

A CASE STUDY DEMONSTRATING US EPA GUIDANCE FOR EVALUATING LANDFILL GAS EMISSIONS FROM CLOSED OR ABANDONED FACILITIES

ROSE HILL REGIONAL LANDFILL SOUTH KINGSTOWN, RHODE ISLAND



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by

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Abstract

This report describes a case study that applies EPA-600/R-05/123—the guidance for conducting air pathway analyses of landfill gas emissions that are of interest to superfund remedial project managers, on-scene coordinators, facility owners, and potentially responsible parties. The particular site examined for this case study was the Rose Hill Regional Landfill in South Kingstown, RI. The case study exemplifies the use of the procedures and tools described in the guidance for evaluating LFG emissions to ambient air. The air pathway analysis is used to evaluate the inhalation risks to offsite receptors as well as the hazards of both onsite and offsite methane explosions and landfill fires. Landfill gases detected at the site were methane and chemicals of particular concern (COPCs) that encompassed nonmethane organic compounds, 1,1,1-trichloroethane, benzene, chlorobenzene, chloroethane, dichlorobenzene, methylene chloride, toluene, trichloroethene, vinyl chloride, and xylenes. The report includes values of 90th percentile concentration of COPCs and isopleths of the COPC concentrations overlaid on an aerial photograph of the site.

Foreword

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This publication has been produced as part of the Laboratory's strategic long-term research plan. It is published and made available by EPA's Office of Research and Development to assist the user community and to link researchers with their clients.

Sally Gutierrez, Director
National Risk Management Research Laboratory

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Executive Summary

The Rose Hill Regional Landfill (Landfill) is located within the town of South Kingstown, Rhode Island in the village of Peace Dale. This site encompasses approximately 70 acres. The facility is composed of three separate, inactive, disposal areas, including the solid waste landfill, bulky waste disposal area, and a sewage sludge landfill. These areas have been covered with soil and graded and currently support vegetative cover. The Landfill, which began operation in 1967, is in an abandoned gravel quarry. The Regional Landfill operated as a municipal disposal facility for the towns of South Kingstown and Narragansett. Industrial waste, however, was also accepted at the facility during its years of operation. In October 1983, the Regional Landfill reached its state permitted maximum capacity and ceased active land filling operations. The solid waste landfill located in the western portion of the site is approximately 28 acres and operated from 1967 until 1982.

On-site groundwater monitoring wells contain several volatile organic compounds (VOCs) including dichloroethane, chloroethane, vinyl chloride, benzene, and xylenes, as well as some heavy metals. Visual observations indicate that Mitchell Brook, an unnamed brook, and the Saugatucket River are impacted by contaminated run-off from the site. Early investigations determined that landfill gases are migrating laterally off-site in the vicinity of some residential properties. Three private wells adjacent to the site are contaminated with low levels of organic compounds, as are on-site soils. The site is not completely fenced, making it possible for people to come into direct contact with the landfill materials on-site. The Saugatucket Pond, located 2,000 feet downstream from the site, is used for fishing and swimming. A freshwater wetland is also located 500 feet downstream of the site and could be subject to contamination. There were several on- and off-site LFG monitoring wells with elevated methane levels. The Rose Hill site included: near-by single family homes, institutional buildings, and a golf course. As a result of this and subsequent investigations, the landfill was placed on the National Priority List (NPL) on October 4, 1989.

This case study documents how the guidance can be used to evaluate landfill gas emissions. It illustrates the usefulness of the information, and procedures presented in the Guidance for Evaluating Landfill Gas Emissions from Closed or Abandoned Facilities (EPA-600/R-05/123). By applying the investigative techniques and recommended practices, the research team was able to:

- 1 Determine where the landfill gases are escaping into the atmosphere,
- 2 Identify the chemicals of potential concern,
- 3 Quantify the speciated LFG emission rates,
- 4 Identify the most likely to be affected at off-site location(s), and
- 5 Characterize ambient air concentrations.

This case study report provided data and information that were used by the remedial project manager to:

- 1 Assess the health risk associated with the emissions from the landfill,
- 2 Determine if additional site investigation effort is needed,
- 3 Evaluate the level of effort associated with the existing LFG monitoring program,
- 4 Determine if the previously proposed remedial design needed to be altered,
- 5 Evaluate the need for institution controls and future land use policy decisions, and

- 6 Decide if the risks and hazards associated with the landfill gas needed to be controlled with LFG control technology.

Specific to the Rose Hill site the following lessons were learned:

- The conventional field screening, discrete sampling using Summa canisters, commercial laboratory analysis using TO15 analytical methods, and emission and dispersion modeling procedures provided the information needed to assess the risks and hazards associated with the LFG emissions. The turn-around time for the commercial laboratory was measured in weeks. The data reduction and modeling efforts require 2–3 man days of effort. Hence, health risks could not be quantified on a real-time basis. Readily available equipment and ordinary environmental technician skills are required to obtain quality results.
- The conventional field screening, discrete sampling using Tedlar bags, onsite mobile laboratory using EPA Method 18 analytical procedures, and emission and dispersion modeling procedures provided the information needed to assess the risks and hazards associated with the LFG emissions. The onsite mobile laboratory was unable to quantify the COPC's concentrations because of detection limit issues.
- Using the research data, the predicted COPC ambient air concentrations are below that which would create an unacceptable risk at the 1×10^{-6} level.

Section 1. Demonstration Objectives

The purpose of the activities described in this document was to provide a demonstration of the procedures described in the Guidance for Evaluating Landfill Gas Emissions from Closed or Abandoned Facilities (Guidance) (EPA-600/R-

05/123). It was also the intent of this demonstration to provide an example case study to be included in the guidance for reference by the practitioner. These efforts were not intended to provide a comprehensive site analysis or complete risk assessment.

Section 2. Site Description

The Rose Hill Regional Landfill (Regional Landfill) is located within the town of South Kingstown, Rhode Island in the village of Peace Dale. The site description contained in this section was derived from historical literature available for the site. This site encompasses approximately 70 acres. The facility is composed of three inactive disposal areas, including the solid waste landfill (28 acres), a bulky waste disposal area (11 acres), and a sewage sludge landfill (unknown). These areas have been covered with soil, graded, and currently support vegetative cover. An active transfer station is located on site where municipal refuse is unloaded from the refuse collection trucks and transferred to trucks that haul the refuse offsite to a separate landfill facility owned and operated by the state of Rhode Island. Figure 1 shows the approximate location and orientation of the solid waste section of the Regional Landfill.

The facility is situated on the east side of Rose Hill Road and is bordered by Rose Hill road to the west, the Saugatucket River to the east, residential property to the north, and a wooded wetland to the south. Mitchell Brook flows southerly through the center of the site and joins the Saugatucket River south of the site. An unnamed brook,

originating on the west side of Rose Hill Road, flows through the wetland and joins the Saugatucket River 500 feet south of Mitchell Brook.

Residential development has occurred along Broad Rock Road, 1200 feet east of the site. There has also been considerable development along Rose Hill Road to the north of the site. A golf course and clubhouse have been constructed on the west side of Rose Hill Road, immediately opposite the facility and to the north of an active sand and gravel operation.

The town of South Kingstown is primarily a residential area with limited industry. The University of Rhode Island (URI), located three miles northwest of the site, houses the largest population center and provides a major portion of South Kingstown's employment and business income.

Water supplies in South Kingstown are a mixture of private wells and district water supply sources. Supply wells for two water supply districts, URI and the Kingstown Fire District, are located within three miles of the facility.



Figure 1. Location and Orientation of the Solid Waste Landfill within the Rose Hill Regional Landfill Site.

Section 3. Site History

The site history contained in this section was derived from historical literature available for the site. The Rose Hill Regional Landfill, which began operation in 1967, is located in an abandoned gravel quarry. The Regional Landfill operated under an annually renewable state permit from the Rhode Island Department of Environmental Management (RIDEM) for approximately 16 years. The Regional Landfill operated as a municipal disposal facility for the towns of South Kingstown and Narragansett. Industrial waste, however, was also accepted at the facility during its years of operation. In October 1983, the Regional Landfill reached its state permitted maximum capacity and ceased active land filling operations.

As previously mentioned, the Regional Landfill is composed of three disposal areas, none of which are currently active. The solid waste landfill, located in the western portion of the site, is approximately 28 acres in area, and it operated from 1967 until 1982. The exact depth of the excavation where the solid waste landfill exists is unknown, but it reportedly extended approximately to bedrock in some places. Refuse was reportedly deposited in areas at, above, and below the water table. The thickness of solid waste deposited throughout the landfill prior to 1977 is unknown. From 1977 to 1982, between 10 and 14 feet of solid waste was deposited. Borings conducted by C.E. Maguire, Inc. in 1977 have confirmed the presence of bedrock within 2.5 feet of ground surface along the eastern portion of the solid waste landfill. Borings have indicated that bedrock was encountered at 31.3 feet on the west side

of the site along Rose Hill Road. From a seismic survey, it appears that the depth to bedrock along the south of the solid waste landfill is between 29 and 32 feet below ground surface. Upon closure, the solid waste landfill was covered with 0.5 to 2 feet of sandy soil and subsoil and seeded.

The sewage sludge disposal area is located in the northeast section of the site between Mitchell Brook and the Saugatucket River. No surveys of the sewage sludge landfill have been conducted to determine its size. This area operated from 1977 to 1983. Sludge was received from the South Kingstown wastewater treatment plant and areas throughout the state of Rhode Island and deposited in trenches. The depth of excavation of the trenches is unknown. Problems with the high moisture content of the sludge persisted throughout the operation of this area and prompted the town of South Kingstown to initiate the hauling of sludge to the Johnston Landfill. Currently, the sewage sludge landfill is covered with soil, graded, and seeded.

The bulky waste disposal area was proposed as an 11-acre area that is located west of the solid waste landfill and southwest of the sewage sludge landfill. This area is approximately 200 feet east of Mitchell Brook and 250 feet west of the Saugatucket River. Disposal of bulky waste began in this area in 1978. Solid waste was also disposed in the interim period between closure of the solid waste area and construction of the transfer station, May 1982 through October 1983. This area was covered, graded, and seeded in the same manner as the solid waste landfill.

Section 4. Field Activities and Data Collection

Field activities were conducted at the Rose Hill Regional Landfill, located in South Kingstown, Rhode Island, from July 22, 2002 through July 25, 2002. Field activities included landfill surface screening analysis, screening data reduction, hot spot and homogeneity determinations, landfill soil gas sampling, passive vent gas sampling, perimeter well gas sampling, and ambient air sampling. Pictures from the site activities can be found in Appendix A.

Prior to arrival at the site, the U.S. Environmental Protection Agency (EPA) Remedial Project Manager (RPM) notified the immediate surrounding residences and businesses that an assessment was to be conducted on and around the landfill area. This was part of a public relations effort to notify the public and address any concerns prior to the activities taking place.

To assist with the field activities, a 30 m by 30 m sampling grid was developed across the extent of the landfill area prior to the field activities. This sampling grid was developed to include the entire extent of the landfill boundary area and extend 30 m beyond that boundary area. This grid was then numbered for each node location, forming a serpentine sampling pathway across the grid. A total of 190 sampling locations comprised the sampling grid layout developed for this site. A reference point was identified using an identifiable landmark on the site to locate the starting point. Figure 2 shows the grid and pathway used for the screening analysis.

4.1 Landfill Surface Screening Analysis

As soon as personnel were on site, the reference point was visually located, and using a handheld global positioning

system (GPS), the starting point (Node No. 1) was located to begin the screening analysis. The screening analysis included measurements for non-methane organic compounds (NMOCs) using a photo ionized detector (PID) and for methane (CH_4) using a flame ionized detector (FID). Both the PID and FID were held no more than one inch above the ground while measurements were being made. It should be noted that the field instrumentation was very sensitive and drifted quite significantly due to slight gusts of wind across the landfill cover. Readings were taken for approximately one minute, and the average value excluding the extreme highs and lows were recorded. While conducting the serpentine walk across the site, an effort was made to identify areas containing cracks and gaps in the landfill cover, and measurements were made at these locations to the extent possible. All predetermined sampling locations were not accessible for a variety of reasons ranging from being located on private property to being inaccessible by the field crew due to extreme overgrowth. An attempt was made to collect a reading at each location, with measurements being collected not greater than 10 m from the predetermined locations. If it was necessary to skip a location due to inaccessibility within the acceptable 10 m range, then replicate readings were collected at the next accessible location. These replicate readings were intended to provide for additional quality assurance and quality control (QA and QC) data and were not intended to back fill missing data for an inaccessible node. Duplicate readings were also taken at predefined locations as part of QA and QC efforts. These predetermined locations were selected based on a random number generator. All screening data were recorded on field log data collection forms along with any field notes relevant to specific locations. There was 89 percent data collection efficiency. Table 1 provides the screening sample results.



Figure 2. Screening Sampling Node Locations.

Table 1. Rose Hill Screening Sample Results.

Grid No.	Sample ID No.	Actual UTM Coordinates		NMOC Conc.	CH ₄ Conc.
		Easting	Northing		
1	LFSG-02-07 22 02 -R 001	291648	4593806	0.20	ND
2	LFSG-02-07 22 02 -R 002	291659	4593806	0.43	ND
3	LFSG-02-07 22 02 -R 003	291686	4593802	0.20	ND
4	LFSG-02-07 22 02 -R 004	291719	4593807	0.20	ND
5	LFSG-02-07 22 02 -R 005	291742	4593813	0.20	ND
6	LFSG-02-07 22 02 -R 006	291773	4591773	ND	ND
7	LFSG-02-07 22 02 -R 007	291744	4593836	0.20	ND
8	LFSG-02-07 22 02 -R 008	291714	4593835	0.20	1.00
9	LFSG-02-07 22 02 -R 009	291683	4593833	1.80	ND
10	LFSG-02-07 22 02 -R 010	291656	4593829	0.40	ND
11	LFSG-02-07 22 02 -R 011	291645	4593834	ND	ND
12	LFSG-02-07 22 02 -D 001	NA	NA	NA	NA
13	LFSG-02-07 22 02 -D 002	NA	NA	NA	NA
14	LFSG-02-07 22 02 -R 012	291634	4593867	ND	ND
15	LFSG-02-07 22 02 -R 013	291657	4593862	0.30	25.00
16	LFSG-02-07 22 02 -R 014	291684	4593866	0.60	ND
17	LFSG-02-07 22 02 -R 015	291712	4593865	ND	ND
18	LFSG-02-07 22 02 -R 016	291745	4593865	ND	300.00
19	LFSG-02-07 22 02 -R 017	291778	4593862	0.26	350.00
20	LFSG-02-07 22 02 -R 018	291803	4593861	ND	ND
21	LFSG-02-07 22 02 -R 019	291808	4593862	ND	ND
22	LFSG-02-07 22 02 -R 020	291782	4593896	ND	ND
23	LFSG-02-07 22 02 -R 021	291742	4593902	ND	ND
24	LFSG-02-07 22 02 -R 022	291710	4593903	ND	ND
25	LFSG-02-07 22 02 -R 023	291681	4593899	0.20	ND
26	LFSG-02-07 22 02 -R 024	291654	4593897	ND	2.10
27	LFSG-02-07 22 02 -R 025	291628	4593896	ND	ND
28	LFSG-02-07 22 02 -D 003	NA	NA	NA	NA
29	LFSG-02-07 22 02 -D 004	NA	NA	NA	NA
30	LFSG-02-07 22 02 -R 026	291619	4593926	ND	ND
31	LFSG-02-07 22 02 -R 027	291654	4593929	ND	3.00
32	LFSG-02-07 22 02 -R 028	291684	4593927	ND	ND
33	LFSG-02-07 22 02 -R 029	291716	4593918	ND	ND
34	LFSG-02-07 22 02 -R 030	291747	4593924	ND	ND
35	LFSG-02-07 22 02 -R 031	291775	4593926	ND	ND
36	LFSG-02-07 22 02 -R 032	291805	4593925	ND	ND
37	LFSG-02-07 22 02 -R 033	291835	4593920	ND	ND
38	LFSG-02-07 22 02 -R 034	291860	4593955	ND	ND
39	LFSG-02-07 22 02 -R 035	291799	4593952	ND	6.00
40	LFSG-02-07 22 02 -R 036	291778	4593961	ND	ND
41	LFSG-02-07 22 02 -R 037	291744	4593958	ND	42.00
42	LFSG-02-07 22 02 -R 038	291714	4593957	ND	2.00
43	LFSG-02-07 22 02 -R 039	291683	4593956	ND	ND
44	LFSG-02-07 22 02 -R 040	291653	4593955	ND	9.00
45	LFSG-02-07 22 02 -R 041	291619	4593954	ND	ND

^a ND = not detected

^b NA = not available

continued

Table 1. Rose Hill Screening Sample Results (continued).

Grid No.	Sample ID No.	Actual UTM Coordinates		NMOC Conc.	CH ₄ Conc.
		Easting	Northing		
46	LFSG-02-07 22 02 -R 042	291592	4593944	ND	ND
47	LFSG-02-07 22 02 -R 043	291595	4593988	ND	ND
48	LFSG-02-07 22 02 -R 045	291624	4593994	ND	8.00
49	LFSG-02-07 22 02 -R 045	291654	4593986	ND	ND
50	LFSG-02-07 22 02 -R 046	291687	4593985	ND	ND
51	LFSG-02-07 22 02 -R 047	291714	4593988	ND	ND
52	LFSG-02-07 22 02 -R 048	291746	4593984	ND	ND
53	LFSG-02-07 22 02 -R 049	291775	4593986	ND	ND
54	LFSG-02-07 22 02 -R 050	291806	4593987	ND	12.00
55	LFSG-02-07 22 02 -R 051	291811	4593988	ND	ND
56	LFSG-02-07 22 02 -R 052	291834	4594017	ND	ND
57	LFSG-02-07 22 02 -R 053	291802	4594019	ND	ND
58	LFSG-02-07 22 02 -R 054	291773	4594016	ND	ND
59	LFSG-02-07 22 02 -R 055	291741	4594017	ND	ND
60	LFSG-02-07 22 02 -R 056	291713	4594015	ND	ND
61	LFSG-02-07 22 02 -R 057	291683	4594016	ND	ND
62	LFSG-02-07 22 02 -R 058	291653	4594016	ND	ND
63	LFSG-02-07 22 02 -R 059	291627	4594015	ND	110.00
64	LFSG-02-07 22 02 -R 060	291590	4594019	ND	ND
65	LFSG-02-07 22 02 -R 061	291563	4594047	ND	ND
66	LFSG-02-07 22 02 -R 062	291597	4594044	ND	ND
67	LFSG-02-07 22 02 -R 063	291626	4594049	ND	6.00
68	LFSG-02-07 22 02 -R 064	291658	4594044	ND	ND
69	LFSG-02-07 22 02 -R 065	291686	4594046	ND	ND
70	LFSG-02-07 22 02 -R 066	291715	4594045	ND	ND
71	LFSG-02-07 22 02 -R 067	291747	4594046	ND	ND
72	LFSG-02-07 22 02 -R 068	291775	4594043	ND	ND
73	LFSG-02-07 22 02 -R 069	291805	4594045	ND	ND
74	LFSG-02-07 22 02 -R 070	291835	4594043	ND	ND
75	LFSG-02-07 22 02 -R 071	291868	4594038	ND	ND
76	LFSG-02-07 22 02 -R 072	291872	4594067	ND	ND
77	LFSG-02-07 22 02 -R 073	291833	4594074	ND	ND
78	LFSG-02-07 22 02 -R 074	291800	4594078	ND	ND
79	LFSG-02-07 22 02 -R 075	291776	4594074	ND	ND
80	LFSG-02-07 22 02 -R 076	291741	4594075	ND	ND
81	LFSG-02-07 22 02 -R 077	291713	4594075	ND	ND
82	LFSG-02-07 22 02 -R 078	291682	4594074	ND	ND
83	LFSG-02-07 22 02 -R 079	291654	4594076	ND	ND
84	LFSG-02-07 22 02 -R 080	291625	4594073	ND	3.00
85	LFSG-02-07 22 02 -R 081	291593	4594076	ND	ND
86	LFSG-02-07 22 02 -D 008	NA	NA	NA	NA
87	LFSG-02-07 22 02 -D 009	NA	NA	NA	NA
88	LFSG-02-07 22 02 -R 082	291577	4594105	ND	ND
89	LFSG-02-07 22 02 -R 083	291597	4594116	ND	ND
90	LFSG-02-07 22 02 -R 084	291614	4594103	ND	1.20

^a ND = not detected

^b NA = not available

continued

Table 1. Rose Hill Screening Sample Results (continued).

Grid No.	Sample ID No.	Actual UTM Coordinates		NMOC Conc.	CH ₄ Conc.
		Easting	Northing		
91	LFSG-02-07 22 02 -R 085	291654	4594108	ND	ND
92	LFSG-02-07 22 02 -R 086	291685	4594105	ND	ND
93	LFSG-02-07 22 02 -R 087	291714	4594106	ND	ND
94	LFSG-02-07 22 02 -R 088	291746	4594107	ND	ND
95	LFSG-02-07 22 02 -R 089	291772	4594105	ND	ND
96	LFSG-02-07 22 02 -R 090	291805	4594107	ND	ND
97	LFSG-02-07 22 02 -R 091	291815	4594105	ND	ND
98	LFSG-02-07 22 02 -D 010	NA	NA	NA	NA
99	LFSG-02-07 22 02 -D 011	NA	NA	NA	NA
100	LFSG-02-07 22 02 -R 092	291825	4594136	ND	ND
101	LFSG-02-07 22 02 -R 093	291789	4594135	ND	ND
102	LFSG-02-07 22 02 -R 094	291770	4594136	ND	ND
103	LFSG-02-07 22 02 -R 095	291744	4594135	ND	ND
104	LFSG-02-07 22 02 -R 096	291713	4594136	ND	ND
105	LFSG-02-07 22 02 -R 097	291683	4594136	ND	ND
106	LFSG-02-07 22 02 -R 098	291652	4594137	ND	ND
107	LFSG-02-07 22 02 -R 099	291624	4594137	ND	ND
108	LFSG-02-07 22 02 -R 100	291594	4594135	ND	ND
109	LFSG-02-07 22 02 -R 101	291583	4594136	ND	ND
110	LFSG-02-07 22 02 -D 012	NA	NA	NA	N
111	LFSG-02-07 22 02 -D 013	NA	NA	NA	NA
112	LFSG-02-07 22 02 -R 102	291571	4594167	ND	ND
113	LFSG-02-07 22 02 -R 103	291605	4594165	ND	20.00
114	LFSG-02-07 22 02 -R 104	291627	4594167	ND	1.00
115	LFSG-02-07 22 02 -R 105	291656	4594166	ND	ND
116	LFSG-02-07 22 02 -R 106	291686	4594167	ND	ND
117	LFSG-02-07 22 02 -R 107	291715	4594167	ND	1.00
118	LFSG-02-07 22 02 -R 108	291737	4594165	ND	ND
119	LFSG-02-07 22 02 -R 109	291768	4594176	ND	2.00
120	LFSG-02-07 22 02 -R 110	291805	4594169	ND	ND
121	LFSG-02-07 22 02 -R 111	291835	4594163	ND	ND
122	LFSG-02-07 22 02 -R 112	291869	4594165	ND	ND
123	LFSG-02-07 22 02 -D 015	NA	NA	NA	NA
124	LFSG-02-07 22 02 -R 113	291821	4594198	ND	ND
125	LFSG-02-07 22 02 -R 114	291802	4594196	ND	ND
126	LFSG-02-07 22 02 -R 115	291770	4594189	ND	11.00
127	LFSG-02-07 22 02 -R 116	291743	4594195	ND	1.00
128	LFSG-02-07 22 02 -R 117	291714	4594197	ND	1.00
129	LFSG-02-07 22 02 -R 118	291683	4594197	0.25	0.03
130	LFSG-02-07 22 02 -R 119	291643	4594197	ND	2.00
131	LFSG-02-07 22 02 -R 120	291623	4594197	ND	7.00
132	LFSG-02-07 22 02 -R 121	291595	4594194	ND	16.00
133	LFSG-02-07 22 02 -R 122	291567	4594194	ND	ND
134	LFSG-02-07 22 02 -R 123	291561	4594190	ND	ND
135	LFSG-02-07 23 02 -R 036	291555	4594324	ND	ND

^a ND = not detected^b NA = not available

continued

Table 1. Rose Hill Screening Sample Results (continued).

Grid No.	Sample ID No.	Actual UTM Coordinates		NMOC Conc.	CH ₄ Conc.
		Easting	Northing		
136	LFSG-02-07 23 02 -R 037	291559	4594324	ND	ND
137	LFSG-02-07 23 02 -R 001	291603	4594217	2.50	160.00
138	LFSG-02-07 23 02 -R 002	291625	4594227	0.50	2.00
139	LFSG-02-07 23 02 -R 003	291655	4594225	5.00	20.00
140	LFSG-02-07 23 02 -R 004	291684	4594226	ND	1.00
141	LFSG-02-07 23 02 -R 005	291715	4594227	ND	ND
142	LFSG-02-07 23 02 -R 006	291746	4594226	ND	ND
143	LFSG-02-07 23 02 -R 007	291775	4594227	2.00	ND
144	LFSG-02-07 23 02 -R 008	291793	4594227	ND	ND
145	LFSG-02-07 23 02 -D 002	NA	NA	NA	NA
146	LFSG-02-07 23 02 -D 003	NA	NA	NA	NA
147	LFSG-02-07 23 02 -R 009	291788	4594261	ND	ND
148	LFSG-02-07 23 02 -R 010	291734	4594262	2.00	ND
149	LFSG-02-07 23 02 -R 011	291712	4594254	ND	ND
150	LFSG-02-07 23 02 -R 012	291692	4594250	ND	ND
151	LFSG-02-07 23 02 -R 013	291668	4594253	ND	11.00
152	LFSG-02-07 23 02 -R 014	291641	4594252	ND	ND
153	LFSG-02-07 23 02 -R 015	291616	4594253	ND	ND
154	LFSG-02-07 23 02 -R 016	291603	4594257	ND	12.00
155	LFSG-02-07 23 02 -R 017	291595	4594254	ND	1.50
156	LFSG-02-07 23 02 -D 004	NA	NA	NA	NA
157	LFSG-02-07 23 02 -R 038	291534	4594356	ND	ND
158	LFSG-02-07 23 02 -R 039	291538	4594357	ND	ND
159	LFSG-02-07 23 02 -D 005	NA	NA	NA	NA
160	LFSG-02-07 23 02 -D 006	NA	NA	NA	NA
161	LFSG-02-07 23 02 -R 018	291573	4594284	ND	25.00
162	LFSG-02-07 23 02 -R 019	291594	4594288	ND	130.00
163	LFSG-02-07 23 02 -R 020	291625	4594286	1.00	ND
164	LFSG-02-07 23 02 -R 021	291656	4594288	ND	ND
165	LFSG-02-07 23 02 -R 022	291676	4594286	ND	ND
166	LFSG-02-07 23 02 -R 023	291694	4594294	ND	ND
167	LFSG-02-07 23 02 -R 024	291745	4594284	ND	ND
168	LFSG-02-07 23 02 -R 025	291751	4594294	ND	ND
169	LFSG-02-07 23 02 -D 007	NA	NA	NA	NA
170	LFSG-02-07 23 02 -D 008	NA	NA	NA	NA
171	LFSG-02-07 23 02 -R 026	291813	4594311	ND	1.00
172	LFSG-02-07 23 02 -R 027	291807	4594311	ND	ND
173	LFSG-02-07 23 02 -R 028	291788	4594308	ND	2.00
174	LFSG-02-07 23 02 -R 029	291746	4594334	ND	8.00
175	LFSG-02-07 23 02 -R 030	291716	4594331	ND	13.00
176	LFSG-02-07 23 02 -R 031	291677	4594321	2.00	2.00
177	LFSG-02-07 23 02 -R 032	291654	4594316	ND	1.50
178	LFSG-02-07 23 02 -R 033	291623	4594316	ND	2.00
179	LFSG-02-07 23 02 -R 034	291594	4594316	1.00	1.00
180	LFSG-02-07 23 02 -R 035	291582	4594317	1.00	7.00

^a ND = not detected^b NA = not available

continued

Table 1. Rose Hill Screening Sample Results (concluded).

Grid No.	Sample ID No.	Actual UTM Coordinates		NMOC Conc.	CH ₄ Conc.
		Easting	Northing		
181	LFSG-02-07 23 02 -D 010	NA	NA	NA	NA
182	LFSG-02-0723 02 -D 011	NA	NA	NA	NA
183	LFSG-02-07 23 02 -D 012	NA	NA	NA	NA
184	LFSG-02-07 23 02 -D 013	NA	NA	NA	NA
185	LFSG-02-07 23 02 -R 040	291563	4594338	ND	ND
186	LFSG-02-07 23 02 -R 041	291595	4594344	ND	1.00
187	LFSG-02-07 23 02 -R 042	291625	4594343	ND	ND
188	LFSG-02-07 23 02 -R 043	291655	4594343	ND	2.00
189	LFSG-02-07 23 02 -R 044	291684	4594344	ND	2.00
190	LFSG-02-07 23 02 -R 045	291715	4594342	ND	1.00

^a ND = not detected

^b NA = not available

4.2 Hot Spot and Homogeneity Determinations

The screening data collected were used for two analyses. The first was for a hot spot analysis. This was accomplished by importing the screening data set into a graphical contouring software package (Surfer) to produce concentration contours that were layered over an aerial photographic image of the site. This method allowed for a visual determination of where the higher concentrations were recorded during the screening analysis. This method also allowed the data set to be divided into two data sets based on the contours derived from these data. This population division was used as part of the homogeneity determinations. Figures 3 and 4 show the concentration contours for NMOCs and methane, respectively.

The second analysis provided a determination of the homogeneity of the site. This was accomplished through statistical means by using the Wilcoxon Rank Sum statistical method, which determines whether two data sets are statistically similar. If the two sets are similar, then the two populations are determined to be one nearly homogeneous area. If the two data sets are determined not to be statistically similar, then the two sets are said to be two non-homogeneous areas. To accomplish this task, the hot spot analysis was used to determine if there appeared to be two distinct population sets. For this site, the Wilcoxon method showed that the site has two nearly homogeneous areas. Appendix B contains the Wilcoxon data analysis. As men-

tioned earlier, for the purposes of this statistical analysis all non-detect, replicate, and duplicate measurements were excluded from this analysis.

4.3 Sampling Activities

Sampling activities encompassed sampling landfill soil gas, passive vent gas, perimeter well gas, and ambient air. Figure 5 shows all sampled locations. Each of these sampling methods will be discussed further in the following sections.

4.3.1 Landfill Soil Gas Sampling

As part of this demonstration, landfill soil gas samples were collected for the chemicals of potential concern (COPCs) by two methods. The first set of samples were collected using Summa canisters, which were sent to an off-site commercial laboratory for analysis. The second set of samples were collected using Tedlar bags and were analyzed at an on-site laboratory provided by EPA's Environmental Response Team Center (ERTC). Field instrumentation was used at each of the designated sampling locations. These instruments were used to measure fixed gases carbon dioxide (CO₂), nitrogen (N₂), and oxygen (O₂), which were used to verify that landfill gas (LFG) was being collected. Sampling was conducted using a slam-bar to drive a sampling hole through the landfill cover, a sampling probe was inserted into the landfill area, and the hole was sealed around the probe to minimize ambient air inleakage.

Based on the data analysis conducted, it was determined that this site consisted of two homogeneous areas. It was determined that, for purposes of this demonstration, six Tedlar bag samples would be collected, three samples in each homogenous area. Samples were collected at grid node locations with the highest NMOC concentrations (2, 9, 16, 137, 139, and 148). Summa canister samples were also collected at each of the six node locations. In conducting the field measurements for fixed gases at node No. 2 it was observed that the O₂ content was greater than 18 percent and the N₂ concentration was greater than 20 percent, indicating the absence of landfill gas in the sample. It was determined that high NMOC reading during screening could have been attributed to vehicle exhaust and not LFG due to the close proximity of a road to this location. It was therefore determined that this sampling location should be abandoned to prevent sampling interference. The sampling location was moved to the next highest screening concentration found at grid No. 15. Laboratory analytical results can be found in Appendix C.

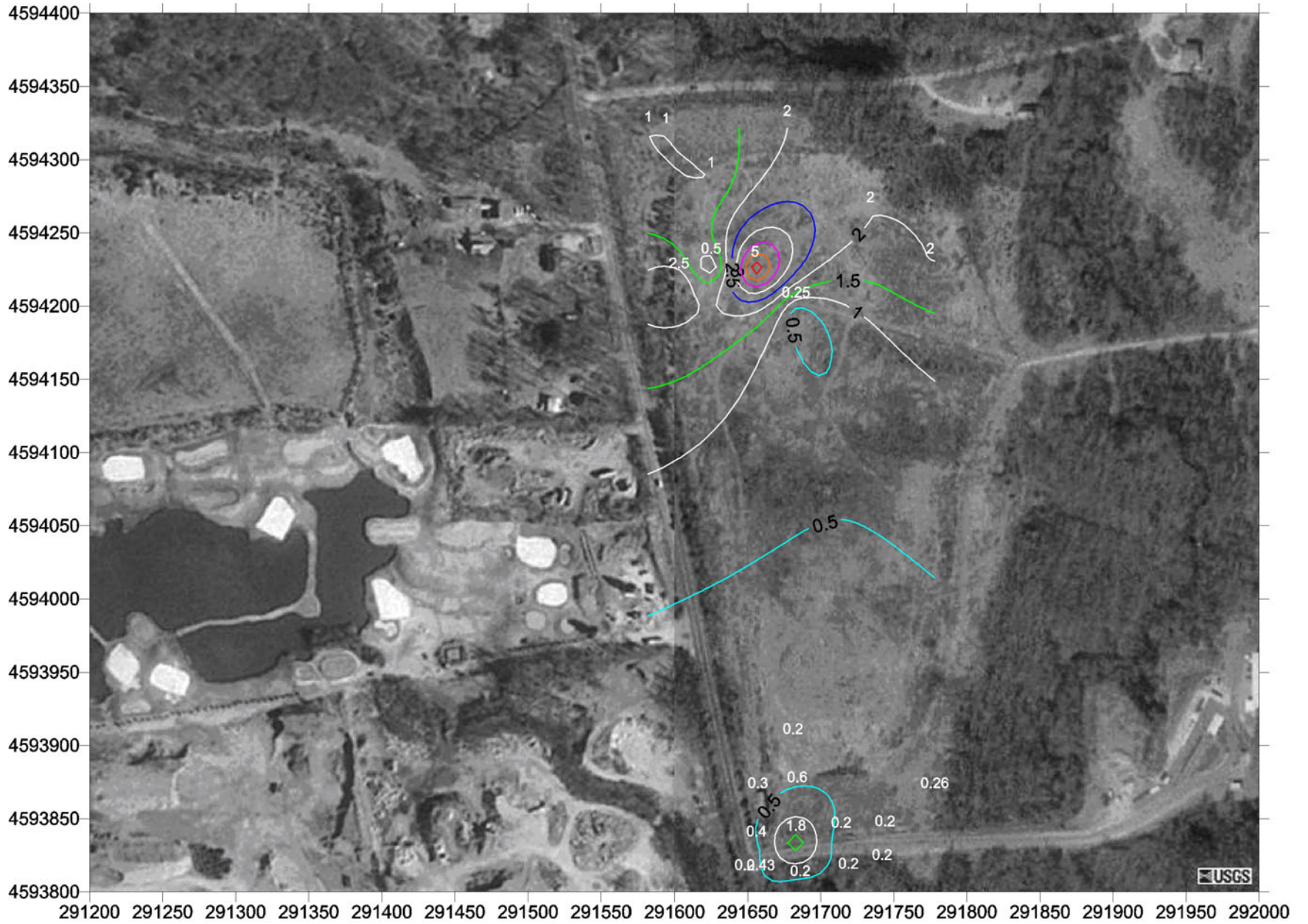


Figure 3. Measured Screening Results (ppm) for NMOCs.

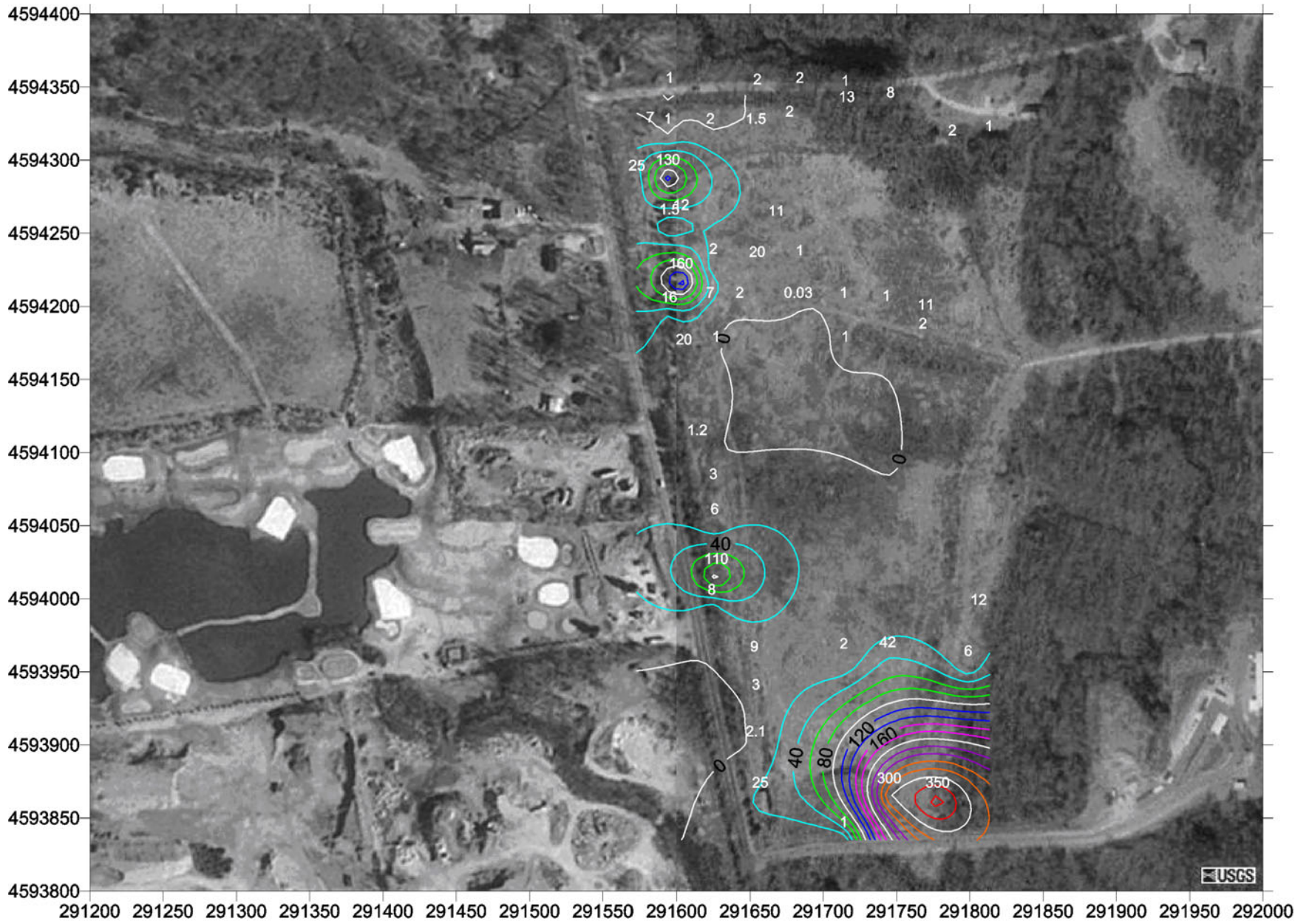


Figure 4. Measured Screening Results (ppm) for Methane.

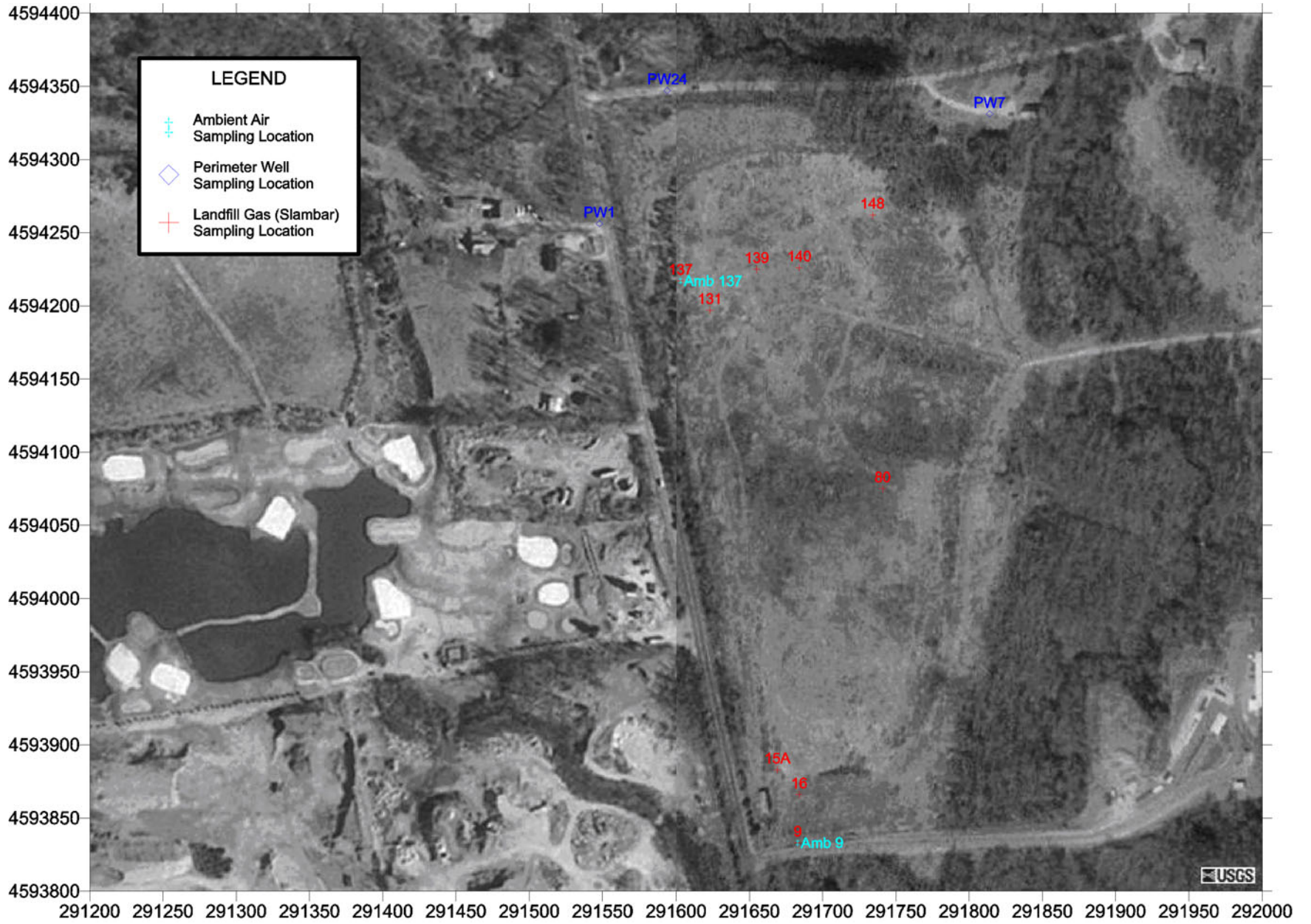


Figure 5. Rose Hill Sampling Locations.

4.3.2 Passive Vent Gas Sampling

During the screening analysis of the site, it was observed that gas monitoring wells were installed within the interior of the landfill boundary area at grid Nos. 80, 131, and 140. Because these wells were not properly capped or sealed, they were assumed to be acting as passive vents through the landfill cover, and it was decided that these passive vent areas should also be sampled for further demonstration purposes. Sampling was conducted using a slam-bar to drive a sampling hole near the passive vents and through the landfill cover. A sampling probe was then inserted into the landfill, and the hole was sealed around the probe to minimize ambient air in-leakage. Summa canister samples were collected for COPCs and fixed gases, and Tedlar bag samples were collected for COPCs. Fixed Gases were also analyzed at these locations using field instrumentation. Laboratory analytical results can be found in Appendix C.

4.3.3 Perimeter Well Gas Sampling

The guidance recommends that sampling be conducted at perimeter wells located nearest to the hot spots and the closest off-site receptor. For this site demonstration, sampling was conducted at three perimeter wells that were located in close proximity to off-site residential houses. At each of these locations, Summa canisters and Tedlar bags were used to collect the samples for COPCs and fixed gases analyses. The Summa canister sampling rate was set to approximately 0.1 L/min in order to minimize the potential for ambient air leakage. The Tedlar bag samples were collected at approximately 1.0 L/min. Laboratory analytical results can be found in Appendix C.

4.3.4 Ambient Air Sampling

As recommended by the guidance, sampling of ambient air should be conducted at the location where the highest NMOC concentrations were measured. For the purpose of this demonstration, samples were collected at grid nodes 9 and 137 using a Summa canister. It should be noted that the sample taken at node 9 was located directly next to a storm drain that appeared to be acting as a passive vent from field observations. An ambient air sample was also collected at one perimeter well (node 137) that was determined to be closest to the nearest occupied structure and had the highest NMOC concentration observed on-site during the screening analysis. Laboratory analytical results can be found in Appendix C.

4.4 Quality Assurance and Data Evaluation

The primary purpose of this project is to establish the usefulness of the guidance document and identify areas that

need to be clarified or expanded. The field efforts are a means to collect the information needed to implement the procedures included in the guidance. A secondary purpose of the project is to provide the RPMs with information that will allow them to determine if LFG controls are needed and if compliance with applicable relevant and appropriate requirements (ARARs) has been achieved. Data quality objectives are a starting point of an interactive process, and they do not necessarily constitute definitive rules for accepting or rejecting results. The measurement quality objectives have been defined in terms of standard methods with accuracy, precision, and completeness goals.

Uncertainty associated with the measurement data is expressed in terms of accuracy and precision. The accuracy of a single value contains both the measurement's random error component and the systematic error, or bias. Accuracy thus reflects the total error for a given measurement. Precision values represent a measure of only the random variability for replicate measurements. In general, the purpose of calibration is to eliminate bias, although inefficient analyte recovery or matrix interferences can contribute to sample bias, which is typically assessed by analyzing matrix spike samples. At very low levels, blank effects (contamination or other artifacts) can also contribute to low-level bias. The potential for bias is evaluated by method blanks. Instrument bias is evaluated by using control samples.

4.4.1 Accuracy

Accuracy of laboratory results has been assessed for compliance with the established QC criteria using the analytical results of method blanks, reagent or preparation blank, matrix spike and matrix spike duplicate samples, and field blanks. The percent recovery (%*R*) of matrix spike samples is calculated using

$$\% R = \frac{A - B}{C} \times 100$$

Where *A* = the analyte concentration determined experimentally from the spiked sample,
B = the background level determined by a separate analysis of the unspiked sample, and
C = the amount of the spike added.

The laboratory did not detect any of the analytes in any sample blanks. The minimum and maximum recovery for the entire set of laboratory control samples (LCS) was greater than 70 percent and less than 122 percent. The 4-bromofluorobenzene surrogate spike recovery was outside

of the upper range for 10 out of 20 field samples. The maximum 4-bromofluorobenzene surrogate spike recovery was 363 percent. The high 4-bromofluorobenzene surrogate recovery is indicative of matrix interference, and the results may be biased on the high side. All other spike surrogate recovery values were within the target range of 70 to 130 percent.

4.4.2 Precision

The analytical results between matrix spike and matrix spike duplicate (MS and MSD) analyses for each COPC have been assessed. The relative percent difference (RPD) was calculated for each pair of duplicate analysis using

$$RPD = \frac{S - D}{(S + D)/2} \times 100$$

Where S = first sample value (original or MS value) and D = second sample value (duplicate or MSD value).

Except for methylene chloride and acetone in the duplicate ambient air samples, the RPD for each of the matched sample pairs ranged from 2.15 to -13.33 percent. The laboratory reported concentrations of methylene chloride and acetone in one of the duplicate ambient air samples but not in the other. The calculated RPD for methylene chloride and acetone in the ambient air samples was 40 and -129.67 percent, respectively. The RPD for the blind reference standard ranged from 0 to 148 percent. The laboratory reported concentrations for methylene chloride, acetone, and toluene in the blind reference standard. The reported values

for the blind reference standard are less than five times the method detection limit (MDL) for each of the contaminants. These three contaminants were not expected to be in the blind reference standard. The RPD for the laboratory control samples (LCS) ranged from 0 to 18 percent. The calculated RPD for each LCS analyte was less than 5 percent except for 1,2,4-trichlorobenzene and hexachlorobutadiene.

This narrow range indicates that the laboratory was capable of reproducing the analytical results. Although, neither methylene chloride, hexane, nor acetone was found in the associated laboratory blanks, they are common laboratory contaminants.

4.4.3 Completeness

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount that was expected under normal conditions. The sampling and analytical goal for completeness is 80 percent or more for all samples tested. The percent completeness was calculated by using

$$Completeness(\%) = \frac{\left(\begin{array}{l} \text{number of valid data} \\ \text{number of samples collected} \\ \text{for each parameter analyzed} \end{array} \right)}{\left(\begin{array}{l} \text{number of samples collected} \\ \text{for each parameter analyzed} \end{array} \right)} \times 100$$

Ninety three percent of the targeted data was collected and validated.

Section 5. Estimation of Landfill Gas Emissions

After all samples were collected, it was possible to estimate the air impact of this site through the methods described in the guidance. For the purpose of this demonstration, it was determined that only select COPCs commonly found in LFG would be fully characterized. Table 2 provides a list of those COPCs commonly found in LFG and considered in this demonstration. From previous site activities and visual inspection of concentration isopleths generated from the laboratory results, the data were divided into groups according to the associated homogenous areas (parcels) for analysis. Those COPCs that contained nondetect data were eliminated from further investigation. Figures 6 through 16 show the soil gas concentration isopleths of all COPCs with detected concentrations. These figures provided a visual presentation of the laboratory results that were used to further understand the dynamics of this landfill and to quantify the division of the landfill into two homogenous parcels, which are shown in Figure 17. Table 3 provides the analytical results for the northern and southern parcels of the landfill. The data for each parcel were analyzed, and the 90th percentile concentrations were determined using the percentile function of Microsoft Excel. A percentile is a value on a scale of 0 to 100 that indicates the percent of a distribution that is equal to or less than the value. Table 4 provides the 90th percentile values of the COPCs for both of the landfill's parcels.

Table 2. COPCs Commonly Found in LFG^{a,b}

1,1,1-Trichloroethane (methyl chloroform)
1,1-Dichloroethene (vinylidene chloride)
1,2-Dichloroethane (ethylene dichloride)
Acrylonitrile
Benzene
Carbon Tetrachloride
Chlorobenzene
Chloroethane (ethyl chloride)
Chlorofluorocarbons
Chloroform
Dichlorobenzene
Ethylene Dibromide
Hydrogen Sulfide
Mercury
Methylene Chloride
Perchloroethylene (tetrachloroethylene)
Toluene
Trichloroethylene (trichloroethene)
Vinyl Chloride
Xylenes

^a Constituents associated with carcinogenic and chronic noncarcinogenic health effects that are routinely measured

^b Source: EPA, 1997

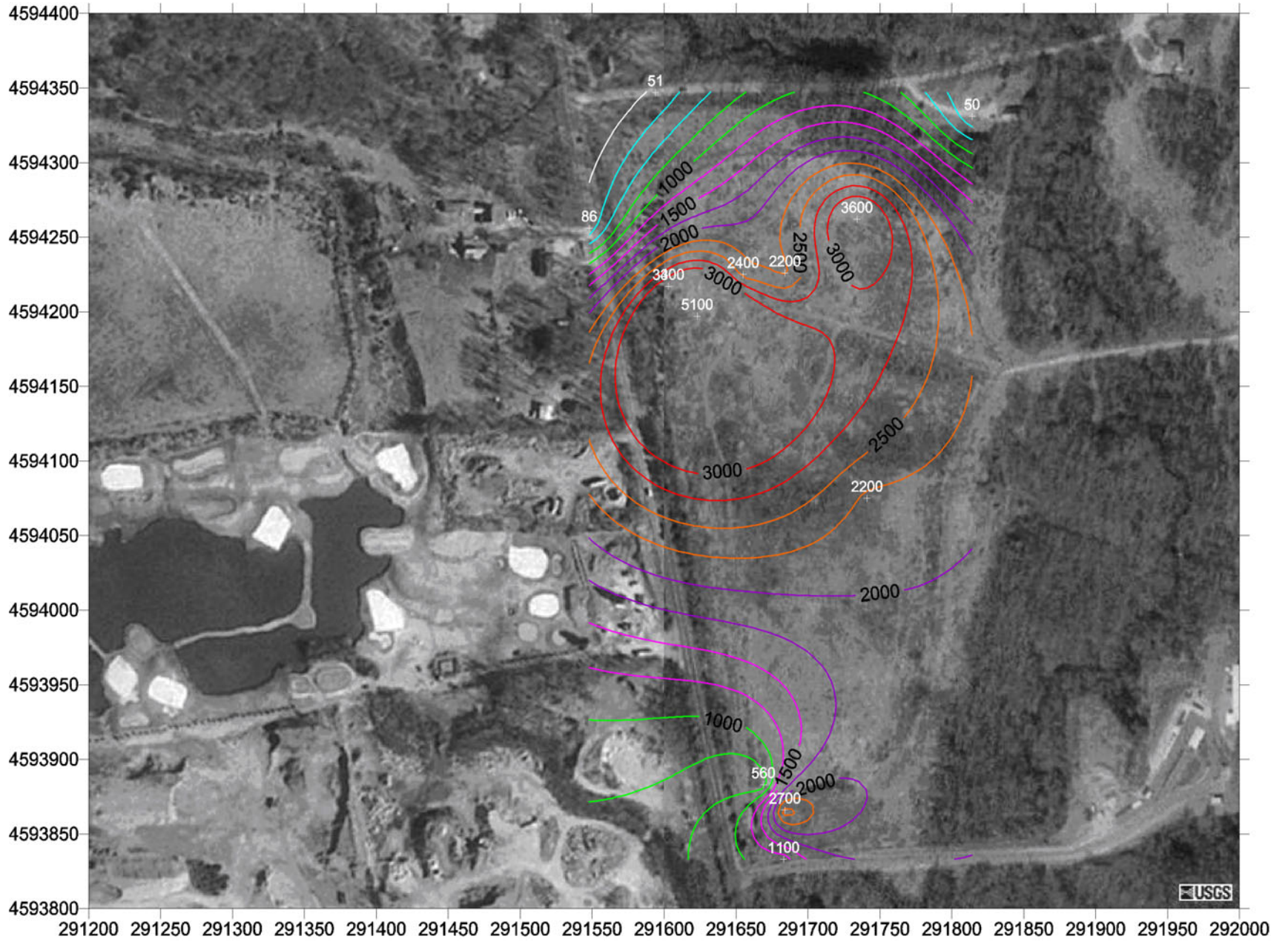


Figure 6. NMOC Concentration Isopleths (ppmvC) from Summa Sampling.



Figure 7. 1,1,1-Trichloroethane Concentration Isopleths (ppbv) from Summa Sampling.

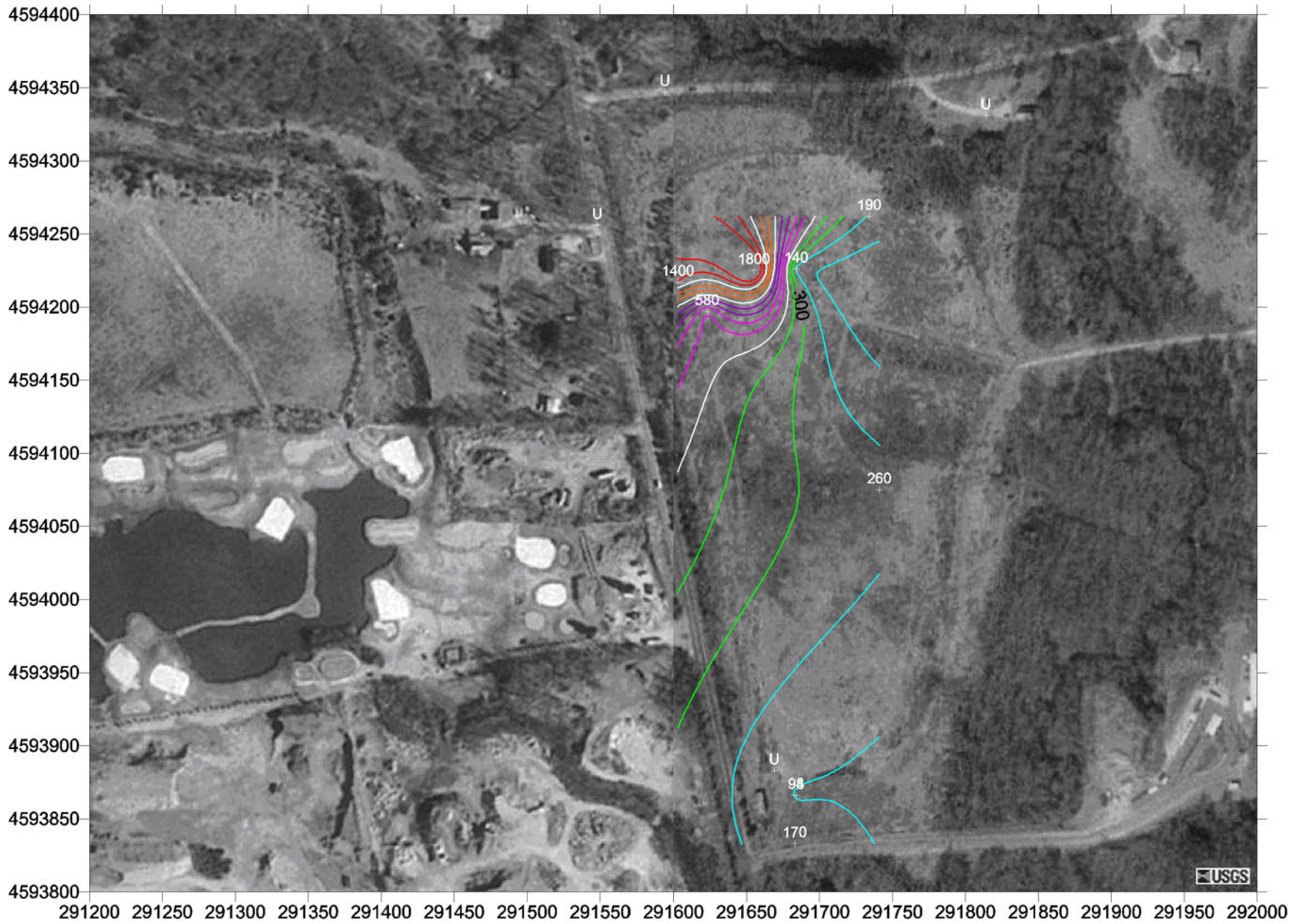


Figure 8. Benzene Concentration Isopleths (ppbv) from Summa Sampling.

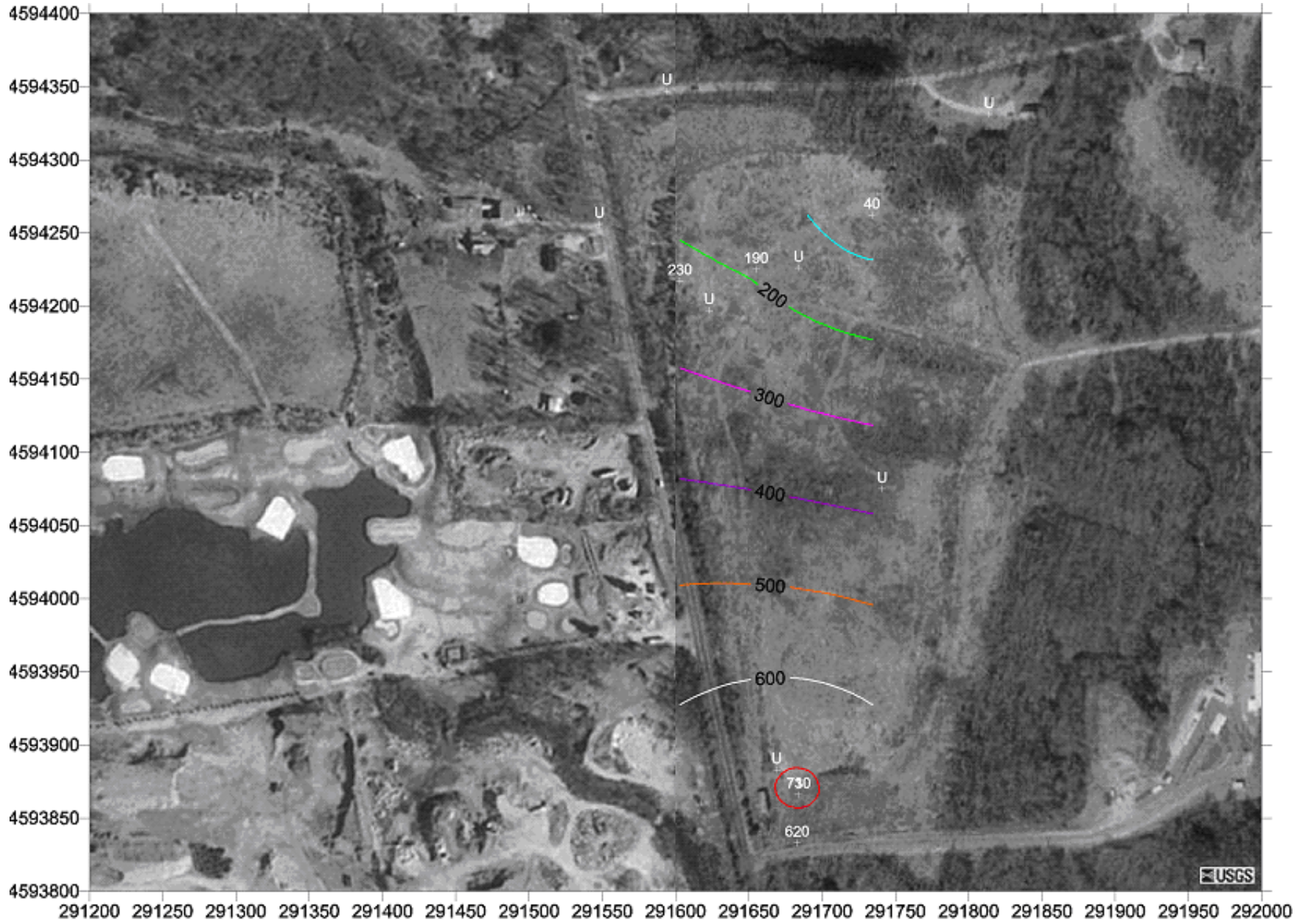


Figure 9. Chlorobenzene Concentration Isopleths (ppbv) from Summa Sampling.

