POST-CLOSURE SITE MONITORING REPORT

LANDFILL AND RESOURCE RECOVERY SUPERFUND SITE
NORTH SMITHFIELD, RHODE ISLAND

Prepared on Behalf of:

LANDFILL AND RESOURCE RECOVERY SITE GROUP

Prepared by:

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DECEMBER 2000

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December 11, 2000

Ms. Anna Krasko
US EPA
Mail Code: HBO
One Congress Street
Boston, MA 02114

RE: Transmittal of December 2000 Post-Closure Site Monitoring Report
L & RR Superfund Site, North Smithfield, Rhode Island

Dear Ms. Krasko:

Attached is one copy of the Post-Closure Site Monitoring Report for December 2000. This report includes the results from the July 2000 groundwater sampling event. The disk containing the groundwater quality data in Excel-compatible format will be forwarded under separate cover.

Please do not hesitate to call me at (908)735-9315 should you have any questions.

Sincerely,
de maximis, inc.

Melissa Williams for
John P. McBurney
Project Coordinator

DFG/mw

cc: D. Moreira - Waste Management, Inc. (w/o disk)
D. Peters - Metcalf & Eddy (w/o disk)
M. DiStefano, RIDEM (w/o disk)
T. Helgason - ***de maximis, inc.*** (w/o disk)

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1.0 INTRODUCTION

This Post-Closure Site Monitoring Report documents the Post-Closure Operation and Maintenance activities performed at the Landfill and Resource Recovery (L&RR) Superfund site from February 2000 through November 2000. During this period, ***de maximis, inc.*** coordinated all post-closure site monitoring and maintenance activities. Activities performed during the referenced period were conducted in accordance with the *Post-Closure Operation and Maintenance Plan*; ***de maximis, inc.***; September 1996 ("Plan").

Groundwater and surface water sampling was performed April 4 through 7, 2000. The groundwater samples collected during the April groundwater sampling event were rejected due to the fact the field indicator parameters had not stabilized before the groundwater samples were collected. The groundwater sampling event was repeated from July 13 through 15, 2000. Sampling parameters for groundwater and surface water are presented in **Table 1** of this report.

Ambient air samples were collected June 8 and 9, 2000 from four locations at the landfill perimeter for TO-14 analysis. On August 14, 2000, a four hour composite sample was collected of the flare inlet gas using Method 18 sampling protocols and TO-14 analysis. Data from all the sampling programs conducted during the referenced period are presented in this report.

This report has been prepared in accordance with the requirements of the Consent Decree and Remedial Design/Remedial Action Statement of Work. This report addresses those requirements as indicated below:

POST-CLOSURE SITE MONITORING REPORT REQUIREMENTS, SPECIFIED IN THE CONSENT DECREE AND RD/RA STATEMENT OF WORK	**SECTION OF THIS REPORT WHERE THE REQUIREMENT IS ADDRESSED**
a. map of the Site showing sample locations	Figure 1 Sample Location Plan
b. tabular representation of laboratory results by each media including comparison with any standard levels, with exceedances of maximum contaminant levels (MCLs) and other performance standards highlighted	5.0 Groundwater Monitoring 6.0 Surface Water Monitoring

POST-CLOSURE SITE MONITORING REPORT REQUIREMENTS, SPECIFIED IN THE CONSENT DECREE AND RD/RA STATEMENT OF WORK (Cont'd)		SECTION OF THIS REPORT WHERE THE REQUIREMENT IS ADDRESSED (Cont'd)	
c.	laboratory results on a computer disc in a spreadsheet file such as Lotus 1-2-3 or D-Base	5.0	Groundwater Monitoring
d.	data validation packages	4.0	Data Validation
e.	results of statistical analysis of data	8.0	Statistical Analysis
f.	interpretation of any trends	5.0	Groundwater Monitoring
g.	inspection reports	2.0	Landfill Inspection and Maintenance
h.	description of maintenance activities completed	2.0	Landfill Inspection and Maintenance
i.	explanation of problems encountered in the field and measures taken to mitigate the problems	7.0	Problems Encountered
j.	activities planned for the next reporting period	9.0	Activities Planned for Next Reporting Period

2.0 LANDFILL INSPECTION AND MAINTENANCE

The landfill cover, drainage structures, gas system and groundwater monitoring wells were inspected monthly, with the results provided, on a monthly basis, to EPA and RIDEM. Overall, the components are in good condition. The following maintenance measures were performed:

- A timer was installed on the condensate pump to the injection system on February 7, 2000.
- The vegetative areas of the landfill cover were treated with slow-release fertilizer and grub control on May 25, 2000.
- Four small burrow holes, near gas wells 6 and 8, were filled in on March 3, 2000.
- Three small areas of sloughing were repaired on May 25, 2000
- The flexhose on gas well 7, which became hyperextended, was replaced on June 1, 2000.
- The flexhose on well 13 was removed and reconnected to avoid crimping on June 1, 2000.

- A louvre control switch on the flare was replaced the week of August 28, 2000.
- Monitoring wells MW-102A; MW-104A; and CW-6B were redeveloped on October 19 and 20, 2000.
- The flexhoses on wells 12, 14, and 18 were adjusted to avoid crimping and hyperextension on October 20, 2000.
- The landfill cover was mowed on November 9, 2000.

Copies of the landfill inspection reports are in **Appendix A.**

The annual settlement monument elevation survey was performed on October 31, 2000. Incremental settlement from the last settlement survey event (November, 1999), as well as total settlement are presented in the following table:

Settlement Monitoring Data

Settlement Monument	Elevation (ft.) Following Installation*	Elevation (ft.) November, 1999	Elevation (ft.) October, 2000	Incremental Settlement (ft.) From November, 1999 to October, 2000	Total Settlement (ft.) From Date of Installation
SM-1	311.96	309.55	309.58	+0.03	2.38
SM-2	298.42	297.67	297.78	+0.11	0.64
SM-3	329.29	326.32	326.56	+0.24	2.73
SM-4	306.05	304.82	305.30	+0.48	0.75
SM-5	287.25	287.26	287.81	+0.55	+0.56
SM-6	321.86	320.70	321.00	+0.30	0.86
SM-7	300.76	299.97	299.62	0.35	1.14
SM-8	365.33	361.09	360.70	0.39	4.63
SM-9	354.67	350.67	349.94	0.73	4.73
SM-10	357.29	355.59	355.35	0.24	1.94
SM-11	321.83	321.39	321.35	0.04	0.48
SM-12	321.07	320.56	319.53	1.03	1.54
SM-13**	361.03	359.67	No pipe	Not available	Not available
SM-14**	360.20	358.54	No pipe	Not available	Not available

*All settlement monuments were installed in December, 1994 except for SM-13 and SM-14, which were installed on August 15, 1997.

**Settlement monuments SM-13 and SM-14 were inadvertently knocked over during a maintenance event and will be replaced and resurveyed.

3.0 LANDFILL GAS WELL AND PROBE MONITORING

The landfill gas extraction wells and methane migration probes were monitored periodically from February through November 2000. During this period, the results of the monitoring were provided on a monthly basis to EPA and RIDEM. Overall, the system continues to operate under negative pressure while controlling methane migration. Methane migration data appear below:

Date	Methane Content (%)		
	Probe GP-1	Probe GP-4	Probe GP-8
2/15/00	0.0	0.0	0.0
3/16/00	0.0	0.0	0.0
4/18/00	0.0	0.0	0.0
5/25/00	0.0	0.0	0.0
6/8/00	0.0	0.0	0.0
7/24/00	0.1	0.3	0.0
8/14/00	1.4	5.6	0.0
9/21/00	0.8	0.9	0.0
10/19/00	23.3	17.4	0.0
11/16/00	5.3	1.4	0.0

There were occasions where the methane level in a particular probe temporarily exceeded the action level of 1.25%. This was primarily due to a temporary flare shutdown or a gas well becoming temporarily inoperative due to a hyper-extended or crimped flex hose. In each case, the methane levels returned to lower levels in a few weeks following flare re-start or adjustment/replacement of the well flexhose. The methane levels in the probes will continue to be monitored on a monthly basis.

Gas well monitoring data is in **Appendix B.**

The condensate injection system, installed in December 1998, continued to treat about 1000 gallons of condensate every six to seven days.

On February 7, 2000, a timer was installed on the condensate pump to the injection system. That timer, set for a 10-hour injection cycle, effectively replaces the low level float switch in the condensate tank. An inspection of the flare was also made at that time, and the system was functioning properly. On August 4, 1999, the semi-annual flare inspection was performed by a representative of John Zink Co., the manufacturer of the flare. The results of that inspection indicate that the flare is in good condition and continues to

function properly. On August 28, 2000, a louvre control switch was replaced on the flare. Flare inspection reports and maintenance documentation is in **Appendix B**.

4.0 DATA VALIDATION

Analytical data for groundwater and surface water presented in this report were validated by Trillium, Inc. of Knoxville, Tennessee using the most current revision of the EPA Region I *Laboratory Data Validation Functional Guidelines for Evaluating Organics and Inorganic Analysis* (December 1996) as appropriate for each analysis. For analyses which do not have specific recommended guidelines for data review, results were evaluated based on the supporting data submitted with the data packages and on the professional judgement of the validator. Data qualifier codes by sample matrix applied by the Data Validator are presented in **Table 2.**

Analytical data for the Quality Assurance / Quality Control (QA/QC) samples were submitted as part of the analytical data package provided to Trillium, Inc. for data validation. The complete data validation reports are included in **Appendix C** (original field samples), **Appendix D** (split sample) and **Appendix E** (surface water samples).

5.0 GROUNDWATER MONITORING

Groundwater samples were collected on July 13 through15, 2000, in accordance with the Plan. Prior to sample collection, groundwater elevations were measured at the monitoring wells. The water level monitoring data are presented in **Table 3**. **Figure 1** presents a groundwater sampling location plan.

Samples were collected from the seven monitoring wells in the groundwater monitoring network (MW-201, MW-202, MW-102A, MW-103A, MW-104A, CW-5B and CW-7A). The samples, along with the required QA/QC samples, were submitted to Severn Trent Laboratories (STL), formerly IEA Laboratories, in Monroe, Connecticut, for analysis. The specific parameters for groundwater samples and analytical methods are presented in **Table 1.**

5.1 Sample Collection

The monitoring wells were purged and sampled using the *EPA Region I Low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells*, Revision 2. Purging and sampling of the monitoring wells was performed using dedicated, nitrogen-driven bladder pumps.

Field measurements (eH, pH, temperature, dissolved oxygen, turbidity and specific conductance) were collected using a YSI Model 6920 Closed Cell Water Quality Monitoring System as purging progressed. The field data collected during purging are presented in **Table 4**. The final reading for each location in **Table 4** is the reading collected immediately before sample collection.

Groundwater samples were shipped each day via Federal Express next day delivery to STL of Monroe, Connecticut, for analysis. A split sample from a single location (MW-104A) was provided to CompuChem Environmental Corporation (Compuchem) of Durham, North Carolina for the same suite of parameters as the original sample.

5.2 Quality Control Samples

All groundwater QA/QC samples for analysis, matrix spike and matrix spike duplicate analysis were collected from monitoring well CW-5B. A duplicate sample was collected from monitoring location MW-102A. A split sample was collected during the sampling event from monitoring location MW-104A for analysis of the same suite of parameters as the original sample. The split sample was shipped via overnight express mail to Compuchem. Trip blanks accompanied sample containers during shipment and were submitted for volatile organic analysis.

5.3 Groundwater Analytical Results

Analytical data packages provided by STL were submitted to Trillium, Inc. of Knoxville, Tennessee for validation. Data validation reports of the STL analyses for the July 2000 sampling event for groundwater are included in **Appendix C** of this report. Data qualifier code definitions are presented in **Table 2** and in the Attachments to each data validation report.

A summary of the validated groundwater analytical data for the July 2000, and previous sampling events under the Plan are presented in **Table 5**.

5.4 Split Sample Comparability Results

In accordance with the Plan, a split sample from monitoring location MW-104A was analyzed by the primary laboratory, STL, and by a secondary laboratory, Compuchem. The data from the primary and secondary laboratories were evaluated for comparability using the procedure outlined in the Plan. **Table 6** provides a comparison of the analytical results from both laboratories.

The data for all the analytes except for five are considered comparable using the criteria considered in the Plan. The five analytes for which the data are not considered comparable are: m, p xylene, Styrene, total lead, ammonia, and COD. The following presents potential causes for the non-comparable results.

5.4.1 m, p -xylene

The analytical data from Severn Trent Laboratories (STL) and Compuchem Laboratories both detected the compound, however, the Relative percent Difference (RPD) was 91.7 %. STL's higher concentration was qualified as "estimated" due to unacceptably high blank spike recoveries that may have result in a biased high result, therefore resulting in a high RPD.

5.4.2 Styrene

The result reported for styrene by STL was greater than twice the reporting limit of the non-detected result reported by Compuchem. The reported result for styrene by STL is very near the reporting limit. The detected estimated concentration of 2.1 μg/L (from STL) is greater than two-times (2x) the nondetected result's reporting limit of 0.5 μg/L.

5.4.3 Total Lead

The reported concentrations of lead for both laboratories were estimated to be near the detection limits. The 91.6 % RPD between the reported results was outside the comparability criteria.

5.4.4 Ammonia and COD

The reported concentrations of ammonia and COD were outside the comparability criteria. The criteria for comparability is 30 %. Ammonia was calculated at 35.4 % RPD and COD was calculated at 60.4% RPD and therefore the results are not considered comparable.

6.0 SURFACE WATER MONITORING

Surface water samples were collected on April 7, 2000 from six surface water monitoring locations. Samples were not collected at locations LCH-2 or LCH-3, as those locations were dry.

Surface water samples were submitted to STL for analysis. Data from the surface water samples are presented in **Table 7**. Data validation reports for the surface water samples are presented in **Appendix E.**

7.0 PROBLEMS ENCOUNTERED

Groundwater samples collected during the April 2000 sampling event were rejected. After reviewing the field data, it was noted that at four wells, several field indicator parameters collected during the purging process had not stabilized as required by Low Flow sampling protocols. Therefore, a second groundwater sampling event was conducted during July 2000.

Except for a problem with the dissolved oxygen display at well MW-104A, no problems were encountered during the July sampling event. During the sampling of well MW-104A, the dissolved oxygen display on the YSI Model 6920 exhibited erratic behavior, the cause of which could not be readily determined at the time of sampling. Because all other parameters had stabilized, the sample was collected, recognizing the erratic dissolved oxygen reading.

8.0 STATISTICAL ANALYSIS

The DUMPSTAT statistical analysis, incorporating all of the groundwater quality data from October 1996 through October 1999, was submitted in February 2000. The next statistical analysis report will be submitted during the first quarter of the year 2001. That report will include the analysis of groundwater quality data from October 1996 through November 2000.

9.0 ACTIVITIES PLANNED FOR NEXT REPORTING PERIOD

The next reporting period will include the following activities from November 2000 through March 2001:

Activity	Schedule
Landfill inspection	Quarterly
Gas Treatment System operation	Continuous
Extraction System monitoring	Monthly
Methane migration monitoring	Monthly
Semi-annual Groundwater Monitoring	November 2000

Tables

TABLE 1
POST-CLOSURE MONITORING/SAMPLING

SAMPLING MEDIUM	PARAMETER AND METHOD	
GROUNDWATER	VOCs Arsenic (Total) Arsenic (Dissolved) Lead (Total) Lead (Dissolved) Chloride Iron Ammonia COD BOD	8260B 7060A 7060A 7421 7421 352(.1, .2, .3) 6010B 350.2 410 (.1, .2) 405.1
FIELD PARAMETERS for Surfacewater & Groundwater	eH pH DO Specific Conductance	
SURFACE WATER	VOCs Arsenic (Total) Arsenic (Dissolved) Chloride	8260B 7060A 7060A 325(.1, .2, .3)
AMBIENT AIR/FLARE INLET	VOCs	TO-14
FLARE INLET	VOCs	Method 18/TO-14

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TABLE 2
DATA QUALIFIER DEFINITIONS BY MATRIX

GROUNDWATER AND SURFACE WATER

Volatile Organics in Groundwater and Surface Waters
STL Job Nos. 7000-1470A

EPA Region I Qualifier Definitions:

U - The material was analyzed for, but was not detected. The associated numerical value is the sample quantitation limit. The sample quantitation limit accounts for the sample-specific dilution factors and percent solids corrections or sample sizes that deviate from those required by the method.

J - The associated numerical value is an estimated quantity.

R - The data are unusable (analyte may or may not be present). Resampling and reanalysis is necessary for verification. The R replaces the numerical value or sample quantitation limit.

UJ - The material was analyzed for, but was not detected. The sample quantitation limit is an estimated quantity.

TOTAL AND DISSOLVED METALS IN GROUNDWATER AND SURFACE WATERS

STL Case No. 1470A, Lot No. 9A08G369; Lot No 9A04G680

EPA Region I Qualifier Definitions:

U - The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

J - The associated value is an estimated quantity.

R - The data are unusable (Note: Analyte may or may not be present).

UJ - The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

AMMONIA, CHLORIDE, BOD AND COD IN GROUNDWATER AND SURFACE WATERS

STL Laboratory Case No. 1470A;; Lot No 9A04G680

EPA Region I Qualifier Definitions:

U - The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

J - The associated numerical value is an estimated quantity.

R - The data are unusable (Note: Analyte may or may not be present).

UJ - The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

TABLE 2 Continued
DATA QUALIFIER DEFINITIONS BY MATRIX

GROUNDWATER
Compuchem Laboratories
Laboratory Case No. Q1458, SDG R1458
Volatile Organics in Groundwater

EPA Region I Qualifier Definitions:

U - The material was analyzed for, but was not detected. The associated numerical value is the sample quantitation limit. The sample quantitiation limit accounts for the sample-specific dilution factors and percent solids corrections or sample sizes that deviate from those required by the method.

J - The associated numerical value is an estimated quantity.

R - The data are unusable (compound may or may not be present). Resampling and reanalysis is necessary for verification. The R replaces the numerical value or the sample quantitation limit.

UJ - The material was analyzed for, but was not detected. The sample quantitation limit is an estimated quantity.

TOTAL AND DISSOLVED METALS IN GROUNDWATER
Compuchem Laboratories
Laboratory Case No. Q1458, SDG R1458 and S1458
Inorganic Analysis in Groundwater

EPA Region I Qualifier Definitions:

U - The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

J - The associated numerical value is an estimated quantity.

R - The data are unusable (Note: Analyte may or may not be present).

UJ - The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise

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CHLORIDE, BOD, COD AND AMMONIA IN GROUNDWATER
Compuchem Laboratories
Wet Chemistry In Groundwater
Laboratory Case No. r1458; Test America Project No. 200001

EPA Region I Qualifier Definitions:

U - The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

J - The associated numerical value is an estimated quantity.

R - The data are unusable (Note: Analyte may or may not be present).

UJ - The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

TABLE 3: WATER LEVEL MONITORING DATA, L&RR SUPERFUND SITE, JULY 11, 2000

Monitoring Location		Top of Casing Elevation (ftamsl)	Ground Surface Elevation (ftamsl)	Pump Intake Depth (fbtoc)	Total Depth ** (fbtoc)	Screened Interval (fbtoc)	Water Level (fbtoc)	Water Elevation (ftamsl)
MW -101		329.07	326.40	78	82.60	74.2 - 79.5	74.54	254.53
MW - 102A		258.03	255.90	69	78.12	62.7 - 73.3	11.45	246.58
MW - 102B	*	253.74	251.10	35	42.05	28.9 - 39.4	7.41	246.33
MW - 103A		268.48	265.48	54	63.11	39.2 - 55.1	16.23	252 25
MW - 103B	*	268.57	265.50	20	30 06	12 0 - 21.8	16.08	252.49
MW - 104A		263.54	260.54	52	55.63	43.5 - 54.0	16.46	247.08
MW - 104B	*	263.77	260.77	22	25.72	14.5 - 24.0	12.51	251.26
CW - 5A		304.31	302.00	134	136.11	125.0 - 135.0	54 05	250.26
CW - 5B	*	303.92	302.00	98	103.53	92.0 - 102.0	54.43	249.49
CW - 5C		303.98	302.40	62	69.41	48.5 - 68.5	53.45	250.53
CW - 6A		264 06	262.30	89	93.53	82.0 - 92.0	18.16	245.90
CW - 6B	*	261.74	261.50	59	62.96	51.0 - 61.0	15.81	245.93
CW - 6C		263.98	261.30	25	34.61	13.0 - 33.0	15.18	248.80
CW - 7A	*	255.59	254.90	46	57.96	37.0 - 47.0	7.81	247.78
CW - 7B		255.50	253.00	None	53.00	43.0 - 53.0	8 24	247.26
CW - 7C		255.05	254.50	26	36.55	7.0 - 27 0	8 63	246.42
MW-201	*	320.25	318.04	79	89.00	69.0 - 89.0	66.32	253.93
MW-202	*	253.26	251.43	28 5	36.00	21.0 - 36.0	11.21	242.05

Notes:

ftamsl - feet above mean sea level

ftbtoc - feet below top of casing

* - Denotes unconsolidated aquifer monitoring locations.

** - As presented in well boring logs.

TABLE 4
WELL PURGING
FIELD WATER QUALITY MEASUREMENTS
July 2000

L&RR SUPERFUND SITE
July 12, 2000
WELL NUMBER - CW-7A
FIELD PERSONNEL - TK/SS
SAMPLING ORGANIZATION - STL

DEPTH TO TOP & BOTTOM OF SCREEN - TOP 37'/BOTTOM 47'

PUMP INTAKE AT (FT. BELOW MP) - 46'
PURGING DEVICE - Geotech/Bladder

CLOCK TIME	WATER DEPTH BELOW MP (FT)	PURGE RATE SPECIFY UNITS (ML/MIN)	CUM. VOLUME PURGED (SPECIFY UNITS) (ML)	TEMP (DEGREES C)	SPEC. COND. millimhos/cm AT 25 DEGREES C	pH	Eh mv	DO mg/l	TURBIDITY (NTU)	COMMENTS
1325	7.81	400	–	16.22	311	6.45	207.5	2.55	34 73	
1330	7.81	400	2,000	16.11	349	6.3	111.1	2.1	31.78	
1335	7.81	400	4,000	15.58	333	6.13	21.6	1.1	12.42	
1340	7.81	400	6,000	15.99	332	6.06	-25 1	0.7	8.52	
1345	7.81	400	8,000	15.77	334	6.08	-47 1	0.8	7.55	
1350	7.81	400	10,000	15.30	334	6.06	-68 1	0.4	7.96	
1355	7.81	400	12,000	15.10	338	6.07	-76.0	0.4	7.64	
1400	7.81	400	14,000	15.24	342	6 07	-78 1	0.4	1.85	
1405	7.81	400	16,000	15.33	343	6.07	-79.3	0.4	2.27	
1410	7 81	400	18,000	15.46	342	6 09	-84.7	0.4	2 12	
1415	7.81	400	20,000	15.52	342	6.09	-88.6	0.4	2.07	

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TABLE 4 (Continued)
WELL PURGING
FIELD WATER QUALITY MEASUREMENTS
July 2000

L&RR SUPERFUND SITE
July 13, 2000
WELL NUMBER - MW-102A
FIELD PERSONNEL - TK/SS
SAMPLING ORGANIZATION - STL

DEPTH TO TOP & BOTTOM OF SCREEN - TOP 62.9'/BOTTOM 73.3'
PUMP INTAKE AT (FT. BELOW MP) - 69'
PURGING DEVICE - Geotech/Bladder

CLOCK TIME	WATER DEPTH BELOW MP (FT)	PURGE RATE SPECIFY UNITS (ML/MIN)	CUM. VOLUME PURGED (SPECIFY UNITS) (ML)	TEMP (DEGREES C)	SPEC. COND. millimhos/cm AT 25 DEGREES C	pH	Eh mv	DO mg/l	TURBIDITY (NTU)	COMMENTS
1330	11.45	400	–	14.76	476	5.92	13.4	3.45	11 57	
1335	11.75	400	2,000	14.13	441	5.83	29.3	2.76	9 44	
1340	11.63	400	4,000	14.28	434	5.85	28.2	3.34	10.9	
1345	11 61	400	6,000	13.78	434	5.73	38.0	1.39	10 64	
1350	11 61	400	8,000	13.72	433	5.86	28.1	1 08	12 78	
1355	11.61	400	10,000	13 28	433	5 84	26 4	0.69	10.12	
1400	11.61	400	12,000	13.55	433	5.76	35.9	0.92	20.33	
1405	11.61	400	14,000	13.66	435	5.84	26 6	0.97	13.84	
1410	11.61	400	16,000	13.80	434	5.87	27 3	0.73	11.35	
1415	11.61	400	18,000	13.78	436	5.85	20.7	0.36	17.63	
1420	11.61	400	20,000	13.55	438	5.87	22 0	0.45	17.33	
1425	11.61	400	22,000	13.72	439	5.93	18.7	0 82	17.37	

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TABLE 4 (Continued)
WELL PURGING
FIELD WATER QUALITY MEASUREMENTS
July 2000

L&RR SUPERFUND SITE
July 12, 2000
WELL NUMBER - MW-201
FIELD PERSONNEL - TK/SS
SAMPLING ORGANIZATION - STL

DEPTH TO TOP & BOTTOM OF SCREEN - TOP 69'/BOTTOM 89'
PUMP INTAKE AT (FT. BELOW MP) - 79'
PURGING DEVICE - Geotech/Bladder

CLOCK TIME	WATER DEPTH BELOW MP (FT)	PURGE RATE SPECIFY UNITS (ML/MIN)	CUM. VOLUME PURGED (SPECIFY UNITS) (ML)	TEMP (DEGREES C)	SPEC. COND. millimhos/cm At 25 Degrees C	pH	Eh mv	DO mg/l	TURBIDITY (NTU)	COMMENTS
845	66.32	400	–	10.86	61	7.96	185.5	9 93	115.10	
850	66.40	400	2,000	11 02	62	7.55	187.9	8.04	146.00	
855	66.93	400	4,000	10.70	61	6.98	201.9	7.77	144.00	
900	66.35	400	6,000	10.89	62	6.72	208.6	8 53	103.00	
905	66.35	400	8,000	10.92	62	6.62	214.5	7 74	78.00	
910	66.35	400	10,000	10.91	60	6.54	219 7	7 72	47.02	
915	66.35	400	12,000	11.02	60	6.49	223.1	7.79	33.15	
920	66.35	400	14,000	11.04	60	6 43	226.1	7 83	31.61	
925	66.35	400	16,000	11.16	60	6.37	233.1	7.80	22 47	
930	66.35	400	18,000	11.26	60	6.32	233.6	7 49	21.70	
935	66.35	400	20,000	11.48	59	6.30	234.8	7.80	17.34	
940	66.35	400	22,000	11.59	59	6.28	235.9	7.70	16.97	
945	66.35	400	24,000	11.96	59	6.26	236 1	7.71	15 72	
950	66.35	400	26,000	12.04	59	6.23	237.7	7.35	14.88	
955	66.35	400	28,000	12.21	59	6.23	237.7	7.35	14.88	

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TABLE 4 (Continued)
WELL PURGING
FIELD WATER QUALITY MEASUREMENTS
July 2000

L&RR SUPERFUND SITE
July 12, 2000
WELL NUMBER - MW-103A
FIELD PERSONNEL - TK/SS
SAMPLING ORGANIZATION - STL

DEPTH TO TOP & BOTTOM OF SCREEN - TOP 39.2'/BOTTOM 55.1
PUMP INTAKE AT (FT. BELOW MP) - 54'
PURGING DEVICE - Geotech/Bladder

CLOCK TIME	WATER DEPTH BELOW MP (FT)	PURGE RATE SPECIFY UNITS (ML/MIN)	CUM. VOLUME PURGED (SPECIFY UNITS) (ML)	TEMP (DEGREES C)	SPEC. COND. millimhos/cm AT 25 DEGREES C	pH	Eh mv	DO mg/l	TURBIDITY (NTU)	COMMENTS
1215	16.23	300	–	11.38	174	6.21	280.5	6.75	0.0	
1220	20.05	300	1,500	12.27	174	6.46	266.1	5.81	0.0	
1225	20.05	300	3,000	12.67	175	6.64	265.1	5.10	0.0	
1230	20.05	300	4,500	12.59	175	6.77	250.0	5.30	0.0	
1235	20.05	300	6,000	12.55	175	6.81	248.4	4.60	0.0	
1240	20.05	300	7,500	12.80	175	6.89	243.8	4.62	0.0	
1245	20.05	300	9,000	13.01	175	6.95	239.9	4.41	0 0	
1250	20.05	300	10,500	13.12	176	6.98	239.3	4.42	0.0	

TABLE 4 (Continued)
WELL PURGING
FIELD WATER QUALITY MEASUREMENTS
July 2000

L&RR SUPERFUND SITE
July 13, 2000
WELL NUMBER - CW-5B
FIELD PERSONNEL - TK/SS
SAMPLING ORGANIZATION - STL

DEPTH TO TOP & BOTTOM OF SCREEN - TOP92'/BOTTOM 102'
PUMP INTAKE AT (FT. BELOW MP) - 98'
PURGING DEVICE - Geotech/Bladder

CLOCK TIME	WATER DEPTH BELOW MP (FT)	PURGE RATE SPECIFY UNITS (ML/MIN)	CUM. VOLUME PURGED (SPECIFY UNITS) (ML)	TEMP (DEGREES C)	SPEC. COND. millimhos/cm AT 25 DEGREES C	pH	Eh mv	DO mg/l	TURBIDITY (NTU)	COMMENTS
920	54.43	400	--	13.94	180	5 78	42.0	6.95	0.01	
925	54.51	400	2,000	11.36	170	5.60	18.8	4.32	3.27	
930	54.51	400	4,000	11.58	169	5.66	18 7	3.35	0 00	
935	54.51	400	6,000	11.66	168	5.63	1.0	1.86	0.00	
940	54.51	400	8,000	11.60	165	5.69	22.5	2.24	0.00	
945	54.51	400	10,000	11.52	162	5.66	21.0	1.1	0.29	
950	54.51	400	12,000	11.44	161	5.69	28.0	1 34	0 00	
955	54.51	400	14,000	11.53	161	5 65	29.3	1.33	0.08	
1000	54.51	400	16,000	11.61	159	5.65	30 2	1.35	0.00	
1005	54.51	400	18,000	11 62	159	5.62	28.6	1.39	0 00	
1010	54.51	400	20,000	11.63	159	5.69	31.0	1.41	0.00	

TABLE 4 (Continued)
WELL PURGING
FIELD WATER QUALITY MEASUREMENTS
July 2000

L&RR SUPERFUND SITE
July 13, 2000
WELL NUMBER - MW-104A
FIELD PERSONNEL - TK/SS
SAMPLING ORGANIZATION - STL

DEPTH TO TOP & BOTTOM OF SCREEN - TOP 44'/BOTTOM 54'
PUMP INTAKE AT (FT. BELOW MP) - 49'
PURGING DEVICE - Geotech/Bladder

CLOCK TIME	WATER DEPTH BELOW MP (FT)	PURGE RATE SPECIFY UNITS (ML/MIN)	CUM. VOLUME PURGED (SPECIFY UNITS) (ML)	TEMP (DEGREES C)	SPEC. COND. millimhos/cm AT 25 DEGREES C	pH	Eh mv	DO mg/l	TURBIDITY (NTU)	COMMENTS
1115	16.56	400	--	17 52	2303	6.42	-86.7	0.67	343	
1120	16.72	400	2,000	15.91	2256	6.32	-78.1	0.44	754	
1125	16.72	400	4,000	15 88	2197	6.32	-80.3	0.52	1000	Cleaned Cell
1130	16.72	400	6,000	15 70	2227	6.32	-81.4	0.41	--	
1135	16.72	400	8,000	15.62	2214	6.32	-88.2	0.38	--	
1140	16.72	400	10,000	15 56	2204	6.32	-92.1	0.28	3260	
1145	16.72	400	12,000	15.52	2184	6.32	-94.8	0.28	1370	
1150	16.72	400	14,000	15.31	2161	6.33	-98.5	0.21	1665	Cleaned Cell
1155	16.72	400	16,000	15.07	2281	6.34	-89.2	0.42	2360	
1200	16.72	400	18,000	15.83	2280	6.33	-88.6	0.33	920	
1205	16.72	400	20,000	15.95	2267	6 33	-93.1	0.20	835	Cleaned Cell
1210	16.72	400	22,000	15 82	2284	6.34	-91.2	0.13	1425	
1215	16.72	400	24,000	15.97	2285	6.33	-90 4	0.62	1515	Cleaned Cell
1220	16 72	400	26,000	15.52	2300	6.37	-91 4	0.54	2015	
1225	16.72	400	28,000	15.68	2260	6 35	-94.3	0.34	550	
1230	16.72	400	30,000	15.48	2226	6.34	-100.2	0.31	995	
1235	16.72	400	32,000	15.32	2210	6.32	-104.1	0.19	1020	
1240	16.72	400	34,000	15.59	2167	6.32	-108.1	0.24	925	
1245	16.72	400	36,000	15.52	2150	6.33	-109.8	0 26	1005	

TABLE 4 (Continued)
WELL PURGING
FIELD WATER QUALITY MEASUREMENTS
July 2000

L&RR SUPERFUND SITE
July 12, 2000
WELL NUMBER - MW-202
FIELD PERSONNEL - TK/SS
SAMPLING ORGANIZATION - STL

DEPTH TO TOP & BOTTOM OF SCREEN - TOP 21.6'/BOTTOM 38.6'
PUMP INTAKE AT (FT. BELOW MP) - 28.6
PURGING DEVICE - Geotech/Bladder

CLOCK TIME	WATER DEPTH BELOW MP (FT)	PURGE RATE SPECIFY UNITS (ML/MIN)	CUM. VOLUME PURGED (SPECIFY UNITS) (ML)	TEMP (DEGREES C)	SPEC. COND. millimhos/cm AT 25 DEGREES C	pH	Eh mv	DO mg/l	TURBIDITY (NTU)	COMMENTS
1030	11.21	400	–	11.23	102	5.41	287.8	9.51	209	
1035	11.40	400	2,000	10.50	101	5.21	303.7	8.90	113	
1040	11.32	400	4,000	11.49	101	5.18	310 1	8.61	71	
1045	11.32	400	6,000	11.55	103	5.16	315 2	8.62	104	
1050	11.32	400	8,000	12.34	102	5.14	320.7	9.10	47	
1055	11.32	400	10,000	12.27	103	5.12	324.7	8.24	100	
1100	11.32	400	12,000	12.31	103	5.12	328.2	8.40	120	
1105	11.32	400	14,000	12.39	103	5.10	330.5	8.42	105	
1110	11.32	400	16,000	12.83	102	5 10	332.7	8.22	111	
1115	11.32	400	18,000	12.87	102	5 10	334.2	8.13	113	
1120	11.32	400	20,000	13.04	102	5 09	331.0	7.98	107	
1125	11.32	400	22,000	11.26	102	5.11	336.4	8.77	84	
1130	11.32	400	24,000	11.63	102	5.06	340.2	8.29	92	
1135	11.32	400	26,000	11.92	102	5.08	341.3	8.38	66	
1140	11.32	400	28,000	12.05	101	5.07	342.1	8.26	67	
1145	11.32	400	30,000	12.15	101	5.09	341.9	8.42	71	

TABLE 5: GROUNDWATER CHEMISTRY DATA, L&RR SUPERFUND SITE, JULY 2000

MONITORING WELL	MCL (2)	MW-102A										Duplicate
WELL		October 1996	February 1997	June 1997	October 1997	February 1998	June 1998	October 1998	March 1999		July 2000	July 2000
TCL VOLATILES (ug/L)												
Acetone		5 U	5 U J	5 U	R	R	2 UJ	2 U	R	R	100 U J	69 U J
Benzene	5	12	10	9	8	7	6 J	7	9	7.6	10	10
Bromobenzene		5 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	5 U
Chloroethane		100	58	56	53	47	32	34	25 J	1 U	28	27
Chlorobenzene	100	24	21	21	16	16	14 J	12	15	11	11	11
Chloromethane		5 U	2	1 U	1 U	2 U	1 UJ	1 U	1 UJ	1 U	5 U	5 U
2-Chlorotoluene		5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	5 U	5 U
Dichlorodifluoromethane		35 J	22	32	2 U	26	28	20	2 UJ	46 J	27	27
Trichlorofluoromethane		5 U	1 U	1 U	1 U	1 J	1 U	1 U	1 U	2	5 U	1.7 U
1,1 - Dichloroethane		180	130	110 J	110	120 J	70	100	130	109	160	160
1,1 - Dichloroethene	7	1 U	1 U	1 U	1 U	2 U	1 U	0.6 J	1 U	1 U	5 U	5 U
1,2 - Dichloroethane	5	18	16	13	13	12	11	10	12	1 U	15	16
1, 2 - Dichloropropane	5	4	3	4	3	2 U	3	3	4	4.1	6.4	6.6
cis-1,2-Dichloroethene	70	46	43	1 U	100	110 J	1 U	130	180	170	230	240
trans-1,2-Dichloroethene	100	5 U	2	2	1 U	2	1 U	2	3	2.4	3.6 J	3.8 J
1,2-dichlorobenzene	600	5 U	2	2	1	1 J	1 U	1	1 U	1 U	0.93 J	1 J
1,3-Dichlorobenzene		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	5 U
1,4-Dichlorobenzene	75	8	6	6	5	5	4	4	1 U	4.2	5.5	5.7
Ethylbenzene	700	5 U	1	1 U	1 U	2 U	1 U	1 U	1 U	1 U	5 U	5 U
Isopropylbenzene		5	5	1 U	4	4	3	3	1 U	3.5	4.1 J	4.2 J
p-Isopropyltoluene		5 U	0.8 J	0.7 J	1 U	2 U	1 U	1 U	1 U	5 U	5 U	5 U
Methylene Chloride	5	5 U	2 U J	2 J	4 J	2 U	2 U	2 U J	2 U	1.5 J	32 U J	31 U J
Naphthalene		5 U	2 J	6	1 U	1 J	2 UJ	0.8 J	2 UJ	2 UJ	5 U	5 U
n-Propylbenzene		5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	5 U	5 U
Tetrachloroethene	5	11	15	25	35	34 J	34	46	70	53	55 J	54 J
Trichloroethene	5	15	18	25	31	31	33	38	52	50	77	79
Toluene	1000	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.95 J	0.89 J
o-Xylene	(4)	5 U	1 J	1 U	1 U	2 U	1 U	0.6 J	1 U	1 U	5 U	5 U
M,P Xylenes	(4)	5 U	3	2	1 U	2 U	1 U	1 U	1 U	1 U	10 U	10 U
1, 2, 3 - Trichlorobenzene		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ	1 UJ	5 U	5 U
1, 1, 1 - Trichloroethane	200	5 U	1	1	1 U	2 U	1 U	1 U	1 U	1 U	5 U	5 U
1,2,4-Trimethylbenzene		5 U	2	1	1 U	2 U	1 U	1 U	1 U	1 U	5 U	5 U
1,3,5-Trimethylbenzene		5 U	5 J	1 U	1 U	2 U	1 U	1 U	1 U	1 U	5 U	5 U
Styrene		5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	5 U	5 U
2-Butanone		5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	R	R
Vinyl Chloride	2	20	20	24	26	30	18	21	40	26	46	45
DISSOLVED TAL METALS (ug/L)												
Arsenic	50	18.6 J	18.4	14.5	15.0	15.5	16.6	14.2	14.4 J	18.6	17.6 J	11.8 J
Lead	15	1.0 U	1.41 U	1.42 U	1.42 U	1.42 U	1.42 U	0.464 U	0.464 UJ	1.30	3.0 U J	0.60 U J
TOTAL TAL METALS (ug/L)												
Arsenic	50	16.6 J	17.9	14.7	15.6	15.9	16.1	16.0	15.9 J	18.0	18.5	14.2
Iron	300 (1)	55,400	57,600	49,400	44,500	48,400	49,000	43,100	49,000	35,400	37,200	36,600
Lead	15	1.0 U	1.41 U	1.74 J	1.42 U	1.42 U	1.42 U	3.53	R	3.47	3.0 U J	0.60 U J
INDICATOR PARAMETERS (mg/L)												
Ammonia		0.824	0.87	0.60	0.68	0.62	0.58 J	1.3	0.564 J	0.496	0.409	0.403
COD		26.9	12.2	14	<10	10 U	17	23	18	<5	5 U	5 U
BOD		4.2	9.1	10	7 J	12	17 J	9	13	10	14.6	11.6
Chloride	250(1)	6.00 J	13.00	2	8.0	8 J	7	<5	5	373	7.41	7.02

Notes

(1) - Secondary standards are as noted.

(2) - Source: Drinking Water Regulations and Health Advisories, Office of Water, USEPA Document Number EPA 822-B-96-002, October 1996

(4) - Concentrations for o-xylene and m, p - xylenes should be added for total xylene concentration. Total Xylene MCL is 10,000 ug/L..

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TABLE 5: GROUNDWATER CHEMISTRY DATA, L&RR SUPERFUND SITE, JULY 2000 (CONTINUED)

MONITORING WELL	MCL (2)	MW-103A									
WELL		October 1996	February 1997	June 1997	October 1997	February 1998	June 1998	October 1998	March 1999	October 1999	July 2000
TCL VOLATILES (ug/L)											
Acetone		5 U	5 U J	1 U	R	R	2 U J	1 U	R	R	R
Benzene	5	5 U	1 U	1 U	1 U	2 UJ	1 U	2 U	1 U	1 U	0.5 U
Bromobenzene		5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
Chloroethane		5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 UJ	1 U	0.5 U
Chlorobenzene	100	5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	0.5 U
Chloromethane		5 U	1 U	1 U	1 U	2 UJ	1 U J	1 U	1 UJ	1 U	0.5 U
2-Chlorotoluene		5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	0.5 U
Dichlorodifluoromethane		5 U	1 U	1 U	2 U	2 UJ	2 U	2 U	2 UJ	2 UJ	0.5 U
Trichlorofluoromethane		5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	0.5 U
1,1 - Dichloroethane		5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	0.1 J
1,1 - Dichloroethene	7	5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	0.5 U
1,2 - Dichloroethane	5	5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	0.5 U
1, 2 - Dichloropropane	5	5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	0.5 U
cis-1,2-Dichloroethene	70	5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	0.5 U
trans-1,2-Dichloroethene	100	5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	0.5 U
1,2-dichlorobenzene	600	5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	0.5 U
1,3-Dichlorobenzene		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U
1,4-Dichlorobenzene	75	5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	0.5 U
Ethylbenzene	700	5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	0.5 U
Isopropylbenzene		5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	0.5 U
p-Isopropyltoluene		5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	5 U	0.5 U
Methylene Chloride	5	5 U	2 U J	2 U	1 U	2 UJ	2 U	2 U J	2 U	2 U	1 U J
Naphthalene		5 U	2 U J	2 U	1 U	2 UJ	2 U J	2 U	2 UJ	2 UJ	0.5 U
n-Propylbenzene		5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	0.5 U
Tetrachloroethene	5	5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	0.5 U
Trichloroethene	5	5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	0.5 U
Toluene	1000	5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	0.5 U
o-Xylene	(4)	5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	0.5 U
M,P Xylenes	(4)	5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	1 U
1, 2, 3 - Trichlorobenzene		1 U	1 U	1 U	1 U	2 U J	1 U	1 U	1 UJ	1 UJ	0.5 U
1, 1, 1 - Trichloroethane	200	5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	0.5 U
1,2,4-Trimethylbenzene		5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	0.5 U
1,3,5-Trimethylbenzene		5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	0.5 U
Styrene		5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	0.5 U
2-Butanone		5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	R
Vinyl Chloride	2	5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	0.5 U
DISSOLVED TAL METALS (ug/L)											
Arsenic	50	1.4 J	3.31 U	3.32 U	3.32 U	3.32 U	3.32 U	R	1.08 U	2.87 U	0.75 U
Lead	15	1.0 U	1.41 U	1.42 U	1.42 U	1.42 U	1.42 U	0.464 U	0.464 UJ	0.464 U	0.60 U J
TOTAL TAL METALS (ug/L)											
Arsenic	50	1.2 J	3.31 U	3.32 U	3.32 U	3.32 U	3.32 U	R	1.08 U	2.31 U	0.80 J
Iron	300 (1)	55.3	162	106 U	29.8 J	104 U	24.4 U J	116	126	68.2 J	13.8 J
Lead	15	1.0 U	1.41 U	1.42 U	1.42 U	1.42 U	1.42 U	0.690 J	0.464 UJ	0.490 J	0.60 U J
INDICATOR PARAMETERS (mg/L)											
Ammonia		0.04 U	0.040 U	0.040 U	0 040 U	0.040 U	0.05 U J	0.28	0.313	0.0400 U	0.0400 U
COD		10.0 UJ	<10 0	10 U	10	10 U	<10	<5	<10	<5	5 U
BOD		2 U	<2.0	2 U	2 UJ	<2	<2	<2	<2	96	2.0 U J
Chloride	250(1)	3.00	13	7	5	5	3	<5	3	3.65	3.58

Notes:

(1) - Secondary standards are as noted

(2) - Source. Drinking Water Regulations and Health Advisories, Office of Water, USEPA Document Number EPA 822-B-96-002, October 1996

(4) - Concentrations for o-xylene and m, p - xylenes should be added for total xylene concentration. Total Xylene MCL is 10,000 ug/L.

TABLE 5: GROUNDWATER CHEMISTRY DATA, L&RR SUPERFUND SITE, JULY 2000 (CONTINUED)

MONITORING WELL	MCL (2)	MW-104A										Split Sample
WELL		October 1996	February 1997	June 1997	October 1997	February 1998	June 1998	October 1998	March 1999	October 1999	July 2000	July 2000
TCL VOLATILES (ug/L)												
Acetone		5 U	5 U J	5 U	R	R	12 J	2 U	R	R	160 U J	16 U J
Benzene	5	18	14	15	16	17	18	12	16 J	12	24	25 J
Bromobenzene		5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	5 U	0.4 J
Chloroethane		110	58	62	45	48	44	24	40 J	1 U	49	44 J
Chlorobenzene	100	7	5	7	8	9	10	8	9 J	7.0	10	10
Chloromethane		5 U	1 U	0.9 J	1 U	2 U	1 U J	1 U	1 UJ	1 U	5 U	0 5 U
2-Chlorotoluene		5 U	1 U	4	1 U	2 U	1 U	1 U	1 U	1 U	5 U	0.5 U
Dichlorodifluoromethane		5 U	1 U	1 U	2 U	2 U	2 U	2 U	2 UJ	11 J	5 U	0.2 J
Trichlorofluoromethane		5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	5 U	0.5 U
1,1 - Dichloroethane		45	36	38	32	36	41	27	42	27	40	41 J
1,1 - Dichloroethene	7	5 U	1 U	1 U	1	2 U	1 U	1 J	1	1 U	5 U	0.5 U
1,2 - Dichloroethane	5	13	11	10	9	9	12	8	11	1 U	9	9
1, 2 - Dichloropropane	5	9	9	10	9	2 U	10	7	10	1 U	10	10
cis-1,2-Dichloroethene	70	5	1 U	1 U	1 U	2 U	1 U	1	1 U	1 U	5 U	0 9
trans-1,2-Dichloroethene	100	5	1 U	2	1 U	1 J	1	0.9 J	1	1.1	1.8 J	2
1,2-dichlorobenzene	600	5 U	4	5	6	6	6	6	5	5.6	6.6	6 J
1,3-Dichlorobenzene		1 U	1 U	1 U	1 U	1 U	1 U	1 J	1 U	1 U	0.88 J	0.9 U J
1,4-Dichlorobenzene	75	18	15	17	20	22	26	24	1 U	21	33	27 J
Ethylbenzene	700	150	120	150 J	140	130 J	150	130	120	104	140	110 J
Isopropylbenzene		38	28	31	24	27	22	17	15	17	23	24
p-Isopropyltoluene		10 J	10	9	12	13	12	9	6	5 U	5 U	12
Methylene Chloride	5	5 U	7 J	7 J	4 J	4 J	2 U	1 J	2 U	2.2 J	18 U J	4 U J
Naphthalene		46	2 U J	48	35	25 J	53	41	25 J	36 J	59	58 J
n-Propylbenzene		5 U	3	4	5	5	4	3	4	7.1	4.8 J	5
Tetrachloroethene	5	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	5 U	0.5 U
Trichloroethene	5	5 U	0.7 J	1 U	1 U	2 U	1 U	1 U	1 U	1 U	5 U	0.5 U
Toluene	1000	13	10	10	9	9	8	8	11 J	9 1	11	12
o-Xylene	(4)	60	1 U	62 J	59	51 J	62	43	46	44	63	60 J
M,P Xylenes	(4)	140	120 J	150 J	150	130 J	150	100	120	120	350 J	130 J
1, 2, 3 - Trichlorobenzene		1 U	1 U	1 U	1 U	1 U	1 U J	0.5 J	1 UJ	1 UJ	5 U	0.5 U J
1, 1, 1 - Trichloroethane	200	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	5 U	0.5 U
1,2,4-Trimethylbenzene		27	24	26	32	35	34	28	26	1 U	42	40 J
1,3,5-Trimethylbenzene		8	25	9	22	10	9	8	1 U	24 J	12	13
Styrene		5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2.1 J	0.5 U
2-Butanone		5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	5 U	10 J
Vinyl Chloride	2	5 U	2	1 U	1 U	2 U	1 U	1 U	1 U	1 U	5 U	1
DISSOLVED TAL METALS (ug/L)												
Arsenic	50	82.0	96.8 J	79.5	106 J	82.5 J	79.7 J	68.5	116 J	98.9 J	86.9	113.0
Lead	15	1.0 U	1.41 U	1.42 U	1.42 U	1.42 U	1.42 U	0.464 U	0.464 U	0.464 U	3.0 U J	2.3 J
TOTAL TAL METALS (ug/L)												
Arsenic	50	92.9	76.4 J	85.0	92.9 J	62.7 J	71.2 J	81.7	107 J	72.3 J	94.7	113
Iron	300 (1)	115,000	98,400	117,000	86,400	104,000	104,000	126,000	136,000	102,000	89,100	99200
Lead	15	8.6	6.92	16.5	5.79	10.6	10 0	42.3	16.1 J	10.2	4.2 J	11.3 J
INDICATOR PARAMETERS (mg/L)												
Ammonia		22.8	20 5	19.0	18.8	18.3	20 J	87	21.5	21.7	22.6	15.8
COD		222	200	300	190	73	190	250	190 J	151	220	118
BOD		24 J	42 J	51 J	30 J	23	20	28	24	257 J	22.3	27.0 J
Chloride	250(1)	344	320	380	370	360	250	330	340	374	419	386

Notes:

(1) - Secondary standards are as noted.

(2) - Source: Drinking Water Regulations and Health Advisories, Office of Water, USEPA Document Number EPA 822-B-96-002, October 1996

(4) - Concentrations for o-xylene and m, p - xylenes should be added for total xylene concentration. Total Xylene MCL is 10,000 ug/L.

TABLE 5: GROUNDWATER CHEMISTRY DATA, L&RR SUPERFUND SITE, JULY 2000 (CONTINUED)

MONITORING WELL	MCL (2)	MW-201									
WELL		October 1996	February 1997	June 1997	October 1997	February 1998	June 1998	October 1998	March 1999	October 1999	July 2000
TCL VOLATILES (ug/L)											
Acetone		5 U	5 UJ	5 U	R	R	2 UJ	2 UJ	R	R	R
Benzene	5	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
Bromobenzene		5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
Chloroethane		5 U	1 U	1 U	1 U	2 U	1 U	1 UJ	1 UJ	1 U	0.5 U
Chlorobenzene	100	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
Chloromethane		5 U	1 U	1 U	1 U	2 U	1 UJ	1 UJ	1 UJ	1 U	0.5 U
2-Chlorotoluene		5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
Dichlorodifluoromethane		5 U	1 U	1 U	3	3	3	4 J	2 UJ	2 UJ	4.6
Trichlorofluoromethane		5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
1,1 - Dichloroethane		5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
1,1 - Dichloroethene	7	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
1,2 - Dichloroethane	5	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
1, 2 - Dichloropropane	5	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
cis-1,2-Dichloroethene	70	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
trans-1,2-Dichloroethene	100	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
1,2-dichlorobenzene	600	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
1,3-Dichlorobenzene		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U
1,4-Dichlorobenzene	75	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
Ethylbenzene	700	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
Isopropylbenzene		5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
p-Isopropyltoluene		5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	5 U	0.5 U
Methylene Chloride	5	5 U	2 UJ	2 U	1 U	2 U	2 U	2 UJ	2 U	2 U	1 UJ
Naphthalene		5 U	16 J	2 U	1 U	2 U	2 UJ	1 U	2 UJ	2 UJ	0.5 U
n-Propylbenzene		5 U	1 U	1 U	1 U	2 U	1 U	1 UJ	1 U	1 U	0.5 U
Tetrachloroethene	5	5 U	1 U	1 U	1 U	2 U	1 U	1 UJ	1 U	1 U	0.5 U
Trichloroethene	5	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
Toluene	1000	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
o-Xylene	(4)	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
M,P Xylenes	(4)	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	1 U
1, 2, 3 - Trichlorobenzene		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ	1 UJ	0.5 U
1, 1, 1 - Trichloroethane	200	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
1,2,4-Trimethylbenzene		5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
1,3,5-Trimethylbenzene		5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
Styrene		5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
2-Butanone		5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	R
Vinyl Chloride	2	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
DISSOLVED TAL METALS (ug/L)											
Arsenic	50	1.2 U	3.31 U	3.32 U	3.32 U	3.32 U	3.3 U	1.70 U	1.08 UJ	1.08 U	0.75 U
Lead	15	1.0 U	1.41 U	1.42 U	1.42 U	1.42 U	1.4 U	0.464 U	0.464 U	0.464 U	0.60 UJ
TOTAL TAL METALS (ug/L)											
Arsenic	50	1.2 U	3.31 U	3.32 U	3.32 U	3.32 U	3.3 U	1.08 U	1.08 UJ	1.08 U	0.75 U
Iron	300 (1)	353	51.1	332 J	100	324	221	261	395	1,190	1,530
Lead	15	1.0 U	1.41 U	1.42 U	1.42 U	1.42 U	1.4 U	0.464 U	0.464 UJ	0.464 U	2.5 J
INDICATOR PARAMETERS (mg/L)											
Ammonia		0.04 U	0.040 U	0.040 U	0.040 U	0.040 U	0.5 UJ	0.13	0.0970	0.0400 U	0.0400 U
COD		10.0 U	<10.0	10 U	<10	7	<10	<5	<10	<5	5 U
BOD		2.0 U	<2.0	4 UJ	2 UJ	<2	<2	<2	<2	<2	2 UJ
Chloride	250(1)	6.00 J	2.0	4	2	7	<2	<5	<2	3.00 U	3.00 U

Notes

(1) - Secondary standards are as noted.

(2) - Source: Drinking Water Regulations and Health Advisories, Office of Water, USEPA Document Number EPA 822-B-96-002, October 1996

(4) - Concentrations for o-xylene and m, p - xylenes should be added for total xylene concentration. Total Xylene MCL is 10,000 ug/L.

TABLE 5: GROUNDWATER CHEMISTRY DATA, L&RR SUPERFUND SITE, JULY 2000 (CONTINUED)

MONITORING WELL	MCL (2)	MW-202									
WELL		October 1996	February 1997	June 1997	October 1997	February 199	June 1998	October 1998	March 1999	October 199	July 2000
TCL VOLATILES (ug/L)											
Acetone		5 U	5 U J	5 U	R	R	4 J	2 U J	R	R	R
Benzene	5	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
Bromobenzene		5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
Chloroethane		5 U	1 U	1 U	1 U	2 U	1 U	1 U J	1 UJ	1 U	0.5 U
Chlorobenzene	100	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
Chloromethane		5 U	1 U	1 U	1 U	2 U	1 U J	1 U J	1 UJ	1 U	0.5 U
2-Chlorotoluene		5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
Dichlorodifluoromethane		5 U	1 U	1 U	2 U	2 U	2 U	2 U J	2 UJ	2 U	0.5 U
Trichlorofluoromethane		5 U	1 U	1 U	1 U	2 U	1 U	1 U J	1 U	1 UJ	0.5 U
1,1 - Dichloroethane		5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0 5 U
1,1 - Dichloroethene	7	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
1,2 - Dichloroethane	5	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0 5 U
1, 2 - Dichloropropane	5	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
cis-1,2-Dichloroethene	70	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
trans-1,2-Dichloroethene	100	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
1,2-dichlorobenzene	600	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 UJ	0 5 U
1,3-Dichlorobenzene		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ	0.5 U
1,4-Dichlorobenzene	75	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 UJ	0.5 U
Ethylbenzene	700	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
Isopropylbenzene		5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
p-Isopropyltoluene		5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	5 UJ	0.5 U
Methylene Chloride	5	5 U	2 U J	2 U	1 U	2 U	2 U	2 U J	2 U	2 U	1 U J
Naphthalene		5 U	2 U J	2 U	1 U	2 U	2 U J	1 U	2 UJ	2 UJ	0 5 U
n-Propylbenzene		5 U	1 U	1 U	1 U	2 U	1 U	1 U J	1 U	1 UJ	0.5 U
Tetrachloroethene	5	5 U	1 U	1 U	1 U	2 U	1 U	1 U J	1 U	1 U	0.5 U
Trichloroethene	5	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
Toluene	1000	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
o-Xylene	(4)	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
M,P Xylenes	(4)	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	1 U
1, 2, 3 - Trichlorobenzene		5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 UJ	1 U	0.5 U
1, 1, 1 - Trichloroethane	200	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
1,2,4-Trimethylbenzene		5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
1,3,5-Trimethylbenzene		5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 UJ	0.5 U
Styrene		5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
2-Butanone		5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	R
Vinyl Chloride	2	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
DISSOLVED TAL METALS (ug/L)											
Arsenic	50	1.2 U	3.31 U	3.32 U	3.32 U	3.32 U	3.32 U	1.80 U	1.08 U	1.20 U	0.75 U
Lead	15	1.0 U	1.41 U	1.42 U	1.42 U	1.42 U	1.42 U	0.464 U	0.464 UJ	0.464 U	0 82 J
TOTAL TAL METALS (ug/L)											
Arsenic	50	2.1 J	3.31 U	3.32 U	3.32 U	3.32 U	3.32 U	1 08 J	1.08 U	1.52 U	0.75 U
Iron	300 (1)	14,900	7,080	1,940	1,490	4,310	4,150	3,220	1,610	2,040	7,790
Lead	15	9.6	11.4	2.95	2.12 J	2.97	2.3 J	1.96 U	0.910 J	1.27	0.6 U J
INDICATOR PARAMETERS (mg/L)											
Ammonia		0.04 U	0.040 U	0 040 U	0.040 U	0.040 U	0 05 UJ	0.30	0.292	0.765	0.0400 U
COD		10.0 U	<10.0	10 U	<10	10 U	<10	<5	<10	<5	5 U
BOD		2.0 U	<2 0	2 U	2 UJ	<2	<2	<2	<2	<2	2.0 U
Chloride	250(1)	12.0 J	8.0	12	9	11	9	14	10	12.3	14.9

Notes:

(1) - Secondary standards are as noted.

