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AIR QUALITY MODELING FINAL REPORT
ROSE HILL REGIONAL LANDFILL
SOUTH KINGSTOWN, RHODE ISLAND
AUGUST 1993

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1.0 INTRODUCTION

This report will compare the results of the revised air quality dispersion modeling of vinyl chloride and benzene emissions with the ambient air SUMMA canister sampling analysis for the Rose Hill Regional Landfill Site in South Kingstown, Rhode Island.

The objective of the modeling study was to determine the downwind dispersion of vinyl chloride and benzene from the 28 acre municipal solid waste landfill. A field study was conducted May 24 through 28, 1993 to determine the amount of vinyl chloride and benzene that is emitted from the site into the air. Flux samples were taken and analyzed on site to provide emission data. The results of the flux sample analysis were used in conjunction with the on-site meteorological data collected during the field investigation to model dispersion of vinyl chloride and benzene. The discrete receptors for this study include an arbitrary point located on the landfill and the inhabited buildings surrounding the site. The receptor locations provided in Figure 1 (Site Map) are indicated by their respective numbers.

SUMMA samples were also taken during the May 1993 field study to support and verify the modeling results and to determine if the ambient concentrations of vinyl chloride and benzene surrounding the landfill are above background concentrations. SUMMA sampling locations are located at the receptors labeled A through G.

2.0 METHODOLOGY

The analysis of air quality was performed using several methods. A systematic sampling procedure was devised in order to measure emissions from the landfill. The site was divided into 100 x 100 foot (ft) grid squares. Random flux emission samples were taken within the grid system to provide an estimate of the overall emissions from the site. Random samples were used to describe the emissions from two - 840 x 840 ft sources (termed the large area sources in this document) and one 100 x 50 ft source. Then, the site was swept for specific venting areas caused by cracks in the soil cap (termed hotspots in this document) using Foxboro™ Organic Vapor Analyzers (OVAs). A source was categorized as a hotspot when the OVA detected organic vapors at concentrations greater than 1000 parts per million above background at the surface of the source. The locations were flagged and recorded on the site map for later sampling. Flux emission measurements were then taken at the hotspot locations. These samples were analyzed on site using a Sentex™ Scentograph field portable Gas Chromatograph (GC) and a SCIEX™ Trace Atmospheric Gas Analyzer (TAGA). The results of the analysis were used to represent the emissions of benzene and vinyl chloride in the air quality dispersion model. The Sentex™ GC results are provided in Appendix A and the TAGA results are provided in Appendix B.

2.1 Emission Rate Determination

The flux sampling procedure uses a volume of pure air adjusted to a known flow rate to purge a stainless-steel flux chamber which is placed on the ground. When a sample is drawn, it contains the pure air along with whatever constituents are emitted through the soil. The samples are then analyzed to determine the concentration of the constituents of interest (in this study vinyl chloride and benzene).

The flux rates of contaminants from the ground are determined by performing a mass balance over the flux chamber volume, assuming that the volume of air in the flux chamber is well mixed;

$$QC_0 - QC + N_A A = 0$$

where:

A	=	area of the flux chamber (0.129 square meters [m^2])
Q	=	volumetric flow rate of the sweep gas (3.33×10^{-5} cubic meters per second [m^3/s])
N_A	=	contaminant flux rate (micrograms per square meter-second [$\mu g/m^2$-s])
C_0	=	concentration of the contaminant in the sweep air entering the flux chamber (micrograms per cubic meter [$\mu g/m^3$])
C	=	concentration of the contaminant in the air leaving the flux chamber ($\mu g/m^3$)

Since the sweep gas is initially pure, the concentration of the contaminants entering the flux chamber (C_0) is zero. The concentration of the constituents in the effluent gas is determined by analysis using field instrumentation as described earlier.

The flux rate of constituents emitted from the ground is determined by the following:

$$N_A = \frac{Q\,C}{A}$$

Substituting the specific values for the flux chamber area (0.129 m^2) and sweep gas volumetric flow rate (3.33×10^{-5} m^3/sec), the flux rate is determined by:

$$N_A \left(\frac{\mu g}{m^2\text{-}s}\right) = 2.58 \times 10^{-4} \left(\frac{m}{s}\right)\ C \left(\frac{\mu g}{m^3}\right)$$

In order to characterize the differences in emissions across the surface of the landfill, individual discrete sources must be documented. There were a total of 52 vinyl chloride and 29 benzene sources. Individual sources were identified when the source strength at any of the hotspot locations exceeded that of the value determined for the large area source. Figure 2 sites the vinyl chloride hotspot locations and illustrates the relative strengths of each source through color coding (through symbols for the black and white copies). The large area source included the entire solid waste area. The rectangle in the northwest section represents the area emissions from a 100 x 50 ft source which was determined to emit vinyl chloride at 4.4 times (and benzene at 3.0 times) the rate of the larger area sources.

The actual emission rate determined for the large area source was 1.45×10^{-3} $\mu g/m^2$-s and was calculated by using the 95% upper confidence limit (UCL) of the flux results taken from the random grid samples. Since the hotspot locations were on the area already identified by the large area sources, their emission rate was described as a rate above the large area sources (i.e.; Flux rate - 1.45×10^{-3} $\mu g/m^2$-s). The highest vinyl chloride emission rate for the hotspots, 1.36 $\mu g/m^2$-s, was found at source #30. Table 1 displays the vinyl chloride emission rates and area size for the source locations cited in Figure 2. Figure 3 illustrates the strength of the benzene hotspots in a manner similar to Figure 2. The benzene emission rate calculated for the large area source was 8.44×10^{-4} $\mu g/m^2$-s (also the 95% UCL). The highest emitting hotspot for benzene was found at source #14 and emitted at a rate of 1.29×10^{-2} $\mu g/m^2$-s (above the emissions of the large area source). Table 2 displays the benzene emission rates for the source locations cited in Figure 3.

2.2 Air Quality Dispersion Modeling

The Point, Area, and Line (PAL) dispersion model was designed to estimate the air quality impact of gas-phase emissions on environments with simple terrain. The model provides hourly concentrations at receptors of interest. It computes downwind concentrations using specific meteorological conditions, namely: wind speed, wind direction, stability classification, and mixing height. The PAL model was selected for this study for numerous reasons, including its ability to simulate rectangular area sources of varying length and width dimensions. In addition, the PAL model may be used to calculate ambient air concentrations for receptors located directly above the source. This option resolves problems with graphing concentrations surrounding a large area source (due to boundary conditions).

The modeling for this project was set up to maximize the rectangular dimensions within the area, such that the site was rotated 13.25° clockwise. Meteorological data was altered to compensate for this convention. The entire landfill area is then represented by two large rectangular areas which accounted for the emission rates from the northern and southern sections of the landfill.

The PAL model was set up to calculate dispersion estimates from the 2 large area sources, the 100 x 50 ft northwestern area source, and the 49 smaller vinyl chloride and 26 smaller benzene hotspot sources. The PAL model predicts receptor concentrations in grams per cubic meter for emission rates given in grams per second per square meter. Since the emission values were so small, they were adjusted to retain significant digits. In this adjustment procedure, the large area source was unitized and all other emission points were factors of that large source. The actual emission rates from the sources (in $\mu g/m^2$-s) may be obtained by multiplying by 1.45×10^{-3} for vinyl chloride and by 8.44×10^{-4} for benzene. These values correspond to the actual emission rates for the large area sources (as given in Tables 1 and 2).

The 8- and 24-hour SUMMA canister sampling locations were used as receptors in the model. All model runs were performed in rural mode with the meteorological data described in Section 2.3.

Regulatory screening procedures require an examination of a range of stability classes and wind speeds to identify the "worst case" meteorological conditions. For this modeling procedure, the wind speed and stability class combinations preselected by SCREEN were utilized.[1] The "worst case" condition is the combination of wind speed and stability that results in the maximum ground level concentrations. This value reflects the maximum hourly concentration expected at each receptor. The maximum hourly value is then factored to provide concentrations over longer averaging periods. The U.S EPA's guidance for screening modeling procedures[1] does not provide a factor for converting 1-hour to annual average concentrations, but there have been some values recommended as a result of extensive studies. Air/Superfund[2] suggests a 1-hr to annual concentration conversion factor of 0.025 for point sources. The U.S. EPA recommends a maximum 1-hour to maximum annual conversion factor of 0.08 for both point and area sources within its procedures for assessing risks.[3] This value is supported by recent studies,[4] researching the dispersion from point sources that undergo initial mixing, which have reported values within the range of 0.06 - 0.10. A 0.10 conversion factor was used in this study - being on the upper end of the range of the values published, it produces the most conservative results.

2.3 Meteorological Data

The meteorological data used in the modeling study was collected during the on-site sampling activities of May 24 through 28, 1993. Additional meteorological data was retrieved from the Providence, RI National Weather Service (NWS) during the sampling period.

The on-site data was collected at five-minute intervals which were used to calculate the hourly averages required as inputs to the model. Stability parameters were calculated with the lateral turbulence and wind speed method[5] using the five-minute intervals at which data was collected. Pasquill-Gifford stability classes were derived from the 3-meter on-site meteorological tower. Specifically, horizontal wind speed and wind direction plus the standard deviation of the horizontal wind direction, or sigma theta, were used. The on-site meteorological data guidance document contains a table which categorizes initial stability classes based on sigma theta.[5] This guidance also states that these categories need to be adjusted if the surface roughness is greater than 15 cm. For surface roughnesses less that 15 cm the document questions the validity of this adjustment. Surface roughness estimates suggests values ranging from 4 cm to 10 cm for high grass and values of 10 cm to 30 cm for palmetto.[6] For this site, a surface roughness of 15 cm was chosen because it contained tall grass and wild rose bushes. The categories for stability class are based on a 10-meter meteorological tower. Therefore an adjustment down to 3-meters was required.[5] These initial estimates would be further refined based on wind speed and time of day.

Wind direction and speed did not vary much during the first 24-hour period - with the wind speeds remaining well within the range of the anemometer's sensitivity. Seven hours (5/26/93, 0200 - 0900) of data were lost during the second 24-hour sampling period. During the third 24-hour sampling period there were 11-consecutive hours where calm conditions were reported. For these periods, the wind speed was set to 1 m/s and the wind direction to 326° (the last recorded direction which did not have a calm reading). Hourly summaries for the three 24-hour sampling periods collected on site and at the Providence, RI NWS are provided in Appendix C.

Wind roses for the 8- and 24-hour sampling periods are provided in Appendix D. They illustrate the direction in which the wind originated during each of the sampling events.

2.4 SUMMA Samples

SUMMA samples were taken at 8- and 24-hour intervals following the procedures described in the U.S. Environmental Protection Agency (U.S. EPA) Compendium Method TO-14.[7] The method is based on the collection of whole air samples in pre-evacuated 6-liter SUMMA passivated stainless steel canisters attached to an Anderson sampling pump. The samples were collected at a flow rate of approximately 7 cubic centimeters per minute for a 24-hour sampling period. This provided a total sample volume of approximately 10 liters. At the end of the sampling period, the canister valve was closed, the pump shut off, and an identification tag was attached to the canister.

Six 8-hour SUMMA canister samples were collected for each of the 3 sampling periods. Air sampling locations were selected by the U.S. EPA's Environmental Response Team (U.S. EPA/ERT) Work Assignment Manager. Samples were drawn at a rate of 750 milliliters per hour over an 8-hour period. The sampling rate was regulated as per the sampling procedure outlined in U.S EPA/ERT/REAC Standard Operating Procedure #1704, "Summa Canister Sampling."

The canisters were then returned to the U.S. EPA/ERT Technical Assistance Team (TAT) where the samples were analyzed for vinyl chloride, benzene, and other VOCs. The results of the analysis are provided in Appendix E.

2.5 Source Adjustment

The concentrations predicted by the dispersion models were adjusted according to the relationship between the results obtained at the on-site receptor (receptor #12) and that analyzed from the on-site SUMMA samples. The adjustment factor was determined by the ratio of the analyzed to the predicted ambient benzene concentration. Each predicted concentration was then multiplied by this factor (38.74). The values were adjusted because it was believed that the majority of the benzene in the ambient air, one meter above the landfill, was contributed by the landfill. No adjustment was used for the vinyl chloride predictions due to the lack of detectable concentrations at the on-site sampling location.

3.0 RESULTS

The PAL modeling and the SUMMA analytical results are presented in Tables 3 through 6. The receptors are referenced by their numbers, which are located on the site map.

The average concentrations for each sampling period are reported on a daily basis. Table 3 summarizes the 8-hour vinyl chloride concentrations measured and predicted for the receptors. Table 4 summarizes the 8-hour benzene concentrations. Model outputs corresponding to the 8-hour SUMMA samples are provided in Appendix F. The average benzene concentration predicted at receptor #12 was 0.0220 $\mu g/m^3$ and the average concentration recovered from the SUMMA samples taken at receptor #12 was 0.852 $\mu g/m^3$. All of the predicted concentrations were adjusted (multiplied by 38.74) to compensate for the above mentioned discrepancies and summarized in Table 5. Table 6 and 7 summarize the 24-hour measured and predicted vinyl chloride and benzene concentrations determined for each of the receptors. Model outputs corresponding to the 24-hour SUMMA samples are provided in Appendix G. Table 8 summarizes the adjusted 24-hour benzene concentrations.

As mentioned earlier, the emission values were multiplied by factors to retain significant values and therefore the results reported in the output files are not in g/m^3 but in units determined by scaling the emission rates relative to those of the large area source. Therefore, the actual predicted concentrations may be determined by multiplying the model output by 1.45×10^{-9} for vinyl chloride and by 8.44×10^{-10} for benzene (for units of g/m^3). Concentrations predicted at the on-site receptor were higher than all others. A summary of the off-site concentrations predicted for the 8- and 24-hour sampling periods is provided below.

Maximum Off-Site Concentrations

Vinyl chloride	8-hour	0.0116 $\mu g/m^3$	Receptor #9
	24-hour	0.0167 $\mu g/m^3$	Receptor #11
Benzene (adjusted)	8-hour	0.0068 (0.263) $\mu g/m^3$	Receptor #9
	24-hour	0.0093 (0.360) $\mu g/m^3$	Receptor #11

Tables 9 and 10 summarize the predicted average annual concentrations for vinyl chloride and benzene, respectively. The predicted values are obtained via the method described earlier. Table 11

summarizes the predicted annual concentrations determined using the adjusted benzene values. All concentrations are reported in $\mu g/m^3$ for the dates and times indicated. Annual values were also predicted for grid-point receptors surrounding the site. These values were smoothed using a krigging technique so that gradients may be illustrated. Figure 4 illustrates the annual concentration isopleths for vinyl chloride and Figure 5 illustrates the concentration isopleths for benzene. The isopleths do not provide a good estimate of the concentrations at a specific locale due to the smoothing techniques, but they do provide a good estimate of the concentration gradient near the landfill. The model output files used to determine the average annual concentrations are provided in Appendix H.

4.0 DISCUSSION OF RESULTS

In the absence of quantifiable ambient air concentrations of vinyl chloride, conclusions can not be drawn regarding the effectiveness of defining the source term within the modeling procedure. Instead, a discussion of the results which provides possible causes for the differences between the measured and predicted values is provided.

The 24-hour concentrations predicted by the model were (most often) larger than those predicted for the 8-hour periods. The SUMMA results did not echo this effect -possibly due to the low levels of vinyl chloride.

Many of the SUMMA analyses indicated vinyl chloride concentrations below the detection limit of the analytical methods used. Those samples for which vinyl chloride was detected had quantities that were below the quantitation limit. SUMMA samples analyzed at receptor #8 were above the detection limit more often than the samples taken at other receptors.

The largest concentration of vinyl chloride detected was 4.09 $\mu g/m^3$, sampled at receptor #8. This value occurred during the 24-hour period with the largest frequency of flows from the north. A concentration of 7.31×10^{-6} $\mu g/m^3$ was predicted for this location during this time period. This also was the highest predicted value for this receptor. The higher concentrations were predicted for this sampling period because of the large frequency of northerly winds. The predicted concentrations were not much higher than those predicted for the second period due to calm conditions occurring 41.7% of the time. Actual wind directions during this period of calms were set to 326° to comply with regulatory procedures. Used in the model, this would simulate a situation where the receptor was upwind for the calm periods thus producing predicted values very close to zero. Therefore, the average concentration predicted for this time period was greatly reduced.

The benzene results, between the model and the SUMMA analyses had even larger discrepancies than those for vinyl chloride. The 8-hour concentrations predicted and measured were both lower than those of vinyl chloride; this may imply that there is a source/receptor relationship. However, the benzene concentrations differed greatly among the 24-hour sampling periods which makes it difficult to compare relationships of the source and receptors. In addition, SUMMA canisters located at the off-site receptors often had a larger quantity of benzene than those located directly above the landfill. This suggests that there are additional sources of benzene which are at least as significant as the landfill. The phenomena realized at receptor #8 for escalated levels of vinyl chloride were also evident in the benzene measurements. However, the samples also revealed escalated values of benzene for receptor #6 during the same time period. This receptor being located to the west of the source should have received very little ambient benzene contributions from the landfill because receptor #6 was not downwind of the source during this period.

The predicted benzene concentrations were adjusted for the purposes of estimating the possible contributions of benzene from the landfill to the ambient air concentrations near the residences. The validity of such a comparison may be challenged on the grounds that the analyses of benzene was below the quantification limit and the benzene detected on site may not be due to the emissions from the landfill.

REFERENCES

1. Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, PB89-159396, U.S. Environmental Protection Agency, Research Triangle Park, NC, 1988.

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6. E. Simiu and R.H. Scanlan, Wind Effect on Structures, John Wiley & Sons, Inc., New York, NY, 1986

7. W.T. Winberry, Jr., N.T. Murphy, and R.M. Riggan, The Determination of VOCs in Ambient Air Using SUMMA Passivated Canister Sampling and Gas Chromatographic Analysis, Methods for Determination of Toxic Organic Compounds in Air: EPA Methods, Noyes Data Corporation, Park Ridge, NJ, June 1988.

Tables

TABLE 1
Vinyl Chloride Emission Rates ($\mu g/m^2$-s)
Air Quality Modeling Final Report
Rose Hill Regional Landfill
August 1993

Source ID	Source Area (m^2)	Emission Rate
North	46745.43	0.001454
South	46745.43	0.001454
Northwest	463.6	0.004903
1	1	0.004114
2	1	0.008184
3	9	0.004903
4	0.25	0.008184
5	1	0.008184
6	4	0.003889
7	1	0.008184
8	1	0.004971
9	1	0.004904
10	0.5	0.008184
11	1	0.012118
12	4	0.008184
13	0.06	0.208186
14	2	0.024771
15	4	0.208186
16	2	0.007861
17	6	0.002957
18	3	0.002310
19	1	0.008184
20	1	0.002428
21	0.9	0.008184
22	0.6	0.004255

Source ID = Source Identifier
North = Northern Half of the Landfill
South = Southern Half of the Landfill
Northwest = 100 x 50 foot Source Located in the Northwestern Portion of the Landfill

TABLE 1 (CONTINUED)
Vinyl Chloride Emission Rates ($\mu g/m^2$-s)
Air Quality Modeling Final Report
Rose Hill Regional Landfill
August 1993

Source I.D.	Source Area (m^2)	Emission Rate
23	2	0.008184
24	0.6	0.008184
25	2	0.008184
26	1	0.002310
27	3	0.008184
28	4	0.008184
29	1	0.004030
30	1	1.359379
31	0.6	0.002451
32	0.8	0.041154
33	0.8	0.009292
34	2	0.085365
35	2.6	0.003315
36	0.6	0.054664
37	0.6	0.002224
38	1	0.015782
39	1	0.271590
40	1.2	0.003889
41	1.2	0.002733
42	1.2	0.002456
43	0.4	0.003373
44	0.4	0.001718
45	0.06	0.298173
46	0.06	0.234127
47	2.1	0.008184
48	3	0.008184
49	4	0.008184

Source ID = Source Identifier
North = Northern Half of the Landfill
South = Southern Half of the Landfill
Northwest = 100 x 50 foot Source Located in the Northwestern Portion of the Landfill

TABLE 2
Benzene Emission Rates ($\mu g/m^2$-s)
Air Quality Modeling Final Report
Rose Hill Regional Landfill
August 1993

Source I.D.	Source Area (m^2)	Emission Rate
North	46745.43	0.000844
South	46745.43	0.000844
Northwest	463.6	0.001656
1	1	0.000844
2	1	0.005120
3	9	0.005120
4	0.25	0.005120
5	1	0.005120
6	1	0.005120
7	1	0.003802
8	1	0.005120
9	0.5	0.005120
10	1	0.005120
11	40	0.005120
12	2	0.001884
13	0.06	0.001732
14	4	0.012970
15	2	0.003641
16	6	0.002636
17	0.6	0.002298
18	0.8	0.003540
19	2	0.002484
20	2.6	0.001656
21	0.6	0.003641
22	0.6	0.001732
23	1	0.001394
24	1.2	0.001985
25	0.06	0.005610
26	0.06	0.001985

Source ID = Source Identifier
North = Northern Half of the Landfill
South = Southern Half of the Landfill
Northwest = 100 x 50 foot Source Located in the Northwestern Portion of the Landfill

TABLE 3
8-Hour Vinyl Chloride Concentrations ($\mu g/m^3$)
Air Quality Modeling Final Report
Rose Hill Regional Landfill
August 1993

	Period 1		Period 2		Period 3	
Receptor	Predicted	Measured	Predicted	Measured	Predicted	Measured
1	2.42E-04	2.81 U	0	3.32 U	4.72E-03	3.32 U
2	0	-	0	-	0	-
3	0	-	0	-	0	-
4	0	-	0	-	0	-
5	0	3.32 U	0	-	0	-
6	0	3.32 U	1.46E-08	3.32 U	0	3.32 U
7	0	-	8.49E-09	-	0	-
8	0	-	6.95E-06	4.35 U	8.27E-07	3.32 U
9	1.16E-02	-	5.77E-04	3.32 U	9.53E-03	3.32 U
10	7.02E-03	-	1.45E-04	-	2.41E-03	-
11	8.84E-06	3.32 U	4.07E-03	3.32 U	5.01E-03	3.32 U
12	3.54E-02	3.58 U	2.74E-02	2.81 U	5.21E-02	3.32 U

U = Not detected at the detection limit
Period 1 = The period ending 2300 05/24/93
Period 2 = The period ending 2000 05/26/93
Period 3 = The period ending 1400 05/27/93
- = There is no sampling data available for these receptors

TABLE 4
8-Hour Benzene Concentrations ($\mu g/m^3$)
Air Quality Modeling Final Report
Rose Hill Regional Landfill
August 1993

	Period 1		Period 2		Period 3	
Receptor	Predicted	Measured	Predicted	Measured	Predicted	Measured
1	1.36E-04	0.959 J	0	0.959 J	2.75E-03	4.16 J
2	0	-	0	-	0	-
3	0	-	0	-	0	-
4	0	-	0	-	0	-
5	0	0.639 J	0	-	0	-
6	0	0.959 J	8.46E-09	0.639 J	0	1.92 J
7	0	-	4.92E-09	-	0	-
8	0	-	3.94E-06	1.28 J	4.72E-07	1.28 J
9	6.82E-03	-	3.19E-04	0.959 J	5.38E-03	0.959 J
10	4.10E-03	-	7.87E-05	-	1.29E-03	-
11	5.13E-06	1.92 J	2.31E-03	0.639 J	2.90E-03	0.639 J
12	2.04E-02	0.959 J	1.58E-02	0.959 J	2.99E-02	0.639 J

J = Detected below the quantitation limit
Period 1 = The period ending 2300 05/24/93
Period 2 = The period ending 2000 05/26/93
Period 3 = The period ending 1400 05/27/93
- = There is no sampling data available for these receptors

TABLE 5
Adjusted 8-Hour Benzene Concentrations ($\mu g/m^3$)
Air Quality Modeling Final Report
Rose Hill Regional Landfill
August 1993

	Period 1		Period 2		Period 3	
Receptor	Predicted	Measured	Predicted	Measured	Predicted	Measured
1	5.27E-03	0.959 J	0	0.959 J	0.107	4.16 J
2	0	-	0	-	0	-
3	0	-	0	-	0	-
4	0	-	0	-	0	-
5	0	0.639 J	0	-	0	-
6	0	0.959 J	3.28E-07	0.639 J	0	1.92 J
7	0	-	1.91E-07	-	0	-
8	0	-	1.53E-04	1.28 J	1.83E-05	1.28 J
9	0.264	-	0.0124	0.959 J	0.208	0.959 J
10	1.59E-02	-	3.05E-03	-	0.0500	-
11	1.99E-04	1.92 J	0.0895	0.639 J	0.112	0.639 J
12	1.61	0.959 J	0.612	0.959 J	1.16	0.639 J

J = Detected below the quantitation limit
Period 1 = The period ending 2300 05/24/93
Period 2 = The period ending 2000 05/26/93
Period 3 = The period ending 1400 05/27/93
- = There is no sampling data available for these receptors

TABLE 6
24-Hour Vinyl Chloride Concentrations ($\mu g/m^3$)
Air Quality Modeling Final Report
Rose Hill Regional Landfill
August 1993

	Period 1		Period 2		Period 3	
Receptor	Predicted	Measured	Predicted	Measured	Predicted	Measured
1	1.45E-05	2.56 U	1.36E-06	2.56 U	0	1.02 J
2	0	-	0	-	0	-
3	0	-	0	-	0	-
4	0	-	0	-	0	-
5	0	-	0	-	0	-
6	0	6.13 U	8.58E-09	2.56 U	1.76E-08	3.58 J
7	0	-	5.00E-09	-	1.42E-08	-
8	0	1.53 J	2.36E-06	1.53 J	7.31E-06	4.09 J
9	1.25E-02	2.56 U	1.26E-02	2.56 U	9.23E-05	2.04 J
10	7.76E-03	-	7.87E-03	-	1.66E-05	-
11	2.02E-05	-	2.08E-03	-	1.67E-02	-
12	3.73E-02	-	4.97E-02	-	8.54E-02	-

U = Not detected at the detection limit
J = Detected below the quantitation limit
Period 1 = The period ending 1500 05/25/93
Period 2 = The period ending 1700 05/26/93
Period 3 = The period ending 1800 05/27/93
- = There is no sampling data available for these receptors

TABLE 7
24-Hour Benzene Concentrations ($\mu g/m^3$)
Air Quality Modeling Final Report
Rose Hill Regional Landfill
August 1993

	Period 1		Period 2		Period 3	
Receptor	Predicted	Measured	Predicted	Measured	Predicted	Measured
1	5.63E-06	0.639 J	5.69E-07	31.0	0	6.08
2	0	-	0	-	0	-
3	0	-	0	-	0	-
4	0	-	0	-	0	-
5	0	-	0	-	0	-
6	0	0.959 J	4.98E-09	0.639 J	1.02E-08	74.8
7	0	-	2.89E-09	-	8.26E-09	-
8	0	0.639 J	1.34E-06	0.639 J	4.10E-06	12.8
9	7.32E-03	0.639 J	7.30E-03	6.71	5.14E-05	2.88 J
10	4.54E-03	-	4.65E-03	-	8.98E-06	-
11	1.17E-05	-	1.18E-03	-	9.34E-03	-
12	2.15E-02	-	2.87E-02	-	4.95E-02	-

J = Detected below the quantitation limit
Period 1 = The period ending 1500 05/25/93
Period 2 = The period ending 1700 05/26/93
Period 3 = The period ending 1800 05/27/93
- = There is no sampling data available for those receptors

TABLE 8
Adjusted 24-Hour Benzene Concentrations ($\mu g/m^3$)
Air Quality Modeling Final Report
Rose Hill Regional Landfill
August 1993

	Period 1		Period 2		Period 3	
Receptor	Predicted	Measured	Predicted	Measured	Predicted	Measured
1	2.18E-04	0.639 J	2.20E-05	31.0	0	6.08
2	0	-	0	-	0	-
3	0	-	0	-	0	-
4	0	-	0	-	0	-
5	0	-	0	-	0	-
6	0	0.959 J	1.92E-07	0.639 J	3.95E-07	74.8
7	0	-	1.12E-07	-	3.20E-07	-
8	0	0.639 J	5.19E-05	0.639 J	1.59E-04	12.8
9	0.284	0.639 J	0.283	6.71	1.99E-03	2.88 J
10	0.176	-	0.180	-	3.48E-04	-
11	4.53E-04	-	0.0457	-	0.362	-
12	0.833	-	1.11	-	1.92	-

J = Detected below the quantitation limit
Period 1 = The period ending 1500 05/25/93
Period 2 = The period ending 1700 05/26/93
Period 3 = The period ending 1800 05/27/93
- = There is no sampling data available for those receptors

TABLE 9
Predicted Average Annual
Vinyl Chloride Concentrations ($\mu g/m^3$)
Air Quality Modeling Final Report
Rose Hill Regional Landfill
August 1993

Receptor	Concentration
1	0.0163
2	0.0094
3	0.0090
4	0.0064
5	0.0182
6	0.0099
7	0.0094
8	0.0081
9	0.0071
10	0.0045
11	0.0050
12	0.0220

TABLE 10
Predicted Average Annual
Benzene Concentrations ($\mu g/m^3$)
Air Quality Modeling Final Report
Rose Hill Regional Landfill
August 1993

Receptor	Concentration
1	0.0094
2	0.0054
3	0.0039
4	0.0036
5	0.0049
6	0.0057
7	0.0048
8	0.0045
9	0.0045
10	0.0026
11	0.0027
12	0.0128

TABLE 11
Predicted Average Annual
Benzene Concentrations ($\mu g/m^3$)
Using the Adjusted Benzene Values
Air Quality Modeling Final Report
Rose Hill Regional Landfill
August 1993

Receptor	Concentration
1	0.364
2	0.209
3	0.151
4	0.139
5	0.190
6	0.221
7	0.186
8	0.174
9	0.174
10	0.101
11	0.105
12	0.496

Figures

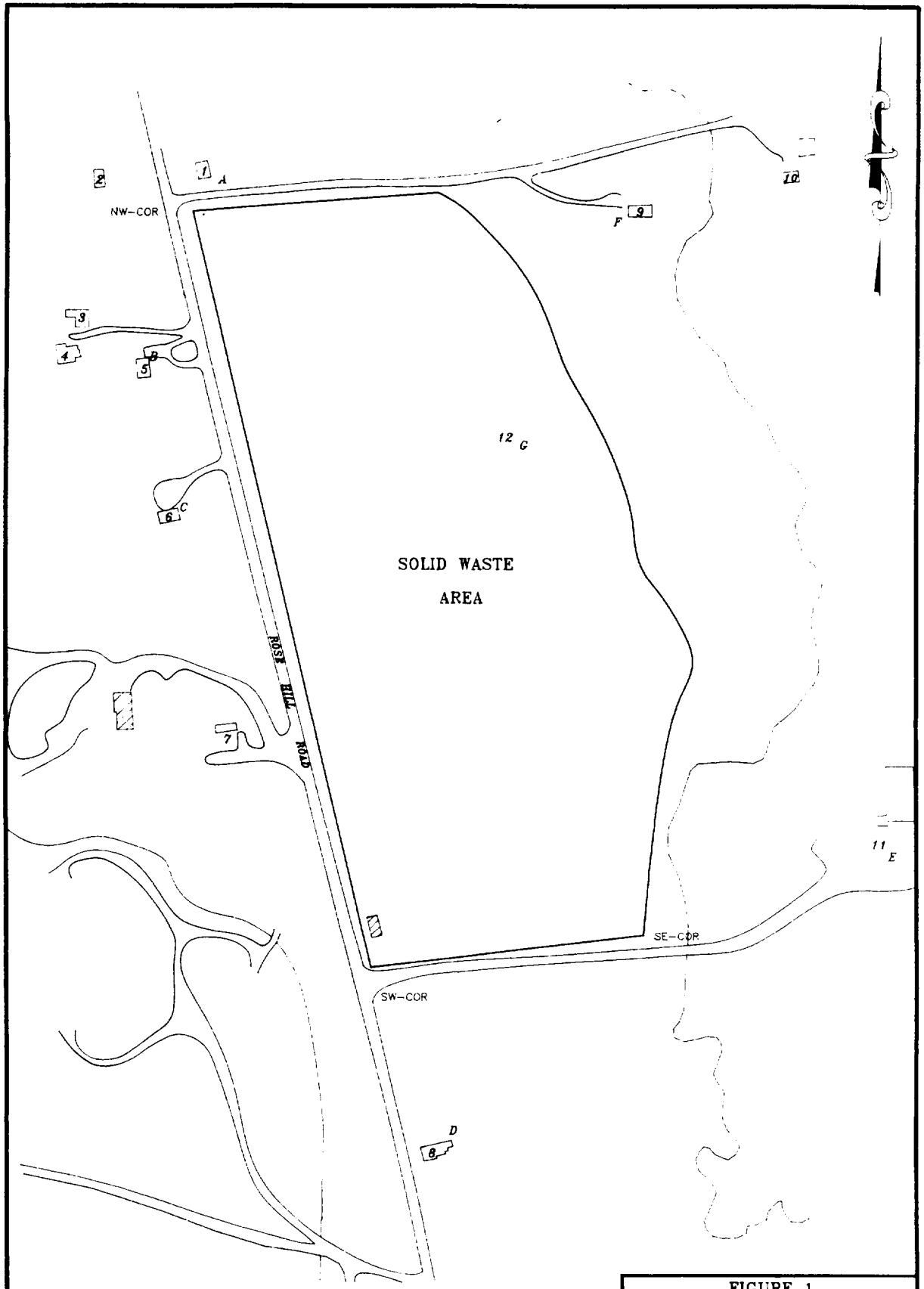
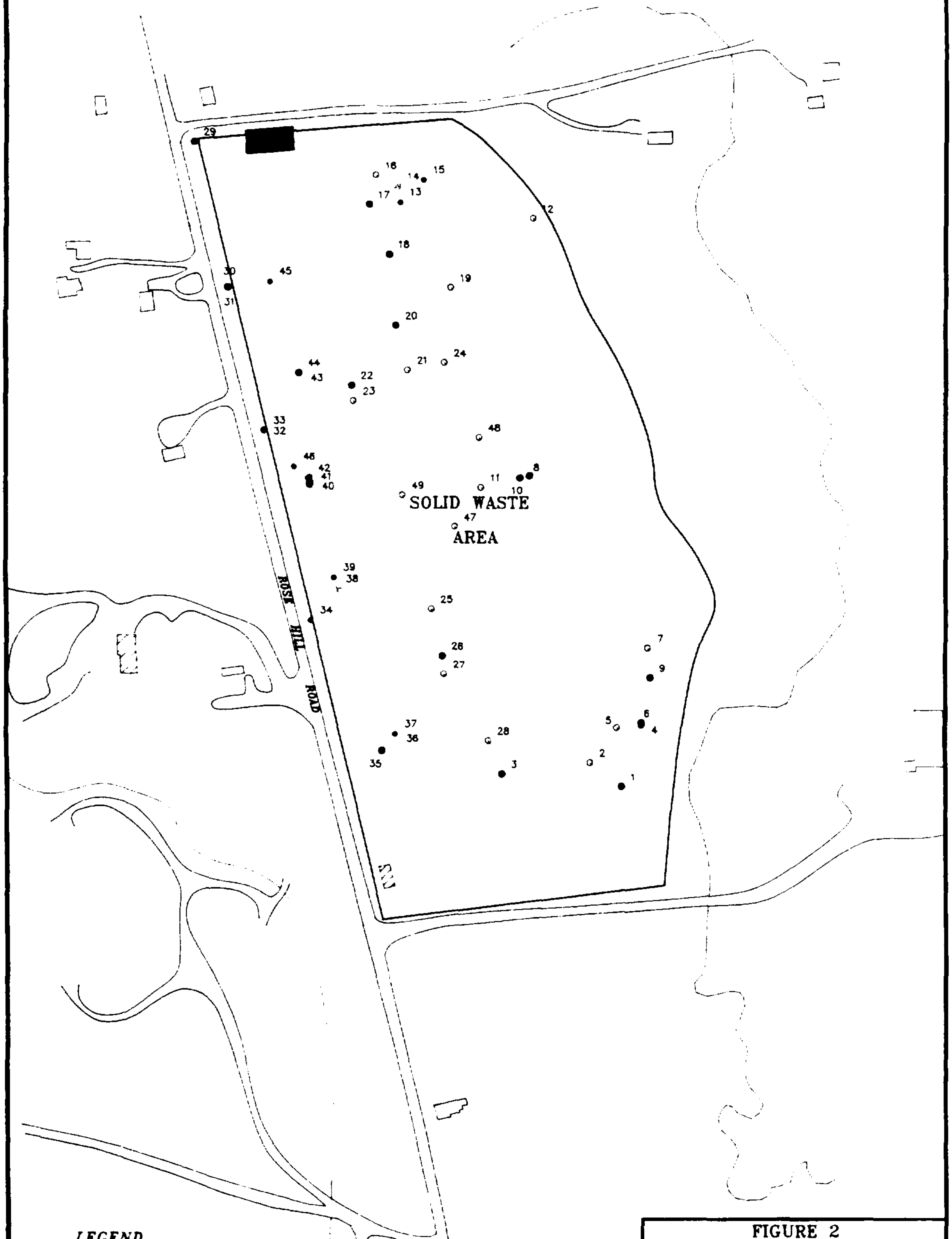


FIGURE 1
SITE MAP
ROSE HILL REGIONAL LANDFILL
SOUTH KINGSTOWN, RI
MAY 1993

U.S. EPA ENVIRONMENTAL RESPONSE TEAM
RESPONSE ENGINEERING AND ANALYTICAL CONTRACT
68-03-3482
V.O.# 02347-034-001-7694-01



LEGEND

- ● < 5X AREA SOURCE EMISSIONS
- ○ < 10X AREA SOURCE EMISSIONS
- · < 20X AREA SOURCE EMISSIONS
- • > 20X AREA SOURCE EMISSIONS
- ■ NORTHWESTERN SOURCE

GRAPHIC SCALE

200 0 100 200 400

(IN FEET)
1 inch = 200 ft.

FIGURE 2
VINYL CHLORIDE HOTSPOT
EMISSION LOCATIONS
ROSE HILL REGIONAL LANDFILL
SOUTH KINGSTOWN, RI
MAY 1993

U.S. EPA ENVIRONMENTAL RESPONSE TEAM
RESPONSE ENGINEERING AND ANALYTICAL CONTRACT
68-03-3482
V.O.# 03347-034-081-5694-01

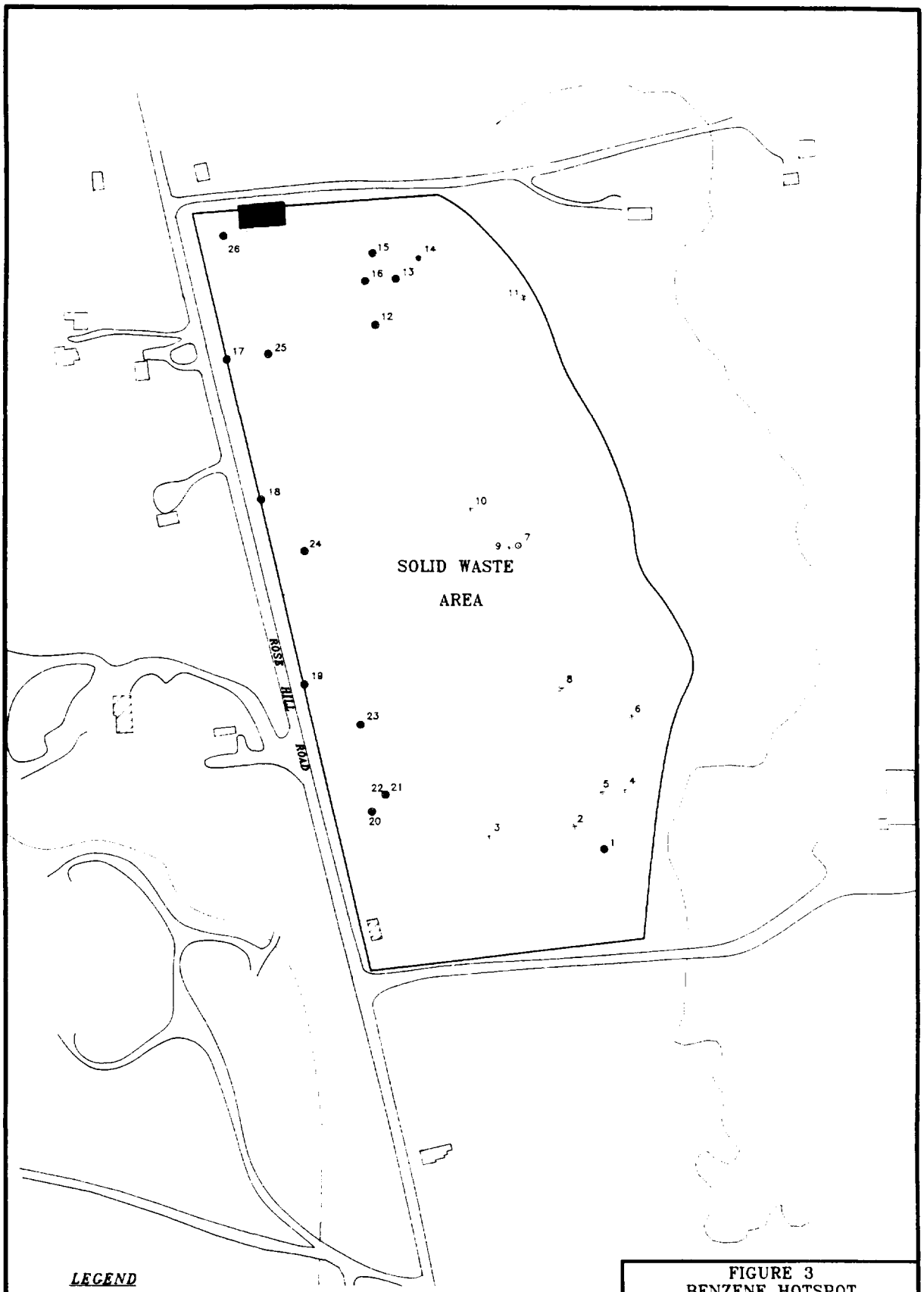


FIGURE 3
BENZENE HOTSPOT
EMISSION LOCATIONS
ROSE HILL REGIONAL LANDFILL
SOUTH KINGSTOWN, RI
MAY 1993

U.S. EPA ENVIRONMENTAL RESPONSE TEAM
RESPONSE ENGINEERING AND ANALYTICAL CONTRACT
68-03-3482
W.A.# 02347-024-001-3694-01

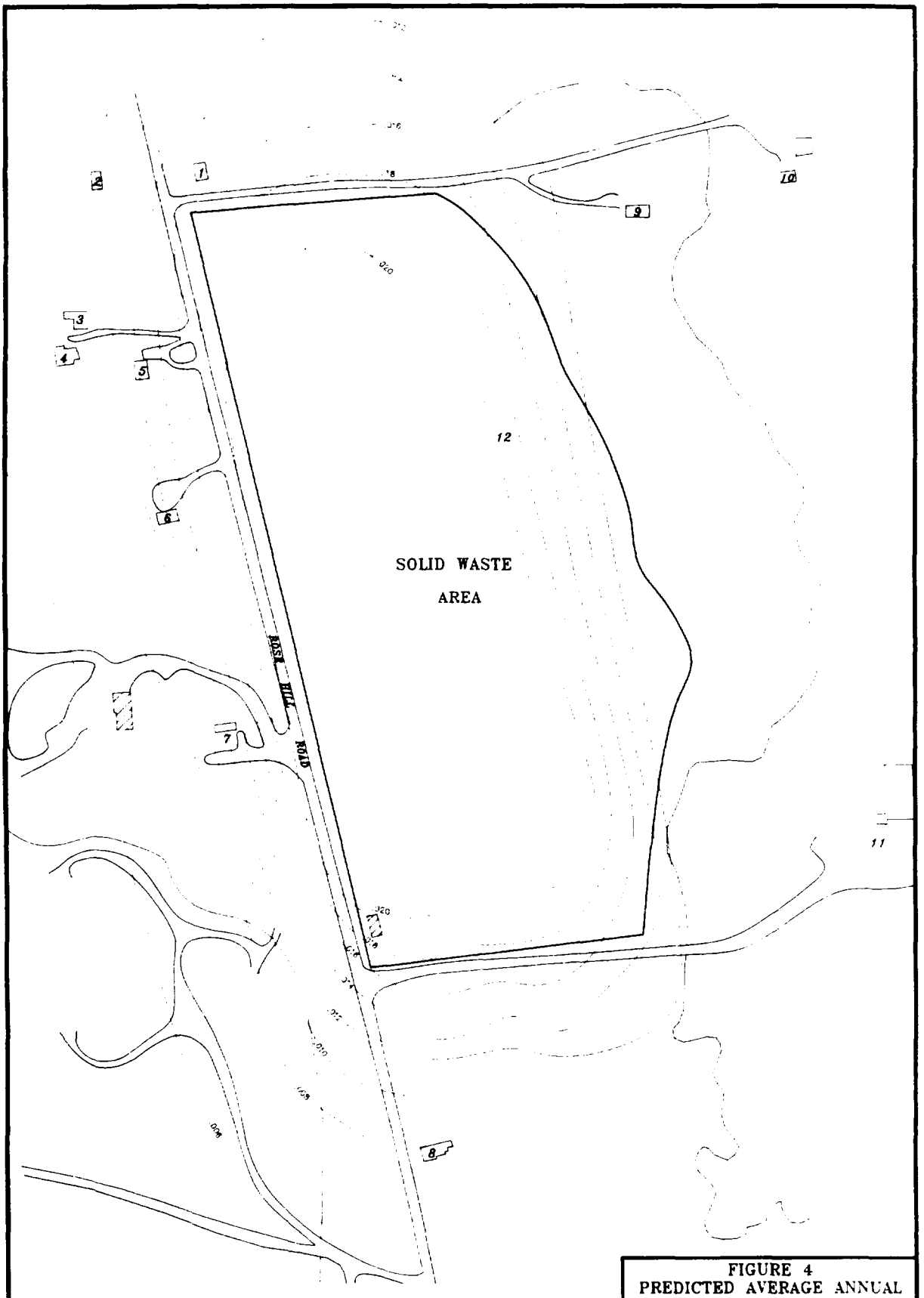


FIGURE 4
PREDICTED AVERAGE ANNUAL
VINYL CHLORIDE CONCENTRATIONS (ug/m^3)
ROSE HILL REGIONAL LANDFILL
SOUTH KINGSTOWN, RI
MAY 1993

U.S. EPA ENVIRONMENTAL RESPONSE TEAM
RESPONSE ENGINEERING AND ANALYTICAL CONTRACT
68-03-3482
W.A.# 03347-634-001-3694-01

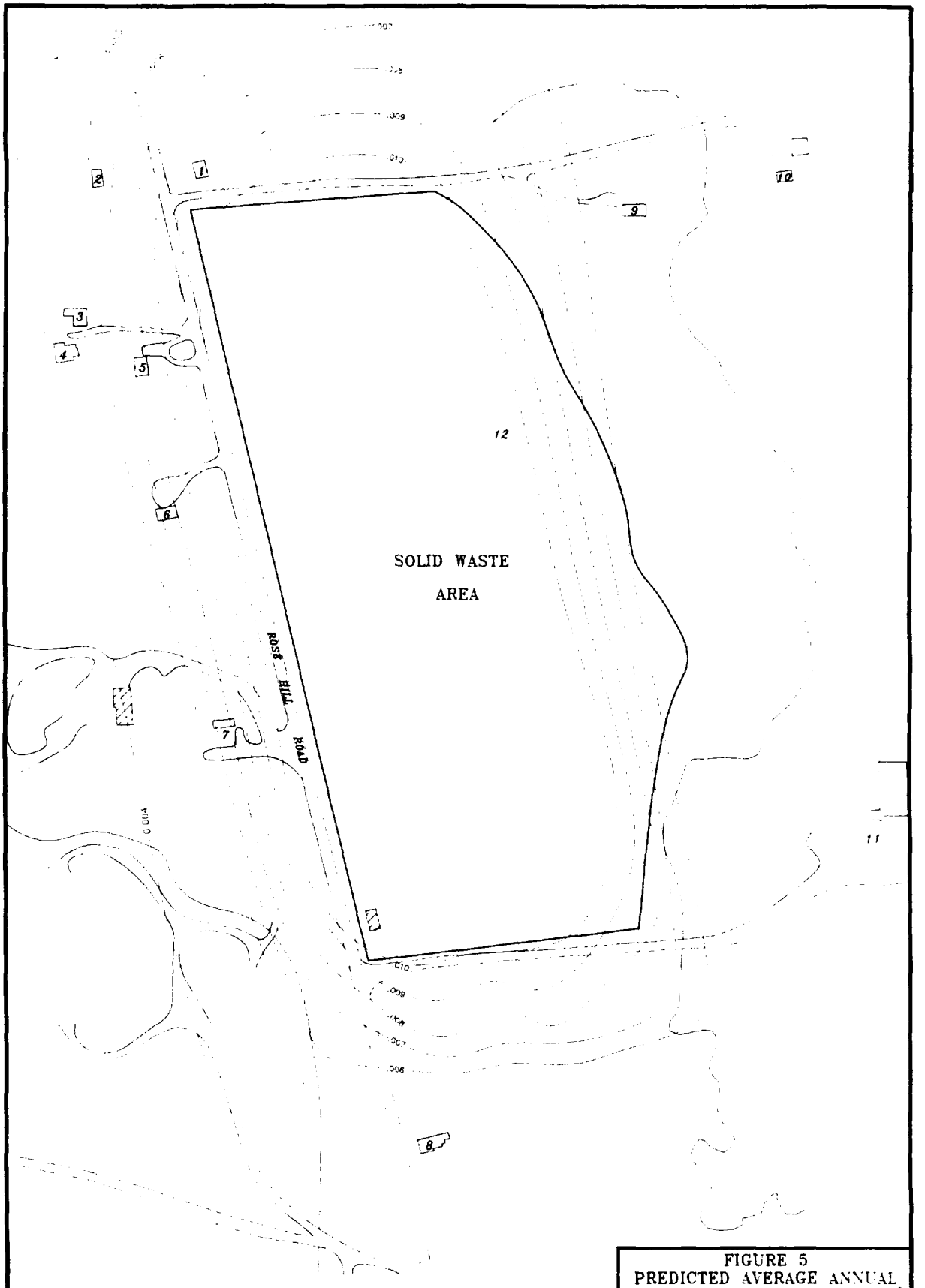


FIGURE 5
PREDICTED AVERAGE ANNUAL
BENZENE CONCENTRATIONS (ug/m^3)
ROSE HILL REGIONAL LANDFILL
SOUTH KINGSTOWN, RI
MAY 1993

U.S. EPA ENVIRONMENTAL RESPONSE TEAM
RESPONSE ENGINEERING AND ANALYTICAL CONTRACT
68-03-3482

APPENDIX A
Sentex™ Scentograph Field Analytical Report
Air Quality Modeling Final Report
Rose Hill Regional Landfill
August 1993

GSA RARITAN DEPOT
2890 WOODBRIDGE AVENUE
BLDG. 209 ANNEX
EDISON, NJ 08837-3679
908-321-4200 • FAX: 908-494-4021

DATE: June 10, 1993

TO: Thomas Pritchett, U.S. EPA/ERT Work Assignment Manager

THROUGH: Vinod Kansal, REAC S&A Section Chief Vinod Kansal

FROM: Renata E. Wynnyk, REAC Field Chemist

SUBJECT: DOCUMENT TRANSMITTAL UNDER WORK ASSIGNMENT NO. 4-694

Attached please find the following document prepared under this work assignment:

Sentex Scentograph
Field Analytical Report
Rose Hill Landfill Site
South Kingstown, Rhode Island

cc: Central File WA #4-694 (w/ attachment)
W. Scott Butterfield (w/o attachment)

lak\WYNNYK\AR-5694

Sentex Scentograph
Field Analytical Report
Rose Hill Landfill Site
South Kingstown, Rhode Island

June 1993

U.S. EPA Work Assignment No.: 4-694
Weston Work Order No.: 03347-034-001-5694-01
U.S. EPA Contract No.: 68-03-3482

Prepared by:

Roy F. Weston, Inc.