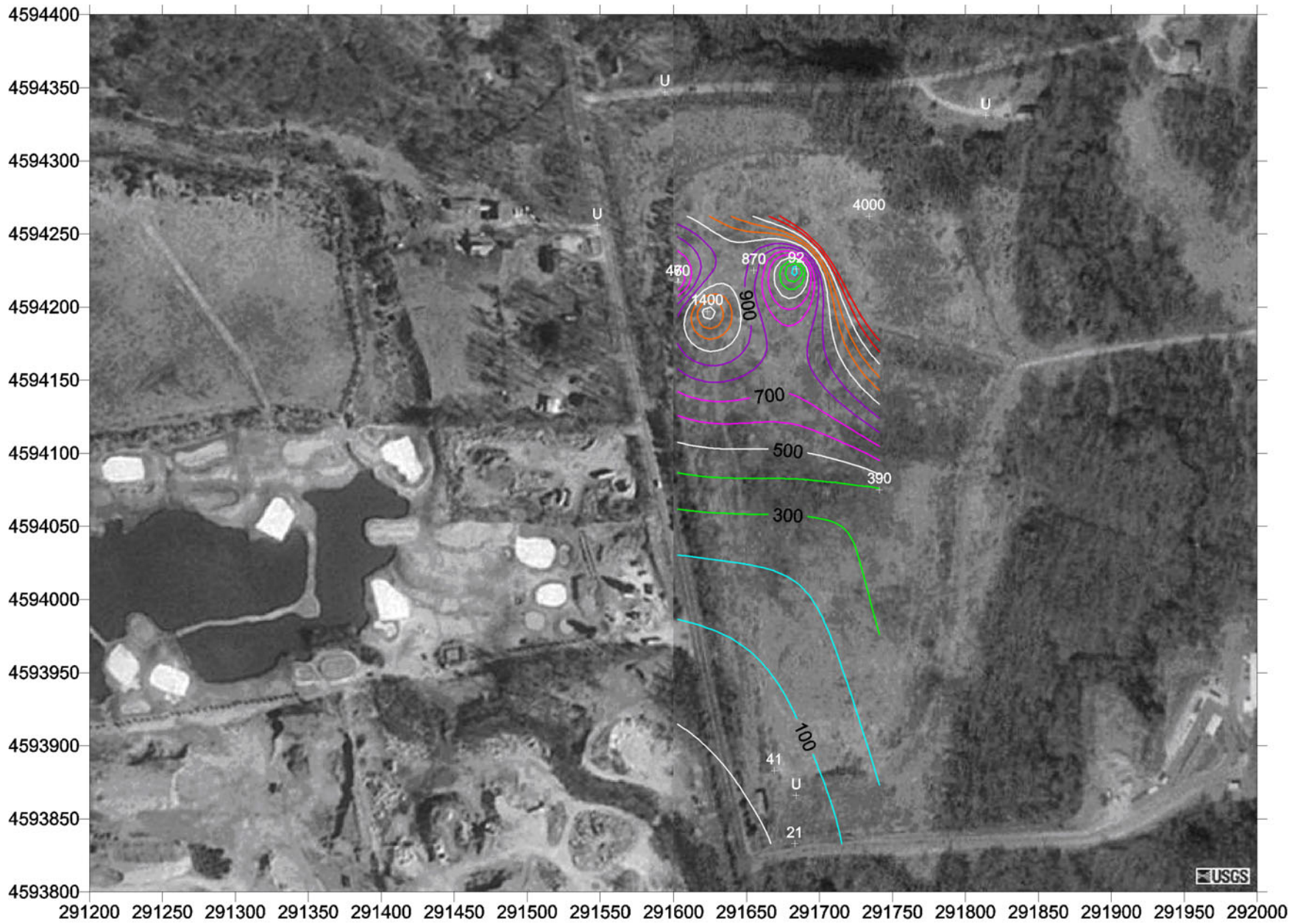


Figure 10. Chloroethane Concentration Isopleths (ppbv) from Summa Sampling.

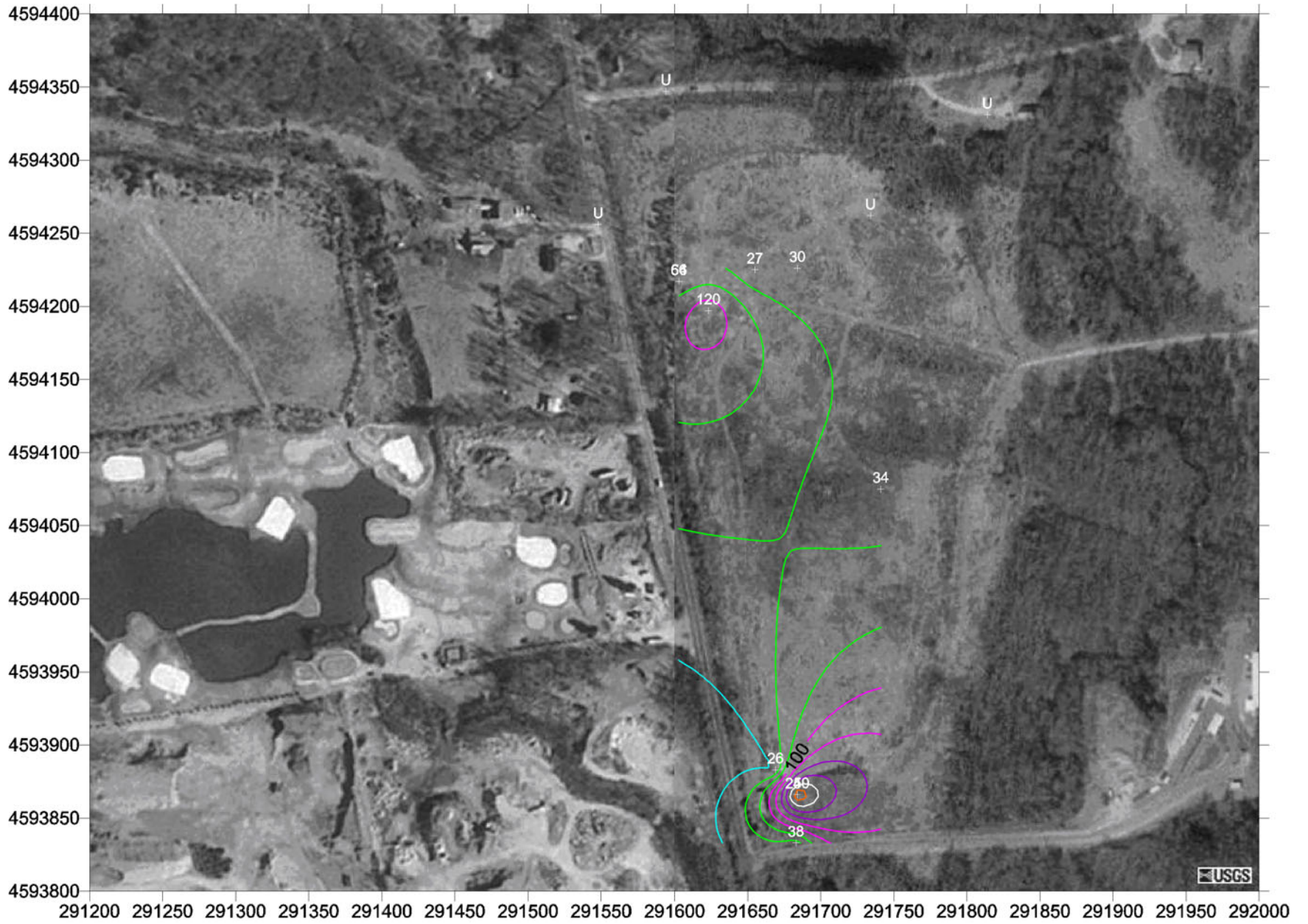


Figure 11. 1,4-Dichlorobenzene Concentration Isopleths (ppbv) from Summa Sampling.

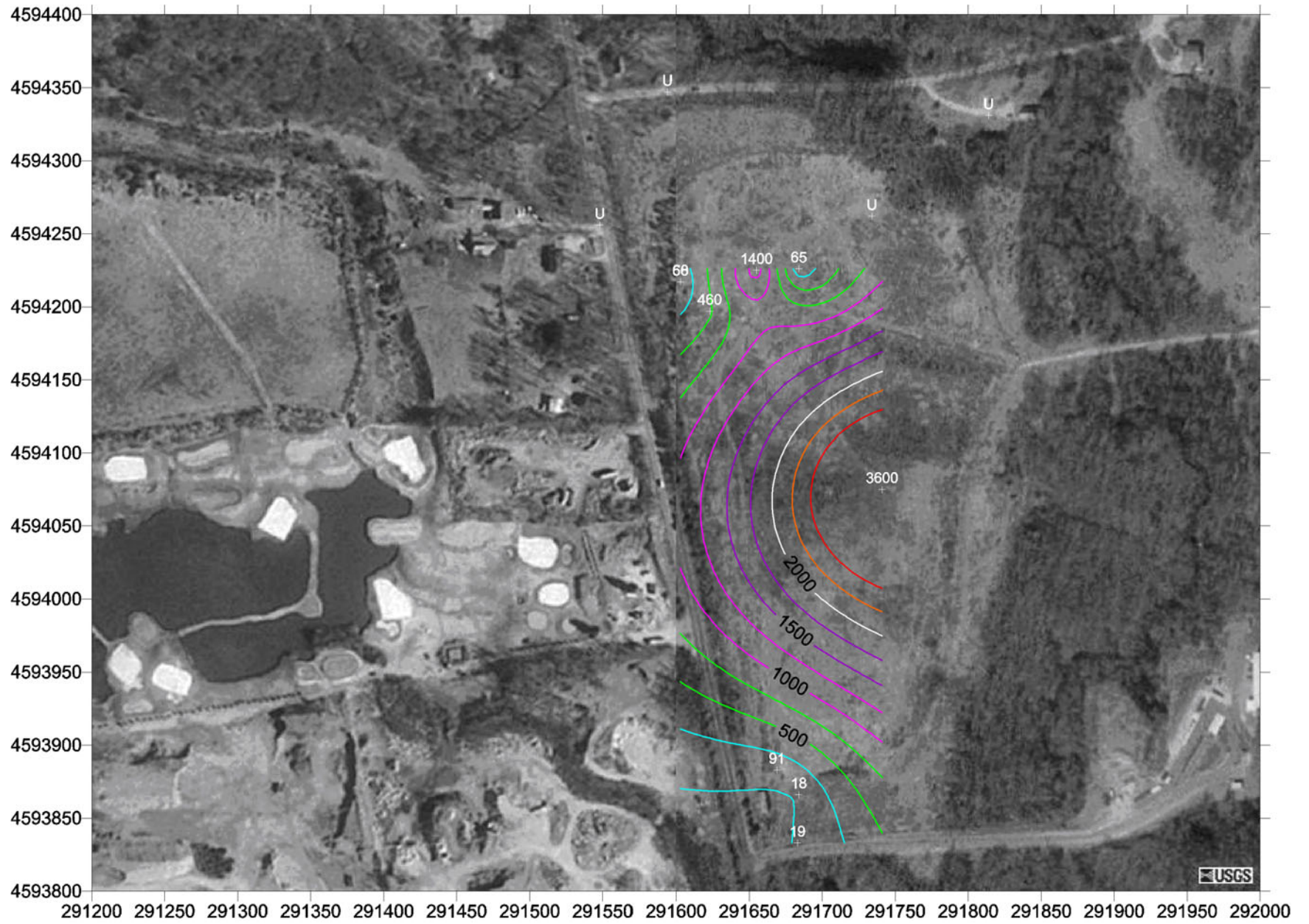


Figure 12. Toluene Concentration Isopleths (ppbv) from Summa Sampling.

25



Figure 13. Trichloroethene Concentration Isopleths (ppbv) from Summa Sampling.



Figure 14. Vinyl Chloride Concentration Isopleths (ppbv) from Summa Sampling.

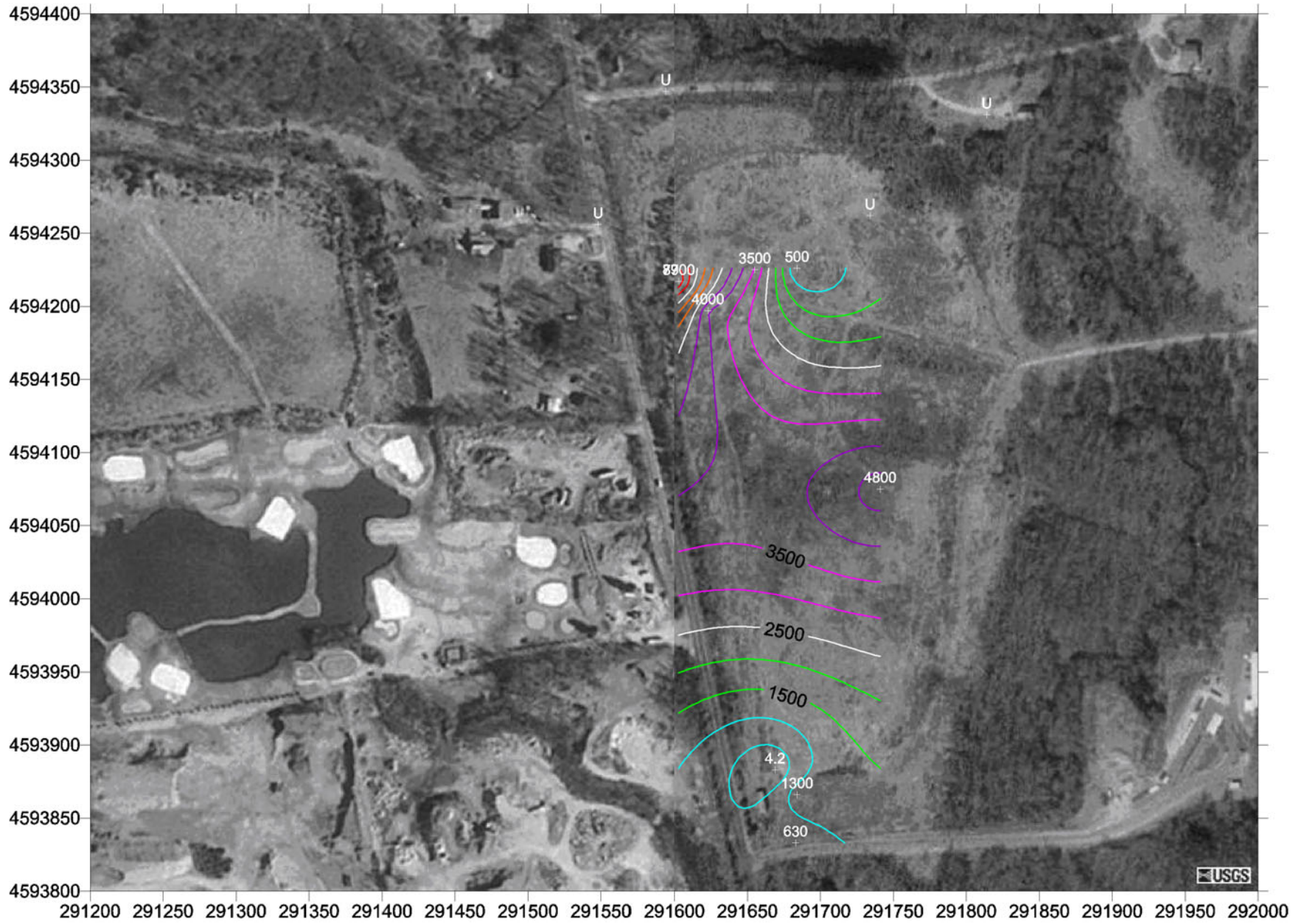


Figure 15. m,p-Xylene Concentration Isopleths (ppbv) from Summa Sampling.

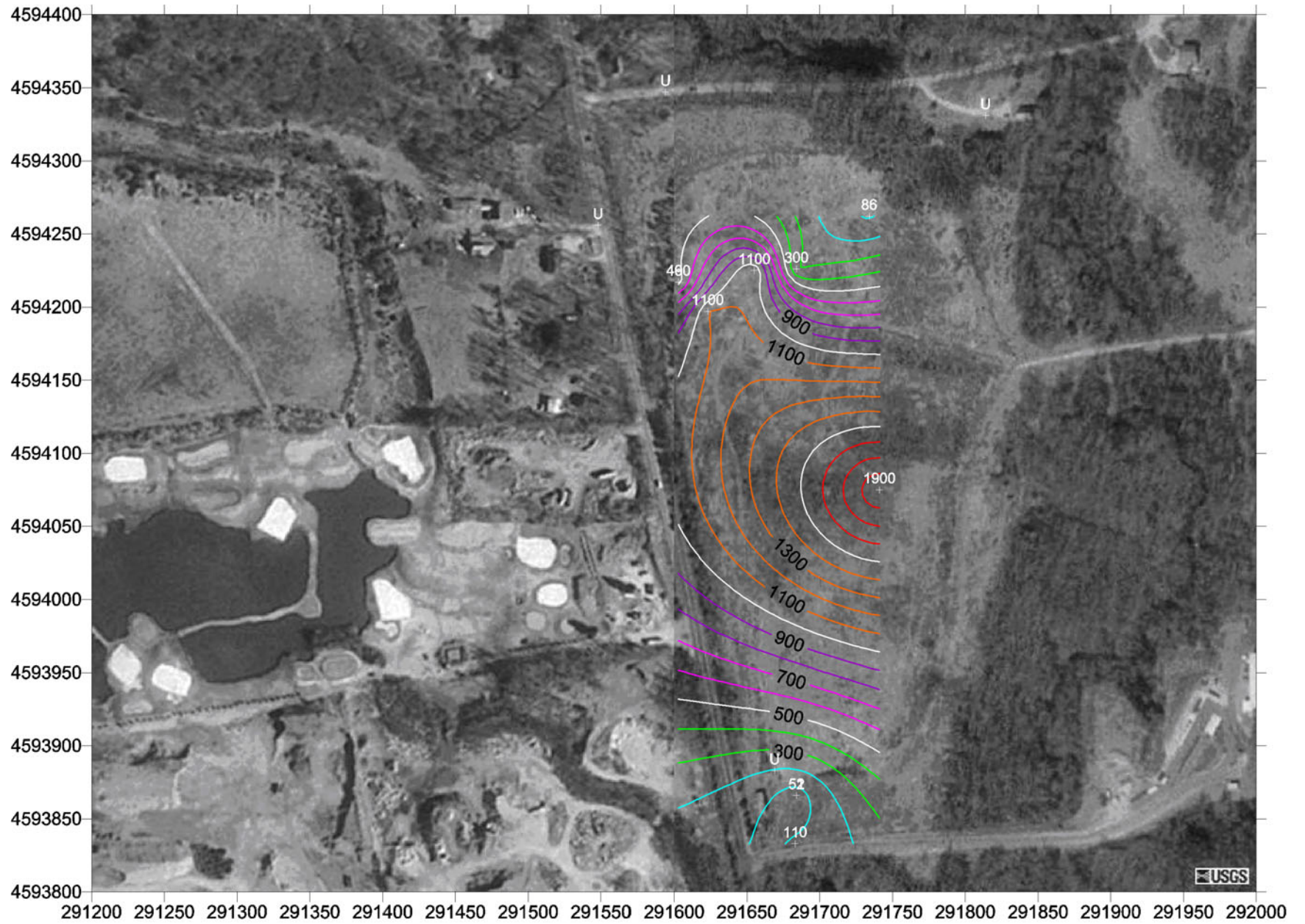


Figure 16. o-Xylene Concentration Isopleths (ppbv) from Summa Sampling.

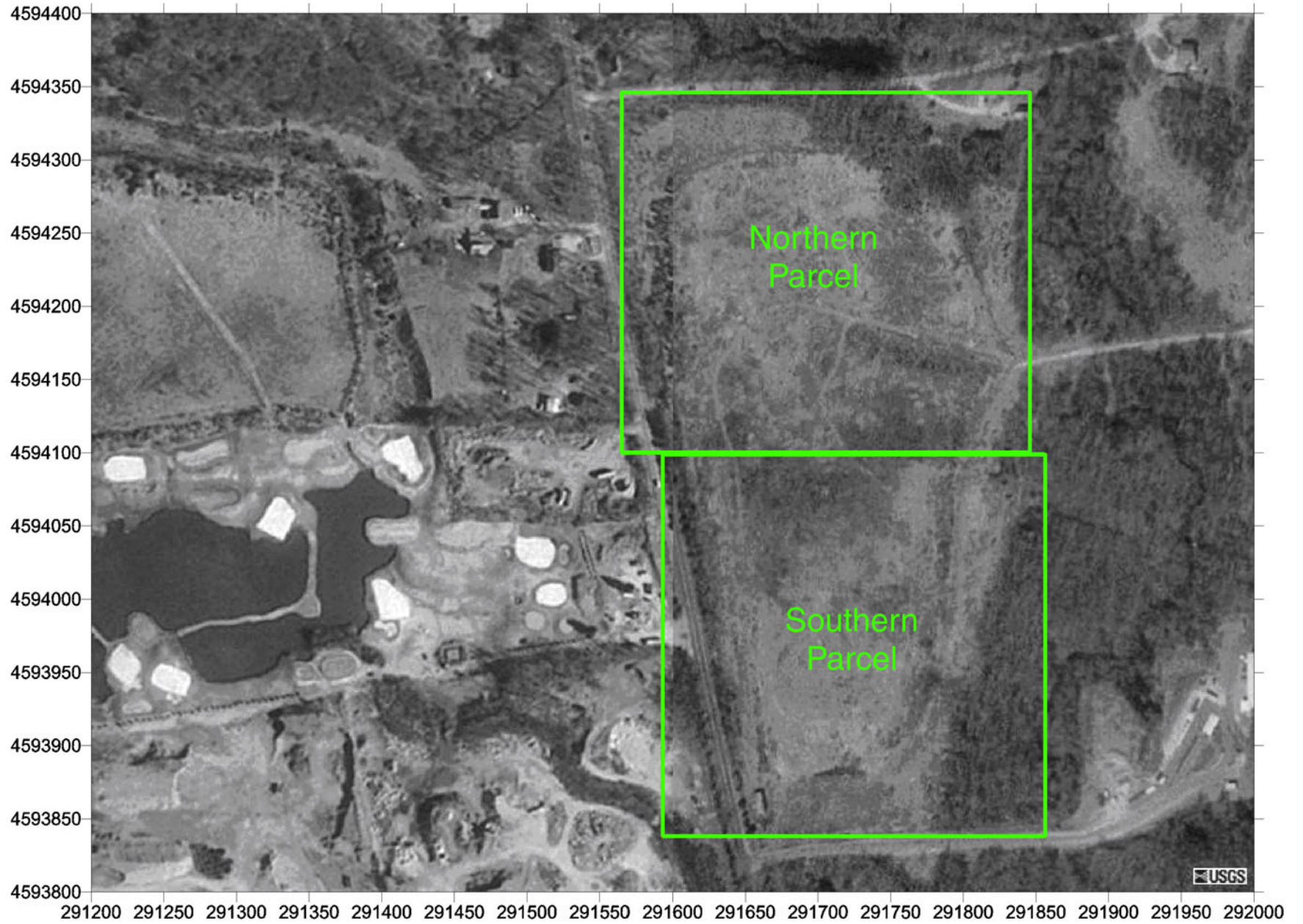


Figure 17. Rose Hill's Two Homogenous Parcels

Table 3. Analytical Results for COPCs.

Parcel	Grid ID No.	O ₂ (%)	N ₂ (%)	CH ₄ (%)	CO ₂ (%)	NMOC (ppmvC)	1,1,1-Trichloroethane (ppmv)	Benzene (ppmv)	Chlorobenzene (ppmv)	Chloroethane (ppmv)	1,4-Dichlorobenzene (ppmv)	Toluene (ppmv)	Trichloroethene (ppmv)	Vinyl Chloride (ppmv)	m,p-Xylene (ppmv)	o-Xylene (ppmv)
Northern	137	0.19	1.2	56	42	3300	ND ^a	1.40	0.23	0.47	0.06	0.06	ND	ND	7.90	0.46
	148	4.1	67	7.8	21	3600	ND	0.19	0.04	4.00	ND	ND	ND	0.80	ND	0.09
	139	ND	0.31	56	43	2400	ND	1.80	0.19	0.87	0.03	1.40	0.07	0.12	3.50	1.10
	140	1.8	44	23	31	2200	ND	0.14	ND	0.09	0.03	0.07	ND	0.20	0.50	0.30
	131	ND	5.2	53	43	5100	0.58	0.58	ND	1.40	0.12	0.46	0.02	0.17	4.00	1.10
Southern	15A	1.6	79	ND	21	560	ND	ND	ND	0.041	0.026	0.091	0.0041	ND	0.0042	ND
	9	0.97	66	11	24	1100	ND	0.17	0.62	0.021	0.038	0.019	ND	0.022	0.63	0.11
	16	ND	1.4	63	38	2700	ND	0.094	0.73	ND	0.25	0.018	ND	ND	1.3	0.051
	80	0.38	19	43	38	2200	ND	0.26	ND	0.39	0.034	3.6	0.03	0.33	4.8	1.9

a ND = not detected

Table 4. COPCs 90th Percentile Concentrations for Northern and Southern Parcels.

COPC	90th Percentile Concentration (ppmv)	
	Northern Parcel	Southern Parcel
NMOC	4500	2550
1,1,1-Trichloroethane	0.58	
1,4-Dichlorobenzene	0.1008	0.1864
Benzene	1.64	0.242
Chlorobenzene	0.222	0.719
Chloroethane	2.96	0.3202
Toluene	1.118	2.5473
Trichloroethene	0.0625	0.02741
Vinyl Chloride	0.62	0.2992
m,p-Xylene	6.73	3.75
o-Xylene	1.1	1.542

5.1 LandGEM Modeling of LFG

With the 90th percentile values derived from the data set, these data were then used as input values for the LandGEM model to estimate the LFG emission rates for each of the COPCs. Because there are two distinct parcels, it was necessary to break this site into two areas and model each individually for NMOC emissions. To model this site the following parameters were used:

- 1 Methane generation rate (k): 0.05/yr [AP-42 default]
- 2 Methane generation potential (Lo): 170 m³/Mg [AP-42 default]

3 Year Opened: 1967

4 Current Year: 2003

5 Landfill Type: Co-disposal

6 Landfill Capacity: 197,692 Mg

This value was derived using the refuse estimator within LandGEM. In order to derive this value, the size of both parcels was estimated to be approximately half of the total acreage of the solid waste landfill. Therefore, each parcel was estimated to be 14 acres. In addition, it was determined from a literature review of the site that each parcel was approximately 18 feet deep. With this information, LandGEM calculated the appropriate landfill capacity.

7 Acceptance rate (1967–1981): 13,179.48 Mg/yr

This value was calculated using the Autocalc function within LandGEM. This was performed due to a lack of historical acceptance rate data available for this site. To perform this calculation the landfill capacity value just calculated was entered as the refuse in place for the year 1982, as historical data indicated this was the year the site was closed and maximum capacity was achieved. Once the refuse in place was entered for the year 1982, all years in which the landfill was active were selected, including closure year (1967–1982). With these years selected, the Autocalc function was initiated, and the acceptance rate was derived for each of the active years as an average value for all years selected.

8 Methane percentage: 56% (Northern), 59% (Southern)
This was based on the 90th percentile of the field sample data results.

- 9 NMOC Concentration: 4500 ppmv (Northern), 2550 ppmv (Southern)
This was based on the 90th percentile of the field sample data results.
- 10 Air Pollutants (COPCs)
Modified per 90th percentile values as shown in Table 4.

With all values input for each parcel, LFG emission rates for each COPC were estimated using the LandGEM model. Table 5 provides the emission rates estimated for each COPC within each landfill parcel, and Appendix D contains all the LandGEM model runs for both parcels. Figure 18 shows the emission rate data for NMOCs over a 236 year time span, and Figure 19 shows an example output file for NMOC emissions from the LandGEM model.

5.2 SCREEN3 Modeling of LFG

The next step in characterizing the emissions of LFG is to evaluate the ambient impact of each of the COPCs. For this, it is necessary to use an atmospheric dispersion model. For demonstration purposes, SCREEN3 was used to provide a screening level assessment, and each parcel was evaluated separately in order to properly screen the landfill. The landfill was broken into two rectangular parcels as shown in Figure 17, and each parcel was treated as an area source within the model. Each parcel was modeled at a unity emission rate of 1 g/s to provide maximum 1-h concentration for each parcel. Because each area was modeled on a unity basis, the emission rates generated from

the LandGEM model could, in turn, be multiplied by this unity-derived concentration to determine the 1-hour maximum concentrations for each COPC. To convert these concentrations to a representative annual concentration, all derived 1-h concentrations were multiplied by the appropriate multiplying factor of 0.08 as identified in the guidance report (EPA-600/R-05/123a). If an alternative averaging time span is to be evaluated, the reader is referred to section 2.2.1.4 – Dispersion Modeling and Table 2-3 of the guidance report. Table 6 provides the maximum annual concentrations for each COPC, and Appendix E contains the SCREEN3 model runs for both parcels.

Table 5. Emission Rates of COPCs by Parcel.

COPC	2002 Emission Rate (Mg/yr)	
	Northern Parcel	Southern Parcel
NMOC	12.84	6.907
1,1,1-Trichloroethane	2.562×10^{-3}	
1,4-Dichlorobenzene	4.868×10^{-4}	8.779×10^{-4}
Benzene	4.243×10^{-3}	5.893×10^{-4}
Chlorobenzene	8.200×10^{-4}	2.547×10^{-3}
Chloroethane	6.324×10^{-3}	6.489×10^{-4}
Toluene	3.417×10^{-3}	7.385×10^{-3}
Trichloroethene	2.610×10^{-4}	1.239×10^{-4}
Vinyl Chloride	1.283×10^{-3}	5.893×10^{-4}
m,p-Xylene	2.366×10^{-2}	1.251×10^{-2}
o-Xylene	3.867×10^{-3}	5.139×10^{-3}

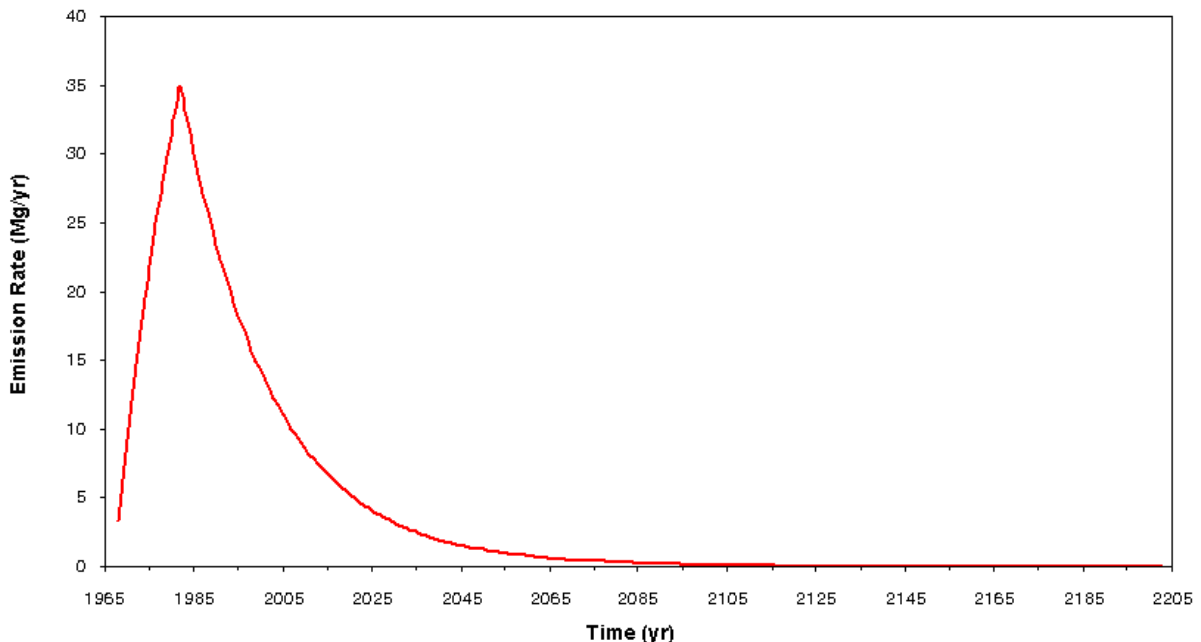


Figure 18. NMOC Emission Rates: 1967-2203

Model Parameters			
Lo : 170.00 m ³ / Mg ***** User Mode Selection *****			
k : 0.0500 1/yr ***** User Mode Selection *****			
NMOC : 4500.00 ppmv ***** User Mode Selection *****			
Methane : 56.0000 % volume			
Carbon Dioxide : 44.0000 % volume			
Landfill Parameters			
Landfill type : Co-Disposal			
Year Opened : 1967 Current Year : 2003 Closure Year: 1982			
Capacity : 197692 Mg			
Average Acceptance Rate Required from			
Current Year to Closure Year : 13179.47 Mg/year			
Model Results			
Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1968	1.318E+04	3.227E+00	9.002E+02
1969	2.636E+04	6.296E+00	1.757E+03
1970	3.954E+04	9.216E+00	2.571E+03
1971	5.272E+04	1.199E+01	3.346E+03
1972	6.590E+04	1.463E+01	4.083E+03
1973	7.908E+04	1.715E+01	4.784E+03
1974	9.226E+04	1.954E+01	5.451E+03
1975	1.054E+05	2.181E+01	6.085E+03
1976	1.186E+05	2.398E+01	6.689E+03
1977	1.318E+05	2.603E+01	7.263E+03
1978	1.450E+05	2.799E+01	7.809E+03
1979	1.582E+05	2.985E+01	8.328E+03
1980	1.713E+05	3.162E+01	8.822E+03
1981	1.845E+05	3.331E+01	9.292E+03
1982	1.977E+05	3.491E+01	9.739E+03
1983	1.977E+05	3.321E+01	9.264E+03
.	.	.	.
2001	1.977E+05	1.350E+01	3.766E+03
2002	1.977E+05	1.284E+01	3.583E+03
2003	1.977E+05	1.222E+01	3.408E+03
.	.	.	.
2201	1.977E+05	6.129E-04	1.710E-01
2202	1.977E+05	5.830E-04	1.627E-01
2203	1.977E+05	5.546E-04	1.547E-01

Table 6. Modeled Maximum Annual Concentrations.

COPC	Maximum Annual Concentrations ($\mu\text{g}/\text{m}^3$)		
	Northern	Southern	Total
NMOC	80.88	38.4	119.3
1,1,1-Trichloroethane	1.614×10^{-2}	0.00	1.614×10^{-2}
1,4-Dichlorobenzene	3.066×10^{-3}	4.88×10^{-3}	7.946×10^{-3}
Benzene	2.673×10^{-2}	3.28×10^{-3}	3.000×10^{-2}
Chlorobenzene	5.165×10^{-3}	1.42×10^{-2}	1.932×10^{-2}
Chloroethane	3.983×10^{-2}	3.61×10^{-3}	4.344×10^{-2}
Toluene	2.152×10^{-2}	4.10×10^{-2}	6.257×10^{-2}
Trichloroethene	1.644×10^{-3}	6.89×10^{-4}	2.333×10^{-3}
Vinyl Chloride	8.081×10^{-3}	3.28×10^{-3}	1.136×10^{-2}
m,p-Xylene	1.490×10^{-1}	6.95×10^{-2}	2.186×10^{-1}
o-Xylene	2.436×10^{-2}	2.86×10^{-2}	5.292×10^{-2}

Figure 19. Example LandGEM Model Run Output

Section 6. Risk Assessment

The risk assessment provided in this section is for illustrative purposes only. It is not intended to represent a complete and detailed risk assessment for determining further actions at this site.

In order to calculate the incremental risk associated with exposure to a COPC, the time averaged emission rate for the time period of concern must first be determined. The equation for determining the time averaged emission rate is

$$\langle E \rangle = (1/ED) \left[\left(\frac{h}{2} \right) \times \left(E_0 + 2 \sum_{E_1}^{E_{n-1}} E \right) + E_n \right]$$

where

- $\langle E \rangle$ = Time-averaged emission rate (megagrams per year),
- ED = Exposure duration (years),
- h = Time-step interval (years), $h = 1$ yr,
- $E_{0,1,2 \dots n}$ = Emission rate at the end of the first year (E_0) and each succeeding year from LandGEM (megagrams per year), and

n = Number of time-steps ($n = ED$).

This time averaged emission rate is then entered into the atmospheric dispersion model to estimate the average exposure point concentration of the COPC. Using this approach, a dispersion model run will be required for each chemical of concern. Alternatively, if the dispersion model is run assuming the emission rate is at unity (1 g/m²•s), the dispersion model will generate a normalized air concentration in (micrograms per cubic meter per gram per square meter second) at the receptor of concern. The estimated ambient air concentration (micrograms per cubic meter) is determined by multiplying the dispersion coefficient and the time averaged emission rate. The LandGEM model runs for the Somersworth Landfill predicted very low emission rates, and the emission rate for every COPC was declining from 2002 forward. Hence, it was decided to use only the 2002 emission rates to calculate, for illustrative purposes, the ambient air concentrations. These predicted ambient air concentrations were then compared to the target concentrations in Table 7.

Table 7. Risk Analysis

CAS No.	Chemical	Basis of Target Conc.	C _{target} —Target Ambient Air Concentration to Satisfy both the Prescribed Risk Level (R) and the Target Hazard Index (HI)			Total Ambient Air Conc. (µg/m ³)
			R=10 ⁻⁴ , HI=1 (µg/m ³)	R=10 ⁻⁵ , HI=1 (µg/m ³)	R=10 ⁻⁶ , HI=1 (µg/m ³)	
75354	1,1-Dichloroethylene	NC ^a	2.2×10 ⁺⁰³	2.2×10 ⁺⁰³	2.2×10 ⁺⁰³	1.6×10 ⁻⁰²
106467	1,4-Dichlorobenzene	NC	8.0×10 ⁺⁰²	8.0×10 ⁺⁰²	8.0×10 ⁺⁰²	7.9×10 ⁻⁰³
71432	Benzene	C ^b	31.	3.1	3.1×10 ⁻⁰¹	3.0×10 ⁻⁰²
108907	Chlorobenzene	NC	60.	60.	60.	1.9×10 ⁻⁰²
75003	Chloroethane (ethyl chloride)	NC	1.0×10 ⁺⁰⁴	1.0×10 ⁺⁰⁴	1.0×10 ⁺⁰⁴	4.3×10 ⁻⁰²
108883	Toluene	NC	4.0×10 ⁺⁰²	4.0×10 ⁺⁰²	4.0×10 ⁺⁰²	6.3×10 ⁻⁰²
79016	Trichloroethylene	C	2.2	0.22	2.2×10 ⁻⁰²	2.3×10 ⁻⁰³
75014	Vinyl Chloride (chloroethene)	C	28.	2.8	0.28	1.1×10 ⁻⁰²
108383	m,p-Xylene	NC	7.0×10 ⁺⁰³	7.0×10 ⁺⁰³	7.0×10 ⁺⁰³	2.2×10 ⁻⁰¹
95476	o-Xylene	NC	7.0×10 ⁺⁰³	7.0×10 ⁺⁰³	7.0×10 ⁺⁰³	5.3×10 ⁻⁰²

^a NC = noncancer risk

^b C = cancer risk

Table 7 identifies target media concentrations corresponding to risk or hazard based concentrations for ambient air in residential settings. Only air concentrations that satisfy both the prescribed cancer risk level and the target hazard index are included in Table 7. The approach described here also can be used to evaluate chemicals not listed in the tables. It must be emphasized that the concentrations presented in Table 7 are screening levels. They are not clean-up levels or preliminary remediation goals nor are they intended to supercede existing criteria of the lead regulatory authority. The lead regulatory authority for a site may determine that criteria other than those provided herein are appropriate for their specific site or area.

The sources of chemical data used in the calculations necessary to create Table 7 were EPA's Superfund Chemical Data Matrix (SCDM) database and EPA's Water 9 database whenever a chemical was not included in the SCDM database. EPA's Integrated Risk Information System (IRIS) is the preferred source of carcinogenic unit risks and non-carcinogenic reference concentrations (RfCs) for inhalation exposure.¹ The following two sources were consulted, in order of preference, when IRIS values were not available: provisional toxicity values recommended by EPA's National Center for Environmental Assessment (NCEA) and EPA's Health Effects Assessment Summary Tables (HEAST). If no inhalation toxicity data could be obtained from IRIS, NCEA, or HEAST, extrapolated unit risks and RfCs were derived by using toxicity data for oral exposure (cancer slope factors and reference doses, respectively) from these reference sources using the same preference order. Toxicity databases such as IRIS are constantly being updated; this table is current as of August 2002. Users of this guidance are strongly encouraged to research the latest toxicity values for contaminants of interest from the sources noted above.

The ambient air concentrations in the table are risk-based screening levels calculated following an approach consistent with that presented in HEAST (U.S. EPA, 1997). Separate carcinogenic and non-carcinogenic target concentrations were calculated for each compound when both unit risks and reference concentrations were available. When inhalation toxicity values were not available, unit risks and reference concentrations were extrapolated from oral slope factors or reference doses, respectively. For both carcinogens and non-carcinogens, target air concentrations were

based on an adult exposure scenario and assume maximum exposure of an individual (i.e., exposure to contaminants 24 hours per day, 7 days per week, over 30-year residential exposure). An inhalation rate of 20 m³/day and a body weight of 70 kg are assumed and have been factored into the inhalation unit risk and reference concentration toxicity values.

Unit risks were extrapolated from cancer slope factors using

$$URF = CFS \times IR \times \left(\frac{1}{BW} \right) \left(\frac{10^{-3} mg}{\mu g} \right)$$

where

URF = unit risk factor (micrograms per cubic meter)⁻¹,

CSF = cancer slope factor,

IR = inhalation rate (cubic meters per day), and

BW = body weight (kilograms).

Reference concentrations were extrapolated from reference doses using

$$RfC = RfD \times BW \times \left(\frac{1}{IR} \right)$$

where

RfC = reference concentration (milligram per cubic meter) and

RfD = reference dose (milligram per kilogram per day).

For carcinogens,

$$C_{cancer} = TCR/URF$$

and for noncarcinogens,

$$C_{noncancer} = THQ \times RfC$$

where

C_{cancer} = target indoor air carcinogen concentration (micrograms per cubic meter),

C_{noncancer} = target indoor air noncarcinogen concentration (micrograms per cubic meter),

TCR = target cancer risk (e.g., 1.0×10⁻⁵), and

THQ = target hazard quotient (e.g., 1.0).

For most compounds, the more stringent of the cancer- and non-cancer-based contaminant concentrations is chosen as the target air concentration that satisfies both the prescribed cancer risk level and the target hazard quotient.

¹ U.S. EPA. 2002. Integrated Risk Information System (IRIS). <http://www.epa.gov/iriswebp/iris/index.html> (accessed October 2005)

$$C_{target,ia} = MIN(C_{cancer}, C_{non-cancer})$$

The target concentration, however, was preferentially selected for those compounds that had both an inhalation-based toxicity value and an oral-extrapolated value. The selected screening level was preferentially based on the non-extrapolated toxicity value chosen to calculate the acceptable ambient air concentration.²

For ease in application of the table, the indoor air concentrations are given in units of micrograms per cubic meter. The conversion from parts per billion by volume to micrograms per cubic meter is

$$C[ppmv] = C\left[\frac{\mu g}{m^3}\right] \times 10^9 \left[\frac{ppb}{atm}\right] \times 10^{-3} \left[\frac{m^3}{L}\right] \times R \times \frac{T}{MW \times 10^6 [\mu g/g]}$$

where

- R = gas constant (0.0821 L•atm/mole•K),
- T = absolute temperature (298 K), and
- MW = molecular weight (grams per mole).

The calculated target air concentrations are listed in the tables along with a column indicating whether cancer or noncancer risks drive the target concentration. If the exposure scenario of concern is an adult resident living at the receptor location being most impacted, the forward-calculation of incremental risks begins with the estimated ambient air concentration (i.e., C_{air} in micrograms per cubic meter). For carcinogenic contaminants, the risk level is calculated as

$$Risk = \frac{URF \times EF \times ED \times C_{air}}{AT_C \times 365 days/yr}$$

where

- $Risk$ = incremental risk level, unitless (e.g., 1×10^{-6}),

² The target air concentration for trichloroethylene is the lone exception to this rule. The target concentration is based on a carcinogenic unit risk extrapolated from an upper bound oral cancer slope factor of $4 \times 10^{-1} (mg/kg/day)^{-1}$ cited in NCEA's draft risk assessment for trichloroethylene (EPA, 2001). However, as noted in that document, available evidence from toxicological studies suggests similar carcinogenic effects from both the oral and inhalation routes of exposure. The existence of this evidence gives greater weight to the extrapolated unit risk, and given that the unit risk produces a lower target concentration than the non-extrapolated RfC, the unit risk-based value is adopted here as the target air concentration for trichloroethylene.

C_{air} = annual average ambient air concentration for each carcinogen (micrograms per cubic meter),

AT_C = averaging time for carcinogens (years—70 yr),

EF = exposure frequency (days per year—350 days), and

ED = exposure duration (years—30 yr).

For noncarcinogenic contaminants, the hazard quotient is calculated as

$$HQ = \frac{EF \times ED \times \frac{1}{RfC} \times C_{air}}{AT_{NC} \times 365 days/yr}$$

where

- HQ = Hazard quotient, unitless (e.g., 1.0) and
- AT_{NC} = Averaging time for noncarcinogens (year—30 yr)

Table 7 illustrates the results of using the above equations and discussions. The last column in Table 7 represents the total ambient air concentration in micrograms per cubic meter. This value is derived by multiplying the emission flux values from LandGEM by the ambient air concentration from the dispersion model (SCREEN3) when run at a unity emission rate (1 g/s). These values would be compared to the appropriate risk derived concentrations as seen in the previous three columns to determine if a particular COPC is above or below an acceptable air concentration and whether further actions or investigations may be needed. For purposes of comparison, approximately 12 COPCs were identified in one or more of the ambient air samples that were collected approximately 3 ft above ground level and adjacent to the subsurface probes. The maximum concentration was always below 20 ppbv ($0.3 \mu g/m^3$) Again Table 7 is presented for illustrative purposes only and is not intended to represent the results or conclusions drawn from a detailed risk assessment.

Section 7. Findings and Conclusions

This case study documents how the guidance can be used to evaluate landfill gas emissions. It illustrates the usefulness of both the information and the procedures presented in the Guidance for Evaluating Landfill Gas Emissions from Closed or Abandoned Facilities. By applying the investigative techniques and recommended practices, the research team was able to:

- 1 Determine where the landfill gases are escaping into the atmosphere ,
- 2 Identify the chemicals of potential concern,
- 3 Quantify the speciated LFG emission rates ,
- 4 Identify the most likely to be affected at off-site location(s), and
- 5 Characterize ambient air concentrations.

This case study report provided data and information that were used by the remedial project manager to:

- 1 Assess the health risk associated with the emissions from the landfill,
- 2 Determine if additional site investigation effort is needed,
- 3 Evaluate the level of effort associated with the existing LFG monitoring program,
- 4 Determine if the previously proposed remedial design needed to be altered,
- 5 Evaluate the need for institution controls and future land use policy decisions, and
- 6 Decide if the risks and hazards associated with the landfill gas needed to be controlled with LFG control technology.

Specific to the Rose Hill site the following lessons were learned:

- The conventional field screening, discrete sampling using Summa canisters, commercial laboratory analysis using TO15 analytical methods, and emission and dispersion modeling procedures provided the information needed to assess the risks and hazards associated with LFG emissions. The turn-around time for the commercial laboratory was measured in weeks. The data reduction and modeling efforts require 2-3 man days of effort. Hence, health risks could not be quantified on a real time basis. Readily available equipment and ordinary environmental technician skills are required to obtain quality results.
- The conventional field screening, discrete sampling using Tedlar bags, onsite mobile laboratory using EPA Modified Method 18 analytical procedures, and emission and dispersion modeling procedures provided the information needed to assess the risks and hazards associated with LFG emissions. The onsite mobile laboratory was unable to quantify the toxic COPCs concentrations because of detection limit issues.
- Using the research data, the predicted COPC ambient air concentrations are below that which would create an unacceptable risk at the 1×10^{-6} level.

Appendix A
Site Activity Photographs



Rose Hill Superfund Landfill



Old Maintenance Shed on Landfill Property



Access Road onto Landfill Property



Storm Drain on Landfill Property



Rosehill Site Terrain



Overgrowth on the Rose Hill Site



Passive Vent at Grid 80



Passive Vent at Grid 131



Passive Vent at Grid 140



Sampling Crew Navigating into Thick Overgrowth



Rose Hill Transfer Station East of the Landfill



Entrance to the Rose Hill Transfer Station and its Proximity to the Landfill



Newly Paved Public Road South of the Landfill



ERTC TAGA Unit Parked Along the Western Property Boundary



Sampling Crew Staging for Sample Collection Activities



Slam-Bar Used for Sampling Probe Insertion



Fixed Gas Sampling Collected by Sampling Probe



Tedlar Bag Chamber and Summa Canister Sampling



QA/QC Sampling with Summa Canisters



Tedlar Bag and Summa Canister Ambient Air Sampling



Passive Vent Gas Sampling



Perimeter Well Sampling

Appendix B

Wilcoxon Statistical Analysis

Wilcoxon Two-Sample, Rank-Sum Test

In order to properly characterize and establish a sampling method for each landfill, it is necessary to identify those areas that are nearly homogeneous in composition. This is determined following the screening procedures. Through application of statistical methods on the screening data, it is possible to divide the landfill into nearly homogeneous areas. For the purpose of this guidance, it was decided to use a method referred to as the Wilcoxon two-sample, rank-sum test, or simply the rank-sum test. This is a statistical method used to determine if two independent sample populations are statistically similar (i.e., they have the same mean and median). For this application, statistically similar populations refer to areas within the landfill that are nearly homogeneous.

The first step is to assign the screening data that was collected to two populations (e.g., north landfill and south landfill) as

$$n = n_1 + n_2$$

where

- n = entire screening data set,
- n_1 = population of size n_1 ,
- n_2 = population of size n_2 , and
- $n_1 \leq n_2$.

Once the all data has been assigned to one or the other populations, all the data must be placed in ascending order regardless of which population it was assigned and assigned

a rank from 1 to n . In case of ties, all tied values should be assigned a ranking that is the mean of the tied rankings. For example, if two values are tied for the second lowest value, they both would be assigned a ranking of 2.5, which is the mean of the second and third ranking spots. After all values have been ranked, the ranks associated with the values from the smaller population, n_1 , are added and the sum denoted as T' . Once T' is derived, it is compared with the values in Table X to decide on a given level of significance. Table X can be used for a given combination of n_1 and n_2 up to a total population size (n) of 20. If $T'_{\alpha} \leq T' \leq T'_{1-\alpha}$, then the two populations can be considered statistically similar and therefore one homogeneous area.

For a larger data set, the following statistical test must be used.

$$Z = \frac{T' - \frac{n_1(n_1 + n_2 + 1)}{2}}{\sqrt{\frac{n_1 n_2 (n_1 + n_2 + 1)}{12}}}$$

This value of Z is then compared to a specific level of significance on a t distribution shown in Table IV, where df is the total population size (n). If $|Z| \geq Z_{\alpha/2}$, then the two populations can not be considered statistically similar and are therefore two nonhomogeneous areas.

Continue this process until all areas of the landfill have been divided into distinct homogeneous areas.

TABLE X DISTRIBUTION OF THE RANK SUM T'

The values of T'_α , $T'_{1-\alpha}$, and α are such that, if the n_1 and n_2 observations are chosen at random from the same population, the chance that the rank sum T' of the n_1 observations in the smaller sample is equal to or less than T'_α is α and the chance that T' is equal to or greater than $T'_{1-\alpha}$ is α . The sample sizes are shown in parentheses (n_1, n_2)

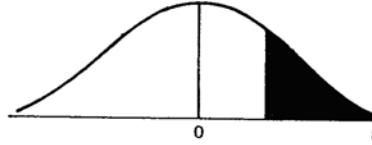
T'_α	$T'_{1-\alpha}$	α	T'_α	$T'_{1-\alpha}$	α	T'_α	$T'_{1-\alpha}$	α	T'_α	$T'_{1-\alpha}$	α
	(1,9)			(3,8)			(4,8) (Cont.)			(5,7) (Cont.)	
1	10	.100	6	30	.006	12	40	.008	19	46	.015
	(1,10)		7	29	.012	13	39	.014	20	45	.024
1	11	.091	8	28	.024	14	38	.024	21	44	.037
	(2,3)		9	27	.042	15	37	.036	22	43	.053
3	9	.100	10	26	.067	16	36	.055	23	42	.074
	(2,4)		11	25	.097	17	35	.077		(5,8)	
3	11	.067		(3,9)			(4,9)		15	55	.001
	(2,5)		6	33	.005	10	46	.001	16	54	.002
3	13	.047	7	32	.009	11	45	.003	17	53	.003
4	12	.095	8	31	.018	12	44	.006	18	52	.005
	(2,6)		9	30	.032	13	43	.010	19	51	.009
3	15	.036	10	29	.050	14	42	.017	20	50	.015
4	14	.071	11	28	.073	15	41	.025	21	49	.023
	(2,7)			(3,10)		16	40	.038	22	48	.033
3	17	.028	6	36	.003	17	39	.053	23	47	.047
4	16	.056	7	35	.007	18	38	.074	24	46	.064
	(2,8)		8	34	.014	19	37	.099	25	45	.085
3	19	.022	9	33	.024		(4,10)			(5,9)	
4	18	.044	10	32	.038	10	50	.001	15	60	.000
5	17	.089	11	31	.056	11	49	.002	16	59	.001
	(2,9)		12	30	.080	12	48	.004	17	58	.002
3	21	.018		(4,4)		13	47	.007	18	57	.003
4	20	.036	10	26	.014	14	46	.012	19	56	.006
5	19	.073	11	25	.029	15	45	.018	20	55	.009
	(2,10)		12	24	.057	16	44	.026	21	54	.014
3	23	.015	13	23	.100	17	43	.038	22	53	.021
4	22	.030		(4,5)		18	42	.053	23	52	.030
5	21	.061	10	30	.008	19	41	.071	24	51	.041
6	20	.091	11	29	.016	20	40	.094	25	50	.056
	(3,3)		12	28	.032		(5,5)		26	49	.073
6	15	.050	13	27	.056	15	40	.004	27	48	.095
7	14	.100	14	26	.095	16	39	.008		(5,10)	
	(3,4)			(4,6)		17	38	.016	15	65	.000
6	18	.028	10	34	.005	18	37	.028	16	64	.001
7	17	.057	11	33	.010	19	36	.048	17	63	.001
	(3,5)		12	32	.019	20	35	.075	18	62	.002
6	21	.018	13	31	.033		(5,6)		19	61	.004
7	20	.036	14	30	.057	15	45	.002	20	60	.006
8	19	.071	15	29	.086	16	44	.004	21	59	.010
	(3,6)			(4,7)		17	43	.009	22	58	.014
6	24	.012	10	38	.003	18	42	.015	23	57	.020
7	23	.024	11	37	.006	19	41	.026	24	56	.028
8	22	.048	12	36	.012	20	40	.041	25	55	.038
9	21	.083	13	35	.021	21	39	.063	26	54	.050
	(3,7)		14	34	.036	22	38	.089	27	53	.065
6	27	.008	15	33	.055		(5,7)		28	52	.082
7	26	.017	16	32	.082	15	50	.001		(6,6)	
8	25	.033		(4,8)		16	49	.003	21	57	.001
9	24	.058	10	42	.002	17	48	.005	22	56	.002
10	23	.092	11	41	.004	18	47	.009	23	55	.004

DISTRIBUTION OF THE RANK SUM T' (continued)

T'_α	$T'_{1-\alpha}$	α	T'_α	$T'_{1-\alpha}$	α	T'_α	$T'_{1-\alpha}$	α	T'_α	$T'_{1-\alpha}$	α
(6,6)	(Cont.)		(6,9)	(Cont.)		(7,8)	(Cont.)		(8,8)	(Cont.)	
24	54	.008	35	61	.072	41	71	.047	37	99	.000
25	53	.013	36	60	.091	42	70	.060	38	98	.000
26	52	.021		(6,10)		43	69	.076	39	97	.001
27	51	.032	21	81	.000	44	68	.095	40	96	.001
28	50	.047	22	80	.000	45	67	.116	41	95	.001
29	49	.066	23	79	.000		(7,9)		42	94	.002
30	48	.090	24	78	.001	28	91	.000	43	93	.003
	(6,7)		25	77	.001	29	90	.000	44	92	.005
21	63	.001	26	76	.002	30	89	.000	45	91	.007
22	62	.001	27	75	.004	31	88	.001	46	90	.010
23	61	.002	28	74	.005	32	87	.001	47	89	.014
24	60	.004	29	73	.008	33	86	.002	48	88	.019
25	59	.007	30	72	.011	34	85	.003	49	87	.025
26	58	.011	31	71	.016	35	84	.004	50	86	.032
27	57	.017	32	70	.021	36	83	.006	51	85	.041
28	56	.026	33	69	.028	37	82	.008	52	84	.052
29	55	.037	34	68	.036	38	81	.011	53	83	.065
30	54	.051	35	67	.047	39	80	.016	54	82	.080
31	53	.069	36	66	.059	40	79	.021	55	81	.097
32	52	.090	37	65	.074	41	78	.027		(8,9)	
	(6,8)		38	64	.090	42	77	.036	36	108	.000
21	69	.000		(7,7)		43	76	.045	40	104	.000
22	68	.001	28	77	.000	44	75	.057	41	103	.001
23	67	.001	29	76	.001	45	74	.071	42	102	.001
24	66	.002	30	75	.001	46	73	.087	43	101	.002
25	65	.004	31	74	.002		(7,10)		44	100	.003
26	64	.006	32	73	.003	28	98	.000	45	99	.004
27	63	.010	33	72	.006	29	97	.000	46	98	.006
28	62	.015	34	71	.009	30	96	.000	47	97	.008
29	61	.021	35	70	.013	31	95	.000	48	96	.010
30	60	.030	36	69	.019	32	94	.001	49	95	.014
31	59	.041	37	68	.027	33	93	.001	50	94	.018
32	58	.054	38	67	.036	34	92	.001	51	93	.023
33	57	.071	39	66	.049	35	91	.002	52	92	.030
34	56	.091	40	65	.064	36	90	.003	53	91	.037
	(6,9)		41	64	.082	37	89	.005	54	90	.046
21	75	.000		(7,8)		38	88	.007	55	89	.057
22	74	.000	28	84	.000	39	87	.009	56	88	.069
23	73	.001	29	83	.000	40	86	.012	57	87	.084
24	72	.001	30	82	.001	41	85	.017		(8,10)	
25	71	.002	31	81	.001	42	84	.022	36	116	.000
26	70	.004	32	80	.002	43	83	.028	41	111	.000
27	69	.006	33	79	.003	44	82	.035	42	110	.001
28	68	.009	34	78	.005	45	81	.044	43	109	.001
29	67	.013	35	77	.007	46	80	.054	44	108	.002
30	66	.018	36	76	.010	47	79	.067	45	107	.002
31	65	.025	37	75	.014	48	78	.081	46	106	.003
32	64	.033	38	74	.020	49	77	.097	47	105	.004
33	63	.044	39	73	.027		(8,8)		48	104	.006
34	62	.057	40	72	.036	36	100	.000	49	103	.008

DISTRIBUTION OF THE RANK SUM T' (continued)

T'_α	$T'_{1-\alpha}$	α	T'_α	$T'_{1-\alpha}$	α	T'_α	$T'_{1-\alpha}$	α	T'_α	$T'_{1-\alpha}$	α
(8,10) (Cont.)			(9,9) (Cont.)			(9,10) (Cont.)			(10,10) (Cont.)		
50	102	.010	58	113	.007	58	122	.004	69	141	.003
51	101	.013	59	112	.009	59	121	.005	70	140	.003
52	100	.017	60	111	.012	60	120	.007	71	139	.004
53	99	.022	61	110	.016	61	119	.009	72	138	.006
54	98	.027	62	109	.020	62	118	.011	73	137	.007
55	97	.034	63	108	.025	63	117	.014	74	136	.009
56	96	.042	64	107	.031	64	116	.017	75	135	.012
57	95	.051	65	106	.039	65	115	.022	76	134	.014
58	94	.061	66	105	.047	66	114	.027	77	133	.018
59	93	.073	67	104	.057	67	113	.033	78	132	.022
60	92	.086	68	103	.068	68	112	.039	79	131	.026
	(9,9)		69	102	.081	69	111	.047	80	130	.032
45	126	.000	70	101	.095	70	110	.056	81	129	.038
50	121	.000	(9,10)			71	109	.067	82	128	.045
51	120	.001	45	135	.000	72	108	.078	83	127	.053
52	119	.001	52	128	.000	73	107	.091	84	126	.062
53	118	.001	53	127	.001	(10,10)			85	125	.072
54	117	.002	54	126	.001	65	145	.001	86	124	.083
55	116	.003	55	125	.001	66	144	.001	87	123	.095
56	115	.004	56	124	.002	67	143	.001			
57	114	.005	57	123	.003	68	142	.002			

TABLE IV *t* DISTRIBUTION

<i>df</i>	.100	.050	.025	.010	.005	<i>df</i>
1	3.078	6.314	12.706	31.821	63.657	1
2	1.886	2.920	4.303	6.965	9.925	2
3	1.638	2.353	3.182	4.541	5.841	3
4	1.533	2.132	2.776	3.747	4.604	4
5	1.476	2.015	2.571	3.365	4.032	5
6	1.440	1.943	2.447	3.143	3.707	6
7	1.415	1.895	2.365	2.998	3.499	7
8	1.397	1.860	2.306	2.896	3.355	8
9	1.383	1.833	2.262	2.821	3.250	9
10	1.372	1.812	2.228	2.764	3.169	10
11	1.363	1.796	2.201	2.718	3.106	11
12	1.356	1.782	2.179	2.681	3.055	12
13	1.350	1.771	2.160	2.650	3.012	13
14	1.345	1.761	2.145	2.624	2.977	14
15	1.341	1.753	2.131	2.602	2.947	15
16	1.337	1.746	2.120	2.583	2.921	16
17	1.333	1.740	2.110	2.567	2.898	17
18	1.330	1.734	2.101	2.552	2.878	18
19	1.328	1.729	2.093	2.539	2.861	19
20	1.325	1.725	2.086	2.528	2.845	20
21	1.323	1.721	2.080	2.518	2.831	21
22	1.321	1.717	2.074	2.508	2.819	22
23	1.319	1.714	2.069	2.500	2.807	23
24	1.318	1.711	2.064	2.492	2.797	24
25	1.316	1.708	2.060	2.485	2.787	25
26	1.315	1.706	2.056	2.479	2.779	26
27	1.314	1.703	2.052	2.473	2.771	27
28	1.313	1.701	2.048	2.467	2.763	28
29	1.311	1.699	2.045	2.462	2.756	29
inf.	1.282	1.645	1.960	2.326	2.576	inf.