(2) - Source: Drinking Water Regulations and Health Advisories, Office of Water, USEPA Document Number EPA 822-B-96-002, October 1996

(4) - Concentrations for o-xylene and m, p - xylenes should be added for total xylene concentration Total Xylene MCL is 10,000 ug/L.

TABLE 5: GROUNDWATER CHEMISTRY DATA, L&RR SUPERFUND SITE, JULY 2000 (CONTINUED)

MONITORING WELL	MCL (2)	CW-5B									
WELL		October 1996	February 1997	June 1997	October 1997	February 1998	June 1998	October 1998	March 1999	October 199	July 2000
TCL VOLATILES (ug/L)											
Acetone		8 J	5 U J	5 U	R	R	2 U J	2 U	R	R	R
Benzene	5	5 U	1 U	1 U	1 U	2 UJ	1 U	0.6 J	1 U	1 U	0.55
Bromobenzene		5 U	1 U	1 U	1 U	2 U J	1 U	1 U	1 U	1 U	0.5 U
Chloroethane		5 U	1 U	1 U	1 U	2 UJ	3	3	1 UJ	1 U	1 8
Chlorobenzene	100	5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	0.5 U
Chloromethane		5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 UJ	1 U	0.5 U
2-Chlorotoluene		5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 UJ	1 U	0 5 U
Dichlorodifluoromethane		80 J	44	45	26	19 J	22	13	1 J	6.2 J	8.7
Trichlorofluoromethane		5 U	1 U	7	3	2 J	1 U	1 U	1 U	1 U	0.5 U
1,1 - Dichloroethane		5 U	18	16	22	19 J	24	24	30	15	19
1,1 - Dichloroethene	7	5 U	0.6 J	0.8 J	1 U	2 UJ	1 U	0.5 J	1 U	1 U	0.35 J
1,2 - Dichloroethane	5	5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	0.5 U
1, 2 - Dichloropropane	5	5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	0.5 U
cis-1,2-Dichloroethene	70	5 U	9	1 U	11	2 UJ	1 U	12	14	6.6	11
trans-1,2-Dichloroethene	100	5 U	1 U	0.8 J	1 U	2 UJ	1 U	0.6 J	1 U	1 U	0.44 J
1,2-dichlorobenzene	600	5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	0.5 U
1,3-Dichlorobenzene		1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
1,4-Dichlorobenzene	75	5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	0.5 U
Ethylbenzene	700	5 U	1 U	1 U	1 U	2 UJ	1 U	0.8 J	0.9 J	1 U	0.12 J
Isopropylbenzene		5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	0.11 J
p-Isopropyltoluene		5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	5 U	0.5 U
Methylene Chloride	5	5 U	19 J	15 J	1 U	6 J	2 U	2 U J	7 U	1.8 J	3.8 U J
Naphthalene		5 U	2 U J	2 U	1 U	2 UJ	2 U J	0.5 J	2 UJ	2 UJ	0.5 U
n-Propylbenzene		5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	0.5 U
Tetrachloroethene	5	18	25	28	40	26 J	36	35	47	29	24 J
Trichloroethene	5	5 U	11	11	14	10 J	14	13	14	7.5	9.4
Toluene	1000	5 U	1	1 J	1 U	2 UJ	1 U	0 9 J	1 U	1 U	0.5 U
o-Xylene	(4)	5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	0.32 J
M,P Xylenes	(4)	5 U	0.6 J	0.8 J	1	2 UJ	2	2	2	1 U	3.7 J
1, 2, 3 - Trichlorobenzene		5 U	1 U	1 U	1 U	2 U J	1 U	1 U	1 UJ	1 UJ	5 U
1, 1, 1 - Trichloroethane	200	6	5	5	4	3 J	3	2	1 U	1 U	1
1,2,4-Trimethylbenzene		5 U	1 U J	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	0.5 U
1,3,5-Trimethylbenzene		5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	0.5 U
Styrene		5 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	0 5 U
2-Butanone		5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	R
Vinyl Chloride	2	5 U	4	4	8	7 J	6	6	12	4.4	6.8
DISSOLVED TAL METALS (ug/L)											
Arsenic	50	1.20 U	3.31 U	3.32 U	3.32 U	3 32 U	3.32 U	2.18	1.08 U	1.95 U	0 75 U
Lead	15	1.0 U	1.41 U	1.42 U	1.42 U	1.42 U	1.42 U	0.464 U	0.870 U	0.464 U	0.6 U J
TOTAL TAL METALS (ug/L)											
Arsenic	50	1.20 U	3.31 U	3.32 U	3 32 U	3.32 U	3.32 U	4.94	1.08 UJ	1.61 U	0.75 U
Iron	300 (1)	233	521	620	1,770	4,790	4070	4,340	3,560	2,330	3,010
Lead	15	1.0 U	1.41 U	2 91	1.42 U	1.42 U	1.42 U	0 590 J	0.464 UJ	0.464 U	0.60 U J
INDICATOR PARAMETERS (mg/L)											
Ammonia		21.1	0.040 U	0.040 U	0.052	0.040 U	0.05 U J	0.13	0.0980	0 0400 U	0.0400 U
COD		10 0 U	<10.0	10 U	<10	10 U	13	10	<10	<5	5 U
BOD		2.0 U	<2.0	2 J	2 J	5	3 J	7	7	12	4.6
Chloride	250(1)	3.00	3.0	4	2	4	2	<5	<2	3.00 U	3 00 U

Notes

(1) - Secondary standards are as noted.

(2) - Source. Drinking Water Regulations and Health Advisories, Office of Water, USEPA Document Number EPA 822-B-96-002, October 1996

(4) - Concentrations for o-xylene and m, p - xylenes should be added for total xylene concentration. Total Xylene MCL is 10,000 ug/L.

TABLE 5: GROUNDWATER CHEMISTRY DATA, L&RR SUPERFUND SITE, JULY 2000 (CONTINUED)

MONITORING WELL	MCL (2)	CW-7A									
WELL		October 1996	February 1997	June 1997	October	February 1	June 1998	October 1998	March 1999	October 199	July 2000
TCL VOLATILES (ug/L)											
Acetone		5 U	5 U J	5 U	R	R	2 UJ	2 U J	R	R	R
Benzene	5	5 U	1	1	2	1 J	1	1	1 J	1 U	0 26 J
Bromobenzene		5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U
Chloroethane		5 U	0.7 J	1 U	1	2 U	1 U	1 J	1 UJ	1 U	0.15 J
Chlorobenzene	100	5 U	2	4	6	5	4	4	3	2	0.75
Chloromethane		5 U	1 U	1 U	1 U	2 U	1 UJ	1 U J	1 UJ	1 U	0.5 U
2-Chlorotoluene		5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
Dichlorodifluoromethane		5 U	1 U	1 U	2 U	2 U	2 U	2 U J	2 UJ	2 UJ	0.5 U
Trichlorofluoromethane		5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
1,1 - Dichloroethane		5 U	0.8 J	0.9 J	1	2 U	1 U	0.6 J	1 U	1 U	0.35 J
1,1 - Dichloroethene	7	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
1,2 - Dichloroethane	5	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
1, 2 - Dichloropropane	5	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
cis-1,2-Dichloroethene	70	5 U	1 U	1 U	0.9 J	2 U	1 U	0.7 J	1 U	1 U	0.12 J
trans-1,2-Dichloroethene	100	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0 5 U
1,2-dichlorobenzene	600	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
1,3-Dichlorobenzene		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0 5 U
1,4-Dichlorobenzene	75	5 U	2	3	6	6	4	4	1 U	2.0	0 83
Ethylbenzene	700	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
Isopropylbenzene		5 U	2	1 U	3	3	2	2	1 U	1 U	0.24 J
p-Isopropyltoluene		5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	5 U	0.5 U
Methylene Chloride	5	5 U	2 U J	2 U	1 U	2 U	2 U	2 U J	2 U	2 U	1 U J
Naphthalene		5 U	2 U J	2 J	1 U	2	2 UJ	1 U	2 UJ	3.9 J	0.5 U
n-Propylbenzene		5 U	1 U	1 U	1 U	2 U	1 U	1 U J	1 U	1 U	0.5 U
Tetrachloroethene	5	5 U	1 U	1 U	1 U	2 U	1 U	1 U J	1 U	1 U	0.5 U
Trichloroethene	5	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
Toluene	1000	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
o-Xylene	(4)	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
M,P Xylenes	(4)	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	1 U
1, 2, 3 - Trichlorobenzene		5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 UJ	1 UJ	0.5 U
1, 1, 1 - Trichloroethane	200	5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
1,2,4-Trimethylbenzene		5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
1,3,5-Trimethylbenzene		5 U	0.6 J	1 U	1 U	2 U	1 U	0.7 J	1 U	1 U	0.5 U
Styrene		5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	0.5 U
2-Butanone		5 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	R
Vinyl Chloride	2	5 U	1 U	1 U	0.9 J	2 U	1 U	1 U	1 U	1 U	0.5 U
DISSOLVED TAL METALS (ug/L)											
Arsenic	50	10.0	9.36	8.76	8.3	10.9	11.5	R	9.51 J	9 37	9.1
Lead	15	1.0 U	1.41 U	1.42 U	1.4 U	1.42 U	1.42 U	0.464 U	0 464 U	0.464 U	3.0 U J
TOTAL TAL METALS (ug/L)											
Arsenic	50	10.0	9.47	8.39	9	10.3	11.9	R	10.3 J	8.98	9 4
Iron	300 (1)	**25,400**	**31,500**	**35,900**	**36,100**	**29,200**	**31,700**	**30,800**	**24,900**	**18,000**	**15,200**
Lead	15	1.0 U	1.41 U	R	1.4 U	1.42 U	1.42 U	0.464 U	0.464 UJ	0.464 U	3.0 U J
INDICATOR PARAMETERS (mg/L)											
Ammonia		0.04 U	0 55	0.62	0.0	0.77	0.6 J	1 8	0.934	0.681	0.260
COD		33.9 J	28.3	42	30	13	24	30	14	5	5 U
BOD		4	6.9	8	6 J	7	8 J	6	7	9	2 6 J
Chloride	250(1)	26 0	32	17	33	4 J	18	22	12	11.2	7.05

Notes:

(1) - Secondary standards are as noted

(2) - Source. Drinking Water Regulations and Health Advisories, Office of Water, USEPA Document Number EPA 822-B-96-002, October 1996

(4) - Concentrations for o-xylene and m, p - xylenes should be added for total xylene concentration. Total Xylene MCL is 10,000 ug/L.

TABLE 6: GROUNDWATER CHEMISTRY SPLIT SAMPLE COMPARISONS, L&RR SUPERFUND SITE, JULY 2000

MONITORING WELL WELL	MW-104A Severn Trent Lab.	MW - 104A SPLIT Compuchem Environmental	RPD % Orig./Split	Orig./Split Comparable Yes/No (1)
TCL VOLATILES (ug/L)				
Acetone	160 U J	16 U J		Yes
Benzene	24	25 J	4 1	Yes
Bromobenzene	5 U	0.4 J		Yes
Chloroethane	49	44 J	10 8	Yes
Chlorobenzene	10	10	0.0	Yes
Chloromethane	5 U	0.5 U		Yes
2-Chlorotoluene	5 U	0.5 U		Yes
Dichlorodifluoromethane	5 U	0.2 J		Yes
Trichlorofluoromethane	5 U	0.5 U		Yes
1,1 - Dichloroethane	40	41 J	2.5	Yes
1,1 - Dichloroethene	5 U	0.5 U		Yes
1,2 - Dichloroethane	9	9	0 0	Yes
1, 2 - Dichloropropane	10	10	0.0	Yes
cis-1,2-Dichloroethene	5 U	0.9		Yes
trans-1,2-Dichloroethene	1.8 J	2	10.5	Yes
1,2-dichlorobenzene	6.6	6 J	9.5	Yes
1,3-Dichlorobenzene	0 88 J	0.9 U J		Yes
1,4-Dichlorobenzene	33	27 J	20.0	Yes
Ethylbenzene	140	110 J	24.0	Yes
Isopropylbenzene	23	24	4.3	Yes
p-isopropyltoluene	13	12	8.0	Yes
Methylene Chloride	5 U	12		Yes
Naphthalene	18 U J	4 U J		Yes
n-Propylbenzene	59	58 J	1.7	Yes
Tetrachloroethene	4 8 J	5	4.1	Yes
Trichloroethene	5 U	0.5 U		Yes
Toluene	5 U	0 5 U		Yes
o-Xylene	11	12	8.7	Yes
M,P Xylenes	63	60 J	4.9	Yes
1, 2, 3 - Trichlorobenzene	350 J	130 J	91 7	No
1, 1, 1 - Trichloroethane	5 U	0.5 U J		Yes
1,2,4-Trimethylbenzene	5 U	0.5 U		Yes
1,3,5-Trimethylbenzene	42	40 J	4.9	Yes
Styrene	12	13	8.0	Yes
2-Butanone	2.1 J	0.5 U		No
Vinyl Chloride	5 U	10 J		Yes
	5 U	1		Yes
DISSOLVED TAL METALS (ug/L)				
Arsenic				
Lead	**86.9**	**113.0**	26.1	Yes
	3.0 U J	2.3 J		Yes
TOTAL TAL METALS (ug/L)				
Arsenic				
Iron	**94.7**	**113**	17.6	Yes
Lead	**89,100**	**99,200**	10.7	Yes
	4.2 J	11.3 J	91.6	No
INDICATOR PARAMETERS (mg/L)				
Ammonia				
COD	22.6	15.8	35.4	No
BOD	220	118	60.4	No
Chloride	22.3	27.0 J	19.1	Yes
	419	386	8.2	Yes

Notes:

(1) - Comparability analysis performed according to the Sampling and Analysis Plan, L&RR Superfund Site, prepared by de maximus, inc., September 1996

TABLE 7: SURFACE WATER CHEMISTRY DATA, L&RR SUPERFUND SITE, APRIL 2000

MONITORING LOCATION	Surface Water Criteria Fresh Water (ug/L) Criterion		SW-5	SW-8	SW-10	SW-16	LCH-4	Duplicate Sample of LCH-4	LCH-5
Sample Designation	Maximum	Continuous							
TCL VOLATILES (ug/L)									
1,1-Dichloroethane			0.5 U	0.8	0.5 U	0.5 U	23	24	0.5 U
Chloroethane			0.5 U	1	0.8	0.8	17	19	0.5 U
p-Isopropyltoluene			0.5 U	0.5 U	0.5 U	0.5 U	0.5	0.6	0.5 U
1,2-Dichlorobenzene			0.5 U	0.5 U	0.5 U	0.5 U	0.7	0.8	0.5 U
1,4-Dichlorobenzene			0.5 U	3	0.5 U	0.5 U	2	2	0.5 U
Toluene			0.5 U	0.5 U	0.5 U	0.5 U	0.7	0.8	0.5 U
m,p Xylene			0.5 U	0.5 U	0.5 U	0.5 U	3	3	0.5 U
o-Xylene			0.5 U	0.5 U	0.5 U	0.5 U	4	5	0.5 U
Isopropylbenzene			0.5 U	2	0.5 U	0.5 U	12	14	0.5 U
Ethylbenzene			0.5 U	0.5 U	0.5 U	0.5 U	9	10	0.5 U
Vinyl Chloride			0.5 U	0.5 U	0.5 U	0.5 U	3	3	0.5 U
Acetone			R	R	R	R	2 J	2 J	R
Methylene Chloride			0.5 U	0.5 U	0.5 U	0.5 U	0.7	0.8	0.5 U
trans-1,2-Dichloroethene			0.5 U	0.5 U	0.5 U	0.5 U	0.7	0.7	0.5 U
cis-1,2-Dichloroethene			0.5 U	0.5 U	0.5 U	0.5 U	8	8	0.5 U
Benzene			0.5 U	0.7	0.5 U	0.5 U	3	3	0.5 U
1,2-Dichloroethane			0.5 U	0.5 U	0.5 U	0.5 U	0.9	1	0.5 U
Trichloroethene			0.5 U	0.5 U	0.5 U	0.5 U	1	1	0.5 U
1,2-Dichloropropane			0.5 U	0.5 U	0.5 U	0.5 U	5	6	0.5 U
Chlorobenzene			0.5 U	2	0.5 U	0.5 U	3	3	0.5 U
1,3,5-Trimethylbenzene			0.5 U	0.5 U	0.5 U	0.5 U	0.8	1.0	0.5 U
1,2,4-Trimethylbenzene			0.5 U	0.5 U	0.5 U	0.5 U	2	2	0.5 U
Naphthalene			0.5 U	0.5 U	0.5 U	0.5 U	7	7	0.5 U
n-Propylbenzene			0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 J	0.5 U
TOTAL METALS (ug/L)									
Arsenic	360	190	0.85 UJ	23.2	0.85 U	0.85 U	6.6 J	3.2 J	4.4
DISSOLVED METALS (ug/L)									
Arsenic	360	190	1.1 J	11.0	0.85 U	0.85 U	5.6 J	8.8 J	0.85 U
WET CHEMISTRY PARAMETERS									
Chlorides			10.5	58.3	30.2	29.4	81 J	49.6 J	16.3
FIELD PARAMETERS									
pH (Standard units)			5.7	6.39	6.93	6.79	6.1	6.07	6.56
Temperature (C)			8.29	12.0	9.4	10.6	11	10.64	12.4
Conductivity (mhos/cm)			443	631	270	259	372	372	83.7

Notes:

(1) - Concentrations reference Federal Register Vol. 57, No. 246, December 22, 1992, Rules and Regulations 60911

TABLE 8: AMBIENT AIR SAMPLING DATA, L&RR SUPERFUND SITE, JUNE 8 AND JUNE 9, 2000

Sampling Location	AS - 1 Upwind	AS - 1 DUPLICATE Upwind	AS - 2 Upwind	AS - 3 Downwind	AS - 4 Downwind
Start date	6-8-00	6-8-00	6-8-00	6-8-00	6-8-00
Start time (1)	11:20	11:20	11:24	11:29	11:33
Canister start pressure(Field)	-30.00	-30.00	-30.00	-30.00	-29.90
End date	6-9-00	6-9-00	6-9-00	6-9-00	6-9-00
End time (2)	9:20	9:20	9:24	9:29	9:33
Canister end pressure (Field)	-7.50	-7.25	-7.00	-7.00	-6.90
TO - 14 Compounds Detected (ppbv) *					
Chloromethane	1.5	0.86 U	0.80 U	0.78 U	0.84 U
Freon 12	1.0	0.86 U	0.82	0.78 U	0.91
Methylene Chloride	1.4	1.4	0.89	1.4 B	0.90
Toluene	0.86 U	4.9	0.80 U	0.78 U	0.84 U
Ethyl Benzene	0.86 U	3.3	0.80 U	0.78 U	0.84 U
m, p - xlylene	0.86 U	23	0.80 U	0.78 U	0.84 U
o-Xylene	0.86 U	3.8	0.80 U	0.78 U	0.84 U
1,3,5-Trimethylbenzene	0.86 U	2.1	0.80 U	0.78 U	0.84 U
1,2,4-Trimethylbenzene	0.86 U	1.0	0.80 U	0.78 U	0.84 U
1,4-Dichlorobenzene	0.86 U	0.99	0.80 U	0.78 U	0.84 U
1,2-Dichlorobenzene	0.86 U	0.94	0.80 U	0.78 U	0.84 U
Chloroform	0.86 U	0.84 U	0.80 U	0.78 U	0.84 U
Carbon Tetrachloride	0.86 U	0.84 U	0.80 U	0.78 U	0.84 U
Acetone	16	36	23	6.8	7.5
Carbon Disulfide	3.4 U	4.1	3.2 U	3.1 U	3.4 U
2-Butanone(MEK)	3.4 U	5.9	3.3	3.1 U	3.4 U

Notes:

* - Parts per billion by volume.

(1) - Start time weather information: 75-80 degrees F,, Wind speed 0-4mph; Barometric pressure 30.13 inches.

(2) - End time weather information: 75-80 degrees F, Wind speed 0-9 mph; Barometric pressure 29.97 inches.

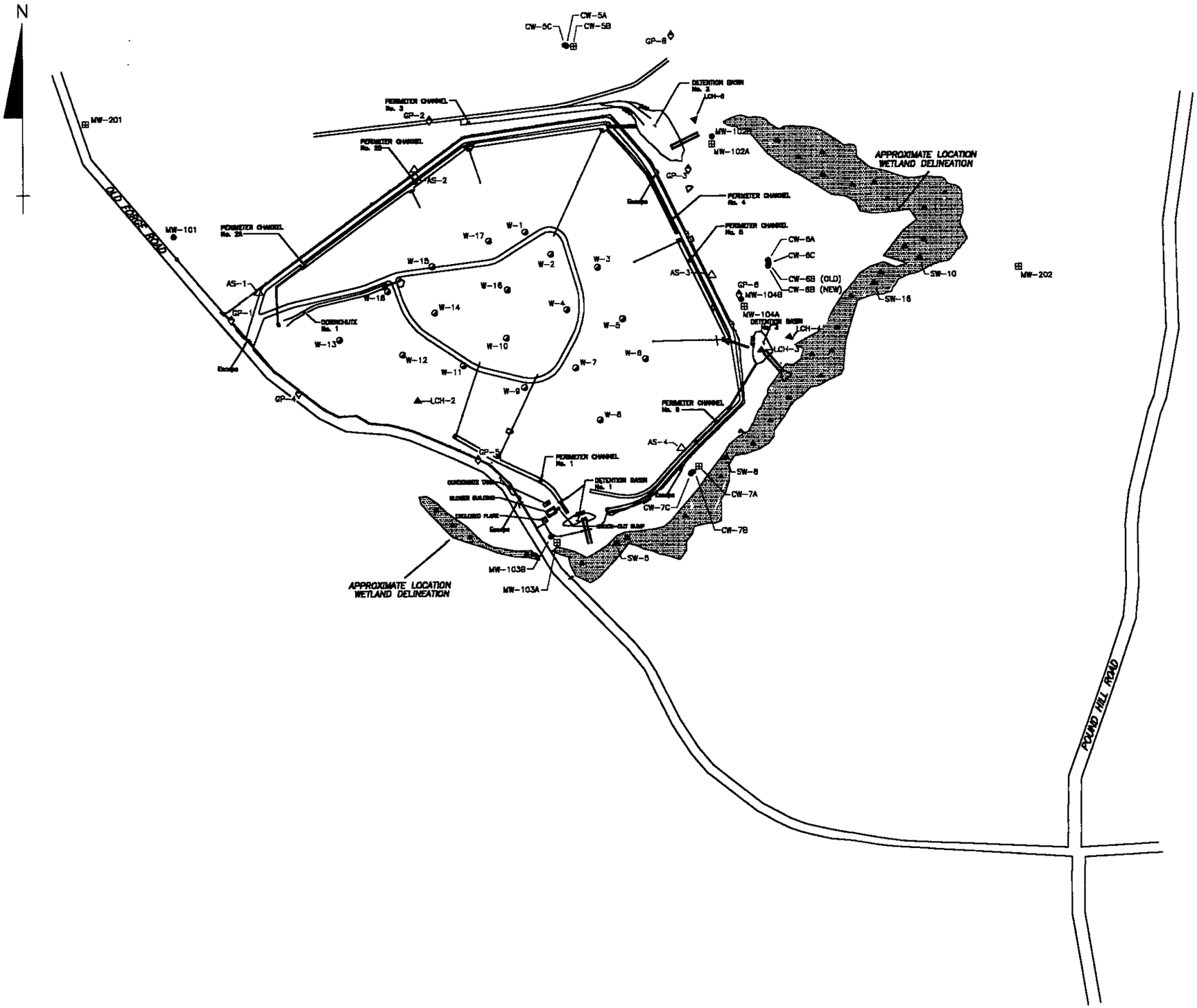
f:\om\353\qpro\tabs7200.wb2 TAB: AIR

TABLE 9: FLARE INLET SAMPLING DATA, L&RR SUPERFUND SITE, AUGUST 15 2000

Sampling Location Start date End date	Flare Inlet August 15, 2000 August 15, 2000
TO - 14 Compounds Detected (ppbv) *	
Freon 12	220
Freon 114	156
Methylene Chloride	1337
Vynyl Chloride	1680
Ethyl Chloride	205
Dichloromethane	682
1,1-Dichloroethane	504
cis, 1,2-Dichloroethylene	34
Benzene	267
Trichloroethylene	349
Toluene	56300
Trans-1,3-Dichloropropene	22
Tetrachloroethylene	488
Chlorobenzene	47
Ethyl Benzene	3730
1,3-Xylene+1,4-Xylene	7030
1,2-Xylene	1610
4-Ethyltoluene	251
Non-target Compouds Detected	
Trans-1,2-Dichloroethylene	1080

Notes:

Figure



LEGEND:

W-1	GAS WELL
GP-6	GAS PROBE
MW-104B	GROUNDWATER MONITORING WELL
	POST-CLOSURE GROUNDWATER MONITORING WELL
SW-5	SURFACE WATER SAMPLING LOCATION
AS-1	AMBIENT AIR MONITORING LOCATION

NOTE:

1) TOPOGRAPHIC DATA, LOCATIONS, AND PROPERTY BOUNDARIES SURVEYED BY DAWSON SURVEYING AND ENGINEERING COMPANY, NOVEMBER 1994, SEPTEMBER 1995 AND SEPTEMBER 1998.
2) ftamsl - Feet above mean sea level.

SCALE
200 0 200 400 FEET

SAMPLE LOCATION PLAN

L&RR SUPERFUND SITE
NORTH SMITHFIELD, RHODE ISLAND
PREPARED FOR
THE L&RR GROUP

O & M, Inc. Environmental Operations and Maintenance Management

DATE:	1-25-00	FIGURE 1	DRAWING NAME
SCALE:	AS SHOWN		SAMPLE LOCATION PLAN

Appendix A

Inspection Reports

TABLE 2-1
L&RR SUPERFUND SITE
INSPECTION LOG

Inspector Name: Clayton Smith
Date: 2/15/2000 Time On Site: 11:00 AM
Weather: Clear
Signature: Clayton Smith

CORRECTIVE MEASURES						
Feature	**Trouble Signs**	**Status**	**Problem Location**	**Description of Problem**	**Action**	**Date**
1. Security System		Good Condition				
a. Gate	Inoperative					
b. Fence	Holes					
c. Locks	Inoperative					
d. Signs	Missing, Unreadable					
2. Cover Integrity		Good Condition (Except where noted)	Surface Feature (see note)	Sloughing (see note)	Document and Observe area	2/15/00
a Surface Features	Animal Burrows, Other Holes, Cracks					
b Slopes	Washouts and Sloughing					
c. Vegetation	Brushes/Tree Growth, Bare Spots					
d Breakouts	Washouts and Discoloration					
3. Stormwater Management System		Good Condition				
a Diversion Swales	Ponding Water, Filling and Sediment					
b. Catch Basins	Filling with Sediment, Blocked by Debris					
c. Stilling Wells	Filling with Sediment					
d. Perimeter Channels	Filling with Sediment, Riprap Lining Disturbed					
e. Culverts	Blocked, Damaged, Riprap Outlets Disturbed					
f Detention Basins	Filling with Sediment, Riprap Outlets Disturbed					
4. Groundwater Monitoring Wells		Good Condition				
a Locking Cap	Broken, No Lock					
b Protective Casing	Cracked, Missing					
c Concrete Collar	Cracked, Missing					
d Local Erosian	Ponding, Water Channels					
5. Landfill Gas Monitoring and Collection System		Good Condition				
a LFG Extraction Wells	Physical Damage to Casing, Wellhead, Sampling Port					
b LFG Migration Probes	Physical Damage to Casing					
c. Control Panel	Recording Paper and Pens Empty					
6. Permanent Monuments		Good Condition				
a. Bench Marks	Tilting/Heaving					
b Settlement Monuments	Tilting /Heaving					

COMMENTS:
A small area of sloughing, approximately 10' X 10' and one foot deep was observed near gas well #8. The area maintains positive drainage and was not ponding water. The area will be observed for any further sloughing.

TABLE 2-1
L&RR SUPERFUND SITE
INSPECTION LOG

Inspector Name: Clayton Smith
Date: 3/15/2000 Time On Site: 8:00 AM
Weather: Clear
Signature: Clayton Smith

CORRECTIVE MEASURES

Feature	Trouble Signs	Status	Problem Location	Description of Problem	Action	Date
1. Security System		Good Condition				
a. Gate	Inoperative					
b. Fence	Holes					
c. Locks	Inoperative					
d. Signs	Missing, Unreadable					
2. Cover Integrity		Good Condition (Except where noted)	Surface Feature (see note)	Animal Burrows (see note)	Filled burrow holes	3/15/00
a. Surface Features	Animal Burrows, Other Holes, Cracks					
b. Slopes	Washouts and Sloughing					
c. Vegetation	Brushes/Tree Growth, Bare Spots					
d. Breakouts	Washouts and Discoloration					
3. Stormwater Management System		Good Condition				
a. Diversion Swales	Ponding Water, Filling and Sediment					
b. Catch Basins	Filling with Sediment, Blocked by Debris					
c. Stilling Wells	Filling with Sediment					
d Perimeter Channels	Filling with Sediment, Riprap Lining Disturbed					
e Culverts	Blocked, Damaged, Riprap Outlets Disturbed					
f. Detention Basins	Filling with Sediment, Riprap Outlets Disturbed					
4. Groundwater Monitoring Wells		Good Condition				
a. Locking Cap	Broken, No Lock					
b. Protective Casing	Cracked, Missing					
c. Concrete Collar	Cracked, Missing					
d. Local Erosian	Ponding, Water Channels					
5. Landfill Gas Monitoring and Collection System		Good Condition				
a. LFG Extraction Wells	Physical Damage to Casing, Wellhead, Sampling Port					
b. LFG Migration Probes	Physical Damage to Casing					
c. Control Panel	Recording Paper and Pens Empty					
6. Permanent Monuments		Good Condition				
a. Bench Marks	Tilting/Heaving					
b. Settlement Monuments	Tilting /Heaving					

COMMENTS:
Four small burrow holes were noted on the landfill surface. Corrective action was to fill each hole and apply grass seed to the area. The small area of sloughing, noted during the Febuary Inspection (3/15/2000), near gas well #8 was repaired (filled with topsoil and seeded) on 3/3/2000. Routine maintenace to Blower Number 2 was completed this period.

TABLE 2-1
L&RR SUPERFUND SITE
INSPECTION LOG

Inspector Name: Clayton Smith
Date: 4/20/2000 Time On Site: 8:00 AM
Weather: Clear
Signature: Clayton Smith

CORRECTIVE MEASURES

Feature	Trouble Signs	Status	Problem Location	Description of Problem	Action	Date
1. Security System		Good Condition				
a. Gate	Inoperative					
b. Fence	Holes					
c. Locks	Inoperative					
d. Signs	Missing, Unreadable					
2. Cover Integrity		Good Condition (Except where noted)	Surface Feature (see note)	Sloughing (see note)	Scheduled corrective action	4/20/00
a. Surface Features	Animal Burrows, Other Holes, Cracks					
b. Slopes	Washouts and Sloughing					
c. Vegetation	Brushes/Tree Growth, Bare Spots					
d. Breakouts	Washouts and Discoloration					
3. Stormwater Management System		Good Condition				
a. Diversion Swales	Ponding Water, Filling and Sediment					
b. Catch Basins	Filling with Sediment, Blocked by Debris					
c. Stilling Wells	Filling with Sediment					
d. Perimeter Channels	Filling with Sediment, Riprap Lining Disturbed					
e. Culverts	Blocked, Damaged, Riprap Outlets Disturbed					
f. Detention Basins	Filling with Sediment, Riprap Outlets Disturbed					
4. Groundwater Monitoring Wells		Good Condition				
a. Locking Cap	Broken, No Lock					
b. Protective Casing	Cracked, Missing					
c. Concrete Collar	Cracked, Missing					
d. Local Erosian	Ponding, Water Channels					
5. Landfill Gas Monitoring and Collection System		Good Condition				
a. LFG Extraction Wells	Physical Damage to Casing, Wellhead, Sampling Port					
b. LFG Migration Probes	Physical Damage to Casing					
c. Control Panel	Recording Paper and Pens Empty					
6. Permanent Monuments		Good Condition				
a. Bench Marks	Tilting/Heaving					
b. Settlement Monuments	Tilting /Heaving					

COMMENTS: Three small areas of sloughing were noted on the landfill surface. The areas are approximatly 20 LF apart from each other and located on a fairly level area approximatly 50 LF northeast of gas probe #4. The first area noted is approximatly 12 feet in diameter and 1.5 feet deep, the second area is approximatly 8 feet in diameter and .5 feet deep and the third area is approximatly 5 feet in diameter and .5 foot deep. Corrective action will be to fill each area with topsoil and apply grass seed to any disturbed areas.

TABLE 2-1
L&RR SUPERFUND SITE
INSPECTION LOG

Inspector Name: Clayton Smith
Date: 5/25/2000 Time On Site: 8:00 AM
Weather: Clear
Signature: Clayton Smith

CORRECTIVE MEASURES						
Feature	**Trouble Signs**	**Status**	**Problem Location**	**Description of Problem**	**Action**	**Date**
1. Security System		Good Condition				
a. Gate	Inoperative					
b. Fence	Holes					
c. Locks	Inoperative					
d. Signs	Missing, Unreadable					
2. Cover Integrity		Good Condition				
a. Surface Features	Animal Burrows, Other Holes, Cracks					
b. Slopes	Washouts and Sloughing					
c. Vegetation	Brushes/Tree Growth, Bare Spots					
d. Breakouts	Washouts and Discoloration					
3. Stormwater Management System		Good Condition				
a. Diversion Swales	Ponding Water, Filling and Sediment					
b. Catch Basins	Filling with Sediment, Blocked by Debris					
c. Stilling Wells	Filling with Sediment					
d Perimeter Channels	Filling with Sediment, Riprap Lining Disturbed					
e. Culverts	Blocked, Damaged, Riprap Outlets Disturbed					
f. Detention Basins	Filling with Sediment, Riprap Outlets Disturbed					
4. Groundwater Monitoring Wells		Good Condition				
a. Locking Cap	Broken, No Lock					
b. Protective Casing	Cracked, Missing					
c. Concrete Collar	Cracked, Missing					
d. Local Erosian	Ponding, Water Channels					
5. Landfill Gas Monitoring and Collection System		Good Condition (Except where noted)	LFG Extraction Well (see note)	Well Head & Flex Coupler (see note)	Closed Well #13 and Scheduled corrective action	5/25/000
a. LFG Extraction Wells	Physical Damage to Casing, Wellhead, Sampling Port					
b. LFG Migration Probes	Physical Damage to Casing					
c. Control Panel	Recording Paper and Pens Empty					
6. Permanent Monuments		Good Condition				
a. Bench Marks	Tilting/Heaving					
b. Settlement Monuments	Tilting /Heaving					

COMMENTS: The three small areas of sloughing noted on the 4/20/00 Inspection Log were repaired. Extraction Well #13 recorded high percent oxygen content and was closed on 5/25/00. The flex coupler on extraction well #7 apeared to be overstressed. Extension of the flex coupler on extraction well #7 was scheduled for 5/1/00. The extent of any necessary corrective action repair to extracton Well #13 will be determined on 5/1/00 and the well will remain closed until determination of further corrective action can be made.

TABLE 2-1
L&RR SUPERFUND SITE
INSPECTION LOG

Inspector Name: Clayton Smith
Date: 6/30/2000 Time On Site: 8:00 AM
Weather: Clear
Signature: Clayton Smith

CORRECTIVE MEASURES						
Feature	**Trouble Signs**	**Status**	**Problem Location**	**Description of Problem**	**Action**	**Date**
1. Security System		Good Condition				
a. Gate	Inoperative					
b. Fence	Holes					
c. Locks	Inoperative					
d. Signs	Missing, Unreadable					
2. Cover Integrity		Good Condition				
a. Surface Features	Animal Burrows, Other Holes, Cracks					
b. Slopes	Washouts and Sloughing					
c. Vegetation	Brushes/Tree Growth, Bare Spots					
d. Breakouts	Washouts and Discoloration					
3. Stormwater Management System		Good Condition				
a. Diversion Swales	Ponding Water, Filling and Sediment					
b. Catch Basins	Filling with Sediment, Blocked by Debris					
c. Stilling Wells	Filling with Sediment					
d. Perimeter Channels	Filling with Sediment, Riprap Lining Disturbed					
e. Culverts	Blocked, Damaged, Riprap Outlets Disturbed					
f. Detention Basins	Filling with Sediment, Riprap Outlets Disturbed					
4. Groundwater Monitoring Wells		Good Condition				
a. Locking Cap	Broken, No Lock					
b. Protective Casing	Cracked, Missing					
c. Concrete Collar	Cracked, Missing					
d. Local Erosion	Ponding, Water Channels					
5. Landfill Gas Monitoring and Collection System		Good Condition				
a. LFG Extraction Wells	Physical Damage to Casing, Wellhead, Sampling Port					
b. LFG Migration Probes	Physical Damage to Casing					
c. Control Panel	Recording Paper and Pens Empty					
6. Permanent Monuments		Good Condition				
a. Bench Marks	Tilting/Heaving					
b. Settlement Monuments	Tilting /Heaving					
COMMENTS: The hyper extended flex coupler and corrective action repair inspection noted on the 5/25/00-inspection log concerning gas extraction wells #7 and # 13 were completed on 5/1/00.						

TABLE 2-1
L&RR SUPERFUND SITE
INSPECTION LOG

Inspector Name: Clayton Smith
Date: 7/24/00 Time On Site: 8:30 AM
Weather: Clear
Signature: Clayton Smith

CORRECTIVE MEASURES						
Feature	**Trouble Signs**	**Status**	**Problem Location**	**Description of Problem**	**Action**	**Date**
1. Security System		Good Condition				
a. Gate	Inoperative					
b. Fence	Holes					
c. Locks	Inoperative					
d Signs	Missing, Unreadable					
2. Cover Integrity		Good Condition				
a. Surface Features	Animal Burrows, Other Holes, Cracks					
b. Slopes	Washouts and Sloughing					
c. Vegetation	Brushes/Tree Growth, Bare Spots					
d Breakouts	Washouts and Discoloration					
3. Stormwater Management System		Good Condition				
a. Diversion Swales	Ponding Water, Filling and Sediment					
b. Catch Basins	Filling with Sediment, Blocked by Debris					
c. Stilling Wells	Filling with Sediment					
d. Perimeter Channels	Filling with Sediment, Riprap Lining Disturbed					
e Culverts	Blocked, Damaged, Riprap Outlets Disturbed					
f. Detention Basins	Filling with Sediment, Riprap Outlets Disturbed					
4. Groundwater Monitoring Wells		Good Condition				
a. Locking Cap	Broken, No Lock					
b. Protective Casing	Cracked, Missing					
c. Concrete Collar	Cracked, Missing					
d. Local Erosion	Ponding, Water Channels					
5. Landfill Gas Monitoring and Collection System		Good Condition				
a. LFG Extraction Wells	Physical Damage to Casing, Wellhead, Sampling Port					
b. LFG Migration Probes	Physical Damage to Casing					
c. Control Panel	Recording Paper and Pens Empty					
6. Permanent Monuments		Good Condition				
a. Bench Marks	Tilting/Heaving					
b. Settlement Monuments	Tilting /Heaving					
COMMENTS: None						

TABLE 2-1
L&RR SUPERFUND SITE
INSPECTION LOG

Inspector Name: Clayton Smith
Date: 8/14/00 Time On Site: 8:30 AM
Weather: Cloudy/Lt. Rain
Signature: Clayton Smith

CORRECTIVE MEASURES						
Feature	**Trouble Signs**	**Status**	**Problem Location**	**Description of Problem**	**Action**	**Date**
1. Security System a. Gate b. Fence c. Locks d. Signs	 Inoperative Holes Inoperative Missing, Unreadable	Good Condition				
2. Cover Integrity a. Surface Features b. Slopes c. Vegetation d. Breakouts	 Animal Burrows, Other Holes, Cracks Washouts and Sloughing Brushes/Tree Growth, Bare Spots Washouts and Discoloration	Good Condition				
3. Stormwater Management System a. Diversion Swales b. Catch Basins c. Stilling Wells d. Perimeter Channels e. Culverts f. Detention Basins	 Ponding Water, Filling and Sediment Filling with Sediment, Blocked by Debris Filling with Sediment Filling with Sediment, Riprap Lining Disturbed Blocked, Damaged, Riprap Outlets Disturbed Filling with Sediment, Riprap Outlets Disturbed	Good Condition				
4. Groundwater Monitoring Wells a. Locking Cap b. Protective Casing c. Concrete Collar d. Local Erosion	 Broken, No Lock Cracked, Missing Cracked, Missing Ponding, Water Channels	Good Condition				
5. Landfill Gas Monitoring and Collection System a. LFG Extraction Wells b. LFG Migration Probes c. Control Panel	 Physical Damage to Casing, Wellhead, Sampling Port Physical Damage to Casing Recording Paper and Pens Empty	Good Condition (Except where noted)	Flare	Intermittent flare shutdowns	Scheduled John Zink Technician	
6. Permanent Monuments a. Bench Marks b. Settlement Monuments	 Tilting/Heaving Tilting /Heaving	Good Condition				

COMMENTS:
The flare has been experiencing intermittent shutdowns. A John Zink Co. technician is scheduled to complete the semi-annual flare inspection and to further investigate the intermittent flare shutdown problem the week of August 28.

TABLE 2-1
L&RR SUPERFUND SITE
INSPECTION LOG

Inspector Name: Clayton Smith
Date: 9/12/00 Time On Site: 8:30 AM
Weather: Clear
Signature: C. Smith

CORRECTIVE MEASURES						
Feature	**Trouble Signs**	**Status**	**Problem Location**	**Description of Problem**	**Action**	**Date**
1. Security System		Good Condition				
a. Gate	Inoperative					
b. Fence	Holes					
c. Locks	Inoperative					
d. Signs	Missing, Unreadable					
2. Cover Integrity		Good Condition				
a. Surface Features	Animal Burrows, Other Holes, Cracks					
b. Slopes	Washouts and Sloughing					
c. Vegetation	Brushes/Tree Growth, Bare Spots					
d. Breakouts	Washouts and Discoloration					
3. Stormwater Management System		Good Condition				
a. Diversion Swales	Ponding Water, Filling and Sediment					
b. Catch Basins	Filling with Sediment, Blocked by Debris					
c. Stilling Wells	Filling with Sediment					
d. Perimeter Channels	Filling with Sediment, Riprap Lining Disturbed					
e. Culverts	Blocked, Damaged, Riprap Outlets Disturbed					
f. Detention Basins	Filling with Sediment, Riprap Outlets Disturbed					
4. Groundwater Monitoring Wells		Good Condition				
a. Locking Cap	Broken, No Lock					
b. Protective Casing	Cracked, Missing					
c. Concrete Collar	Cracked, Missing					
d. Local Erosion	Ponding, Water Channels					
5. Landfill Gas Monitoring and Collection System		Good Condition				
a. LFG Extraction Wells	Physical Damage to Casing, Wellhead, Sampling Port					
b. LFG Migration Probes	Physical Damage to Casing					
c. Control Panel	Recording Paper and Pens Empty					
6. Permanent Monuments		Good Condition				
a. Bench Marks	Tilting/Heaving					
b. Settlement Monuments	Tilting/Heaving					

COMMENTS: As noted in the August 14, 2000 inspection report, the flare was experiencing intermittent shutdowns and a John Zink Co. technician was scheduled to investigate the problem. The John Zink technician determined that the cause for the intermittent shutdowns was a faulty louvre control. The louvre control automatically regulates the air intake to the flare which in turn controls the flare temperature. At times, the faulty louver did not allow enough air to the flare causing a low temperature flare shutdown. The louvre control was replaced during the week of August 28, 2000. The flare has been in continuous operation following replacement of the louver control.

TABLE 2-1
L&RR SUPERFUND SITE
INSPECTION LOG

Inspector Name: Clayton Smith
Date: 10/19/00 Time On Site: 8:30 AM
Weather: Clear
Signature: Clayton Smith

CORRECTIVE MEASURES						
Feature	**Trouble Signs**	**Status**	**Problem Location**	**Description of Problem**	**Action**	**Date**
1. Security System a. Gate b. Fence c. Locks d. Signs	 Inoperative Holes Inoperative Missing, Unreadable	Good Condition				
2. Cover Integrity a. Surface Features b. Slopes c. Vegetation d. Breakouts	 Animal Burrows, Other Holes, Cracks Washouts and Sloughing Brushes/Tree Growth, Bare Spots Washouts and Discoloration	Good Condition				
3. Stormwater Management System a. Diversion Swales b. Catch Basins c. Stilling Wells d. Perimeter Channels e. Culverts f. Detention Basins	 Ponding Water, Filling and Sediment Filling with Sediment, Blocked by Debris Filling with Sediment Filling with Sediment, Riprap Lining Disturbed Blocked, Damaged, Riprap Outlets Disturbed Filling with Sediment, Riprap Outlets Disturbed	Good Condition				
4. Groundwater Monitoring Wells a. Locking Cap b Protective Casing c. Concrete Collar d. Local Erosion	 Broken, No Lock Cracked, Missing Cracked, Missing Ponding, Water Channels	Good Condition				
5. Landfill Gas Monitoring and Collection System a. LFG Extraction Wells b. LFG Migration Probes c. Control Panel	 Physical Damage to Casing, Wellhead, Sampling Port Physical Damage to Casing Recording Paper and Pens Empty	Good Condition (Except where noted)	LFG Extraction Wells	Strained Flex Coupler	Schedule Maintenance	Target Maint. Date: 10/20/00
6. Permanent Monuments a. Bench Marks b. Settlement Monuments	 Tilting/Heaving Tilting /Heaving	Good Condition				

COMMENTS: As noted on the 10/19/00 Field Well Monitoring Data Sheet (Data Sheet), methane concentration in monitoring probes #1 and #4 were above criteria established in the PC/O&M Plan. Also noted on the Data Sheet the flex couplers on gas wells 12, 14 and 18 were strained. Immediate corrective action was to schedule maintenance of the flex couplers noted.

L&RR SUPERFUND SITE
INSPECTION LOG

Inspector Name: John Hunt
Date: 11/16/00 Time On Site: 0800
Weather: Sunny
Signature:

CORRECTIVE MEASURES

Feature	Trouble Signs	Status	Problem Location	Description of Problem	Action	Date
1. Security System a. Gate b. Fence c. Locks d. Signs	 a. Inoperative b. Holes c. Inoperative d. Missing, Unreadable	Good Condition				
2. Cover Integrity a. Surface Features b. Slopes c. Vegetation d. Breakouts	 a. Animal Burrows, Other Holes, Cracks b. Washouts and Sloughing c. Brushes/Tree Growth, Bare Spots d. Washouts and Discoloration	Good Condition				
3. Stormwater Management System a. Diversion Swales b Catch Basins c. Stilling Wells d. Perimeter Channels e. Culverts f. Detention Basins	 a. Ponding Water, Filling and Sediment b. Filling with Sediment, Blocked by Debris c. Filling with Sediment d. Filling with Sediment, Riprap Lining Disturbed e. Blocked, Damaged, Riprap Outlets Disturbed f. Filling with Sediment, Riprap Outlets Disturbed	Good Condition				
4. Groundwater Monitoring Wells a. Locking Cap b. Protective Casing c. Concrete Collar d. Local Erosion	 a. Broken, No Lock b. Cracked, Missing c. Cracked, Missing d. Ponding, Water Channels	Good Condition				
5. Landfill Gas Monitoring and Collection System a. LFG Extraction Wells b. LFG Migration Probes c. Control Panel	 a. Physical Damage to Casing, Wellhead, Sampling Port b. Physical Damage to Casing c. Recording Paper and Pens Empty	Good Condition				
6. Permanent Monuments a. Bench Marks b. Settlement Monuments	 a. Tilting/Heaving b. Tilting /Heaving	Good Conditions				

COMMENTS:

Appendix B

Gas Monitoring Data

LANDFILL & RESOURCE RECOVERY SUPERFUND SITE
FIELD GAS WELL MONITORING DATA SHEET

Date: 2/15/00 By: C. Smith

Weather Conditions: Clear Temp: 40° Barometric Pressure: 29.9

System Conditions: Good Control Temp (TIC201): 1603 Flame Temp (TISH101): 1589 Flow (cfm): 426

Well No.	Time	CH_4 (%)	CO_2 (%)	O_2 (%)	Temp (°F)	Pressure (in H_2O)	Comments
1	11:00	52.7	43.1	0.2	78°	-12.1	
2		53.7	41.0	0.1	101	-5.1	
3		48.6	41.5	0.0	88	-7.8	
4		50.5	38.2	0.1	90	-5.8	
5		35.6	40.2	0.0	38	-5.0	
6		3.0	11.5	11.2	45	-0.3	Well Closed
7		54.2	42.1	0.0	90	-7.1	
8		0.5	16.7	19.5	40	-1.2	Well Closed
9		40.1	37.1	0.0	80	-7.1	
10		50.1	38.2	0.1	82	-6.0	
11		43.2	38.5	0.0	70	-7.2	
12		53.3	36.2	0.0	88	-5.8	
13		58.5	43.2	0.0	80	-1.3	
14		52.5	35.1	0.0	90	-5.7	
15		50.5	40.6	0.1	80	-6.5	
16		0.5	0.3	16.7	35	-0.4	Well Closed
17		55.4	42.0	0.1	90	-7.2	
18	12:30	57.8	40.2	0.0	76	-6.8	
Probe							
1		0.0	3.4	17.8			
2							
3							
4		0.0	5.4	14.9			
5							
6							
7							
8		0.0	1.1	15.4			
Flare		54.5	42.7	0.0			
Blower		50.8	41.8	0.2			

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LANDFILL & RESOURCE RECOVERY SUPERFUND SITE
FIELD GAS WELL MONITORING DATA SHEET

Date: 3/16/00 By: Clayton Smith

Weather Conditions: Clear Temp: 52° Barometric Pressure: 29.9

System Conditions: Good Control Temp (TIC201): 1608 Flame Temp (TISH101): 1580 Flow (cfm): 435

Well No.	Time	CH_4 (%)	CO_2 (%)	O_2 (%)	Temp (°F)	Pressure (in H_2O)	Comments
1	1030	53.5	42.9	0.0	84°	-10.4	
2		50.6	41.2	0.3	106	-8.0	
3		36.6	33.8	1.2	92	-1.1	
4		46.7	36.5	0.4	90	-8.0	
5		38.2	28.4	5.4	42	-0.5	
6		0.7	8.5	15.5	50	0.0	Well Closed
7		41.9	32.3	0.0	98	-1.3	
8		0.0	0.0	19.0	50	-2.3	Well Closed
9		42.6	34.6	0.0	92	-4.2	
10		48.7	38.9	0.0	88	-1.6	
11		41.3	34.5	0.0	90	-2.3	
12		32.2	30.9	0.0	98	-0.3	
13		45.7	38.3	0.0	62	-0.6	
14		55.0	40.8	0.1	84	-0.2	
15		51.1	41.9	0.0	82	-3.5	
16		5.2	3.6	19.2	86	-1.4	Well Closed
17		52.8	41.5	0.0	92	-3.6	
18		54.2	41.0	0.0	80	-2.4	
Probe							
(1)		0.0	3.6	19.6			
~~2~~							
~~3~~							
(4)		0.0	1.4	18.7			
~~5~~							
~~6~~							
~~7~~							
(8)		0.0	2.7	9.10			
Flare	↓	46.0	36.9	0.0			
Blower	1330	46.8	38.7	0.2			

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LANDFILL & RESOURCE RECOVERY SUPERFUND SITE
FIELD GAS WELL MONITORING DATA SHEET

Date: 4/18/2000 By: C. Smith

Weather Conditions: Cloudy Temp: 50° Barometric Pressure: 30.1

System Conditions: Good Control Temp (TIC201): 1601 Flame Temp (TISH101): 1537 Flow (cfm): 420

Well No.	Time	CH_4 (%)	CO_2 (%)	O_2 (%)	Temp (°F)	Pressure (in H_2O)	Comments
1	0830	51.7	39.8	0.0	82	-7.2	
2		53.6	38.9	0.1	108	-4.2	
3		50.1	39.1	0.1	90	-2.1	
4		53.4	36.1	6.3	90	-3.1	
5		55.7	41.4	0.2	40	-0.8	
6		3.0	7.2	15.6	50	-0.1	Well closed
7		55.5	42.0	0.0	100	-0.5	
8		53.9	40.4	12.0	40	-0.2	Well closed
9		47.6	35.4	0.2	85	-1.0	
10		41.8	31.8	0.0	85	-1.4	
11		55.2	32.4	0.4	78	-0.7	
12		53.8	41.3	0.0	90	-1.6	
13		55.1	41.1	0.0	50	-2.1	
14		49.7	38.7	0.0	80	-2.4	
15		50.7	38.1	0.0	84	-2.1	
16		55.3	38.3	15.8	40	-1.9	Well Closed
17		49.7	36.7	0.0	92	-2.7	
18		51.8	38.9	0.0	80	-2.8	
Probe							
(1)		0.0	6.1				
~~2~~							
~~3~~							
(4)		0.0	4.3				
~~5~~							
~~6~~							
~~7~~							
(8)		0.0	2.0	15.8			
Flare		49.9	40.8	0.1			
Blower	1045	47.7	38.7	1.1			

LANDFILL & RESOURCE RECOVERY SUPERFUND SITE
FIELD GAS WELL MONITORING DATA SHEET

Date: 5/25/00 By: C. Smith

Weather Conditions: Cloudy Temp: 64°F Barometric Pressure: _____

System Conditions: Good Control Temp (TIC201): 1602 Flame Temp (TISH101): 1684 Flow (cfm): 450

Well No.	Time	CH_4 (%)	CO_2 (%)	O_2 (%)	Temp (°F)	Pressure (in H_2O)	Comments
1	0800	45.5	39.6	0.0	92°	-16.1	
2		36.6	34.9	0.0	110	-12.6	
3		21.4	26.2	0.0	90	-2.1	
4		33.0	31.2	0.0	90	-12.8	
5		45.7	40.1	0.4	52	-1.2	
6		0.4	9.1	15.1	60	-0.6	Well Closed
7		44.0	36.2	1.7	100	-4.8	Flex Coupler to rigid
8		0.1	0.0	18.6	60	-3.6	Well Closed
9		22.1	26.5	0.1	92	-8.5	
10		38.5	36.9	0.0	89	-7.7	
11		32.1	29.8	0.0	80	-7.3	
12		29.4	32.1	0.0	98	-6.7	
13		0.3	0.2	18.8	75	-2.6	Closed Well this Inspection
14		43.6	39.5	0.0	90	-6.3	
15		38.0	34.4	0.0	80	-7.1	
16		38.6	36.5	15.4	62	-6.5	Well Closed
17		39.2	35.0	0.3	98	-6.7	
18		42.6	37.5	0.0	80	-5.3	
Probe							
1		0.0	6.4	10.3			
2							
3							
4		0.0	3.0	15.5			
5							
6							
7							
8		0.0	7.8	14.6			
Flare		38.5	34.2	0.2			
Blower	1130	37.6	32.8	0.8			

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LANDFILL & RESOURCE RECOVERY SUPERFUND SITE
FIELD GAS WELL MONITORING DATA SHEET

Date: 6/8/00 By: C. Smith

Weather Conditions: Clear/Calm Temp: _____ Barometric Pressure: 30.1

System Conditions: Good Control Temp (TIC201): 1595 Flame Temp (TISH101): 1655 Flow (cfm): 425

Well No.	Time	CH_4 (%)	CO_2 (%)	O_2 (%)	Temp (°F)	Pressure (in H_2O)	Comments
1	0800	47.5	39.9	0.8	92	-14.2	
2		41.2	39.8	0.0	110	-11.2	
3		30.8	29.9	0.3	100	-9.2	
4		32.8	29.0	1.3	90	-11.1	
5		40.7	31.8	4.0	60	-5.5	
6		0.7	14.7	14.5	60	-0.6	Well Closed
7		49.1	40.6	0.6	100	-10.2	
8		0.3	0.1	19.9	60	-3.9	Well closed
9		22.7	26.7	0.2	90	-7.8	
10		38.7	34.4	0.1	90	-7.0	
11		33.2	30.1	0.1	85	-6.8	
12		34.8	32.7	0.0	100	-6.3	
13		38.2	18.8	7.9	90	-2.2	Well Closed
14		45.1	37.4	0.2	92	-5.3	
15		40.5	32.9	0.8	90	-6.0	
16		0.5	0.1	20.0	60	-6.1	Well Closed
17		43.2	34.4	0.8	100	-6.7	
18		45.1	38.7	0.1	85	-4.9	
Probe							
1		0.0	4.8	12.8			
2							
3							
4		0.0	3.6	16.1			
5							
6							
7							
8		0.0	7.8	15.2			
Flare		44.5	34.2	0.2			
Blower	1130	43.2	33.3	0.3			

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LANDFILL & RESOURCE RECOVERY SUPERFUND SITE
FIELD GAS WELL MONITORING DATA SHEET

Date: 7/24/00 By: C. Smith

Weather Conditions: Clear Temp: 65° Barometric Pressure: 30.1

System Conditions: Good Control Temp (TIC201): 1618 Flame Temp (TISH101): 1716 Flow (cfm): 410

Well No.	Time	CH_4 (%)	CO_2 (%)	O_2 (%)	Temp (°F)	Pressure (in H_2O)	Comments
1	0845	46.3	40.7	1.5	98	-11.4	
2		43.7	37.2	1.0	110	-9.0	
3		39.6	35.4	0.2	98	-1.6	
4		37.6	30.2	1.4	90	-9.4	
5		33.3	26.0	8.5	60	-4.4	
6		2.2	13.2	13.1	60	-0.1	Well Closed
7		50.2	40.8	0.3	100	-8.3	
8		0.2	0.0	20.6	60	-3.3	Well Closed
9		29.2	28.4	0.5	94	-6.9	
10		44.9	35.6	0.2	92	-4.3	
11		36.1	33.3	0.4	90	-6.1	
12		35.7	37.2	0.1	98	-5.1	
13		22.5	12.7	13.1	89	-2.0	Well Closed
14		47.2	40.6	0.1	89	-3.4	
15		43.6	34.1	0.4	90	-8.6	
16		0.5	0.0	20.3	75	-5.7	Well Closed
17		46.9	37.7	0.5	100	-6.0	
18		51.4	41.2	0.1	82	-4.8	
Probe							
(1)		0.1	4.1	15.8			
2							
3							
(4)		0.3	9.3	9.1			
5							
6							
7							
(8)		0.0	8.4	15.1			
Flare		46.4	37.8	0.1			
Blower	1330	44.2	36.7	0.3			

de maximis, inc

LANDFILL & RESOURCE RECOVERY SUPERFUND SITE
FIELD GAS WELL MONITORING DATA SHEET

Date: 8/14/00 By: C. Smith

Weather Conditions: Cloudy / Lt. Rain Temp: 67° Barometric Pressure: 29.95

System Conditions: Fair Control Temp (T_{IC201}): 1502 Flame Temp (T_{ISH101}): 1615 Flow (cfm): 440

Well No.	Time	CH_4 (%)	CO_2 (%)	O_2 (%)	Temp (°F)	Pressure (in H_2O)	Comments
1	0900	55.2	44.0	0.7	98	-4.5	
2		52.7	40.7	0.2	110	-1.8	
3		46.3	40.2	0.3	98	-2.1	
4		42.6	39.8	0.8	92	-3.3	
5		36.6	42.9	0.4	65	-0.1	
6		3.0	43.8	16.1	62	-4.7	Well Closed
7		52.3	42.4	0.3	100	-0.4	
8		1.3	0.2	20.1	60	-0.7	well Closed
9		28.6	27.4	0.0	95	-3.4	
10		41.6	37.6	0.1	92	-0.2	
11		42.6	38.5	0.2	90	-3.4	
12		47.3	35.6	0.0	98	-3.1	
13		20.5	14.7	12.8	90	-1.8	Well Closed
14		41.9	40.6	0.0	90	-2.6	
15		48.6	42.8	0.1	90	-2.4	
16		0.1	2.8	18.6	75	-3.5	Well Closed
17		48.1	41.6	0.2	100	-3.7	
18		42.8	43.7	0.1	82	-2.4	
Probe							
1		1.4	17.8	6.9			
2							
3							
4		5.6	15.4	4.8			
5							
6							
7							
8		0.0	6.8	15.4			
Flare		52.1	43.2	0.6			
Blower	1050	47.2	38.7	0.3			

de maximis, inc.