Renata E. Wynnyk (Date) 6/14/93
Field Chemist

Vinod Kansal (Date) 6/14/93
S&A Section Chief

W. Scott Butterfield (Date) 6/14/93
Project Manager

Prepared for:

U.S. EPA/ERT

Thomas Pritchett
Work Assignment Manager

Analysis by:
Renata E. Wynnyk

Prepared by:
Renata E. Wynnyk

Reviewed by:
Larry Kaelin
David B. Mickunas

lak\WYNNYK\AR-5694

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LIST OF TABLES

1.0 INTRODUCTION

1.1 Objective

The United States Environmental Protection Agency/Environmental Response Team (U.S. EPA/ERT) tasked Roy F. Weston, Inc., under the Response Engineering and Analytical Contract (REAC) to provide on-site analysis of air samples from the Rose Hill Landfill site for the presence of vinyl chloride (VCl). A Sentex Sensing Technologies (Ridgefield, NJ) Model Scentograph field-portable gas chromatograph (GC) was used for the analysis of VCl.

1.2 Site Background

The Rose Hill Landfill site is located on Rose Hill Road, South Kingstown, Washington County, Rhode Island. The site operated as a landfill from 1967 to 1983 and accepted industrial and municipal wastes and sewerage sludge.

2.0 METHODOLOGY

2.1 Sampling

Air samples were collected in 1-liter Tedlar bags by REAC personnel on May 26 and May 27, 1993 using U.S. EPA/ERT and REAC Standard Operating Procedure (SOP) #2050, Tedlar Bag Sampling. The sample bags were transported to the on-site field laboratory for same day analysis.

2.2 Sentex Scentograph

A Sentex Sensing Technologies, Inc. Model Scentograph field-portable GC was used for the determination of VCl in soil gas samples. This system contains an argon ionization detector (AID), a Carboxin packed trap and a 10 foot x 1/8 inch O.D. Carbopak C with 0.1 percent picric acid column for detecting and identifying VCl.

The GC was calibrated prior to air sample analyses. A three-point calibration (0.025 part per million, volume/volume (ppmv), 0.050 ppmv, and 0.101 ppmv VCl) was analyzed on-site on May 26, 1993. In order to establish a minimum detection limit (MDL) and a minimum quantitation limit (MQL), the lowest concentration standard was analyzed eight consecutive times prior to sample analysis. The MDL and MQL were calculated as three and ten times the standard deviation of these consecutive measurements, respectively. For additional information, refer to REAC SOP #1702, Sentex Scentograph GC Field Use.

3.0 RESULTS

3.1 Sentex Scentograph

The results for the VCl analyses are listed in Table 1. The Scentograph operating parameters, sample chromatograms, and a copy of the laboratory notebook appear in Appendix A.

The GC minimum detection and quantitation limit determination is in Table 2.

4.0 DISCUSSION OF RESULTS

A total of 113 air samples were received for VCl analysis. Two of the air samples (#11146 and #11481) could not be analyzed on the GC, because the Tedlar bags were empty. On May 26, 1993, 48 air samples were analyzed; there was no VCl detected in these samples. On May 27, 1993, 63 air samples were analyzed. Due to the high level of methane and other contaminants in the second set of air samples, some GC parameters had to be changed. The GC sampling time was reduced from 120 seconds to 20 seconds and a backflush option was activated. In addition, a preconcentrator cleaning cycle was used after analysis of highly contaminated samples. A one-point calibration (using a 1.03-ppmv standard) was used with a detection limit of 0.115-ppmv. New MDLs and MQLs were calculated using the 0.101-ppmv standard; they are listed in Table 2. Of the 63 air samples, 56 had no VCl detected; 5 samples had VCl present at "J" levels (i.e., the VCl concentration was above the MDL but below the MQL); and 2 samples, #11110 and #12131AF had the highest concentrations of VCl, 0.414 ppmv and 1.885 ppmv, respectively. The concentration of VCl was calculated by multiplying the VCl area counts of the sample by the response factor determined using the 0.101 ppmv VCl standard.

TABLE 1
Sentex Scentograph Analytical Results
Rose Hill Landfill Site
South Kingstown, Rhode Island
May 26-27, 1993

Sample ID	Date Sampled	Vinyl Chloride Concentration
11371	May 26, 1993	ND[1]
09071AF	May 26, 1993	ND
09072	May 26, 1993	ND
11372	May 26, 1993	ND
11373	May 26, 1993	ND
09073AF	May 26, 1993	ND
11374	May 26, 1993	ND
09074AF	May 26, 1993	ND
09101AF	May 26, 1993	ND
11375	May 26, 1993	ND
11375AF	May 26, 1993	ND
11376	May 26, 1993	ND
09076AF	May 26, 1993	ND
09102	May 26, 1993	ND
09077AF	May 26, 1993	ND
11378	May 26, 1993	ND
11378AF	May 26, 1993	ND
11379	May 26, 1993	ND
09079AF	May 26, 1993	ND
09080AF	May 26, 1993	ND

All concentrations reported in parts-per-million, volume/volume (ppmv)

[1]ND - Denotes not detected. On May 26, 1993, the minimum detection level (MDL) for vinyl chloride was 0.029 ppmv, and the minimum quantitation level (MQL) for vinyl chloride was 0.090 ppmv. On May 27, 1993, the MDL for vinyl chloride was 0.115 ppmv, and the MQL was 0.380 ppmv.

[2]J - Reported value is above the MDL and below the MQL.

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TABLE 1 (cont'd)
Sentex Scentograph Analytical Results
Rose Hill Landfill Site
South Kingstown, Rhode Island
May 26-27, 1993

Sample ID	Date Sampled	Vinyl Chloride Concentration
09111AF	May 26, 1993	ND
09112AF	May 26, 1993	ND
09103	May 26 1993	ND
09105	May 26, 1993	ND
11377	May 26, 1993	ND
11380	May 26, 1993	ND
09106	May 26, 1993	ND
09107	May 26, 1993	ND
09114AF	May 26, 1993	ND
11382	May 26, 1993	ND
11383	May 26, 1993	ND
11141AF	May 26, 1993	ND
09113AF	May 26, 1993	ND
09115AF	May 26, 1993	ND
09116AF	May 26, 1993	ND
11142	May 26, 1993	ND
11384	May 26, 1993	ND
09108	May 26, 1993	ND
11143AF	May 26, 1993	ND
11144AF	May 26, 1993	ND
09109	May 26, 1993	ND

All concentrations reported in parts-per-million, volume/volume (ppmv)

[1]ND - Denotes not detected. On May 26, 1993, the minimum detection level (MDL) for vinyl chloride was 0.029 ppmv, and the minimum quantitation level (MQL) for vinyl chloride was 0.090 ppmv. On May 27, 1993, the MDL for vinyl chloride was 0.115 ppmv, and the MQL was 0.380 ppmv.

[2]J - Reported value is above the MDL and below the MQL.

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TABLE 1 (cont'd)
Sentex Scentograph Analytical Results
Rose Hill Landfill Site
South Kingstown, Rhode Island
May 26-27, 1993

Sample ID	Date Sampled	Vinyl Chloride Concentration
09110	May 26, 1993	ND
09117AF	May 26, 1993	ND
09118AF	May 26, 1993	ND
09119AF	May 26, 1993	ND
09081	May 26, 1993	ND
11145	May 26, 1993	ND
11386	May 26, 1993	ND
09082	May 27, 1993	0.372J[(2)]
09083	May 27, 1993	ND
09084	May 27, 1993	0.289J
09085	May 27, 1993	ND
11101	May 27, 1993	ND
11102	May 27, 1993	ND
11531	May 27, 1993	ND
11532	May 27, 1993	ND
11103	May 27, 1993	ND
11104	May 27, 1993	ND
11534	May 27, 1993	ND
11105	May 27, 1993	ND
11151	May 27, 1993	ND
11152	May 27, 1993	ND

All concentrations reported in parts-per-million, volume/volume (ppmv)

[(1)]ND - Denotes not detected. On May 26, 1993, the minimum detection level (MDL) for vinyl chloride was 0.029 ppmv, and the minimum quantitation level (MQL) for vinyl chloride was 0.090 ppmv. On May 27, 1993, the MDL for vinyl chloride was 0.115 ppmv, and the MQL was 0.380 ppmv.

[(2)]J - Reported value is above the MDL and below the MQL.

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TABLE 1 (cont'd)
Sentex Scentograph Analytical Results
Rose Hill Landfill Site
South Kingstown, Rhode Island
May 26-27, 1993

Sample ID	Date Sampled	Vinyl Chloride Concentration
11153	May 27, 1993	ND
11107	May 27, 1993	ND
09086	May 27, 1993	ND
09087	May 27, 1993	ND
09089	May 27, 1993	ND
11535	May 27, 1993	ND
11536AF	May 27, 1993	ND
11537	May 27, 1993	ND
11154	May 27, 1993	ND
11155	May 27, 1993	ND
11157	May 27, 1993	ND
11108	May 27, 1993	ND
11102	May 27, 1993	ND
09090	May 27, 1993	ND
12817	May 27, 1993	ND
12818	May 27, 1993	ND
11538AF	May 27, 1993	ND
11539	May 27, 1993	ND
11158	May 27, 1993	ND
11110	May 27, 1993	0.414
11112	May 27, 1993	ND

All concentrations reported in parts-per-million, volume/volume (ppmv)

[1]ND - Denotes not detected. On May 26, 1993, the minimum detection level (MDL) for vinyl chloride was 0.029 ppmv, and the minimum quantitation level (MQL) for vinyl chloride was 0.090 ppmv. On May 27, 1993, the MDL for vinyl chloride was 0.115 ppmv, and the MQL was 0.380 ppmv.

[2]J - Reported value is above the MDL and below the MQL.

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TABLE 1 (cont'd)
Sentex Scentograph Analytical Results
Rose Hill Landfill Site
South Kingstown, Rhode Island
May 26-27, 1993

Sample ID	Date Sampled	Vinyl Chloride Concentration
12819	May 27, 1993	ND
10697	May 27, 1993	ND
10698	May 27, 1993	ND
12131AFD	May 27, 1993	1.885
12132	May 27, 1993	ND
11391	May 27, 1993	ND
11392	May 27, 1993	ND
11393	May 27, 1993	ND
12133AF	May 27, 1993	0.108J
12134	May 27, 1993	ND
12135	May 27, 1993	ND
11394	May 27, 1993	ND
11395	May 27, 1993	ND
11396	May 27, 1993	ND
10701	May 27, 1993	ND
10702	May 27, 1993	ND
10703	May 27, 1993	ND
10699	May 27, 1993	ND
11115	May 27, 1993	ND
11116	May 27, 1993	0.377J
11117	May 27, 1993	0.325J

All concentrations reported in parts-per-million, volume/volume (ppmv)

[1]ND - Denotes not detected. On May 26, 1993, the minimum detection level (MDL) for vinyl chloride was 0.029 ppmv, and the minimum quantitation level (MQL) for vinyl chloride was 0.090 ppmv. On May 27, 1993, the MDL for vinyl chloride was 0.115 ppmv, and the MQL was 0.380 ppmv.

[2]J - Reported value is above the MDL and below the MQL.

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TABLE 1 (cont'd)
Sentex Scentograph Analytical Results
Rose Hill Landfill Site
South Kingstown, Rhode Island
May 26-27, 1993

Sample ID	Date Sampled	Vinyl Chloride Concentration
11113	May 27, 1993	ND
11114	May 27, 1993	ND
12136	May 27, 1993	ND
12137	May 27, 1993	ND
11397	May 27, 1993	ND
11398	May 27, 1993	ND
11540AF	May 27, 1993	ND

All concentrations reported in parts-per-million, volume/volume (ppmv)

(1) ND - Denotes not detected. On may 26, 1993, the minimum detection level (MDL) for vinyl chloride was 0.029 ppmv, and the minimum quantitation level (MQL) for vinyl chloride was 0.090 ppmv. On May 27, 1993, the MDL for vinyl chloride was 0.115 ppmv, and the MQL was 0.280 ppmv.

(2) J - Reported value is above the MDL and below the MQL.

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TABLE 2
Sentex Scentograph Results, Minimum Detection
and Quantitation Limits
Rose Hill Landfill Site
May 26-27, 1993

Sample Number	Date Analyzed	Vinyl Chloride
0.025 STD-1	May 26, 1993	0.0057
0.025 STD-2	May 26, 1993	0.0027
0.025 STD-3	May 26, 1993	0.0064
0.025 STD-4	May 26, 1993	0.0098
0.025 STD-5	May 26, 1993	0.0089
0.025 STD-6	May 26, 1993	0.0043
0.025 STD-7	May 26, 1993	0.0095
0.025 STD-8	May 26, 1993	0.0058
All concentrations reported in parts-per-million, volume/volume Mean (X) = 0.0066 Standard Deviation (SD) = 0.0025 Minimum Detection Limit (MDL) = 0.0076 Minimum Quantitation Limit (MQL) = 0.025		
0.101 - 1	May 27, 1993	0.11
0.101 - 2	May 27, 1993	0.09
0.101 - 3	May 27, 1993	0.11
0.101 - 4	May 27, 1993	0.15
0.101 - 5	May 27, 1993	0.14
0.101 - 6	May 27, 1993	0.10
0.101 - 7	May 27, 1993	0.14
0.101 - 8	May 27, 1993	0.11
0.101 - 9	May 27, 1993	0.15
0.101 - 10	May 27, 1993	0.09
All concentrations reported in parts-per-million, volume/volume Mean (X) = 0.1055 Standard Deviation (SD) = 0.038 Minimum Detection Limit (MDL) = 0.115 Minimum Quantitation Limit (MQL) = 0.380 Response Factor (RF) = 0.0000007		

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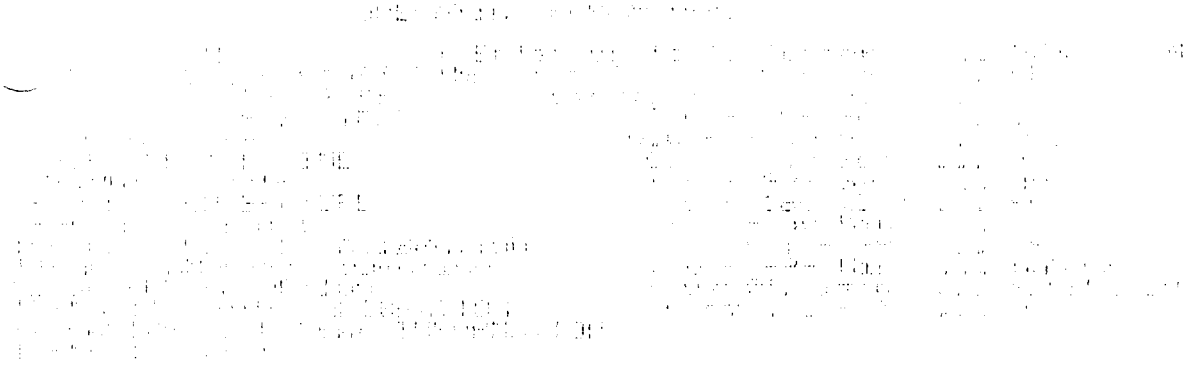
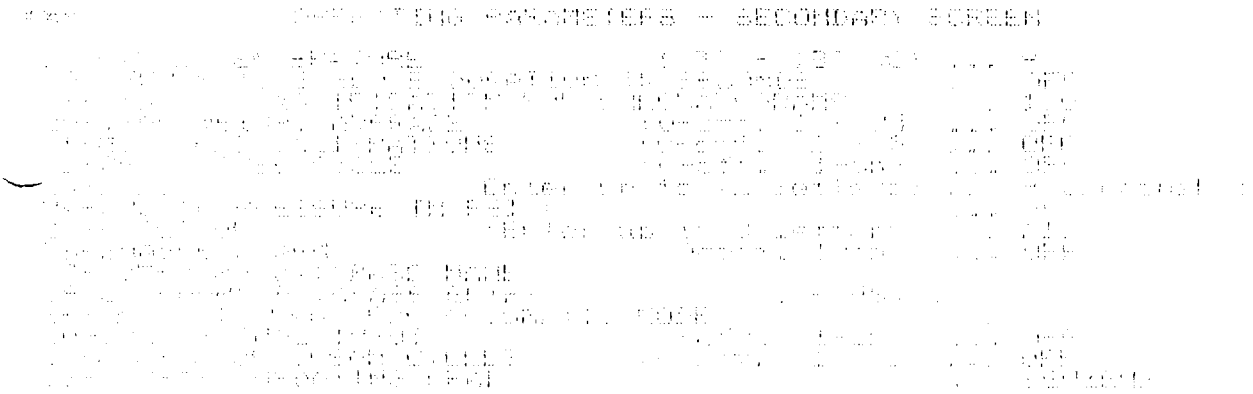
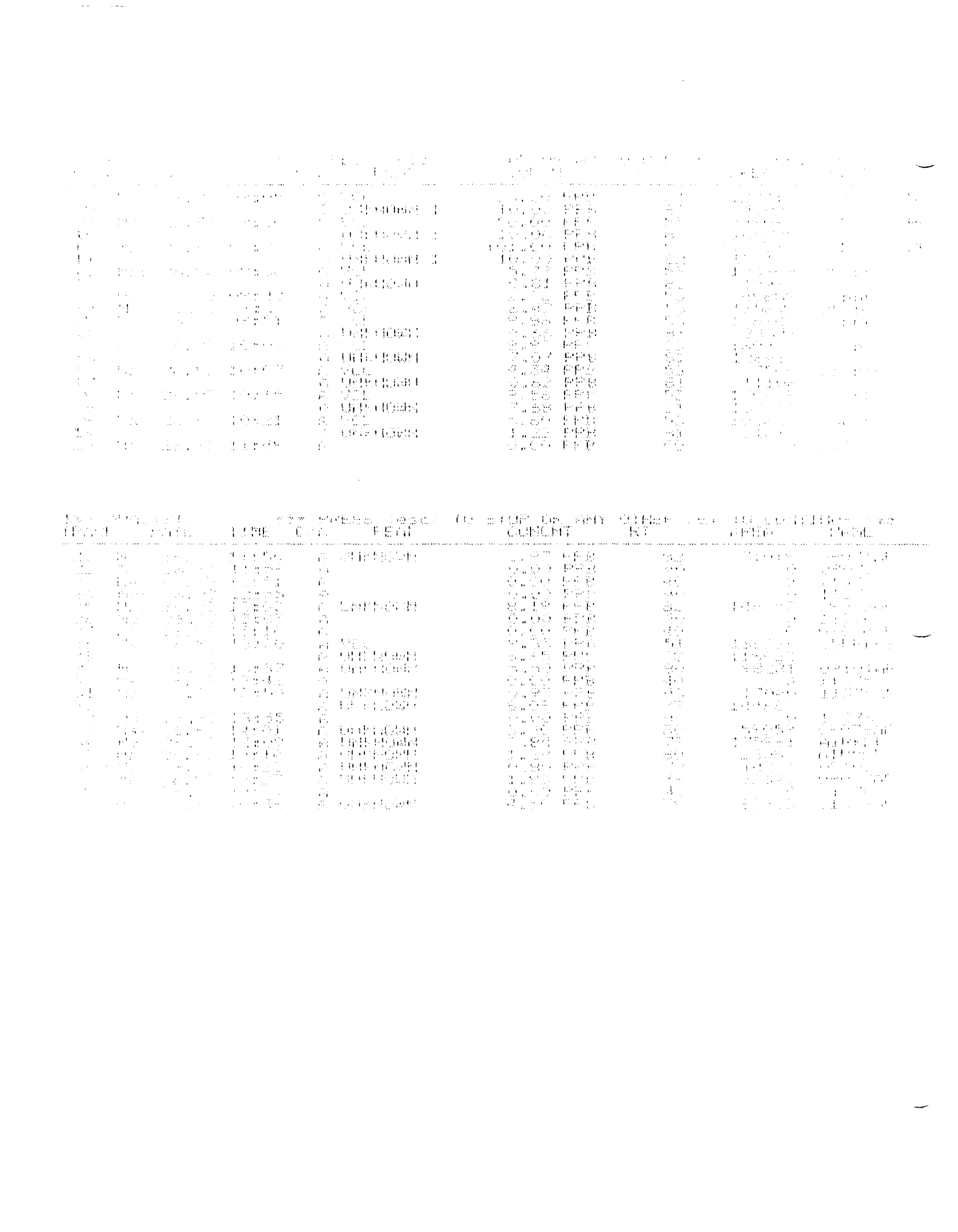
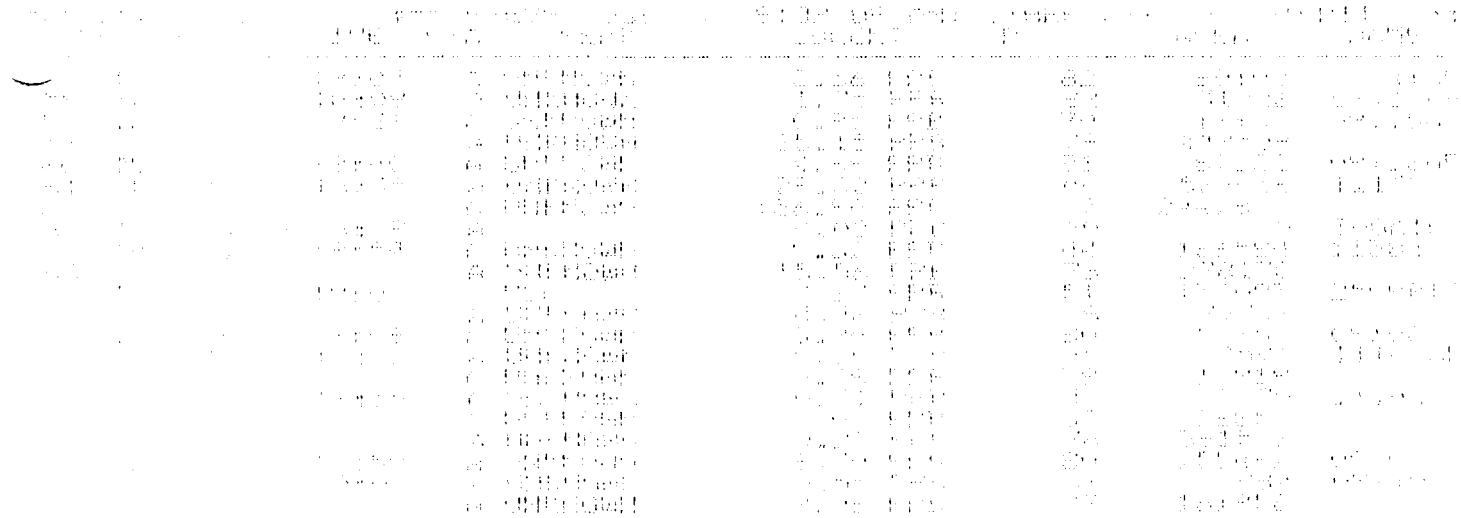
APPENDIX A
Sentex Scentograph Raw Data
Rose Hill Landfill Site
May 24-28, 1993









*** CHROMATOGRAPH REVIEW

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TRACE #9 May 26,93 09:05

PRESS ? FOR HELP, <esc> TO EXIT ()

COLUMN: 8'carbopak c

COLUMN PRESSURE: 30

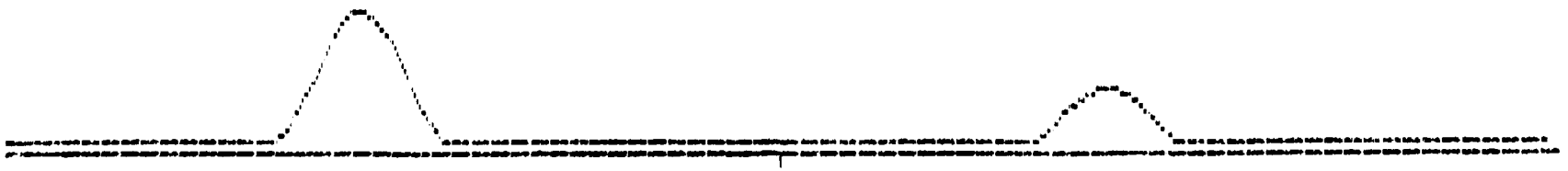
DETECTOR: AID

TEMPERATURE: 90-90 , 0 Secs

SAMPLE TIME:120

GAIN: 1.000

DURATION: 1 Minutes



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PRESS ? FOR HELP, (esc) TO EXIT ()
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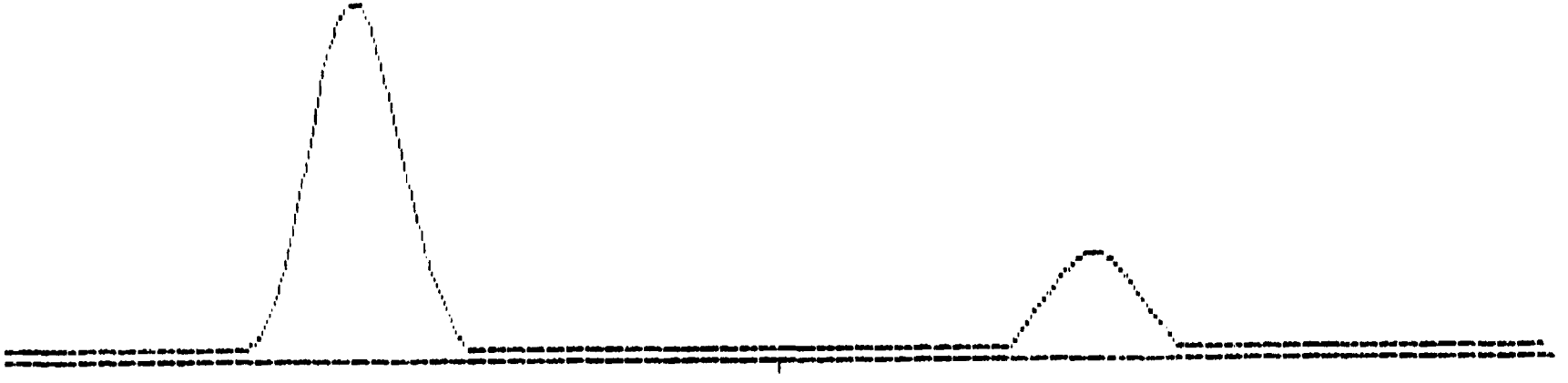
COLUMN PRESSURE: 30
DETECTOR: AID
TEMPERATURE: 90-90 , 0 Secs
SAMPLE TIME:120
GAIN: 1.000
DURATION: 1 Minutes



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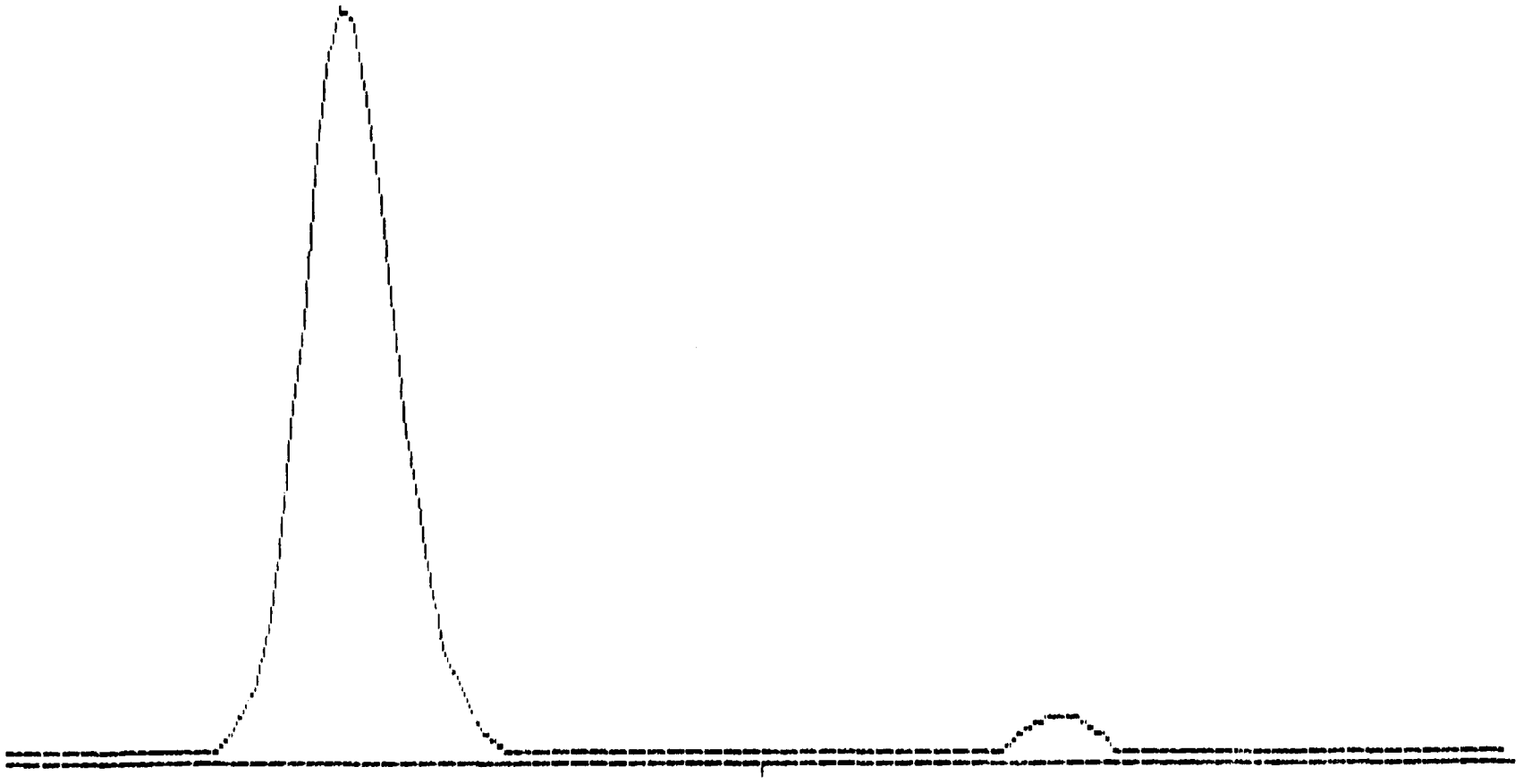
NAME: UCM MPC3
TRACE #11 May 26,93 09:24

PRESS ? FOR HELP, (esc) TO EXIT ()
COLUMN: 8' carbopak c
COLUMN PRESSURE: 30
DETECTOR: AID
TEMPERATURE: 90-90 , 0 Secs
SAMPLE TIME:120
GAIN: 1.000
DURATION: 1 Minutes



*** CHROMATOGRAPH REVIEW PRESS ? FOR HELP, (esc) TO EXIT ()

NAME: 25ppb-1

UPPER TRACE #12 9.12% May 26,93 09:36

LOWER TRACE #11 100.00%

COLUMN: 8'carbopak c

COLUMN PRESSURE: 30

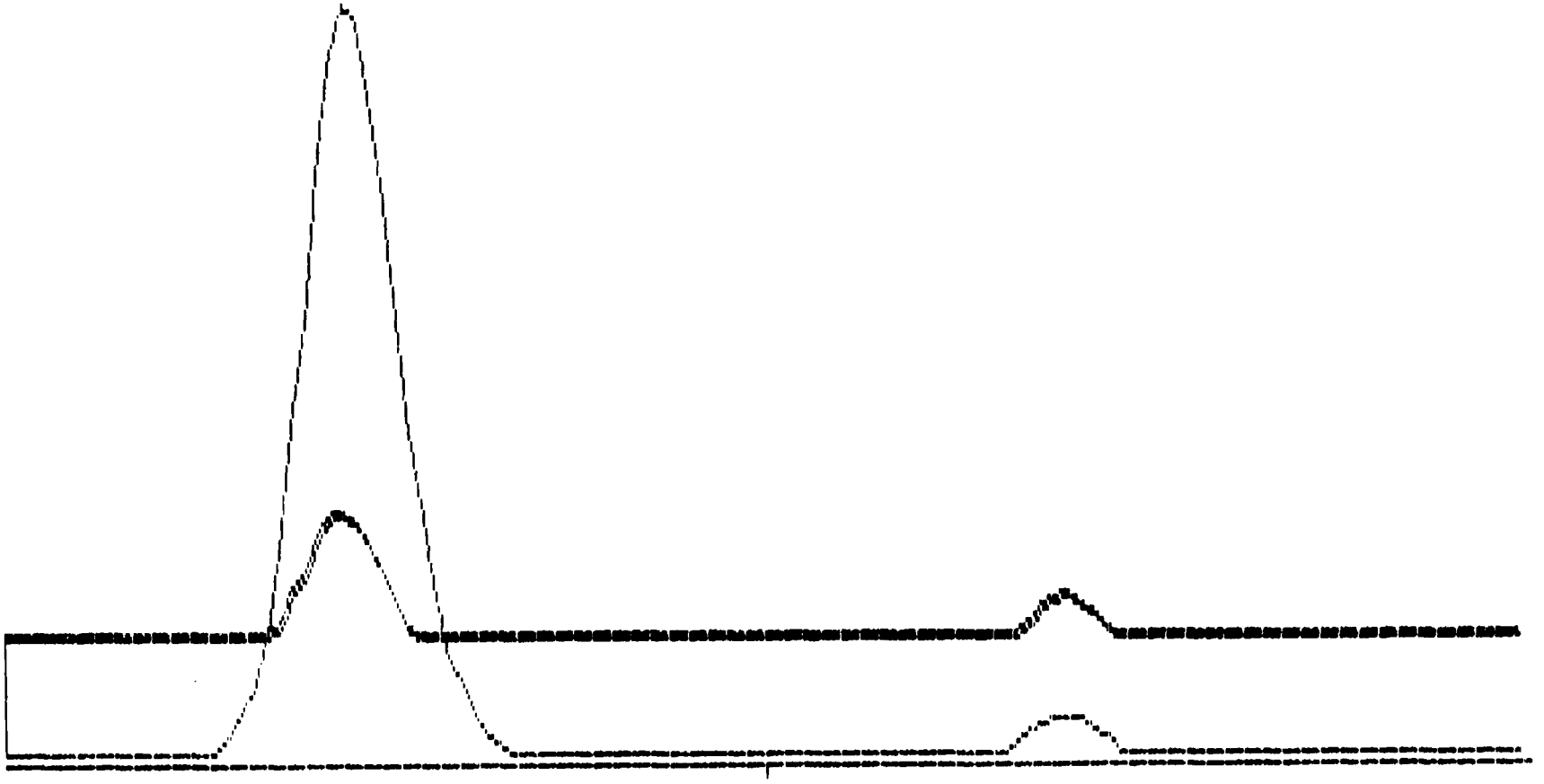
DETECTOR: AID

TEMPERATURE: 90-90 , 0 Secs

SAMPLE TIME:120

GAIN: 1.000

DURATION: 1 Minutes



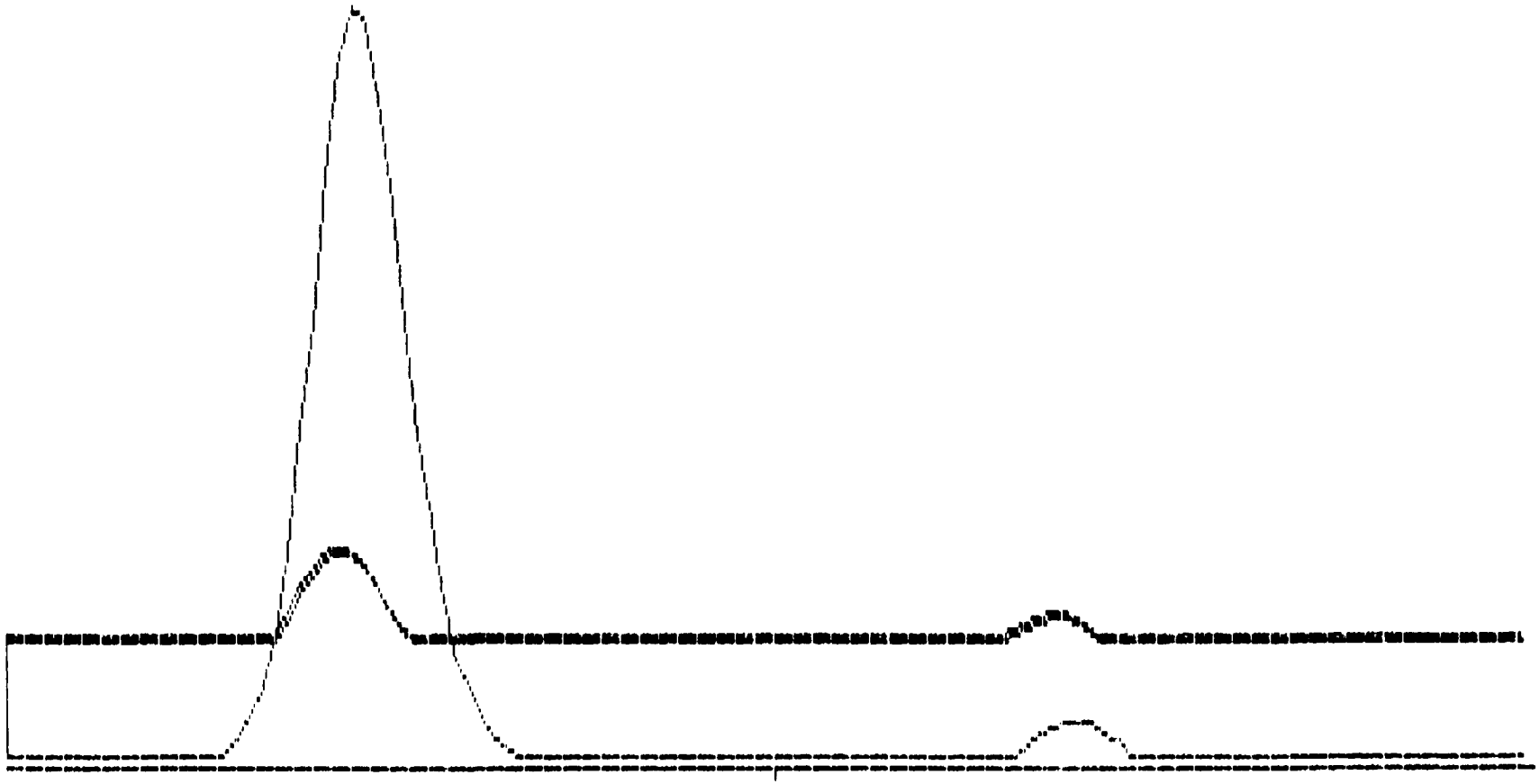
*** CHROMATOGRAPH REVIEW PRESS ? FOR HELP, (esc) TO EXIT ()

NAME: 25ppb-6

UPPER TRACE #17 6.87% May 26,93 10:07

LOWER TRACE #11 100.00%

COLUMN: 8'carbopak c
COLUMN PRESSURE: 30
DETECTOR: AID
TEMPERATURE: 90-90 , 0 Secs
SAMPLE TIME:120
GAIN: 1.000
DURATION: 1 Minutes



*** CHROMATOGRAPH REVIEW PRESS ? FOR HELP, <esc> TO EXIT ()

NAME: 09072

UPPER TRACE #22 0.00% May 26,93 11:59

LOWER TRACE #11 100.00%

COLUMN: 8'carbopak c

COLUMN PRESSURE: 30

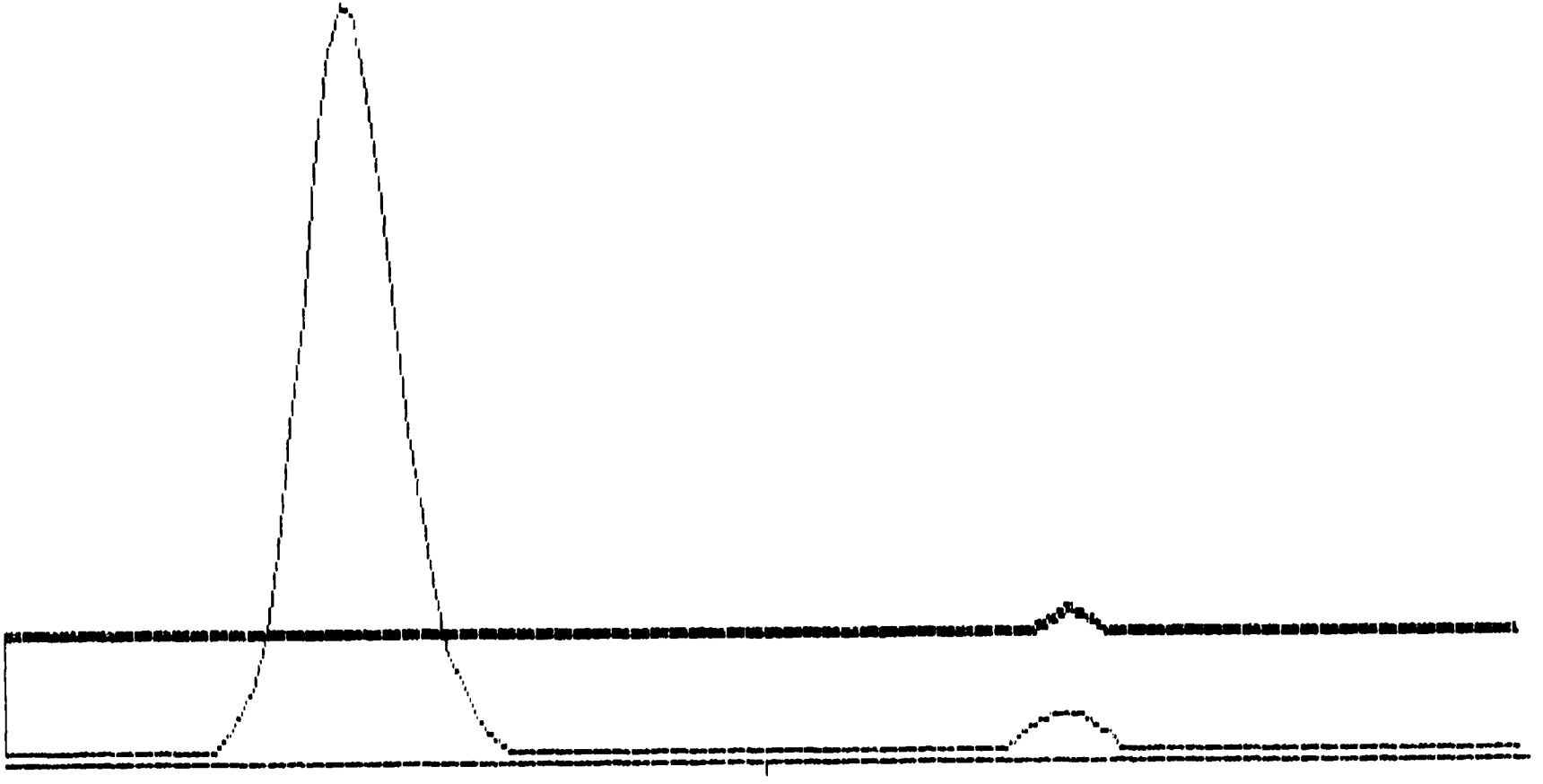
DETECTOR: AID

TEMPERATURE: 90-90 , 0 Secs

SAMPLE TIME:120

GAIN: 1.000

DURATION: 1 Minutes



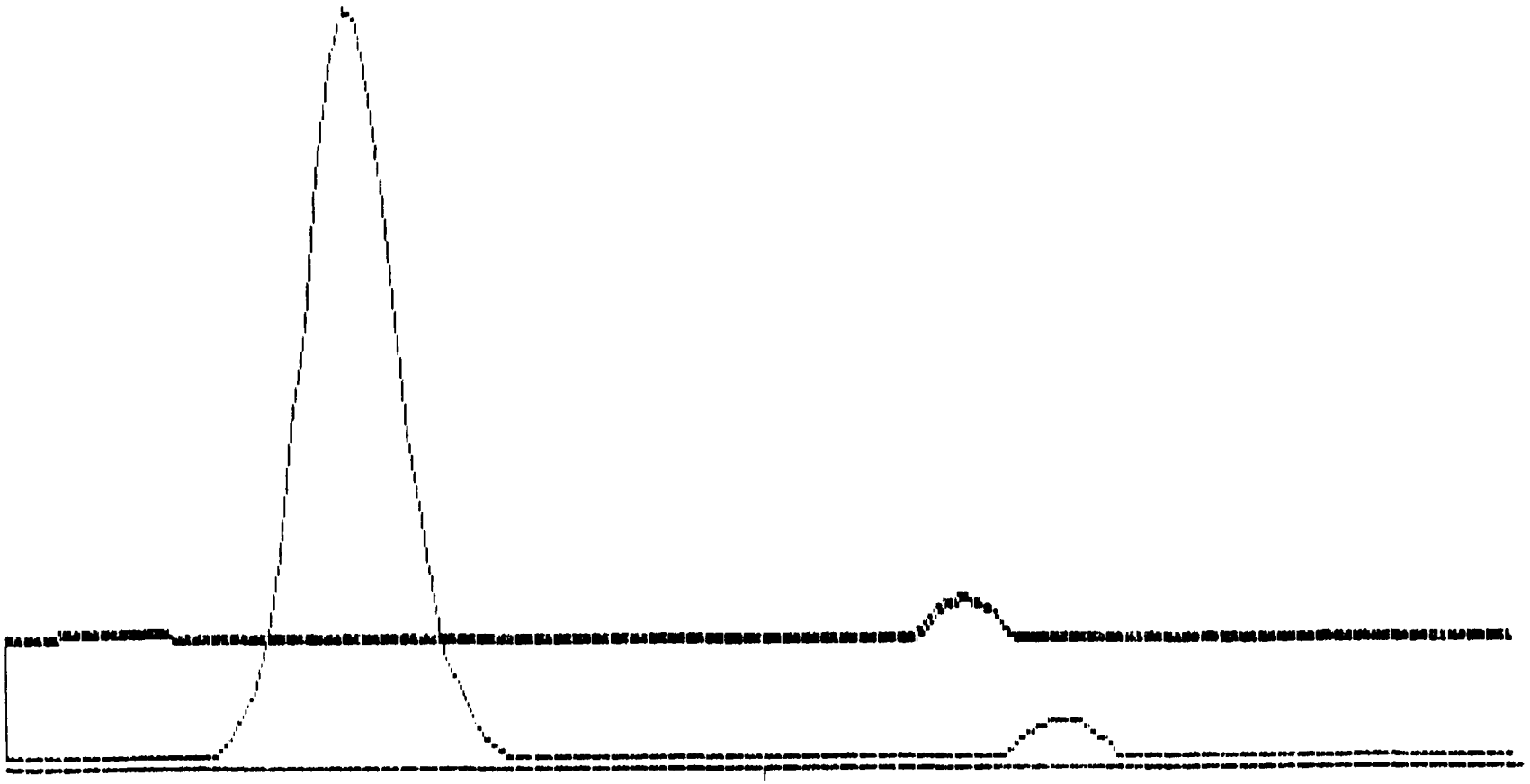
*** CHROMATOGRAPH REVIEW PRESS ? FOR HELP, (esc) TO EXIT ()