Rose Hill Landfill Site
22–24 July 2002
Wilcoxon Rank Sum Analysis (Run 1)

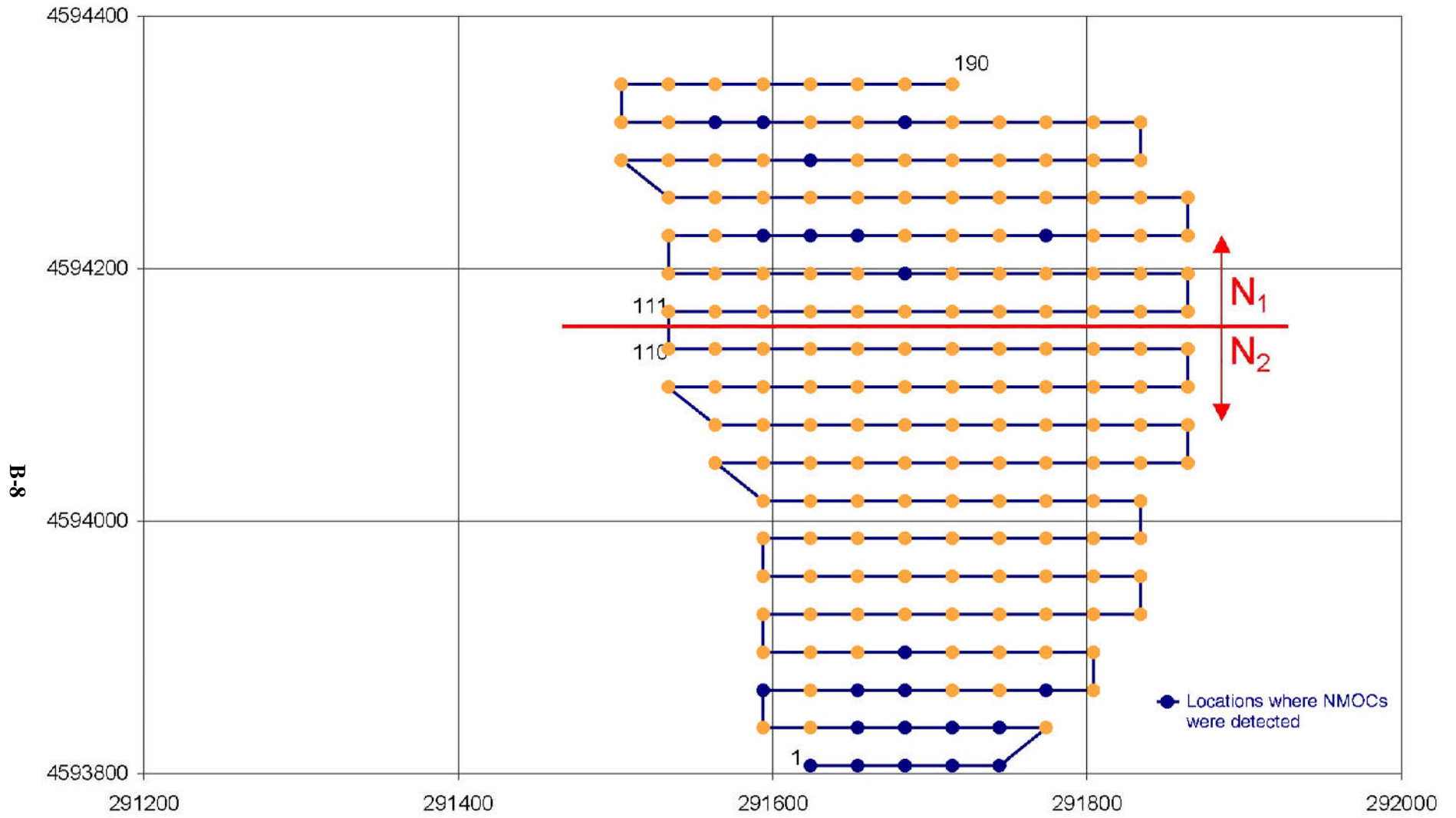
Population 1 size (n_1)	11
Population 2 size (n_2)	14
Total population size (n)	25
Sum of Ranks (W_{rs})	209
Large Sample Statistic (Z_{rs})	3.683
Confidence Interval	5.0%
$Z_{1-\alpha}$	1.708
Accept or Reject H_0 ?	REJECT

Rose Hill Landfill Site
22–24 July 2002
Wilcoxon Rank Sum Analysis (Run 1)

Grid No.	UTM Coordinates of Grid Node		NMOC Conc.	NMOC Conc. for Rank	Assign Pop. Set	Prelim Ranking	No. Ties 15	Final Ranking	Pop. 1 W_{rs} 209.0
	Easting	Northing							
1	291624	4593806	0.20	0.2	2	1	8	4.5	
2	291654	4593806	0.43	0.43	2	13	1	13	
3	291684	4593806	0.20	0.2	2	1	8	4.5	
4	291714	4593806	0.20	0.2	2	1	8	4.5	
5	291744	4593806	0.20	0.2	2	1	8	4.5	
7	291744	4593836	0.20	0.2	2	1	8	4.5	
8	291744	4593836	0.20	0.2	2	1	8	4.5	
9	291684	4593836	1.80	1.8	2	19	1	19	
10	291654	4593836	0.40	0.4	2	12	1	12	
13	291594	4593866	0.20 ^a	0.2	2	1	8	4.5	
15	291654	4593866	0.30	0.3	2	11	1	11	
16	291684	4593866	0.60	0.6	2	15	1	15	
19	291774	4593866	0.26	0.26	2	10	1	10	
25	291684	4593896	0.20	0.2	2	1	8	4.5	
129	291684	4594196	0.25	0.25	1	9	1	9	9
137	291594	4594226	2.50	2.5	1	24	1	24	24
138	291624	4594226	0.50	0.5	1	14	1	14	14
139	291654	4594226	5.00	5	1	25	1	25	25
143	291774	4594226	2.00	2	1	20	4	21.5	21.5
146	291864	4594226	2.00 ^b	2	1	20	4	21.5	21.5
148	291834	4594256	2.00	2	1	20	4	21.5	21.5
163	291624	4594286	1.00	1	1	16	3	17	17
176	291684	4594316	2.00	2	1	20	4	21.5	21.5
179	291594	4594316	1.00	1	1	16	3	17	17
180	291564	4594316	1.00	1	1	16	3	17	17

^a Duplicate value from grid 15 used.

^b Duplicate value from grid 148 used.



Rose Hill Screening Sampling Locations for Wilcoxon Run 1 Populations

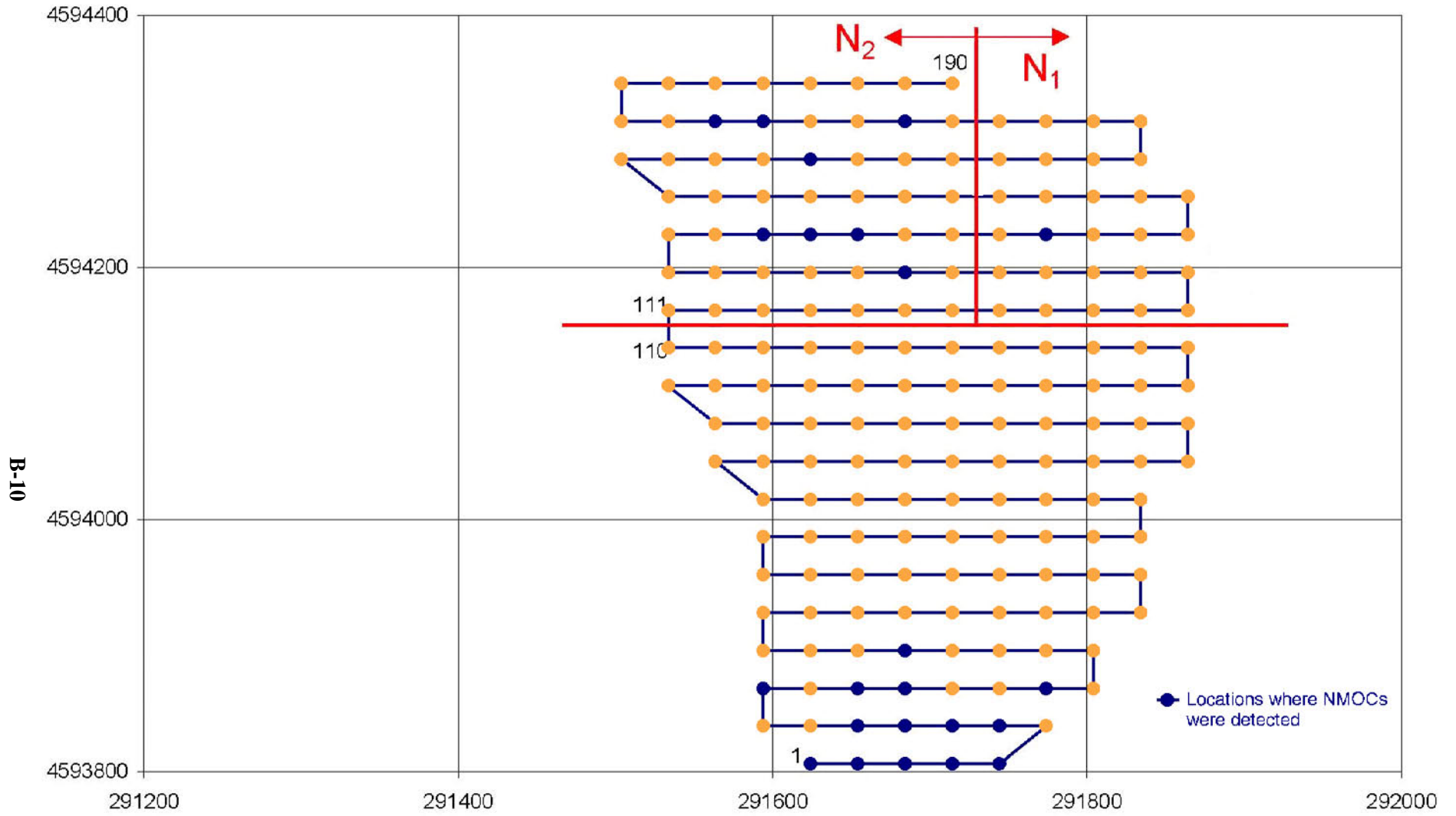
Rose Hill Landfill Site
22–24 July 2002
Wilcoxon Rank Sum Analysis (Run 2)

Population 1 size (n_1)	3
Population 2 size (n_2)	8
Total population size (n)	11
Sum of Ranks (W_{rs})	22.5
Large Sample Statistic (Z_{rs})	SEE TABLE X
Confidence Interval	5.0%
$Z_{1-\alpha}$	SEE TABLE X
Accept or Reject H_0 ?	H_0 ACCEPTED

Rose Hill Landfill Site
22–24 July 2002
Wilcoxon Rank Sum Analysis (Run 2)

Grid No.	UTM Coordinates of Grid Node		NMOC Conc.	NMOC Conc. for Rank	Assign Pop. Set	Prelim Ranking	No. Ties 7	Final Ranking	Pop. 1 W_{rs} 22.5
	Easting	Northing							
129	291684	4594196	0.25	0.25	2	1	1	1	
137	291594	4594226	2.50	2.5	2	10	1	10	
138	291624	4594226	0.50	0.5	2	2	1	2	
139	291654	4594226	5.00	5	2	11	1	11	
143	291774	4594226	2.00	2	1	6	4	7.5	7.5
146	291864	4594226	2.00 ^a	2	1	6	4	7.5	7.5
148	291834	4594256	2.00	2	1	6	4	7.5	7.5
163	291624	4594286	1.00	1	2	3	3	4	
176	291684	4594316	2.00	2	2	6	4	7.5	
179	291594	4594316	1.00	1	2	3	3	4	
180	291564	4594316	1.00	1	2	3	3	4	

^a Duplicate value from grid 148 used.



Rose Hill Screening Sampling Locations for Wilcoxon Run 2 Populations

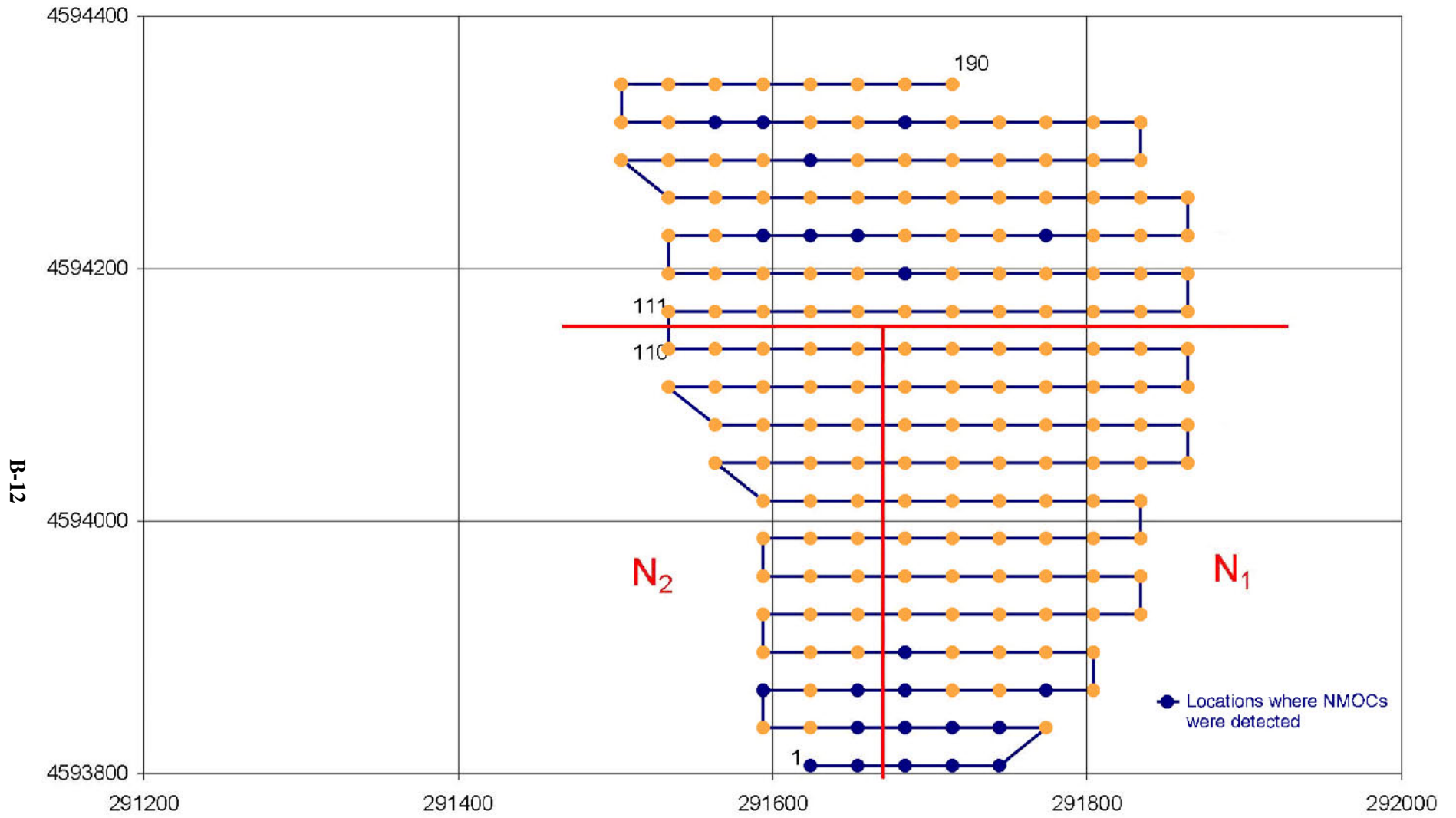
Rose Hill Landfill Site
22–24 July 2002
Wilcoxon Rank Sum Analysis (Run 3)

Population 1 size (n_1)	5
Population 2 size (n_2)	9
Total population size (n)	14
Sum of Ranks (W_{rs})	42
Large Sample Statistic (Z_{rs})	SEE TABLE X
Confidence Interval	5.0%
$Z_{1-\alpha}$	SEE TABLE X
Accept or Reject H_0 ?	H_0 ACCEPTED

Rose Hill Landfill Site
22–24 July 2002
Wilcoxon Rank Sum Analysis (Run 3)

Grid No.	UTM Coordinates of Grid Node		NMOC Conc.	NMOC Conc. for Rank	Assign Pop. Set	Prelim Ranking	No. Ties 8	Final Ranking	Pop. 1 W_{rs} 42.0
	Eastings	Northing							
1	291624	4593806	0.20	0.2	1	1	8	4.5	4.5
2	291654	4593806	0.43	0.43	1	12	1	12	12
3	291684	4593806	0.20	0.2	2	1	8	4.5	
4	291714	4593806	0.20	0.2	2	1	8	4.5	
5	291744	4593806	0.20	0.2	2	1	8	4.5	
7	291744	4593836	0.20	0.2	2	1	8	4.5	
8	291744	4593836	0.20	0.2	2	1	8	4.5	
9	291684	4593836	1.80	1.8	2	14	1	14	
10	291654	4593836	0.40	0.4	1	11	1	11	11
13	291594	4593866	0.20 ^a	0.2	1	1	8	4.5	4.5
15	291654	4593866	0.30	0.3	1	10	1	10	10
16	291684	4593866	0.60	0.6	2	13	1	13	
19	291774	4593866	0.26	0.26	2	19	1	9	
25	291684	4593896	0.20	0.2	2	1	8	4.5	

^a Duplicate value from grid 15 used.



Rose Hill Screening Sampling Locations for Wilcoxon Run 3 Populations

Appendix C

Laboratory Results

Table 1. Comparison of October 2002 Analysis Results of Rose Hill Volatile Organic Compounds in Air.

Sample Number	13500	12941	% Diff.	13499	12942	% Diff.	13498	12943	% Diff.
Sample Location	Grid 137	Grid 137		Grid 137 D.	Grid 137 Dup		Grid 137 Amb.	Grid 137 Amb.	
Dichlorodifluoromethane	1500	1600	6.7	1500	1700	13	U	U	
Dichlorotetrafluoroethane	120	120	0.0	120	120	0.0	U	U	
Vinyl Chloride	U	U		U	U		U	U	
Chloroethane	770	470	39	590	460	22	U	U	
Trichlorofluoromethane	U	U		U	U		U	U	
Isopropyl Alcohol	U	U		U	U		U	U	
Acetone	U	U		U	U		15	16	6.7
1,1-Dichloroethene	U	U		U	U		U	U	
Methylene Chloride	U	U		U	U		U	2.4	
trans-1,2-Dichloroethene	9.1	U		9.8	U		U	U	
Hexane	2800	2600	7.1	2800	2600	7.1	8.2	U	
1,1-Dichloroethane	U	U		U	U		U	U	
2-Butanone	U	U		U	U		U	U	
cis-1,2-Dichloroethene	12	U		13	U		U	U	
1,1,1-Trichloroethane	U	U		U	U		U	U	
Cyclohexane	3000	1600	47	3000	1600	47	U	U	
Carbon Tetrachloride	U	U		U	U		U	U	
1,2-Dichloroethane	U	U		U	U		U	U	
Benzene	2200	1400	36	2200	1400	36	7.1	U	
Heptane	5200	4100	21	5200	4200	19	17	U	
Trichloroethene	U	U		U	U		U	U	
1,2-Dichloropropane	U	U		U	U		U	U	
Toluene	99	58	41	79	60	24	4.1	U	
Tetrachloroethene	U	U		U	U		U	U	
Chlorobenzene	330	230	30	340	230	32	U	U	
Ethylbenzene	5800	5400	6.9	5800	5600	3.4	51	U	
m&p-Xylenes	8600	7900	8.1	8600	8700	1.2	85	1.3	98
o-Xylene	430	460	7.0	410	490	20	4.8	U	
Styrene	160	U		120	U		U	U	
4-Ethyltoluene	960	800	17	940	840	11	20	U	
1,3,5-Trimethylbenzene	450	460	2.2	450	480	6.7	10	U	
1,2,4-Trimethylbenzene	1100	1200	9.1	1100	1200	9.1	33	U	
1,3-Dichlorobenzene	U	U		U	U		U	U	
1,4-Dichlorobenzene	76	56	26	74	64	14	U	U	
1,2-Dichlorobenzene	U	U		U	U		U	U	

Results are in part per billion by volume (ppbv)

U = None detected

% Diff. = percent difference

Results in the non-shaded columns are from on-site analysis.

Results in the shaded columns are from laboratory analysis.

continued

Table 1. Comparison of October 2002 Analysis Results of Rose Hill Volatile Organic Compounds in Air (continued).

Sample Number	13497	12944		13496	12945		13495	12946	
Sample Location	Grid 137 Amb. D.	Grid 137 Amb.	%	Grid 139	Grid 139	%	Grid 140	Grid 140	%
			Diff.			Diff.			Diff.
Dichlorodifluoromethane	U	U		590	780	32	43	46	7.0
Dichlorotetrafluoroethane	U	U		U	71		38	40	5.3
Vinyl Chloride	U	U		U	120		300	200	33
Chloroethane	U	U		980	870	11	99	92	7.1
Trichlorofluoromethane	U	U		68	66	2.9	U	U	
Isopropyl Alcohol	U	U		U	U		U	U	
Acetone	19	75	295	U	U		U	95	
1,1-Dichloroethene	U	U		U	U		U	U	
Methylene Chloride	U	1.6		U	47		U	7.6	
trans-1,2-Dichloroethene	U	U		12	U		U	U	
Hexane	U	U		3200	3100	3.1	850	930	9.4
1,1-Dichloroethane	U	U		U	31		U	U	
2-Butanone	U	U		U	U		U	U	
cis-1,2-Dichloroethene	U	U		67	51	24	U	6.4	
1,1,1-Trichloroethane	U	U		U	U		U	U	
Cyclohexane	U	U		3000	1900	37	990	710	28
Carbon Tetrachloride	U	U		U	U		U	U	
1,2-Dichloroethane	U	U		U	U		U	U	
Benzene	U	U		2800	1800	36	200	140	30
Heptane	U	U		2700	2300	15	1100	1000	9.1
Trichloroethene	U	U		57	67	18	U	U	
1,2-Dichloropropane	U	U		U	U		U	U	
Toluene	U	2.5		1800	1400	22	83	65	22
Tetrachloroethene	U	U		31	22	29	U	U	
Chlorobenzene	U	U		220	190	14	U	U	
Ethylbenzene	11	U		2800	2600	7.1	1400	1400	0.0
m&p-Xylenes	19	U		3700	3500	5.4	550	500	9.1
o-Xylene	U	U		1100	1100	0.0	320	300	6.3
Styrene	U	U		U	57		U	U	
4-Ethyltoluene	4.7	U		1000	920	8.0	170	120	29
1,3,5-Trimethylbenzene	U	U		470	450	4.3	130	83	36
1,2,4-Trimethylbenzene	8.1	U		930	950	3.2	220	150	32
1,3-Dichlorobenzene	U	U		U	U		U	U	
1,4-Dichlorobenzene	U	U		23	27	17	29	30	3.4
1,2-Dichlorobenzene	U	U		U	U		U	U	

Results are in part per billion by volume (ppbv)

U = None detected

% Diff. = percent difference

Results in the non-shaded columns are from on-site analysis.

Results in the shaded columns are from laboratory analysis.

continued

Table 1. Comparison of October 2002 Analysis Results of Rose Hill Volatile Organic Compounds in Air (continued).

Sample Number	13494	12947		13493	12948		13492	12949	
Sample Location	Grid 131	Grid 131	%	Grid 80	Grid 80	%	Grid 146	Grid 146	%
			Diff.			Diff.			Diff.
Dichlorodifluoromethane	55	60	9.1	74	88	19	34	44	29
Dichlorotetrafluoroethane	25	29	16	U	U		U	U	
Vinyl Chloride	120	170	42	290	330	14	650	800	23
Chloroethane	1800	1400	22	430	390	9.3	4000	4000	0.0
Trichlorofluoromethane	U	U		77	82	6.5	U	U	
Isopropyl Alcohol	U	U		670	330	51	U	U	
Acetone	U	U		650	550	15	34	U	
1,1-Dichloroethene	16	U		U	U		U	U	
Methylene Chloride	U	22		U	U		U	U	
trans-1,2-Dichloroethene	U	U		14	U		35	U	
Hexane	2600	2500	3.8	900	980	8.9	83	73	12
1,1-Dichloroethane	1000	620	38	U	U		670	650	3.0
2-Butanone	U	U		790	580	27	14	U	
cis-1,2-Dichloroethene	55	52	5.5	94	97	3.2	100	110	10
1,1,1-Trichloroethane	910	580	36	U	U		U	U	
Cyclohexane	3100	1400	55	1200	560	53	160	140	13
Carbon Tetrachloride	130	U		U	U		U	U	
1,2-Dichloroethane	U	U		U	U		12	U	
Benzene	810	580	28	360	260	28	250	190	24
Heptane	4400	3700	16	2200	2100	4.5	52	U	
Trichloroethene	U	22		25	30	20	U	U	
1,2-Dichloropropane	U	U		U	U		U	U	
Toluene	520	460	12	3400	3600	5.9	60	U	
Tetrachloroethene	U	U		17	U		U	U	
Chlorobenzene	U	U		U	U		38	40	5.3
Ethylbenzene	3500	2900	17	2600	2900	12	91	U	
m&p-Xylenes	4600	4000	13	4300	4800	12	170	U	
o-Xylene	1200	1100	8.3	1600	1900	19	170	86	49
Styrene	U	U		U	U		U	U	
4-Ethyltoluene	990	780	21	760	630	17	71	U	
1,3,5-Trimethylbenzene	490	450	8.2	370	350	5.4	31	U	
1,2,4-Trimethylbenzene	1300	1400	7.7	840	830	1.2	91	U	
1,3-Dichlorobenzene	U	U		U	U		U	U	
1,4-Dichlorobenzene	100	120	20	31	34	9.7	10	U	
1,2-Dichlorobenzene	U	U		U	U		U	U	

Results are in part per billion by volume (ppbv)

U = None detected

% Diff. = percent difference

Results in the non-shaded columns are from on-site analysis.

Results in the shaded columns are from laboratory analysis.

continued

Table 1. Comparison of October 2002 Analysis Results of Rose Hill Volatile Organic Compounds in Air (continued).

Sample Number	13490	12955		13489	12956		13488	12957	
Sample Location	LFG7	PW7	%	LFG24	PW24	%	LFG1	PW1	%
			Diff.			Diff.			Diff.
Dichlorodifluoromethane	U	U		4.8	6.1	27	11	13	18
Dichlorotetrafluoroethane	U	U		U	U		U	1.3	
Vinyl Chloride	U	U		U	U		U	U	
Chloroethane	U	U		U	U		U	U	
Trichlorofluoromethane	U	U		U	1.1		U	U	
Isopropyl Alcohol	U	U		U	U		U	U	
Acetone	7.6	13	71	U	15		U	12	
1,1-Dichloroethene	U	U		4.9	4.3	12	U	U	
Methylene Chloride	U	14		U	34		U	15	
trans-1,2-Dichloroethene	U	U		U	U		U	U	
Hexane	U	U		U	U		U	U	
1,1-Dichloroethane	U	U		6.4	5.1	20	U	U	
2-Butanone	U	U		U	U		U	U	
cis-1,2-Dichloroethene	U	U		230	270	17	U	U	
1,1,1-Trichloroethane	U	U		76	56	26	U	U	
Cyclohexane	U	U		U	U		U	U	
Carbon Tetrachloride	U	U		12	U		U	U	
1,2-Dichloroethane	U	U		U	U		U	U	
Benzene	U	U		U	U		U	U	
Heptane	U	U		U	U		U	U	
Trichloroethene	U	U		130	110	15	U	U	
1,2-Dichloropropane	U	U		U	U		U	U	
Toluene	U	U		U	U		U	U	
Tetrachloroethene	U	U		U	U		U	U	
Chlorobenzene	U	U		U	U		U	U	
Ethylbenzene	U	U		U	U		U	U	
m&p-Xylenes	U	U		U	U		U	U	
o-Xylene	U	U		U	U		U	U	
Styrene	U	U		U	U		U	U	
4-Ethyltoluene	U	U		U	U		U	U	
1,3,5-Trimethylbenzene	U	U		U	U		U	U	
1,2,4-Trimethylbenzene	U	U		U	U		U	U	
1,3-Dichlorobenzene	U	U		U	U		U	U	
1,4-Dichlorobenzene	U	U		U	U		U	U	
1,2-Dichlorobenzene	U	U		U	U		U	U	

Results are in part per billion by volume (ppbv)

U = None detected

% Diff. = percent difference

Results in the non-shaded columns are from on-site analysis.

Results in the shaded columns are from laboratory analysis.

continued

Table 1. Comparison of October 2002 Analysis Results of Rose Hill Volatile Organic Compounds in Air (continued).

Sample Number	13487	12950		13486	12951		13483	12954	
Sample Location	Grid 9	Grid 9	% Diff.	Grid 9 Amb	Grid 9 Amb	% Diff.	Grid 15A	Grid 15A	% Diff.
Dichlorodifluoromethane	490	590	20	U	U		30	34	13.3
Dichlorotetrafluoroethane	130	160	23	U	U		U	U	
Vinyl Chloride	U	22		U	U		U	U	
Chloroethane	19	21	11	U	1.5		56	41	27
Trichlorofluoromethane	U	U		U	U		U	2.8	
Isopropyl Alcohol	U	U		U	U		U	U	
Acetone	43	91	112	5.3	48	806	U	85	
1,1-Dichloroethene	U	U		U	U		U	U	
Methylene Chloride	U	U		U	1.7		U	U	
trans-1,2-Dichloroethene	U	U		U	U		U	U	
Hexane	180	180	11	U	U		U	U	
1,1-Dichloroethane	6.1	U		U	U		51	48	
2-Butanone	U	U		U	U		U	U	
cis-1,2-Dichloroethene	9.3	8.8	5.4	U	U		U	U	
1,1,1-Trichloroethane	U	U		U	U		U	U	
Cyclohexane	170	97	43	U	U		19	17	11
Carbon Tetrachloride	U	U		U	U		U	U	
1,2-Dichloroethane	U	U		U	U		U	U	
Benzene	250	170	32	U	U		U	U	
Heptane	420	340	19	U	U		U	U	
Trichloroethene	U	U		U	U		U	4.1	
1,2-Dichloropropane	U	U		U	U		40	27	33
Toluene	24	19	21	U	2.1		130	91	30
Tetrachloroethene	U	U		U	U		U	5.5	
Chlorobenzene	640	620	3.1	U	U		10	U	
Ethylbenzene	790	790	0.0	U	1.3		14	4.3	69
m&p-Xylenes	650	630	3.1	U	1.4		U	4.2	
o-Xylene	130	110	15	U	U		U	U	
Styrene	U	U		U	U		U	U	
4-Ethyltoluene	230	150	35	U	U		23	U	
1,3,5-Trimethylbenzene	220	170	23	U	U		15	U	
1,2,4-Trimethylbenzene	370	340	8.1	5.7	U		33	4.6	86
1,3-Dichlorobenzene	U	U		U	U		U	U	
1,4-Dichlorobenzene	45	38	16	U	U		23	26	13
1,2-Dichlorobenzene	31	26	16	U	U		U	U	

Results are in part per billion by volume (ppbv)

U = None detected

% Diff. = percent difference

Results in the non-shaded columns are from on-site analysis.

Results in the shaded columns are from laboratory analysis.

continued

Table 1. Comparison of October 2002 Analysis Results of Rose Hill Volatile Organic Compounds in Air (concluded).

Sample Number	13485	12952	% Diff.	13484	12953	% Diff.
Sample Location	Grid 16	Grid 16		Grid 16 Dup.	Grid 16 Dup.	
Dichlorodifluoromethane	U	U		90	U	
Dichlorotetrafluoroethane	100	130	30	110	130	
Vinyl Chloride	U	U		U	U	
Chloroethane	U	U		U	U	
Trichlorofluoromethane	U	U		U	U	
Isopropyl Alcohol	U	U		U	U	
Acetone	U	U		U	U	
1,1-Dichloroethene	U	U		U	U	
Methylene Chloride	U	U		U	U	
trans-1,2-Dichloroethene	U	U		U	U	
Hexane	710	670	5.6	750	740	1.3
1,1-Dichloroethane	U	U		U	U	
2-Butanone	U	U		U	U	
cis-1,2-Dichloroethene	U	U		4.3	U	
1,1,1-Trichloroethane	U	U		U	U	
Cyclohexane	620	350	44	660	350	47
Carbon Tetrachloride	U	U		U	U	
1,2-Dichloroethane	U	U		U	U	
Benzene	130	94	28	140	98	30
Heptane	1100	890	19	1100	960	13
Trichloroethene	U	U		U	U	
1,2-Dichloropropane	U	U		U	U	
Toluene	31	18	42	30	18	40
Tetrachloroethene	U	U		U	U	
Chlorobenzene	800	730	8.8	820	710	13
Ethylbenzene	1300	1300	0.0	1400	1300	7.1
m&p-Xylenes	1300	1300	0.0	1400	1300	7.1
o-Xylene	74	51	31	76	52	32
Styrene	27	U		U	U	
4-Ethyltoluene	1600	1400	13	1700	1400	18
1,3,5-Trimethylbenzene	810	780	3.7	860	750	13
1,2,4-Trimethylbenzene	1300	1400	7.7	1400	1300	7.1
1,3-Dichlorobenzene	73	90	23	79	80	1.3
1,4-Dichlorobenzene	200	250	25	210	240	14
1,2-Dichlorobenzene	64	74	16	66	69	4.5

Results are in part per billion by volume (ppbv)

U = None detected

% Diff. = percent difference

Results in the non-shaded columns are from on-site analysis.

Results in the shaded columns are from laboratory analysis.

Table 2. Comparison of October 2002 Analysis Results of Rose Hill Fixed Gases.

Sample Number	13500	12941	% Diff.	13499	12942	% Diff.	13498	12943	% Diff.
Sample Location	Grid 137	Grid 137		Grid 137 D.	Grid 137 Dup.		Grid 137 Amb.	Grid 137 Amb.	
Oxygen	1.3	0.19	85.4	0.68	0.23	66.2	21	20	4.8
Nitrogen	4.8	1.2	75.0	2.4	0.79	67.1	76	78	2.6
Methane	57	56	1.8	59	56	5.1	0.11	U	
Carbon dioxide	40	42	5.0	42	42	0.0	0.099	U	

Sample Number	13497	12944	% Diff.	13496	12945	% Diff.	13495	12946	% Diff.
Sample Location	Grid 137 Amb. D.	Grid 137 Amb.		Grid 139	Grid 139		Grid 140	Grid 140	
Oxygen	21	20	4.8	0.57	U		1.4	1.8	28.6
Nitrogen	77	78	1.3	2.0	0.31	84.5	42	44	4.8
Methane	U	U		59	56	5.1	25	23	8.0
Carbon dioxide	0.035	U		43	43	0.0	29	31	6.9

Sample Number	13494	12947	% Diff.	13493	12948	% Diff.	13492	12949	% Diff.
Sample Location	Grid 131	Grid 131		Grid 80	Grid 80		Grid 146	Grid 146	
Oxygen	0.70	U		1.2	0.38	68.3	5.3	4.1	22.6
Nitrogen	6.8	5.2	23.5	21	19	9.5	67	67	0.0
Methane	55	53	3.6	44	43	2.3	7.8	7.8	0.0
Carbon dioxide	41	43	4.9	34	38	11.8	16	21	31.3

Results are in percent by volume (%v)

U = None detected

% Diff. = percent difference

Results in the non-shaded columns are from on-site analysis.

Results in the shaded columns are from laboratory analysis.

Average results from the replicates of the on-site analyses are entered here.

continued

Table 2. Comparison of October 2002 Analysis Results of Rose Hill Fixed Gases (concluded).

Sample Number	13490	12955	% Diff.	13489	12956	% Diff.	13488	12957	% Diff.
Sample Location	LFG7	PW7		LFG24	PW24		LFG1	PW1	
Oxygen	20	18	5.0	20	20	0.0	19	18	5.3
Nitrogen	77	82	6.5	77	80	3.9	77	83	7.8
Methane	U	U		U	U		U	U	
Carbon dioxide	0.82	1.5	82.9	0.89	1.2	34.8	2.3	3.0	30.4

Sample Number	13487	12950	% Diff.	13486	12951	% Diff.	13483	12954	% Diff.
Sample Location	Grid 9	Grid 9		Grid 9 Amb	Grid 9 Amb		Grid 15A	Grid 15A	
Oxygen	2.1	0.97	53.8	21	20	4.8	2.9	1.6	44.8
Nitrogen	65	66	1.5	77	82	6.5	77	79	2.6
Methane	11	11	0.0	U	U		0.083	U	
Carbon dioxide	20	24	20.0	0.038	U		16	21	31.3

Sample Number	13485	12952	% Diff.	13484	12953	% Diff.
Sample Location	Grid 16	Grid 16		Grid 16 Dup.	Grid 16 Dup.	
Oxygen	2.3	U		0.63	0.30	52.4
Nitrogen	8.7	1.4	83.9	2.8	1.8	35.7
Methane	60	63	5.0	66	63	4.5
Carbon dioxide	33	38	15.2	37	38	2.7

Results are in percent by volume (%v)

U = None detected

% Diff. = percent difference

Results in the non-shaded columns are from on-site analysis.

Results in the shaded columns are from laboratory analysis.

Average results from the replicates of the on-site analyses are entered here.

Appendix D

LandGEM Model Runs

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Table D-1. Northern Parcel Methane Emission Rate from Year 1968 to 2203.

Source: H:\3000\030177~1.000\030177~1.002\ROSEHI~1\NORTHERN.PRM

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=====
                                Model Parameters
=====
Lo : 170.00 m^3 / Mg ***** User Mode Selection *****
k : 0.0500 1/yr ***** User Mode Selection *****
NMOC : 4500.00 ppmv ***** User Mode Selection *****
Methane : 56.0000 % volume
Carbon Dioxide : 44.0000 % volume
=====

                                Landfill Parameters
=====
Landfill type : Co-Disposal
Year Opened : 1967      Current Year : 2003  Closure Year: 2004
Capacity : 197692 Mg
Average Acceptance Rate Required from
      Current Year to Closure Year : 13179.47 Mg/year
=====

                                Model Results
=====
Year      Refuse In Place (Mg)      Methane Emission Rate
                                (Mg/yr)      (Cubic m/yr)
=====
1968      1.318E+04      7.474E+01      1.120E+05
1969      2.636E+04      1.458E+02      2.186E+05
1970      3.954E+04      2.135E+02      3.200E+05
1971      5.272E+04      2.778E+02      4.164E+05
1972      6.590E+04      3.390E+02      5.081E+05
1973      7.908E+04      3.972E+02      5.953E+05
1974      9.226E+04      4.525E+02      6.783E+05
1975      1.054E+05      5.052E+02      7.573E+05
1976      1.186E+05      5.553E+02      8.324E+05
1977      1.318E+05      6.030E+02      9.038E+05
1978      1.450E+05      6.483E+02      9.717E+05
1979      1.582E+05      6.914E+02      1.036E+06
1980      1.713E+05      7.324E+02      1.098E+06
1981      1.845E+05      7.714E+02      1.156E+06
1982      1.977E+05      8.086E+02      1.212E+06
1983      1.977E+05      7.691E+02      1.153E+06
1984      1.977E+05      7.316E+02      1.097E+06
1985      1.977E+05      6.959E+02      1.043E+06
1986      1.977E+05      6.620E+02      9.923E+05
1987      1.977E+05      6.297E+02      9.439E+05
1988      1.977E+05      5.990E+02      8.978E+05
1989      1.977E+05      5.698E+02      8.541E+05
1990      1.977E+05      5.420E+02      8.124E+05
1991      1.977E+05      5.156E+02      7.728E+05
1992      1.977E+05      4.904E+02      7.351E+05
1993      1.977E+05      4.665E+02      6.992E+05
1994      1.977E+05      4.437E+02      6.651E+05
1995      1.977E+05      4.221E+02      6.327E+05
1996      1.977E+05      4.015E+02      6.018E+05
1997      1.977E+05      3.819E+02      5.725E+05
1998      1.977E+05      3.633E+02      5.446E+05
1999      1.977E+05      3.456E+02      5.180E+05
2000      1.977E+05      3.287E+02      4.927E+05
2001      1.977E+05      3.127E+02      4.687E+05
2002      1.977E+05      2.975E+02      4.459E+05
2003      1.977E+05      2.829E+02      4.241E+05
2004      1.977E+05      2.691E+02      4.034E+05
2005      1.977E+05      2.560E+02      3.838E+05
2006      1.977E+05      2.435E+02      3.650E+05
2007      1.977E+05      2.317E+02      3.472E+05
2008      1.977E+05      2.204E+02      3.303E+05
2009      1.977E+05      2.096E+02      3.142E+05
2010      1.977E+05      1.994E+02      2.989E+05
2011      1.977E+05      1.897E+02      2.843E+05
2012      1.977E+05      1.804E+02      2.704E+05
2013      1.977E+05      1.716E+02      2.572E+05
2014      1.977E+05      1.632E+02      2.447E+05
=====

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Table D-1. Northern Parcel Methane Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2015	1.977E+05	1.553E+02	2.328E+05
2016	1.977E+05	1.477E+02	2.214E+05
2017	1.977E+05	1.405E+02	2.106E+05
2018	1.977E+05	1.337E+02	2.003E+05
2019	1.977E+05	1.271E+02	1.906E+05
2020	1.977E+05	1.209E+02	1.813E+05
2021	1.977E+05	1.150E+02	1.724E+05
2022	1.977E+05	1.094E+02	1.640E+05
2023	1.977E+05	1.041E+02	1.560E+05
2024	1.977E+05	9.901E+01	1.484E+05
2025	1.977E+05	9.419E+01	1.412E+05
2026	1.977E+05	8.959E+01	1.343E+05
2027	1.977E+05	8.522E+01	1.277E+05
2028	1.977E+05	8.107E+01	1.215E+05
2029	1.977E+05	7.711E+01	1.156E+05
2030	1.977E+05	7.335E+01	1.099E+05
2031	1.977E+05	6.977E+01	1.046E+05
2032	1.977E+05	6.637E+01	9.949E+04
2033	1.977E+05	6.313E+01	9.463E+04
2034	1.977E+05	6.006E+01	9.002E+04
2035	1.977E+05	5.713E+01	8.563E+04
2036	1.977E+05	5.434E+01	8.145E+04
2037	1.977E+05	5.169E+01	7.748E+04
2038	1.977E+05	4.917E+01	7.370E+04
2039	1.977E+05	4.677E+01	7.011E+04
2040	1.977E+05	4.449E+01	6.669E+04
2041	1.977E+05	4.232E+01	6.343E+04
2042	1.977E+05	4.026E+01	6.034E+04
2043	1.977E+05	3.829E+01	5.740E+04
2044	1.977E+05	3.643E+01	5.460E+04
2045	1.977E+05	3.465E+01	5.194E+04
2046	1.977E+05	3.296E+01	4.940E+04
2047	1.977E+05	3.135E+01	4.699E+04
2048	1.977E+05	2.982E+01	4.470E+04
2049	1.977E+05	2.837E+01	4.252E+04
2050	1.977E+05	2.698E+01	4.045E+04
2051	1.977E+05	2.567E+01	3.847E+04
2052	1.977E+05	2.442E+01	3.660E+04
2053	1.977E+05	2.323E+01	3.481E+04
2054	1.977E+05	2.209E+01	3.312E+04
2055	1.977E+05	2.102E+01	3.150E+04
2056	1.977E+05	1.999E+01	2.996E+04
2057	1.977E+05	1.902E+01	2.850E+04
2058	1.977E+05	1.809E+01	2.711E+04
2059	1.977E+05	1.721E+01	2.579E+04
2060	1.977E+05	1.637E+01	2.453E+04
2061	1.977E+05	1.557E+01	2.334E+04
2062	1.977E+05	1.481E+01	2.220E+04
2063	1.977E+05	1.409E+01	2.112E+04
2064	1.977E+05	1.340E+01	2.009E+04
2065	1.977E+05	1.275E+01	1.911E+04
2066	1.977E+05	1.212E+01	1.817E+04
2067	1.977E+05	1.153E+01	1.729E+04
2068	1.977E+05	1.097E+01	1.644E+04
2069	1.977E+05	1.044E+01	1.564E+04
2070	1.977E+05	9.927E+00	1.488E+04
2071	1.977E+05	9.443E+00	1.415E+04
2072	1.977E+05	8.982E+00	1.346E+04
2073	1.977E+05	8.544E+00	1.281E+04
2074	1.977E+05	8.128E+00	1.218E+04
2075	1.977E+05	7.731E+00	1.159E+04
2076	1.977E+05	7.354E+00	1.102E+04
2077	1.977E+05	6.995E+00	1.049E+04
2078	1.977E+05	6.654E+00	9.974E+03
2079	1.977E+05	6.330E+00	9.488E+03
2080	1.977E+05	6.021E+00	9.025E+03
2081	1.977E+05	5.727E+00	8.585E+03
2082	1.977E+05	5.448E+00	8.166E+03
2083	1.977E+05	5.182E+00	7.768E+03
2084	1.977E+05	4.930E+00	7.389E+03
2085	1.977E+05	4.689E+00	7.029E+03

Table D-1. Northern Parcel Methane Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2086	1.977E+05	4.461E+00	6.686E+03
2087	1.977E+05	4.243E+00	6.360E+03
2088	1.977E+05	4.036E+00	6.050E+03
2089	1.977E+05	3.839E+00	5.755E+03
2090	1.977E+05	3.652E+00	5.474E+03
2091	1.977E+05	3.474E+00	5.207E+03
2092	1.977E+05	3.304E+00	4.953E+03
2093	1.977E+05	3.143E+00	4.712E+03
2094	1.977E+05	2.990E+00	4.482E+03
2095	1.977E+05	2.844E+00	4.263E+03
2096	1.977E+05	2.705E+00	4.055E+03
2097	1.977E+05	2.573E+00	3.857E+03
2098	1.977E+05	2.448E+00	3.669E+03
2099	1.977E+05	2.329E+00	3.490E+03
2100	1.977E+05	2.215E+00	3.320E+03
2101	1.977E+05	2.107E+00	3.158E+03
2102	1.977E+05	2.004E+00	3.004E+03
2103	1.977E+05	1.906E+00	2.858E+03
2104	1.977E+05	1.814E+00	2.718E+03
2105	1.977E+05	1.725E+00	2.586E+03
2106	1.977E+05	1.641E+00	2.460E+03
2107	1.977E+05	1.561E+00	2.340E+03
2108	1.977E+05	1.485E+00	2.226E+03
2109	1.977E+05	1.412E+00	2.117E+03
2110	1.977E+05	1.343E+00	2.014E+03
2111	1.977E+05	1.278E+00	1.916E+03
2112	1.977E+05	1.216E+00	1.822E+03
2113	1.977E+05	1.156E+00	1.733E+03
2114	1.977E+05	1.100E+00	1.649E+03
2115	1.977E+05	1.046E+00	1.568E+03
2116	1.977E+05	9.953E-01	1.492E+03
2117	1.977E+05	9.467E-01	1.419E+03
2118	1.977E+05	9.006E-01	1.350E+03
2119	1.977E+05	8.566E-01	1.284E+03
2120	1.977E+05	8.149E-01	1.221E+03
2121	1.977E+05	7.751E-01	1.162E+03
2122	1.977E+05	7.373E-01	1.105E+03
2123	1.977E+05	7.014E-01	1.051E+03
2124	1.977E+05	6.672E-01	1.000E+03
2125	1.977E+05	6.346E-01	9.512E+02
2126	1.977E+05	6.037E-01	9.048E+02
2127	1.977E+05	5.742E-01	8.607E+02
2128	1.977E+05	5.462E-01	8.187E+02
2129	1.977E+05	5.196E-01	7.788E+02
2130	1.977E+05	4.942E-01	7.408E+02
2131	1.977E+05	4.701E-01	7.047E+02
2132	1.977E+05	4.472E-01	6.703E+02
2133	1.977E+05	4.254E-01	6.376E+02
2134	1.977E+05	4.046E-01	6.065E+02
2135	1.977E+05	3.849E-01	5.770E+02
2136	1.977E+05	3.661E-01	5.488E+02
2137	1.977E+05	3.483E-01	5.220E+02
2138	1.977E+05	3.313E-01	4.966E+02
2139	1.977E+05	3.151E-01	4.724E+02
2140	1.977E+05	2.998E-01	4.493E+02
2141	1.977E+05	2.852E-01	4.274E+02
2142	1.977E+05	2.712E-01	4.066E+02
2143	1.977E+05	2.580E-01	3.867E+02
2144	1.977E+05	2.454E-01	3.679E+02
2145	1.977E+05	2.335E-01	3.499E+02
2146	1.977E+05	2.221E-01	3.329E+02
2147	1.977E+05	2.112E-01	3.166E+02
2148	1.977E+05	2.009E-01	3.012E+02
2149	1.977E+05	1.911E-01	2.865E+02
2150	1.977E+05	1.818E-01	2.725E+02
2151	1.977E+05	1.730E-01	2.592E+02
2152	1.977E+05	1.645E-01	2.466E+02
2153	1.977E+05	1.565E-01	2.346E+02
2154	1.977E+05	1.489E-01	2.231E+02
2155	1.977E+05	1.416E-01	2.122E+02
2156	1.977E+05	1.347E-01	2.019E+02

Table D-1. Northern Parcel Methane Emission Rate from Year 1968 to 2203 (concluded).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2157	1.977E+05	1.281E-01	1.921E+02
2158	1.977E+05	1.219E-01	1.827E+02
2159	1.977E+05	1.159E-01	1.738E+02
2160	1.977E+05	1.103E-01	1.653E+02
2161	1.977E+05	1.049E-01	1.572E+02
2162	1.977E+05	9.979E-02	1.496E+02
2163	1.977E+05	9.492E-02	1.423E+02
2164	1.977E+05	9.029E-02	1.353E+02
2165	1.977E+05	8.589E-02	1.287E+02
2166	1.977E+05	8.170E-02	1.225E+02
2167	1.977E+05	7.771E-02	1.165E+02
2168	1.977E+05	7.392E-02	1.108E+02
2169	1.977E+05	7.032E-02	1.054E+02
2170	1.977E+05	6.689E-02	1.003E+02
2171	1.977E+05	6.363E-02	9.537E+01
2172	1.977E+05	6.052E-02	9.072E+01
2173	1.977E+05	5.757E-02	8.629E+01
2174	1.977E+05	5.476E-02	8.209E+01
2175	1.977E+05	5.209E-02	7.808E+01
2176	1.977E+05	4.955E-02	7.427E+01
2177	1.977E+05	4.714E-02	7.065E+01
2178	1.977E+05	4.484E-02	6.721E+01
2179	1.977E+05	4.265E-02	6.393E+01
2180	1.977E+05	4.057E-02	6.081E+01
2181	1.977E+05	3.859E-02	5.784E+01
2182	1.977E+05	3.671E-02	5.502E+01
2183	1.977E+05	3.492E-02	5.234E+01
2184	1.977E+05	3.322E-02	4.979E+01
2185	1.977E+05	3.160E-02	4.736E+01
2186	1.977E+05	3.005E-02	4.505E+01
2187	1.977E+05	2.859E-02	4.285E+01
2188	1.977E+05	2.719E-02	4.076E+01
2189	1.977E+05	2.587E-02	3.877E+01
2190	1.977E+05	2.461E-02	3.688E+01
2191	1.977E+05	2.341E-02	3.508E+01
2192	1.977E+05	2.227E-02	3.337E+01
2193	1.977E+05	2.118E-02	3.175E+01
2194	1.977E+05	2.015E-02	3.020E+01
2195	1.977E+05	1.916E-02	2.872E+01
2196	1.977E+05	1.823E-02	2.732E+01
2197	1.977E+05	1.734E-02	2.599E+01
2198	1.977E+05	1.649E-02	2.472E+01
2199	1.977E+05	1.569E-02	2.352E+01
2200	1.977E+05	1.492E-02	2.237E+01
2201	1.977E+05	1.420E-02	2.128E+01
2202	1.977E+05	1.350E-02	2.024E+01
2203	1.977E+05	1.285E-02	1.925E+01

Table D-2. Northern Parcel NMOC Emission Rate from Year 1968 to 2203.

Source: H:\3000\030177~1.000\030177~1.002\ROSEHI~1\NORTHERN.PRM

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=====
                          Model Parameters
=====
Lo : 170.00 m^3 / Mg ***** User Mode Selection *****
k : 0.0500 1/yr ***** User Mode Selection *****
NMOC : 4500.00 ppmv ***** User Mode Selection *****
Methane : 56.0000 % volume
Carbon Dioxide : 44.0000 % volume
=====

                          Landfill Parameters
=====
Landfill type : Co-Disposal
Year Opened : 1967   Current Year : 2003   Closure Year: 2004
Capacity : 197692 Mg
Average Acceptance Rate Required from
      Current Year to Closure Year : 13179.47 Mg/year
=====

                          Model Results
=====
Year      Refuse In Place (Mg)      NMOC Emission Rate
                          (Mg/yr)      (Cubic m/yr)
-----
1968      1.318E+04      3.227E+00      9.002E+02
1969      2.636E+04      6.296E+00      1.757E+03
1970      3.954E+04      9.216E+00      2.571E+03
1971      5.272E+04      1.199E+01      3.346E+03
1972      6.590E+04      1.463E+01      4.083E+03
1973      7.908E+04      1.715E+01      4.784E+03
1974      9.226E+04      1.954E+01      5.451E+03
1975      1.054E+05      2.181E+01      6.085E+03
1976      1.186E+05      2.398E+01      6.689E+03
1977      1.318E+05      2.603E+01      7.263E+03
1978      1.450E+05      2.799E+01      7.809E+03
1979      1.582E+05      2.985E+01      8.328E+03
1980      1.713E+05      3.162E+01      8.822E+03
1981      1.845E+05      3.331E+01      9.292E+03
1982      1.977E+05      3.491E+01      9.739E+03
1983      1.977E+05      3.321E+01      9.264E+03
1984      1.977E+05      3.159E+01      8.812E+03
1985      1.977E+05      3.005E+01      8.382E+03
1986      1.977E+05      2.858E+01      7.974E+03
1987      1.977E+05      2.719E+01      7.585E+03
1988      1.977E+05      2.586E+01      7.215E+03
1989      1.977E+05      2.460E+01      6.863E+03
1990      1.977E+05      2.340E+01      6.528E+03
1991      1.977E+05      2.226E+01      6.210E+03
1992      1.977E+05      2.117E+01      5.907E+03
1993      1.977E+05      2.014E+01      5.619E+03
1994      1.977E+05      1.916E+01      5.345E+03
1995      1.977E+05      1.822E+01      5.084E+03
1996      1.977E+05      1.734E+01      4.836E+03
1997      1.977E+05      1.649E+01      4.600E+03
1998      1.977E+05      1.569E+01      4.376E+03
1999      1.977E+05      1.492E+01      4.163E+03
2000      1.977E+05      1.419E+01      3.960E+03
2001      1.977E+05      1.350E+01      3.766E+03
2002      1.977E+05      1.284E+01      3.583E+03
2003      1.977E+05      1.222E+01      3.408E+03
2004      1.977E+05      1.162E+01      3.242E+03
2005      1.977E+05      1.105E+01      3.084E+03
2006      1.977E+05      1.051E+01      2.933E+03
2007      1.977E+05      1.000E+01      2.790E+03
2008      1.977E+05      9.514E+00      2.654E+03
2009      1.977E+05      9.050E+00      2.525E+03
2010      1.977E+05      8.609E+00      2.402E+03
2011      1.977E+05      8.189E+00      2.285E+03
2012      1.977E+05      7.789E+00      2.173E+03
2013      1.977E+05      7.409E+00      2.067E+03
2014      1.977E+05      7.048E+00      1.966E+03
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Table D-2. Northern Parcel NMOC Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2015	1.977E+05	6.704E+00	1.870E+03
2016	1.977E+05	6.377E+00	1.779E+03
2017	1.977E+05	6.066E+00	1.692E+03
2018	1.977E+05	5.770E+00	1.610E+03
2019	1.977E+05	5.489E+00	1.531E+03
2020	1.977E+05	5.221E+00	1.457E+03
2021	1.977E+05	4.967E+00	1.386E+03
2022	1.977E+05	4.724E+00	1.318E+03
2023	1.977E+05	4.494E+00	1.254E+03
2024	1.977E+05	4.275E+00	1.193E+03
2025	1.977E+05	4.066E+00	1.134E+03
2026	1.977E+05	3.868E+00	1.079E+03
2027	1.977E+05	3.679E+00	1.026E+03
2028	1.977E+05	3.500E+00	9.764E+02
2029	1.977E+05	3.329E+00	9.288E+02
2030	1.977E+05	3.167E+00	8.835E+02
2031	1.977E+05	3.012E+00	8.404E+02
2032	1.977E+05	2.866E+00	7.994E+02
2033	1.977E+05	2.726E+00	7.604E+02
2034	1.977E+05	2.593E+00	7.234E+02
2035	1.977E+05	2.466E+00	6.881E+02
2036	1.977E+05	2.346E+00	6.545E+02
2037	1.977E+05	2.232E+00	6.226E+02
2038	1.977E+05	2.123E+00	5.922E+02
2039	1.977E+05	2.019E+00	5.634E+02
2040	1.977E+05	1.921E+00	5.359E+02
2041	1.977E+05	1.827E+00	5.097E+02
2042	1.977E+05	1.738E+00	4.849E+02
2043	1.977E+05	1.653E+00	4.612E+02
2044	1.977E+05	1.573E+00	4.387E+02
2045	1.977E+05	1.496E+00	4.173E+02
2046	1.977E+05	1.423E+00	3.970E+02
2047	1.977E+05	1.354E+00	3.776E+02
2048	1.977E+05	1.288E+00	3.592E+02
2049	1.977E+05	1.225E+00	3.417E+02
2050	1.977E+05	1.165E+00	3.250E+02
2051	1.977E+05	1.108E+00	3.092E+02
2052	1.977E+05	1.054E+00	2.941E+02
2053	1.977E+05	1.003E+00	2.798E+02
2054	1.977E+05	9.539E-01	2.661E+02
2055	1.977E+05	9.073E-01	2.531E+02
2056	1.977E+05	8.631E-01	2.408E+02
2057	1.977E+05	8.210E-01	2.290E+02
2058	1.977E+05	7.810E-01	2.179E+02
2059	1.977E+05	7.429E-01	2.072E+02
2060	1.977E+05	7.066E-01	1.971E+02
2061	1.977E+05	6.722E-01	1.875E+02
2062	1.977E+05	6.394E-01	1.784E+02
2063	1.977E+05	6.082E-01	1.697E+02
2064	1.977E+05	5.785E-01	1.614E+02
2065	1.977E+05	5.503E-01	1.535E+02
2066	1.977E+05	5.235E-01	1.460E+02
2067	1.977E+05	4.980E-01	1.389E+02
2068	1.977E+05	4.737E-01	1.321E+02
2069	1.977E+05	4.506E-01	1.257E+02
2070	1.977E+05	4.286E-01	1.196E+02
2071	1.977E+05	4.077E-01	1.137E+02
2072	1.977E+05	3.878E-01	1.082E+02
2073	1.977E+05	3.689E-01	1.029E+02
2074	1.977E+05	3.509E-01	9.790E+01
2075	1.977E+05	3.338E-01	9.312E+01
2076	1.977E+05	3.175E-01	8.858E+01
2077	1.977E+05	3.020E-01	8.426E+01
2078	1.977E+05	2.873E-01	8.015E+01
2079	1.977E+05	2.733E-01	7.624E+01
2080	1.977E+05	2.600E-01	7.252E+01
2081	1.977E+05	2.473E-01	6.899E+01
2082	1.977E+05	2.352E-01	6.562E+01
2083	1.977E+05	2.237E-01	6.242E+01
2084	1.977E+05	2.128E-01	5.938E+01
2085	1.977E+05	2.025E-01	5.648E+01

Table D-2. Northern Parcel NMOC Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2086	1.977E+05	1.926E-01	5.373E+01
2087	1.977E+05	1.832E-01	5.111E+01
2088	1.977E+05	1.743E-01	4.861E+01
2089	1.977E+05	1.658E-01	4.624E+01
2090	1.977E+05	1.577E-01	4.399E+01
2091	1.977E+05	1.500E-01	4.184E+01
2092	1.977E+05	1.427E-01	3.980E+01
2093	1.977E+05	1.357E-01	3.786E+01
2094	1.977E+05	1.291E-01	3.601E+01
2095	1.977E+05	1.228E-01	3.426E+01
2096	1.977E+05	1.168E-01	3.259E+01
2097	1.977E+05	1.111E-01	3.100E+01
2098	1.977E+05	1.057E-01	2.949E+01
2099	1.977E+05	1.005E-01	2.805E+01
2100	1.977E+05	9.563E-02	2.668E+01
2101	1.977E+05	9.097E-02	2.538E+01
2102	1.977E+05	8.653E-02	2.414E+01
2103	1.977E+05	8.231E-02	2.296E+01
2104	1.977E+05	7.830E-02	2.184E+01
2105	1.977E+05	7.448E-02	2.078E+01
2106	1.977E+05	7.085E-02	1.976E+01
2107	1.977E+05	6.739E-02	1.880E+01
2108	1.977E+05	6.410E-02	1.788E+01
2109	1.977E+05	6.098E-02	1.701E+01
2110	1.977E+05	5.800E-02	1.618E+01
2111	1.977E+05	5.518E-02	1.539E+01
2112	1.977E+05	5.248E-02	1.464E+01
2113	1.977E+05	4.992E-02	1.393E+01
2114	1.977E+05	4.749E-02	1.325E+01
2115	1.977E+05	4.517E-02	1.260E+01
2116	1.977E+05	4.297E-02	1.199E+01
2117	1.977E+05	4.087E-02	1.140E+01
2118	1.977E+05	3.888E-02	1.085E+01
2119	1.977E+05	3.699E-02	1.032E+01
2120	1.977E+05	3.518E-02	9.815E+00
2121	1.977E+05	3.347E-02	9.336E+00
2122	1.977E+05	3.183E-02	8.881E+00
2123	1.977E+05	3.028E-02	8.448E+00
2124	1.977E+05	2.880E-02	8.036E+00
2125	1.977E+05	2.740E-02	7.644E+00
2126	1.977E+05	2.606E-02	7.271E+00
2127	1.977E+05	2.479E-02	6.916E+00
2128	1.977E+05	2.358E-02	6.579E+00
2129	1.977E+05	2.243E-02	6.258E+00
2130	1.977E+05	2.134E-02	5.953E+00
2131	1.977E+05	2.030E-02	5.663E+00
2132	1.977E+05	1.931E-02	5.387E+00
2133	1.977E+05	1.837E-02	5.124E+00
2134	1.977E+05	1.747E-02	4.874E+00
2135	1.977E+05	1.662E-02	4.636E+00
2136	1.977E+05	1.581E-02	4.410E+00
2137	1.977E+05	1.504E-02	4.195E+00
2138	1.977E+05	1.430E-02	3.990E+00
2139	1.977E+05	1.361E-02	3.796E+00
2140	1.977E+05	1.294E-02	3.611E+00
2141	1.977E+05	1.231E-02	3.435E+00
2142	1.977E+05	1.171E-02	3.267E+00
2143	1.977E+05	1.114E-02	3.108E+00
2144	1.977E+05	1.060E-02	2.956E+00
2145	1.977E+05	1.008E-02	2.812E+00
2146	1.977E+05	9.588E-03	2.675E+00
2147	1.977E+05	9.120E-03	2.544E+00
2148	1.977E+05	8.676E-03	2.420E+00
2149	1.977E+05	8.252E-03	2.302E+00
2150	1.977E+05	7.850E-03	2.190E+00
2151	1.977E+05	7.467E-03	2.083E+00
2152	1.977E+05	7.103E-03	1.982E+00
2153	1.977E+05	6.757E-03	1.885E+00
2154	1.977E+05	6.427E-03	1.793E+00
2155	1.977E+05	6.114E-03	1.706E+00
2156	1.977E+05	5.815E-03	1.622E+00

Table D-2. Northern Parcel NMOC Emission Rate from Year 1968 to 2203 (concluded).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2157	1.977E+05	5.532E-03	1.543E+00
2158	1.977E+05	5.262E-03	1.468E+00
2159	1.977E+05	5.005E-03	1.396E+00
2160	1.977E+05	4.761E-03	1.328E+00
2161	1.977E+05	4.529E-03	1.264E+00
2162	1.977E+05	4.308E-03	1.202E+00
2163	1.977E+05	4.098E-03	1.143E+00
2164	1.977E+05	3.898E-03	1.088E+00
2165	1.977E+05	3.708E-03	1.034E+00
2166	1.977E+05	3.527E-03	9.840E-01
2167	1.977E+05	3.355E-03	9.360E-01
2168	1.977E+05	3.192E-03	8.904E-01
2169	1.977E+05	3.036E-03	8.470E-01
2170	1.977E+05	2.888E-03	8.057E-01
2171	1.977E+05	2.747E-03	7.664E-01
2172	1.977E+05	2.613E-03	7.290E-01
2173	1.977E+05	2.486E-03	6.934E-01
2174	1.977E+05	2.364E-03	6.596E-01
2175	1.977E+05	2.249E-03	6.274E-01
2176	1.977E+05	2.139E-03	5.968E-01
2177	1.977E+05	2.035E-03	5.677E-01
2178	1.977E+05	1.936E-03	5.400E-01
2179	1.977E+05	1.841E-03	5.137E-01
2180	1.977E+05	1.752E-03	4.887E-01
2181	1.977E+05	1.666E-03	4.648E-01
2182	1.977E+05	1.585E-03	4.422E-01
2183	1.977E+05	1.508E-03	4.206E-01
2184	1.977E+05	1.434E-03	4.001E-01
2185	1.977E+05	1.364E-03	3.806E-01
2186	1.977E+05	1.298E-03	3.620E-01
2187	1.977E+05	1.234E-03	3.443E-01
2188	1.977E+05	1.174E-03	3.276E-01
2189	1.977E+05	1.117E-03	3.116E-01
2190	1.977E+05	1.062E-03	2.964E-01
2191	1.977E+05	1.011E-03	2.819E-01
2192	1.977E+05	9.613E-04	2.682E-01
2193	1.977E+05	9.144E-04	2.551E-01
2194	1.977E+05	8.698E-04	2.427E-01
2195	1.977E+05	8.274E-04	2.308E-01
2196	1.977E+05	7.870E-04	2.196E-01
2197	1.977E+05	7.486E-04	2.089E-01
2198	1.977E+05	7.121E-04	1.987E-01
2199	1.977E+05	6.774E-04	1.890E-01
2200	1.977E+05	6.444E-04	1.798E-01
2201	1.977E+05	6.129E-04	1.710E-01
2202	1.977E+05	5.830E-04	1.627E-01
2203	1.977E+05	5.546E-04	1.547E-01

Table D-3. Northern Parcel 1,1,1,-Trichloroethane Emission Rate from Year 1968 to 2203.

