.301E+01	8.739E-04
2064	1.011E+02	5.523E+04	3.711E+00	4.435E-02	1.237E+01	8.313E-04
2065	9.617E+01	5.254E+04	3.530E+00	4.218E-02	1.177E+01	7.907E-04
2066	9.148E+01	4.998E+04	3.358E+00	4.013E-02	1.119E+01	7.522E-04
2067	8.702E+01	4.754E+04	3.194E+00	3.817E-02	1.065E+01	7.155E-04
2068	8.278E+01	4.522E+04	3.038E+00	3.631E-02	1.013E+01	6.806E-04
2069	7.874E+01	4.302E+04	2.890E+00	3.454E-02	9.636E+00	6.474E-04
2070	7.490E+01	4.092E+04	2.749E+00	3.285E-02	9.166E+00	6.158E-04
2071	7.125E+01	3.892E+04	2.615E+00	3.125E-02	8.719E+00	5.858E-04
2072	6.777E+01	3.702E+04	2.488E+00	2.973E-02	8.293E+00	5.572E-04



**Results (Continued)**

Year	Carbon dioxide			NMOC		
	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)
2073	6.447E+01	3.522E+04	2.366E+00	2.828E-02	7.889E+00	5.301E-04
2074	6.132E+01	3.350E+04	2.251E+00	2.690E-02	7.504E+00	5.042E-04
2075	5.833E+01	3.187E+04	2.141E+00	2.559E-02	7.138E+00	4.796E-04
2076	5.549E+01	3.031E+04	2.037E+00	2.434E-02	6.790E+00	4.562E-04
2077	5.278E+01	2.883E+04	1.937E+00	2.315E-02	6.459E+00	4.340E-04
2078	5.021E+01	2.743E+04	1.843E+00	2.202E-02	6.144E+00	4.128E-04
2079	4.776E+01	2.609E+04	1.753E+00	2.095E-02	5.844E+00	3.927E-04
2080	4.543E+01	2.482E+04	1.668E+00	1.993E-02	5.559E+00	3.735E-04
2081	4.321E+01	2.361E+04	1.586E+00	1.895E-02	5.288E+00	3.553E-04
2082	4.111E+01	2.246E+04	1.509E+00	1.803E-02	5.030E+00	3.380E-04
2083	3.910E+01	2.136E+04	1.435E+00	1.715E-02	4.785E+00	3.215E-04
2084	3.719E+01	2.032E+04	1.365E+00	1.631E-02	4.551E+00	3.058E-04
2085	3.538E+01	1.933E+04	1.299E+00	1.552E-02	4.330E+00	2.909E-04
2086	3.365E+01	1.839E+04	1.235E+00	1.476E-02	4.118E+00	2.767E-04
2087	3.201E+01	1.749E+04	1.175E+00	1.404E-02	3.918E+00	2.632E-04
2088	3.045E+01	1.664E+04	1.118E+00	1.336E-02	3.726E+00	2.504E-04
2089	2.897E+01	1.582E+04	1.063E+00	1.271E-02	3.545E+00	2.382E-04
2090	2.755E+01	1.505E+04	1.011E+00	1.209E-02	3.372E+00	2.266E-04
2091	2.621E+01	1.432E+04	9.621E-01	1.150E-02	3.207E+00	2.155E-04
2092	2.493E+01	1.362E+04	9.151E-01	1.094E-02	3.051E+00	2.050E-04
2093	2.372E+01	1.296E+04	8.705E-01	1.040E-02	2.902E+00	1.950E-04
2094	2.256E+01	1.232E+04	8.281E-01	9.895E-03	2.761E+00	1.855E-04
2095	2.146E+01	1.172E+04	7.877E-01	9.413E-03	2.626E+00	1.764E-04
2096	2.041E+01	1.115E+04	7.493E-01	8.954E-03	2.498E+00	1.678E-04
2097	1.942E+01	1.061E+04	7.127E-01	8.517E-03	2.376E+00	1.596E-04
2098	1.847E+01	1.009E+04	6.780E-01	8.102E-03	2.260E+00	1.519E-04
2099	1.757E+01	9.598E+03	6.449E-01	7.706E-03	2.150E+00	1.445E-04
2100	1.671E+01	9.130E+03	6.134E-01	7.331E-03	2.045E+00	1.374E-04
2101	1.590E+01	8.685E+03	5.835E-01	6.973E-03	1.945E+00	1.307E-04
2102	1.512E+01	8.261E+03	5.551E-01	6.633E-03	1.850E+00	1.243E-04
2103	1.438E+01	7.858E+03	5.280E-01	6.310E-03	1.760E+00	1.183E-04
2104	1.368E+01	7.475E+03	5.022E-01	6.002E-03	1.674E+00	1.125E-04
2105	1.302E+01	7.110E+03	4.777E-01	5.709E-03	1.593E+00	1.070E-04
2106	1.238E+01	6.764E+03	4.544E-01	5.431E-03	1.515E+00	1.018E-04
2107	1.178E+01	6.434E+03	4.323E-01	5.166E-03	1.441E+00	9.683E-05
2108	1.120E+01	6.120E+03	4.112E-01	4.914E-03	1.371E+00	9.211E-05
2109	1.066E+01	5.822E+03	3.911E-01	4.674E-03	1.304E+00	8.762E-05
2110	1.014E+01	5.538E+03	3.721E-01	4.446E-03	1.240E+00	8.334E-05
2111	9.642E+00	5.268E+03	3.539E-01	4.229E-03	1.180E+00	7.928E-05
2112	9.172E+00	5.011E+03	3.367E-01	4.023E-03	1.122E+00	7.541E-05



## Summary Report

**Landfill Name or Identifier:** Tier II: PCCL Class I Phase II Landfill

**Date:** Wednesday, April 09, 2014

### Description/Comments:

#### About LandGEM:

First-Order Decomposition Rate Equation: 
$$Q_{CH_4} = \sum_{i=1}^n \sum_{j=0.1}^1 kL_o \left( \frac{M_i}{10} \right) e^{-kt_{ij}}$$

Where,

$Q_{CH_4}$  = annual methane generation in the year of the calculation ( $m^3/year$ )

$i$  = 1-year time increment

$n$  = (year of the calculation) - (initial year of waste acceptance)

$j$  = 0.1-year time increment

$k$  = methane generation rate ( $year^{-1}$ )

$L_o$  = potential methane generation capacity ( $m^3/Mg$ )

$M_i$  = mass of waste accepted in the  $i^{th}$  year ( $Mg$ )

$t_{ij}$  = age of the  $j^{th}$  section of waste mass  $M_i$  accepted in the  $i^{th}$  year (*decimal years*, e.g., 3.2 years)

LandGEM is based on a first-order decomposition rate equation for quantifying emissions from the decomposition of landfilled waste in municipal solid waste (MSW) landfills. The software provides a relatively simple approach to estimating landfill gas emissions. Model defaults are based on empirical data from U.S. landfills. Field test data can also be used in place of model defaults when available. Further guidance on EPA test methods, Clean Air Act (CAA) regulations, and other guidance regarding landfill gas emissions and control technology requirements can be found at <http://www.epa.gov/ttnatw01/landfill/landflpg.html>.

LandGEM is considered a screening tool — the better the input data, the better the estimates. Often, there are limitations with the available data regarding waste quantity and composition, variation in design and operating practices over time, and changes occurring over time that impact the emissions potential. Changes to landfill operation, such as operating under wet conditions through leachate recirculation or other liquid additions, will result in generating more gas at a faster rate. Defaults for estimating emissions for this type of operation are being developed to include in LandGEM along with defaults for conventional landfills (no leachate or liquid additions) for developing emission inventories and determining CAA applicability. Refer to the Web site identified above for future updates.

**Input Review**

## LANDFILL CHARACTERISTICS

Landfill Open Year	<b>1991</b>	
Landfill Closure Year (with 80-year limit)	<b>2044</b>	
Actual Closure Year (without limit)	<b>2044</b>	
Have Model Calculate Closure Year?	<b>No</b>	
Waste Design Capacity		<i>short tons</i>

## MODEL PARAMETERS

Methane Generation Rate, k	<b>0.050</b>	<i>year<sup>-1</sup></i>
Potential Methane Generation Capacity, L <sub>0</sub>	<b>170</b>	<i>m<sup>3</sup>/Mg</i>
NMOC Concentration	<b>137</b>	<i>ppmv as hexane</i>
Methane Content	<b>50</b>	<i>% by volume</i>

## GASES / POLLUTANTS SELECTED

Gas / Pollutant #1:	<b>Total landfill gas</b>
Gas / Pollutant #2:	<b>Methane</b>
Gas / Pollutant #3:	<b>Carbon dioxide</b>
Gas / Pollutant #4:	<b>NMOC</b>

## WASTE ACCEPTANCE RATES

Year	Waste Accepted		Waste-In-Place	
	(Mg/year)	(short tons/year)	(Mg)	(short tons)
1991	38,972	42,870	0	0
1992	22,066	24,273	38,972	42,870
1993	22,513	24,764	61,039	67,143
1994	21,141	23,255	83,552	91,907
1995	18,736	20,609	104,692	115,162
1996	18,326	20,159	123,428	135,771
1997	18,428	20,270	141,754	155,930
1998	20,119	22,131	160,182	176,200
1999	19,942	21,936	180,301	198,331
2000	22,001	24,201	200,242	220,266
2001	32,492	35,741	222,243	244,467
2002	35,410	38,951	254,735	280,209
2003	52,783	58,061	290,145	319,160
2004	68,927	75,820	342,928	377,221
2005	51,918	57,110	411,855	453,041
2006	90,158	99,174	463,774	510,151
2007	88,413	97,254	553,932	609,325
2008	78,990	86,890	642,345	706,579
2009	70,130	77,143	721,335	793,469
2010	65,848	72,433	791,465	870,612
2011	67,749	74,524	857,313	943,045
2012	64,327	70,760	925,063	1,017,569
2013	60,609	66,670	989,389	1,088,328
2014	63,754	70,129	1,049,999	1,154,999
2015	63,871	70,259	1,113,753	1,225,128
2016	64,076	70,483	1,177,624	1,295,386
2017	64,280	70,708	1,241,700	1,365,870
2018	64,486	70,934	1,305,980	1,436,578
2019	64,692	71,161	1,370,466	1,507,512
2020	64,899	71,389	1,435,158	1,578,674
2021	65,106	71,617	1,500,057	1,650,062
2022	65,314	71,846	1,565,163	1,721,679
2023	65,523	72,075	1,630,477	1,793,525
2024	65,733	72,306	1,696,001	1,865,601
2025	65,943	72,537	1,761,733	1,937,907
2026	66,154	72,769	1,827,676	2,010,444
2027	66,365	73,002	1,893,830	2,083,212
2028	66,577	73,235	1,960,195	2,156,214
2029	66,790	73,469	2,026,772	2,229,449
2030	67,004	73,704	2,093,562	2,302,918

## WASTE ACCEPTANCE RATES (Continued)

Year	Waste Accepted		Waste-In-Place	
	(Mg/year)	(short tons/year)	(Mg)	(short tons)
2031	67,218	73,939	2,160,565	2,376,622
2032	67,433	74,176	2,227,783	2,450,561
2033	67,648	74,413	2,295,215	2,524,737
2034	67,864	74,651	2,362,864	2,599,150
2035	68,081	74,889	2,430,728	2,673,801
2036	68,299	75,129	2,498,809	2,748,690
2037	68,517	75,369	2,567,108	2,823,819
2038	68,736	75,610	2,635,625	2,899,188
2039	68,956	75,852	2,704,362	2,974,798
2040	69,176	76,094	2,773,318	3,050,650
2041	69,398	76,337	2,842,494	3,126,744
2042	69,619	76,581	2,911,892	3,203,081
2043	69,842	76,826	2,981,511	3,279,662
2044	28,099	30,909	3,051,353	3,356,489
2045	0	0	3,079,453	3,387,398
2046	0	0	3,079,453	3,387,398
2047	0	0	3,079,453	3,387,398
2048	0	0	3,079,453	3,387,398
2049	0	0	3,079,453	3,387,398
2050	0	0	3,079,453	3,387,398
2051	0	0	3,079,453	3,387,398
2052	0	0	3,079,453	3,387,398
2053	0	0	3,079,453	3,387,398
2054	0	0	3,079,453	3,387,398
2055	0	0	3,079,453	3,387,398
2056	0	0	3,079,453	3,387,398
2057	0	0	3,079,453	3,387,398
2058	0	0	3,079,453	3,387,398
2059	0	0	3,079,453	3,387,398
2060	0	0	3,079,453	3,387,398
2061	0	0	3,079,453	3,387,398
2062	0	0	3,079,453	3,387,398
2063	0	0	3,079,453	3,387,398
2064	0	0	3,079,453	3,387,398
2065	0	0	3,079,453	3,387,398
2066	0	0	3,079,453	3,387,398
2067	0	0	3,079,453	3,387,398
2068	0	0	3,079,453	3,387,398
2069	0	0	3,079,453	3,387,398
2070	0	0	3,079,453	3,387,398