LANDFILL & RESOURCE RECOVERY SUPERFUND SITE
FIELD GAS WELL MONITORING DATA SHEET

Date: 9/21/00 By: C. Smith

Weather Conditions: Cloudy Temp: 75° Barometric Pressure: 29.67

System Conditions: Good Control Temp (TIC201): 1587 Flame Temp (TISH101): 1542 Flow (cfm): 435

Well No.	Time	CH_4 (%)	CO_2 (%)	O_2 (%)	Temp (°F)	Pressure (in H_2O)	Comments
1	1030	53.8	41.2	0.2	100	-6.8	
2		54.2	42.1	0.4	110	-6.2	
3		55.1	43.0	0.2	108	-4.3	
4		54.2	40.3	0.4	92	-5.4	
5		52.3	42.4	0.1	60	-1.3	
6		4.7	14.9	14.1	70	-0.8	Well closed
7		55.6	41.3	0.0	100	-3.4	
8		41.1	32.8	6.1	64	-1.3	Well closed
9		46.6	38.9	0.0	92	-3.9	
10		52.4	37.6	0.1	86	-1.5	
11		48.7	39.6	0.0	82	-3.7	
12		47.6	38.6	10.2	98	-1.2	
13		30.4	17.6	0.2	84	-0.9	
14		52.4	42.6	0.1	92	-2.8	
15		50.1	44.5	0.4	90	-3.2	
16		48.6	33.0	18.5	72	-0.7	Well closed
17		50.1	40.6	0.5	98	-2.5	
18		48.0	42.6	0.4	88	-2.9	
Probe							
1		0.8	6.4	15.6			
2							
3							
4		0.9	1.8	16.7			
5							
6							
7							
8		0.0	6.4	16.2			
Flare	↓	52.2	39.7	1.2			
Blower	1245	49.1	37.6	1.3			

de maximis, inc

LANDFILL & RESOURCE RECOVERY SUPERFUND SITE
FIELD GAS WELL MONITORING DATA SHEET

Date: 10/19/00 By: C Smith

Weather Conditions: Clear Temp: _____ Barometric Pressure: 29.89

System Conditions: Good Control Temp (meas): 1604 Flame Temp (meas): 1627 Flow (cfm): 421

Well No.	Time	CH_4 (%)	CO_2 (%)	O_2 (%)	Temp (°F)	Pressure (in H2O)	Comments
1	0955	55.4	43.2	0.5	108	~~-10~~ -9.8	
2	"	47.6	38.3	0.5	110	-9.40	
3	"	46.6	36.4	0.5	108	-7.2	
4	"	53.2	40.6	0.5	94	-7.5	
5	"	51.3	39.6	2.3	50	-3.1	Well Closed
6	"	4.4	17.2	13.1	58	-0.6	
7	"	55.1	42.1	0.8	96	-5.60	
8	"	8.0	5.9	17.3	50	-1.60	Well Closed
9	"	33.6	32.0	0.5	80	-4.70	
10	"	52.1	40.6	0.4	82	-4.50	
11	"	39.7	34.5	0.4	80	-4.60	
12	"	40.4	37.0	1.0	92	-4.5	Flex Coupler strained
13	"	39.8	26.4	6.7	62	-0.7	
14	"	53.9	41.6	0.4	82	-3.6	Flex Coupler strained
15	"	50.8	39.20	0.5	90	-6.8	
16	"	49.9	33.6	5.0	52	-3.5	Well Closed
17	"	50.3	38.4	1.0	92	-4.3	
18	"	55.6	41.5	0.9	80	-3.0	Flex Coupler Strained
Probe							
1	"	23.3	24.7	0.5			
2	"						
3	"						
4	"	17.4	21.3	4.6			
5	"						
6	"						
7	"						
8	"	0.0	1.5	16.8			
Flare	↓	48.6	34.3	1.4			
Blower	1200	45.4	36.2	2.0			

de maximis, inc.

LANDFILL & RESOURCE RECOVERY SUPERFUND SITE
FIELD GAS WELL MONITORING DATA SHEET

Date: 11/16/00 By: J Hunt

Weather Conditions: Sunny Temp: 30° Barometric Pressure:

System Conditions: Good Control Temp (TIC201): 1597 Flame Temp (TISH101): 1644 Flow (cfm): 379 1600

Well No.	Time	CH_4 (%)	CO_2 (%)	O_2 (%)	Temp (°F)	Pressure (in H_2O)	Comments
1	0900	55.5	41.1	0.4	102°	-9.00	
2		45.5	36.5	0.7	110°	-8.70	
3		37.5	34.6	0.4	104°	-6.90	
4		48.2	39.4	0.4	92°	-7.0	
5		45.6	34.7	4.4	40°	-2.50	
6		3.60	12.7	13.7	52°	+1.0	
7		55.8	41.3	1.0	94°	-5.50	
8		0	0.1	19.4	38°F	-1.2	
9		29.1	30.5	0.8	80°	-4.30	
10		51.0	39.1	0.4	80°	~~-3.80~~	-4.0
11		36.4	32.4	0.4	68°	-3.70	
12		39.5	35.3	0.8	88°	-3.10	
13		18.4	15.1	13.3	50°	-0.80	
14		52.8	39.5	0.6	80°	-3.0	
15		48.7	36.9	0.4	88°	-5.70	
16		43.4	27.8	7.0	38°	-3.30	
17		48.4	38.8	1.0	88°	-4.0	
18		57.1	41.4	0.4	76°	-2.80	
Probe							
1		5.3	19.5	2.70	—	+2.30	
~~2~~							
~~3~~						~~+2.30~~	
4		1.4	11.0	10.6	—	+2.70	
~~5~~							
~~6~~							
~~7~~							
8		0.0	1.5	17.0	-	+1.30	
Gare	↓	44.1	35.0	1.1	-	+6.90	
Blower	1050	41.4	33.3	2.4	—	-15.40	

JOHN ZINK
A KOCH INDUSTRIES COMPANY
East Apache Tulsa, Oklahoma 74121-1220
234-2800 FAX 918/234-1988

Original SO #		New SO #	925757
Customer	de maximis	P.O. #	LR+R Landfill
Invoice Address		Site Address	
Invoice City	Waltham	Site City	N. Smithfield
State, Zip	MA	State, Zip	RI
Requested by	Clayton Smith	Site Contact & Phone Number	

Field Service Engineer: Tim Levandivski

Are T&C's in place? ☑ Yes ☐ No If No, have the Customer sign KJZ T&C's prior to the start of ANY work. If Yes, what type of T&C's?
☐ Technical Asst Agmt ☐ PM Contract @ (rate) ☐ Blanket Contract @ (rate) ☐ Warranty ☐ Other

Type of Work:
(Check ☒ at least one in each section)

☐ Internal
☒ External

☐ TOSG
☐ Burners
☑ Flares
☐ Vapor

☐ Inspection
☐ Startup
☑ Callout
☐ Training

☐ PM
☐ Sales Call
☐ Non-JZ Equip
☐

Date	Time Interval	Chargeable Hours Reg.	Wknd	OT	Warranty Hours	Non Rev	Description of Work Performed
2/7	12:00	4					Install ATC Timer on Condensate Injection System.
							Timer To Replace low level Float.
							High level starts pump, Timer stops pump system after 10 hrs of operation.
							Checked operation - ok.
Sub-Total Hours		4					
Total Hours Worked:		4					

RATE INFORMA
Regular Days @ $ ____ Weekend Days @ $ ____
Reg OT Hours @ $ ____ Wknd OT ____

Required Parts and Sales Price: 1- ATC Timer and Base
Comments or Recommendations:

Work Verified By: Not Available (Customer Representative) 2/7/00 (Date) ____ Phone (Fax)

Work Submitted By: Tim Levandivski (John Zink Representative) 2/7/00 (Date)

☐ Add'l Info. Attached

Trip Expenses:

		Miles	Date	Amount	Date	Amount
Air Fare:						
Mileage:						
Tolls/Taxi:						
Car Rental:		Me				
Hotel:						
Phone/Tips:						
Fuel/Parking						
Meals:						
Misc.:						
Sub-Total:						

Leave Open ☐
Close ☑

Refer to Code List for Valid Codes
Failure Codes:
Repair Codes:

Labor Total:
Expenses Total:
Parts Total: 3
Grand Total: =

Rev. 3/96W

40W

Credit Memo (Apr21/1999)

LLC Invoi

JOHN ZINK
A KOCH INDUSTRIES COMPANY
4920 East Apache Tulsa, Oklahoma 74121-1220
918/234-1800 FAX 918/234-1968

Original SO #		New SO #	910749
Customer	de maximis	P.O. #	
Invoice Address		Site Address	
Invoice City	Waltham	Site City	
State, Zip	MA	State, Zip	
Requested by	Clayton Smith	Site Contact & Phone Number	

Field Service Engineer: Tim Levandusky

Are T&C's in place? ☐ Yes ☐ No If No, have the Customer sign KJZ T&C's prior to the start of ANY work. If Yes, what type of T&C's?
☐ Technical Asst Agmt ☐ PM Contract @ (rate) ☐ Blanket Contract @ (rate) ☐ Warranty ☐ Other

Type of Work: *(Check ☒ at least one in each section)*

☐ Internal ☑ External

☐ TOSG ☐ Burners ☑ Flares ☐ Vapor

☐ Inspection ☐ Startup ☐ Callout ☐ Training

☑ PM ☐ Sales Call ☐ Non-JZ Equip ☐

Date	Time Interval	Chargeable Hours Reg.	Wknd	OT	Warranty Hours	Non Rev	Description of Work Performed
8/9	7:30	10					BI-ANUAL INSPECTION OF Flare SYSTEM.
							Cleaned Flame arrester To Flare
							Checked Blowers, greased all Bearings.
							Cleaned Condensate gun and all strainers.
							Checked Full operation of Flare
							Unit running properly.
Sub-Total Hours		10					
Total Hours Worked:		10					

RATE INFORMATION:
Regular Days @ $_____ Weekend Days @ $_____
Reg OT Hours @ $_____ Wknd OT Hours @ $_____

Required Parts and Sales Price
Comments or Recommendations

Work Verified By: _____ _____ _____
Customer Representative Date Phone (Fax)

Work Submitted By: _____ 8/9/00 ☐ Add'l Info. Attached
John Zink Representative Date

Trip Expenses:

Air Fare:	
Mileage:	
Tolls/Taxi:	
Car Rental:	
Hotel:	
Phone/Tips:	
Fuel/Parking	
Meals:	
Misc.:	
Sub-Total:	

(_____ Miles @ _____/mile)

Meals:

Date	Amount	Date	Amount

Leave Open ☐
Close ☑

Refer to Code List for Valid Codes

Failure Codes:
Repair Codes:

Labor Total:
Expenses Total:
Parts Total:
Grand Total:

Rev. 3/96W

JOHN ZINK
A COMPANY OF KOCH INDUSTRIES
11920 East Apache Tulsa, Oklahoma 74121-1220
918/234-1800 FAX 918/234-1968

Original SO #		New SO #	930289
Customer	de Maximis	P.O. #	
Invoice Address		Site Address	LR+R Land fill
Invoice City	Waltham	Site City	N. Smithfield
State, Zip	MA	State, Zip	RI
Requested by	Clayton Smith	Site Contact & Phone Number	

Field Service Engineer: Tim Levanduski

Are T&C's in place? ☑ Yes ☐ No If No, have the Customer sign KJZ T&C's prior to the start of ANY work. If Yes, what type of T&C's?
☐ Technical Asst Agmt ☐ PM Contract @ (rate) ☐ Blanket Contract @ (rate) ☐ Warranty ☐ Other

Type of Work: *(Check ☒ at least one in each section)*

☐ Internal
☒ External

☐ TOSG
☐ Burners
☒ Flares
☐ Vapor

☐ Inspection
☐ Startup
☒ Callout
☐ Training

☐ PM
☐ Sales Call
☐ Non-JZ Equip
☐

Date	Time Interval	Chargeable Hours Reg.	Wknd	OT	Warranty Hours	Non Rev	Description of Work Performed
8/28	8:30	8					Flare shutting Down on Low Flare Temp.
							Checked all Flame scanner operation -OK
							Found signal Board inside Damper motor Control Defective. The motor would go Full open with loss of signal on Board!
							Replaced Damper motor with spare at site.
							Unit operating properly.
Sub-Total Hours		8					
Total Hours Worked:		8					

RATE INFORMATION
Regular Days @ $_ Weekend Days @ $_
Reg OT Hours @ $_ Wknd OT Hours @ $_

Required Parts and Sales Price
Comments or Recommendations

Work Verified By: Not Available (Customer Representative) 8/28/00 (Date) (Phone (Fax))

Work Submitted By: (John Zink Representative) 8/28/00 (Date)

☐ Add'l Info. Attached

Trip Expenses:

Air Fare:	
Mileage:	
Tolls/Taxi:	
Car Rental:	
Hotel:	
Phone/Tips:	
Fuel/Parking	
Meals:	
Misc.:	
Sub-Total:	

130 Miles @ mile)

Leave Open ☐
Close ☑

Meals:

Date	Amount	Date	Amount

Refer to Code List for Valid Codes

Failure Codes:
Repair Codes:

Labor Total:
Expenses Total:
Parts Total:
Grand Total:

Appendix C

Groundwater Data Validation Reports
Severn Trent Laboratories

TRILLIUM INC.
Consultants in Environmental Chemistry

356 FARRAGUT CROSSING DR.
KNOXVILLE, TN 37922
(423) 966-8880
FAX (423) 966-8885
cerikson@trilliuminc.com

September 11, 2000

Mr. Dan Garrigan
O&M, Inc.
450 Montbrook Lane
Knoxville, TN 37919

RE: Data Package Review Report - STL Report No. 7000-1470A - VOAs in Ground Waters

Dear Dan:

I have completed my evaluation of the volatile organics analysis data prepared by the Severn Trent Laboratory (STL) in Monroe, Connecticut, for eight ground water (GW) samples and two trip blanks (TB) from the L&RR Site, which were reported in a single data package under Report No. 7000-1470A. The data package was received by Trillium for review on August 28, 2000, with additional requested information received on September 1-2, 2000 and again on September 6, 2000. The following samples were reported:

MW-201	MW-202
MW-103A	CW-7A
TBL+RR071200	CW-5B
MW-104A	MW-102A
DUP-L+RR	TBL+RR071300

Sample identifications for both trip blanks were shortened by the laboratory throughout the data package by removing "L+RR" from the identifications found on the chain of custody records. The chain of custody identifications are listed above and are used throughout this evaluation report for all samples.

Analyses were performed according to EPA Method 8260B (SW-846, Third Edition, Update III); my evaluation was based on the specifications of the project-specific Quality Assurance Project Plan (QAPP, 9/96), the referenced method, and the *Region I, EPA-New England Data Validation Functional Guidelines for Evaluating Environmental Analyses* (12/96). Qualifiers consistent with those defined in the Region I document were applied as necessary and appropriate.

No volatiles analysis raw data were provided in the data package. As specified by the QAPP, my review was limited to a Level III evaluation of the summary forms as presented.

Based on the evaluation, the following qualifiers were applied:

- Results for 2-butanone in all samples in this data set and for acetone in MW-201, MW-202, MW-103A, CW-7A, and CW-5B were rejected (R) as unreliable based on very low relative response factors in the associated calibration standards. Results for 2-butanone also warranted qualification as estimated due to unacceptably low recoveries in the associated blank spike, but the "R" qualifiers take precedence.

- Results for acetone in TBL+RR071200, TBL+RR071300, MW-104A, MW-102A, and DUP-L+RR were qualified as estimated (J) based on low relative response factors in the associated calibration standards.

- Results for tetrachloroethene in CW-5B, MW-102A, and DUP-L+RR were qualified as estimated (J) based on high percent relative standard deviations in the associated initial calibration.

- Results for methylene chloride in all samples were qualified as less than the reported values or less than the sample-specific reporting limit (RL), whichever was greater, based on associated method blank contamination and as estimated based on high percent relative standard deviations in the associated initial calibration and unacceptably high blank spike recoveries (UJ).

- Results for acetone in MW-102A, MW-104A, and DUP-L+RR were qualified as less than the reported values or less than the sample-specific RL, whichever was greater, based on associated method and trip blank contamination (U).

- Results for trichlorofluoromethane in MW-102A and DUP-L+RR were qualified as less than the reported values or less than the sample-specific RL, whichever was greater, based on associated method blank contamination (U).

- Results for m/p-xylenes in CW-5B and MW-104A were qualified as estimated (J) based on the unacceptably high blank spike recoveries; these results may be biased high.

- Results for 4-methyl-2-pentanone in all samples were qualified as estimated (UJ) based on unacceptably low recoveries in the associated blank spike.

- Reporting limits for vinyl chloride and methylene chloride were corrected to 0.5 µg/L and 1 µg/L, respectively (from 0.2 µg/L and 0.3 µg/L, respectively), to reflect the lowest concentration calibration standards run in association with these analyses.

All qualifiers are reflected on the Organic Analysis Data Sheets (Form I) included as Attachment A to this report. Region I qualifier definitions are also provided in this attachment.

At the discretion of the data user, the following points may warrant consideration by laboratory and field personnel prior to future sampling efforts:

- Documentation of sample preservation in the field on all chain of custody records.
- Documentation of complete cooler temperatures and sample pHs on receipt at the laboratory directly on the chain of custody records or, as a minimum, documentation of cooler temperatures directly on the applicable chain of custody records and inclusion of copies of run logs or other laboratory documentation containing sample pH measurements at the time of analysis.
- Use of linear (or higher order) regressions for calibration of target analytes for which the %RSD from initial calibration exceeds 15%, in accordance with the requirements of the referenced method.
- Use of reporting limits for non-detected analytes that reflect, at best, the lowest concentration initial calibration standard run for each target analyte.
- Documentation of applicable method detection limits (MDLs) in the data package.

Specific details regarding the review and evaluation of these data are discussed below:

Holding Times, Preservation, Sample Integrity: Copies of the two applicable chain of custody (COC) records were included in the data package, documenting sample collection dates of 7/12/00 and 7/13/00. An acceptable temperature (4°C) on laboratory receipt was documented on the COC for the samples collected on 7/12/00. On the COC for samples collected 7/13/00, "7°" was documented by the laboratory. It was assumed that this was also a centigrade measurement. Although slightly above the generally accepted temperature range of 4°C±2°C, the exceedance is very minor and no action was taken on this basis.

Acidification of the samples for volatiles analysis with hydrochloric acid was recorded by the sampler on only one of the COCs and documentation of sample pHs on laboratory receipt or at the time of

analysis was not included in the data package. At the request of the evaluator, the laboratory provided their sample receiving preservative records for all samples. However, these records contained pH measurements for only those sample containers preserved with sulfuric acid or nitric acid; they offered no information regarding verification of preservation for the sample containers intended for volatile organics analysis. The laboratory was contacted again by the evaluator, on 9/5/00. On 9/6/00, copies of the laboratory's "GC/MS Volatiles Injection Logs" were received from STL/Connecticut via facsimile. Sample pHs were documented on these records and were verified to be <2 in all cases. No further action was taken with regard to this issue.

All volatiles analyses were performed on 7/21/00 and 7/24/00. Both dates are within the required 14-day holding time for chemically preserved water samples.

GC/MS Instrument Performance Check: Summary forms (Form V) were included for four bromofluorobenzene (BFB) instrument performance checks on instrument "HP5971L," reflecting each 12-hour period during which samples, associated standards, and associated quality control samples were analyzed. Reported relative abundances for all four performance checks were acceptable.

Calibration: Summary results (Form VI) for an initial calibration (IC) performed on instrument HP5971L on 7/20/00 were reported in support of the sample analyses. Results for five standards were reported, at concentrations of 0.5, 2, 10, 20, and 30 µg/L for most target analytes, establishing a calibration range of 0.5 µg/L to 30 µg/L for most target analytes. There was no indication in the data package that any target analytes were included in the standards at higher concentrations, however the laboratory was asked for clarification of the individual analyte concentrations and responded (memorandum dated 9/1/00) that the ketones (acetone, 2-butanone, 4-methyl-2-pentanone, and 2-hexanone) were present at five times the concentration of most target analytes (i.e., 2.5 µg/L to 150 µg/L and that methylene chloride was calibrated at concentrations twice those of most target analytes (i.e., 1 µg/L to 60 µg/L).

For the relevant target analytes, reported average relative response factors (RRFs) were acceptable (greater than 0.05) in the IC except for acetone (0.019) and 2-butanone (0.037). Results for acetone in MW-201, MW-202, MW-103A, CW-7A, and CW-5B and for 2-butanone in all 10 samples were rejected (R) as unreliable on this basis. Acetone was detected in TBL+RR071200, TBL+RR071300, MW-104A, MW-102A, and DUP-L+RR, therefore these results were qualified as estimated (J) based on the low responses in the associated calibration standards.

Percent relative standard deviations (%RSDs) were below the method-specified maximum acceptance criterion of 15% for all target analytes except bromomethane (21.8%), acetone (21.7%), methylene chloride (34.6%), 2-butanone (18.5%), bromochloromethane (26.1%), tetrachloroethene (25.4%),

1,2-dibromo-3-chloropropane (25.6%), and 1,2-dichloroethane-d_4 (24.1%). No evidence that linear (or higher order) regressions were performed was provided in the data package. No positive results were reported for bromomethane, bromochloromethane, or 1,2-dibromo-3-chloropropane in any of the samples and the %RSDs for these compounds did not exceed the less restrictive validation criterion of 30%, therefore no action was taken with respect to the results for these analytes. Results for 2-butanone in all samples were previously rejected and results for acetone in all samples were rejected or estimated based on unacceptably low average RRFs; no further action was warranted with respect to these analytes. 1,2-Dichloroethane-d_4 is a system monitoring compound and recoveries were not adversely affected in any of the samples, therefore no action was warranted based on the high %RSD for this compound. Results for methylene chloride in all samples and for tetrachloroethene in CW-5B, MW-102A, and DUP-L+RR were qualified as estimated (J) based on the high %RSDs; tetrachloroethene was not detected in any other samples and the %RSD did not exceed the less restrictive validation criterion of 30%, therefore no further action was warranted.

Form VII-equivalents were provided for three continuing calibration (CC) standards, run on 7/21/00 at 08:56, on 7/21/00 at 22:31, and on 7/24/00 at 07:56. Reported RRFs were acceptable (greater than 0.05) except for acetone (0.016, 0.016, and 0.018) and 2-butanone (0.034, 0.035, and 0.032) in all three CCs. All sample results for acetone and 2-butanone were previously qualified based on similar responses in the ICs and no additional action was taken based on the CC results.

Reported percent differences (%Ds) from the IC were less than the method-specified acceptance criterion (20%) in each of the CCs with the following exceptions:

7/21/00-08:56: 1,2-dibromo-3-chloropropane - 22.4%

7/21/00-22:31: 2,2-dichloropropane - 21.0%

7/24/00-07:56: 1,2-dibromo-3-chloropropane - 20.8%

All of the %Ds listed above are below the maximum acceptance limit specified by the validation guidelines (25%). Therefore, no sample results were qualified based on these responses.

Blanks: Results for three method blanks (MBs) associated with the site sample analyses were provided in the data package. Methylene chloride was detected in all three MBs, at concentrations ranging from 1.1 µg/L to 1.4 µg/L. In addition, acetone (6.1 µg/L) and trichlorofluoromethane (0.14 µg/L) were reported in the MB run on 7/24/00. Results for methylene chloride in all samples, for acetone in MW-102A, MW-104A, and DUP-L+RR, and for trichlorofluoromethane in MW-102A and DUP-L+RR were qualified as less than the reported values or less than the sample-specific reporting limit (RL), whichever was greater, based on the associated MB contamination (U). In all

cases, the qualified sample results were less than ten times (methylene chloride and acetone) or five times (trichlorofluoromethane) the concentration found in the associated MB. All comparisons were made based on sample results prior to adjustment for the applicable dilution factor.

Two trip blanks (TBs) were submitted with this data set. After qualifications based on MB contamination, chloroform (0.72 µg/L), toluene (0.1 µg/L), and acetone (12 µg/L) were reported in TBL+RR071200 and chloroform (0.72 µg/L) and acetone (4.7 µg/L) were reported in TBL+RR071300. Results for acetone in MW-102A, MW-104A, and DUP-L+RR warranted qualification as less than the reported values or less than the sample-specific RL, whichever was greater based on the TB results; however, these results were similarly qualified based on associated MB contamination and no additional action was taken. Chloroform was not detected in any of the site samples and toluene was not detected in any of the samples associated with TBL+RR071200, therefore no further action was warranted on this basis.

Surrogates: Reported recoveries (Form II) were acceptable for all site samples and quality control (QC) analyses.

Matrix Spike/Matrix Spike Duplicate (MS/MSD): Percent recovery (%R) and relative percent difference (RPD) results for MS/MSD analyses performed on sample CW-5B were reported on Form III. Percent recoveries (100-106%) for the five reported spiked target analytes (1,1-dichloroethene, trichloroethene, benzene, toluene, and chlorobenzene at 10 µg/L each) were within the specified acceptance limits in both spiked analyses. In addition, relative percent differences (RPDs) were below the laboratory-specified maximum acceptance limits for all five reported spiked analytes.

Based on the Form I results provided for the MS and the MSD analyses, it is apparent that most, if not all, of the target analytes were actually included in the spiking solution. However, true values were provided only for the five compounds listed above and no further evaluation of these data could be made.

Blank Spikes: Recoveries for 36 analytes in a blank spike analysis performed in association with the site sample analyses were also reported in the data package. The 36 analytes were included in the spiking solution at 10 µg/L or 50 µg/L. Percent recoveries were within the laboratory-specified acceptance limits (QC 60-140%) in all cases except carbon disulfide (0%), methylene chloride (200%), 2-butanone (40%), 4-methyl-2-pentanone (42%), 2-hexanone (42%), and m/p-xylenes (205%). Carbon disulfide and 2-hexanone are not project-specific target analytes, therefore no action was warranted with respect to these two analytes. Results for methylene chloride in all samples and for m/p-xylenes in CW-5B and MW-104A were qualified as estimated (J) based on the unacceptably high recoveries; these results may be biased high. Results for 2-butanone and 4-methyl-2-pentanone

in all samples were qualified as estimated (UJ) based on the unacceptably low recoveries in the blank spike.

Field Duplicate: Sample DUP-L+RR was identified as a field duplicate of MW-102A based on information provided by the client. Positive paired results for benzene (0 RPD), chlorobenzene (0 RPD), chloroethane (3.6 RPD), 1,2-dichlorobenzene (7.3 RPD), 1,4-dichlorobenzene (3.6 RPD), dichlorodifluoromethane (0 RPD), 1,1-dichloroethane (0 RPD), 1,2-dichloroethane (6.5 RPD), cis-1,2-dichloroethene (4.3 RPD), trans-1,2-dichloroethene (5.4 RPD), 1,2-dichloropropane (3.1 RPD), isopropylbenzene (2.4 RPD), tetrachloroethene (1.8 RPD), toluene (6.5 RPD), trichloroethene (2.6 RPD), and vinyl chloride (2.2 RPD) showed excellent reproducibility.

Internal Standard Responses: Internal standard areas and retention times (RTs) were reported on Form VIII for all site samples reported in this data set and the related quality control analyses; all areas and RTs were within acceptable limits as reported on the forms.

Sample Results: Results for all GW samples and both TBs were reported on Form Is, all of which indicated a sample analysis volume of 25 mL. Samples MW-102A, MW-104A, and DUPL+RR were run at 1:10 dilutions, and only the diluted analysis results were reported. Reporting limits for target analytes that were not detected were appropriately adjusted to reflect the dilution factor in these three sample analyses.

Target analytes that were not detected in the samples were reported by the laboratory as less than 0.5 µg/L (0.5 U) except for acetone (12 U), 2-butanone (6 U), 4-methyl-2-pentanone (5 U), 1,2-dibromo-3-chloropropane (2 U), vinyl chloride (0.2 U), and methylene chloride (0.3 U).

No MDL study results were provided in the data package. With the exceptions of vinyl chloride and methylene chloride, all RLs reported by the laboratory were equivalent to or above the lowest concentration IC standard associated with these analyses and no positive sample results less than the RLs were reported. Therefore, the reported results for all target analytes except vinyl chloride and methylene chloride are fully supported by the available data and are acceptable as reported.

Vinyl chloride was present at 0.5 µg/L in the lowest concentration calibration standard and methylene chloride was present in this standard at 1.0 µg/L. In the absence of MDL data for these two analytes, the RLs reported by the laboratory for these two analytes are not supportable. Therefore, RLs for vinyl chloride and methylene chloride were corrected to 0.5 µg/L and 1 µg/L, respectively, to reflect the lowest concentration calibration standards run in association with these analyses.

Documentation: Data package documentation was consistent with the specifications of the QAPP; specifically, a Level III data package (summary forms only - no supporting raw data) was provided for review.

COC records provided in the data package included all reported samples and were properly completed except that sample preservation was recorded on only one of the COCs and improper corrections were noted on both documents. In the future, all corrections should be made by drawing a single line through the incorrect information, inserting the correct information, and initialing and dating the change. "Write-overs" are not legally defensible.

Documentation of sample pHs on laboratory receipt (or at the time of analysis) was not provided in the data package as received for review. This information was verbally requested by the validator on 8/30/00; sample receiving preservation logs were received from the laboratory via facsimile on 9/2/00. These records were inserted into the data package by the evaluator as pages 55a and 55b, but did not address the samples intended for volatile organics analyses. The laboratory was contacted by the evaluator again on 9/5/00, and copies of the laboratory's GC/MS injection logs were provided via facsimile on 9/6/00. These logs are included in Attachment B.

Sample identifications for both trip blanks were shortened by the laboratory throughout the data package by removing "L+RR" from the identifications found on the COC records. The chain of custody identifications are used throughout this evaluation report for all samples, and the Form Is for the trip blanks were corrected by the evaluator to reflect the COC identifications.

On Form II, the identification of SMC2 at the bottom of the page was corrected to dibromofluoromethane (from 1,2-dichloroethane-d4) by the evaluator. A copy of the corrected form is included in Attachment B to this report.

On Form III, a result of 0.03 µg/L was reported for toluene in the unspiked analysis of CW-5B. On the Form I for this sample, toluene is reported as not detected (0.5 U). Therefore, the Form III result is incorrect. However, it is so low that it does not affect the calculated recovery, and no action was taken by the evaluator.

Form VII was not included in the data package for two of the three CCs associated with the sample analyses. The missing forms were requested from the laboratory on 8/30/00, and were received via facsimile on 9/1/00. They were inserted into the data package by the evaluator as pages 74a-74f.

Please let me know if you have any questions regarding this data package review report.

Sincerely,

Carol

Carol A. Erikson
Quality Assessment Manager

CAE/ekd
95406\Apr00\GWVoa

TRILLIUM INC.

ATTACHMENT A

ORGANIC ANALYSIS DATA SHEETS (Form I)
STL/Connecticut Case No. 1470A

EPA Region I Qualifier Definitions:

U - **The material was analyzed for, but was not detected. The associated numerical value is the sample quantitation limit. The sample quantitation limit accounts for sample-specific dilution factors and percent solids corrections or sample sizes that deviate from those required by the method.**

J - **The associated numerical value is an estimated quantity.**

R - **The data are unusable (analyte may or may not be present). Resampling and reanalysis is necessary for verification. The R replaces the numerical value or sample quantitation limit.**

UJ - **The analyte was analyzed for, but was not detected. The sample quantitation limit is an estimated quantity.**

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT ID: MW-201

Lab Name: STL/CT Contract: _____

Lab Code: IEACT Case No.: 1470A SAS No.: _____ SDG No.: A1470

Matrix: (soil/water) WATER Lab Sample ID: 001470A-01

Sample wt/vol: 25 (g/mL) ML Lab File ID: >L2009

Level: (low/med) LOW Date Received: 07/13/00

% Moisture: not dec. _____ Date Analyzed: 07/21/00

GC Column: 007-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	.5	U
108-86-1	Bromobenzene	.5	U
74-97-5	Bromochloromethane	.5	U
75-27-4	Bromodichloromethane	.5	U
75-25-2	Bromoform	.5	U
74-83-9	Bromomethane	.5	U
104-51-8	n-Butylbenzene	.5	U
135-98-8	Sec-Butylbenzene	.5	U
98-06-6	Tert-Butylbenzene	.5	U
56-23-5	Carbon Tetrachloride	.5	U
108-90-7	Chlorobenzene	.5	U
124-48-1	Dibromochloromethane	.5	U
75-00-3	Chloroethane	.5	U
67-66-3	Chloroform	.5	U
74-87-3	Chloromethane	.5	U
95-49-8	2-Chlorotoluene	.5	U
106-43-4	4-Chlorotoluene	.5	U
96-12-8	1,2-Dibromo-3-Chloropropane	2	U
106-93-4	1,2-Dibromoethane	.5	U
74-95-3	Dibromomethane	.5	U
95-50-1	1,2-Dichlorobenzene	.5	U
541-73-1	1,3-Dichlorobenzene	.5	U
106-46-7	1,4-Dichlorobenzene	.5	U
75-71-8	Dichlorodifluoromethane	4.6	
75-34-3	1,1-Dichloroethane	.5	U
107-06-2	1,2-Dichloroethane	.5	U
75-35-4	1,1-Dichloroethene	.5	U
156-59-2	cis-1,2-Dichloroethene	.5	U
156-60-5	trans-1,2-Dichloroethene	.5	U
78-87-5	1,2-Dichloropropane	.5	U
142-28-9	1,3-Dichloropropane	.5	U
544-20-7	2,2-Dichloropropane	.5	U
563-58-6	1,1-Dichloropropene	.5	U
100-41-4	Ethylbenzene	.5	U
87-68-3	Hexachlorobutadiene	.5	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT ID: MW-201

Lab Name: STL/CT Contract: _____

Lab Code: IEACT Case No.: 1470A SAS No.: _____ SDG No.: A1470

Matrix: (soil/water) WATER Lab Sample ID: 001470A-01

Sample wt/vol: 25 (g/mL) ML Lab File ID: >L2009

Level: (low/med) LOW Date Received: 07/13/00

% Moisture: not dec. _____ Date Analyzed: 07/21/00

GC Column: 007-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
98-82-8	Isopropylbenzene	.5	U
99-87-6	4-Isopropyltoluene	.5	U
75-09-2	Methylene Chloride	1 ~~.6~~	~~JB~~ U J
91-20-3	Naphthalene	.5	U
103-65-1	N-Propylbenzene	.5	U
100-42-5	Styrene	.5	U
630-20-6	1,1,1,2-Tetrachloroethane	.5	U
79-34-5	1,1,2,2-Tetrachloroethane	.5	U
127-18-4	Tetrachloroethene	.5	U
108-88-3	Toluene	.5	U
87-61-6	1,2,3-Trichlorobenzene	.5	U
120-82-1	1,2,4-Trichlorobenzene	.5	U
71-55-6	1,1,1-Trichloroethane	.5	U
79-00-5	1,1,2-Trichloroethane	.5	U
79-01-6	Trichloroethene	.5	U
75-69-4	Trichlorofluoromethane	.23	J
96-18-4	1,2,3-Trichloropropane	.5	U
95-63-6	1,2,4-Trimethylbenzene	.5	U
108-67-8	1,3,5-Trimethylbenzene	.5	U
75-01-4	Vinyl Chloride	0.5 ~~.2~~	U
NO CAS	mp-Xylene	1	U
95-47-6	o-xylene	.5	U
67-64-1	Acetone	R ~~12~~	~~U~~
78-93-3	2-Butanone	R ~~6~~	~~U~~
108-10-1	4-Methyl-2-Pentanone	5	~~U~~ UJ

CAE 9/8/00

CAErikson 9/8/00

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT ID: MW-202

Lab Name: STL/CT Contract: _____

Lab Code: IEACT Case No.: 1470A SAS No.: _____ SDG No.: A1470

Matrix: (soil/water) WATER Lab Sample ID: 001470A-02

Sample wt/vol: 25 (g/mL) ML Lab File ID: >L2010

Level: (low/med) LOW Date Received: 07/13/00

% Moisture: not dec. _____ Date Analyzed: 07/21/00

GC Column: 007-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	.5	U
108-86-1	Bromobenzene	.5	U
74-97-5	Bromochloromethane	.5	U
75-27-4	Bromodichloromethane	.5	U
75-25-2	Bromoform	.5	U
74-83-9	Bromomethane	.5	U
104-51-8	n-Butylbenzene	.5	U
135-98-8	Sec-Butylbenzene	.5	U
98-06-6	Tert-Butylbenzene	.5	U
56-23-5	Carbon Tetrachloride	.5	U
108-90-7	Chlorobenzene	.5	U
124-48-1	Dibromochloromethane	.5	U
75-00-3	Chloroethane	.5	U
67-66-3	Chloroform	.5	U
74-87-3	Chloromethane	.5	U
95-49-8	2-Chlorotoluene	.5	U
106-43-4	4-Chlorotoluene	.5	U
96-12-8	1,2-Dibromo-3-Chloropropane	2	U
106-93-4	1,2-Dibromoethane	.5	U
74-95-3	Dibromomethane	.5	U
95-50-1	1,2-Dichlorobenzene	.5	U
541-73-1	1,3-Dichlorobenzene	.5	U
106-46-7	1,4-Dichlorobenzene	.5	U
75-71-8	Dichlorodifluoromethane	.5	U
75-34-3	1,1-Dichloroethane	.5	U
107-06-2	1,2-Dichloroethane	.5	U
75-35-4	1,1-Dichloroethene	.5	U
156-59-2	cis-1,2-Dichloroethene	.5	U
156-60-5	trans-1,2-Dichloroethene	.5	U
78-87-5	1,2-Dichloropropane	.5	U
142-28-9	1,3-Dichloropropane	.5	U
544-20-7	2,2-Dichloropropane	.5	U
563-58-6	1,1-Dichloropropene	.5	U
100-41-4	Ethylbenzene	.5	U
87-68-3	Hexachlorobutadiene	.5	U

1A 0005

VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT ID: MW-202

Lab Name: STL/CT Contract: _____

Lab Code: IEACT Case No.: 1470A SAS No.: _____ SDG No.: A1470

Matrix: (soil/water) WATER Lab Sample ID: 001470A-02

Sample wt/vol: 25 (g/mL) ML Lab File ID: >L2010

Level: (low/med) LOW Date Received: 07/13/00

% Moisture: not dec. _____ Date Analyzed: 07/21/00

GC Column: 007-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
98-82-8	Isopropylbenzene	.5	U
99-87-6	4-Isopropyltoluene	.5	U
75-09-2	Methylene Chloride	1 ~~.5~~	~~JB~~ UJ CAE 9/8/00
91-20-3	Naphthalene	.5	U
103-65-1	N-Propylbenzene	.5	U
100-42-5	Styrene	.5	U
630-20-6	1,1,1,2-Tetrachloroethane	.5	U
79-34-5	1,1,2,2-Tetrachloroethane	.5	U
127-18-4	Tetrachloroethene	.5	U
108-88-3	Toluene	.5	U
87-61-6	1,2,3-Trichlorobenzene	.5	U
120-82-1	1,2,4-Trichlorobenzene	.5	U
71-55-6	1,1,1-Trichloroethane	.5	U
79-00-5	1,1,2-Trichloroethane	.5	U
79-01-6	Trichloroethene	.5	U
75-69-4	Trichlorofluoromethane	.5	U
96-18-4	1,2,3-Trichloropropane	.5	U
95-63-6	1,2,4-Trimethylbenzene	.5	U
108-67-8	1,3,5-Trimethylbenzene	.5	U
75-01-4	Vinyl Chloride	0.5 ~~.2~~	U CAE 9/8/00
NO CAS	mp-Xylene	1	U
95-47-6	o-xylene	.5	U
67-64-1	Acetone	R ~~12~~	~~U~~
78-93-3	2-Butanone	R ~~6~~	~~U~~ CAE 9/8/00
108-10-1	4-Methyl-2-Pentanone	5	UJ

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT ID: MW-103A

Lab Name: STL/CT Contract: _____

Lab Code: IEACT Case No.: 1470A SAS No.: _____ SDG No.: A1470

Matrix: (soil/water) WATER Lab Sample ID: 001470A-03

Sample wt/vol: 25 (g/mL) ML Lab File ID: >L2011

Level: (low/med) LOW Date Received: 07/13/00

% Moisture: not dec. _____ Date Analyzed: 07/21/00

GC Column: 007-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: ____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	.5	U
108-86-1	Bromobenzene	.5	U
74-97-5	Bromochloromethane	.5	U
75-27-4	Bromodichloromethane	.5	U
75-25-2	Bromoform	.5	U
74-83-9	Bromomethane	.5	U
104-51-8	n-Butylbenzene	.5	U
135-98-8	Sec-Butylbenzene	.5	U
98-06-6	Tert-Butylbenzene	.5	U
56-23-5	Carbon Tetrachloride	.5	U
108-90-7	Chlorobenzene	.5	U
124-48-1	Dibromochloromethane	.5	U
75-00-3	Chloroethane	.5	U
67-66-3	Chloroform	.5	U
74-87-3	Chloromethane	.5	U
95-49-8	2-Chlorotoluene	.5	U
106-43-4	4-Chlorotoluene	.5	U
96-12-8	1,2-Dibromo-3-Chloropropane	2	U
106-93-4	1,2-Dibromoethane	.5	U
74-95-3	Dibromomethane	.5	U
95-50-1	1,2-Dichlorobenzene	.5	U
541-73-1	1,3-Dichlorobenzene	.5	U
106-46-7	1,4-Dichlorobenzene	.5	U
75-71-8	Dichlorodifluoromethane	.5	U
75-34-3	1,1-Dichloroethane	.1	J
107-06-2	1,2-Dichloroethane	.5	U
75-35-4	1,1-Dichloroethene	.5	U
156-59-2	cis-1,2-Dichloroethene	.5	U
156-60-5	trans-1,2-Dichloroethene	.5	U
78-87-5	1,2-Dichloropropane	.5	U
142-28-9	1,3-Dichloropropane	.5	U
544-20-7	2,2-Dichloropropane	.5	U
563-58-6	1,1-Dichloropropene	.5	U
100-41-4	Ethylbenzene	.5	U
87-68-3	Hexachlorobutadiene	.5	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT ID: MW-103A

Lab Name: STL/CT Contract: _____

Lab Code: IEACT Case No.: 1470A SAS No.: _____ SDG No.: A1470

Matrix: (soil/water) WATER Lab Sample ID: 001470A-03

Sample wt/vol: 25 (g/mL) ML Lab File ID: >L2011

Level: (low/med) LOW Date Received: 07/13/00

% Moisture: not dec. _____ Date Analyzed: 07/21/00

GC Column: 007-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: ____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
98-82-8	Isopropylbenzene	.5	U
99-87-6	4-Isopropyltoluene	.5	U
75-09-2	Methylene Chloride	1 ~~.38~~	~~JB~~ UJ CAE 9/8/00
91-20-3	Naphthalene	.5	U
103-65-1	N-Propylbenzene	.5	U
100-42-5	Styrene	.5	U
630-20-6	1,1,1,2-Tetrachloroethane	.5	U
79-34-5	1,1,2,2-Tetrachloroethane	.5	U
127-18-4	Tetrachloroethene	.5	U
108-88-3	Toluene	.5	U
87-61-6	1,2,3-Trichlorobenzene	.5	U
120-82-1	1,2,4-Trichlorobenzene	.5	U
71-55-6	1,1,1-Trichloroethane	.5	U
79-00-5	1,1,2-Trichloroethane	.5	U
79-01-6	Trichloroethene	.5	U
75-69-4	Trichlorofluoromethane	.5	U
96-18-4	1,2,3-Trichloropropane	.5	U
95-63-6	1,2,4-Trimethylbenzene	.5	U
108-67-8	1,3,5-Trimethylbenzene	.5	U
75-01-4	Vinyl Chloride	0.5 ~~2~~	U CAE 9/8/00
NO CAS	mp-Xylene	1	U
95-47-6	o-xylene	.5	U
67-64-1	Acetone	R ~~12~~	~~U~~
78-93-3	2-Butanone	R ~~6~~	~~U~~ CAE 9/8/00
108-10-1	4-Methyl-2-Pentanone	5	~~U~~ UJ

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT ID: CW-7A

Lab Name: STL/CT Contract: _____

Lab Code: IEACT Case No.: 1470A SAS No.: _____ SDG No.: A1470

Matrix: (soil/water) WATER Lab Sample ID: 001470A-04

Sample wt/vol: 25 (g/mL) ML Lab File ID: >L2012

Level: (low/med) LOW Date Received: 07/13/00

% Moisture: not dec. _____ Date Analyzed: 07/21/00

GC Column: 007-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: ____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	.26	J
108-86-1	Bromobenzene	.5	U
74-97-5	Bromochloromethane	.5	U
75-27-4	Bromodichloromethane	.5	U
75-25-2	Bromoform	.5	U
74-83-9	Bromomethane	.5	U
104-51-8	n-Butylbenzene	.5	U
135-98-8	Sec-Butylbenzene	.5	U
98-06-6	Tert-Butylbenzene	.5	U
56-23-5	Carbon Tetrachloride	.5	U
108-90-7	Chlorobenzene	.75	
124-48-1	Dibromochloromethane	.5	U
75-00-3	Chloroethane	.15	J
67-66-3	Chloroform	.5	U
74-87-3	Chloromethane	.5	U
95-49-8	2-Chlorotoluene	.5	U
106-43-4	4-Chlorotoluene	.5	U
96-12-8	1,2-Dibromo-3-Chloropropane	2	U
106-93-4	1,2-Dibromoethane	.5	U
74-95-3	Dibromomethane	.5	U
95-50-1	1,2-Dichlorobenzene	.5	U
541-73-1	1,3-Dichlorobenzene	.5	U
106-46-7	1,4-Dichlorobenzene	.83	
75-71-8	Dichlorodifluoromethane	.5	U
75-34-3	1,1-Dichloroethane	.35	J
107-06-2	1,2-Dichloroethane	.5	U
75-35-4	1,1-Dichloroethene	.5	U
156-59-2	cis-1,2-Dichloroethene	.12	J
156-60-5	trans-1,2-Dichloroethene	.5	U
78-87-5	1,2-Dichloropropane	.5	U
142-28-9	1,3-Dichloropropane	.5	U
544-20-7	2,2-Dichloropropane	.5	U
563-58-6	1,1-Dichloropropene	.5	U
100-41-4	Ethylbenzene	.5	U
87-68-3	Hexachlorobutadiene	.5	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT ID: CW-7A

Lab Name: STL/CT Contract: _____

Lab Code: IEACT Case No.: 1470A SAS No.: _____ SDG No.: A1470

Matrix: (soil/water) WATER Lab Sample ID: 001470A-04

Sample wt/vol: 25 (g/mL) ML Lab File ID: >L2012

Level: (low/med) LOW Date Received: 07/13/00

% Moisture: not dec. _____ Date Analyzed: 07/21/00

GC Column: 007-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
98-82-8	Isopropylbenzene	.24	J
99-87-6	4-Isopropyltoluene	.5	U
75-09-2	Methylene Chloride	~~.44~~	~~JB~~ UJ CAE 9/8/00
91-20-3	Naphthalene	.5	U
103-65-1	N-Propylbenzene	.5	U
100-42-5	Styrene	.5	U
630-20-6	1,1,1,2-Tetrachloroethane	.5	U
79-34-5	1,1,2,2-Tetrachloroethane	.5	U
127-18-4	Tetrachloroethene	.5	U
108-88-3	Toluene	.5	U
87-61-6	1,2,3-Trichlorobenzene	.5	U
120-82-1	1,2,4-Trichlorobenzene	.5	U
71-55-6	1,1,1-Trichloroethane	.5	U
79-00-5	1,1,2-Trichloroethane	.5	U
79-01-6	Trichloroethene	.5	U
75-69-4	Trichlorofluoromethane	.5	U
96-18-4	1,2,3-Trichloropropane	.5	U
95-63-6	1,2,4-Trimethylbenzene	.5	U
108-67-8	1,3,5-Trimethylbenzene	.5	U
75-01-4	Vinyl Chloride	0.5 ~~2~~	U CAE 9/8/00
NO CAS	mp-Xylene	1	U
95-47-6	o-xylene	.5	U
67-64-1	Acetone	R ~~12~~	~~U~~
78-93-3	2-Butanone	R ~~6~~	~~U~~ CAE 9/8/00
108-10-1	4-Methyl-2-Pentanone	5	~~U~~ UJ

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT ID

TBLTRR071200
TB071200
CRL 9/8/00

Lab Name: STL/CT Contract: _____

Lab Code: IEACT Case No.: 1470A SAS No.: _____ SDG No.: A1470

Matrix: (soil/water) WATER Lab Sample ID: 001470A-05

Sample wt/vol: 25 (g/mL) ML Lab File ID: >L2008

Level: (low/med) LOW Date Received: 07/13/00

% Moisture: not dec. _____ Date Analyzed: 07/21/00

GC Column: 007-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	.5	U
108-86-1	Bromobenzene	.5	U
74-97-5	Bromochloromethane	.5	U
75-27-4	Bromodichloromethane	.5	U
75-25-2	Bromoform	.5	U
74-83-9	Bromomethane	.5	U
104-51-8	n-Butylbenzene	.5	U
135-98-8	Sec-Butylbenzene	.5	U
98-06-6	Tert-Butylbenzene	.5	U
56-23-5	Carbon Tetrachloride	.5	U
108-90-7	Chlorobenzene	.5	U
124-48-1	Dibromochloromethane	.5	U
75-00-3	Chloroethane	.5	U
67-66-3	Chloroform	.72	
74-87-3	Chloromethane	.5	U
95-49-8	2-Chlorotoluene	.5	U
106-43-4	4-Chlorotoluene	.5	U
96-12-8	1,2-Dibromo-3-Chloropropane	2	U
106-93-4	1,2-Dibromoethane	.5	U
74-95-3	Dibromomethane	.5	U
95-50-1	1,2-Dichlorobenzene	.5	U
541-73-1	1,3-Dichlorobenzene	.5	U
106-46-7	1,4-Dichlorobenzene	.5	U
75-71-8	Dichlorodifluoromethane	.5	U
75-34-3	1,1-Dichloroethane	.5	U
107-06-2	1,2-Dichloroethane	.5	U
75-35-4	1,1-Dichloroethene	.5	U
156-59-2	cis-1,2-Dichloroethene	.5	U
156-60-5	trans-1,2-Dichloroethene	.5	U
78-87-5	1,2-Dichloropropane	.5	U
142-28-9	1,3-Dichloropropane	.5	U
544-20-7	2,2-Dichloropropane	.5	U
563-58-6	1,1-Dichloropropene	.5	U
100-41-4	Ethylbenzene	.5	U
87-68-3	Hexachlorobutadiene	.5	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT ID: TBL+RR071200 TB071200 CAE 9/8/00

Lab Name: STL/CT Contract: _____

Lab Code: IEACT Case No.: 1470A SAS No.: _____ SDG No.: A1470

Matrix: (soil/water) WATER Lab Sample ID: 001470A-05

Sample wt/vol: 25 (g/mL) ML Lab File ID: >L2008

Level: (low/med) LOW Date Received: 07/13/00

% Moisture: not dec. _____ Date Analyzed: 07/21/00

GC Column: 007-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: ____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
98-82-8	Isopropylbenzene	.5	U
99-87-6	4-Isopropyltoluene	.5	U
75-09-2	Methylene Chloride	3.4	~~B~~ U J CAE 9/8/00
91-20-3	Naphthalene	.5	U
103-65-1	N-Propylbenzene	.5	U
100-42-5	Styrene	.5	U
630-20-6	1,1,1,2-Tetrachloroethane	.5	U
79-34-5	1,1,2,2-Tetrachloroethane	.5	U
127-18-4	Tetrachloroethene	.5	U
108-88-3	Toluene	.1	J
87-61-6	1,2,3-Trichlorobenzene	.5	U
120-82-1	1,2,4-Trichlorobenzene	.5	U
71-55-6	1,1,1-Trichloroethane	.5	U
79-00-5	1,1,2-Trichloroethane	.5	U
79-01-6	Trichloroethene	.5	U
75-69-4	Trichlorofluoromethane	.5	U
96-18-4	1,2,3-Trichloropropane	.5	U
95-63-6	1,2,4-Trimethylbenzene	.5	U
108-67-8	1,3,5-Trimethylbenzene	.5	U
75-01-4	Vinyl Chloride	0.5 ~~2~~	U CAE 9/8/00
NO CAS	mp-Xylene	1	U
95-47-6	o-xylene	.5	U
67-64-1	Acetone	12	J
78-93-3	2-Butanone	R ~~6~~	~~U~~ CAE 9/8/00
108-10-1	4-Methyl-2-Pentanone	5	~~B~~ U J

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT ID: CW-5B

Lab Name: STL/CT Contract: _____

Lab Code: IEACT Case No.: 1470A SAS No.: _____ SDG No.: A1470

Matrix: (soil/water) WATER Lab Sample ID: 001470A-06

Sample wt/vol: 25 (g/mL) ML Lab File ID: >L2006

Level: (low/med) LOW Date Received: 07/14/00

% Moisture: not dec. _____ Date Analyzed: 07/21/00

GC Column: 007-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: ____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	.55	
108-86-1	Bromobenzene	.5	U
74-97-5	Bromochloromethane	.5	U
75-27-4	Bromodichloromethane	.5	U
75-25-2	Bromoform	.5	U
74-83-9	Bromomethane	.5	U
104-51-8	n-Butylbenzene	.5	U
135-98-8	Sec-Butylbenzene	.5	U
98-06-6	Tert-Butylbenzene	.5	U
56-23-5	Carbon Tetrachloride	.5	U
108-90-7	Chlorobenzene	.5	U
124-48-1	Dibromochloromethane	.5	U
75-00-3	Chloroethane	1.8	
67-66-3	Chloroform	.5	U
74-87-3	Chloromethane	.5	U
95-49-8	2-Chlorotoluene	.5	U
106-43-4	4-Chlorotoluene	.5	U
96-12-8	1,2-Dibromo-3-Chloropropane	2	U
106-93-4	1,2-Dibromoethane	.5	U
74-95-3	Dibromomethane	.5	U
95-50-1	1,2-Dichlorobenzene	.5	U
541-73-1	1,3-Dichlorobenzene	.5	U
106-46-7	1,4-Dichlorobenzene	.5	U
75-71-8	Dichlorodifluoromethane	8.7	
75-34-3	1,1-Dichloroethane	19	
107-06-2	1,2-Dichloroethane	.5	U
75-35-4	1,1-Dichloroethene	.35	J
156-59-2	cis-1,2-Dichloroethene	11	
156-60-5	trans-1,2-Dichloroethene	.44	J
78-87-5	1,2-Dichloropropane	.5	U
142-28-9	1,3-Dichloropropane	.5	U
544-20-7	2,2-Dichloropropane	.5	U
563-58-6	1,1-Dichloropropene	.5	U
100-41-4	Ethylbenzene	.12	J
87-68-3	Hexachlorobutadiene	.5	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT ID: CW-5B

Lab Name: STL/CT Contract: _____

Lab Code: IEACT Case No.: 1470A SAS No.: _____ SDG No.: A1470

Matrix: (soil/water) WATER Lab Sample ID: 001470A-06

Sample wt/vol: 25 (g/mL) ML Lab File ID: >L2006

Level: (low/med) LOW Date Received: 07/14/00

% Moisture: not dec. _____ Date Analyzed: 07/21/00

GC Column: 007-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: ____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
98-82-8	Isopropylbenzene	.11	J
99-87-6	4-Isopropyltoluene	.15	J
75-09-2	Methylene Chloride	3.8	~~B~~ UJ
91-20-3	Naphthalene	.5	U
103-65-1	N-Propylbenzene	.5	U
100-42-5	Styrene	.5	U
630-20-6	1,1,1,2-Tetrachloroethane	.5	U
79-34-5	1,1,2,2-Tetrachloroethane	.5	U
127-18-4	Tetrachloroethene	24	J
108-88-3	Toluene	.5	U
87-61-6	1,2,3-Trichlorobenzene	.5	U
120-82-1	1,2,4-Trichlorobenzene	.5	U
71-55-6	1,1,1-Trichloroethane	1	
79-00-5	1,1,2-Trichloroethane	.5	U
79-01-6	Trichloroethene	9.4	
75-69-4	Trichlorofluoromethane	.5	U
96-18-4	1,2,3-Trichloropropane	.5	U
95-63-6	1,2,4-Trimethylbenzene	.5	U
108-67-8	1,3,5-Trimethylbenzene	.5	U
75-01-4	Vinyl Chloride	6.8	
NO CAS	mp-Xylene	3.7	J
95-47-6	o-xylene	.32	J
67-64-1	Acetone	R ~~12~~	~~U~~
78-93-3	2-Butanone	R ~~6~~	~~U~~
108-10-1	4-Methyl-2-Pentanone	5	~~B~~ UJ