Source: H:\3000\030177~1.000\030177~1.002\ROSEHI~1\NORTHERN.PRM

Model Parameters

Lo : 170.00 m³ / Mg ***** User Mode Selection *****
 k : 0.0500 1/yr ***** User Mode Selection *****
 NMOC : 4500.00 ppmv ***** User Mode Selection *****
 Methane : 56.0000 % volume
 Carbon Dioxide : 44.0000 % volume
 Air Pollutant : 1,1,1-Trichloroethane (HAP)
 Molecular Wt = 133.41 Concentration = 0.580000 ppmV

Landfill Parameters

Landfill type : Co-Disposal
 Year Opened : 1967 Current Year : 2003 Closure Year: 2004
 Capacity : 197692 Mg
 Average Acceptance Rate Required from
 Current Year to Closure Year : 13179.47 Mg/year

Model Results

Year	Refuse In Place (Mg)	1,1,1-Trichloroethane (HAP) Emission Rate (Mg/yr)	(Cubic m/yr)
1968	1.318E+04	6.438E-04	1.160E-01
1969	2.636E+04	1.256E-03	2.264E-01
1970	3.954E+04	1.839E-03	3.314E-01
1971	5.272E+04	2.393E-03	4.312E-01
1972	6.590E+04	2.920E-03	5.262E-01
1973	7.908E+04	3.421E-03	6.166E-01
1974	9.226E+04	3.898E-03	7.026E-01
1975	1.054E+05	4.352E-03	7.843E-01
1976	1.186E+05	4.784E-03	8.621E-01
1977	1.318E+05	5.194E-03	9.361E-01
1978	1.450E+05	5.585E-03	1.006E+00
1979	1.582E+05	5.956E-03	1.073E+00
1980	1.713E+05	6.309E-03	1.137E+00
1981	1.845E+05	6.646E-03	1.198E+00
1982	1.977E+05	6.965E-03	1.255E+00
1983	1.977E+05	6.626E-03	1.194E+00
1984	1.977E+05	6.302E-03	1.136E+00
1985	1.977E+05	5.995E-03	1.080E+00
1986	1.977E+05	5.703E-03	1.028E+00
1987	1.977E+05	5.425E-03	9.776E-01
1988	1.977E+05	5.160E-03	9.299E-01
1989	1.977E+05	4.908E-03	8.846E-01
1990	1.977E+05	4.669E-03	8.414E-01
1991	1.977E+05	4.441E-03	8.004E-01
1992	1.977E+05	4.225E-03	7.613E-01
1993	1.977E+05	4.019E-03	7.242E-01
1994	1.977E+05	3.823E-03	6.889E-01
1995	1.977E+05	3.636E-03	6.553E-01
1996	1.977E+05	3.459E-03	6.233E-01
1997	1.977E+05	3.290E-03	5.929E-01
1998	1.977E+05	3.130E-03	5.640E-01
1999	1.977E+05	2.977E-03	5.365E-01
2000	1.977E+05	2.832E-03	5.103E-01
2001	1.977E+05	2.694E-03	4.855E-01
2002	1.977E+05	2.562E-03	4.618E-01
2003	1.977E+05	2.437E-03	4.393E-01
2004	1.977E+05	2.319E-03	4.178E-01
2005	1.977E+05	2.205E-03	3.975E-01
2006	1.977E+05	2.098E-03	3.781E-01
2007	1.977E+05	1.996E-03	3.596E-01
2008	1.977E+05	1.898E-03	3.421E-01
2009	1.977E+05	1.806E-03	3.254E-01
2010	1.977E+05	1.718E-03	3.095E-01
2011	1.977E+05	1.634E-03	2.944E-01
2012	1.977E+05	1.554E-03	2.801E-01

Table D-3. Northern Parcel 1,1,1,-Trichloroethane Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2013	1.977E+05	1.478E-03	2.664E-01
2014	1.977E+05	1.406E-03	2.534E-01
2015	1.977E+05	1.338E-03	2.411E-01
2016	1.977E+05	1.272E-03	2.293E-01
2017	1.977E+05	1.210E-03	2.181E-01
2018	1.977E+05	1.151E-03	2.075E-01
2019	1.977E+05	1.095E-03	1.974E-01
2020	1.977E+05	1.042E-03	1.877E-01
2021	1.977E+05	9.910E-04	1.786E-01
2022	1.977E+05	9.427E-04	1.699E-01
2023	1.977E+05	8.967E-04	1.616E-01
2024	1.977E+05	8.529E-04	1.537E-01
2025	1.977E+05	8.113E-04	1.462E-01
2026	1.977E+05	7.718E-04	1.391E-01
2027	1.977E+05	7.341E-04	1.323E-01
2028	1.977E+05	6.983E-04	1.259E-01
2029	1.977E+05	6.643E-04	1.197E-01
2030	1.977E+05	6.319E-04	1.139E-01
2031	1.977E+05	6.011E-04	1.083E-01
2032	1.977E+05	5.717E-04	1.030E-01
2033	1.977E+05	5.439E-04	9.801E-02
2034	1.977E+05	5.173E-04	9.323E-02
2035	1.977E+05	4.921E-04	8.869E-02
2036	1.977E+05	4.681E-04	8.436E-02
2037	1.977E+05	4.453E-04	8.025E-02
2038	1.977E+05	4.236E-04	7.633E-02
2039	1.977E+05	4.029E-04	7.261E-02
2040	1.977E+05	3.833E-04	6.907E-02
2041	1.977E+05	3.646E-04	6.570E-02
2042	1.977E+05	3.468E-04	6.250E-02
2043	1.977E+05	3.299E-04	5.945E-02
2044	1.977E+05	3.138E-04	5.655E-02
2045	1.977E+05	2.985E-04	5.379E-02
2046	1.977E+05	2.839E-04	5.117E-02
2047	1.977E+05	2.701E-04	4.867E-02
2048	1.977E+05	2.569E-04	4.630E-02
2049	1.977E+05	2.444E-04	4.404E-02
2050	1.977E+05	2.325E-04	4.189E-02
2051	1.977E+05	2.211E-04	3.985E-02
2052	1.977E+05	2.103E-04	3.791E-02
2053	1.977E+05	2.001E-04	3.606E-02
2054	1.977E+05	1.903E-04	3.430E-02
2055	1.977E+05	1.810E-04	3.263E-02
2056	1.977E+05	1.722E-04	3.103E-02
2057	1.977E+05	1.638E-04	2.952E-02
2058	1.977E+05	1.558E-04	2.808E-02
2059	1.977E+05	1.482E-04	2.671E-02
2060	1.977E+05	1.410E-04	2.541E-02
2061	1.977E+05	1.341E-04	2.417E-02
2062	1.977E+05	1.276E-04	2.299E-02
2063	1.977E+05	1.214E-04	2.187E-02
2064	1.977E+05	1.154E-04	2.080E-02
2065	1.977E+05	1.098E-04	1.979E-02
2066	1.977E+05	1.044E-04	1.882E-02
2067	1.977E+05	9.935E-05	1.791E-02
2068	1.977E+05	9.451E-05	1.703E-02
2069	1.977E+05	8.990E-05	1.620E-02
2070	1.977E+05	8.552E-05	1.541E-02
2071	1.977E+05	8.134E-05	1.466E-02
2072	1.977E+05	7.738E-05	1.394E-02
2073	1.977E+05	7.360E-05	1.326E-02
2074	1.977E+05	7.001E-05	1.262E-02
2075	1.977E+05	6.660E-05	1.200E-02
2076	1.977E+05	6.335E-05	1.142E-02
2077	1.977E+05	6.026E-05	1.086E-02
2078	1.977E+05	5.732E-05	1.033E-02
2079	1.977E+05	5.453E-05	9.827E-03
2080	1.977E+05	5.187E-05	9.347E-03
2081	1.977E+05	4.934E-05	8.892E-03
2082	1.977E+05	4.693E-05	8.458E-03
2083	1.977E+05	4.464E-05	8.045E-03

Table D-3. Northern Parcel 1,1,1,-Trichloroethane Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2084	1.977E+05	4.247E-05	7.653E-03
2085	1.977E+05	4.039E-05	7.280E-03
2086	1.977E+05	3.842E-05	6.925E-03
2087	1.977E+05	3.655E-05	6.587E-03
2088	1.977E+05	3.477E-05	6.266E-03
2089	1.977E+05	3.307E-05	5.960E-03
2090	1.977E+05	3.146E-05	5.669E-03
2091	1.977E+05	2.993E-05	5.393E-03
2092	1.977E+05	2.847E-05	5.130E-03
2093	1.977E+05	2.708E-05	4.880E-03
2094	1.977E+05	2.576E-05	4.642E-03
2095	1.977E+05	2.450E-05	4.415E-03
2096	1.977E+05	2.331E-05	4.200E-03
2097	1.977E+05	2.217E-05	3.995E-03
2098	1.977E+05	2.109E-05	3.800E-03
2099	1.977E+05	2.006E-05	3.615E-03
2100	1.977E+05	1.908E-05	3.439E-03
2101	1.977E+05	1.815E-05	3.271E-03
2102	1.977E+05	1.727E-05	3.111E-03
2103	1.977E+05	1.642E-05	2.960E-03
2104	1.977E+05	1.562E-05	2.815E-03
2105	1.977E+05	1.486E-05	2.678E-03
2106	1.977E+05	1.414E-05	2.547E-03
2107	1.977E+05	1.345E-05	2.423E-03
2108	1.977E+05	1.279E-05	2.305E-03
2109	1.977E+05	1.217E-05	2.193E-03
2110	1.977E+05	1.157E-05	2.086E-03
2111	1.977E+05	1.101E-05	1.984E-03
2112	1.977E+05	1.047E-05	1.887E-03
2113	1.977E+05	9.961E-06	1.795E-03
2114	1.977E+05	9.475E-06	1.708E-03
2115	1.977E+05	9.013E-06	1.624E-03
2116	1.977E+05	8.574E-06	1.545E-03
2117	1.977E+05	8.156E-06	1.470E-03
2118	1.977E+05	7.758E-06	1.398E-03
2119	1.977E+05	7.379E-06	1.330E-03
2120	1.977E+05	7.020E-06	1.265E-03
2121	1.977E+05	6.677E-06	1.203E-03
2122	1.977E+05	6.352E-06	1.145E-03
2123	1.977E+05	6.042E-06	1.089E-03
2124	1.977E+05	5.747E-06	1.036E-03
2125	1.977E+05	5.467E-06	9.852E-04
2126	1.977E+05	5.200E-06	9.372E-04
2127	1.977E+05	4.947E-06	8.915E-04
2128	1.977E+05	4.705E-06	8.480E-04
2129	1.977E+05	4.476E-06	8.066E-04
2130	1.977E+05	4.258E-06	7.673E-04
2131	1.977E+05	4.050E-06	7.299E-04
2132	1.977E+05	3.852E-06	6.943E-04
2133	1.977E+05	3.665E-06	6.604E-04
2134	1.977E+05	3.486E-06	6.282E-04
2135	1.977E+05	3.316E-06	5.976E-04
2136	1.977E+05	3.154E-06	5.684E-04
2137	1.977E+05	3.000E-06	5.407E-04
2138	1.977E+05	2.854E-06	5.143E-04
2139	1.977E+05	2.715E-06	4.892E-04
2140	1.977E+05	2.582E-06	4.654E-04
2141	1.977E+05	2.456E-06	4.427E-04
2142	1.977E+05	2.337E-06	4.211E-04
2143	1.977E+05	2.223E-06	4.006E-04
2144	1.977E+05	2.114E-06	3.810E-04
2145	1.977E+05	2.011E-06	3.624E-04
2146	1.977E+05	1.913E-06	3.448E-04
2147	1.977E+05	1.820E-06	3.279E-04
2148	1.977E+05	1.731E-06	3.120E-04
2149	1.977E+05	1.647E-06	2.967E-04
2150	1.977E+05	1.566E-06	2.823E-04
2151	1.977E+05	1.490E-06	2.685E-04
2152	1.977E+05	1.417E-06	2.554E-04
2153	1.977E+05	1.348E-06	2.429E-04
2154	1.977E+05	1.282E-06	2.311E-04

Table D-3. Northern Parcel 1,1,1,-Trichloroethane Emission Rate from Year 1968 to 2203 (concluded).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2155	1.977E+05	1.220E-06	2.198E-04
2156	1.977E+05	1.160E-06	2.091E-04
2157	1.977E+05	1.104E-06	1.989E-04
2158	1.977E+05	1.050E-06	1.892E-04
2159	1.977E+05	9.987E-07	1.800E-04
2160	1.977E+05	9.500E-07	1.712E-04
2161	1.977E+05	9.037E-07	1.629E-04
2162	1.977E+05	8.596E-07	1.549E-04
2163	1.977E+05	8.177E-07	1.474E-04
2164	1.977E+05	7.778E-07	1.402E-04
2165	1.977E+05	7.399E-07	1.333E-04
2166	1.977E+05	7.038E-07	1.268E-04
2167	1.977E+05	6.694E-07	1.206E-04
2168	1.977E+05	6.368E-07	1.148E-04
2169	1.977E+05	6.057E-07	1.092E-04
2170	1.977E+05	5.762E-07	1.038E-04
2171	1.977E+05	5.481E-07	9.878E-05
2172	1.977E+05	5.214E-07	9.396E-05
2173	1.977E+05	4.959E-07	8.938E-05
2174	1.977E+05	4.718E-07	8.502E-05
2175	1.977E+05	4.487E-07	8.087E-05
2176	1.977E+05	4.269E-07	7.693E-05
2177	1.977E+05	4.060E-07	7.317E-05
2178	1.977E+05	3.862E-07	6.961E-05
2179	1.977E+05	3.674E-07	6.621E-05
2180	1.977E+05	3.495E-07	6.298E-05
2181	1.977E+05	3.324E-07	5.991E-05
2182	1.977E+05	3.162E-07	5.699E-05
2183	1.977E+05	3.008E-07	5.421E-05
2184	1.977E+05	2.861E-07	5.157E-05
2185	1.977E+05	2.722E-07	4.905E-05
2186	1.977E+05	2.589E-07	4.666E-05
2187	1.977E+05	2.463E-07	4.438E-05
2188	1.977E+05	2.343E-07	4.222E-05
2189	1.977E+05	2.228E-07	4.016E-05
2190	1.977E+05	2.120E-07	3.820E-05
2191	1.977E+05	2.016E-07	3.634E-05
2192	1.977E+05	1.918E-07	3.457E-05
2193	1.977E+05	1.824E-07	3.288E-05
2194	1.977E+05	1.735E-07	3.128E-05
2195	1.977E+05	1.651E-07	2.975E-05
2196	1.977E+05	1.570E-07	2.830E-05
2197	1.977E+05	1.494E-07	2.692E-05
2198	1.977E+05	1.421E-07	2.561E-05
2199	1.977E+05	1.352E-07	2.436E-05
2200	1.977E+05	1.286E-07	2.317E-05
2201	1.977E+05	1.223E-07	2.204E-05
2202	1.977E+05	1.163E-07	2.096E-05
2203	1.977E+05	1.107E-07	1.994E-05

Table D-4. Northern Parcel Benzene Emission Rate from Year 1968 to 2203.

Source: H:\3000\030177~1.000\030177~1.002\ROSEHI~1\NORTHERN.PRM

Model Parameters

Lo : 170.00 m³ / Mg ***** User Mode Selection *****
 k : 0.0500 1/yr ***** User Mode Selection *****
 NMOC : 4500.00 ppmv ***** User Mode Selection *****
 Methane : 56.0000 % volume
 Carbon Dioxide : 44.0000 % volume
 Air Pollutant : Benzene (HAP/VOC)
 Molecular Wt = 78.12 Concentration = 1.640000 ppmV

Landfill Parameters

Landfill type : Co-Disposal
 Year Opened : 1967 Current Year : 2003 Closure Year: 2004
 Capacity : 197692 Mg
 Average Acceptance Rate Required from
 Current Year to Closure Year : 13179.47 Mg/year

Model Results

Year	Refuse In Place (Mg)	Benzene (HAP/VOC) Emission Rate (Mg/yr)	(Cubic m/yr)
1968	1.318E+04	1.066E-03	3.281E-01
1969	2.636E+04	2.080E-03	6.401E-01
1970	3.954E+04	3.045E-03	9.370E-01
1971	5.272E+04	3.962E-03	1.219E+00
1972	6.590E+04	4.835E-03	1.488E+00
1973	7.908E+04	5.665E-03	1.743E+00
1974	9.226E+04	6.455E-03	1.987E+00
1975	1.054E+05	7.206E-03	2.218E+00
1976	1.186E+05	7.920E-03	2.438E+00
1977	1.318E+05	8.600E-03	2.647E+00
1978	1.450E+05	9.247E-03	2.846E+00
1979	1.582E+05	9.862E-03	3.035E+00
1980	1.713E+05	1.045E-02	3.215E+00
1981	1.845E+05	1.100E-02	3.386E+00
1982	1.977E+05	1.153E-02	3.549E+00
1983	1.977E+05	1.097E-02	3.376E+00
1984	1.977E+05	1.044E-02	3.212E+00
1985	1.977E+05	9.926E-03	3.055E+00
1986	1.977E+05	9.442E-03	2.906E+00
1987	1.977E+05	8.982E-03	2.764E+00
1988	1.977E+05	8.544E-03	2.629E+00
1989	1.977E+05	8.127E-03	2.501E+00
1990	1.977E+05	7.731E-03	2.379E+00
1991	1.977E+05	7.354E-03	2.263E+00
1992	1.977E+05	6.995E-03	2.153E+00
1993	1.977E+05	6.654E-03	2.048E+00
1994	1.977E+05	6.329E-03	1.948E+00
1995	1.977E+05	6.021E-03	1.853E+00
1996	1.977E+05	5.727E-03	1.763E+00
1997	1.977E+05	5.448E-03	1.677E+00
1998	1.977E+05	5.182E-03	1.595E+00
1999	1.977E+05	4.929E-03	1.517E+00
2000	1.977E+05	4.689E-03	1.443E+00
2001	1.977E+05	4.460E-03	1.373E+00
2002	1.977E+05	4.243E-03	1.306E+00
2003	1.977E+05	4.036E-03	1.242E+00
2004	1.977E+05	3.839E-03	1.181E+00
2005	1.977E+05	3.652E-03	1.124E+00
2006	1.977E+05	3.474E-03	1.069E+00
2007	1.977E+05	3.304E-03	1.017E+00
2008	1.977E+05	3.143E-03	9.673E-01
2009	1.977E+05	2.990E-03	9.201E-01
2010	1.977E+05	2.844E-03	8.753E-01
2011	1.977E+05	2.705E-03	8.326E-01
2012	1.977E+05	2.573E-03	7.920E-01

Table D-4. Northern Parcel Benzene Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2013	1.977E+05	2.448E-03	7.533E-01
2014	1.977E+05	2.328E-03	7.166E-01
2015	1.977E+05	2.215E-03	6.817E-01
2016	1.977E+05	2.107E-03	6.484E-01
2017	1.977E+05	2.004E-03	6.168E-01
2018	1.977E+05	1.906E-03	5.867E-01
2019	1.977E+05	1.813E-03	5.581E-01
2020	1.977E+05	1.725E-03	5.309E-01
2021	1.977E+05	1.641E-03	5.050E-01
2022	1.977E+05	1.561E-03	4.804E-01
2023	1.977E+05	1.485E-03	4.569E-01
2024	1.977E+05	1.412E-03	4.346E-01
2025	1.977E+05	1.343E-03	4.134E-01
2026	1.977E+05	1.278E-03	3.933E-01
2027	1.977E+05	1.216E-03	3.741E-01
2028	1.977E+05	1.156E-03	3.559E-01
2029	1.977E+05	1.100E-03	3.385E-01
2030	1.977E+05	1.046E-03	3.220E-01
2031	1.977E+05	9.952E-04	3.063E-01
2032	1.977E+05	9.467E-04	2.913E-01
2033	1.977E+05	9.005E-04	2.771E-01
2034	1.977E+05	8.566E-04	2.636E-01
2035	1.977E+05	8.148E-04	2.508E-01
2036	1.977E+05	7.751E-04	2.385E-01
2037	1.977E+05	7.373E-04	2.269E-01
2038	1.977E+05	7.013E-04	2.158E-01
2039	1.977E+05	6.671E-04	2.053E-01
2040	1.977E+05	6.346E-04	1.953E-01
2041	1.977E+05	6.036E-04	1.858E-01
2042	1.977E+05	5.742E-04	1.767E-01
2043	1.977E+05	5.462E-04	1.681E-01
2044	1.977E+05	5.195E-04	1.599E-01
2045	1.977E+05	4.942E-04	1.521E-01
2046	1.977E+05	4.701E-04	1.447E-01
2047	1.977E+05	4.472E-04	1.376E-01
2048	1.977E+05	4.254E-04	1.309E-01
2049	1.977E+05	4.046E-04	1.245E-01
2050	1.977E+05	3.849E-04	1.185E-01
2051	1.977E+05	3.661E-04	1.127E-01
2052	1.977E+05	3.483E-04	1.072E-01
2053	1.977E+05	3.313E-04	1.020E-01
2054	1.977E+05	3.151E-04	9.698E-02
2055	1.977E+05	2.997E-04	9.225E-02
2056	1.977E+05	2.851E-04	8.775E-02
2057	1.977E+05	2.712E-04	8.347E-02
2058	1.977E+05	2.580E-04	7.940E-02
2059	1.977E+05	2.454E-04	7.553E-02
2060	1.977E+05	2.334E-04	7.185E-02
2061	1.977E+05	2.221E-04	6.834E-02
2062	1.977E+05	2.112E-04	6.501E-02
2063	1.977E+05	2.009E-04	6.184E-02
2064	1.977E+05	1.911E-04	5.882E-02
2065	1.977E+05	1.818E-04	5.595E-02
2066	1.977E+05	1.729E-04	5.322E-02
2067	1.977E+05	1.645E-04	5.063E-02
2068	1.977E+05	1.565E-04	4.816E-02
2069	1.977E+05	1.489E-04	4.581E-02
2070	1.977E+05	1.416E-04	4.358E-02
2071	1.977E+05	1.347E-04	4.145E-02
2072	1.977E+05	1.281E-04	3.943E-02
2073	1.977E+05	1.219E-04	3.751E-02
2074	1.977E+05	1.159E-04	3.568E-02
2075	1.977E+05	1.103E-04	3.394E-02
2076	1.977E+05	1.049E-04	3.228E-02
2077	1.977E+05	9.978E-05	3.071E-02
2078	1.977E+05	9.491E-05	2.921E-02
2079	1.977E+05	9.028E-05	2.779E-02
2080	1.977E+05	8.588E-05	2.643E-02
2081	1.977E+05	8.169E-05	2.514E-02
2082	1.977E+05	7.771E-05	2.392E-02
2083	1.977E+05	7.392E-05	2.275E-02

Table D-4. Northern Parcel Benzene Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2084	1.977E+05	7.031E-05	2.164E-02
2085	1.977E+05	6.688E-05	2.058E-02
2086	1.977E+05	6.362E-05	1.958E-02
2087	1.977E+05	6.052E-05	1.863E-02
2088	1.977E+05	5.757E-05	1.772E-02
2089	1.977E+05	5.476E-05	1.685E-02
2090	1.977E+05	5.209E-05	1.603E-02
2091	1.977E+05	4.955E-05	1.525E-02
2092	1.977E+05	4.713E-05	1.451E-02
2093	1.977E+05	4.483E-05	1.380E-02
2094	1.977E+05	4.265E-05	1.313E-02
2095	1.977E+05	4.057E-05	1.248E-02
2096	1.977E+05	3.859E-05	1.188E-02
2097	1.977E+05	3.671E-05	1.130E-02
2098	1.977E+05	3.492E-05	1.075E-02
2099	1.977E+05	3.321E-05	1.022E-02
2100	1.977E+05	3.159E-05	9.723E-03
2101	1.977E+05	3.005E-05	9.249E-03
2102	1.977E+05	2.859E-05	8.798E-03
2103	1.977E+05	2.719E-05	8.369E-03
2104	1.977E+05	2.587E-05	7.961E-03
2105	1.977E+05	2.460E-05	7.572E-03
2106	1.977E+05	2.340E-05	7.203E-03
2107	1.977E+05	2.226E-05	6.852E-03
2108	1.977E+05	2.118E-05	6.518E-03
2109	1.977E+05	2.014E-05	6.200E-03
2110	1.977E+05	1.916E-05	5.897E-03
2111	1.977E+05	1.823E-05	5.610E-03
2112	1.977E+05	1.734E-05	5.336E-03
2113	1.977E+05	1.649E-05	5.076E-03
2114	1.977E+05	1.569E-05	4.828E-03
2115	1.977E+05	1.492E-05	4.593E-03
2116	1.977E+05	1.420E-05	4.369E-03
2117	1.977E+05	1.350E-05	4.156E-03
2118	1.977E+05	1.284E-05	3.953E-03
2119	1.977E+05	1.222E-05	3.760E-03
2120	1.977E+05	1.162E-05	3.577E-03
2121	1.977E+05	1.106E-05	3.403E-03
2122	1.977E+05	1.052E-05	3.237E-03
2123	1.977E+05	1.000E-05	3.079E-03
2124	1.977E+05	9.516E-06	2.929E-03
2125	1.977E+05	9.052E-06	2.786E-03
2126	1.977E+05	8.610E-06	2.650E-03
2127	1.977E+05	8.190E-06	2.521E-03
2128	1.977E+05	7.791E-06	2.398E-03
2129	1.977E+05	7.411E-06	2.281E-03
2130	1.977E+05	7.049E-06	2.170E-03
2131	1.977E+05	6.706E-06	2.064E-03
2132	1.977E+05	6.379E-06	1.963E-03
2133	1.977E+05	6.067E-06	1.867E-03
2134	1.977E+05	5.772E-06	1.776E-03
2135	1.977E+05	5.490E-06	1.690E-03
2136	1.977E+05	5.222E-06	1.607E-03
2137	1.977E+05	4.968E-06	1.529E-03
2138	1.977E+05	4.725E-06	1.454E-03
2139	1.977E+05	4.495E-06	1.383E-03
2140	1.977E+05	4.276E-06	1.316E-03
2141	1.977E+05	4.067E-06	1.252E-03
2142	1.977E+05	3.869E-06	1.191E-03
2143	1.977E+05	3.680E-06	1.133E-03
2144	1.977E+05	3.501E-06	1.077E-03
2145	1.977E+05	3.330E-06	1.025E-03
2146	1.977E+05	3.167E-06	9.748E-04
2147	1.977E+05	3.013E-06	9.273E-04
2148	1.977E+05	2.866E-06	8.821E-04
2149	1.977E+05	2.726E-06	8.391E-04
2150	1.977E+05	2.593E-06	7.981E-04
2151	1.977E+05	2.467E-06	7.592E-04
2152	1.977E+05	2.347E-06	7.222E-04
2153	1.977E+05	2.232E-06	6.870E-04
2154	1.977E+05	2.123E-06	6.535E-04

Table D-4. Northern Parcel Benzene Emission Rate from Year 1968 to 2203 (concluded).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2155	1.977E+05	2.020E-06	6.216E-04
2156	1.977E+05	1.921E-06	5.913E-04
2157	1.977E+05	1.827E-06	5.624E-04
2158	1.977E+05	1.738E-06	5.350E-04
2159	1.977E+05	1.654E-06	5.089E-04
2160	1.977E+05	1.573E-06	4.841E-04
2161	1.977E+05	1.496E-06	4.605E-04
2162	1.977E+05	1.423E-06	4.380E-04
2163	1.977E+05	1.354E-06	4.167E-04
2164	1.977E+05	1.288E-06	3.963E-04
2165	1.977E+05	1.225E-06	3.770E-04
2166	1.977E+05	1.165E-06	3.586E-04
2167	1.977E+05	1.108E-06	3.411E-04
2168	1.977E+05	1.054E-06	3.245E-04
2169	1.977E+05	1.003E-06	3.087E-04
2170	1.977E+05	9.540E-07	2.936E-04
2171	1.977E+05	9.075E-07	2.793E-04
2172	1.977E+05	8.632E-07	2.657E-04
2173	1.977E+05	8.211E-07	2.527E-04
2174	1.977E+05	7.811E-07	2.404E-04
2175	1.977E+05	7.430E-07	2.287E-04
2176	1.977E+05	7.068E-07	2.175E-04
2177	1.977E+05	6.723E-07	2.069E-04
2178	1.977E+05	6.395E-07	1.968E-04
2179	1.977E+05	6.083E-07	1.872E-04
2180	1.977E+05	5.786E-07	1.781E-04
2181	1.977E+05	5.504E-07	1.694E-04
2182	1.977E+05	5.236E-07	1.611E-04
2183	1.977E+05	4.980E-07	1.533E-04
2184	1.977E+05	4.738E-07	1.458E-04
2185	1.977E+05	4.507E-07	1.387E-04
2186	1.977E+05	4.287E-07	1.319E-04
2187	1.977E+05	4.078E-07	1.255E-04
2188	1.977E+05	3.879E-07	1.194E-04
2189	1.977E+05	3.690E-07	1.136E-04
2190	1.977E+05	3.510E-07	1.080E-04
2191	1.977E+05	3.339E-07	1.027E-04
2192	1.977E+05	3.176E-07	9.774E-05
2193	1.977E+05	3.021E-07	9.297E-05
2194	1.977E+05	2.873E-07	8.844E-05
2195	1.977E+05	2.733E-07	8.412E-05
2196	1.977E+05	2.600E-07	8.002E-05
2197	1.977E+05	2.473E-07	7.612E-05
2198	1.977E+05	2.353E-07	7.241E-05
2199	1.977E+05	2.238E-07	6.887E-05
2200	1.977E+05	2.129E-07	6.551E-05
2201	1.977E+05	2.025E-07	6.232E-05
2202	1.977E+05	1.926E-07	5.928E-05
2203	1.977E+05	1.832E-07	5.639E-05

Table D-5. Northern Parcel Chlorobenzene Emission Rate from Year 1968 to 2203.

Source: H:\3000\030177~1.000\030177~1.002\ROSEHI~1\NORTHERN.PRM

Model Parameters

Lo : 170.00 m³ / Mg ***** User Mode Selection *****
 k : 0.0500 1/yr ***** User Mode Selection *****
 NMOC : 4500.00 ppmv ***** User Mode Selection *****
 Methane : 56.0000 % volume
 Carbon Dioxide : 44.0000 % volume
 Air Pollutant : Chlorobenzene (HAP/VOC)
 Molecular Wt = 112.56 Concentration = 0.220000 ppmv

Landfill Parameters

Landfill type : Co-Disposal
 Year Opened : 1967 Current Year : 2003 Closure Year: 2004
 Capacity : 197692 Mg
 Average Acceptance Rate Required from
 Current Year to Closure Year : 13179.47 Mg/year

Model Results

Year	Refuse In Place (Mg)	Chlorobenzene (HAP/VOC) Emission Rate (Mg/yr)	(Cubic m/yr)
1968	1.318E+04	2.060E-04	4.401E-02
1969	2.636E+04	4.020E-04	8.587E-02
1970	3.954E+04	5.885E-04	1.257E-01
1971	5.272E+04	7.658E-04	1.636E-01
1972	6.590E+04	9.345E-04	1.996E-01
1973	7.908E+04	1.095E-03	2.339E-01
1974	9.226E+04	1.248E-03	2.665E-01
1975	1.054E+05	1.393E-03	2.975E-01
1976	1.186E+05	1.531E-03	3.270E-01
1977	1.318E+05	1.662E-03	3.551E-01
1978	1.450E+05	1.787E-03	3.818E-01
1979	1.582E+05	1.906E-03	4.071E-01
1980	1.713E+05	2.019E-03	4.313E-01
1981	1.845E+05	2.127E-03	4.543E-01
1982	1.977E+05	2.229E-03	4.761E-01
1983	1.977E+05	2.120E-03	4.529E-01
1984	1.977E+05	2.017E-03	4.308E-01
1985	1.977E+05	1.919E-03	4.098E-01
1986	1.977E+05	1.825E-03	3.898E-01
1987	1.977E+05	1.736E-03	3.708E-01
1988	1.977E+05	1.651E-03	3.527E-01
1989	1.977E+05	1.571E-03	3.355E-01
1990	1.977E+05	1.494E-03	3.192E-01
1991	1.977E+05	1.421E-03	3.036E-01
1992	1.977E+05	1.352E-03	2.888E-01
1993	1.977E+05	1.286E-03	2.747E-01
1994	1.977E+05	1.223E-03	2.613E-01
1995	1.977E+05	1.164E-03	2.486E-01
1996	1.977E+05	1.107E-03	2.364E-01
1997	1.977E+05	1.053E-03	2.249E-01
1998	1.977E+05	1.002E-03	2.139E-01
1999	1.977E+05	9.527E-04	2.035E-01
2000	1.977E+05	9.063E-04	1.936E-01
2001	1.977E+05	8.621E-04	1.841E-01
2002	1.977E+05	8.200E-04	1.752E-01
2003	1.977E+05	7.800E-04	1.666E-01
2004	1.977E+05	7.420E-04	1.585E-01
2005	1.977E+05	7.058E-04	1.508E-01
2006	1.977E+05	6.714E-04	1.434E-01
2007	1.977E+05	6.386E-04	1.364E-01
2008	1.977E+05	6.075E-04	1.298E-01
2009	1.977E+05	5.779E-04	1.234E-01
2010	1.977E+05	5.497E-04	1.174E-01
2011	1.977E+05	5.229E-04	1.117E-01
2012	1.977E+05	4.974E-04	1.062E-01

Table D-5. Northern Parcel Chlorobenzene Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2013	1.977E+05	4.731E-04	1.011E-01
2014	1.977E+05	4.500E-04	9.613E-02
2015	1.977E+05	4.281E-04	9.144E-02
2016	1.977E+05	4.072E-04	8.698E-02
2017	1.977E+05	3.874E-04	8.274E-02
2018	1.977E+05	3.685E-04	7.870E-02
2019	1.977E+05	3.505E-04	7.487E-02
2020	1.977E+05	3.334E-04	7.121E-02
2021	1.977E+05	3.171E-04	6.774E-02
2022	1.977E+05	3.017E-04	6.444E-02
2023	1.977E+05	2.870E-04	6.129E-02
2024	1.977E+05	2.730E-04	5.831E-02
2025	1.977E+05	2.597E-04	5.546E-02
2026	1.977E+05	2.470E-04	5.276E-02
2027	1.977E+05	2.349E-04	5.018E-02
2028	1.977E+05	2.235E-04	4.774E-02
2029	1.977E+05	2.126E-04	4.541E-02
2030	1.977E+05	2.022E-04	4.319E-02
2031	1.977E+05	1.924E-04	4.109E-02
2032	1.977E+05	1.830E-04	3.908E-02
2033	1.977E+05	1.741E-04	3.718E-02
2034	1.977E+05	1.656E-04	3.536E-02
2035	1.977E+05	1.575E-04	3.364E-02
2036	1.977E+05	1.498E-04	3.200E-02
2037	1.977E+05	1.425E-04	3.044E-02
2038	1.977E+05	1.356E-04	2.895E-02
2039	1.977E+05	1.289E-04	2.754E-02
2040	1.977E+05	1.227E-04	2.620E-02
2041	1.977E+05	1.167E-04	2.492E-02
2042	1.977E+05	1.110E-04	2.371E-02
2043	1.977E+05	1.056E-04	2.255E-02
2044	1.977E+05	1.004E-04	2.145E-02
2045	1.977E+05	9.552E-05	2.040E-02
2046	1.977E+05	9.086E-05	1.941E-02
2047	1.977E+05	8.643E-05	1.846E-02
2048	1.977E+05	8.222E-05	1.756E-02
2049	1.977E+05	7.821E-05	1.670E-02
2050	1.977E+05	7.439E-05	1.589E-02
2051	1.977E+05	7.076E-05	1.512E-02
2052	1.977E+05	6.731E-05	1.438E-02
2053	1.977E+05	6.403E-05	1.368E-02
2054	1.977E+05	6.091E-05	1.301E-02
2055	1.977E+05	5.794E-05	1.238E-02
2056	1.977E+05	5.511E-05	1.177E-02
2057	1.977E+05	5.242E-05	1.120E-02
2058	1.977E+05	4.987E-05	1.065E-02
2059	1.977E+05	4.743E-05	1.013E-02
2060	1.977E+05	4.512E-05	9.638E-03
2061	1.977E+05	4.292E-05	9.168E-03
2062	1.977E+05	4.083E-05	8.721E-03
2063	1.977E+05	3.884E-05	8.295E-03
2064	1.977E+05	3.694E-05	7.891E-03
2065	1.977E+05	3.514E-05	7.506E-03
2066	1.977E+05	3.343E-05	7.140E-03
2067	1.977E+05	3.180E-05	6.792E-03
2068	1.977E+05	3.025E-05	6.460E-03
2069	1.977E+05	2.877E-05	6.145E-03
2070	1.977E+05	2.737E-05	5.846E-03
2071	1.977E+05	2.603E-05	5.561E-03
2072	1.977E+05	2.476E-05	5.289E-03
2073	1.977E+05	2.356E-05	5.031E-03
2074	1.977E+05	2.241E-05	4.786E-03
2075	1.977E+05	2.131E-05	4.553E-03
2076	1.977E+05	2.027E-05	4.331E-03
2077	1.977E+05	1.929E-05	4.119E-03
2078	1.977E+05	1.834E-05	3.918E-03
2079	1.977E+05	1.745E-05	3.727E-03
2080	1.977E+05	1.660E-05	3.546E-03
2081	1.977E+05	1.579E-05	3.373E-03
2082	1.977E+05	1.502E-05	3.208E-03
2083	1.977E+05	1.429E-05	3.052E-03

Table D-5. Northern Parcel Chlorobenzene Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2084	1.977E+05	1.359E-05	2.903E-03
2085	1.977E+05	1.293E-05	2.761E-03
2086	1.977E+05	1.230E-05	2.627E-03
2087	1.977E+05	1.170E-05	2.499E-03
2088	1.977E+05	1.113E-05	2.377E-03
2089	1.977E+05	1.058E-05	2.261E-03
2090	1.977E+05	1.007E-05	2.150E-03
2091	1.977E+05	9.577E-06	2.046E-03
2092	1.977E+05	9.110E-06	1.946E-03
2093	1.977E+05	8.666E-06	1.851E-03
2094	1.977E+05	8.243E-06	1.761E-03
2095	1.977E+05	7.841E-06	1.675E-03
2096	1.977E+05	7.459E-06	1.593E-03
2097	1.977E+05	7.095E-06	1.515E-03
2098	1.977E+05	6.749E-06	1.442E-03
2099	1.977E+05	6.420E-06	1.371E-03
2100	1.977E+05	6.107E-06	1.304E-03
2101	1.977E+05	5.809E-06	1.241E-03
2102	1.977E+05	5.525E-06	1.180E-03
2103	1.977E+05	5.256E-06	1.123E-03
2104	1.977E+05	5.000E-06	1.068E-03
2105	1.977E+05	4.756E-06	1.016E-03
2106	1.977E+05	4.524E-06	9.663E-04
2107	1.977E+05	4.303E-06	9.192E-04
2108	1.977E+05	4.093E-06	8.743E-04
2109	1.977E+05	3.894E-06	8.317E-04
2110	1.977E+05	3.704E-06	7.911E-04
2111	1.977E+05	3.523E-06	7.525E-04
2112	1.977E+05	3.351E-06	7.158E-04
2113	1.977E+05	3.188E-06	6.809E-04
2114	1.977E+05	3.032E-06	6.477E-04
2115	1.977E+05	2.885E-06	6.161E-04
2116	1.977E+05	2.744E-06	5.861E-04
2117	1.977E+05	2.610E-06	5.575E-04
2118	1.977E+05	2.483E-06	5.303E-04
2119	1.977E+05	2.362E-06	5.044E-04
2120	1.977E+05	2.246E-06	4.798E-04
2121	1.977E+05	2.137E-06	4.564E-04
2122	1.977E+05	2.033E-06	4.342E-04
2123	1.977E+05	1.934E-06	4.130E-04
2124	1.977E+05	1.839E-06	3.929E-04
2125	1.977E+05	1.750E-06	3.737E-04
2126	1.977E+05	1.664E-06	3.555E-04
2127	1.977E+05	1.583E-06	3.381E-04
2128	1.977E+05	1.506E-06	3.216E-04
2129	1.977E+05	1.432E-06	3.060E-04
2130	1.977E+05	1.363E-06	2.910E-04
2131	1.977E+05	1.296E-06	2.768E-04
2132	1.977E+05	1.233E-06	2.633E-04
2133	1.977E+05	1.173E-06	2.505E-04
2134	1.977E+05	1.116E-06	2.383E-04
2135	1.977E+05	1.061E-06	2.267E-04
2136	1.977E+05	1.009E-06	2.156E-04
2137	1.977E+05	9.602E-07	2.051E-04
2138	1.977E+05	9.133E-07	1.951E-04
2139	1.977E+05	8.688E-07	1.856E-04
2140	1.977E+05	8.264E-07	1.765E-04
2141	1.977E+05	7.861E-07	1.679E-04
2142	1.977E+05	7.478E-07	1.597E-04
2143	1.977E+05	7.113E-07	1.519E-04
2144	1.977E+05	6.766E-07	1.445E-04
2145	1.977E+05	6.436E-07	1.375E-04
2146	1.977E+05	6.122E-07	1.308E-04
2147	1.977E+05	5.824E-07	1.244E-04
2148	1.977E+05	5.540E-07	1.183E-04
2149	1.977E+05	5.270E-07	1.126E-04
2150	1.977E+05	5.013E-07	1.071E-04
2151	1.977E+05	4.768E-07	1.018E-04
2152	1.977E+05	4.536E-07	9.688E-05
2153	1.977E+05	4.314E-07	9.215E-05
2154	1.977E+05	4.104E-07	8.766E-05

Table D-5. Northern Parcel Chlorobenzene Emission Rate from Year 1968 to 2203 (concluded).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2155	1.977E+05	3.904E-07	8.338E-05
2156	1.977E+05	3.713E-07	7.932E-05
2157	1.977E+05	3.532E-07	7.545E-05
2158	1.977E+05	3.360E-07	7.177E-05
2159	1.977E+05	3.196E-07	6.827E-05
2160	1.977E+05	3.040E-07	6.494E-05
2161	1.977E+05	2.892E-07	6.177E-05
2162	1.977E+05	2.751E-07	5.876E-05
2163	1.977E+05	2.617E-07	5.589E-05
2164	1.977E+05	2.489E-07	5.317E-05
2165	1.977E+05	2.368E-07	5.057E-05
2166	1.977E+05	2.252E-07	4.811E-05
2167	1.977E+05	2.142E-07	4.576E-05
2168	1.977E+05	2.038E-07	4.353E-05
2169	1.977E+05	1.939E-07	4.141E-05
2170	1.977E+05	1.844E-07	3.939E-05
2171	1.977E+05	1.754E-07	3.747E-05
2172	1.977E+05	1.669E-07	3.564E-05
2173	1.977E+05	1.587E-07	3.390E-05
2174	1.977E+05	1.510E-07	3.225E-05
2175	1.977E+05	1.436E-07	3.068E-05
2176	1.977E+05	1.366E-07	2.918E-05
2177	1.977E+05	1.299E-07	2.776E-05
2178	1.977E+05	1.236E-07	2.640E-05
2179	1.977E+05	1.176E-07	2.511E-05
2180	1.977E+05	1.118E-07	2.389E-05
2181	1.977E+05	1.064E-07	2.272E-05
2182	1.977E+05	1.012E-07	2.162E-05
2183	1.977E+05	9.627E-08	2.056E-05
2184	1.977E+05	9.157E-08	1.956E-05
2185	1.977E+05	8.710E-08	1.861E-05
2186	1.977E+05	8.286E-08	1.770E-05
2187	1.977E+05	7.882E-08	1.683E-05
2188	1.977E+05	7.497E-08	1.601E-05
2189	1.977E+05	7.132E-08	1.523E-05
2190	1.977E+05	6.784E-08	1.449E-05
2191	1.977E+05	6.453E-08	1.378E-05
2192	1.977E+05	6.138E-08	1.311E-05
2193	1.977E+05	5.839E-08	1.247E-05
2194	1.977E+05	5.554E-08	1.186E-05
2195	1.977E+05	5.283E-08	1.128E-05
2196	1.977E+05	5.026E-08	1.073E-05
2197	1.977E+05	4.780E-08	1.021E-05
2198	1.977E+05	4.547E-08	9.713E-06
2199	1.977E+05	4.325E-08	9.239E-06
2200	1.977E+05	4.115E-08	8.789E-06
2201	1.977E+05	3.914E-08	8.360E-06
2202	1.977E+05	3.723E-08	7.952E-06
2203	1.977E+05	3.541E-08	7.564E-06

Table D-6. Northern Parcel Chloroethane Emission Rate from Year 1968 to 2203.

Source: H:\3000\030177~1.000\030177~1.002\ROSEHI~1\NORTHERN.PRM

Model Parameters

Lo : 170.00 m³ / Mg ***** User Mode Selection *****
 k : 0.0500 1/yr ***** User Mode Selection *****
 NMOC : 4500.00 ppmv ***** User Mode Selection *****
 Methane : 56.0000 % volume
 Carbon Dioxide : 44.0000 % volume
 Air Pollutant : Chloroethane (HAP/VOC)
 Molecular Wt = 64.52 Concentration = 2.960000 ppmV

Landfill Parameters

Landfill type : Co-Disposal
 Year Opened : 1967 Current Year : 2003 Closure Year: 2004
 Capacity : 197692 Mg
 Average Acceptance Rate Required from
 Current Year to Closure Year : 13179.47 Mg/year

Model Results

Year	Refuse In Place (Mg)	Chloroethane (HAP/VOC) Emission Rate (Mg/yr)	(Cubic m/yr)
1968	1.318E+04	1.589E-03	5.921E-01
1969	2.636E+04	3.101E-03	1.155E+00
1970	3.954E+04	4.538E-03	1.691E+00
1971	5.272E+04	5.906E-03	2.201E+00
1972	6.590E+04	7.207E-03	2.686E+00
1973	7.908E+04	8.445E-03	3.147E+00
1974	9.226E+04	9.622E-03	3.585E+00
1975	1.054E+05	1.074E-02	4.003E+00
1976	1.186E+05	1.181E-02	4.400E+00
1977	1.318E+05	1.282E-02	4.777E+00
1978	1.450E+05	1.378E-02	5.136E+00
1979	1.582E+05	1.470E-02	5.478E+00
1980	1.713E+05	1.557E-02	5.803E+00
1981	1.845E+05	1.640E-02	6.112E+00
1982	1.977E+05	1.719E-02	6.406E+00
1983	1.977E+05	1.635E-02	6.094E+00
1984	1.977E+05	1.556E-02	5.796E+00
1985	1.977E+05	1.480E-02	5.514E+00
1986	1.977E+05	1.408E-02	5.245E+00
1987	1.977E+05	1.339E-02	4.989E+00
1988	1.977E+05	1.274E-02	4.746E+00
1989	1.977E+05	1.211E-02	4.514E+00
1990	1.977E+05	1.152E-02	4.294E+00
1991	1.977E+05	1.096E-02	4.085E+00
1992	1.977E+05	1.043E-02	3.886E+00
1993	1.977E+05	9.918E-03	3.696E+00
1994	1.977E+05	9.435E-03	3.516E+00
1995	1.977E+05	8.975E-03	3.344E+00
1996	1.977E+05	8.537E-03	3.181E+00
1997	1.977E+05	8.121E-03	3.026E+00
1998	1.977E+05	7.725E-03	2.878E+00
1999	1.977E+05	7.348E-03	2.738E+00
2000	1.977E+05	6.989E-03	2.605E+00
2001	1.977E+05	6.649E-03	2.478E+00
2002	1.977E+05	6.324E-03	2.357E+00
2003	1.977E+05	6.016E-03	2.242E+00
2004	1.977E+05	5.723E-03	2.132E+00
2005	1.977E+05	5.443E-03	2.028E+00
2006	1.977E+05	5.178E-03	1.929E+00
2007	1.977E+05	4.925E-03	1.835E+00
2008	1.977E+05	4.685E-03	1.746E+00
2009	1.977E+05	4.457E-03	1.661E+00
2010	1.977E+05	4.239E-03	1.580E+00
2011	1.977E+05	4.033E-03	1.503E+00
2012	1.977E+05	3.836E-03	1.429E+00

Table D-6. Northern Parcel Chloroethane Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2013	1.977E+05	3.649E-03	1.360E+00
2014	1.977E+05	3.471E-03	1.293E+00
2015	1.977E+05	3.302E-03	1.230E+00
2016	1.977E+05	3.141E-03	1.170E+00
2017	1.977E+05	2.987E-03	1.113E+00
2018	1.977E+05	2.842E-03	1.059E+00
2019	1.977E+05	2.703E-03	1.007E+00
2020	1.977E+05	2.571E-03	9.582E-01
2021	1.977E+05	2.446E-03	9.114E-01
2022	1.977E+05	2.327E-03	8.670E-01
2023	1.977E+05	2.213E-03	8.247E-01
2024	1.977E+05	2.105E-03	7.845E-01
2025	1.977E+05	2.003E-03	7.462E-01
2026	1.977E+05	1.905E-03	7.098E-01
2027	1.977E+05	1.812E-03	6.752E-01
2028	1.977E+05	1.724E-03	6.423E-01
2029	1.977E+05	1.640E-03	6.109E-01
2030	1.977E+05	1.560E-03	5.812E-01
2031	1.977E+05	1.484E-03	5.528E-01
2032	1.977E+05	1.411E-03	5.258E-01
2033	1.977E+05	1.342E-03	5.002E-01
2034	1.977E+05	1.277E-03	4.758E-01
2035	1.977E+05	1.215E-03	4.526E-01
2036	1.977E+05	1.155E-03	4.305E-01
2037	1.977E+05	1.099E-03	4.095E-01
2038	1.977E+05	1.045E-03	3.896E-01
2039	1.977E+05	9.944E-04	3.706E-01
2040	1.977E+05	9.459E-04	3.525E-01
2041	1.977E+05	8.998E-04	3.353E-01
2042	1.977E+05	8.559E-04	3.189E-01
2043	1.977E+05	8.142E-04	3.034E-01
2044	1.977E+05	7.745E-04	2.886E-01
2045	1.977E+05	7.367E-04	2.745E-01
2046	1.977E+05	7.008E-04	2.611E-01
2047	1.977E+05	6.666E-04	2.484E-01
2048	1.977E+05	6.341E-04	2.363E-01
2049	1.977E+05	6.031E-04	2.248E-01
2050	1.977E+05	5.737E-04	2.138E-01
2051	1.977E+05	5.458E-04	2.034E-01
2052	1.977E+05	5.191E-04	1.934E-01
2053	1.977E+05	4.938E-04	1.840E-01
2054	1.977E+05	4.697E-04	1.750E-01
2055	1.977E+05	4.468E-04	1.665E-01
2056	1.977E+05	4.250E-04	1.584E-01
2057	1.977E+05	4.043E-04	1.507E-01
2058	1.977E+05	3.846E-04	1.433E-01
2059	1.977E+05	3.658E-04	1.363E-01
2060	1.977E+05	3.480E-04	1.297E-01
2061	1.977E+05	3.310E-04	1.233E-01
2062	1.977E+05	3.149E-04	1.173E-01
2063	1.977E+05	2.995E-04	1.116E-01
2064	1.977E+05	2.849E-04	1.062E-01
2065	1.977E+05	2.710E-04	1.010E-01
2066	1.977E+05	2.578E-04	9.606E-02
2067	1.977E+05	2.452E-04	9.138E-02
2068	1.977E+05	2.333E-04	8.692E-02
2069	1.977E+05	2.219E-04	8.268E-02
2070	1.977E+05	2.111E-04	7.865E-02
2071	1.977E+05	2.008E-04	7.481E-02
2072	1.977E+05	1.910E-04	7.117E-02
2073	1.977E+05	1.817E-04	6.770E-02
2074	1.977E+05	1.728E-04	6.439E-02
2075	1.977E+05	1.644E-04	6.125E-02
2076	1.977E+05	1.564E-04	5.827E-02
2077	1.977E+05	1.487E-04	5.542E-02
2078	1.977E+05	1.415E-04	5.272E-02
2079	1.977E+05	1.346E-04	5.015E-02
2080	1.977E+05	1.280E-04	4.770E-02
2081	1.977E+05	1.218E-04	4.538E-02
2082	1.977E+05	1.158E-04	4.316E-02
2083	1.977E+05	1.102E-04	4.106E-02

Table D-6. Northern Parcel Chloroethane Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2084	1.977E+05	1.048E-04	3.906E-02
2085	1.977E+05	9.970E-05	3.715E-02
2086	1.977E+05	9.484E-05	3.534E-02
2087	1.977E+05	9.021E-05	3.362E-02
2088	1.977E+05	8.581E-05	3.198E-02
2089	1.977E+05	8.163E-05	3.042E-02
2090	1.977E+05	7.765E-05	2.893E-02
2091	1.977E+05	7.386E-05	2.752E-02
2092	1.977E+05	7.026E-05	2.618E-02
2093	1.977E+05	6.683E-05	2.490E-02
2094	1.977E+05	6.357E-05	2.369E-02
2095	1.977E+05	6.047E-05	2.253E-02
2096	1.977E+05	5.752E-05	2.143E-02
2097	1.977E+05	5.472E-05	2.039E-02
2098	1.977E+05	5.205E-05	1.939E-02
2099	1.977E+05	4.951E-05	1.845E-02
2100	1.977E+05	4.709E-05	1.755E-02
2101	1.977E+05	4.480E-05	1.669E-02
2102	1.977E+05	4.261E-05	1.588E-02
2103	1.977E+05	4.053E-05	1.510E-02
2104	1.977E+05	3.856E-05	1.437E-02
2105	1.977E+05	3.668E-05	1.367E-02
2106	1.977E+05	3.489E-05	1.300E-02
2107	1.977E+05	3.319E-05	1.237E-02
2108	1.977E+05	3.157E-05	1.176E-02
2109	1.977E+05	3.003E-05	1.119E-02
2110	1.977E+05	2.856E-05	1.064E-02
2111	1.977E+05	2.717E-05	1.013E-02
2112	1.977E+05	2.585E-05	9.631E-03
2113	1.977E+05	2.459E-05	9.162E-03
2114	1.977E+05	2.339E-05	8.715E-03
2115	1.977E+05	2.225E-05	8.290E-03
2116	1.977E+05	2.116E-05	7.885E-03
2117	1.977E+05	2.013E-05	7.501E-03
2118	1.977E+05	1.915E-05	7.135E-03
2119	1.977E+05	1.821E-05	6.787E-03
2120	1.977E+05	1.733E-05	6.456E-03
2121	1.977E+05	1.648E-05	6.141E-03
2122	1.977E+05	1.568E-05	5.842E-03
2123	1.977E+05	1.491E-05	5.557E-03
2124	1.977E+05	1.418E-05	5.286E-03
2125	1.977E+05	1.349E-05	5.028E-03
2126	1.977E+05	1.283E-05	4.783E-03
2127	1.977E+05	1.221E-05	4.549E-03
2128	1.977E+05	1.161E-05	4.328E-03
2129	1.977E+05	1.105E-05	4.117E-03
2130	1.977E+05	1.051E-05	3.916E-03
2131	1.977E+05	9.996E-06	3.725E-03
2132	1.977E+05	9.508E-06	3.543E-03
2133	1.977E+05	9.045E-06	3.370E-03
2134	1.977E+05	8.603E-06	3.206E-03
2135	1.977E+05	8.184E-06	3.050E-03
2136	1.977E+05	7.785E-06	2.901E-03
2137	1.977E+05	7.405E-06	2.759E-03
2138	1.977E+05	7.044E-06	2.625E-03
2139	1.977E+05	6.700E-06	2.497E-03
2140	1.977E+05	6.374E-06	2.375E-03
2141	1.977E+05	6.063E-06	2.259E-03
2142	1.977E+05	5.767E-06	2.149E-03
2143	1.977E+05	5.486E-06	2.044E-03
2144	1.977E+05	5.218E-06	1.945E-03
2145	1.977E+05	4.964E-06	1.850E-03
2146	1.977E+05	4.722E-06	1.759E-03
2147	1.977E+05	4.491E-06	1.674E-03
2148	1.977E+05	4.272E-06	1.592E-03
2149	1.977E+05	4.064E-06	1.514E-03
2150	1.977E+05	3.866E-06	1.441E-03
2151	1.977E+05	3.677E-06	1.370E-03
2152	1.977E+05	3.498E-06	1.303E-03
2153	1.977E+05	3.327E-06	1.240E-03
2154	1.977E+05	3.165E-06	1.179E-03

Table D-6. Northern Parcel Chloroethane Emission Rate from Year 1968 to 2203 (concluded).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2155	1.977E+05	3.011E-06	1.122E-03
2156	1.977E+05	2.864E-06	1.067E-03
2157	1.977E+05	2.724E-06	1.015E-03
2158	1.977E+05	2.591E-06	9.656E-04
2159	1.977E+05	2.465E-06	9.185E-04
2160	1.977E+05	2.345E-06	8.737E-04
2161	1.977E+05	2.230E-06	8.311E-04
2162	1.977E+05	2.122E-06	7.906E-04
2163	1.977E+05	2.018E-06	7.520E-04
2164	1.977E+05	1.920E-06	7.153E-04
2165	1.977E+05	1.826E-06	6.805E-04
2166	1.977E+05	1.737E-06	6.473E-04
2167	1.977E+05	1.652E-06	6.157E-04
2168	1.977E+05	1.572E-06	5.857E-04
2169	1.977E+05	1.495E-06	5.571E-04
2170	1.977E+05	1.422E-06	5.299E-04
2171	1.977E+05	1.353E-06	5.041E-04
2172	1.977E+05	1.287E-06	4.795E-04
2173	1.977E+05	1.224E-06	4.561E-04
2174	1.977E+05	1.164E-06	4.339E-04
2175	1.977E+05	1.108E-06	4.127E-04
2176	1.977E+05	1.054E-06	3.926E-04
2177	1.977E+05	1.002E-06	3.734E-04
2178	1.977E+05	9.533E-07	3.552E-04
2179	1.977E+05	9.068E-07	3.379E-04
2180	1.977E+05	8.626E-07	3.214E-04
2181	1.977E+05	8.205E-07	3.058E-04
2182	1.977E+05	7.805E-07	2.908E-04
2183	1.977E+05	7.424E-07	2.767E-04
2184	1.977E+05	7.062E-07	2.632E-04
2185	1.977E+05	6.718E-07	2.503E-04
2186	1.977E+05	6.390E-07	2.381E-04
2187	1.977E+05	6.078E-07	2.265E-04
2188	1.977E+05	5.782E-07	2.155E-04
2189	1.977E+05	5.500E-07	2.050E-04
2190	1.977E+05	5.232E-07	1.950E-04
2191	1.977E+05	4.977E-07	1.854E-04
2192	1.977E+05	4.734E-07	1.764E-04
2193	1.977E+05	4.503E-07	1.678E-04
2194	1.977E+05	4.283E-07	1.596E-04
2195	1.977E+05	4.074E-07	1.518E-04
2196	1.977E+05	3.876E-07	1.444E-04
2197	1.977E+05	3.687E-07	1.374E-04
2198	1.977E+05	3.507E-07	1.307E-04
2199	1.977E+05	3.336E-07	1.243E-04
2200	1.977E+05	3.173E-07	1.182E-04
2201	1.977E+05	3.018E-07	1.125E-04
2202	1.977E+05	2.871E-07	1.070E-04
2203	1.977E+05	2.731E-07	1.018E-04

Table D-7. Northern Parcel Dichlorobenzene Emission Rate from Year 1968 to 2203.