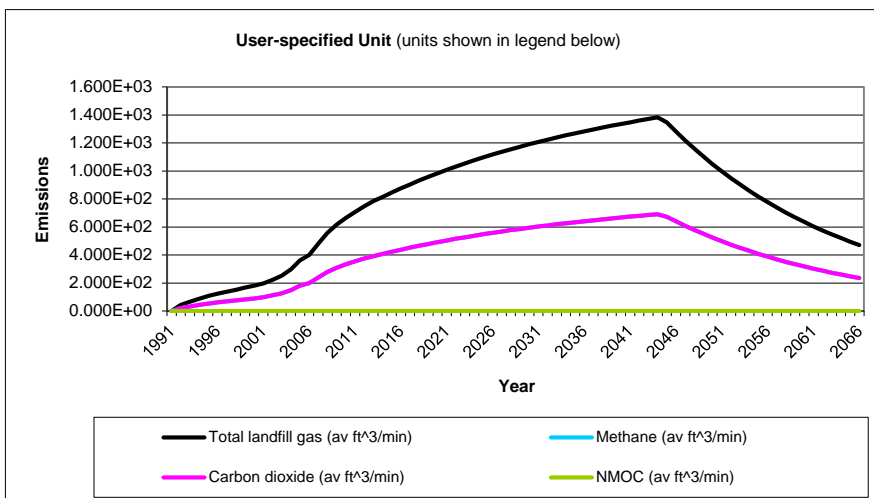
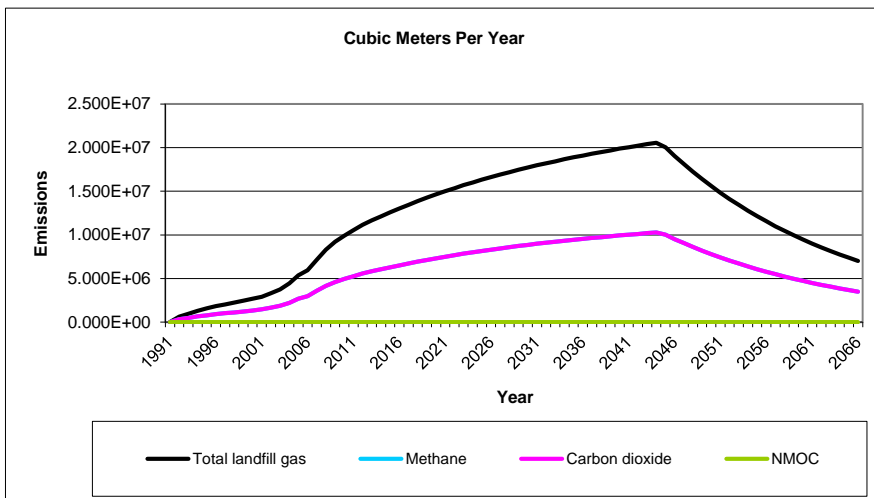
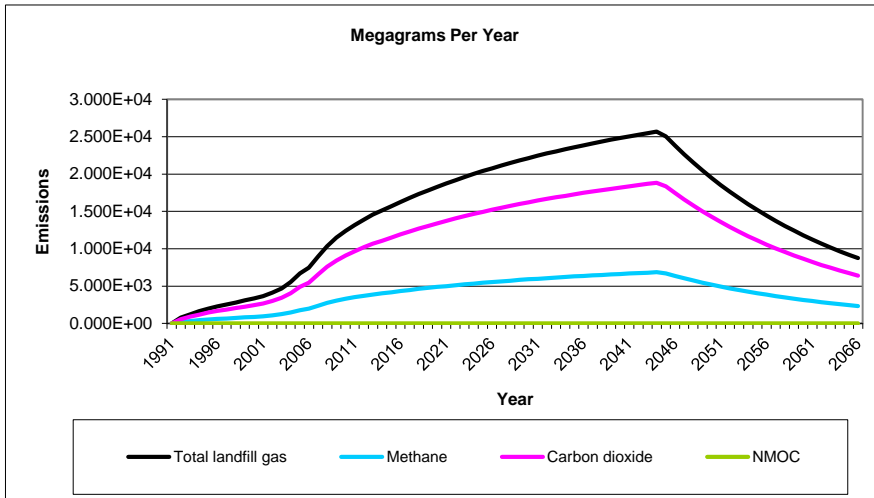
**Pollutant Parameters**

		<b>Gas / Pollutant Default Parameters:</b>		<b>User-specified Pollutant Parameters:</b>	
	Compound	Concentration (ppmv)	Molecular Weight	Concentration (ppmv)	Molecular Weight
<b>Gases</b>	Total landfill gas		0.00		
	Methane		16.04		
	Carbon dioxide		44.01		
	NMOC	4,000	86.18		
<b>Pollutants</b>	1,1,1-Trichloroethane (methyl chloroform) - HAP	0.48	133.41		
	1,1,2,2- Tetrachloroethane - HAP/VOC	1.1	167.85		
	1,1-Dichloroethane (ethylidene dichloride) - HAP/VOC	2.4	98.97		
	1,1-Dichloroethene (vinylidene chloride) - HAP/VOC	0.20	96.94		
	1,2-Dichloroethane (ethylene dichloride) - HAP/VOC	0.41	98.96		
	1,2-Dichloropropane (propylene dichloride) - HAP/VOC	0.18	112.99		
	2-Propanol (isopropyl alcohol) - VOC	50	60.11		
	Acetone	7.0	58.08		
	Acrylonitrile - HAP/VOC	6.3	53.06		
	Benzene - No or Unknown Co-disposal - HAP/VOC	1.9	78.11		
	Benzene - Co-disposal - HAP/VOC	11	78.11		
	Bromodichloromethane - VOC	3.1	163.83		
	Butane - VOC	5.0	58.12		
	Carbon disulfide - HAP/VOC	0.58	76.13		
	Carbon monoxide	140	28.01		
	Carbon tetrachloride - HAP/VOC	4.0E-03	153.84		
	Carbonyl sulfide - HAP/VOC	0.49	60.07		
	Chlorobenzene - HAP/VOC	0.25	112.56		
	Chlorodifluoromethane	1.3	86.47		
	Chloroethane (ethyl chloride) - HAP/VOC	1.3	64.52		
	Chloroform - HAP/VOC	0.03	119.39		
	Chloromethane - VOC	1.2	50.49		
	Dichlorobenzene - (HAP for para isomer/VOC)	0.21	147		
	Dichlorodifluoromethane	16	120.91		
	Dichlorofluoromethane - VOC	2.6	102.92		
	Dichloromethane (methylene chloride) - HAP	14	84.94		
	Dimethyl sulfide (methyl sulfide) - VOC	7.8	62.13		
	Ethane	890	30.07		
	Ethanol - VOC	27	46.08		

**Pollutant Parameters (Continued)**

<i>Gas / Pollutant Default Parameters:</i>				<i>User-specified Pollutant Parameters:</i>	
	Compound	Concentration (ppmv)	Molecular Weight	Concentration (ppmv)	Molecular Weight
<b>Pollutants</b>	Ethyl mercaptan (ethanethiol) - VOC	2.3	62.13		
	Ethylbenzene - HAP/VOC	4.6	106.16		
	Ethylene dibromide - HAP/VOC	1.0E-03	187.88		
	Fluorotrichloromethane - VOC	0.76	137.38		
	Hexane - HAP/VOC	6.6	86.18		
	Hydrogen sulfide	36	34.08		
	Mercury (total) - HAP	2.9E-04	200.61		
	Methyl ethyl ketone - HAP/VOC	7.1	72.11		
	Methyl isobutyl ketone - HAP/VOC	1.9	100.16		
	Methyl mercaptan - VOC	2.5	48.11		
	Pentane - VOC	3.3	72.15		
	Perchloroethylene (tetrachloroethylene) - HAP	3.7	165.83		
	Propane - VOC	11	44.09		
	t-1,2-Dichloroethene - VOC	2.8	96.94		
	Toluene - No or Unknown Co-disposal - HAP/VOC	39	92.13		
	Toluene - Co-disposal - HAP/VOC	170	92.13		
	Trichloroethylene (trichloroethene) - HAP/VOC	2.8	131.40		
	Vinyl chloride - HAP/VOC	7.3	62.50		
	Xylenes - HAP/VOC	12	106.16		

**Graphs**



**Results**

Year	Total landfill gas			Methane		
	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)
1991	0	0	0	0	0	0
1992	8.091E+02	6.479E+05	4.353E+01	2.161E+02	3.239E+05	2.176E+01
1993	1.228E+03	9.831E+05	6.605E+01	3.279E+02	4.915E+05	3.303E+01
1994	1.635E+03	1.309E+06	8.798E+01	4.368E+02	6.547E+05	4.399E+01
1995	1.994E+03	1.597E+06	1.073E+02	5.327E+02	7.985E+05	5.365E+01
1996	2.286E+03	1.831E+06	1.230E+02	6.106E+02	9.153E+05	6.150E+01
1997	2.555E+03	2.046E+06	1.375E+02	6.825E+02	1.023E+06	6.873E+01
1998	2.813E+03	2.252E+06	1.513E+02	7.514E+02	1.126E+06	7.567E+01
1999	3.093E+03	2.477E+06	1.664E+02	8.263E+02	1.239E+06	8.322E+01
2000	3.356E+03	2.688E+06	1.806E+02	8.966E+02	1.344E+06	9.029E+01
2001	3.650E+03	2.922E+06	1.964E+02	9.748E+02	1.461E+06	9.818E+01
2002	4.146E+03	3.320E+06	2.231E+02	1.107E+03	1.660E+06	1.115E+02
2003	4.679E+03	3.747E+06	2.517E+02	1.250E+03	1.873E+06	1.259E+02
2004	5.547E+03	4.441E+06	2.984E+02	1.482E+03	2.221E+06	1.492E+02
2005	6.707E+03	5.371E+06	3.609E+02	1.791E+03	2.685E+06	1.804E+02
2006	7.458E+03	5.972E+06	4.012E+02	1.992E+03	2.986E+06	2.006E+02
2007	8.966E+03	7.179E+06	4.824E+02	2.395E+03	3.590E+06	2.412E+02
2008	1.036E+04	8.299E+06	5.576E+02	2.768E+03	4.149E+06	2.788E+02
2009	1.150E+04	9.207E+06	6.186E+02	3.071E+03	4.604E+06	3.093E+02
2010	1.239E+04	9.924E+06	6.668E+02	3.310E+03	4.962E+06	3.334E+02
2011	1.316E+04	1.053E+07	7.078E+02	3.514E+03	5.267E+06	3.539E+02
2012	1.392E+04	1.115E+07	7.490E+02	3.718E+03	5.574E+06	3.745E+02
2013	1.458E+04	1.167E+07	7.843E+02	3.894E+03	5.836E+06	3.921E+02
2014	1.512E+04	1.211E+07	8.137E+02	4.040E+03	6.055E+06	4.069E+02
2015	1.571E+04	1.258E+07	8.453E+02	4.196E+03	6.290E+06	4.226E+02
2016	1.627E+04	1.303E+07	8.754E+02	4.346E+03	6.514E+06	4.377E+02
2017	1.681E+04	1.346E+07	9.042E+02	4.489E+03	6.729E+06	4.521E+02
2018	1.732E+04	1.387E+07	9.319E+02	4.627E+03	6.935E+06	4.660E+02
2019	1.782E+04	1.427E+07	9.585E+02	4.759E+03	7.133E+06	4.793E+02
2020	1.829E+04	1.465E+07	9.840E+02	4.885E+03	7.323E+06	4.920E+02
2021	1.874E+04	1.501E+07	1.009E+03	5.007E+03	7.505E+06	5.043E+02
2022	1.918E+04	1.536E+07	1.032E+03	5.124E+03	7.680E+06	5.160E+02
2023	1.960E+04	1.570E+07	1.055E+03	5.236E+03	7.848E+06	5.273E+02
2024	2.001E+04	1.602E+07	1.076E+03	5.344E+03	8.010E+06	5.382E+02
2025	2.040E+04	1.633E+07	1.097E+03	5.448E+03	8.166E+06	5.487E+02
2026	2.077E+04	1.663E+07	1.117E+03	5.548E+03	8.316E+06	5.587E+02
2027	2.113E+04	1.692E+07	1.137E+03	5.644E+03	8.460E+06	5.684E+02
2028	2.148E+04	1.720E+07	1.156E+03	5.737E+03	8.599E+06	5.778E+02
2029	2.181E+04	1.747E+07	1.174E+03	5.826E+03	8.733E+06	5.868E+02
2030	2.213E+04	1.772E+07	1.191E+03	5.912E+03	8.862E+06	5.955E+02
2031	2.245E+04	1.797E+07	1.208E+03	5.996E+03	8.987E+06	6.038E+02
2032	2.275E+04	1.821E+07	1.224E+03	6.076E+03	9.107E+06	6.119E+02
2033	2.304E+04	1.845E+07	1.239E+03	6.154E+03	9.224E+06	6.197E+02
2034	2.332E+04	1.867E+07	1.255E+03	6.229E+03	9.336E+06	6.273E+02
2035	2.359E+04	1.889E+07	1.269E+03	6.301E+03	9.445E+06	6.346E+02
2036	2.385E+04	1.910E+07	1.283E+03	6.371E+03	9.550E+06	6.417E+02
2037	2.411E+04	1.930E+07	1.297E+03	6.439E+03	9.652E+06	6.485E+02
2038	2.435E+04	1.950E+07	1.310E+03	6.505E+03	9.751E+06	6.552E+02
2039	2.459E+04	1.969E+07	1.323E+03	6.569E+03	9.847E+06	6.616E+02
2040	2.483E+04	1.988E+07	1.336E+03	6.631E+03	9.940E+06	6.678E+02