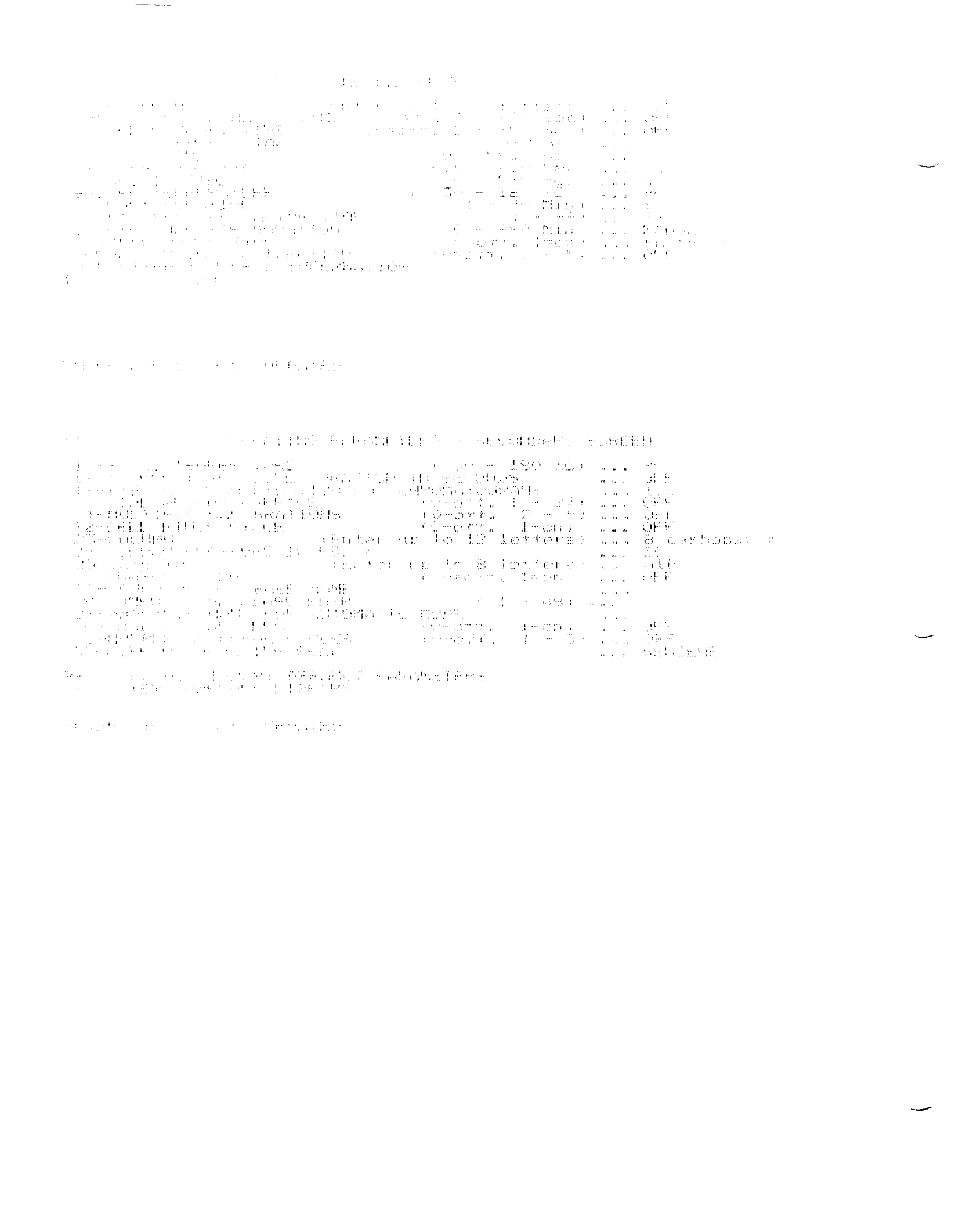
NAME: 11143AF

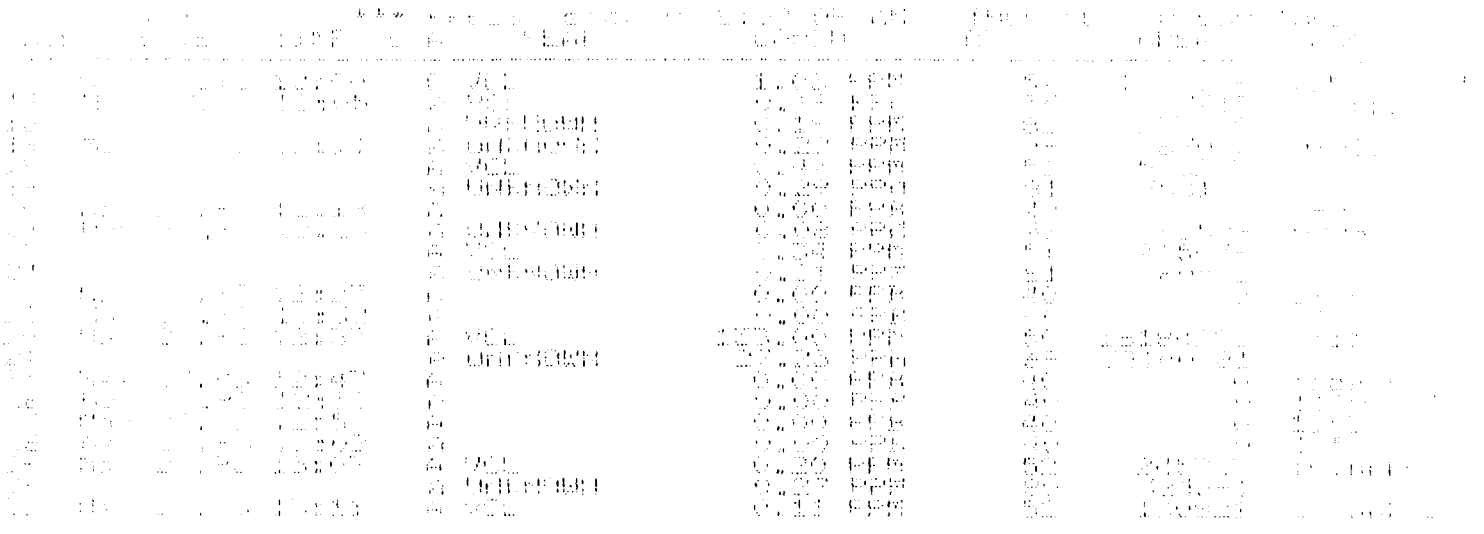
UPPER TRACE #66 1.36% May 26,93 19:13

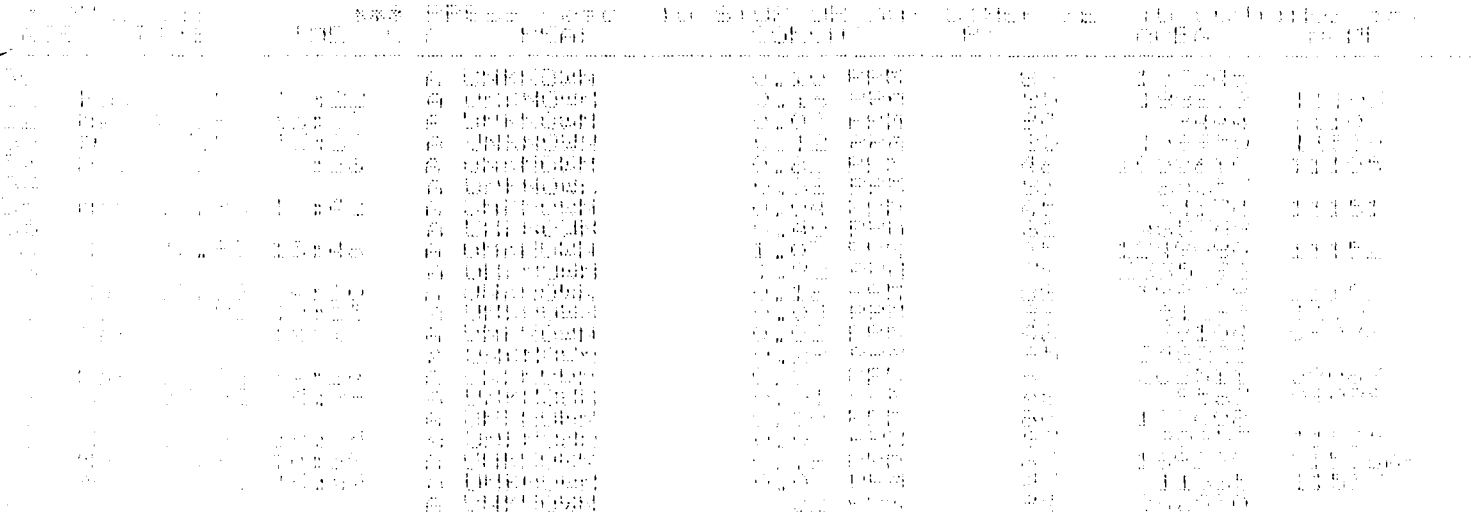
LOWER TRACE #11 100.00%

COLUMN: 8'carbopak c
COLUMN PRESSURE: 30
DETECTOR: AID
TEMPERATURE: 90-90 , 0 Secs
SAMPLE TIME:120
GAIN: 1.000
DURATION: 1 Minutes





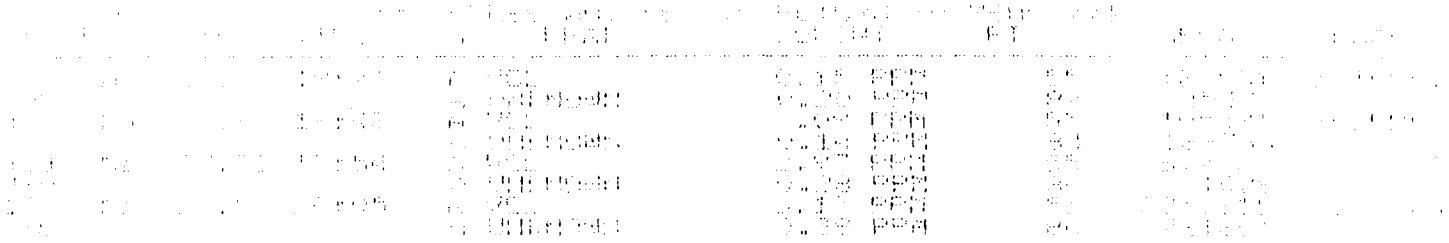


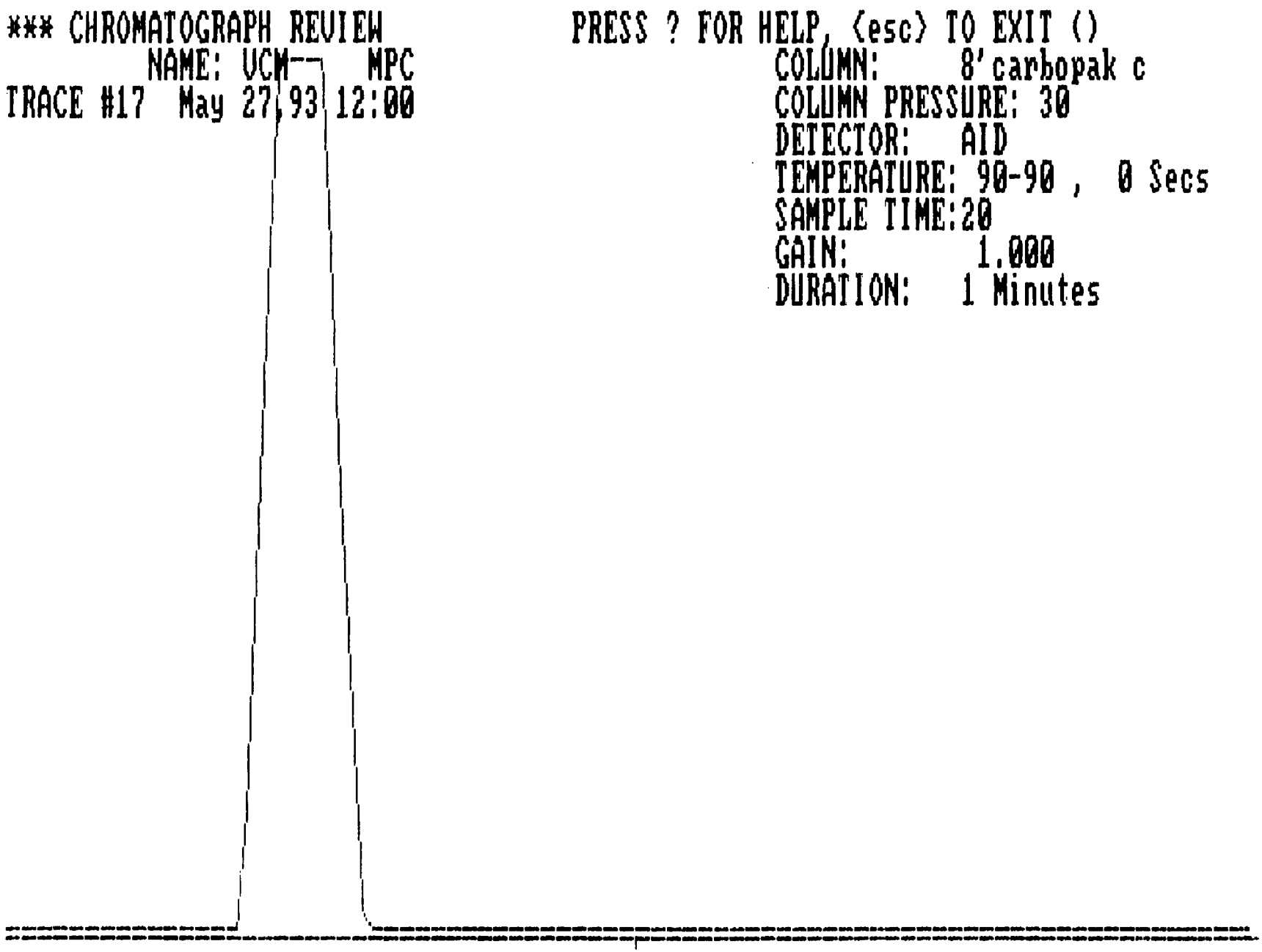


			TIME	C/A	PEAK	CONCNT	RT	AREA	NAME
[illegible]	[illegible]	[illegible]	[illegible]	A	VCL	[illegible] PPM	[illegible]	[illegible]	[illegible]
[illegible]				A	UNKNOWN	[illegible] PPM	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	A	VCL	[illegible] PPM	[illegible]	[illegible]	[illegible]
[illegible]				A	UNKNOWN	0.19 PPM	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	A	VCL	0.15 PPM	[illegible]	[illegible]	[illegible]
[illegible]				A	UNKNOWN	[illegible] PPM	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	A		0.00 PPM	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	A	UNKNOWN	[illegible] PPM	[illegible]	[illegible]	[illegible]
				A	UNKNOWN	[illegible] PPM	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	A	UNKNOWN	[illegible] PPM	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	A	UNKNOWN	[illegible] PPM	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	A	UNKNOWN	[illegible] PPM	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	A	UNKNOWN	0.16 PPM	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	A	UNKNOWN	0.15 PPM	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]:38	A	UNKNOWN	0.15 PPM	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	A	UNKNOWN	0.21 PPM	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	A	UNKNOWN	[illegible] PPM	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	A	UNKNOWN	0.10 PPM	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	A	VCL	[illegible] PPM	54	[illegible]	[illegible]
[illegible]				A	UNKNOWN	0.20 PPM	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	A	VCL	0.10 PPM	54	[illegible]	[illegible]

*** PRESS 'ESC' TO STOP OR ANY OTHER KEY TO CONTINUE ***

[illegible]	[illegible]	[illegible]	TIME	C/A	PEAK	CONCNT	RT	AREA	NAME
[illegible]				A	UNKNOWN	0.13 PPM	82	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	A	UNKNOWN	0.15 PPM	[illegible]	[illegible]	[illegible]
[illegible]				A	VCL	[illegible] PPM	54	[illegible]	
[illegible]				A	UNKNOWN	[illegible] PPM	81	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	A		0.00 PPM	40	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	A		0.00 PPM	40	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	A		[illegible] PPM	40	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	A		[illegible] PPM	40	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	A	UNKNOWN	[illegible] PPM	[illegible]	[illegible]	[illegible]
[illegible]				A	VCL	[illegible] PPM	[illegible]	[illegible]	
				A	UNKNOWN	[illegible] PPM	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	A	UNKNOWN	[illegible] PPM	[illegible]	[illegible]	[illegible]
				A	VCL	[illegible] PPM	[illegible]	[illegible]	
				A	UNKNOWN	[illegible] PPM	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	A	UNKNOWN	[illegible] PPM	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	A	UNKNOWN	[illegible] PPM	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	A	UNKNOWN	[illegible] PPM	[illegible]	[illegible]	[illegible]
				A	UNKNOWN	[illegible] PPM	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	A	UNKNOWN	[illegible] PPM	[illegible]	[illegible]	[illegible]
				A	UNKNOWN	[illegible] PPM	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	A	UNKNOWN	[illegible] PPM	[illegible]	[illegible]	[illegible]




*** CHROMATOGRAPH REVIEW
PRESS ? FOR HELP, <esc> TO EXIT ()
NAME: UCM-- MPC
TRACE #17 May 27,93 12:00
COLUMN: 8'carbopak c
COLUMN PRESSURE: 30
DETECTOR: AID
TEMPERATURE: 90-90 , 0 Secs
SAMPLE TIME:20
GAIN: 1.000
DURATION: 1 Minutes

*** CHROMATOGRAPH REVIEW PRESS ? FOR HELP, <esc> TO EXIT ()

NAME: 10ppb-1

UPPER TRACE #18 | 36 | 31% May 27,93 12:05

LOWER TRACE #17 | 100 | 00%

COLUMN: 8' carbopak c

COLUMN PRESSURE: 30

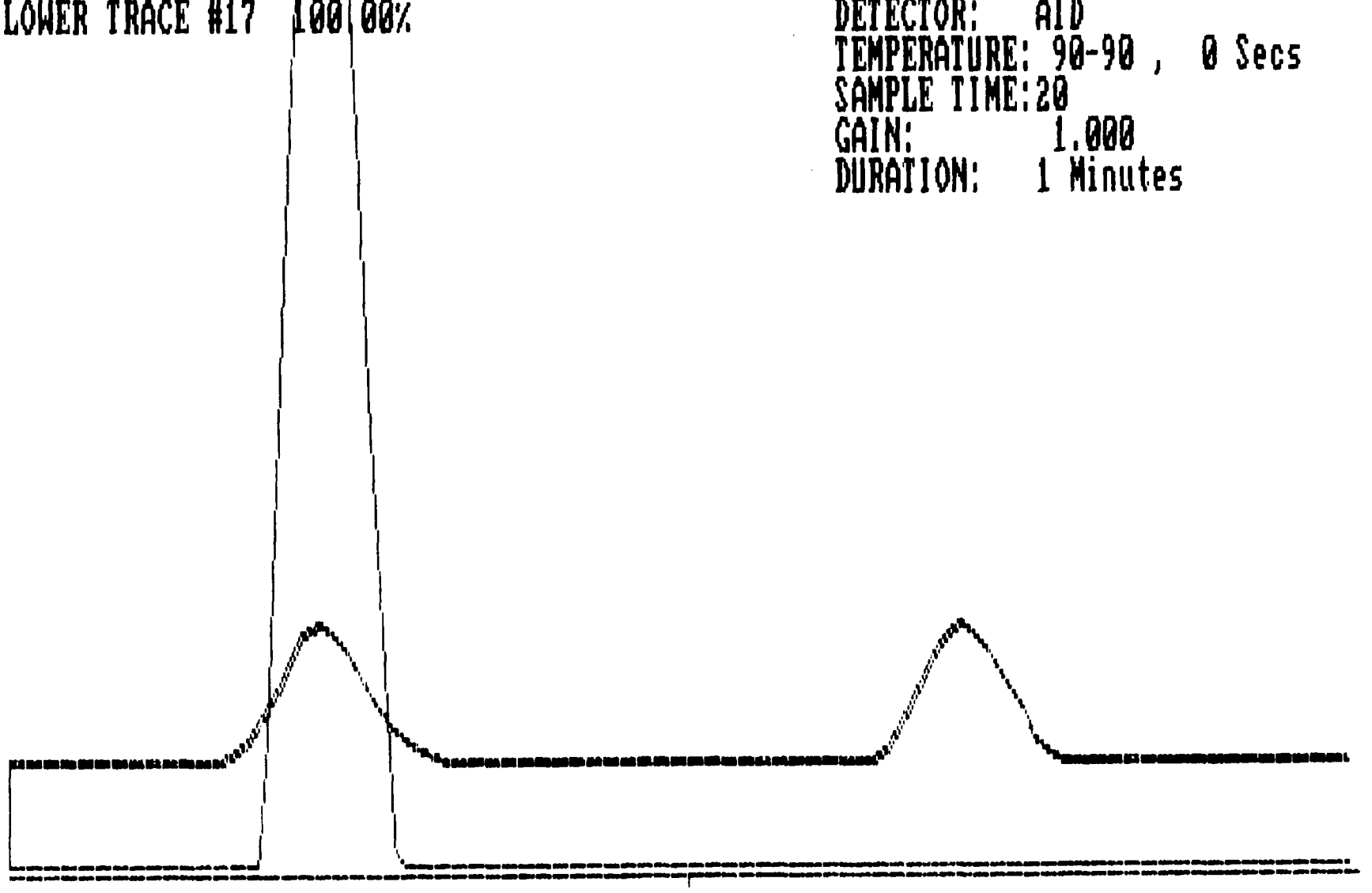
DETECTOR: AID

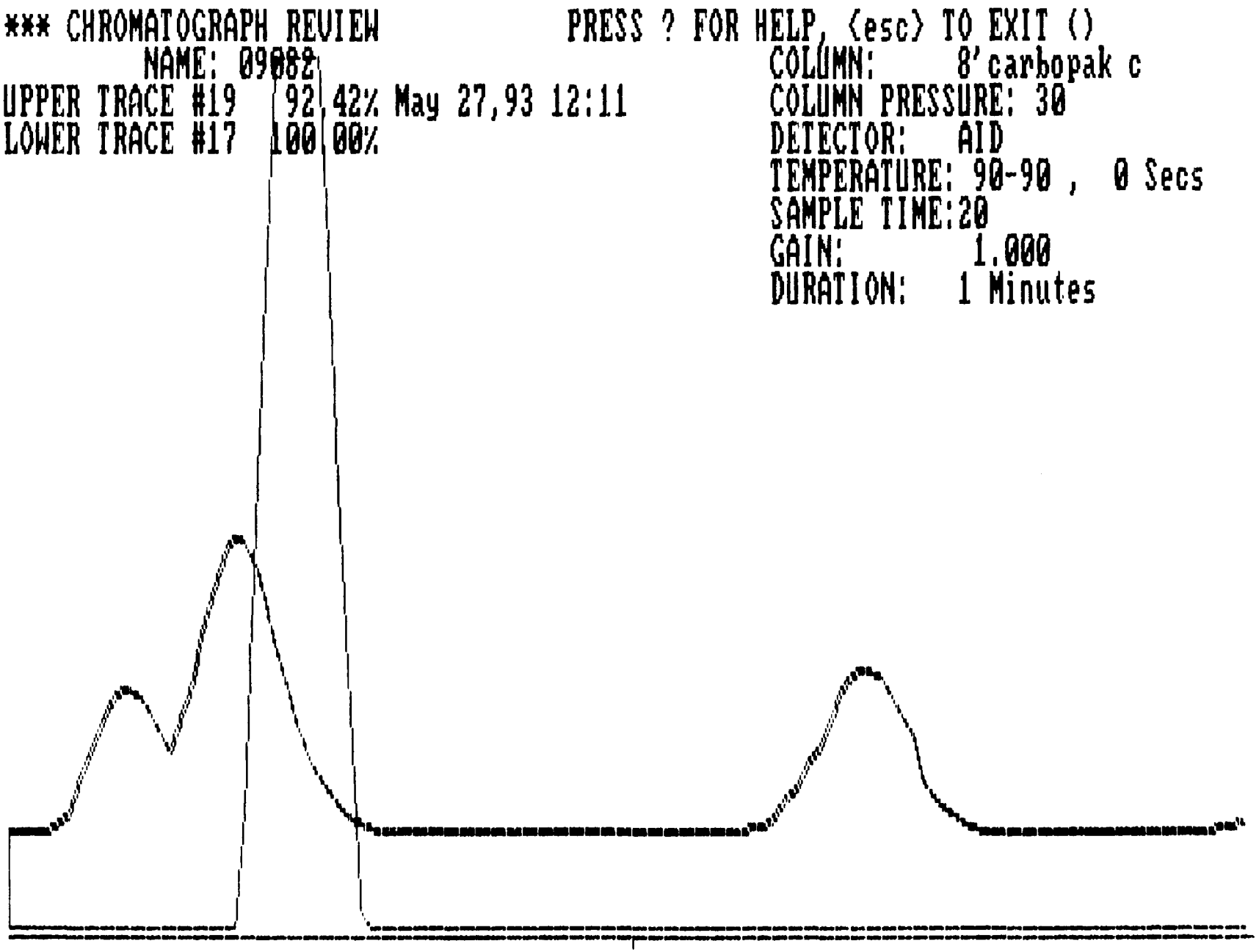
TEMPERATURE: 90-90 , 0 Secs

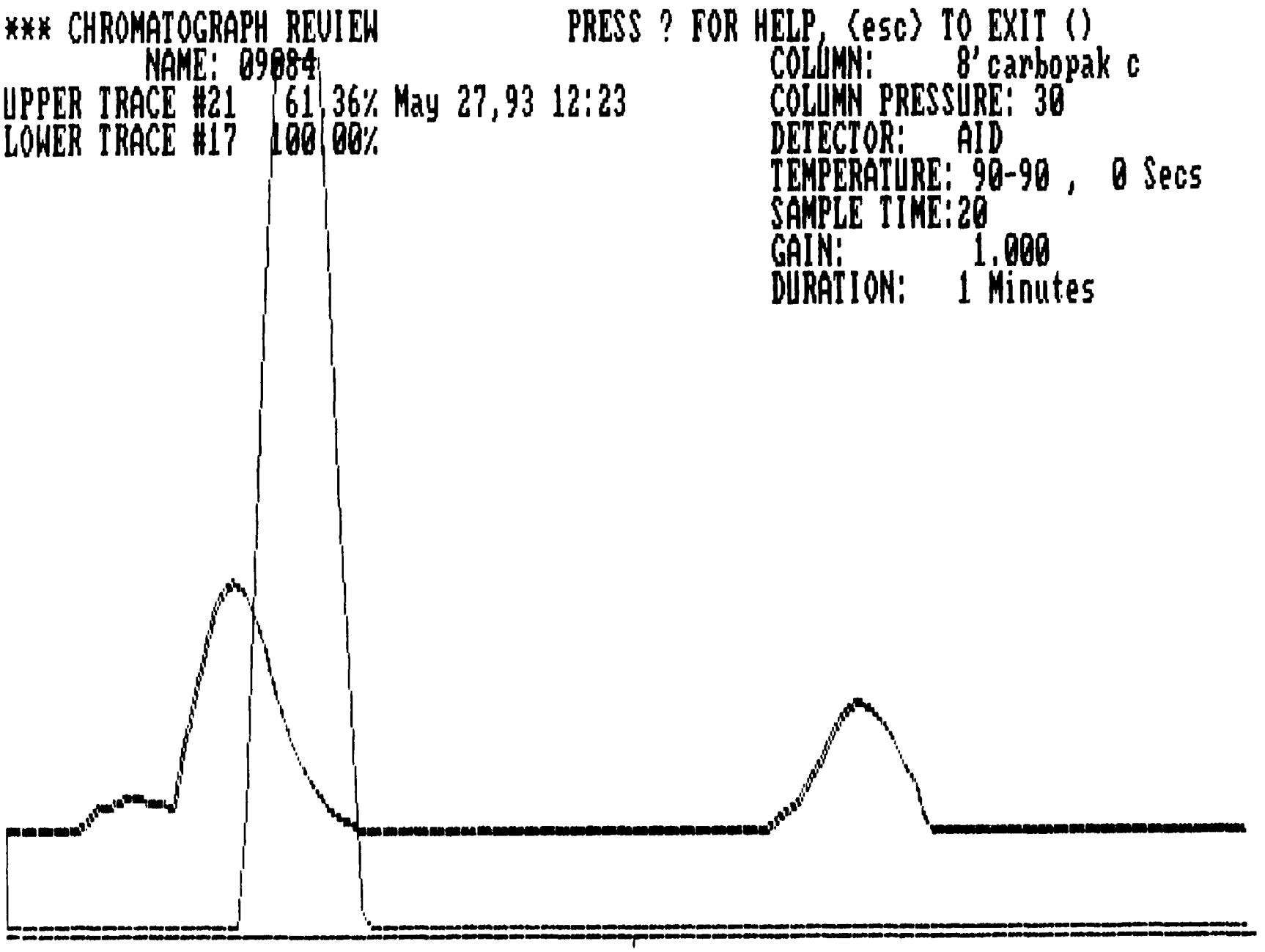
SAMPLE TIME:20

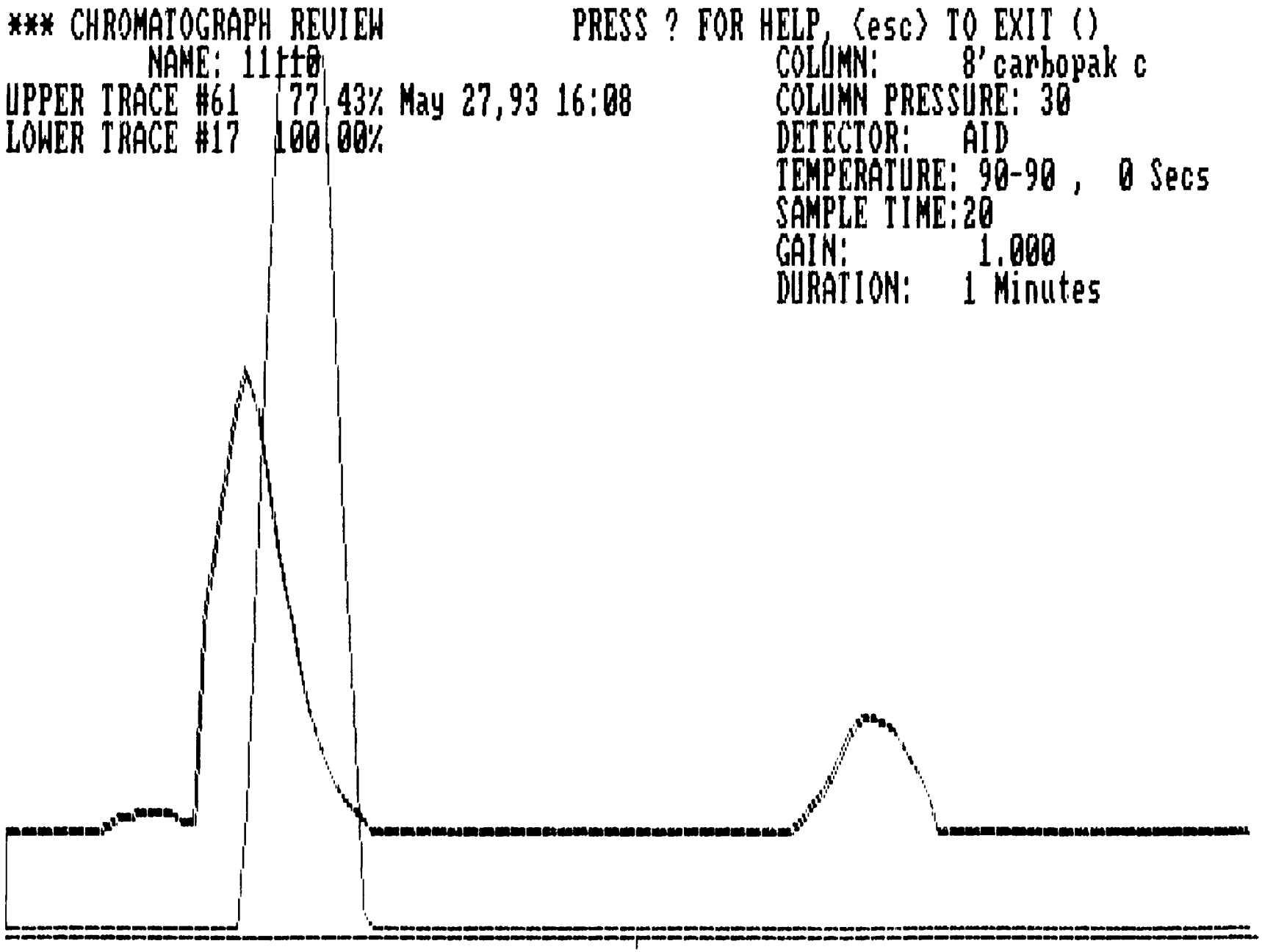
GAIN: 1.000

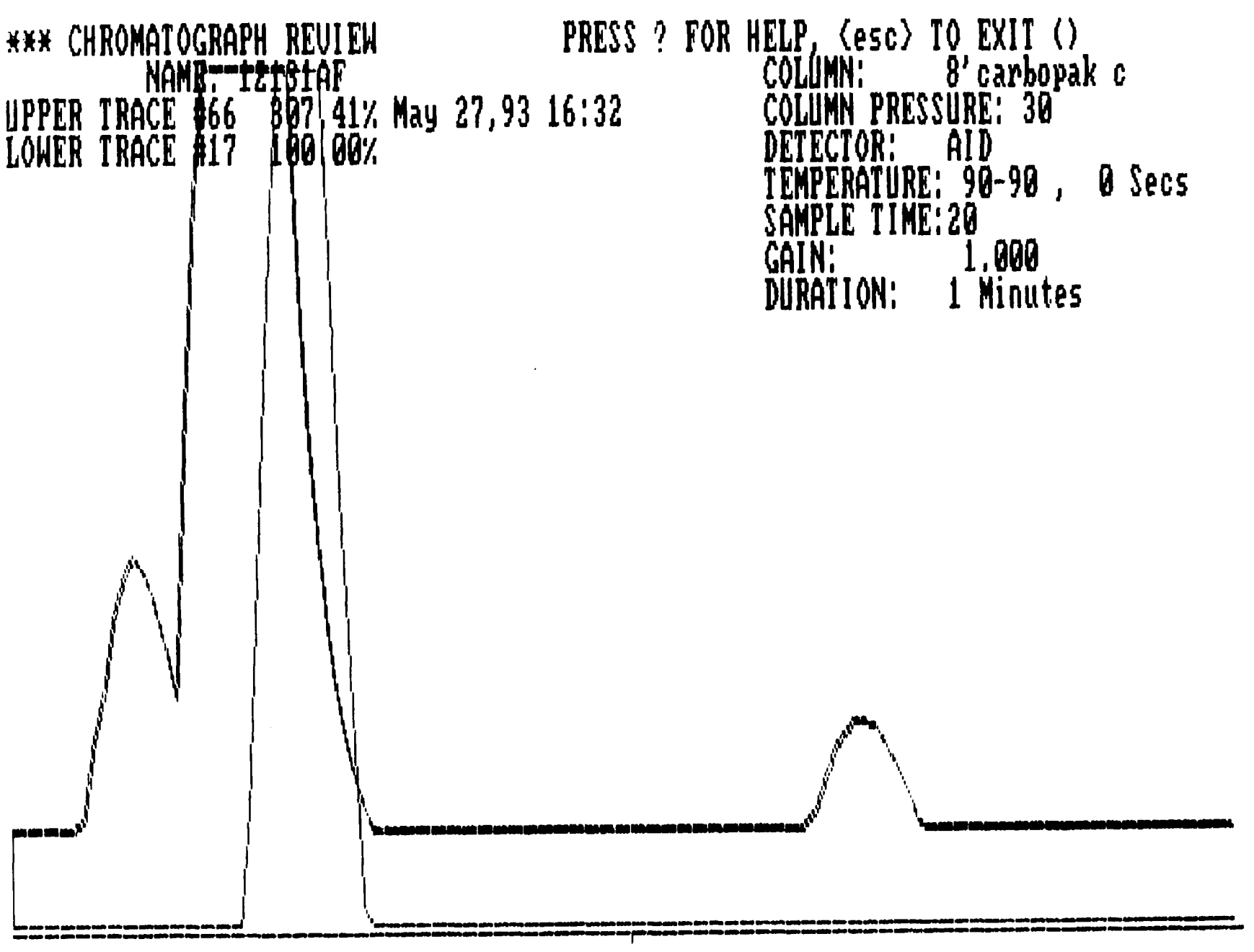
DURATION: 1 Minutes

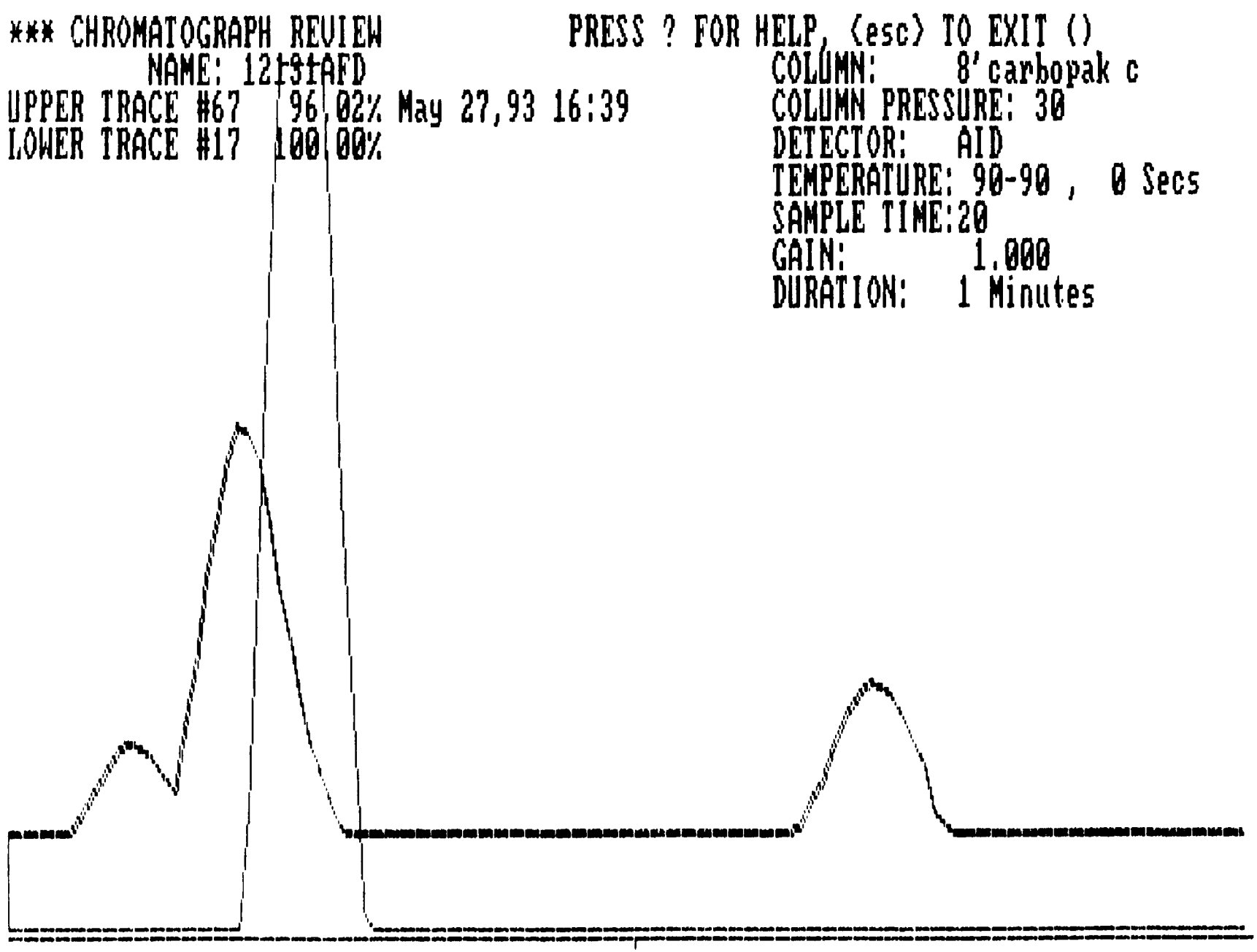


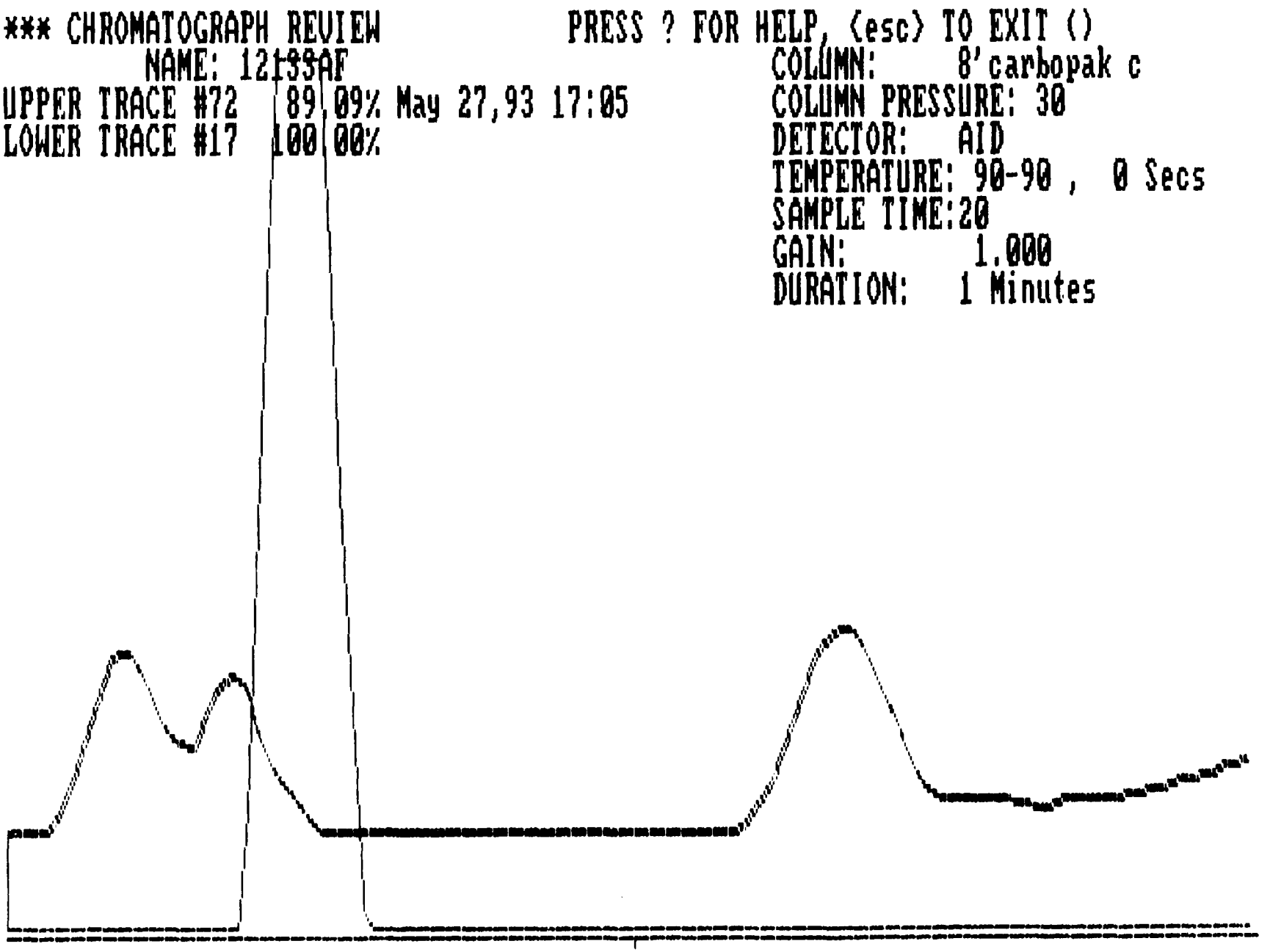

*** CHROMATOGRAPH REVIEW
PRESS ? FOR HELP, (esc) TO EXIT ()
NAME: 09082
UPPER TRACE #19 92.42% May 27,93 12:11
LOWER TRACE #17 100.00%
COLUMN: 8'carbopak c
COLUMN PRESSURE: 30
DETECTOR: AID
TEMPERATURE: 90-90 , 0 Secs
SAMPLE TIME:20
GAIN: 1.000
DURATION: 1 Minutes

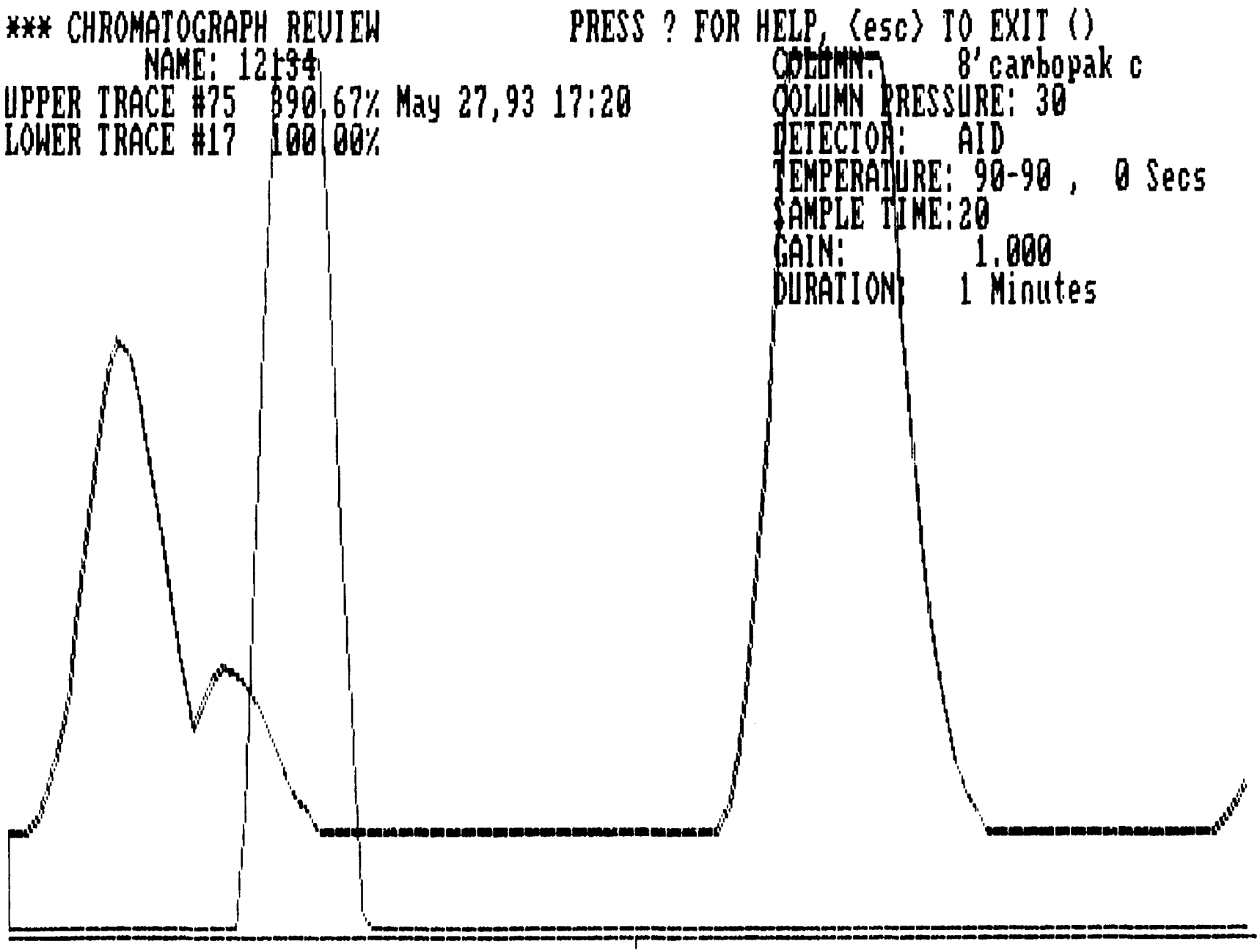

*** CHROMATOGRAPH REVIEW
PRESS ? FOR HELP, (esc) TO EXIT ()
NAME: 09084
UPPER TRACE #21 61,36% May 27,93 12:23
LOWER TRACE #17 100,00%
COLUMN: 8'carbopak c
COLUMN PRESSURE: 30
DETECTOR: AID
TEMPERATURE: 90-90 , 0 Secs
SAMPLE TIME:20
GAIN: 1.000
DURATION: 1 Minutes