Source: H:\3000\030177~1.000\030177~1.002\ROSEHI~1\NORTHERN.PRM

Model Parameters

Lo : 170.00 m³ / Mg ***** User Mode Selection *****
 k : 0.0500 1/yr ***** User Mode Selection *****
 NMOC : 4500.00 ppmv ***** User Mode Selection *****
 Methane : 56.0000 % volume
 Carbon Dioxide : 44.0000 % volume
 Air Pollutant : Dichlorobenzene (VOC/HAP for 1,4 isomer)
 Molecular Wt = 147.00 Concentration = 0.100000 ppmv

Landfill Parameters

Landfill type : Co-Disposal
 Year Opened : 1967 Current Year : 2003 Closure Year: 2004
 Capacity : 197692 Mg
 Average Acceptance Rate Required from
 Current Year to Closure Year : 13179.47 Mg/year

Model Results

Year	Dichlorobenzene (VOC/HAP for 1,4 isomer) Emission Ra		
	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
1968	1.318E+04	1.223E-04	2.000E-02
1969	2.636E+04	2.387E-04	3.903E-02
1970	3.954E+04	3.493E-04	5.713E-02
1971	5.272E+04	4.546E-04	7.435E-02
1972	6.590E+04	5.547E-04	9.073E-02
1973	7.908E+04	6.500E-04	1.063E-01
1974	9.226E+04	7.406E-04	1.211E-01
1975	1.054E+05	8.268E-04	1.352E-01
1976	1.186E+05	9.088E-04	1.486E-01
1977	1.318E+05	9.868E-04	1.614E-01
1978	1.450E+05	1.061E-03	1.735E-01
1979	1.582E+05	1.132E-03	1.851E-01
1980	1.713E+05	1.199E-03	1.960E-01
1981	1.845E+05	1.263E-03	2.065E-01
1982	1.977E+05	1.323E-03	2.164E-01
1983	1.977E+05	1.259E-03	2.059E-01
1984	1.977E+05	1.197E-03	1.958E-01
1985	1.977E+05	1.139E-03	1.863E-01
1986	1.977E+05	1.083E-03	1.772E-01
1987	1.977E+05	1.031E-03	1.686E-01
1988	1.977E+05	9.803E-04	1.603E-01
1989	1.977E+05	9.325E-04	1.525E-01
1990	1.977E+05	8.870E-04	1.451E-01
1991	1.977E+05	8.437E-04	1.380E-01
1992	1.977E+05	8.026E-04	1.313E-01
1993	1.977E+05	7.634E-04	1.249E-01
1994	1.977E+05	7.262E-04	1.188E-01
1995	1.977E+05	6.908E-04	1.130E-01
1996	1.977E+05	6.571E-04	1.075E-01
1997	1.977E+05	6.251E-04	1.022E-01
1998	1.977E+05	5.946E-04	9.725E-02
1999	1.977E+05	5.656E-04	9.250E-02
2000	1.977E+05	5.380E-04	8.799E-02
2001	1.977E+05	5.118E-04	8.370E-02
2002	1.977E+05	4.868E-04	7.962E-02
2003	1.977E+05	4.631E-04	7.573E-02
2004	1.977E+05	4.405E-04	7.204E-02
2005	1.977E+05	4.190E-04	6.853E-02
2006	1.977E+05	3.986E-04	6.519E-02
2007	1.977E+05	3.791E-04	6.201E-02
2008	1.977E+05	3.606E-04	5.898E-02
2009	1.977E+05	3.430E-04	5.611E-02
2010	1.977E+05	3.263E-04	5.337E-02
2011	1.977E+05	3.104E-04	5.077E-02
2012	1.977E+05	2.953E-04	4.829E-02

Table D-7. Northern Parcel Dichlorobenzene Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2013	1.977E+05	2.809E-04	4.594E-02
2014	1.977E+05	2.672E-04	4.370E-02
2015	1.977E+05	2.541E-04	4.156E-02
2016	1.977E+05	2.417E-04	3.954E-02
2017	1.977E+05	2.299E-04	3.761E-02
2018	1.977E+05	2.187E-04	3.577E-02
2019	1.977E+05	2.081E-04	3.403E-02
2020	1.977E+05	1.979E-04	3.237E-02
2021	1.977E+05	1.883E-04	3.079E-02
2022	1.977E+05	1.791E-04	2.929E-02
2023	1.977E+05	1.703E-04	2.786E-02
2024	1.977E+05	1.620E-04	2.650E-02
2025	1.977E+05	1.541E-04	2.521E-02
2026	1.977E+05	1.466E-04	2.398E-02
2027	1.977E+05	1.395E-04	2.281E-02
2028	1.977E+05	1.327E-04	2.170E-02
2029	1.977E+05	1.262E-04	2.064E-02
2030	1.977E+05	1.200E-04	1.963E-02
2031	1.977E+05	1.142E-04	1.868E-02
2032	1.977E+05	1.086E-04	1.777E-02
2033	1.977E+05	1.033E-04	1.690E-02
2034	1.977E+05	9.828E-05	1.607E-02
2035	1.977E+05	9.349E-05	1.529E-02
2036	1.977E+05	8.893E-05	1.454E-02
2037	1.977E+05	8.459E-05	1.384E-02
2038	1.977E+05	8.047E-05	1.316E-02
2039	1.977E+05	7.654E-05	1.252E-02
2040	1.977E+05	7.281E-05	1.191E-02
2041	1.977E+05	6.926E-05	1.133E-02
2042	1.977E+05	6.588E-05	1.078E-02
2043	1.977E+05	6.267E-05	1.025E-02
2044	1.977E+05	5.961E-05	9.750E-03
2045	1.977E+05	5.670E-05	9.274E-03
2046	1.977E+05	5.394E-05	8.822E-03
2047	1.977E+05	5.131E-05	8.392E-03
2048	1.977E+05	4.881E-05	7.982E-03
2049	1.977E+05	4.643E-05	7.593E-03
2050	1.977E+05	4.416E-05	7.223E-03
2051	1.977E+05	4.201E-05	6.871E-03
2052	1.977E+05	3.996E-05	6.535E-03
2053	1.977E+05	3.801E-05	6.217E-03
2054	1.977E+05	3.616E-05	5.914E-03
2055	1.977E+05	3.439E-05	5.625E-03
2056	1.977E+05	3.272E-05	5.351E-03
2057	1.977E+05	3.112E-05	5.090E-03
2058	1.977E+05	2.960E-05	4.842E-03
2059	1.977E+05	2.816E-05	4.605E-03
2060	1.977E+05	2.679E-05	4.381E-03
2061	1.977E+05	2.548E-05	4.167E-03
2062	1.977E+05	2.424E-05	3.964E-03
2063	1.977E+05	2.305E-05	3.771E-03
2064	1.977E+05	2.193E-05	3.587E-03
2065	1.977E+05	2.086E-05	3.412E-03
2066	1.977E+05	1.984E-05	3.245E-03
2067	1.977E+05	1.888E-05	3.087E-03
2068	1.977E+05	1.795E-05	2.937E-03
2069	1.977E+05	1.708E-05	2.793E-03
2070	1.977E+05	1.625E-05	2.657E-03
2071	1.977E+05	1.545E-05	2.528E-03
2072	1.977E+05	1.470E-05	2.404E-03
2073	1.977E+05	1.398E-05	2.287E-03
2074	1.977E+05	1.330E-05	2.175E-03
2075	1.977E+05	1.265E-05	2.069E-03
2076	1.977E+05	1.204E-05	1.968E-03
2077	1.977E+05	1.145E-05	1.872E-03
2078	1.977E+05	1.089E-05	1.781E-03
2079	1.977E+05	1.036E-05	1.694E-03
2080	1.977E+05	9.854E-06	1.612E-03
2081	1.977E+05	9.373E-06	1.533E-03
2082	1.977E+05	8.916E-06	1.458E-03
2083	1.977E+05	8.481E-06	1.387E-03

Table D-7. Northern Parcel Dichlorobenzene Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2084	1.977E+05	8.068E-06	1.319E-03
2085	1.977E+05	7.674E-06	1.255E-03
2086	1.977E+05	7.300E-06	1.194E-03
2087	1.977E+05	6.944E-06	1.136E-03
2088	1.977E+05	6.605E-06	1.080E-03
2089	1.977E+05	6.283E-06	1.028E-03
2090	1.977E+05	5.977E-06	9.775E-04
2091	1.977E+05	5.685E-06	9.298E-04
2092	1.977E+05	5.408E-06	8.845E-04
2093	1.977E+05	5.144E-06	8.413E-04
2094	1.977E+05	4.893E-06	8.003E-04
2095	1.977E+05	4.655E-06	7.613E-04
2096	1.977E+05	4.428E-06	7.241E-04
2097	1.977E+05	4.212E-06	6.888E-04
2098	1.977E+05	4.006E-06	6.552E-04
2099	1.977E+05	3.811E-06	6.233E-04
2100	1.977E+05	3.625E-06	5.929E-04
2101	1.977E+05	3.448E-06	5.640E-04
2102	1.977E+05	3.280E-06	5.365E-04
2103	1.977E+05	3.120E-06	5.103E-04
2104	1.977E+05	2.968E-06	4.854E-04
2105	1.977E+05	2.823E-06	4.617E-04
2106	1.977E+05	2.685E-06	4.392E-04
2107	1.977E+05	2.554E-06	4.178E-04
2108	1.977E+05	2.430E-06	3.974E-04
2109	1.977E+05	2.311E-06	3.780E-04
2110	1.977E+05	2.199E-06	3.596E-04
2111	1.977E+05	2.091E-06	3.421E-04
2112	1.977E+05	1.989E-06	3.254E-04
2113	1.977E+05	1.892E-06	3.095E-04
2114	1.977E+05	1.800E-06	2.944E-04
2115	1.977E+05	1.712E-06	2.801E-04
2116	1.977E+05	1.629E-06	2.664E-04
2117	1.977E+05	1.549E-06	2.534E-04
2118	1.977E+05	1.474E-06	2.410E-04
2119	1.977E+05	1.402E-06	2.293E-04
2120	1.977E+05	1.334E-06	2.181E-04
2121	1.977E+05	1.269E-06	2.075E-04
2122	1.977E+05	1.207E-06	1.974E-04
2123	1.977E+05	1.148E-06	1.877E-04
2124	1.977E+05	1.092E-06	1.786E-04
2125	1.977E+05	1.039E-06	1.699E-04
2126	1.977E+05	9.879E-07	1.616E-04
2127	1.977E+05	9.397E-07	1.537E-04
2128	1.977E+05	8.939E-07	1.462E-04
2129	1.977E+05	8.503E-07	1.391E-04
2130	1.977E+05	8.088E-07	1.323E-04
2131	1.977E+05	7.694E-07	1.258E-04
2132	1.977E+05	7.319E-07	1.197E-04
2133	1.977E+05	6.962E-07	1.139E-04
2134	1.977E+05	6.622E-07	1.083E-04
2135	1.977E+05	6.299E-07	1.030E-04
2136	1.977E+05	5.992E-07	9.800E-05
2137	1.977E+05	5.700E-07	9.322E-05
2138	1.977E+05	5.422E-07	8.868E-05
2139	1.977E+05	5.157E-07	8.435E-05
2140	1.977E+05	4.906E-07	8.024E-05
2141	1.977E+05	4.667E-07	7.632E-05
2142	1.977E+05	4.439E-07	7.260E-05
2143	1.977E+05	4.223E-07	6.906E-05
2144	1.977E+05	4.017E-07	6.569E-05
2145	1.977E+05	3.821E-07	6.249E-05
2146	1.977E+05	3.634E-07	5.944E-05
2147	1.977E+05	3.457E-07	5.654E-05
2148	1.977E+05	3.288E-07	5.379E-05
2149	1.977E+05	3.128E-07	5.116E-05
2150	1.977E+05	2.976E-07	4.867E-05
2151	1.977E+05	2.830E-07	4.629E-05
2152	1.977E+05	2.692E-07	4.404E-05
2153	1.977E+05	2.561E-07	4.189E-05
2154	1.977E+05	2.436E-07	3.984E-05

Table D-7. Northern Parcel Dichlorobenzene Emission Rate from Year 1968 to 2203 (concluded).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2155	1.977E+05	2.317E-07	3.790E-05
2156	1.977E+05	2.204E-07	3.605E-05
2157	1.977E+05	2.097E-07	3.429E-05
2158	1.977E+05	1.995E-07	3.262E-05
2159	1.977E+05	1.897E-07	3.103E-05
2160	1.977E+05	1.805E-07	2.952E-05
2161	1.977E+05	1.717E-07	2.808E-05
2162	1.977E+05	1.633E-07	2.671E-05
2163	1.977E+05	1.553E-07	2.541E-05
2164	1.977E+05	1.478E-07	2.417E-05
2165	1.977E+05	1.406E-07	2.299E-05
2166	1.977E+05	1.337E-07	2.187E-05
2167	1.977E+05	1.272E-07	2.080E-05
2168	1.977E+05	1.210E-07	1.979E-05
2169	1.977E+05	1.151E-07	1.882E-05
2170	1.977E+05	1.095E-07	1.790E-05
2171	1.977E+05	1.041E-07	1.703E-05
2172	1.977E+05	9.905E-08	1.620E-05
2173	1.977E+05	9.422E-08	1.541E-05
2174	1.977E+05	8.962E-08	1.466E-05
2175	1.977E+05	8.525E-08	1.394E-05
2176	1.977E+05	8.109E-08	1.326E-05
2177	1.977E+05	7.714E-08	1.262E-05
2178	1.977E+05	7.338E-08	1.200E-05
2179	1.977E+05	6.980E-08	1.142E-05
2180	1.977E+05	6.639E-08	1.086E-05
2181	1.977E+05	6.316E-08	1.033E-05
2182	1.977E+05	6.008E-08	9.826E-06
2183	1.977E+05	5.715E-08	9.346E-06
2184	1.977E+05	5.436E-08	8.891E-06
2185	1.977E+05	5.171E-08	8.457E-06
2186	1.977E+05	4.919E-08	8.045E-06
2187	1.977E+05	4.679E-08	7.652E-06
2188	1.977E+05	4.450E-08	7.279E-06
2189	1.977E+05	4.233E-08	6.924E-06
2190	1.977E+05	4.027E-08	6.586E-06
2191	1.977E+05	3.831E-08	6.265E-06
2192	1.977E+05	3.644E-08	5.960E-06
2193	1.977E+05	3.466E-08	5.669E-06
2194	1.977E+05	3.297E-08	5.392E-06
2195	1.977E+05	3.136E-08	5.129E-06
2196	1.977E+05	2.983E-08	4.879E-06
2197	1.977E+05	2.838E-08	4.641E-06
2198	1.977E+05	2.699E-08	4.415E-06
2199	1.977E+05	2.568E-08	4.200E-06
2200	1.977E+05	2.442E-08	3.995E-06
2201	1.977E+05	2.323E-08	3.800E-06
2202	1.977E+05	2.210E-08	3.615E-06
2203	1.977E+05	2.102E-08	3.438E-06

Table D-8. Northern Parcel Toluene Emission Rate from Year 1968 to 2203.

Source: H:\3000\030177~1.000\030177~1.002\ROSEHI~1\NORTHERN.PRM

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=====
                          Model Parameters
=====
Lo : 170.00 m^3 / Mg ***** User Mode Selection *****
k : 0.0500 1/yr ***** User Mode Selection *****
NMOC : 4500.00 ppmv ***** User Mode Selection *****
Methane : 56.0000 % volume
Carbon Dioxide : 44.0000 % volume
Air Pollutant : Toluene (HAP/VOC)
Molecular Wt = 92.14      Concentration =      1.120000 ppmV
=====
    
```

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=====
                          Landfill Parameters
=====
Landfill type : Co-Disposal
Year Opened : 1967      Current Year : 2003      Closure Year: 2004
Capacity : 197692 Mg
Average Acceptance Rate Required from
      Current Year to Closure Year : 13179.47 Mg/year
=====
    
```

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=====
                          Model Results
=====

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Year	Refuse In Place (Mg)	Toluene (HAP/VOC) Emission Rate (Mg/yr)	Emission Rate (Cubic m/yr)
1968	1.318E+04	8.586E-04	2.241E-01
1969	2.636E+04	1.675E-03	4.372E-01
1970	3.954E+04	2.452E-03	6.399E-01
1971	5.272E+04	3.191E-03	8.327E-01
1972	6.590E+04	3.894E-03	1.016E+00
1973	7.908E+04	4.563E-03	1.191E+00
1974	9.226E+04	5.199E-03	1.357E+00
1975	1.054E+05	5.804E-03	1.515E+00
1976	1.186E+05	6.380E-03	1.665E+00
1977	1.318E+05	6.927E-03	1.808E+00
1978	1.450E+05	7.448E-03	1.943E+00
1979	1.582E+05	7.944E-03	2.073E+00
1980	1.713E+05	8.415E-03	2.196E+00
1981	1.845E+05	8.863E-03	2.313E+00
1982	1.977E+05	9.289E-03	2.424E+00
1983	1.977E+05	8.836E-03	2.306E+00
1984	1.977E+05	8.405E-03	2.193E+00
1985	1.977E+05	7.995E-03	2.086E+00
1986	1.977E+05	7.606E-03	1.985E+00
1987	1.977E+05	7.235E-03	1.888E+00
1988	1.977E+05	6.882E-03	1.796E+00
1989	1.977E+05	6.546E-03	1.708E+00
1990	1.977E+05	6.227E-03	1.625E+00
1991	1.977E+05	5.923E-03	1.546E+00
1992	1.977E+05	5.634E-03	1.470E+00
1993	1.977E+05	5.360E-03	1.398E+00
1994	1.977E+05	5.098E-03	1.330E+00
1995	1.977E+05	4.849E-03	1.265E+00
1996	1.977E+05	4.613E-03	1.204E+00
1997	1.977E+05	4.388E-03	1.145E+00
1998	1.977E+05	4.174E-03	1.089E+00
1999	1.977E+05	3.970E-03	1.036E+00
2000	1.977E+05	3.777E-03	9.855E-01
2001	1.977E+05	3.593E-03	9.374E-01
2002	1.977E+05	3.417E-03	8.917E-01
2003	1.977E+05	3.251E-03	8.482E-01
2004	1.977E+05	3.092E-03	8.069E-01
2005	1.977E+05	2.941E-03	7.675E-01
2006	1.977E+05	2.798E-03	7.301E-01
2007	1.977E+05	2.661E-03	6.945E-01
2008	1.977E+05	2.532E-03	6.606E-01
2009	1.977E+05	2.408E-03	6.284E-01
2010	1.977E+05	2.291E-03	5.977E-01
2011	1.977E+05	2.179E-03	5.686E-01
2012	1.977E+05	2.073E-03	5.409E-01

Table D-8. Northern Parcel Toluene Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2013	1.977E+05	1.972E-03	5.145E-01
2014	1.977E+05	1.876E-03	4.894E-01
2015	1.977E+05	1.784E-03	4.655E-01
2016	1.977E+05	1.697E-03	4.428E-01
2017	1.977E+05	1.614E-03	4.212E-01
2018	1.977E+05	1.536E-03	4.007E-01
2019	1.977E+05	1.461E-03	3.811E-01
2020	1.977E+05	1.389E-03	3.625E-01
2021	1.977E+05	1.322E-03	3.449E-01
2022	1.977E+05	1.257E-03	3.280E-01
2023	1.977E+05	1.196E-03	3.120E-01
2024	1.977E+05	1.138E-03	2.968E-01
2025	1.977E+05	1.082E-03	2.824E-01
2026	1.977E+05	1.029E-03	2.686E-01
2027	1.977E+05	9.791E-04	2.555E-01
2028	1.977E+05	9.313E-04	2.430E-01
2029	1.977E+05	8.859E-04	2.312E-01
2030	1.977E+05	8.427E-04	2.199E-01
2031	1.977E+05	8.016E-04	2.092E-01
2032	1.977E+05	7.625E-04	1.990E-01
2033	1.977E+05	7.253E-04	1.893E-01
2034	1.977E+05	6.900E-04	1.800E-01
2035	1.977E+05	6.563E-04	1.713E-01
2036	1.977E+05	6.243E-04	1.629E-01
2037	1.977E+05	5.939E-04	1.550E-01
2038	1.977E+05	5.649E-04	1.474E-01
2039	1.977E+05	5.373E-04	1.402E-01
2040	1.977E+05	5.111E-04	1.334E-01
2041	1.977E+05	4.862E-04	1.269E-01
2042	1.977E+05	4.625E-04	1.207E-01
2043	1.977E+05	4.399E-04	1.148E-01
2044	1.977E+05	4.185E-04	1.092E-01
2045	1.977E+05	3.981E-04	1.039E-01
2046	1.977E+05	3.787E-04	9.881E-02
2047	1.977E+05	3.602E-04	9.399E-02
2048	1.977E+05	3.426E-04	8.940E-02
2049	1.977E+05	3.259E-04	8.504E-02
2050	1.977E+05	3.100E-04	8.090E-02
2051	1.977E+05	2.949E-04	7.695E-02
2052	1.977E+05	2.805E-04	7.320E-02
2053	1.977E+05	2.668E-04	6.963E-02
2054	1.977E+05	2.538E-04	6.623E-02
2055	1.977E+05	2.414E-04	6.300E-02
2056	1.977E+05	2.297E-04	5.993E-02
2057	1.977E+05	2.185E-04	5.701E-02
2058	1.977E+05	2.078E-04	5.423E-02
2059	1.977E+05	1.977E-04	5.158E-02
2060	1.977E+05	1.880E-04	4.907E-02
2061	1.977E+05	1.789E-04	4.667E-02
2062	1.977E+05	1.701E-04	4.440E-02
2063	1.977E+05	1.618E-04	4.223E-02
2064	1.977E+05	1.540E-04	4.017E-02
2065	1.977E+05	1.464E-04	3.821E-02
2066	1.977E+05	1.393E-04	3.635E-02
2067	1.977E+05	1.325E-04	3.458E-02
2068	1.977E+05	1.260E-04	3.289E-02
2069	1.977E+05	1.199E-04	3.129E-02
2070	1.977E+05	1.140E-04	2.976E-02
2071	1.977E+05	1.085E-04	2.831E-02
2072	1.977E+05	1.032E-04	2.693E-02
2073	1.977E+05	9.816E-05	2.561E-02
2074	1.977E+05	9.338E-05	2.437E-02
2075	1.977E+05	8.882E-05	2.318E-02
2076	1.977E+05	8.449E-05	2.205E-02
2077	1.977E+05	8.037E-05	2.097E-02
2078	1.977E+05	7.645E-05	1.995E-02
2079	1.977E+05	7.272E-05	1.898E-02
2080	1.977E+05	6.917E-05	1.805E-02
2081	1.977E+05	6.580E-05	1.717E-02
2082	1.977E+05	6.259E-05	1.633E-02
2083	1.977E+05	5.954E-05	1.554E-02

Table D-8. Northern Parcel Toluene Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2084	1.977E+05	5.664E-05	1.478E-02
2085	1.977E+05	5.387E-05	1.406E-02
2086	1.977E+05	5.125E-05	1.337E-02
2087	1.977E+05	4.875E-05	1.272E-02
2088	1.977E+05	4.637E-05	1.210E-02
2089	1.977E+05	4.411E-05	1.151E-02
2090	1.977E+05	4.196E-05	1.095E-02
2091	1.977E+05	3.991E-05	1.041E-02
2092	1.977E+05	3.796E-05	9.906E-03
2093	1.977E+05	3.611E-05	9.423E-03
2094	1.977E+05	3.435E-05	8.963E-03
2095	1.977E+05	3.268E-05	8.526E-03
2096	1.977E+05	3.108E-05	8.110E-03
2097	1.977E+05	2.957E-05	7.715E-03
2098	1.977E+05	2.812E-05	7.339E-03
2099	1.977E+05	2.675E-05	6.981E-03
2100	1.977E+05	2.545E-05	6.640E-03
2101	1.977E+05	2.421E-05	6.316E-03
2102	1.977E+05	2.303E-05	6.008E-03
2103	1.977E+05	2.190E-05	5.715E-03
2104	1.977E+05	2.084E-05	5.437E-03
2105	1.977E+05	1.982E-05	5.171E-03
2106	1.977E+05	1.885E-05	4.919E-03
2107	1.977E+05	1.793E-05	4.679E-03
2108	1.977E+05	1.706E-05	4.451E-03
2109	1.977E+05	1.623E-05	4.234E-03
2110	1.977E+05	1.543E-05	4.028E-03
2111	1.977E+05	1.468E-05	3.831E-03
2112	1.977E+05	1.397E-05	3.644E-03
2113	1.977E+05	1.328E-05	3.467E-03
2114	1.977E+05	1.264E-05	3.297E-03
2115	1.977E+05	1.202E-05	3.137E-03
2116	1.977E+05	1.143E-05	2.984E-03
2117	1.977E+05	1.088E-05	2.838E-03
2118	1.977E+05	1.035E-05	2.700E-03
2119	1.977E+05	9.842E-06	2.568E-03
2120	1.977E+05	9.362E-06	2.443E-03
2121	1.977E+05	8.905E-06	2.324E-03
2122	1.977E+05	8.471E-06	2.210E-03
2123	1.977E+05	8.058E-06	2.103E-03
2124	1.977E+05	7.665E-06	2.000E-03
2125	1.977E+05	7.291E-06	1.902E-03
2126	1.977E+05	6.935E-06	1.810E-03
2127	1.977E+05	6.597E-06	1.721E-03
2128	1.977E+05	6.275E-06	1.637E-03
2129	1.977E+05	5.969E-06	1.558E-03
2130	1.977E+05	5.678E-06	1.482E-03
2131	1.977E+05	5.401E-06	1.409E-03
2132	1.977E+05	5.138E-06	1.341E-03
2133	1.977E+05	4.887E-06	1.275E-03
2134	1.977E+05	4.649E-06	1.213E-03
2135	1.977E+05	4.422E-06	1.154E-03
2136	1.977E+05	4.207E-06	1.098E-03
2137	1.977E+05	4.001E-06	1.044E-03
2138	1.977E+05	3.806E-06	9.932E-04
2139	1.977E+05	3.621E-06	9.447E-04
2140	1.977E+05	3.444E-06	8.987E-04
2141	1.977E+05	3.276E-06	8.548E-04
2142	1.977E+05	3.116E-06	8.131E-04
2143	1.977E+05	2.964E-06	7.735E-04
2144	1.977E+05	2.820E-06	7.358E-04
2145	1.977E+05	2.682E-06	6.999E-04
2146	1.977E+05	2.551E-06	6.657E-04
2147	1.977E+05	2.427E-06	6.333E-04
2148	1.977E+05	2.309E-06	6.024E-04
2149	1.977E+05	2.196E-06	5.730E-04
2150	1.977E+05	2.089E-06	5.451E-04
2151	1.977E+05	1.987E-06	5.185E-04
2152	1.977E+05	1.890E-06	4.932E-04
2153	1.977E+05	1.798E-06	4.691E-04
2154	1.977E+05	1.710E-06	4.463E-04

Table D-8. Northern Parcel Toluene Emission Rate from Year 1968 to 2203 (concluded).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2155	1.977E+05	1.627E-06	4.245E-04
2156	1.977E+05	1.547E-06	4.038E-04
2157	1.977E+05	1.472E-06	3.841E-04
2158	1.977E+05	1.400E-06	3.654E-04
2159	1.977E+05	1.332E-06	3.476E-04
2160	1.977E+05	1.267E-06	3.306E-04
2161	1.977E+05	1.205E-06	3.145E-04
2162	1.977E+05	1.146E-06	2.991E-04
2163	1.977E+05	1.090E-06	2.846E-04
2164	1.977E+05	1.037E-06	2.707E-04
2165	1.977E+05	9.867E-07	2.575E-04
2166	1.977E+05	9.386E-07	2.449E-04
2167	1.977E+05	8.928E-07	2.330E-04
2168	1.977E+05	8.493E-07	2.216E-04
2169	1.977E+05	8.079E-07	2.108E-04
2170	1.977E+05	7.685E-07	2.005E-04
2171	1.977E+05	7.310E-07	1.907E-04
2172	1.977E+05	6.953E-07	1.814E-04
2173	1.977E+05	6.614E-07	1.726E-04
2174	1.977E+05	6.292E-07	1.642E-04
2175	1.977E+05	5.985E-07	1.562E-04
2176	1.977E+05	5.693E-07	1.485E-04
2177	1.977E+05	5.415E-07	1.413E-04
2178	1.977E+05	5.151E-07	1.344E-04
2179	1.977E+05	4.900E-07	1.279E-04
2180	1.977E+05	4.661E-07	1.216E-04
2181	1.977E+05	4.434E-07	1.157E-04
2182	1.977E+05	4.217E-07	1.100E-04
2183	1.977E+05	4.012E-07	1.047E-04
2184	1.977E+05	3.816E-07	9.957E-05
2185	1.977E+05	3.630E-07	9.472E-05
2186	1.977E+05	3.453E-07	9.010E-05
2187	1.977E+05	3.285E-07	8.570E-05
2188	1.977E+05	3.124E-07	8.152E-05
2189	1.977E+05	2.972E-07	7.755E-05
2190	1.977E+05	2.827E-07	7.377E-05
2191	1.977E+05	2.689E-07	7.017E-05
2192	1.977E+05	2.558E-07	6.675E-05
2193	1.977E+05	2.433E-07	6.349E-05
2194	1.977E+05	2.315E-07	6.040E-05
2195	1.977E+05	2.202E-07	5.745E-05
2196	1.977E+05	2.094E-07	5.465E-05
2197	1.977E+05	1.992E-07	5.198E-05
2198	1.977E+05	1.895E-07	4.945E-05
2199	1.977E+05	1.803E-07	4.704E-05
2200	1.977E+05	1.715E-07	4.474E-05
2201	1.977E+05	1.631E-07	4.256E-05
2202	1.977E+05	1.551E-07	4.048E-05
2203	1.977E+05	1.476E-07	3.851E-05

Table D-9. Northern Parcel Trichloroethene Emission Rate from Year 1968 to 2203.

Source: H:\3000\030177~1.000\030177~1.002\ROSEHI~1\NORTHERN.PRM

```

=====
                        Model Parameters
=====
Lo : 170.00 m^3 / Mg ***** User Mode Selection *****
k : 0.0500 1/yr ***** User Mode Selection *****
NMOC : 4500.00 ppmv ***** User Mode Selection *****
Methane : 56.0000 % volume
Carbon Dioxide : 44.0000 % volume
Air Pollutant : Trichloroethene (HAP/VOC)
Molecular Wt = 131.38      Concentration =      0.060000 ppmV
=====
    
```

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=====
                        Landfill Parameters
=====
Landfill type : Co-Disposal
Year Opened : 1967      Current Year : 2003      Closure Year: 2004
Capacity : 197692 Mg
Average Acceptance Rate Required from
      Current Year to Closure Year : 13179.47 Mg/year
=====
    
```

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=====
                        Model Results
=====
Year      Refuse In Place (Mg)      Trichloroethene (HAP/VOC) Emission Rate
                        (Mg/yr)      (Cubic m/yr)
=====
1968      1.318E+04      6.559E-05      1.200E-02
1969      2.636E+04      1.280E-04      2.342E-02
1970      3.954E+04      1.873E-04      3.428E-02
1971      5.272E+04      2.438E-04      4.461E-02
1972      6.590E+04      2.975E-04      5.444E-02
1973      7.908E+04      3.486E-04      6.379E-02
1974      9.226E+04      3.971E-04      7.268E-02
1975      1.054E+05      4.434E-04      8.114E-02
1976      1.186E+05      4.873E-04      8.918E-02
1977      1.318E+05      5.292E-04      9.684E-02
1978      1.450E+05      5.689E-04      1.041E-01
1979      1.582E+05      6.068E-04      1.110E-01
1980      1.713E+05      6.428E-04      1.176E-01
1981      1.845E+05      6.770E-04      1.239E-01
1982      1.977E+05      7.096E-04      1.299E-01
1983      1.977E+05      6.750E-04      1.235E-01
1984      1.977E+05      6.421E-04      1.175E-01
1985      1.977E+05      6.107E-04      1.118E-01
1986      1.977E+05      5.810E-04      1.063E-01
1987      1.977E+05      5.526E-04      1.011E-01
1988      1.977E+05      5.257E-04      9.620E-02
1989      1.977E+05      5.000E-04      9.151E-02
1990      1.977E+05      4.756E-04      8.704E-02
1991      1.977E+05      4.524E-04      8.280E-02
1992      1.977E+05      4.304E-04      7.876E-02
1993      1.977E+05      4.094E-04      7.492E-02
1994      1.977E+05      3.894E-04      7.127E-02
1995      1.977E+05      3.704E-04      6.779E-02
1996      1.977E+05      3.524E-04      6.448E-02
1997      1.977E+05      3.352E-04      6.134E-02
1998      1.977E+05      3.188E-04      5.835E-02
1999      1.977E+05      3.033E-04      5.550E-02
2000      1.977E+05      2.885E-04      5.279E-02
2001      1.977E+05      2.744E-04      5.022E-02
2002      1.977E+05      2.610E-04      4.777E-02
2003      1.977E+05      2.483E-04      4.544E-02
2004      1.977E+05      2.362E-04      4.322E-02
2005      1.977E+05      2.247E-04      4.112E-02
2006      1.977E+05      2.137E-04      3.911E-02
2007      1.977E+05      2.033E-04      3.720E-02
2008      1.977E+05      1.934E-04      3.539E-02
2009      1.977E+05      1.840E-04      3.366E-02
2010      1.977E+05      1.750E-04      3.202E-02
2011      1.977E+05      1.664E-04      3.046E-02
2012      1.977E+05      1.583E-04      2.897E-02
=====
    
```

Table D-9. Northern Parcel Trichloroethene Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2013	1.977E+05	1.506E-04	2.756E-02
2014	1.977E+05	1.433E-04	2.622E-02
2015	1.977E+05	1.363E-04	2.494E-02
2016	1.977E+05	1.296E-04	2.372E-02
2017	1.977E+05	1.233E-04	2.257E-02
2018	1.977E+05	1.173E-04	2.146E-02
2019	1.977E+05	1.116E-04	2.042E-02
2020	1.977E+05	1.061E-04	1.942E-02
2021	1.977E+05	1.010E-04	1.847E-02
2022	1.977E+05	9.603E-05	1.757E-02
2023	1.977E+05	9.135E-05	1.672E-02
2024	1.977E+05	8.689E-05	1.590E-02
2025	1.977E+05	8.266E-05	1.513E-02
2026	1.977E+05	7.862E-05	1.439E-02
2027	1.977E+05	7.479E-05	1.369E-02
2028	1.977E+05	7.114E-05	1.302E-02
2029	1.977E+05	6.767E-05	1.238E-02
2030	1.977E+05	6.437E-05	1.178E-02
2031	1.977E+05	6.123E-05	1.121E-02
2032	1.977E+05	5.825E-05	1.066E-02
2033	1.977E+05	5.541E-05	1.014E-02
2034	1.977E+05	5.270E-05	9.645E-03
2035	1.977E+05	5.013E-05	9.174E-03
2036	1.977E+05	4.769E-05	8.727E-03
2037	1.977E+05	4.536E-05	8.301E-03
2038	1.977E+05	4.315E-05	7.896E-03
2039	1.977E+05	4.105E-05	7.511E-03
2040	1.977E+05	3.904E-05	7.145E-03
2041	1.977E+05	3.714E-05	6.797E-03
2042	1.977E+05	3.533E-05	6.465E-03
2043	1.977E+05	3.361E-05	6.150E-03
2044	1.977E+05	3.197E-05	5.850E-03
2045	1.977E+05	3.041E-05	5.565E-03
2046	1.977E+05	2.892E-05	5.293E-03
2047	1.977E+05	2.751E-05	5.035E-03
2048	1.977E+05	2.617E-05	4.789E-03
2049	1.977E+05	2.490E-05	4.556E-03
2050	1.977E+05	2.368E-05	4.334E-03
2051	1.977E+05	2.253E-05	4.122E-03
2052	1.977E+05	2.143E-05	3.921E-03
2053	1.977E+05	2.038E-05	3.730E-03
2054	1.977E+05	1.939E-05	3.548E-03
2055	1.977E+05	1.844E-05	3.375E-03
2056	1.977E+05	1.754E-05	3.210E-03
2057	1.977E+05	1.669E-05	3.054E-03
2058	1.977E+05	1.587E-05	2.905E-03
2059	1.977E+05	1.510E-05	2.763E-03
2060	1.977E+05	1.436E-05	2.629E-03
2061	1.977E+05	1.366E-05	2.500E-03
2062	1.977E+05	1.300E-05	2.378E-03
2063	1.977E+05	1.236E-05	2.262E-03
2064	1.977E+05	1.176E-05	2.152E-03
2065	1.977E+05	1.119E-05	2.047E-03
2066	1.977E+05	1.064E-05	1.947E-03
2067	1.977E+05	1.012E-05	1.852E-03
2068	1.977E+05	9.628E-06	1.762E-03
2069	1.977E+05	9.158E-06	1.676E-03
2070	1.977E+05	8.712E-06	1.594E-03
2071	1.977E+05	8.287E-06	1.517E-03
2072	1.977E+05	7.883E-06	1.443E-03
2073	1.977E+05	7.498E-06	1.372E-03
2074	1.977E+05	7.133E-06	1.305E-03
2075	1.977E+05	6.785E-06	1.242E-03
2076	1.977E+05	6.454E-06	1.181E-03
2077	1.977E+05	6.139E-06	1.123E-03
2078	1.977E+05	5.840E-06	1.069E-03
2079	1.977E+05	5.555E-06	1.017E-03
2080	1.977E+05	5.284E-06	9.670E-04
2081	1.977E+05	5.026E-06	9.198E-04
2082	1.977E+05	4.781E-06	8.750E-04
2083	1.977E+05	4.548E-06	8.323E-04

Table D-9. Northern Parcel Trichloroethene Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2084	1.977E+05	4.326E-06	7.917E-04
2085	1.977E+05	4.115E-06	7.531E-04
2086	1.977E+05	3.914E-06	7.164E-04
2087	1.977E+05	3.724E-06	6.814E-04
2088	1.977E+05	3.542E-06	6.482E-04
2089	1.977E+05	3.369E-06	6.166E-04
2090	1.977E+05	3.205E-06	5.865E-04
2091	1.977E+05	3.049E-06	5.579E-04
2092	1.977E+05	2.900E-06	5.307E-04
2093	1.977E+05	2.758E-06	5.048E-04
2094	1.977E+05	2.624E-06	4.802E-04
2095	1.977E+05	2.496E-06	4.568E-04
2096	1.977E+05	2.374E-06	4.345E-04
2097	1.977E+05	2.258E-06	4.133E-04
2098	1.977E+05	2.148E-06	3.931E-04
2099	1.977E+05	2.044E-06	3.740E-04
2100	1.977E+05	1.944E-06	3.557E-04
2101	1.977E+05	1.849E-06	3.384E-04
2102	1.977E+05	1.759E-06	3.219E-04
2103	1.977E+05	1.673E-06	3.062E-04
2104	1.977E+05	1.592E-06	2.912E-04
2105	1.977E+05	1.514E-06	2.770E-04
2106	1.977E+05	1.440E-06	2.635E-04
2107	1.977E+05	1.370E-06	2.507E-04
2108	1.977E+05	1.303E-06	2.385E-04
2109	1.977E+05	1.239E-06	2.268E-04
2110	1.977E+05	1.179E-06	2.158E-04
2111	1.977E+05	1.122E-06	2.052E-04
2112	1.977E+05	1.067E-06	1.952E-04
2113	1.977E+05	1.015E-06	1.857E-04
2114	1.977E+05	9.653E-07	1.766E-04
2115	1.977E+05	9.182E-07	1.680E-04
2116	1.977E+05	8.734E-07	1.598E-04
2117	1.977E+05	8.308E-07	1.520E-04
2118	1.977E+05	7.903E-07	1.446E-04
2119	1.977E+05	7.518E-07	1.376E-04
2120	1.977E+05	7.151E-07	1.309E-04
2121	1.977E+05	6.802E-07	1.245E-04
2122	1.977E+05	6.471E-07	1.184E-04
2123	1.977E+05	6.155E-07	1.126E-04
2124	1.977E+05	5.855E-07	1.071E-04
2125	1.977E+05	5.569E-07	1.019E-04
2126	1.977E+05	5.298E-07	9.695E-05
2127	1.977E+05	5.039E-07	9.222E-05
2128	1.977E+05	4.794E-07	8.772E-05
2129	1.977E+05	4.560E-07	8.344E-05
2130	1.977E+05	4.337E-07	7.937E-05
2131	1.977E+05	4.126E-07	7.550E-05
2132	1.977E+05	3.925E-07	7.182E-05
2133	1.977E+05	3.733E-07	6.832E-05
2134	1.977E+05	3.551E-07	6.499E-05
2135	1.977E+05	3.378E-07	6.182E-05
2136	1.977E+05	3.213E-07	5.880E-05
2137	1.977E+05	3.056E-07	5.593E-05
2138	1.977E+05	2.907E-07	5.321E-05
2139	1.977E+05	2.766E-07	5.061E-05
2140	1.977E+05	2.631E-07	4.814E-05
2141	1.977E+05	2.502E-07	4.579E-05
2142	1.977E+05	2.380E-07	4.356E-05
2143	1.977E+05	2.264E-07	4.144E-05
2144	1.977E+05	2.154E-07	3.942E-05
2145	1.977E+05	2.049E-07	3.749E-05
2146	1.977E+05	1.949E-07	3.567E-05
2147	1.977E+05	1.854E-07	3.393E-05
2148	1.977E+05	1.763E-07	3.227E-05
2149	1.977E+05	1.677E-07	3.070E-05
2150	1.977E+05	1.596E-07	2.920E-05
2151	1.977E+05	1.518E-07	2.778E-05
2152	1.977E+05	1.444E-07	2.642E-05
2153	1.977E+05	1.373E-07	2.513E-05
2154	1.977E+05	1.306E-07	2.391E-05

Table D-9. Northern Parcel Trichloroethene Emission Rate from Year 1968 to 2203 (concluded).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2155	1.977E+05	1.243E-07	2.274E-05
2156	1.977E+05	1.182E-07	2.163E-05
2157	1.977E+05	1.124E-07	2.058E-05
2158	1.977E+05	1.070E-07	1.957E-05
2159	1.977E+05	1.017E-07	1.862E-05
2160	1.977E+05	9.678E-08	1.771E-05
2161	1.977E+05	9.206E-08	1.685E-05
2162	1.977E+05	8.757E-08	1.603E-05
2163	1.977E+05	8.330E-08	1.524E-05
2164	1.977E+05	7.924E-08	1.450E-05
2165	1.977E+05	7.537E-08	1.379E-05
2166	1.977E+05	7.170E-08	1.312E-05
2167	1.977E+05	6.820E-08	1.248E-05
2168	1.977E+05	6.487E-08	1.187E-05
2169	1.977E+05	6.171E-08	1.129E-05
2170	1.977E+05	5.870E-08	1.074E-05
2171	1.977E+05	5.584E-08	1.022E-05
2172	1.977E+05	5.311E-08	9.720E-06
2173	1.977E+05	5.052E-08	9.246E-06
2174	1.977E+05	4.806E-08	8.795E-06
2175	1.977E+05	4.572E-08	8.366E-06
2176	1.977E+05	4.349E-08	7.958E-06
2177	1.977E+05	4.137E-08	7.570E-06
2178	1.977E+05	3.935E-08	7.201E-06
2179	1.977E+05	3.743E-08	6.849E-06
2180	1.977E+05	3.560E-08	6.515E-06
2181	1.977E+05	3.387E-08	6.198E-06
2182	1.977E+05	3.222E-08	5.895E-06
2183	1.977E+05	3.064E-08	5.608E-06
2184	1.977E+05	2.915E-08	5.334E-06
2185	1.977E+05	2.773E-08	5.074E-06
2186	1.977E+05	2.638E-08	4.827E-06
2187	1.977E+05	2.509E-08	4.591E-06
2188	1.977E+05	2.387E-08	4.367E-06
2189	1.977E+05	2.270E-08	4.154E-06
2190	1.977E+05	2.159E-08	3.952E-06
2191	1.977E+05	2.054E-08	3.759E-06
2192	1.977E+05	1.954E-08	3.576E-06
2193	1.977E+05	1.859E-08	3.401E-06
2194	1.977E+05	1.768E-08	3.235E-06
2195	1.977E+05	1.682E-08	3.078E-06
2196	1.977E+05	1.600E-08	2.928E-06
2197	1.977E+05	1.522E-08	2.785E-06
2198	1.977E+05	1.448E-08	2.649E-06
2199	1.977E+05	1.377E-08	2.520E-06
2200	1.977E+05	1.310E-08	2.397E-06
2201	1.977E+05	1.246E-08	2.280E-06
2202	1.977E+05	1.185E-08	2.169E-06
2203	1.977E+05	1.127E-08	2.063E-06

Table D-10. Northern Parcel Vinyl Chloride Emission Rate from Year 1968 to 2203.