**Results (Continued)**

Year	Total landfill gas			Methane		
	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)
2041	2.505E+04	2.006E+07	1.348E+03	6.691E+03	1.003E+07	6.739E+02
2042	2.527E+04	2.023E+07	1.360E+03	6.750E+03	1.012E+07	6.798E+02
2043	2.548E+04	2.041E+07	1.371E+03	6.807E+03	1.020E+07	6.855E+02
2044	2.569E+04	2.057E+07	1.382E+03	6.862E+03	1.029E+07	6.911E+02
2045	2.502E+04	2.003E+07	1.346E+03	6.683E+03	1.002E+07	6.731E+02
2046	2.380E+04	1.906E+07	1.280E+03	6.357E+03	9.529E+06	6.402E+02
2047	2.264E+04	1.813E+07	1.218E+03	6.047E+03	9.064E+06	6.090E+02
2048	2.153E+04	1.724E+07	1.159E+03	5.752E+03	8.622E+06	5.793E+02
2049	2.048E+04	1.640E+07	1.102E+03	5.472E+03	8.202E+06	5.511E+02
2050	1.949E+04	1.560E+07	1.048E+03	5.205E+03	7.802E+06	5.242E+02
2051	1.854E+04	1.484E+07	9.972E+02	4.951E+03	7.421E+06	4.986E+02
2052	1.763E+04	1.412E+07	9.486E+02	4.710E+03	7.059E+06	4.743E+02
2053	1.677E+04	1.343E+07	9.023E+02	4.480E+03	6.715E+06	4.512E+02
2054	1.595E+04	1.277E+07	8.583E+02	4.261E+03	6.387E+06	4.292E+02
2055	1.518E+04	1.215E+07	8.165E+02	4.054E+03	6.076E+06	4.082E+02
2056	1.444E+04	1.156E+07	7.767E+02	3.856E+03	5.780E+06	3.883E+02
2057	1.373E+04	1.100E+07	7.388E+02	3.668E+03	5.498E+06	3.694E+02
2058	1.306E+04	1.046E+07	7.027E+02	3.489E+03	5.230E+06	3.514E+02
2059	1.242E+04	9.949E+06	6.685E+02	3.319E+03	4.975E+06	3.342E+02
2060	1.182E+04	9.464E+06	6.359E+02	3.157E+03	4.732E+06	3.179E+02
2061	1.124E+04	9.002E+06	6.049E+02	3.003E+03	4.501E+06	3.024E+02
2062	1.069E+04	8.563E+06	5.754E+02	2.856E+03	4.282E+06	2.877E+02
2063	1.017E+04	8.146E+06	5.473E+02	2.717E+03	4.073E+06	2.737E+02
2064	9.676E+03	7.748E+06	5.206E+02	2.585E+03	3.874E+06	2.603E+02
2065	9.204E+03	7.370E+06	4.952E+02	2.459E+03	3.685E+06	2.476E+02
2066	8.755E+03	7.011E+06	4.711E+02	2.339E+03	3.505E+06	2.355E+02
2067	8.328E+03	6.669E+06	4.481E+02	2.225E+03	3.335E+06	2.240E+02
2068	7.922E+03	6.344E+06	4.262E+02	2.116E+03	3.172E+06	2.131E+02
2069	7.536E+03	6.034E+06	4.055E+02	2.013E+03	3.017E+06	2.027E+02
2070	7.168E+03	5.740E+06	3.857E+02	1.915E+03	2.870E+06	1.928E+02
2071	6.819E+03	5.460E+06	3.669E+02	1.821E+03	2.730E+06	1.834E+02
2072	6.486E+03	5.194E+06	3.490E+02	1.733E+03	2.597E+06	1.745E+02
2073	6.170E+03	4.941E+06	3.320E+02	1.648E+03	2.470E+06	1.660E+02
2074	5.869E+03	4.700E+06	3.158E+02	1.568E+03	2.350E+06	1.579E+02
2075	5.583E+03	4.470E+06	3.004E+02	1.491E+03	2.235E+06	1.502E+02
2076	5.310E+03	4.252E+06	2.857E+02	1.418E+03	2.126E+06	1.429E+02
2077	5.051E+03	4.045E+06	2.718E+02	1.349E+03	2.022E+06	1.359E+02
2078	4.805E+03	3.848E+06	2.585E+02	1.283E+03	1.924E+06	1.293E+02
2079	4.571E+03	3.660E+06	2.459E+02	1.221E+03	1.830E+06	1.230E+02
2080	4.348E+03	3.482E+06	2.339E+02	1.161E+03	1.741E+06	1.170E+02
2081	4.136E+03	3.312E+06	2.225E+02	1.105E+03	1.656E+06	1.113E+02
2082	3.934E+03	3.150E+06	2.117E+02	1.051E+03	1.575E+06	1.058E+02
2083	3.742E+03	2.997E+06	2.013E+02	9.996E+02	1.498E+06	1.007E+02
2084	3.560E+03	2.850E+06	1.915E+02	9.508E+02	1.425E+06	9.576E+01
2085	3.386E+03	2.711E+06	1.822E+02	9.045E+02	1.356E+06	9.109E+01
2086	3.221E+03	2.579E+06	1.733E+02	8.604E+02	1.290E+06	8.665E+01
2087	3.064E+03	2.453E+06	1.648E+02	8.184E+02	1.227E+06	8.242E+01
2088	2.914E+03	2.334E+06	1.568E+02	7.785E+02	1.167E+06	7.840E+01
2089	2.772E+03	2.220E+06	1.492E+02	7.405E+02	1.110E+06	7.458E+01
2090	2.637E+03	2.112E+06	1.419E+02	7.044E+02	1.056E+06	7.094E+01
2091	2.508E+03	2.009E+06	1.350E+02	6.700E+02	1.004E+06	6.748E+01

**Results (Continued)**

Year	Total landfill gas			Methane		
	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)
2092	2.386E+03	1.911E+06	1.284E+02	6.374E+02	9.554E+05	6.419E+01
2093	2.270E+03	1.818E+06	1.221E+02	6.063E+02	9.088E+05	6.106E+01
2094	2.159E+03	1.729E+06	1.162E+02	5.767E+02	8.644E+05	5.808E+01
2095	2.054E+03	1.645E+06	1.105E+02	5.486E+02	8.223E+05	5.525E+01
2096	1.954E+03	1.564E+06	1.051E+02	5.218E+02	7.822E+05	5.255E+01
2097	1.858E+03	1.488E+06	9.998E+01	4.964E+02	7.440E+05	4.999E+01
2098	1.768E+03	1.415E+06	9.511E+01	4.722E+02	7.077E+05	4.755E+01
2099	1.681E+03	1.346E+06	9.047E+01	4.491E+02	6.732E+05	4.523E+01
2100	1.599E+03	1.281E+06	8.606E+01	4.272E+02	6.404E+05	4.303E+01
2101	1.521E+03	1.218E+06	8.186E+01	4.064E+02	6.092E+05	4.093E+01
2102	1.447E+03	1.159E+06	7.787E+01	3.866E+02	5.795E+05	3.893E+01
2103	1.377E+03	1.102E+06	7.407E+01	3.677E+02	5.512E+05	3.703E+01
2104	1.310E+03	1.049E+06	7.046E+01	3.498E+02	5.243E+05	3.523E+01
2105	1.246E+03	9.975E+05	6.702E+01	3.327E+02	4.987E+05	3.351E+01
2106	1.185E+03	9.488E+05	6.375E+01	3.165E+02	4.744E+05	3.188E+01
2107	1.127E+03	9.026E+05	6.064E+01	3.011E+02	4.513E+05	3.032E+01
2108	1.072E+03	8.585E+05	5.769E+01	2.864E+02	4.293E+05	2.884E+01
2109	1.020E+03	8.167E+05	5.487E+01	2.724E+02	4.083E+05	2.744E+01
2110	9.701E+02	7.768E+05	5.220E+01	2.591E+02	3.884E+05	2.610E+01
2111	9.228E+02	7.390E+05	4.965E+01	2.465E+02	3.695E+05	2.483E+01
2112	8.778E+02	7.029E+05	4.723E+01	2.345E+02	3.515E+05	2.361E+01
2113	8.350E+02	6.686E+05	4.493E+01	2.230E+02	3.343E+05	2.246E+01
2114	7.943E+02	6.360E+05	4.273E+01	2.122E+02	3.180E+05	2.137E+01
2115	7.555E+02	6.050E+05	4.065E+01	2.018E+02	3.025E+05	2.033E+01
2116	7.187E+02	5.755E+05	3.867E+01	1.920E+02	2.877E+05	1.933E+01
2117	6.836E+02	5.474E+05	3.678E+01	1.826E+02	2.737E+05	1.839E+01
2118	6.503E+02	5.207E+05	3.499E+01	1.737E+02	2.604E+05	1.749E+01
2119	6.186E+02	4.953E+05	3.328E+01	1.652E+02	2.477E+05	1.664E+01
2120	5.884E+02	4.712E+05	3.166E+01	1.572E+02	2.356E+05	1.583E+01
2121	5.597E+02	4.482E+05	3.011E+01	1.495E+02	2.241E+05	1.506E+01
2122	5.324E+02	4.263E+05	2.865E+01	1.422E+02	2.132E+05	1.432E+01
2123	5.065E+02	4.055E+05	2.725E+01	1.353E+02	2.028E+05	1.362E+01
2124	4.818E+02	3.858E+05	2.592E+01	1.287E+02	1.929E+05	1.296E+01
2125	4.583E+02	3.670E+05	2.466E+01	1.224E+02	1.835E+05	1.233E+01
2126	4.359E+02	3.491E+05	2.345E+01	1.164E+02	1.745E+05	1.173E+01
2127	4.146E+02	3.320E+05	2.231E+01	1.108E+02	1.660E+05	1.115E+01
2128	3.944E+02	3.158E+05	2.122E+01	1.054E+02	1.579E+05	1.061E+01
2129	3.752E+02	3.004E+05	2.019E+01	1.002E+02	1.502E+05	1.009E+01
2130	3.569E+02	2.858E+05	1.920E+01	9.533E+01	1.429E+05	9.601E+00
2131	3.395E+02	2.718E+05	1.827E+01	9.068E+01	1.359E+05	9.133E+00