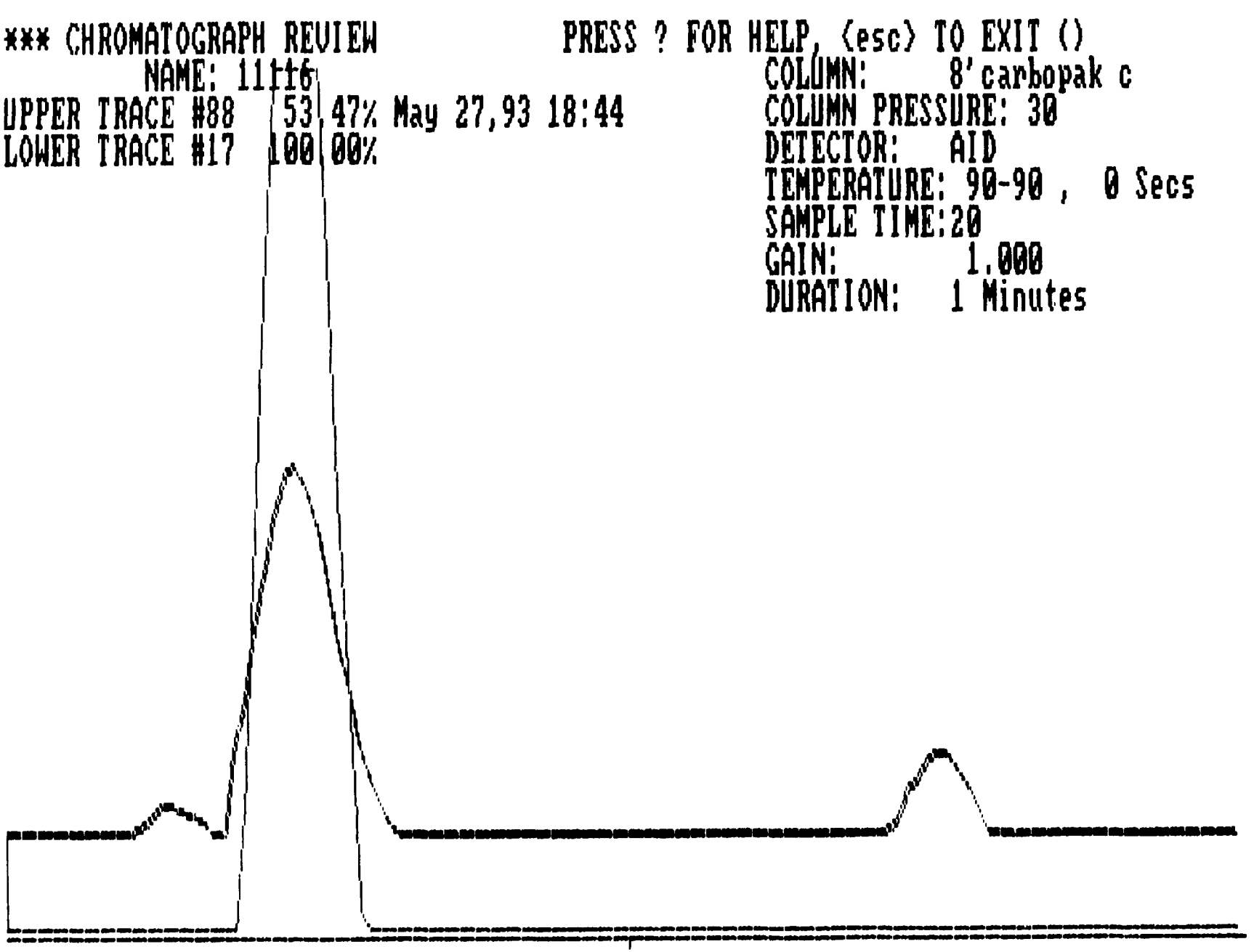

*** CHROMATOGRAPH REVIEW
PRESS ? FOR HELP, (esc) TO EXIT ()
NAME: 11tt0
UPPER TRACE #61 77 43% May 27,93 16:08
LOWER TRACE #17 100 00%
COLUMN: 8'carbopak c
COLUMN PRESSURE: 30
DETECTOR: AID
TEMPERATURE: 90-90 , 0 Secs
SAMPLE TIME:20
GAIN: 1.000
DURATION: 1 Minutes

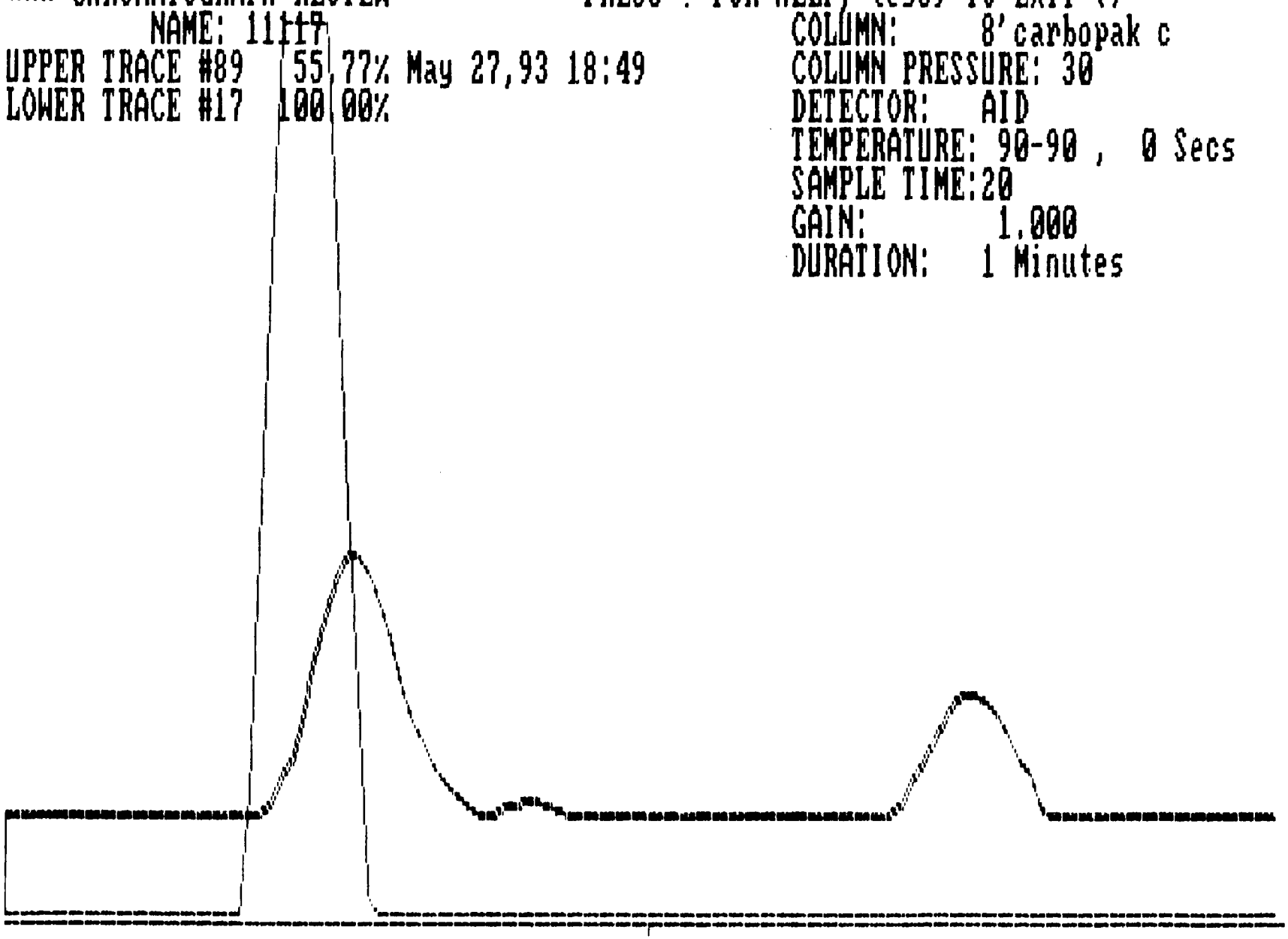

*** CHROMATOGRAPH REVIEW
PRESS ? FOR HELP, (esc) TO EXIT ()
NAME: IZISTAF
UPPER TRACE #66 307.41% May 27,93 16:32
LOWER TRACE #17 100.00%
COLUMN: 8' carbopak c
COLUMN PRESSURE: 30
DETECTOR: AID
TEMPERATURE: 90-90 , 0 Secs
SAMPLE TIME:20
GAIN: 1.000
DURATION: 1 Minutes

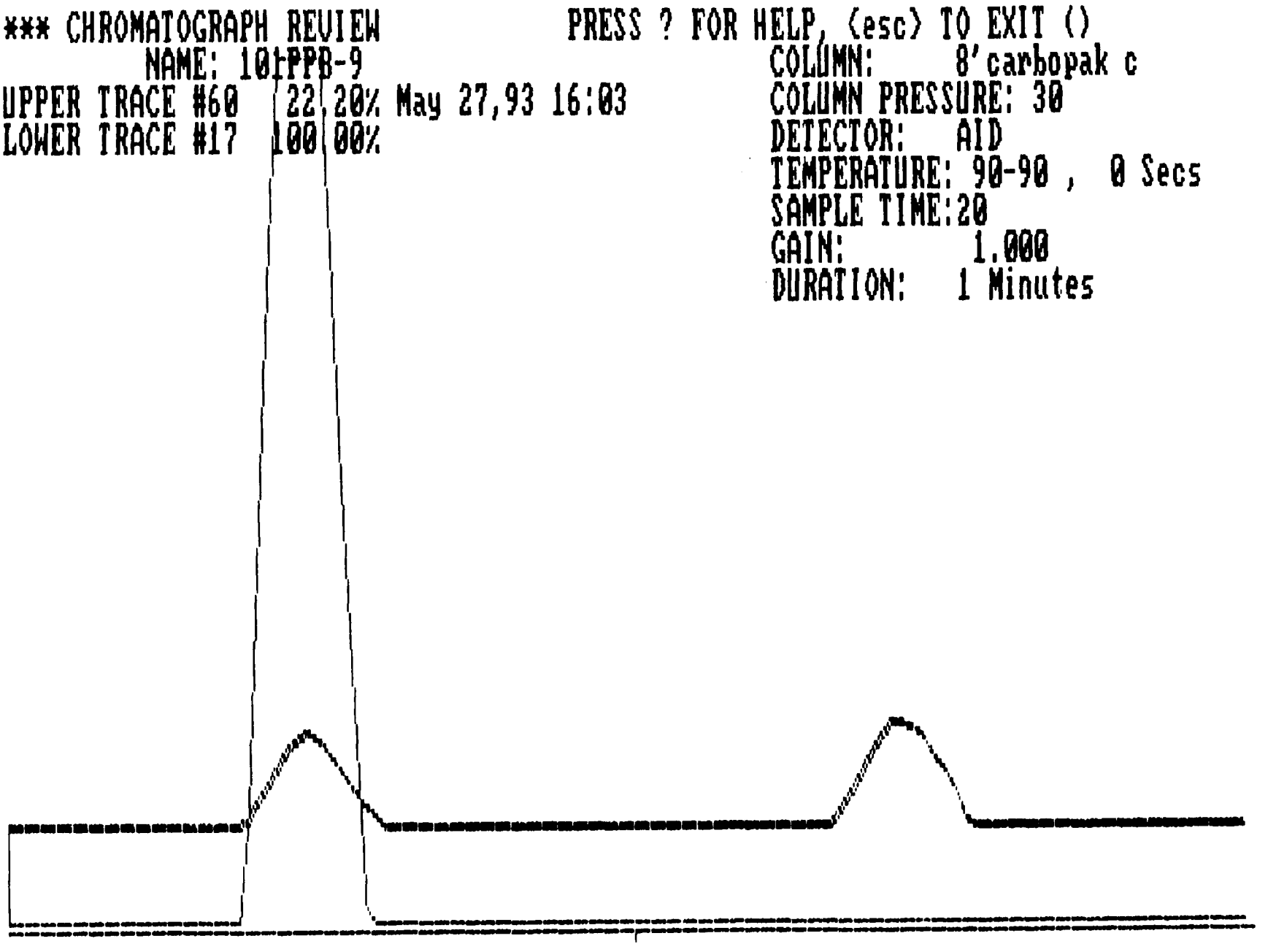

*** CHROMATOGRAPH REVIEW
PRESS ? FOR HELP, (esc) TO EXIT ()
NAME: 1213TAFD
UPPER TRACE #67 96.02% May 27,93 16:39
LOWER TRACE #17 100.00%
COLUMN: 8' carbopak c
COLUMN PRESSURE: 30
DETECTOR: AID
TEMPERATURE: 90-90 , 0 Secs
SAMPLE TIME:20
GAIN: 1.000
DURATION: 1 Minutes

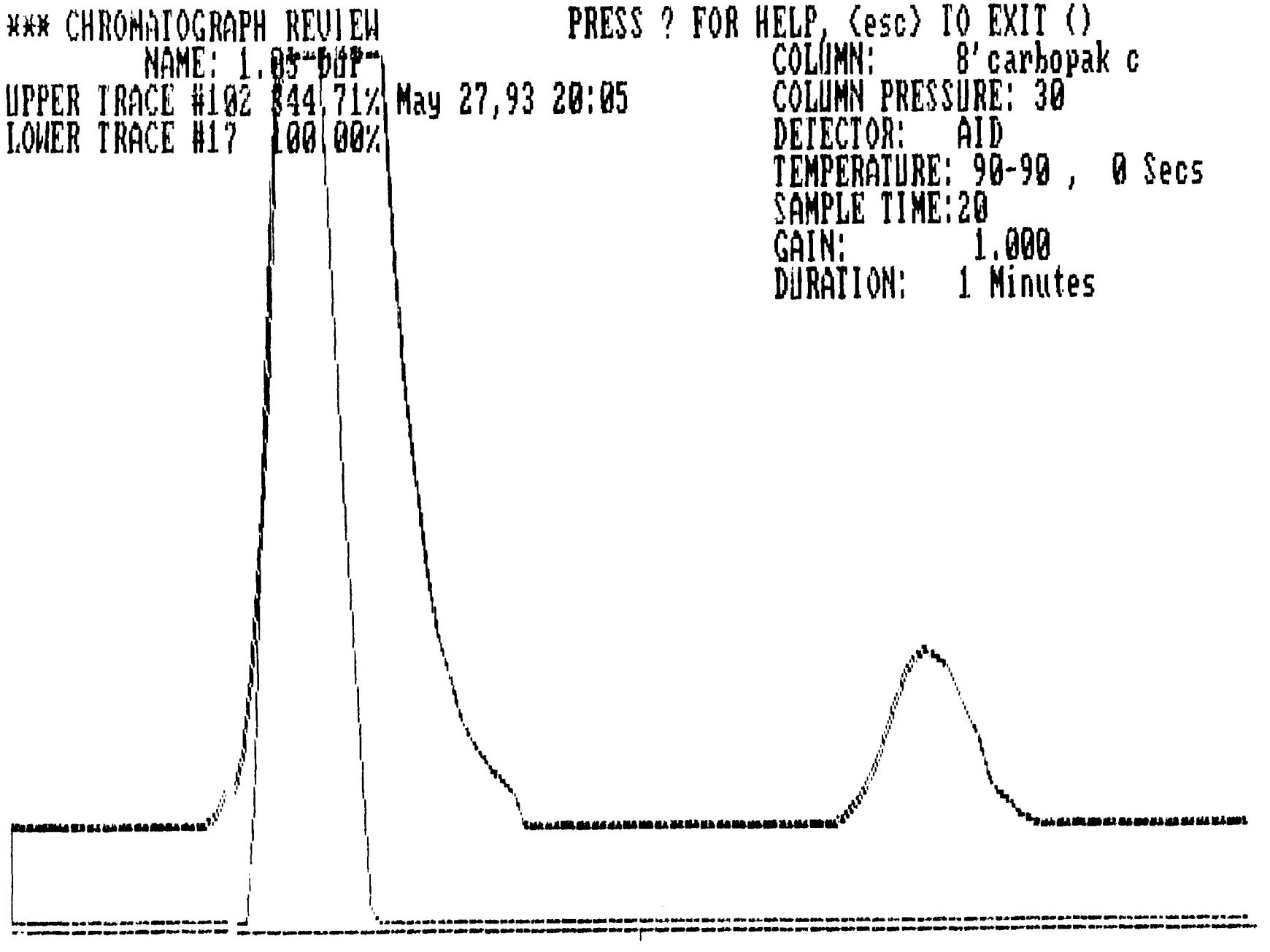

*** CHROMATOGRAPH REVIEW
PRESS ? FOR HELP, (esc) TO EXIT ()
NAME: 12133AF
UPPER TRACE #72 89.09% May 27,93 17:05
LOWER TRACE #17 100.00%
COLUMN: 8'carbopak c
COLUMN PRESSURE: 30
DETECTOR: AID
TEMPERATURE: 90-90 , 0 Secs
SAMPLE TIME:20
GAIN: 1.000
DURATION: 1 Minutes


*** CHROMATOGRAPH REVIEW
PRESS ? FOR HELP, (esc) TO EXIT ()
NAME: 1213
UPPER TRACE #75 390.67% May 27,93 17:20
LOWER TRACE #17 100.00%
COLUMN: 8'carbopak c
COLUMN PRESSURE: 30
DETECTOR: AID
TEMPERATURE: 90-90 , 0 Secs
SAMPLE TIME:20
GAIN: 1.000
DURATION: 1 Minutes


*** CHROMATOGRAPH REVIEW
PRESS ? FOR HELP, (esc) TO EXIT ()
NAME: 11ff6
UPPER TRACE #88 53 47% May 27,93 18:44
LOWER TRACE #17 100 00%
COLUMN: 8'carbopak c
COLUMN PRESSURE: 30
DETECTOR: AID
TEMPERATURE: 90-90 , 0 Secs
SAMPLE TIME:20
GAIN: 1.000
DURATION: 1 Minutes


*** CHROMATOGRAPH REVIEW
PRESS ? FOR HELP, <esc> TO EXIT ()
NAME: 11117
UPPER TRACE #89 55,77% May 27,93 18:49
LOWER TRACE #17 100,00%
COLUMN: 8'carbopak c
COLUMN PRESSURE: 30
DETECTOR: AID
TEMPERATURE: 90-90 , 0 Secs
SAMPLE TIME:20
GAIN: 1,000
DURATION: 1 Minutes


*** CHROMATOGRAPH REVIEW
PRESS ? FOR HELP, (esc) TO EXIT ()
NAME: 10 PPB-9
UPPER TRACE #60 22.20% May 27,93 16:03
LOWER TRACE #17 100.00%
COLUMN: 8' carbopak c
COLUMN PRESSURE: 30
DETECTOR: AID
TEMPERATURE: 90-90 , 0 Secs
SAMPLE TIME:20
GAIN: 1.000
DURATION: 1 Minutes


*** CHROMATOGRAPH REVIEW
PRESS ? FOR HELP, (esc) TO EXIT ()
NAME: 1.05 DUP
UPPER TRACE #102 344.71% May 27,93 20:05
LOWER TRACE #17 100.00%
COLUMN: 8' carbopak c
COLUMN PRESSURE: 30
DETECTOR: AID
TEMPERATURE: 90-90 , 0 Secs
SAMPLE TIME:20
GAIN: 1.000
DURATION: 1 Minutes

PROJECT Rose Hill Site (VCl via Sensor) Notebook No. ____ Continued From Page ____

COMMENTS — 25ppb std

A/D VOLTAGE = 1.2 — $\bar{x}$ = 6.691 — 119615
CAL FLOW RATE = 170 — Std DEV = 2.57 — 46086
SAMPLE FLOW RATE = 170 — MDL = 7.73 — 138,259
MQL = 25.7 — 460860 (area count)

* corrected for error { rf = 0.0000559; MDL = 28.9; MQL = 96.5 }

Run #	SAMPLE ID	COMMENTS (VCl)
1	VCl 101 ppb std	VCl rf = 54, old trap preconc
2	VCl 101 ppb	Δ rf: 54
3	TAGANE	
4	10 ppb VCl std	ND
5	25 ppb VCl std	ok Area cts = 100,914 — not linear
6	50 ppb VCl std	ok Area cts: 525,219 — rerun
7	101 ppb VCl std	ok Area cts = 131,701 — cal range
		(cleaned preconcentrator)
8	10 ppb	ND - ND
9	25 ppb } 3 pt.	Area = 127,318
10	50 ppb } cal	Area = 449,066
11	101 ppb } range	Area = 1137315
		AREA COUNTS
12	25 ppb - 1	5.77 ppb — 103309
13	25 ppb - 2	2.73 ppb — 48889
14	25 ppb - 3	6.47 ppb — 115692
15	25 ppb - 4	9.88 ppb — 176643
16	25 ppb - 5	8.97 ppb — 160424
17	25 ppb - 6	4.34 ppb — 77504
18	25 ppb - 7	9.56 ppb — 170939
19	25 ppb - 8	5.80 ppb — 103625
		(cleaned preconcentrator)
20	11371	ND
21	090711AF	ND
22	090712	ND
23	11372	ND

Continued on Page

Read and Understood By

[signature] 5/26/93
Signed — Date — Signed — Date

RUN #	SAMPLE ID	COMMENTS	
24	11373	ND	
25	09073 AF	ND	
26	11374	ND	
27	ⓡ ~~11~~ 09074 ~~AF~~	ND	
28	25ppb-9	(rt=51)	
29	09101 AF	ND	
30	11375	ND	
31	11375 AF	ND	
32	11376 ⓡ	ND	
33	090 ~~76 11376~~ ⓡ AF	ND	SAMPLE # 09076
34	AIRBLK	ND	
35	AIRBLK	ND	
36	09102	ND	
37	09077AF	ND	
38	11378	ND	
39	11378 AF	ND	
40	11379	ND	
41	25ppb10	6.74	(rt 53)
42	25ppb11	4.93	(rt 53)
43	09079AF	ND	
44	09080 AF	ND	
45	09111AF	ND	
46	09112AF	ND	
47	09103	ND	
48	09105	ND	
49	11377	ND	
50	11380	ND	
51	09106	ND	
52	25ppb12	(10.121)	rt 52
53	09107	ND	
54	09114 AF	ND	
55	11382	ND	
56	11383	ND	
57	1141 AF	ND	
58	09113AF	ND	
	11481 -	NOT RUN - FAT!	

Continued on Page

Read and Understood By

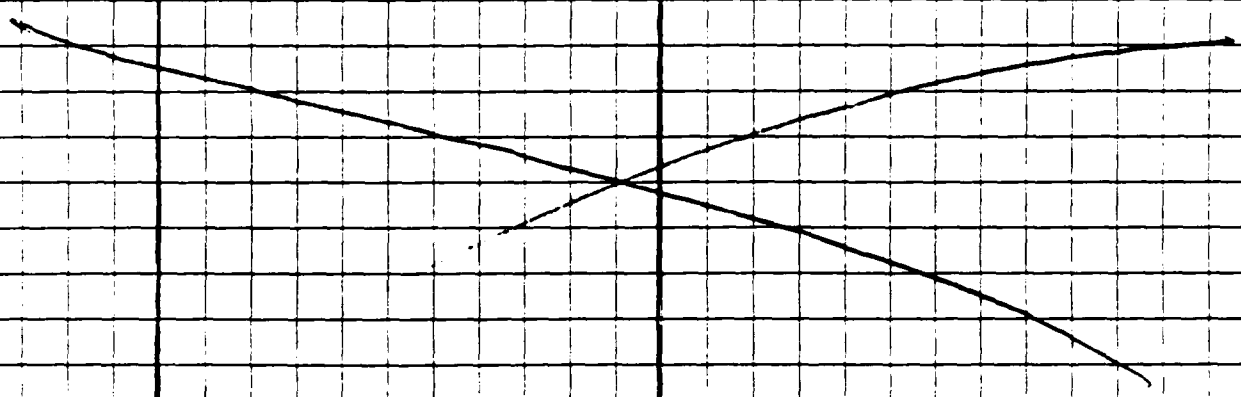
R.E. Wozniak — Signed | 5/26/93 — Date | Signed | Date

PROJECT ROSE HILL SITE

Notebook No. _____

Continued From Page _____

RUN #	SAMPLE ID	COMMENTS
59	09115AF	ND
60	09116AF	ND
631	11142	ND - some large peaks
632	~~@ 11384~~ TAGATR	OK
633	11384	ND
634	25ppb 13	7.67ppb (1=51)
65	09108	ND
66	11143 AF	ND
67	11144 AF	ND (mislabeled on dbase)
68	09109	ND
69	09110	ND
70	TAGATR	ND
71	09117 AF	ND
72	09118AF	ND
73	09119AF	ND
74	09081	ND
75	11145	ND
76	11386	ND
77	25ppb 14	3.87ppb
	#11146	FLAT BAG!



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Read and Understood By

Renata E Wyngle 5/26/93

Signed Date

_____ _____

Signed Date

RUN #	SAMPLE ID	COMMENTS
1	10 ppb std	N/G - not detected (A/D VOLTAGE △ 1.50)
2	25 ppb std	A = 293,400 (RT=57)
3	50 ppb std	A = 880,618 (RT=56)
4	100 ppb std	A = 1859938
5	25 ppb-1	281,206 15.73 ppb
6	25 ppb-2	283,198 15.84 ppb
7	25 ppb-3	255,839 14.31 ppb
8	25 ppb-4	120,833 6.76 ppb
9	090E3	26.12 ppb (VCC) large peaks
10	090E5	507.70 → diluted
11	09084	N.D
12	09085	OFF SCALE PEAK!
13	25 ppb-5	OFF SCALE - set on backflush & 2 clean.
14	AIR	OK - NO PEAKS
15	25 ppb-6	N/G - bad parameters
16	VCC std (1 ppm)	30 sec. sample purge
17	VCC std (1 ppm)	1253366 (60 sec.)
18	10 ppb-1	0.19 ppm detection limit
19	09082	0.44 ppm VCC A = 533,203
20	09083	N.D
21	09084	0.34 ppm VCC A = 415,079
22	09085	N.D
23	11101	N.D
24	11102	OFF SCALE, ran clean cycle
25	TAG AIR	OK
26	11102 (20:1)	DILUTED - N.D run on TAG A
27	11531	N.D
28	11532	N.D
29	101 ppb-2	0.20 ppm A = 245747
30	101 ppb-3	0.11 ppm - A = 130,821
31	11103	N.D
32	11104	N.D
33	11105 11534	N.D
34	11105	N.D
35	11151	N.D

Continued on Page

Read and Understood By

Signed — Date 5/27/93

Signed — Date

RUN #	SAMPLE ID	COMMENTS
36	11152	ND
37	11153	ND
38	11107	ND
39	09086	ND
40	09087	ND
41	09089	ND
42	11535	ND
43	11536 AF	ND
44	11537	ND
45	101 ppb-5	0.09 ppm rt-55 A=107335
46	101 ppb-6	0.11 ppm A=134,982
47	101 ppb-7	0.15 ppm A=188,384
48	11154	ND
49	11155	ND
50	11157	ND
51	11108	ND
52	11102	rerun straight ND
53	09090	ND
54	12817	ND
55	12818	ND
56	11538 AF	ND
57	11539	ND
58	11158	ND
59	101 ppb-8	0.14 rt=54 - A= 174537
60	101 ppb-9	0.10 rt=54 - A= 122498
61	11110	0.49 ppm VCl (w/coelutor?) A= 5930…
62	11112	ND
63	12819	ND
64	10697	ND
65	10698	ND
66	12131 AF	2.28 ppm VCl - offscale
67	12131 AFD	(4:1 DIL) 0.55 ppm A= 675212
68	12132 AF	ND
69	11391	ND
70	11392	ND
71	11393	ND

Continued on Page

Read and Understood By

R.E. Wy[illegible] 5/27/93

Signed Date Signed Date

RUN #	SAMPLE ID	COMMENTS
72	12133 AF	0.13 ppm — A=155546
73	101ppb 10	0.14 ppm RT=53 — A=165889
74	101ppb 11	0.06 ppm RT=53 A=75,997
75	12134	possible IKE - double peaks
76	12135	ND
77	11394	ND
78	11395	ND
79	11396	ND
80	1070 1	ND
81	1070 2	ND
82	1070 3	ND
83	10699	ND 13% methane
84	TAGAK	ND
85	101ppb 12	0.20 ppm
86	101ppb 13	0.11 ppm — A=132321
87	11115	ND
88	11116	0.44 ppm A=541350
89	11117	0.38 ppm A=465090
90	11113	ND
91	11114	ND
92	12136	ND
93	12137	ND
94	11397	ND
95	11398	ND
96	~~10 ppb 14~~ 11540AF	ND
97	101ppb ~~13~~ 14	0.05 ppm A=66793
98	101ppb 15	0.08 ppm A=95312
99	101ppb 16	0.15 ppm — A=184531
100	101ppb 17	0.09 ppm A=105481
101	1.03ppm STD	2.97 A=3614362
102	1.03ppm STD	3.17 A=3858615

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Read and Understood By

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4/27/93
Date

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APPENDIX B
TAGA 6000E Field Report
Air Quality Modeling Final Report
Rose Hill Regional Landfill
August 1993

GSA RARITAN DEPOT
2890 WOODBRIDGE AVENUE
BLDG. 209 ANNEX
EDISON, NJ 08837-3679
908-632-9200 • FAX: 908-632-9205

DATE: July 1, 1993

TO: Thomas H. Pritchett, U.S.EPA/ERT Work Assignment Manager

THRU: Vinod Kansal, REAC Section Chief

FROM: Hung-Chi Chen, REAC TAGA Team Member

SUBJECT: DOCUMENT TRANSMITTAL UNDER WORK ASSIGNMENT 4-694

Attached please find the following document(s) prepared under this work assignment:

TAGA 6000E FIELD REPORT
ROSE HILL REGIONAL LANDFILL
KINGSTOWN, RHODE ISLAND
ANALYTICAL REPORT

cc: Central File WA 4-694 (w/attachment)
W. Scott Butterfield (w/o attachment)
Stephen Blaze (w/o attachment)

pat\CHEN\AR-5694

TAGA ANALYTICAL REPORT

AIR ANALYSIS

ROSE HILL REGIONAL LANDFILL
KINGSTOWN, RHODE ISLAND

July 1993

EPA Work Assignment No.: 4-694
Weston Work Order No.: 3347-34-01-5694
EPA Contract No.: 68-03-3482

Prepared by:

Roy F. Weston, Inc.

Stephen Blaze 7/1/93
Stephen Blaze (Date)
Task Leader

W. Scott Butterfield 7/2/93
W. Scott Butterfield (Date)
Project Manager

Prepared for:

U.S. EPA/ERT

Thomas H. Pritchett
Work Assignment Manager

pat\CHEN\AR-5694

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LIST OF QA/QC TABLES

1.0 INTRODUCTION

This report presents the soil gas analysis results of United States Environmental Protection Agency/Environmental Response Team (U.S. EPA/ERT) Work Assignment No. 4-694, Weston Order No. 3347-34-01-5694, U.S. EPA Contract No.68-03-3482.

The Response Engineering and Analytical Contract (REAC) was tasked to mobilize the U.S. EPA Trace Atmospheric Gas Analyzer (TAGA) to Kingstown, Rhode Island, to conduct analysis of soil gas samples collected in the Rose Hill landfill. The monitoring began on May 26, 1993, and concluded on May 28, 1993. Soil gas samples were collected in accordance with REAC Standard Operation Procedure (SOP) #2149 (Soil Gas Sampling), using Tedlar bags at locations identified by U.S. EPA officials.

The TAGA monitoring used a target compound list which was provided by U.S. EPA personnel and was comprised of benzene and vinyl chloride. These two compounds were identified during previous mobilizations in soil gas samples collected at the Rose Hill landfill.

The two objectives of this study were to measure the concentrations of the target compounds in the soil gas samples and report daily preliminary concentrations to the U.S. EPA/ERT representative, which would be used as input data for air dispersion modeling.

2.0 PROCEDURE

2.1 TAGA Procedure

The following procedures were performed each sampling day using the TAGA 6000E:

(1) The first and third quadrupoles were scanned for 30 minutes each; this readied the instrument electronically.
(2) A gas mixture containing trichloroethene and tetrachloroethene was introduced by a mass flow controller into the sample air stream to optimize the first and third quadrupoles for sensitivity and mass assignment.
(3) The instrument was calibrated before and after each sampling period to generate target compound response factors - ion counts per second/parts per billion by volume (ICPS/ppbv).

The calibration systems consisted of a regulated gas cylinder with a mass flow controller. This calibration system was used to generate analytes' response factors (ICPS/ppbv), which were then used to quantify trace components in ambient air samples. Benzene and vinyl chloride were the target compounds for which the instrument was calibrated using the gas cylinder method.

The gas cylinder, which contained a known mixture of target compounds as certified by Scott Specialty Gases, was regulated at preset flow rates and diluted with ambient air. A list of compounds and concentrations in the standard gas cylinder is listed in the Appendix. This dilution of the gas cylinder gave known analyte concentrations. The software utilized the analytes' cylinder concentrations, the gas flow rates, the air sampling flow rates, and the atmospheric pressure to calculate the analytes' response factors (RFs). Those response factors (RFs) were obtained for the ion pairs of each compound of interest in the cylinder. The cylinder SX-22629 contained both benzene and vinyl chloride.

2.2 Tedlar Bag Procedure

Tedlar bags were used to collect soil gas samples. After a sample was collected, the Tedlar bag was placed in an opaque plastic bag to prevent photodegradation of the analyte and was transported to the TAGA. The bag's sample number, location, and sampling date and time were logged into the TAGA computer prior to analysis.

Tedlar bag analysis was performed by connecting the bag via Teflon® tubing and Swagelok® fittings directly to the heated transfer line. The bag's valve was opened, and the sample was introduced into the TAGA by the pressure gradient which exists between the ambient atmosphere and the mass spectrometer's core. Once the sample's target ion response equilibrated, a 3-minute selected ion monitoring file was collected and saved for each sample. For samples that showed high concentrations of target compounds, a diluted sample was prepared by introducing a known volume of the concentrated sample into a clean Tedlar bag containing a known volume of ambient air. The diluted samples were analyzed by the above method.

After the sample was analyzed, the intensity data was downloaded from the hard disk and processed as described in the PC-Plessey Interface Manual. The PC programs calculated an average concentration for each target compound. This concentration was determined by taking the signal intensity of the selected parent/daughter ion pairs of a compound, dividing them by the appropriate response factor, and averaging the resultant concentrations of their ion pairs.

3.0 RESULTS AND DISCUSSION

The TAGA 6000E laboratory conducted analysis of soil gas samples collected on the Rose Hill Regional Landfill in Kingstown, Rhode Island. The study was designed to measure on-site contaminant concentrations so that estimates of contaminant emission fluxes from the site could be modeled. To perform this study, two compounds were chosen for selected ion monitoring. Vinyl chloride was initially the only target compound of interest. Benzene was added to the target compound list to monitor for volitile organic compounds from common sources such as fuel. This technique allowed for quantitation of the compounds based on signal intensity of the compounds' parent/daughter ions.

The results of the soil gas analysis for the 3 days of sampling are in Tables 1 through 5 (May 26 through May 28, 1993).

The samples listed below had quantifiable vinyl chloride concentrations.

Table 2 : 09114AF
Table 3 : 09083, 09082, 09084, 11101
Table 4 : 11531, 11108, 11110, 12134, 11393, 11392, 12133AF, 11391, 11115, 11109

Samples which encountered no interference and had detected but not quantitated vinyl chloride concentrations, are listed below.

Table 1 : BAG11371
Table 2 : 11379, 09106, 11142, 11384, 09108, 11144AF
Table 4 : 09087, 11154, 09090, 12818, 10703, 12135, 12132AF, 10701, 11114, 12136

In the rest of samples, vinyl chloride was either not detected or the sample exhibited interference.

Only 3 samples, as listed below, had quantifiable benzene concentrations.

Table 3 : 09082
Table 4 : 11105, 11110

In the rest of samples, benzene was not detected, detected but not quantitated, or encountered an interference.

TABLE I
TAGA Analytical Results
May 26, 1993, Sampling Period One
Rose Hill Regional Landfill, Kingstown, RI

SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE TIME	CONCENTRATION (in $\mu g/m^3$) BEN	VNCL
BAG11371	C2-C3	11:09	DL=3.2	4.9 J
BAG09072	G2	11:35	DL=3.2	4.1 I
09071AF	E2	11:30	DL=3.2	DL=4.6
11372	OVA 2 C4-C5	11:30	DL=3.2	DL=4.6
11373	OVA 1.2 C6-C7	11:45	DL=3.2	DL=4.6
09073AF	E4	12:14	DL=3.2	DL=4.6
11374	OVA 35 B5-B6	12:25	DL=3.2	DL=4.6
09074AF	G4	12:24	DL=3.2	DL=4.6

DL = Detection limit
I = Due to interference, VNCL may be at least this high. The 64/27 ion pair concentration is more than 50% higher than 62/27 ion pair concentration, and the 62/27 concentration is entered into the table.
J = Value is above or equal to the detection limit but below the quantitation limit.
BEN = Benzene
VNCL = Vinyl chloride

TABLE 2
TAGA Analytical Results
May 26, 1993, Sampling Period Two
Rose Hill Regional Landfill, Kingstown, RI

SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE TIME	CONCENTRATION (in $\mu g/m^3$) BEN	VNCL
09076AF	E6	13:05	DL=3.5	DL=6.4
11375	OVA 2 C8-C9	12:20	DL=3.5	DL=6.4
11376	OVA 0.5 B7-B8	12:55	DL=3.5	DL=6.4
0975AF	G6	12:54	DL=3.5	3.6 I
09077AF	F7	13:15	DL=3.5	3.3 I
0978AF	H7	13:40	DL=3.5	DL=6.4
11379	OVA 5 B11-B12	13:50	3.8 J	7.2 J
09102	D5	13:50	DL=3.5	3.8 I
11378	B9-B10 OVA 2	13:05	5.4 J	DL=6.4
11381	C17 OUTSIDE FENCE	15:45	DL=3.5	7.2 I
09080AF	F5	14:40	DL=3.5	DL=6.4
09111AF	F3	15:10	DL=3.5	DL=6.4
09112AF	F1	15:20	DL=3.5	DL=6.4
09103	OVA 1000 C2	14:30	DL=3.5	3.8 I
09105	D3	15:20	DL=3.5	DL=6.4
09106	G9	16:21	DL=3.5	5.6 J
11380	OVA 2 B13-B14	14:40	7.7 J	DL=6.4
11377	OVA 10 B15-B16	15:15	DL=3.5	DL=6.4
09107	E11	16:59	4.2 J	DL=6.4
09114AF	C0	17:20	DL=3.5	17.92
11382	E17 OUTSIDE FENCE	16:25	DL=3.5	DL=6.4

DL = Detection limit
I = Due to interference, VNCL may be at least this high. The 64/27 ion pair concentration is more than 50% higher than 62/27 ion pair concentration, and the 62/27 concentration is entered into the table.
J = Value is above or equal to the detection limit but below the quantitation limit.
BEN = Benzene
VNCL = Vinyl chloride

TABLE 2 (Cont'd)
TAGA Analytical Results
May 26, 1993, Sampling Period Two
Rose Hill Regional Landfill, Kingstown, RI

SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE TIME	CONCENTRATION (in $\mu g/m^3$) BEN	VNCL
11383	F16-F17	17:15	DL=3.5	DL=6.4
11141AF	C9	17:25	DL=3.5	4.4 I
09113AF	E7	14:45	DL=3.5	3.6 I
09115AF	D1	17:55	DL=3.5	DL=6.4
09116AF	B1	16:18	DL=3.5	DL=6.4
11142	OVA 300 C13	17:57	5.8 J	8.7 J
11384	OVA >1000 E16-E17	17:45	DL=3.5	7.7 J
09108	G13	16:30	DL=3.5	6.7 J
11143AF	C16	18:35	DL=3.5	3.8 I
11144AF	B17	19:13	DL=3.5	5.6 J
09109	E15	19:24	DL=3.5	5.1 I
09110	F18	19:30	5.1 J	DL=6.4
09117AF	B3	18:53	DL=3.5	4.9 I
09118AF	B4	19:20	DL=3.5	4.9 I
09119AF	C2	20:07	DL=3.5	5.9 I
09081	Q2	20:10	DL=3.5	3.8 I
11145	Q1	19:57	DL=3.5	4.4 I
11146	Q3	20:20	3.8 J	5.4 I
11386	E18	19:25	3.8 J	4.4 I

DL = Detection limit
I = Due to interference, VNCL may be at least this high. The 64/27 ion pair concentration is more than 50% higher than 62/27 ion pair concentration, and the 62/27 concentration is entered into the table.
J = Value is above or equal to the detection limit but below the quantitation limit.
BEN = Benzene
VNCL = Vinyl chloride

TABLE 3
TAGA Analytical Results
May 27, 1993, Sampling Period One
Rose Hill Regional Landfill, Kingstown, RI

SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE TIME	CONCENTRATION (in $\mu g/m^3$) BEN	VNCL
09083	OVA >1000 #21	09:11	DL=4.2	87.9
09082	OVA >1000 #22	09:05	50.2	572.3
09084	OVA 1000 #20	09:45	6.7 J	336.9
09085	OVA 100 #19	09:47	DL=4.2	DL=4.9
11101	OVA 270 F10-F11(8)	08:55	DL=4.2	17.6

DL = Detection limit
J = Value is above or equal to the detection limit but below the quantitation limit.
BEN = Benzene
VNCL = Vinyl chloride

TABLE 4
TAGA Analytical Results
May 27, 1993, Sampling Period Two
Rose Hill Regional Landfill, Kingstown, RI

SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE TIME	CONCENTRATION (in $\mu g/m^3$) BEN	VNCL
11102	OVA F13-F14(10) DIL 1/20	09:15	DL=4.5	3.3 I
11531	OVA 400 OVA2 350 #23	09:05	14.1 J	27.9
11532	OVA 0 #25	09:32	DL=4.5	DL=5.9
11103	OVA 450 G14-H14(9)	09:45	14.7 J	17.4 I
11104	OVA 100 F15-G15(6)	10:05	DL=4.5	13.8 I
11534	OVA 110 OVA2 82 #24	09:57	DL=4.5	DL=5.9
11105	OVA >1000 F16-F17(3)	10:20	19.8	17.4 I
11151	OVA >1000 #40	09:10	DL=4.5	4.1 I
11152	OVA >1000 #12	09:33	DL=4.5	43.0 I
11153	OVA 12 #38	10:04	DL=4.5	DL=5.9
11107	OVA >1000 F16-F17(1)	11:00	DL=4.5	14.6 I
09086	OVA >1000 #28	10:17	DL=4.5	8.2 I
09087	OVA 8 #18	10:23	DL=4.5	5.1 J
09089	OVA >1000 #17	11:05	7.3 J	4.9 I
11535	C2	10:28	DL=4.5	5.1 I
11536AF	OVA >1000 OVA2 400 #27	10:58	DL=4.5	5.4 I
11537	OVA/OVA2 >1000 #26	11:25	10.2 J	10.5 I
11155	OVA >1000 #42	11:02	DL=4.5	8.2 I
11154	OVA 62 #36	10:28	DL=4.5	5.4 J
11157	OVA 240 #44	11:35	DL=4.5	4.4 I

DL = Detection limit
I = Due to interference, VNCL may be at least this high. The 64/27 ion pair concentration is more than 50% higher than 62/27 ion pair concentration, and the 62/27 concentration is entered into the table.
J = Value is above or equal to the detection limit but below the quantitation limit.
BEN = Benzene
VNCL = Vinyl chloride

TABLE 4 (Cont'd)
TAGA Analytical Results
May 27, 1993, Sampling Period Two
Rose Hill Regional Landfill, Kingstown, RI

SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE TIME	CONCENTRATION (in $\mu g/m^3$) BEN	VNCL
11108	OVA 10 C6-C7(32)	11:45	DL=4.5	15.1
09090	OVA 150 #16	11:52	DL=4.5	4.9 J
12817	C1	12:40	DL=4.5	DL=5.9
12818	OVA 150 C2	12:55	DL=4.5	6.7 J
11538AF	OVA 500 #30	12:02	DL=4.5	8.4 I
11539	OVA 290 #14	12:34	DL=4.5	3.3 I
11158	OVA 100 #34	12:17	DL=4.5	3.6 I
11110	OVA >1000 B4(84)	13:50	21.7	756.9
11112	OVA >1000 B8.5(77)	14:30	DL=4.5	13.8 I
12819	OVA >1000 #86	13:47	7.7 J	DL=5.9
12134	OVA >1000 #70	15:43	14.1 J	194.0
10702	OVA >1000 #80	15:50	DL=4.5	3.8 I
10703	OVA >1000 #81	15:52	DL=4.5	5.6 J
11393	OVA 250 #64	14:45	DL=4.5	33.0
11392	OVA 650 #63	14:20	13.7 J	146.2
12133AF	OVA>1000 #65	15:05	9.6 J	302.9
11395	#69	15:43	6.4 J	11.8 I
12135	OVA 30 #71	16:10	6.7 J	7.9 J
12132AF	OVA 50 #62	14:24	8.9 J	8.7 J
11396	OVA 220 #67	16:01	DL=4.5	4.4 I

DL = Detection limit
I = Due to interference, VNCL may be at least this high. The 64/27 ion pair concentration is more than 50% higher than 62/27 ion pair concentration, and the 62/27 concentration is entered into the table.
J = Value is above or equal to the detection limit but below the quantitation limit.
BEN = Benzene
VNCL = Vinyl chloride

TABLE 4 (Cont'd)
TAGA Analytical Results
May 27, 1993, Sampling Period Two
Rose Hill Regional Landfill, Kingstown, RI

SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE TIME	CONCENTRATION (in $\mu g/m^3$) BEN	VNCL
10701	OVA>1000 #83	15:20	DL=4.5	6.1 J
11394	OVA 20 #66	15:07	DL=4.5	3.6 I
10698	OVA 15 #85	14:36	DL=4.5	4.4 I
11391	#60	12:49	DL=4.5	14.3
10698	OVA 15 #85	14:36	DL=4.5	4.4 I
11398	OVA 220 #73	16:56	DL=4.5	4.9 I
10697	OVA 10 #87	13:58	DL=4.5	4.9 I
11113	OVA >1000 B8.5(78)	14:50	DL=4.5	9.7 I
11115	OVA 250-260 B10.5(75)	15:50	DL=4.5	56.0
11114	OVA >1000 B8.5(79)	15:15	7.7 J	8.7 J
12136	OVA 650 #72	16:49	5.4 J	6.7 J
11397	#68	16:11	DL=4.5	4.1 I
12137	OVA 100 C2	17:22	DL=4.5	5.4 I
11540	AB0	13:15	DL=4.5	DL=5.9
11160	B0	12:08	6.4 J	DL=5.9
11159	OVA 9.2 D0	12:45	DL=4.5	4.1 I
11109	C(-47)	12:35	DL=4.5	17.4
10699	OVA >1000 DIL 1:20	15:00	DL=4.5	12.0 I

DL = Detection limit
I = Due to interference, VNCL may be at least this high. The 64/27 ion pair concentration is more than 50% higher than 62/27 ion pair concentration, and the 62/27 concentration is entered into the table
J = Value is above or equal to the detection limit but below the quantitation limit
BEN = Benzene
VNCL = Vinyl chloride

TABLE 5
TAGA Analytical Results
May 28, 1993, Sampling Period One
Rose Hill Regional Landfill, Kingstown, RI

SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE TIME	CONCENTRATION (in $\mu g/m^3$) BEN	VNCL
10705	C(-75)	09:42	DL=2.9	DL=4.1
10706	(CD) 10	10:07	DL=2.9	DL=4.1

DL = Detection limit
BEN = Benzene
VNCL = Vinyl chloride

4.0 QUALITY ASSURANCE / QUALITY CONTROL

The compound parent/daughter ion pairs used for ion profile quantitation and detection are listed below.

Compound	ID	Parent Mass/Daughter Mass
Vinyl chloride	VNCL	62/27
Vinyl chloride	VNCL	64/27
Benzene	BEN	78/39
Benzene	BEN	78/52

The Summary of Detection and Quantitation Limit Data for the Sampling Periods documents the part per billion concentration required for a compound's ion pair to be considered detectable and quantifiable during the specified sampling period. The detection limit is defined as three times the standard deviation of the concentration for a compound's ion pair measured in an ambient air matrix collected in a Tedlar bag. The quantitation limit is defined as 10 times the standard deviation of the concentration for the same conditions. Both the detection and quantitation limits use an ambient air matrix collected in a Tedlar bag and the intermediate response factors.

The Summaries of the Target Compound Detection and Quantitation Limits for the Target Compounds documents the part per billion concentration required for the compounds to be considered detectable and quantifiable. The detection and quantitation limits for a compound result from averaging the detection and quantitation limits of the compound's ion pairs, as listed above. The Potential Maximum Concentration Percent Deviation for the Target Compounds During the Sampling Periods are symmetrical measurements of the concentration variance resulting from daily response factor variability.

Error bars were not available for the last day, May 28, 1993, because only one calibration was run.

For each sample, the mass to charge ratio (m/z) 64/27 ion pair concentration was checked to see if it exceeded the m/z 64/27 ion pair detection limit (DL). If the m/z 64/27 ion pair DL was not exceeded, then the m/z 64/27 ion pair DL was reported.

For some samples, vinyl chloride (VNCL) encountered interference in the m/z 64/27 ion pair. The relative concentration difference between the m/z 62/27 ion pair, and the m/z 64/27 ion pair was checked to determine if interference existed. If the m/z 64/27 ion pair concentration was more than 50 percent higher than the m/z 62/27 ion pair concentration, then the m/z 62/27 ion pair concentration was entered into the results table and flagged with an "I" for interference.

4.1 Calculations for the Actual and Intermediate Response Factor Summaries for the Sampling Periods

Response factors were generated from the initial and final calibration events, as described in the procedure. Tables 6 - 10 contain the RFs in units of ion counts per second/parts per billion by volume (ICPS/ppbv). The actual RFs are used to calculate the intermediate RFs, which are used to calculate the concentrations reported in the results. The following is a list of the target compounds and the "ID" used in Tables 6 - 10.