Source: H:\3000\030177~1.000\030177~1.002\ROSEHI~1\NORTHERN.PRM

```

=====
Model Parameters
=====
Lo : 170.00 m^3 / Mg ***** User Mode Selection *****
k : 0.0500 1/yr ***** User Mode Selection *****
NMOC : 4500.00 ppmv ***** User Mode Selection *****
Methane : 56.0000 % volume
Carbon Dioxide : 44.0000 % volume
Air Pollutant : Vinyl Chloride (HAP/VOC)
Molecular Wt = 62.50      Concentration = 0.620000 ppmV
=====

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=====
Landfill Parameters
=====
Landfill type : Co-Disposal
Year Opened : 1967      Current Year : 2003      Closure Year: 2004
Capacity : 197692 Mg
Average Acceptance Rate Required from
      Current Year to Closure Year : 13179.47 Mg/year
=====

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=====
Model Results
=====

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Year	Refuse In Place (Mg)	Vinyl Chloride (HAP/VOC) Emission Rate (Mg/yr)	(Cubic m/yr)
1968	1.318E+04	3.224E-04	1.240E-01
1969	2.636E+04	6.291E-04	2.420E-01
1970	3.954E+04	9.208E-04	3.542E-01
1971	5.272E+04	1.198E-03	4.610E-01
1972	6.590E+04	1.462E-03	5.625E-01
1973	7.908E+04	1.713E-03	6.591E-01
1974	9.226E+04	1.952E-03	7.510E-01
1975	1.054E+05	2.179E-03	8.384E-01
1976	1.186E+05	2.396E-03	9.215E-01
1977	1.318E+05	2.601E-03	1.001E+00
1978	1.450E+05	2.797E-03	1.076E+00
1979	1.582E+05	2.983E-03	1.147E+00
1980	1.713E+05	3.160E-03	1.215E+00
1981	1.845E+05	3.328E-03	1.280E+00
1982	1.977E+05	3.488E-03	1.342E+00
1983	1.977E+05	3.318E-03	1.276E+00
1984	1.977E+05	3.156E-03	1.214E+00
1985	1.977E+05	3.002E-03	1.155E+00
1986	1.977E+05	2.856E-03	1.099E+00
1987	1.977E+05	2.717E-03	1.045E+00
1988	1.977E+05	2.584E-03	9.940E-01
1989	1.977E+05	2.458E-03	9.456E-01
1990	1.977E+05	2.338E-03	8.995E-01
1991	1.977E+05	2.224E-03	8.556E-01
1992	1.977E+05	2.116E-03	8.139E-01
1993	1.977E+05	2.012E-03	7.742E-01
1994	1.977E+05	1.914E-03	7.364E-01
1995	1.977E+05	1.821E-03	7.005E-01
1996	1.977E+05	1.732E-03	6.663E-01
1997	1.977E+05	1.648E-03	6.338E-01
1998	1.977E+05	1.567E-03	6.029E-01
1999	1.977E+05	1.491E-03	5.735E-01
2000	1.977E+05	1.418E-03	5.455E-01
2001	1.977E+05	1.349E-03	5.189E-01
2002	1.977E+05	1.283E-03	4.936E-01
2003	1.977E+05	1.221E-03	4.696E-01
2004	1.977E+05	1.161E-03	4.467E-01
2005	1.977E+05	1.104E-03	4.249E-01
2006	1.977E+05	1.051E-03	4.042E-01
2007	1.977E+05	9.994E-04	3.844E-01
2008	1.977E+05	9.506E-04	3.657E-01
2009	1.977E+05	9.043E-04	3.479E-01
2010	1.977E+05	8.602E-04	3.309E-01
2011	1.977E+05	8.182E-04	3.148E-01
2012	1.977E+05	7.783E-04	2.994E-01

Table D-10. Northern Parcel Vinyl Chloride Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2013	1.977E+05	7.404E-04	2.848E-01
2014	1.977E+05	7.042E-04	2.709E-01
2015	1.977E+05	6.699E-04	2.577E-01
2016	1.977E+05	6.372E-04	2.451E-01
2017	1.977E+05	6.062E-04	2.332E-01
2018	1.977E+05	5.766E-04	2.218E-01
2019	1.977E+05	5.485E-04	2.110E-01
2020	1.977E+05	5.217E-04	2.007E-01
2021	1.977E+05	4.963E-04	1.909E-01
2022	1.977E+05	4.721E-04	1.816E-01
2023	1.977E+05	4.490E-04	1.727E-01
2024	1.977E+05	4.271E-04	1.643E-01
2025	1.977E+05	4.063E-04	1.563E-01
2026	1.977E+05	3.865E-04	1.487E-01
2027	1.977E+05	3.676E-04	1.414E-01
2028	1.977E+05	3.497E-04	1.345E-01
2029	1.977E+05	3.327E-04	1.280E-01
2030	1.977E+05	3.164E-04	1.217E-01
2031	1.977E+05	3.010E-04	1.158E-01
2032	1.977E+05	2.863E-04	1.101E-01
2033	1.977E+05	2.724E-04	1.048E-01
2034	1.977E+05	2.591E-04	9.966E-02
2035	1.977E+05	2.464E-04	9.480E-02
2036	1.977E+05	2.344E-04	9.018E-02
2037	1.977E+05	2.230E-04	8.578E-02
2038	1.977E+05	2.121E-04	8.160E-02
2039	1.977E+05	2.018E-04	7.762E-02
2040	1.977E+05	1.919E-04	7.383E-02
2041	1.977E+05	1.826E-04	7.023E-02
2042	1.977E+05	1.737E-04	6.681E-02
2043	1.977E+05	1.652E-04	6.355E-02
2044	1.977E+05	1.571E-04	6.045E-02
2045	1.977E+05	1.495E-04	5.750E-02
2046	1.977E+05	1.422E-04	5.470E-02
2047	1.977E+05	1.353E-04	5.203E-02
2048	1.977E+05	1.287E-04	4.949E-02
2049	1.977E+05	1.224E-04	4.708E-02
2050	1.977E+05	1.164E-04	4.478E-02
2051	1.977E+05	1.107E-04	4.260E-02
2052	1.977E+05	1.053E-04	4.052E-02
2053	1.977E+05	1.002E-04	3.854E-02
2054	1.977E+05	9.531E-05	3.666E-02
2055	1.977E+05	9.066E-05	3.488E-02
2056	1.977E+05	8.624E-05	3.317E-02
2057	1.977E+05	8.203E-05	3.156E-02
2058	1.977E+05	7.803E-05	3.002E-02
2059	1.977E+05	7.423E-05	2.855E-02
2060	1.977E+05	7.061E-05	2.716E-02
2061	1.977E+05	6.716E-05	2.584E-02
2062	1.977E+05	6.389E-05	2.458E-02
2063	1.977E+05	6.077E-05	2.338E-02
2064	1.977E+05	5.781E-05	2.224E-02
2065	1.977E+05	5.499E-05	2.115E-02
2066	1.977E+05	5.231E-05	2.012E-02
2067	1.977E+05	4.976E-05	1.914E-02
2068	1.977E+05	4.733E-05	1.821E-02
2069	1.977E+05	4.502E-05	1.732E-02
2070	1.977E+05	4.283E-05	1.647E-02
2071	1.977E+05	4.074E-05	1.567E-02
2072	1.977E+05	3.875E-05	1.491E-02
2073	1.977E+05	3.686E-05	1.418E-02
2074	1.977E+05	3.506E-05	1.349E-02
2075	1.977E+05	3.335E-05	1.283E-02
2076	1.977E+05	3.173E-05	1.220E-02
2077	1.977E+05	3.018E-05	1.161E-02
2078	1.977E+05	2.871E-05	1.104E-02
2079	1.977E+05	2.731E-05	1.050E-02
2080	1.977E+05	2.597E-05	9.992E-03
2081	1.977E+05	2.471E-05	9.505E-03
2082	1.977E+05	2.350E-05	9.041E-03
2083	1.977E+05	2.236E-05	8.600E-03

Table D-10. Northern Parcel Vinyl Chloride Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2084	1.977E+05	2.127E-05	8.181E-03
2085	1.977E+05	2.023E-05	7.782E-03
2086	1.977E+05	1.924E-05	7.402E-03
2087	1.977E+05	1.830E-05	7.041E-03
2088	1.977E+05	1.741E-05	6.698E-03
2089	1.977E+05	1.656E-05	6.371E-03
2090	1.977E+05	1.575E-05	6.060E-03
2091	1.977E+05	1.499E-05	5.765E-03
2092	1.977E+05	1.426E-05	5.484E-03
2093	1.977E+05	1.356E-05	5.216E-03
2094	1.977E+05	1.290E-05	4.962E-03
2095	1.977E+05	1.227E-05	4.720E-03
2096	1.977E+05	1.167E-05	4.490E-03
2097	1.977E+05	1.110E-05	4.271E-03
2098	1.977E+05	1.056E-05	4.062E-03
2099	1.977E+05	1.005E-05	3.864E-03
2100	1.977E+05	9.556E-06	3.676E-03
2101	1.977E+05	9.090E-06	3.497E-03
2102	1.977E+05	8.646E-06	3.326E-03
2103	1.977E+05	8.225E-06	3.164E-03
2104	1.977E+05	7.823E-06	3.010E-03
2105	1.977E+05	7.442E-06	2.863E-03
2106	1.977E+05	7.079E-06	2.723E-03
2107	1.977E+05	6.734E-06	2.590E-03
2108	1.977E+05	6.405E-06	2.464E-03
2109	1.977E+05	6.093E-06	2.344E-03
2110	1.977E+05	5.796E-06	2.230E-03
2111	1.977E+05	5.513E-06	2.121E-03
2112	1.977E+05	5.244E-06	2.017E-03
2113	1.977E+05	4.988E-06	1.919E-03
2114	1.977E+05	4.745E-06	1.825E-03
2115	1.977E+05	4.514E-06	1.736E-03
2116	1.977E+05	4.294E-06	1.652E-03
2117	1.977E+05	4.084E-06	1.571E-03
2118	1.977E+05	3.885E-06	1.494E-03
2119	1.977E+05	3.696E-06	1.422E-03
2120	1.977E+05	3.515E-06	1.352E-03
2121	1.977E+05	3.344E-06	1.286E-03
2122	1.977E+05	3.181E-06	1.224E-03
2123	1.977E+05	3.026E-06	1.164E-03
2124	1.977E+05	2.878E-06	1.107E-03
2125	1.977E+05	2.738E-06	1.053E-03
2126	1.977E+05	2.604E-06	1.002E-03
2127	1.977E+05	2.477E-06	9.529E-04
2128	1.977E+05	2.356E-06	9.065E-04
2129	1.977E+05	2.241E-06	8.622E-04
2130	1.977E+05	2.132E-06	8.202E-04
2131	1.977E+05	2.028E-06	7.802E-04
2132	1.977E+05	1.929E-06	7.421E-04
2133	1.977E+05	1.835E-06	7.060E-04
2134	1.977E+05	1.746E-06	6.715E-04
2135	1.977E+05	1.661E-06	6.388E-04
2136	1.977E+05	1.580E-06	6.076E-04
2137	1.977E+05	1.502E-06	5.780E-04
2138	1.977E+05	1.429E-06	5.498E-04
2139	1.977E+05	1.360E-06	5.230E-04
2140	1.977E+05	1.293E-06	4.975E-04
2141	1.977E+05	1.230E-06	4.732E-04
2142	1.977E+05	1.170E-06	4.501E-04
2143	1.977E+05	1.113E-06	4.282E-04
2144	1.977E+05	1.059E-06	4.073E-04
2145	1.977E+05	1.007E-06	3.874E-04
2146	1.977E+05	9.580E-07	3.685E-04
2147	1.977E+05	9.113E-07	3.506E-04
2148	1.977E+05	8.669E-07	3.335E-04
2149	1.977E+05	8.246E-07	3.172E-04
2150	1.977E+05	7.844E-07	3.017E-04
2151	1.977E+05	7.461E-07	2.870E-04
2152	1.977E+05	7.097E-07	2.730E-04
2153	1.977E+05	6.751E-07	2.597E-04
2154	1.977E+05	6.422E-07	2.470E-04

Table D-10. Northern Parcel Vinyl Chloride Emission Rate from Year 1968 to 2203 (concluded).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2155	1.977E+05	6.109E-07	2.350E-04
2156	1.977E+05	5.811E-07	2.235E-04
2157	1.977E+05	5.527E-07	2.126E-04
2158	1.977E+05	5.258E-07	2.023E-04
2159	1.977E+05	5.001E-07	1.924E-04
2160	1.977E+05	4.757E-07	1.830E-04
2161	1.977E+05	4.525E-07	1.741E-04
2162	1.977E+05	4.305E-07	1.656E-04
2163	1.977E+05	4.095E-07	1.575E-04
2164	1.977E+05	3.895E-07	1.498E-04
2165	1.977E+05	3.705E-07	1.425E-04
2166	1.977E+05	3.524E-07	1.356E-04
2167	1.977E+05	3.353E-07	1.290E-04
2168	1.977E+05	3.189E-07	1.227E-04
2169	1.977E+05	3.033E-07	1.167E-04
2170	1.977E+05	2.886E-07	1.110E-04
2171	1.977E+05	2.745E-07	1.056E-04
2172	1.977E+05	2.611E-07	1.004E-04
2173	1.977E+05	2.484E-07	9.554E-05
2174	1.977E+05	2.362E-07	9.088E-05
2175	1.977E+05	2.247E-07	8.645E-05
2176	1.977E+05	2.138E-07	8.223E-05
2177	1.977E+05	2.033E-07	7.822E-05
2178	1.977E+05	1.934E-07	7.441E-05
2179	1.977E+05	1.840E-07	7.078E-05
2180	1.977E+05	1.750E-07	6.733E-05
2181	1.977E+05	1.665E-07	6.404E-05
2182	1.977E+05	1.584E-07	6.092E-05
2183	1.977E+05	1.506E-07	5.795E-05
2184	1.977E+05	1.433E-07	5.512E-05
2185	1.977E+05	1.363E-07	5.243E-05
2186	1.977E+05	1.297E-07	4.988E-05
2187	1.977E+05	1.233E-07	4.744E-05
2188	1.977E+05	1.173E-07	4.513E-05
2189	1.977E+05	1.116E-07	4.293E-05
2190	1.977E+05	1.062E-07	4.084E-05
2191	1.977E+05	1.010E-07	3.884E-05
2192	1.977E+05	9.605E-08	3.695E-05
2193	1.977E+05	9.137E-08	3.515E-05
2194	1.977E+05	8.691E-08	3.343E-05
2195	1.977E+05	8.267E-08	3.180E-05
2196	1.977E+05	7.864E-08	3.025E-05
2197	1.977E+05	7.480E-08	2.878E-05
2198	1.977E+05	7.116E-08	2.737E-05
2199	1.977E+05	6.769E-08	2.604E-05
2200	1.977E+05	6.439E-08	2.477E-05
2201	1.977E+05	6.125E-08	2.356E-05
2202	1.977E+05	5.826E-08	2.241E-05
2203	1.977E+05	5.542E-08	2.132E-05

Table D-11. Northern Parcel m,p-Xylene Emission Rate from Year 1968 to 2203.

Source: H:\3000\030177~1.000\030177~1.002\ROSEHI~1\NORTHERN.PRM

Model Parameters

Lo : 170.00 m³ / Mg ***** User Mode Selection *****
 k : 0.0500 1/yr ***** User Mode Selection *****
 NMOC : 4500.00 ppmv ***** User Mode Selection *****
 Methane : 56.0000 % volume
 Carbon Dioxide : 44.0000 % volume
 Air Pollutant : m,p-Xylene (HAP/VOC)
 Molecular Wt = 106.17 Concentration = 6.730000 ppmV

Landfill Parameters

Landfill type : Co-Disposal
 Year Opened : 1967 Current Year : 2003 Closure Year: 2004
 Capacity : 197692 Mg
 Average Acceptance Rate Required from
 Current Year to Closure Year : 13179.47 Mg/year

Model Results

Year	Refuse In Place (Mg)	m,p-Xylene (HAP/VOC) Emission Rate (Mg/yr)	(Cubic m/yr)
1968	1.318E+04	5.945E-03	1.346E+00
1969	2.636E+04	1.160E-02	2.627E+00
1970	3.954E+04	1.698E-02	3.845E+00
1971	5.272E+04	2.210E-02	5.004E+00
1972	6.590E+04	2.696E-02	6.106E+00
1973	7.908E+04	3.159E-02	7.155E+00
1974	9.226E+04	3.600E-02	8.152E+00
1975	1.054E+05	4.019E-02	9.101E+00
1976	1.186E+05	4.417E-02	1.000E+01
1977	1.318E+05	4.796E-02	1.086E+01
1978	1.450E+05	5.157E-02	1.168E+01
1979	1.582E+05	5.500E-02	1.246E+01
1980	1.713E+05	5.826E-02	1.319E+01
1981	1.845E+05	6.137E-02	1.390E+01
1982	1.977E+05	6.432E-02	1.457E+01
1983	1.977E+05	6.118E-02	1.385E+01
1984	1.977E+05	5.820E-02	1.318E+01
1985	1.977E+05	5.536E-02	1.254E+01
1986	1.977E+05	5.266E-02	1.193E+01
1987	1.977E+05	5.009E-02	1.134E+01
1988	1.977E+05	4.765E-02	1.079E+01
1989	1.977E+05	4.532E-02	1.026E+01
1990	1.977E+05	4.311E-02	9.763E+00
1991	1.977E+05	4.101E-02	9.287E+00
1992	1.977E+05	3.901E-02	8.834E+00
1993	1.977E+05	3.711E-02	8.403E+00
1994	1.977E+05	3.530E-02	7.994E+00
1995	1.977E+05	3.358E-02	7.604E+00
1996	1.977E+05	3.194E-02	7.233E+00
1997	1.977E+05	3.038E-02	6.880E+00
1998	1.977E+05	2.890E-02	6.545E+00
1999	1.977E+05	2.749E-02	6.225E+00
2000	1.977E+05	2.615E-02	5.922E+00
2001	1.977E+05	2.487E-02	5.633E+00
2002	1.977E+05	2.366E-02	5.358E+00
2003	1.977E+05	2.251E-02	5.097E+00
2004	1.977E+05	2.141E-02	4.848E+00
2005	1.977E+05	2.037E-02	4.612E+00
2006	1.977E+05	1.937E-02	4.387E+00
2007	1.977E+05	1.843E-02	4.173E+00
2008	1.977E+05	1.753E-02	3.970E+00
2009	1.977E+05	1.667E-02	3.776E+00
2010	1.977E+05	1.586E-02	3.592E+00
2011	1.977E+05	1.509E-02	3.417E+00
2012	1.977E+05	1.435E-02	3.250E+00

Table D-11. Northern Parcel m,p-Xylene Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2013	1.977E+05	1.365E-02	3.091E+00
2014	1.977E+05	1.299E-02	2.941E+00
2015	1.977E+05	1.235E-02	2.797E+00
2016	1.977E+05	1.175E-02	2.661E+00
2017	1.977E+05	1.118E-02	2.531E+00
2018	1.977E+05	1.063E-02	2.408E+00
2019	1.977E+05	1.011E-02	2.290E+00
2020	1.977E+05	9.620E-03	2.179E+00
2021	1.977E+05	9.151E-03	2.072E+00
2022	1.977E+05	8.705E-03	1.971E+00
2023	1.977E+05	8.280E-03	1.875E+00
2024	1.977E+05	7.876E-03	1.784E+00
2025	1.977E+05	7.492E-03	1.697E+00
2026	1.977E+05	7.127E-03	1.614E+00
2027	1.977E+05	6.779E-03	1.535E+00
2028	1.977E+05	6.449E-03	1.460E+00
2029	1.977E+05	6.134E-03	1.389E+00
2030	1.977E+05	5.835E-03	1.321E+00
2031	1.977E+05	5.550E-03	1.257E+00
2032	1.977E+05	5.280E-03	1.196E+00
2033	1.977E+05	5.022E-03	1.137E+00
2034	1.977E+05	4.777E-03	1.082E+00
2035	1.977E+05	4.544E-03	1.029E+00
2036	1.977E+05	4.323E-03	9.789E-01
2037	1.977E+05	4.112E-03	9.311E-01
2038	1.977E+05	3.911E-03	8.857E-01
2039	1.977E+05	3.721E-03	8.425E-01
2040	1.977E+05	3.539E-03	8.014E-01
2041	1.977E+05	3.366E-03	7.623E-01
2042	1.977E+05	3.202E-03	7.252E-01
2043	1.977E+05	3.046E-03	6.898E-01
2044	1.977E+05	2.898E-03	6.562E-01
2045	1.977E+05	2.756E-03	6.242E-01
2046	1.977E+05	2.622E-03	5.937E-01
2047	1.977E+05	2.494E-03	5.648E-01
2048	1.977E+05	2.372E-03	5.372E-01
2049	1.977E+05	2.257E-03	5.110E-01
2050	1.977E+05	2.147E-03	4.861E-01
2051	1.977E+05	2.042E-03	4.624E-01
2052	1.977E+05	1.942E-03	4.398E-01
2053	1.977E+05	1.848E-03	4.184E-01
2054	1.977E+05	1.757E-03	3.980E-01
2055	1.977E+05	1.672E-03	3.786E-01
2056	1.977E+05	1.590E-03	3.601E-01
2057	1.977E+05	1.513E-03	3.425E-01
2058	1.977E+05	1.439E-03	3.258E-01
2059	1.977E+05	1.369E-03	3.099E-01
2060	1.977E+05	1.302E-03	2.948E-01
2061	1.977E+05	1.238E-03	2.805E-01
2062	1.977E+05	1.178E-03	2.668E-01
2063	1.977E+05	1.121E-03	2.538E-01
2064	1.977E+05	1.066E-03	2.414E-01
2065	1.977E+05	1.014E-03	2.296E-01
2066	1.977E+05	9.645E-04	2.184E-01
2067	1.977E+05	9.175E-04	2.078E-01
2068	1.977E+05	8.727E-04	1.976E-01
2069	1.977E+05	8.302E-04	1.880E-01
2070	1.977E+05	7.897E-04	1.788E-01
2071	1.977E+05	7.512E-04	1.701E-01
2072	1.977E+05	7.145E-04	1.618E-01
2073	1.977E+05	6.797E-04	1.539E-01
2074	1.977E+05	6.465E-04	1.464E-01
2075	1.977E+05	6.150E-04	1.393E-01
2076	1.977E+05	5.850E-04	1.325E-01
2077	1.977E+05	5.565E-04	1.260E-01
2078	1.977E+05	5.293E-04	1.199E-01
2079	1.977E+05	5.035E-04	1.140E-01
2080	1.977E+05	4.790E-04	1.085E-01
2081	1.977E+05	4.556E-04	1.032E-01
2082	1.977E+05	4.334E-04	9.814E-02
2083	1.977E+05	4.122E-04	9.335E-02

Table D-11. Northern Parcel m,p-Xylene Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2084	1.977E+05	3.921E-04	8.880E-02
2085	1.977E+05	3.730E-04	8.447E-02
2086	1.977E+05	3.548E-04	8.035E-02
2087	1.977E+05	3.375E-04	7.643E-02
2088	1.977E+05	3.211E-04	7.270E-02
2089	1.977E+05	3.054E-04	6.916E-02
2090	1.977E+05	2.905E-04	6.579E-02
2091	1.977E+05	2.763E-04	6.258E-02
2092	1.977E+05	2.629E-04	5.953E-02
2093	1.977E+05	2.500E-04	5.662E-02
2094	1.977E+05	2.378E-04	5.386E-02
2095	1.977E+05	2.262E-04	5.123E-02
2096	1.977E+05	2.152E-04	4.874E-02
2097	1.977E+05	2.047E-04	4.636E-02
2098	1.977E+05	1.947E-04	4.410E-02
2099	1.977E+05	1.852E-04	4.195E-02
2100	1.977E+05	1.762E-04	3.990E-02
2101	1.977E+05	1.676E-04	3.795E-02
2102	1.977E+05	1.594E-04	3.610E-02
2103	1.977E+05	1.517E-04	3.434E-02
2104	1.977E+05	1.443E-04	3.267E-02
2105	1.977E+05	1.372E-04	3.107E-02
2106	1.977E+05	1.305E-04	2.956E-02
2107	1.977E+05	1.242E-04	2.812E-02
2108	1.977E+05	1.181E-04	2.675E-02
2109	1.977E+05	1.123E-04	2.544E-02
2110	1.977E+05	1.069E-04	2.420E-02
2111	1.977E+05	1.017E-04	2.302E-02
2112	1.977E+05	9.670E-05	2.190E-02
2113	1.977E+05	9.198E-05	2.083E-02
2114	1.977E+05	8.750E-05	1.981E-02
2115	1.977E+05	8.323E-05	1.885E-02
2116	1.977E+05	7.917E-05	1.793E-02
2117	1.977E+05	7.531E-05	1.705E-02
2118	1.977E+05	7.164E-05	1.622E-02
2119	1.977E+05	6.814E-05	1.543E-02
2120	1.977E+05	6.482E-05	1.468E-02
2121	1.977E+05	6.166E-05	1.396E-02
2122	1.977E+05	5.865E-05	1.328E-02
2123	1.977E+05	5.579E-05	1.263E-02
2124	1.977E+05	5.307E-05	1.202E-02
2125	1.977E+05	5.048E-05	1.143E-02
2126	1.977E+05	4.802E-05	1.087E-02
2127	1.977E+05	4.568E-05	1.034E-02
2128	1.977E+05	4.345E-05	9.839E-03
2129	1.977E+05	4.133E-05	9.360E-03
2130	1.977E+05	3.932E-05	8.903E-03
2131	1.977E+05	3.740E-05	8.469E-03
2132	1.977E+05	3.557E-05	8.056E-03
2133	1.977E+05	3.384E-05	7.663E-03
2134	1.977E+05	3.219E-05	7.289E-03
2135	1.977E+05	3.062E-05	6.934E-03
2136	1.977E+05	2.913E-05	6.596E-03
2137	1.977E+05	2.771E-05	6.274E-03
2138	1.977E+05	2.635E-05	5.968E-03
2139	1.977E+05	2.507E-05	5.677E-03
2140	1.977E+05	2.385E-05	5.400E-03
2141	1.977E+05	2.268E-05	5.137E-03
2142	1.977E+05	2.158E-05	4.886E-03
2143	1.977E+05	2.052E-05	4.648E-03
2144	1.977E+05	1.952E-05	4.421E-03
2145	1.977E+05	1.857E-05	4.206E-03
2146	1.977E+05	1.767E-05	4.000E-03
2147	1.977E+05	1.680E-05	3.805E-03
2148	1.977E+05	1.598E-05	3.620E-03
2149	1.977E+05	1.520E-05	3.443E-03
2150	1.977E+05	1.446E-05	3.275E-03
2151	1.977E+05	1.376E-05	3.116E-03
2152	1.977E+05	1.309E-05	2.964E-03
2153	1.977E+05	1.245E-05	2.819E-03
2154	1.977E+05	1.184E-05	2.682E-03

Table D-11. Northern Parcel m,p-Xylene Emission Rate from Year 1968 to 2203 (concluded).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2155	1.977E+05	1.126E-05	2.551E-03
2156	1.977E+05	1.071E-05	2.426E-03
2157	1.977E+05	1.019E-05	2.308E-03
2158	1.977E+05	9.695E-06	2.195E-03
2159	1.977E+05	9.222E-06	2.088E-03
2160	1.977E+05	8.772E-06	1.987E-03
2161	1.977E+05	8.345E-06	1.890E-03
2162	1.977E+05	7.938E-06	1.798E-03
2163	1.977E+05	7.551E-06	1.710E-03
2164	1.977E+05	7.182E-06	1.626E-03
2165	1.977E+05	6.832E-06	1.547E-03
2166	1.977E+05	6.499E-06	1.472E-03
2167	1.977E+05	6.182E-06	1.400E-03
2168	1.977E+05	5.880E-06	1.332E-03
2169	1.977E+05	5.594E-06	1.267E-03
2170	1.977E+05	5.321E-06	1.205E-03
2171	1.977E+05	5.061E-06	1.146E-03
2172	1.977E+05	4.814E-06	1.090E-03
2173	1.977E+05	4.580E-06	1.037E-03
2174	1.977E+05	4.356E-06	9.865E-04
2175	1.977E+05	4.144E-06	9.384E-04
2176	1.977E+05	3.942E-06	8.926E-04
2177	1.977E+05	3.749E-06	8.491E-04
2178	1.977E+05	3.567E-06	8.077E-04
2179	1.977E+05	3.393E-06	7.683E-04
2180	1.977E+05	3.227E-06	7.308E-04
2181	1.977E+05	3.070E-06	6.952E-04
2182	1.977E+05	2.920E-06	6.613E-04
2183	1.977E+05	2.778E-06	6.290E-04
2184	1.977E+05	2.642E-06	5.983E-04
2185	1.977E+05	2.513E-06	5.692E-04
2186	1.977E+05	2.391E-06	5.414E-04
2187	1.977E+05	2.274E-06	5.150E-04
2188	1.977E+05	2.163E-06	4.899E-04
2189	1.977E+05	2.058E-06	4.660E-04
2190	1.977E+05	1.957E-06	4.433E-04
2191	1.977E+05	1.862E-06	4.216E-04
2192	1.977E+05	1.771E-06	4.011E-04
2193	1.977E+05	1.685E-06	3.815E-04
2194	1.977E+05	1.603E-06	3.629E-04
2195	1.977E+05	1.524E-06	3.452E-04
2196	1.977E+05	1.450E-06	3.284E-04
2197	1.977E+05	1.379E-06	3.124E-04
2198	1.977E+05	1.312E-06	2.971E-04
2199	1.977E+05	1.248E-06	2.826E-04
2200	1.977E+05	1.187E-06	2.689E-04
2201	1.977E+05	1.129E-06	2.557E-04
2202	1.977E+05	1.074E-06	2.433E-04
2203	1.977E+05	1.022E-06	2.314E-04

Table D-12. Northern Parcel o-Xylene Emission Rate from Year 1968 to 2203.

Source: H:\3000\030177~1.000\030177~1.002\ROSEHI~1\NORTHERN.PRM

Model Parameters

Lo : 170.00 m³ / Mg ***** User Mode Selection *****
 k : 0.0500 1/yr ***** User Mode Selection *****
 NMOC : 4500.00 ppmv ***** User Mode Selection *****
 Methane : 56.0000 % volume
 Carbon Dioxide : 44.0000 % volume
 Air Pollutant : o-Xylene (HAP/VOC)
 Molecular Wt = 106.17 Concentration = 1.100000 ppmV

Landfill Parameters

Landfill type : Co-Disposal
 Year Opened : 1967 Current Year : 2003 Closure Year: 2004
 Capacity : 197692 Mg
 Average Acceptance Rate Required from
 Current Year to Closure Year : 13179.47 Mg/year

Model Results

Year	Refuse In Place (Mg)	o-Xylene (HAP/VOC) (Mg/yr)	Emission Rate (Cubic m/yr)
1968	1.318E+04	9.717E-04	2.201E-01
1969	2.636E+04	1.896E-03	4.294E-01
1970	3.954E+04	2.775E-03	6.285E-01
1971	5.272E+04	3.612E-03	8.179E-01
1972	6.590E+04	4.407E-03	9.980E-01
1973	7.908E+04	5.164E-03	1.169E+00
1974	9.226E+04	5.884E-03	1.332E+00
1975	1.054E+05	6.569E-03	1.487E+00
1976	1.186E+05	7.220E-03	1.635E+00
1977	1.318E+05	7.840E-03	1.775E+00
1978	1.450E+05	8.429E-03	1.909E+00
1979	1.582E+05	8.990E-03	2.036E+00
1980	1.713E+05	9.523E-03	2.157E+00
1981	1.845E+05	1.003E-02	2.271E+00
1982	1.977E+05	1.051E-02	2.381E+00
1983	1.977E+05	1.000E-02	2.265E+00
1984	1.977E+05	9.512E-03	2.154E+00
1985	1.977E+05	9.048E-03	2.049E+00
1986	1.977E+05	8.607E-03	1.949E+00
1987	1.977E+05	8.187E-03	1.854E+00
1988	1.977E+05	7.788E-03	1.764E+00
1989	1.977E+05	7.408E-03	1.678E+00
1990	1.977E+05	7.047E-03	1.596E+00
1991	1.977E+05	6.703E-03	1.518E+00
1992	1.977E+05	6.376E-03	1.444E+00
1993	1.977E+05	6.065E-03	1.374E+00
1994	1.977E+05	5.770E-03	1.307E+00
1995	1.977E+05	5.488E-03	1.243E+00
1996	1.977E+05	5.220E-03	1.182E+00
1997	1.977E+05	4.966E-03	1.125E+00
1998	1.977E+05	4.724E-03	1.070E+00
1999	1.977E+05	4.493E-03	1.018E+00
2000	1.977E+05	4.274E-03	9.679E-01
2001	1.977E+05	4.066E-03	9.207E-01
2002	1.977E+05	3.867E-03	8.758E-01
2003	1.977E+05	3.679E-03	8.331E-01
2004	1.977E+05	3.499E-03	7.925E-01
2005	1.977E+05	3.329E-03	7.538E-01
2006	1.977E+05	3.166E-03	7.170E-01
2007	1.977E+05	3.012E-03	6.821E-01
2008	1.977E+05	2.865E-03	6.488E-01
2009	1.977E+05	2.725E-03	6.172E-01
2010	1.977E+05	2.592E-03	5.871E-01
2011	1.977E+05	2.466E-03	5.584E-01
2012	1.977E+05	2.346E-03	5.312E-01

Table D-12. Northern Parcel o-Xylene Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2013	1.977E+05	2.231E-03	5.053E-01
2014	1.977E+05	2.122E-03	4.806E-01
2015	1.977E+05	2.019E-03	4.572E-01
2016	1.977E+05	1.921E-03	4.349E-01
2017	1.977E+05	1.827E-03	4.137E-01
2018	1.977E+05	1.738E-03	3.935E-01
2019	1.977E+05	1.653E-03	3.743E-01
2020	1.977E+05	1.572E-03	3.561E-01
2021	1.977E+05	1.496E-03	3.387E-01
2022	1.977E+05	1.423E-03	3.222E-01
2023	1.977E+05	1.353E-03	3.065E-01
2024	1.977E+05	1.287E-03	2.915E-01
2025	1.977E+05	1.225E-03	2.773E-01
2026	1.977E+05	1.165E-03	2.638E-01
2027	1.977E+05	1.108E-03	2.509E-01
2028	1.977E+05	1.054E-03	2.387E-01
2029	1.977E+05	1.003E-03	2.270E-01
2030	1.977E+05	9.537E-04	2.160E-01
2031	1.977E+05	9.072E-04	2.054E-01
2032	1.977E+05	8.629E-04	1.954E-01
2033	1.977E+05	8.209E-04	1.859E-01
2034	1.977E+05	7.808E-04	1.768E-01
2035	1.977E+05	7.427E-04	1.682E-01
2036	1.977E+05	7.065E-04	1.600E-01
2037	1.977E+05	6.721E-04	1.522E-01
2038	1.977E+05	6.393E-04	1.448E-01
2039	1.977E+05	6.081E-04	1.377E-01
2040	1.977E+05	5.784E-04	1.310E-01
2041	1.977E+05	5.502E-04	1.246E-01
2042	1.977E+05	5.234E-04	1.185E-01
2043	1.977E+05	4.979E-04	1.127E-01
2044	1.977E+05	4.736E-04	1.072E-01
2045	1.977E+05	4.505E-04	1.020E-01
2046	1.977E+05	4.285E-04	9.704E-02
2047	1.977E+05	4.076E-04	9.231E-02
2048	1.977E+05	3.877E-04	8.781E-02
2049	1.977E+05	3.688E-04	8.352E-02
2050	1.977E+05	3.508E-04	7.945E-02
2051	1.977E+05	3.337E-04	7.558E-02
2052	1.977E+05	3.175E-04	7.189E-02
2053	1.977E+05	3.020E-04	6.838E-02
2054	1.977E+05	2.872E-04	6.505E-02
2055	1.977E+05	2.732E-04	6.188E-02
2056	1.977E+05	2.599E-04	5.886E-02
2057	1.977E+05	2.472E-04	5.599E-02
2058	1.977E+05	2.352E-04	5.326E-02
2059	1.977E+05	2.237E-04	5.066E-02
2060	1.977E+05	2.128E-04	4.819E-02
2061	1.977E+05	2.024E-04	4.584E-02
2062	1.977E+05	1.925E-04	4.360E-02
2063	1.977E+05	1.832E-04	4.148E-02
2064	1.977E+05	1.742E-04	3.945E-02
2065	1.977E+05	1.657E-04	3.753E-02
2066	1.977E+05	1.576E-04	3.570E-02
2067	1.977E+05	1.500E-04	3.396E-02
2068	1.977E+05	1.426E-04	3.230E-02
2069	1.977E+05	1.357E-04	3.073E-02
2070	1.977E+05	1.291E-04	2.923E-02
2071	1.977E+05	1.228E-04	2.780E-02
2072	1.977E+05	1.168E-04	2.645E-02
2073	1.977E+05	1.111E-04	2.516E-02
2074	1.977E+05	1.057E-04	2.393E-02
2075	1.977E+05	1.005E-04	2.276E-02
2076	1.977E+05	9.562E-05	2.165E-02
2077	1.977E+05	9.095E-05	2.060E-02
2078	1.977E+05	8.652E-05	1.959E-02
2079	1.977E+05	8.230E-05	1.864E-02
2080	1.977E+05	7.828E-05	1.773E-02
2081	1.977E+05	7.447E-05	1.686E-02
2082	1.977E+05	7.083E-05	1.604E-02
2083	1.977E+05	6.738E-05	1.526E-02

Table D-12. Northern Parcel o-Xylene Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2084	1.977E+05	6.409E-05	1.451E-02
2085	1.977E+05	6.097E-05	1.381E-02
2086	1.977E+05	5.799E-05	1.313E-02
2087	1.977E+05	5.517E-05	1.249E-02
2088	1.977E+05	5.248E-05	1.188E-02
2089	1.977E+05	4.992E-05	1.130E-02
2090	1.977E+05	4.748E-05	1.075E-02
2091	1.977E+05	4.517E-05	1.023E-02
2092	1.977E+05	4.296E-05	9.729E-03
2093	1.977E+05	4.087E-05	9.255E-03
2094	1.977E+05	3.887E-05	8.803E-03
2095	1.977E+05	3.698E-05	8.374E-03
2096	1.977E+05	3.518E-05	7.966E-03
2097	1.977E+05	3.346E-05	7.577E-03
2098	1.977E+05	3.183E-05	7.208E-03
2099	1.977E+05	3.028E-05	6.856E-03
2100	1.977E+05	2.880E-05	6.522E-03
2101	1.977E+05	2.739E-05	6.204E-03
2102	1.977E+05	2.606E-05	5.901E-03
2103	1.977E+05	2.479E-05	5.613E-03
2104	1.977E+05	2.358E-05	5.340E-03
2105	1.977E+05	2.243E-05	5.079E-03
2106	1.977E+05	2.134E-05	4.831E-03
2107	1.977E+05	2.029E-05	4.596E-03
2108	1.977E+05	1.930E-05	4.372E-03
2109	1.977E+05	1.836E-05	4.158E-03
2110	1.977E+05	1.747E-05	3.956E-03
2111	1.977E+05	1.662E-05	3.763E-03
2112	1.977E+05	1.581E-05	3.579E-03
2113	1.977E+05	1.503E-05	3.405E-03
2114	1.977E+05	1.430E-05	3.239E-03
2115	1.977E+05	1.360E-05	3.081E-03
2116	1.977E+05	1.294E-05	2.930E-03
2117	1.977E+05	1.231E-05	2.787E-03
2118	1.977E+05	1.171E-05	2.652E-03
2119	1.977E+05	1.114E-05	2.522E-03
2120	1.977E+05	1.059E-05	2.399E-03
2121	1.977E+05	1.008E-05	2.282E-03
2122	1.977E+05	9.586E-06	2.171E-03
2123	1.977E+05	9.119E-06	2.065E-03
2124	1.977E+05	8.674E-06	1.964E-03
2125	1.977E+05	8.251E-06	1.868E-03
2126	1.977E+05	7.849E-06	1.777E-03
2127	1.977E+05	7.466E-06	1.691E-03
2128	1.977E+05	7.102E-06	1.608E-03
2129	1.977E+05	6.755E-06	1.530E-03
2130	1.977E+05	6.426E-06	1.455E-03
2131	1.977E+05	6.113E-06	1.384E-03
2132	1.977E+05	5.814E-06	1.317E-03
2133	1.977E+05	5.531E-06	1.252E-03
2134	1.977E+05	5.261E-06	1.191E-03
2135	1.977E+05	5.005E-06	1.133E-03
2136	1.977E+05	4.760E-06	1.078E-03
2137	1.977E+05	4.528E-06	1.025E-03
2138	1.977E+05	4.307E-06	9.754E-04
2139	1.977E+05	4.097E-06	9.279E-04
2140	1.977E+05	3.898E-06	8.826E-04
2141	1.977E+05	3.707E-06	8.396E-04
2142	1.977E+05	3.527E-06	7.986E-04
2143	1.977E+05	3.355E-06	7.597E-04
2144	1.977E+05	3.191E-06	7.226E-04
2145	1.977E+05	3.035E-06	6.874E-04
2146	1.977E+05	2.887E-06	6.539E-04
2147	1.977E+05	2.747E-06	6.220E-04
2148	1.977E+05	2.613E-06	5.916E-04
2149	1.977E+05	2.485E-06	5.628E-04
2150	1.977E+05	2.364E-06	5.353E-04
2151	1.977E+05	2.249E-06	5.092E-04
2152	1.977E+05	2.139E-06	4.844E-04
2153	1.977E+05	2.035E-06	4.608E-04
2154	1.977E+05	1.935E-06	4.383E-04

Table D-12. Northern Parcel o-Xylene Emission Rate from Year 1968 to 2203 (concluded).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2155	1.977E+05	1.841E-06	4.169E-04
2156	1.977E+05	1.751E-06	3.966E-04
2157	1.977E+05	1.666E-06	3.772E-04
2158	1.977E+05	1.585E-06	3.588E-04
2159	1.977E+05	1.507E-06	3.413E-04
2160	1.977E+05	1.434E-06	3.247E-04
2161	1.977E+05	1.364E-06	3.089E-04
2162	1.977E+05	1.297E-06	2.938E-04
2163	1.977E+05	1.234E-06	2.795E-04
2164	1.977E+05	1.174E-06	2.658E-04
2165	1.977E+05	1.117E-06	2.529E-04
2166	1.977E+05	1.062E-06	2.405E-04
2167	1.977E+05	1.010E-06	2.288E-04
2168	1.977E+05	9.611E-07	2.177E-04
2169	1.977E+05	9.143E-07	2.070E-04
2170	1.977E+05	8.697E-07	1.969E-04
2171	1.977E+05	8.272E-07	1.873E-04
2172	1.977E+05	7.869E-07	1.782E-04
2173	1.977E+05	7.485E-07	1.695E-04
2174	1.977E+05	7.120E-07	1.612E-04
2175	1.977E+05	6.773E-07	1.534E-04
2176	1.977E+05	6.443E-07	1.459E-04
2177	1.977E+05	6.128E-07	1.388E-04
2178	1.977E+05	5.830E-07	1.320E-04
2179	1.977E+05	5.545E-07	1.256E-04
2180	1.977E+05	5.275E-07	1.194E-04
2181	1.977E+05	5.018E-07	1.136E-04
2182	1.977E+05	4.773E-07	1.081E-04
2183	1.977E+05	4.540E-07	1.028E-04
2184	1.977E+05	4.319E-07	9.780E-05
2185	1.977E+05	4.108E-07	9.303E-05
2186	1.977E+05	3.908E-07	8.849E-05
2187	1.977E+05	3.717E-07	8.417E-05
2188	1.977E+05	3.536E-07	8.007E-05
2189	1.977E+05	3.363E-07	7.616E-05
2190	1.977E+05	3.199E-07	7.245E-05
2191	1.977E+05	3.043E-07	6.892E-05
2192	1.977E+05	2.895E-07	6.556E-05
2193	1.977E+05	2.754E-07	6.236E-05
2194	1.977E+05	2.619E-07	5.932E-05
2195	1.977E+05	2.492E-07	5.642E-05
2196	1.977E+05	2.370E-07	5.367E-05
2197	1.977E+05	2.255E-07	5.105E-05
2198	1.977E+05	2.145E-07	4.856E-05
2199	1.977E+05	2.040E-07	4.620E-05
2200	1.977E+05	1.940E-07	4.394E-05
2201	1.977E+05	1.846E-07	4.180E-05
2202	1.977E+05	1.756E-07	3.976E-05
2203	1.977E+05	1.670E-07	3.782E-05

Table D-13. Southern Parcel Methane Emission Rate from Year 1968 to 2203.

Source: H:\3000\030177~1.000\030177~1.002\ROSEHI~1\SOUTHERN.PRM

Model Parameters

Lo : 170.00 m³ / Mg ***** User Mode Selection *****
 k : 0.0500 1/yr ***** User Mode Selection *****
 NMOC : 2550.00 ppmv ***** User Mode Selection *****
 Methane : 59.0000 % volume
 Carbon Dioxide : 41.0000 % volume

Landfill Parameters

Landfill type : Co-Disposal
 Year Opened : 1967 Current Year : 2003 Closure Year: 2002
 Capacity : 197692 Mg
 Average Acceptance Rate Required from
 Current Year to Closure Year : 12238.07 Mg/year

Model Results

Year	Refuse In Place (Mg)	Methane Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1968	1.318E+04	7.474E+01	1.120E+05
1969	2.636E+04	1.458E+02	2.186E+05
1970	3.954E+04	2.135E+02	3.200E+05
1971	5.272E+04	2.778E+02	4.164E+05
1972	6.590E+04	3.390E+02	5.081E+05
1973	7.908E+04	3.972E+02	5.953E+05
1974	9.226E+04	4.525E+02	6.783E+05
1975	1.054E+05	5.052E+02	7.573E+05
1976	1.186E+05	5.553E+02	8.324E+05
1977	1.318E+05	6.030E+02	9.038E+05
1978	1.450E+05	6.483E+02	9.717E+05
1979	1.582E+05	6.914E+02	1.036E+06
1980	1.713E+05	7.324E+02	1.098E+06
1981	1.845E+05	7.714E+02	1.156E+06
1982	1.977E+05	8.086E+02	1.212E+06
1983	1.977E+05	7.691E+02	1.153E+06
1984	1.977E+05	7.316E+02	1.097E+06
1985	1.977E+05	6.959E+02	1.043E+06
1986	1.977E+05	6.620E+02	9.923E+05
1987	1.977E+05	6.297E+02	9.439E+05
1988	1.977E+05	5.990E+02	8.978E+05
1989	1.977E+05	5.698E+02	8.541E+05
1990	1.977E+05	5.420E+02	8.124E+05
1991	1.977E+05	5.156E+02	7.728E+05
1992	1.977E+05	4.904E+02	7.351E+05
1993	1.977E+05	4.665E+02	6.992E+05
1994	1.977E+05	4.437E+02	6.651E+05
1995	1.977E+05	4.221E+02	6.327E+05
1996	1.977E+05	4.015E+02	6.018E+05
1997	1.977E+05	3.819E+02	5.725E+05
1998	1.977E+05	3.633E+02	5.446E+05
1999	1.977E+05	3.456E+02	5.180E+05
2000	1.977E+05	3.287E+02	4.927E+05
2001	1.977E+05	3.127E+02	4.687E+05
2002	1.977E+05	2.975E+02	4.459E+05
2003	1.977E+05	2.829E+02	4.241E+05
2004	1.977E+05	2.691E+02	4.034E+05
2005	1.977E+05	2.560E+02	3.838E+05
2006	1.977E+05	2.435E+02	3.650E+05
2007	1.977E+05	2.317E+02	3.472E+05
2008	1.977E+05	2.204E+02	3.303E+05
2009	1.977E+05	2.096E+02	3.142E+05
2010	1.977E+05	1.994E+02	2.989E+05
2011	1.977E+05	1.897E+02	2.843E+05
2012	1.977E+05	1.804E+02	2.704E+05
2013	1.977E+05	1.716E+02	2.572E+05
2014	1.977E+05	1.632E+02	2.447E+05

Table D-13. Southern Parcel Methane Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2015	1.977E+05	1.553E+02	2.328E+05
2016	1.977E+05	1.477E+02	2.214E+05
2017	1.977E+05	1.405E+02	2.106E+05
2018	1.977E+05	1.337E+02	2.003E+05
2019	1.977E+05	1.271E+02	1.906E+05
2020	1.977E+05	1.209E+02	1.813E+05
2021	1.977E+05	1.150E+02	1.724E+05
2022	1.977E+05	1.094E+02	1.640E+05
2023	1.977E+05	1.041E+02	1.560E+05
2024	1.977E+05	9.901E+01	1.484E+05
2025	1.977E+05	9.418E+01	1.412E+05
2026	1.977E+05	8.959E+01	1.343E+05
2027	1.977E+05	8.522E+01	1.277E+05
2028	1.977E+05	8.107E+01	1.215E+05
2029	1.977E+05	7.711E+01	1.156E+05
2030	1.977E+05	7.335E+01	1.099E+05
2031	1.977E+05	6.977E+01	1.046E+05
2032	1.977E+05	6.637E+01	9.948E+04
2033	1.977E+05	6.313E+01	9.463E+04
2034	1.977E+05	6.005E+01	9.002E+04
2035	1.977E+05	5.713E+01	8.563E+04
2036	1.977E+05	5.434E+01	8.145E+04
2037	1.977E+05	5.169E+01	7.748E+04
2038	1.977E+05	4.917E+01	7.370E+04
2039	1.977E+05	4.677E+01	7.011E+04
2040	1.977E+05	4.449E+01	6.669E+04
2041	1.977E+05	4.232E+01	6.343E+04
2042	1.977E+05	4.026E+01	6.034E+04
2043	1.977E+05	3.829E+01	5.740E+04
2044	1.977E+05	3.643E+01	5.460E+04
2045	1.977E+05	3.465E+01	5.194E+04
2046	1.977E+05	3.296E+01	4.940E+04
2047	1.977E+05	3.135E+01	4.699E+04
2048	1.977E+05	2.982E+01	4.470E+04
2049	1.977E+05	2.837E+01	4.252E+04
2050	1.977E+05	2.698E+01	4.045E+04
2051	1.977E+05	2.567E+01	3.847E+04
2052	1.977E+05	2.442E+01	3.660E+04
2053	1.977E+05	2.323E+01	3.481E+04
2054	1.977E+05	2.209E+01	3.312E+04
2055	1.977E+05	2.102E+01	3.150E+04
2056	1.977E+05	1.999E+01	2.996E+04
2057	1.977E+05	1.902E+01	2.850E+04
2058	1.977E+05	1.809E+01	2.711E+04
2059	1.977E+05	1.721E+01	2.579E+04
2060	1.977E+05	1.637E+01	2.453E+04
2061	1.977E+05	1.557E+01	2.334E+04
2062	1.977E+05	1.481E+01	2.220E+04
2063	1.977E+05	1.409E+01	2.112E+04
2064	1.977E+05	1.340E+01	2.009E+04
2065	1.977E+05	1.275E+01	1.911E+04
2066	1.977E+05	1.212E+01	1.817E+04
2067	1.977E+05	1.153E+01	1.729E+04
2068	1.977E+05	1.097E+01	1.644E+04
2069	1.977E+05	1.044E+01	1.564E+04
2070	1.977E+05	9.927E+00	1.488E+04
2071	1.977E+05	9.443E+00	1.415E+04
2072	1.977E+05	8.982E+00	1.346E+04
2073	1.977E+05	8.544E+00	1.281E+04
2074	1.977E+05	8.128E+00	1.218E+04
2075	1.977E+05	7.731E+00	1.159E+04
2076	1.977E+05	7.354E+00	1.102E+04
2077	1.977E+05	6.995E+00	1.049E+04
2078	1.977E+05	6.654E+00	9.974E+03
2079	1.977E+05	6.330E+00	9.488E+03
2080	1.977E+05	6.021E+00	9.025E+03
2081	1.977E+05	5.727E+00	8.585E+03
2082	1.977E+05	5.448E+00	8.166E+03
2083	1.977E+05	5.182E+00	7.768E+03
2084	1.977E+05	4.930E+00	7.389E+03
2085	1.977E+05	4.689E+00	7.029E+03

Table D-13. Southern Parcel Methane Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2086	1.977E+05	4.460E+00	6.686E+03
2087	1.977E+05	4.243E+00	6.360E+03
2088	1.977E+05	4.036E+00	6.050E+03
2089	1.977E+05	3.839E+00	5.755E+03
2090	1.977E+05	3.652E+00	5.474E+03
2091	1.977E+05	3.474E+00	5.207E+03
2092	1.977E+05	3.304E+00	4.953E+03
2093	1.977E+05	3.143E+00	4.711E+03
2094	1.977E+05	2.990E+00	4.482E+03
2095	1.977E+05	2.844E+00	4.263E+03
2096	1.977E+05	2.705E+00	4.055E+03
2097	1.977E+05	2.573E+00	3.857E+03
2098	1.977E+05	2.448E+00	3.669E+03
2099	1.977E+05	2.329E+00	3.490E+03
2100	1.977E+05	2.215E+00	3.320E+03
2101	1.977E+05	2.107E+00	3.158E+03
2102	1.977E+05	2.004E+00	3.004E+03
2103	1.977E+05	1.906E+00	2.858E+03
2104	1.977E+05	1.813E+00	2.718E+03
2105	1.977E+05	1.725E+00	2.586E+03
2106	1.977E+05	1.641E+00	2.460E+03
2107	1.977E+05	1.561E+00	2.340E+03
2108	1.977E+05	1.485E+00	2.226E+03
2109	1.977E+05	1.412E+00	2.117E+03
2110	1.977E+05	1.343E+00	2.014E+03
2111	1.977E+05	1.278E+00	1.916E+03
2112	1.977E+05	1.216E+00	1.822E+03
2113	1.977E+05	1.156E+00	1.733E+03
2114	1.977E+05	1.100E+00	1.649E+03
2115	1.977E+05	1.046E+00	1.568E+03
2116	1.977E+05	9.953E-01	1.492E+03
2117	1.977E+05	9.467E-01	1.419E+03
2118	1.977E+05	9.006E-01	1.350E+03
2119	1.977E+05	8.566E-01	1.284E+03
2120	1.977E+05	8.149E-01	1.221E+03
2121	1.977E+05	7.751E-01	1.162E+03
2122	1.977E+05	7.373E-01	1.105E+03
2123	1.977E+05	7.014E-01	1.051E+03
2124	1.977E+05	6.671E-01	1.000E+03
2125	1.977E+05	6.346E-01	9.512E+02
2126	1.977E+05	6.037E-01	9.048E+02
2127	1.977E+05	5.742E-01	8.607E+02
2128	1.977E+05	5.462E-01	8.187E+02
2129	1.977E+05	5.196E-01	7.788E+02
2130	1.977E+05	4.942E-01	7.408E+02
2131	1.977E+05	4.701E-01	7.047E+02
2132	1.977E+05	4.472E-01	6.703E+02
2133	1.977E+05	4.254E-01	6.376E+02
2134	1.977E+05	4.046E-01	6.065E+02
2135	1.977E+05	3.849E-01	5.770E+02
2136	1.977E+05	3.661E-01	5.488E+02
2137	1.977E+05	3.483E-01	5.220E+02
2138	1.977E+05	3.313E-01	4.966E+02
2139	1.977E+05	3.151E-01	4.724E+02
2140	1.977E+05	2.998E-01	4.493E+02
2141	1.977E+05	2.851E-01	4.274E+02
2142	1.977E+05	2.712E-01	4.066E+02
2143	1.977E+05	2.580E-01	3.867E+02
2144	1.977E+05	2.454E-01	3.679E+02
2145	1.977E+05	2.335E-01	3.499E+02
2146	1.977E+05	2.221E-01	3.329E+02
2147	1.977E+05	2.112E-01	3.166E+02
2148	1.977E+05	2.009E-01	3.012E+02
2149	1.977E+05	1.911E-01	2.865E+02
2150	1.977E+05	1.818E-01	2.725E+02
2151	1.977E+05	1.730E-01	2.592E+02
2152	1.977E+05	1.645E-01	2.466E+02
2153	1.977E+05	1.565E-01	2.346E+02
2154	1.977E+05	1.489E-01	2.231E+02
2155	1.977E+05	1.416E-01	2.122E+02
2156	1.977E+05	1.347E-01	2.019E+02

Table D-13. Southern Parcel Methane Emission Rate from Year 1968 to 2203 (concluded).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2157	1.977E+05	1.281E-01	1.921E+02
2158	1.977E+05	1.219E-01	1.827E+02
2159	1.977E+05	1.159E-01	1.738E+02
2160	1.977E+05	1.103E-01	1.653E+02
2161	1.977E+05	1.049E-01	1.572E+02
2162	1.977E+05	9.978E-02	1.496E+02
2163	1.977E+05	9.492E-02	1.423E+02
2164	1.977E+05	9.029E-02	1.353E+02
2165	1.977E+05	8.589E-02	1.287E+02
2166	1.977E+05	8.170E-02	1.225E+02
2167	1.977E+05	7.771E-02	1.165E+02
2168	1.977E+05	7.392E-02	1.108E+02
2169	1.977E+05	7.032E-02	1.054E+02
2170	1.977E+05	6.689E-02	1.003E+02
2171	1.977E+05	6.363E-02	9.537E+01
2172	1.977E+05	6.052E-02	9.072E+01
2173	1.977E+05	5.757E-02	8.629E+01
2174	1.977E+05	5.476E-02	8.209E+01
2175	1.977E+05	5.209E-02	7.808E+01
2176	1.977E+05	4.955E-02	7.427E+01
2177	1.977E+05	4.713E-02	7.065E+01
2178	1.977E+05	4.484E-02	6.721E+01
2179	1.977E+05	4.265E-02	6.393E+01
2180	1.977E+05	4.057E-02	6.081E+01
2181	1.977E+05	3.859E-02	5.784E+01
2182	1.977E+05	3.671E-02	5.502E+01
2183	1.977E+05	3.492E-02	5.234E+01
2184	1.977E+05	3.322E-02	4.979E+01
2185	1.977E+05	3.160E-02	4.736E+01
2186	1.977E+05	3.005E-02	4.505E+01
2187	1.977E+05	2.859E-02	4.285E+01
2188	1.977E+05	2.719E-02	4.076E+01
2189	1.977E+05	2.587E-02	3.877E+01
2190	1.977E+05	2.461E-02	3.688E+01
2191	1.977E+05	2.341E-02	3.508E+01
2192	1.977E+05	2.226E-02	3.337E+01
2193	1.977E+05	2.118E-02	3.175E+01
2194	1.977E+05	2.015E-02	3.020E+01
2195	1.977E+05	1.916E-02	2.872E+01
2196	1.977E+05	1.823E-02	2.732E+01
2197	1.977E+05	1.734E-02	2.599E+01
2198	1.977E+05	1.649E-02	2.472E+01
2199	1.977E+05	1.569E-02	2.352E+01
2200	1.977E+05	1.492E-02	2.237E+01
2201	1.977E+05	1.420E-02	2.128E+01

Table D-14. Southern Parcel NMOC Emission Rate from Year 1968 to 2203.

Source: H:\3000\030177~1.000\030177~1.002\ROSEHI~1\SOUTHERN.PRM

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=====
                          Model Parameters
=====
Lo : 170.00 m^3 / Mg ***** User Mode Selection *****
k : 0.0500 1/yr ***** User Mode Selection *****
NMOC : 2550.00 ppmv ***** User Mode Selection *****
Methane : 59.0000 % volume
Carbon Dioxide : 41.0000 % volume
=====

                          Landfill Parameters
=====
Landfill type : Co-Disposal
Year Opened : 1967      Current Year : 2003  Closure Year: 2002
Capacity : 197692 Mg
Average Acceptance Rate Required from
      Current Year to Closure Year : 12238.07 Mg/year
=====

                          Model Results
=====
Year      Refuse In Place (Mg)      NMOC Emission Rate
                          (Mg/yr)      (Cubic m/yr)
-----
1968      1.318E+04      1.736E+00      4.842E+02
1969      2.636E+04      3.386E+00      9.447E+02
1970      3.954E+04      4.957E+00      1.383E+03
1971      5.272E+04      6.451E+00      1.800E+03
1972      6.590E+04      7.871E+00      2.196E+03
1973      7.908E+04      9.223E+00      2.573E+03
1974      9.226E+04      1.051E+01      2.932E+03
1975      1.054E+05      1.173E+01      3.273E+03
1976      1.186E+05      1.290E+01      3.598E+03
1977      1.318E+05      1.400E+01      3.906E+03
1978      1.450E+05      1.505E+01      4.200E+03
1979      1.582E+05      1.606E+01      4.479E+03
1980      1.713E+05      1.701E+01      4.745E+03
1981      1.845E+05      1.791E+01      4.998E+03
1982      1.977E+05      1.878E+01      5.238E+03
1983      1.977E+05      1.786E+01      4.983E+03
1984      1.977E+05      1.699E+01      4.740E+03
1985      1.977E+05      1.616E+01      4.509E+03
1986      1.977E+05      1.537E+01      4.289E+03
1987      1.977E+05      1.462E+01      4.079E+03
1988      1.977E+05      1.391E+01      3.881E+03
1989      1.977E+05      1.323E+01      3.691E+03
1990      1.977E+05      1.259E+01      3.511E+03
1991      1.977E+05      1.197E+01      3.340E+03
1992      1.977E+05      1.139E+01      3.177E+03
1993      1.977E+05      1.083E+01      3.022E+03
1994      1.977E+05      1.030E+01      2.875E+03
1995      1.977E+05      9.802E+00      2.735E+03
1996      1.977E+05      9.324E+00      2.601E+03
1997      1.977E+05      8.869E+00      2.474E+03
1998      1.977E+05      8.437E+00      2.354E+03
1999      1.977E+05      8.025E+00      2.239E+03
2000      1.977E+05      7.634E+00      2.130E+03
2001      1.977E+05      7.261E+00      2.026E+03
2002      1.977E+05      6.907E+00      1.927E+03
2003      1.977E+05      6.570E+00      1.833E+03
2004      1.977E+05      6.250E+00      1.744E+03
2005      1.977E+05      5.945E+00      1.659E+03
2006      1.977E+05      5.655E+00      1.578E+03
2007      1.977E+05      5.379E+00      1.501E+03
2008      1.977E+05      5.117E+00      1.428E+03
2009      1.977E+05      4.868E+00      1.358E+03
2010      1.977E+05      4.630E+00      1.292E+03
2011      1.977E+05      4.404E+00      1.229E+03
2012      1.977E+05      4.190E+00      1.169E+03
2013      1.977E+05      3.985E+00      1.112E+03
2014      1.977E+05      3.791E+00      1.058E+03
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Table D-14. Southern Parcel NMOC Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2015	1.977E+05	3.606E+00	1.006E+03
2016	1.977E+05	3.430E+00	9.569E+02
2017	1.977E+05	3.263E+00	9.103E+02
2018	1.977E+05	3.104E+00	8.659E+02
2019	1.977E+05	2.952E+00	8.236E+02
2020	1.977E+05	2.808E+00	7.835E+02
2021	1.977E+05	2.671E+00	7.453E+02
2022	1.977E+05	2.541E+00	7.089E+02
2023	1.977E+05	2.417E+00	6.743E+02
2024	1.977E+05	2.299E+00	6.414E+02
2025	1.977E+05	2.187E+00	6.102E+02
2026	1.977E+05	2.080E+00	5.804E+02
2027	1.977E+05	1.979E+00	5.521E+02
2028	1.977E+05	1.882E+00	5.252E+02
2029	1.977E+05	1.791E+00	4.996E+02
2030	1.977E+05	1.703E+00	4.752E+02
2031	1.977E+05	1.620E+00	4.520E+02
2032	1.977E+05	1.541E+00	4.300E+02
2033	1.977E+05	1.466E+00	4.090E+02
2034	1.977E+05	1.395E+00	3.891E+02
2035	1.977E+05	1.327E+00	3.701E+02
2036	1.977E+05	1.262E+00	3.520E+02
2037	1.977E+05	1.200E+00	3.349E+02
2038	1.977E+05	1.142E+00	3.185E+02
2039	1.977E+05	1.086E+00	3.030E+02
2040	1.977E+05	1.033E+00	2.882E+02
2041	1.977E+05	9.827E-01	2.742E+02
2042	1.977E+05	9.348E-01	2.608E+02
2043	1.977E+05	8.892E-01	2.481E+02
2044	1.977E+05	8.458E-01	2.360E+02
2045	1.977E+05	8.046E-01	2.245E+02
2046	1.977E+05	7.654E-01	2.135E+02
2047	1.977E+05	7.280E-01	2.031E+02
2048	1.977E+05	6.925E-01	1.932E+02
2049	1.977E+05	6.587E-01	1.838E+02
2050	1.977E+05	6.266E-01	1.748E+02
2051	1.977E+05	5.961E-01	1.663E+02
2052	1.977E+05	5.670E-01	1.582E+02
2053	1.977E+05	5.393E-01	1.505E+02
2054	1.977E+05	5.130E-01	1.431E+02
2055	1.977E+05	4.880E-01	1.361E+02
2056	1.977E+05	4.642E-01	1.295E+02
2057	1.977E+05	4.416E-01	1.232E+02
2058	1.977E+05	4.200E-01	1.172E+02
2059	1.977E+05	3.995E-01	1.115E+02
2060	1.977E+05	3.801E-01	1.060E+02
2061	1.977E+05	3.615E-01	1.009E+02
2062	1.977E+05	3.439E-01	9.594E+01
2063	1.977E+05	3.271E-01	9.126E+01
2064	1.977E+05	3.112E-01	8.681E+01
2065	1.977E+05	2.960E-01	8.258E+01
2066	1.977E+05	2.816E-01	7.855E+01
2067	1.977E+05	2.678E-01	7.472E+01
2068	1.977E+05	2.548E-01	7.107E+01
2069	1.977E+05	2.423E-01	6.761E+01
2070	1.977E+05	2.305E-01	6.431E+01
2071	1.977E+05	2.193E-01	6.117E+01
2072	1.977E+05	2.086E-01	5.819E+01
2073	1.977E+05	1.984E-01	5.535E+01
2074	1.977E+05	1.887E-01	5.265E+01
2075	1.977E+05	1.795E-01	5.009E+01
2076	1.977E+05	1.708E-01	4.764E+01
2077	1.977E+05	1.624E-01	4.532E+01
2078	1.977E+05	1.545E-01	4.311E+01
2079	1.977E+05	1.470E-01	4.101E+01
2080	1.977E+05	1.398E-01	3.901E+01
2081	1.977E+05	1.330E-01	3.710E+01
2082	1.977E+05	1.265E-01	3.529E+01
2083	1.977E+05	1.203E-01	3.357E+01
2084	1.977E+05	1.145E-01	3.194E+01
2085	1.977E+05	1.089E-01	3.038E+01

Table D-14. Southern Parcel NMOC Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2086	1.977E+05	1.036E-01	2.890E+01
2087	1.977E+05	9.853E-02	2.749E+01
2088	1.977E+05	9.372E-02	2.615E+01
2089	1.977E+05	8.915E-02	2.487E+01
2090	1.977E+05	8.480E-02	2.366E+01
2091	1.977E+05	8.067E-02	2.250E+01
2092	1.977E+05	7.673E-02	2.141E+01
2093	1.977E+05	7.299E-02	2.036E+01
2094	1.977E+05	6.943E-02	1.937E+01
2095	1.977E+05	6.605E-02	1.843E+01
2096	1.977E+05	6.282E-02	1.753E+01
2097	1.977E+05	5.976E-02	1.667E+01
2098	1.977E+05	5.685E-02	1.586E+01
2099	1.977E+05	5.407E-02	1.509E+01
2100	1.977E+05	5.144E-02	1.435E+01
2101	1.977E+05	4.893E-02	1.365E+01
2102	1.977E+05	4.654E-02	1.298E+01
2103	1.977E+05	4.427E-02	1.235E+01
2104	1.977E+05	4.211E-02	1.175E+01
2105	1.977E+05	4.006E-02	1.118E+01
2106	1.977E+05	3.810E-02	1.063E+01
2107	1.977E+05	3.625E-02	1.011E+01
2108	1.977E+05	3.448E-02	9.619E+00
2109	1.977E+05	3.280E-02	9.150E+00
2110	1.977E+05	3.120E-02	8.704E+00
2111	1.977E+05	2.968E-02	8.279E+00
2112	1.977E+05	2.823E-02	7.875E+00
2113	1.977E+05	2.685E-02	7.491E+00
2114	1.977E+05	2.554E-02	7.126E+00
2115	1.977E+05	2.430E-02	6.778E+00
2116	1.977E+05	2.311E-02	6.448E+00
2117	1.977E+05	2.198E-02	6.133E+00
2118	1.977E+05	2.091E-02	5.834E+00
2119	1.977E+05	1.989E-02	5.550E+00
2120	1.977E+05	1.892E-02	5.279E+00
2121	1.977E+05	1.800E-02	5.021E+00
2122	1.977E+05	1.712E-02	4.777E+00
2123	1.977E+05	1.629E-02	4.544E+00
2124	1.977E+05	1.549E-02	4.322E+00
2125	1.977E+05	1.474E-02	4.111E+00
2126	1.977E+05	1.402E-02	3.911E+00
2127	1.977E+05	1.333E-02	3.720E+00
2128	1.977E+05	1.268E-02	3.539E+00
2129	1.977E+05	1.207E-02	3.366E+00
2130	1.977E+05	1.148E-02	3.202E+00
2131	1.977E+05	1.092E-02	3.046E+00
2132	1.977E+05	1.038E-02	2.897E+00
2133	1.977E+05	9.878E-03	2.756E+00
2134	1.977E+05	9.396E-03	2.621E+00
2135	1.977E+05	8.938E-03	2.494E+00
2136	1.977E+05	8.502E-03	2.372E+00
2137	1.977E+05	8.088E-03	2.256E+00
2138	1.977E+05	7.693E-03	2.146E+00
2139	1.977E+05	7.318E-03	2.042E+00
2140	1.977E+05	6.961E-03	1.942E+00
2141	1.977E+05	6.622E-03	1.847E+00
2142	1.977E+05	6.299E-03	1.757E+00
2143	1.977E+05	5.991E-03	1.672E+00
2144	1.977E+05	5.699E-03	1.590E+00
2145	1.977E+05	5.421E-03	1.512E+00
2146	1.977E+05	5.157E-03	1.439E+00
2147	1.977E+05	4.905E-03	1.369E+00
2148	1.977E+05	4.666E-03	1.302E+00
2149	1.977E+05	4.439E-03	1.238E+00
2150	1.977E+05	4.222E-03	1.178E+00
2151	1.977E+05	4.016E-03	1.120E+00
2152	1.977E+05	3.820E-03	1.066E+00
2153	1.977E+05	3.634E-03	1.014E+00
2154	1.977E+05	3.457E-03	9.644E-01
2155	1.977E+05	3.288E-03	9.173E-01
2156	1.977E+05	3.128E-03	8.726E-01

Table D-14. Southern Parcel NMOC Emission Rate from Year 1968 to 2203 (concluded).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2157	1.977E+05	2.975E-03	8.300E-01
2158	1.977E+05	2.830E-03	7.896E-01
2159	1.977E+05	2.692E-03	7.511E-01
2160	1.977E+05	2.561E-03	7.144E-01
2161	1.977E+05	2.436E-03	6.796E-01
2162	1.977E+05	2.317E-03	6.464E-01
2163	1.977E+05	2.204E-03	6.149E-01
2164	1.977E+05	2.097E-03	5.849E-01
2165	1.977E+05	1.994E-03	5.564E-01
2166	1.977E+05	1.897E-03	5.293E-01
2167	1.977E+05	1.805E-03	5.034E-01
2168	1.977E+05	1.717E-03	4.789E-01
2169	1.977E+05	1.633E-03	4.555E-01
2170	1.977E+05	1.553E-03	4.333E-01
2171	1.977E+05	1.477E-03	4.122E-01
2172	1.977E+05	1.405E-03	3.921E-01
2173	1.977E+05	1.337E-03	3.730E-01
2174	1.977E+05	1.272E-03	3.548E-01
2175	1.977E+05	1.210E-03	3.375E-01
2176	1.977E+05	1.151E-03	3.210E-01
2177	1.977E+05	1.095E-03	3.054E-01
2178	1.977E+05	1.041E-03	2.905E-01
2179	1.977E+05	9.904E-04	2.763E-01
2180	1.977E+05	9.421E-04	2.628E-01
2181	1.977E+05	8.961E-04	2.500E-01
2182	1.977E+05	8.524E-04	2.378E-01
2183	1.977E+05	8.109E-04	2.262E-01
2184	1.977E+05	7.713E-04	2.152E-01
2185	1.977E+05	7.337E-04	2.047E-01
2186	1.977E+05	6.979E-04	1.947E-01
2187	1.977E+05	6.639E-04	1.852E-01
2188	1.977E+05	6.315E-04	1.762E-01
2189	1.977E+05	6.007E-04	1.676E-01
2190	1.977E+05	5.714E-04	1.594E-01
2191	1.977E+05	5.435E-04	1.516E-01
2192	1.977E+05	5.170E-04	1.442E-01
2193	1.977E+05	4.918E-04	1.372E-01
2194	1.977E+05	4.678E-04	1.305E-01
2195	1.977E+05	4.450E-04	1.241E-01
2196	1.977E+05	4.233E-04	1.181E-01
2197	1.977E+05	4.027E-04	1.123E-01
2198	1.977E+05	3.830E-04	1.069E-01
2199	1.977E+05	3.643E-04	1.016E-01
2200	1.977E+05	3.466E-04	9.669E-02
2201	1.977E+05	3.297E-04	9.197E-02

Table D-15. Southern Parcel Benzene Emission Rate from Year 1968 to 2203.

Source: H:\3000\030177~1.000\030177~1.002\ROSEHI~1\SOUTHERN.PRM

Model Parameters

Lo : 170.00 m³ / Mg ***** User Mode Selection *****
 k : 0.0500 1/yr ***** User Mode Selection *****
 NMOC : 2550.00 ppmv ***** User Mode Selection *****
 Methane : 59.0000 % volume
 Carbon Dioxide : 41.0000 % volume
 Air Pollutant : Benzene (HAP/VOC)
 Molecular Wt = 78.12 Concentration = 0.240000 ppmv

Landfill Parameters

Landfill type : Co-Disposal
 Year Opened : 1967 Current Year : 2003 Closure Year: 2002
 Capacity : 197692 Mg
 Average Acceptance Rate Required from
 Current Year to Closure Year : 12238.07 Mg/year

Model Results

Year	Refuse In Place (Mg)	Benzene (HAP/VOC) Emission Rate (Mg/yr)	(Cubic m/yr)
1968	1.318E+04	1.481E-04	4.557E-02
1969	2.636E+04	2.889E-04	8.892E-02
1970	3.954E+04	4.229E-04	1.302E-01
1971	5.272E+04	5.503E-04	1.694E-01
1972	6.590E+04	6.716E-04	2.067E-01
1973	7.908E+04	7.869E-04	2.422E-01
1974	9.226E+04	8.966E-04	2.759E-01
1975	1.054E+05	1.001E-03	3.080E-01
1976	1.186E+05	1.100E-03	3.386E-01
1977	1.318E+05	1.195E-03	3.676E-01
1978	1.450E+05	1.284E-03	3.953E-01
1979	1.582E+05	1.370E-03	4.216E-01
1980	1.713E+05	1.451E-03	4.466E-01
1981	1.845E+05	1.528E-03	4.704E-01
1982	1.977E+05	1.602E-03	4.930E-01
1983	1.977E+05	1.524E-03	4.690E-01
1984	1.977E+05	1.449E-03	4.461E-01
1985	1.977E+05	1.379E-03	4.243E-01
1986	1.977E+05	1.312E-03	4.036E-01
1987	1.977E+05	1.248E-03	3.840E-01
1988	1.977E+05	1.187E-03	3.652E-01
1989	1.977E+05	1.129E-03	3.474E-01
1990	1.977E+05	1.074E-03	3.305E-01
1991	1.977E+05	1.021E-03	3.144E-01
1992	1.977E+05	9.716E-04	2.990E-01
1993	1.977E+05	9.242E-04	2.844E-01
1994	1.977E+05	8.791E-04	2.706E-01
1995	1.977E+05	8.363E-04	2.574E-01
1996	1.977E+05	7.955E-04	2.448E-01
1997	1.977E+05	7.567E-04	2.329E-01
1998	1.977E+05	7.198E-04	2.215E-01
1999	1.977E+05	6.847E-04	2.107E-01
2000	1.977E+05	6.513E-04	2.004E-01
2001	1.977E+05	6.195E-04	1.907E-01
2002	1.977E+05	5.893E-04	1.814E-01
2003	1.977E+05	5.606E-04	1.725E-01
2004	1.977E+05	5.332E-04	1.641E-01
2005	1.977E+05	5.072E-04	1.561E-01
2006	1.977E+05	4.825E-04	1.485E-01
2007	1.977E+05	4.589E-04	1.412E-01
2008	1.977E+05	4.366E-04	1.344E-01
2009	1.977E+05	4.153E-04	1.278E-01
2010	1.977E+05	3.950E-04	1.216E-01
2011	1.977E+05	3.758E-04	1.156E-01
2012	1.977E+05	3.574E-04	1.100E-01

Table D-15. Southern Parcel Benzene Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2013	1.977E+05	3.400E-04	1.046E-01
2014	1.977E+05	3.234E-04	9.954E-02
2015	1.977E+05	3.076E-04	9.468E-02
2016	1.977E+05	2.926E-04	9.006E-02
2017	1.977E+05	2.784E-04	8.567E-02
2018	1.977E+05	2.648E-04	8.149E-02
2019	1.977E+05	2.519E-04	7.752E-02
2020	1.977E+05	2.396E-04	7.374E-02
2021	1.977E+05	2.279E-04	7.014E-02
2022	1.977E+05	2.168E-04	6.672E-02
2023	1.977E+05	2.062E-04	6.347E-02
2024	1.977E+05	1.962E-04	6.037E-02
2025	1.977E+05	1.866E-04	5.743E-02
2026	1.977E+05	1.775E-04	5.463E-02
2027	1.977E+05	1.688E-04	5.196E-02
2028	1.977E+05	1.606E-04	4.943E-02
2029	1.977E+05	1.528E-04	4.702E-02
2030	1.977E+05	1.453E-04	4.472E-02
2031	1.977E+05	1.382E-04	4.254E-02
2032	1.977E+05	1.315E-04	4.047E-02
2033	1.977E+05	1.251E-04	3.849E-02
2034	1.977E+05	1.190E-04	3.662E-02
2035	1.977E+05	1.132E-04	3.483E-02
2036	1.977E+05	1.077E-04	3.313E-02
2037	1.977E+05	1.024E-04	3.152E-02
2038	1.977E+05	9.741E-05	2.998E-02
2039	1.977E+05	9.266E-05	2.852E-02
2040	1.977E+05	8.814E-05	2.713E-02
2041	1.977E+05	8.384E-05	2.580E-02
2042	1.977E+05	7.975E-05	2.455E-02
2043	1.977E+05	7.586E-05	2.335E-02
2044	1.977E+05	7.216E-05	2.221E-02
2045	1.977E+05	6.864E-05	2.113E-02
2046	1.977E+05	6.530E-05	2.010E-02
2047	1.977E+05	6.211E-05	1.912E-02
2048	1.977E+05	5.908E-05	1.818E-02
2049	1.977E+05	5.620E-05	1.730E-02
2050	1.977E+05	5.346E-05	1.645E-02
2051	1.977E+05	5.085E-05	1.565E-02
2052	1.977E+05	4.837E-05	1.489E-02
2053	1.977E+05	4.601E-05	1.416E-02
2054	1.977E+05	4.377E-05	1.347E-02
2055	1.977E+05	4.163E-05	1.281E-02
2056	1.977E+05	3.960E-05	1.219E-02
2057	1.977E+05	3.767E-05	1.159E-02
2058	1.977E+05	3.584E-05	1.103E-02
2059	1.977E+05	3.409E-05	1.049E-02
2060	1.977E+05	3.243E-05	9.979E-03
2061	1.977E+05	3.084E-05	9.493E-03
2062	1.977E+05	2.934E-05	9.030E-03
2063	1.977E+05	2.791E-05	8.589E-03
2064	1.977E+05	2.655E-05	8.170E-03
2065	1.977E+05	2.525E-05	7.772E-03
2066	1.977E+05	2.402E-05	7.393E-03
2067	1.977E+05	2.285E-05	7.032E-03
2068	1.977E+05	2.174E-05	6.689E-03
2069	1.977E+05	2.068E-05	6.363E-03
2070	1.977E+05	1.967E-05	6.053E-03
2071	1.977E+05	1.871E-05	5.758E-03
2072	1.977E+05	1.780E-05	5.477E-03
2073	1.977E+05	1.693E-05	5.210E-03
2074	1.977E+05	1.610E-05	4.956E-03
2075	1.977E+05	1.532E-05	4.714E-03
2076	1.977E+05	1.457E-05	4.484E-03
2077	1.977E+05	1.386E-05	4.265E-03
2078	1.977E+05	1.318E-05	4.057E-03
2079	1.977E+05	1.254E-05	3.859E-03
2080	1.977E+05	1.193E-05	3.671E-03
2081	1.977E+05	1.135E-05	3.492E-03
2082	1.977E+05	1.079E-05	3.322E-03
2083	1.977E+05	1.027E-05	3.160E-03

Table D-15. Southern Parcel Benzene Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2084	1.977E+05	9.766E-06	3.006E-03
2085	1.977E+05	9.290E-06	2.859E-03
2086	1.977E+05	8.837E-06	2.720E-03
2087	1.977E+05	8.406E-06	2.587E-03
2088	1.977E+05	7.996E-06	2.461E-03
2089	1.977E+05	7.606E-06	2.341E-03
2090	1.977E+05	7.235E-06	2.227E-03
2091	1.977E+05	6.882E-06	2.118E-03
2092	1.977E+05	6.547E-06	2.015E-03
2093	1.977E+05	6.227E-06	1.917E-03
2094	1.977E+05	5.924E-06	1.823E-03
2095	1.977E+05	5.635E-06	1.734E-03
2096	1.977E+05	5.360E-06	1.650E-03
2097	1.977E+05	5.098E-06	1.569E-03
2098	1.977E+05	4.850E-06	1.493E-03
2099	1.977E+05	4.613E-06	1.420E-03
2100	1.977E+05	4.388E-06	1.351E-03
2101	1.977E+05	4.174E-06	1.285E-03
2102	1.977E+05	3.971E-06	1.222E-03
2103	1.977E+05	3.777E-06	1.162E-03
2104	1.977E+05	3.593E-06	1.106E-03
2105	1.977E+05	3.418E-06	1.052E-03
2106	1.977E+05	3.251E-06	1.001E-03
2107	1.977E+05	3.092E-06	9.517E-04
2108	1.977E+05	2.942E-06	9.053E-04
2109	1.977E+05	2.798E-06	8.612E-04
2110	1.977E+05	2.662E-06	8.192E-04
2111	1.977E+05	2.532E-06	7.792E-04
2112	1.977E+05	2.408E-06	7.412E-04
2113	1.977E+05	2.291E-06	7.051E-04
2114	1.977E+05	2.179E-06	6.707E-04
2115	1.977E+05	2.073E-06	6.380E-04
2116	1.977E+05	1.972E-06	6.068E-04
2117	1.977E+05	1.876E-06	5.772E-04
2118	1.977E+05	1.784E-06	5.491E-04
2119	1.977E+05	1.697E-06	5.223E-04
2120	1.977E+05	1.614E-06	4.968E-04
2121	1.977E+05	1.536E-06	4.726E-04
2122	1.977E+05	1.461E-06	4.496E-04
2123	1.977E+05	1.389E-06	4.276E-04
2124	1.977E+05	1.322E-06	4.068E-04
2125	1.977E+05	1.257E-06	3.869E-04
2126	1.977E+05	1.196E-06	3.681E-04
2127	1.977E+05	1.138E-06	3.501E-04
2128	1.977E+05	1.082E-06	3.330E-04
2129	1.977E+05	1.029E-06	3.168E-04
2130	1.977E+05	9.792E-07	3.014E-04
2131	1.977E+05	9.314E-07	2.867E-04
2132	1.977E+05	8.860E-07	2.727E-04
2133	1.977E+05	8.428E-07	2.594E-04
2134	1.977E+05	8.017E-07	2.467E-04
2135	1.977E+05	7.626E-07	2.347E-04
2136	1.977E+05	7.254E-07	2.232E-04
2137	1.977E+05	6.900E-07	2.124E-04
2138	1.977E+05	6.563E-07	2.020E-04
2139	1.977E+05	6.243E-07	1.921E-04
2140	1.977E+05	5.939E-07	1.828E-04
2141	1.977E+05	5.649E-07	1.739E-04
2142	1.977E+05	5.374E-07	1.654E-04
2143	1.977E+05	5.112E-07	1.573E-04
2144	1.977E+05	4.862E-07	1.496E-04
2145	1.977E+05	4.625E-07	1.423E-04
2146	1.977E+05	4.400E-07	1.354E-04
2147	1.977E+05	4.185E-07	1.288E-04
2148	1.977E+05	3.981E-07	1.225E-04
2149	1.977E+05	3.787E-07	1.165E-04
2150	1.977E+05	3.602E-07	1.109E-04
2151	1.977E+05	3.426E-07	1.055E-04
2152	1.977E+05	3.259E-07	1.003E-04
2153	1.977E+05	3.100E-07	9.542E-05
2154	1.977E+05	2.949E-07	9.076E-05

Table D-15. Southern Parcel Benzene Emission Rate from Year 1968 to 2203 (concluded).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2155	1.977E+05	2.805E-07	8.634E-05
2156	1.977E+05	2.669E-07	8.213E-05
2157	1.977E+05	2.538E-07	7.812E-05
2158	1.977E+05	2.415E-07	7.431E-05
2159	1.977E+05	2.297E-07	7.069E-05
2160	1.977E+05	2.185E-07	6.724E-05
2161	1.977E+05	2.078E-07	6.396E-05
2162	1.977E+05	1.977E-07	6.084E-05
2163	1.977E+05	1.880E-07	5.787E-05
2164	1.977E+05	1.789E-07	5.505E-05
2165	1.977E+05	1.702E-07	5.237E-05
2166	1.977E+05	1.619E-07	4.981E-05
2167	1.977E+05	1.540E-07	4.738E-05
2168	1.977E+05	1.465E-07	4.507E-05
2169	1.977E+05	1.393E-07	4.287E-05
2170	1.977E+05	1.325E-07	4.078E-05
2171	1.977E+05	1.261E-07	3.879E-05
2172	1.977E+05	1.199E-07	3.690E-05
2173	1.977E+05	1.141E-07	3.510E-05
2174	1.977E+05	1.085E-07	3.339E-05
2175	1.977E+05	1.032E-07	3.176E-05
2176	1.977E+05	9.817E-08	3.021E-05
2177	1.977E+05	9.338E-08	2.874E-05
2178	1.977E+05	8.883E-08	2.734E-05
2179	1.977E+05	8.449E-08	2.600E-05
2180	1.977E+05	8.037E-08	2.474E-05
2181	1.977E+05	7.645E-08	2.353E-05
2182	1.977E+05	7.273E-08	2.238E-05
2183	1.977E+05	6.918E-08	2.129E-05
2184	1.977E+05	6.580E-08	2.025E-05
2185	1.977E+05	6.260E-08	1.926E-05
2186	1.977E+05	5.954E-08	1.833E-05
2187	1.977E+05	5.664E-08	1.743E-05
2188	1.977E+05	5.388E-08	1.658E-05
2189	1.977E+05	5.125E-08	1.577E-05
2190	1.977E+05	4.875E-08	1.500E-05
2191	1.977E+05	4.637E-08	1.427E-05
2192	1.977E+05	4.411E-08	1.358E-05
2193	1.977E+05	4.196E-08	1.291E-05
2194	1.977E+05	3.991E-08	1.228E-05
2195	1.977E+05	3.797E-08	1.168E-05
2196	1.977E+05	3.611E-08	1.111E-05
2197	1.977E+05	3.435E-08	1.057E-05
2198	1.977E+05	3.268E-08	1.006E-05
2199	1.977E+05	3.108E-08	9.567E-06
2200	1.977E+05	2.957E-08	9.100E-06
2201	1.977E+05	2.813E-08	8.656E-06

Table D-16. Southern Parcel Chlorobenzene Emission Rate from Year 1968 to 2203.

Source: H:\3000\030177~1.000\030177~1.002\ROSEHI~1\SOUTHERN.PRM

Model Parameters

Lo : 170.00 m³ / Mg ***** User Mode Selection *****
 k : 0.0500 1/yr ***** User Mode Selection *****
 NMOC : 2550.00 ppmv ***** User Mode Selection *****
 Methane : 59.0000 % volume
 Carbon Dioxide : 41.0000 % volume
 Air Pollutant : Chlorobenzene (HAP/VOC)
 Molecular Wt = 112.56 Concentration = 0.720000 ppmV

Landfill Parameters

Landfill type : Co-Disposal
 Year Opened : 1967 Current Year : 2003 Closure Year: 2002
 Capacity : 197692 Mg
 Average Acceptance Rate Required from
 Current Year to Closure Year : 12238.07 Mg/year

Model Results

Year	Refuse In Place (Mg)	Chlorobenzene (HAP/VOC) Emission Rate (Mg/yr)	(Cubic m/yr)
1968	1.318E+04	6.400E-04	1.367E-01
1969	2.636E+04	1.249E-03	2.668E-01
1970	3.954E+04	1.828E-03	3.905E-01
1971	5.272E+04	2.379E-03	5.081E-01
1972	6.590E+04	2.903E-03	6.200E-01
1973	7.908E+04	3.401E-03	7.265E-01
1974	9.226E+04	3.875E-03	8.278E-01
1975	1.054E+05	4.326E-03	9.241E-01
1976	1.186E+05	4.755E-03	1.016E+00
1977	1.318E+05	5.164E-03	1.103E+00
1978	1.450E+05	5.552E-03	1.186E+00
1979	1.582E+05	5.921E-03	1.265E+00
1980	1.713E+05	6.272E-03	1.340E+00
1981	1.845E+05	6.606E-03	1.411E+00
1982	1.977E+05	6.924E-03	1.479E+00
1983	1.977E+05	6.587E-03	1.407E+00
1984	1.977E+05	6.265E-03	1.338E+00
1985	1.977E+05	5.960E-03	1.273E+00
1986	1.977E+05	5.669E-03	1.211E+00
1987	1.977E+05	5.393E-03	1.152E+00
1988	1.977E+05	5.130E-03	1.096E+00
1989	1.977E+05	4.879E-03	1.042E+00
1990	1.977E+05	4.641E-03	9.914E-01
1991	1.977E+05	4.415E-03	9.431E-01
1992	1.977E+05	4.200E-03	8.971E-01
1993	1.977E+05	3.995E-03	8.533E-01
1994	1.977E+05	3.800E-03	8.117E-01
1995	1.977E+05	3.615E-03	7.721E-01
1996	1.977E+05	3.438E-03	7.345E-01
1997	1.977E+05	3.271E-03	6.986E-01
1998	1.977E+05	3.111E-03	6.646E-01
1999	1.977E+05	2.960E-03	6.322E-01
2000	1.977E+05	2.815E-03	6.013E-01
2001	1.977E+05	2.678E-03	5.720E-01
2002	1.977E+05	2.547E-03	5.441E-01
2003	1.977E+05	2.423E-03	5.176E-01
2004	1.977E+05	2.305E-03	4.923E-01
2005	1.977E+05	2.192E-03	4.683E-01
2006	1.977E+05	2.086E-03	4.455E-01
2007	1.977E+05	1.984E-03	4.237E-01
2008	1.977E+05	1.887E-03	4.031E-01
2009	1.977E+05	1.795E-03	3.834E-01
2010	1.977E+05	1.708E-03	3.647E-01
2011	1.977E+05	1.624E-03	3.469E-01
2012	1.977E+05	1.545E-03	3.300E-01

Table D-16. Southern Parcel Chlorobenzene Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2013	1.977E+05	1.470E-03	3.139E-01
2014	1.977E+05	1.398E-03	2.986E-01
2015	1.977E+05	1.330E-03	2.840E-01
2016	1.977E+05	1.265E-03	2.702E-01
2017	1.977E+05	1.203E-03	2.570E-01
2018	1.977E+05	1.145E-03	2.445E-01
2019	1.977E+05	1.089E-03	2.326E-01
2020	1.977E+05	1.036E-03	2.212E-01
2021	1.977E+05	9.851E-04	2.104E-01
2022	1.977E+05	9.371E-04	2.002E-01
2023	1.977E+05	8.914E-04	1.904E-01
2024	1.977E+05	8.479E-04	1.811E-01
2025	1.977E+05	8.066E-04	1.723E-01
2026	1.977E+05	7.672E-04	1.639E-01
2027	1.977E+05	7.298E-04	1.559E-01
2028	1.977E+05	6.942E-04	1.483E-01
2029	1.977E+05	6.604E-04	1.411E-01
2030	1.977E+05	6.282E-04	1.342E-01
2031	1.977E+05	5.975E-04	1.276E-01
2032	1.977E+05	5.684E-04	1.214E-01
2033	1.977E+05	5.407E-04	1.155E-01
2034	1.977E+05	5.143E-04	1.099E-01
2035	1.977E+05	4.892E-04	1.045E-01
2036	1.977E+05	4.653E-04	9.940E-02
2037	1.977E+05	4.427E-04	9.455E-02
2038	1.977E+05	4.211E-04	8.994E-02
2039	1.977E+05	4.005E-04	8.555E-02
2040	1.977E+05	3.810E-04	8.138E-02
2041	1.977E+05	3.624E-04	7.741E-02
2042	1.977E+05	3.447E-04	7.364E-02
2043	1.977E+05	3.279E-04	7.004E-02
2044	1.977E+05	3.119E-04	6.663E-02
2045	1.977E+05	2.967E-04	6.338E-02
2046	1.977E+05	2.822E-04	6.029E-02
2047	1.977E+05	2.685E-04	5.735E-02
2048	1.977E+05	2.554E-04	5.455E-02
2049	1.977E+05	2.429E-04	5.189E-02
2050	1.977E+05	2.311E-04	4.936E-02
2051	1.977E+05	2.198E-04	4.695E-02
2052	1.977E+05	2.091E-04	4.466E-02
2053	1.977E+05	1.989E-04	4.248E-02
2054	1.977E+05	1.892E-04	4.041E-02
2055	1.977E+05	1.800E-04	3.844E-02
2056	1.977E+05	1.712E-04	3.657E-02
2057	1.977E+05	1.628E-04	3.478E-02
2058	1.977E+05	1.549E-04	3.309E-02
2059	1.977E+05	1.473E-04	3.147E-02
2060	1.977E+05	1.402E-04	2.994E-02
2061	1.977E+05	1.333E-04	2.848E-02
2062	1.977E+05	1.268E-04	2.709E-02
2063	1.977E+05	1.206E-04	2.577E-02
2064	1.977E+05	1.148E-04	2.451E-02
2065	1.977E+05	1.092E-04	2.332E-02
2066	1.977E+05	1.038E-04	2.218E-02
2067	1.977E+05	9.877E-05	2.110E-02
2068	1.977E+05	9.395E-05	2.007E-02
2069	1.977E+05	8.937E-05	1.909E-02
2070	1.977E+05	8.501E-05	1.816E-02
2071	1.977E+05	8.087E-05	1.727E-02
2072	1.977E+05	7.692E-05	1.643E-02
2073	1.977E+05	7.317E-05	1.563E-02
2074	1.977E+05	6.960E-05	1.487E-02
2075	1.977E+05	6.621E-05	1.414E-02
2076	1.977E+05	6.298E-05	1.345E-02
2077	1.977E+05	5.991E-05	1.280E-02
2078	1.977E+05	5.698E-05	1.217E-02
2079	1.977E+05	5.421E-05	1.158E-02
2080	1.977E+05	5.156E-05	1.101E-02
2081	1.977E+05	4.905E-05	1.048E-02
2082	1.977E+05	4.666E-05	9.966E-03
2083	1.977E+05	4.438E-05	9.479E-03

Table D-16. Southern Parcel Chlorobenzene Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2084	1.977E+05	4.222E-05	9.017E-03
2085	1.977E+05	4.016E-05	8.577E-03
2086	1.977E+05	3.820E-05	8.159E-03
2087	1.977E+05	3.634E-05	7.761E-03
2088	1.977E+05	3.456E-05	7.383E-03
2089	1.977E+05	3.288E-05	7.023E-03
2090	1.977E+05	3.127E-05	6.680E-03
2091	1.977E+05	2.975E-05	6.354E-03
2092	1.977E+05	2.830E-05	6.044E-03
2093	1.977E+05	2.692E-05	5.750E-03
2094	1.977E+05	2.560E-05	5.469E-03
2095	1.977E+05	2.436E-05	5.202E-03
2096	1.977E+05	2.317E-05	4.949E-03
2097	1.977E+05	2.204E-05	4.707E-03
2098	1.977E+05	2.096E-05	4.478E-03
2099	1.977E+05	1.994E-05	4.259E-03
2100	1.977E+05	1.897E-05	4.052E-03
2101	1.977E+05	1.804E-05	3.854E-03
2102	1.977E+05	1.716E-05	3.666E-03
2103	1.977E+05	1.633E-05	3.487E-03
2104	1.977E+05	1.553E-05	3.317E-03
2105	1.977E+05	1.477E-05	3.155E-03
2106	1.977E+05	1.405E-05	3.002E-03
2107	1.977E+05	1.337E-05	2.855E-03
2108	1.977E+05	1.272E-05	2.716E-03
2109	1.977E+05	1.209E-05	2.583E-03
2110	1.977E+05	1.151E-05	2.457E-03
2111	1.977E+05	1.094E-05	2.338E-03
2112	1.977E+05	1.041E-05	2.224E-03
2113	1.977E+05	9.903E-06	2.115E-03
2114	1.977E+05	9.420E-06	2.012E-03
2115	1.977E+05	8.960E-06	1.914E-03
2116	1.977E+05	8.523E-06	1.821E-03
2117	1.977E+05	8.107E-06	1.732E-03
2118	1.977E+05	7.712E-06	1.647E-03
2119	1.977E+05	7.336E-06	1.567E-03
2120	1.977E+05	6.978E-06	1.491E-03
2121	1.977E+05	6.638E-06	1.418E-03
2122	1.977E+05	6.314E-06	1.349E-03
2123	1.977E+05	6.006E-06	1.283E-03
2124	1.977E+05	5.713E-06	1.220E-03
2125	1.977E+05	5.435E-06	1.161E-03
2126	1.977E+05	5.170E-06	1.104E-03
2127	1.977E+05	4.917E-06	1.050E-03
2128	1.977E+05	4.678E-06	9.991E-04
2129	1.977E+05	4.449E-06	9.504E-04
2130	1.977E+05	4.232E-06	9.041E-04
2131	1.977E+05	4.026E-06	8.600E-04
2132	1.977E+05	3.830E-06	8.180E-04
2133	1.977E+05	3.643E-06	7.781E-04
2134	1.977E+05	3.465E-06	7.402E-04
2135	1.977E+05	3.296E-06	7.041E-04
2136	1.977E+05	3.135E-06	6.697E-04
2137	1.977E+05	2.983E-06	6.371E-04
2138	1.977E+05	2.837E-06	6.060E-04
2139	1.977E+05	2.699E-06	5.764E-04
2140	1.977E+05	2.567E-06	5.483E-04
2141	1.977E+05	2.442E-06	5.216E-04
2142	1.977E+05	2.323E-06	4.962E-04
2143	1.977E+05	2.210E-06	4.720E-04
2144	1.977E+05	2.102E-06	4.489E-04
2145	1.977E+05	1.999E-06	4.270E-04
2146	1.977E+05	1.902E-06	4.062E-04
2147	1.977E+05	1.809E-06	3.864E-04
2148	1.977E+05	1.721E-06	3.676E-04
2149	1.977E+05	1.637E-06	3.496E-04
2150	1.977E+05	1.557E-06	3.326E-04
2151	1.977E+05	1.481E-06	3.164E-04
2152	1.977E+05	1.409E-06	3.009E-04
2153	1.977E+05	1.340E-06	2.863E-04
2154	1.977E+05	1.275E-06	2.723E-04

Table D-16. Southern Parcel Chlorobenzene Emission Rate from Year 1968 to 2203 (concluded).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2155	1.977E+05	1.213E-06	2.590E-04
2156	1.977E+05	1.153E-06	2.464E-04
2157	1.977E+05	1.097E-06	2.344E-04
2158	1.977E+05	1.044E-06	2.229E-04
2159	1.977E+05	9.928E-07	2.121E-04
2160	1.977E+05	9.444E-07	2.017E-04
2161	1.977E+05	8.983E-07	1.919E-04
2162	1.977E+05	8.545E-07	1.825E-04
2163	1.977E+05	8.128E-07	1.736E-04
2164	1.977E+05	7.732E-07	1.652E-04
2165	1.977E+05	7.355E-07	1.571E-04
2166	1.977E+05	6.996E-07	1.494E-04
2167	1.977E+05	6.655E-07	1.422E-04
2168	1.977E+05	6.330E-07	1.352E-04
2169	1.977E+05	6.022E-07	1.286E-04
2170	1.977E+05	5.728E-07	1.223E-04
2171	1.977E+05	5.449E-07	1.164E-04
2172	1.977E+05	5.183E-07	1.107E-04
2173	1.977E+05	4.930E-07	1.053E-04
2174	1.977E+05	4.690E-07	1.002E-04
2175	1.977E+05	4.461E-07	9.529E-05
2176	1.977E+05	4.243E-07	9.064E-05
2177	1.977E+05	4.036E-07	8.622E-05
2178	1.977E+05	3.840E-07	8.201E-05
2179	1.977E+05	3.652E-07	7.801E-05
2180	1.977E+05	3.474E-07	7.421E-05
2181	1.977E+05	3.305E-07	7.059E-05
2182	1.977E+05	3.144E-07	6.715E-05
2183	1.977E+05	2.990E-07	6.387E-05
2184	1.977E+05	2.844E-07	6.076E-05
2185	1.977E+05	2.706E-07	5.779E-05
2186	1.977E+05	2.574E-07	5.498E-05
2187	1.977E+05	2.448E-07	5.229E-05
2188	1.977E+05	2.329E-07	4.974E-05
2189	1.977E+05	2.215E-07	4.732E-05
2190	1.977E+05	2.107E-07	4.501E-05
2191	1.977E+05	2.004E-07	4.281E-05
2192	1.977E+05	1.907E-07	4.073E-05
2193	1.977E+05	1.814E-07	3.874E-05
2194	1.977E+05	1.725E-07	3.685E-05
2195	1.977E+05	1.641E-07	3.505E-05
2196	1.977E+05	1.561E-07	3.334E-05
2197	1.977E+05	1.485E-07	3.172E-05
2198	1.977E+05	1.413E-07	3.017E-05
2199	1.977E+05	1.344E-07	2.870E-05
2200	1.977E+05	1.278E-07	2.730E-05
2201	1.977E+05	1.216E-07	2.597E-05

Table D-17. Southern Parcel Chloroethane Emission Rate from Year 1968 to 2203.

Source: H:\3000\030177~1.000\030177~1.002\ROSEHI~1\SOUTHERN.PRM

Model Parameters

Lo : 170.00 m³ / Mg ***** User Mode Selection *****
 k : 0.0500 1/yr ***** User Mode Selection *****
 NMOC : 2550.00 ppmv ***** User Mode Selection *****
 Methane : 59.0000 % volume
 Carbon Dioxide : 41.0000 % volume
 Air Pollutant : Chloroethane (HAP/VOC)
 Molecular Wt = 64.52 Concentration = 0.320000 ppmV

Landfill Parameters

Landfill type : Co-Disposal
 Year Opened : 1967 Current Year : 2003 Closure Year: 2002
 Capacity : 197692 Mg
 Average Acceptance Rate Required from
 Current Year to Closure Year : 12238.07 Mg/year

Model Results

Year	Refuse In Place (Mg)	Chloroethane (HAP/VOC) Emission Rate (Mg/yr)	(Cubic m/yr)
1968	1.318E+04	1.631E-04	6.076E-02
1969	2.636E+04	3.182E-04	1.186E-01
1970	3.954E+04	4.657E-04	1.735E-01
1971	5.272E+04	6.060E-04	2.258E-01
1972	6.590E+04	7.395E-04	2.756E-01
1973	7.908E+04	8.665E-04	3.229E-01
1974	9.226E+04	9.873E-04	3.679E-01
1975	1.054E+05	1.102E-03	4.107E-01
1976	1.186E+05	1.212E-03	4.515E-01
1977	1.318E+05	1.315E-03	4.902E-01
1978	1.450E+05	1.414E-03	5.270E-01
1979	1.582E+05	1.508E-03	5.621E-01
1980	1.713E+05	1.598E-03	5.954E-01
1981	1.845E+05	1.683E-03	6.272E-01
1982	1.977E+05	1.764E-03	6.573E-01
1983	1.977E+05	1.678E-03	6.253E-01
1984	1.977E+05	1.596E-03	5.948E-01
1985	1.977E+05	1.518E-03	5.658E-01
1986	1.977E+05	1.444E-03	5.382E-01
1987	1.977E+05	1.374E-03	5.119E-01
1988	1.977E+05	1.307E-03	4.870E-01
1989	1.977E+05	1.243E-03	4.632E-01
1990	1.977E+05	1.182E-03	4.406E-01
1991	1.977E+05	1.125E-03	4.191E-01
1992	1.977E+05	1.070E-03	3.987E-01
1993	1.977E+05	1.018E-03	3.793E-01
1994	1.977E+05	9.681E-04	3.608E-01
1995	1.977E+05	9.209E-04	3.432E-01
1996	1.977E+05	8.760E-04	3.264E-01
1997	1.977E+05	8.333E-04	3.105E-01
1998	1.977E+05	7.926E-04	2.954E-01
1999	1.977E+05	7.540E-04	2.810E-01
2000	1.977E+05	7.172E-04	2.673E-01
2001	1.977E+05	6.822E-04	2.542E-01
2002	1.977E+05	6.489E-04	2.418E-01
2003	1.977E+05	6.173E-04	2.300E-01
2004	1.977E+05	5.872E-04	2.188E-01
2005	1.977E+05	5.586E-04	2.081E-01
2006	1.977E+05	5.313E-04	1.980E-01
2007	1.977E+05	5.054E-04	1.883E-01
2008	1.977E+05	4.807E-04	1.791E-01
2009	1.977E+05	4.573E-04	1.704E-01
2010	1.977E+05	4.350E-04	1.621E-01
2011	1.977E+05	4.138E-04	1.542E-01
2012	1.977E+05	3.936E-04	1.467E-01

Table D-17. Southern Parcel Chloroethane Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2013	1.977E+05	3.744E-04	1.395E-01
2014	1.977E+05	3.561E-04	1.327E-01
2015	1.977E+05	3.388E-04	1.262E-01
2016	1.977E+05	3.223E-04	1.201E-01
2017	1.977E+05	3.065E-04	1.142E-01
2018	1.977E+05	2.916E-04	1.087E-01
2019	1.977E+05	2.774E-04	1.034E-01
2020	1.977E+05	2.638E-04	9.832E-02
2021	1.977E+05	2.510E-04	9.352E-02
2022	1.977E+05	2.387E-04	8.896E-02
2023	1.977E+05	2.271E-04	8.462E-02
2024	1.977E+05	2.160E-04	8.050E-02
2025	1.977E+05	2.055E-04	7.657E-02
2026	1.977E+05	1.955E-04	7.284E-02
2027	1.977E+05	1.859E-04	6.928E-02
2028	1.977E+05	1.769E-04	6.590E-02
2029	1.977E+05	1.682E-04	6.269E-02
2030	1.977E+05	1.600E-04	5.963E-02
2031	1.977E+05	1.522E-04	5.672E-02
2032	1.977E+05	1.448E-04	5.396E-02
2033	1.977E+05	1.377E-04	5.133E-02
2034	1.977E+05	1.310E-04	4.882E-02
2035	1.977E+05	1.246E-04	4.644E-02
2036	1.977E+05	1.186E-04	4.418E-02
2037	1.977E+05	1.128E-04	4.202E-02
2038	1.977E+05	1.073E-04	3.997E-02
2039	1.977E+05	1.020E-04	3.802E-02
2040	1.977E+05	9.706E-05	3.617E-02
2041	1.977E+05	9.233E-05	3.440E-02
2042	1.977E+05	8.782E-05	3.273E-02
2043	1.977E+05	8.354E-05	3.113E-02
2044	1.977E+05	7.947E-05	2.961E-02
2045	1.977E+05	7.559E-05	2.817E-02
2046	1.977E+05	7.191E-05	2.679E-02
2047	1.977E+05	6.840E-05	2.549E-02
2048	1.977E+05	6.506E-05	2.424E-02
2049	1.977E+05	6.189E-05	2.306E-02
2050	1.977E+05	5.887E-05	2.194E-02
2051	1.977E+05	5.600E-05	2.087E-02
2052	1.977E+05	5.327E-05	1.985E-02
2053	1.977E+05	5.067E-05	1.888E-02
2054	1.977E+05	4.820E-05	1.796E-02
2055	1.977E+05	4.585E-05	1.708E-02
2056	1.977E+05	4.361E-05	1.625E-02
2057	1.977E+05	4.149E-05	1.546E-02
2058	1.977E+05	3.946E-05	1.471E-02
2059	1.977E+05	3.754E-05	1.399E-02
2060	1.977E+05	3.571E-05	1.331E-02
2061	1.977E+05	3.397E-05	1.266E-02
2062	1.977E+05	3.231E-05	1.204E-02
2063	1.977E+05	3.073E-05	1.145E-02
2064	1.977E+05	2.923E-05	1.089E-02
2065	1.977E+05	2.781E-05	1.036E-02
2066	1.977E+05	2.645E-05	9.857E-03
2067	1.977E+05	2.516E-05	9.376E-03
2068	1.977E+05	2.394E-05	8.919E-03
2069	1.977E+05	2.277E-05	8.484E-03
2070	1.977E+05	2.166E-05	8.070E-03
2071	1.977E+05	2.060E-05	7.677E-03
2072	1.977E+05	1.960E-05	7.302E-03
2073	1.977E+05	1.864E-05	6.946E-03
2074	1.977E+05	1.773E-05	6.607E-03
2075	1.977E+05	1.687E-05	6.285E-03
2076	1.977E+05	1.604E-05	5.979E-03
2077	1.977E+05	1.526E-05	5.687E-03
2078	1.977E+05	1.452E-05	5.410E-03
2079	1.977E+05	1.381E-05	5.146E-03
2080	1.977E+05	1.314E-05	4.895E-03
2081	1.977E+05	1.250E-05	4.656E-03
2082	1.977E+05	1.189E-05	4.429E-03
2083	1.977E+05	1.131E-05	4.213E-03

Table D-17. Southern Parcel Chloroethane Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2084	1.977E+05	1.075E-05	4.008E-03
2085	1.977E+05	1.023E-05	3.812E-03
2086	1.977E+05	9.731E-06	3.626E-03
2087	1.977E+05	9.257E-06	3.449E-03
2088	1.977E+05	8.805E-06	3.281E-03
2089	1.977E+05	8.376E-06	3.121E-03
2090	1.977E+05	7.967E-06	2.969E-03
2091	1.977E+05	7.579E-06	2.824E-03
2092	1.977E+05	7.209E-06	2.686E-03
2093	1.977E+05	6.858E-06	2.555E-03
2094	1.977E+05	6.523E-06	2.431E-03
2095	1.977E+05	6.205E-06	2.312E-03
2096	1.977E+05	5.902E-06	2.199E-03
2097	1.977E+05	5.614E-06	2.092E-03
2098	1.977E+05	5.341E-06	1.990E-03
2099	1.977E+05	5.080E-06	1.893E-03
2100	1.977E+05	4.832E-06	1.801E-03
2101	1.977E+05	4.597E-06	1.713E-03
2102	1.977E+05	4.373E-06	1.629E-03
2103	1.977E+05	4.159E-06	1.550E-03
2104	1.977E+05	3.956E-06	1.474E-03
2105	1.977E+05	3.763E-06	1.402E-03
2106	1.977E+05	3.580E-06	1.334E-03
2107	1.977E+05	3.405E-06	1.269E-03
2108	1.977E+05	3.239E-06	1.207E-03
2109	1.977E+05	3.081E-06	1.148E-03
2110	1.977E+05	2.931E-06	1.092E-03
2111	1.977E+05	2.788E-06	1.039E-03
2112	1.977E+05	2.652E-06	9.883E-04
2113	1.977E+05	2.523E-06	9.401E-04
2114	1.977E+05	2.400E-06	8.942E-04
2115	1.977E+05	2.283E-06	8.506E-04
2116	1.977E+05	2.171E-06	8.091E-04
2117	1.977E+05	2.065E-06	7.697E-04
2118	1.977E+05	1.965E-06	7.321E-04
2119	1.977E+05	1.869E-06	6.964E-04
2120	1.977E+05	1.778E-06	6.625E-04
2121	1.977E+05	1.691E-06	6.301E-04
2122	1.977E+05	1.609E-06	5.994E-04
2123	1.977E+05	1.530E-06	5.702E-04
2124	1.977E+05	1.455E-06	5.424E-04
2125	1.977E+05	1.385E-06	5.159E-04
2126	1.977E+05	1.317E-06	4.908E-04
2127	1.977E+05	1.253E-06	4.668E-04
2128	1.977E+05	1.192E-06	4.441E-04
2129	1.977E+05	1.134E-06	4.224E-04
2130	1.977E+05	1.078E-06	4.018E-04
2131	1.977E+05	1.026E-06	3.822E-04
2132	1.977E+05	9.756E-07	3.636E-04
2133	1.977E+05	9.281E-07	3.458E-04
2134	1.977E+05	8.828E-07	3.290E-04
2135	1.977E+05	8.397E-07	3.129E-04
2136	1.977E+05	7.988E-07	2.977E-04
2137	1.977E+05	7.598E-07	2.831E-04
2138	1.977E+05	7.228E-07	2.693E-04
2139	1.977E+05	6.875E-07	2.562E-04
2140	1.977E+05	6.540E-07	2.437E-04
2141	1.977E+05	6.221E-07	2.318E-04
2142	1.977E+05	5.918E-07	2.205E-04
2143	1.977E+05	5.629E-07	2.098E-04
2144	1.977E+05	5.354E-07	1.995E-04
2145	1.977E+05	5.093E-07	1.898E-04
2146	1.977E+05	4.845E-07	1.805E-04
2147	1.977E+05	4.609E-07	1.717E-04
2148	1.977E+05	4.384E-07	1.634E-04
2149	1.977E+05	4.170E-07	1.554E-04
2150	1.977E+05	3.967E-07	1.478E-04
2151	1.977E+05	3.773E-07	1.406E-04
2152	1.977E+05	3.589E-07	1.337E-04
2153	1.977E+05	3.414E-07	1.272E-04
2154	1.977E+05	3.248E-07	1.210E-04

Table D-17. Southern Parcel Chloroethane Emission Rate from Year 1968 to 2203 (concluded).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2155	1.977E+05	3.089E-07	1.151E-04
2156	1.977E+05	2.939E-07	1.095E-04
2157	1.977E+05	2.795E-07	1.042E-04
2158	1.977E+05	2.659E-07	9.908E-05
2159	1.977E+05	2.529E-07	9.425E-05
2160	1.977E+05	2.406E-07	8.965E-05
2161	1.977E+05	2.289E-07	8.528E-05
2162	1.977E+05	2.177E-07	8.112E-05
2163	1.977E+05	2.071E-07	7.717E-05
2164	1.977E+05	1.970E-07	7.340E-05
2165	1.977E+05	1.874E-07	6.982E-05
2166	1.977E+05	1.782E-07	6.642E-05
2167	1.977E+05	1.695E-07	6.318E-05
2168	1.977E+05	1.613E-07	6.010E-05
2169	1.977E+05	1.534E-07	5.717E-05
2170	1.977E+05	1.459E-07	5.438E-05
2171	1.977E+05	1.388E-07	5.173E-05
2172	1.977E+05	1.320E-07	4.920E-05
2173	1.977E+05	1.256E-07	4.680E-05
2174	1.977E+05	1.195E-07	4.452E-05
2175	1.977E+05	1.136E-07	4.235E-05
2176	1.977E+05	1.081E-07	4.028E-05
2177	1.977E+05	1.028E-07	3.832E-05
2178	1.977E+05	9.782E-08	3.645E-05
2179	1.977E+05	9.305E-08	3.467E-05
2180	1.977E+05	8.851E-08	3.298E-05
2181	1.977E+05	8.419E-08	3.137E-05
2182	1.977E+05	8.009E-08	2.984E-05
2183	1.977E+05	7.618E-08	2.839E-05
2184	1.977E+05	7.246E-08	2.700E-05
2185	1.977E+05	6.893E-08	2.569E-05
2186	1.977E+05	6.557E-08	2.443E-05
2187	1.977E+05	6.237E-08	2.324E-05
2188	1.977E+05	5.933E-08	2.211E-05
2189	1.977E+05	5.644E-08	2.103E-05
2190	1.977E+05	5.368E-08	2.000E-05
2191	1.977E+05	5.107E-08	1.903E-05
2192	1.977E+05	4.857E-08	1.810E-05
2193	1.977E+05	4.621E-08	1.722E-05
2194	1.977E+05	4.395E-08	1.638E-05
2195	1.977E+05	4.181E-08	1.558E-05
2196	1.977E+05	3.977E-08	1.482E-05
2197	1.977E+05	3.783E-08	1.410E-05
2198	1.977E+05	3.598E-08	1.341E-05
2199	1.977E+05	3.423E-08	1.276E-05
2200	1.977E+05	3.256E-08	1.213E-05
2201	1.977E+05	3.097E-08	1.154E-05

Table D-18. Southern Parcel Dichlorobenzene Emission Rate from Year 1968 to 2203.

Source: H:\3000\030177~1.000\030177~1.002\ROSEHI~1\SOUTHERN.PRM

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=====
Model Parameters
=====
Lo : 170.00 m^3 / Mg ***** User Mode Selection *****
k : 0.0500 1/yr ***** User Mode Selection *****
NMOC : 2550.00 ppmv ***** User Mode Selection *****
Methane : 59.0000 % volume
Carbon Dioxide : 41.0000 % volume
Air Pollutant : Dichlorobenzene (VOC/HAP for 1,4 isomer)
Molecular Wt = 147.00      Concentration =      0.190000 ppmV
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=====
Landfill Parameters
=====
Landfill type : Co-Disposal
Year Opened : 1967      Current Year : 2003      Closure Year: 2002
Capacity : 197692 Mg
Average Acceptance Rate Required from
      Current Year to Closure Year : 12238.07 Mg/year
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Model Results
=====
Dichlorobenzene (VOC/HAP for 1,4 isomer) Emission Ra
Year      Refuse In Place (Mg)      (Mg/yr)      (Cubic m/yr)
=====
1968      1.318E+04      2.206E-04      3.608E-02
1969      2.636E+04      4.304E-04      7.039E-02
1970      3.954E+04      6.300E-04      1.030E-01
1971      5.272E+04      8.198E-04      1.341E-01
1972      6.590E+04      1.000E-03      1.636E-01
1973      7.908E+04      1.172E-03      1.917E-01
1974      9.226E+04      1.336E-03      2.184E-01
1975      1.054E+05      1.491E-03      2.439E-01
1976      1.186E+05      1.639E-03      2.680E-01
1977      1.318E+05      1.780E-03      2.911E-01
1978      1.450E+05      1.913E-03      3.129E-01
1979      1.582E+05      2.041E-03      3.337E-01
1980      1.713E+05      2.162E-03      3.535E-01
1981      1.845E+05      2.277E-03      3.724E-01
1982      1.977E+05      2.386E-03      3.903E-01
1983      1.977E+05      2.270E-03      3.713E-01
1984      1.977E+05      2.159E-03      3.532E-01
1985      1.977E+05      2.054E-03      3.359E-01
1986      1.977E+05      1.954E-03      3.195E-01
1987      1.977E+05      1.858E-03      3.040E-01
1988      1.977E+05      1.768E-03      2.891E-01
1989      1.977E+05      1.682E-03      2.750E-01
1990      1.977E+05      1.600E-03      2.616E-01
1991      1.977E+05      1.522E-03      2.489E-01
1992      1.977E+05      1.447E-03      2.367E-01
1993      1.977E+05      1.377E-03      2.252E-01
1994      1.977E+05      1.310E-03      2.142E-01
1995      1.977E+05      1.246E-03      2.038E-01
1996      1.977E+05      1.185E-03      1.938E-01
1997      1.977E+05      1.127E-03      1.844E-01
1998      1.977E+05      1.072E-03      1.754E-01
1999      1.977E+05      1.020E-03      1.668E-01
2000      1.977E+05      9.702E-04      1.587E-01
2001      1.977E+05      9.229E-04      1.509E-01
2002      1.977E+05      8.779E-04      1.436E-01
2003      1.977E+05      8.351E-04      1.366E-01
2004      1.977E+05      7.943E-04      1.299E-01
2005      1.977E+05      7.556E-04      1.236E-01
2006      1.977E+05      7.187E-04      1.176E-01
2007      1.977E+05      6.837E-04      1.118E-01
2008      1.977E+05      6.503E-04      1.064E-01
2009      1.977E+05      6.186E-04      1.012E-01
2010      1.977E+05      5.885E-04      9.625E-02
2011      1.977E+05      5.598E-04      9.155E-02
2012      1.977E+05      5.325E-04      8.709E-02
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Table D-18. Southern Parcel Dichlorobenzene Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2013	1.977E+05	5.065E-04	8.284E-02
2014	1.977E+05	4.818E-04	7.880E-02
2015	1.977E+05	4.583E-04	7.496E-02
2016	1.977E+05	4.359E-04	7.130E-02
2017	1.977E+05	4.147E-04	6.782E-02
2018	1.977E+05	3.945E-04	6.452E-02
2019	1.977E+05	3.752E-04	6.137E-02
2020	1.977E+05	3.569E-04	5.838E-02
2021	1.977E+05	3.395E-04	5.553E-02
2022	1.977E+05	3.230E-04	5.282E-02
2023	1.977E+05	3.072E-04	5.024E-02
2024	1.977E+05	2.922E-04	4.779E-02
2025	1.977E+05	2.780E-04	4.546E-02
2026	1.977E+05	2.644E-04	4.325E-02
2027	1.977E+05	2.515E-04	4.114E-02
2028	1.977E+05	2.392E-04	3.913E-02
2029	1.977E+05	2.276E-04	3.722E-02
2030	1.977E+05	2.165E-04	3.541E-02
2031	1.977E+05	2.059E-04	3.368E-02
2032	1.977E+05	1.959E-04	3.204E-02
2033	1.977E+05	1.863E-04	3.047E-02
2034	1.977E+05	1.772E-04	2.899E-02
2035	1.977E+05	1.686E-04	2.757E-02
2036	1.977E+05	1.604E-04	2.623E-02
2037	1.977E+05	1.526E-04	2.495E-02
2038	1.977E+05	1.451E-04	2.373E-02
2039	1.977E+05	1.380E-04	2.258E-02
2040	1.977E+05	1.313E-04	2.148E-02
2041	1.977E+05	1.249E-04	2.043E-02
2042	1.977E+05	1.188E-04	1.943E-02
2043	1.977E+05	1.130E-04	1.848E-02
2044	1.977E+05	1.075E-04	1.758E-02
2045	1.977E+05	1.023E-04	1.672E-02
2046	1.977E+05	9.727E-05	1.591E-02
2047	1.977E+05	9.253E-05	1.513E-02
2048	1.977E+05	8.801E-05	1.440E-02
2049	1.977E+05	8.372E-05	1.369E-02
2050	1.977E+05	7.964E-05	1.303E-02
2051	1.977E+05	7.576E-05	1.239E-02
2052	1.977E+05	7.206E-05	1.179E-02
2053	1.977E+05	6.855E-05	1.121E-02
2054	1.977E+05	6.520E-05	1.066E-02
2055	1.977E+05	6.202E-05	1.014E-02
2056	1.977E+05	5.900E-05	9.649E-03
2057	1.977E+05	5.612E-05	9.179E-03
2058	1.977E+05	5.338E-05	8.731E-03
2059	1.977E+05	5.078E-05	8.305E-03
2060	1.977E+05	4.830E-05	7.900E-03
2061	1.977E+05	4.595E-05	7.515E-03
2062	1.977E+05	4.371E-05	7.148E-03
2063	1.977E+05	4.158E-05	6.800E-03
2064	1.977E+05	3.955E-05	6.468E-03
2065	1.977E+05	3.762E-05	6.153E-03
2066	1.977E+05	3.578E-05	5.853E-03
2067	1.977E+05	3.404E-05	5.567E-03
2068	1.977E+05	3.238E-05	5.296E-03
2069	1.977E+05	3.080E-05	5.037E-03
2070	1.977E+05	2.930E-05	4.792E-03
2071	1.977E+05	2.787E-05	4.558E-03
2072	1.977E+05	2.651E-05	4.336E-03
2073	1.977E+05	2.522E-05	4.124E-03
2074	1.977E+05	2.399E-05	3.923E-03
2075	1.977E+05	2.282E-05	3.732E-03
2076	1.977E+05	2.170E-05	3.550E-03
2077	1.977E+05	2.065E-05	3.377E-03
2078	1.977E+05	1.964E-05	3.212E-03
2079	1.977E+05	1.868E-05	3.055E-03
2080	1.977E+05	1.777E-05	2.906E-03
2081	1.977E+05	1.690E-05	2.765E-03
2082	1.977E+05	1.608E-05	2.630E-03
2083	1.977E+05	1.529E-05	2.502E-03

Table D-18. Southern Parcel Dichlorobenzene Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2084	1.977E+05	1.455E-05	2.380E-03
2085	1.977E+05	1.384E-05	2.263E-03
2086	1.977E+05	1.316E-05	2.153E-03
2087	1.977E+05	1.252E-05	2.048E-03
2088	1.977E+05	1.191E-05	1.948E-03
2089	1.977E+05	1.133E-05	1.853E-03
2090	1.977E+05	1.078E-05	1.763E-03
2091	1.977E+05	1.025E-05	1.677E-03
2092	1.977E+05	9.752E-06	1.595E-03
2093	1.977E+05	9.277E-06	1.517E-03
2094	1.977E+05	8.824E-06	1.443E-03
2095	1.977E+05	8.394E-06	1.373E-03
2096	1.977E+05	7.985E-06	1.306E-03
2097	1.977E+05	7.595E-06	1.242E-03
2098	1.977E+05	7.225E-06	1.182E-03
2099	1.977E+05	6.872E-06	1.124E-03
2100	1.977E+05	6.537E-06	1.069E-03
2101	1.977E+05	6.218E-06	1.017E-03
2102	1.977E+05	5.915E-06	9.674E-04
2103	1.977E+05	5.627E-06	9.203E-04
2104	1.977E+05	5.352E-06	8.754E-04
2105	1.977E+05	5.091E-06	8.327E-04
2106	1.977E+05	4.843E-06	7.921E-04
2107	1.977E+05	4.607E-06	7.534E-04
2108	1.977E+05	4.382E-06	7.167E-04
2109	1.977E+05	4.168E-06	6.817E-04
2110	1.977E+05	3.965E-06	6.485E-04
2111	1.977E+05	3.772E-06	6.169E-04
2112	1.977E+05	3.588E-06	5.868E-04
2113	1.977E+05	3.413E-06	5.582E-04
2114	1.977E+05	3.246E-06	5.309E-04
2115	1.977E+05	3.088E-06	5.051E-04
2116	1.977E+05	2.937E-06	4.804E-04
2117	1.977E+05	2.794E-06	4.570E-04
2118	1.977E+05	2.658E-06	4.347E-04
2119	1.977E+05	2.528E-06	4.135E-04
2120	1.977E+05	2.405E-06	3.933E-04
2121	1.977E+05	2.288E-06	3.742E-04
2122	1.977E+05	2.176E-06	3.559E-04
2123	1.977E+05	2.070E-06	3.385E-04
2124	1.977E+05	1.969E-06	3.220E-04
2125	1.977E+05	1.873E-06	3.063E-04
2126	1.977E+05	1.782E-06	2.914E-04
2127	1.977E+05	1.695E-06	2.772E-04
2128	1.977E+05	1.612E-06	2.637E-04
2129	1.977E+05	1.533E-06	2.508E-04
2130	1.977E+05	1.459E-06	2.386E-04
2131	1.977E+05	1.388E-06	2.269E-04
2132	1.977E+05	1.320E-06	2.159E-04
2133	1.977E+05	1.255E-06	2.053E-04
2134	1.977E+05	1.194E-06	1.953E-04
2135	1.977E+05	1.136E-06	1.858E-04
2136	1.977E+05	1.081E-06	1.767E-04
2137	1.977E+05	1.028E-06	1.681E-04
2138	1.977E+05	9.778E-07	1.599E-04
2139	1.977E+05	9.301E-07	1.521E-04
2140	1.977E+05	8.847E-07	1.447E-04
2141	1.977E+05	8.416E-07	1.376E-04
2142	1.977E+05	8.005E-07	1.309E-04
2143	1.977E+05	7.615E-07	1.245E-04
2144	1.977E+05	7.243E-07	1.185E-04
2145	1.977E+05	6.890E-07	1.127E-04
2146	1.977E+05	6.554E-07	1.072E-04
2147	1.977E+05	6.234E-07	1.020E-04
2148	1.977E+05	5.930E-07	9.699E-05
2149	1.977E+05	5.641E-07	9.226E-05
2150	1.977E+05	5.366E-07	8.776E-05
2151	1.977E+05	5.104E-07	8.348E-05
2152	1.977E+05	4.855E-07	7.941E-05
2153	1.977E+05	4.619E-07	7.554E-05
2154	1.977E+05	4.393E-07	7.186E-05

Table D-18. Southern Parcel Dichlorobenzene Emission Rate from Year 1968 to 2203 (concluded).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2155	1.977E+05	4.179E-07	6.835E-05
2156	1.977E+05	3.975E-07	6.502E-05
2157	1.977E+05	3.781E-07	6.185E-05
2158	1.977E+05	3.597E-07	5.883E-05
2159	1.977E+05	3.422E-07	5.596E-05
2160	1.977E+05	3.255E-07	5.323E-05
2161	1.977E+05	3.096E-07	5.064E-05
2162	1.977E+05	2.945E-07	4.817E-05
2163	1.977E+05	2.801E-07	4.582E-05
2164	1.977E+05	2.665E-07	4.358E-05
2165	1.977E+05	2.535E-07	4.146E-05
2166	1.977E+05	2.411E-07	3.944E-05
2167	1.977E+05	2.294E-07	3.751E-05
2168	1.977E+05	2.182E-07	3.568E-05
2169	1.977E+05	2.075E-07	3.394E-05
2170	1.977E+05	1.974E-07	3.229E-05
2171	1.977E+05	1.878E-07	3.071E-05
2172	1.977E+05	1.786E-07	2.921E-05
2173	1.977E+05	1.699E-07	2.779E-05
2174	1.977E+05	1.616E-07	2.643E-05
2175	1.977E+05	1.537E-07	2.514E-05
2176	1.977E+05	1.462E-07	2.392E-05
2177	1.977E+05	1.391E-07	2.275E-05
2178	1.977E+05	1.323E-07	2.164E-05
2179	1.977E+05	1.259E-07	2.059E-05
2180	1.977E+05	1.197E-07	1.958E-05
2181	1.977E+05	1.139E-07	1.863E-05
2182	1.977E+05	1.083E-07	1.772E-05
2183	1.977E+05	1.031E-07	1.686E-05
2184	1.977E+05	9.803E-08	1.603E-05
2185	1.977E+05	9.325E-08	1.525E-05
2186	1.977E+05	8.870E-08	1.451E-05
2187	1.977E+05	8.437E-08	1.380E-05
2188	1.977E+05	8.026E-08	1.313E-05
2189	1.977E+05	7.634E-08	1.249E-05
2190	1.977E+05	7.262E-08	1.188E-05
2191	1.977E+05	6.908E-08	1.130E-05
2192	1.977E+05	6.571E-08	1.075E-05
2193	1.977E+05	6.251E-08	1.022E-05
2194	1.977E+05	5.946E-08	9.725E-06
2195	1.977E+05	5.656E-08	9.250E-06
2196	1.977E+05	5.380E-08	8.799E-06
2197	1.977E+05	5.118E-08	8.370E-06
2198	1.977E+05	4.868E-08	7.962E-06
2199	1.977E+05	4.631E-08	7.574E-06
2200	1.977E+05	4.405E-08	7.204E-06
2201	1.977E+05	4.190E-08	6.853E-06

Table D-19. Southern Parcel Toluene Emission Rate from Year 1968 to 2203.

Source: H:\3000\030177~1.000\030177~1.002\ROSEHI~1\SOUTHERN.PRM

Model Parameters

Lo : 170.00 m³ / Mg ***** User Mode Selection *****
 k : 0.0500 1/yr ***** User Mode Selection *****
 NMOC : 2550.00 ppmv ***** User Mode Selection *****
 Methane : 59.0000 % volume
 Carbon Dioxide : 41.0000 % volume
 Air Pollutant : Toluene (HAP/VOC)
 Molecular Wt = 92.14 Concentration = 2.550000 ppmV

Landfill Parameters

Landfill type : Co-Disposal
 Year Opened : 1967 Current Year : 2003 Closure Year: 2002
 Capacity : 197692 Mg
 Average Acceptance Rate Required from
 Current Year to Closure Year : 12238.07 Mg/year

Model Results

Year	Refuse In Place (Mg)	Toluene (HAP/VOC) Emission Rate (Mg/yr)	(Cubic m/yr)
1968	1.318E+04	1.856E-03	4.842E-01
1969	2.636E+04	3.621E-03	9.447E-01
1970	3.954E+04	5.300E-03	1.383E+00
1971	5.272E+04	6.897E-03	1.800E+00
1972	6.590E+04	8.416E-03	2.196E+00
1973	7.908E+04	9.861E-03	2.573E+00
1974	9.226E+04	1.124E-02	2.932E+00
1975	1.054E+05	1.254E-02	3.273E+00
1976	1.186E+05	1.379E-02	3.598E+00
1977	1.318E+05	1.497E-02	3.906E+00
1978	1.450E+05	1.610E-02	4.200E+00
1979	1.582E+05	1.717E-02	4.479E+00
1980	1.713E+05	1.818E-02	4.745E+00
1981	1.845E+05	1.915E-02	4.998E+00
1982	1.977E+05	2.007E-02	5.238E+00
1983	1.977E+05	1.910E-02	4.983E+00
1984	1.977E+05	1.816E-02	4.740E+00
1985	1.977E+05	1.728E-02	4.509E+00
1986	1.977E+05	1.644E-02	4.289E+00
1987	1.977E+05	1.563E-02	4.079E+00
1988	1.977E+05	1.487E-02	3.881E+00
1989	1.977E+05	1.415E-02	3.691E+00
1990	1.977E+05	1.346E-02	3.511E+00
1991	1.977E+05	1.280E-02	3.340E+00
1992	1.977E+05	1.218E-02	3.177E+00
1993	1.977E+05	1.158E-02	3.022E+00
1994	1.977E+05	1.102E-02	2.875E+00
1995	1.977E+05	1.048E-02	2.735E+00
1996	1.977E+05	9.969E-03	2.601E+00
1997	1.977E+05	9.483E-03	2.474E+00
1998	1.977E+05	9.020E-03	2.354E+00
1999	1.977E+05	8.580E-03	2.239E+00
2000	1.977E+05	8.162E-03	2.130E+00
2001	1.977E+05	7.764E-03	2.026E+00
2002	1.977E+05	7.385E-03	1.927E+00
2003	1.977E+05	7.025E-03	1.833E+00
2004	1.977E+05	6.682E-03	1.744E+00
2005	1.977E+05	6.356E-03	1.659E+00
2006	1.977E+05	6.046E-03	1.578E+00
2007	1.977E+05	5.751E-03	1.501E+00
2008	1.977E+05	5.471E-03	1.428E+00
2009	1.977E+05	5.204E-03	1.358E+00
2010	1.977E+05	4.950E-03	1.292E+00
2011	1.977E+05	4.709E-03	1.229E+00
2012	1.977E+05	4.479E-03	1.169E+00

Table D-19. Southern Parcel Toluene Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2013	1.977E+05	4.261E-03	1.112E+00
2014	1.977E+05	4.053E-03	1.058E+00
2015	1.977E+05	3.855E-03	1.006E+00
2016	1.977E+05	3.667E-03	9.569E-01
2017	1.977E+05	3.488E-03	9.103E-01
2018	1.977E+05	3.318E-03	8.659E-01
2019	1.977E+05	3.156E-03	8.236E-01
2020	1.977E+05	3.003E-03	7.835E-01
2021	1.977E+05	2.856E-03	7.453E-01
2022	1.977E+05	2.717E-03	7.089E-01
2023	1.977E+05	2.584E-03	6.743E-01
2024	1.977E+05	2.458E-03	6.414E-01
2025	1.977E+05	2.338E-03	6.102E-01
2026	1.977E+05	2.224E-03	5.804E-01
2027	1.977E+05	2.116E-03	5.521E-01
2028	1.977E+05	2.013E-03	5.252E-01
2029	1.977E+05	1.914E-03	4.996E-01
2030	1.977E+05	1.821E-03	4.752E-01
2031	1.977E+05	1.732E-03	4.520E-01
2032	1.977E+05	1.648E-03	4.300E-01
2033	1.977E+05	1.567E-03	4.090E-01
2034	1.977E+05	1.491E-03	3.891E-01
2035	1.977E+05	1.418E-03	3.701E-01
2036	1.977E+05	1.349E-03	3.520E-01
2037	1.977E+05	1.283E-03	3.349E-01
2038	1.977E+05	1.221E-03	3.185E-01
2039	1.977E+05	1.161E-03	3.030E-01
2040	1.977E+05	1.105E-03	2.882E-01
2041	1.977E+05	1.051E-03	2.742E-01
2042	1.977E+05	9.995E-04	2.608E-01
2043	1.977E+05	9.507E-04	2.481E-01
2044	1.977E+05	9.043E-04	2.360E-01
2045	1.977E+05	8.602E-04	2.245E-01
2046	1.977E+05	8.183E-04	2.135E-01
2047	1.977E+05	7.784E-04	2.031E-01
2048	1.977E+05	7.404E-04	1.932E-01
2049	1.977E+05	7.043E-04	1.838E-01
2050	1.977E+05	6.700E-04	1.748E-01
2051	1.977E+05	6.373E-04	1.663E-01
2052	1.977E+05	6.062E-04	1.582E-01
2053	1.977E+05	5.766E-04	1.505E-01
2054	1.977E+05	5.485E-04	1.431E-01
2055	1.977E+05	5.218E-04	1.361E-01
2056	1.977E+05	4.963E-04	1.295E-01
2057	1.977E+05	4.721E-04	1.232E-01
2058	1.977E+05	4.491E-04	1.172E-01
2059	1.977E+05	4.272E-04	1.115E-01
2060	1.977E+05	4.063E-04	1.060E-01
2061	1.977E+05	3.865E-04	1.009E-01
2062	1.977E+05	3.677E-04	9.594E-02
2063	1.977E+05	3.497E-04	9.126E-02
2064	1.977E+05	3.327E-04	8.681E-02
2065	1.977E+05	3.165E-04	8.258E-02
2066	1.977E+05	3.010E-04	7.855E-02
2067	1.977E+05	2.863E-04	7.472E-02
2068	1.977E+05	2.724E-04	7.107E-02
2069	1.977E+05	2.591E-04	6.761E-02
2070	1.977E+05	2.465E-04	6.431E-02
2071	1.977E+05	2.344E-04	6.117E-02
2072	1.977E+05	2.230E-04	5.819E-02
2073	1.977E+05	2.121E-04	5.535E-02
2074	1.977E+05	2.018E-04	5.265E-02
2075	1.977E+05	1.919E-04	5.009E-02
2076	1.977E+05	1.826E-04	4.764E-02
2077	1.977E+05	1.737E-04	4.532E-02
2078	1.977E+05	1.652E-04	4.311E-02
2079	1.977E+05	1.572E-04	4.101E-02
2080	1.977E+05	1.495E-04	3.901E-02
2081	1.977E+05	1.422E-04	3.710E-02
2082	1.977E+05	1.353E-04	3.529E-02
2083	1.977E+05	1.287E-04	3.357E-02

Table D-19. Southern Parcel Toluene Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2084	1.977E+05	1.224E-04	3.194E-02
2085	1.977E+05	1.164E-04	3.038E-02
2086	1.977E+05	1.107E-04	2.890E-02
2087	1.977E+05	1.053E-04	2.749E-02
2088	1.977E+05	1.002E-04	2.615E-02
2089	1.977E+05	9.532E-05	2.487E-02
2090	1.977E+05	9.067E-05	2.366E-02
2091	1.977E+05	8.625E-05	2.250E-02
2092	1.977E+05	8.204E-05	2.141E-02
2093	1.977E+05	7.804E-05	2.036E-02
2094	1.977E+05	7.423E-05	1.937E-02
2095	1.977E+05	7.061E-05	1.843E-02
2096	1.977E+05	6.717E-05	1.753E-02
2097	1.977E+05	6.389E-05	1.667E-02
2098	1.977E+05	6.078E-05	1.586E-02
2099	1.977E+05	5.781E-05	1.509E-02
2100	1.977E+05	5.499E-05	1.435E-02
2101	1.977E+05	5.231E-05	1.365E-02
2102	1.977E+05	4.976E-05	1.298E-02
2103	1.977E+05	4.733E-05	1.235E-02
2104	1.977E+05	4.502E-05	1.175E-02
2105	1.977E+05	4.283E-05	1.118E-02
2106	1.977E+05	4.074E-05	1.063E-02
2107	1.977E+05	3.875E-05	1.011E-02
2108	1.977E+05	3.686E-05	9.619E-03
2109	1.977E+05	3.507E-05	9.150E-03
2110	1.977E+05	3.336E-05	8.704E-03
2111	1.977E+05	3.173E-05	8.279E-03
2112	1.977E+05	3.018E-05	7.875E-03
2113	1.977E+05	2.871E-05	7.491E-03
2114	1.977E+05	2.731E-05	7.126E-03
2115	1.977E+05	2.598E-05	6.778E-03
2116	1.977E+05	2.471E-05	6.448E-03
2117	1.977E+05	2.350E-05	6.133E-03
2118	1.977E+05	2.236E-05	5.834E-03
2119	1.977E+05	2.127E-05	5.550E-03
2120	1.977E+05	2.023E-05	5.279E-03
2121	1.977E+05	1.924E-05	5.021E-03
2122	1.977E+05	1.831E-05	4.777E-03
2123	1.977E+05	1.741E-05	4.544E-03
2124	1.977E+05	1.656E-05	4.322E-03
2125	1.977E+05	1.576E-05	4.111E-03
2126	1.977E+05	1.499E-05	3.911E-03
2127	1.977E+05	1.426E-05	3.720E-03
2128	1.977E+05	1.356E-05	3.539E-03
2129	1.977E+05	1.290E-05	3.366E-03
2130	1.977E+05	1.227E-05	3.202E-03
2131	1.977E+05	1.167E-05	3.046E-03
2132	1.977E+05	1.110E-05	2.897E-03
2133	1.977E+05	1.056E-05	2.756E-03
2134	1.977E+05	1.005E-05	2.621E-03
2135	1.977E+05	9.556E-06	2.494E-03
2136	1.977E+05	9.090E-06	2.372E-03
2137	1.977E+05	8.647E-06	2.256E-03
2138	1.977E+05	8.225E-06	2.146E-03
2139	1.977E+05	7.824E-06	2.042E-03
2140	1.977E+05	7.443E-06	1.942E-03
2141	1.977E+05	7.080E-06	1.847E-03
2142	1.977E+05	6.734E-06	1.757E-03
2143	1.977E+05	6.406E-06	1.672E-03
2144	1.977E+05	6.093E-06	1.590E-03
2145	1.977E+05	5.796E-06	1.512E-03
2146	1.977E+05	5.514E-06	1.439E-03
2147	1.977E+05	5.245E-06	1.369E-03
2148	1.977E+05	4.989E-06	1.302E-03
2149	1.977E+05	4.746E-06	1.238E-03
2150	1.977E+05	4.514E-06	1.178E-03
2151	1.977E+05	4.294E-06	1.120E-03
2152	1.977E+05	4.085E-06	1.066E-03
2153	1.977E+05	3.885E-06	1.014E-03
2154	1.977E+05	3.696E-06	9.644E-04

Table D-19. Southern Parcel Toluene Emission Rate from Year 1968 to 2203 (concluded).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2155	1.977E+05	3.516E-06	9.173E-04
2156	1.977E+05	3.344E-06	8.726E-04
2157	1.977E+05	3.181E-06	8.300E-04
2158	1.977E+05	3.026E-06	7.896E-04
2159	1.977E+05	2.878E-06	7.511E-04
2160	1.977E+05	2.738E-06	7.144E-04
2161	1.977E+05	2.604E-06	6.796E-04
2162	1.977E+05	2.477E-06	6.464E-04
2163	1.977E+05	2.357E-06	6.149E-04
2164	1.977E+05	2.242E-06	5.849E-04
2165	1.977E+05	2.132E-06	5.564E-04
2166	1.977E+05	2.028E-06	5.293E-04
2167	1.977E+05	1.929E-06	5.034E-04
2168	1.977E+05	1.835E-06	4.789E-04
2169	1.977E+05	1.746E-06	4.555E-04
2170	1.977E+05	1.661E-06	4.333E-04
2171	1.977E+05	1.580E-06	4.122E-04
2172	1.977E+05	1.503E-06	3.921E-04
2173	1.977E+05	1.429E-06	3.730E-04
2174	1.977E+05	1.360E-06	3.548E-04
2175	1.977E+05	1.293E-06	3.375E-04
2176	1.977E+05	1.230E-06	3.210E-04
2177	1.977E+05	1.170E-06	3.054E-04
2178	1.977E+05	1.113E-06	2.905E-04
2179	1.977E+05	1.059E-06	2.763E-04
2180	1.977E+05	1.007E-06	2.628E-04
2181	1.977E+05	9.581E-07	2.500E-04
2182	1.977E+05	9.114E-07	2.378E-04
2183	1.977E+05	8.669E-07	2.262E-04
2184	1.977E+05	8.247E-07	2.152E-04
2185	1.977E+05	7.844E-07	2.047E-04
2186	1.977E+05	7.462E-07	1.947E-04
2187	1.977E+05	7.098E-07	1.852E-04
2188	1.977E+05	6.752E-07	1.762E-04
2189	1.977E+05	6.422E-07	1.676E-04
2190	1.977E+05	6.109E-07	1.594E-04
2191	1.977E+05	5.811E-07	1.516E-04
2192	1.977E+05	5.528E-07	1.442E-04
2193	1.977E+05	5.258E-07	1.372E-04
2194	1.977E+05	5.002E-07	1.305E-04
2195	1.977E+05	4.758E-07	1.241E-04
2196	1.977E+05	4.526E-07	1.181E-04
2197	1.977E+05	4.305E-07	1.123E-04
2198	1.977E+05	4.095E-07	1.069E-04
2199	1.977E+05	3.895E-07	1.016E-04
2200	1.977E+05	3.705E-07	9.669E-05
2201	1.977E+05	3.525E-07	9.197E-05

Table D-20. Southern Parcel Trichloroethene Emission Rate from Year 1968 to 2203.

Source: H:\3000\030177~1.000\030177~1.002\ROSEHI~1\SOUTHERN.PRM