**Results (Continued)**

Year	Carbon dioxide			NMOC		
	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)
1991	0	0	0	0	0	0
1992	5.930E+02	3.239E+05	2.176E+01	3.181E-01	8.876E+01	5.964E-03
1993	8.998E+02	4.915E+05	3.303E+01	4.828E-01	1.347E+02	9.049E-03
1994	1.198E+03	6.547E+05	4.399E+01	6.430E-01	1.794E+02	1.205E-02
1995	1.462E+03	7.985E+05	5.365E+01	7.842E-01	2.188E+02	1.470E-02
1996	1.675E+03	9.153E+05	6.150E+01	8.989E-01	2.508E+02	1.685E-02
1997	1.872E+03	1.023E+06	6.873E+01	1.005E+00	2.803E+02	1.883E-02
1998	2.062E+03	1.126E+06	7.567E+01	1.106E+00	3.086E+02	2.073E-02
1999	2.267E+03	1.239E+06	8.322E+01	1.216E+00	3.394E+02	2.280E-02
2000	2.460E+03	1.344E+06	9.029E+01	1.320E+00	3.682E+02	2.474E-02
2001	2.675E+03	1.461E+06	9.818E+01	1.435E+00	4.004E+02	2.690E-02
2002	3.039E+03	1.660E+06	1.115E+02	1.630E+00	4.548E+02	3.056E-02
2003	3.429E+03	1.873E+06	1.259E+02	1.840E+00	5.133E+02	3.449E-02
2004	4.065E+03	2.221E+06	1.492E+02	2.181E+00	6.085E+02	4.088E-02
2005	4.915E+03	2.685E+06	1.804E+02	2.637E+00	7.358E+02	4.944E-02
2006	5.466E+03	2.986E+06	2.006E+02	2.933E+00	8.181E+02	5.497E-02
2007	6.571E+03	3.590E+06	2.412E+02	3.526E+00	9.836E+02	6.609E-02
2008	7.596E+03	4.149E+06	2.788E+02	4.075E+00	1.137E+03	7.639E-02
2009	8.427E+03	4.604E+06	3.093E+02	4.521E+00	1.261E+03	8.475E-02
2010	9.083E+03	4.962E+06	3.334E+02	4.873E+00	1.360E+03	9.135E-02
2011	9.642E+03	5.267E+06	3.539E+02	5.173E+00	1.443E+03	9.697E-02
2012	1.020E+04	5.574E+06	3.745E+02	5.474E+00	1.527E+03	1.026E-01
2013	1.068E+04	5.836E+06	3.921E+02	5.732E+00	1.599E+03	1.074E-01
2014	1.108E+04	6.055E+06	4.069E+02	5.947E+00	1.659E+03	1.115E-01
2015	1.151E+04	6.290E+06	4.226E+02	6.178E+00	1.723E+03	1.158E-01
2016	1.192E+04	6.514E+06	4.377E+02	6.398E+00	1.785E+03	1.199E-01
2017	1.232E+04	6.729E+06	4.521E+02	6.609E+00	1.844E+03	1.239E-01
2018	1.269E+04	6.935E+06	4.660E+02	6.811E+00	1.900E+03	1.277E-01
2019	1.306E+04	7.133E+06	4.793E+02	7.006E+00	1.954E+03	1.313E-01
2020	1.340E+04	7.323E+06	4.920E+02	7.192E+00	2.006E+03	1.348E-01
2021	1.374E+04	7.505E+06	5.043E+02	7.371E+00	2.056E+03	1.382E-01
2022	1.406E+04	7.680E+06	5.160E+02	7.543E+00	2.104E+03	1.414E-01
2023	1.437E+04	7.848E+06	5.273E+02	7.708E+00	2.150E+03	1.445E-01
2024	1.466E+04	8.010E+06	5.382E+02	7.867E+00	2.195E+03	1.475E-01
2025	1.495E+04	8.166E+06	5.487E+02	8.020E+00	2.237E+03	1.503E-01
2026	1.522E+04	8.316E+06	5.587E+02	8.167E+00	2.279E+03	1.531E-01
2027	1.549E+04	8.460E+06	5.684E+02	8.309E+00	2.318E+03	1.558E-01
2028	1.574E+04	8.599E+06	5.778E+02	8.446E+00	2.356E+03	1.583E-01
2029	1.599E+04	8.733E+06	5.868E+02	8.577E+00	2.393E+03	1.608E-01
2030	1.622E+04	8.862E+06	5.955E+02	8.704E+00	2.428E+03	1.632E-01
2031	1.645E+04	8.987E+06	6.038E+02	8.827E+00	2.462E+03	1.655E-01
2032	1.667E+04	9.107E+06	6.119E+02	8.945E+00	2.495E+03	1.677E-01
2033	1.688E+04	9.224E+06	6.197E+02	9.059E+00	2.527E+03	1.698E-01
2034	1.709E+04	9.336E+06	6.273E+02	9.169E+00	2.558E+03	1.719E-01
2035	1.729E+04	9.445E+06	6.346E+02	9.276E+00	2.588E+03	1.739E-01
2036	1.748E+04	9.550E+06	6.417E+02	9.380E+00	2.617E+03	1.758E-01
2037	1.767E+04	9.652E+06	6.485E+02	9.480E+00	2.645E+03	1.777E-01
2038	1.785E+04	9.751E+06	6.552E+02	9.577E+00	2.672E+03	1.795E-01
2039	1.802E+04	9.847E+06	6.616E+02	9.671E+00	2.698E+03	1.813E-01
2040	1.819E+04	9.940E+06	6.678E+02	9.762E+00	2.723E+03	1.830E-01

**Results (Continued)**

Year	Carbon dioxide			NMOC		
	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)
2041	1.836E+04	1.003E+07	6.739E+02	9.851E+00	2.748E+03	1.846E-01
2042	1.852E+04	1.012E+07	6.798E+02	9.937E+00	2.772E+03	1.863E-01
2043	1.868E+04	1.020E+07	6.855E+02	1.002E+01	2.796E+03	1.878E-01
2044	1.883E+04	1.029E+07	6.911E+02	1.010E+01	2.818E+03	1.894E-01
2045	1.834E+04	1.002E+07	6.731E+02	9.839E+00	2.745E+03	1.844E-01
2046	1.744E+04	9.529E+06	6.402E+02	9.359E+00	2.611E+03	1.754E-01
2047	1.659E+04	9.064E+06	6.090E+02	8.902E+00	2.484E+03	1.669E-01
2048	1.578E+04	8.622E+06	5.793E+02	8.468E+00	2.362E+03	1.587E-01
2049	1.501E+04	8.202E+06	5.511E+02	8.055E+00	2.247E+03	1.510E-01
2050	1.428E+04	7.802E+06	5.242E+02	7.662E+00	2.138E+03	1.436E-01
2051	1.358E+04	7.421E+06	4.986E+02	7.289E+00	2.033E+03	1.366E-01
2052	1.292E+04	7.059E+06	4.743E+02	6.933E+00	1.934E+03	1.300E-01
2053	1.229E+04	6.715E+06	4.512E+02	6.595E+00	1.840E+03	1.236E-01
2054	1.169E+04	6.387E+06	4.292E+02	6.273E+00	1.750E+03	1.176E-01
2055	1.112E+04	6.076E+06	4.082E+02	5.967E+00	1.665E+03	1.119E-01
2056	1.058E+04	5.780E+06	3.883E+02	5.676E+00	1.584E+03	1.064E-01
2057	1.006E+04	5.498E+06	3.694E+02	5.400E+00	1.506E+03	1.012E-01
2058	9.573E+03	5.230E+06	3.514E+02	5.136E+00	1.433E+03	9.628E-02
2059	9.106E+03	4.975E+06	3.342E+02	4.886E+00	1.363E+03	9.158E-02
2060	8.662E+03	4.732E+06	3.179E+02	4.647E+00	1.297E+03	8.711E-02
2061	8.239E+03	4.501E+06	3.024E+02	4.421E+00	1.233E+03	8.287E-02
2062	7.837E+03	4.282E+06	2.877E+02	4.205E+00	1.173E+03	7.882E-02
2063	7.455E+03	4.073E+06	2.737E+02	4.000E+00	1.116E+03	7.498E-02
2064	7.092E+03	3.874E+06	2.603E+02	3.805E+00	1.062E+03	7.132E-02
2065	6.746E+03	3.685E+06	2.476E+02	3.619E+00	1.010E+03	6.784E-02
2066	6.417E+03	3.505E+06	2.355E+02	3.443E+00	9.605E+02	6.454E-02
2067	6.104E+03	3.335E+06	2.240E+02	3.275E+00	9.137E+02	6.139E-02
2068	5.806E+03	3.172E+06	2.131E+02	3.115E+00	8.691E+02	5.839E-02
2069	5.523E+03	3.017E+06	2.027E+02	2.963E+00	8.267E+02	5.555E-02
2070	5.254E+03	2.870E+06	1.928E+02	2.819E+00	7.864E+02	5.284E-02
2071	4.997E+03	2.730E+06	1.834E+02	2.681E+00	7.480E+02	5.026E-02
2072	4.754E+03	2.597E+06	1.745E+02	2.551E+00	7.116E+02	4.781E-02
2073	4.522E+03	2.470E+06	1.660E+02	2.426E+00	6.769E+02	4.548E-02
2074	4.301E+03	2.350E+06	1.579E+02	2.308E+00	6.438E+02	4.326E-02
2075	4.092E+03	2.235E+06	1.502E+02	2.195E+00	6.124E+02	4.115E-02
2076	3.892E+03	2.126E+06	1.429E+02	2.088E+00	5.826E+02	3.914E-02
2077	3.702E+03	2.022E+06	1.359E+02	1.986E+00	5.542E+02	3.723E-02
2078	3.522E+03	1.924E+06	1.293E+02	1.889E+00	5.271E+02	3.542E-02
2079	3.350E+03	1.830E+06	1.230E+02	1.797E+00	5.014E+02	3.369E-02
2080	3.186E+03	1.741E+06	1.170E+02	1.710E+00	4.770E+02	3.205E-02
2081	3.031E+03	1.656E+06	1.113E+02	1.626E+00	4.537E+02	3.048E-02
2082	2.883E+03	1.575E+06	1.058E+02	1.547E+00	4.316E+02	2.900E-02
2083	2.743E+03	1.498E+06	1.007E+02	1.472E+00	4.105E+02	2.758E-02
2084	2.609E+03	1.425E+06	9.576E+01	1.400E+00	3.905E+02	2.624E-02
2085	2.482E+03	1.356E+06	9.109E+01	1.332E+00	3.715E+02	2.496E-02
2086	2.361E+03	1.290E+06	8.665E+01	1.267E+00	3.533E+02	2.374E-02
2087	2.245E+03	1.227E+06	8.242E+01	1.205E+00	3.361E+02	2.258E-02
2088	2.136E+03	1.167E+06	7.840E+01	1.146E+00	3.197E+02	2.148E-02
2089	2.032E+03	1.110E+06	7.458E+01	1.090E+00	3.041E+02	2.043E-02
2090	1.933E+03	1.056E+06	7.094E+01	1.037E+00	2.893E+02	1.944E-02
2091	1.838E+03	1.004E+06	6.748E+01	9.864E-01	2.752E+02	1.849E-02