ID	COMPOUND
VNCL	vinyl chloride
BEN	benzene

The following equation was used to calculate the intermediate response factors (IRF) found in Tables 6 - 10.

$$IRF = 2\,\frac{(RF1 \times RF2)}{(RF1 + RF2)}$$

where:

IRF = Intermediate response factor (ICPS/ppb)
RF1 = The RF for an ion pair measured during the initial calibration event (ICPS/ppb)
RF2 = The RF for the same ion pair measured during the final calibration event (ICPS/ppb)

For example, the entry for the 78/39 ion pair of benzene from Table 6 is:

RF1 = 71.35 (ICPS/ppb)
RF2 = 41.86 (ICPS/ppb)

and then

$$IRF = \frac{2(71.35 \times 41.86)}{(71.35 + 41.86)} = \frac{5973.4}{113.2} = 52.8 \text{ ICPS/ppb}$$

TABLE 6

Actual and Intermediate Response Factor Summary
for Sampling Period One of May 26, 1993
Rose Hill Regional Landfill, Kingstown, RI

RESPONSE FACTORS IN ION COUNTS PER SECOND PER PART PER BILLION BY VOLUME (ICPS/PPBV)

CALIBRATION TIME 08:43 13:27

ID	PM/DM	INTERMEDIATE RESPONSE FACTOR	RESPONSE FACTOR	RESPONSE FACTOR
VNCL	62/ 27	247.34	150.23	186.9
VNCL	64/ 27	82.83	46.13	59.3
BEN	78/ 39	71.35	41.86	52.8
BEN	78/ 52	80.48	50.58	62.1

ID = Identification code
PM = Parent ion mass
DM = Daughter ion mass

TABLE 7

Actual and Intermediate Response Factor Summary
for Sampling Period Two of May 26, 1993
Rose Hill Regional Landfill, Kingstown, RI

RESPONSE FACTOR IN ION COUNTS PER SECOND PER PART PER BILLION BY VOLUME (ICPS/PPBV)

CALIBRATION TIME 13:27 21:09

ID	PM/DM	RESPONSE FACTOR	RESPONSE FACTOR	INTERMEDIATE RESPONSE FACTOR
VNCL	62/ 27	150.23	134.03	141.7
VNCL	64/ 27	46.13	39.26	42.4
BEN	78/ 39	41.86	47.97	44.7
BEN	78/ 52	50.58	58.49	54.2

ID = Identification code
PM = Parent ion mass
DM = Daughter ion mass

TABLE 8

Actual and Intermediate Response Factor Summary
for Sampling Period One of May 27, 1993
Rose Hill Regional Landfill, Kingstown, RI

RESPONSE FACTOR IN ION COUNTS PER SECOND PER PART PER BILLION BY VOLUME (ICPS/PPBV)

CALIBRATION	TIME	08:43	12:42	
ID	PM/DM	RESPONSE FACTOR	RESPONSE FACTOR	INTERMEDIATE RESPONSE FACTOR
VNCL	62/ 27	192.12	162.16	175.9
VNCL	64/ 27	61.12	49.52	54.7
BEN	78/ 39	64.87	55.92	60.1
BEN	78/ 52	73.01	63.81	68.1

ID = Identification code
PM = Parent ion mass
DM = Daughter ion mass

TABLE 9

Actual and Intermediate Response Factor Summary
for Sampling Period Two of May 27, 1993
Rose Hill Regional Landfill, Kingstown, RI

RESPONSE FACTOR IN ION COUNTS PER SECOND PER PART PER BILLION BY VOLUME (ICPS/PPBV)

CALIBRATION TIME 12:42 20:41

ID	PM/DM	RESPONSE FACTOR	RESPONSE FACTOR	INTERMEDIATE RESPONSE FACTOR
VNCL	62/ 27	162.16	135.75	147.8
VNCL	64/ 27	49.52	40.58	44.6
BEN	78/ 39	55.92	51.85	53.8
BEN	78/ 52	63.81	62.18	63.0

ID = Identification code
PM = Parent ion mass
DM = Daughter ion mass

TABLE 10

Actual and Intermediate Response Factor Summary
for Sampling Period One of May 28, 1993
Rose Hill Regional Landfill, Kingstown, RI

RESPONSE FACTOR IN ION COUNTS PER SECOND PER PART PER BILLION BY VOLUME (ICPS/PPBV)

CALIBRATION	TIME	09:34	09:34	
ID	PM/DM	RESPONSE FACTOR	RESPONSE FACTOR	INTERMEDIATE RESPONSE FACTOR
VNCL	62/ 27	176.53	176.53	176.5
VNCL	64/ 27	62.36	62.36	62.4
BEN	78/ 39	93.38	93.38	93.4
BEN	78/ 52	101.98	101.98	102.0

ID = Identification code
PM = Parent ion mass
DM = Daughter ion mass

4.2 Calculations for the Summaries of the Detection and Quantitation Limit Data for the Sampling Periods

The detection limits (DL) and quantitation limits (QL) were generated from the intensity of the standard deviation (SD) of the compound's ion pair intensity measured in an ambient air matrix collected in a Tedlar bag and from its IRF, described earlier in this section. Tables 11 to 15 contain these IRFs that are in units of ion counts per second/part per billion by volume (ICPS/ppbv).

The following equation was used to calculate the detection concentration limits found in Tables 11 to 15.

$$DL = \frac{3 \times SD}{IRF}$$

where:

DL = Detection limit for an ion pair (ppbv)
SD = Standard deviation of the ion intensity for an ion pair measured in an ambient air matrix collected in a Tedlar bag (ICPS)
IRF = Intermediate response factor for an ion pair (ICPS/ppbv)

For example, the entry for the 78/39 ion pair of benzene from Table 11 is:

SD = 18 ICPS
IRF= 52.8 ICPS/ppbv

$$DL = \frac{3 \times 18}{52.8} = 1.0 \text{ ppbv}$$

The following equation was used to calculate the QL concentrations found in Tables 11 to 15:

$$QL = \frac{10 \times SD}{IRF}$$

where:
QL = Quantitation limit concentration for an ion pair (ppbv)
SD = Ion intensity for an ion pair measured in an ambient air matrix collected in a Tedlar bag (ICPS/ppbv)
IRF = Intermediate response factor for an ion pair (ICPS/ppbv)

For example, the entry for the 78/39 ion pair of benzene from Table 11 is:

SD = 18 ICPS
IRF = 52.8 ICPS/ppbv

$$QL = \frac{10 \times 18}{52.8} = 3.4 \text{ ppbv}$$

TABLE 11

Summary of Detection And Quantitation Limit Data
for Sampling Period One of May 26, 1993
Rose Hill Regional Landfill, Kingstown, RI

ID	PM/DM	IRF	EBAR	DL ICPS	QL ICPS	DL PPBV	QL PPBV	INTENSITY ICPS	SD ICPS
VNCL	62/ 27	186.9	0.244	111	370	0.6	2.0	132	37
VNCL	64/ 27	59.3	0.285	108	360	1.8	6.1	92	36
BEN	78/ 39	52.8	0.261	54	180	1.0	3.4	29	18
BEN	78/ 52	62.1	0.228	57	190	0.9	3.1	30	19

ID = Identification code
PM = Parent ion mass
DM = Daughter ion mass
IRF = Intermediate response factor
EBAR = "Error bar"
DL = Detection limit
QL = Quantitation limit
SD = Standard deviation

TABLE 12

Summary of Detection And Quantitation Limit Data
for Sampling Period Two of May 26, 1993
Rose Hill Regional Landfill, Kingstown, RI

ID	PM/DM	IRF	EBAR	DL ICPS	QL ICPS	DL PPBV	QL PPBV	INTENSITY ICPS	SD ICPS
VNCL	62/ 27	141.7	0.057	111	370	0.8	2.6	132	37
VNCL	64/ 27	42.4	0.080	108	360	2.5	8.5	92	36
BEN	78/ 39	44.7	0.068	54	180	1.2	4.0	29	18
BEN	78/ 52	54.2	0.073	57	190	1.1	3.5	30	19

ID = Identification code
PM = Parent ion mass
DM = Daughter ion mass
IRF = Intermediate response factor
EBAR = "Error bar"
DL = Detection limit
QL = Quantitation limit
SD = Standard deviation

TABLE 13

Summary of Detection And Quantitation Limit Data
for Sampling Period One of May 27, 1993
Rose Hill Regional Landfill, Kingstown, RI

ID	PM/DM	IRF	EBAR	DL ICPS	QL ICPS	DL PPBV	QL PPBV	INTENSITY ICPS	SD ICPS
VNCL	62/ 27	175.9	0.085	141	470	0.8	2.7	137	47
VNCL	64/ 27	54.7	0.105	102	340	1.9	6.2	88	34
BEN	78/ 39	60.1	0.074	81	270	1.3	4.5	46	27
BEN	78/ 52	68.1	0.067	84	280	1.2	4.1	47	28

ID = Identification code
PM = Parent ion mass
DM = Daughter ion mass
IRF = Intermediate response factor
EBAR = "Error bar"
DL = Detection limit
QL = Quantitation limit
SD = Standard deviation

TABLE 14

Summary of Detection And Quantitation Limit Data
for Sampling Period Two of May 27, 1993
Rose Hill Regional Landfill, Kingstown, RI

ID	PM/DM	IRF	EBAR	DL ICPS	QL ICPS	DL PPBV	QL PPBV	INTENSITY ICPS	SD ICPS
VNCL	62/ 27	147.8	0.089	141	470	1.0	3.2	137	47
VNCL	64/ 27	44.6	0.099	102	340	2.3	7.6	88	34
BEN	78/ 39	53.8	0.038	81	270	1.5	5.0	46	27
BEN	78/ 52	63.0	0.013	84	280	1.3	4.4	47	28

ID = Identification code
PM = Parent ion mass
DM = Daughter ion mass
IRF = Intermediate response factor
EBAR = "Error bar"
DL = Detection limit
QL = Quantitation limit
SD = Standard deviation

TABLE 15

Summary of Detection And Quantitation Limit Data
for Sampling Period One of May 28, 1993
Rose Hill Regional Landfill, Kingstown, RI

ID	PM/DM	IRF	EBAR	DL ICPS	QL ICPS	DL PPBV	QL PPBV	INTENSITY ICPS	SD ICPS
VNCL	62/ 27	176.5	0	141	470	0.8	2.7	152	47
VNCL	64/ 27	62.4	0	102	340	1.6	5.5	89	34
BEN	78/ 39	93.4	0	93	310	1.0	3.3	59	31
BEN	78/ 52	102.0	0	90	300	0.9	2.9	56	30

ID = Identification code
PM = Parent ion mass
DM = Daughter ion mass
IRF = Intermediate response factor
EBAR = "Error bar"
DL = Detection limit
QL = Quantitation limit
SD = Standard deviation

4.3 Calculations for the Summaries of the Target Compound Detection and Quantitation Limits

The DLs and QLs for the target compounds found in Table 16 were generated by averaging the respective DLs and QLs of the target compounds' ion pairs found in Tables 11 to 15.

The following equation was used to calculate the compound's detection limit.

$$DL = \frac{DL1 + DL2 + \ldots + DLn}{n}$$

where:

DL = Detection limit for a compound (ppbv)
DL1 = Detection limit for the first ion pair (ppbv)
DL2 = Detection limit for the second ion pair (ppbv)
DLn = Detection limit for the nth ion pair (ppbv)
n = Number of ion pairs to be averaged

For example, using the entries for the 78/39 and 78/52 ion pairs of benzene from Table 11:

$$DL = \frac{1.0 + 0.9}{2} = \frac{1.9}{2} = 1.0 \text{ ppbv}$$

This number is the DL for benzene found in the Sampling Period One of 5/26/93 column of Table 16.

The following equation was used to calculate the compound's quantitation limit.

$$QL = \frac{QL1 + QL2 + \ldots + QLn}{n}$$

where:

QL = Quantitation limit for a compound (ppbv)
QL1 = Quantitation limit for the first ion pair (ppbv)
QL2 = Quantitation limit for the second ion pair (ppbv)
QLn = Quantitation limit for the nth ion pair (ppbv)
n = Number of ion pairs to be averaged

For example, using the entries for the 78/39 and 78/52 ion pairs of benzene from Table 11:

$$QL = \frac{3.4 + 3.1}{2} = \frac{6.5}{2} = 3.2 \text{ ppbv}$$

This number is the QL for benzene found in the Sampling Period One of 5/26/93 column of Table 16.

TABLE 16

Summary of the Target Compound Detection and Quantitation Limits Measured from May 26, 1993 to May 28, 1993 Rose Hill Regional Landfill, Kingstown, RI

	SAMPLING PERIOD ONE 5/26/93		SAMPLING PERIOD TWO 5/26/93		SAMPLING PERIOD ONE 5/27/93		SAMPLING PERIOD TWO 5/27/93		SAMPLING PERIOD ONE 5/28/93	
COMPOUND	DL	QL	DL	QL	DL	QL	DL	QL	DL	QL
BEN	1.0	3.2	1.1	3.8	1.3	4.3	1.4	4.7	0.9	3.1
VNCL	1.2	4.0	1.7	5.5	1.3	4.4	1.6	5.4	1.2	4.1

DL = Detection limit (PPBV)
QL = Quantitation limit (PPBV)

4.4 Calculations for the Potential Maximum Concentration Percent Deviations for the Target Compounds During the Sampling Periods

The potential maximum concentration percent deviations presented in Table 17 are called "error bars" for simplicity. They represent the potential bias in the concentration due to changes in the sensitivity of the TAGA. "Error bars" were calculated using the following equation:

$$\text{"error bars"} = \frac{|RF1 - RF2|}{(RF1 + RF2)} \times 100$$

where:

error bars = maximum concentration percent deviation (unitless)

RF1 = The RF for an ion pair measured during the initial calibration event (ICPS/ppbv)

RF2 = The RF for the same ion pair measured during the final calibration event (ICPS/ppbv).

The above calculation was repeated for each ion pair. The "error bars" for each compound's ions were averaged to give a single value for the compound. This error bar can be applied to the samples analyzed between the two calibrations of the sampling period.

For example, using the benzene data from Table 6 for the 78/39 ion pair:

RF1 = 71.35
RF2 = 41.86

and then

$$\frac{|RF1 - RF2|}{(RF1 + RF2)} \times 100 = \frac{|71.35 - 41.86|}{71.35 + 41.86} \times 100 = 26.1\%$$

26.1% is the entry found in Table 11 for the 78/39 ion pair of benzene. For the other benzene ion pair, 78/52, the "error bar" is 22.8%. These ion pair "error bars" are averaged to give an "error bar" for benzene equal to 24.4%, which is the entry in Table 17.

TABLE 17

Summary of the Potential Maximum Concentration Percent Deviations for the Target Compounds from May 26, 1993 to May 28, 1993 Rose Hill Regional Landfill, Kingstown, RI

COMPOUND	SAMPLING PERIODS OF 5/26/93 ONE	TWO	SAMPLING PERIODS OF 5/27/93 ONE	TWO	SAMPLING PERIODS OF 5/28/93 ONE
VNCL	26.4%	6.9%	9.5%	9.4%	N/A
BEN	24.4%	7.1%	7.1%	2.5%	N/A

N/A - Not available

APPENDIX

The List of Compounds and Concentrations in the Standard Gas Cylinder
Rose Hill Regional Landfill, Kingstown, RI
July 1, 1993

The List of Compounds and Concentrations in the Standard Gas Cylinder

COMPOUND	CONCENTRATION (IN PPM)
Benzene	22
p-Xylene	16.7
o-Xylene	11.0
m-Xylene	12.7
Vinyl Chloride	21
Toluene	23
Trichloroethylene	25
trans-1,2-Dichloroethylene	22
Tetrachloroethylene	26

APPENDIX C
Meteorological Data
Air Quality Modeling Final Report
Rose Hill Regional Landfill
August 1993

On-Site Meteorological Data
24-Hour Sampling Period Ending 05/25/93 1500
Air Quality Modeling Final Report
Rose Hill Regional Landfill
August 1993

MO	DY	HR	MW	MD	SD	T	T(K)	RH	BP	STAB
5	24	14	2.61	209	16	19.3	292.4	52.2	1010	C
5	24	15	2.88	208	15.4	18.4	291.5	59.5	1010	C
5	24	16	3.15	228	17.6	18.6	291.7	59.5	1010	C
5	24	17	3.16	230	15.4	17.9	291	59.7	1009	C
5	24	18	2.91	233	15	16.9	290.1	63.5	1008	D
5	24	19	2.97	233	15.9	15.9	289.1	68.6	1008	C
5	24	20	2.57	244	17.9	15.4	288.6	71.8	1008	D
5	24	21	2.14	242	17.1	15.2	288.3	74.9	1008	E
5	24	22	2.45	244	17.8	15.4	288.6	76	1009	D
5	24	23	2.15	241	16.4	15.2	288.4	78.7	1008	E
5	24	24	2.17	246	18.2	15.2	288.3	80	1008	E
5	25	1	1.95	242	14.9	15.2	288.3	80.5	1008	D
5	25	2	1.65	243	14.6	15	288.2	81.9	1008	D
5	25	3	1.43	244	17	14.7	287.8	83.7	1008	E
5	25	4	1.98	245	17.2	14.8	288	84	1008	E
5	25	5	2.24	236	15.6	14.8	288	84.8	1007	E
5	25	6	2.41	234	14.5	14.5	287.6	87.5	1007	D
5	25	7	2.94	232	15.2	15.2	288.3	85.8	1008	D
5	25	8	3.26	233	16.2	16.1	289.3	82.7	1009	C
5	25	9	2.94	238	19.3	17.1	290.3	80.1	1009	C
5	25	10	2.3	242	22.7	19.1	292.3	75.5	1009	B
5	25	11	2.84	227	17.5	22.1	295.2	65.2	1009	C
5	25	12	3.41	232	17	22.6	295.7	62	1008	C
5	25	13	4.32	232	17.4	23.8	296.9	56.1	1007	C
5	25	14	3.76	235	18.4	23.6	296.7	54.6	1007	C
5	25	15	3.91	233	17.3	23.3	296.4	53.7	1006	C

MO Month
HR Hour
MD Mean Wind Direction (°)
T Temperature (°C)
T(K) Temperature (K)
BP Barometric Pressure (mB)

DY Day
MW Mean Wind Speed (m/s)
SD Standard Deviation of the Mean Wind Speed
RH Relative Humidity (%)
STAB Stability Class

...\HARVEY\MT-0109G.RPT

On-Site Meteorological Data
24-Hour Sampling Period Ending 05/26/93 1700
Air Quality Modeling Final Report
Rose Hill Regional Landfill
August 1993

MO	DY	HR	MW	MD	SD	T	T(K)	RH	BP	STAB
5	25	16	4.2	239	17.6	23.1	296.2	51.7	1006	C
5	25	17	3.69	237	18.5	22.1	295.2	54.5	1006	C
5	25	18	2.75	241	21.7	21.4	294.5	56.6	1006	B
5	25	19	3	245	21	19.9	293.1	61	1006	C
5	25	20	2.55	243	19	18.4	291.6	66.7	1006	D
5	25	21	1.82	244	17.9	17.2	290.3	73.2	1006	E
5	25	22	0.9	258	18.7	16.5	289.7	79.5	1007	E
5	25	23	0.15	288	33.5	16.4	289.6	82.5	1007	F
5	25	24	0.56	254	16.1	15.7	288.8	87.3	1008	E
5	26	1	1.21	330	14.9	16.3	289.5	81.2	1008	D
5	26	Hours 2 to 9 are Missing								
5	26	10	1.42	306	37.7	17.9	291.1	52.6	1010	A
5	26	11	1.51	306	40.5	18.9	292	48.4	1010	A
5	26	12	1.74	300	36.5	19.1	292.3	46.9	1010	A
5	26	13	1.45	281	39.8	19.2	292.3	46.9	1010	A
5	26	14	1.69	310	36.8	18.9	292.1	46.9	1009	A
5	26	15	2	317	35.6	19.2	292.4	45	1009	A
5	26	16	1.95	309	38.8	20.4	293.5	41.5	1008	A
5	26	17	2.75	327	28.5	20.2	293.3	39.2	1008	A

MO Month
HR Hour
MD Mean Wind Direction (°)
T Temperature (°C)
T(K) Temperature (K)
BP Barometric Pressure (mB)
MD Mean Wind Direction (°)

DY Day
MW Mean Wind Speed (m/s)
SD Standard Deviation of the Mean Wind Speed
RH Relative Humidity (%)
STAB Stability Class

...\HARVEY\MT-0109G.RPT

On-Site Meteorological Data
24-Hour Sampling Period Ending 05/27/93 1900
Air Quality Modeling Final Report
Rose Hill Regional Landfill
August 1993

MO	DY	HR	MW	MD	SD	T	T(K)	RH	BP	STAB
5	26	18	2.46	319	31.4	19.5	292.6	39	1008	A
5	26	19	2.49	325	25.6	18.4	291.6	40.4	1008	A
5	26	20	1.48	326	20.5	16.6	289.8	53.6	1011	E
5	26	21	0.93	331	19.3	14.3	287.4	58.6	1011	E
5	26	22	1.05	334	17.5	12.9	286.1	60	1012	E
5	26	23	0.04	144	7.85	10.4	283.6	66.9	1011	E
5	26	24	0.01	46.9	0.79	7.65	280.8	84.3	1011	F
5	27	1	0.03	124	19.5	6.22	279.4	94.6	1011	E
5	27	2	0	51.4	20.7	5.45	278.6	99.1	1011	E
5	27	3	0.11	92.4	24.1	5.48	278.6	100	1010	F
5	27	4	0	38.4	16.8	4.97	278.1	100	1010	E
5	27	5	0.08	101	25.1	5.33	278.5	100	1009	F
5	27	6	0.26	196	23.5	8.01	281.2	100	1009	F
5	27	7	0.44	273	20.7	9.64	282.8	100	1009	E
5	27	8	1.17	294	34.3	13.1	286.3	86.8	1010	A
5	27	9	3.04	320	27.6	15.6	288.7	57.3	1010	B
5	27	10	2.72	314	34.4	17.3	290.5	39.1	1010	A
5	27	11	3.85	319	27.8	17.5	290.6	31.2	1009	B
5	27	12	4.28	334	23.8	17.3	290.5	31.9	1010	C
5	27	13	4.05	329	26.6	17.6	290.7	32	1010	C
5	27	14	3.12	325	30.7	18.6	291.7	32.3	1010	B
5	27	15	3.55	329	27.3	18.6	291.8	32.5	1010	B
5	27	16	3.38	337	24.7	19.1	292.2	31.6	1010	B
5	27	17	2.85	328	27.4	18.7	291.8	31.1	1010	A
5	27	18	2.48	321	28.7	18.8	292	31.9	1011	A
5	27	19	2.56	323	38.7	18.1	291.2	32.5	1011	A

MO Month
HR Hour
MD Mean Wind Direction (°)
T Temperature (°C)
T(K) Temperature (K)
BP Barometric Pressure (mB)

DY Day
MW Mean Wind Speed (m/s)
SD Standard Deviation of the Mean Wind Speed
RH Relative Humidity (%)
STAB Stability Class

...\HARVEY\MT-0109G.RPT

Station: WSO PROVIDENCE, RI

[illegible] Weather Observations Date: MAY 24, 1950 To convert [illegible]

[illegible] Time [illegible] Obsns Slp/Temp/Dp/Wnd/Asl/ Remarks&SupplementalCodedData

SA 0054 250 -SCT 15 147/54/46/2507/996/ 102 1001 75 (KC 05:55Z)

SA 0152 250 -BKN 15 147/55/46/2605/996 (KC 06:52Z)

SA 0251 E250 BKN 15 147/53/46/2504/996/ 98887 (KC 07:53Z)

SA 0352 [illegible] SCT E250 BKN 15 148/54/47/2806/997/ 302 1071 (KC 08:50Z)

SA 0451 [illegible] BKN 250 BKN 15 152/53/42/0404/998 (KC 09:53Z)

SA 0552 [illegible] SCT E250 OVC 15 157/56/49/0000/999/BINOVC (KC 10:52Z)

SA 0656 E140 BKN 250 OVC 15 160/61/50/0000/000/BINOVC OVC PTLY THN/ 212 1071 52 (KC 11:52Z)

SA 07[illegible] E[illegible] 15 158/65/50/2104/000/BINOVC E (DRV 12:51Z)

SA 0851 M95 BKN 130 OVC 15 160/64/51/1706/000/ (DRV 13:51Z)

SA 0954 M35 BKN 100 OVC 15 153/67/54/2007/998/ 807 107/ (DRV 14:55Z)

SA 1054 M55 BKN 90 OVC 15 152/70/51/2007/998 (DRV 15:54Z)

SA 1150 M55 BKN 90 OVC 15 147/70/55/1909/996/BINOVC (DRV 16:50Z)

SA 1250 55 SCT E100 BKN 250 OVC 15 140/75/50/2513G21/994/OVC PTLY THN APRNT WRM FROPA/ 814 1171 52 (DRV 17:51Z)

SA 1350 E130 BKN 250 OVC 15 138/75/51/2219/994/OVC PTLY THN SUN DMLY VSB (DRV 18:55Z)

SA 1453 E130 BKN 250 -OVC 15 135/76/51/2317G22/993/BINOVC W (DRV 19:53Z)

SA 1550 M25 BKN 100 BKN 130 OVC 15 133/73/52/2615/992/BINOVC E/ 807 107/ (MMC 20:51Z)

SA 1654 M65 BKN 85 BKN 100 OVC 15 126/70/53/2111/990 (MMC 21:54Z)

SA 1750 M65 BKN 90 BKN 140 OVC 12 128/67/55/1908/991 (MMC 22:56Z)

SA 1850 E50 BKN 250 OVC 12 133/66/56/2308/992/ 500 1078 76 (MMC 23:53Z)

SA 1950 50 SCT E150 BKN 170 OVC 10 136/65/56/2407/993 (MMC 00:50Z)

SA 2050 E170 BKN 270 OVC 9 140/64/56/2105/994 (MMC 01:53Z)

SA 2150 150 SCT E170 OVC 6 140/62/55/1804/994/ 807 1071 (MMC 02:50Z)

SA 2250 150 SCT E170 OVC 12 136/63/56/2206/993 (MMC 03:50Z)

SA 2350 E140 BKN 250 OVC 10 135/62/56/1706/992 (KC 04:53Z)

U.S. DEPARTMENT OF [illegible]
NATIONAL WEATHER [illegible]

Station: WSO PROVIDENCE, RI

[illegible] Weather Observations Date: MAY 25, 1990 To convert LST [illegible]

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[illegible] Remarks&SupplementalCodedData

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SA [illegible] 1565/992 (KC 06:51Z)
SA [illegible] 1307/991/ 95171 (KC 07:50Z)
SA [illegible] 1207 990/ 025 107/ (KC 08:53Z)
SA 0450 M100 BKN 250 OVC 5F 126/61/57/1709/991 (KC 09:50Z)
SA 0551 E150 BKN 250 OVC 5F 135/62/57/1807/993 (KC 10:52Z)
SA 0650 M95 BKN 250 OVC 6H 135/64/58/2007/993/ 108 1071 61 (KC 11:51Z)
SA 0750 M95 BKN 250 OVC 6H 136/67/60/2207/993 (SAM 12:51Z)
SA 0853 M100 BKN 250 BKN 6H 136/69/60/2310/993 (SAM 13:53Z)
SA 0952 E110 BKN 250 BKN 6H [illegible]/75/61/1908/992/ 802 1071 (SAM 14:52Z)
SA 1053 [illegible] SCT 250 SCT 7 126 79/61/2214/990 (SAM 15:53Z)
SA 1153 50 SCT 5H [illegible] 82 [illegible]/2215/988 (DRV 16:53Z)
SA 1250 50 SCT 5H [illegible]/82/60/2416G20/986/ 720 1100 61 (DRV 17:50Z)
SA 1351 50 SCT 6H 105/82/60/2419G22/984 (DRV 18:51Z)
SA 1450 250 -SCT 6 105/82/59/2218G22/984/CU W-NE (MMC 19:51Z)
SA 1552 250 -SCT 7 105/82/59/2515/984/ 507 1001 (MMC 20:52Z)
SA 1652 250 -SCT 7 103/79/57/2216/984/H ALF (MMC 21:52Z)
SA 1752 250 -SCT 12 107/76/59/2417/985/H ALF (MMC 22:52Z)
SA 1855 110 SCT 270 -BKN 10 112/72/58/2013/986/ 107 1071 83 (MMC 23:55Z)
SA 1954 110 SCT 270 -OVC 7 115/71/58/2509/987 (MMC 00:55Z)
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SA 2150 270 -BKN 7 131/66/59/2909/992/AC SE/ 219 1071 (MMC 02:50Z)
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U.S. DEPARTMENT OF COMMERCE
NATIONAL WEATHER SERVICE

Station: WSO PROVIDENCE, RI
Surface Weather Observations   Date: MAY 26, 1992   To convert [illegible]

Type Time SkyaCeiling Vsb&Wx&Obsns Slp/Temp/Dp/Wnd/Asi/ Remarks&SupplementalCodedData

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SA 0450 M95 BKN 250 BKN 15 156 58/48/3409/999 (JH 09:51Z)
SA 0550 E150 OVC 15 156/60/47/3310/999/BINOVC (JH 10:53Z)
SA 0651 E130 BKN 250 OVC 15 158/61/46/3213/000/OVC PTLY THN/ 205 1071 60 (KC 11:52Z)
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SA 1051 40 SCT E250 OVC 15 148/67/47/2914G19/997/BINOVC W-N SUN VSB (KC 15:53Z)
SA 1154 45 SCT E250 OVC 15 144 68/46/3212/996/BINOVC W-N SUN DMLY VSB (KC 16:54Z)
SA 1250 45 SCT E250 BKN 15 150/66/47/3412/997/ 500 1500 60 (SAM 17:53Z)
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SA 1654 250 -SCT 15 141 67/46/3012/995/CU ALQDS (MMC 21:54Z)
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SA 1850 CLR 15 155 63 46 3110/999/ 314 69 (MMC 23:53Z)
SA 1950 CLR 15 158 62 46 3009/000 (MMC 00:50Z)
SA 2050 CLR 15 160 59/43 2907/002 (MMC 01:52Z)
SA 2150 CLR 15 164 56 43 2706/001 108 (MMC 02:50Z)
SA 2250 CLR 15 162 55/43 2705/001 (JH 03:51Z)
SA 2352 CLR 15 159 52 44 2705/000 (JH 04:53Z)
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U.S. DEPARTMENT OF COMMERCE
NATIONAL WEATHER SERVICE

Station: WSO PROVIDENCE, RI
Surface Weather Observations   Date: MAY 27, 1990

Type Time Sky&Ceiling Vsby&Wx&Obsns Slp/Temp/Dp/Wnd/Asi/ Remarks&SupplementalCodedData

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SA 0150 CLR 15 197/53/44/2506/995 (JH 06:52Z)
SA 0252 E250 BKN 15 190/53/45/2805/995/ 95616 (JH 07:53Z)
SA 0350 M100 OVC 15 180/54/45/2808/994/BINOVC/ 714 187/ (JH 08:51Z)
SA 0453 M35 BKN 110 OVC 12RW- 140/55/45/2808/995/BINOVC PCPN VLGT RB15 (JH 09:54Z)
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SA 0754 CLR 15 131/64/48/2917G25/992 (RFS 12:53Z)
SA 0850 CLR 15 138/65/38/3021G27/994/FEW CU NW (RFS 13:50Z)
SA 0950 45 SCT 15 142/66/38/3416G25/995/ 208 1100 (RFS 14:54Z)
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SA 1150 M55 BKN 15 144/66/39/3319G25/995 (RFS 16:50Z)
SA 1250 M60 BKN 15 143/69/40/3318G24/995/ 102 1500 51 (RFS 17:50Z)
SA 1352 M60 BKN 15 147/68/40/3317G31/996 (RFS 18:53Z)
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SA COR 1452 60 SCT 15 147/69/39/3319G25/996 (MMC 19:54Z)
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SA 1752 60 SCT 15 160/65/40/2314/000 (MMC 22:52Z)
SA 1850 240 -SCT 15 177/63/40/3212/005/SC DSPTS N-W/ 329 1401 70 (MMC 23:53Z)
SA 1955 70 SCT 240 -SCT 15 194/60/41/3308/007 (MMC 00:53Z)
SA 2056 90 -SCT 250 -BKN 15 184/58/42/3207/007 (MMC 01:54Z)
SA 2150 110 -SCT 250 -SCT 15 187/57/43/3009/008/ 310 1010 (MMC 02:51Z)
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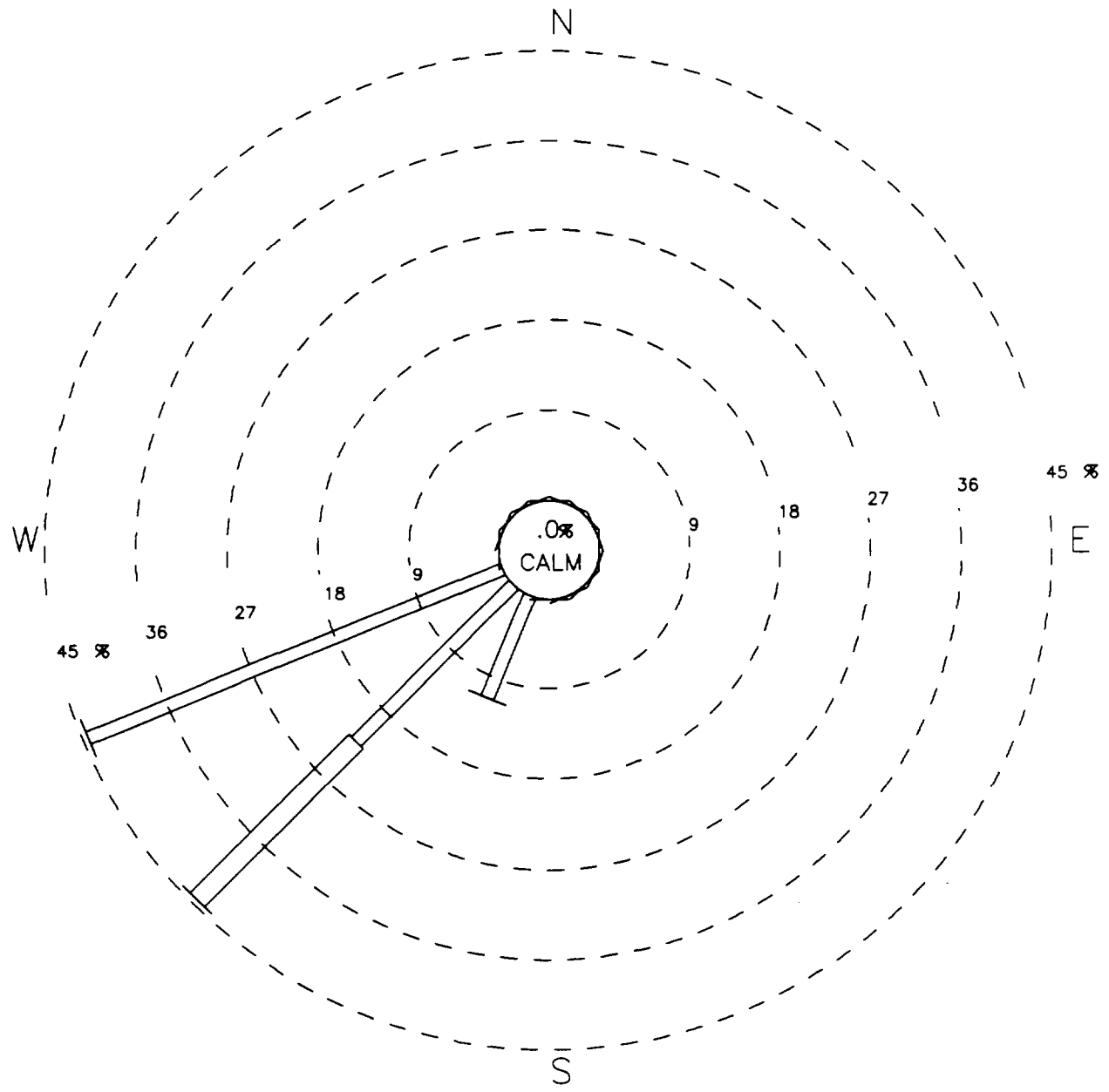
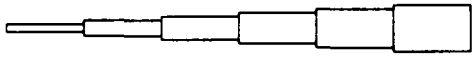
SA 2350 CLR 15 194/55/42/3007/010 (JH 04:51Z)

APPENDIX D
On-Site Wind Roses
Air Quality Modeling Final Report
Rose Hill Regional Landfill
August 1993

FREQUENCY OF WIND SPEED AND DIRECTION





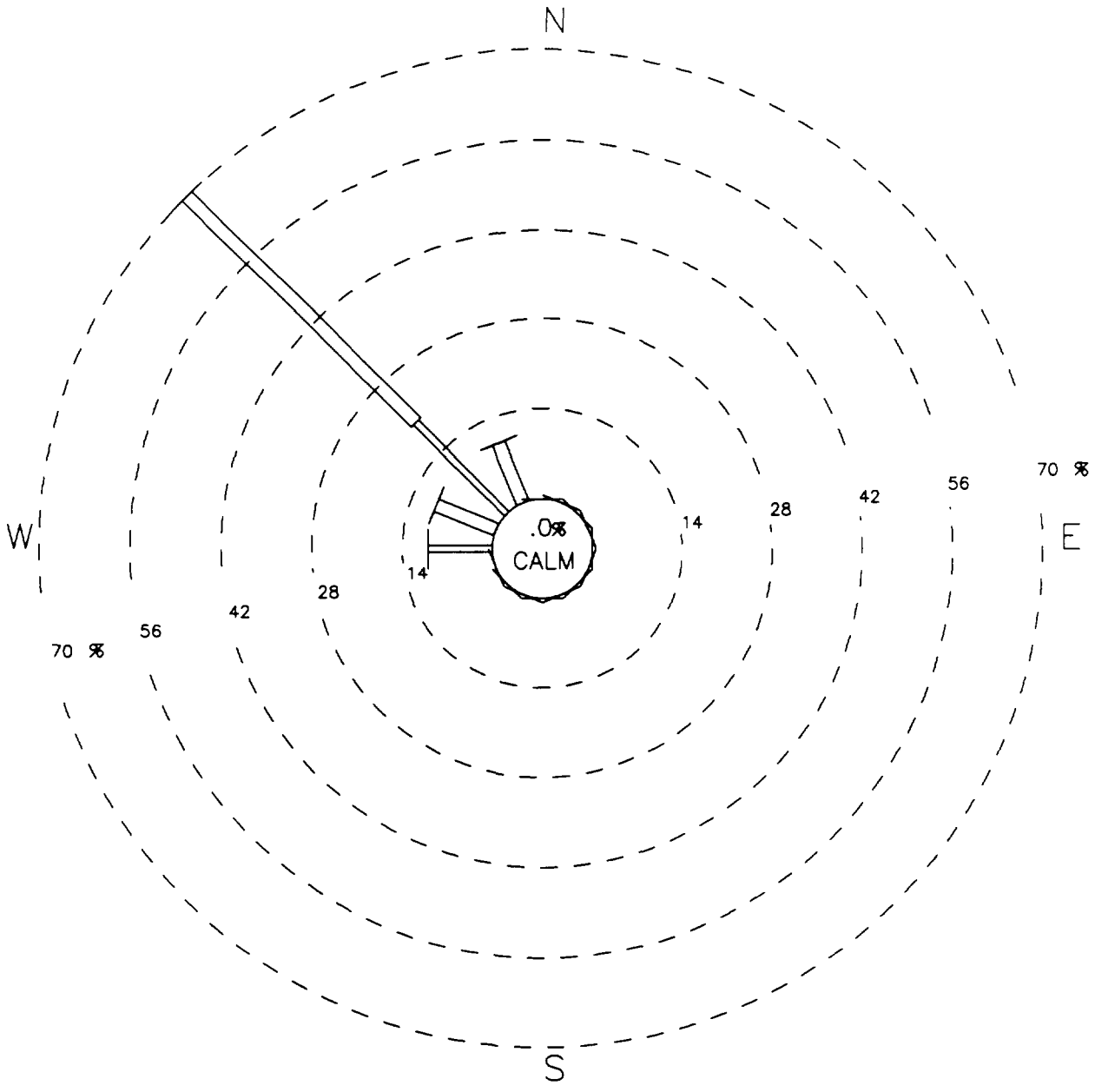
1-3 (0 %) 4-6 (78 %) 7-10 (22 %) 11-16 (0 %) 17-21 (0 %) 22-99 (0 %)

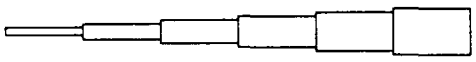
WIND SPEED SCALE (KNOTS)

NOTE – WIND DIRECTION IS THE DIRECTION WIND IS BLOWING FROM

ROSE HILL SITE
SOUTH KINGSTOWN, RI
8-HR 2300 05/24/93
U.S. EPA/ERT & REAC
CONTRACT # 68-03-3482
WA# 3347-34-01-5694

FREQUENCY OF WIND SPEED AND DIRECTION





WIND SPEED SCALE (KNOTS)

NOTE – WIND DIRECTION IS THE DIRECTION WIND IS BLOWING FROM

ROSE HILL SITE
SOUTH KINGSTOWN, RI
8-HR 2000 05/26/93
U.S. EPA/ERT & REAC
CONTRACT # 68-03-3482
WA# 3347-34-01-5694

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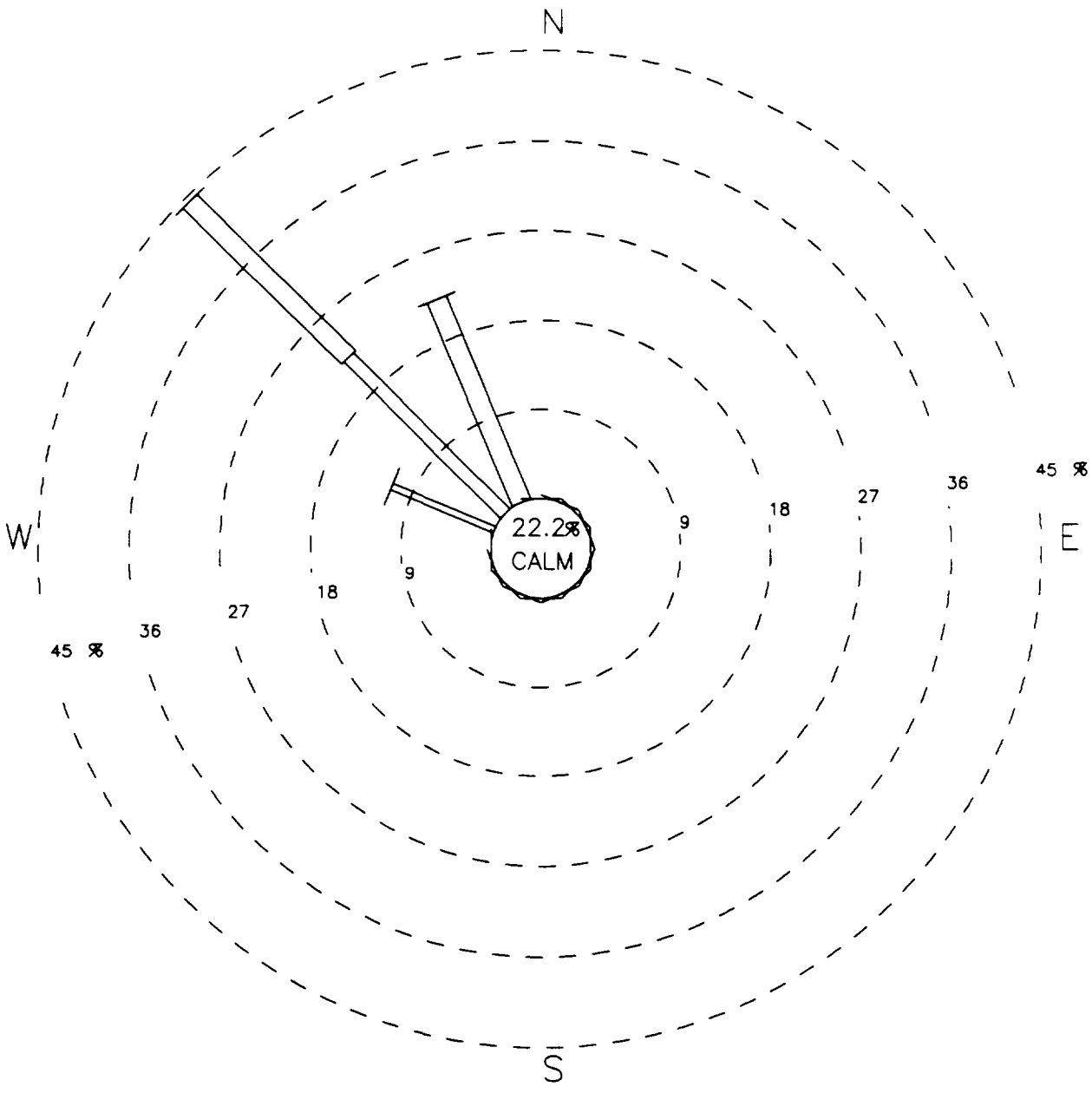

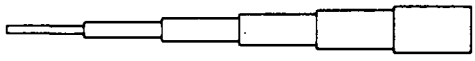

WIND SPEED SCALE (KNOTS)

NOTE – WIND DIRECTION IS THE DIRECTION WIND IS BLOWING FROM

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SOUTH KINGSTOWN, RI
8-HR 1400 05/27/93
U.S. EPA/ERT & REAC
CONTRACT # 68-03-3482
WA# 3347-34-01-5694

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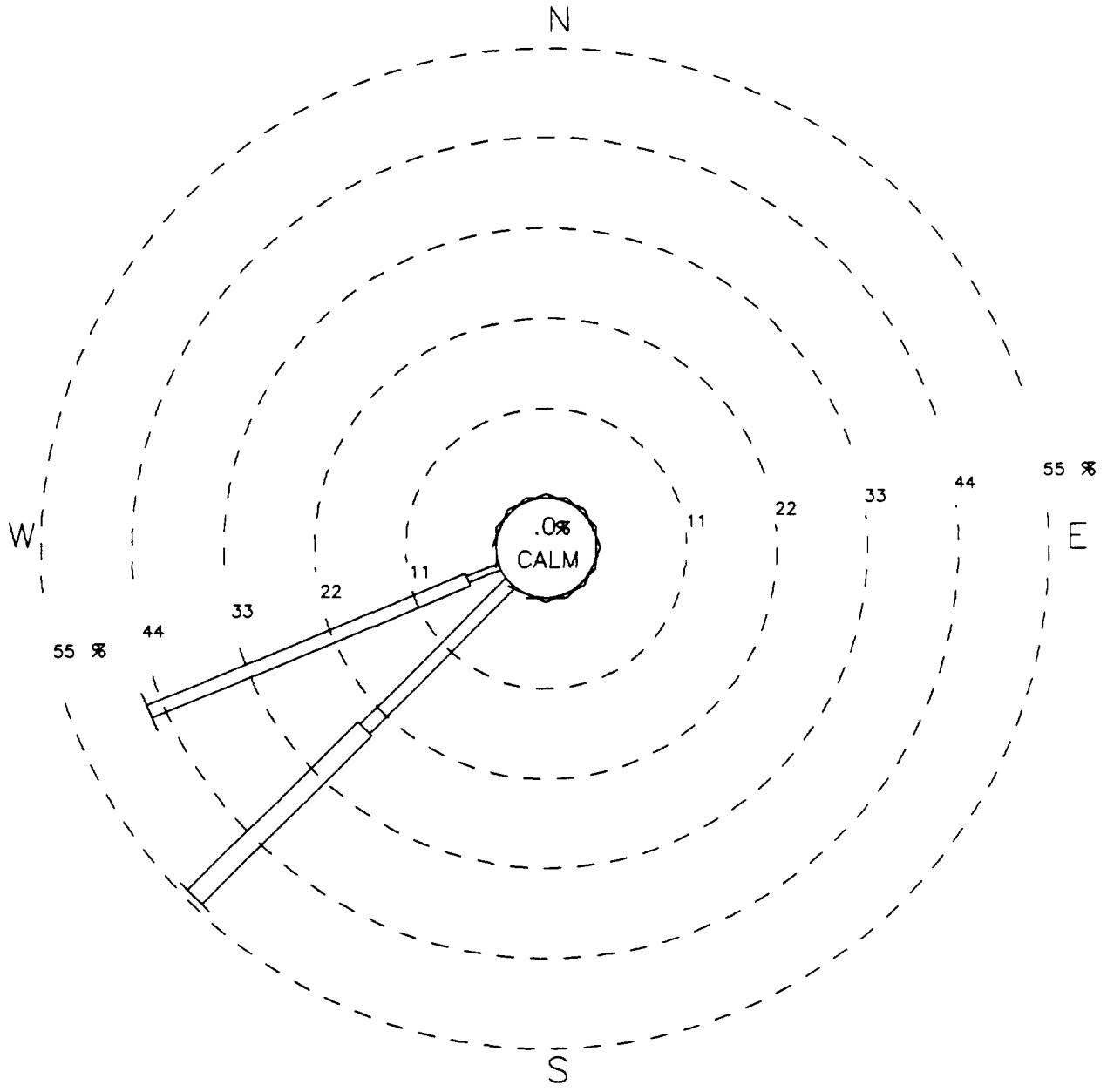

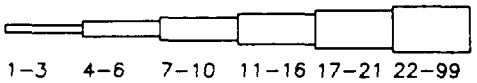

WIND SPEED SCALE (KNOTS)

NOTE – WIND DIRECTION IS THE DIRECTION WIND IS BLOWING FROM

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SOUTH KINGSTOWN, RI
24-HR 1500 05/25/93
U.S. EPA/ERT & REAC
CONTRACT # 68-03-3482
WA# 3347-34-01-5694