```

=====
                          Model Parameters
=====
Lo : 170.00 m^3 / Mg ***** User Mode Selection *****
k : 0.0500 1/yr ***** User Mode Selection *****
NMOC : 2550.00 ppmv ***** User Mode Selection *****
Methane : 59.0000 % volume
Carbon Dioxide : 41.0000 % volume
Air Pollutant : Trichloroethene (HAP/VOC)
Molecular Wt = 131.38      Concentration =      0.030000 ppmV
=====
    
```

```

=====
                          Landfill Parameters
=====
Landfill type : Co-Disposal
Year Opened : 1967      Current Year : 2003      Closure Year: 2002
Capacity : 197692 Mg
Average Acceptance Rate Required from
      Current Year to Closure Year : 12238.07 Mg/year
=====
    
```

```

=====
                          Model Results
=====
Year      Refuse In Place (Mg)      Trichloroethene (HAP/VOC) Emission Rate
                          (Mg/yr)                      (Cubic m/yr)
=====
1968      1.318E+04      3.113E-05      5.696E-03
1969      2.636E+04      6.074E-05      1.111E-02
1970      3.954E+04      8.890E-05      1.627E-02
1971      5.272E+04      1.157E-04      2.117E-02
1972      6.590E+04      1.412E-04      2.584E-02
1973      7.908E+04      1.654E-04      3.027E-02
1974      9.226E+04      1.885E-04      3.449E-02
1975      1.054E+05      2.104E-04      3.851E-02
1976      1.186E+05      2.313E-04      4.232E-02
1977      1.318E+05      2.511E-04      4.596E-02
1978      1.450E+05      2.700E-04      4.941E-02
1979      1.582E+05      2.880E-04      5.270E-02
1980      1.713E+05      3.050E-04      5.582E-02
1981      1.845E+05      3.213E-04      5.880E-02
1982      1.977E+05      3.368E-04      6.163E-02
1983      1.977E+05      3.203E-04      5.862E-02
1984      1.977E+05      3.047E-04      5.576E-02
1985      1.977E+05      2.898E-04      5.304E-02
1986      1.977E+05      2.757E-04      5.045E-02
1987      1.977E+05      2.623E-04      4.799E-02
1988      1.977E+05      2.495E-04      4.565E-02
1989      1.977E+05      2.373E-04      4.343E-02
1990      1.977E+05      2.257E-04      4.131E-02
1991      1.977E+05      2.147E-04      3.929E-02
1992      1.977E+05      2.042E-04      3.738E-02
1993      1.977E+05      1.943E-04      3.555E-02
1994      1.977E+05      1.848E-04      3.382E-02
1995      1.977E+05      1.758E-04      3.217E-02
1996      1.977E+05      1.672E-04      3.060E-02
1997      1.977E+05      1.591E-04      2.911E-02
1998      1.977E+05      1.513E-04      2.769E-02
1999      1.977E+05      1.439E-04      2.634E-02
2000      1.977E+05      1.369E-04      2.506E-02
2001      1.977E+05      1.302E-04      2.383E-02
2002      1.977E+05      1.239E-04      2.267E-02
2003      1.977E+05      1.178E-04      2.157E-02
2004      1.977E+05      1.121E-04      2.051E-02
2005      1.977E+05      1.066E-04      1.951E-02
2006      1.977E+05      1.014E-04      1.856E-02
2007      1.977E+05      9.648E-05      1.766E-02
2008      1.977E+05      9.178E-05      1.679E-02
2009      1.977E+05      8.730E-05      1.598E-02
2010      1.977E+05      8.304E-05      1.520E-02
2011      1.977E+05      7.899E-05      1.446E-02
2012      1.977E+05      7.514E-05      1.375E-02
=====
    