**Results (Continued)**

Year	Carbon dioxide			NMOC		
	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)
2092	1.749E+03	9.554E+05	6.419E+01	9.383E-01	2.618E+02	1.759E-02
2093	1.663E+03	9.088E+05	6.106E+01	8.925E-01	2.490E+02	1.673E-02
2094	1.582E+03	8.644E+05	5.808E+01	8.490E-01	2.369E+02	1.591E-02
2095	1.505E+03	8.223E+05	5.525E+01	8.076E-01	2.253E+02	1.514E-02
2096	1.432E+03	7.822E+05	5.255E+01	7.682E-01	2.143E+02	1.440E-02
2097	1.362E+03	7.440E+05	4.999E+01	7.307E-01	2.039E+02	1.370E-02
2098	1.296E+03	7.077E+05	4.755E+01	6.951E-01	1.939E+02	1.303E-02
2099	1.232E+03	6.732E+05	4.523E+01	6.612E-01	1.845E+02	1.239E-02
2100	1.172E+03	6.404E+05	4.303E+01	6.290E-01	1.755E+02	1.179E-02
2101	1.115E+03	6.092E+05	4.093E+01	5.983E-01	1.669E+02	1.121E-02
2102	1.061E+03	5.795E+05	3.893E+01	5.691E-01	1.588E+02	1.067E-02
2103	1.009E+03	5.512E+05	3.703E+01	5.414E-01	1.510E+02	1.015E-02
2104	9.598E+02	5.243E+05	3.523E+01	5.149E-01	1.437E+02	9.653E-03
2105	9.129E+02	4.987E+05	3.351E+01	4.898E-01	1.367E+02	9.182E-03
2106	8.684E+02	4.744E+05	3.188E+01	4.659E-01	1.300E+02	8.734E-03
2107	8.261E+02	4.513E+05	3.032E+01	4.432E-01	1.237E+02	8.308E-03
2108	7.858E+02	4.293E+05	2.884E+01	4.216E-01	1.176E+02	7.903E-03
2109	7.475E+02	4.083E+05	2.744E+01	4.010E-01	1.119E+02	7.517E-03
2110	7.110E+02	3.884E+05	2.610E+01	3.815E-01	1.064E+02	7.151E-03
2111	6.763E+02	3.695E+05	2.483E+01	3.629E-01	1.012E+02	6.802E-03
2112	6.433E+02	3.515E+05	2.361E+01	3.452E-01	9.630E+01	6.470E-03
2113	6.120E+02	3.343E+05	2.246E+01	3.283E-01	9.160E+01	6.155E-03
2114	5.821E+02	3.180E+05	2.137E+01	3.123E-01	8.713E+01	5.855E-03
2115	5.537E+02	3.025E+05	2.033E+01	2.971E-01	8.289E+01	5.569E-03
2116	5.267E+02	2.877E+05	1.933E+01	2.826E-01	7.884E+01	5.297E-03
2117	5.010E+02	2.737E+05	1.839E+01	2.688E-01	7.500E+01	5.039E-03
2118	4.766E+02	2.604E+05	1.749E+01	2.557E-01	7.134E+01	4.793E-03
2119	4.534E+02	2.477E+05	1.664E+01	2.432E-01	6.786E+01	4.560E-03
2120	4.312E+02	2.356E+05	1.583E+01	2.314E-01	6.455E+01	4.337E-03
2121	4.102E+02	2.241E+05	1.506E+01	2.201E-01	6.140E+01	4.126E-03
2122	3.902E+02	2.132E+05	1.432E+01	2.094E-01	5.841E+01	3.924E-03
2123	3.712E+02	2.028E+05	1.362E+01	1.992E-01	5.556E+01	3.733E-03
2124	3.531E+02	1.929E+05	1.296E+01	1.894E-01	5.285E+01	3.551E-03
2125	3.359E+02	1.835E+05	1.233E+01	1.802E-01	5.027E+01	3.378E-03
2126	3.195E+02	1.745E+05	1.173E+01	1.714E-01	4.782E+01	3.213E-03
2127	3.039E+02	1.660E+05	1.115E+01	1.631E-01	4.549E+01	3.056E-03
2128	2.891E+02	1.579E+05	1.061E+01	1.551E-01	4.327E+01	2.907E-03
2129	2.750E+02	1.502E+05	1.009E+01	1.475E-01	4.116E+01	2.766E-03
2130	2.616E+02	1.429E+05	9.601E+00	1.403E-01	3.915E+01	2.631E-03
2131	2.488E+02	1.359E+05	9.133E+00	1.335E-01	3.724E+01	2.502E-03



## Summary Report

**Landfill Name or Identifier:** Tier II: PCCL Class III Landfill

**Date:** Wednesday, April 09, 2014

### Description/Comments:

#### About LandGEM:

First-Order Decomposition Rate Equation:

$$Q_{CH_4} = \sum_{i=1}^n \sum_{j=0.1}^1 kL_o \left( \frac{M_i}{10} \right) e^{-kt_{ij}}$$

Where,

$Q_{CH_4}$  = annual methane generation in the year of the calculation ( $m^3/year$ )

$i$  = 1-year time increment

$n$  = (year of the calculation) - (initial year of waste acceptance)

$j$  = 0.1-year time increment

$k$  = methane generation rate ( $year^{-1}$ )

$L_o$  = potential methane generation capacity ( $m^3/Mg$ )

$M_i$  = mass of waste accepted in the  $i^{th}$  year ( $Mg$ )

$t_{ij}$  = age of the  $j^{th}$  section of waste mass  $M_i$  accepted in the  $i^{th}$  year (*decimal years*, e.g., 3.2 years)

LandGEM is based on a first-order decomposition rate equation for quantifying emissions from the decomposition of landfilled waste in municipal solid waste (MSW) landfills. The software provides a relatively simple approach to estimating landfill gas emissions. Model defaults are based on empirical data from U.S. landfills. Field test data can also be used in place of model defaults when available. Further guidance on EPA test methods, Clean Air Act (CAA) regulations, and other guidance regarding landfill gas emissions and control technology requirements can be found at <http://www.epa.gov/ttnatw01/landfill/landflpg.html>.

LandGEM is considered a screening tool — the better the input data, the better the estimates. Often, there are limitations with the available data regarding waste quantity and composition, variation in design and operating practices over time, and changes occurring over time that impact the emissions potential. Changes to landfill operation, such as operating under wet conditions through leachate recirculation or other liquid additions, will result in generating more gas at a faster rate. Defaults for estimating emissions for this type of operation are being developed to include in LandGEM along with defaults for conventional landfills (no leachate or liquid additions) for developing emission inventories and determining CAA applicability. Refer to the Web site identified above for future updates.

**Input Review**

## LANDFILL CHARACTERISTICS

Landfill Open Year	<b>1992</b>	
Landfill Closure Year (with 80-year limit)	<b>2005</b>	
Actual Closure Year (without limit)	<b>2005</b>	
Have Model Calculate Closure Year?	<b>No</b>	
Waste Design Capacity		<i>short tons</i>

## MODEL PARAMETERS

Methane Generation Rate, k	<b>0.050</b>	<i>year<sup>-1</sup></i>
Potential Methane Generation Capacity, L <sub>0</sub>	<b>170</b>	<i>m<sup>3</sup>/Mg</i>
NMOC Concentration	<b>78</b>	<i>ppmv as hexane</i>
Methane Content	<b>50</b>	<i>% by volume</i>

## GASES / POLLUTANTS SELECTED

Gas / Pollutant #1:	<b>Total landfill gas</b>
Gas / Pollutant #2:	<b>Methane</b>
Gas / Pollutant #3:	<b>Carbon dioxide</b>
Gas / Pollutant #4:	<b>NMOC</b>

## WASTE ACCEPTANCE RATES

Year	Waste Accepted		Waste-In-Place	
	(Mg/year)	(short tons/year)	(Mg)	(short tons)
1992	7,101	7,811	0	0
1993	7,245	7,969	7,101	7,811
1994	6,803	7,483	14,346	15,780
1995	6,029	6,632	21,149	23,264
1996	11,795	12,974	27,178	29,896
1997	11,860	13,046	38,973	42,870
1998	12,949	14,243	50,833	55,917
1999	12,835	14,118	63,782	70,160
2000	14,160	15,576	76,616	84,278
2001	14,660	16,126	90,776	99,854
2002	11,630	12,792	105,436	115,980
2003	41,355	45,491	117,066	128,772
2004	57,072	62,780	158,421	174,263
2005	30,734	33,808	215,493	237,043
2006	0	0	246,228	270,850
2007	0	0	246,228	270,850
2008	0	0	246,228	270,850
2009	0	0	246,228	270,850
2010	0	0	246,228	270,850
2011	0	0	246,228	270,850
2012	0	0	246,228	270,850
2013	0	0	246,228	270,850
2014	0	0	246,228	270,850
2015	0	0	246,228	270,850
2016	0	0	246,228	270,850
2017	0	0	246,228	270,850
2018	0	0	246,228	270,850
2019	0	0	246,228	270,850
2020	0	0	246,228	270,850
2021	0	0	246,228	270,850
2022	0	0	246,228	270,850
2023	0	0	246,228	270,850
2024	0	0	246,228	270,850
2025	0	0	246,228	270,850
2026	0	0	246,228	270,850
2027	0	0	246,228	270,850
2028	0	0	246,228	270,850
2029	0	0	246,228	270,850
2030	0	0	246,228	270,850
2031	0	0	246,228	270,850

## WASTE ACCEPTANCE RATES (Continued)

Year	Waste Accepted		Waste-In-Place	
	(Mg/year)	(short tons/year)	(Mg)	(short tons)
2032	0	0	246,228	270,850
2033	0	0	246,228	270,850
2034	0	0	246,228	270,850
2035	0	0	246,228	270,850
2036	0	0	246,228	270,850
2037	0	0	246,228	270,850
2038	0	0	246,228	270,850
2039	0	0	246,228	270,850
2040	0	0	246,228	270,850
2041	0	0	246,228	270,850
2042	0	0	246,228	270,850
2043	0	0	246,228	270,850
2044	0	0	246,228	270,850
2045	0	0	246,228	270,850
2046	0	0	246,228	270,850
2047	0	0	246,228	270,850
2048	0	0	246,228	270,850
2049	0	0	246,228	270,850
2050	0	0	246,228	270,850
2051	0	0	246,228	270,850
2052	0	0	246,228	270,850
2053	0	0	246,228	270,850
2054	0	0	246,228	270,850
2055	0	0	246,228	270,850
2056	0	0	246,228	270,850
2057	0	0	246,228	270,850
2058	0	0	246,228	270,850
2059	0	0	246,228	270,850
2060	0	0	246,228	270,850
2061	0	0	246,228	270,850
2062	0	0	246,228	270,850
2063	0	0	246,228	270,850
2064	0	0	246,228	270,850
2065	0	0	246,228	270,850
2066	0	0	246,228	270,850
2067	0	0	246,228	270,850
2068	0	0	246,228	270,850
2069	0	0	246,228	270,850
2070	0	0	246,228	270,850
2071	0	0	246,228	270,850



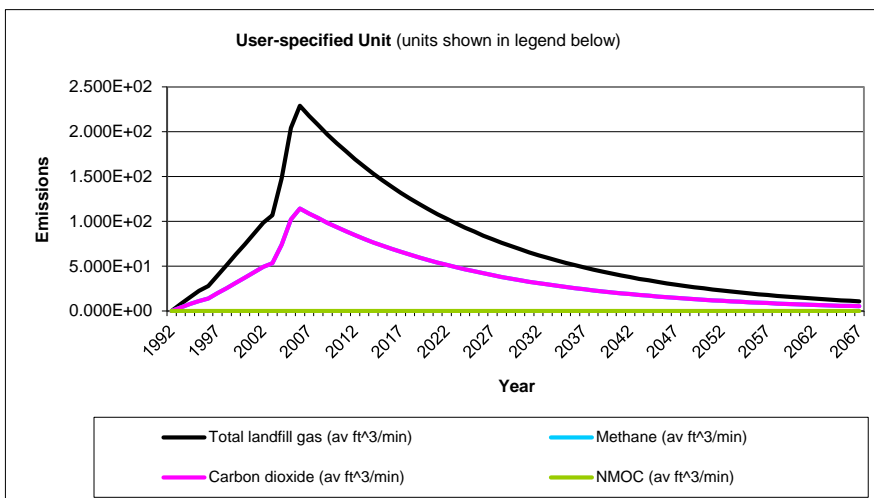
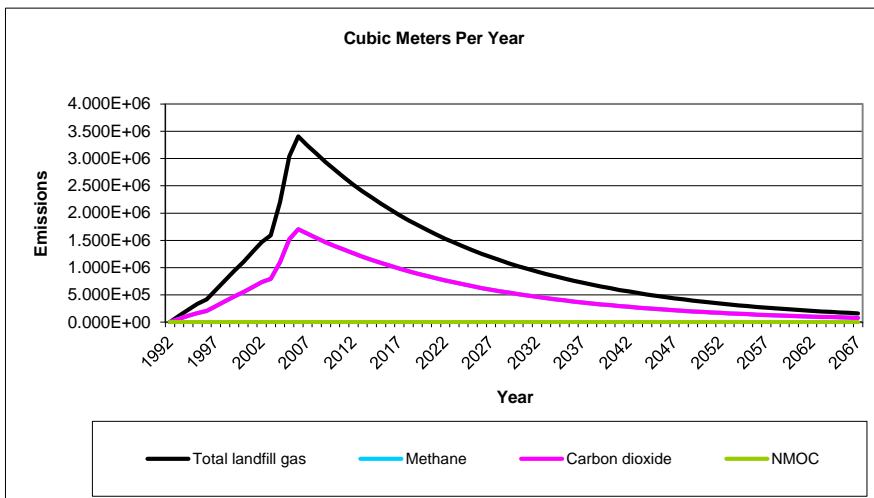
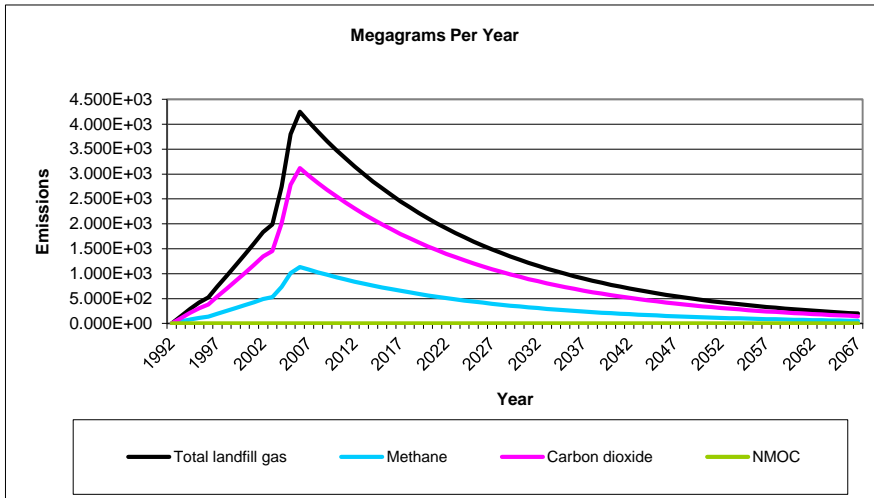
**Pollutant Parameters**