9/8/00 M Erikson

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT ID: MW-104A

Lab Name: STL/CT Contract: _____

Lab Code: IEACT Case No.: 1470A SAS No.: _____ SDG No.: A1470

Matrix: (soil/water) WATER Lab Sample ID: 001470A-07

Sample wt/vol: 25 (g/mL) ML Lab File ID: >L2032

Level: (low/med) LOW Date Received: 07/14/00

% Moisture: not dec. _____ Date Analyzed: 07/24/00

GC Column: 007-624 ID: 0.53 (mm) Dilution Factor: 10.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: ____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	24	
108-86-1	Bromobenzene	5	U
74-97-5	Bromochloromethane	5	U
75-27-4	Bromodichloromethane	5	U
75-25-2	Bromoform	5	U
74-83-9	Bromomethane	5	U
104-51-8	n-Butylbenzene	5	U
135-98-8	Sec-Butylbenzene	5	U
98-06-6	Tert-Butylbenzene	5	U
56-23-5	Carbon Tetrachloride	5	U
108-90-7	Chlorobenzene	10	
124-48-1	Dibromochloromethane	5	U
75-00-3	Chloroethane	49	
67-66-3	Chloroform	5	U
74-87-3	Chloromethane	5	U
95-49-8	2-Chlorotoluene	5	U
106-43-4	4-Chlorotoluene	5	U
96-12-8	1,2-Dibromo-3-Chloropropane	20	U
106-93-4	1,2-Dibromoethane	5	U
74-95-3	Dibromomethane	5	U
95-50-1	1,2-Dichlorobenzene	6.6	
541-73-1	1,3-Dichlorobenzene	.88	J
106-46-7	1,4-Dichlorobenzene	33	
75-71-8	Dichlorodifluoromethane	5	U
75-34-3	1,1-Dichloroethane	40	
107-06-2	1,2-Dichloroethane	9	
75-35-4	1,1-Dichloroethene	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
156-60-5	trans-1,2-Dichloroethene	1.8	J
78-87-5	1,2-Dichloropropane	10	
142-28-9	1,3-Dichloropropane	5	U
544-20-7	2,2-Dichloropropane	5	U
563-58-6	1,1-Dichloropropene	5	U
100-41-4	Ethylbenzene	140	
87-68-3	Hexachlorobutadiene	5	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT ID: MW-104A

Lab Name: STL/CT Contract: _____

Lab Code: IEACT Case No.: 1470A SAS No.: _____ SDG No.: A1470

Matrix: (soil/water) WATER Lab Sample ID: 001470A-07

Sample wt/vol: 25 (g/mL) ML Lab File ID: >L2032

Level: (low/med) LOW Date Received: 07/14/00

% Moisture: not dec. _____ Date Analyzed: 07/24/00

GC Column: 007-624 ID: 0.53 (mm) Dilution Factor: 10.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: ____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
98-82-8	Isopropylbenzene	23	
99-87-6	4-Isopropyltoluene	13	
75-09-2	Methylene Chloride	18	B UJ
91-20-3	Naphthalene	59	
103-65-1	N-Propylbenzene	4.8	J
100-42-5	Styrene	2.1	J
630-20-6	1,1,1,2-Tetrachloroethane	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
127-18-4	Tetrachloroethene	5	U
108-88-3	Toluene	11	
87-61-6	1,2,3-Trichlorobenzene	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U
71-55-6	1,1,1-Trichloroethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
79-01-6	Trichloroethene	5	U
75-69-4	Trichlorofluoromethane	5	U
96-18-4	1,2,3-Trichloropropane	5	U
95-63-6	1,2,4-Trimethylbenzene	42	
108-67-8	1,3,5-Trimethylbenzene	12	
75-01-4	Vinyl Chloride	~~5~~ 2	U
NO CAS	mp-Xylene	350	J
95-47-6	o-xylene	63	
67-64-1	Acetone	160	UJ B
78-93-3	2-Butanone	R ~~60~~	U
108-10-1	4-Methyl-2-Pentanone	50	UJ

9/8/00 CWErikson

1A 0016 CLIENT ID

VOLATILE ORGANICS ANALYSIS DATA SHEET

MW-102A

Lab Name: STL/CT Contract: _____

Lab Code: IEACT Case No.: 1470A SAS No.: _____ SDG No.: A1470

Matrix: (soil/water) WATER Lab Sample ID: 001470A-08

Sample wt/vol: 25 (g/mL) ML Lab File ID: >L2030

Level: (low/med) LOW Date Received: 07/14/00

% Moisture: not dec. _____ Date Analyzed: 07/24/00

GC Column: 007-624 ID: 0.53 (mm) Dilution Factor: 10.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: ____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	10	
108-86-1	Bromobenzene	5	U
74-97-5	Bromochloromethane	5	U
75-27-4	Bromodichloromethane	5	U
75-25-2	Bromoform	5	U
74-83-9	Bromomethane	5	U
104-51-8	n-Butylbenzene	5	U
135-98-8	Sec-Butylbenzene	5	U
98-06-6	Tert-Butylbenzene	5	U
56-23-5	Carbon Tetrachloride	5	U
108-90-7	Chlorobenzene	11	
124-48-1	Dibromochloromethane	5	U
75-00-3	Chloroethane	28	
67-66-3	Chloroform	5	U
74-87-3	Chloromethane	5	U
95-49-8	2-Chlorotoluene	5	U
106-43-4	4-Chlorotoluene	5	U
96-12-8	1,2-Dibromo-3-Chloropropane	20	U
106-93-4	1,2-Dibromoethane	5	U
74-95-3	Dibromomethane	5	U
95-50-1	1,2-Dichlorobenzene	.93	J
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5.5	
75-71-8	Dichlorodifluoromethane	27	
75-34-3	1,1-Dichloroethane	160	
107-06-2	1,2-Dichloroethane	15	
75-35-4	1,1-Dichloroethene	5	U
156-59-2	cis-1,2-Dichloroethene	230	
156-60-5	trans-1,2-Dichloroethene	3.6	J
78-87-5	1,2-Dichloropropane	6.4	
142-28-9	1,3-Dichloropropane	5	U
544-20-7	2,2-Dichloropropane	5	U
563-58-6	1,1-Dichloropropene	5	U
100-41-4	Ethylbenzene	5	U
87-68-3	Hexachlorobutadiene	5	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT ID: MW-102A

Lab Name: STL/CT Contract: _____

Lab Code: IEACT Case No.: 1470A SAS No.: _____ SDG No.: A1470

Matrix: (soil/water) WATER Lab Sample ID: 001470A-08

Sample wt/vol: 25 (g/mL) ML Lab File ID: >L2030

Level: (low/med) LOW Date Received: 07/14/00

% Moisture: not dec. _____ Date Analyzed: 07/24/00

GC Column: 007-624 ID: 0.53 (mm) Dilution Factor: 10.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
98-82-8	Isopropylbenzene	4.1	J
99-87-6	4-Isopropyltoluene	5	U
75-09-2	Methylene Chloride	32	~~B~~ UJ
91-20-3	Naphthalene	5	U
103-65-1	N-Propylbenzene	5	U
100-42-5	Styrene	5	U
630-20-6	1,1,1,2-Tetrachloroethane	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
127-18-4	Tetrachloroethene	55	J
108-88-3	Toluene	.95	J
87-61-6	1,2,3-Trichlorobenzene	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U
71-55-6	1,1,1-Trichloroethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
79-01-6	Trichloroethene	77	
75-69-4	Trichlorofluoromethane	1.7	~~JB~~ U
96-18-4	1,2,3-Trichloropropane	5	U
95-63-6	1,2,4-Trimethylbenzene	5	U
108-67-8	1,3,5-Trimethylbenzene	5	U
75-01-4	Vinyl Chloride	46	
NO CAS	mp-Xylene	10	U
95-47-6	o-xylene	5	U
67-64-1	Acetone	100	~~JB~~ UJ
78-93-3	2-Butanone	R ~~60~~	~~U~~
108-10-1	4-Methyl-2-Pentanone	50	~~U~~ UJ

9/8/00 CA Sinkson

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT ID: DUP-L+RR

Lab Name: STL/CT Contract: _____

Lab Code: IEACT Case No.: 1470A SAS No.: _____ SDG No.: A1470

Matrix: (soil/water) WATER Lab Sample ID: 001470A-09

Sample wt/vol: 25 (g/mL) ML Lab File ID: >L2031

Level: (low/med) LOW Date Received: 07/14/00

% Moisture: not dec. _____ Date Analyzed: 07/24/00

GC Column: 007-624 ID: 0.53 (mm) Dilution Factor: 10.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: ____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	10	
108-86-1	Bromobenzene	5	U
74-97-5	Bromochloromethane	5	U
75-27-4	Bromodichloromethane	5	U
75-25-2	Bromoform	5	U
74-83-9	Bromomethane	5	U
104-51-8	n-Butylbenzene	5	U
135-98-8	Sec-Butylbenzene	5	U
98-06-6	Tert-Butylbenzene	5	U
56-23-5	Carbon Tetrachloride	5	U
108-90-7	Chlorobenzene	11	
124-48-1	Dibromochloromethane	5	U
75-00-3	Chloroethane	27	
67-66-3	Chloroform	5	U
74-87-3	Chloromethane	5	U
95-49-8	2-Chlorotoluene	5	U
106-43-4	4-Chlorotoluene	5	U
96-12-8	1,2-Dibromo-3-Chloropropane	20	U
106-93-4	1,2-Dibromoethane	5	U
74-95-3	Dibromomethane	5	U
95-50-1	1,2-Dichlorobenzene	1	J
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5.7	
75-71-8	Dichlorodifluoromethane	27	
75-34-3	1,1-Dichloroethane	160	
107-06-2	1,2-Dichloroethane	16	
75-35-4	1,1-Dichloroethene	5	U
156-59-2	cis-1,2-Dichloroethene	240	
156-60-5	trans-1,2-Dichloroethene	3.8	J
78-87-5	1,2-Dichloropropane	6.6	
142-28-9	1,3-Dichloropropane	5	U
544-20-7	2,2-Dichloropropane	5	U
563-58-6	1,1-Dichloropropene	5	U
100-41-4	Ethylbenzene	5	U
87-68-3	Hexachlorobutadiene	5	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT ID: DUP-L+RR

Lab Name: STL/CT Contract: _____

Lab Code: IEACT Case No.: 1470A SAS No.: _____ SDG No.: A1470

Matrix: (soil/water) WATER Lab Sample ID: 001470A-09

Sample wt/vol: 25 (g/mL) ML Lab File ID: >L2031

Level: (low/med) LOW Date Received: 07/14/00

% Moisture: not dec. _____ Date Analyzed: 07/24/00

GC Column: 007-624 ID: 0.53 (mm) Dilution Factor: 10.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
98-82-8	Isopropylbenzene	4.2	J
99-87-6	4-Isopropyltoluene	5	U
75-09-2	Methylene Chloride	31	~~B~~ UJ
91-20-3	Naphthalene	5	U
103-65-1	N-Propylbenzene	5	U
100-42-5	Styrene	5	U
630-20-6	1,1,1,2-Tetrachloroethane	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
127-18-4	Tetrachloroethene	54	J
108-88-3	Toluene	.89	J
87-61-6	1,2,3-Trichlorobenzene	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U
71-55-6	1,1,1-Trichloroethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
79-01-6	Trichloroethene	79	
75-69-4	Trichlorofluoromethane	1.7	~~JB~~ U
96-18-4	1,2,3-Trichloropropane	5	U
95-63-6	1,2,4-Trimethylbenzene	5	U
108-67-8	1,3,5-Trimethylbenzene	5	U
75-01-4	Vinyl Chloride	45	
NO CAS	mp-Xylene	10	U
95-47-6	o-xylene	5	U
67-64-1	Acetone	69	~~JB~~ UJ
78-93-3	2-Butanone	R ~~60~~	~~U~~
108-10-1	4-Methyl-2-Pentanone	50	~~B~~ UJ

08/16 M Erikson

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT ID

TBL+RR071300
TB071300
AAG 9/8/00

Lab Name: STL/CT Contract: _____

Lab Code: IEACT Case No.: 1470A SAS No.: _____ SDG No.: A1470

Matrix: (soil/water) WATER Lab Sample ID: 001470A-10

Sample wt/vol: 25 (g/mL) ML Lab File ID: >L2007

Level: (low/med) LOW Date Received: 07/14/00

% Moisture: not dec. _____ Date Analyzed: 07/21/00

GC Column: 007-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	.5	U
108-86-1	Bromobenzene	.5	U
74-97-5	Bromochloromethane	.5	U
75-27-4	Bromodichloromethane	.5	U
75-25-2	Bromoform	.5	U
74-83-9	Bromomethane	.5	U
104-51-8	n-Butylbenzene	.5	U
135-98-8	Sec-Butylbenzene	.5	U
98-06-6	Tert-Butylbenzene	.5	U
56-23-5	Carbon Tetrachloride	.5	U
108-90-7	Chlorobenzene	.5	U
124-48-1	Dibromochloromethane	.5	U
75-00-3	Chloroethane	.5	U
67-66-3	Chloroform	.72	
74-87-3	Chloromethane	.5	U
95-49-8	2-Chlorotoluene	.5	U
106-43-4	4-Chlorotoluene	.5	U
96-12-8	1,2-Dibromo-3-Chloropropane	2	U
106-93-4	1,2-Dibromoethane	.5	U
74-95-3	Dibromomethane	.5	U
95-50-1	1,2-Dichlorobenzene	.5	U
541-73-1	1,3-Dichlorobenzene	.5	U
106-46-7	1,4-Dichlorobenzene	.5	U
75-71-8	Dichlorodifluoromethane	.5	U
75-34-3	1,1-Dichloroethane	.5	U
107-06-2	1,2-Dichloroethane	.5	U
75-35-4	1,1-Dichloroethene	.5	U
156-59-2	cis-1,2-Dichloroethene	.5	U
156-60-5	trans-1,2-Dichloroethene	.5	U
78-87-5	1,2-Dichloropropane	.5	U
142-28-9	1,3-Dichloropropane	.5	U
544-20-7	2,2-Dichloropropane	.5	U
563-58-6	1,1-Dichloropropene	.5	U
100-41-4	Ethylbenzene	.5	U
87-68-3	Hexachlorobutadiene	.5	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT ID

TBL+RR071300
TB071300
CAE 9/8/00

Lab Name: STL/CT Contract: _____

Lab Code: IEACT Case No.: 1470A SAS No.: _____ SDG No.: A1470

Matrix: (soil/water) WATER Lab Sample ID: 001470A-10

Sample wt/vol: 25 (g/mL) ML Lab File ID: >L2007

Level: (low/med) LOW Date Received: 07/14/00

% Moisture: not dec. _____ Date Analyzed: 07/21/00

GC Column: 007-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
98-82-8	Isopropylbenzene	.5	U
99-87-6	4-Isopropyltoluene	.5	U
75-09-2	Methylene Chloride	3	~~B~~ UJ CAE 9/8/00
91-20-3	Naphthalene	.5	U
103-65-1	N-Propylbenzene	.5	U
100-42-5	Styrene	.5	U
630-20-6	1,1,1,2-Tetrachloroethane	.5	U
79-34-5	1,1,2,2-Tetrachloroethane	.5	U
127-18-4	Tetrachloroethene	.5	U
108-88-3	Toluene	.5	U
87-61-6	1,2,3-Trichlorobenzene	.5	U
120-82-1	1,2,4-Trichlorobenzene	.5	U
71-55-6	1,1,1-Trichloroethane	.5	U
79-00-5	1,1,2-Trichloroethane	.5	U
79-01-6	Trichloroethene	.5	U
75-69-4	Trichlorofluoromethane	.5	U
96-18-4	1,2,3-Trichloropropane	.5	U
95-63-6	1,2,4-Trimethylbenzene	.5	U
108-67-8	1,3,5-Trimethylbenzene	.5	U
75-01-4	Vinyl Chloride	~~0.5~~ ~~2~~	U CAE 9/8/00
NO CAS	mp-Xylene	1	U
95-47-6	o-xylene	.5	U
67-64-1	Acetone	4.7	J
78-93-3	2-Butanone	~~R 6~~	~~U~~
108-10-1	4-Methyl-2-Pentanone	5	~~U~~ UJ CAE 9/8/00

TRILLIUM INC.

ATTACHMENT B

CORRECTED FORM II
GC/MS Volatiles Injection Logs
STL/Connecticut Case No. 1470A

WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: STL/CT Contract: _____

Lab Code: IEACT Case No.: 1470A SAS No.: _____ SDG No.: A1470

	EPA SAMPLE NO.	SMC1 (DCA) #	SMC2 (DBFM) #	SMC3 (TOL) #	SMC4 (BFB) #	TOT OUT
01	VBLKLN	100	107	106	106	0
02	CW-5BFMS	93	102	99	95	0
03	CW-5BFMSD	88	91	85	85	0
04	VBLKLO	115	123	121	122	0
05	MW-102A	113	115	107	108	0
06	DUP-L+RR	114	115	107	108	0
07	MW-104A	105	109	104	100	0
08	VBLKLM	89	90	88	91	0
09	CW-5B	109	110	105	110	0
10	TB071300	111	108	105	108	0
11	TB071200	110	110	106	110	0
12	MW-201	112	110	106	108	0
13	MW-202	111	110	107	111	0
14	MW-103A	110	109	106	109	0
15	CW-7A	110	110	104	107	0
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						

QC LIMITS

SMC1 (DCA)	=	1,2-Dichloroethane-d4	(83-143)
SMC2 (DBFM)	=	~~1,2-Dichloroethane-d4~~ Dibromofluoromethane	(75-125)
SMC3 (TOL)	=	Toluene-d8	(75-125)
SMC4 (BFB)	=	Bromofluorobenzene	(75-125)

CAE 8/30/00

Column to be used to flag recovery values

* Values outside of contract required QC limits

GC/MS VOLATILES INJECTION LOG Instr. HP5971L

Standards Codes:	Routine Maintenance Performed:	Date: 9/21/00
P:070000:76B:MS2B	P:071800:83A:MS2B	QC Batch: L0834
P ↓ 76C	P:071900:83C ↓	IDfile: L524Pest@L826OB25
P:071800:82B ↓		Calib file:
P: ↓ 82A ↓		Method file:

Calibrated for the following (please check): Protocol= SW846( ) CLP ( ) NYSDEC( ) 524.2 (X) Other(X) 826OB25
List= Tal(X) PP( ) 524.2 ( ) Other( )

Data file	CLP Data file	Client/Job#	Sample ID	Inj. Time	ALS #	DF	QF	Analyst	Comments	pH/WT
UB199			25ng/ml		N/A	1	1	JP	NG	
UB20D			↓	731	↓	1	1		OK	
U997			STD010ML		1	1	1		R-10W; new stds	
L1998			STD010ML		1	1	1		OK	
L1999			PCE lot		1	1	1		OK	
L2000			MBLK ML		2	1	1		acetone	
L2001			MBLK ML		1	1	1		OK	
L2002		QCS	10ppb		2	1	1			
L2003		001480A	A-09		3	1	1		DM-2	5
L2004			A-10		4	1	1		DM-1	5
L2005			A-11		5	1	1		TB000713	5
L2006		001470A	A-05		6	1	1		TB L+RR 071200	1.6 ✓
L2007			A-10 (DP)		7	1	1		TB L+RR 071300	1.6 ✓
L2008			A-05		8	1	1		GW-5B	1.6 ✓
L2009			A-1		9	1	1		MW-201	1.6 ✓
L2010			A-2		10	1	1		MW-202	1.6 ✓
L2011			A-3		11	1	1		MW-103A	1.6 ✓
L2012			A-4		12	1	1		GW-7A	1.6 ✓
L2013			A-7		13	1	1	↓	GMW-104A	1.9 ✓
L2014	JP 9/21/00				14					

CAE 9/8/00

JP 9/21/00

Witnessed by: DAM Date: 9/27/00

GC/MS VOLATILES INJECTION LOG Instr. HP5971L

Standards Codes:	Routine Maintenance Performed:	Date: 7/21/00
P: 042400:51B:MS2.8	P: 071800:82A:MS2	QC Batch: L0835
P: 070500:76B	P: ↓ 82B	IDfile: L821
P: ↓ 76C	P: ↓ 83C	Calib file:
P: 071900:83C		Method file:

Calibrated for the following (please check): Protocol= SW846( ) CLP ( ) NYSDEC( ) 524.2 ( ) Other( )
List= Tal) PP( ) 524.2 ( ) Other( )

Data file	CLP Data file	Client/Job#	Sample ID	Inj. Time	ALS #	DF	QF	Analyst	Comments	pH/WT
LB201			35 LB 35		15	1	1			
LB202					16	1	1			
LB203					17	1	1			
LB204			↓	0914	18	1	1			
L20154			VSTD010LN		19	1	1		ok	
L20165			VSTD010LN		20	1	1			
L20176			PCE 10pt		21	1	1			
L20187			VBLKLN		22	1	1			
L20198			VBLKLN		23	1	1		ok	
L2019		QCS	010026		24	1	1			
L2020		00M70A	A-16FMS		25	1	1		MW-5B	1.6
L2021			A-16FMSD		26	1	1		↓	1.6
L2022		duplblk			27	1	1		blk, C/o	–
L2023			A-8		28	1	1		MW-102A	1.9
L2024			A-9		29	1	1		dup-MW	1.6
L2025			A-10		30	1	1		~~TB-072300~~	~~1.9~~
L2026					~~31~~					
~~L2027~~					32					

✓ OKE 9/8/00

Witnessed by: Pam Date: 7-27-00

TRILLIUM INC.
Consultants in Environmental Chemistry

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August 31, 2000

Mr. Dan Garrigan
O&M, Inc.
450 Montbrook Lane
Knoxville, TN 37919

RE: Data Package Review Report - STL/Illinois Lot No. 9A08G369, STL/Connecticut Case No. 1470A - Total and Dissolved Metals in Ground Water

Dear Dan:

I have completed my evaluation of the inorganics analysis data prepared by the Severn Trent Laboratory (STL) in University Park, Illinois (under subcontract to STL/Connecticut), for eight ground water (GW) samples from the L&RR Site. These data were reported in a single data package under STL/Illinois Lot No. 9A08G369 (STL/Connecticut Case No. 1470A) which was received by Trillium for review on August 28, 2000. The following GW samples were reported:

MW-201	MW-202
MW-103A	CW-7A
CW-5B	MW-104A
MW-102A	DUP-L+RR

Analyses were performed according to EPA Methods 7060A (total and dissolved arsenic) and 7421A (total and dissolved lead); both methods are found in the Third Edition of SW-846, Update III. My evaluation was based on the specifications of the project-specific Quality Assurance Project Plan (QAPP, 9/96), the referenced methods, and the USEPA Region I *Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses* (6/88; Rev. 2/89). Qualifiers consistent with those defined in the Region I document were applied as necessary and appropriate.

Although the QAPP specifies that Level III data packages are required for all analyses except the 5-year sampling events, full raw data deliverables (i.e., GFAA instrument print-outs) were provided for all of the metals analyses. ***Unless otherwise noted, these raw data were not reviewed by Trillium as part of this evaluation.*** As specified in Section 9.2 of the QAPP (page 23), a Level III evaluation, limited to an overview of the information provided on the summary forms, was performed.

Results from analysis of the dissolved metals sample fractions were distinguished by the laboratory from analysis results for the total metals fractions by the addition of the suffix "S" (for "soluble") to the client sample identification (CW-5BS, for example). The word "Dissolved" was also added by the evaluator to the results forms for the dissolved sample analyses in Attachment A to emphasize the distinction, as well as for consistency with previous data sets generated in support of this project.

Based on the evaluation, the following qualifiers were applied:

- Results for total lead in MW-201 and for dissolved lead in MW-202S were qualified as estimated (J) based on an unacceptably high recovery in the associated CRDL standard.

- Results for lead in MW-201, MW-201S, MW-202, MW-202S, MW-103A, MW-103AS, CW-5B, CW-5BS, CW-7A, CW-7AS, MW-102A, MW-102AS, DUP-L+RR, DUP-L+RRS, and MW-104AS were qualified as estimated (J, UJ) due to negative responses in the associated calibration blanks.

- Results for total and dissolved lead in all samples were qualified as estimated (J, UJ) based on unacceptably low recoveries in the matrix spike analyses.

- The result for total arsenic in MW-103A was qualified as estimated (J) due to an unacceptably high post-digestion spike recovery.

- Results for total lead in MW-202, CW-5B, CW-7A, MW-104A, MW-102A, and DUP-L+RR, and for dissolved lead in MW-202S, CW-5BS, CW-7AS, MW-102AS, and DUP-L+RRS were qualified as estimated (J, UJ) due to unacceptably low post-digestion spike recoveries.

- Results for dissolved arsenic in MW-102AS and DUP-L+RRS were qualified as estimated (J) based on poor reproducibility in the field duplicate analyses.

- Results for total and dissolved lead in MW-202 were qualified as estimated (J) due to discrepancies between the measured total and dissolved concentrations.

All "B," "N," and "W" qualifiers applied by the laboratory were removed by the evaluator.

These qualifiers are reflected on the Inorganic Analysis Data Sheets (Form Is) included as Attachment A to this report. Region I qualifier definitions are also provided in this attachment. Where a sample result was qualified as estimated for more than one reason (as listed above), the qualifier was applied once and no further action was taken.

At the discretion of the data user, the following points may warrant attention by laboratory and field personnel with regard to this data package and/or prior to future sampling events at this site:

- Documentation of sample preservation in the field on all chain of custody records.
- Documentation of cooler temperatures and sample pHs on laboratory receipt on all chain of custody records.

Specific details regarding the review and evaluation of these data are discussed below:

Holding Times, Preservation and Sample Integrity: Copies of the two applicable field chain of custody (COC) records were not included in this data package. A "Subcontracting Requisition Form" was provided and apparently serves as the COC for the shipment of the samples from STL/Connecticut to STL/Illinois. The samples were shipped on 8/9/00 and received on 8/10/00. No shipping information is recorded on the Requisition Form, and no copy of a courier airbill is included in the data package.

No physical preservation or cooler temperature information was recorded by either laboratory on the Requisition Form. An acceptable temperature (4°C) on laboratory receipt was documented on the field COC for the samples collected on 7/12/00 (as reviewed in associated data packages). On the field COC for samples collected 7/13/00, "7°"was documented by the laboratory. It was assumed that this was also a centigrade measurement. Although slightly above the generally accepted temperature range of 4°C±2°C, the exceedance is very minor and no action was taken on this basis.

Acidification of the samples for dissolved metals analysis with nitric acid was not recorded by the sampler on either of the field COCs and was not recorded by either laboratory on the Requisition Form. Documentation of sample pHs was, however, present on the STL/Illinois digestion logs. All samples were verified to be at pH<2 at the time of preparation for analysis, confirming appropriate preservation.

Field filtration of the samples for dissolved metals analysis was documented on both field COC records.

Total and dissolved metals analyses were performed 8/11/00 through 8/18/00, well within the 6-month holding time specified by the QAPP.

Calibrations: Based on the Analysis Run Logs for each instrument and analysis date (Contract Laboratory Program [CLP] Form XIV), initial and continuing calibration verification (ICV/CCV) standards were run at appropriate frequencies throughout all reported GFAA (graphite furnace atomic absorption) analysis series. All ICV/CCV recoveries documented on the accompanying Initial and Continuing Calibration Verification Reports (CLP Form II) were acceptable (QC 90-110%).

Linearity check results (i.e., correlation coefficients for the initial multipoint calibrations) for arsenic and lead by GFAA were found in the raw data provided in the data package and were acceptable (>0.995) at the start of each analysis series.

Contract required detection limit (CRDL) standards were run at the beginning of each analysis series. Recoveries were acceptable (80-120%) with the exception of lead (152%) in the 8/11/00 CRDL standard. The high recovery suggests that low measurements of lead may be biased high or represent false positives. Results for total lead in MW-201 and for dissolved lead in MW-202S were qualified as estimated (J) on this basis.

Blanks: Based on the run logs, initial and continuing calibration blanks (ICB/CCBs) were run at appropriate frequencies throughout the reported sample analysis series. No arsenic or lead was reported above the applicable instrument detection limit (IDL) in any of the ICB/CCBs run by GFAA. Lead (-1.8 to -1.2 µg/L) was reported below the negative IDL in many of the CCBs run during all three analysis series, and arsenic was reported below the negative IDL (-1.6 and -1.9 µg/L) in two of the CCBs run during the 8/15/00 GFAA series. Results for lead in MW-201, MW-201S, MW-202, MW-202S, MW-103A, MW-103AS, CW-5B, CW-5BS, CW-7A, CW-7AS, MW-102A, MW-102AS, DUP-L+RR, DUP-L+RRS, and MW-104AS were qualified as estimated (J, UJ) on this basis. Results for arsenic in the sample analyses associated with the affected CCBs on 8/15/00 were greater than the action limit for qualification (two times the absolute value of the associated blank response), therefore no action was taken on this basis.

A water matrix preparation blank (PBW) was digested with the samples (per the preparation logs, CLP Form XIII, and the laboratory's digestion logs); no arsenic or lead contamination was reported in the PBW.

Laboratory Control Samples: Laboratory control sample results were reported in the data package. Acceptable (QC 80-120%) recoveries were reported for both arsenic and lead.

Duplicate Analysis: Sample CW-5B was analyzed in duplicate for total arsenic, total lead, dissolved arsenic, and dissolved lead. No total or dissolved lead or arsenic was detected above the IDL in any of the paired sample analyses, therefore no quantitative evaluation of precision could be made for these analytes using these data.

Matrix Spike Analysis: Sample CW-5B was prepared and analyzed as a matrix spike for total arsenic, total lead, dissolved arsenic, and dissolved lead. Reported percent recoveries for total and dissolved arsenic (98.0% and 104.4%) were acceptable (QC 75-125%). Recoveries for total and dissolved lead, however, were unacceptably low (70.4% and 44.0%). Results for total and dissolved lead in all samples were qualified as estimated (J, UJ) on this basis. The "N" qualifiers applied by the laboratory to all sample results for lead were removed by the evaluator.

Graphite Furnace Atomic Absorption (GFAA) QC: Post-digestion spike (PDS) recoveries for arsenic and lead were reported on the analysis run logs and were acceptable (QC 85-115%) with the exception of total arsenic in MW-103A (127.9%), CW-5B (124.6%), MW-104A (115.6%), and DUP-L+RR (115.9%), for dissolved arsenic in MW-103AS (138.2%), CW-5BS (121.5%), and DUP-L+RRS (118.1%), for total lead in MW-202 (66.5%), CW-5B (49.5%), CW-7A (75.6%), MW-104A (63.1%), MW-102A (71.7%), and DUP-L+RR (72.8%), and for dissolved lead in MW-202S (81.5%), CW-5BS (41.2%), CW-7AS (77.6%), MW-102AS (72.2%), and DUP-L+RRS (64.0%).

MW-104A, DUP-L+RR and DUP-L+RRS were rerun at five- or ten-fold dilutions for arsenic. The diluted analyses gave acceptable PDS recoveries and the diluted analysis results were reported, therefore no further action was warranted with respect to these sample results.

The positive result for arsenic in MW-103A was qualified as estimated (J) based on the unacceptably high PDS recovery. Arsenic was not detected above the IDL in MW-103S, CW-5B, and CW-5BS and the PDS recoveries were too high; therefore, no qualifiers were applied on this basis.

Results for total lead in MW-202, CW-5B, CW-7A, MW-104A, MW-102A, and DUP-L+RR and for dissolved lead in MW-202S, CW-5BS, CW-7AS, MW-102AS, and DUP-L+RRS were qualified as estimated (J, UJ) because the PDS recoveries were all unacceptably low.

Analysis by the Method of Standard Additions (MSA) was not required for any of the above samples. All "W" qualifiers applied by the laboratory were removed by the validator.

Sample Results: Results greater than or equal to the laboratory-specified IDLs were appropriately reported on the Inorganic Analysis Data Sheets for both analytes in each sample.

All undetected sample results for arsenic and lead were correctly adjusted (multiplied by 0.5) to reflect the concentration factor resulting from processing 100 mL of sample to a final volume of 50 mL, which was clearly documented on the laboratory's digestion logs. Positive sample results were not similarly verified as part of this evaluation.

IDLs for undetected analytes were also appropriately adjusted to reflect sample dilutions, where applicable. Positive sample results were not similarly verified as part of this evaluation.

Form X documentation of laboratory-specified IDLs established on 7/15/00 for arsenic (1.5 µg/L) and lead (1.2 µg/L) on AA4, for arsenic (1.3 µg/L) on AA3, and for lead (1.2 µg/L) on AA6 was provided in the data package. An IDL of 1.5 µg/L was reported by the laboratory for arsenic in all samples; this is acceptable, as it represents the higher of the two IDLs established on the two instruments used for these analyses.

Field Duplicates: Sample DUP-L+RR was identified as a field duplicate of MW-102A based on information provided by the client. Paired results for total arsenic (26.3 RPD) were acceptable. No total or dissolved lead was reported in either sample, therefore no quantitative evaluation of precision could be performed for this analyte using these data. An unacceptably high RPD was obtained for dissolved arsenic (39.5%; Region I Validation QC ≤30%). Results for dissolved arsenic in MW-102AS and DUP-L+RRS were qualified as estimated (J) based on this poor reproducibility.

Total versus Dissolved Concentrations: Comparison of total versus dissolved results for lead and arsenic in the ground water samples revealed one case where the dissolved concentration was higher than the total concentration: in MW-202, a low concentration of dissolved lead (0.82 µg/L) was reported while total lead was not detected above the IDL (0.60 U). Since the positive result was less than twice the sample-specific IDL, this discrepancy most likely reflects the increased variability typically observed at concentrations near the detection limit of the method. Results for total and dissolved lead in MW-202 were qualified as estimated (J, UJ) on this basis.

Documentation: Data package documentation was inconsistent with the specifications of the QAPP; specifically, a Level IV package was provided when a Level III package was required. The presence of the raw data documentation does not adversely affect the reported sample results, but, pursuant to the validation specifications for this project, it was not reviewed by Trillium as part of this evaluation except where otherwise noted above.

Client-assigned sample identifications were modified by the laboratory. Hyphens were eliminated from MW-201, MW-202, CW-5B, and CW-7A; both hyphens and the "A" suffix were eliminated from MW-102A, MW-103A, and MW-104A; and DUP-L+RR was shortened to DUPLR. The laboratory-abbreviated identifications were used consistently throughout the data package. The correct identifications, as found on the COC records, are used throughout this report and have been added to the attached Form Is by the validator.

Please let me know if you have any questions regarding this data package review report.

Sincerely,

Carol

Carol A. Erikson
Quality Assessment Manager

CAE/psn
July 2000\GWMetals (95406)

TRILLIUM INC.

ATTACHMENT A

INORGANIC ANALYSIS DATA SHEETS
STL/Illinois Lot No. 9A08G369, STL/Connecticut Case No.1470A

EPA Region I Qualifier Definitions:

U - **The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.**

J - **The associated numerical value is an estimated quantity.**

R - **The data are unusable (Note: Analyte may or may not be present).**

UJ - **The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.**

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1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW-201
MW201

Lab Name: STL_CHICAGO_____ Contract: _____

Lab Code: STL___ Case No.: _____ SAS No.: _____ SDG No.: U08369

CAE 8/31/00

Matrix (soil/water): WATER Lab Sample ID: 9A08G369-001

Level (low/med): LOW__ Date Received: 08/10/00

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_		_		NR
7440-36-0	Antimony_		_		NR
7440-38-2	Arsenic__	0.75	U		F_
7440-39-3	Barium___		_		NR
7440-41-7	Beryllium		_		NR
7440-43-9	Cadmium__		_		NR
7440-70-2	Calcium__		_		NR
7440-47-3	Chromium_		_		NR
7440-48-4	Cobalt___		_		NR
7440-50-8	Copper___		_		NR
7439-89-6	Iron_____		_		NR
7439-92-1	Lead_____	2.5	_	N J	F_
7439-95-4	Magnesium		_		NR
7439-96-5	Manganese		_		NR
7439-97-6	Mercury__		_		NR
7440-02-0	Nickel___		_		NR
7440-09-7	Potassium		_		NR
7782-49-2	Selenium_		_		NR
7440-22-4	Silver___		_		NR
7440-23-5	Sodium___		_		NR
7440-28-0	Thallium_		_		NR
7440-62-2	Vanadium_		_		NR
7440-66-6	Zinc_____		_		NR
_____	Cyanide__		_		NR
_____	_____		_		___

CAErikson 8/31/00

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

MW-201_____

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW-201 Dissolved
MW201S
CAE 8/31/00

Lab Name: STL_CHICAGO Contract: _____

Lab Code: STL___ Case No.: _____ SAS No.: _____ SDG No.: U08369

Matrix (soil/water): WATER Lab Sample ID: 9A08G369-002

Level (low/med): LOW__ Date Received: 08/10/00

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum_		_		NR	
7440-36-0	Antimony_		_		NR	
7440-38-2	Arsenic__	0.75	U		F_	
7440-39-3	Barium___		_		NR	
7440-41-7	Beryllium		_		NR	
7440-43-9	Cadmium__		_		NR	
7440-70-2	Calcium__		_		NR	
7440-47-3	Chromium_		_		NR	
7440-48-4	Cobalt___		_		NR	
7440-50-8	Copper___		_		NR	
7439-89-6	Iron____		_		NR	
7439-92-1	Lead____	0.60	U	~~J~~ UJ	F_	CAE 8/31/00
7439-95-4	Magnesium		_		NR	
7439-96-5	Manganese		_		NR	
7439-97-6	Mercury__		_		NR	
7440-02-0	Nickel___		_		NR	
7440-09-7	Potassium		_		NR	
7782-49-2	Selenium_		_		NR	
7440-22-4	Silver___		_		NR	
7440-23-5	Sodium___		_		NR	
7440-28-0	Thallium_		_		NR	
7440-62-2	Vanadium_		_		NR	
7440-66-6	Zinc____		_		NR	
_____	Cyanide__		_		NR	
_____	_____		_		___	

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
MW-201_SOLUBLE

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW-202
MW202

Lab Name: STL_CHICAGO_____ Contract: _____

CAE 8/31/00

Lab Code: STL___ Case No.: _____ SAS No.: _____ SDG No.: U08369

Matrix (soil/water): WATER Lab Sample ID: 9A08G369-003

Level (low/med): LOW__ Date Received: 08/10/00

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_		_		NR
7440-36-0	Antimony_		_		NR
7440-38-2	Arsenic__	0.75	U		F_
7440-39-3	Barium___		_		NR
7440-41-7	Beryllium		_		NR
7440-43-9	Cadmium__		_		NR
7440-70-2	Calcium__		_		NR
7440-47-3	Chromium_		_		NR
7440-48-4	Cobalt___		_		NR
7440-50-8	Copper___		_		NR
7439-89-6	Iron____		_		NR
7439-92-1	Lead____	0.60	U	UJ/W	F_
7439-95-4	Magnesium		_		NR
7439-96-5	Manganese		_		NR
7439-97-6	Mercury__		_		NR
7440-02-0	Nickel___		_		NR
7440-09-7	Potassium		_		NR
7782-49-2	Selenium_		_		NR
7440-22-4	Silver___		_		NR
7440-23-5	Sodium___		_		NR
7440-28-0	Thallium_		_		NR
7440-62-2	Vanadium_		_		NR
7440-66-6	Zinc____		_		NR
_____	Cyanide__		_		NR
_____	_____		_		__

CAE 8/31/00

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

MW-202_____

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW-202 Dissolved
MW202S

CAE 8/31/00

Lab Name: STL_CHICAGO_____ Contract: _____

Lab Code: STL___ Case No.: _____ SAS No.: _____ SDG No.: U08369

Matrix (soil/water): WATER Lab Sample ID: 9A08G369-004

Level (low/med): LOW__ Date Received: 08/10/00

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	0.75	U		F
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	0.82	~~B~~	J ~~W~~	F CAE 8/31/00
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

MW-202_SOLUBLE_____

U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW-103A
MW103

Lab Name: STL_CHICAGO_____ Contract: _____

Lab Code: STL___ Case No.: _____ SAS No.: _____ SDG No.: U08369

CAE 8/31/00

Matrix (soil/water): WATER Lab Sample ID: 9A08G369-005

Level (low/med): LOW__ Date Received: 08/10/00

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum_				NR	
7440-36-0	Antimony_				NR	
7440-38-2	Arsenic__	0.80	B	W J	F	CAE 8/31/00
7440-39-3	Barium___				NR	
7440-41-7	Beryllium				NR	
7440-43-9	Cadmium__				NR	
7440-70-2	Calcium__				NR	
7440-47-3	Chromium_				NR	
7440-48-4	Cobalt___				NR	
7440-50-8	Copper___				NR	
7439-89-6	Iron_____				NR	
7439-92-1	Lead_____	0.60	B	W UJ	F	CAE 8/31/00
7439-95-4	Magnesium				NR	
7439-96-5	Manganese				NR	
7439-97-6	Mercury__				NR	
7440-02-0	Nickel___				NR	
7440-09-7	Potassium				NR	
7782-49-2	Selenium_				NR	
7440-22-4	Silver___				NR	
7440-23-5	Sodium___				NR	
7440-28-0	Thallium_				NR	
7440-62-2	Vanadium_				NR	
7440-66-6	Zinc_____				NR	
_____	Cyanide__				NR	
_____	_____				__	

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

MW-103A_____

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW-103A Dissolved
MW103S

CAE 8/31/00

Lab Name: STL_CHICAGO Contract: _____

Lab Code: STL___ Case No.: _____ SAS No.: _____ SDG No.: U08369

Matrix (soil/water): WATER Lab Sample ID: 9A08G369-006

Level (low/med): LOW__ Date Received: 08/10/00

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum_		_		NR	
7440-36-0	Antimony_		_		NR	
7440-38-2	Arsenic__	0.75	U	W	F_	CAE 8/31/00
7440-39-3	Barium___		_		NR	
7440-41-7	Beryllium		_		NR	
7440-43-9	Cadmium__		_		NR	
7440-70-2	Calcium__		_		NR	
7440-47-3	Chromium_		_		NR	
7440-48-4	Cobalt___		_		NR	
7440-50-8	Copper___		_		NR	
7439-89-6	Iron_____		_		NR	
7439-92-1	Lead_____	0.60	U	W UJ	F_	CAE 8/31/00
7439-95-4	Magnesium		_		NR	
7439-96-5	Manganese		_		NR	
7439-97-6	Mercury__		_		NR	
7440-02-0	Nickel___		_		NR	
7440-09-7	Potassium		_		NR	
7782-49-2	Selenium_		_		NR	
7440-22-4	Silver___		_		NR	
7440-23-5	Sodium___		_		NR	
7440-28-0	Thallium_		_		NR	
7440-62-2	Vanadium_		_		NR	
7440-66-6	Zinc_____		_		NR	
_____	Cyanide__		_		NR	

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

MW-103A_SOLUBLE

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

CW-7A
CW7A

CAE 8/31/00

Lab Name: STL_CHICAGO_____ Contract: _____

Lab Code: STL___ Case No.: _____ SAS No.: _____ SDG No.: U08369

Matrix (soil/water): WATER Lab Sample ID: 9A08G369-007

Level (low/med): LOW__ Date Received: 08/10/00

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	9.4			F
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	3.0	U	UJ~~W~~	F
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

CAE 8/31/00

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

CW-7A_____

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

CW-7A Dissolved
CW7AS
CAE 8/31/00

Lab Name: STL_CHICAGO Contract: _____

Lab Code: STL___ Case No.: _____ SAS No.: _____ SDG No.: U08369

Matrix (soil/water): WATER Lab Sample ID: 9A08G369-008

Level (low/med): LOW__ Date Received: 08/10/00

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	9.1			F
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	3.0	U	UJ/~~R~~	F
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
_____	Cyanide				NR
_____	_____	_____	__	_____	__

CAE 8/31/00

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

CW-7A_SOLUBLE_____

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

CW-5B
CW5B
CAE 8/31/00

Lab Name: STL_CHICAGO_____ Contract: _____

Lab Code: STL___ Case No.: _____ SAS No.: _____ SDG No.: U08369

Matrix (soil/water): WATER Lab Sample ID: 9A08G369-009

Level (low/med): LOW__ Date Received: 08/10/00

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum_				NR	
7440-36-0	Antimony_				NR	
7440-38-2	Arsenic__	0.75	U	W	F_	CAE 8/31/00
7440-39-3	Barium___				NR	
7440-41-7	Beryllium				NR	
7440-43-9	Cadmium__				NR	
7440-70-2	Calcium__				NR	
7440-47-3	Chromium_				NR	
7440-48-4	Cobalt___				NR	
7440-50-8	Copper___				NR	
7439-89-6	Iron_____				NR	
7439-92-1	Lead_____	0.60	J	UJW	F_	CAE 8/31/00
7439-95-4	Magnesium				NR	
7439-96-5	Manganese				NR	
7439-97-6	Mercury__				NR	
7440-02-0	Nickel___				NR	
7440-09-7	Potassium				NR	
7782-49-2	Selenium_				NR	
7440-22-4	Silver___				NR	
7440-23-5	Sodium___				NR	
7440-28-0	Thallium_				NR	
7440-62-2	Vanadium_				NR	
7440-66-6	Zinc_____				NR	
_____	Cyanide__				NR	
_____	_____				___	

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

CW-5B_____

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

CW-5B Dissolved
CW5BS
CAE 8/31/00

Lab Name: STL_CHICAGO_____ Contract: _____

Lab Code: STL___ Case No.: _____ SAS No.: _____ SDG No.: U08369

Matrix (soil/water): WATER Lab Sample ID: 9A08G369-010

Level (low/med): LOW__ Date Received: 08/10/00

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	0.75	U	W	F CAE 8/31/00
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	0.60	U	UJ W	F CAE 8/31/00
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
_____	Cyanide				NR
_____	_____				___

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

CW-5B_SOLUBLE_____

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
MW-104A
MW104

Lab Name: STL_CHICAGO Contract: _____

CAE 8/31/00

Lab Code: STL Case No.: _____ SAS No.: _____ SDG No.: U08369

Matrix (soil/water): WATER Lab Sample ID: 9A08G369-011

Level (low/med): LOW Date Received: 08/10/00

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	94.7			F
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	4.2	B	JWN	F
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

CAE 8/31/00

Color Before: BROWN Clarity Before: CLOUDY Texture: _____

Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:
MW-104A

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW-104A Dissolved
MW104S

CAE 8/31/00

Lab Name: STL_CHICAGO_____ Contract: _____

Lab Code: STL___ Case No.: _____ SAS No.: _____ SDG No.: U08369

Matrix (soil/water): WATER Lab Sample ID: 9A08G369-012

Level (low/med): LOW__ Date Received: 08/10/00

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	86.9			F
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	3.0	U	~~U~~ UJ	F
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

CAE 8/31/00

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

MW-104A_SOLUBLE_____

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW-102A
MW102

CAE 8/31/00

Lab Name: STL_CHICAGO_____ Contract: _____

Lab Code: STL___ Case No.: _____ SAS No.: _____ SDG No.: U08369

Matrix (soil/water): WATER Lab Sample ID: 9A08G369-013

Level (low/med): LOW__ Date Received: 08/10/00

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_		_		NR
7440-36-0	Antimony_		_		NR
7440-38-2	Arsenic__	18.5	_		F_
7440-39-3	Barium___		_		NR
7440-41-7	Beryllium		_		NR
7440-43-9	Cadmium__		_		NR
7440-70-2	Calcium__		_		NR
7440-47-3	Chromium_		_		NR
7440-48-4	Cobalt___		_		NR
7440-50-8	Copper___		_		NR
7439-89-6	Iron____		_		NR
7439-92-1	Lead____	3.0	U	UJ/N	F_
7439-95-4	Magnesium		_		NR
7439-96-5	Manganese		_		NR
7439-97-6	Mercury__		_		NR
7440-02-0	Nickel___		_		NR
7440-09-7	Potassium		_		NR
7782-49-2	Selenium_		_		NR
7440-22-4	Silver___		_		NR
7440-23-5	Sodium___		_		NR
7440-28-0	Thallium_		_		NR
7440-62-2	Vanadium_		_		NR
7440-66-6	Zinc____		_		NR
_____	Cyanide__		_		NR
_____	_____		_		___

CAE 8/31/00

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

MW-102A_____

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW-102A Dissolved
MW102S

CAE 8/31/00

Lab Name: STL_CHICAGO_____ Contract: _____

Lab Code: STL___ Case No.: _____ SAS No.: _____ SDG No.: U08369

Matrix (soil/water): WATER Lab Sample ID: 9A08G369-014

Level (low/med): LOW__ Date Received: 08/10/00

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum				NR	
7440-36-0	Antimony				NR	
7440-38-2	Arsenic	17.6		J	F	CAE 8/31/00
7440-39-3	Barium				NR	
7440-41-7	Beryllium				NR	
7440-43-9	Cadmium				NR	
7440-70-2	Calcium				NR	
7440-47-3	Chromium				NR	
7440-48-4	Cobalt				NR	
7440-50-8	Copper				NR	
7439-89-6	Iron				NR	
7439-92-1	Lead	3.0	U	UJ	F	CAE 8/31/00
7439-95-4	Magnesium				NR	
7439-96-5	Manganese				NR	
7439-97-6	Mercury				NR	
7440-02-0	Nickel				NR	
7440-09-7	Potassium				NR	
7782-49-2	Selenium				NR	
7440-22-4	Silver				NR	
7440-23-5	Sodium				NR	
7440-28-0	Thallium				NR	
7440-62-2	Vanadium				NR	
7440-66-6	Zinc				NR	
	Cyanide				NR	

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

MW-102A_SOLUBLE_____

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DUP-L+RR
DUPLR

Lab Name: STL_CHICAGO_____ Contract: _____

Lab Code: STL___ Case No.: _____ SAS No.: _____ SDG No.: U08369

CAE 8/31/00

Matrix (soil/water): WATER Lab Sample ID: 9A08G369-015

Level (low/med): LOW__ Date Received: 08/10/00

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_		_		NR
7440-36-0	Antimony_		_		NR
7440-38-2	Arsenic__	14.2	_		F_
7440-39-3	Barium___		_		NR
7440-41-7	Beryllium		_		NR
7440-43-9	Cadmium__		_		NR
7440-70-2	Calcium__		_		NR
7440-47-3	Chromium_		_		NR
7440-48-4	Cobalt___		_		NR
7440-50-8	Copper___		_		NR
7439-89-6	Iron_____		_		NR
7439-92-1	Lead_____	0.60	U	UJ WM	F_
7439-95-4	Magnesium		_		NR
7439-96-5	Manganese		_		NR
7439-97-6	Mercury__		_		NR
7440-02-0	Nickel___		_		NR
7440-09-7	Potassium		_		NR
7782-49-2	Selenium_		_		NR
7440-22-4	Silver___		_		NR
7440-23-5	Sodium___		_		NR
7440-28-0	Thallium_		_		NR
7440-62-2	Vanadium_		_		NR
7440-66-6	Zinc_____		_		NR
_____	Cyanide__		_		NR

CAE 8/31/00

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

DUP-LRR_____

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DUP-LRR Dissolved
DUPLRS

CAE 8/31/00

Lab Name: STL_CHICAGO_____ Contract: _____

Lab Code: STL___ Case No.: _____ SAS No.: _____ SDG No.: U08369

Matrix (soil/water): WATER Lab Sample ID: 9A08G369-016

Level (low/med): LOW__ Date Received: 08/10/00

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum				NR	
7440-36-0	Antimony				NR	
7440-38-2	Arsenic	11.8		J	F	CAE 8/31/00
7440-39-3	Barium				NR	
7440-41-7	Beryllium				NR	
7440-43-9	Cadmium				NR	
7440-70-2	Calcium				NR	
7440-47-3	Chromium				NR	
7440-48-4	Cobalt				NR	
7440-50-8	Copper				NR	
7439-89-6	Iron				NR	
7439-92-1	Lead	0.60	U	UJ/NJ	F	CAE 8/31/00
7439-95-4	Magnesium				NR	
7439-96-5	Manganese				NR	
7439-97-6	Mercury				NR	
7440-02-0	Nickel				NR	
7440-09-7	Potassium				NR	
7782-49-2	Selenium				NR	
7440-22-4	Silver				NR	
7440-23-5	Sodium				NR	
7440-28-0	Thallium				NR	
7440-62-2	Vanadium				NR	
7440-66-6	Zinc				NR	
	Cyanide				NR	

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

DUP-LRR_SOLUBLE_____

TRILLIUM INC.
Consultants in Environmental Chemistry

356 FARRAGUT CROSSING DR.
KNOXVILLE, TN 37922
(423) 966-8880
FAX (423) 966-8885
cerikson@trilliuminc.com

October 5, 2000

Mr. Dan Garrigan
O&M, Inc.
450 Montbrook Lane
Knoxville, TN 37919

RE: Data Package Review Report - STL Case No. 1470A - Total Iron in Ground Water

Dear Dan:

I have completed my evaluation of the inorganics analysis data prepared by the Severn Trent Laboratory (STL) in Monroe, Connecticut, for eight ground water (GW) samples from the L&RR Site. These data were reported in a single data package, under Case No. 1470A, which was received by Trillium for review on October 5, 2000. The following GW samples were reported:

MW-201	MW-202
MW-103A	CW-7A
CW-5B	MW-104A
MW-102A	DUP-L+RR

This data package includes re-analysis data for all eight samples. A data package received on August 28, 2000, presented the original analysis results. Review of the original data revealed an excessively large discrepancy between the results for the field duplicate pair (MW-102A and DUP-L+RR). Historically, the field duplicate pair has shown very good reproducibility, and paired results for all other analyzed parameters did match quite well. At the request of the evaluator, the laboratory rechecked their calculations and verified that the correct values were reported based on the raw data. Subsequently, the laboratory ran "quick and dirty" reruns of the field duplicate samples, and found the paired results to be very consistent. Therefore, re-analysis of all eight samples for total iron was requested by the evaluator, due to the possibility that one or more additional sample results could be wrong if two samples had been switched at some point during the original preparations. This did, in fact, turn out to be the case. The following table summarizes the original and re-analysis results for total iron:

Sample	Original Result (µg/L)	Re-Analysis Result (µg/L)
MW-201	351	1530
MW-202	321	7790
MW-103A	47700	13.8
CW-7A	15800	15200
CW-5B	3780	3010
MW-104A	82600	89100
MW-102A	33.8	37200
DUP-L+RR	43900	36600

From these data, it appears that samples MW-103A and MW-102A were switched at some point in the original preparation and analysis process for total iron. The re-analysis results are also consistent with results obtained for total iron in the April 2000 samples collected from this site. Therefore, only the re-analysis results were reviewed and discussed in the remainder of this report. The original analysis results (pages 78-105 of the August 25, 2000 data package) have been clipped separately and marked "Do Not Use" for clarity.

Analyses were performed according to EPA Method 6010B, which is found in the Third Edition of SW-846, Update III. My evaluation was based on the specifications of the project-specific Quality Assurance Project Plan (QAPP, 9/96), the referenced method, and the USEPA Region I *Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses* (6/88; Rev. 2/89). Qualifiers consistent with those defined in the Region I document were applied as necessary and appropriate.

No metals analysis raw data were provided in the data package; a Level III evaluation of the summary forms as presented was performed, as required by the QAPP.

Based on the evaluation, the following action was taken:

- The result for total iron in MW-103A was qualified as estimated (J) because it was less than twice the instrument detection limit. The "B" qualifier applied by the laboratory was removed by the evaluator.

This action is reflected on the Inorganic Analysis Data Sheet (Form I) for MW-103A included in Attachment A to this report. Region I qualifier definitions are also provided in this attachment.

At the discretion of the data user, the following points may warrant attention by laboratory and field personnel with regard to this data package and/or prior to future sampling events at this site:

- Documentation of sample preservation in the field on all chain of custody records.
- Documentation of complete cooler temperatures and sample pHs on laboratory receipt directly on all chain of custody records.
- Use of updated (within three months of sample analyses) instrument detection limits in association with every data package.

Specific details regarding the review and evaluation of these data are discussed below:

Holding Times, Preservation and Sample Integrity: Copies of the applicable chain of custody (COC) records were not included in the 10/4/00 data package, however these records were available in the 8/25/00 data package (which also included results for other analysis parameters). The following discussion refers to review of those documents.

The two applicable COC records documented sample collection dates of 7/12/00 and 7/13/00. An acceptable temperature (4°C) on laboratory receipt was documented on the COC for the samples collected on 7/12/00. On the COC for samples collected 7/13/00, "7°"was documented by the laboratory; it was assumed that this was also a centigrade measurement. Although slightly above the generally accepted temperature range of 4°C±2°C, the exceedance is very minor and no action was taken on this basis.

Acidification of the samples for total iron analysis with nitric acid was not recorded by the sampler on either of the COCs and documentation of sample pHs on laboratory receipt or at the time of preparation for analysis was also not included in the data package. At the evaluator's request, the laboratory provided their sample receiving preservative records for all samples, which verified that the sample containers preserved with nitric acid were at pH<2 on receipt from the field in all cases. No further action was taken on this basis.

The re-analyses for total iron were performed on 9/25/00, well within the 6-month holding time specified by the QAPP.

Calibrations: Based on the Analysis Run Log (Contract Laboratory Program [CLP] Form XIV), initial and continuing calibration verification (ICV/CCV) standards were run at appropriate frequencies throughout the ICP (inductively coupled plasma) analysis series. All ICV/CCV

recoveries documented on the accompanying Initial and Continuing Calibration Verification Reports (CLP Form II) were acceptable (QC 90-110%).

Blanks: Based on the run log, initial and continuing calibration blanks (ICB/CCBs) were run at appropriate frequencies throughout the reported sample analysis series. Iron was not detected above the instrument detection limit (IDL) in any of the ICB/CCBs run during the ICP analysis series.

A water matrix preparation blank (PBW) was digested with the samples (per the preparation log, CLP Form XIII). Iron was not detected in the PBW.

ICP Interference Check Sample: No interference check sample results were reported in the data package, although entries for these analyses were found on the run log.

Laboratory Control Samples: Laboratory control sample results were reported in the data package. An acceptable (QC 80-120%) recovery was reported for iron (91.0%).

Duplicate Analysis: Sample CW-5B was analyzed in duplicate for total iron, and excellent reproducibility was demonstrated (2.9 relative percent difference [RPD]).

Matrix Spike Analysis: Sample CW-5B was prepared and analyzed as a matrix spike for total iron. The reported percent recovery (80.9%) was acceptable (QC 75-125%).

ICP Serial Dilution: An acceptable serial dilution analysis result (QC ≤15% difference, per Region I validation guidance) for iron in MW-104A (11.9%) was reported in the data package.

Sample Results: Results greater than or equal to the laboratory-specified IDL were appropriately reported on the Inorganic Analysis Data Sheets for total iron in each sample.

Form X documentation of the laboratory-specified IDL established for iron on 4/15/00 (7.2 µg/L) was provided in the data package. IDLs should be established quarterly and this is much more than three months prior to the sample analyses. The laboratory should be instructed to establish and provide documentation of updated IDLs in association with every data package.