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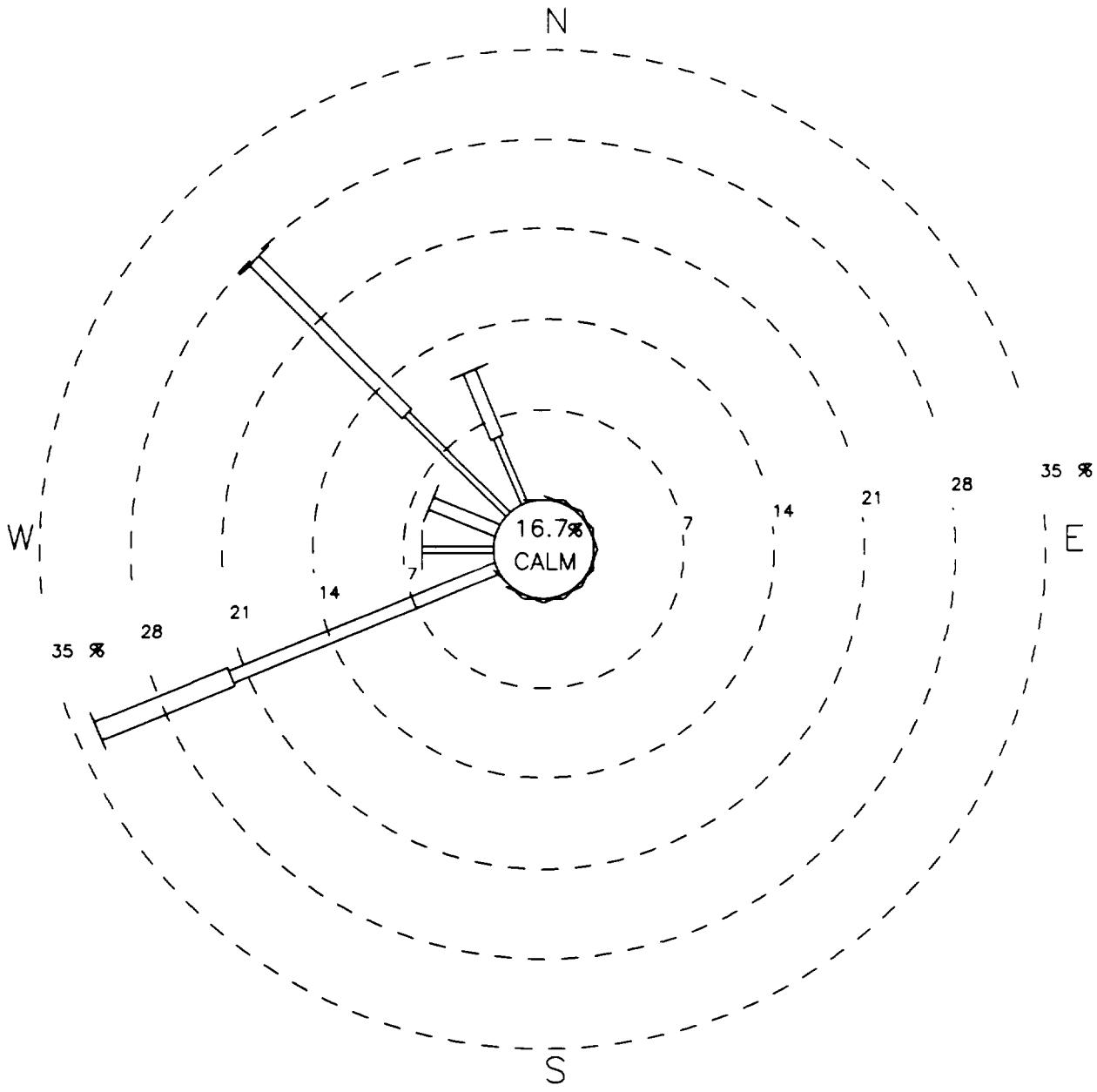

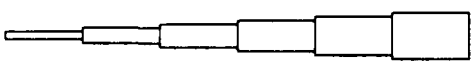

WIND SPEED SCALE (KNOTS)

NOTE – WIND DIRECTION IS THE DIRECTION WIND IS BLOWING FROM

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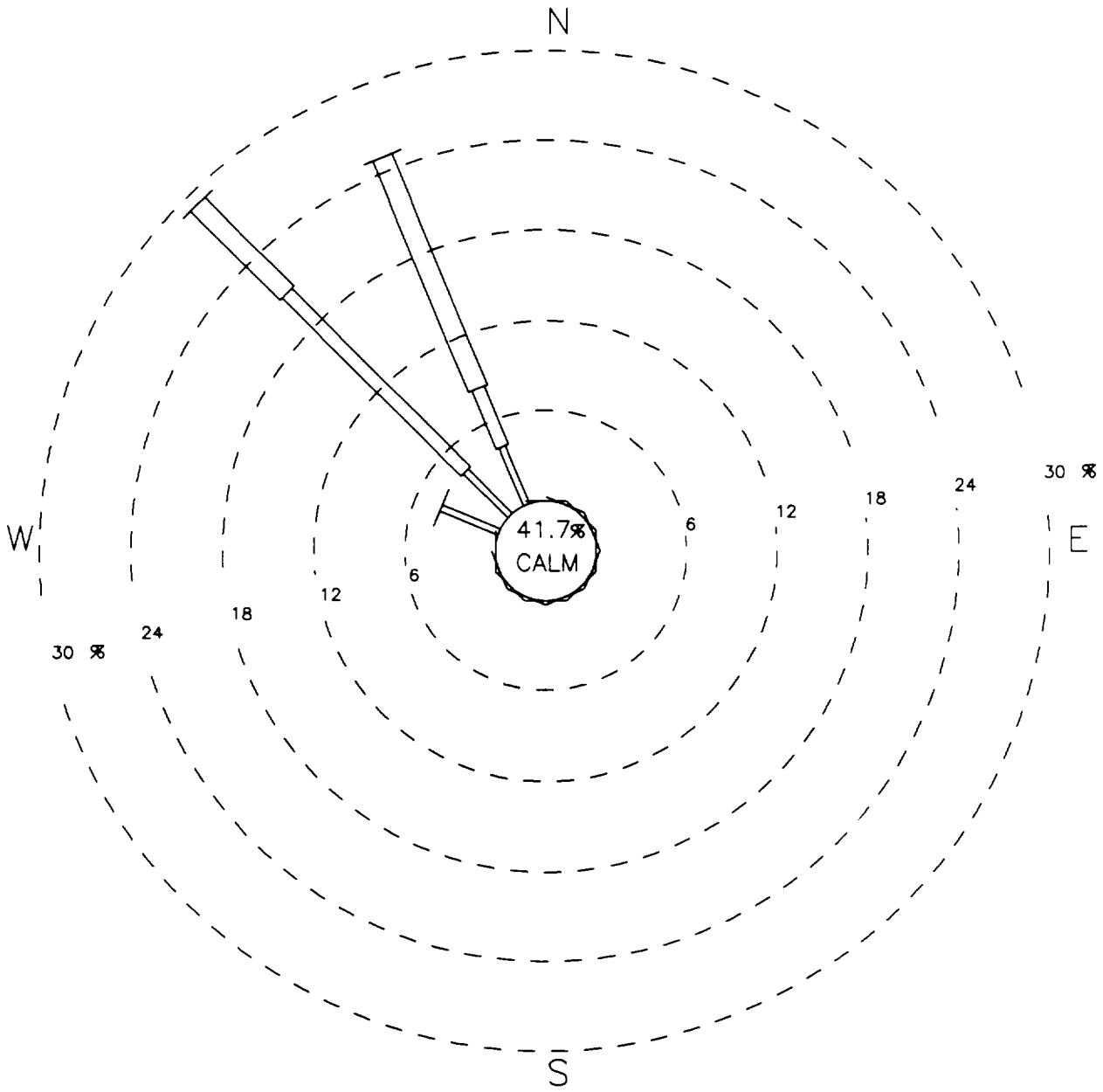
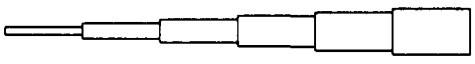
SOUTH KINGSTOWN, RI
24-HR 1700 05/26/93
U.S. EPA/ERT & REAC
CONTRACT # 68-03-3482
WA# 3347-34-01-5694

FREQUENCY OF WIND SPEED AND DIRECTION





WIND SPEED SCALE (KNOTS)

NOTE – WIND DIRECTION IS THE DIRECTION WIND IS BLOWING FROM

ROSE HILL SITE
SOUTH KINGSTOWN, RI
24-HR 1800 05/27/93
U.S. EPA/ERT & REAC
CONTRACT # 68-03-3482
WA# 3347-34-01-5694

APPENDIX E
SUMMA Canisters Analytical Report
Air Quality Modeling Final Report
Rose Hill Regional Landfill
August 1993

Summa Canister Screening
by Gas Chromatography/Mass Spectrometry

Rose Hill Landfill, Kingston, Rhode Island
Sampled 24 to 27 May 1993

DCN: TAT-11-N-267
TDD: 11-9210-015D
PCS: 4073

Prepared for: Thomas Pritchett, EPA/ERT
Submitted: 23 July 1993

Prepared by: Valerie Reed
Robert Isaacs
Gerald Ball
John Johnson

Principal Author: Valerie Reed Date: 23 July 93

Technical Peer Review: Robert Isaacs Date: 7/23/93

Approval: Robert Isaacs for Joe Sarkos Date: 7/23/93

CONTENTS

LIST OF TABLES

FIGURE

1.0 INTRODUCTION

Summa canister samples were collected at the **Rose Hill Landfill** site in Kingston, Rhode Island, between 24 and 27 May 1993. Forty-eight samples were collected in 6 liter passivated Summa canisters and were transported to the ERT's facilities in Edison, New Jersey. These samples were screened by Gas Chromatography/Mass Spectrometry (GC/MS) between 15 and 25 June 1993.

2.0 GC/MS PROCEDURES

2.1 Sample Pressurization

The Summa canisters used for sampling were cleaned by REAC using ERT SOP #1703 and taken from batches certified to be cleaned by ERT/TAT. Before analysis, most canisters were pressurized. Eleven canister samples were received above atmospheric pressure and therefore needed no pressurization. A pressurizing train was set up with a pressure gauge accurate to within ± 0.1 psi. The gauge and train were purged with nitrogen gas for 20 minutes, the train was connected to the canister, an initial reading was taken, and then nitrogen was added to bring the canister pressure to two times the initial reading. Following are the pressures for the canister samples:

Sample	Initial Pressure(psig)	Final Pressure(psig)
09088SG, #28	14.3	28.6
09104, CONTROL C2	14.4	28.8
10474SG, TRIP BLK	00.3	21.0
10691, 278 RH RD	08.7	21.1
10692, CLEANING BLK	03.4	21.4
10693, 278 RH RD	24.3	24.3
10694, 349 RH RD	27.5	27.5
10695, 339 BEAK ST	26.2	26.2
10696, 121 RH RD	31.3	31.3
10700SG, #82	14.0	28.0
10704SG, #61	14.6	29.1
10711SG, #21	14.3	28.6
10712SG, #22	14.7	29.4
10713SG, #76	15.0	30.0
11106SG, #3	14.0	28.0
11111SG, #84	14.3	28.8
11118SG, #88	12.3	24.2
11121SG, #70	14.6	29.2
11156SG, #42	14.3	28.6
11385, F-16 - F-17	14.7	29.4
11399, 349 RH RD	26.5	26.5
11400, 121 RH RD	26.3	26.3
11401, 278 RH RD	24.4	24.4

11402, 339 BEAK ST	31.3	31.3
11403, NEC LANDFILL	14.0	28.0
11404, 278 RH RD	14.6	29.2
11405, 121 RH RD	14.7	29.4
11406, 339 BEAK ST	14.4	28.8
11407, TRAN-X STA	14.0	28.0
11408, 349 RH RD	14.8	29.6
11409, FIELD BLK	00.6	24.5
12138SG, #20	14.5	29.1
12281, NE CMW	15.1	30.2
12282, 349 RH RD	14.5	31.8
12283, 278 RH RD	15.1	30.2
12284, 294 RH RD	14.5	29.0
12285, TRAN-X STA	15.0	30.0
12287, FIELD BLK	00.3	21.1
12288, 349 RH RD	26.7	26.7
12289, 121 RH RD	31.8	31.8
12290, 339 BEAK ST	26.9	26.9
12811, NE CORNER	15.0	30.0
12812, 121 RH RD	14.9	29.8
12813, TRAN-X STA	14.8	29.6
12814, 339 RH RD	14.8	29.6
12815, 278 RH RD	14.8	29.6
12816, 349 RH RD	14.8	29.6
12820SG, #86	13.9	27.9

2.2 Sample Analysis

Samples were analyzed by thermal desorption and cryogenic trapping of direct syringe injections or aliquots from a Summa canister sampling train, followed by cryofocussing onto the head of a fused silica capillary column, and then analyzed by GC/MS[1]. Sample aliquots ranging from 450 ml to 1000 ml were used from the pressurized (diluted) canisters, except for sample 11156SG (#42), where aliquots of 20 ml and 650 ml were used. A Tekmar model 5010GT automatic desorber and Hewlett-Packard 5996 GC/MS controlled by a HP1000 computer running RTE-6/Aquarius software was used. Table 1 lists cryogenic trap and GC/MS conditions. Table 2 lists GC/MS materials and supplies.

Sample analysis began by cooling the first cyrotrap, C-1, to -160°C. Once C-1 was cooled to the programmed temperature setting, the unit automatically stepped to the desorb cycle. At this time, for sample volumes >20 ml, the Summa train was opened, allowing the sample to flow from the canister through the desorb oven to C-1 during the desorb cycle. The sample volume at 20 ml was injected

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[1]"Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air", EPA 600/4-84-041, April 1984.

directly by syringe into the desorb oven to C-1 during the desorb cycle. Larger sample volumes were obtained by flowing the diluted sample through a mass flow controller at 50 ml/min from 9 minutes (450 ml) up to 20 minutes (1000 ml). A blank of the analysis train was run before the sample analysis by flowing 500 ml of ultra zero grade air (50 ml/min for 10 minutes) into C-1 during the desorb cycle to ensure the cleanliness of the summa train.

2.3 Calibration and Sample Spiking

A twenty-five compound standard was provided in two compressed gas cylinders by Scott Specialty Gases, Inc. The daily standard was obtained by directly injecting 10 ml of the standards and surrogates into the desorb oven of the thermal desorber. The initial calibration range was obtained by varying the volume of the standards injected from 1 to 25 ml.

P-bromofluorobenzene (BFB) and bromochloromethane (BCM) were added as surrogates to all samples and standards. Both were provided in a compressed gas cylinder by Matheson Gas Products at concentrations of 1.30 ppm for BFB and 2.00 ppm for BCM. (Standard cylinder I.D. numbers, concentrations, retention times (RT) for the daily standard, and their quantitation ions are listed in Table 3.)

2.4 Compound Identification /Quantitation

Samples were identified and quantitated by the Aquarius software on the RTE-6 data system. This system uses reconstructed, extracted ion chromatograms matched with retention time windows to tentatively identify and quantitate target compounds. The Aquarius report format of the RTE-6 prints the identified compound mass spectra (both raw and background subtracted), quantitation, and qualifier ion chromatograms. These results were then validated and adjusted where necessary.

Target compounds results are originally reported in nanoliters (nL). The Limit of Quantitation (LOQ) for all the target compounds is estimated to be 1 nL, being the lowest volume of standard on the calibration curve. The method detection limit is estimated to be 0.5 nL. The target compound results are calculated in parts per billion (ppb) using the following equation:

$$Concentration(ppb) = \frac{Concentration(nL)\ x\ 1000}{Undiluted\ Sample\ Volume(ml)}$$

The quantitation limits varied from 100 ppb for a 20 ml sample aliquot to 1.0 ppb for a 1000 ml sample aliquot; method detection limits varied from 50 ppb to 0.5 ppb, respectively.

Non-target compounds were identified with the help of a user-generated program. This program identifies up to the 40 most abundant peaks, generates an area response table, and library searches each peak. The sample spectrum was printed out along with the ten best library matches and the two best library match spectra. These matches were used along with mass spectral interpretation techniques to tentatively identify the unknowns. Concentrations were calculated based on the total ion response of toluene in the daily standard. Calculations were performed using MassSpec Generator, a dBase 3+ program written by ERT/TAT. All Compounds appearing in the Method Blank as well as other background compounds commonly found in Summa canister GC/MS analyses (siloxanes, carbon dioxide, etc.) were deleted from the sample results to provide a true listing of the compounds in the samples.

2.5 GC/MS QA/QC

The following QA/QC procedures were performed for this analysis.

- The HP 5996 was tuned daily for perfluorotributylamine (PFTBA) to meet abundance criteria for p-bromofluoro-benzene as listed in EPA Method 624. Tuning results are included in the QA/QC Data section. The tune was adjusted when necessary.

- Initial calibrations from 1 to 25 ml by direct injection were run on 15 and 21 June 1993. All compounds had a relative standard deviation of less than 25%, except meta-ethyltoluene (25.8%) on 21 July 1993.

- A twenty-five compound standard was used as a daily standard. Samples were quantified using the response factors of the calibration. Daily standard response was compared to the response factor of the calibration; differences should be less than 25%. This information is found in the Calibration Check Reports (Appendix B).

- A surrogate standard of BFB and BCM was added to all standards and samples. Percent recoveries for samples were calculated against daily standards, and are listed in Table 4. Recoveries should be within 70% to 130% for BFB and BCM.

- A Method Blank (Summa Train Blank) was analyzed after the daily standard to check for carryover and to ensure the system was clean.

- Replicates were analyzed on samples 12283, 10713SG, and 10700SG.

- Matrix Spikes/Matrix Spike Duplicates were analyzed on samples 12284, 10711SG, and 11121SG. 10 ml of the twenty-five compound standard was added to each sample aliquot prior to

analysis.

- Three Group A and B Performance Evaluation (PE) canisters were run.

3.0 RESULTS

Summa canister target compound results are listed in Table 4. Results are given in ppb for all samples and blanks. Table 5 presents recoveries for the MS/MSD, and Table 6 gives the recoveries for the PE sample. This is followed by the non-target results, which are given in order of file numbers. The GC/MS data is in Appendix B.

Following is a list of the QA/QC Flags used in qualifying the results:

U - Not detected (estimated detection limit in ppb).
J - Below Quantitation Limit.
B - <3 times Method Blank value.
C - Compound Calibration RSD >25% (concentrations calculated by average response factor only).
D - Compound daily calibration check RPD >25%.
E - Concentration exceed calibration limit (25 nL).

GC/MS QA/QC data and results are in Appendix B. In Appendix B the Analysis Log and Calibration Report, (listing standard compounds by retention time (RT), scan number, response factor(RF) for each level, average response factor (RF), and concentration (conc=)), are followed by the calibration package for each day of analysis (which includes the daily analysis log, PFTBA tune, Calibration Check Report, and daily standard Quant Report).

The Quant Report lists the retention time, the scan number, the peak area, and the concentration for each target compound and surrogate standard. Concentrations listed on this table are generated by Aquarius using the average response factors of the calibration range. The BFB scan number is used in the non-target spreadsheet for calculating the relative retention time (RRT).

4.0 DISCUSSION

Only sixteen of the forty-eight samples contained target analyte concentrations above the method detection limit. Eight of the sixteen samples were soil gas samples.

Samples 10694 (349 Rose Hill Road), 10695 (339 Beak Street), 11399 (349 Rose Hill Road), 11400 (121 Rose Hill Road), and 11401

(278 Rose Hill Road), contained benzene ranging from 2 ppb to 23 ppb. Samples 10691 (278 Rose Hill Road) and 11385 (F16-F17) contained meta-xylene at 14 ppb and 8 ppb and ortho-xylene at 13 ppb and 5 ppb, respectively. Sample 12288 (349 Rose Hill Road) contained ortho-xylene at 2 ppb. Sample 10712SG contained vinyl chloride at 21 ppb, 1,1-dichloroethene (1,1-DCE) at 3 ppb, trans-1,2-dichloroethene (t-1,2-DCE) at 5.0 ppb, and benzene at 3 ppb.

The soil gas samples contained vinyl chloride (ranging from 8 ppb to 21 ppb), chloroethane (ranging from 2 ppb to 24 ppb), 1,1-DCE (ranging from 3 ppb to 14 ppb), t-1,2-DCE (ranging from 4 ppb to 12 ppb), 1,1-dichloroethane (ranging from 5 ppb to 26 ppb), benzene (ranging from 3 ppb to 5 ppb), trichloroethene (TCE) (ranging from 6 ppb to 1320 ppb), toluene (ranging from 3 ppb to 9 ppb), meta-xylene (ranging from 5 ppb to 43 ppb), and ortho-xylene (ranging from 4 ppb to 7 ppb). Sample 11118SG contained 1,1,1-trichloroethane at 76 ppb, sample 12820SG contained meta-ethyltoluene at 7 ppb, and 11121SG contained tetrachloroethene at 3 ppb. Because the concentration was above the calibration curve, TCE for sample 12138SG is estimated at 1320 ppb

Non-target results consisted of acetone (ranging from 2 ppb to 142 ppb), aldehydes (ranging from heptanal to nonanal), low levels fluorocarbons (ranging from 1 ppb to 33 ppb), C4 alkene, alkanes (ranging from C5 to C12), C9 to C12 alkene/cycloalkanes, C9 to C11 diene/cycloalkene, cis-1,1-dichloroethene (ranging from 1.7 ppb to 450 ppb), C3 to C4 alkylbenzene, and terpenes (ranging from alpha-pinene to beta-phellandrene).

Many of the highly concentrated non-target analytes were found in the soil gas samples. Samples 10704SG, 10712SG, 11111SG, and 11118SG contained high levels of cis-1,2-DCE (ranging from 2 ppb to 450 ppb). There was an apparent trend that if there were significant levels of 1,1-DCE in the Summa canister then they also contained vinyl chloride, trans-1,2-dichloroethene, and cis-1,2-dichloroethene. For example, sample 11111SG contained cis-1,2-DCE at 450 ppb and low level concentrations of vinyl chloride, 1,1-DCE, t-1,2-DCE, 1,1-DCA, and TCE. These samples also contained an unknown analyte, possibly chlorinated, that eluted at approximately 8.4 minutes (ranging from 9 ppb to 97 ppb), as well as cis-1,2-DCE.

Samples 10694, 10696, 11399, 11402, 12288, and 12289 contained only fluorocarbons, except for low levels of acetone and aldehydes.

Most of the soil gas samples (09088SG, 10700SG, 10704SG, 10711SG, 10712SG, 11106SG, 11111SG, 11118SG, 11121SG, 11156SG, and 12802SG) and one of the ambient air samples (11385), exhibited an envelope, with retention times ranging from 11 minutes to 18 minutes, in the chromatogram probably due to C9 to C11 hydrocarbons. Figure 1 is a chromatogram from sample 11121SG.

Replicates were run on samples 10713SG at 800 ml, 11111SG at 650 ml, and 12283 at 800 ml, and 86566 at 150 ml. These samples showed good reproducibility.

Except for two low recoveries for BCM and BFB (53.8% and 69.2%) and one high recovery for BCM (147.4%), all recoveries were between 70% to 130%.

Matrix Spikes/Matrix Spike Duplicates (MS/MSD) were analyzed on sample 10711SG by spiking an 800 ml aliquot of the sample, 12284 by spiking an 800 ml aliquot of the sample, and 11121SG by spiking a 650 ml aliquot of the sample with 10 ml of a twenty-five compound standard mixture, respectively. Sample 10711SG and 12284 yielded low recoveries on chloromethane and vinyl chloride which could be due to suppression from high levels of CO_2 in the samples. Note that several samples (10693, 11399, 11400, 11401, 11403, 11404, 11405, 11407, 12813, 12814, 12815, 12282, 12283, 12288, 10700SG, 11106SG, and 11118SG) also exhibited high levels of CO_2, which could suppress the recoveries of the early eluting analytes. Trichlorofluoromethane (freon) also exhibited low recoveries for both the MS and MSD. Trichloroethylene (TCE), dibromomethane, bromodichloromethane, toluene, 1,1,2-trichloromethane and tetrachloroethylene (PCE) exhibited low recoveries for both MS and MSD, possibly due to water suppression. Sample 11121SG exhibited low recoveries for the same analytes plus chloroethane. 1,1-DCA, 1,1-DCE, 1,1,1-TCA, and benzene had low recoveries, possibly due to water suppression. These low recoveries have been observed on other high volume Summa canister MS and MSD analyses. There was good precision between the MS and MSD for sample 11284 (all RPD were under 14%).

Three Group A and B PE canister were analyzed to assure accuracy. Relative Percent Difference for all analytes were <25%, except for chloromethane (26.6%), TCE (RPD 32.9%) and ethylbenzene (46.3% to 50.9%). Ethylbenzene has been consistently low for this PE in other analyses.

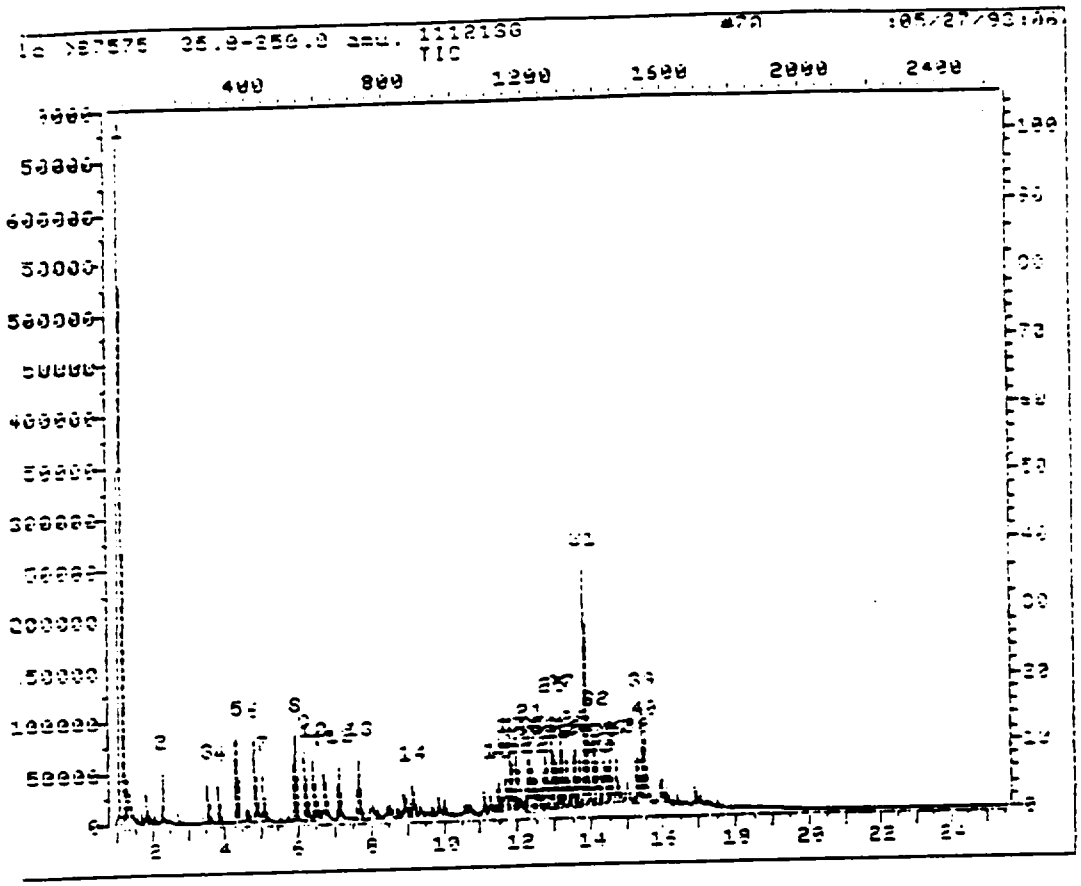

Figure 1 - Example of an envelope appearance in the chromatogram in sample 11121SG (#70).

TABLE 1 - INSTRUMENT CONDITIONS

A. Thermal Desorber Conditions:

Furnace Desorb Temperature:	240°C
Desorb Time:	10 Minutes
C-1 Temperature:	-160°C
C-1 Desorb Temperature:	250°C
C-1 Desorb Time:	3.5 Minutes
C-2 Temperature	-160°C
C-2 Desorb Temperature:	250°C*
C-2 Desorb Time:	2.0 Minutes*

B. GC/MS Conditions:

Initial Temperature:	5°C
Hold Time:	3 Minutes
Ramp Rate:	8°C/min.
Final Temperature:	185°C
Run Time:	25.5 Minutes
EM Voltage:	1332
Mass Scan Range:	35 to 250 AMU

Column: 0.32 x 30 meter Restek RT5, 0.25 um film thickness (Restek Corporation)

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* - Column injection temperature and time.

Table 2 - GC/MS MATERIALS AND SUPPLIERS

MATERIALS	SUPPLIERS
Summa Canisters	Passivated 6 liter Summa canisters (Anderson Samplers, Inc., or equivalent)
Calibrated standards, -mixture (1 ppm)	Scott Speciality Gases, Inc. (Cylinder Nos. ALM011112, ALM011117)
Surrogate standards	Matheson Gas Products, Inc Cylinder No. SX-19717
Syringes, gas-tight -various volumes	Dynatech-Precision Sampling, Inc.
Mass Flow Controller	Valco Instrument Co. Inc.

TABLE 3 - GC/MS STANDARDS

Compound	Cylinder[1]	Conc.(ppm)	RT(min)	Quant.Ion
chloromethane	ALM011112	0.979	1.24	50
vinyl chloride	ALM011112	0.991	1.35	62
chloroethane	ALM011112	0.965	1.65	64
trichlorofluoromethane	ALM011112	1.020	1.97	101
1,1-dichloroethene	ALM011112	1.020	2.44	61
dichloromethane	ALM011112	1.020	2.77	49
trans-1,2-dichloroethene	ALM011112	1.000	3.41	61
1,1-dichloroethane	ALM011112	1.010	3.77	63
trichloromethane	ALM011112	1.010	4.85	83
1,1,1-trichloromethane	ALM011112	1.030	5.53	97
1,2-dichloroethane	ALM011112	1.010	5.69	62
carbon tetrachloride	ALM011112	1.030	5.95	117
benzene	ALM011112	1.000	5.96	78
trichloroethene	ALM011112	1.030	7.05	130
dibromomethane	ALM011112	1.050	7.09	174
bromodichloromethane	ALM011112	1.040	7.26	83
toluene	ALM011112	1.030	8.90	91
1,1,2-trichloroethene	ALM011112	1.050	9.07	97
tetrachloroethene	ALM011112	1.020	10.01	166
ethylbenzene	ALM011117	1.020	11.38	91
meta-xylene	ALM011117	1.050	11.58	91
styrene	ALM011117	1.070	12.11	104
ortho-xylene	ALM011117	1.070	12.15	91
1,1,2,2-tetrachloroethane	ALM011112	1.050	12.65	83
meta-ethyltoluene	ALM011112	1.060	13.82	105
Surrogate Standards[2]				
bromochloromethane	SX-19717	2.00	4.79	49
p-bromofluorobenzene	SX-19717	1.30	12.92	95

[1]Scott Specialty Gases, Inc.
[2]Matheson Gas Products, Inc.

TABLE 4 - TARGET COMPOUND ANALYSIS BY GC/MS - ROSEHILL LANDFILL, S. KINGSTON, RI (All concentrations in ppb(v/v))

SAMPLE NUMBER	METHOD BLANK	12287	12285	12811	12812	12281	12282	METHOD BLANK	12283	12283 REP	12284
SAMPLE LOCATION	S.T.BLANK	FIELD BLANK	TRANS-X ST	N.E.C.M.W	121 R.H.RD	N.E.C.M.W.	349 R.H.RD	S.T.BLANK	278 R.H.RD	278 R.H.RD	294 R.H.RD
DATE SAMPLED	N/A	05/24/93	05/24/93	05/24/93	05/26/93	05/24/93	05/24/93	N/A	05/24/93	05/24/93	05/24/93
DATE ANALYZED	06/15/93	06/15/93	06/15/93	06/15/93	06/15/93	06/15/93	06/15/93	06/16/93	06/16/93	06/16/93	06/16/93
FRN	B7473	B7474	B7475	B7476	B7477	B7478	B7479	B7486	B7487	B7488	B7489
1) CHLOROMETHANE	1.0 U	0.5 U	0.8 J	1.1 U	1.7 U	1.4 U	1.1 U	1.0 U	1.0 J	1.3 U	0.8 J
2) VINYL CHLORIDE	1.0 U	0.5 U	1.3 U	1.1 U	1.7 U	1.4 U	1.1 U	1.0 U	1.3 U	1.3 U	1.3 U
3) CHLOROETHANE	1.0 U	0.5 U	1.3 U	1.1 U	1.7 U	1.4 U	1.1 U	1.0 U	1.3 U	1.3 U	1.3 U
4) TRICHLOROFLUOROMETHANE	1.0 U	0.6 J	0.3 J	1.1 U	1.7 U	2.8 J	0.2 J	1.0 U	0.3 J	0.2 J	0.3 J
5) 1,1-DICHLOROETHENE	1.0 U	0.5 U	1.3 U	1.1 U	1.7 U	1.4 U	1.1 U	1.0 U	1.3 U	1.3 U	1.3 U
6) METHYLENE CHLORIDE	1.0 U	0.5 U	0.3 J	1.1 U	1.7 U	0.3 J	1.1 U	1.0 U	0.3 J	1.3 U	0.4 J
7) TRANS-1,2-DICHLOROETHENE	1.0 U	0.5 U	1.3 U	1.1 U	1.7 U	1.4 U	1.1 U	1.0 U	1.3 U	1.3 U	1.3 U
8) 1,1-DICHLOROETHANE	1.0 U	0.5 U	1.3 U	1.1 U	1.7 U	1.4 U	1.1 U	1.0 U	1.3 U	1.3 U	1.3 U
10) TRICHLOROMETHANE	1.0 U	0.5 U	1.3 U	1.1 U	1.7 U	1.4 U	1.1 U	1.0 U	1.3 U	1.3 U	1.3 U
11) 1,1,1-TRICHLOROETHANE	1.0 U	0.5 U	0.7 J	0.3 J	0.3 J	0.2 J	0.4 J	1.0 U	0.5 J	0.4 J	1.0 J
12) 1,2-DICHLOROETHANE	1.0 U	0.5 U	1.3 U	1.1 U	1.7 U	1.4 U	1.1 U	1.0 U	1.3 U	1.3 U	1.3 U
13) CARBON TETRACHLORIDE	1.0 U	0.5 U	1.3 U	1.1 U	1.7 U	1.4 U	1.1 U	1.0 U	1.3 U	1.3 U	1.3 U
14) BENZENE	1.0 U	0.2 J	0.6 J	0.3 J	0.4 J	0.3 J	0.3 J	1.0 U	0.3 J	0.3 J	0.2 J
15) TRICHLOROETHYLENE	1.0 U	0.5 U	1.3 U	1.1 U	1.7 U	1.4 U	1.1 U	1.0 U	1.3 U	1.3 U	1.3 U
16) DIBROMOMETHANE	0.6 J	0.3 JB	0.5 JB	0.4 JB	1.7 U	0.5 JB	0.3 JB	0.6 J	0.4 JB	0.4 JB	0.5 JB
17) BROMODICHLOROMETHANE	1.0 U	0.5 U	1.3 U	1.1 U	1.7 U	1.4 U	1.1 U	1.0 U	1.3 U	1.3 U	1.3 U
18) TOLUENE	1.0 U	0.5 U	0.3 J	0.1 J	0.2 J	1.4 U	0.2 J	1.0 U	0.2 J	1.3 U	1.3 U
19) 1,1,2-TRICHLOROETHANE	1.0 U	0.5 U	1.3 U	1.1 U	1.7 U	1.4 U	1.1 U	1.0 U	1.3 U	1.3 U	1.3 U
20) TETRACHLOROETHYLENE	1.0 U	0.1 J	1.3 U	0.2 J	1.7 U	1.4 U	0.3 J	1.0 U	0.4 J	0.3 J	1.3 U
21) ETHYLBENZENE	1.0 U	0.5 U	0.2 J	0.1 J	0.2 J	1.4 U	0.2 J	1.0 U	0.1 J	1.3 U	1.3 U
22) META & PARA-XYLENES	1.0 U	0.5 U	1.3 U	0.1 J	0.3 J	1.4 U	0.3 J	1.0 U	0.2 J	0.2 J	1.3 U
23) STYRENE	1.0 U	0.5 U	1.3 U	1.1 U	1.7 U	1.4 U	1.1 U	1.0 U	1.3 U	1.3 U	1.3 U
24) ORTHO-XYLENE	0.1 J	0.5 U	0.1 JB	1.1 U	1.7 U	1.4 U	0.1 JB	0.1 J	1.3 U	1.3 U	1.3 U
25) 1,1,2,2-TETRACHLOROETHANE	1.0 U	0.5 U	0.4 J	1.1 U	1.7 U	1.4 U	1.1 U	1.0 U	1.3 U	1.3 U	1.3 U
27) META-ETHYLTOLUENE	1.0 U	0.5 U	1.3 U	1.1 U	1.7 U	1.4 U	1.1 U	1.0 U	1.3 U	1.3 U	1.3 U
BROMOCHLOROMETHANE (SURR)(%)	96.75	85.85	82.30	84.85	53.80	83.90	84.10	100.20	85.25	84.25	82.05
P-BROMOFLUOROBENZENE (SURR)(%)	107.31	96.38	108.38	110.08	79.00	109.38	97.00	105.54	107.08	105.85	114.31
SAMPLE VOLUME (mL)	500	1000	800	900	600	700	985	500	800	800	800
INITIAL PRESSURE (psi)	N/A	0.3	15.0	15.0	14.9	15.1	14.5	N/A	15.1	15.1	14.5
FINAL PRESSURE (psi)	N/A	21.1	30.0	30.0	29.8	30.2	31.8	N/A	30.2	30.2	29.0
METHOD DETECTION LIMIT (ppb)	1.0	0.5	1.3	1.1	1.7	1.4	1.1	1.0	1.3	1.3	1.3

A - Assumed volume for Blanks N/A - Not Applicable

U - Not Detected at 0.50 nL detection limit J - Below 1.00 nL Quantitation Limit B - <3 times Method Blank value

C - Compound Calibration >25% RSD D - Compound Calibration Check >25% RPD E - Exceeds Calibration Range

TABLE 4 - TARGET COMPOUND ANALYSIS BY GC/MS - ROSEHILL LANDFILL, S. KINGSTON, RI (All concentrations in ppb(v/v))

SAMPLE NUMBER	11403	11404	11405	11406	11407	11408	12813	12815	METHOD BLK	12814	12816
SAMPLE LOCATION	N.E.C.LF	278 R.H.RD	121 R.H.RD	349 BEAK ST	TRANS-X ST	349 R.H.RD	TRANS-X ST	278 R.H.RD	S.T. BLANK	339 R.H.RD	349 R.H.RD
DATE SAMPLED	05/27/93	05/27/93	05/27/93	05/27/93	05/27/93	05/27/93	05/26/93	05/26/93	N/A	05/26/93	05/26/93
DATE ANALYZED	06/16/93	06/16/93	06/16/93	06/16/93	06/16/93	06/16/93	06/16/93	06/16/93	06/21/93	06/21/93	06/21/93
FRN	B7492	B7493	B7494	B7495	B7496	B7497	B7498	B7500	B7523	B7524	B7525
1) CHLOROMETHANE	1.3 U	1.3 U	1.3 U	1.3 U	0.8 J	1.7 J	1.3 U	1.3 U	1.0 U	0.6 J	1.3 U
2) VINYL CHLORIDE	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.0 U	1.3 U	1.3 U
3) CHLOROETHANE	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.0 U	1.3 U	1.3 U
4) TRICHLOROFLUOROMETHANE	0.3 J	0.2 J	0.2 J	0.2 J	1.1 J	0.3 J	1.3 U	0.3 J	1.0 U	0.3 J	1.3 U
5) 1,1-DICHLOROETHENE	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.0 U	1.3 U	1.3 U
6) METHYLENE CHLORIDE	0.4 J	0.4 J	0.4 J	0.5 J	0.4 J	0.4 J	0.3 J	0.3 J	1.0 U	0.4 J	0.4 J
7) TRANS-1,2-DICHLOROETHENE	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.0 U	1.3 U	1.3 U
8) 1,1-DICHLOROETHANE	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.0 U	1.3 U	1.3 U
10) TRICHLOROMETHANE	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.0 U	1.3 U	1.3 U
11) 1,1,1-TRICHLOROETHANE	1.3 U	0.2 J	0.5 J	0.3 J	0.5 J	0.3 J	0.4 J	1.3 U	1.0 U	0.9 J	0.4 J
12) 1,2-DICHLOROETHANE	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.0 U	1.3 U	1.3 U
13) CARBON TETRACHLORIDE	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.0 U	1.3 U	1.3 U
14) BENZENE	0.2 J	0.6 J	0.4 J	0.3 J	0.2 J	1.3 U	0.2 J	0.2 J	0.2 J	0.3 JB	0.3 JB
15) TRICHLOROETHYLENE	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.0 U	1.3 U	1.3 U
16) DIBROMOMETHANE	0.5 JB	0.5 JB	0.6 JB	1.3 U	0.4 JB	0.6 JB	0.5 JB	1.3 U	0.6 J	0.3 JB	1.3 U
17) BROMODICHLOROMETHANE	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.0 U	1.3 U	1.3 U
18) TOLUENE	0.4 J	1.2 J	0.7 J	0.5 J	0.3 J	0.9 J	0.2 J	1.3 U	1.0 U	1.3 U	0.2 J
19) 1,1,2-TRICHLOROETHANE	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.0 U	1.3 U	1.3 U
20) TETRACHLOROETHYLENE	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.0 U	1.3 U	1.3 U
22) ETHYLBENZENE	1.3 U	0.4 J	0.1 J	1.3 U	0.1 J	0.2 J	1.3 U	0.2 J	0.1 J	1.3 U	0.1 JB
23) META & PARA-XYLENES	0.3 J	1.2 J	0.5 J	0.3 J	0.3 J	0.5 J	1.3 U	0.2 J	0.3 J	1.3 U	0.3 J
24) STYRENE	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.0 U	1.3 U	1.3 U
25) ORTHO-XYLENE	1.3 U	0.5 JB	0.2 JB	1.3 U	1.3 U	0.2 JB	1.3 U	1.3 U	0.2 J	1.3 U	0.1 JB
26) 1,1,2,2-TETRACHLOROETHANE	1.3 U	1.3 U	0.4 J	0.8 J	1.3 U	0.3 J	1.3 U	1.3 U	1.0 U	1.3 U	1.3 U
29) META-ETHYLTOLUENE	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.0 U	1.3 U	0.8 J
BROMOCHLOROMETHANE (SURR)(%)	74.00	76.40	82.45	147.40	141.90	88.50	87.90	76.90	94.65	91.75	89.45
P-BROMOFLUOROBENZENE (SURR)(%)	112.08	112.31	103.23	118.23	112.31	107.54	99.92	120.31	101.46	99.69	111.85
SAMPLE VOLUME (mL)	800	800	800	800	800	800	800	800	500	800	800
INITIAL PRESSURE (psi)	14.0	14.6	14.7	14.4	14.0	14.8	14.8	14.8	N/A	14.8	14.8
FINAL PRESSURE (psi)	28.0	29.2	29.4	28.8	28.0	29.6	29.6	29.6	N/A	29.6	29.6
METHOD DETECTION LIMIT (ppb)	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.0	1.3	1.3

A - Assumed volume for Blanks N/A - Not Applicable

U - Not Detected at 0.50 nL detection limit J - Below 1.00 nL Quantitation Limit B - <3 times Method Blank value

C - Compound Calibration >25% RSD D - Compound Calibration Check >25% RPD E - Exceeds Calibration Range

TABLE 4 - TARGET COMPOUND ANALYSIS BY GC/MS - ROSEHILL LANDFILL, KINGSTON, RI (All concentrations in ppb(v/v))

SAMPLE NUMBER	11399	11400	11401	11402	METHOD BLANK	10695	11409	10692	09104	10691	12290
SAMPLE LOCATION	349 R.H.RD	121 R.H.RD	278 R.H.RD	339 BEAK ST	S.T. BLANK	339 BEAK ST	FIELD BLANK	CLEAN BLK	CONTROL C2	278 R.H.RD	339 BEAK ST
DATE SAMPLED	05/26/93	05/26/93	05/26/93	05/26/93	N/A	05/25/93	05/27/93	05/25/93	05/26/93	05/25/93	05/25/93
DATE ANALYZED	06/21/93	06/21/93	06/21/93	06/21/93	06/22/93	06/22/93	06/22/93	06/22/93	06/22/93	06/22/93	06/22/93
FRN	B7526	B7527	B7528	B7529	B7532	B7533	B7534	B7535	B7536	B7537	B7538
1) CHLOROMETHANE	1.0 J	0.4 J	1.0 J	1.0 U	1.0 U	1.1 J	1.0 U	1.0 U	1.0 U	2.4 U	1.0 U
2) VINYL CHLORIDE	0.4 J	1.6 J	1.4 J	0.8 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.4 U	1.0 U
3) CHLOROETHANE	0.8 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.4 U	1.0 U
4) TRICHLOROFLUOROMETHANE	0.3 J	0.3 J	0.3 J	1.0 U	1.0 U	0.3 J	1.0 U	1.0 U	1.0 U	2.4 U	0.2 J
5) 1,1-DICHLOROETHENE	0.8 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.4 U	1.0 U
6) METHYLENE CHLORIDE	0.2 J	0.3 J	0.4 J	0.3 J	1.0 U	0.6 J	1.0 U	1.5 J	1.0 U	2.4 U	1.0 U
7) TRANS-1,2-DICHLOROETHENE	0.8 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.4 U	1.0 U
8) 1,1-DICHLOROETHANE	0.8 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.4 U	1.0 U
10) TRICHLOROMETHANE	0.8 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.4 U	1.0 U
11) 1,1,1-TRICHLOROETHANE	0.2 J	0.2 J	0.3 J	0.3 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.4 U	1.0 U
12) 1,2-DICHLOROETHANE	0.8 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.4 U	1.0 U
13) CARBON TETRACHLORIDE	0.8 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.4 U	1.0 U
14) BENZENE	1.9	4.0	23.4	0.9 J	1.0 U	2.1	1.0 U	3.7 J	1.0 U	0.3 J	0.2 J
15) TRICHLOROETHYLENE	0.8 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.4 U	1.0 U
16) DIBROMOMETHANE	0.3 JB	0.4 JB	0.4 JB	0.4 JB	0.6 J	0.3 JB	16.8 JB	1.5 JB	0.6 JB	1.0 JB	0.4 JB
17) BROMODICHLOROMETHANE	0.8 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.4 U	1.0 U
18) TOLUENE	0.2 J	0.3 J	0.4 J	0.3 J	0.1 J	0.2 JB	1.0 U	1.0 U	1.0 U	0.6 J	0.1 JB
19) 1,1,2-TRICHLOROETHANE	0.8 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.4 U	1.0 U
20) TETRACHLOROETHYLENE	0.8 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.4 U	1.0 U
21) ETHYLBENZENE	0.2 JB	0.1 JB	0.4 J	0.3 JB	1.0 U	0.1 J	1.0 U	1.0 U	1.0 U	2.6 J	0.1 J
22) META & PARA-XYLENES	1.0 J	0.3 J	1.6 J	1.2 J	1.0 U	0.3 J	1.0 U	1.0 U	1.0 U	14.3	0.3 J
23) STYRENE	0.8 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.4 U	1.0 U
24) ORTHO-XYLENE	1.2 J	0.2 JB	1.6 J	1.0 J	1.0 U	0.3 J	1.0 U	1.0 U	1.0 U	13.3	0.3 J
25) 1,1,2,2-TETRACHLOROETHANE	0.3 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.4 U	1.0 U
27) META-ETHYLTOLUENE	0.8 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.4 U	1.0 U
BROMOCHLOROMETHANE (SURR)(%)	90.75	91.85	97.75	91.50	85.45	86.10	88.85	85.95	85.20	87.75	89.55
P-BROMOFLUOROBENZENE (SURR)(%)	112.31	117.38	122.00	114.38	104.92	112.08	105.08	101.31	106.92	107.77	105.00
SAMPLE VOLUME (mL)	600	500	500	500	500	500	500	500	500	500	500
INITIAL PRESSURE (psi)	26.5	26.3	24.4	31.3	N/A	26.2	0.6	3.4	14.4	8.7	26.9
FINAL PRESSURE (psi)	26.5	26.3	24.4	31.3	N/A	26.2	26.5	21.4	28.8	21.1	26.9
METHOD DETECTION LIMIT (ppb)	0.8	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.4	1.0

A - Assumed volume for Blanks N/A - Not Applicable

U - Not Detected at 0.50 nL detection limit J - Below 1.00 nL Quantitation Limit B - <3 times Method Blank value

C - Compound Calibration >25% RSD D - Compound Calibration Check >25% RPD E - Exceeds Calibration Range

TABLE 4 - TARGET COMPOUND ANALYSIS BY GC/MS - ROSEHILL LANDFILL, S. KINGSTON, RI (All concentrations in ppb(v/v))