```

Table D-20. Southern Parcel Trichloroethene Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2013	1.977E+05	7.147E-05	1.308E-02
2014	1.977E+05	6.799E-05	1.244E-02
2015	1.977E+05	6.467E-05	1.184E-02
2016	1.977E+05	6.152E-05	1.126E-02
2017	1.977E+05	5.852E-05	1.071E-02
2018	1.977E+05	5.566E-05	1.019E-02
2019	1.977E+05	5.295E-05	9.690E-03
2020	1.977E+05	5.037E-05	9.217E-03
2021	1.977E+05	4.791E-05	8.768E-03
2022	1.977E+05	4.557E-05	8.340E-03
2023	1.977E+05	4.335E-05	7.933E-03
2024	1.977E+05	4.124E-05	7.546E-03
2025	1.977E+05	3.923E-05	7.178E-03
2026	1.977E+05	3.731E-05	6.828E-03
2027	1.977E+05	3.549E-05	6.495E-03
2028	1.977E+05	3.376E-05	6.179E-03
2029	1.977E+05	3.212E-05	5.877E-03
2030	1.977E+05	3.055E-05	5.591E-03
2031	1.977E+05	2.906E-05	5.318E-03
2032	1.977E+05	2.764E-05	5.059E-03
2033	1.977E+05	2.629E-05	4.812E-03
2034	1.977E+05	2.501E-05	4.577E-03
2035	1.977E+05	2.379E-05	4.354E-03
2036	1.977E+05	2.263E-05	4.142E-03
2037	1.977E+05	2.153E-05	3.940E-03
2038	1.977E+05	2.048E-05	3.747E-03
2039	1.977E+05	1.948E-05	3.565E-03
2040	1.977E+05	1.853E-05	3.391E-03
2041	1.977E+05	1.763E-05	3.225E-03
2042	1.977E+05	1.677E-05	3.068E-03
2043	1.977E+05	1.595E-05	2.919E-03
2044	1.977E+05	1.517E-05	2.776E-03
2045	1.977E+05	1.443E-05	2.641E-03
2046	1.977E+05	1.373E-05	2.512E-03
2047	1.977E+05	1.306E-05	2.389E-03
2048	1.977E+05	1.242E-05	2.273E-03
2049	1.977E+05	1.181E-05	2.162E-03
2050	1.977E+05	1.124E-05	2.057E-03
2051	1.977E+05	1.069E-05	1.956E-03
2052	1.977E+05	1.017E-05	1.861E-03
2053	1.977E+05	9.673E-06	1.770E-03
2054	1.977E+05	9.201E-06	1.684E-03
2055	1.977E+05	8.753E-06	1.602E-03
2056	1.977E+05	8.326E-06	1.524E-03
2057	1.977E+05	7.920E-06	1.449E-03
2058	1.977E+05	7.533E-06	1.379E-03
2059	1.977E+05	7.166E-06	1.311E-03
2060	1.977E+05	6.816E-06	1.247E-03
2061	1.977E+05	6.484E-06	1.187E-03
2062	1.977E+05	6.168E-06	1.129E-03
2063	1.977E+05	5.867E-06	1.074E-03
2064	1.977E+05	5.581E-06	1.021E-03
2065	1.977E+05	5.309E-06	9.715E-04
2066	1.977E+05	5.050E-06	9.241E-04
2067	1.977E+05	4.803E-06	8.790E-04
2068	1.977E+05	4.569E-06	8.362E-04
2069	1.977E+05	4.346E-06	7.954E-04
2070	1.977E+05	4.134E-06	7.566E-04
2071	1.977E+05	3.933E-06	7.197E-04
2072	1.977E+05	3.741E-06	6.846E-04
2073	1.977E+05	3.559E-06	6.512E-04
2074	1.977E+05	3.385E-06	6.194E-04
2075	1.977E+05	3.220E-06	5.892E-04
2076	1.977E+05	3.063E-06	5.605E-04
2077	1.977E+05	2.913E-06	5.332E-04
2078	1.977E+05	2.771E-06	5.072E-04
2079	1.977E+05	2.636E-06	4.824E-04
2080	1.977E+05	2.508E-06	4.589E-04
2081	1.977E+05	2.385E-06	4.365E-04
2082	1.977E+05	2.269E-06	4.152E-04
2083	1.977E+05	2.158E-06	3.950E-04

Table D-20. Southern Parcel Trichloroethene Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2084	1.977E+05	2.053E-06	3.757E-04
2085	1.977E+05	1.953E-06	3.574E-04
2086	1.977E+05	1.858E-06	3.400E-04
2087	1.977E+05	1.767E-06	3.234E-04
2088	1.977E+05	1.681E-06	3.076E-04
2089	1.977E+05	1.599E-06	2.926E-04
2090	1.977E+05	1.521E-06	2.783E-04
2091	1.977E+05	1.447E-06	2.648E-04
2092	1.977E+05	1.376E-06	2.518E-04
2093	1.977E+05	1.309E-06	2.396E-04
2094	1.977E+05	1.245E-06	2.279E-04
2095	1.977E+05	1.185E-06	2.168E-04
2096	1.977E+05	1.127E-06	2.062E-04
2097	1.977E+05	1.072E-06	1.961E-04
2098	1.977E+05	1.020E-06	1.866E-04
2099	1.977E+05	9.698E-07	1.775E-04
2100	1.977E+05	9.225E-07	1.688E-04
2101	1.977E+05	8.775E-07	1.606E-04
2102	1.977E+05	8.347E-07	1.528E-04
2103	1.977E+05	7.940E-07	1.453E-04
2104	1.977E+05	7.553E-07	1.382E-04
2105	1.977E+05	7.185E-07	1.315E-04
2106	1.977E+05	6.834E-07	1.251E-04
2107	1.977E+05	6.501E-07	1.190E-04
2108	1.977E+05	6.184E-07	1.132E-04
2109	1.977E+05	5.882E-07	1.076E-04
2110	1.977E+05	5.595E-07	1.024E-04
2111	1.977E+05	5.322E-07	9.740E-05
2112	1.977E+05	5.063E-07	9.265E-05
2113	1.977E+05	4.816E-07	8.813E-05
2114	1.977E+05	4.581E-07	8.383E-05
2115	1.977E+05	4.358E-07	7.974E-05
2116	1.977E+05	4.145E-07	7.586E-05
2117	1.977E+05	3.943E-07	7.216E-05
2118	1.977E+05	3.751E-07	6.864E-05
2119	1.977E+05	3.568E-07	6.529E-05
2120	1.977E+05	3.394E-07	6.211E-05
2121	1.977E+05	3.228E-07	5.908E-05
2122	1.977E+05	3.071E-07	5.620E-05
2123	1.977E+05	2.921E-07	5.345E-05
2124	1.977E+05	2.779E-07	5.085E-05
2125	1.977E+05	2.643E-07	4.837E-05
2126	1.977E+05	2.514E-07	4.601E-05
2127	1.977E+05	2.392E-07	4.376E-05
2128	1.977E+05	2.275E-07	4.163E-05
2129	1.977E+05	2.164E-07	3.960E-05
2130	1.977E+05	2.058E-07	3.767E-05
2131	1.977E+05	1.958E-07	3.583E-05
2132	1.977E+05	1.863E-07	3.408E-05
2133	1.977E+05	1.772E-07	3.242E-05
2134	1.977E+05	1.685E-07	3.084E-05
2135	1.977E+05	1.603E-07	2.934E-05
2136	1.977E+05	1.525E-07	2.791E-05
2137	1.977E+05	1.451E-07	2.654E-05
2138	1.977E+05	1.380E-07	2.525E-05
2139	1.977E+05	1.312E-07	2.402E-05
2140	1.977E+05	1.248E-07	2.285E-05
2141	1.977E+05	1.188E-07	2.173E-05
2142	1.977E+05	1.130E-07	2.067E-05
2143	1.977E+05	1.075E-07	1.966E-05
2144	1.977E+05	1.022E-07	1.871E-05
2145	1.977E+05	9.723E-08	1.779E-05
2146	1.977E+05	9.249E-08	1.693E-05
2147	1.977E+05	8.798E-08	1.610E-05
2148	1.977E+05	8.369E-08	1.531E-05
2149	1.977E+05	7.961E-08	1.457E-05
2150	1.977E+05	7.572E-08	1.386E-05
2151	1.977E+05	7.203E-08	1.318E-05
2152	1.977E+05	6.852E-08	1.254E-05
2153	1.977E+05	6.518E-08	1.193E-05
2154	1.977E+05	6.200E-08	1.135E-05

Table D-20. Southern Parcel Trichloroethene Emission Rate from Year 1968 to 2203 (concluded).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2155	1.977E+05	5.897E-08	1.079E-05
2156	1.977E+05	5.610E-08	1.027E-05
2157	1.977E+05	5.336E-08	9.765E-06
2158	1.977E+05	5.076E-08	9.289E-06
2159	1.977E+05	4.828E-08	8.836E-06
2160	1.977E+05	4.593E-08	8.405E-06
2161	1.977E+05	4.369E-08	7.995E-06
2162	1.977E+05	4.156E-08	7.605E-06
2163	1.977E+05	3.953E-08	7.234E-06
2164	1.977E+05	3.760E-08	6.881E-06
2165	1.977E+05	3.577E-08	6.546E-06
2166	1.977E+05	3.403E-08	6.227E-06
2167	1.977E+05	3.237E-08	5.923E-06
2168	1.977E+05	3.079E-08	5.634E-06
2169	1.977E+05	2.929E-08	5.359E-06
2170	1.977E+05	2.786E-08	5.098E-06
2171	1.977E+05	2.650E-08	4.849E-06
2172	1.977E+05	2.521E-08	4.613E-06
2173	1.977E+05	2.398E-08	4.388E-06
2174	1.977E+05	2.281E-08	4.174E-06
2175	1.977E+05	2.170E-08	3.970E-06
2176	1.977E+05	2.064E-08	3.777E-06
2177	1.977E+05	1.963E-08	3.592E-06
2178	1.977E+05	1.867E-08	3.417E-06
2179	1.977E+05	1.776E-08	3.251E-06
2180	1.977E+05	1.690E-08	3.092E-06
2181	1.977E+05	1.607E-08	2.941E-06
2182	1.977E+05	1.529E-08	2.798E-06
2183	1.977E+05	1.454E-08	2.661E-06
2184	1.977E+05	1.383E-08	2.532E-06
2185	1.977E+05	1.316E-08	2.408E-06
2186	1.977E+05	1.252E-08	2.291E-06
2187	1.977E+05	1.191E-08	2.179E-06
2188	1.977E+05	1.133E-08	2.073E-06
2189	1.977E+05	1.077E-08	1.972E-06
2190	1.977E+05	1.025E-08	1.875E-06
2191	1.977E+05	9.748E-09	1.784E-06
2192	1.977E+05	9.273E-09	1.697E-06
2193	1.977E+05	8.821E-09	1.614E-06
2194	1.977E+05	8.390E-09	1.535E-06
2195	1.977E+05	7.981E-09	1.461E-06
2196	1.977E+05	7.592E-09	1.389E-06
2197	1.977E+05	7.222E-09	1.322E-06
2198	1.977E+05	6.870E-09	1.257E-06
2199	1.977E+05	6.535E-09	1.196E-06
2200	1.977E+05	6.216E-09	1.137E-06
2201	1.977E+05	5.913E-09	1.082E-06

Table D-21. Southern Parcel Vinyl Chloride Emission Rate from Year 1968 to 2203.

Source: H:\3000\030177~1.000\030177~1.002\ROSEHI~1\SOUTHERN.PRM

```

=====
                        Model Parameters
=====
Lo : 170.00 m^3 / Mg ***** User Mode Selection *****
k : 0.0500 1/yr ***** User Mode Selection *****
NMOC : 2550.00 ppmv ***** User Mode Selection *****
Methane : 59.0000 % volume
Carbon Dioxide : 41.0000 % volume
Air Pollutant : Vinyl Chloride (HAP/VOC)
Molecular Wt = 62.50      Concentration = 0.300000 ppmV
=====

```

```

=====
                        Landfill Parameters
=====
Landfill type : Co-Disposal
Year Opened : 1967      Current Year : 2003      Closure Year: 2002
Capacity : 197692 Mg
Average Acceptance Rate Required from
      Current Year to Closure Year : 12238.07 Mg/year
=====

```

```

=====
                        Model Results
=====

```

Year	Refuse In Place (Mg)	Vinyl Chloride (HAP/VOC) Emission Rate (Mg/yr)	(Cubic m/yr)
1968	1.318E+04	1.481E-04	5.696E-02
1969	2.636E+04	2.889E-04	1.111E-01
1970	3.954E+04	4.229E-04	1.627E-01
1971	5.272E+04	5.504E-04	2.117E-01
1972	6.590E+04	6.716E-04	2.584E-01
1973	7.908E+04	7.869E-04	3.027E-01
1974	9.226E+04	8.966E-04	3.449E-01
1975	1.054E+05	1.001E-03	3.851E-01
1976	1.186E+05	1.100E-03	4.232E-01
1977	1.318E+05	1.195E-03	4.596E-01
1978	1.450E+05	1.284E-03	4.941E-01
1979	1.582E+05	1.370E-03	5.270E-01
1980	1.713E+05	1.451E-03	5.582E-01
1981	1.845E+05	1.528E-03	5.880E-01
1982	1.977E+05	1.602E-03	6.163E-01
1983	1.977E+05	1.524E-03	5.862E-01
1984	1.977E+05	1.450E-03	5.576E-01
1985	1.977E+05	1.379E-03	5.304E-01
1986	1.977E+05	1.312E-03	5.045E-01
1987	1.977E+05	1.248E-03	4.799E-01
1988	1.977E+05	1.187E-03	4.565E-01
1989	1.977E+05	1.129E-03	4.343E-01
1990	1.977E+05	1.074E-03	4.131E-01
1991	1.977E+05	1.021E-03	3.929E-01
1992	1.977E+05	9.717E-04	3.738E-01
1993	1.977E+05	9.243E-04	3.555E-01
1994	1.977E+05	8.792E-04	3.382E-01
1995	1.977E+05	8.363E-04	3.217E-01
1996	1.977E+05	7.955E-04	3.060E-01
1997	1.977E+05	7.567E-04	2.911E-01
1998	1.977E+05	7.198E-04	2.769E-01
1999	1.977E+05	6.847E-04	2.634E-01
2000	1.977E+05	6.513E-04	2.506E-01
2001	1.977E+05	6.196E-04	2.383E-01
2002	1.977E+05	5.893E-04	2.267E-01
2003	1.977E+05	5.606E-04	2.157E-01
2004	1.977E+05	5.333E-04	2.051E-01
2005	1.977E+05	5.072E-04	1.951E-01
2006	1.977E+05	4.825E-04	1.856E-01
2007	1.977E+05	4.590E-04	1.766E-01
2008	1.977E+05	4.366E-04	1.679E-01
2009	1.977E+05	4.153E-04	1.598E-01
2010	1.977E+05	3.950E-04	1.520E-01
2011	1.977E+05	3.758E-04	1.446E-01
2012	1.977E+05	3.575E-04	1.375E-01

Table D-21. Southern Parcel Vinyl Chloride Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2013	1.977E+05	3.400E-04	1.308E-01
2014	1.977E+05	3.234E-04	1.244E-01
2015	1.977E+05	3.077E-04	1.184E-01
2016	1.977E+05	2.927E-04	1.126E-01
2017	1.977E+05	2.784E-04	1.071E-01
2018	1.977E+05	2.648E-04	1.019E-01
2019	1.977E+05	2.519E-04	9.690E-02
2020	1.977E+05	2.396E-04	9.217E-02
2021	1.977E+05	2.279E-04	8.768E-02
2022	1.977E+05	2.168E-04	8.340E-02
2023	1.977E+05	2.062E-04	7.933E-02
2024	1.977E+05	1.962E-04	7.546E-02
2025	1.977E+05	1.866E-04	7.178E-02
2026	1.977E+05	1.775E-04	6.828E-02
2027	1.977E+05	1.688E-04	6.495E-02
2028	1.977E+05	1.606E-04	6.179E-02
2029	1.977E+05	1.528E-04	5.877E-02
2030	1.977E+05	1.453E-04	5.591E-02
2031	1.977E+05	1.382E-04	5.318E-02
2032	1.977E+05	1.315E-04	5.059E-02
2033	1.977E+05	1.251E-04	4.812E-02
2034	1.977E+05	1.190E-04	4.577E-02
2035	1.977E+05	1.132E-04	4.354E-02
2036	1.977E+05	1.077E-04	4.142E-02
2037	1.977E+05	1.024E-04	3.940E-02
2038	1.977E+05	9.742E-05	3.747E-02
2039	1.977E+05	9.267E-05	3.565E-02
2040	1.977E+05	8.815E-05	3.391E-02
2041	1.977E+05	8.385E-05	3.225E-02
2042	1.977E+05	7.976E-05	3.068E-02
2043	1.977E+05	7.587E-05	2.919E-02
2044	1.977E+05	7.217E-05	2.776E-02
2045	1.977E+05	6.865E-05	2.641E-02
2046	1.977E+05	6.530E-05	2.512E-02
2047	1.977E+05	6.212E-05	2.389E-02
2048	1.977E+05	5.909E-05	2.273E-02
2049	1.977E+05	5.620E-05	2.162E-02
2050	1.977E+05	5.346E-05	2.057E-02
2051	1.977E+05	5.086E-05	1.956E-02
2052	1.977E+05	4.838E-05	1.861E-02
2053	1.977E+05	4.602E-05	1.770E-02
2054	1.977E+05	4.377E-05	1.684E-02
2055	1.977E+05	4.164E-05	1.602E-02
2056	1.977E+05	3.961E-05	1.524E-02
2057	1.977E+05	3.768E-05	1.449E-02
2058	1.977E+05	3.584E-05	1.379E-02
2059	1.977E+05	3.409E-05	1.311E-02
2060	1.977E+05	3.243E-05	1.247E-02
2061	1.977E+05	3.085E-05	1.187E-02
2062	1.977E+05	2.934E-05	1.129E-02
2063	1.977E+05	2.791E-05	1.074E-02
2064	1.977E+05	2.655E-05	1.021E-02
2065	1.977E+05	2.525E-05	9.715E-03
2066	1.977E+05	2.402E-05	9.241E-03
2067	1.977E+05	2.285E-05	8.790E-03
2068	1.977E+05	2.174E-05	8.362E-03
2069	1.977E+05	2.068E-05	7.954E-03
2070	1.977E+05	1.967E-05	7.566E-03
2071	1.977E+05	1.871E-05	7.197E-03
2072	1.977E+05	1.780E-05	6.846E-03
2073	1.977E+05	1.693E-05	6.512E-03
2074	1.977E+05	1.610E-05	6.194E-03
2075	1.977E+05	1.532E-05	5.892E-03
2076	1.977E+05	1.457E-05	5.605E-03
2077	1.977E+05	1.386E-05	5.332E-03
2078	1.977E+05	1.318E-05	5.072E-03
2079	1.977E+05	1.254E-05	4.824E-03
2080	1.977E+05	1.193E-05	4.589E-03
2081	1.977E+05	1.135E-05	4.365E-03
2082	1.977E+05	1.079E-05	4.152E-03
2083	1.977E+05	1.027E-05	3.950E-03

Table D-21. Southern Parcel Vinyl Chloride Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2084	1.977E+05	9.767E-06	3.757E-03
2085	1.977E+05	9.291E-06	3.574E-03
2086	1.977E+05	8.837E-06	3.400E-03
2087	1.977E+05	8.406E-06	3.234E-03
2088	1.977E+05	7.996E-06	3.076E-03
2089	1.977E+05	7.606E-06	2.926E-03
2090	1.977E+05	7.235E-06	2.783E-03
2091	1.977E+05	6.883E-06	2.648E-03
2092	1.977E+05	6.547E-06	2.518E-03
2093	1.977E+05	6.228E-06	2.396E-03
2094	1.977E+05	5.924E-06	2.279E-03
2095	1.977E+05	5.635E-06	2.168E-03
2096	1.977E+05	5.360E-06	2.062E-03
2097	1.977E+05	5.099E-06	1.961E-03
2098	1.977E+05	4.850E-06	1.866E-03
2099	1.977E+05	4.614E-06	1.775E-03
2100	1.977E+05	4.389E-06	1.688E-03
2101	1.977E+05	4.175E-06	1.606E-03
2102	1.977E+05	3.971E-06	1.528E-03
2103	1.977E+05	3.777E-06	1.453E-03
2104	1.977E+05	3.593E-06	1.382E-03
2105	1.977E+05	3.418E-06	1.315E-03
2106	1.977E+05	3.251E-06	1.251E-03
2107	1.977E+05	3.093E-06	1.190E-03
2108	1.977E+05	2.942E-06	1.132E-03
2109	1.977E+05	2.798E-06	1.076E-03
2110	1.977E+05	2.662E-06	1.024E-03
2111	1.977E+05	2.532E-06	9.740E-04
2112	1.977E+05	2.408E-06	9.265E-04
2113	1.977E+05	2.291E-06	8.813E-04
2114	1.977E+05	2.179E-06	8.383E-04
2115	1.977E+05	2.073E-06	7.974E-04
2116	1.977E+05	1.972E-06	7.586E-04
2117	1.977E+05	1.876E-06	7.216E-04
2118	1.977E+05	1.784E-06	6.864E-04
2119	1.977E+05	1.697E-06	6.529E-04
2120	1.977E+05	1.614E-06	6.211E-04
2121	1.977E+05	1.536E-06	5.908E-04
2122	1.977E+05	1.461E-06	5.620E-04
2123	1.977E+05	1.390E-06	5.345E-04
2124	1.977E+05	1.322E-06	5.085E-04
2125	1.977E+05	1.257E-06	4.837E-04
2126	1.977E+05	1.196E-06	4.601E-04
2127	1.977E+05	1.138E-06	4.376E-04
2128	1.977E+05	1.082E-06	4.163E-04
2129	1.977E+05	1.029E-06	3.960E-04
2130	1.977E+05	9.792E-07	3.767E-04
2131	1.977E+05	9.315E-07	3.583E-04
2132	1.977E+05	8.860E-07	3.408E-04
2133	1.977E+05	8.428E-07	3.242E-04
2134	1.977E+05	8.017E-07	3.084E-04
2135	1.977E+05	7.626E-07	2.934E-04
2136	1.977E+05	7.254E-07	2.791E-04
2137	1.977E+05	6.900E-07	2.654E-04
2138	1.977E+05	6.564E-07	2.525E-04
2139	1.977E+05	6.244E-07	2.402E-04
2140	1.977E+05	5.939E-07	2.285E-04
2141	1.977E+05	5.650E-07	2.173E-04
2142	1.977E+05	5.374E-07	2.067E-04
2143	1.977E+05	5.112E-07	1.966E-04
2144	1.977E+05	4.863E-07	1.871E-04
2145	1.977E+05	4.625E-07	1.779E-04
2146	1.977E+05	4.400E-07	1.693E-04
2147	1.977E+05	4.185E-07	1.610E-04
2148	1.977E+05	3.981E-07	1.531E-04
2149	1.977E+05	3.787E-07	1.457E-04
2150	1.977E+05	3.602E-07	1.386E-04
2151	1.977E+05	3.427E-07	1.318E-04
2152	1.977E+05	3.260E-07	1.254E-04
2153	1.977E+05	3.101E-07	1.193E-04
2154	1.977E+05	2.949E-07	1.135E-04

Table D-21. Southern Parcel Vinyl Chloride Emission Rate from Year 1968 to 2203 (concluded).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2155	1.977E+05	2.806E-07	1.079E-04
2156	1.977E+05	2.669E-07	1.027E-04
2157	1.977E+05	2.539E-07	9.765E-05
2158	1.977E+05	2.415E-07	9.289E-05
2159	1.977E+05	2.297E-07	8.836E-05
2160	1.977E+05	2.185E-07	8.405E-05
2161	1.977E+05	2.078E-07	7.995E-05
2162	1.977E+05	1.977E-07	7.605E-05
2163	1.977E+05	1.881E-07	7.234E-05
2164	1.977E+05	1.789E-07	6.881E-05
2165	1.977E+05	1.702E-07	6.546E-05
2166	1.977E+05	1.619E-07	6.227E-05
2167	1.977E+05	1.540E-07	5.923E-05
2168	1.977E+05	1.465E-07	5.634E-05
2169	1.977E+05	1.393E-07	5.359E-05
2170	1.977E+05	1.325E-07	5.098E-05
2171	1.977E+05	1.261E-07	4.849E-05
2172	1.977E+05	1.199E-07	4.613E-05
2173	1.977E+05	1.141E-07	4.388E-05
2174	1.977E+05	1.085E-07	4.174E-05
2175	1.977E+05	1.032E-07	3.970E-05
2176	1.977E+05	9.818E-08	3.777E-05
2177	1.977E+05	9.339E-08	3.592E-05
2178	1.977E+05	8.883E-08	3.417E-05
2179	1.977E+05	8.450E-08	3.251E-05
2180	1.977E+05	8.038E-08	3.092E-05
2181	1.977E+05	7.646E-08	2.941E-05
2182	1.977E+05	7.273E-08	2.798E-05
2183	1.977E+05	6.918E-08	2.661E-05
2184	1.977E+05	6.581E-08	2.532E-05
2185	1.977E+05	6.260E-08	2.408E-05
2186	1.977E+05	5.955E-08	2.291E-05
2187	1.977E+05	5.664E-08	2.179E-05
2188	1.977E+05	5.388E-08	2.073E-05
2189	1.977E+05	5.125E-08	1.972E-05
2190	1.977E+05	4.875E-08	1.875E-05
2191	1.977E+05	4.637E-08	1.784E-05
2192	1.977E+05	4.411E-08	1.697E-05
2193	1.977E+05	4.196E-08	1.614E-05
2194	1.977E+05	3.992E-08	1.535E-05
2195	1.977E+05	3.797E-08	1.461E-05
2196	1.977E+05	3.612E-08	1.389E-05
2197	1.977E+05	3.436E-08	1.322E-05
2198	1.977E+05	3.268E-08	1.257E-05
2199	1.977E+05	3.109E-08	1.196E-05
2200	1.977E+05	2.957E-08	1.137E-05
2201	1.977E+05	2.813E-08	1.082E-05

Table D-22. Southern Parcel m,p-Xylene Emission Rate from Year 1968 to 2203.

Source: H:\3000\030177~1.000\030177~1.002\ROSEHI~1\SOUTHERN.PRM

Model Parameters

Lo : 170.00 m³ / Mg ***** User Mode Selection *****
 k : 0.0500 1/yr ***** User Mode Selection *****
 NMOC : 2550.00 ppmv ***** User Mode Selection *****
 Methane : 59.0000 % volume
 Carbon Dioxide : 41.0000 % volume
 Air Pollutant : m,p-Xylene (HAP/VOC)
 Molecular Wt = 106.17 Concentration = 3.750000 ppmV

Landfill Parameters

Landfill type : Co-Disposal
 Year Opened : 1967 Current Year : 2003 Closure Year: 2002
 Capacity : 197692 Mg
 Average Acceptance Rate Required from
 Current Year to Closure Year : 12238.07 Mg/year

Model Results

Year	Refuse In Place (Mg)	m,p-Xylene (HAP/VOC) Emission Rate (Mg/yr)	(Cubic m/yr)
1968	1.318E+04	3.144E-03	7.120E-01
1969	2.636E+04	6.135E-03	1.389E+00
1970	3.954E+04	8.980E-03	2.034E+00
1971	5.272E+04	1.169E-02	2.646E+00
1972	6.590E+04	1.426E-02	3.229E+00
1973	7.908E+04	1.671E-02	3.784E+00
1974	9.226E+04	1.904E-02	4.311E+00
1975	1.054E+05	2.125E-02	4.813E+00
1976	1.186E+05	2.336E-02	5.290E+00
1977	1.318E+05	2.537E-02	5.744E+00
1978	1.450E+05	2.727E-02	6.176E+00
1979	1.582E+05	2.909E-02	6.587E+00
1980	1.713E+05	3.081E-02	6.978E+00
1981	1.845E+05	3.246E-02	7.350E+00
1982	1.977E+05	3.402E-02	7.703E+00
1983	1.977E+05	3.236E-02	7.327E+00
1984	1.977E+05	3.078E-02	6.970E+00
1985	1.977E+05	2.928E-02	6.630E+00
1986	1.977E+05	2.785E-02	6.307E+00
1987	1.977E+05	2.649E-02	5.999E+00
1988	1.977E+05	2.520E-02	5.707E+00
1989	1.977E+05	2.397E-02	5.428E+00
1990	1.977E+05	2.280E-02	5.164E+00
1991	1.977E+05	2.169E-02	4.912E+00
1992	1.977E+05	2.063E-02	4.672E+00
1993	1.977E+05	1.963E-02	4.444E+00
1994	1.977E+05	1.867E-02	4.228E+00
1995	1.977E+05	1.776E-02	4.021E+00
1996	1.977E+05	1.689E-02	3.825E+00
1997	1.977E+05	1.607E-02	3.639E+00
1998	1.977E+05	1.528E-02	3.461E+00
1999	1.977E+05	1.454E-02	3.292E+00
2000	1.977E+05	1.383E-02	3.132E+00
2001	1.977E+05	1.316E-02	2.979E+00
2002	1.977E+05	1.251E-02	2.834E+00
2003	1.977E+05	1.190E-02	2.696E+00
2004	1.977E+05	1.132E-02	2.564E+00
2005	1.977E+05	1.077E-02	2.439E+00
2006	1.977E+05	1.025E-02	2.320E+00
2007	1.977E+05	9.746E-03	2.207E+00
2008	1.977E+05	9.271E-03	2.099E+00
2009	1.977E+05	8.818E-03	1.997E+00
2010	1.977E+05	8.388E-03	1.900E+00
2011	1.977E+05	7.979E-03	1.807E+00
2012	1.977E+05	7.590E-03	1.719E+00

Table D-22. Southern Parcel m,p-Xylene Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2013	1.977E+05	7.220E-03	1.635E+00
2014	1.977E+05	6.868E-03	1.555E+00
2015	1.977E+05	6.533E-03	1.479E+00
2016	1.977E+05	6.214E-03	1.407E+00
2017	1.977E+05	5.911E-03	1.339E+00
2018	1.977E+05	5.623E-03	1.273E+00
2019	1.977E+05	5.349E-03	1.211E+00
2020	1.977E+05	5.088E-03	1.152E+00
2021	1.977E+05	4.840E-03	1.096E+00
2022	1.977E+05	4.604E-03	1.043E+00
2023	1.977E+05	4.379E-03	9.917E-01
2024	1.977E+05	4.166E-03	9.433E-01
2025	1.977E+05	3.962E-03	8.973E-01
2026	1.977E+05	3.769E-03	8.535E-01
2027	1.977E+05	3.585E-03	8.119E-01
2028	1.977E+05	3.410E-03	7.723E-01
2029	1.977E+05	3.244E-03	7.346E-01
2030	1.977E+05	3.086E-03	6.988E-01
2031	1.977E+05	2.935E-03	6.647E-01
2032	1.977E+05	2.792E-03	6.323E-01
2033	1.977E+05	2.656E-03	6.015E-01
2034	1.977E+05	2.527E-03	5.721E-01
2035	1.977E+05	2.403E-03	5.442E-01
2036	1.977E+05	2.286E-03	5.177E-01
2037	1.977E+05	2.175E-03	4.924E-01
2038	1.977E+05	2.069E-03	4.684E-01
2039	1.977E+05	1.968E-03	4.456E-01
2040	1.977E+05	1.872E-03	4.239E-01
2041	1.977E+05	1.780E-03	4.032E-01
2042	1.977E+05	1.694E-03	3.835E-01
2043	1.977E+05	1.611E-03	3.648E-01
2044	1.977E+05	1.532E-03	3.470E-01
2045	1.977E+05	1.458E-03	3.301E-01
2046	1.977E+05	1.387E-03	3.140E-01
2047	1.977E+05	1.319E-03	2.987E-01
2048	1.977E+05	1.255E-03	2.841E-01
2049	1.977E+05	1.193E-03	2.703E-01
2050	1.977E+05	1.135E-03	2.571E-01
2051	1.977E+05	1.080E-03	2.445E-01
2052	1.977E+05	1.027E-03	2.326E-01
2053	1.977E+05	9.771E-04	2.213E-01
2054	1.977E+05	9.295E-04	2.105E-01
2055	1.977E+05	8.841E-04	2.002E-01
2056	1.977E+05	8.410E-04	1.904E-01
2057	1.977E+05	8.000E-04	1.812E-01
2058	1.977E+05	7.610E-04	1.723E-01
2059	1.977E+05	7.239E-04	1.639E-01
2060	1.977E+05	6.886E-04	1.559E-01
2061	1.977E+05	6.550E-04	1.483E-01
2062	1.977E+05	6.230E-04	1.411E-01
2063	1.977E+05	5.926E-04	1.342E-01
2064	1.977E+05	5.637E-04	1.277E-01
2065	1.977E+05	5.363E-04	1.214E-01
2066	1.977E+05	5.101E-04	1.155E-01
2067	1.977E+05	4.852E-04	1.099E-01
2068	1.977E+05	4.616E-04	1.045E-01
2069	1.977E+05	4.390E-04	9.942E-02
2070	1.977E+05	4.176E-04	9.457E-02
2071	1.977E+05	3.973E-04	8.996E-02
2072	1.977E+05	3.779E-04	8.557E-02
2073	1.977E+05	3.595E-04	8.140E-02
2074	1.977E+05	3.419E-04	7.743E-02
2075	1.977E+05	3.253E-04	7.365E-02
2076	1.977E+05	3.094E-04	7.006E-02
2077	1.977E+05	2.943E-04	6.665E-02
2078	1.977E+05	2.799E-04	6.340E-02
2079	1.977E+05	2.663E-04	6.030E-02
2080	1.977E+05	2.533E-04	5.736E-02
2081	1.977E+05	2.410E-04	5.456E-02
2082	1.977E+05	2.292E-04	5.190E-02
2083	1.977E+05	2.180E-04	4.937E-02

Table D-22. Southern Parcel m,p-Xylene Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2084	1.977E+05	2.074E-04	4.696E-02
2085	1.977E+05	1.973E-04	4.467E-02
2086	1.977E+05	1.877E-04	4.250E-02
2087	1.977E+05	1.785E-04	4.042E-02
2088	1.977E+05	1.698E-04	3.845E-02
2089	1.977E+05	1.615E-04	3.658E-02
2090	1.977E+05	1.536E-04	3.479E-02
2091	1.977E+05	1.461E-04	3.310E-02
2092	1.977E+05	1.390E-04	3.148E-02
2093	1.977E+05	1.322E-04	2.995E-02
2094	1.977E+05	1.258E-04	2.849E-02
2095	1.977E+05	1.197E-04	2.710E-02
2096	1.977E+05	1.138E-04	2.577E-02
2097	1.977E+05	1.083E-04	2.452E-02
2098	1.977E+05	1.030E-04	2.332E-02
2099	1.977E+05	9.796E-05	2.218E-02
2100	1.977E+05	9.319E-05	2.110E-02
2101	1.977E+05	8.864E-05	2.007E-02
2102	1.977E+05	8.432E-05	1.909E-02
2103	1.977E+05	8.021E-05	1.816E-02
2104	1.977E+05	7.629E-05	1.728E-02
2105	1.977E+05	7.257E-05	1.643E-02
2106	1.977E+05	6.903E-05	1.563E-02
2107	1.977E+05	6.567E-05	1.487E-02
2108	1.977E+05	6.246E-05	1.415E-02
2109	1.977E+05	5.942E-05	1.346E-02
2110	1.977E+05	5.652E-05	1.280E-02
2111	1.977E+05	5.376E-05	1.218E-02
2112	1.977E+05	5.114E-05	1.158E-02
2113	1.977E+05	4.865E-05	1.102E-02
2114	1.977E+05	4.628E-05	1.048E-02
2115	1.977E+05	4.402E-05	9.968E-03
2116	1.977E+05	4.187E-05	9.482E-03
2117	1.977E+05	3.983E-05	9.020E-03
2118	1.977E+05	3.789E-05	8.580E-03
2119	1.977E+05	3.604E-05	8.161E-03
2120	1.977E+05	3.428E-05	7.763E-03
2121	1.977E+05	3.261E-05	7.385E-03
2122	1.977E+05	3.102E-05	7.024E-03
2123	1.977E+05	2.951E-05	6.682E-03
2124	1.977E+05	2.807E-05	6.356E-03
2125	1.977E+05	2.670E-05	6.046E-03
2126	1.977E+05	2.540E-05	5.751E-03
2127	1.977E+05	2.416E-05	5.471E-03
2128	1.977E+05	2.298E-05	5.204E-03
2129	1.977E+05	2.186E-05	4.950E-03
2130	1.977E+05	2.079E-05	4.709E-03
2131	1.977E+05	1.978E-05	4.479E-03
2132	1.977E+05	1.881E-05	4.261E-03
2133	1.977E+05	1.790E-05	4.053E-03
2134	1.977E+05	1.702E-05	3.855E-03
2135	1.977E+05	1.619E-05	3.667E-03
2136	1.977E+05	1.540E-05	3.488E-03
2137	1.977E+05	1.465E-05	3.318E-03
2138	1.977E+05	1.394E-05	3.156E-03
2139	1.977E+05	1.326E-05	3.002E-03
2140	1.977E+05	1.261E-05	2.856E-03
2141	1.977E+05	1.200E-05	2.717E-03
2142	1.977E+05	1.141E-05	2.584E-03
2143	1.977E+05	1.085E-05	2.458E-03
2144	1.977E+05	1.033E-05	2.338E-03
2145	1.977E+05	9.822E-06	2.224E-03
2146	1.977E+05	9.343E-06	2.116E-03
2147	1.977E+05	8.887E-06	2.013E-03
2148	1.977E+05	8.454E-06	1.914E-03
2149	1.977E+05	8.041E-06	1.821E-03
2150	1.977E+05	7.649E-06	1.732E-03
2151	1.977E+05	7.276E-06	1.648E-03
2152	1.977E+05	6.921E-06	1.567E-03
2153	1.977E+05	6.584E-06	1.491E-03
2154	1.977E+05	6.263E-06	1.418E-03

Table D-22. Southern Parcel m,p-Xylene Emission Rate from Year 1968 to 2203 (concluded).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2155	1.977E+05	5.957E-06	1.349E-03
2156	1.977E+05	5.667E-06	1.283E-03
2157	1.977E+05	5.390E-06	1.221E-03
2158	1.977E+05	5.127E-06	1.161E-03
2159	1.977E+05	4.877E-06	1.104E-03
2160	1.977E+05	4.639E-06	1.051E-03
2161	1.977E+05	4.413E-06	9.994E-04
2162	1.977E+05	4.198E-06	9.506E-04
2163	1.977E+05	3.993E-06	9.043E-04
2164	1.977E+05	3.798E-06	8.602E-04
2165	1.977E+05	3.613E-06	8.182E-04
2166	1.977E+05	3.437E-06	7.783E-04
2167	1.977E+05	3.269E-06	7.404E-04
2168	1.977E+05	3.110E-06	7.043E-04
2169	1.977E+05	2.958E-06	6.699E-04
2170	1.977E+05	2.814E-06	6.372E-04
2171	1.977E+05	2.677E-06	6.062E-04
2172	1.977E+05	2.546E-06	5.766E-04
2173	1.977E+05	2.422E-06	5.485E-04
2174	1.977E+05	2.304E-06	5.217E-04
2175	1.977E+05	2.192E-06	4.963E-04
2176	1.977E+05	2.085E-06	4.721E-04
2177	1.977E+05	1.983E-06	4.491E-04
2178	1.977E+05	1.886E-06	4.272E-04
2179	1.977E+05	1.794E-06	4.063E-04
2180	1.977E+05	1.707E-06	3.865E-04
2181	1.977E+05	1.624E-06	3.677E-04
2182	1.977E+05	1.544E-06	3.497E-04
2183	1.977E+05	1.469E-06	3.327E-04
2184	1.977E+05	1.397E-06	3.164E-04
2185	1.977E+05	1.329E-06	3.010E-04
2186	1.977E+05	1.264E-06	2.863E-04
2187	1.977E+05	1.203E-06	2.724E-04
2188	1.977E+05	1.144E-06	2.591E-04
2189	1.977E+05	1.088E-06	2.464E-04
2190	1.977E+05	1.035E-06	2.344E-04
2191	1.977E+05	9.847E-07	2.230E-04
2192	1.977E+05	9.367E-07	2.121E-04
2193	1.977E+05	8.910E-07	2.018E-04
2194	1.977E+05	8.476E-07	1.919E-04
2195	1.977E+05	8.062E-07	1.826E-04
2196	1.977E+05	7.669E-07	1.737E-04
2197	1.977E+05	7.295E-07	1.652E-04
2198	1.977E+05	6.939E-07	1.571E-04
2199	1.977E+05	6.601E-07	1.495E-04
2200	1.977E+05	6.279E-07	1.422E-04
2201	1.977E+05	5.973E-07	1.353E-04

Table D-23. Southern Parcel o-Xylene Emission Rate from Year 1968 to 2203.

Source: H:\3000\030177~1.000\030177~1.002\ROSEHI~1\SOUTHERN.PRM

Model Parameters

Lo : 170.00 m³ / Mg ***** User Mode Selection *****
 k : 0.0500 1/yr ***** User Mode Selection *****
 NMOC : 2550.00 ppmv ***** User Mode Selection *****
 Methane : 59.0000 % volume
 Carbon Dioxide : 41.0000 % volume
 Air Pollutant : o-Xylene (HAP/VOC)
 Molecular Wt = 106.17 Concentration = 1.540000 ppmV

Landfill Parameters

Landfill type : Co-Disposal
 Year Opened : 1967 Current Year : 2003 Closure Year: 2002
 Capacity : 197692 Mg
 Average Acceptance Rate Required from
 Current Year to Closure Year : 12238.07 Mg/year

Model Results

Year	Refuse In Place (Mg)	o-Xylene (HAP/VOC) (Mg/yr)	Emission Rate (Cubic m/yr)
1968	1.318E+04	1.291E-03	2.924E-01
1969	2.636E+04	2.519E-03	5.706E-01
1970	3.954E+04	3.688E-03	8.351E-01
1971	5.272E+04	4.799E-03	1.087E+00
1972	6.590E+04	5.856E-03	1.326E+00
1973	7.908E+04	6.862E-03	1.554E+00
1974	9.226E+04	7.819E-03	1.771E+00
1975	1.054E+05	8.729E-03	1.977E+00
1976	1.186E+05	9.594E-03	2.173E+00
1977	1.318E+05	1.042E-02	2.359E+00
1978	1.450E+05	1.120E-02	2.536E+00
1979	1.582E+05	1.195E-02	2.705E+00
1980	1.713E+05	1.265E-02	2.866E+00
1981	1.845E+05	1.333E-02	3.018E+00
1982	1.977E+05	1.397E-02	3.163E+00
1983	1.977E+05	1.329E-02	3.009E+00
1984	1.977E+05	1.264E-02	2.862E+00
1985	1.977E+05	1.202E-02	2.723E+00
1986	1.977E+05	1.144E-02	2.590E+00
1987	1.977E+05	1.088E-02	2.464E+00
1988	1.977E+05	1.035E-02	2.344E+00
1989	1.977E+05	9.844E-03	2.229E+00
1990	1.977E+05	9.364E-03	2.121E+00
1991	1.977E+05	8.907E-03	2.017E+00
1992	1.977E+05	8.473E-03	1.919E+00
1993	1.977E+05	8.060E-03	1.825E+00
1994	1.977E+05	7.667E-03	1.736E+00
1995	1.977E+05	7.293E-03	1.651E+00
1996	1.977E+05	6.937E-03	1.571E+00
1997	1.977E+05	6.599E-03	1.494E+00
1998	1.977E+05	6.277E-03	1.421E+00
1999	1.977E+05	5.971E-03	1.352E+00
2000	1.977E+05	5.680E-03	1.286E+00
2001	1.977E+05	5.403E-03	1.223E+00
2002	1.977E+05	5.139E-03	1.164E+00
2003	1.977E+05	4.888E-03	1.107E+00
2004	1.977E+05	4.650E-03	1.053E+00
2005	1.977E+05	4.423E-03	1.002E+00
2006	1.977E+05	4.208E-03	9.528E-01
2007	1.977E+05	4.002E-03	9.063E-01
2008	1.977E+05	3.807E-03	8.621E-01
2009	1.977E+05	3.621E-03	8.201E-01
2010	1.977E+05	3.445E-03	7.801E-01
2011	1.977E+05	3.277E-03	7.420E-01
2012	1.977E+05	3.117E-03	7.059E-01

Table D-23. Southern Parcel o-Xylene Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2013	1.977E+05	2.965E-03	6.714E-01
2014	1.977E+05	2.820E-03	6.387E-01
2015	1.977E+05	2.683E-03	6.075E-01
2016	1.977E+05	2.552E-03	5.779E-01
2017	1.977E+05	2.428E-03	5.497E-01
2018	1.977E+05	2.309E-03	5.229E-01
2019	1.977E+05	2.197E-03	4.974E-01
2020	1.977E+05	2.089E-03	4.732E-01
2021	1.977E+05	1.987E-03	4.501E-01
2022	1.977E+05	1.891E-03	4.281E-01
2023	1.977E+05	1.798E-03	4.072E-01
2024	1.977E+05	1.711E-03	3.874E-01
2025	1.977E+05	1.627E-03	3.685E-01
2026	1.977E+05	1.548E-03	3.505E-01
2027	1.977E+05	1.472E-03	3.334E-01
2028	1.977E+05	1.401E-03	3.172E-01
2029	1.977E+05	1.332E-03	3.017E-01
2030	1.977E+05	1.267E-03	2.870E-01
2031	1.977E+05	1.205E-03	2.730E-01
2032	1.977E+05	1.147E-03	2.597E-01
2033	1.977E+05	1.091E-03	2.470E-01
2034	1.977E+05	1.038E-03	2.350E-01
2035	1.977E+05	9.870E-04	2.235E-01
2036	1.977E+05	9.388E-04	2.126E-01
2037	1.977E+05	8.930E-04	2.022E-01
2038	1.977E+05	8.495E-04	1.924E-01
2039	1.977E+05	8.081E-04	1.830E-01
2040	1.977E+05	7.686E-04	1.741E-01
2041	1.977E+05	7.312E-04	1.656E-01
2042	1.977E+05	6.955E-04	1.575E-01
2043	1.977E+05	6.616E-04	1.498E-01
2044	1.977E+05	6.293E-04	1.425E-01
2045	1.977E+05	5.986E-04	1.356E-01
2046	1.977E+05	5.694E-04	1.289E-01
2047	1.977E+05	5.417E-04	1.227E-01
2048	1.977E+05	5.152E-04	1.167E-01
2049	1.977E+05	4.901E-04	1.110E-01
2050	1.977E+05	4.662E-04	1.056E-01
2051	1.977E+05	4.435E-04	1.004E-01
2052	1.977E+05	4.218E-04	9.553E-02
2053	1.977E+05	4.013E-04	9.087E-02
2054	1.977E+05	3.817E-04	8.644E-02
2055	1.977E+05	3.631E-04	8.222E-02
2056	1.977E+05	3.454E-04	7.821E-02
2057	1.977E+05	3.285E-04	7.440E-02
2058	1.977E+05	3.125E-04	7.077E-02
2059	1.977E+05	2.973E-04	6.732E-02
2060	1.977E+05	2.828E-04	6.403E-02
2061	1.977E+05	2.690E-04	6.091E-02
2062	1.977E+05	2.559E-04	5.794E-02
2063	1.977E+05	2.434E-04	5.511E-02
2064	1.977E+05	2.315E-04	5.243E-02
2065	1.977E+05	2.202E-04	4.987E-02
2066	1.977E+05	2.095E-04	4.744E-02
2067	1.977E+05	1.993E-04	4.512E-02
2068	1.977E+05	1.895E-04	4.292E-02
2069	1.977E+05	1.803E-04	4.083E-02
2070	1.977E+05	1.715E-04	3.884E-02
2071	1.977E+05	1.631E-04	3.694E-02
2072	1.977E+05	1.552E-04	3.514E-02
2073	1.977E+05	1.476E-04	3.343E-02
2074	1.977E+05	1.404E-04	3.180E-02
2075	1.977E+05	1.336E-04	3.025E-02
2076	1.977E+05	1.271E-04	2.877E-02
2077	1.977E+05	1.209E-04	2.737E-02
2078	1.977E+05	1.150E-04	2.603E-02
2079	1.977E+05	1.094E-04	2.476E-02
2080	1.977E+05	1.040E-04	2.356E-02
2081	1.977E+05	9.895E-05	2.241E-02
2082	1.977E+05	9.413E-05	2.132E-02
2083	1.977E+05	8.953E-05	2.028E-02

Table D-23. Southern Parcel o-Xylene Emission Rate from Year 1968 to 2203 (continued).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2084	1.977E+05	8.517E-05	1.929E-02
2085	1.977E+05	8.101E-05	1.835E-02
2086	1.977E+05	7.706E-05	1.745E-02
2087	1.977E+05	7.331E-05	1.660E-02
2088	1.977E+05	6.973E-05	1.579E-02
2089	1.977E+05	6.633E-05	1.502E-02
2090	1.977E+05	6.309E-05	1.429E-02
2091	1.977E+05	6.002E-05	1.359E-02
2092	1.977E+05	5.709E-05	1.293E-02
2093	1.977E+05	5.431E-05	1.230E-02
2094	1.977E+05	5.166E-05	1.170E-02
2095	1.977E+05	4.914E-05	1.113E-02
2096	1.977E+05	4.674E-05	1.058E-02
2097	1.977E+05	4.446E-05	1.007E-02
2098	1.977E+05	4.229E-05	9.577E-03
2099	1.977E+05	4.023E-05	9.110E-03
2100	1.977E+05	3.827E-05	8.666E-03
2101	1.977E+05	3.640E-05	8.243E-03
2102	1.977E+05	3.463E-05	7.841E-03
2103	1.977E+05	3.294E-05	7.459E-03
2104	1.977E+05	3.133E-05	7.095E-03
2105	1.977E+05	2.980E-05	6.749E-03
2106	1.977E+05	2.835E-05	6.420E-03
2107	1.977E+05	2.697E-05	6.107E-03
2108	1.977E+05	2.565E-05	5.809E-03
2109	1.977E+05	2.440E-05	5.526E-03
2110	1.977E+05	2.321E-05	5.256E-03
2111	1.977E+05	2.208E-05	5.000E-03
2112	1.977E+05	2.100E-05	4.756E-03
2113	1.977E+05	1.998E-05	4.524E-03
2114	1.977E+05	1.900E-05	4.303E-03
2115	1.977E+05	1.808E-05	4.094E-03
2116	1.977E+05	1.720E-05	3.894E-03
2117	1.977E+05	1.636E-05	3.704E-03
2118	1.977E+05	1.556E-05	3.523E-03
2119	1.977E+05	1.480E-05	3.352E-03
2120	1.977E+05	1.408E-05	3.188E-03
2121	1.977E+05	1.339E-05	3.033E-03
2122	1.977E+05	1.274E-05	2.885E-03
2123	1.977E+05	1.212E-05	2.744E-03
2124	1.977E+05	1.153E-05	2.610E-03
2125	1.977E+05	1.096E-05	2.483E-03
2126	1.977E+05	1.043E-05	2.362E-03
2127	1.977E+05	9.921E-06	2.247E-03
2128	1.977E+05	9.437E-06	2.137E-03
2129	1.977E+05	8.977E-06	2.033E-03
2130	1.977E+05	8.539E-06	1.934E-03
2131	1.977E+05	8.122E-06	1.839E-03
2132	1.977E+05	7.726E-06	1.750E-03
2133	1.977E+05	7.349E-06	1.664E-03
2134	1.977E+05	6.991E-06	1.583E-03
2135	1.977E+05	6.650E-06	1.506E-03
2136	1.977E+05	6.326E-06	1.432E-03
2137	1.977E+05	6.017E-06	1.363E-03
2138	1.977E+05	5.724E-06	1.296E-03
2139	1.977E+05	5.445E-06	1.233E-03
2140	1.977E+05	5.179E-06	1.173E-03
2141	1.977E+05	4.927E-06	1.116E-03
2142	1.977E+05	4.686E-06	1.061E-03
2143	1.977E+05	4.458E-06	1.009E-03
2144	1.977E+05	4.240E-06	9.602E-04
2145	1.977E+05	4.033E-06	9.134E-04
2146	1.977E+05	3.837E-06	8.689E-04
2147	1.977E+05	3.650E-06	8.265E-04
2148	1.977E+05	3.472E-06	7.862E-04
2149	1.977E+05	3.302E-06	7.478E-04
2150	1.977E+05	3.141E-06	7.114E-04
2151	1.977E+05	2.988E-06	6.767E-04
2152	1.977E+05	2.842E-06	6.437E-04
2153	1.977E+05	2.704E-06	6.123E-04
2154	1.977E+05	2.572E-06	5.824E-04

Table D-23. Southern Parcel o-Xylene Emission Rate from Year 1968 to 2203 (concluded).

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2155	1.977E+05	2.446E-06	5.540E-04
2156	1.977E+05	2.327E-06	5.270E-04
2157	1.977E+05	2.214E-06	5.013E-04
2158	1.977E+05	2.106E-06	4.768E-04
2159	1.977E+05	2.003E-06	4.536E-04
2160	1.977E+05	1.905E-06	4.315E-04
2161	1.977E+05	1.812E-06	4.104E-04
2162	1.977E+05	1.724E-06	3.904E-04
2163	1.977E+05	1.640E-06	3.714E-04
2164	1.977E+05	1.560E-06	3.532E-04
2165	1.977E+05	1.484E-06	3.360E-04
2166	1.977E+05	1.411E-06	3.196E-04
2167	1.977E+05	1.343E-06	3.040E-04
2168	1.977E+05	1.277E-06	2.892E-04
2169	1.977E+05	1.215E-06	2.751E-04
2170	1.977E+05	1.156E-06	2.617E-04
2171	1.977E+05	1.099E-06	2.489E-04
2172	1.977E+05	1.046E-06	2.368E-04
2173	1.977E+05	9.946E-07	2.252E-04
2174	1.977E+05	9.461E-07	2.143E-04
2175	1.977E+05	9.000E-07	2.038E-04
2176	1.977E+05	8.561E-07	1.939E-04
2177	1.977E+05	8.143E-07	1.844E-04
2178	1.977E+05	7.746E-07	1.754E-04
2179	1.977E+05	7.369E-07	1.669E-04
2180	1.977E+05	7.009E-07	1.587E-04
2181	1.977E+05	6.667E-07	1.510E-04
2182	1.977E+05	6.342E-07	1.436E-04
2183	1.977E+05	6.033E-07	1.366E-04
2184	1.977E+05	5.739E-07	1.300E-04
2185	1.977E+05	5.459E-07	1.236E-04
2186	1.977E+05	5.192E-07	1.176E-04
2187	1.977E+05	4.939E-07	1.119E-04
2188	1.977E+05	4.698E-07	1.064E-04
2189	1.977E+05	4.469E-07	1.012E-04
2190	1.977E+05	4.251E-07	9.627E-05
2191	1.977E+05	4.044E-07	9.158E-05
2192	1.977E+05	3.847E-07	8.711E-05
2193	1.977E+05	3.659E-07	8.286E-05
2194	1.977E+05	3.481E-07	7.882E-05
2195	1.977E+05	3.311E-07	7.498E-05
2196	1.977E+05	3.149E-07	7.132E-05
2197	1.977E+05	2.996E-07	6.784E-05
2198	1.977E+05	2.850E-07	6.453E-05
2199	1.977E+05	2.711E-07	6.139E-05
2200	1.977E+05	2.579E-07	5.839E-05
2201	1.977E+05	2.453E-07	5.554E-05

Appendix E

SCREEN3 Model Runs

02/20/03
09:27:30

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

Rose Hill Northern Portion

SIMPLE TERRAIN INPUTS:

SOURCE TYPE = AREA
EMISSION RATE (G/(S-M**2)) = 0.158730E-04
SOURCE HEIGHT (M) = 0.0000
LENGTH OF LARGER SIDE (M) = 300.0000
LENGTH OF SMALLER SIDE (M) = 210.0000
RECEPTOR HEIGHT (M) = 0.0000
URBAN/RURAL OPTION = RURAL

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

MODEL ESTIMATES DIRECTION TO MAX CONCENTRATION

BUOY. FLUX = 0.000 M**4/S**3; MOM. FLUX = 0.000 M**4/S**2.

*** FULL METEOROLOGY ***

*** SCREEN AUTOMATED DISTANCES ***

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	MAX DIR (DEG)
1.	2024.	6	1.0	1.0	10000.0	0.00	34.
100.	2303.	6	1.0	1.0	10000.0	0.00	33.
200.	1624.	6	1.0	1.0	10000.0	0.00	35.
300.	878.5	6	1.0	1.0	10000.0	0.00	34.
400.	653.7	6	1.0	1.0	10000.0	0.00	33.
500.	529.2	6	1.0	1.0	10000.0	0.00	33.
600.	447.4	6	1.0	1.0	10000.0	0.00	32.
700.	389.7	6	1.0	1.0	10000.0	0.00	31.
800.	347.0	6	1.0	1.0	10000.0	0.00	30.
900.	314.5	6	1.0	1.0	10000.0	0.00	29.
1000.	288.2	6	1.0	1.0	10000.0	0.00	28.
1100.	266.6	6	1.0	1.0	10000.0	0.00	26.
1200.	248.3	6	1.0	1.0	10000.0	0.00	25.
1300.	232.4	6	1.0	1.0	10000.0	0.00	23.
1400.	218.3	6	1.0	1.0	10000.0	0.00	22.
1500.	205.8	6	1.0	1.0	10000.0	0.00	18.
1600.	194.5	6	1.0	1.0	10000.0	0.00	17.
1700.	184.3	6	1.0	1.0	10000.0	0.00	13.
1800.	174.9	6	1.0	1.0	10000.0	0.00	6.
1900.	166.4	6	1.0	1.0	10000.0	0.00	1.
2000.	158.6	6	1.0	1.0	10000.0	0.00	2.
2100.	151.6	6	1.0	1.0	10000.0	0.00	0.
2200.	145.1	6	1.0	1.0	10000.0	0.00	0.

2300.	139.0	6	1.0	1.0	10000.0	0.00	0.
2400.	133.3	6	1.0	1.0	10000.0	0.00	2.
2500.	127.9	6	1.0	1.0	10000.0	0.00	0.
2600.	122.9	6	1.0	1.0	10000.0	0.00	2.
2700.	118.0	6	1.0	1.0	10000.0	0.00	0.
2800.	113.5	6	1.0	1.0	10000.0	0.00	1.
2900.	109.2	6	1.0	1.0	10000.0	0.00	1.
3000.	105.3	6	1.0	1.0	10000.0	0.00	0.
3500.	89.11	6	1.0	1.0	10000.0	0.00	1.
4000.	76.59	6	1.0	1.0	10000.0	0.00	0.
4500.	66.70	6	1.0	1.0	10000.0	0.00	0.
5000.	58.73	6	1.0	1.0	10000.0	0.00	0.
5500.	52.23	6	1.0	1.0	10000.0	0.00	1.
6000.	46.88	6	1.0	1.0	10000.0	0.00	0.
6500.	42.36	6	1.0	1.0	10000.0	0.00	1.
7000.	38.55	6	1.0	1.0	10000.0	0.00	1.
7500.	35.42	6	1.0	1.0	10000.0	0.00	0.
8000.	32.68	6	1.0	1.0	10000.0	0.00	1.
8500.	30.29	6	1.0	1.0	10000.0	0.00	1.
9000.	28.21	6	1.0	1.0	10000.0	0.00	1.
9500.	26.37	6	1.0	1.0	10000.0	0.00	0.
10000.	24.71	6	1.0	1.0	10000.0	0.00	1.
15000.	14.74	6	1.0	1.0	10000.0	0.00	1.
20000.	10.46	6	1.0	1.0	10000.0	0.00	0.
25000.	8.005	6	1.0	1.0	10000.0	0.00	0.
30000.	6.432	6	1.0	1.0	10000.0	0.00	0.
40000.	4.628	6	1.0	1.0	10000.0	0.00	0.
50000.	3.589	6	1.0	1.0	10000.0	0.00	0.

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:
 183. 2483. 6 1.0 1.0 10000.0 0.00 35.

 *** SUMMARY OF SCREEN MODEL RESULTS ***

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
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SIMPLE TERRAIN	2483.	183.	0.

02/20/03
09:28:31

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

Rose Hill Southern Portion

SIMPLE TERRAIN INPUTS:

SOURCE TYPE = AREA
EMISSION RATE (G/(S-M**2)) = 0.138890E-04
SOURCE HEIGHT (M) = 0.0000
LENGTH OF LARGER SIDE (M) = 300.0000
LENGTH OF SMALLER SIDE (M) = 240.0000
RECEPTOR HEIGHT (M) = 0.0000
URBAN/RURAL OPTION = RURAL

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

MODEL ESTIMATES DIRECTION TO MAX CONCENTRATION

BUOY. FLUX = 0.000 M**4/S**3; MOM. FLUX = 0.000 M**4/S**2.

*** FULL METEOROLOGY ***

*** SCREEN AUTOMATED DISTANCES ***

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	MAX DIR (DEG)
1.	1796.	6	1.0	1.0	10000.0	0.00	38.
100.	2033.	6	1.0	1.0	10000.0	0.00	38.
200.	1644.	6	1.0	1.0	10000.0	0.00	39.
300.	819.5	6	1.0	1.0	10000.0	0.00	38.
400.	605.2	6	1.0	1.0	10000.0	0.00	38.
500.	488.9	6	1.0	1.0	10000.0	0.00	37.
600.	412.9	6	1.0	1.0	10000.0	0.00	37.
700.	359.5	6	1.0	1.0	10000.0	0.00	36.
800.	320.0	6	1.0	1.0	10000.0	0.00	36.
900.	289.9	6	1.0	1.0	10000.0	0.00	35.
1000.	265.7	6	1.0	1.0	10000.0	0.00	35.
1100.	245.7	6	1.0	1.0	10000.0	0.00	34.
1200.	228.8	6	1.0	1.0	10000.0	0.00	33.
1300.	214.2	6	1.0	1.0	10000.0	0.00	32.
1400.	201.2	6	1.0	1.0	10000.0	0.00	31.
1500.	189.7	6	1.0	1.0	10000.0	0.00	31.
1600.	179.3	6	1.0	1.0	10000.0	0.00	30.
1700.	169.9	6	1.0	1.0	10000.0	0.00	29.
1800.	161.3	6	1.0	1.0	10000.0	0.00	27.
1900.	153.5	6	1.0	1.0	10000.0	0.00	26.
2000.	146.4	6	1.0	1.0	10000.0	0.00	25.
2100.	140.1	6	1.0	1.0	10000.0	0.00	22.
2200.	134.4	6	1.0	1.0	10000.0	0.00	21.

2300.	129.1	6	1.0	1.0	10000.0	0.00	19.
2400.	124.1	6	1.0	1.0	10000.0	0.00	18.
2500.	119.4	6	1.0	1.0	10000.0	0.00	14.
2600.	115.0	6	1.0	1.0	10000.0	0.00	12.
2700.	110.8	6	1.0	1.0	10000.0	0.00	11.
2800.	106.9	6	1.0	1.0	10000.0	0.00	2.
2900.	103.2	6	1.0	1.0	10000.0	0.00	0.
3000.	99.72	6	1.0	1.0	10000.0	0.00	0.
3500.	85.33	6	1.0	1.0	10000.0	0.00	0.
4000.	73.95	6	1.0	1.0	10000.0	0.00	0.
4500.	64.79	6	1.0	1.0	10000.0	0.00	0.
5000.	57.31	6	1.0	1.0	10000.0	0.00	0.
5500.	51.14	6	1.0	1.0	10000.0	0.00	0.
6000.	46.04	6	1.0	1.0	10000.0	0.00	0.
6500.	41.68	6	1.0	1.0	10000.0	0.00	0.
7000.	38.04	6	1.0	1.0	10000.0	0.00	0.
7500.	34.97	6	1.0	1.0	10000.0	0.00	0.
8000.	32.31	6	1.0	1.0	10000.0	0.00	0.
8500.	30.01	6	1.0	1.0	10000.0	0.00	0.
9000.	27.96	6	1.0	1.0	10000.0	0.00	0.
9500.	26.13	6	1.0	1.0	10000.0	0.00	0.
10000.	24.51	6	1.0	1.0	10000.0	0.00	0.
15000.	14.69	6	1.0	1.0	10000.0	0.00	0.
20000.	10.43	6	1.0	1.0	10000.0	0.00	0.
25000.	8.001	6	1.0	1.0	10000.0	0.00	0.
30000.	6.428	6	1.0	1.0	10000.0	0.00	0.
40000.	4.625	6	1.0	1.0	10000.0	0.00	0.
50000.	3.587	6	1.0	1.0	10000.0	0.00	0.

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:
 191. 2191. 6 1.0 1.0 10000.0 0.00 38.

 *** SUMMARY OF SCREEN MODEL RESULTS ***

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	2191.	191.	0.