The result for total iron in MW-103A was greater than the applicable IDL but below the laboratory-specified reporting limit (RL) and was correctly reported by the laboratory with a "B" qualifier. As concentrations approach the IDL the accuracy of the measurement decreases; values closer to the RL, however, are probably quite accurate. Therefore, a guideline of 2xIDL was used to determine whether the reported result warranted qualification; specifically, sample results below the respective RL, less than 2xIDL and not otherwise qualified warrant qualification as estimated. The result for total iron in MW-103A was qualified as estimated (J) on this basis, and the "B" qualifier applied by the laboratory was removed by the validator.

Field Duplicates: Sample DUP-L+RR was identified as a field duplicate of MW-102A based on information provided by the client. Paired results for total iron showed excellent reproducibility, with an RPD of 1.6%.

Documentation: Data package documentation was consistent with the specifications of the QAPP; specifically, a Level III package containing summary forms only with no supporting raw data was provided.

Documentation of sample pHs on laboratory receipt was not provided in the data package as received for review. This information was verbally requested by the evaluator on 8/30/00 (in association with the original data package); sample receiving preservation logs were received from the laboratory via facsimile on 9/2/00. These records were inserted into the 8/25/00 data package by the evaluator as pages 55a and 55b.

The narrative included in the 10/4/00 data package is identical to the narrative in the 8/25/00 data package. The statement, "Iron failed the controls for spike recovery analysis of sample CW-5B resulting in one 'N' flag." is not applicable to the 10/4/00 data package and was deleted by the evaluator.

No interference check sample results were reported, although the run log indicates that these quality control analyses were performed.

The preparation and analysis summary form on pages 10-11 of the 10/4/00 data package implies that samples were prepared and analyzed on 9/25/00 for total and dissolved arsenic and lead as well as for total iron. Only total iron reruns were requested, and only total iron data were reported in the data package, although it is certainly possible that the additional preparations were unnecessarily performed by the laboratory.

Please let me know if you have any questions regarding this data package review report.

Sincerely,

Carol Erikson

Carol A. Erikson
Quality Assessment Manager

CAE/esc
July 2000\GWTotalFe (95406)

TRILLIUM INC.

ATTACHMENT A

INORGANIC ANALYSIS DATA SHEETS
Laboratory Case No. 1470A

EPA Region I Qualifier Definitions:

U - **The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.**

J - **The associated numerical value is an estimated quantity.**

R - **The data are unusable (Note: Analyte may or may not be present).**

UJ - **The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.**

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW-201

Lab Name: STL Contract: _____

Lab Code: STL Case No.: 1470A SAS No.: _____ SDG No.: A1470

Matrix (soil/water): WATER Lab Sample ID: T001470A-01

Level (low/med): LOW Date Received: 07/13/00

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron	1530			P
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
57-12-5	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

Total Metals

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW-202

Lab Name: STL Contract: _____

Lab Code: STL Case No.: 1470A SAS No.: _____ SDG No.: A1470

Matrix (soil/water): WATER Lab Sample ID: T001470A-02

Level (low/med): LOW Date Received: 07/13/00

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron	7790			P
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
57-12-5	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

Total Metals

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW-103A

Lab Name: STL Contract: _____

Lab Code: STL Case No.: 1470A SAS No.: _____ SDG No.: A1470

Matrix (soil/water): WATER Lab Sample ID: T001470A-03

Level (low/med): LOW Date Received: 07/13/00

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron	13.8	B	J CAStilkson 10/5/00	P
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
57-12-5	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

Total Metals

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

CW-7A

Lab Name: STL Contract: _____

Lab Code: STL Case No.: 1470A SAS No.: _____ SDG No.: A1470

Matrix (soil/water): WATER Lab Sample ID: T001470A-04

Level (low/med): LOW Date Received: 07/13/00

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron	15200			P
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
57-12-5	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

Total Metals

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

CW-5B

Lab Name: STL Contract: _____

Lab Code: STL Case No.: 1470A SAS No.: _____ SDG No.: A1470

Matrix (soil/water): WATER Lab Sample ID: T001470A-06

Level (low/med): LOW Date Received: 07/14/00

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron	3010			P
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
57-12-5	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

Total Metals

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW-104A

Lab Name: STL Contract: _____

Lab Code: STL Case No.: 1470A SAS No.: _____ SDG No.: A1470

Matrix (soil/water): WATER Lab Sample ID: T001470A-07

Level (low/med): LOW Date Received: 07/14/00

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron	89100			P
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
57-12-5	Cyanide				

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

Total Metals

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW-102A

Lab Name: STL Contract: _____

Lab Code: STL Case No.: 1470A SAS No.: _____ SDG No.: A1470

Matrix (soil/water): WATER Lab Sample ID: T001470A-08

Level (low/med): LOW Date Received: 07/14/00

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron	37200			P
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
57-12-5	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

Total Metals

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DUP-L+RR

Lab Name: STL Contract: _____

Lab Code: STL Case No.: 1470A SAS No.: _____ SDG No.: A1470

Matrix (soil/water): WATER Lab Sample ID: T001470A-09

Level (low/med): LOW Date Received: 07/14/00

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron	36600			P
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
57-12-5	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

Total Metals

TRILLIUM INC.
Consultants in Environmental Chemistry

TRILLIUM INC.

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FAX (423) 966-8885
cerikson@trilliuminc.com

September 14, 2000

Mr. Dan Garrigan
O&M, Inc.
450 Montbrook Lane
Knoxville, TN 37919

RE: Data Package Review Report - STL/Connecticut Case No. 1470A - Ammonia, Chloride, and BOD in Ground Water

Dear Dan:

I have completed my evaluation of the wet chemistry analysis data prepared by the Severn Trent Laboratory in Shelton, Connecticut (STL/Connecticut), for eight ground water samples from the L&RR Site, which were reported in a single data package under STL Case No. 1470A. The data package was received by Trillium for review on August 28, 2000, with additional requested documentation provided on September 2 and 11, 2000. The following samples were reported:

MW-201	MW-202
MW-103A	CW-7A
CW-5B	MW-104A
MW-102A	DUP-L+RR

Analyses were performed according to EPA Methods 325.2 (chloride), 350.1 (ammonia), and 405.1 (BOD); these three methods are found in *Methods for Chemical Analysis of Water and Wastes* (EPA-600/4-79-020, 3/83). My evaluation was based on the specifications of the project-specific Quality Assurance Project Plan (QAPP, 9/96), the referenced methods, and, to the extent applicable, the USEPA Region I *Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses* (6/88; Rev. 2/89). Qualifiers consistent with those defined in the Region I document were applied as necessary and appropriate.

No raw data were provided in the data package as initially submitted for review. As specified by the QAPP, only a Level III evaluation of the summary results was required. However, for these parameters, the raw data pages also serve as analysis run logs and are necessary to verify calibrations when spectrophotometric methods are used as well as generally helpful for verifying that all samples were analyzed. Raw data documentation has also been provided in previous data packages generated

in support of this project. Additional documentation was therefore requested from and received by the laboratory as discussed throughout this report.

Based on the evaluation, results for BOD in all samples collected on 7/12/00 (MW-201, MW-202, MW-103A, and CW-7A) were qualified as estimated (J, UJ) because incubation was started after the 48 hour holding time for this parameter had expired. All other sample results were determined to be valid as reported; no qualifiers were applied.

At the discretion of the data user, the following points may warrant attention by field and laboratory personnel with regard to this data package and prior to future sampling events at this site:

- Documentation of sample preservation performed in the field on all chain of custody records.
- Documentation of complete cooler temperatures and sample pHs at the time of laboratory receipt on all chain of custody records.
- Inclusion of raw data as needed to document calibrations and analysis of all samples.

Specific details regarding the review and evaluation of these data are discussed below:

Holding Times, Preservation and Sample Integrity: Copies of the two applicable chain of custody (COC) records were included in the data package, documenting sample collection dates of 7/12/00 and 7/13/00. An acceptable temperature (4°C) on laboratory receipt was documented on the COC for the samples collected on 7/12/00. On the COC for samples collected 7/13/00, "7°"was documented by the laboratory. It was assumed that this was also a centigrade measurement. Although slightly above the generally accepted temperature range of 4°C ±2°C, the exceedance is very minor and no action was taken on this basis.

Acidification of the samples for ammonia analysis with sulfuric acid was recorded by the sampler on only one of the COCs and documentation of sample pHs on laboratory receipt or at the time of analysis was not included in the data package. At the evaluator's request, STL/Connecticut provided their sample receiving preservative records for all samples, which verified that the sample containers preserved with sulfuric acid were at pH<2 on receipt from the field in all cases. No further action was taken on this basis.

All sample analyses for chloride and ammonia were performed within the 28-day holding time specified by the QAPP for these two parameters. BOD incubation was initiated on 7/15/00 for all samples; this is within the required 48-hour holding time for those samples collected on 7/13/00 but exceeds the holding time for those samples collected on 7/12/00. Results for BOD in the four samples collected on 7/12/00 (MW-201, MW-202, MW-103A, and CW-7A) were qualified as estimated (J, UJ) on this basis.

Calibrations: Chloride analyses were performed according to EPA 325.2. No documentation of an initial calibration for chloride was provided in the package initially received for review. At the request of the evaluator, copies of the applicable instrument print-outs, including the initial calibration for chloride, were provided by the laboratory via FedEx on 9/11/00. Based on this documentation, an initial calibration (3.0-75 mg/L) was run for chloride on 7/23/00 (immediately prior to sample analyses) and acceptable correlation coefficients (>0.995) were reported for two segments of that curve. Initial and continuing calibration verification standards were run at appropriate frequencies throughout the chloride analysis series, and all recoveries were acceptable (QC 85-115%) as reported on the summary forms provided for review.

Ammonia analyses were performed according to EPA 350.1. No documentation of an initial calibration for ammonia was provided in the package initially received for review. At the request of the evaluator, copies of the applicable instrument print-outs, including the initial calibration for ammonia, were provided by the laboratory via FedEx on 9/11/00. Based on this documentation, an initial calibration (0.04-4.0 mg/L) was run for ammonia on 7/20/00 (immediately prior to sample analyses) and acceptable correlation coefficients (>0.995) were reported for two segments of that curve. Initial and continuing calibration verification standards were run at appropriate frequencies throughout the ammonia analysis series, and all recoveries were acceptable (QC 85-115%) as reported on the summary forms provided for review.

Initial calibration is not applicable to the BOD analyses, which were performed by titration.

Blanks: Method blank results were reported for ammonia, chloride, and BOD on summary forms in the data package; no contamination was reported above the applicable reporting limit in any of these blanks.

Initial and continuing calibration blanks (ICB/CCBs) were run at the appropriate frequencies for both chloride and ammonia and no contamination was detected in any of these blanks, based on the summary forms provided for review.

Laboratory Control Samples: Laboratory control samples (LCSs) were analyzed in association with the sample analyses for ammonia and chloride. Acceptable recoveries (87.1% and103.7%) were reported in both cases.

Duplicate Analysis: Unspiked duplicate analyses of CW-5B were performed for chloride and ammonia. Neither chloride nor ammonia was detected above the reporting limit in either sample analysis; therefore, no evaluation of precision could be made using these data.

Results for an unspiked duplicate analysis of a non-project sample were reported for BOD. These data have no relevance to the site samples included in this data set and were not further reviewed.

Matrix Spike Analysis: Sample CW-5B was prepared and analyzed as a matrix spike for ammonia and chloride. Reported percent recoveries (86.4% and 112.1%) were acceptable (QC 75-125%) for both spikes.

Spiked sample results for a non-project sample were reported for BOD. These data have no relevance to the site samples included in this data set and were not further reviewed.

Sample Results: Sample results greater than or equal to the laboratory-specified reporting limits (RLs) for ammonia, chloride, and BOD were reported on "Wet Chem Analysis Data Sheets" for all samples. Non-detected analytes were reported as less than the applicable RL in all cases. Based on the raw data/run logs provided by the laboratory, some samples were appropriately re-analyzed at dilutions for some parameters.

Field Duplicates: Sample DUP-L+RR was identified as a field duplicate of MW-102A. Positive paired results for chloride (5.4 RPD), ammonia (1.5 RPD), and BOD (22.9 RPD) showed acceptable reproducibility (QC ≤30%).

Documentation: Data package documentation was consistent with the specifications of the QAPP; specifically, a Level III package containing summary forms only was provided. However, no documentation of initial or continuing calibration standards for chloride and ammonia was provided, although this information has been provided in previous data packages generated in support of this project. For wet chemistry parameters in general, the raw data pages serve as run logs and are helpful for verifying that all samples were, in fact, analyzed. For those parameters run by spectrophotometric methods, the raw data pages are necessary to evaluate calibrations and calibration blanks, which are not routinely summarized elsewhere. Additional documentation for chloride, ammonia, and BOD was therefore requested from and provided by the laboratory on 9/11/00, as discussed previously in this report. The BOD documentation was added to the end of the data package as pages 125-127; the

ammonia documentation was added as pages 128-142; and the chloride documentation was added as pages 143-150.

COC records provided in the data package included all reported samples and were properly completed except that sample preservation was recorded on only one of the COCs and improper corrections were noted on both documents. In the future, all corrections should be made by drawing a single line through the incorrect information, inserting the correct information, and initialing and dating the change. "Write-overs" are not legally defensible.

Documentation of sample pHs on laboratory receipt (or at the time of analysis) was not provided in the data package as received for review. This information was verbally requested by the validator on 8/30/00; sample receiving preservation logs were received from the laboratory via facsimile on 9/2/00. These records were inserted into the data package by the evaluator as pages 55a and 55b.

Please let me know if you have any questions regarding this data package review report.

Sincerely,

Carol

Carol A. Erikson
Quality Assessment Manager

CAE/esc
July 2000\GWWetChem (95406)

TRILLIUM INC.

ATTACHMENT A

WET CHEM ANALYSIS DATA SHEETS (Form I)
STL/Connecticut Case No. 1470A

EPA Region I Qualifier Definitions:

U - **The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.**

J - **The associated numerical value is an estimated quantity.**

R - **The data are unusable (Note: Analyte may or may not be present).**

UJ - **The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.**

1

WET CHEM ANALYSIS DATA SHEET

SAMPLE NO.

MW-201

Lab Name: STL Contract: _____

Lab Code: STL Case No.: 1470A SAS No.: _____ SDG No.: A1470

Matrix (soil/water): WATER Lab Sample ID: 001470A-01

% Solids: 0 Date Received: 07/13/00

CAS No.	Analyte	Concentration	C	Units	Q	M
7727-37-9	Ammonia	0.0400	U	mg/L		L
	BOD5	2.0	Ø UJ	mg/L		P
16887-00-6	Chloride	3.00	U	mg/L		L
				CAS ikap 9/13/00		

Comments:

FORM I - WC

1
WET CHEM ANALYSIS DATA SHEET

SAMPLE NO.

MW-202

Lab Name: STL Contract: _____

Lab Code: STL Case No.: 1470A SAS No.: _____ SDG No.: A1470

Matrix (soil/water): WATER Lab Sample ID: 001470A-02

% Solids: 0 Date Received: 07/13/00

CAS No.	Analyte	Concentration	C	Units	Q	M
7727-37-9	Ammonia	0.0400	U	mg/L		L
	BOD5	2.0	U	UJ mg/L		P
16887-00-6	Chloride	14.9		mg/L		L
				CAE 9/13/00		

Comments:

FORM I - WC

1

WET CHEM ANALYSIS DATA SHEET

SAMPLE NO.

MW-103A

Lab Name: STL Contract: _____

Lab Code: STL Case No.: 1470A SAS No.: _____ SDG No.: A1470

Matrix (soil/water): WATER Lab Sample ID: 001470A-03

% Solids: 0 Date Received: 07/13/00

CAS No.	Analyte	Concentration	C	Units	Q	M
7727-37-9	Ammonia	0.0400	U	mg/L		L
	BOD5	2.0	U UJ	mg/L		P
16887-00-6	Chloride	3.58		mg/L		L
				CAE 9/13/00		

Comments:

FORM I - WC

1

WET CHEM ANALYSIS DATA SHEET

SAMPLE NO.

CW-7A

Lab Name: STL Contract: _____

Lab Code: STL Case No.: 1470A SAS No.: _____ SDG No.: A1470

Matrix (soil/water): WATER Lab Sample ID: 001470A-04

% Solids: 0 Date Received: 07/13/00

CAS No.	Analyte	Concentration	C	Units	Q	M
7727-37-9	Ammonia	0.260		mg/L		L
	BOD5	2.6	J	mg/L		P
16887-00-6	Chloride	7.05		mg/L		L
			CAF 9/13/00			

Comments:

_____

_____

_____

_____

FORM I - WC

1

WET CHEM ANALYSIS DATA SHEET

SAMPLE NO.

CW-5B

Lab Name: STL Contract: _____

Lab Code: STL Case No.: 1470A SAS No.: _____ SDG No.: A1470

Matrix (soil/water): WATER Lab Sample ID: 001470A-06

% Solids: 0 Date Received: 07/14/00

CAS No.	Analyte	Concentration	C	Units	Q	M
7727-37-9	Ammonia	0.0400	U	mg/L		L
	BOD5	4.6		mg/L		P
16887-00-6	Chloride	3.00	U	mg/L		L

Comments:

1

WET CHEM ANALYSIS DATA SHEET

SAMPLE NO.

MW-104A

Lab Name: STL Contract: _____

Lab Code: STL Case No.: 1470A SAS No.: _____ SDG No.: A1470

Matrix (soil/water): WATER Lab Sample ID: 001470A-07

% Solids: 0 Date Received: 07/14/00

CAS No.	Analyte	Concentration	C	Units	Q	M
7727-37-9	Ammonia	22.6		mg/L		L
	BOD5	22.3		mg/L		P
16887-00-6	Chloride	419.		mg/L		L

Comments:

FORM I - WC

1

WET CHEM ANALYSIS DATA SHEET

SAMPLE NO.

MW-102A

Lab Name: STL Contract: _____

Lab Code: STL Case No.: 1470A SAS No.: _____ SDG No.: A1470

Matrix (soil/water): WATER Lab Sample ID: 001470A-08

% Solids: 0 Date Received: 07/14/00

CAS No.	Analyte	Concentration	C	Units	Q	M
7727-37-9	Ammonia	0.409		mg/L		L
	BOD5	14.6		mg/L		P
16887-00-6	Chloride	7.41		mg/L		L

Comments:

1

WET CHEM ANALYSIS DATA SHEET

SAMPLE NO.

DUP-L+RR

Lab Name: STL Contract: _____

Lab Code: STL Case No.: 1470A SAS No.: _____ SDG No.: A1470

Matrix (soil/water): WATER Lab Sample ID: 001470A-09

% Solids: 0 Date Received: 07/14/00

CAS No.	Analyte	Concentration	C	Units	Q	M
7727-37-9	Ammonia	0.403		mg/L		L
	BOD5	11.6		mg/L		P
16887-00-6	Chloride	7.02		mg/L		L

Comments:

FORM I - WC

TRILLIUM INC.
Consultants in Environmental Chemistry

356 FARRAGUT CROSSING DR.
KNOXVILLE, TN 37922
(423) 966-8880
FAX (423) 966-8885
cerikson@trilliuminc.com

September 11, 2000

Mr. Dan Garrigan
O&M, Inc.
450 Montbrook Lane
Knoxville, TN 37919

RE: Data Package Review - STL/Illinois Lot No. 9A07G171, STL/Connecticut Case No. 1470A - COD in Ground Waters

Dear Dan:

I have completed my evaluation of the chemical oxygen demand (COD) analysis data prepared by the Severn Trent Laboratory (STL) in University Park, Illinois (under subcontract to STL/Connecticut), for eight ground water samples from the L&RR site. The data were reported in a single data package under STL/Illinois Lot No. 9A07G171, STL/Connecticut Case No. 1470A, which was received by Trillium for review on August 28, 2000 and included the following samples:

MW-201	MW-202
MW-103A	CW-7A
CW-5B	MW-104A
MW-102A	DUP-L+RR

Analyses were performed according to Hach Method 8000, which is a closed reflux digestion with titration assay, as referenced by the laboratory. My evaluation was based on the specifications of the project-specific Quality Assurance Project Plan (QAPP, 9/96), the referenced method, and, to the extent applicable, the USEPA Region I *Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses* (6/88; Rev. 2/89).

Based on the evaluation, all sample results for COD were determined to be valid as reported. No qualifiers were applied.

At the discretion of the data user, the following points may warrant attention by field and laboratory personnel with regard to this data package and prior to future sampling events at this site:

- Documentation of sample preservation performed in the field on all chain of custody records.

- Documentation of complete cooler temperatures and sample pHs at the time of laboratory receipt on all applicable chain of custody records.

Specific details regarding the review and evaluation of these data are discussed below:

Holding Times, Preservation, Sample Integrity: Copies of the two applicable field chain of custody (COC) records were not included in the data package. A "Subcontracting Requisition Form" was provided, which apparently serves as the COC for the shipment of samples from STL/Connecticut to STL/Illinois. The samples were shipped on 7/19/00 and received on 7/20/00; a copy of a FedEx label is also provided in the data package, however the airbill number is not recorded on the Requisition Form and the airbill is not dated. Therefore, the airbill cannot be reliably linked to the shipment of these samples.

The notation "Temp 2.2" is present in the "Special Instructions" portion of the Requisition Form, but it is not clear when this entry was made or who made it. For the purposes of this evaluation, it was assumed that this was recorded by STL/Illinois on receipt of the samples and that it means that the cooler was at the acceptable temperature of 2.2°C when it arrived.

Acidification of the samples for COD analysis with sulfuric acid was recorded by the sampler on only one of the field COCs (as reviewed in associated data packages) and was not recorded by STL/Connecticut at all on the Requisition Form. Documentation of sample pHs was also not documented by either laboratory anywhere else in this data package. At the request of the validator, STL/Connecticut provided their sample receiving preservative records for all samples, which verified that the sample containers preserved with sulfuric acid were at pH<2 on receipt from the field in all cases. For the purposes of this evaluation, it was assumed that the pHs of the samples for COD analysis did not change during transport from STL/Connecticut to STL/Illinois and no further action was taken on this basis.

All sample analyses for COD were performed within the 28-day holding time specified by the QAPP for this parameter.

Calibrations: Calibration is not applicable to the titrimetric method used for these analyses.

Blanks: Low- and high-level method blanks (MBs) containing no COD above the reporting limit were reported in the data package.

Laboratory Control Samples: Low- and high-level laboratory control samples (LCSs) were analyzed in association with the sample analyses for COD. Acceptable recoveries (114% and 94.0%) were reported in both cases.

Duplicate Analysis: No unspiked laboratory duplicate analysis was performed on any of the samples in this data package.

Matrix Spike Analysis: Sample CW-5B was prepared and analyzed as a matrix spike/matrix spike duplicate (MS/MSD) pair. Reported COD recoveries were acceptable (113% and 102%) and reproducible (relative percent difference, RPD, 9.8%).

Sample Results: Sample results greater than or equal to the laboratory-specified reporting limit (5 mg/L) for COD were reported on summary forms for all samples. MW-104A was analyzed as a high-level sample; all remaining samples were analyzed as low-level samples.

Field Duplicates: Sample DUP-L+RR was identified as a field duplicate of MW-102A. COD was not detected above the RL in either sample, therefore no quantitative evaluation of precision could be performed using these data.

Documentation: Data package documentation was inconsistent with the specifications of the QAPP, in that full raw data documentation was provided when a Level III package containing summary forms only was required. However, for wet chemistry parameters in general, the raw data pages serve as run logs and are helpful for verifying that all samples were, in fact, analyzed. Therefore, the data package documentation was appropriate as provided.

Field COC records were not provided in the data package, and documentation of sample pHs on receipt at STL/Illinois was not found in the data package as received for review. The field COC records were available for review in other data packages associated with this data set, and no action was taken on this basis. Chemical preservation of the samples for COD analysis was verified based on the preservative logs provided by STL/Connecticut, which verified that they were at pH<2 on arrival at that laboratory. It was assumed that the pHs did not change during shipment to STL/Illinois, and no further action was taken on this basis.

Sample results were reported by STL/Illinois using the STL/Connecticut identifications. COC identifications were added to the results forms in Attachment A for the sake of clarity.

Please let me know if you have any questions regarding this data package review report.

Sincerely,

Carol

Carol A. Erikson
Quality Assessment Manager

CAE/psn
95406\July 2000\GWCOD

TRILLIUM INC.

ATTACHMENT A

COD in Ground Waters
STL/Illinois Lot No. 9A07G171, STL/Connecticut Case No. 1470A

EPA Region I Qualifier Definitions:

U - **The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.**

J - **The associated value is an estimated quantity.**

R - **The data are unusable. (Note: Analyte may or may not be present).**

UJ - **The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.**

To: STL Connecticut
Severn Trent Laboratories
128 Long Hill Cross Road
Shelton, CT 06484

Attn: Paul Hobart

Date: Friday July 28th, 2000

RE: 1470A-01 MW-201 CAE 8/30/00
Project # 00000-000-000-0000
Lab ID: 9A07G171-001
Sample Date: 07/12/00
Date Received: 07/20/00

Inorganic Data Report

Parameters	Result		Units	Reporting Limit
COD	5	u	mg/L	5

To: STL Connecticut
Severn Trent Laboratories
128 Long Hill Cross Road
Shelton, CT 06484

Attn: Paul Hobart

Date: Friday July 28th, 2000

RE: 1470A-02 MW-202 CAE 8/30/00
Project # 00000-000-000-0000
Lab ID: 9A07G171-002
Sample Date: 07/12/00
Date Received: 07/20/00

Inorganic Data Report

Parameters	Result		Units	Reporting Limit
COD	5	u	mg/L	5

To: STL Connecticut
Severn Trent Laboratories
128 Long Hill Cross Road
Shelton, CT 06484

Attn: Paul Hobart

Date: Friday July 28th, 2000

RE: 1470A-03 MW-103A CAE 8/30/00
Project # 00000-000-000-0000
Lab ID: 9A07G171-003
Sample Date: 07/12/00
Date Received: 07/20/00

Inorganic Data Report

Parameters	Result		Units	Reporting Limit
COD	5	u	mg/L	5

To: STL Connecticut
Severn Trent Laboratories
128 Long Hill Cross Road
Shelton, CT 06484

Attn: Paul Hobart

Date: Friday July 28th, 2000

RE: 1470A-04 CW-7A CAE 8/30/00
Project # 00000-000-000-0000
Lab ID: 9A07G171-004
Sample Date: 07/12/00
Date Received: 07/20/00

Inorganic Data Report

Parameters	Result		Units	Reporting Limit
COD	5	u	mg/L	5

To: STL Connecticut
Severn Trent Laboratories
128 Long Hill Cross Road
Shelton, CT 06484

Attn: Paul Hobart

Date: Friday July 28th, 2000

RE: 1470A-06 CW-5B CAE 8/30/00
Project # 00000-000-000-0000
Lab ID: 9A07G171-005
Sample Date: 07/13/00
Date Received: 07/20/00

Inorganic Data Report

Parameters	Result		Units	Reporting Limit
COD	5	u	mg/L	5

To: STL Connecticut
Severn Trent Laboratories
128 Long Hill Cross Road
Shelton, CT 06484

Attn: Paul Hobart

Date: Friday July 28th, 2000

RE: 1470A-07 MW-104A CAE 8/30/00
Project # 00000-000-000-0000
Lab ID: 9A07G171-006
Sample Date: 07/13/00
Date Received: 07/20/00

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
COD	220	mg/L	50

To: STL Connecticut
Severn Trent Laboratories
128 Long Hill Cross Road
Shelton, CT 06484

Attn: Paul Hobart

Date: Friday July 28th, 2000

RE: 1470A-08 MW-102A CAE 8/30/00
Project # 00000-000-000-0000
Lab ID: 9A07G171-007
Sample Date: 07/13/00
Date Received: 07/20/00

Inorganic Data Report

Parameters	Result		Units	Reporting Limit
COD	5	u	mg/L	5

To: STL Connecticut
Severn Trent Laboratories
128 Long Hill Cross Road
Shelton, CT 06484

Attn: Paul Hobart

Date: Friday July 28th, 2000

RE: 1470A-09 DUP-L+RR CAE 8/30/00
Project # 00000-000-000-0000
Lab ID: 9A07G171-008
Sample Date: 07/13/00
Date Received: 07/20/00

Inorganic Data Report

Parameters	Result		Units	Reporting Limit
COD	5	u	mg/L	5

Appendix D

Groundwater Data Validation Reports Compuchem Environmental Laboratories

TRILLIUM INC.
Consultants in Environmental Chemistry

356 FARRAGUT CROSSING DR.
KNOXVILLE, TN 37922
(423) 966-8880
FAX (423) 966-8885
cerikson@trilliuminc.com

August 31, 2000

Mr. Dan Garrigan
O&M, Inc.
450 Montbrook Lane
Knoxville, TN 37919

RE: Data Package Review Report - CompuChem Case No. Q1458, SDG R1458, VOAs in Ground Water

Dear Dan:

I have completed my evaluation of the volatile organics analysis data prepared by CompuChem Environmental (CompuChem) for one ground water (GW) sample and one trip blank (TB) from the L&RR Site, which were reported in a single data package under Case No. Q1458, SDG R1458. The data package was received by Trillium for review on August 11, 2000, and includes results for the following samples:

TB	MW-104A

Analyses were performed according to EPA Method 8260B (SW-846, Third Edition, Update III). My evaluation was based on the specifications of the project-specific Quality Assurance Project Plan (QAPP, 9/96), the referenced method, and the *Region I, EPA-New England Data Validation Functional Guidelines for Evaluating Environmental Analyses* (12/96). Qualifiers consistent with those defined in the Region I document were applied as necessary and appropriate.

Although the QAPP specifies that Level III data packages are required for all analyses except the 5-year sampling events, full raw data deliverables (i.e., quantitation reports, chromatograms, mass spectra, etc.) were provided for the samples, calibration standards, blanks, spikes and instrument performance checks. ***These raw data were not reviewed by Trillium as part of this evaluation.*** As specified in Section 9.2 of the QAPP (page 23), a Level III evaluation, limited to an overview of the information provided on the summary forms, was performed.

Based on the evaluation, the following qualifiers were applied:

- The result for 2-butanone in TB was rejected (R) based on unacceptably low relative response factors (RRFs) in the associated calibration standards.

- Results for acetone in MW-104A and TB and for 2-butanone in MW-104A were qualified as estimated (J) based on unacceptably low RRFs in the associated calibration standards.

- Results for dichlorodifluoromethane, acetone, 2-butanone, 1,3-dichlorobenzene, 1,4-dichlorobenzene, 1,2-dichlorobenzene, 1,2,4-trichlorobenzene, naphthalene, and 1,2,3-trichlorobenzene in MW-104A were qualified as estimated (J, UJ) based on unacceptable percent relative standard deviation (%RSD) values in the associated initial calibration.

- Results for acetone, 1,3-dichlorobenzene, 1,4-dichlorobenzene, 1,2-dichlorobenzene, 1,2-dibromo-3-chloropropane, 1,2,4-trichlorobenzene, naphthalene, and 1,2,3-trichlorobenzene in TB were qualified as estimated (J, UJ) based on unacceptable %RSD values in the associated initial calibration.

- Results for acetone in MW-104A and TB were qualified as less than the reported value or less than the sample-specific reporting limit, whichever was greater (U), based on associated method blank contamination.

- Results for methylene chloride, 1,3-dichlorobenzene, and 1,2,4-trichlorobenzene in MW-104A were qualified as less than the reported value or less than the sample-specific RL, whichever was greater (U), based on associated TB contamination.

- Results for all detected target analytes in TB were qualified as estimated (J) due to unacceptably high recoveries for three of four system monitoring compounds in the reported analysis.

- Results for chloroethane, 1,1-dichloroethane, benzene, ethylbenzene, m/p-xylenes, o-xylene, 1,2,4-trimethylbenzene, 1,4-dichlorobenzene, naphthalene, and total xylenes in MW-104A were qualified as estimated (J) because they exceeded the upper limit of the established calibration range. No quantitatively accurate analysis results are available for these compounds, and the data user is cautioned that the accuracy of the reported values for these compounds cannot be verified. In particular, those results exceeding the upper limit of the calibration range by more than 20% (i.e., values greater than 30 µg/L) should be considered minimum concentrations.

- All "B" and "E" qualifiers appropriately applied by the laboratory were removed by the validator.

These qualifiers are reflected on the affected Organic Analysis Data Sheets (Form I) included as Attachment A to this report. Region I qualifier definitions are also provided in this attachment. Where a sample result was qualified as estimated for more than one reason (as listed above), the qualifier was applied once and no further action was taken.

Specific details regarding the review and evaluation of these data are discussed below:

Holding Times, Preservation, Sample Integrity: A copy of the field chain of custody (COC) record was included in the data package, documenting a sample collection date of 7/13/00 for both samples. Volatile organics analyses were performed on 7/27/00, just within the required 14-day holding time. An acceptable (4°C ±2°C) cooler temperature (3°C) on laboratory receipt was recorded on the COC. Acidification of the samples for volatiles analysis with hydrochloric acid was documented by the sampler on the COC; although sample pHs on laboratory receipt were not documented on the COC, verification of successful acidification of both samples (pH=1) was confirmed on the Water Batch Sheet prepared by the laboratory and included in the data package.

GC/MS Instrument Performance Check: Form V was provided for the single bromofluorobenzene (BFB) performance check run on instrument F50051 in association with the reported sample analyses. Reported mass abundances were acceptable for this performance check.

Calibration: Form VI was provided for the initial calibration (IC) performed on 7/27/00 which established a calibration range of 0.5-25 µg/L for most target analytes (acetone, 2-butanone, and 4-methyl-2-pentanone were in the standards at five times these concentrations). Reported average relative response factors (RRFs) were below the minimum acceptable value (0.05) for acetone (0.014), 2-butanone (0.004), and 1,2,3-trichloropropane (0.046). The result for 2-butanone in TB was rejected (R) on this basis. Acetone was detected in both samples and 2-butanone was detected in MW-104A; therefore, results for acetone in MW-104A and TB and for 2-butanone in MW-104A were qualified as estimated (J) based on the low average RRFs.

The average RRF for 1,2,3-trichloropropane was only slightly below the minimum acceptable value and an acceptable RRF was reported for this compound in the continuing calibration standard. Therefore, based on professional judgment, results for 1,2,3-trichloropropane were not qualified on this basis.

Percent relative standard deviations (%RSDs) were less than the maximum method-specified acceptance limit (15%) except for dichlorodifluoromethane (16.9%), chloromethane (18.7%), acetone (33.1%), 2-butanone (17.9%), 4-methyl-2-pentanone (18.4%), bromoform (18.5%), 1,2,3-trichloropropane (18.7%), 1,3-dichlorobenzene (20.7%), 1,4-dichlorobenzene (20.1%), 1,2-dichlorobenzene (19.7%), 1,2-dibromo-3-chloropropane (19.9%), 1,2,4-trichlorobenzene (25.7%), hexachlorobutadiene (24.6%), naphthalene (30.9%), and 1,2,3-trichlorobenzene (33.9%).

In evaluating this IC, the laboratory exercised an option included in Method 8000B (which contains calibration requirements for Method 8260B) that allows calculation of the mean %RSD value for all of the analytes in the calibration standards. If the mean %RSD is less than 15%, then (1) the IC may still be considered acceptable even if one or more individual %RSDs exceeds 15% and (2) the mean RRFs from IC may be used for calculation of all sample results, rather than having to use regression analyses to generate calibration curves for individual target analytes with %RSDs greater than 15%. This calculation was documented in the data package, and a mean %RSD of 14.5% was reported by the laboratory. This is, however, a contractual/method compliance issue; since the evaluation effort focuses on the individual analyte responses in determining whether or not associated sample results require qualification, the use of the mean %RSD by the laboratory to evaluate the IC has no direct bearing on the data evaluation effort.

For chloromethane, 4-methyl-2-pentanone, bromoform, 1,2,3-trichloropropane, and hexachlorobutadiene, no positive results were reported in the two samples and the %RSDs did not exceed the less-restrictive validation criterion of 30%. Therefore, no qualifiers were applied to the sample results for these compounds on this basis. Results for dichlorodifluoromethane, acetone, 2-butanone, 1,3-dichlorobenzene, 1,4-dichlorobenzene, 1,2-dichlorobenzene, 1,2,4-trichlorobenzene, naphthalene, and 1,2,3-trichlorobenzene in MW-104A and for acetone, 1,3-dichlorobenzene, 1,4-dichlorobenzene, 1,2-dichlorobenzene, 1,2-dibromo-3-chloropropane, 1,2,4-trichlorobenzene, naphthalene, and 1,2,3-trichlorobenzene in TB were qualified as estimated (J, UJ) based on the unacceptable %RSD values.

Form VII was provided for one continuing calibration (CC) standard run in association with these samples. In fact, the samples were run immediately following the IC and this "CC" was the mid-level standard from the IC. RRFs were acceptable (greater than 0.05) in the CC except for acetone (0.012) and 2-butanone (0.004). Results for acetone and 2-butanone were previously qualified based on similar responses in the IC; no additional action was taken based on the CC results.

All reported percent differences (%Ds) from the IC were less than the maximum method-specified acceptance criterion of 20%.

Blanks: Results for one method blank (MB) associated with the site sample analyses were provided in the data report. Acetone (2 µg/L) was reported in this MB. Results for acetone in MW-104A and TB were qualified as less than the reported value or less than the sample-specific reporting limit, whichever was greater (U), based on the associated MB contamination. In both cases, the sample result was less than ten times the MB concentration. All "B" qualifiers appropriately applied by the laboratory were removed by the validator.

One trip blank was submitted with this data set; after qualifications based on MB contamination, methylene chloride (2 µg/L), toluene (0.2 µg/L), 1,3-dichlorobenzene (0.2 µg/L), 1,4-

dichlorobenzene (0.2 µg/L), 1,2-dichlorobenzene (0.3 µg/L), n-butylbenzene (0.2 µg/L), 1,2-dibromo-3-chloropropane (0.2 µg/L), 1,2,4-trichlorobenzene (0.4 µg/L), and naphthalene (0.5 µg/L) were reported in the TB. Results for methylene chloride, 1,3-dichlorobenzene, and 1,2,4-trichlorobenzene in MW-104A were qualified as less than the reported value or less than the sample-specific RL, whichever was greater (U), based on the associated TB contamination. The remaining compounds listed above were either not detected in MW-104A or the result was greater than the action limit for qualification (five or ten times the TB concentration) and no further action was warranted on this basis.

System Monitoring Compounds: Reported recoveries (Form II) of the four system monitoring compounds (SMCs) were acceptable for MW-104A, the MB, and the laboratory control sample. Recoveries for three of the four SMCs in TB were too high (131-142%). Results for all detected target analytes in TB were qualified as estimated (J) on this basis.

Matrix Spike/Matrix Spike Duplicate: No matrix spike analysis was performed on MW-104A.

Laboratory Control Sample: Results for a laboratory control sample were reported on a Form III-equivalent in the data package. Acceptable recoveries (102-120%) were reported for the five spiked target analytes listed on this form (1,1-dichloroethene, benzene, trichloroethene, toluene, and chlorobenzene).

Field Duplicate: No field duplicate pair was included in this data package.

Internal Standard Responses: Internal standard (IS) areas and retention times (RTs) were reported on Form VIII for both site samples reported in this data set and the related QC analyses; all areas and RTs were within acceptable limits.

Sample Results: Results for MW-104A and TB were appropriately reported on Form Is, each of which indicated the appropriate analysis date and a sample analysis volume of 25 mL.

Results for chloroethane, 1,1-dichloroethane, benzene, ethylbenzene, m/p-xylenes, o-xylene, 1,2,4-trimethylbenzene, 1,4-dichlorobenzene, naphthalene, and total xylenes in the undiluted analysis of MW-104A exceeded the upper limit of the calibration range and were therefore qualified as estimated (J); the "E" qualifiers appropriately applied by the laboratory to these results were removed by the evaluator. According to the narrative, a diluted rerun analysis was performed by the laboratory but was lost due to an instrument failure. No further analyses were performed because the holding time had expired. Therefore, only the undiluted analysis results are available for MW-104A. The data user is cautioned that the accuracy of the reported values for those compounds exceeding the calibration range cannot be verified. In particular, those results exceeding the upper limit of the calibration range by more than 20% (i.e., values greater than 30 µg/L) should be considered minimum concentrations.

Reporting limits for target analytes that were not detected were correctly reported as equivalent to the lowest concentration IC standard analyzed.

Documentation: Data package documentation was inconsistent with the specifications of the QAPP; specifically, a Level IV package was provided when a Level III package was required. The fact that the additional raw data documentation was included certainly does not adversely affect the reported sample results, but, pursuant to the validation specifications for this project, it was not reviewed by Trillium as part of this evaluation.

On the field COC, the date accompanying the laboratory receipt signature was incomplete (no year was included). This COC documentation issue does not directly affect the validity of the reported sample results, but it could be problematic if the data were used in litigation.

Please let me know if you have any questions regarding this data package review report.

Sincerely,

Carol

Carol A. Erikson
Quality Assessment Manager

CAE/ekd
July 2000\voacc (95406)

TRILLIUM INC.

ATTACHMENT A

ORGANIC ANALYSIS DATA SHEETS (Form I)
Case No. Q1458, SDG R1458
Volatiles in Water

EPA Region I Qualifier Definitions:

U - **The material was analyzed for, but was not detected. The associated numerical value is the sample quantitation limit. The sample quantitation limit accounts for sample-specific dilution factors and percent solids corrections or sample sizes that deviate from those required by the method.**

J - **The associated numerical value is an estimated quantity.**

R - **The data are unusable (analyte may or may not be present). Resampling and reanalysis is necessary for verification. The R replaces the numerical value or sample quantitation limit.**

UJ - **The analyte was analyzed for, but was not detected. The sample quantitation limit is an estimated quantity.**

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW-104A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R1458

Matrix: (soil/water) WATER Lab Sample ID: R1458-1

Sample wt/vol: 25 (g/ml) ML Lab File ID: R1458-1A51

Level: (low/med) LOW Date Received: 07/14/00

% Moisture: not dec. _____ Date Analyzed: 07/27/00

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L		Q
75-71-8	Dichlorodifluoromethane		0.2	J
74-87-3	Chloromethane		0.5	U
75-01-4	Vinyl Chloride		1	
74-83-9	Bromomethane		0.5	U
75-00-3	Chloroethane		44	~~E~~ J
75-69-4	Trichlorofluoromethane		0.5	U
75-35-4	1,1-Dichloroethene		0.5	U
67-64-1	Acetone		16	~~B~~ UJ
75-09-2	Methylene Chloride		4	U
156-60-5	trans-1,2-Dichloroethene		2	
75-34-3	1,1-Dichloroethane		41	~~E~~ J
594-20-7	2,2-Dichloropropane		0.5	U
156-59-2	cis-1,2-Dichloroethene		0.9	
78-93-3	2-butanone		10	J
74-97-5	Bromochloromethane		0.5	U
67-66-3	Chloroform		0.5	U
71-55-6	1,1,1-Trichloroethane		0.5	U
56-23-5	Carbon Tetrachloride		0.5	U
563-58-6	1,1-dichloropropene		0.5	U
71-43-2	Benzene		25	~~E~~ J
107-06-2	1,2-Dichloroethane		9	
79-01-6	Trichloroethene		0.5	U
78-87-5	1,2-Dichloropropane		10	
74-95-3	Dibromomethane		0.5	U
75-27-4	Bromodichloromethane		0.5	U
108-10-1	4-Methyl-2-pentanone		3	U
108-88-3	Toluene		12	
79-00-5	1,1,2-Trichloroethane		0.5	U
127-18-4	Tetrachloroethene		0.5	U
142-28-9	1,3-Dichloropropane		0.5	U
124-48-1	Dibromochloromethane		0.5	U
106-93-4	1,2-Dibromoethane		0.5	U
108-90-7	Chlorobenzene		10	

AE Evaluation 8/31/00

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MW-104A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R1458

Matrix: (soil/water) WATER Lab Sample ID: R1458-1

Sample wt/vol: 25 (g/ml) ML Lab File ID: R1458-1A51

Level: (low/med) LOW Date Received: 07/14/00

% Moisture: not dec. _____ Date Analyzed: 07/27/00

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
630-20-6	1,1,1,2-Tetrachloroethane	0.5	U
100-41-4	Ethylbenzene	110	~~E~~ J
108-38-3	m,p-Xylene	130	~~E~~ J
95-47-6	o-Xylene	60	~~E~~ J
100-42-5	Styrene	0.5	U
75-25-2	Bromoform	0.5	U
98-82-8	Isopropyl Benzene	24	
108-86-1	Bromobenzene	0.4	J
96-18-4	1,2,3-Trichloropropane	0.5	U
79-34-5	1,1,2,2-Tetrachloroethane	0.5	U
103-65-1	n-Propyl Benzene	5	
95-49-8	2-Chlorotoluene	0.5	U
106-43-4	4-Chlorotoluene	0.5	U
108-67-8	1,3,5-Trimethyl Benzene	13	
98-06-6	tert-Butyl Benzene	0.5	U
95-63-6	1,2,4-Trimethyl Benzene	40	~~E~~ J
135-98-8	sec-Butyl Benzene	0.5	U
541-73-1	1,3-Dichlorobenzene	0.9	UJ
106-46-7	1,4-Dichlorobenzene	27	~~E~~ J
99-87-6	p-Isopropyl Toluene	12	
95-50-1	1,2-Dichlorobenzene	6	J
104-51-8	n-Butyl Benzene	0.5	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.5	U
120-82-1	1,2,4-Trichlorobenzene	1	UJ
87-68-3	Hexachlorobutadiene	0.5	U
91-20-3	Naphthalene	58	~~E~~ J
87-61-6	1,2,3-Trichlorobenzene	0.5	UJ
540-59-0	1,2-Dichloroethene (total)	3	
1330-20-7	Xylene (total)	200	~~E~~ J

M Erikson 8/31/00

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TB

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R1458

Matrix: (soil/water) WATER Lab Sample ID: R1458-2

Sample wt/vol: 25 (g/ml) ML Lab File ID: R1458-2A51

Level: (low/med) LOW Date Received: 07/14/00

% Moisture: not dec. _____ Date Analyzed: 07/27/00

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	0.5	U
74-87-3	Chloromethane	0.5	U
75-01-4	Vinyl Chloride	0.5	U
74-83-9	Bromomethane	0.5	U
75-00-3	Chloroethane	0.5	U
75-69-4	Trichlorofluoromethane	0.5	U
75-35-4	1,1-Dichloroethene	0.5	U
67-64-1	Acetone	3 ~~2 JB~~	UJ
75-09-2	Methylene Chloride	2	J
156-60-5	trans-1,2-Dichloroethene	0.5	U
75-34-3	1,1-Dichloroethane	0.5	U
594-20-7	2,2-Dichloropropane	0.5	U
156-59-2	cis-1,2-Dichloroethene	0.5	U
78-93-3	2-butanone	R ~~3~~	~~U~~
74-97-5	Bromochloromethane	0.5	U
67-66-3	Chloroform	0.5	U
71-55-6	1,1,1-Trichloroethane	0.5	U
56-23-5	Carbon Tetrachloride	0.5	U
563-58-6	1,1-dichloropropene	0.5	U
71-43-2	Benzene	0.5	U
107-06-2	1,2-Dichloroethane	0.5	U
79-01-6	Trichloroethene	0.5	U
78-87-5	1,2-Dichloropropane	0.5	U
74-95-3	Dibromomethane	0.5	U
75-27-4	Bromodichloromethane	0.5	U
108-10-1	4-Methyl-2-pentanone	3	U
108-88-3	Toluene	0.2	J
79-00-5	1,1,2-Trichloroethane	0.5	U
127-18-4	Tetrachloroethene	0.5	U
142-28-9	1,3-Dichloropropane	0.5	U
124-48-1	Dibromochloromethane	0.5	U
106-93-4	1,2-Dibromoethane	0.5	U
108-90-7	Chlorobenzene	0.5	U

CA Erickson 8/31/00

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TB

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R1458

Matrix: (soil/water) WATER Lab Sample ID: R1458-2

Sample wt/vol: 25 (g/ml) ML Lab File ID: R1458-2A51

Level: (low/med) LOW Date Received: 07/14/00

% Moisture: not dec. _____ Date Analyzed: 07/27/00

GC Column: EQUITY624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
630-20-6	1,1,1,2-Tetrachloroethane	0.5	U
100-41-4	Ethylbenzene	0.5	U
108-38-3	m,p-Xylene	1	U
95-47-6	o-Xylene	0.5	U
100-42-5	Styrene	0.5	U
75-25-2	Bromoform	0.5	U
98-82-8	Isopropyl Benzene	0.5	U
108-86-1	Bromobenzene	0.5	U
96-18-4	1,2,3-Trichloropropane	0.5	U
79-34-5	1,1,2,2-Tetrachloroethane	0.5	U
103-65-1	n-Propyl Benzene	0.5	U
95-49-8	2-Chlorotoluene	0.5	U
106-43-4	4-Chlorotoluene	0.5	U
108-67-8	1,3,5-Trimethyl Benzene	0.5	U
98-06-6	tert-Butyl Benzene	0.5	U
95-63-6	1,2,4-Trimethyl Benzene	0.5	U
135-98-8	sec-Butyl Benzene	0.5	U
541-73-1	1,3-Dichlorobenzene	0.2	J
106-46-7	1,4-Dichlorobenzene	0.2	J
99-87-6	p-Isopropyl Toluene	0.5	U
95-50-1	1,2-Dichlorobenzene	0.3	J
104-51-8	n-Butyl Benzene	0.2	J
96-12-8	1,2-Dibromo-3-Chloropropane	0.2	J
120-82-1	1,2,4-Trichlorobenzene	0.4	J
87-68-3	Hexachlorobutadiene	0.5	U
91-20-3	Naphthalene	0.5	J
87-61-6	1,2,3-Trichlorobenzene	0.5	~~U~~ UJ
540-59-0	1,2-Dichloroethene (total)	0.5	U
1330-20-7	Xylene (total)	0.5	U

CAE 8/31/00

TRILLIUM INC.
Consultants in Environmental Chemistry

356 FARRAGUT CROSSING DR.
KNOXVILLE, TN 37922
(423) 966-8880
FAX (423) 966-8885
cerikson@trilliuminc.com

September 11, 2000

Mr. Dan Garrigan
O&M, Inc.
450 Montbrook Lane
Knoxville, TN 37919

RE: Data Package Review Report - CompuChem Case No. Q1458, SDGs R1458 and S1458 - Total and Dissolved Arsenic and Lead and Total Iron in Ground Water

Dear Dan:

I have completed my evaluation of the inorganics analysis data prepared by CompuChem Environmental for one ground water (GW) sample from the L&RR Site, which was reported in two data packages under Case No. Q1458, SDGs R1458 and S1458. The packages were received by Trillium for review on August 11, 2000 and September 6, 2000, respectively. Total and dissolved metals analysis results for sample MW-104A were reported.

Analyses were performed according to EPA SW-846 (Third Edition)-Update III Methods for total and dissolved arsenic, total and dissolved lead, and total iron; all elements were analyzed using trace inductively coupled plasma (ICP) instrumentation (EPA 6010B). My evaluation was based on the specifications of the project-specific Quality Assurance Project Plan (QAPP, 9/96), the referenced methods, and the USEPA Region I *Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses* (6/88; Rev. 2/89). Qualifiers consistent with those defined in the Region I document were applied as necessary and appropriate.

Although the QAPP specifies that Level III data packages are required for all analyses except the 5-year sampling events, full raw data deliverables (i.e., ICP instrument print-outs) were provided for all of the metals analyses. ***These raw data were not reviewed by Trillium as part of this evaluation.*** As specified in Section 9.2 of the QAPP (page 23), a Level III evaluation, limited to an overview of the information provided on the summary forms, was performed.

Based on the evaluation, results for total and dissolved lead in MW-104A were qualified as estimated (J) based on an unacceptably high recovery in the associated low range standard. All results for arsenic and iron were determined to be valid as reported; no other qualifiers were applied.

These qualifiers are noted on the Inorganic Analysis Data Sheets (Form I) for the reported sample analyses in Attachment A to this report; Region I qualifier definitions are also provided in this attachment.

Specific details regarding the review and evaluation of these data are discussed below:

Holding Times, Preservation and Sample Integrity: A copy of the applicable field chain of custody (COC) record was included in the data package for SDG R1458 but was not found in the data package for SDG S1458; a copy of the COC from R1458 was made by the evaluator and inserted into S1458 as page 175a to ensure that complete documentation is available for future reference.

The site sample was collected on 7/13/00. Total and dissolved metals analyses were performed on 7/29/00, well within the 6-month holding time specified by the QAPP.

An acceptable (4°C ± 2°C) cooler temperature (3°C) on laboratory receipt was recorded on the COC. The "Filtered/Unfiltered" column on the COC indicated that both filtered and unfiltered sample containers were provided for analysis, and acidification with nitric acid was also noted by the sampler on the COC. Verification of successful acidification was not recorded by the laboratory on the COC, but was found (pH<2) for both the total and dissolved metals samples on the laboratory receiving log and on the laboratory preparation logs.

Results from analysis of the dissolved metals sample fraction were distinguished from analysis results for the total metals fraction only by reporting the samples in separate SDGs and data packages. The word "Dissolved" was added by the evaluator to the dissolved metals analysis results form (Form I) attached to this report to clarify the distinction; similarly, the word "Total" was added to the total metals analysis results form.

Calibrations: Based on the Analytical Run Logs (Contract Laboratory Program, CLP, Form XIV) in both data packages, initial and continuing calibration verification (ICV/CCV) standards were run at the appropriate frequencies throughout the single analysis series during which MW-104A was run for both total and dissolved constituents. All ICV/CCV recoveries documented on the accompanying CLP Form IIAs were acceptable (QC 90-110%).

Results for a "low range standard (LRS)," containing arsenic at 10 µg/L and lead at 3 µg/L, were reported on Form IIB in each data package; iron (at 100 µg/L) was also reported in SDG R1458. Recoveries for arsenic (82.5%) and iron (99.9%) were acceptable (QC 80-120%), but an unacceptably high recovery was reported for lead (125.0%). Since the recovery for lead was too high, suggesting a high bias at low concentrations, and the detected total and dissolved lead concentrations were less than four times the reporting limit (RL) of 3 µg/L, the results for total and dissolved lead in MW-104A were qualified as estimated (J).

Blanks: Initial and continuing calibration blanks (ICB/CCBs) were run at the appropriate frequencies throughout the sample analysis series. Arsenic, iron, and lead were not reported above the applicable IDLs or below the negative IDLs in any of the ICB/CCBs.

Two water matrix preparation blanks (PBW) were analyzed with the site sample (CLP Form XIII), one each with the total and dissolved fractions; no arsenic or lead was reported above the applicable IDLs (or below the negative IDLs) in either PBW, but iron (47.510 µg/L) was reported in the PBW associated with SDG R1458. The sample result for iron was much greater than the action limit for qualification based on the blank contamination (five times the blank concentration), therefore no action was warranted on this basis.

Interference Check Sample: Recoveries reported on CLP Form IV in each data package for all target elements in the interference check sample analyses performed at the start of the analytical series were acceptable (QC 80-120%).

Laboratory Control Samples (LCS): Acceptable recoveries (QC 80-120%) for total arsenic, iron, and lead were reported on the Laboratory Control Sample Report (CLP Form VII) in the data package for SDG R1458 (101.8-104.2%). Acceptable recoveries for dissolved arsenic and lead were reported on the LCS Report in the data package for SDG S1458 (100.8% and 102.3%).

Duplicate Analysis: MW-104A was run as an unspiked duplicate pair for dissolved arsenic and lead. Excellent reproducibility was demonstrated for arsenic (0.2 relative percent difference [RPD]). The RPD for lead (21.3%) slightly exceeded the method-specified acceptance criterion of 20%, and the result was qualified "N" by the laboratory. Since the concentration of dissolved lead in the sample was less than the CRDL and the paired results agreed within ±CRDL, no qualifiers were warranted on this basis and the "N" qualifier was removed.

Matrix Spike Analysis: MW-104A was prepared and analyzed as a matrix spike/matrix spike duplicate pair for dissolved arsenic and lead. Recoveries (93.5-103.7%) were acceptable (QC 75-125%) and reproducible (RPDs 1.5% and 2.6%).

ICP Serial Dilution: Serial dilution analysis was performed on MW-104A for dissolved arsenic and lead. Both target analytes were less than 50xIDL in the undiluted sample analysis, therefore no meaningful information was obtained from this quality control analysis and no further evaluation was made.

Sample Results: Results greater than or equal to the laboratory-specified IDLs were appropriately reported on the Inorganic Analysis Data Sheets (Form I) for the individual sample analytes.

Form X was provided in both data packages, documenting IDLs established on 7/15/00. All non-detected blank results were reported to the appropriate IDLs, and all sample analyses were documented on the run logs (Form XIV) in the two data packages.

Field Duplicates: No field duplicate sample was submitted with this data set.

Total versus Dissolved Concentrations: Comparison of total versus dissolved results for arsenic and lead in MW-102A revealed no cases where the dissolved concentration was greater than the total concentration.

Documentation: Data package documentation was inconsistent with the specifications of the QAPP; specifically, a Level IV package was provided when a Level III package was required. The presence of this additional raw data documentation certainly does not adversely affect the reported sample results, but, pursuant to the validation specifications for this project, it was not reviewed by Trillium as part of this evaluation.

The field COC record was not included in the data package for SDG S1458. A copy of the COC record found in SDG R1458 was made by the evaluator and inserted into S1458 as page 175a to ensure that complete documentation is available for future reference.

On the field COC record, the date accompanying the laboratory receipt signature is incomplete; no year is included. In addition, sample pHs on laboratory receipt were not recorded on the COC and the project-specific analytes for analysis were not specified by the sampler on the COC.

Total iron results were not reported in the data package for SDG R1458 as originally received for review. At the request of the evaluator, the laboratory provided revised summary forms (Forms I, IIA, III, IV, VII, X, XII, and XIV and the LRS Summary Form) on 9/6/00 via FedEx. These forms were page-numbered and inserted into the R1458 data package by the evaluator, *replacing* the pages originally provided by the laboratory.

Although the laboratory was sure they had sent it, the data package for SDG S1458 was not received by Trillium with the rest of the data packages associated with this data set. At the evaluator's request, a second copy of this data package (which was, in fact, dated August 4, 2000) was received by Trillium on September 6, 2000.

Please let me know if you have any questions regarding this report.

Sincerely,

Carol

Carol A. Erikson
Quality Assessment Manager

CAE/esc
July 2000\Metalscc (95406)

TRILLIUM INC.