<b>Gas / Pollutant Default Parameters:</b>				<b>User-specified Pollutant Parameters:</b>	
	Compound	Concentration (ppmv)	Molecular Weight	Concentration (ppmv)	Molecular Weight
<b>Gases</b>	Total landfill gas		0.00		
	Methane		16.04		
	Carbon dioxide		44.01		
	NMOC	4,000	86.18		
<b>Pollutants</b>	1,1,1-Trichloroethane (methyl chloroform) - HAP	0.48	133.41		
	1,1,2,2- Tetrachloroethane - HAP/VOC	1.1	167.85		
	1,1-Dichloroethane (ethylidene dichloride) - HAP/VOC	2.4	98.97		
	1,1-Dichloroethene (vinylidene chloride) - HAP/VOC	0.20	96.94		
	1,2-Dichloroethane (ethylene dichloride) - HAP/VOC	0.41	98.96		
	1,2-Dichloropropane (propylene dichloride) - HAP/VOC	0.18	112.99		
	2-Propanol (isopropyl alcohol) - VOC	50	60.11		
	Acetone	7.0	58.08		
	Acrylonitrile - HAP/VOC	6.3	53.06		
	Benzene - No or Unknown Co-disposal - HAP/VOC	1.9	78.11		
	Benzene - Co-disposal - HAP/VOC	11	78.11		
	Bromodichloromethane - VOC	3.1	163.83		
	Butane - VOC	5.0	58.12		
	Carbon disulfide - HAP/VOC	0.58	76.13		
	Carbon monoxide	140	28.01		
	Carbon tetrachloride - HAP/VOC	4.0E-03	153.84		
	Carbonyl sulfide - HAP/VOC	0.49	60.07		
	Chlorobenzene - HAP/VOC	0.25	112.56		
	Chlorodifluoromethane	1.3	86.47		
	Chloroethane (ethyl chloride) - HAP/VOC	1.3	64.52		
	Chloroform - HAP/VOC	0.03	119.39		
	Chloromethane - VOC	1.2	50.49		
	Dichlorobenzene - (HAP for para isomer/VOC)	0.21	147		
	Dichlorodifluoromethane	16	120.91		
	Dichlorofluoromethane - VOC	2.6	102.92		
	Dichloromethane (methylene chloride) - HAP	14	84.94		
	Dimethyl sulfide (methyl sulfide) - VOC	7.8	62.13		
	Ethane	890	30.07		
	Ethanol - VOC	27	46.08		

**Pollutant Parameters (Continued)**

<i>Gas / Pollutant Default Parameters:</i>				<i>User-specified Pollutant Parameters:</i>	
	Compound	Concentration (ppmv)	Molecular Weight	Concentration (ppmv)	Molecular Weight
<b>Pollutants</b>	Ethyl mercaptan (ethanethiol) - VOC	2.3	62.13		
	Ethylbenzene - HAP/VOC	4.6	106.16		
	Ethylene dibromide - HAP/VOC	1.0E-03	187.88		
	Fluorotrichloromethane - VOC	0.76	137.38		
	Hexane - HAP/VOC	6.6	86.18		
	Hydrogen sulfide	36	34.08		
	Mercury (total) - HAP	2.9E-04	200.61		
	Methyl ethyl ketone - HAP/VOC	7.1	72.11		
	Methyl isobutyl ketone - HAP/VOC	1.9	100.16		
	Methyl mercaptan - VOC	2.5	48.11		
	Pentane - VOC	3.3	72.15		
	Perchloroethylene (tetrachloroethylene) - HAP	3.7	165.83		
	Propane - VOC	11	44.09		
	t-1,2-Dichloroethene - VOC	2.8	96.94		
	Toluene - No or Unknown Co-disposal - HAP/VOC	39	92.13		
	Toluene - Co-disposal - HAP/VOC	170	92.13		
	Trichloroethylene (trichloroethene) - HAP/VOC	2.8	131.40		
	Vinyl chloride - HAP/VOC	7.3	62.50		
	Xylenes - HAP/VOC	12	106.16		

**Graphs**



**Results**

Year	Total landfill gas			Methane		
	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)
1992	0	0	0	0	0	0
1993	1.474E+02	1.180E+05	7.931E+00	3.938E+01	5.902E+04	3.966E+00
1994	2.906E+02	2.327E+05	1.564E+01	7.763E+01	1.164E+05	7.818E+00
1995	4.177E+02	3.345E+05	2.247E+01	1.116E+02	1.672E+05	1.124E+01
1996	5.225E+02	4.184E+05	2.811E+01	1.396E+02	2.092E+05	1.406E+01
1997	7.419E+02	5.940E+05	3.991E+01	1.982E+02	2.970E+05	1.996E+01
1998	9.519E+02	7.622E+05	5.121E+01	2.543E+02	3.811E+05	2.561E+01
1999	1.174E+03	9.403E+05	6.318E+01	3.137E+02	4.702E+05	3.159E+01
2000	1.383E+03	1.108E+06	7.443E+01	3.695E+02	5.539E+05	3.722E+01
2001	1.610E+03	1.289E+06	8.662E+01	4.300E+02	6.446E+05	4.331E+01
2002	1.836E+03	1.470E+06	9.877E+01	4.903E+02	7.350E+05	4.938E+01
2003	1.988E+03	1.592E+06	1.069E+02	5.309E+02	7.958E+05	5.347E+01
2004	2.749E+03	2.201E+06	1.479E+02	7.344E+02	1.101E+06	7.396E+01
2005	3.800E+03	3.043E+06	2.044E+02	1.015E+03	1.521E+06	1.022E+02
2006	4.253E+03	3.405E+06	2.288E+02	1.136E+03	1.703E+06	1.144E+02
2007	4.045E+03	3.239E+06	2.176E+02	1.081E+03	1.620E+06	1.088E+02
2008	3.848E+03	3.081E+06	2.070E+02	1.028E+03	1.541E+06	1.035E+02
2009	3.660E+03	2.931E+06	1.969E+02	9.777E+02	1.466E+06	9.847E+01
2010	3.482E+03	2.788E+06	1.873E+02	9.300E+02	1.394E+06	9.366E+01
2011	3.312E+03	2.652E+06	1.782E+02	8.847E+02	1.326E+06	8.910E+01
2012	3.150E+03	2.523E+06	1.695E+02	8.415E+02	1.261E+06	8.475E+01
2013	2.997E+03	2.400E+06	1.612E+02	8.005E+02	1.200E+06	8.062E+01
2014	2.851E+03	2.283E+06	1.534E+02	7.614E+02	1.141E+06	7.669E+01
2015	2.712E+03	2.171E+06	1.459E+02	7.243E+02	1.086E+06	7.295E+01
2016	2.579E+03	2.065E+06	1.388E+02	6.890E+02	1.033E+06	6.939E+01
2017	2.454E+03	1.965E+06	1.320E+02	6.554E+02	9.824E+05	6.600E+01
2018	2.334E+03	1.869E+06	1.256E+02	6.234E+02	9.344E+05	6.279E+01
2019	2.220E+03	1.778E+06	1.194E+02	5.930E+02	8.889E+05	5.972E+01
2020	2.112E+03	1.691E+06	1.136E+02	5.641E+02	8.455E+05	5.681E+01
2021	2.009E+03	1.609E+06	1.081E+02	5.366E+02	8.043E+05	5.404E+01
2022	1.911E+03	1.530E+06	1.028E+02	5.104E+02	7.651E+05	5.140E+01
2023	1.818E+03	1.455E+06	9.779E+01	4.855E+02	7.277E+05	4.890E+01
2024	1.729E+03	1.385E+06	9.303E+01	4.618E+02	6.923E+05	4.651E+01
2025	1.645E+03	1.317E+06	8.849E+01	4.393E+02	6.585E+05	4.424E+01
2026	1.564E+03	1.253E+06	8.417E+01	4.179E+02	6.264E+05	4.209E+01
2027	1.488E+03	1.192E+06	8.007E+01	3.975E+02	5.958E+05	4.003E+01
2028	1.416E+03	1.134E+06	7.616E+01	3.781E+02	5.668E+05	3.808E+01
2029	1.347E+03	1.078E+06	7.245E+01	3.597E+02	5.391E+05	3.622E+01
2030	1.281E+03	1.026E+06	6.891E+01	3.421E+02	5.128E+05	3.446E+01
2031	1.218E+03	9.756E+05	6.555E+01	3.255E+02	4.878E+05	3.278E+01
2032	1.159E+03	9.281E+05	6.236E+01	3.096E+02	4.640E+05	3.118E+01
2033	1.102E+03	8.828E+05	5.932E+01	2.945E+02	4.414E+05	2.966E+01
2034	1.049E+03	8.397E+05	5.642E+01	2.801E+02	4.199E+05	2.821E+01
2035	9.976E+02	7.988E+05	5.367E+01	2.665E+02	3.994E+05	2.684E+01
2036	9.489E+02	7.598E+05	5.105E+01	2.535E+02	3.799E+05	2.553E+01
2037	9.026E+02	7.228E+05	4.856E+01	2.411E+02	3.614E+05	2.428E+01
2038	8.586E+02	6.875E+05	4.619E+01	2.293E+02	3.438E+05	2.310E+01
2039	8.167E+02	6.540E+05	4.394E+01	2.182E+02	3.270E+05	2.197E+01
2040	7.769E+02	6.221E+05	4.180E+01	2.075E+02	3.111E+05	2.090E+01
2041	7.390E+02	5.918E+05	3.976E+01	1.974E+02	2.959E+05	1.988E+01