SAMPLE NUMBER	12288	12289	10696	11385	10693	10694	METHOD BLANK	10712SG	10713SG	10713SG REP	10711SG
SAMPLE LOCATION	349 R.H.RD	121 R.H.RD	121 R.H.RD	F16-F17	278 R.H.RD	349 R.H.RD	S.T. BLANK	#22	#76	#76	#21
DATE SAMPLED	05/25/93	05/24/93	05/25/93	05/26/93	05/25/93	05/25/93	N/A	05/27/93	05/27/93	05/27/93	05/27/93
DATE ANALYZED	06/22/93	06/22/93	06/22/93	06/22/93	06/22/93	06/22/93	06/23/93	06/23/93	06/23/93	06/23/93	06/23/93
FRN	B7539	B7542	B7543	B7544	B7545	B7546	B7550	B7552	B7553	B7554	B7555
1) CHLOROMETHANE	0.6 J	1.1 U	1.1 U	0.6 U	0.5 J	0.7 J	1.0 U	1.3 U	1.3 U	1.3 U	1.3 U
2) VINYL CHLORIDE	1.0 U	0.6 J	0.6 J	0.6 U	1.0 U	1.0 U	1.0 U	20.5	2.5 J	3.6	1.3 J
3) CHLOROETHANE	1.0 U	1.1 U	1.1 U	0.6 U	1.0 U	1.0 U	1.0 U	2.2 J	1.3 U	1.3 U	1.2 J
4) TRICHLOROFLUOROMETHANE	0.2 J	1.1 U	1.1 U	0.2 J	0.2 J	1.0 U	1.0 U	0.4 J	1.3 U	1.3 U	0.4 J
5) 1,1-DICHLOROETHENE	1.0 U	1.1 U	1.1 U	0.6 U	1.0 U	1.0 U	1.0 U	2.5	1.3 U	1.3 U	1.3 U
6) METHYLENE CHLORIDE	0.3 J	1.1 U	0.3 J	0.5 J	1.0 U	0.3 J	1.0 U	0.5 J	1.3 U	1.3 U	1.3 U
7) TRANS-1,2-DICHLOROETHENE	1.0 U	1.1 U	1.1 U	0.6 U	1.0 U	1.0 U	1.0 U	5.0	1.3 U	1.3 U	1.3 U
8) 1,1-DICHLOROETHANE	1.0 U	1.1 U	1.1 U	0.6 U	1.0 U	1.0 U	1.0 U	1.9 J	1.3 U	1.3 U	1.3 U
10) TRICHLOROMETHANE	1.0 U	1.1 U	1.1 U	0.6 U	1.0 U	1.0 U	1.0 U	1.3 U	1.3 U	1.3 U	1.3 U
11) 1,1,1-TRICHLOROETHANE	0.2 J	0.2 J	0.2 J	0.6 U	0.2 J	1.0 U	1.0 U	1.3 U	1.3 U	1.3 U	0.7 J
12) 1,2-DICHLOROETHANE	1.0 U	1.1 U	1.1 U	0.6 U	1.0 U	1.0 U	1.0 U	1.3 U	1.3 U	1.3 U	1.3 U
13) CARBON TETRACHLORIDE	1.0 U	1.1 U	1.1 U	0.6 U	1.0 U	1.0 U	1.0 U	1.3 U	1.3 U	1.3 U	1.3 U
14) BENZENE	0.2 J	0.2 J	0.2 J	0.6 U	0.2 J	9.7	1.0 U	3.4	1.3 U	1.3 U	0.2 J
15) TRICHLOROETHYLENE	1.0 U	1.1 U	1.1 U	0.6 U	1.0 U	1.0 U	1.0 U	1.4 J	1.3 U	1.3 U	1.3 U
16) DIBROMOMETHANE	0.3 JB	0.4 JB	0.5 JB	0.3 JB	0.2 JB	0.3 JB	0.5 J	0.5 JB	1.3 U	0.4 JB	0.5 JB
17) BROMODICHLOROMETHANE	1.0 U	1.1 U	1.1 U	0.6 U	1.0 U	1.0 U	1.0 U	1.3 U	1.3 U	1.3 U	1.3 U
18) TOLUENE	0.2 JB	1.1 U	0.2 JB	0.2 JB	0.1 JB	0.1 JB	1.0 U	1.3 U	1.3 U	1.3 U	0.2 J
19) 1,1,2-TRICHLOROETHANE	1.0 U	1.1 U	1.1 U	0.6 U	1.0 U	1.0 U	1.0 U	1.3 U	1.3 U	1.3 U	1.3 U
20) TETRACHLOROETHYLENE	1.0 U	1.1 U	1.1 U	0.6 U	1.0 U	1.0 U	1.0 U	0.5 J	1.3 U	1.3 U	1.3 U
22) ETHYLBENZENE	0.4 J	0.2 J	0.2 J	1.1 J	0.2 J	1.0 U	1.0 U	1.3 U	1.3 U	1.3 U	0.3 J
23) META & PARA-XYLENES	1.6 J	1.2 J	0.8 J	5.2	0.6 J	0.4 J	1.0 U	1.3 U	1.3 U	1.3 U	0.8 J
24) STYRENE	1.0 U	1.1 U	1.1 U	0.6 U	1.0 U	1.0 U	1.0 U	1.3 U	1.3 U	1.3 U	1.3 U
25) ORTHO-XYLENE	2.4	1.1 J	0.7 J	3.1	0.7 J	0.4 J	1.0 U	1.3 U	1.3 U	1.3 U	0.4 J
26) 1,1,2,2-TETRACHLOROETHANE	1.0 U	1.1 U	1.1 U	0.6 U	1.0 U	1.0 U	1.0 U	1.3 U	1.3 U	1.3 U	0.4 J
29) META-ETHYLTOLUENE	1.0 U	1.1 U	1.1 U	4.1 D	1.0 U	1.0 U	1.0 U	1.3 U	1.3 U	1.3 U	0.7 JC
BROMOCHLOROMETHANE (SURR)(%)	93.05	87.10	92.30	85.10	74.45	87.75	98.70	93.70	91.80	88.75	92.90
P-BROMOFLUOROBENZENE (SURR)(%)	107.31	103.08	110.77	113.38	94.85	110.15	91.46	106.31	100.15	99.23	93.38
SAMPLE VOLUME (mL)	500	450	450	800	500	500	500	800	800	800	800
INITIAL PRESSURE (psi)	26.7	31.8	31.3	14.7	24.3	27.5	N/A	14.7	15.0	15.0	14.3
FINAL PRESSURE (psi)	26.7	31.8	31.3	29.4	24.3	27.5	N/A	29.4	30.0	30.0	28.6
METHOD DETECTION LIMIT (ppb)	1.0	1.1	1.1	0.6	1.0	1.0	1.0	1.3	1.3	1.3	1.3

A - Assumed volume for Blanks N/A - Not Applicable

U - Not Detected at 0.50 nL detection limit J - Below 1.00 nL Quantitation Limit B - <3 times Method Blank value

C - Compound Calibration >25% RSD D - Compound Calibration Check >25% RPD E - Exceeds Calibration Range

SAMPLE NUMBER :	12138SG	METHOD BLANK	10704SG	11118SG	12820SG	11111SG	11111SG REP	10700SG
SAMPLE LOCATION :	#20	S.T. BLANK	#61	#88	#86	#84	#84	#82
DATE SAMPLED :	05/27/93	N/A	05/27/93	05/27/93	05/27/93	05/27/93	05/27/93	05/27/93
DATE ANALYZED :	06/23/93	06/24/93	06/24/93	06/24/93	06/24/93	06/24/93	06/24/93	06/24/93
FRN :	B7558	B7563	B7564	B7565	B7567	B7570	B7571	B7572
1) CHLOROMETHANE	1.3 U	1.0 U	4.1	0.8 J	1.3 U	1.5 U	0.9 J	1.5 U
2) VINYL CHLORIDE	10.7	1.0 U	20.8	1.1 J	1.3 U	2.6 J	8.1	0.8 J
3) CHLOROETHANE	1.3 U	1.0 U	5.2	6.4	3.4	1.5 U	2.1 J	5.7
4) TRICHLOROFLUOROMETHANE	1.3 U	1.0 U	1.4 U	1.2 U	1.3 U	1.5 U	1.5 U	1.5 U
5) 1,1-DICHLOROETHENE	13.5	1.0 U	2.2 J	0.6 J	1.3 U	3.2	6.7	1.5 U
6) METHYLENE CHLORIDE	0.5 J	1.0 U	0.5 J	1.8 J	1.3 U	1.2 J	2.5 J	1.5 U
7) TRANS-1,2-DICHLOROETHENE	10.6	1.0 U	3.9	0.4 J	1.3 U	5.8	12.3	1.5 U
8) 1,1-DICHLOROETHANE	1.3 U	1.0 U	7.2	15.2	1.3 U	4.9	5.8	0.6 J
10) TRICHLOROMETHANE	0.9 J	1.0 U	1.4 U	1.2 U	1.3 U	0.7 J	0.7 J	1.5 U
11) 1,1,1-TRICHLOROETHANE	1.3 U	1.0 U	1.7 J	74.8 E	0.4 J	0.5 J	1.5 U	1.5 U
12) 1,2-DICHLOROETHANE	1.3 U	1.0 U	1.4 U	0.3 J	1.3 U	0.6 J	1.5 U	1.5 U
13) CARBON TETRACHLORIDE	1.3 U	1.0 U	1.4 U	1.2 U	1.3 U	1.5 U	1.5 U	1.5 U
14) BENZENE	0.3 J	1.0 U	4.9	0.9 J	0.3 J	2.6 J	2.7 J	2.2 J
15) TRICHLOROETHYLENE	1317.5 E	1.0 U	1.2 J	1.0 J	1.3 U	5.9	6.5	1.5 U
16) DIBROMOMETHANE	1.3 U	0.5 J	0.5 JB	0.4 JB	0.4 JB	0.4 JB	0.5 JB	1.5 U
17) BROMODICHLOROMETHANE	1.3 U	1.0 U	1.4 U	1.2 U	1.3 U	1.5 U	1.5 U	1.5 U
18) TOLUENE	2.8	1.0 U	0.7 J	3.1	3.6	8.6	8.6	0.2 J
19) 1,1,2-TRICHLOROETHANE	1.3 U	1.0 U	1.4 U	1.2 U	1.3 U	1.5 U	1.5 U	1.5 U
20) TETRACHLOROETHYLENE	0.3 J	1.0 U	1.0 J	0.3 J	0.3 J	1.5 U	1.5 U	1.5 U
21) ETHYLBENZENE	1.1 J	1.0 U	0.3 J	0.4 J	7.1	1.5 J	1.3 J	0.5 J
22) META & PARA-XYLENES	0.2 J	1.0 U	0.5 JD	1.8 JD	42.9 D	4.8 D	4.5 D	2.3 JD
23) STYRENE	1.3 U	1.0 U	1.4 U	1.2 U	1.3 U	1.5 U	1.5 U	1.5 U
24) ORTHO-XYLENE	0.4 J	0.2 J	0.4 JB	0.5 J	7.1	1.7 J	1.5 J	1.3 J
25) 1,1,2,2-TETRACHLOROETHANE	1.3 U	1.0 U	1.4 U	1.2 U	1.3 U	1.5 U	1.5 U	1.5 U
27) META-ETHYLTOLUENE	1.3 U	1.0 U	1.4 U	1.2 U	7.1 D	1.5 U	1.5 U	0.6 JD
BROMOCHLOROMETHANE (SURR)(%)	85.55	77.00	83.30	83.15	81.45	78.10	77.55	80.20
P-BROMOFLUOROBENZENE (SURR)(%)	96.08	69.23	96.46	86.46	87.00	95.69	88.85	84.23
SAMPLE VOLUME (mL)	800	500	700	800	800	650	650	650
INITIAL PRESSURE (psi)	14.5	N/A	14.6	12.3	13.9	14.3	14.3	14.0
FINAL PRESSURE (psi)	29.1	N/A	29.1	24.2	27.9	28.8	28.8	28.0
METHOD DETECTION LIMIT (ppb)	1.3	1.0	1.4	1.2	1.3	1.5	1.5	1.5

A - Assumed volume for Blanks N/A - Not Applicable

U - Not Detected at 0.50 nL detection limit J - Below 1.00 nL Quantitation Limit B - <3 times Method Blank value

C - Compound Calibration >25% RSD D - Compound Calibration Check >25% RPD E - Exceeds Calibration Range

TABLE 4 - TARGET COMPOUND ANALYSIS BY GC/MS - ROSEHILL LANDFILL, S. KINGSTON, RI (All concentrations in ppb(v/v))

SAMPLE NUMBER	METHOD BLANK	11121SG	11156SG	11156SG	11106SG	09088SG	10474SG
SAMPLE LOCATION	S.T. BLANK	#70	#42	#42	#3	#28	TRIP BLANK
DATE SAMPLED	N/A	05/27/93	05/27/93	05/27/93	05/27/93	05/27/93	05/27/93
DATE ANALYZED	06/25/93	06/25/93	06/25/93	06/25/93	06/25/93	06/25/93	06/25/93
FRN	B7574	B7575	B7579	B7580	B7581	B7582	B7583
1) CHLOROMETHANE	1.0 U	1.5 U	50.0 U	1.5 U	3.3	1.5 U	0.8 U
2) VINYL CHLORIDE	1.0 U	13.2	50.0 U	1.5 U	0.8 J	1.5 U	0.8 U
3) CHLOROETHANE	1.0 U	23.7	50.0 U	1.5 U	6.5	1.9 J	0.8 U
4) TRICHLOROFLUOROMETHANE	1.0 U	3.1	50.0 U	1.5 U	1.5 U	1.5 U	0.8 U
5) 1,1-DICHLOROETHENE	1.0 U	1.1 J	50.0 U	1.5 U	1.5 U	1.5 U	0.8 U
6) METHYLENE CHLORIDE	1.0 U	2.5 J	50.0 U	1.5 U	1.7 J	0.4 J	0.8 U
7) TRANS-1,2-DICHLOROETHENE	1.0 U	1.5 U	50.0 U	1.5 U	1.5 U	1.5 U	0.8 U
8) 1,1-DICHLOROETHANE	1.0 U	25.8	50.0 U	1.5 U	1.5 U	1.5 U	0.8 U
10) TRICHLOROMETHANE	1.0 U	1.5 U	50.0 U	1.5 U	1.5 U	1.5 U	0.8 U
11) 1,1,1-TRICHLOROETHANE	1.0 U	1.7 J	50.0 U	1.1 J	1.5 U	0.5 J	0.8 U
12) 1,2-DICHLOROETHANE	1.0 U	0.3 J	50.0 U	1.5 U	1.5 U	1.5 U	0.8 U
13) CARBON TETRACHLORIDE	1.0 U	1.5 U	50.0 U	1.5 U	1.5 U	1.5 U	0.8 U
14) BENZENE	1.0 U	3.2	50.0 U	0.2 J	4.4	0.3 J	0.8 U
15) TRICHLOROETHYLENE	1.0 U	3.6	50.0 U	1.5 U	1.5 U	1.5 U	0.8 U
16) DIBROMOMETHANE	0.6 J	0.4 JB	27.0 JB	0.5 JB	0.4 JB	0.6 JB	0.4 JB
17) BROMODICHLOROMETHANE	1.0 U	1.5 U	50.0 U	1.5 U	1.5 U	1.5 U	0.8 U
18) TOLUENE	1.0 U	2.0 J	50.0 U	1.5 U	4.6	1.5 U	0.8 U
19) 1,1,2-TRICHLOROETHANE	1.0 U	1.5 U	50.0 U	1.5 U	1.5 U	1.5 U	0.8 U
20) TETRACHLOROETHYLENE	1.0 U	3.7	50.0 U	0.4 J	0.4 J	1.5 U	0.2 J
22) ETHYLBENZENE	1.0 U	0.8 J	50.0 U	0.3 J	2.0 J	1.5 U	0.8 U
23) META & PARA-XYLENES	1.0 U	2.6 J	50.0 U	1.6 J	11.7	1.4 J	0.8 U
24) STYRENE	1.0 U	1.5 U	50.0 U	1.5 U	1.5 U	1.5 U	0.8 U
25) ORTHO-XYLENE	0.1 J	1.5 J	50.0 U	0.9 J	3.6	1.3 J	0.8 U
26) 1,1,2,2-TETRACHLOROETHANE	1.0 U	1.5 U	50.0 U	1.5 U	1.5 U	1.5 U	0.8 U
29) META-ETHYLTOLUENE	1.0 U	0.5 JD	50.0 U	0.6 JD	1.9 JD	0.7 JD	0.8 U
BROMOCHLOROMETHANE (SURR)(%)	92.20	83.85	81.00	75.95	80.10	81.10	79.70
P-BROMOFLUOROBENZENE (SURR)(%)	83.77	87.54	84.38	78.08	82.31	86.23	79.77
SAMPLE VOLUME (mL)	500	650	20.0	650	650	650	650
INITIAL PRESSURE (psi)	N/A	14.6	14.3	14.3	14.0	14.3	0.3
FINAL PRESSURE (psi)	N/A	29.2	28.6	28.6	28.0	28.6	21.0
METHOD DETECTION LIMIT (ppb)	1.0	1.5	50.0	1.5	1.5	1.5	0.8

A - Assumed volume for Blanks N/A - Not Applicable

U - Not Detected at 0.50 nL detection limit J - Below 1.00 nL Quantitation Limit B - <3 times Method Blank value

C - Compound Calibration >25% RSD D - Compound Calibration Check >25% RPD E - Exceeds Calibration Range

TABLE 5 - MATRIX SPIKE/MATRIX SPIKE DUPLICATE SUMMARY - ROSE HILL LANDFILL (All concentrations in nL)

SAMPLE NUMBER		12284	12284 MS		12284 MSD			10711SG	10711SG MS		10711SG MSD		
SAMPLE LOCATION		294 R.H.RD	294 R.H.RD		294 R.H.RD			#21	#21		#21		
DATE SAMPLED		05/24/93	05/24/93		05/24/93			05/27/93	05/27/93		05/27/93		
DATE ANALYZED	: SPIKE	06/16/93	06/16/93	%	06/16/93	%		06/23/93	06/23/93	%	06/23/93	%	
FRN	: AMOUNT	B7489	B7490	RECOVERIES	B7491	RECOVERIES	RPD	B7555	B7556	RECOVERIES	B7557	RECOVERIES	RPD
1) CHLOROMETHANE	9.8	0.6 J	0.6 J	-0.9	0.5 J	-1.0	-10.5	0.00 U	0.68 J	6.9	1.89	19.3	94.
2) VINYL CHLORIDE	9.9	0.0 U	1.0 J	9.7	0.9 J	9.1	6.5	1.00 J	1.32	3.2	1.64	6.5	66.
3) CHLOROETHANE	9.7	0.0 U	7.6	78.4	8.4	86.7	10.1	0.92 J	8.60	79.2	6.36	56.1	34.
4) TRICHLOROFLUOROMETHANE	9.7	0.2 J	1.2	10.7	1.3	11.7	9.3	0.30 J	1.14	8.7	2.00	17.6	67.
5) 1,1-DICHLOROETHENE	10.2	0.0 U	6.6	65.0	5.9	58.2	11.0	0.00 U	7.35	72.1	8.48	83.1	14.
6) METHYLENE CHLORIDE	10.2	0.3 J	7.4	69.6	8.2	77.5	10.7	0.00 U	7.81	76.6	8.20	80.4	4
7) TRANS-1,2-DICHLOROETHENE	10.0	0.0 U	8.0	79.5	8.0	80.2	0.9	0.00 U	7.65	76.5	8.23	82.3	7
8) 1,1-DICHLOROETHANE	10.2	0.0 U	7.5	73.8	7.8	76.1	3.0	0.00 U	7.68	75.3	7.85	77.0	2
10) TRICHLOROMETHANE	10.1	0.0 U	7.4	73.4	8.2	81.4	10.4	0.00 U	7.26	71.9	7.71	76.3	6
11) 1,1,1-TRICHLOROETHANE	10.3	0.8 J	7.5	65.0	8.1	71.1	9.0	0.52 J	6.93	62.2	7.40	66.8	7
12) 1,2-DICHLOROETHANE	10.1	0.0 U	7.4	72.8	8.0	79.0	8.2	0.00 U	6.74	66.7	7.49	74.2	10
13) CARBON TETRACHLORIDE	10.3	0.0 U	9.1	88.7	10.0	96.7	8.6	0.00 U	8.61	83.6	8.42	81.7	2
14) BENZENE	10.0	0.2 J	6.3	61.6	5.7	55.3	10.8	0.16 J	7.65	74.9	7.80	76.4	2
15) TRICHLOROETHYLENE	10.3	0.0 U	5.8	55.8	6.4	61.7	10.1	0.00 U	5.30	51.5	5.97	58.0	11
16) DIBROMOMETHANE	10.5	0.4 JB	6.4	57.1	6.2	55.6	2.7	0.36 JB	4.56	40.0	4.90	43.2	7
17) BROMODICHLOROMETHANE	10.4	0.0 U	6.0	57.7	6.6	63.8	10.0	0.00 U	4.98	47.9	5.81	55.9	15
18) TOLUENE	10.3	0.0 U	3.3	31.9	2.9	27.7	14.3	0.18 J	4.41	41.1	4.58	42.7	3
19) 1,1,2-TRICHLOROETHANE	10.5	0.0 U	3.7	35.1	3.8	36.3	3.2	0.00 U	3.13	29.8	3.38	32.2	7
20) TETRACHLOROETHYLENE	10.2	0.0 U	2.4	23.2	2.4	23.9	2.9	0.00 U	6.83	67.0	1.85	18.1	114
21) ETHYLBENZENE	10.2	0.0 U	7.3	71.6	7.2	70.3	1.8	0.26 J	11.24	107.6	11.49	110.1	2
22) META & PARA-XYLENES	10.5	0.0 U	8.0	76.1	7.3	69.8	8.6	0.66 J	11.25	100.9	11.48	103.0	2
23) STYRENE	10.7	0.0 U	8.1	75.3	7.5	69.8	7.6	0.00 U	13.40	125.2	14.31	133.7	6
24) ORTHO-XYLENE	10.7	0.0 U	7.8	72.8	7.0	65.6	10.4	0.30 J	11.85	107.9	12.44	113.5	5
25) 1,1,2,2-TETRACHLOROETHANE	10.5	0.0 U	9.8	93.2	10.1	96.6	3.5	0.32 J	7.48	68.2	8.19	75.0	9
27) META-ETHYLTOLUENE	10.6	0.0 U	8.7	82.5	8.4	79.2	4.0	0.56 JC	14.95 C	135.8	15.92 C	144.9	6
BROMOCHLOROMETHANE (SURR)(%)	N/A	82.05	75.20	N/A	91.70	N/A	N/A	92.90	96.20	N/A	99.90	N/A	N
P-BROMOFLUOROBENZENE (SURR)(%)	N/A	114.31	109.54	N/A	109.92	N/A	N/A	93.90	102.54	N/A	100.69	N/A	N

Abbreviations:

RPD - Relative Percent Difference
J - Below 1.0 nL Quantitation Limit
C - Compound Calibration >25% RSD
E - Exceeds Calibration Range
U - Not Detected at 0.50 nL Detection Limit
B - <3 times Method Blank value
D - Compound Calibration Check >25% RPD
N/A - Not Applicable

TABLE 5 - MATRIX SPIKE/MATRIX SPIKE DUPLICATE SUMMARY - ROSE HILL LANDFILL (All concentrations in nL) - Page 2 of 2

SAMPLE NUMBER	:		11121SG	11121SG MS		11121SG MSD		
SAMPLE LOCATION	:		#70	#70		#70		
DATE SAMPLED	:		05/27/93	05/27/93		05/27/93		
DATE ANALYZED	:	SPIKE	06/25/93	06/25/93	%	06/25/93	%	
FRN	:	AMOUNT	B7575	B7576	RECOVERIES	B7577	RECOVERIES	RPD
1) CHLOROMETHANE		9.8	0.0 U	0.6 J	6.2	0.7 J	7.3	15.2
2) VINYL CHLORIDE		9.9	8.6	4.2	-44.1	3.2	-54.6	-21.3
3) CHLOROETHANE		9.7	15.4	14.6	-8.2	14.3	-11.5	-33.3
4) TRICHLOROFLUOROMETHANE		9.7	2.0	1.5	-5.6	1.3	-6.8	-20.0
5) 1,1-DICHLOROETHENE		10.2	0.7 J	1.9	11.9	1.5	7.8	40.8
6) METHYLENE CHLORIDE		10.2	1.6 J	8.6	68.3	9.3	74.8	9.0
7) TRANS-1,2-DICHLOROETHENE		10.0	0.0 U	7.9	78.5	8.4	84.1	6.9
8) 1,1-DICHLOROETHANE		10.2	16.8	15.1	-16.3	16.2	-5.8	-95.1
10) TRICHLOROMETHANE		10.1	0.0 U	7.4	73.6	6.5	64.1	13.8
11) 1,1,1-TRICHLOROETHANE		10.3	1.1 J	7.3	59.8	7.9	65.8	9.6
12) 1,2-DICHLOROETHANE		10.1	0.2 J	7.6	73.0	8.0	76.8	5.2
13) CARBON TETRACHLORIDE		10.3	0.0 U	8.2	79.5	9.0	87.5	9.5
14) BENZENE		10.0	2.1	7.9	57.9	7.2	51.6	11.5
15) TRICHLOROETHYLENE		10.3	2.4	6.4	39.5	6.9	44.0	10.7
16) DIBROMOMETHANE		10.5	0.3 JB	4.9	44.4	5.0	45.2	1.9
17) BROMODICHLOROMETHANE		10.4	0.0 U	5.7	54.9	6.5	62.7	13.2
18) TOLUENE		10.3	1.3 J	4.7	33.3	4.4	30.2	9.8
19) 1,1,2-TRICHLOROETHANE		10.5	0.0 U	3.4	32.5	3.7	35.4	8.7
20) TETRACHLOROETHYLENE		10.2	2.4	3.0	5.5	3.1	7.2	26.4
21) ETHYLBENZENE		10.2	0.5 J	10.4	96.6	8.8	81.1	17.4
22) META & PARA-XYLENES		10.5	1.7 J	11.2	90.7	10.3	81.6	10.5
23) STYRENE		10.7	0.0 U	12.3	115.0	10.8	101.3	12.7
24) ORTHO-XYLENE		10.7	1.0 J	11.2	95.0	9.6	80.9	16.0
25) 1,1,2,2-TETRACHLOROETHANE		10.5	0.0 U	8.5	77.4	9.6	88.5	13.3
27) META-ETHYLTOLUENE		10.6	0.3 JD	12.0 D	113.1	11.7 D	110.3	2.5
BROMOCHLOROMETHANE (SURR)(%)		N/A	83.85	78.65	N/A	60.05	N/A	N/A
P-BROMOFLUOROBENZENE (SURR)(%)		N/A	87.54	87.85	N/A	83.15	N/A	N/A

Abbreviations:

RPD - Relative Percent Difference
J - Below 1.0 nL Quantitation Limit
C - Compound Calibration >25% RSD
E - Exceeds Calibration Range
U - Not Detected at 0.50 nL Detection Limit
B - <3 times Method Blank value
D - Compound Calibration Check >25% RPD
N/A - Not Applicable

TABLE 6 - PERFORMANCE EVALUATION CANISTERS - ROSE HILL LANDFILL (ALL CONCENTRATIONS IN PPB)

SAMPLE LOCATION		PE, A & B		PE, A & B		PE, A & B	
SAMPLE NUMBER		3833 & 3811		3833 & 3811		3833 & 3811	
DATE ANALYZED	EXPECTED	06/16/93		06/23/93		06/25/93	
FRN	CONC.	87501	% RPD	87559	% RPD	87578	% RPD
1) CHLOROMETHANE	561.1	421	25.0	442	21.2	412	26.6
2) VINYL CHLORIDE	507.3	526	3.7	447	11.9	462	8.9
3) CHLOROETHANE	490.4	439	10.5	422	13.9	370	24.6
6) METHYLENE CHLORIDE	440.5	435	1.2	387	12.1	380	13.7
7) TRANS-1,2-DICHLOROETHENE	435.5	476	9.3	436	0.1	471	8.2
10) TRICHLOROMETHANE	257.0	269	4.7	253	1.6	233	9.3
11) 1,1,1-TRICHLOROETHANE	264.9	247	6.8	243	8.3	227	14.3
14) BENZENE	262.9	254	3.4	255	3.0	225	14.4
15) TRICHLOROETHYLENE	259.0	296	14.3	371	43.2	275	6.2
18) TOLUENE	267.9	247	7.8	249	7.1	217	19.0
20) TETRACHLOROETHYLENE	276.1	367	32.9	333	20.6	285	3.2
21) ETHYLBENZENE	282.9	148	47.7	152	46.3	139	50.9

U - Not Detected at detection limit. J - Below Quantitation Limit

B - <3 times System Blank value C - Compound Calibration >25% RSD

D - Compound Calibration Check >25% RPD E - Exceeds Calibration Range

NON - TARGET COMPOUNDS

SUMMA CANISTER ANALYSIS BY GC/MS

SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: METHOD BLANK
SAMPLE VOLUME (ml)	: 500.00 (a)	LOCATION	: SUMMA TRAIN BLANK
QUANTITATION CONCENTRATION (PPB)	: 1030	FRN	: B7473
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: N/A
QUANTITATION SCAN, AREA and RT	: 1270 204439 12.97	DATE ANALYZED	: 06/15/93

Chemical Name	Scan	Area	RT	RRT	ppb

Key to Comments:

* - Below 2.0 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

SUMMA CANISTER ANALYSIS BY GC/MS

SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 12287 CANISTER #157
SAMPLE VOLUME (ml)	: 1000.00	LOCATION	: FIELD BLANK
QUANTITATION CONCENTRATION (PPB)	: 1030	FRN	: B7474
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/25/93
QUANTITATION SCAN, AREA and RT	: 1269 204439 12.94	DATE ANALYZED	: 06/15/93

Chemical Name	Scan	Area	RT	RRT	ppb

Key to Comments:

* - Below 1.0 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

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SUMMA CANISTER ANALYSIS BY GC/MS

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SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 12285 CANISTER #137
SAMPLE VOLUME (ml)	: 800.00	LOCATION	: TRANSFER STATE
QUANTITATION CONCENTRATION (PPB):	1030	FRN	: 87475
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/24/93
QUANTITATION SCAN, AREA and RT	: 1262 204439 12.91	DATE ANALYZED	: 06/15/93

Chemical Name	Scan	Area	RT	RRT	ppb
argon + acetaldehyde	35	22457	1.23	0.10	1.4
heptanal	1210	15160	12.42	0.96	1.0 *
flurocarbon	1265	255081	12.94	1.00	16.1
octanal	1459	20268	14.79	1.15	1.3
nonanal	1692	16325	17.00	1.32	1.0 *

Key to Comments:

* - Below 1.3 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

SUMMA CANISTER ANALYSIS BY GC/MS

SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 12811 CANISTER #86
SAMPLE VOLUME (ml)	: 900.00	LOCATION	: NE CHW
QUANTITATION CONCENTRATION (PPB)	: 1030	FRN	: 87476
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/26/93
QUANTITATION SCAN, AREA and RT	: 1266 204439 12.95	DATE ANALYZED	: 06/15/93

Chemical Name	Scan	Area	RT	RRT	ppb
acetaldehyde	55	13224	1.42	0.11	0.7 *
acetone	143	30686	2.26	0.17	1.7
heptanal	1215	13382	12.46	0.96	0.7 *
octanal	1463	15595	14.82	1.14	0.9 *
nonanal	1697	11361	17.05	1.32	0.6 *

Key to Comments:

* - Below 1.1 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

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SUMMA CANISTER ANALYSIS BY GC/MS

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SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 12812 CANISTER #40
SAMPLE VOLUME (ml)	: 600.00	LOCATION	: 121 R.H. ROAD
QUANTITATION CONCENTRATION (PPB)	: 1030	FRN	: 87477
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/26/93
QUANTITATION SCAN, AREA and RT	: 1260 204439 12.93	DATE ANALYZED	: 06/15/93

Chemical Name	Scan	Area	RT	RRT	ppb	
acetaldehyde	63	13810	1.53	0.12	1.2	*
acetone	144	25121	2.30	0.18	2.1	
heptanal	1209	12589	12.45	0.96	1.1	*
nonanal	1694	10111	17.06	1.32	0.8	*

Key to Comments:

* - Below 1.7 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

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SUMMA CANISTER ANALYSIS BY GC/MS

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SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 12281 CANISTER #139
SAMPLE VOLUME (ml)	: 700.00	LOCATION	: NE CMW
QUANTITATION CONCENTRATION (PPB)	: 1030	FRN	: 87478
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/24/93
QUANTITATION SCAN, AREA and RT	: 1264 204439 12.93	DATE ANALYZED	: 06/15/93

Chemical Name	Scan	Area	RT	RRT	ppb
heptanal + CO2	1212	10965	12.43	0.96	0.8 *
nonanal	1696	11264	17.04	1.32	0.8 *

Key to Comments:

* - Below 1.4 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

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SUMMA CANISTER ANALYSIS BY GC/MS

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SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 12282 CANISTER #138
SAMPLE VOLUME (ml)	: 985.00	LOCATION	: 399 R.HILL ROAD
QUANTITATION CONCENTRATION (PPB)	: 1030	FRN	: 87479
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/24/93
QUANTITATION SCAN, AREA and RT	: 1259 204439 12.92	DATE ANALYZED	: 06/15/93

Chemical Name	Scan	Area	RT	RRT	ppb
acetaldehyde	52	15534	1.43	0.11	0.8 *
acetone	138	11491	2.25	0.17	0.6 *
heptanal	1207	13520	12.42	0.96	0.7 *
octanal	1457	19802	14.80	1.15	1.0 *
nonanal	1691	11556	17.03	1.32	0.6 *

Key to Comments:

* - Below 1.0 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

SUMMA CANISTER ANALYSIS BY GC/MS

SITE NAME :	ROSE HILL LANDFILL	SAMPLE NUMBER :	METHOD BLANK
SAMPLE VOLUME (ml) :	500.00 (a)	LOCATION :	SUMMA TRAIN BLANK
QUANTITATION CONCENTRATION (PPB):	1030	FRN :	B7486
QUANTITAION VOLUME (ml) :	10.00	DATE SAMPLED :	N/A
QUANTITATION SCAN, AREA and RT :	1261 156946 12.89	DATE ANALYZED :	06/16/93

Chemical Name	Scan	Area	RT	RRT	ppb

Key to Comments:

* - Below 2.0 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

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SUMMA CANISTER ANALYSIS BY GC/MS

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SITE NAME	:	ROSE HILL LANDFILL	SAMPLE NUMBER	:	12283 CANISTER #150
SAMPLE VOLUME (ml)	:	800.00	LOCATION	:	278 R.H. ROAD
QUANTITATION CONCENTRATION (PPB):		1030	FRN	:	B7487
QUANTITAION VOLUME (ml)	:	10.00	DATE SAMPLED	:	05/24/93
QUANTITATION SCAN, AREA and RT	:	1264 156946 12.92	DATE ANALYZED	:	06/16/93

Chemical Name	Scan	Area	RT	RRT	ppb
heptanal	1213	16157	12.44	0.96	1.3
octanal	1461	14140	14.79	1.14	1.2 *
nonanal	1694	14208	17.01	1.32	1.2 *

Key to Comments:

* - Below 1.3 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

****

SUMMA CANISTER ANALYSIS BY GC/MS

****

SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 12283 CANISTER #150
SAMPLE VOLUME (ml)	: 800.00	LOCATION	: 278 R.H. ROAD REP
QUANTITATION CONCENTRATION (PPB)	: 1030	FRN	: 87488
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/24/93
QUANTITATION SCAN, AREA and RT	: 1260 156946 12.88	DATE ANALYZED	: 06/16/93

Chemical Name	Scan	Area	RT	RRT	ppb
acetone	146	21268	2.29	0.18	1.7
heptanal	1209	11580	12.39	0.96	0.9 *

Key to Comments:

* - Below 1.3 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

SUMMA CANISTER ANALYSIS BY GC/MS

SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 12284 CANISTER #154
SAMPLE VOLUME (ml)	: 800.00	LOCATION	: 294 R. H. ROAD
QUANTITATION CONCENTRATION (PPB):	1030	FRN	: 87489
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/24/93
QUANTITATION SCAN, AREA and RT	: 1259 156946 12.90	DATE ANALYZED	: 06/16/93

Chemical Name	Scan	Area	RT	RRT	ppb
acetaldehyde	60	25245	1.49	0.12	2.1

Key to Comments:

* - Below 1.3 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

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SUMMA CANISTER ANALYSIS BY GC/MS

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SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 11403 CANISTER #143
SAMPLE VOLUME (ml)	: 800.00	LOCATION	: NE CWF
QUANTITATION CONCENTRATION (PPB)	: 1030	FRN	: B7492
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/27/93
QUANTITATION SCAN, AREA and RT	: 1264 156946 12.90	DATE ANALYZED	: 06/16/93

Chemical Name	Scan	Area	RT	RRT	ppb
acetone	144	14120	2.27	0.18	1.2 *

Key to Comments:

* - Below 1.3 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

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SUMMA CANISTER ANALYSIS BY GC/MS

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SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 11404 CANISTER #140
SAMPLE VOLUME (ml)	: 800.00	LOCATION	: 278 R. H. ROAD
QUANTITATION CONCENTRATION (PPB)	: 1030	FRN	: B7493
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/27/93
QUANTITATION SCAN, AREA and RT	: 1263 156946 12.90	DATE ANALYZED	: 06/16/93

Chemical Name	Scan	Area	RT	RRT	ppb

Key to Comments:

* - Below 1.3 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

SUMMA CANISTER ANALYSIS BY GC/MS

SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 11405 CANISTER #151
SAMPLE VOLUME (ml)	: 800.00	LOCATION	: 121 R. H. ROAD
QUANTITATION CONCENTRATION (PPB)	: 1030	FRN	: 87494
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/27/93
QUANTITATION SCAN, AREA and RT	: 1262 156946 12.88	DATE ANALYZED	: 06/16/93

Chemical Name	Scan	Area	RT	RRT	ppb

Key to Comments:

* - Below 1.3 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

SUMMA CANISTER ANALYSIS BY GC/MS

SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 11406 CANISTER #
SAMPLE VOLUME (ml)	: 800.00	LOCATION	: 349 BEAL STREET
QUANTITATION CONCENTRATION (PPB):	1030	FRN	: 87495
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/27/93
QUANTITATION SCAN, AREA and RT	: 1260 156946 12.87	DATE ANALYZED	: 06/16/93

Chemical Name	Scan	Area	RT	RRT	ppb
argon + acetaldehyde	27	23142	1.16	0.09	1.9

Key to Comments:

* - Below 1.3 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

SUMMA CANISTER ANALYSIS BY GC/MS

SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 11407 CANISTER #82
SAMPLE VOLUME (ml)	: 800.00	LOCATION	: TRANS-X STREET
QUANTITATION CONCENTRATION (PPB)	: 1030	FRN	: B7496
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/27/93
QUANTITATION SCAN, AREA and RT	: 1262 156946 12.90	DATE ANALYZED	: 06/16/93

Chemical Name	Scan	Area	RT	RRT	ppb
1,1-difluoroethane + CO2	34	15467	1.24	0.10	1.3
acetaldehyde + C4 alkene	57	22067	1.45	0.11	1.8
acetone	141	10190	2.25	0.17	0.8 *

Key to Comments:

* - Below 1.3 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

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SUMMA CANISTER ANALYSIS BY GC/MS

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SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 11408 CANISTER #29
SAMPLE VOLUME (ml)	: 800.00	LOCATION	: 349 R.H. ROAD
QUANTITATION CONCENTRATION (PPB)	: 1030	FRN	: B7497
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/27/93
QUANTITATION SCAN, AREA and RT	: 1263 156946 12.92	DATE ANALYZED	: 06/16/93

Chemical Name	Scan	Area	RT	RRT	ppb
acetone	138	16823	2.23	0.17	1.4

Key to Comments:

* - Below 1.3 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

SUMMA CANISTER ANALYSIS BY GC/MS

SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 12813 CANISTER #81
SAMPLE VOLUME (ml)	: 800.00	LOCATION	: TRANS-X STREET
QUANTITATION CONCENTRATION (PPB)	: 1030	FRN	: 87498
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/25/93
QUANTITATION SCAN, AREA and RT	: 1260 156946 12.89	DATE ANALYZED	: 06/16/93

Chemical Name	Scan	Area	RT	RRT	ppb
acetaldehyde	58	14577	1.47	0.11	1.2 *

Key to Comments:

* - Below 1.3 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

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SUMMA CANISTER ANALYSIS BY GC/MS

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SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 12815 CANISTER #
SAMPLE VOLUME (ml)	: 800.00	LOCATION	: 278 R.H. ROAD
QUANTITATION CONCENTRATION (PPB)	: 1030	FRN	: 87500
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/26/93
QUANTITATION SCAN, AREA and RT	: 1260 156946 12.90	DATE ANALYZED	: 06/16/93

Chemical Name	Scan	Area	RT	RRT	ppb
argon + acetaldehyde	37	33866	1.28	0.10	2.8

Key to Comments:

* - Below 1.3 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

SUMMA CANISTER ANALYSIS BY GC/MS

SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: METHOD BLANK
SAMPLE VOLUME (ml)	: 500.00 (a)	LOCATION	: SUMMA TRAIN BLANK
QUANTITATION CONCENTRATION (PPB)	: 1030	FRN	: B7523
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: N/A
QUANTITATION SCAN, AREA and RT	: 1275 190715 13.02	DATE ANALYZED	: 06/21/93

Chemical Name	Scan	Area	RT	RRT	ppb
heptanal + CO2	1224	16614	12.53	0.96	1.8 *
octanal	1474	16055	14.91	1.15	1.7 *
nonanal	1709	11260	17.14	1.32	1.2 *

Key to Comments:

* - Below 2.0 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

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SUMMA CANISTER ANALYSIS BY GC/MS

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SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 12814 CANISTER #55
SAMPLE VOLUME (ml)	: 800.00	LOCATION	: 339 R.H ROAD
QUANTITATION CONCENTRATION (PPB):	1030	FRN	: 87524
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/26/93
QUANTITATION SCAN, AREA and RT	: 1268 190715 12.93	DATE ANALYZED	: 06/21/93

Chemical Name	Scan	Area	RT	RRT	ppb
acetaldehyde + C4 alkene	55	33464	1.42	0.11	2.3
acetone	144	10905	2.26	0.17	0.7 *
n-pentane + CO2	361	12406	4.32	0.33	0.8 *

Key to Comments:

* - Below 1.3 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

SUMMA CANISTER ANALYSIS BY GC/MS

SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 12816 CANISTER #121
SAMPLE VOLUME (ml)	: 800.00	LOCATION	: 349 R.H ROAD
QUANTITATION CONCENTRATION (PPB)	: 1030	FRN	: 87525
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/26/93
QUANTITATION SCAN, AREA and RT	: 1265 190715 12.92	DATE ANALYZED	: 06/21/93

Chemical Name	Scan	Area	RT	RRT	ppb
acetaldehyde + argon	54	63794	1.41	0.11	4.3
acetone	134	46391	2.17	0.17	3.1
C12 alkene/cycloalkane	1865	12716	18.61	1.44	0.9 *

Key to Comments:

* - Below 1.3 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

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SUMMA CANISTER ANALYSIS BY GC/MS

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SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 11399 CANISTER #133
SAMPLE VOLUME (ml)	: 600.00	LOCATION	: 349 R.H ROAD
QUANTITATION CONCENTRATION (PPB)	: 1030	FRN	: 87526
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/26/93
QUANTITATION SCAN, AREA and RT	: 1269 190715 12.95	DATE ANALYZED	: 06/21/93

Chemical Name	Scan	Area	RT	RRT	ppb
CO2 + argon + chlorodifluoromethane	43	100872	1.31	0.10	9.1
acetaldehyde	57	10228	1.44	0.11	0.9 *
fluorocarbon	71	51589	1.58	0.12	4.6
fluorocarbon	124	53964	2.08	0.16	4.9
acetone	147	14379	2.30	0.18	1.3 *
fluorocarbon	236	64561	3.14	0.24	5.8
fluorocarbon	393	65175	4.63	0.36	5.9
fluorocarbon	554	70931	6.16	0.48	6.4
fluorocarbon	707	58009	7.61	0.59	5.2
fluorocarbon	852	41072	8.99	0.69	3.7
fluorocarbon	988	71388	10.28	0.79	6.4
fluorocarbon	1120	41823	11.53	0.89	3.8
fluorocarbon	1247	20193	12.74	0.98	1.8

Key to Comments:

* - Below 1.7 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

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SUMMA CANISTER ANALYSIS BY GC/MS

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SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 11400 CANISTER #153
SAMPLE VOLUME (ml)	: 500.00	LOCATION	: 278 R. H. ROAD
QUANTITATION CONCENTRATION (PPB)	: 1030	FRN	: 87527
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/26/93
QUANTITATION SCAN, AREA and RT	: 1272 190715 12.94	DATE ANALYZED	: 06/21/93

Chemical Name	Scan	Area	RT	RRT	ppb
acetone	148	21641	2.28	0.18	2.3
fluorocarbon + meta and para- xylenes	1132	11849	11.62	0.90	1.3 *

Key to Comments:

* - Below 2.0 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

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SUMMA CANISTER ANALYSIS BY GC/MS

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SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 11401 CANISTER #134
SAMPLE VOLUME (ml)	: 500.00	LOCATION	: 278 R. H. ROAD
QUANTITATION CONCENTRATION (PPB)	: 1030	FRN	: 87529
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/26/93
QUANTITATION SCAN, AREA and RT	: 1271 190715 12.96	DATE ANALYZED	: 06/21/93

Chemical Name	Scan	Area	RT	RRT	ppb
acetaldehyde + argon	57	133420	1.44	0.11	14.4
acetone	140	21710	2.23	0.17	2.3
cis-1,2-dichloroethene	387	15967	4.57	0.35	1.7 *

Key to Comments:

* - Below 2.0 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

SUMMA CANISTER ANALYSIS BY GC/MS

SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 11402 CANISTER #152
SAMPLE VOLUME (ml)	: 500.00	LOCATION	: 339 BEAK STREET
QUANTITATION CONCENTRATION (PPB)	: 1030	FRN	: 87529
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/26/93
QUANTITATION SCAN, AREA and RT	: 1274 190715 12.97	DATE ANALYZED	: 06/21/93

Chemical Name	Scan	Area	RT	RRT	ppb
argon + CO2 + fluorocarbon	38	11003	1.23	0.09	1.2 *
fluorocarbon	44	126777	1.29	0.10	13.7
acetaldehyde	61	11230	1.45	0.11	1.2 *
fluorocarbon	73	244135	1.56	0.12	26.4
fluorocarbon	125	283454	2.06	0.16	30.6
acetone	152	14249	2.31	0.18	1.5 *
fluorocarbon	224	15092	3.00	0.23	1.6 *
fluorocarbon	237	285209	3.12	0.24	30.8
fluorocarbon	377	16302	4.45	0.34	1.8 *
fluorocarbon	395	302973	4.62	0.36	32.7
fluorocarbon + benzene	538	20496	5.98	0.46	2.2
fluorocarbon	557	285478	6.16	0.47	30.8
fluorocarbon	693	13444	7.45	0.57	1.5 *
fluorocarbon	712	219962	7.63	0.59	23.8
fluorocarbon	856	137524	9.00	0.69	14.9
fluorocarbon	992	73317	10.29	0.79	7.9
fluorocarbon	1124	118434	11.54	0.89	12.8
fluorocarbon	1252	40608	12.76	0.98	4.4
unknown	1668	515816	16.71	1.29	55.7

Key to Comments:

* - Below 2.0 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

SUMMA CANISTER ANALYSIS BY GC/MS

SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: METHOD BLANK
SAMPLE VOLUME (ml)	: 500.00 (a)	LOCATION	: SUMMA TRAIN BLANK
QUANTITATION CONCENTRATION (PPB):	1030	FRN	: 87532
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: N/A
QUANTITATION SCAN, AREA and RT	: 1269 177469 12.98	DATE ANALYZED	: 06/22/93

Chemical Name	Scan	Area	RT	RRT	ppb

Key to Comments:

* - Below 2.0 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

SUMMA CANISTER ANALYSIS BY GC/MS

SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 11409 CANISTER #114
SAMPLE VOLUME (ml)	: 500.00	LOCATION	: FIELD BLANK
QUANTITATION CONCENTRATION (PPB)	: 1030	FRN	: B7534
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/27/93
QUANTITATION SCAN, AREA and RT	: 1269 177469 12.95	DATE ANALYZED	: 06/22/93

Chemical Name	Scan	Area	RT	RRT	ppb

Key to Comments:

* - Below 2.0 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

SUMMA CANISTER ANALYSIS BY GC/MS

SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 10692 CANISTER #159
SAMPLE VOLUME (ml)	: 500.00	LOCATION	: CLEANING BLANK
QUANTITATION CONCENTRATION (PPB):	1030	FRN	: B7535
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/25/93
QUANTITATION SCAN, AREA and RT	: 1269 177469 12.95	DATE ANALYZED	: 06/22/93

Chemical Name	Scan	Area	RT	RRT	ppb

Key to Comments:

* - Below 2.0 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

SUMMA CANISTER ANALYSIS BY GC/MS

SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 09104 CANISTER #93
SAMPLE VOLUME (ml)	: 500.00	LOCATION	: CONTROL #2
QUANTITATION CONCENTRATION (PPB):	1030	FRN	: 87536
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/26/93
QUANTITATION SCAN, AREA and RT	: 1272 177669 12.97	DATE ANALYZED	: 06/22/93

Chemical Name	Scan	Area	RT	RRT	ppb
acetaldehyde	65	14607	1.50	0.12	1.7 *
acetone	144	112654	2.25	0.17	13.1
benzaldehyde	1370	20365	13.90	1.07	2.4

Key to Comments:

* - Below 2.0 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

SUMMA CANISTER ANALYSIS BY GC/MS

SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 10691 CANISTER #145
SAMPLE VOLUME (ml)	: 500.00	LOCATION	: 278 R.H. ROAD
QUANTITATION CONCENTRATION (PPB):	1030	FRN	: 87537
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/25/93
QUANTITATION SCAN, AREA and RT	: 1266 177469 12.93	DATE ANALYZED	: 06/22/93

Chemical Name	Scan	Area	RT	RRT	ppb
acetaldehyde	62	11208	1.51	0.12	1.3 *
acetone	138	164068	2.23	0.17	19.0
alkane	1432	23786	14.51	1.12	2.8
C12 alkane	1901	28041	18.96	1.47	3.3
1-chloro-5-(1-chloroethynyl)-cyclohexene	1991	96410	19.82	1.53	11.2
1-chloro-4-(1-chloroethenyl)-cyclohexene	1998	117093	19.89	1.54	13.6

Key to Comments:

* - Below 2.0 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

SUMMA CANISTER ANALYSIS BY GC/MS

SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 12290 CANISTER #155
SAMPLE VOLUME (ml)	: 500.00	LOCATION	: 339 BEAK STREET
QUANTITATION CONCENTRATION (PPB)	: 1030	FRN	: 87538
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/25/93
QUANTITATION SCAN, AREA and RT	: 1269 177469 12.95	DATE ANALYZED	: 06/22/93

Chemical Name	Scan	Area	RT	RRT	ppb
acetaldehyde	56	13462	1.44	0.11	1.6 *
acetone	143	13328	2.26	0.17	1.5 *
1-chloro-5-(1-chloroethenyl)-cyclohexene	1997	13261	19.85	1.53	1.5 *
1-chloro-4-(1-chloroethenyl)-cyclohexene	2005	14486	19.93	1.54	1.7 *

Key to Comments:

* - Below 2.0 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

SUMMA CANISTER ANALYSIS BY GC/MS

SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 12288 CANISTER #146
SAMPLE VOLUME (ml)	: 500.00	LOCATION	: 349 R. N. ROAD
QUANTITATION CONCENTRATION (PPB)	: 1030	FRN	: 87539
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/25/93
QUANTITATION SCAN, AREA and RT	: 1268 177469 12.94	DATE ANALYZED	: 06/22/93