ATTACHMENT A

INORGANIC ANALYSIS DATA SHEETS
CompuChem Case No. Q1458, SDGs R1458 and S1458

EPA Region I Qualifier Definitions:

U - **The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.**

J - **The associated numerical value is an estimated quantity.**

R - **The data are unusable (Note: Analyte may or may not be present).**

UJ - **The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.**

SW-846 METALS

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-104A TOTAL

Lab Name: CompuChem Contract:

Lab Code: LIBRTY Case No.: Q1458 SAS No.: SDG No.: R1458

CAE 9/8/00

Matrix (soil/water): WATER Lab Sample ID: R1458-1

Level (low/med): LOW Date Received: 07/14/00

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	113			P
7439-89-6	Iron	99200			P
7439-92-1	Lead	11.3		J	P

CAE 9/8/00

Color Before: BROWN Clarity Before: CLOUDY Texture:

Color After: BROWN Clarity After: CLOUDY Artifacts:

Comments:

SW-846 METALS

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-104A DISSOLVED

CAE 9/8/00

Lab Name: CompuChem Contract:

Lab Code: LIBRTY Case No.: Q1458 SAS No.: SDG No.: S1458

Matrix (soil/water): WATER Lab Sample ID: S1458-1

Level (low/med): LOW Date Received: 07/14/00

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	113			P
7439-92-1	Lead	2.3	B	N J	P

CAE 9/8/00

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

TRILLIUM INC.
Consultants in Environmental Chemistry

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September 1, 2000

Mr. Dan Garrigan
O&M, Inc.
450 Montbrook Lane
Knoxville, TN 37919

RE: Data Package Review Report - CompuChem Case No. R1458 - Chloride and Ammonia in Ground Water and TestAmerica Project No. 200001 - BOD and COD in Ground Water

Dear Dan:

I have completed my evaluation of the wet chemistry analysis data prepared by CompuChem Environmental (chloride and ammonia) and TestAmerica (BOD and COD) for one ground water (GW) sample from the L&RR Site. These data were reported in two data packages under CompuChem Case R1458 and TestAmerica Project No. 200001, which were received by Trillium for review on August 11, 2000. Results for sample MW-104A were reported in both data packages.

Analyses were performed according to EPA Methods 325.2 (chloride), 410.4 (COD), 350.1 (ammonia), and 405.1 (BOD); all four methods are found in *Methods for Chemical Analysis of Water and Wastes* (EPA-600/4-79-020, 3/83). My evaluation was based on the specifications of the project-specific Quality Assurance Project Plan (QAPP, 9/96), the referenced methods, and, to the extent applicable, the USEPA Region I *Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses* (6/88; Rev. 2/89). Qualifiers consistent with those defined in the Region I document were applied as necessary and appropriate.

Based on the evaluation, the result for BOD in MW-104A was qualified as estimated (J) because incubation was initiated past the specified holding time. No additional qualifiers were applied; the remaining sample results were determined to be valid as reported based on the available data reports.

This qualifier is reflected on the affected laboratory reporting form included as Attachment A to this report. Region I qualifier definitions are also provided in this attachment.

Specific details regarding the review and evaluation of these data are discussed below:

Holding Times, Preservation and Sample Integrity: A copy of the field chain of custody (COC) record was included in the CompuChem data package and a copy of the COC record transferring the BOD and COD samples to TestAmerica was included in the TestAmerica report. Both COCs documented a sample collection date of 7/13/00. An acceptable cooler temperature (3°C) was documented on the field COC by CompuChem on receipt of the samples. No cooler temperature was recorded by TestAmerica on the subcontract COC,

however an acceptable temperature of 2 °C was recorded on their cooler receipt form, which was also provided for review.

Chemical preservation of the sample containers for ammonia and COD analysis using sulfuric acid was documented on both COC records. Sample pH on laboratory receipt was not recorded on the COCs by either laboratory, but CompuChem's receiving log indicated that both sample containers were at pH<2 and TestAmerica's cooler receipt form noted that "correct preservatives" were used. It was therefore assumed that the sample was properly preserved at the time of collection.

Analyses for chloride were performed on 8/3/00, ammonia analyses were performed on 7/29/00, and COD analyses were run on 7/19/00; these are all within the 28-day holding time specified by the QAPP. BOD incubation was initiated on 7/15/00 at 22:00, which is 10 hours past the required 48-hour holding time. The reported result for BOD in MW-104A was qualified as estimated (J) on this basis. Five-day BOD readings were appropriately taken on 7/20/00.

Calibrations: Based on the run log provided in the CompuChem data package, initial and continuing calibration verification (ICV/CCV) standards were run at the appropriate frequencies throughout the analysis series for ammonia. All ICV/CCV recoveries for this analysis parameter were acceptable (QC 85-115%). Summary results for an eight-point calibration curve run on 7/29/00 were also found in the data package; an acceptable correlation coefficient of 0.9998 (QC ≥0.995) was reported for the best-fit quadratic equation.

Based on the run log provided in the CompuChem data package, ICV/CCV standards were run at the appropriate frequencies throughout the analysis series for chloride. All ICV/CCV recoveries for this analysis parameter were acceptable (QC 85-115%). Summary results for a nine-point calibration curve run on 8/3/00 were also found in the data package; an acceptable correlation coefficient of 0.9991 was reported for the best-fit quadratic equation.

Based on the run log provided in the TestAmerica data package, ICV/CCV standards were run at the appropriate frequencies throughout the analysis series for COD. All ICV/CCV recoveries for this analysis parameter were acceptable (QC 85-115%). Summary results for a six-point calibration curve run on 7/19/00 were also found in the data package; an acceptable correlation coefficient of 0.9997 was reported for the best-fit linear regression.

Calibration, per se, is not applicable to BOD measurements.

Blanks: Initial and continuing calibration blanks (ICB/CCBs) were run at the appropriate frequencies throughout the ammonia, chloride, and COD analysis series; no target analytes were detected above the reporting limit (RL) in any of these blanks.

A water matrix preparation blank (PBW) was also prepared with the sample for each parameter; no ammonia, chloride, BOD, or COD was reported in the PBW analyses.

Laboratory Control Samples: Acceptable recoveries (90.6-103%) for all four analysis parameters were reported for the laboratory control samples run in association with the site sample.

Duplicate Analysis: MW-104A was run in duplicate for COD, and excellent reproducibility (relative percent difference 1.7%) was demonstrated.

No laboratory duplicate analyses were reported for ammonia or chloride. Duplicate analysis results using a non-project sample were reported for BOD, but these data are not relevant to MW-104A and were not reviewed.

Matrix Spike Analysis: MW-104A was not prepared and analyzed as a matrix spike for any of the four wet chemistry analysis parameters.

Spike recovery results for a non-project sample were reported for COD, but these data are not relevant to MW-104A and were not reviewed.

Sample Results: Sample results for each analysis parameter were correctly transcribed from the laboratory run logs and appropriately reported on summary forms.

Field Duplicates: No field duplicate was submitted with this site sample.

Documentation: Data package documentation was complete and acceptable for all four analysis parameters. On the field COC, the date accompanying the laboratory receipt signature was incomplete (no year was included). On the subcontract COC, the dates accompanying both "Relinquished by" signatures are incomplete (no year is included for either date) and there is no signature indicating receipt at TestAmerica in Nashville, TN, where the analyses were performed. These COC documentation issues do not directly affect the validity of the reported sample results, but they could be problematic if the data were used in litigation.

Please let me know if you have any questions regarding this data package review report.

Sincerely,

Carol

Carol A. Erikson
Quality Assessment Manager

CAE/das
July 2000\wchemcc (95406)

TRILLIUM INC.

ATTACHMENT A

LABORATORY REPORTING FORMS
CompuChem Case No. R1458 and TestAmerica Project No. 200001

EPA Region I Qualifier Definitions:

U - **The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.**

J - **The associated numerical value is an estimated quantity.**

R - **The data are unusable (Note: Analyte may or may not be present).**

UJ - **The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.**

AMMONIA ANALYSIS

SUMMARY REPORT

ITEM NO.	SAMPLE IDENTIFIER	COMPUCHEM NUMBER	RESULT (mg/L)	REPORTING LIMIT (mg/L)
1.	MW-104A	R1458-1	15.8	0.1

BRL = BELOW REPORTING LIMIT

Reviewed by/ID#: R W George 12405 Date: 8/3/00

CHLORIDE ANALYSIS

SUMMARY REPORT

ITEM NO.	SAMPLE IDENTIFIER	COMPUCHEM NUMBER	RESULT (mg/L)	REPORTING LIMIT (mg/L)
1.	MW-104A	R1458-1	386	3

BRL = BELOW REPORTING LIMIT

Reviewed by/ID#: R W George / 2405 Date: 8/3/00

5

TestAmerica
INCORPORATED

ANALYTICAL REPORT

COMPUCHEM 2303
DIANE BYRD
501 MADISON AVENUE
CARY, NC 27513

Project:
Project Name: L&RR
Sampler:

Lab Number: 00-A99172
Sample ID: MW-104A
Sample Type: Water
Site ID:

Date Collected: 7/13/00
Time Collected: 12:50
Date Received: 7/15/00
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
BOD Set Up						7/15/00	22:00			
BOD 5 Day	27.0 J	mg/l	2.0	2.0	1	7/20/00	20:30	M.Shockley	405.1	6571
	CAE 9/1/00									
MISCELLANEOUS CHEMISTRY										
pH	6.50	pH Units			1	7/18/00	11:40	K. Stewart	150.1	6405
Chemical Oxygen Demand	118.	mg/l	15.0	3.00	5	7/19/00 7/23/00	15:32	K.Kenney	410.4	8294

BOD: Analyzed out of hold

ND = Not detected at the report limit.

Sample report continued . . .

TABLE 2
DATA QUALIFIER DEFINITIONS BY MATRIX

GROUNDWATER AND SURFACE WATER

Volatile Organics in Groundwater and Surface Waters
STL Job Nos. 20980-84697, 84717 and 84719

EPA Region I Qualifier Definitions:

U - The material was analyzed for, but was not detected. The associated numerical value is the sample quantitation limit. The sample quantitation limit accounts for the sample-specific dilution factors and percent solids corrections or sample sizes that deviate from those required by the method.

J - The associated numerical value is an estimated quantity.

R - The data are unusable (analyte may or may not be present). Resampling and reanalysis is necessary for verification. The R replaces the numerical value or sample quantitation limit.

UJ - The material was analyzed for, but was not detected. The sample quantitation limit is an estimated quantity.

TOTAL AND DISSOLVED METALS IN GROUNDWATER AND SURFACE WATERS
STL Job Nos. 20980-84697,84717 and 84719

EPA Region I Qualifier Definitions:

U - The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

J - The associated value is an estimated quantity.

R - The data are unusable (Note: Analyte may or may not be present).

UJ - The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

AMMONIA, CHLORIDE, BOD AND COD IN GROUNDWATER AND SURFACE WATERS
Laboratory Job No. 083967-10

EPA Region I Qualifier Definitions:

U - The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

J - The associated numerical value is an estimated quantity.

R - The data are unusable (Note: Analyte may or may not be present).

UJ - The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

TABLE 2 Continued
DATA QUALIFIER DEFINITIONS BY MATRIX

GROUNDWATER
Compuchem Laboratories
Laboratory Job No. 33003
Volatile Organics in Groundwater

EPA Region I Qualifier Definitions:

U - The material was analyzed for, but was not detected. The associated numerical value is the sample quantitation limit. The sample quantitiation limit accounts for the sample-specific dilution factors and percent solids corrections or sample sizes that deviate from those required by the method.

J - The associated numerical value is an estimated quantity.

R - The data are unusable (compound may or may not be present). Resampling and reanalysis is necessary for verification. The R replaces the numerical value or the sample quantitation limit.

UJ - The material was analyzed for, but was not detected. The sample quantitation limit is an estimated quantity.

TOTAL AND DISSOLVED METALS IN GROUNDWATER
Compuchem Laboratories
Laboratory Job No. 33003
Inorganic Analysis in Groundwater

EPA Region I Qualifier Definitions:

U - The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

J - The associated numerical value is an estimated quantity.

R - The data are unusable (Note: Analyte may or may not be present).

UJ - The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise

---

CHLORIDE, BOD, COD AND AMMONIA IN GROUNDWATER
Compuchem Laboratories
Wet Chemistry In Groundwater
Laboratory Job No. 33003/00017

EPA Region I Qualifier Definitions:

U - The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

J - The associated numerical value is an estimated quantity.

R - The data are unusable (Note: Analyte may or may not be present).

UJ - The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

Appendix E

Surface Water Data Validation Reports
Severn Trent Laboratories

TRILLIUM INC.
Consultants in Environmental Chemistry

356 FARRAGUT CROSSING DR.
KNOXVILLE, TN 37922
(423) 966-8880
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cerikson@trilliuminc.com

June 13, 2000

Mr. Dan Garrigan
O&M, Inc.
450 Montbrook Lane
Knoxville, TN 37919

RE: Data Package Review Report - STL Lot No. 9A04G680 - Total and Dissolved Arsenic in Surface Water

Dear Dan:

I have completed my evaluation of the inorganics analysis data prepared by the Severn Trent Laboratory (STL) in University Park, Illinois, for seven surface water (SW) samples from the L&RR Site, which were reported in a single data package under Lot No. 9A04G680. The data package was received by Trillium for review on April 28, 2000, and the following samples were reported:

LCH-5	LCH-4	SW-16
SW-10	SW-8	SW-5
DUP		

Analyses were performed according to EPA Method 7060A (total and dissolved arsenic), which is found in the Third Edition of SW-846. My evaluation was based on the specifications of the project-specific Quality Assurance Project Plan (QAPP, 9/96), the referenced method, and the USEPA Region I *Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses* (6/88; Rev. 2/89); professional judgment was applied as necessary. Qualifiers consistent with those defined in the Region I document were applied where appropriate.

As required by the QAPP, a Level III data package was provided for these metals analyses. As specified in Section 9.2 of the QAPP (page 23), a Level III evaluation, limited to an overview of the information provided on the summary forms, was performed.

Results from analysis of the dissolved metals sample fractions were distinguished from analysis results for the total metals fractions by the addition of the suffix "S" (for "soluble") to the client sample identification (SW-8S, for example). The word "Dissolved" was also added by the evaluator

to the results forms for the dissolved sample analyses to emphasize the distinction, and for consistency with previous data sets generated in support of this project.

Based on the evaluation, the following qualifiers were applied:

- Results for total and dissolved arsenic in LCH-4 and DUP were qualified as estimated (J) due to poor reproducibility in the field duplicate analyses. Total and dissolved arsenic in DUP were similarly qualified due to a severe discrepancy between the measured total and dissolved concentrations and professional judgment. The result for dissolved arsenic in DUP was also estimated based on an unacceptably low post-digestion spike recovery.

- Results for total and dissolved arsenic in SW-5 were qualified as estimated (J, UJ) due to a minor discrepancy between the measured total and dissolved concentrations.

These qualifiers are reflected on the Inorganic Analysis Data Sheets (Form Is) included as Attachment A to this report. Region I qualifier definitions are also provided in this attachment.

At the discretion of the data user, the following points may warrant attention by laboratory personnel with regard to this data package and/or prior to future sampling events at this site:

- Documentation of sample preservation performed in the field on the chain of custody record.

- Documentation of field filtration for dissolved metals analysis on the chain of custody record.

- Documentation of cooler temperatures and sample pHs at the time of laboratory receipt on the chain of custody record.

- Documentation of linearity check data (correlation coefficient, at a minimum) for all analytes run by GFAA techniques.

Specific details regarding the review and evaluation of these data are discussed below:

Holding Times, Preservation and Sample Integrity: A copy of the field chain of custody (COC) record was included in the data package, documenting a sample collection date of 4/7/00 for the surface waters. Acceptable cooler temperatures (3.6°C and 2.6°C) on laboratory receipt were

recorded on the COC. Acidification of the samples with nitric acid, however, was not noted by the sampler on the COC and no verification of acidification was documented in the data package by the laboratory. At the request of the evaluator, the laboratory provided a revised COC for the surface water samples, with a checkmark in the "Preserved" space added. In addition, "pH<2" was noted for all samples on the laboratory digestion logs for arsenic, which were also provided by the laboratory at the request of the evaluator. These records verify successful preservation of the samples for metals analysis.

The revised COC was inserted into the data package for G680 as page 199a and the laboratory digestion logs were inserted as pages 82a and 82b by the evaluator.

Field-filtration of the samples intended for dissolved metals analysis was also not recorded on the COC. For the purposes of this review, it was assumed that the samples *were* field-filtered for dissolved metals analyses (prior to acidification) based on procedures followed during previous sampling events.

Metals analyses were performed 4/14/00 through 4/24/00, well within the 6-month holding time specified by the QAPP.

Calibrations: Based on the run logs (Form XIV), initial and continuing calibration verification (ICV/CCV) standards were run at the appropriate frequencies throughout the three reported GFAA (graphite furnace atomic absorption) analysis series. All ICV/CCV recoveries documented on the accompanying Form II were acceptable (QC 90-110%).

Analysis of linearity check standards for arsenic was evident from the run log entries, however linearity results were not documented in the data package. Therefore, no evaluation of this portion of the data could be made. At the discretion of the data user, the laboratory should be requested to provide this information (at a minimum, the applicable correlation coefficients) for inclusion in the data package, to ensure that complete documentation is available for future reference. For the purposes of this validation effort, it was assumed that acceptable correlation coefficients (>0.995) were achieved for arsenic prior to the reported sample analyses in each series.

Contract required detection limit (CRDL) standards, containing arsenic at 10 µg/L, were also run at the start of each analysis series. Acceptable (QC 80-120%) recoveries were reported for all three reported CRDL standards (100.7-115.7%).

Blanks: Initial and continuing calibration blanks (ICB/CCBs) were also run at the appropriate frequencies throughout each sample analysis series. Per Form III, no arsenic was detected above the instrument detection limit (IDL) in any of the ICB/CCBs. Arsenic was reported at a concentration

below the negative IDL in one CCB (-1.9 µg/L) run on 4/24/00. No sample results were affected by this negative response.

A water matrix preparation blank (PBW) was digested with the samples (per the preparation log); no arsenic was detected in the PBW.

Laboratory Control Samples: An acceptable recovery for arsenic (97.5%) was reported on Form VII in the data package.

Duplicate Analysis: Sample LCH-5 was analyzed in duplicate for total arsenic. A slightly high relative percent difference (RPD) of 20.2% (QC ≤20%) was reported on Form VI for the paired results, but the arsenic concentrations in both analyses were less than five times the CRDL specified on Form X and the paired values were well within ±CRDL. Therefore, no action was warranted on this basis.

Matrix Spike Analysis: Sample LCH-5 was prepared and analyzed as a matrix spike/matrix spike duplicate (MS/MSD) pair for total arsenic. Acceptable percent recoveries (96.4% and 94.2%) were reported on Form V for these analyses (QC 75-125%), which also demonstrated excellent reproducibility (2.3 RPD).

No separate spiked analysis was done for dissolved arsenic.

Graphite Furnace Atomic Absorption (GFAA) QC: Post-digestion spike (PDS) recoveries for arsenic were reported on the analysis run logs and were acceptable (QC 85-115%) with the exception of arsenic in DUPS (51.3%), despite a 1:4 dilution performed by the laboratory. The result for arsenic in DUPS was qualified as estimated (J) on this basis.

Unacceptable PDS recoveries were also obtained for several samples that were re-analyzed at various dilutions. In these cases, the diluted analyses gave acceptable PDS recoveries and the diluted analysis results were reported, therefore no further action was warranted on this basis.

Sample Results: Results greater than or equal to the laboratory-specified IDL were appropriately reported on the Inorganic Analysis Data Sheets (Form Is) for total and dissolved arsenic in each sample.

CLP Form X was provided in the data package, indicating an IDL of 1.7 µg/L established for arsenic on 4/15/00.

All undetected sample results for arsenic were correctly adjusted (multiplied by 0.5) to reflect the concentration factor resulting from processing 100 mL of sample to a final volume of 50 mL, which was clearly documented on the laboratory digestion logs. Positive sample results cannot be similarly verified without the supporting raw data.

IDLs for undetected analytes were also appropriately adjusted to reflect sample dilutions, where applicable. Positive sample results cannot be similarly verified without the supporting raw data.

Field Duplicates: Sample DUP was identified as a field duplicate of LCH-4 based on information provided by the laboratory. Paired results for total arsenic (69.3 RPD) and dissolved arsenic (44.4 RPD) exceeded the QAPP-specified acceptance limit of 30%. Although the arsenic concentrations in both samples were less than five times the CRDL specified on Form X, the paired values were also outside the alternate criterion for low concentrations (±CRDL). Therefore, results for total and dissolved arsenic in LCH-4 and DUP were qualified as estimated (J) on this basis.

Total versus Dissolved Concentrations: Comparison of validated total versus validated dissolved results for arsenic in the seven surface water samples revealed the following cases where the dissolved concentration was higher than the total concentration:

		ug/L		
Sample		**Total**	**Dissolved**	**%D**
SW-5	As	0.85 U	1.1	--
DUP	As	3.2 J	8.8 J	175%

For SW-5, the positive dissolved arsenic result is only slightly greater than the reporting limit, and these results most likely reflect the increased variability inherent at concentrations at or near the lower measurement limit. Therefore, results for total and dissolved arsenic in SW-5 were qualified as estimated (J, UJ) on this basis.

For DUP, the percent difference (%D) is unusually high. Validation guidelines recommend that results for which the %D exceeds 50% be rejected, however several additional pieces of data are available in this case that allow a less drastic conclusion. DUP is a field duplicate of LCH-4. Although the paired results for total and dissolved arsenic in these two samples showed poor reproducibility, the total versus dissolved comparison for LCH-4 was acceptable. In addition, post-digestion spike recoveries were acceptable for analyses of total and dissolved arsenic in LCH-4 and for total arsenic in DUP; only the post-digestion spike recovery for (dissolved) arsenic in DUPS was unacceptable (too low). Finally, all four of the arsenic results for these two samples are less than ten times the

CRDL reported on Form X in the data package. It may be that the discrepancies simply reflect the increased variability typically observed at low concentrations. Or, the low post-digestion spike recovery may suggest that the reported concentration for dissolved arsenic in DUPS is incorrectly biased high. Or, it is possible that one or more of the results is incorrectly reported, which cannot be evaluated in this level review. Therefore, based on the generally low analyte concentrations, review of all the available data, and professional judgment, results for total and dissolved arsenic in DUP were not rejected but were qualified as estimated (J).

Documentation: Data package documentation was consistent with the specifications of the QAPP; specifically, a Level III package was provided, as required. However, summary forms documenting linearity checks (initial multipoint calibration correlation coefficients) for GFAA analytes were missing from the data packages provided for review. At the discretion of the data user, the laboratory may be requested to provide the missing linearity information to ensure that accurate and complete documentation is available for future reference.

Documentation of sample pHs on laboratory receipt was incomplete in the data package as received for review. Clarifications and corrections, as appropriate, were verbally requested by the validator on 6/6/00; responses were received from the laboratory via FedEx on 6/9/00. Corrected documents (revised COC and digestion logs) were inserted into the data package as previously discussed.

A revised COC for the surface water samples, with a checkmark in the "Preserved" space added, was provided by the laboratory, but this new entry was not initialed or dated. While this has no direct effect on the technical validity of the reported sample data, it could be problematic if the data are used for litigation.

Please let me know if you have any questions regarding this data package review report.

Sincerely,

Carol Erikson

Carol A. Erikson
Quality Assessment Manager

CAE/ekd
95406\Apr00\swmetals

TRILLIUM INC.

ATTACHMENT A

INORGANIC ANALYSIS DATA SHEETS (FORM Is)
Laboratory Lot No. 9A04G680

EPA Region I Qualifier Definitions:

U - **The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.**

J - **The associated numerical value is an estimated quantity.**

R - **The data are unusable (Note: Analyte may or may not be present).**

UJ - **The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.**

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
LCH-5

Lab Name: STL_CHICAGO_____ Contract: _____

Lab Code: STL___ Case No.: _____ SAS No.: _____ SDG No.: U04680

Matrix (soil/water): WATER Lab Sample ID: 9A04G680-001

Level (low/med): LOW__ Date Received: 04/08/00

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_				NR
7440-36-0	Antimony_				NR
7440-38-2	Arsenic__	4.4			F_
7440-39-3	Barium___				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium__				NR
7440-70-2	Calcium__				NR
7440-47-3	Chromium_				NR
7440-48-4	Cobalt___				NR
7440-50-8	Copper___				NR
7439-89-6	Iron____				NR
7439-92-1	Lead____				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury__				NR
7440-02-0	Nickel___				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium_				NR
7440-22-4	Silver___				NR
7440-23-5	Sodium___				NR
7440-28-0	Thallium_				NR
7440-62-2	Vanadium_				NR
7440-66-6	Zinc_____				NR
_____	Cyanide__				NR
_____	_____				__

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

LCH-5S DISSOLVED Case 6/13/00

Lab Name: STL_CHICAGO_____ Contract: _____ SDG No.: U04680

Lab Code: STL___ Case No.: _____ SAS No.: _____

Matrix (soil/water): WATER Lab Sample ID: 9A04G680-002

Level (low/med): LOW__ Date Received: 04/08/00

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_				NR
7440-36-0	Antimony_				NR
7440-38-2	Arsenic__	0.85	U		F_
7440-39-3	Barium___				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium__				NR
7440-70-2	Calcium__				NR
7440-47-3	Chromium_				NR
7440-48-4	Cobalt___				NR
7440-50-8	Copper___				NR
7439-89-6	Iron_____				NR
7439-92-1	Lead_____				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury__				NR
7440-02-0	Nickel___				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium_				NR
7440-22-4	Silver___				NR
7440-23-5	Sodium___				NR
7440-28-0	Thallium_				NR
7440-62-2	Vanadium_				NR
7440-66-6	Zinc_____				NR
_____	Cyanide__				NR
_____	_____				___

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

LCH-4

Lab Name: STL_CHICAGO_____ Contract: _____

Lab Code: STL___ Case No.: _____ SAS No.: _____ SDG No.: U04680

Matrix (soil/water): WATER Lab Sample ID: 9A04G680-003

Level (low/med): LOW__ Date Received: 04/08/00

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	6.6		J	F
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

CAE 6/13/00

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

LCH-4S
DISSOLVED
CAE 6/13/00

Lab Name: STL_CHICAGO_____ Contract: _____

Lab Code: STL___ Case No.: _____ SAS No.: _____ SDG No.: U04680

Matrix (soil/water): WATER Lab Sample ID: 9A04G680-004

Level (low/med): LOW__ Date Received: 04/08/00

Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_		_		NR
7440-36-0	Antimony_		_		NR
7440-38-2	Arsenic__	5.6	_	J	F_
7440-39-3	Barium___		_		NR
7440-41-7	Beryllium		_		NR
7440-43-9	Cadmium__		_		NR
7440-70-2	Calcium__		_		NR
7440-47-3	Chromium_		_		NR
7440-48-4	Cobalt___		_		NR
7440-50-8	Copper___		_		NR
7439-89-6	Iron_____		_		NR
7439-92-1	Lead_____		_		NR
7439-95-4	Magnesium		_		NR
7439-96-5	Manganese		_		NR
7439-97-6	Mercury__		_		NR
7440-02-0	Nickel___		_		NR
7440-09-7	Potassium		_		NR
7782-49-2	Selenium_		_		NR
7440-22-4	Silver___		_		NR
7440-23-5	Sodium___		_		NR
7440-28-0	Thallium_		_		NR
7440-62-2	Vanadium_		_		NR
7440-66-6	Zinc_____		_		NR
_____	Cyanide__		_		NR
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CAE 6/13/00

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SW-16

Lab Name: STL_CHICAGO Contract:

Lab Code: STL Case No.: SAS No.: SDG No.: U04680

Matrix (soil/water): WATER Lab Sample ID: 9A04G680-005

Level (low/med): LOW Date Received: 04/08/00

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	0.85	U		F
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SW-16S
DISSOLVED
CAE 6/13/00

Lab Name: STL_CHICAGO Contract: _____

Lab Code: STL___ Case No.: _____ SAS No.: _____ SDG No.: U04680

Matrix (soil/water): WATER Lab Sample ID: 9A04G680-006

Level (low/med): LOW__ Date Received: 04/08/00

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	0.85	U		F
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SW-10

Lab Name: STL_CHICAGO Contract: _____

Lab Code: STL___ Case No.: _____ SAS No.: _____ SDG No.: U04680

Matrix (soil/water): WATER Lab Sample ID: 9A04G680-007

Level (low/med): LOW__ Date Received: 04/08/00

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	0.85	U		F
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SW-10S
DISSOLVED
CAE 6/13/00

Lab Name: STL_CHICAGO Contract: _____

Lab Code: STL___ Case No.: _____ SAS No.: _____ SDG No.: U04680

Matrix (soil/water): WATER Lab Sample ID: 9A04G680-008

Level (low/med): LOW__ Date Received: 04/08/00

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	0.85	U		F
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SW-8

Lab Name: STL_CHICAGO Contract: _____

Lab Code: STL___ Case No.: _____ SAS No.: _____ SDG No.: U04680

Matrix (soil/water): WATER Lab Sample ID: 9A04G680-009

Level (low/med): LOW__ Date Received: 04/08/00

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_		_		NR
7440-36-0	Antimony_		_		NR
7440-38-2	Arsenic__	23.2	_		F_
7440-39-3	Barium___		_		NR
7440-41-7	Beryllium		_		NR
7440-43-9	Cadmium__		_		NR
7440-70-2	Calcium__		_		NR
7440-47-3	Chromium_		_		NR
7440-48-4	Cobalt___		_		NR
7440-50-8	Copper___		_		NR
7439-89-6	Iron_____		_		NR
7439-92-1	Lead_____		_		NR
7439-95-4	Magnesium		_		NR
7439-96-5	Manganese		_		NR
7439-97-6	Mercury__		_		NR
7440-02-0	Nickel___		_		NR
7440-09-7	Potassium		_		NR
7782-49-2	Selenium_		_		NR
7440-22-4	Silver___		_		NR
7440-23-5	Sodium___		_		NR
7440-28-0	Thallium_		_		NR
7440-62-2	Vanadium_		_		NR
7440-66-6	Zinc_____		_		NR
_____	Cyanide__		_		NR
_____	_____		_		___

Color Before: YELLOW___ Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

_____

_____

_____

_____

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SW-8S DISSOLVED

CAE 6/13/00

Lab Name: STL_CHICAGO Contract: _____

Lab Code: STL___ Case No.: _____ SAS No.: _____ SDG No.: U04680

Matrix (soil/water): WATER Lab Sample ID: 9A04G680-010

Level (low/med): LOW__ Date Received: 04/08/00

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_		_		NR
7440-36-0	Antimony_		_		NR
7440-38-2	Arsenic__	11.0	_		F_
7440-39-3	Barium___		_		NR
7440-41-7	Beryllium		_		NR
7440-43-9	Cadmium__		_		NR
7440-70-2	Calcium__		_		NR
7440-47-3	Chromium_		_		NR
7440-48-4	Cobalt___		_		NR
7440-50-8	Copper___		_		NR
7439-89-6	Iron____		_		NR
7439-92-1	Lead____		_		NR
7439-95-4	Magnesium		_		NR
7439-96-5	Manganese		_		NR
7439-97-6	Mercury__		_		NR
7440-02-0	Nickel___		_		NR
7440-09-7	Potassium		_		NR
7782-49-2	Selenium_		_		NR
7440-22-4	Silver___		_		NR
7440-23-5	Sodium___		_		NR
7440-28-0	Thallium_		_		NR
7440-62-2	Vanadium_		_		NR
7440-66-6	Zinc____		_		NR
_____	Cyanide__		_		NR
_____	_____		_		__

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

SOLUBLE_____

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SW-5

Lab Name: STL_CHICAGO_____ Contract: _____

Lab Code: STL___ Case No.: _____ SAS No.: _____ SDG No.: U04680

Matrix (soil/water): WATER Lab Sample ID: 9A04G680-011

Level (low/med): LOW__ Date Received: 04/08/00

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_				NR
7440-36-0	Antimony_				NR
7440-38-2	Arsenic__	0.85	B	UJ	F_
7440-39-3	Barium___				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium__				NR
7440-70-2	Calcium__				NR
7440-47-3	Chromium_				NR
7440-48-4	Cobalt___				NR
7440-50-8	Copper___				NR
7439-89-6	Iron____				NR
7439-92-1	Lead____				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury__				NR
7440-02-0	Nickel___				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium_				NR
7440-22-4	Silver___				NR
7440-23-5	Sodium___				NR
7440-28-0	Thallium_				NR
7440-62-2	Vanadium_				NR
7440-66-6	Zinc____				NR
_____	Cyanide__				NR

CRE 6/13/00

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SW-5S DISSOLVED

CAE 6/13/00

Lab Name: STL_CHICAGO Contract: _____

Lab Code: STL___ Case No.: _____ SAS No.: _____ SDG No.: U04680

Matrix (soil/water): WATER Lab Sample ID: 9A04G680-012

Level (low/med): LOW__ Date Received: 04/08/00

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_		_		NR
7440-36-0	Antimony_		_		NR
7440-38-2	Arsenic__	1.1	_	J	F_
7440-39-3	Barium___		_		NR
7440-41-7	Beryllium		_		NR
7440-43-9	Cadmium__		_		NR
7440-70-2	Calcium__		_		NR
7440-47-3	Chromium_		_		NR
7440-48-4	Cobalt___		_		NR
7440-50-8	Copper___		_		NR
7439-89-6	Iron____		_		NR
7439-92-1	Lead____		_		NR
7439-95-4	Magnesium		_		NR
7439-96-5	Manganese		_		NR
7439-97-6	Mercury__		_		NR
7440-02-0	Nickel___		_		NR
7440-09-7	Potassium		_		NR
7782-49-2	Selenium_		_		NR
7440-22-4	Silver___		_		NR
7440-23-5	Sodium___		_		NR
7440-28-0	Thallium_		_		NR
7440-62-2	Vanadium_		_		NR
7440-66-6	Zinc_____		_		NR
_____	Cyanide__		_		NR
_____	_____		_		__

CAE 6/13/00

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

SOLUBLE_____

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DUP

Lab Name: STL_CHICAGO Contract:

Lab Code: STL Case No.: SAS No.: SDG No.: U04680

Matrix (soil/water): WATER Lab Sample ID: 9A04G680-013

Level (low/med): LOW Date Received: 04/08/00

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	3.2		J	F
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

CAE 6/13/00

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DUPS
DISSOLVED
CAE 6/13/00

Lab Name: STL_CHICAGO Contract: _____

Lab Code: STL___ Case No.: _____ SAS No.: _____ SDG No.: U04680

Matrix (soil/water): WATER Lab Sample ID: 9A04G680-014

Level (low/med): LOW__ Date Received: 04/08/00

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	8.8		J	F
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

CAE 6/13/00

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
SOLUBLE

TRILLIUM INC.
Consultants in Environmental Chemistry

356 FARRAGUT CROSSING DR.
KNOXVILLE, TN 37922
(423) 966-8880
FAX (423) 966-8885
cerikson@trilliuminc.com

June 13, 2000

Mr. Dan Garrigan
O&M, Inc.
450 Montbrook Lane
Knoxville, TN 37919

RE: Data Package Review - STL Lot No. 9A04G680 - Chloride in Surface Waters

Dear Dan:

I have completed my evaluation of the chloride analysis data prepared by the Severn Trent Laboratory (STL) in University Park, Illinois, for seven surface water samples from the L&RR site. The data were reported in a single data package under Lot No. 9A04G680, which was received by Trillium for review on April 28, 2000 and included the following samples:

LCH-5	LCH-4	SW-16
SW-10	SW-8	SW-5
DUP		

Analyses were performed according to EPA Method 325.2 (EPA-600/4-79-020, March 1983). My evaluation was based on the specifications of the project-specific Quality Assurance Project Plan (QAPP, 9/96), the referenced method, and, to the extent applicable, the USEPA Region I *Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses* (6/88; Rev. 2/89).

Based on the evaluation, the following qualifiers were applied:

- Results for chloride in LCH-5 and DUP were qualified as estimated (J) due to poor reproducibility in the field duplicate analyses.

These qualifiers are reflected on the laboratory's Inorganic Data Reports included as Attachment A to this report. Region I qualifier definitions are also provided in this attachment.

At the discretion of the data user, the following points may warrant attention by field and laboratory personnel with regard to this data package and prior to future sampling events at this site:

- Documentation of sample preservation performed in the field on all applicable chain of custody records.
- Documentation of cooler temperatures and sample pHs at the time of laboratory receipt on all applicable chain of custody records.
- Inclusion of raw data as needed to document calibrations and analysis of all samples.

Specific details regarding the review and evaluation of these data are discussed below:

Holding Times, Preservation, Sample Integrity: A copy of the field chain of custody (COC) record was included in the data package, documenting a sample collection date of 4/7/00 for the surface waters. Acceptable cooler temperatures (3.6°C and 2.6°C) on laboratory receipt were recorded on the COC. Acidification of the samples for chloride analysis, however, was not noted by the sampler on the COC and no verification of acidification was documented in the data package by the laboratory. At the request of the evaluator, the laboratory provided a revised COC for the surface water samples, with a checkmark in the "Preserved" space added.

The revised COC was inserted into the data package for G680 as page 199a.

Sample pHs were still not found on the additional documentation provided by the laboratory. For the purposes of this evaluation, it was assumed that samples for chloride analyses were properly preserved at the time of collection, and no further action was taken on this basis.

All sample analyses for chloride were performed within the 28-day holding time specified by the QAPP for this parameter.

Calibrations: Although a spectrophotometric method was referenced for chloride, no documentation of an initial calibration curve or calibration verification standards was provided in the data package. A statement in the narrative says, "The initial and continuing calibration verification standards and blanks were in control," but is not specific as to which method is referred to. At the request of the evaluator, copies of the applicable instrument print-outs and analyst log book pages as well as a summary data table for chloride were provided by the laboratory via FedEx on 6/9/00. Based on this documentation, an initial calibration (1.0-30 mg/L) was run for chloride on 4/12/00 (immediately prior to sample analyses) and an acceptable correlation coefficient (>0.995) was reported for that curve. Initial and continuing calibration verification standards were run at appropriate frequencies throughout the chloride analysis series, and all recoveries were acceptable (QC 85-115%).

The chloride raw data documentation was inserted into the data package for G680 as pages 12a through 12i by the evaluator.

Blanks: A method blank (MB) containing no chloride above the reporting limit was reported in the data package.

Calibration blanks were also run at the appropriate frequencies throughout the analysis series, based on the raw data documentation provided by the laboratory as discussed above. No chloride was detected above the reporting limit in any of the calibration blanks.

Laboratory Control Samples: A laboratory control sample (LCS) was analyzed in association with the sample analyses for chloride, and an acceptable recovery (103%) was reported.

Duplicate Analysis: No laboratory duplicate analysis was performed on any of the samples in this data package.

Matrix Spike Analysis: No matrix spike analysis was performed on any of the samples in this data package.

Sample Results: Sample results greater than or equal to the laboratory-specified reporting limits for chloride were reported on summary forms for all samples. Based on the raw data provided by the laboratory, some samples were appropriately re-analyzed at dilutions for some parameters

Field Duplicates: Sample DUP was identified as a field duplicate of LCH-4. Paired results for chloride showed poor reproducibility, with a relative percent difference of 47.7%. Results for chloride in LCH-4 and DUP were qualified as estimated (J) on this basis.

Documentation: Data package documentation was consistent with the specifications of the QAPP; specifically, a Level III package containing summary forms only was provided. However, no documentation of initial or continuing calibration standards for chloride was provided, although this information has been provided in previous data packages generated in support of this project. For wet chemistry parameters in general, the raw data pages serve as run logs and are helpful for verifying that all samples were, in fact, analyzed. For those parameters run by spectrophotometric methods, the raw data pages are necessary to evaluate calibrations and calibration blanks, which are not routinely summarized elsewhere. Additional documentation for chloride was therefore requested from and provided by the laboratory as discussed previously in this report.

Documentation of sample pHs and cooler temperatures on laboratory receipt was also incomplete in the data packages as received for review. Clarifications and corrections, as appropriate, were verbally requested by the validator on 6/6/00; responses were received from the laboratory via FedEx on 6/9/00. Corrected documents were inserted into the applicable data packages as discussed previously in this report.

A revised COC for the surface water samples, with a checkmark in the "Preserved" space added, was provided by the laboratory, but this new entry was not initialed or dated. While this has no direct effect on the technical validity of the reported sample data, it could be problematic if the data are used for litigation.

Please let me know if you have any questions regarding this data package review report.

Sincerely,

Carol Erikson

Carol A. Erikson
Quality Assessment Manager

CAE/hrs
95406\Apr00\swchloride

TRILLIUM INC.

ATTACHMENT A

Chloride in Surface Waters
STL Lot No. 9A04G680

EPA Region I Qualifier Definitions:

U - **The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.**

J - **The associated value is an estimated quantity.**

R - **The data are unusable. (Note: Analyte may or may not be present).**

UJ - **The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.**

To: O&M-L&RR Landfill
301 Gallaher View Road
Suite 230
Knoxville, TN 37919

Attn: Mr. Daniel Garrigan

Date: Thursday April 20th, 2000

RE: LCH-5
Project # 00000-000-000-0000
Lab ID: 9A04G680-001
Sample Date: 04/07/00
Date Received: 04/08/00

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Chloride	16.3	mg/L	1.0

To: O&M-L&RR Landfill
301 Gallaher View Road
Suite 230
Knoxville, TN 37919

Attn: Mr. Daniel Garrigan

Date: Thursday April 20th, 2000

RE: LCH-4
Project # 00000-000-000-0000
Lab ID: 9A04G680-003
Sample Date: 04/07/00
Date Received: 04/08/00

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Chloride	80.7 J	mg/L	5.0

CAErikson 6/13/00

To: O&M-L&RR Landfill
301 Gallaher View Road
Suite 230
Knoxville, TN 37919

Attn: Mr. Daniel Garrigan

Date: Thursday April 20th, 2000

RE: SW-16
Project # 00000-000-000-0000
Lab ID: 9A04G680-005
Sample Date: 04/07/00
Date Received: 04/08/00

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Chloride	29.4	mg/L	1.0

To: O&M-L&RR Landfill
301 Gallaher View Road
Suite 230
Knoxville, TN 37919

Attn: Mr. Daniel Garrigan

Date: Thursday April 20th, 2000

RE: SW-10
Project # 00000-000-000-0000
Lab ID: 9A04G680-007
Sample Date: 04/07/00
Date Received: 04/08/00

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Chloride	30.2	mg/L	2.0

To: O&M-L&RR Landfill
301 Gallaher View Road
Suite 230
Knoxville, TN 37919

Attn: Mr. Daniel Garrigan

Date: Thursday April 20th, 2000

RE: SW-8
Project # 00000-000-000-0000
Lab ID: 9A04G680-009
Sample Date: 04/07/00
Date Received: 04/08/00

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Chloride	58.3	mg/L	5.0

To: O&M-L&RR Landfill
301 Gallaher View Road
Suite 230
Knoxville, TN 37919

Attn: Mr. Daniel Garrigan

Date: Thursday April 20th, 2000

RE: SW-5
Project # 00000-000-000-0000
Lab ID: 9A04G680-011
Sample Date: 04/07/00
Date Received: 04/08/00

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Chloride	10.5	mg/L	1.0

To: O&M-L&RR Landfill
301 Gallaher View Road
Suite 230
Knoxville, TN 37919

Attn: Mr. Daniel Garrigan

Date: Thursday April 20th, 2000

RE: DUP
Project # 00000-000-000-0000
Lab ID: 9A04G680-013
Sample Date: 04/07/00
Date Received: 04/08/00

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Chloride	49.6 J	mg/L	2.0

CAE 6/13/00

Appendix F

Ambient Air Sampling Report
AirRecon, Inc.

AirRecon®
Division of Levine • Fricke • Recon

July 11, 2000

Mr. Dan Garrigan
Operations and Maintenance, Inc.
301 Gallaher View Rd.
Suite 230
Knoxville, TN 37919

RE: L&RR Landfill
North Smithfield, RI
AirRECON Project 311-00105-00-000

Dear Mr. Garrigan:

Enclosed, please find copies of the laboratory results from the test program performed at the L&RR landfill located in North Smithfield RI, and associated data from the test program.

Five TO-14 samples were collected around the perimeter of the landfill. The sampling duration was twenty-two (22) hours. The shortened sampling duration was used to insure samples did not go "ambient" and that enough pressure was left in the samples during shipment back to the laboratory.

In addition, one (1) USEPA Method 18 grab sample was also collected at the header to the flare. This sample was collected over a four-hour period.

All sampling was performed without incident, and by USEPA methodologies.

If you have any questions or require additional information, please do not hesitate to contact me at (860) 721-7728.

It was a pleasure being of service to you. Should you require additional work please feel free to contact me.

Sincerely,

John S. Gammie
Sr. Environmental Specialist
AirRECON a division of LFR

Cc. Andrew McNeel/ AirRECON/ NJ
Thor Helgasin/ DeMaximus, Inc.

Sampling Data on June 8-9 2000 at the Smithfield, RI Landfill TO 14 Samples

Weather Conditions June 8, 2000 Barometric Pressure 30.13, dewpoint 11, west wind (0-4)mph, temp 75-80F

Location		start time	date	finish time	date	tank #	orifice#
AS-1	near gate entrance	1120am	6/8/00	0920am	6/9/00	332	05967 (1)
AS-1 dup		1120am	6/8/00	0920am	6/9/00	271	05033 (95-03)
AS-2		1124am	6/8/00	0924am	6/9/00	2701	05483 (98-17)
AS-3		1129am	6/8/00	0929am	6/9/00	2507	05995 (97-03)
AS-4	closest to flare	1133am	6/8/00	0933am	6/9/00	913	05493 (96-06)

Weather Conditions 6-9-2000 Barometric Pressure 29.97, dew point 17, west wind (0-9) mph temp 75-80F

Method 18 Sampling data

Start time	date	finish time	date
0953am	6/8/00	1353pm	6/8/00

@ AIR TOXICS LTD.
AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 0006175

Work Order Summary

CLIENT:	Tom Brown LFR Levine-Fricke 5 Johnson Drive P.O. Box 130 Raritan, NJ 08869	**BILL TO:**	Tom Brown LFR Levine-Fricke 5 Johnson Drive P.O. Box 130 Raritan, NJ 08869
PHONE:	908-526-1000	**P.O. #**	
FAX:	908-526-7886	**PROJECT #**	311-00105 OIM
DATE RECEIVED:	6/12/00		
DATE COMPLETED:	6/22/00		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.
01A	AS-1	TO-14	6.5 "Hg
02A	AS-1 Dup	TO-14	6.0 "Hg
03A	AS-2	TO-14	5.0 "Hg
04A	AS-3	TO-14	6.0 "Hg
05A	AS-4	TO-14	6.0 "Hg
06A	BLANK	TO-14	28.5 "Hg
07A	Lab Blank	TO-14	NA
07B	Lab Blank	TO-14	NA

CERTIFIED BY: _____ DATE: 6/29/00

FAR Laboratory Director

Certification numbers: CA ELAP - 1149, NY ELAP - 11291, UT ELAP - E-217, AZ ELAP - AZ0567

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
TO-14
LFR Levine-Fricke
Workorder# 0006175

Six 6 Liter Summa Canister samples were received on June 12, 2000. The laboratory performed analysis via EPA Method TO-14 using GC/MS in the full scan mode. The method involves concentrating up to 0.5 liters of air. The concentrated aliquot is then flash vaporized and swept through a water management system to remove water vapor. Following dehumidification, the sample passes directly into the GC/MS for analysis. See the data sheets for the reporting limits for each compound.

During the five point calibration, two low-level standards are used. The low-level standard for TO-14 compounds is spiked at 0.5 ppbv and represents the reporting limit for these compounds. The low-level standard for the non-TO-14 compounds is spiked at 2.0 ppbv and represents the reporting limit for these compounds. The TO-14 compounds are present in both standards but are excluded from reporting in the 2.0 ppbv standard since a lower level is already included in the curve.

Method modifications taken to run these samples include:

Requirement	*TO-14*	*ATL Modifications*
Internal standard retention times.	Not specified.	Within 0.50 minutes of most recent daily CCV internal standards
Internal standard recoveries.	Not specified.	Within 40% of the daily CCV internal standard area for blanks and samples.
Internal standard retention times.	Not specified.	Within 0.50 minutes of most recent daily CCV internal standards
Internal calibration criteria.	Not specified.	RSD of 30% or less for standard compounds, 40% or less for non-standard and polar compounds
Continuing calibration verification criteria	Not specified.	70 - 130% for at least 90% of standard compounds, 60 - 140% for at least 80% of non-standard and polar compounds
Response factor for quantitation.	Average response factor (ICAL).	Average response factor (ICAL).

Receiving Notes

The chain of custody information for sample BLANK did not match the entry on the sample tag. The client was notified and the information on the chain of custody was used to process and report the sample.

Analytical Notes

Methylene Chloride was detected in the laboratory blank analyzed on 06/20/00 at less than 5X the reporting limit. Associated sample results are reported as qualified.

Definition of Data Qualifying Flags

Seven qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit(background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.
S - Saturated peak.
Q - Exceeds quality control limits.
U - Compound analyzed for but not detected above the reporting limit.
N - The identification is based on presumptive evidence.

AIR TOXICS LTD.

SAMPLE NAME : AS-1

ID#: 0006175-01A

EPA METHOD TO-14 GC/MS Full Scan

File Name:	C061919	Date of Collection: 6/8/00
Dil. Factor:	1.71	Date of Analysis: 6/19/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	0.86	4.3	1.0	5.3
Freon 114	0.86	6.1	Not Detected	Not Detected
Chloromethane	0.86	1.8	1.5	3.1
Vinyl Chloride	0.86	2.2	Not Detected	Not Detected
Bromomethane	0.86	3.4	Not Detected	Not Detected
Chloroethane	0.86	2.3	Not Detected	Not Detected
Freon 11	0.86	4.9	Not Detected	Not Detected
1,1-Dichloroethene	0.86	3.4	Not Detected	Not Detected
Freon 113	0.86	6.7	Not Detected	Not Detected
Methylene Chloride	0.86	3.0	1.4	5.0
1,1-Dichloroethane	0.86	3.5	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.86	3.4	Not Detected	Not Detected
Chloroform	0.86	4.2	Not Detected	Not Detected
1,1,1-Trichloroethane	0.86	4.7	Not Detected	Not Detected
Carbon Tetrachloride	0.86	5.5	Not Detected	Not Detected
Benzene	0.86	2.8	Not Detected	Not Detected
1,2-Dichloroethane	0.86	3.5	Not Detected	Not Detected
Trichloroethene	0.86	4.7	Not Detected	Not Detected
1,2-Dichloropropane	0.86	4.0	Not Detected	Not Detected
cis-1,3-Dichloropropene	0.86	3.9	Not Detected	Not Detected
Toluene	0.86	3.3	Not Detected	Not Detected
trans-1,3-Dichloropropene	0.86	3.9	Not Detected	Not Detected
1,1,2-Trichloroethane	0.86	4.7	Not Detected	Not Detected
Tetrachloroethene	0.86	5.9	Not Detected	Not Detected
Ethylene Dibromide	0.86	6.7	Not Detected	Not Detected
Chlorobenzene	0.86	4.0	Not Detected	Not Detected
Ethyl Benzene	0.86	3.8	Not Detected	Not Detected
m,p-Xylene	0.86	3.8	Not Detected	Not Detected
o-Xylene	0.86	3.8	Not Detected	Not Detected
Styrene	0.86	3.7	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	0.86	6.0	Not Detected	Not Detected
1,3,5-Trimethylbenzene	0.86	4.3	Not Detected	Not Detected
1,2,4-Trimethylbenzene	0.86	4.3	Not Detected	Not Detected
1,3-Dichlorobenzene	0.86	5.2	Not Detected	Not Detected
1,4-Dichlorobenzene	0.86	5.2	Not Detected	Not Detected
Chlorotoluene	0.86	4.5	Not Detected	Not Detected
1,2-Dichlorobenzene	0.86	5.2	Not Detected	Not Detected
1,2,4-Trichlorobenzene	0.86	6.4	Not Detected	Not Detected
Hexachlorobutadiene	0.86	9.3	Not Detected	Not Detected
Propylene	3.4	6.0	Not Detected	Not Detected
1,3-Butadiene	3.4	7.7	Not Detected	Not Detected
Acetone	3.4	8.2	16	39

AIR TOXICS LTD.

SAMPLE NAME : AS-1

ID#: 0006175-01A

EPA METHOD TO-14 GC/MS Full Scan

File Name:	c061919	Date of Collection:	6/8/00
Dil. Factor:	1.71	Date of Analysis:	6/19/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Carbon Disulfide	3.4	11	Not Detected	Not Detected
2-Propanol	3.4	8.5	Not Detected	Not Detected
trans-1,2-Dichloroethene	3.4	14	Not Detected	Not Detected
Vinyl Acetate	3.4	12	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	3.4	10	Not Detected	Not Detected
Hexane	3.4	12	Not Detected	Not Detected
Tetrahydrofuran	3.4	10	Not Detected	Not Detected
Cyclohexane	3.4	12	Not Detected	Not Detected
1,4-Dioxane	3.4	12	Not Detected	Not Detected
Bromodichloromethane	3.4	23	Not Detected	Not Detected
4-Methyl-2-pentanone	3.4	14	Not Detected	Not Detected
2-Hexanone	3.4	14	Not Detected	Not Detected
Dibromochloromethane	3.4	30	Not Detected	Not Detected
Bromoform	3.4	36	Not Detected	Not Detected
4-Ethyltoluene	3.4	17	Not Detected	Not Detected
Ethanol	3.4	6.5	Not Detected	Not Detected
Methyl tert-Butyl Ether	3.4	12	Not Detected	Not Detected
Heptane	3.4	14	Not Detected	Not Detected

Container Type: 6 Liter Summa Canister

Surrogates	% Recovery	Method Limits
1,2-Dichloroethane-d4	104	70-130
Toluene-d8	105	70-130
4-Bromofluorobenzene	94	70-130

AIR TOXICS LTD.

SAMPLE NAME : AS-1 Dup

ID#: 0006175-02A

EPA METHOD TO-14 GC/MS Full Scan

File Name:	c061920	Date of Collection:	6/8/00
Dil. Factor:	1.68	Date of Analysis:	6/19/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	0.84	4.2	Not Detected	Not Detected
Freon 114	0.84	6.0	Not Detected	Not Detected
Chloromethane	0.84	1.8	Not Detected	Not Detected
Vinyl Chloride	0.84	2.2	Not Detected	Not Detected
Bromomethane	0.84	3.3	Not Detected	Not Detected
Chloroethane	0.84	2.2	Not Detected	Not Detected
Freon 11	0.84	4.8	Not Detected	Not Detected
1,1-Dichloroethene	0.84	3.4	Not Detected	Not Detected
Freon 113	0.84	6.5	Not Detected	Not Detected
Methylene Chloride	0.84	3.0	1.4	5.1
1,1-Dichloroethane	0.84	3.4	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.84	3.4	Not Detected	Not Detected
Chloroform	0.84	4.2	Not Detected	Not Detected
1,1,1-Trichloroethane	0.84	4.6	Not Detected	Not Detected
Carbon Tetrachloride	0.84	5.4	Not Detected	Not Detected
Benzene	0.84	2.7	Not Detected	Not Detected
1,2-Dichloroethane	0.84	3.4	Not Detected	Not Detected
Trichloroethene	0.84	4.6	Not Detected	Not Detected
1,2-Dichloropropane	0.84	3.9	Not Detected	Not Detected
cis-1,3-Dichloropropene	0.84	3.9	Not Detected	Not Detected
Toluene	0.84	3.2	4.9	19
trans-1,3-Dichloropropene	0.84	3.9	Not Detected	Not Detected
1,1,2-Trichloroethane	0.84	4.6	Not Detected	Not Detected
Tetrachloroethene	0.84	5.8	Not Detected	Not Detected
Ethylene Dibromide	0.84	6.6	Not Detected	Not Detected
Chlorobenzene	0.84	3.9	Not Detected	Not Detected
Ethyl Benzene	0.84	3.7	3.3	15
m,p-Xylene	0.84	3.7	23	100
o-Xylene	0.84	3.7	3.8	16
Styrene	0.84	3.6	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	0.84	5.9	Not Detected	Not Detected
1,3,5-Trimethylbenzene	0.84	4.2	2.1	10
1,2,4-Trimethylbenzene	0.84	4.2	1.0	5.2
1,3-Dichlorobenzene	0.84	5.1	Not Detected	Not Detected
1,4-Dichlorobenzene	0.84	5.1	0.99	6.0
Chlorotoluene	0.84	4.4	Not Detected	Not Detected
1,2-Dichlorobenzene	0.84	5.1	0.94	5.8
1,2,4-Trichlorobenzene	0.84	6.3	Not Detected	Not Detected
Hexachlorobutadiene	0.84	9.1	Not Detected	Not Detected
Propylene	3.4	5.9	Not Detected	Not Detected
1,3-Butadiene	3.4	7.6	Not Detected	Not Detected
Acetone	3.4	8.1	36	87

AIR TOXICS LTD.

SAMPLE NAME : AS-1 Dup

ID#: 0006175-02A

EPA METHOD TO-14 GC/MS Full Scan

File Name:	c061920	Date of Collection:	6/8/00
Dil. Factor:	1.68	Date of Analysis:	6/19/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Carbon Disulfide	3.4	11	4.1	13
2-Propanol	3.4	8.4	Not Detected	Not Detected
trans-1,2-Dichloroethene	3.4	14	Not Detected	Not Detected
Vinyl Acetate	3.4	12	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	3.4	10	5.9	18
Hexane	3.4	12	Not Detected	Not Detected
Tetrahydrofuran	3.4	10	Not Detected	Not Detected
Cyclohexane	3.4	12	Not Detected	Not Detected
1,4-Dioxane	3.4	12	Not Detected	Not Detected
Bromodichloromethane	3.4	23	Not Detected	Not Detected
4-Methyl-2-pentanone	3.4	14	Not Detected	Not Detected
2-Hexanone	3.4	14	Not Detected	Not Detected
Dibromochloromethane	3.4	29	Not Detected	Not Detected
Bromoform	3.4	35	Not Detected	Not Detected
4-Ethyltoluene	3.4	17	Not Detected	Not Detected
Ethanol	3.4	6.4	Not Detected	Not Detected
Methyl tert-Butyl Ether	3.4	12	Not Detected	Not Detected
Heptane	3.4	14	Not Detected	Not Detected

Container Type: 6 Liter Summa Canister

Surrogates	% Recovery	Method Limits
1,2-Dichloroethane-d4	106	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	94	70-130

AIR TOXICS LTD.