**Results (Continued)**

Year	Total landfill gas			Methane		
	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)
2042	7.030E+02	5.629E+05	3.782E+01	1.878E+02	2.815E+05	1.891E+01
2043	6.687E+02	5.354E+05	3.598E+01	1.786E+02	2.677E+05	1.799E+01
2044	6.361E+02	5.093E+05	3.422E+01	1.699E+02	2.547E+05	1.711E+01
2045	6.050E+02	4.845E+05	3.255E+01	1.616E+02	2.422E+05	1.628E+01
2046	5.755E+02	4.609E+05	3.097E+01	1.537E+02	2.304E+05	1.548E+01
2047	5.475E+02	4.384E+05	2.946E+01	1.462E+02	2.192E+05	1.473E+01
2048	5.208E+02	4.170E+05	2.802E+01	1.391E+02	2.085E+05	1.401E+01
2049	4.954E+02	3.967E+05	2.665E+01	1.323E+02	1.983E+05	1.333E+01
2050	4.712E+02	3.773E+05	2.535E+01	1.259E+02	1.887E+05	1.268E+01
2051	4.482E+02	3.589E+05	2.412E+01	1.197E+02	1.795E+05	1.206E+01
2052	4.264E+02	3.414E+05	2.294E+01	1.139E+02	1.707E+05	1.147E+01
2053	4.056E+02	3.248E+05	2.182E+01	1.083E+02	1.624E+05	1.091E+01
2054	3.858E+02	3.089E+05	2.076E+01	1.030E+02	1.545E+05	1.038E+01
2055	3.670E+02	2.939E+05	1.974E+01	9.802E+01	1.469E+05	9.872E+00
2056	3.491E+02	2.795E+05	1.878E+01	9.324E+01	1.398E+05	9.391E+00
2057	3.321E+02	2.659E+05	1.787E+01	8.870E+01	1.329E+05	8.933E+00
2058	3.159E+02	2.529E+05	1.699E+01	8.437E+01	1.265E+05	8.497E+00
2059	3.005E+02	2.406E+05	1.617E+01	8.026E+01	1.203E+05	8.083E+00
2060	2.858E+02	2.289E+05	1.538E+01	7.634E+01	1.144E+05	7.688E+00
2061	2.719E+02	2.177E+05	1.463E+01	7.262E+01	1.088E+05	7.314E+00
2062	2.586E+02	2.071E+05	1.391E+01	6.908E+01	1.035E+05	6.957E+00
2063	2.460E+02	1.970E+05	1.324E+01	6.571E+01	9.849E+04	6.618E+00
2064	2.340E+02	1.874E+05	1.259E+01	6.250E+01	9.369E+04	6.295E+00
2065	2.226E+02	1.782E+05	1.198E+01	5.945E+01	8.912E+04	5.988E+00
2066	2.117E+02	1.695E+05	1.139E+01	5.655E+01	8.477E+04	5.696E+00
2067	2.014E+02	1.613E+05	1.084E+01	5.380E+01	8.064E+04	5.418E+00
2068	1.916E+02	1.534E+05	1.031E+01	5.117E+01	7.670E+04	5.154E+00
2069	1.822E+02	1.459E+05	9.805E+00	4.868E+01	7.296E+04	4.902E+00
2070	1.733E+02	1.388E+05	9.327E+00	4.630E+01	6.940E+04	4.663E+00
2071	1.649E+02	1.320E+05	8.872E+00	4.405E+01	6.602E+04	4.436E+00
2072	1.569E+02	1.256E+05	8.439E+00	4.190E+01	6.280E+04	4.220E+00
2073	1.492E+02	1.195E+05	8.027E+00	3.985E+01	5.974E+04	4.014E+00
2074	1.419E+02	1.136E+05	7.636E+00	3.791E+01	5.682E+04	3.818E+00
2075	1.350E+02	1.081E+05	7.264E+00	3.606E+01	5.405E+04	3.632E+00
2076	1.284E+02	1.028E+05	6.909E+00	3.430E+01	5.142E+04	3.455E+00
2077	1.222E+02	9.782E+04	6.572E+00	3.263E+01	4.891E+04	3.286E+00
2078	1.162E+02	9.305E+04	6.252E+00	3.104E+01	4.652E+04	3.126E+00
2079	1.105E+02	8.851E+04	5.947E+00	2.952E+01	4.425E+04	2.973E+00
2080	1.051E+02	8.419E+04	5.657E+00	2.808E+01	4.210E+04	2.828E+00
2081	1.000E+02	8.009E+04	5.381E+00	2.671E+01	4.004E+04	2.690E+00
2082	9.514E+01	7.618E+04	5.119E+00	2.541E+01	3.809E+04	2.559E+00
2083	9.050E+01	7.246E+04	4.869E+00	2.417E+01	3.623E+04	2.434E+00
2084	8.608E+01	6.893E+04	4.631E+00	2.299E+01	3.447E+04	2.316E+00
2085	8.188E+01	6.557E+04	4.406E+00	2.187E+01	3.278E+04	2.203E+00
2086	7.789E+01	6.237E+04	4.191E+00	2.081E+01	3.119E+04	2.095E+00
2087	7.409E+01	5.933E+04	3.986E+00	1.979E+01	2.966E+04	1.993E+00
2088	7.048E+01	5.644E+04	3.792E+00	1.883E+01	2.822E+04	1.896E+00
2089	6.704E+01	5.368E+04	3.607E+00	1.791E+01	2.684E+04	1.803E+00
2090	6.377E+01	5.107E+04	3.431E+00	1.703E+01	2.553E+04	1.716E+00
2091	6.066E+01	4.857E+04	3.264E+00	1.620E+01	2.429E+04	1.632E+00
2092	5.770E+01	4.621E+04	3.105E+00	1.541E+01	2.310E+04	1.552E+00

**Results (Continued)**

Year	Total landfill gas			Methane		
	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)
2093	5.489E+01	4.395E+04	2.953E+00	1.466E+01	2.198E+04	1.477E+00
2094	5.221E+01	4.181E+04	2.809E+00	1.395E+01	2.090E+04	1.405E+00
2095	4.967E+01	3.977E+04	2.672E+00	1.327E+01	1.988E+04	1.336E+00
2096	4.724E+01	3.783E+04	2.542E+00	1.262E+01	1.891E+04	1.271E+00
2097	4.494E+01	3.599E+04	2.418E+00	1.200E+01	1.799E+04	1.209E+00
2098	4.275E+01	3.423E+04	2.300E+00	1.142E+01	1.711E+04	1.150E+00
2099	4.066E+01	3.256E+04	2.188E+00	1.086E+01	1.628E+04	1.094E+00
2100	3.868E+01	3.097E+04	2.081E+00	1.033E+01	1.549E+04	1.041E+00
2101	3.679E+01	2.946E+04	1.980E+00	9.828E+00	1.473E+04	9.898E-01
2102	3.500E+01	2.803E+04	1.883E+00	9.348E+00	1.401E+04	9.415E-01
2103	3.329E+01	2.666E+04	1.791E+00	8.893E+00	1.333E+04	8.956E-01
2104	3.167E+01	2.536E+04	1.704E+00	8.459E+00	1.268E+04	8.519E-01
2105	3.012E+01	2.412E+04	1.621E+00	8.046E+00	1.206E+04	8.104E-01
2106	2.865E+01	2.295E+04	1.542E+00	7.654E+00	1.147E+04	7.708E-01
2107	2.726E+01	2.183E+04	1.466E+00	7.281E+00	1.091E+04	7.332E-01
2108	2.593E+01	2.076E+04	1.395E+00	6.926E+00	1.038E+04	6.975E-01
2109	2.466E+01	1.975E+04	1.327E+00	6.588E+00	9.874E+03	6.635E-01
2110	2.346E+01	1.879E+04	1.262E+00	6.266E+00	9.393E+03	6.311E-01
2111	2.232E+01	1.787E+04	1.201E+00	5.961E+00	8.935E+03	6.003E-01
2112	2.123E+01	1.700E+04	1.142E+00	5.670E+00	8.499E+03	5.711E-01
2113	2.019E+01	1.617E+04	1.086E+00	5.394E+00	8.085E+03	5.432E-01
2114	1.921E+01	1.538E+04	1.033E+00	5.131E+00	7.690E+03	5.167E-01
2115	1.827E+01	1.463E+04	9.830E-01	4.880E+00	7.315E+03	4.915E-01
2116	1.738E+01	1.392E+04	9.351E-01	4.642E+00	6.958E+03	4.675E-01
2117	1.653E+01	1.324E+04	8.895E-01	4.416E+00	6.619E+03	4.447E-01
2118	1.573E+01	1.259E+04	8.461E-01	4.201E+00	6.296E+03	4.230E-01
2119	1.496E+01	1.198E+04	8.048E-01	3.996E+00	5.989E+03	4.024E-01
2120	1.423E+01	1.139E+04	7.656E-01	3.801E+00	5.697E+03	3.828E-01
2121	1.354E+01	1.084E+04	7.282E-01	3.615E+00	5.419E+03	3.641E-01
2122	1.288E+01	1.031E+04	6.927E-01	3.439E+00	5.155E+03	3.464E-01
2123	1.225E+01	9.807E+03	6.589E-01	3.271E+00	4.904E+03	3.295E-01
2124	1.165E+01	9.329E+03	6.268E-01	3.112E+00	4.664E+03	3.134E-01
2125	1.108E+01	8.874E+03	5.962E-01	2.960E+00	4.437E+03	2.981E-01
2126	1.054E+01	8.441E+03	5.672E-01	2.816E+00	4.221E+03	2.836E-01
2127	1.003E+01	8.029E+03	5.395E-01	2.678E+00	4.015E+03	2.697E-01
2128	9.538E+00	7.638E+03	5.132E-01	2.548E+00	3.819E+03	2.566E-01
2129	9.073E+00	7.265E+03	4.882E-01	2.423E+00	3.633E+03	2.441E-01
2130	8.631E+00	6.911E+03	4.643E-01	2.305E+00	3.455E+03	2.322E-01
2131	8.210E+00	6.574E+03	4.417E-01	2.193E+00	3.287E+03	2.208E-01
2132	7.809E+00	6.253E+03	4.202E-01	2.086E+00	3.127E+03	2.101E-01

**Results (Continued)**

Year	Carbon dioxide			NMOC		
	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)
1992	0	0	0	0	0	0
1993	1.080E+02	5.902E+04	3.966E+00	3.300E-02	9.207E+00	6.186E-04
1994	2.130E+02	1.164E+05	7.818E+00	6.507E-02	1.815E+01	1.220E-03
1995	3.061E+02	1.672E+05	1.124E+01	9.351E-02	2.609E+01	1.753E-03
1996	3.829E+02	2.092E+05	1.406E+01	1.170E-01	3.263E+01	2.193E-03
1997	5.437E+02	2.970E+05	1.996E+01	1.661E-01	4.634E+01	3.113E-03
1998	6.976E+02	3.811E+05	2.561E+01	2.131E-01	5.945E+01	3.995E-03
1999	8.606E+02	4.702E+05	3.159E+01	2.629E-01	7.334E+01	4.928E-03
2000	1.014E+03	5.539E+05	3.722E+01	3.097E-01	8.641E+01	5.806E-03
2001	1.180E+03	6.446E+05	4.331E+01	3.604E-01	1.006E+02	6.756E-03
2002	1.345E+03	7.350E+05	4.938E+01	4.110E-01	1.147E+02	7.704E-03
2003	1.457E+03	7.958E+05	5.347E+01	4.450E-01	1.241E+02	8.341E-03
2004	2.015E+03	1.101E+06	7.396E+01	6.155E-01	1.717E+02	1.154E-02
2005	2.785E+03	1.521E+06	1.022E+02	8.507E-01	2.373E+02	1.595E-02
2006	3.117E+03	1.703E+06	1.144E+02	9.521E-01	2.656E+02	1.785E-02
2007	2.965E+03	1.620E+06	1.088E+02	9.057E-01	2.527E+02	1.698E-02
2008	2.820E+03	1.541E+06	1.035E+02	8.615E-01	2.403E+02	1.615E-02
2009	2.683E+03	1.466E+06	9.847E+01	8.195E-01	2.286E+02	1.536E-02
2010	2.552E+03	1.394E+06	9.366E+01	7.795E-01	2.175E+02	1.461E-02
2011	2.427E+03	1.326E+06	8.910E+01	7.415E-01	2.069E+02	1.390E-02
2012	2.309E+03	1.261E+06	8.475E+01	7.053E-01	1.968E+02	1.322E-02
2013	2.196E+03	1.200E+06	8.062E+01	6.709E-01	1.872E+02	1.258E-02
2014	2.089E+03	1.141E+06	7.669E+01	6.382E-01	1.780E+02	1.196E-02
2015	1.987E+03	1.086E+06	7.295E+01	6.071E-01	1.694E+02	1.138E-02
2016	1.890E+03	1.033E+06	6.939E+01	5.775E-01	1.611E+02	1.082E-02
2017	1.798E+03	9.824E+05	6.600E+01	5.493E-01	1.532E+02	1.030E-02
2018	1.711E+03	9.344E+05	6.279E+01	5.225E-01	1.458E+02	9.795E-03
2019	1.627E+03	8.889E+05	5.972E+01	4.970E-01	1.387E+02	9.317E-03
2020	1.548E+03	8.455E+05	5.681E+01	4.728E-01	1.319E+02	8.862E-03
2021	1.472E+03	8.043E+05	5.404E+01	4.497E-01	1.255E+02	8.430E-03
2022	1.400E+03	7.651E+05	5.140E+01	4.278E-01	1.193E+02	8.019E-03
2023	1.332E+03	7.277E+05	4.890E+01	4.069E-01	1.135E+02	7.628E-03
2024	1.267E+03	6.923E+05	4.651E+01	3.871E-01	1.080E+02	7.256E-03
2025	1.205E+03	6.585E+05	4.424E+01	3.682E-01	1.027E+02	6.902E-03
2026	1.147E+03	6.264E+05	4.209E+01	3.503E-01	9.772E+01	6.565E-03
2027	1.091E+03	5.958E+05	4.003E+01	3.332E-01	9.295E+01	6.245E-03
2028	1.037E+03	5.668E+05	3.808E+01	3.169E-01	8.842E+01	5.941E-03
2029	9.869E+02	5.391E+05	3.622E+01	3.015E-01	8.410E+01	5.651E-03
2030	9.387E+02	5.128E+05	3.446E+01	2.868E-01	8.000E+01	5.375E-03
2031	8.930E+02	4.878E+05	3.278E+01	2.728E-01	7.610E+01	5.113E-03
2032	8.494E+02	4.640E+05	3.118E+01	2.595E-01	7.239E+01	4.864E-03
2033	8.080E+02	4.414E+05	2.966E+01	2.468E-01	6.886E+01	4.627E-03
2034	7.686E+02	4.199E+05	2.821E+01	2.348E-01	6.550E+01	4.401E-03
2035	7.311E+02	3.994E+05	2.684E+01	2.233E-01	6.231E+01	4.186E-03
2036	6.954E+02	3.799E+05	2.553E+01	2.124E-01	5.927E+01	3.982E-03
2037	6.615E+02	3.614E+05	2.428E+01	2.021E-01	5.638E+01	3.788E-03
2038	6.293E+02	3.438E+05	2.310E+01	1.922E-01	5.363E+01	3.603E-03
2039	5.986E+02	3.270E+05	2.197E+01	1.828E-01	5.101E+01	3.427E-03
2040	5.694E+02	3.111E+05	2.090E+01	1.739E-01	4.852E+01	3.260E-03
2041	5.416E+02	2.959E+05	1.988E+01	1.654E-01	4.616E+01	3.101E-03