Chemical Name	Scan	Area	RT	RRT	ppb
argon + CO2 + chlorodifluoromethane	48	99967	1.36	0.11	11.6
acetaldehyde + alkene	58	14570	1.45	0.11	1.7 *
fluorocarbon	76	15877	1.62	0.13	1.8 *
fluorocarbon	128	17804	2.11	0.16	2.1
acetone	147	26428	2.29	0.18	3.1
fluorocarbon	238	18845	3.16	0.24	2.2
fluorocarbon	394	22679	4.64	0.36	2.6
fluorocarbon	556	20802	6.17	0.48	2.4
fluorocarbon	711	17975	7.64	0.59	2.1
fluorocarbon	855	12697	9.01	0.70	1.5 *
fluorocarbon + meta nad para-xylenes	1126	23486	11.59	0.90	2.7
heptanal	1216	14344	12.44	0.96	1.7 *
octanal	1466	18767	14.82	1.15	2.2
nonanal	1701	24054	17.05	1.32	2.8

Key to Comments:

* - Below 2.0 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

SUMMA CANISTER ANALYSIS BY GC/MS

SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 12299 CANISTER #132
SAMPLE VOLUME (ml)	: 450.00	LOCATION	: 121 R.H. ROAD
QUANTITATION CONCENTRATION (PPB):	1030	FRN	: 87542
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/24/93
QUANTITATION SCAN, AREA and RT	: 1266 177469 12.93	DATE ANALYZED	: 06/22/93

Chemical Name	Scan	Area	RT	RRT	ppb
fluorocarbon	8	193986	0.98	0.08	25.0
fluorocarbon	61	231746	1.48	0.11	29.9
acetone	85	27563	1.71	0.13	3.6
fluorocarbon	174	231540	2.55	0.20	29.9
fluorocarbon	358	240562	4.30	0.33	31.0
flurocarbon	537	154632	6.00	0.46	19.9
fluorocarbon	546	77751	6.08	0.47	10.0
fluorocarbon	703	175245	7.57	0.59	22.6
fluorocarbon	849	115412	8.96	0.69	14.9
fluorocarbon	985	72292	10.25	0.79	9.3
flurocarbon	1116	157966	11.50	0.89	20.4
fluorocarbon	1242	70371	12.70	0.98	9.1

Key to Comments:

* - Below 2.2 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

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SUMMA CANISTER ANALYSIS BY GC/MS

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SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 10696 CANISTER #156
SAMPLE VOLUME (ml)	: 500.00	LOCATION	: 121 R.H. ROAD
QUANTITATION CONCENTRATION (PPB)	: 1030	FRN	: 87543
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/25/93
QUANTITATION SCAN, AREA and RT	: 1267 177469 12.95	DATE ANALYZED	: 06/22/93

Chemical Name	Scan	Area	RT	RRT	ppb
fluorocarbon	21	60162	1.12	0.09	7.0
fluorocarbon	32	100699	1.22	0.09	11.7
fluorocarbon	36	22040	1.26	0.10	2.6
acetaldehyde	45	19706	1.34	0.10	2.3
fluorocarbon	57	221114	1.46	0.11	25.7
fluorocarbon	104	238448	1.90	0.15	27.7
acetone	126	22737	2.11	0.16	2.6
fluorocarbon	213	222822	2.94	0.23	25.9
fluorocarbon	264	14371	3.42	0.26	1.7 *
fluorocarbon	378	209029	4.50	0.35	24.3
fluorocarbon	407	71980	4.78	0.37	8.4
fluorocarbon	545	140893	6.09	0.47	16.4
fluorocarbon	560	122342	6.23	0.48	14.2
fluorocarbon	704	101688	7.60	0.59	11.8
fluorocarbon	710	97662	7.65	0.59	11.3
fluorocarbon	852	130827	9.00	0.69	15.2
fluorocarbon	986	77624	10.28	0.79	9.0
fluorocarbon	1117	183215	11.52	0.89	21.3
fluorocarbon	1242	82098	12.71	0.98	9.5
fluorocarbon	1365	26111	13.88	1.07	3.0

Key to Comments:

* - Below 2.0 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

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SUMMA CANISTER ANALYSIS BY GC/MS

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SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 11385 CANISTER #27
SAMPLE VOLUME (ml)	: 800.00	LOCATION	: F16 - F17
QUANTITATION CONCENTRATION (PPB):	1030	FRN	: B7544
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/26/93
QUANTITATION SCAN, AREA and RT	: 1269 177469 12.95	DATE ANALYZED	: 06/22/93

Chemical Name	Scan	Area	RT	RRT	ppb
acetaldehyde	59	26725	1.46	0.11	1.9
acetone	142	1961713	2.25	0.17	142.3
acetone	150	343438	2.32	0.18	24.9
fluorocarbon	987	40682	10.27	0.79	3.0
fluorocarbon	1120	72417	11.53	0.89	5.3
n-nonane	1209	101771	12.38	0.96	7.4
cis-1-ethyl-2-methyl-cyclohexane	1224	24498	12.52	0.97	1.8
C9 diene/cycloalkene	1255	46601	12.82	0.99	3.4
propyl-cyclohexane	1284	73178	13.09	1.01	5.3
3,6-dimethyl-octane	1295	66589	13.20	1.02	4.8
C10 alkene/cycloalkane	1313	44376	13.37	1.03	3.2
C10 diene/cycloalkene + C10 alkene/cycloakane	1325	34049	13.48	1.04	2.5
C10 alkene/cycloalkane	1348	83351	13.70	1.06	6.0
alkane + C10 alkene/cycloalkane	1361	157716	13.83	1.07	11.4
C10 alkane + C3 alkylbenzene	1370	46307	13.91	1.07	3.4
1,2,3-trimethyl-benzene	1382	51798	14.03	1.08	3.8
C10 alkane	1387	41093	14.07	1.09	3.0
C10 alkene/cycloalkane	1392	46802	14.12	1.09	3.4
C10 alkene/cylcoalkane	1399	45091	14.19	1.10	3.3
1-methyl-3-propyl-cyclohexane	1417	29346	14.36	1.11	2.1
C10 diene/cycloalkene + C11 alkene/cycloalkane	1420	70845	14.39	1.11	5.1
trimethylbenzene isomer + C10 alkene/cycloalkane	1444	29910	14.62	1.13	2.2
n-decane	1456	202515	14.73	1.14	14.7
alkane + alkylbenzenes	1513	118621	15.27	1.18	8.6
C10 diene/cycloalkene	1530	94973	15.44	1.19	6.9
alkane	1540	82639	15.53	1.20	6.0
alkane + C12 alkene/cycloalkane	1548	47150	15.61	1.21	3.4
alkane	1585	67745	15.96	1.23	4.9
alkane + decahydro-naphthalene	1591	44372	16.02	1.24	3.2
alkane + C4 alkylbenzene	1597	27453	16.07	1.24	2.0
alkane	1606	51171	16.16	1.25	3.7
alkane	1635	49682	16.44	1.27	3.6
n-undecane	1686	110994	16.92	1.31	8.1

Key to Comments:

* - Below 1.3 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

SUMMA CANISTER ANALYSIS BY GC/MS

SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 10694 CANISTER #113
SAMPLE VOLUME (ml)	: 500.00	LOCATION	: 349 R. H. ROAD
QUANTITATION CONCENTRATION (PPB)	: 1030	FRN	: 87546
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/25/93
QUANTITATION SCAN, AREA and RT	: 1272 177469 12.97	DATE ANALYZED	: 06/22/93

Chemical Name	Scan	Area	RT	RRT	ppb
fluorocarbon	47	19878	1.35	0.10	2.3
acetaldehyde	59	34163	1.46	0.11	4.0
fluorocarbon	72	35062	1.58	0.12	4.1
fluorocarbon	121	41247	2.05	0.16	4.8
fluorocarbon	230	38915	3.08	0.24	4.5
fluorocarbon	390	38236	4.60	0.35	4.4
fluorocarbon	556	19756	6.17	0.48	2.3
fluorocarbon	715	26713	7.68	0.59	3.1
fluorocarbon	857	18367	9.03	0.70	2.1
fluorocarbon	993	21092	10.33	0.80	2.4
fluorocarbon	1125	28278	11.58	0.89	3.3

Key to Comments:

* - Below 2.0 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

SUMMA CANISTER ANALYSIS BY GC/MS

SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: METHOD BLANK
SAMPLE VOLUME (ml)	: 500.00 (a)	LOCATION	: SUMMA TRAIN BLANK
QUANTITATION CONCENTRATION (PPB):	1030	FRN	: B7550
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: N/A
QUANTITATION SCAN, AREA and RT	: 1268 181013 12.92	DATE ANALYZED	: 06/23/93

Chemical Name	Scan	Area	RT	RRT	ppb

Key to Comments:

* - Below 2.0 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

SUMMA CANISTER ANALYSIS BY GC/MS

SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 10712SG
SAMPLE VOLUME (ml)	: 800.00	LOCATION	: #22
QUANTITATION CONCENTRATION (PPB)	: 1030	FRN	: 87552
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/27/93
QUANTITATION SCAN, AREA and RT	: 1268 181013 12.93	DATE ANALYZED	: 06/23/93

Chemical Name	Scan	Area	RT	RRT	ppb
acetone	122	700406	2.06	0.16	49.8
acetone	126	57737	2.09	0.16	4.1
cis-1,2-dichloroethene	380	2129410	4.50	0.35	151.5
cyclohexane	521	11240	5.84	0.45	0.8 *
alkane	605	20008	6.64	0.51	1.4
unknown	795	256505	8.44	0.65	18.2
alkene/cycloalkane	1037	11510	10.74	0.83	0.8 *
C9 alkene/cycloalkane	1077	14842	11.12	0.86	1.1 *
alkane	1168	14390	11.98	0.93	1.0 *
alkane	1201	12874	12.30	0.95	0.9 *
cis-1-ethyl-2-methyl-cyclohexane	1223	12861	12.51	0.97	0.9 *
C9 alkene/cycloalkane	1255	11898	12.81	0.99	0.8 *
alkane + alkene/cycloalkane	1313	17978	13.36	1.03	1.3
C10 diene/cycloalkane	1324	11109	13.47	1.04	0.8 *
alkane	1360	82440	13.81	1.07	5.9
C10 alkene/cycloalkane	1392	22629	14.11	1.09	1.6
alkane	1435	11418	14.52	1.12	0.8 *
alkane	1512	25618	15.25	1.18	1.8
alkane	1539	40274	15.51	1.20	2.9
alkane	1585	30035	15.95	1.23	2.1
C10 diene/cycloalkene	1591	18352	16.00	1.24	1.3
alkane	1634	11675	16.41	1.27	0.8 *
n-undecane	1687	12378	16.91	1.31	0.9 *

Key to Comments:

* - Below 1.3 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

SUMMA CANISTER ANALYSIS BY GC/MS

SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 10713SG
SAMPLE VOLUME (ml)	: 800.00	LOCATION	: #76 REP
QUANTITATION CONCENTRATION (PPB)	: 1030	FRN	: 87554
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/27/93
QUANTITATION SCAN, AREA and RT	: 1269 181013 12.93	DATE ANALYZED	: 06/23/93

Chemical Name	Scan	Area	RT	RRT	ppb
acetone	144	37285	2.26	0.17	2.7

Key to Comments:

* - Below 1.3 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

SUMMA CANISTER ANALYSIS BY GC/MS

SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 10711SG
SAMPLE VOLUME (ml)	: 800.00	LOCATION	: #21
QUANTITATION CONCENTRATION (PPB)	: 1030	FRN	: 87555
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/27/93
QUANTITATION SCAN, AREA and RT	: 1268 181013 12.93	DATE ANALYZED	: 06/23/93

Chemical Name	Scan	Area	RT	RRT	ppb	
acetone	141	863857	2.24	0.17	61.4	
acetone	155	43523	2.37	0.18	3.1	
alkene/cycloalkane	1037	16112	10.74	0.83	1.1	*
alkane	1168	10501	11.98	0.93	0.7	*
heptanal	1215	19564	12.42	0.96	1.4	
C9 diene/cycloalkene	1254	11013	12.80	0.99	0.8	*
alkane + BFB	1295	17714	13.19	1.02	1.3	
alkene/cycloalkane	1313	16892	13.36	1.03	1.2	*
C10 diene/cycloalkene	1325	15833	13.47	1.04	1.1	*
camphene	1333	11150	13.55	1.05	0.8	*
C10 alkene/cycloalkane	1348	26484	13.69	1.06	1.9	
alkane	1361	68412	13.81	1.07	4.9	
C10 alkene/cycloalkane	1392	21177	14.11	1.09	1.5	
C10 alkene/cycloalkane + C3 alkylbenzene	1444	12394	14.60	1.13	0.9	*
n-decane	1456	23497	14.72	1.14	1.7	
alkane + C3 alkylbenzene	1513	55124	15.26	1.18	3.9	
C10 diene/cycloalkene	1530	13455	15.42	1.19	1.0	*
alkane	1540	45643	15.51	1.20	3.2	
C11 alkene/cycloalkane	1564	16507	15.74	1.22	1.2	*
alkane	1585	32732	15.94	1.23	2.3	
alkene + decahydro-naphthalene	1591	18206	16.00	1.24	1.3	
alkane	1606	28785	16.14	1.25	2.0	
alkane + alkane/cycloalkene	1635	32338	16.42	1.27	2.3	
n-undecane	1686	18810	16.90	1.31	1.3	
C11 diene/cycloalkene	1720	11148	17.23	1.33	0.8	*

Key to Comments:

* - Below 1.3 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

SUMMA CANISTER ANALYSIS BY GC/MS

SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 12138SG CANISTER #80
SAMPLE VOLUME (ml)	: 800.00	LOCATION	: #20
QUANTITATION CONCENTRATION (PPB)	: 1030	FRN	: B7558
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/27/93
QUANTITATION SCAN, AREA and RT	: 1268 181013 12.94	DATE ANALYZED	: 06/23/93

Chemical Name	Scan	Area	RT	RRT	ppb
acetaldehyde	61	10058	1.48	0.11	0.7 *
acetone	146	53479	2.28	0.18	3.8
cis-1,2-dichloroethene	395	4527710	4.64	0.36	322.0
unknown	797	245609	8.46	0.65	17.5

Key to Comments:

* - Below 1.3 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

SUMMA CANISTER ANALYSIS BY GC/MS

SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: METHOD BLANK
SAMPLE VOLUME (ml)	: 500.00 (a)	LOCATION	: SUMMA TRAIN BLANK
QUANTITATION CONCENTRATION (PPB)	: 1030	FRN	: 87563
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: N/A
QUANTITATION SCAN, AREA and RT	: 1265 18198 12.89	DATE ANALYZED	: 06/24/93

Chemical Name	Scan	Area	RT	RRT	ppb

Key to Comments:

* - Below 2.0 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

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SUMMA CANISTER ANALYSIS BY GC/MS

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SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 10704SG CAN #115
SAMPLE VOLUME (ml)	: 700.00	LOCATION	: #61
QUANTITATION CONCENTRATION (PPB):	1030	FRN	: 87564
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/27/93
QUANTITATION SCAN, AREA and RT	: 1263 181984 12.89	DATE ANALYZED	: 06/24/93

Chemical Name	Scan	Area	RT	RRT	ppb
acetone	138	89073	2.21	0.17	7.2
cis-1,2-dichloroethene	383	928541	4.53	0.35	75.1
cyclohexane	522	18198	5.85	0.45	1.5
alkane	606	26250	6.65	0.52	2.1
methyl-cyclohexane	704	28467	7.58	0.59	2.3
unknown	796	594236	8.45	0.66	48.0
cis-1,3-dimethyl-cyclohexane	866	24058	9.12	0.71	1.9
C9 alkene/cyloalkane	1030	24456	10.68	0.83	2.0
trimethyl-cyclohexane isomer	1070	30269	11.06	0.86	2.4
1,2,3-trimethyl-cyclohexane	1132	18646	11.64	0.90	1.5
alkane	1163	22203	11.94	0.93	1.8
C9 diene/cycloalkene	1178	17970	12.08	0.94	1.5
alkene/cycloalkane	1212	22951	12.40	0.96	1.9
ethyl-methyl-cyclohexane isomer	1217	31444	12.45	0.97	2.5
C9 diene/cycloalkene	1249	27156	12.76	0.99	2.2
C10 alkene/cycloalkane + BFB	1274	47182	12.99	1.01	3.8
alkene/cycloalkane	1307	39336	13.31	1.03	3.2
diene/cycloalkene + alkene/cycloalkane	1318	18480	13.41	1.04	1.5
C10 diene/cycloalkene + C10 alkene/cylcoalkane	1329	23947	13.52	1.05	1.9
C10 alkene/cycloalkane	1342	41834	13.64	1.06	3.4
alkane	1355	149024	13.76	1.07	12.0
C10 alkene/cycloalkane + C10 diene/cycloalkane	1387	32314	14.07	1.09	2.6
alkene/cycloalkane + siloxane	1445	30397	14.62	1.13	2.5
diene/cycloalene + alkene/cycloalkane	1461	18690	14.77	1.15	1.5
alkene/cycloalkane	1507	39885	15.21	1.18	3.2
alkene/cycloalkane	1524	40461	15.37	1.19	3.3
alkane	1534	93207	15.47	1.20	7.5
alkane	1580	66789	15.90	1.23	5.4
alkane + trans-decahydro-naphthalene	1585	34385	15.95	1.24	2.8
alkane	1629	19838	16.37	1.27	1.5
alkene/cycloalkane + unknown	1694	19760	16.99	1.32	1.6
1,7,7-trimethyl-bicyclo[2.2.1]heptan-2-one	1793	19991	17.93	1.39	1.6

Key to Comments:

* - Below 1.4 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

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SUMMA CANISTER ANALYSIS BY GC/MS

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SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 11118SG CAN #71
SAMPLE VOLUME (ml)	: 800.00	LOCATION	: #88
QUANTITATION CONCENTRATION (PPB)	: 1030	FRN	: 87565
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/27/93
QUANTITATION SCAN, AREA and RT	: 1264 181984 12.89	DATE ANALYZED	: 06/24/93

Chemical Name	Scan	Area	RT	RRT	ppb	
acetone	139	455370	2.22	0.17	32.2	
1,1,2-trichloro-1,2,2-trifluoroethane	187	97820	2.67	0.21	6.9	
cis-1,2-dichloroethene	385	815366	4.55	0.35	57.7	
unknown	793	123973	8.42	0.65	8.8	
alkene/cycloalkane	1031	10737	10.68	0.83	0.8	*
1,3,5-trimethyl-cyclohexane	1071	10479	11.06	0.86	0.7	*
cis-1-ethyl-2-methyl-cyclohexane	1219	15742	12.47	0.97	1.1	*
C9 diene/cyloalkene	1251	13732	12.77	0.99	1.0	*
alkene/cycloalkane + BFB	1276	20755	13.01	1.01	1.5	
C10 alkene/cycloalkane + BFB	1309	23919	13.32	1.03	1.7	
C10 alkene/cycloalkane + C9 diene/cycloalkene	1320	10591	13.43	1.04	0.7	*
C10 alkene/cycloalkane	1344	19799	13.65	1.06	1.4	
alkane + C10 alkene/cylcoalkane	1357	52626	13.78	1.07	3.7	
C10 alkene/cycloalkane + C10 diene/cycloalkene	1389	19263	14.08	1.09	1.4	
alkane	1509	23907	15.22	1.18	1.7	
alkane	1535	32542	15.47	1.20	2.3	
alkane	1581	22775	15.91	1.23	1.6	
decanydro-naphthalene + alkane	1587	16112	15.96	1.24	1.1	*

Key to Comments:

* - Below 1.3 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

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SUMMA CANISTER ANALYSIS BY GC/MS

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SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 12820SG CAN #53
SAMPLE VOLUME (ml)	: 800.00	LOCATION	: #86
QUANTITATION CONCENTRATION (PPB):	1030	FRN	: 87567
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/27/93
QUANTITATION SCAN, AREA and RT	: 1269 181984 12.95	DATE ANALYZED	: 06/24/93

Chemical Name	Scan	Area	RT	RRT	ppb
acetone	140	1517848	2.23	0.17	107.4
C9 alkene/cycloalkane	868	152534	9.13	0.71	10.8
n-octane	939	139370	9.81	0.76	9.9
dimethyl-cyclohexane isomer	945	137637	9.87	0.76	9.7
ethyl-cyclohexane	1024	161616	10.62	0.82	11.4
1,1,2-trimethyl-cyclohexane	1034	202797	10.71	0.83	14.3
trimethyl-cyclohexane isomer	1074	103584	11.09	0.86	7.3
2-methyl-octane + diene/cycloalkene	1117	140185	11.50	0.89	9.9
C9 alkene/cycloalkane + meta and para-xylenes	1135	91204	11.67	0.90	6.5
ethyl-methyl-cyclohexane isomer	1173	88018	12.04	0.93	6.2
n-nonane	1209	210681	12.38	0.96	14.9
ethyl-methyl-cyclohexene isomer	1223	100131	12.51	0.97	7.1
C9 diene/cycloalkene + alkene/cycloalkane	1255	146891	12.82	0.99	10.4
C10 terpene	1281	435349	13.06	1.01	30.8
alpha-pinene	1300	1803779	13.25	1.02	127.6
C10 alkene/cycloalkane	1314	138732	13.38	1.03	9.8
2-methyl-4,5-nonadiene	1325	107039	13.48	1.04	7.6
camphene	1334	426066	13.57	1.05	30.1
C10 alkene/cycloalkane	1349	213261	13.71	1.06	15.1
C10 alkene/cycloalkane + C11 alkane	1362	265650	13.84	1.07	18.8
trimethyl-benzene isomer + C10 alkene/cycloalkane	1383	151498	14.04	1.08	10.7
C10 terpene	1399	675097	14.19	1.10	47.8
beta-pinene	1406	945140	14.26	1.10	66.9
C10 diene/cycloalkene + C10 alkene/cycloalkane	1421	118803	14.40	1.11	8.4
beta-myrcene	1438	213050	14.56	1.12	15.1
n-decane	1458	238947	14.75	1.14	16.9
C10 terpene	1471	388030	14.88	1.15	27.5
1-methyl-4-(1-methylethyl)-1,3-cyclohexadiene	1501	595515	15.16	1.17	42.1
2,6-dimethyl-nonane + alkene/cycloalkane + C4 alkylbenzene	1513	109568	15.28	1.18	7.8
C4 alkylbenzene	1520	387807	15.35	1.19	27.4
beta-phellandrene	1533	1330766	15.47	1.19	94.1
3,7-dimethyl-nonane + C11 alkene/cycloalkane + C10 terpene	1540	103893	15.54	1.20	7.4
3-carene + C11 alkene/cycloalkane	1547	123980	15.60	1.20	8.8
C10 terpene + C4 alkylbenzene	1601	747170	16.12	1.24	52.9
1-methyl-4-(1-methylethlidene)-cyclohexene	1667	411296	16.75	1.29	29.1

Key to Comments:

* - Below 1.3 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

SUMMA CANISTER ANALYSIS BY GC/MS

SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 11111SG CAN #37
SAMPLE VOLUME (ml)	: 650.00	LOCATION	: #84
QUANTITATION CONCENTRATION (PPB)	: 1030	FRN	: 87570
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/27/93
QUANTITATION SCAN, AREA and RT	: 1263 181984 12.89	DATE ANALYZED	: 06/24/93

Chemical Name	Scan	Area	RT	RRT	ppb	
fluorotrimethyl-silane	69	38272	1.55	0.12	3.3	
acetone	143	467813	2.25	0.17	40.7	
1,1,2-trifluoro-1,2,2-trifluoro-ethane	188	57748	2.68	0.21	5.0	
1,2-dichloroethane + alkene	307	15317	3.81	0.30	1.3	*
3-methyl-2-butanone	373	15499	4.44	0.34	1.3	*
cis-1,2-dichloroethene	396	3036702	4.65	0.36	264.4	
cis-1,2-dichloroethene	398	1551951	4.67	0.36	135.1	
cis-1,2-dichloroethene	403	86233	4.72	0.37	7.5	
unknown	801	1109119	8.50	0.66	96.6	
unknown	804	24879	8.53	0.66	2.2	
alkene/cycloalkane	1032	12679	10.69	0.83	1.1	*
cis-1-ethyl-2-methyl-cyclohexane	1217	12914	12.45	0.97	1.1	*
C9 diene/cycloalkene + C9 alkene/cycloalkane	1250	14240	12.76	0.99	1.2	*
alpha-pinene	1289	394887	13.14	1.02	34.4	
alkene/cycloalkane + C10 terpene	1306	22919	13.30	1.03	2.0	
camphene	1326	33984	13.49	1.05	3.0	
C10 alkene/cycloalkane	1354	53512	13.75	1.07	4.7	
C10 alkene/cycloalkane	1385	21349	14.05	1.09	1.9	
beta-pinene	1396	184070	14.15	1.10	16.0	
alkene/cycloalkane	1462	13725	14.78	1.15	1.2	*
alkane	1506	35125	15.20	1.18	3.1	
C4 alkyl benzene	1510	22346	15.24	1.18	1.9	
limonene + C4 alkylbenzene	1521	193611	15.34	1.19	16.9	
alkane	1532	85940	15.45	1.20	7.5	
alkane	1542	16494	15.54	1.21	1.4	*
alkane	1578	59047	15.89	1.23	5.1	
trans-decahydro-naphthalene + alkane	1583	17290	15.93	1.24	1.5	*
alkane	1598	19948	16.08	1.25	1.7	
alkene/cycloalkane + alkane	1627	28644	16.35	1.27	2.5	
1,7,7-trimethyl-bicyclo[2.2.1]heptan-2-one	1790	21996	17.90	1.39	1.9	

Key to Comments:

* - Below 1.5 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

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SUMMA CANISTER ANALYSIS BY GC/MS

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SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 11111SG CAN #37
SAMPLE VOLUME (ml)	: 650.00	LOCATION	: #84 REP
QUANTITATION CONCENTRATION (PPB)	: 1030	FRN	: 87571
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/27/93
QUANTITATION SCAN, AREA and RT	: 1268 181984 12.93	DATE ANALYZED	: 06/24/93

Chemical Name	Scan	Area	RT	RRT	ppb	
fluorotrimethyl-silane	66	47061	1.52	0.12	4.1	
acetone	145	410860	2.27	0.18	35.8	
1,1,2-trichloro-1,2,2-trifluoro-ethane	186	78808	2.66	0.21	6.9	
n-hexane	357	13547	4.28	0.33	1.2	*
alkane	375	13085	4.45	0.34	1.1	*
cis-1,2-dichloroethene	392	5134120	4.62	0.36	447.1	
cis-1,2-dichloroethene	396	107892	4.65	0.36	9.4	
alkane	612	12044	6.70	0.52	1.0	*
unknown	804	1080478	8.53	0.66	94.1	
alkene/cycloalkane	1035	14173	10.72	0.83	1.2	*
ethyl-methyl-cyclohexane isomer	1222	10235	12.50	0.97	0.9	*
C9 alkene/cycloalkane + C9 diene/cycloalkene	1254	13499	12.80	0.99	1.2	*
alpha-pinene	1294	384499	13.18	1.02	33.5	
C11 alkene/cycloalkane	1311	19402	13.34	1.03	1.7	
camphene	1331	26531	13.53	1.05	2.3	
alkene/cycloalkane	1346	11318	13.68	1.06	1.0	*
alkene/cycloalkane	1359	47186	13.80	1.07	4.1	

Key to Comments:

* - Below 1.5 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

SUMMA CANISTER ANALYSIS BY GC/MS

SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 10700SG CAN #56
SAMPLE VOLUME (ml)	: 650.00	LOCATION	: #82
QUANTITATION CONCENTRATION (PPB):	1030	FRN	: 87572
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/27/93
QUANTITATION SCAN, AREA and RT	: 1267 181984 12.94	DATE ANALYZED	: 06/24/93

Chemical Name	Scan	Area	RT	RRT	ppb
acetone	135	90862	2.18	0.17	7.9
n-hexane	353	114454	4.25	0.33	10.0
2-methyl-hexane	553	98054	6.15	0.48	8.5
3-methyl-hexane	578	84501	6.38	0.49	7.4
alkane	609	112613	6.68	0.52	9.8
n-heptane	653	81468	7.10	0.55	7.1
methyl-cyclohexane	707	97214	7.61	0.59	8.5
C9 alkene/cycloalkane + C9 alkane	1037	177055	10.75	0.83	15.4
1,2,4-trimethyl-cyclohexane	1075	106835	11.11	0.86	9.3
2-methyl-octane	1117	128760	11.51	0.89	11.2
C9 alkene/cycloalkane	1135	175211	11.68	0.90	15.3
C9 alkene/cycloalkene	1150	94225	11.83	0.91	8.2
alkane + C10 alkene/cycloalkane	1168	125318	12.00	0.93	10.9
1-ethyl-4-methyl-cyclohexane	1173	110678	12.05	0.93	9.6
alkane	1200	84336	12.30	0.95	7.3
n-nonane	1208	206416	12.38	0.96	18.0
ethyl-methyl-cyclohexane isomer	1222	99142	12.51	0.97	8.6
C10 alkane	1247	91487	12.75	0.99	8.0
C10 alkane + C9 diene/cycloalkene	1253	127690	12.81	0.99	11.1
propyl-cyclohexane + alkane	1282	190105	13.08	1.01	16.6
C10 alkane	1293	168254	13.19	1.02	14.7
alkane + C10 alkene/cycloalkane	1312	184176	13.37	1.03	16.0
C10 diene/cycloalkene	1323	113964	13.47	1.04	9.9
camphene	1331	74720	13.55	1.05	6.5
C10 alkene/cycloalkane	1347	181997	13.70	1.06	15.8
C11 alkane	1360	555975	13.83	1.07	48.4
alkane + C10 alkene/cycloalkane	1390	145962	14.11	1.09	12.7
C10 alkene/cycloalkene + C10 diene/cycloalkene	1399	89949	14.20	1.10	7.8
alkane + alkene/cycloalkene	1434	74220	14.53	1.12	6.5
n-decane	1454	128234	14.72	1.14	11.2
alkane	1511	223244	15.27	1.18	19.4
alkane	1537	234093	15.51	1.20	20.4
C11 alkane + alkene/cycloalkane	1546	100663	15.60	1.21	8.8
alkane	1583	139220	15.95	1.23	12.1
alkane + alkene/cycloalkane	1603	74470	16.14	1.25	6.5
C11 alkene/cycloalkane + alkane	1632	83846	16.42	1.27	7.3

Key to Comments:

* - Below 1.5 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

SUMMA CANISTER ANALYSIS BY GC/MS

SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: METHOD BLANK
SAMPLE VOLUME (ml)	: 500.00 (a)	LOCATION	: SUMMA TRAIN BLANK
QUANTITATION CONCENTRATION (PPB):	1030	FRN	: 87574
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: N/A
QUANTITATION SCAN, AREA and RT	: 1269 170337 12.93	DATE ANALYZED	: 06/25/93

Chemical Name	Scan	Area	RT	RRT	ppb

Key to Comments:

* - Below 2.0 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

SUMMA CANISTER ANALYSIS BY GC/MS

SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	: 11121SG
SAMPLE VOLUME (ml)	: 650.00	LOCATION	: #70
QUANTITATION CONCENTRATION (PPB)	: 1030	FRN	: 87575
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	: 05/27/93
QUANTITATION SCAN, AREA and RT	: 1263 170337 12.90	DATE ANALYZED	: 06/25/93

Chemical Name	Scan	Area	RT	RRT	ppb
acetone	139	96137	2.22	0.17	8.9
2-methyl-pentane	275	78624	3.51	0.27	7.3
3-methyl-pentane	310	85155	3.84	0.30	7.9
n-hexane	361	192269	4.32	0.33	17.9
methyl-cyclopentane	434	97541	5.02	0.39	9.1
cyclohexane	529	173982	5.92	0.46	16.2
2-methyl-hexane	557	162637	6.18	0.48	15.1
3-methyl-hexane	582	133910	6.42	0.50	12.5
alkane	612	110812	6.70	0.52	10.3
n-heptane	655	113954	7.11	0.55	10.6
methyl-cyclohexane	710	178971	7.64	0.59	16.6
dimethyl-cyclohexane isomer	870	115004	9.16	0.71	10.7
2-methyl-octane	1112	92349	11.46	0.89	8.6
C9 alkene/cycloalkane + alkane	1133	142705	11.66	0.90	13.3
C9 alkene/cycloalkane + alkane	1146	110398	11.78	0.91	10.3
alkane	1164	129424	11.95	0.93	12.0
ethyl-methyl-cyclohexane isomer	1168	77298	11.99	0.93	7.2
alkane	1196	117711	12.26	0.95	11.0
n-nonane	1204	191210	12.33	0.96	17.8
ethyl-methyl-cyclohexane isomer	1218	79368	12.47	0.97	7.4
2,3,6-trimethyl-heptane	1243	117560	12.70	0.98	10.9
C9 diene/cycloalkene + alkane	1249	140044	12.76	0.99	13.0
propyl-cyclohexane	1278	122090	13.04	1.01	11.4
alpha-pinene + C10 alkane	1289	233267	13.14	1.02	21.7
C10 alkene/cycloalkane	1307	107295	13.31	1.03	10.0
camphene	1327	134647	13.51	1.05	12.5
C10 alkene/cycloalkane	1342	130958	13.65	1.06	12.2
C11 alkane	1356	573126	13.78	1.07	53.3
alkane	1386	183937	14.07	1.09	17.1
alkane + alkene/cycloalkane	1396	88115	14.16	1.10	8.2
alkane + alkene/cycloalkane	1406	81326	14.26	1.11	7.6
C10 diene/cycloalkane + C10 alkene/cycloalkane	1416	159461	14.35	1.11	14.8
alkane	1429	98047	14.48	1.12	9.1
n-decane	1450	102830	14.68	1.14	9.6
alkane	1507	137739	15.22	1.18	12.8
C10 diene/cycloalkane	1523	232942	15.37	1.19	21.7
alkane	1533	122958	15.47	1.20	11.4

Key to Comments:

* - Below 1.5 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

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SUMMA CANISTER ANALYSIS BY GC/MS

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SITE NAME	:	ROSE HILL LANDFILL	SAMPLE NUMBER	:	11156SC CAN #42
SAMPLE VOLUME (ml)	:	20.00	LOCATION	:	#42
QUANTITATION CONCENTRATION (PPB):		1030	FRN	:	87579
QUANTITAION VOLUME (ml)	:	10.00	DATE SAMPLED	:	05/27/93
QUANTITATION SCAN, AREA and RT	:	1270 170337 12.94	DATE ANALYZED	:	06/25/93

Chemical Name	Scan	Area	RT	RRT	ppb
argon + acetaldehyde	42	56732	1.31	0.10	171

Key to Comments:

* - Below 50 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

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SUMMA CANISTER ANALYSIS BY GC/MS

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SITE NAME	: ROSE HILL LANDFILL		SAMPLE NUMBER	: 11156SC	CAN #42
SAMPLE VOLUME (ml)	: 650.00		LOCATION	: #42	
QUANTITATION CONCENTRATION (PPB):	1030		FRN	: 87580	
QUANTITAION VOLUME (ml)	: 10.00		DATE SAMPLED	: 05/27/93	
QUANTITATION SCAN, AREA and RT	: 1266 170337 12.91		DATE ANALYZED	: 06/25/93	

Chemical Name	Scan	Area	RT	RRT	ppb
acetaldehyde + argon	41	56764	1.29	0.10	5.3
acetaldehyde	56	11603	1.43	0.11	1.1 *
2-methyl-butane	104	12600	1.89	0.15	1.2 *
n-pentane + C5 alkene/cycloalkane	135	17291	2.18	0.17	1.6
acetone	139	76025	2.22	0.17	7.1
1-fluoro-pentane	227	13027	3.05	0.24	1.2 *
2-methyl-pentane	272	20313	3.48	0.27	1.9
3-methyl-pentane	307	16818	3.81	0.30	1.6
n-hexane	357	20090	4.28	0.33	1.9
methyl-cyclopentane	430	14178	4.98	0.39	1.3 *
cyclohexane	526	17868	5.89	0.46	1.7
2-methyl-hexane	554	55503	6.15	0.48	5.2
3-methyl-hexane	578	54786	6.38	0.49	5.1
alkane	609	28263	6.67	0.52	2.6
n-heptane	653	36248	7.09	0.55	3.4
methyl-cyclohexane	708	23623	7.61	0.59	2.2
ethyl-cyclohexane	1025	11766	10.62	0.82	1.1 *
alkane + alkene/ctloalkane	1035	20291	10.72	0.83	1.9
trimethyl-cyclohexane isomer	1074	10883	11.09	0.86	1.0 *
alkane	1115	13998	11.48	0.89	1.3 *
n-nonane	1206	19270	12.34	0.96	1.8
ethyl-methyl-cyclohexane isomer	1221	10153	12.48	0.97	0.9 *
C9 alkene/cycloalkane + C9 diene/cycloalkane	1253	12285	12.79	0.99	1.1 *
propyl-cyclohexane + BFB	1281	15385	13.05	1.01	1.4 *
3,6-dimethyl-octane + BFB	1292	16450	13.16	1.02	1.5 *
alkane + alkene/cycloalkane	1310	14521	13.33	1.03	1.4 *
camphene	1330	19292	13.52	1.05	1.8
alkene/cycloalkane + diene/cycloalkene	1345	14720	13.66	1.06	1.4 *
C10 alkene/cycloalkane	1358	28469	13.78	1.07	2.6

Key to Comments:

* - Below 1.5 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

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SUMMA CANISTER ANALYSIS BY GC/MS

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SITE NAME	: ROSE HILL LANDFILL		SAMPLE NUMBER	: 11106SG	CAN #60
SAMPLE VOLUME (ml)	: 650.00		LOCATION	: #3	
QUANTITATION CONCENTRATION (PPB):	1030		FRN	: 87581	
QUANTITAION VOLUME (ml)	: 10.00		DATE SAMPLED	: 05/27/93	
QUANTITATION SCAN, AREA and RT	: 1267 170337 12.92		DATE ANALYZED	: 06/25/93	

Chemical Name	Scan	Area	RT	RRT	ppb
chlorofluoromethane + CO2 + argon	45	48813	1.33	0.10	4.5
acetone	139	73603	2.22	0.17	6.8
1,1,2-trichloro-1,2,2-trifluoro-ethane	188	117802	2.68	0.21	11.0
n-heptane	655	44007	7.11	0.55	4.1
methyl-cyclohexane	709	42173	7.62	0.59	3.9
2-methyl-heptane + toluene	845	51792	8.91	0.69	4.8
n-octane	942	114531	9.83	0.76	10.7
2,6-dimethyl-heptane + C9 alkene/cycloalkane	1021	44534	10.58	0.82	4.1
ethyl-cyclohexane	1027	62612	10.64	0.82	5.8
alkene/cycloalkane + alkane	1037	112134	10.74	0.83	10.4
1,2,4-trimethyl-cyclohexane	1076	47885	11.11	0.86	4.5
2-methyl-octane	1117	117619	11.50	0.89	10.9
C9 alkane	1135	76128	11.67	0.90	7.1
C9 alkene/cycloalkane	1168	45534	11.98	0.93	4.2
1-ethyl-4-methyl-cyclohexane	1172	58050	12.02	0.93	5.4
n-nonane	1208	195567	12.36	0.96	18.2
ethyl-methyl-cyclohexane isomer	1222	45697	12.50	0.97	4.3
C10 alkane + diene/cycloalkene	1253	71574	12.79	0.99	6.7
C9 alkene/cycloalkane	1282	108116	13.07	1.01	10.1
C10 alkane	1293	102887	13.17	1.02	9.6
C10 alkane/cycloalkane	1311	74026	13.34	1.03	6.9
C10 diene/cyloalkene + alkene/cycloalkane	1323	38046	13.46	1.04	3.5
camphene	1331	39526	13.53	1.05	3.7
C10 alkene/cycloalkane	1346	101870	13.68	1.06	9.5
C11 alkane	1359	198971	13.80	1.07	18.5
2-methyl-nonane	1368	40752	13.89	1.08	3.8
C10 alkane + C10 diene/cycloalkane	1384	38493	14.04	1.09	3.6
C10 alkene/cycloalkane	1390	37690	14.09	1.09	3.5
C10 alkene/cycloalkane	1396	58328	14.15	1.10	5.4
methyl-propyl-cyclohexane isomer	1414	59692	14.32	1.11	5.6
n-decane	1454	109834	14.70	1.14	10.2
dichlorobenzene isomer	1485	46857	15.00	1.16	4.4
alkane	1510	90269	15.24	1.18	8.4
alkane	1537	66201	15.49	1.20	6.2
alkene/cycloalkane + alkane	1546	45523	15.58	1.21	4.2
alkane	1582	37921	15.92	1.23	3.5

Key to Comments:

* - Below 1.5 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

NON - TARGET COMPOUNDS

SUMMA CANISTER ANALYSIS BY GC/MS

SITE NAME	: ROSE HILL LANDFILL	SAMPLE NUMBER	:	09088SG	CAN #74
SAMPLE VOLUME (ml)	: 650.00	LOCATION	:	#28	
QUANTITATION CONCENTRATION (PPB):	1030	FRN	:	87582	
QUANTITAION VOLUME (ml)	: 10.00	DATE SAMPLED	:	05/27/93	
QUANTITATION SCAN, AREA and RT	: 1269 170337 12.93	DATE ANALYZED	:	06/25/93	

Chemical Name	Scan	Area	RT	RRT	ppb
acetone	137	70917	2.19	0.17	6.6
3-methyl-pentane	306	17651	3.79	0.29	1.6
n-hexane	357	23978	4.27	0.33	2.2
methyl-cyclopentane	430	26598	4.97	0.38	2.5
cyclohexane	527	28152	5.89	0.46	2.6
alkane	555	42485	6.15	0.48	4.0
3-methyl-hexane	580	33685	6.39	0.49	3.1
alkane	611	38956	6.68	0.52	3.6
methyl-cyclohexane	710	27043	7.62	0.59	2.5
alkene/cycloalkane	1037	31165	10.73	0.83	2.9
1,3,5-trimethyl-cyclohexane	1076	20512	11.10	0.86	1.9
alkane + C9 alkene/cycloalkane	1151	21011	11.81	0.91	2.0
alkane	1169	26207	11.98	0.93	2.4
alkane	1201	16894	12.28	0.95	1.6
n-nonane	1209	20457	12.36	0.96	1.9
cis-1-ethyl-2-methyl-cyclohexane	1224	22787	12.50	0.97	2.1
alkane	1249	17596	12.74	0.99	1.6
C9 diene/cycloalkene + C9 alkene/cycloalkane	1255	40559	12.80	0.99	3.8
C9 alkene/cycloalkane + BFB	1283	53197	13.06	1.01	4.9
C10 alkane	1295	40297	13.18	1.02	3.7
alkane + C10 alkene/cycloalkane	1313	52661	13.35	1.03	4.9
C10 diene/cycloalkene + C10 alkene/cycloalkane	1324	25078	13.45	1.04	2.3
C10 alkene/cycloalkane	1348	54849	13.68	1.06	5.1
alkane + C10 alkene/cycloalkane	1361	131389	13.81	1.07	12.2
C10 alkene/cycloalkane	1391	41211	14.09	1.09	3.8
C10 alkene/cycloalkane	1398	26888	14.16	1.10	2.5
C10 alkene/cycloalkane	1415	30505	14.32	1.11	2.8
alkane + C10 alkene/cycloalkane	1435	20655	14.51	1.12	1.9
C10 alkane + C10 alkene/cycloalkane	1456	22780	14.71	1.14	2.1
alkane	1512	67163	15.24	1.18	6.2
alkane	1538	76587	15.49	1.20	7.1
alkane	1548	29781	15.58	1.20	2.8
alkane	1584	56877	15.93	1.23	5.3
C11 alkene/cycloalkane + C10 diene/cycloalkene	1590	33719	15.98	1.24	3.1
alkane + alkene/cycloalkane	1605	31699	16.13	1.25	2.9
alkane	1634	36377	16.40	1.27	3.4

Key to Comments:

* - Below 1.5 ppb limit of quantitation.

(a) - Assumed volume for blank quantitation.

N/A - Not Applicable.

position.

- Set mode switch to comp. position.
- Adjust meter to zero using coarse and fine comp. controls.
- Check phasing, set mode switch to phase position.
- Note meter reading.
- Rotate coarse control to original position. No further adjustments are needed.
- If there is a difference in meter readings, an adjustment is needed.
- Put coarse control in original position.
- Rotate phase potentiometer 1/4 turn clockwise and note meter reading.
- Rotate coarse control one step clockwise and note meter reading.
- If meter reading does not change, no further adjustment is needed. Return coarse control to original position.
- If meter reading changes - repeat above adjustments until meter reading remains the same when coarse control is rotated one step clockwise.
- Meter should read between 75 - 85 percent of full scale (in Black Mark).
- Return coarse control to original position.
- EM-31 is ready for operation!

Note: When calibrating the EM-31 over ground with higher conductivity than 30 millimhos/meter, the range switch should be set at the appropriate range level.

7.10.4.1.2 <u>EM-31 Operating Procedure - Measuring Soil Conductivity</u>

- Adjust the shoulder strap so that the instrument rests comfortably on the hip.

- Switch the mode switch to OPER position and rotate range switch so that meter reads in upper 2/3 of the scale.

- EM-31 can be operated continuously while moving from one measuring station to the other or the EM-31 can be turned off while walking from station to station and then turned on when taking a reading. The latter saves battery life.

- Dismantle EM-31 and clean before storage.

7.10.4.1.3 EM-31 Operating Procedure - Buried Metal Detection

- Set the mode switch to the COMP position.

- Set the range switch to 30 millimhos/meter.

- Adjust the COARSE and FINE compensation controls so that a meter deflection of about 20 percent of full scale is obtained.

- Operate the EM-31 while continuously moving to determine the exact location of the buried objects.

- Dismantle EM-31 and clean before storage.

7.10.4.2 Unimag II Portable Proton Magnetometer Model G-846

7.10.4.2.1 Calibration and Operating Procedure

The Unimag II is completely self-contained and ready for field operation. A few simple procedures should be observed to obtain optimum results.

- Check the sensor for sensor fluid: Shake the instrument gently and listen for a "sloshing" sound. If the fluid is not present or cannot be heard, it will be necessary to fill the sensor with strained kerosene or unleaded gasoline. This procedure is outlined in the operator's manual furnished with the instrument.

- Check the battery: Simply depress the black push bottom and observe the readout. If the readout flashes on/off during the display period, the battery is not fully charged. Refer to the operators manual for battery

recharging instructions.

- Lift the Unimag II out of the carrying case and adjust the shoulder strap for a comfortable fit.

- Adjust the "tuning-kilograms" knob to a position that correlates with the earth's magnetic field. The earth's field can be estimated by referring to the world intensity map located in front of the operators manual.

- Depress the black button on top of the instrument and release. The center digit on the readout will, briefly flash. This indicates that the cycle has started. It will take two seconds for the display to illuminate and give the earth's magnetic field in gammas.

- When operating, hold the Unimag II waist high. When depressing black button for reading, hold instrument as still as possible.

- The instrument should exhibit one count stability. If one count stability is not possible, a ferromagnetic object is present or a steep magnetic gradient is being encountered. Verify the one count stability by repeating the measurement with the instrument held in the same position.

  Note: If the earth's magnetic field is 40,000 gammas or less (low magnetic latitudes-equator area), the sensor should be rotated 90°. See operator's manual for the correct procedure. The sensor rotation is not necessary in Region IV. If problems arise with the instrument, refer to the operator's manual.

- Do not operate the Unimag II in buildings, near high energy sources (powerlines, etc.), or directly on the ground. Hold instrument waist high. Do not wear magnetic objects such as jewelry, keys, watches, zippers, pocket knives, belt buckles, etc.

- Become familiar with the instrument and it's operation before attempting a field survey.

7.10.4.3 <u>Metal Detector - The Tracer Metallic Pipe & Liner Locator</u>

APPENDIX F
PAL 8-Hour Model Output
Air Quality Modeling Final Report
Rose Hill Regional Landfill
August 1993

...\HARVEY\MT-0109G.RPT

The information provided by the models may be found in the accompanying diskette. Those files that were used to determine the 8-hour concentrations are labled for each of the three sampling periods. Below is a listing of the files and the corresponding times for which they represent.

V8-1.LST	=	Vinyl Chloride for the period ending 2300 05/24/93
V8-2.LST	=	Vinyl Chloride for the period ending 2000 05/26/93
V8-3.LST	=	Vinyl Chloride for the period ending 1400 05/27/93
B8-1.LST	=	Benzene for the period ending 2300 05/24/93
B8-2.LST	=	Benzene for the period ending 2000 05/26/93
B8-3.LST	=	Benzene for the period ending 1400 05/27/93

APPENDIX G
PAL 24-Hour Model Output
Air Quality Modeling Final Report
Rose Hill Regional Landfill
August 1993

The information provided by the models may be found in the accompanying diskette. Those files that were used to determine the 24-hour concentrations are labled for each of the three sampling periods. Below is a listing of the files and the corresponding times for which they represent.

V24-1.LST	=	Vinyl Chloride for the period ending 1500 05/25/93
V24-2.LST	=	Vinyl Chloride for the period ending 1700 05/26/93
V24-3.LST	=	Vinyl Chloride for the period ending 1800 05/27/93
B24-1.LST	=	Benzene for the period ending 1500 05/25/93
B24-2.LST	=	Benzene for the period ending 1700 05/26/93
B24-3.LST	=	Benzene for the period ending 1800 05/27/93

APPENDIX H
PAL Maximum 1-Hour Model Output
Air Quality Modeling Final Report
Rose Hill Regional Landfill
August 1993

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The information provided by the models may be found in the accompanying diskettes. The maximum (worst-case) 1-hour output files which were used to determine the annual average concentrations are labled below.

V365W.LST	=	Maximum 1-hour concentrations of vinyl chloride for the 12 receptors
V365WG.LST	=	Maximum 1-hour concentrations of vinyl chloride for grid-point receptors
B365W.LST	=	Maximum 1-hour concentrations of benzene for the 12 receptors
B365WG.LST	=	Maximum 1-hour concentrations of benzene for grid-point receptors