SAMPLE NAME : AS-2

ID#: 0006175-03A

EPA METHOD TO-14 GC/MS Full Scan

File Name:	c061921	Date of Collection: 6/8/00
Dil. Factor:	1.61	Date of Analysis: 6/19/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	0.80	4.0	0.82	4.1
Freon 114	0.80	5.7	Not Detected	Not Detected
Chloromethane	0.80	1.7	Not Detected	Not Detected
Vinyl Chloride	0.80	2.1	Not Detected	Not Detected
Bromomethane	0.80	3.2	Not Detected	Not Detected
Chloroethane	0.80	2.2	Not Detected	Not Detected
Freon 11	0.80	4.6	Not Detected	Not Detected
1,1-Dichloroethene	0.80	3.2	Not Detected	Not Detected
Freon 113	0.80	6.3	Not Detected	Not Detected
Methylene Chloride	0.80	2.8	0.89	3.1
1,1-Dichloroethane	0.80	3.3	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.80	3.2	Not Detected	Not Detected
Chloroform	0.80	4.0	Not Detected	Not Detected
1,1,1-Trichloroethane	0.80	4.5	Not Detected	Not Detected
Carbon Tetrachloride	0.80	5.1	Not Detected	Not Detected
Benzene	0.80	2.6	Not Detected	Not Detected
1,2-Dichloroethane	0.80	3.3	Not Detected	Not Detected
Trichloroethene	0.80	4.4	Not Detected	Not Detected
1,2-Dichloropropane	0.80	3.8	Not Detected	Not Detected
cis-1,3-Dichloropropene	0.80	3.7	Not Detected	Not Detected
Toluene	0.80	3.1	Not Detected	Not Detected
trans-1,3-Dichloropropene	0.80	3.7	Not Detected	Not Detected
1,1,2-Trichloroethane	0.80	4.5	Not Detected	Not Detected
Tetrachloroethene	0.80	5.6	Not Detected	Not Detected
Ethylene Dibromide	0.80	6.3	Not Detected	Not Detected
Chlorobenzene	0.80	3.8	Not Detected	Not Detected
Ethyl Benzene	0.80	3.6	Not Detected	Not Detected
m,p-Xylene	0.80	3.6	Not Detected	Not Detected
o-Xylene	0.80	3.6	Not Detected	Not Detected
Styrene	0.80	3.5	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	0.80	5.6	Not Detected	Not Detected
1,3,5-Trimethylbenzene	0.80	4.0	Not Detected	Not Detected
1,2,4-Trimethylbenzene	0.80	4.0	Not Detected	Not Detected
1,3-Dichlorobenzene	0.80	4.9	Not Detected	Not Detected
1,4-Dichlorobenzene	0.80	4.9	Not Detected	Not Detected
Chlorotoluene	0.80	4.2	Not Detected	Not Detected
1,2-Dichlorobenzene	0.80	4.9	Not Detected	Not Detected
1,2,4-Trichlorobenzene	0.80	6.1	Not Detected	Not Detected
Hexachlorobutadiene	0.80	8.7	Not Detected	Not Detected
Propylene	3.2	5.6	Not Detected	Not Detected
1,3-Butadiene	3.2	7.2	Not Detected	Not Detected
Acetone	3.2	7.8	23	55

AIR TOXICS LTD.

SAMPLE NAME : AS-2

ID#: 0006175-03A

EPA METHOD TO-14 GC/MS Full Scan

File Name:	c061921	Date of Collection: 6/8/00
Dil. Factor:	1.61	Date of Analysis: 6/19/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Carbon Disulfide	3.2	10	Not Detected	Not Detected
2-Propanol	3.2	8.0	Not Detected	Not Detected
trans-1,2-Dichloroethene	3.2	13	Not Detected	Not Detected
Vinyl Acetate	3.2	12	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	3.2	9.6	3.3	9.9
Hexane	3.2	12	Not Detected	Not Detected
Tetrahydrofuran	3.2	9.6	Not Detected	Not Detected
Cyclohexane	3.2	11	Not Detected	Not Detected
1,4-Dioxane	3.2	12	Not Detected	Not Detected
Bromodichloromethane	3.2	22	Not Detected	Not Detected
4-Methyl-2-pentanone	3.2	13	Not Detected	Not Detected
2-Hexanone	3.2	13	Not Detected	Not Detected
Dibromochloromethane	3.2	28	Not Detected	Not Detected
Bromoform	3.2	34	Not Detected	Not Detected
4-Ethyltoluene	3.2	16	Not Detected	Not Detected
Ethanol	3.2	6.2	Not Detected	Not Detected
Methyl tert-Butyl Ether	3.2	12	Not Detected	Not Detected
Heptane	3.2	13	Not Detected	Not Detected

Container Type: 6 Liter Summa Canister

Surrogates	% Recovery	Method Limits
1,2-Dichloroethane-d4	108	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	87	70-130

AIR TOXICS LTD.

SAMPLE NAME : AS-3

ID#: 0006175-04A

EPA METHOD TO-14 GC/MS Full Scan

File Name:	g062019	Date of Collection: 6/8/00
Dil. Factor:	1.55	Date of Analysis: 6/20/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	0.78	3.9	Not Detected	Not Detected
Freon 114	0.78	5.5	Not Detected	Not Detected
Chloromethane	0.78	1.6	Not Detected	Not Detected
Vinyl Chloride	0.78	2.0	Not Detected	Not Detected
Bromomethane	0.78	3.0	Not Detected	Not Detected
Chloroethane	0.78	2.1	Not Detected	Not Detected
Freon 11	0.78	4.4	Not Detected	Not Detected
1,1-Dichloroethene	0.78	3.1	Not Detected	Not Detected
Freon 113	0.78	6.0	Not Detected	Not Detected
Methylene Chloride	0.78	2.7	1.4 B	4.9 B
1,1-Dichloroethane	0.78	3.2	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.78	3.1	Not Detected	Not Detected
Chloroform	0.78	3.8	Not Detected	Not Detected
1,1,1-Trichloroethane	0.78	4.3	Not Detected	Not Detected
Carbon Tetrachloride	0.78	5.0	Not Detected	Not Detected
Benzene	0.78	2.5	Not Detected	Not Detected
1,2-Dichloroethane	0.78	3.2	Not Detected	Not Detected
Trichloroethene	0.78	4.2	Not Detected	Not Detected
1,2-Dichloropropane	0.78	3.6	Not Detected	Not Detected
cis-1,3-Dichloropropene	0.78	3.6	Not Detected	Not Detected
Toluene	0.78	3.0	Not Detected	Not Detected
trans-1,3-Dichloropropene	0.78	3.6	Not Detected	Not Detected
1,1,2-Trichloroethane	0.78	4.3	Not Detected	Not Detected
Tetrachloroethene	0.78	5.3	Not Detected	Not Detected
Ethylene Dibromide	0.78	6.0	Not Detected	Not Detected
Chlorobenzene	0.78	3.6	Not Detected	Not Detected
Ethyl Benzene	0.78	3.4	Not Detected	Not Detected
m,p-Xylene	0.78	3.4	Not Detected	Not Detected
o-Xylene	0.78	3.4	Not Detected	Not Detected
Styrene	0.78	3.4	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	0.78	5.4	Not Detected	Not Detected
1,3,5-Trimethylbenzene	0.78	3.9	Not Detected	Not Detected
1,2,4-Trimethylbenzene	0.78	3.9	Not Detected	Not Detected
1,3-Dichlorobenzene	0.78	4.7	Not Detected	Not Detected
1,4-Dichlorobenzene	0.78	4.7	Not Detected	Not Detected
Chlorotoluene	0.78	4.1	Not Detected	Not Detected
1,2-Dichlorobenzene	0.78	4.7	Not Detected	Not Detected
1,2,4-Trichlorobenzene	0.78	5.8	Not Detected	Not Detected
Hexachlorobutadiene	0.78	8.4	Not Detected	Not Detected
Propylene	3.1	5.4	Not Detected	Not Detected
1,3-Butadiene	3.1	7.0	Not Detected	Not Detected
Acetone	3.1	7.5	6.8	16

AIR TOXICS LTD.

SAMPLE NAME : AS-3

ID#: 0006175-04A

EPA METHOD TO-14 GC/MS Full Scan

File Name:	2g062019	Date of Collection:	6/8/00
Dil. Factor:	1.55	Date of Analysis:	6/20/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Carbon Disulfide	3.1	9.8	Not Detected	Not Detected
2-Propanol	3.1	7.7	Not Detected	Not Detected
trans-1,2-Dichloroethene	3.1	12	Not Detected	Not Detected
Vinyl Acetate	3.1	11	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	3.1	9.3	Not Detected	Not Detected
Hexane	3.1	11	Not Detected	Not Detected
Tetrahydrofuran	3.1	9.3	Not Detected	Not Detected
Cyclohexane	3.1	11	Not Detected	Not Detected
1,4-Dioxane	3.1	11	Not Detected	Not Detected
Bromodichloromethane	3.1	21	Not Detected	Not Detected
4-Methyl-2-pentanone	3.1	13	Not Detected	Not Detected
2-Hexanone	3.1	13	Not Detected	Not Detected
Dibromochloromethane	3.1	27	Not Detected	Not Detected
Bromoform	3.1	32	Not Detected	Not Detected
4-Ethyltoluene	3.1	15	Not Detected	Not Detected
Ethanol	3.1	5.9	Not Detected	Not Detected
Methyl tert-Butyl Ether	3.1	11	Not Detected	Not Detected
Heptane	3.1	13	Not Detected	Not Detected

B = Compound present in laboratory blank, background subtraction not performed.

Container Type: 6 Liter Summa Canister

Surrogates	% Recovery	Method Limits
1,2-Dichloroethane-d4	104	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	93	70-130

AIR TOXICS LTD.

SAMPLE NAME : AS-4

ID#: 0006175-05A

EPA METHOD TO-14 GC/MS Full Scan

File Name:	c061923	Date of Collection:	6/8/00
Dil. Factor:	1.68	Date of Analysis:	6/20/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	0.84	4.2	0.91	4.6
Freon 114	0.84	6.0	Not Detected	Not Detected
Chloromethane	0.84	1.8	Not Detected	Not Detected
Vinyl Chloride	0.84	2.2	Not Detected	Not Detected
Bromomethane	0.84	3.3	Not Detected	Not Detected
Chloroethane	0.84	2.2	Not Detected	Not Detected
Freon 11	0.84	4.8	Not Detected	Not Detected
1,1-Dichloroethene	0.84	3.4	Not Detected	Not Detected
Freon 113	0.84	6.5	Not Detected	Not Detected
Methylene Chloride	0.84	3.0	0.90	3.2
1,1-Dichloroethane	0.84	3.4	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.84	3.4	Not Detected	Not Detected
Chloroform	0.84	4.2	Not Detected	Not Detected
1,1,1-Trichloroethane	0.84	4.6	Not Detected	Not Detected
Carbon Tetrachloride	0.84	5.4	Not Detected	Not Detected
Benzene	0.84	2.7	Not Detected	Not Detected
1,2-Dichloroethane	0.84	3.4	Not Detected	Not Detected
Trichloroethene	0.84	4.6	Not Detected	Not Detected
1,2-Dichloropropane	0.84	3.9	Not Detected	Not Detected
cis-1,3-Dichloropropene	0.84	3.9	Not Detected	Not Detected
Toluene	0.84	3.2	Not Detected	Not Detected
trans-1,3-Dichloropropene	0.84	3.9	Not Detected	Not Detected
1,1,2-Trichloroethane	0.84	4.6	Not Detected	Not Detected
Tetrachloroethene	0.84	5.8	Not Detected	Not Detected
Ethylene Dibromide	0.84	6.6	Not Detected	Not Detected
Chlorobenzene	0.84	3.9	Not Detected	Not Detected
Ethyl Benzene	0.84	3.7	Not Detected	Not Detected
m,p-Xylene	0.84	3.7	Not Detected	Not Detected
o-Xylene	0.84	3.7	Not Detected	Not Detected
Styrene	0.84	3.6	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	0.84	5.9	Not Detected	Not Detected
1,3,5-Trimethylbenzene	0.84	4.2	Not Detected	Not Detected
1,2,4-Trimethylbenzene	0.84	4.2	Not Detected	Not Detected
1,3-Dichlorobenzene	0.84	5.1	Not Detected	Not Detected
1,4-Dichlorobenzene	0.84	5.1	Not Detected	Not Detected
Chlorotoluene	0.84	4.4	Not Detected	Not Detected
1,2-Dichlorobenzene	0.84	5.1	Not Detected	Not Detected
1,2,4-Trichlorobenzene	0.84	6.3	Not Detected	Not Detected
Hexachlorobutadiene	0.84	9.1	Not Detected	Not Detected
Propylene	3.4	5.9	Not Detected	Not Detected
1,3-Butadiene	3.4	7.6	Not Detected	Not Detected
Acetone	3.4	8.1	7.5	18

AIR TOXICS LTD.

SAMPLE NAME : AS-4

ID#: 0006175-05A

EPA METHOD TO-14 GC/MS Full Scan

File Name:	c061923	**Date of Collection:**	6/8/00
Dil. Factor:	1.68	**Date of Analysis:**	6/20/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Carbon Disulfide	3.4	11	Not Detected	Not Detected
2-Propanol	3.4	8.4	Not Detected	Not Detected
trans-1,2-Dichloroethene	3.4	14	Not Detected	Not Detected
Vinyl Acetate	3.4	12	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	3.4	10	Not Detected	Not Detected
Hexane	3.4	12	Not Detected	Not Detected
Tetrahydrofuran	3.4	10	Not Detected	Not Detected
Cyclohexane	3.4	12	Not Detected	Not Detected
1,4-Dioxane	3.4	12	Not Detected	Not Detected
Bromodichloromethane	3.4	23	Not Detected	Not Detected
4-Methyl-2-pentanone	3.4	14	Not Detected	Not Detected
2-Hexanone	3.4	14	Not Detected	Not Detected
Dibromochloromethane	3.4	29	Not Detected	Not Detected
Bromoform	3.4	35	Not Detected	Not Detected
4-Ethyltoluene	3.4	17	Not Detected	Not Detected
Ethanol	3.4	6.4	Not Detected	Not Detected
Methyl tert-Butyl Ether	3.4	12	Not Detected	Not Detected
Heptane	3.4	14	Not Detected	Not Detected

Container Type: 6 Liter Summa Canister

Surrogates	% Recovery	Method Limits
1,2-Dichloroethane-d4	107	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	92	70-130

AIR TOXICS LTD.

SAMPLE NAME : Blank

ID#: 0006175-06A

EPA METHOD TO-14 GC/MS Full Scan

File Name:	c061924	Date of Collection:	6/8/00
Dil. Factor:	1.00	Date of Analysis:	6/20/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	0.50	2.5	Not Detected	Not Detected
Freon 114	0.50	3.6	Not Detected	Not Detected
Chloromethane	0.50	1.0	Not Detected	Not Detected
Vinyl Chloride	0.50	1.3	Not Detected	Not Detected
Bromomethane	0.50	2.0	Not Detected	Not Detected
Chloroethane	0.50	1.3	Not Detected	Not Detected
Freon 11	0.50	2.8	Not Detected	Not Detected
1,1-Dichloroethene	0.50	2.0	Not Detected	Not Detected
Freon 113	0.50	3.9	Not Detected	Not Detected
Methylene Chloride	0.50	1.8	Not Detected	Not Detected
1,1-Dichloroethane	0.50	2.0	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.50	2.0	Not Detected	Not Detected
Chloroform	0.50	2.5	Not Detected	Not Detected
1,1,1-Trichloroethane	0.50	2.8	Not Detected	Not Detected
Carbon Tetrachloride	0.50	3.2	Not Detected	Not Detected
Benzene	0.50	1.6	Not Detected	Not Detected
1,2-Dichloroethane	0.50	2.0	Not Detected	Not Detected
Trichloroethene	0.50	2.7	Not Detected	Not Detected
1,2-Dichloropropane	0.50	2.3	Not Detected	Not Detected
cis-1,3-Dichloropropene	0.50	2.3	Not Detected	Not Detected
Toluene	0.50	1.9	Not Detected	Not Detected
trans-1,3-Dichloropropene	0.50	2.3	Not Detected	Not Detected
1,1,2-Trichloroethane	0.50	2.8	Not Detected	Not Detected
Tetrachloroethene	0.50	3.4	Not Detected	Not Detected
Ethylene Dibromide	0.50	3.9	Not Detected	Not Detected
Chlorobenzene	0.50	2.3	Not Detected	Not Detected
Ethyl Benzene	0.50	2.2	Not Detected	Not Detected
m,p-Xylene	0.50	2.2	Not Detected	Not Detected
o-Xylene	0.50	2.2	Not Detected	Not Detected
Styrene	0.50	2.2	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	0.50	3.5	Not Detected	Not Detected
1,3,5-Trimethylbenzene	0.50	2.5	Not Detected	Not Detected
1,2,4-Trimethylbenzene	0.50	2.5	Not Detected	Not Detected
1,3-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
1,4-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
Chlorotoluene	0.50	2.6	Not Detected	Not Detected
1,2-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
1,2,4-Trichlorobenzene	0.50	3.8	Not Detected	Not Detected
Hexachlorobutadiene	0.50	5.4	Not Detected	Not Detected
Propylene	2.0	3.5	Not Detected	Not Detected
1,3-Butadiene	2.0	4.5	Not Detected	Not Detected
Acetone	2.0	4.8	Not Detected	Not Detected

AIR TOXICS LTD.

SAMPLE NAME : Blank

ID#: 0006175-06A

EPA METHOD TO-14 GC/MS Full Scan

File Name:	C061924	Date of Collection:	6/8/00
Dil. Factor:	1.00	Date of Analysis:	6/20/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Carbon Disulfide	2.0	6.3	Not Detected	Not Detected
2-Propanol	2.0	5.0	Not Detected	Not Detected
trans-1,2-Dichloroethene	2.0	8.0	Not Detected	Not Detected
Vinyl Acetate	2.0	7.2	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	6.0	Not Detected	Not Detected
Hexane	2.0	7.2	Not Detected	Not Detected
Tetrahydrofuran	2.0	6.0	Not Detected	Not Detected
Cyclohexane	2.0	7.0	Not Detected	Not Detected
1,4-Dioxane	2.0	7.3	Not Detected	Not Detected
Bromodichloromethane	2.0	14	Not Detected	Not Detected
4-Methyl-2-pentanone	2.0	8.3	Not Detected	Not Detected
2-Hexanone	2.0	8.3	Not Detected	Not Detected
Dibromochloromethane	2.0	17	Not Detected	Not Detected
Bromoform	2.0	21	Not Detected	Not Detected
4-Ethyltoluene	2.0	10	Not Detected	Not Detected
Ethanol	2.0	3.8	Not Detected	Not Detected
Methyl tert-Butyl Ether	2.0	7.3	Not Detected	Not Detected
Heptane	2.0	8.3	Not Detected	Not Detected

Container Type: 6 Liter Summa Canister

Surrogates	% Recovery	Method Limits
1,2-Dichloroethane-d4	105	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	91	70-130

AIR TOXICS LTD.

SAMPLE NAME : Lab Blank

ID#: 0006175-07A

EPA METHOD TO-14 GC/MS Full Scan

File Name: c061909 Date of Collection: NA

Dil. Factor: 1.00 Date of Analysis: 6/19/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	0.50	2.5	Not Detected	Not Detected
Freon 114	0.50	3.6	Not Detected	Not Detected
Chloromethane	0.50	1.0	Not Detected	Not Detected
Vinyl Chloride	0.50	1.3	Not Detected	Not Detected
Bromomethane	0.50	2.0	Not Detected	Not Detected
Chloroethane	0.50	1.3	Not Detected	Not Detected
Freon 11	0.50	2.8	Not Detected	Not Detected
1,1-Dichloroethene	0.50	2.0	Not Detected	Not Detected
Freon 113	0.50	3.9	Not Detected	Not Detected
Methylene Chloride	0.50	1.8	Not Detected	Not Detected
1,1-Dichloroethane	0.50	2.0	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.50	2.0	Not Detected	Not Detected
Chloroform	0.50	2.5	Not Detected	Not Detected
1,1,1-Trichloroethane	0.50	2.8	Not Detected	Not Detected
Carbon Tetrachloride	0.50	3.2	Not Detected	Not Detected
Benzene	0.50	1.6	Not Detected	Not Detected
1,2-Dichloroethane	0.50	2.0	Not Detected	Not Detected
Trichloroethene	0.50	2.7	Not Detected	Not Detected
1,2-Dichloropropane	0.50	2.3	Not Detected	Not Detected
cis-1,3-Dichloropropene	0.50	2.3	Not Detected	Not Detected
Toluene	0.50	1.9	Not Detected	Not Detected
trans-1,3-Dichloropropene	0.50	2.3	Not Detected	Not Detected
1,1,2-Trichloroethane	0.50	2.8	Not Detected	Not Detected
Tetrachloroethene	0.50	3.4	Not Detected	Not Detected
Ethylene Dibromide	0.50	3.9	Not Detected	Not Detected
Chlorobenzene	0.50	2.3	Not Detected	Not Detected
Ethyl Benzene	0.50	2.2	Not Detected	Not Detected
m,p-Xylene	0.50	2.2	Not Detected	Not Detected
o-Xylene	0.50	2.2	Not Detected	Not Detected
Styrene	0.50	2.2	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	0.50	3.5	Not Detected	Not Detected
1,3,5-Trimethylbenzene	0.50	2.5	Not Detected	Not Detected
1,2,4-Trimethylbenzene	0.50	2.5	Not Detected	Not Detected
1,3-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
1,4-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
Chlorotoluene	0.50	2.6	Not Detected	Not Detected
1,2-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
1,2,4-Trichlorobenzene	0.50	3.8	Not Detected	Not Detected
Hexachlorobutadiene	0.50	5.4	Not Detected	Not Detected
Propylene	2.0	3.5	Not Detected	Not Detected
1,3-Butadiene	2.0	4.5	Not Detected	Not Detected
Acetone	2.0	4.8	Not Detected	Not Detected

AIR TOXICS LTD.

SAMPLE NAME : Lab Blank

ID#: 0006175-07A

EPA METHOD TO-14 GC/MS Full Scan

File Name: c061909	Date of Collection: NA
Dil. Factor: 1.00	Date of Analysis: 6/19/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Carbon Disulfide	2.0	6.3	Not Detected	Not Detected
2-Propanol	2.0	5.0	Not Detected	Not Detected
trans-1,2-Dichloroethene	2.0	8.0	Not Detected	Not Detected
Vinyl Acetate	2.0	7.2	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	6.0	Not Detected	Not Detected
Hexane	2.0	7.2	Not Detected	Not Detected
Tetrahydrofuran	2.0	6.0	Not Detected	Not Detected
Cyclohexane	2.0	7.0	Not Detected	Not Detected
1,4-Dioxane	2.0	7.3	Not Detected	Not Detected
Bromodichloromethane	2.0	14	Not Detected	Not Detected
4-Methyl-2-pentanone	2.0	8.3	Not Detected	Not Detected
2-Hexanone	2.0	8.3	Not Detected	Not Detected
Dibromochloromethane	2.0	17	Not Detected	Not Detected
Bromoform	2.0	21	Not Detected	Not Detected
4-Ethyltoluene	2.0	10	Not Detected	Not Detected
Ethanol	2.0	3.8	Not Detected	Not Detected
Methyl tert-Butyl Ether	2.0	7.3	Not Detected	Not Detected
Heptane	2.0	8.3	Not Detected	Not Detected

Container Type: NA

Surrogates	% Recovery	Method Limits
1,2-Dichloroethane-d4	102	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	85	70-130

AIR TOXICS LTD.

SAMPLE NAME : Lab Blank

ID#: 0006175-07B

EPA METHOD TO-14 GC/MS Full Scan

File Name:	g06201t	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 6/20/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	0.50	2.5	Not Detected	Not Detected
Freon 114	0.50	3.6	Not Detected	Not Detected
Chloromethane	0.50	1.0	Not Detected	Not Detected
Vinyl Chloride	0.50	1.3	Not Detected	Not Detected
Bromomethane	0.50	2.0	Not Detected	Not Detected
Chloroethane	0.50	1.3	Not Detected	Not Detected
Freon 11	0.50	2.8	Not Detected	Not Detected
1,1-Dichloroethene	0.50	2.0	Not Detected	Not Detected
Freon 113	0.50	3.9	Not Detected	Not Detected
Methylene Chloride	0.50	1.8	0.65	2.3
1,1-Dichloroethane	0.50	2.0	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.50	2.0	Not Detected	Not Detected
Chloroform	0.50	2.5	Not Detected	Not Detected
1,1,1-Trichloroethane	0.50	2.8	Not Detected	Not Detected
Carbon Tetrachloride	0.50	3.2	Not Detected	Not Detected
Benzene	0.50	1.6	Not Detected	Not Detected
1,2-Dichloroethane	0.50	2.0	Not Detected	Not Detected
Trichloroethene	0.50	2.7	Not Detected	Not Detected
1,2-Dichloropropane	0.50	2.3	Not Detected	Not Detected
cis-1,3-Dichloropropene	0.50	2.3	Not Detected	Not Detected
Toluene	0.50	1.9	Not Detected	Not Detected
trans-1,3-Dichloropropene	0.50	2.3	Not Detected	Not Detected
1,1,2-Trichloroethane	0.50	2.8	Not Detected	Not Detected
Tetrachloroethene	0.50	3.4	Not Detected	Not Detected
Ethylene Dibromide	0.50	3.9	Not Detected	Not Detected
Chlorobenzene	0.50	2.3	Not Detected	Not Detected
Ethyl Benzene	0.50	2.2	Not Detected	Not Detected
m,p-Xylene	0.50	2.2	Not Detected	Not Detected
o-Xylene	0.50	2.2	Not Detected	Not Detected
Styrene	0.50	2.2	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	0.50	3.5	Not Detected	Not Detected
1,3,5-Trimethylbenzene	0.50	2.5	Not Detected	Not Detected
1,2,4-Trimethylbenzene	0.50	2.5	Not Detected	Not Detected
1,3-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
1,4-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
Chlorotoluene	0.50	2.6	Not Detected	Not Detected
1,2-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
1,2,4-Trichlorobenzene	0.50	3.8	Not Detected	Not Detected
Hexachlorobutadiene	0.50	5.4	Not Detected	Not Detected
Propylene	2.0	3.5	Not Detected	Not Detected
1,3-Butadiene	2.0	4.5	Not Detected	Not Detected
Acetone	2.0	4.8	Not Detected	Not Detected

AIR TOXICS LTD.

SAMPLE NAME : Lab Blank

ID#: 0006175-07B

EPA METHOD TO-14 GC/MS Full Scan

File Name: G062011 **Date of Collection: NA**

Dil. Factor: 1.00 **Date of Analysis: 6/20/00**

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Carbon Disulfide	2.0	6.3	Not Detected	Not Detected
2-Propanol	2.0	5.0	Not Detected	Not Detected
trans-1,2-Dichloroethene	2.0	8.0	Not Detected	Not Detected
Vinyl Acetate	2.0	7.2	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	6.0	Not Detected	Not Detected
Hexane	2.0	7.2	Not Detected	Not Detected
Tetrahydrofuran	2.0	6.0	Not Detected	Not Detected
Cyclohexane	2.0	7.0	Not Detected	Not Detected
1,4-Dioxane	2.0	7.3	Not Detected	Not Detected
Bromodichloromethane	2.0	14	Not Detected	Not Detected
4-Methyl-2-pentanone	2.0	8.3	Not Detected	Not Detected
2-Hexanone	2.0	8.3	Not Detected	Not Detected
Dibromochloromethane	2.0	17	Not Detected	Not Detected
Bromoform	2.0	21	Not Detected	Not Detected
4-Ethyltoluene	2.0	10	Not Detected	Not Detected
Ethanol	2.0	3.8	Not Detected	Not Detected
Methyl tert-Butyl Ether	2.0	7.3	Not Detected	Not Detected
Heptane	2.0	8.3	Not Detected	Not Detected

Container Type: NA

Surrogates	% Recovery	Method Limits
1,2-Dichloroethane-d4	103	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	91	70-130

@ AIR TOXICS LTD.
AN ENVIRONMENTAL ANALYTICAL LABORATORY

180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630-4719
(916) 985-1000 FAX: (916) 985-1020

CHAIN-OF-CUSTODY RECORD

№ 027595

Page 1 of 1

Contact Person JOHN GAMMIE
Company LFR
Address 5 JOHNSON DR City RARITAN State NJ Zip 08869
Phone 860 721-7728 FAX 860 721-7665
Collected By: Signature John Gammie

Project Info:
P.O. # _____
Project # 311.00105
Project Name OLM

Turn Around Time:
☒ Normal
☐ Rush _____ Specify

Lab I.D.	Field Sample I.D.	Date & Time	Analyses Requested	Canister Pressure / Vacuum Initial	Final	Receipt
0332	AS-1	6/8/00 1042am	TO-14 list	30.00	7.5	
0271	AS-1 Dup	6/8/00 1042am	"	30.00	7.25	
2701	AS-2	6/8/00 1023am	"	>30.00	7.0	
2507	AS-3	6/8/00 1048am	"	30.00	7.0	
0913	AS-4	6/8/00 1054am	"	29.90	6.9	
1034	Blank	6/8/00 1100am	"	30.00	30.00	

Relinquished By: (Signature) Date/Time: John Gammie 6/9/00 1410hrs
Print Name: JOHN GAMMIE
Relinquished By: (Signature) Date/Time
Received By: (Signature) Date/Time
Relinquished By: (Signature) Date/Time
Received By: (Signature) Date/Time

Notes:
please fax results to me @ 860 721-7665
I send report to me @
94 Baneberry Lane
Wethersfield, CT 06109

Lab Use Only	Shipper Name	Air Bill #	Opened By:	Date/Time	Temp. (°C)	Condition	Custody Seals Intact?	Work Order #
							Yes No None N/A	

Form 1293 rev 06

AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Sample Transportation Notice
Air Toxics Limited assumes no liability with respect to the collection, handling or shipping of these samples. Client represents and warrants that any sample delivered to LAB will be preceded or accompanied by completed written disclosure of presence of any hazardous substances known or suspected by client. Client further warrants that any sample containing any hazardous substance which is to be delivered to LAB will be packaged, labeled, transported and delivered properly and in accordance with applicable local, State, Federal, national, and international laws, regulations and ordinances of any kind. D.O.T. HAZMAT Hotline (800) 467-4922

180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630-4719
(916) 985-1000 FAX: (916) 985-1020

CHAIN-OF-CUSTODY RECORD

Nº 027595

Page 1 of 1

Contact Person: JOHN GAMMIE
Company: LFR
Address: 5 JOHNSON DR City: RARITAN State: NJ Zip: 08869
Phone: 860 721-2727 FAX: 860 721-7665
Collected By: Signature: John Gammie

Project Info:
P.O. #:
Project #: 311-00105
Project Name: DUM

Turn Around Time:
☒ Normal
☐ Rush ____ Specify

Lab ID	Field Sample I.D.	Date & Time	Analyses Requested	Canister Pressure / Vacuum Initial	Final	Receipt
0332	AS-1	6/8/00 1042am	TO-14 list	30.00	7.5	6.0"Hg
0271	AS-1 Dup	6/8/00 1042am	"	30.00	7.25	6.0"Hg
2701	AS-2	6/8/00 1023am	"	>30.00	7.0	<6.0"Hg
2507	AS-3	6/8/00 1048am	"	30.00	7.0	6.0"Hg
0913	AS-4	6/8/00 1054am	"	29.90	6.9	6.0"Hg
0211	Blank	6/9/00 1100am	"	30.00	30.00	28.5"Hg

Relinquished By: (Signature) Date/Time: 6/9/00 1430hrs Print Name: JOHN GAMMIE
Received By: (Signature) Date/Time:
Relinquished By: (Signature) Date/Time:
Received By: (Signature) Date/Time: ATL 6-12-00 907
Relinquished By: (Signature) Date/Time:
Received By: (Signature) Date/Time:

Notes: Please fax results home @ 860 721-7665
I send report to me @
94 Gooseberry Lane
Westhersfield, CT 06109

Lab Use Only	Shipper Name	Air Bill #	Checked By	Date/Time	Temp. (°C)	Condition	Custody Seals Intact?	Work Order #
	Fedex	898374592	GS	6-12-00 907	ambient	seal	Yes No None N/A	0006175

Form 1253 rev 06

PAGE 22
LFR
9085267886
07/06/2000 09:13

ANALYTICAL RESEARCH & TESTING, INC.
SOMERVILLE, NJ Fax 908-725-8848

Fax

To: John Gammie , L-F-R, Inc **From:** Tom Sabatino

Fax: 860-721-7865 **Date:** June 27, 2000

Phone: 908-419-5966 **Pages:** 2

Re: 311-00105-00, TNMHCS as Heptane **CC:**

☐ **Urgent** ☐ **For Review** ☐ **Please Comment** ☐ **Please Reply** ☐ **Please Recycle**

•Comments:

Attached are the results for the analysis of total non-methane hydrocarbons as n-heptane in gas samples, collected on 6/8/2000. If you have any questions, please call me.

Thank You,

Tom Sabatino

AR06082000, C-7 TNMHCS

SUMMARY ANALYTICAL RESULTS AND CALIBRATION FOR THE ANALYSIS OF
NON-METHANE HYDROCARBONS AS HEPTANE IN GAS SAMPLES
RECEIVED 6/9/00, RUN 6/9/00, PROJECT # AR 311-00105-00-000

SAMPLE IDENTIFICATION	COMPOUND	CONCENTRATION	UNITS
INLET TO FLARE	NON-METHANE HC AS HEPTANE	6280	PPMV

Thomas Sabatino, Chemist

AirRecon®

Chain of Custody Record

Page ____ of ____

	DUE DATE	
	Draft	Final
Emergency Rush ≤ 5 Bus. Days		
Rush ≤ 10 Business Days		
Normal ≤ 15 Business Days		

5 Johnson Drive, P O. Box 130
Raritan, NJ 08869
(908) 526-1000 / FAX (908) 526-7886

AirRecon Job #: 311- 00105-00

City/State: _____

Project Manager: JSG ext. _____

P. O. Number: _____

Samples Submitted to: ☐ AirRecon Lab ☒ Other _____

Container Type
B. Gas Bag
D. Petri Dish
E. Method 25 Tank
F. Method 25 Trap
G. Glass
N. NIOSH Tube
P. Plastic Bottle
S. Summa Canister
T. VOST Tube
V. VOC Vial
X. XAD-2 Trap
O. Other _____

Sample Type
1. Liquid
2. Gas
3. Filter
4. Charcoal
5. Resin _____
6. Other _____

Requested Analysis / Method

Sample Identification	Filter #	Sample Type	Container Type	Container Size	Sampling Information Date	Sampling Information Tech	Reagents and/or Preservatives	EPA method 18 for TNMOC as heptane	Lab ID #
M18-1 Inlet to Flare		2	B		6/8/00	JSG		X	

Please Dept results ASAP to me @ 861-7665

Special Instructions:

Submitted By: John S. Gamme	Date: 6/8/00	Received By:	Date:
Relinquished By:	Date:	Received By:	Date:
Relinquished By:	Date:	Received By:	Date:

QA/QC Report Package
Compliance NJDEP ☐ ____
Non-compliance Method Normal ☒ ____

Appendix G

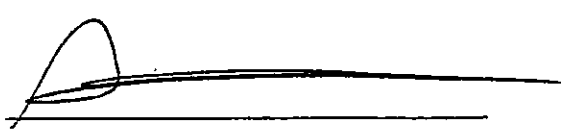
Method 18 Flare Inlet Gas Testing Report AirRecon, Inc.

ANALYTICAL RESULTS AND SUPPORTING DOCUMENTS FOR THE ANALYSIS OF TO-14 VOLATILE ORGANIC COMPOUNDS IN TEDLAR GAS SAMPLING BAGS, USING GAS CHROMATOGRAPHY/ MASS SPECTROSCOPY DETECTION

SUBMITTED BY: L-F-R, INC.
5 JOHNSON DRIVE
RARITAN, NEW JERSEY 08869
COLLECTED ON 8/14/2000
SUBMITTED ON 8/15/2000
PROJECT # 311-00142-00-000

ANALYTICAL RESEARCH AND TESTING, INC.
19 ROSS STREET
SOMERVILLE, N.J. 08876

SEPTEMBER 30, 2000



Thomas Sabatino, Director

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ANALYTICAL RESULTS AND SUPPORTING DOCUMENTS FOR THE ANALYSIS OF TO-14 VOLATILE ORGANIC COMPOUNDS IN TEDLAR GAS SAMPLING BAGS, USING GAS CHROMATOGRAPHY/ MASS SPECTROSCOPY DETECTION

ANALYTICAL RESEARCH AND TESTING, INC. 19 ROSS STREET SOMVEVILLE, NJ 08876
TELEPHONE # 1-908-725-0101 FAX # 1-908-725-8848

ANALYSIS OF VOLATILE ORGANIC COMPOUNDS COLLECTED IN TEDLAR SAMPLING BAGS, USING USEPA ANALYTICAL METHOD TO-14, MODIFIED, CAPILLARY COLUMN GAS CHROMATOGRAPHY/ MASS SPECTROSCOPY, VFRMT14H

CLIENT	L-F-R		TOTAL VOLUME	60.00	LITERS
SAMPLE #	LAB AIR BLANK		MATRIX	TEDLAR GB	
COLLECTED	8/15/00		GC/ MS #	VOC30-35	
ARTI #	00-464B		CC ON COLUMN	0.50	CC
DATE RECEIVED	8/15/00		DATE ANALYZED	8/15/00	
INITIAL FLOW RATE	1.00	L/ MIN	ANALYST	T.S.	
FINAL FLOW RATE	1.00	L/ MIN	REPORT DATE	9/30/00	
SAMPLING TIME	60	MIN			

TARGET COMPOUND	NANOGRAMS/ SAMPLE FOUND	CORR(2)	ANALYTE VALUE MGS/M3	PPBV (3)	
FREON 12	ND < 0.05	0.00	ND < 0.05	N.D. <	20
METHYLCHLORIDE	ND < 0.05	0.00	ND < 0.05	N.D. <	48
FREON 114	ND < 0.05	0.00	ND < 0.05	N.D <	14
VINYLCHLORIDE	ND < 0 05	0.00	ND < 0.05	N.D. <	39
METHYLBROMIDE	ND < 0 05	0.00	ND < 0.05	N.D <	26
ETHYLCHLORIDE	ND < 0.05	0.00	ND < 0.05	N.D. <	38
FREON 11	ND < 0.05	0.00	ND < 0.05	N.D. <	18
VINYLDIENE CHLORIDE	ND < 0.05	0.00	ND < 0.05	N D <	25
DICHLOROMETHANE	ND < 0.05	0.00	ND < 0.05	N.D <	29
FREON 113	ND < 0.05	0.00	ND < 0.05	N.D. <	13
CARBON DISULFIDE	ND < 0.05	0.00	ND < 0.05	N.D. <	32
1,1-DICHLOROETHANE	ND < 0.05	0.00	ND < 0.05	N.D. <	25
CIS-1,2-DICHLOROETHYLENE	ND < 0 05	0.00	ND < 0.05	N.D. <	25
CHLOROFORM	ND < 0.05	0.00	ND < 0.05	N.D. <	20
1,2-DICHLOROETHANE	ND < 0.05	0.00	ND < 0.05	N.D. <	25
METHYL CHLOROFORM	ND < 0.05	0.00	ND < 0.05	N.D. <	18
BENZENE	ND < 0.05	0.00	ND < 0.05	N.D. <	31
CARBON TETRACHLORIDE	ND < 0 05	0.00	ND < 0.05	N.D. <	16
1,2-DICHLOROPROPANE	ND < 0.05	0.00	ND < 0.05	N.D. <	22
TRICHLOROETHYLENE	ND < 0.05	0.00	ND < 0.05	N.D. <	19
CIS-1,3-DICHLOROPROPENE	ND < 0.05	0.00	ND < 0.05	N.D <	22
TRANS-1,3-DICHLOROPROPENE	ND < 0.05	0.00	ND < 0.05	N.D. <	22
1,1,2-TRICHLOROETHANE	ND < 0.05	0.00	ND < 0.05	N D <	18
TOLUENE	ND < 0.05	0.00	ND < 0.05	N.D <	27
1,2-DIBROMOETHANE	ND < 0.05	0.00	ND < 0.05	N.D <	13
TETRACHLOROETHYLENE	ND < 0.05	0.00	ND < 0.05	N.D. <	13
CHLOROBENZENE	ND < 0 05	0.00	ND < 0 05	N.D. <	22
ETHYLBENZENE	ND < 0.05	0.00	ND < 0.05	N.D. <	23
1,3-XYLENE + 1,4-XYLENE	ND < 0.05	0.00	ND < 0.05	N.D <	23
STYRENE	ND < 0 05	0.00	ND < 0.05	N.D <	24
1,1,2,2-TETRACHLOROETHANE	ND < 0.05	0.00	ND < 0.05	N.D. <	15
1,2-XYLENE	ND < 0.05	0.00	ND < 0.05	N.D. <	23

ARTI # 00-464B GC/ MS # VOC30-35

TARGET COMPOUND	ANALYTE VALUE NANOGRAMS/ SAMPLE FOUND	CORR	ANALYTE VALUE MGS/M3	PPBV
4-ETHYLTOLUENE	ND < 0.05	0.00	ND < 0.05	N.D. < 20
1,3,5-TRIMETHYLBENZENE	ND < 0.05	0.00	ND < 0.05	N.D. < 17
1,2,4-TRIMETHYLBENZENE	ND < 0.05	0.00	ND < 0.05	N.D. < 19
1,3-DICHLOROBENZENE	ND < 0.05	0.00	ND < 0.05	N.D. < 17
BENZYLCHLORIDE	ND < 0.05	0.00	ND < 0.05	N.D. < 19
1,4-DICHLOROBENZENE	ND < 0.05	0.00	ND < 0.05	N.D. < 17
1,2-DICHLOROBENZENE	ND < 0.05	0.00	ND < 0.05	N.D < 17
1,2,4-TRICHLOROBENZENE	ND < 0.05	0.00	ND < 0.05	N.D < 13
NAPHTHALENE	ND < 0.05	0.00	ND < 0.05	N.D. < 19
HEXACHLOROBUTADIENE	ND < 0.05	0.00	ND < 0.05	N.D. < 9
NON-TARGET COMPOUNDS FOUND				
TRANS-1,2-DICHLOROETHYLENE	ND < 0.05	0.00	ND < 0.05	N.D. < 25

SURROGATE COMPOUND RESPONSE

COMPOUND	% RECOVERY	ANALYTE VALUE NANOGRAMS FOUND	ADDED	NLS (1)
4-BROMOFLUOROBENZENE	98	5.90	6.00	0.82

(1) Milligrams/ M-3 = Milligrams per Cubic Meter Found in Sample. Corrected for Analyte Concentration in Trip Blank
(2) PPBV = Microliters/ cubic meter, Parts per Billion by Volume at 25.0 C Corrected for Blank Value.
(3) N.D. = Non-Detectable, Less Than Concentration Indicated.
(4) A "J" Indicates an Estimated Value. This Flag is Used Either When E+A19stimating a Concentration for a Tentatively Identified Compound or When a Given Compound is Suspected of Breakthrough and the Reported Value May be Biased Low.
(5) A "B" Indicates When the Analyte is Found in the Field Control as Well as the Sample. It Indicates Probable Contamination and Warns the Data User to Use This Result Cautiously.

ARTI # 00-464B GC/ MS # VOC30-35

TRIP BLANK CORRECTION VALUES

TARGET COMPOUND	ANALYTE VALUE MILLIGRAMS/ M-3 FOUND
FREON 12	0.00
METHYLCHLORIDE	0.00
FREON 114	0.00
VINYLCHLORIDE	0.00
METHYLBROMIDE	0.00
ETHYLCHLORIDE	0.00
FREON 11	0.00
ETHYL ETHER	0.00
VINYLDIENE CHLORIDE	0.00
DICHLOROMETHANE	0.00
FREON 113	0.00
CARBONDISULFIDE	0.00
1,1-DICHLOROETHANE	0.00
CIS-1,2-DICHLOROETHYLENE	0.00
CHLOROFORM	0.00
1,2-DICHLOROETHANE	0.00
METHYL CHLOROFORM	0.00
BENZENE	0.00
CARBON TETRACHLORIDE	0.00
1,2-DICHLOROPROPANE	0.00
TRICHLOROETHYLENE	0.00
CIS-1,3-DICHLOROPROPENE	0.00
TRANS-1,3-DICHLOROPROPENE	0.00
1,1,2-TRICHLOROETHANE	0 00
TOLUENE	0 00
1,2-DIBROMOETHANE	0.00
TETRACHLOROETHYLENE	0.00
CHLOROBENZENE	0.00
ETHYLBENZENE	0.00
1,3-XYLENE + 1,4-XYLENE	0.00
STYRENE	0.00
1,1,2,2-TETRACHLOROETHANE	0.00
1,2-XYLENE	0.00
4-ETHYLTOLUENE	0 00
1,3,5-TRIMETHYLBENZENE	0 00
1,2,4-TRIMETHYLBENZENE	0.00
1,3-DICHLOROBENZENE	0.00
BENZYLCHLORIDE	0.00
1,4-DICHLOROBENZENE	0.00
1,2-DICHLOROBENZENE	0.00
1,2,4-TRICHLOROBENZENE	0 00
NAPHTHALENE	0 00
HEXACHLOROBUTADIENE	0 00

Thomas Sabatino, Chemist

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ANALYSIS OF VOLATILE ORGANIC COMPOUNDS COLLECTED IN TEDLAR SAMPLING BAGS, USING USEPA ANALYTICAL METHOD TO-14, MODIFIED, CAPILLARY COLUMN GAS CHROMATOGRAPHY/ MASS SPECTROSCOPY, VFRMT14H

CLIENT	**L-F-R**		TOTAL VOLUME	**60.00**	**LITERS**
SAMPLE #	**BAG # 1, LANDFILL GAS**		MATRIX	**TEDLAR GB**	
COLLECTED	**8/15/00**		GC/ MS #	**VOC30-36**	
ARTI #	**00-464**		CC ON COLUMN	**0.50**	**CC**
DATE RECEIVED	**8/15/00**		DATE ANALYZED	**8/15/00**	
INITIAL FLOW RATE	**1.00**	L/ MIN	ANALYST	**T.S.**	
FINAL FLOW RATE	**1.00**	L/ MIN	REPORT DATE	**9/30/00**	
SAMPLING TIME	**60**	MIN			

TARGET COMPOUND	**NANOGRAMS/ SAMPLE FOUND**	**CORR(2)**	**ANALYTE VALUE MGS/M3**		**PPBV (3)**
FREON 12	0.55	0.55	1.09		220
METHYLCHLORIDE	1.38	1.38	2.76		1337
FREON 114	0.55	0.55	1.09		156
VINYLCHLORIDE	2.15	2.15	4.29		1680
METHYLBROMIDE	ND < 0.05	0.00	ND < 0.05	N.D. <	26
ETHYLCHLORIDE	0 27	0.27	0.54		205
FREON 11	ND < 0.05	0.00	ND < 0.05	N.D <	18
VINYLDIENE CHLORIDE	ND < 0.05	0.00	ND < 0.05	N.D. <	25
DICHLOROMETHANE	1.19	1.19	2.37		682
FREON 113	ND < 0.05	0.00	ND < 0.05	N.D. <	13
CARBON DISULFIDE	ND < 0.05	0.00	ND < 0.05	N D. <	32
1,1-DICHLOROETHANE	1.02	1.02	2.04		504
CIS-1,2-DICHLOROETHYLENE	0.07	0.07	0.14		34
CHLOROFORM	ND < 0.05	0.00	ND < 0.05	N.D. <	20
1,2-DICHLOROETHANE	ND < 0.05	0.00	ND < 0.05	N.D <	25
METHYL CHLOROFORM	ND < 0.05	0.00	ND < 0.05	N.D <	18
BENZENE	0.43	0.43	0 85		267
CARBON TETRACHLORIDE	ND < 0.05	0.00	ND < 0.05	N.D. <	16
1,2-DICHLOROPROPANE	ND < 0 05	0.00	ND < 0.05	N.D <	22
TRICHLOROETHYLENE	0 94	0.94	1 88		349
CIS-1,3-DICHLOROPROPENE	ND < 0 05	0.00	ND < 0.05	N.D. <	22
TRANS-1,3-DICHLOROPROPENE	0.05	0.05	0.10		22
1,1,2-TRICHLOROETHANE	ND < 0 05	0.00	ND < 0.05	N.D <	18
TOLUENE	106	106	212		56300
1,2-DIBROMOETHANE	ND < 0.05	0.00	ND < 0.05	N D. <	13
TETRACHLOROETHYLENE	1 88	1.88	3.75		488
CHLOROBENZENE	0.11	0.11	0.22		47
ETHYLBENZENE	8.09	8.09	16.18		3730
1,3-XYLENE + 1,4-XYLENE	15 25	15.25	30.49		7030
STYRENE	ND < 0.05	0.00	ND < 0.05	N.D. <	24
1,1,2,2-TETRACHLOROETHANE	ND < 0 05	0.00	ND < 0.05	N.D. <	15
1,2-XYLENE	3 49	3.49	6.99		1610

ARTI # 00-464 GC/ MS # VOC30-36

TARGET COMPOUND	ANALYTE VALUE NANOGRAMS/ SAMPLE FOUND	CORR	ANALYTE VALUE MGS/M3	PPBV
4-ETHYLTOLUENE	0.62	0.62	1.23	251
1,3,5-TRIMETHYLBENZENE	ND < 0.05	0.00	ND < 0.05	N.D < 17
1,2,4-TRIMETHYLBENZENE	ND < 0.05	0.00	ND < 0.05	N.D. < 19
1,3-DICHLOROBENZENE	ND < 0.05	0.00	ND < 0.05	N.D. < 17
BENZYLCHLORIDE	ND < 0.05	0.00	ND < 0.05	N.D. < 19
1,4-DICHLOROBENZENE	ND < 0.05	0.00	ND < 0.05	N.D. < 17
1,2-DICHLOROBENZENE	ND < 0.05	0.00	ND < 0.05	N.D. < 17
1,2,4-TRICHLOROBENZENE	ND < 0.05	0.00	ND < 0.05	N.D. < 13
NAPHTHALENE	ND < 0.05	0.00	ND < 0.05	N.D. < 19
HEXACHLOROBUTADIENE	ND < 0.05	0.00	ND < 0.05	N.D < 9
NON-TARGET COMPOUNDS FOUND				
TRANS-1,2-DICHLOROETHYLENE	2 15	2.15	4.30	1080

SURROGATE COMPOUND RESPONSE

COMPOUND	% RECOVERY	ANALYTE VALUE NANOGRAMS FOUND	ADDED	NLS (1)
4-BROMOFLUOROBENZENE	94	5.66	6.00	0.79

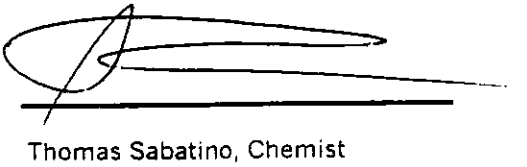
(1) Milligrams/ M-3 = Milligrams per Cubic Meter Found in Sample. Corrected for Analyte Concentration in Trip Blank
(2) PPBV = Microliters/ cubic meter, Parts per Billion by Volume at 25.0 C Corrected for Blank Value.
(3) N.D. = Non-Detectable, Less Than Concentration Indicated.
(4) A "J" Indicates an Estimated Value. This Flag is Used Either When E+A19stimating a Concentration for a Tentatively Identified Compound or When a Given Compound is Suspected of Breakthrough and the Reported Value May be Biased Low.
(5) A "B" Indicates When the Analyte is Found in the Field Control as Well as the Sample. It Indicates Probable Contamination and Warns the Data User to Use This Result Cautiously.

ARTI # 00-464

GC/ MS # VOC30-36

TRIP BLANK CORRECTION VALUES

TARGET COMPOUND	ANALYTE VALUE MILLIGRAMS/ M-3 FOUND
FREON 12	0.00
METHYLCHLORIDE	0 00
FREON 114	0.00
VINYLCHLORIDE	0.00
METHYLBROMIDE	0.00
ETHYLCHLORIDE	0.00
FREON 11	0.00
ETHYL ETHER	0.00
VINYLDIENE CHLORIDE	0.00
DICHLOROMETHANE	0.00
FREON 113	0.00
CARBONDISULFIDE	0.00
1,1-DICHLOROETHANE	0 00
CIS-1,2-DICHLOROETHYLENE	0.00
CHLOROFORM	0.00
1,2-DICHLOROETHANE	0 00
METHYL CHLOROFORM	0 00
BENZENE	0.00
CARBON TETRACHLORIDE	0.00
1,2-DICHLOROPROPANE	0.00
TRICHLOROETHYLENE	0.00
CIS-1,3-DICHLOROPROPENE	0.00
TRANS-1,3-DICHLOROPROPENE	0.00
1,1,2-TRICHLOROETHANE	0.00
TOLUENE	0.00
1,2-DIBROMOETHANE	0.00
TETRACHLOROETHYLENE	0.00
CHLOROBENZENE	0.00
ETHYLBENZENE	0.00
1,3-XYLENE + 1,4-XYLENE	0.00
STYRENE	0.00
1,1,2,2-TETRACHLOROETHANE	0.00
1,2-XYLENE	0 00
4-ETHYLTOLUENE	0.00
1,3,5-TRIMETHYLBENZENE	0.00
1,2,4-TRIMETHYLBENZENE	0.00
1,3-DICHLOROBENZENE	0.00
BENZYLCHLORIDE	0.00
1,4-DICHLOROBENZENE	0.00
1,2-DICHLOROBENZENE	0.00
1,2,4-TRICHLOROBENZENE	0.00
NAPHTHALENE	0.00
HEXACHLOROBUTADIENE	0.00



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CLIENT	**L-F-R DUPLICATE**		TOTAL VOLUME	**60.00**	**LITERS**
SAMPLE #	**BAG # 1, LANDFILL GAS**		MATRIX	**TEDLAR GB**	
COLLECTED	**8/15/00**		GC/ MS #	**VOC30-37**	
ARTI #	**00-464D**		CC ON COLUMN	**0.50**	**CC**
DATE RECEIVED	**8/15/00**		DATE ANALYZED	**8/15/00**	
INITIAL FLOW RATE	**1.00**	L/ MIN	ANALYST	**T.S.**	
FINAL FLOW RATE	**1.00**	L/ MIN	REPORT DATE	**9/30/00**	
SAMPLING TIME	**60**	MIN			

TARGET COMPOUND	**NANOGRAMS/ SAMPLE FOUND**	**CORR(2)**	**ANALYTE VALUE MGS/M3**	**PPBV (3)**
FREON 12	0.57	0.57	1.14	230
METHYLCHLORIDE	1.45	1.45	2 90	1400
FREON 114	0 57	0.57	1.14	163
VINYLCHLORIDE	2.03	2.03	4.05	1590
METHYLBROMIDE	ND < 0 05	0.00	ND < 0.05	N.D < 26
ETHYLCHLORIDE	0 22	0 22	0.43	165
FREON 11	ND < 0.05	0.00	ND < 0.05	N.D. < 18
VINYLDIENE CHLORIDE	ND < 0.05	0.00	ND < 0.05	N D. < 25
DICHLOROMETHANE	1 12	1.12	2 23	642
FREON 113	ND < 0.05	0.00	ND < 0.05	N.D. < 13
CARBON DISULFIDE	ND < 0.05	0.00	ND < 0.05	N.D < 32
1,1-DICHLOROETHANE	0.98	0.98	1.95	482
CIS-1,2-DICHLOROETHYLENE	0.06	0 06	0.12	31
CHLOROFORM	ND < 0.05	0.00	ND < 0.05	N.D < 20
1,2-DICHLOROETHANE	ND < 0 05	0 00	ND < 0 05	N.D. < 25
METHYL CHLOROFORM	ND < 0.05	0.00	ND < 0.05	N.D < 18
BENZENE	0.38	0.38	0.77	240
CARBON TETRACHLORIDE	ND < 0.05	0.00	ND < 0.05	N.D. < 16
1,2-DICHLOROPROPANE	ND < 0.05	0.00	ND < 0.05	N D. < 22
TRICHLOROETHYLENE	ND < 0.05	0.00	ND < 0.05	N.D < 19
CIS-1,3-DICHLOROPROPENE	ND < 0.05	0.00	ND < 0.05	N.D. < 22
TRANS-1,3-DICHLOROPROPENE	0.05	0.05	0.10	21
1,1,2-TRICHLOROETHANE	ND < 0.05	0.00	ND < 0.05	N.D. < 18
TOLUENE	96.53	96.53	193	51300
1,2-DIBROMOETHANE	ND < 0 05	0.00	ND < 0 05	N.D. < 13
TETRACHLOROETHYLENE	1.72	1 72	3.44	448
CHLOROBENZENE	0 10	0.10	0.20	44
ETHYLBENZENE	8.56	8.56	17.13	3950
1,3-XYLENE + 1,4-XYLENE	15.78	15.78	31.56	7280
STYRENE	ND < 0.05	0.00	ND < 0.05	N.D < 24
1,1,2,2-TETRACHLOROETHANE	ND < 0.05	0.00	ND < 0.05	N.D < 15
1,2-XYLENE	3.68	3.68	7.36	1700

ARTI # 00-464D GC/ MS # VOC30-37

TARGET COMPOUND	ANALYTE VALUE NANOGRAMS/ SAMPLE FOUND	CORR	ANALYTE VALUE MGS/M3	PPBV
4-ETHYLTOLUENE	0.82	0.82	1.64	335
1,3,5-TRIMETHYLBENZENE	ND < 0 05	0.00	ND < 0.05	N.D. < 17
1,2,4-TRIMETHYLBENZENE	ND < 0.05	0.00	ND < 0.05	N.D. < 19
1,3-DICHLOROBENZENE	ND < 0.05	0.00	ND < 0.05	N.D. < 17
BENZYLCHLORIDE	ND < 0.05	0.00	ND < 0.05	N.D. < 19
1,4-DICHLOROBENZENE	ND < 0.05	0.00	ND < 0.05	N.D < 17
1,2-DICHLOROBENZENE	ND < 0.05	0.00	ND < 0.05	N.D. < 17
1,2,4-TRICHLOROBENZENE	ND < 0.05	0.00	ND < 0 05	N.D. < 13
NAPHTHALENE	ND < 0.05	0.00	ND < 0.05	N.D. < 19
HEXACHLOROBUTADIENE	ND < 0 05	0.00	ND < 0.05	N.D. < 9
NON-TARGET COMPOUNDS FOUND				
TRANS-1,2-DICHLOROETHYLENE	2.02	2.02	4 04	1020

SURROGATE COMPOUND RESPONSE

COMPOUND	% RECOVERY	ANALYTE VALUE NANOGRAMS FOUND	ADDED	NLS (1)
4-BROMOFLUOROBENZENE	101	6.05	6.00	0 85

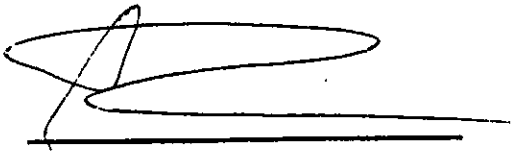
(1) Milligrams/ M-3 = Milligrams per Cubic Meter Found in Sample. Corrected for Analyte Concentration in Trip Blank
(2) PPBV = Microliters/ cubic meter, Parts per Billion by Volume at 25.0 C Corrected for Blank Value.
(3) N.D. = Non-Detectable, Less Than Concentration Indicated
(4) A "J" Indicates an Estimated Value. This Flag is Used Either When E+A19stimating a Concentration for a Tentatively Identified Compound or When a Given Compound is Suspected of Breakthrough and the Reported Value May be Biased Low.
(5) A "B" Indicates When the Analyte is Found in the Field Control as Well as the Sample. It Indicates Probable Contamination and Warns the Data User to Use This Result Cautiously.