**Results (Continued)**

Year	Carbon dioxide			NMOC		
	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)
2042	5.152E+02	2.815E+05	1.891E+01	1.574E-01	4.391E+01	2.950E-03
2043	4.901E+02	2.677E+05	1.799E+01	1.497E-01	4.176E+01	2.806E-03
2044	4.662E+02	2.547E+05	1.711E+01	1.424E-01	3.973E+01	2.669E-03
2045	4.434E+02	2.422E+05	1.628E+01	1.355E-01	3.779E+01	2.539E-03
2046	4.218E+02	2.304E+05	1.548E+01	1.289E-01	3.595E+01	2.415E-03
2047	4.012E+02	2.192E+05	1.473E+01	1.226E-01	3.419E+01	2.298E-03
2048	3.817E+02	2.085E+05	1.401E+01	1.166E-01	3.253E+01	2.185E-03
2049	3.631E+02	1.983E+05	1.333E+01	1.109E-01	3.094E+01	2.079E-03
2050	3.453E+02	1.887E+05	1.268E+01	1.055E-01	2.943E+01	1.977E-03
2051	3.285E+02	1.795E+05	1.206E+01	1.004E-01	2.800E+01	1.881E-03
2052	3.125E+02	1.707E+05	1.147E+01	9.546E-02	2.663E+01	1.789E-03
2053	2.972E+02	1.624E+05	1.091E+01	9.080E-02	2.533E+01	1.702E-03
2054	2.827E+02	1.545E+05	1.038E+01	8.637E-02	2.410E+01	1.619E-03
2055	2.690E+02	1.469E+05	9.872E+00	8.216E-02	2.292E+01	1.540E-03
2056	2.558E+02	1.398E+05	9.391E+00	7.815E-02	2.180E+01	1.465E-03
2057	2.434E+02	1.329E+05	8.933E+00	7.434E-02	2.074E+01	1.394E-03
2058	2.315E+02	1.265E+05	8.497E+00	7.072E-02	1.973E+01	1.326E-03
2059	2.202E+02	1.203E+05	8.083E+00	6.727E-02	1.877E+01	1.261E-03
2060	2.095E+02	1.144E+05	7.688E+00	6.399E-02	1.785E+01	1.199E-03
2061	1.992E+02	1.088E+05	7.314E+00	6.087E-02	1.698E+01	1.141E-03
2062	1.895E+02	1.035E+05	6.957E+00	5.790E-02	1.615E+01	1.085E-03
2063	1.803E+02	9.849E+04	6.618E+00	5.507E-02	1.536E+01	1.032E-03
2064	1.715E+02	9.369E+04	6.295E+00	5.239E-02	1.462E+01	9.820E-04
2065	1.631E+02	8.912E+04	5.988E+00	4.983E-02	1.390E+01	9.341E-04
2066	1.552E+02	8.477E+04	5.696E+00	4.740E-02	1.322E+01	8.885E-04
2067	1.476E+02	8.064E+04	5.418E+00	4.509E-02	1.258E+01	8.452E-04
2068	1.404E+02	7.670E+04	5.154E+00	4.289E-02	1.197E+01	8.040E-04
2069	1.336E+02	7.296E+04	4.902E+00	4.080E-02	1.138E+01	7.648E-04
2070	1.270E+02	6.940E+04	4.663E+00	3.881E-02	1.083E+01	7.275E-04
2071	1.208E+02	6.602E+04	4.436E+00	3.692E-02	1.030E+01	6.920E-04
2072	1.150E+02	6.280E+04	4.220E+00	3.512E-02	9.797E+00	6.582E-04
2073	1.093E+02	5.974E+04	4.014E+00	3.340E-02	9.319E+00	6.261E-04
2074	1.040E+02	5.682E+04	3.818E+00	3.177E-02	8.865E+00	5.956E-04
2075	9.894E+01	5.405E+04	3.632E+00	3.022E-02	8.432E+00	5.666E-04
2076	9.412E+01	5.142E+04	3.455E+00	2.875E-02	8.021E+00	5.389E-04
2077	8.953E+01	4.891E+04	3.286E+00	2.735E-02	7.630E+00	5.126E-04
2078	8.516E+01	4.652E+04	3.126E+00	2.601E-02	7.258E+00	4.876E-04
2079	8.101E+01	4.425E+04	2.973E+00	2.475E-02	6.904E+00	4.639E-04
2080	7.706E+01	4.210E+04	2.828E+00	2.354E-02	6.567E+00	4.412E-04
2081	7.330E+01	4.004E+04	2.690E+00	2.239E-02	6.247E+00	4.197E-04
2082	6.972E+01	3.809E+04	2.559E+00	2.130E-02	5.942E+00	3.992E-04
2083	6.632E+01	3.623E+04	2.434E+00	2.026E-02	5.652E+00	3.798E-04
2084	6.309E+01	3.447E+04	2.316E+00	1.927E-02	5.377E+00	3.613E-04
2085	6.001E+01	3.278E+04	2.203E+00	1.833E-02	5.114E+00	3.436E-04
2086	5.709E+01	3.119E+04	2.095E+00	1.744E-02	4.865E+00	3.269E-04
2087	5.430E+01	2.966E+04	1.993E+00	1.659E-02	4.628E+00	3.109E-04
2088	5.165E+01	2.822E+04	1.896E+00	1.578E-02	4.402E+00	2.958E-04
2089	4.913E+01	2.684E+04	1.803E+00	1.501E-02	4.187E+00	2.813E-04
2090	4.674E+01	2.553E+04	1.716E+00	1.428E-02	3.983E+00	2.676E-04
2091	4.446E+01	2.429E+04	1.632E+00	1.358E-02	3.789E+00	2.546E-04
2092	4.229E+01	2.310E+04	1.552E+00	1.292E-02	3.604E+00	2.422E-04



**Results (Continued)**

Year	Carbon dioxide			NMOC		
	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)	(Mg/year)	(m <sup>3</sup> /year)	(av ft <sup>3</sup> /min)
2093	4.023E+01	2.198E+04	1.477E+00	1.229E-02	3.428E+00	2.303E-04
2094	3.827E+01	2.090E+04	1.405E+00	1.169E-02	3.261E+00	2.191E-04
2095	3.640E+01	1.988E+04	1.336E+00	1.112E-02	3.102E+00	2.084E-04
2096	3.462E+01	1.891E+04	1.271E+00	1.058E-02	2.951E+00	1.983E-04
2097	3.294E+01	1.799E+04	1.209E+00	1.006E-02	2.807E+00	1.886E-04
2098	3.133E+01	1.711E+04	1.150E+00	9.570E-03	2.670E+00	1.794E-04
2099	2.980E+01	1.628E+04	1.094E+00	9.104E-03	2.540E+00	1.706E-04
2100	2.835E+01	1.549E+04	1.041E+00	8.660E-03	2.416E+00	1.623E-04
2101	2.697E+01	1.473E+04	9.898E-01	8.237E-03	2.298E+00	1.544E-04
2102	2.565E+01	1.401E+04	9.415E-01	7.836E-03	2.186E+00	1.469E-04
2103	2.440E+01	1.333E+04	8.956E-01	7.453E-03	2.079E+00	1.397E-04
2104	2.321E+01	1.268E+04	8.519E-01	7.090E-03	1.978E+00	1.329E-04
2105	2.208E+01	1.206E+04	8.104E-01	6.744E-03	1.881E+00	1.264E-04
2106	2.100E+01	1.147E+04	7.708E-01	6.415E-03	1.790E+00	1.203E-04
2107	1.998E+01	1.091E+04	7.332E-01	6.102E-03	1.702E+00	1.144E-04
2108	1.900E+01	1.038E+04	6.975E-01	5.805E-03	1.619E+00	1.088E-04
2109	1.808E+01	9.874E+03	6.635E-01	5.522E-03	1.540E+00	1.035E-04
2110	1.719E+01	9.393E+03	6.311E-01	5.252E-03	1.465E+00	9.845E-05
2111	1.636E+01	8.935E+03	6.003E-01	4.996E-03	1.394E+00	9.365E-05
2112	1.556E+01	8.499E+03	5.711E-01	4.752E-03	1.326E+00	8.908E-05
2113	1.480E+01	8.085E+03	5.432E-01	4.521E-03	1.261E+00	8.474E-05
2114	1.408E+01	7.690E+03	5.167E-01	4.300E-03	1.200E+00	8.061E-05
2115	1.339E+01	7.315E+03	4.915E-01	4.090E-03	1.141E+00	7.668E-05
2116	1.274E+01	6.958E+03	4.675E-01	3.891E-03	1.086E+00	7.294E-05
2117	1.212E+01	6.619E+03	4.447E-01	3.701E-03	1.033E+00	6.938E-05
2118	1.153E+01	6.296E+03	4.230E-01	3.521E-03	9.822E-01	6.599E-05
2119	1.096E+01	5.989E+03	4.024E-01	3.349E-03	9.343E-01	6.278E-05
2120	1.043E+01	5.697E+03	3.828E-01	3.186E-03	8.887E-01	5.971E-05
2121	9.920E+00	5.419E+03	3.641E-01	3.030E-03	8.454E-01	5.680E-05
2122	9.436E+00	5.155E+03	3.464E-01	2.883E-03	8.042E-01	5.403E-05
2123	8.976E+00	4.904E+03	3.295E-01	2.742E-03	7.650E-01	5.140E-05
2124	8.538E+00	4.664E+03	3.134E-01	2.608E-03	7.276E-01	4.889E-05
2125	8.122E+00	4.437E+03	2.981E-01	2.481E-03	6.922E-01	4.651E-05
2126	7.726E+00	4.221E+03	2.836E-01	2.360E-03	6.584E-01	4.424E-05
2127	7.349E+00	4.015E+03	2.697E-01	2.245E-03	6.263E-01	4.208E-05
2128	6.990E+00	3.819E+03	2.566E-01	2.135E-03	5.957E-01	4.003E-05
2129	6.650E+00	3.633E+03	2.441E-01	2.031E-03	5.667E-01	3.808E-05
2130	6.325E+00	3.455E+03	2.322E-01	1.932E-03	5.391E-01	3.622E-05
2131	6.017E+00	3.287E+03	2.208E-01	1.838E-03	5.128E-01	3.445E-05
2132	5.723E+00	3.127E+03	2.101E-01	1.748E-03	4.878E-01	3.277E-05