ARTI # 00-464D

GC/ MS # VOC30-37

TRIP BLANK CORRECTION VALUES

TARGET COMPOUND	ANALYTE VALUE MILLIGRAMS/ M-3 FOUND
FREON 12	0.00
METHYLCHLORIDE	0.00
FREON 114	0.00
VINYLCHLORIDE	0.00
METHYLBROMIDE	0.00
ETHYLCHLORIDE	0.00
FREON 11	0.00
ETHYL ETHER	0.00
VINYLDIENE CHLORIDE	0.00
DICHLOROMETHANE	0.00
FREON 113	0.00
CARBONDISULFIDE	0.00
1,1-DICHLOROETHANE	0.00
CIS-1,2-DICHLOROETHYLENE	0.00
CHLOROFORM	0.00
1,2-DICHLOROETHANE	0.00
METHYL CHLOROFORM	0.00
BENZENE	0.00
CARBON TETRACHLORIDE	0 00
1,2-DICHLOROPROPANE	0 00
TRICHLOROETHYLENE	0.00
CIS-1,3-DICHLOROPROPENE	0.00
TRANS-1,3-DICHLOROPROPENE	0.00
1,1,2-TRICHLOROETHANE	0.00
TOLUENE	0.00
1,2-DIBROMOETHANE	0.00
TETRACHLOROETHYLENE	0.00
CHLOROBENZENE	0.00
ETHYLBENZENE	0.00
1,3-XYLENE + 1,4-XYLENE	0.00
STYRENE	0.00
1,1,2,2-TETRACHLOROETHANE	0.00
1,2-XYLENE	0 00
4-ETHYLTOLUENE	0.00
1,3,5-TRIMETHYLBENZENE	0.00
1,2,4-TRIMETHYLBENZENE	0.00
1,3-DICHLOROBENZENE	0.00
BENZYLCHLORIDE	0.00
1,4-DICHLOROBENZENE	0.00
1,2-DICHLOROBENZENE	0 00
1,2,4-TRICHLOROBENZENE	0.00
NAPHTHALENE	0.00
HEXACHLOROBUTADIENE	0.00



Thomas Sabatino, Chemist

SECTION 2.0
TARGET COMPOUND RETENTION TIME TABLES FOR THE ANALYSIS OF TO-14 VOLATILE ORGANIC COMPOUNDS IN GAS SAMPLES

Quantitation Report Quanfile: VOC30-29 Quan Entries: 45
Comment: TO-14 VOC STANDARD 1.5 NGS@ + 4-BFB
Sorted via: Entry Number ↑ (S) = Standard

Cal	Name of Compound	S	Scan#	R Time	Me	Calc Amt(A)	Units
1	Freon 12	E	88	1:32	BB	1.403	NANOS
2	Methyl Chloride	E	94	1:39	VV	1.709	NANOS
3	Freon 114	E	88	1:32	BB	1.403	NANOS
4	Vinyl Chloride	E	102	1:47	BB	1.394	NANOS
5	Methyl Bromide	E	117	2:03	BB	1.390	NANOS
6	Ethyl Chloride	E	123	2:09	BB	1.392	NANOS
7	Freon 11	E	151	2:39	BB	1.393	NANOS
8	Ethyl Ether	E	165	2:53	BB	1.397	NANOS
9	1,1-Dichloroethene	E	178	3:07	BB	1.388	NANOS
10	Methylene Chloride	E	182	3:11	BV	1.394	NANOS
11	Freon 113	E	195	3:25	BB	1.395	NANOS
12	Carbon Disulfide	E	198	3:28	BB	1.399	NANOS
13	Cis-1,2-Dichloroethene	E	229	4:00	BV	1.396	NANOS
14	1,1-Dichloroethane	E	240	4:12	VB	1.395	NANOS
15	Trans-1,2-Dichloroethe	E	287	5:01	BB	1.393	NANOS
16	Chloroform	E	305	5:20	BB	1.394	NANOS
17	1,2-Dichloroethane	E	350	6:07	BV	1.397	NANOS
18	1,1,1-Trichloroethane	E	366	6:24	BB	1.390	NANOS
19	Benzene	E	395	6:55	BB	1.393	NANOS
20	Carbontetrachloride	E	405	7:05	BB	1.392	NANOS
21	1,2-Dichloropropane	E	450	7:52	BB	1.393	NANOS
22	Trichloroethene	E	466	8:09	BB	1.397	NANOS
23	Cis-1,3-Dichloropropen	E	527	9:13	BB	1.396	NANOS
24	Trans-1,3-Dichloroprop	E	566	9:54	BB	1.397	NANOS
25	1,1,2-Trichloroethane	E	578	10:07	BB	1.390	NANOS
26	Toluene	E	599	10:29	BB	1.398	NANOS

Quantitation Report Quanfile: VOC30-29 Quan Entries: 45
Comment: TO-14 VOC STANDARD 1.5 NGS@ + 4-BFB
Sorted via: Entry Number ↑ (S) = Standard

Cal	Name of Compound	S	Scan#	R Time	Me	Calc Amt(A)	Units
27	1,2-Dibromoethane	E	649	11:21	BB	1.400	NANOS
28	Tetrachloroethene	E	687	12:01	BB	1.397	NANOS
29	Chlorobenzene	E	742	12:59	BB	1.406	NANOS
30	Ethylbenzene	E	775	13:34	BB	1.406	NANOS
31	1,3+1,4-Xylenes	E	790	13:49	BB	2.828	NANOS
32	Styrene	E	822	14:23	BV	1.412	NANOS
33	1,1,2,2-Tetrachloroeth	E	830	14:31	BB	1.406	NANOS
34	1,2-Xylene	E	831	14:32	BB	1.406	NANOS
35	4-Bromofluorobenzene	E	872	15:16	BB	1.412	NANOS
36	Benzylchloride	E	930	16:16	BB	1.405	NANOS
37	4-Ethyltoluene	E	950	16:38	BV	1.451	NANOS
38	1,3,5-Trimethylbenzene	E	959	16:47	VV	1.422	NANOS
39	1,2,4-Trimethylbenzene	E	1001	17:31	BB	1.488	NANOS
40	1,3-Dichlorobenzene	E	1015	17:46	BV	1.584	NANOS
41	1,4-Dichlorobenzene	E	1023	17:54	MM	1.375	NANOS
42	1,2-Dichlorobenzene	E	1060	18:33	BB	1.823	NANOS
43	1,2,4-Trichlorobenzene	E	1276	22:20	BB	1.591	NANOS
44	Naphthalene	E	1289	22:33	BB	1.676	NANOS
45	Hexachlorobutadiene	E	1341	23:28	BB	1.545	NANOS

SECTION 3.0
GC/ MS OPERATING CONDITIONS FOR THE ANALYSIS OF TO-14 VOLATILE ORGANIC COMPOUNDS IN GAS SAMPLES

Log Information File: D:\VOC30-29 Date: Aug-15-2000 14:00:29
Comment: TO-14 VOC STANDARD 1.5 NGS@ + 4-BFB
Comment: T. SABATINO VOLATILE ORGANIC COMPOUND ANALYSIS

Acquisition Method Table

Instrument set points		
Multiplier set voltage	1700	volts
Manifold set temperature	220	°C
Emmision set current	10	micro amps
A/M amplitude set voltage	4.0	volts
User cancelled acquisition	no	
End instrument set points		
Acquire segment #	1	
Target value	10000	
Low mass	49	amu
High mass	300	amu
Scan rate	1050	milli seconds
Segment acquire time	28	minutes
Threshold	1	counts
Filament delay	10	seconds
Mass defect	50	milli mass/100 amu
Background mass	48	amu
Calibration gas	no	
Scan mode	EI	
Ionization control	automatic	
End Acquire segment #	1	

↑-Prev seg ↓-Next seg Esc to continue

Log Information File: D:\VOC30-29 Date: Aug-15-2000 14:00:29
Comment: TO-14 VOC STANDARD 1.5 NGS@ + 4-BFB
Comment: T. SABATINO VOLATILE ORGANIC COMPOUND ANALYSIS

Title Saturn Log File

Analysis list file name VOC30
Acquisition method file name TO14FG
GC method file name TO14G
Autosampler method file name

Column Table

Column tables

Start temp °C	End temp °C	rate °C/minute	time minutes
40	40	0.0	4.00
40	180	7.0	20.00
180	180	0.0	4.00

End column tables

Esc to continue

F7 - Display GC transfer line table
F8 - Display GC valve parameters
F9 - Display GC error table

F10 - User log notes and comments editor

? - Help
Esc - Exit

```
Log Information                    File: D:\VOC30-29    Date: Aug-15-2000  14:00:29
Comment: TO-14 VOC STANDARD  1.5 NGS@ + 4-BFB
Comment: T. SABATINO         VOLATILE ORGANIC COMPOUND ANALYSIS

 Title            Saturn Log File

 Analysis list file name          VOC30
 Acquisition method file name     TO14FG
 GC method file name              TO14G
 Autosampler method file name

                    Injector Table

  Injector tables
     Start temp  End temp        rate         time
        °C          °C         °C/minute     minutes
        150         150           0.0         28.00
  End injector tables

                                          Esc to continue

            F6 - Display GC injector table
            F7 - Display GC transfer line table
            F8 - Display GC valve parameters
            F9 - Display GC error table

           F10 - User log notes and comments editor

            ? - Help
            Esc - Exit
```

```
Log Information                    File: D:\VOC30-29    Date: Aug-15-2000  14:00:29
Comment: TO-14 VOC STANDARD  1.5 NGS@ + 4-BFB
Comment: T. SABATINO         VOLATILE ORGANIC COMPOUND ANALYSIS

 Title            Saturn Log File

 Analysis list file name          VOC30
 Acquisition method file name     TO14FG
 GC method file name              TO14G
 Autosampler method file name
```

Transfer Line Table

```
 Transfer line tables
    Start temp  End temp        rate          time
       °C          °C        °C/minute      minutes
       200         200           0.0          4.00
 End transfer line tables

                                          Esc to continue
```

```
          F6 - Display GC injector table
          F7 - Display GC transfer line table
          F8 - Display GC valve parameters
          F9 - Display GC error table

         F10 - User log notes and comments editor

          ? - Help
          Esc - Exit
```

SECTION 4.0
GC/ MS RAW DATA REPORTS FOR THE ANALYSIS OF TO-14 VOLATILE ORGANIC COMPOUNDS IN GAS SAMPLES

Quantitation Report Quanfile: VOC30-35 Quan Entries: 15
Comment: LAB AIR BLANK 0.50 CC + 4-BFB
Sorted via: Entry Number ↑ (S) = Standard

Cal	Name of Compound	S	Scan#	R Time	Me	Calc Amt(A)	Units
2	Methyl Chloride	E	105	1:50	BV	0.000	NANOS
10	Methylene Chloride	E	182	3:11	BB	0.000	NANOS
11	Freon 113	E	196	3:26	BB	0.000	NANOS
12	Carbon Disulfide	E	198	3:28	BB	0.000	NANOS
16	Chloroform	E	306	5:21	BB	0.000	NANOS
19	Benzene	E	394	6:54	BB	0.000	NANOS
26	Toluene	E	599	10:29	BB	0.000	NANOS
30	Ethylbenzene	E	778	13:37	BB	0.000	NANOS
31	1,3+1,4-Xylenes	E	778	13:37	BB	0.000	NANOS
35	4-Bromofluorobenzene	E	872	15:16	BB	5.902	NANOS
37	4-Ethyltoluene	E	951	16:39	BB	0.000	NANOS
38	1,3,5-Trimethylbenzene	E	951	16:39	BB	0.000	NANOS
39	1,2,4-Trimethylbenzene	E	1001	17:31	BB	0.000	NANOS
43	1,2,4-Trichlorobenzene	E	1278	22:22	BB	0.000	NANOS
44	Naphthalene	E	1291	22:35	BB	0.000	NANOS

Quantitation Report Quanfile: VOC30-36 Quan Entries: 34
Comment: LFR GB 8/14/2000 DM LF 0.10 CC + 4-BFB
Sorted via: Entry Number ↑ (S) = Standard

Cal	Name of Compound	S	Scan#	R Time	Me	Calc Amt(A)	Units
1	Freon 12	E	87	1:31	BV	0.545	NANOS
2	Methyl Chloride	E	105	1:50	VV	1.381	NANOS
3	Freon 114	E	87	1:31	BV	0.545	NANOS
4	Vinyl Chloride	E	101	1:46	BB	2.147	NANOS
6	Ethyl Chloride	E	125	2:11	BB	0.270	NANOS
8	Ethyl Ether	E	176	3:05	BB	3.361	NANOS
10	Methylene Chloride	E	182	3:11	VB	1.185	NANOS
11	Freon 113	E	195	3:25	BB	0.000	NANOS
12	Carbon Disulfide	E	198	3:28	BB	0.000	NANOS
13	Cis-1,2-Dichloroethene	E	229	4:00	BV	0.068	NANOS
14	1,1-Dichloroethane	E	240	4:12	VB	1.020	NANOS
15	Trans-1,2-Dichloroethe	E	287	5:01	VV	2.149	NANOS
18	1,1,1-Trichloroethane	E	366	6:24	BB	0.000	NANOS
19	Benzene	E	395	6:55	BB	0.426	NANOS
21	1,2-Dichloropropane	E	449	7:51	VB	0.000	NANOS
22	Trichloroethene	E	466	8:09	BB	0.938	NANOS
24	Trans-1,3-Dichloroprop	E	565	9:53	BB	0.050	NANOS
25	1,1,2-Trichloroethane	E	574	10:03	BB	0.000	NANOS
26	Toluene	E	599	10:29	BB	106.101	NANOS
28	Tetrachloroethene	E	687	12:01	BB	1.876	NANOS
29	Chlorobenzene	E	742	12:59	BB	0.108	NANOS
30	Ethylbenzene	E	774	13:33	BB	8.089	NANOS
31	1,3+1,4-Xylenes	E	789	13:48	BB	15.247	NANOS
33	1,1,2,2-Tetrachloroeth	E	814	14:15	VV	0.000	NANOS
34	1,2-Xylene	E	831	14:33	BV	3.494	NANOS
35	4-Bromofluorobenzene	E	871	15:15	BV	5.659	NANOS

Quantitation Report Quanfile: VOC30-36 Quan Entries: 34
Comment: LFR GB 8/14/2000 DM LF 0.10 CC + 4-BFB
Sorted via: Entry Number ↑ (S) = Standard

Cal	Name of Compound	S	Scan#	R Time	Me	Calc Amt(A)	Units
36	Benzylchloride	E	935	16:22	VV	0.000	NANOS
37	4-Ethyltoluene	E	946	16:33	VV	0.617	NANOS
38	1,3,5-Trimethylbenzene	E	959	16:47	VB	0.000	NANOS
39	1,2,4-Trimethylbenzene	E	1001	17:31	BB	0.000	NANOS
40	1,3-Dichlorobenzene	E	1023	17:54	BB	0.000	NANOS
41	1,4-Dichlorobenzene	E	1023	17:54	BB	0.000	NANOS
43	1,2,4-Trichlorobenzene	E	1275	22:19	BB	0.000	NANOS
44	Naphthalene	E	1289	22:33	BB	0.000	NANOS

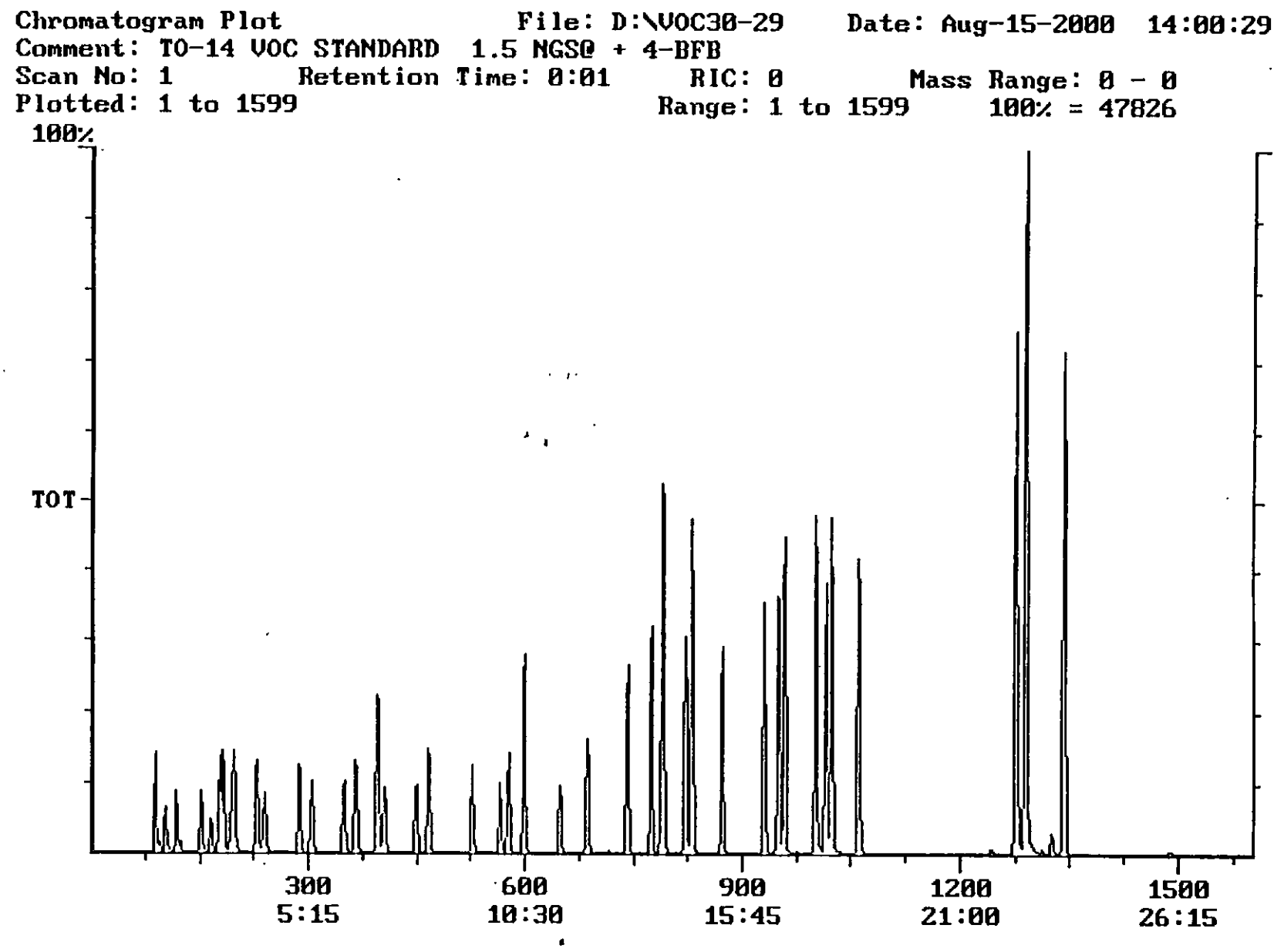
Quantitation Report Quanfile: VOC30-37 Quan Entries: 34
Comment: LFR GB 8/14/2000 DM LF 0.10 CC + 4-BFB DUPLICATE
Sorted via: Entry Number ↑ (S) = Standard

Cal	Name of Compound	S	Scan#	R Time	Me	Calc Amt(A)	Units
1	Freon 12	E	87	1:31	BV	0.570	NANOS
2	Methyl Chloride	E	105	1:50	VV	1.452	NANOS
3	Freon 114	E	87	1:31	BV	0.570	NANOS
4	Vinyl Chloride	E	101	1:46	BB	2.026	NANOS
6	Ethyl Chloride	E	124	2:10	BB	0.217	NANOS
7	Freon 11	E	151	2:39	BB	0.001	NANOS
8	Ethyl Ether	E	176	3:05	BB	3.151	NANOS
10	Methylene Chloride	E	182	3:11	VB	1.115	NANOS
11	Freon 113	E	193	3:23	BB	0.000	NANOS
12	Carbon Disulfide	E	197	3:27	BB	0.000	NANOS
13	Cis-1,2-Dichloroethene	E	228	3:59	BV	0.062	NANOS
14	1,1-Dichloroethane	E	239	4:11	BB	0.976	NANOS
15	Trans-1,2-Dichloroethe	E	287	5:01	VV	2.022	NANOS
18	1,1,1-Trichloroethane	E	366	6:24	BB	0.000	NANOS
19	Benzene	E	395	6:55	BB	0.383	NANOS
21	1,2-Dichloropropane	E	449	7:51	BB	0.000	NANOS
24	Trans-1,3-Dichloroprop	E	565	9:53	BB	0.048	NANOS
25	1,1,2-Trichloroethane	E	574	10:03	BB	0.000	NANOS
26	Toluene	E	599	10:29	BB	96.529	NANOS
28	Tetrachloroethene	E	687	12:01	BB	1.722	NANOS
29	Chlorobenzene	E	742	12:59	BB	0.102	NANOS
30	Ethylbenzene	E	775	13:34	BB	8.563	NANOS
31	1,3+1,4-Xylenes	E	790	13:49	VV	15.779	NANOS
33	1,1,2,2-Tetrachloroeth	E	837	14:39	BV	0.000	NANOS
34	1,2-Xylene	E	831	14:33	BB	3.679	NANOS
35	4-Bromofluorobenzene	E	872	15:16	BV	6.054	NANOS

Quantitation Report Quanfile: VOC30-37 Quan Entries: 34
Comment: LFR GB 8/14/2000 DM LF 0.10 CC + 4-BFB DUPLICATE
Sorted via: Entry Number ↑ (S) = Standard

Cal	Name of Compound	S	Scan#	R Time	Me	Calc Amt(A)	Units
36	Benzylchloride	E	935	16:22	VB	0.000	NANOS
37	4-Ethyltoluene	E	947	16:34	BV	0.822	NANOS
38	1,3,5-Trimethylbenzene	E	959	16:47	VB	0.000	NANOS
39	1,2,4-Trimethylbenzene	E	1001	17:31	VB	0.000	NANOS
40	1,3-Dichlorobenzene	E	1023	17:54	BB	0.000	NANOS
41	1,4-Dichlorobenzene	E	1023	17:54	BB	0.000	NANOS
43	1,2,4-Trichlorobenzene	E	1276	22:20	BB	0.000	NANOS
44	Naphthalene	E	1289	22:33	BB	0.000	NANOS

SECTION 5.0
GC/ MS ION CHROMATOGRAMS FOR THE ANALYSIS OF TO-14 VOLATILE ORGANIC COMPOUNDS IN GAS SAMPLES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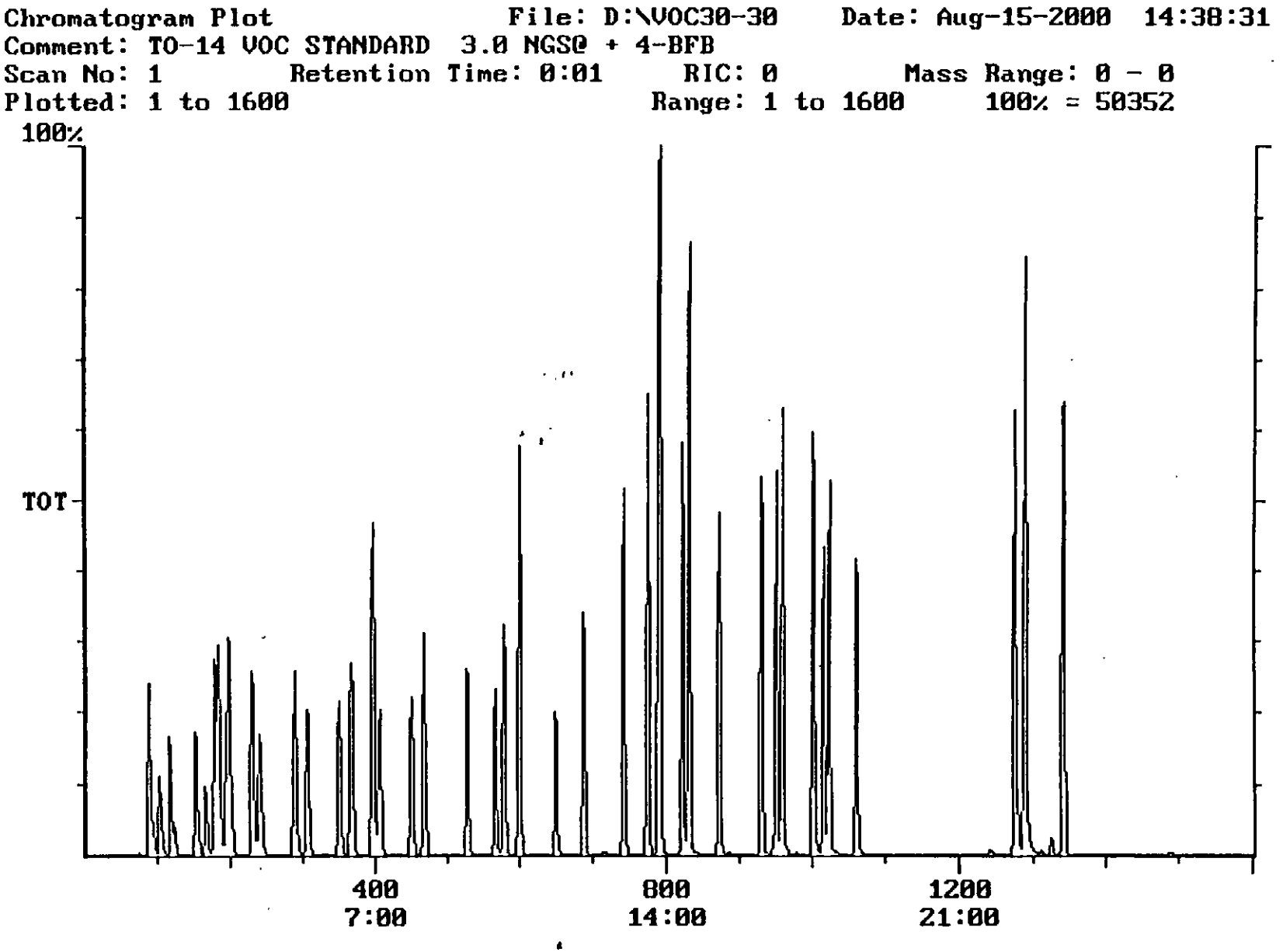
Comment: TO-14 VOC STANDARD 1.5 NGS@ + 4-BFB
Scan No: 1 Retention Time: 0:01 RIC: 0 Mass Range: 0 - 0
Plotted: 1 to 1599 Range: 1 to 1599 100% = 47826
100%
TOT
300
5:15
600
10:30
900
15:45
1200
21:00
1500
26:15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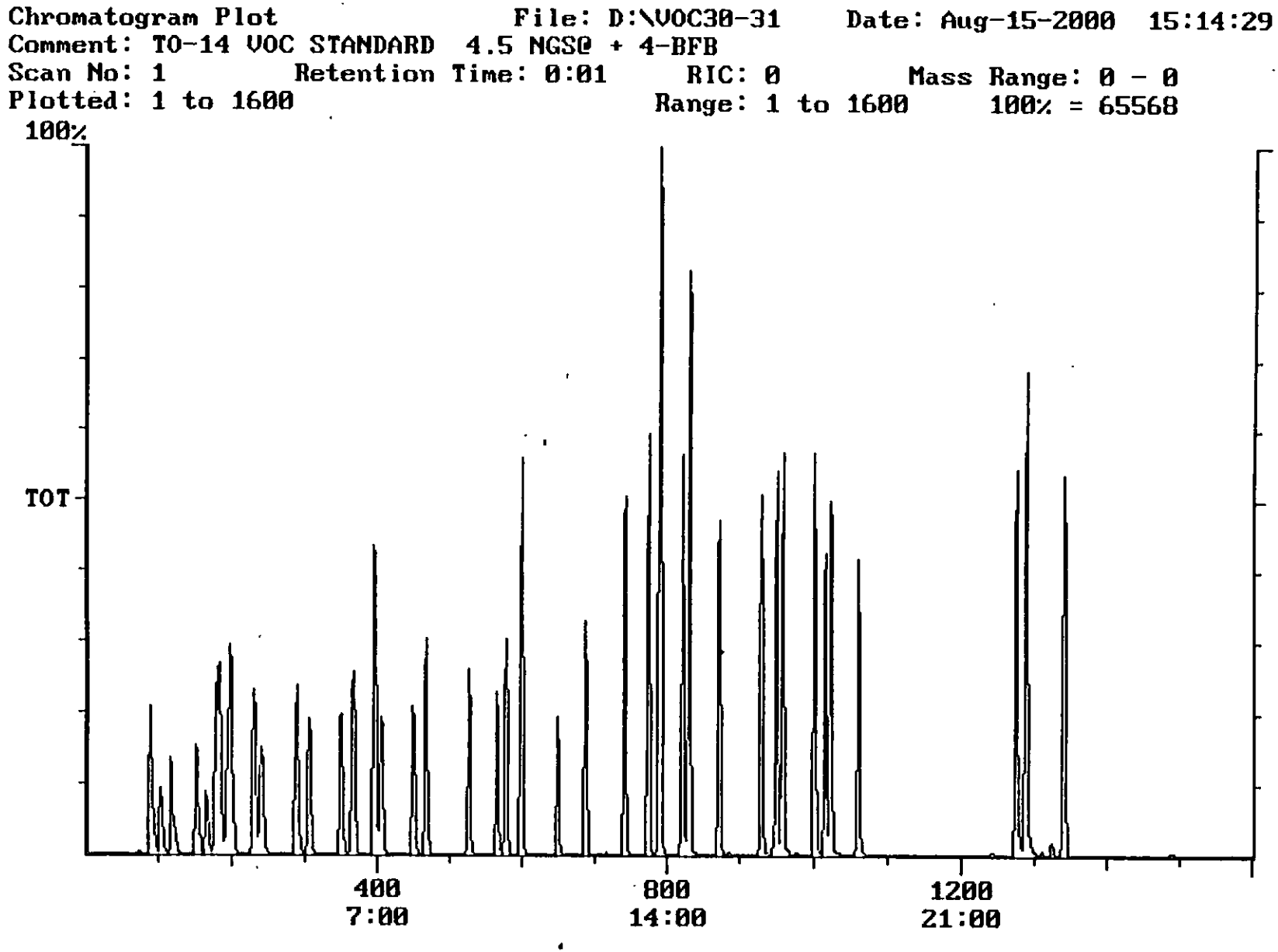
Comment: TO-14 VOC STANDARD 3.0 NGS@ + 4-BFB
Scan No: 1 Retention Time: 0:01 RIC: 0 Mass Range: 0 - 0
Plotted: 1 to 1600 Range: 1 to 1600 100% = 50352
100%
TOT
400
7:00
800
14:00
1200
21:00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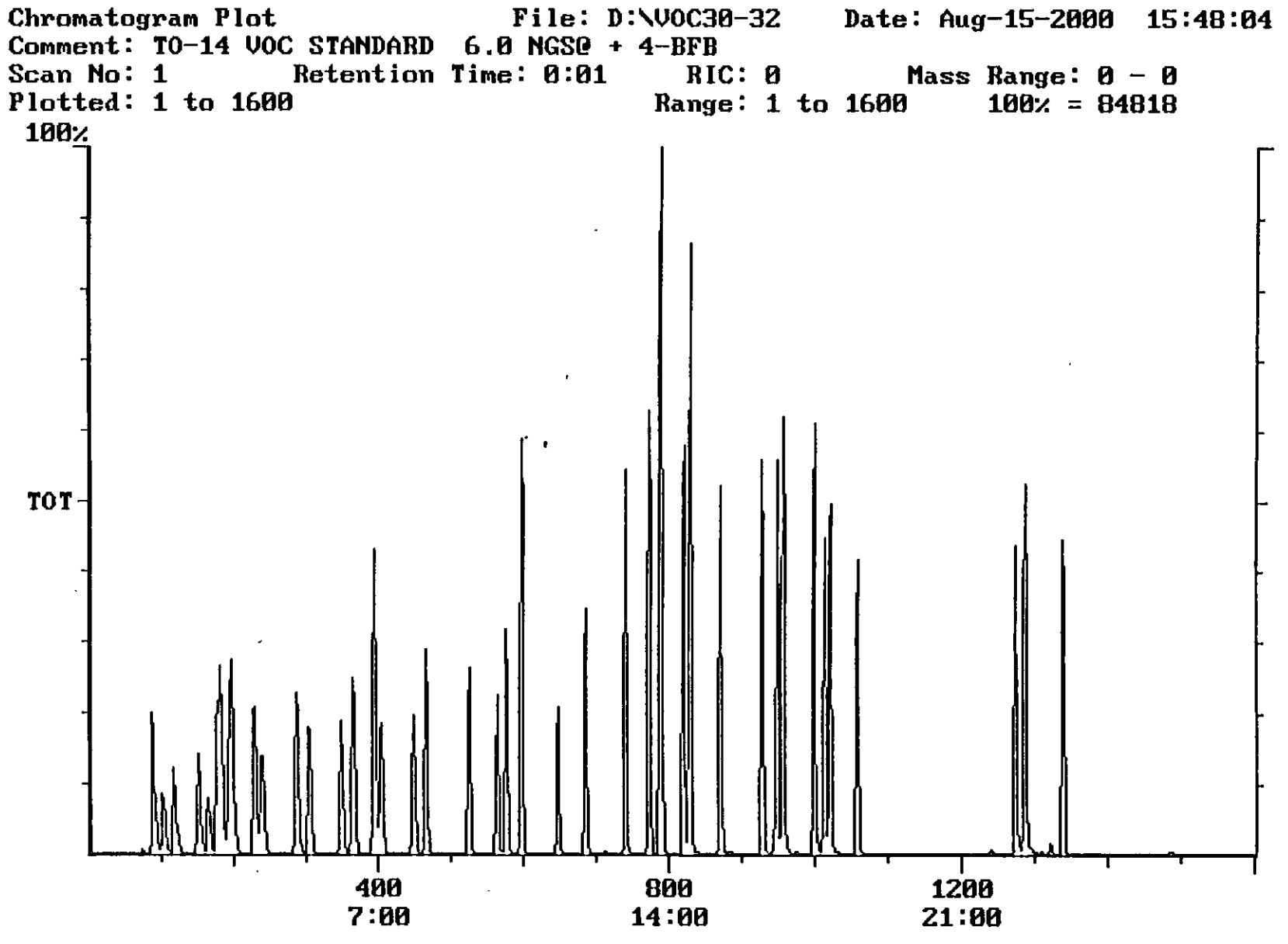
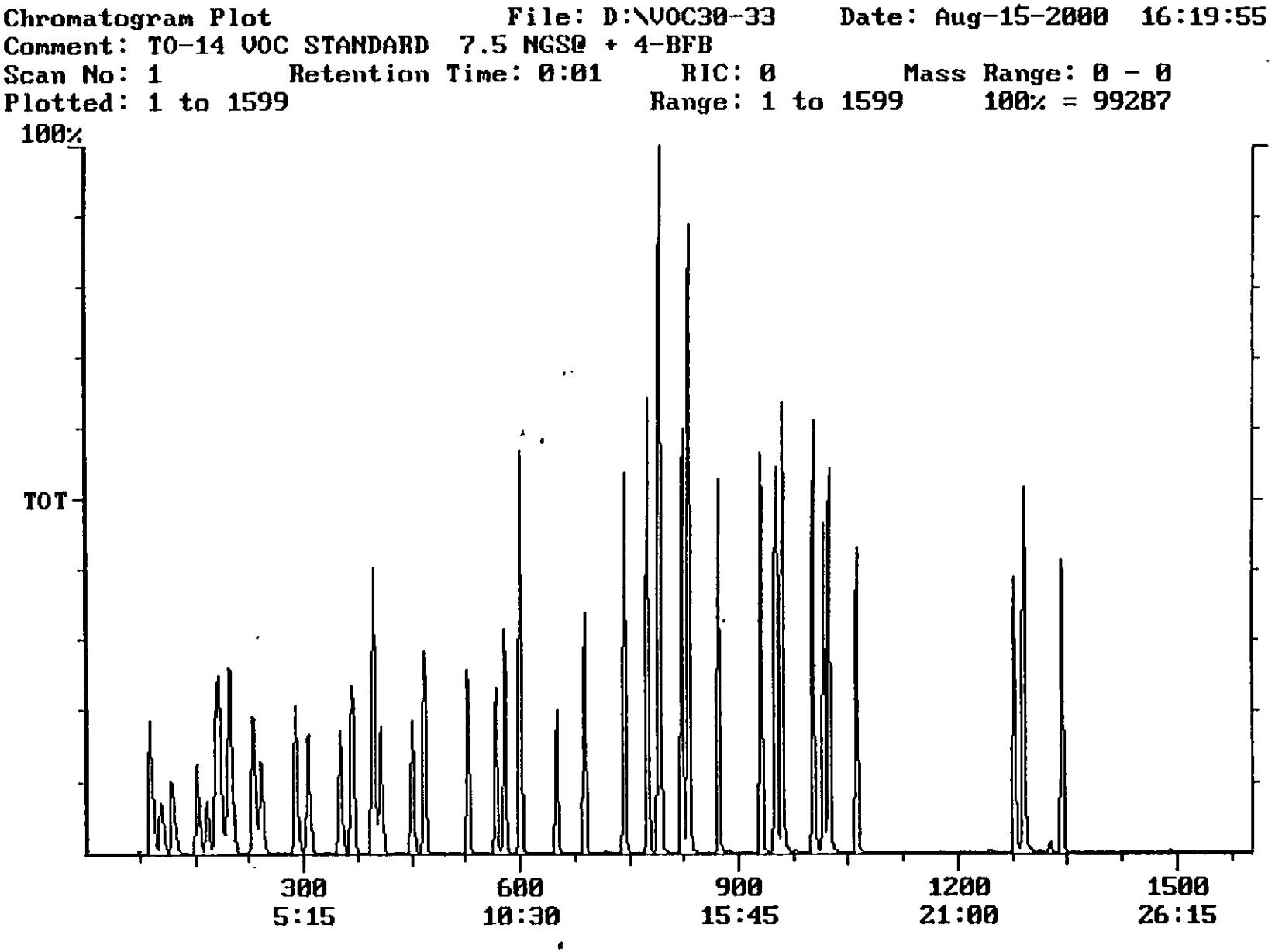
Comment: TO-14 VOC STANDARD 4.5 NGS@ + 4-BFB
Scan No: 1 Retention Time: 0:01 RIC: 0 Mass Range: 0 - 0
Plotted: 1 to 1600 Range: 1 to 1600 100% = 65568
100%
TOT
400
7:00
800
14:00
1200
21:00


Chromatogram Plot File: D:\VOC30-32 Date: Aug-15-2000 15:48:04
Comment: TO-14 VOC STANDARD 6.0 NGS@ + 4-BFB
Scan No: 1 Retention Time: 0:01 RIC: 0 Mass Range: 0 - 0
Plotted: 1 to 1600 Range: 1 to 1600 100% = 84818
100%
TOT
400
7:00
800
14:00
1200
21:00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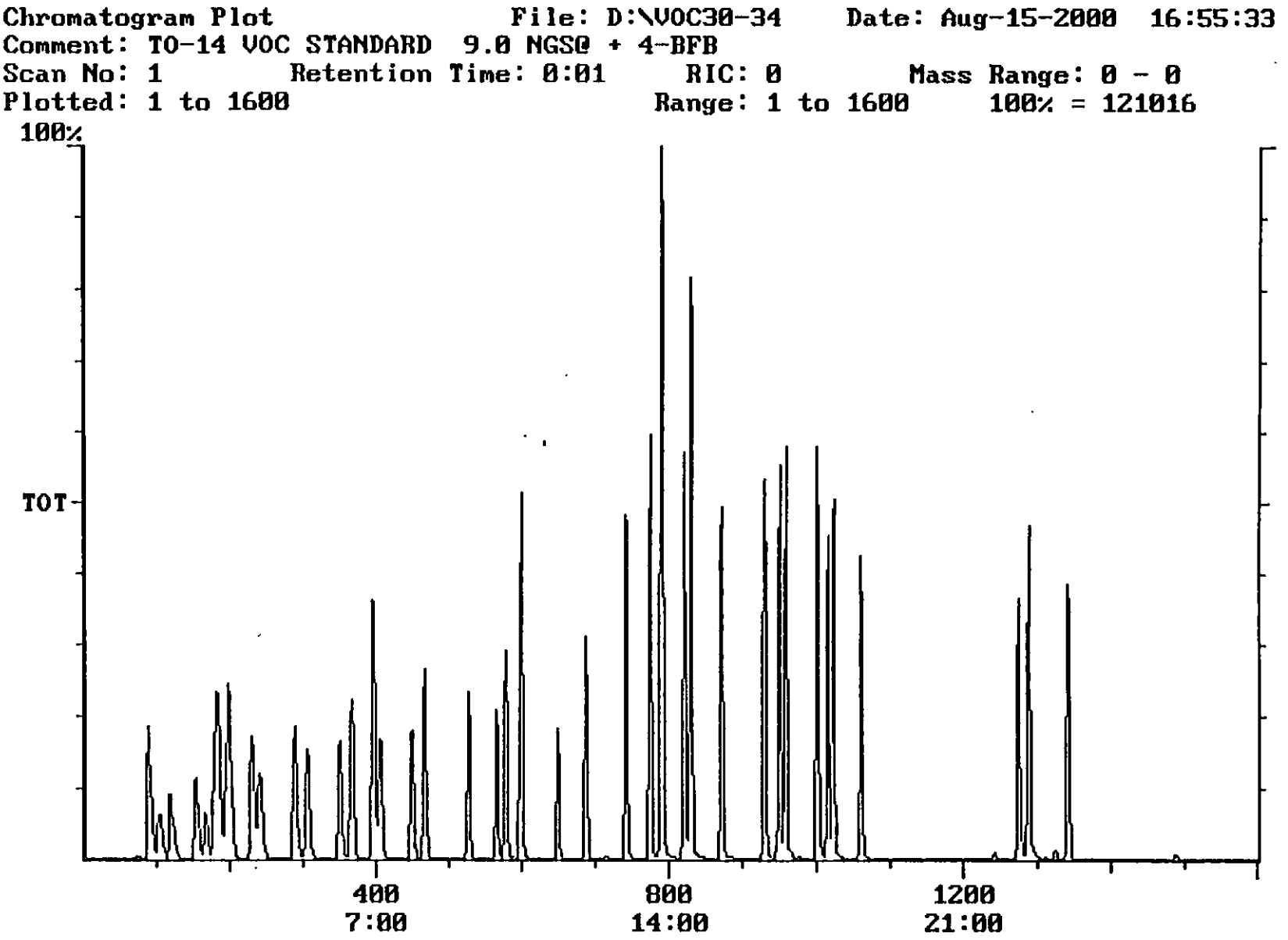
Date: Aug-15-2000 16:19:55
Comment: TO-14 VOC STANDARD 7.5 NGS@ + 4-BFB
Scan No: 1
Retention Time: 0:01
RIC: 0
Mass Range: 0 - 0
Plotted: 1 to 1599
Range: 1 to 1599
100% = 99287
100%
TOT
300
5:15
600
10:30
900
15:45
1200
21:00
1500
26:15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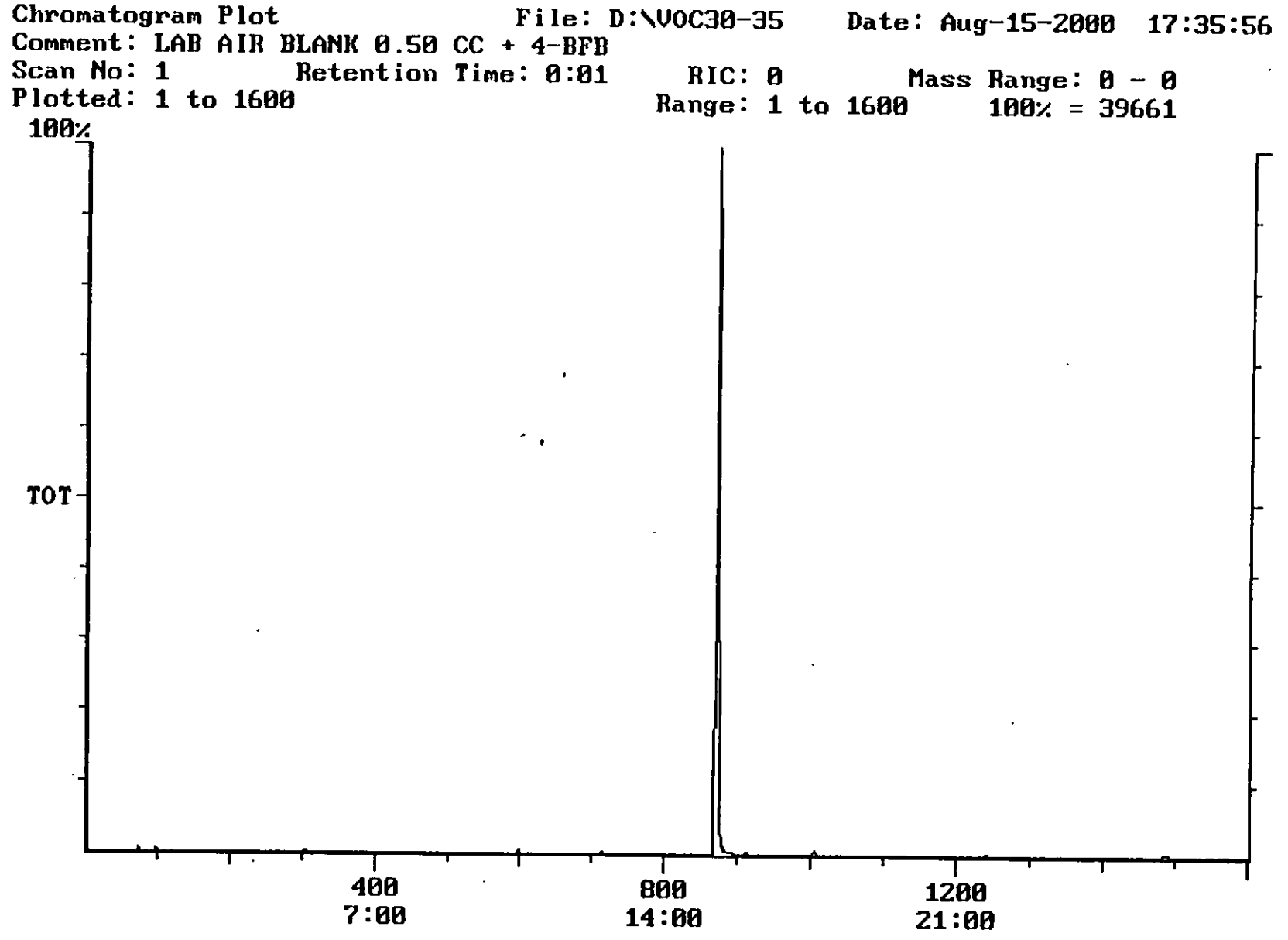
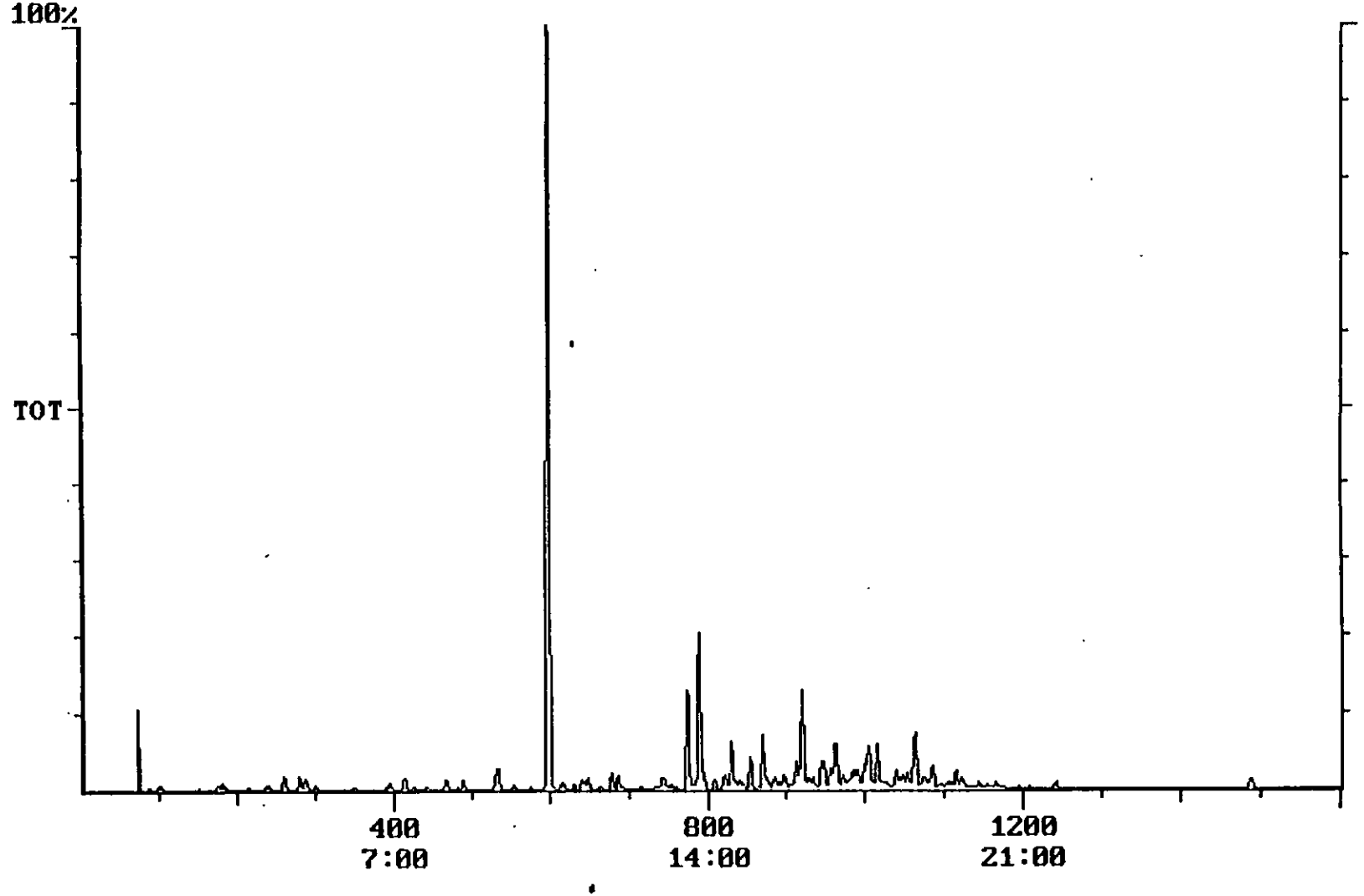
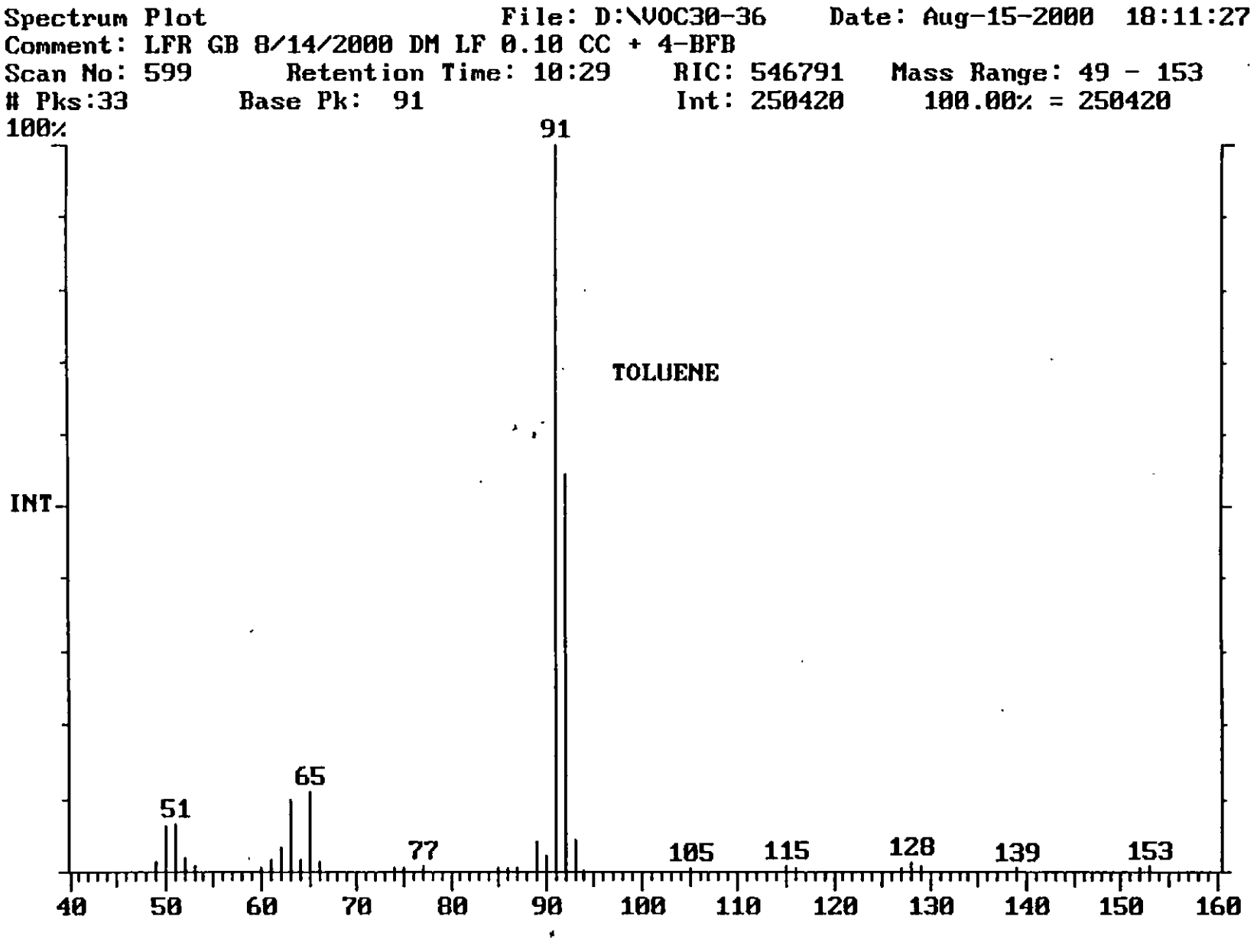
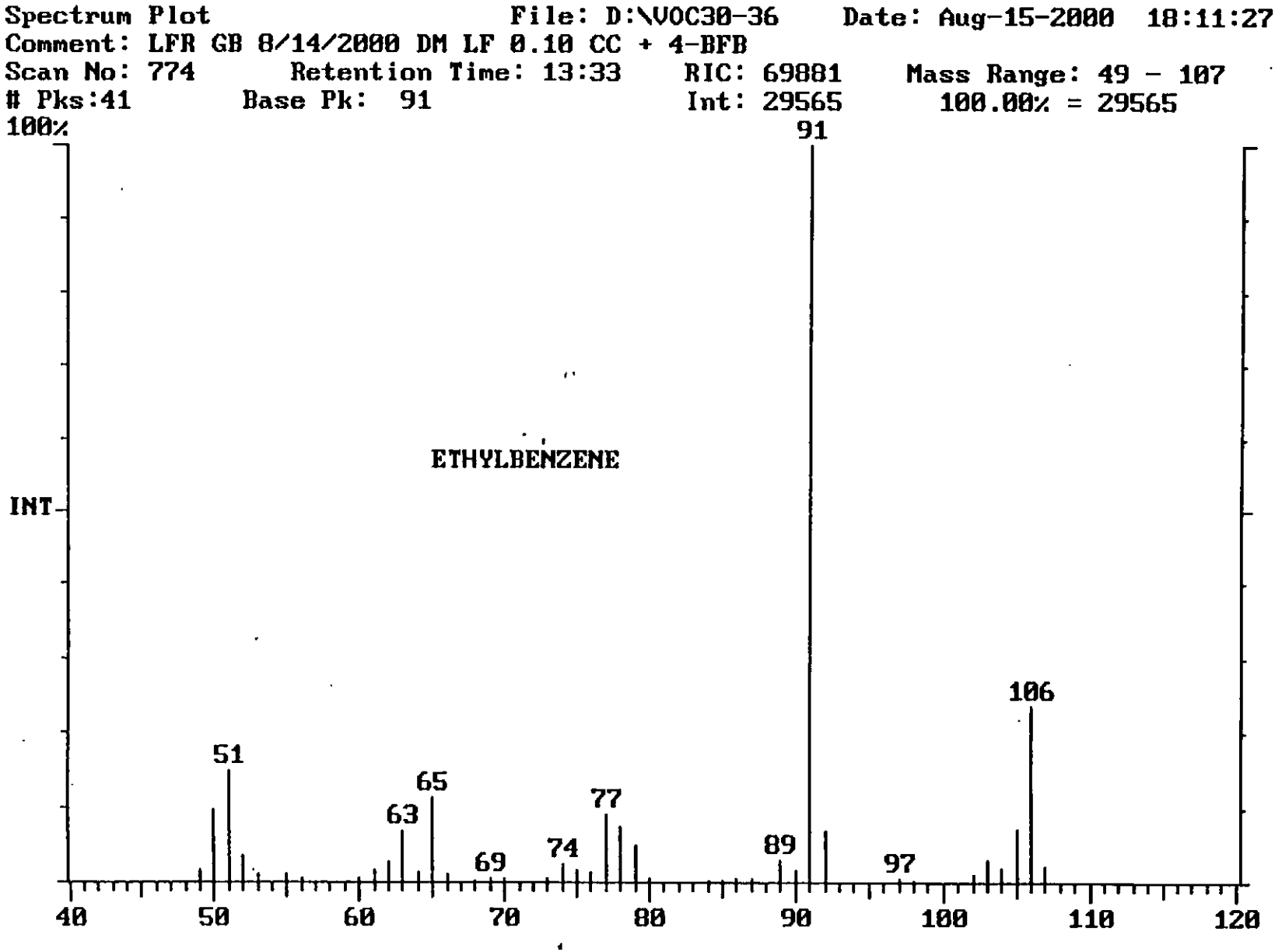
File: D:\VOC30-34
Date: Aug-15-2000 16:55:33
Comment: TO-14 VOC STANDARD 9.0 NGS@ + 4-BFB
Scan No: 1
Retention Time: 0:01
RIC: 0
Mass Range: 0 - 0
Plotted: 1 to 1600
Range: 1 to 1600
100% = 121016
100%
TOT
400
7:00
800
14:00
1200
21:00

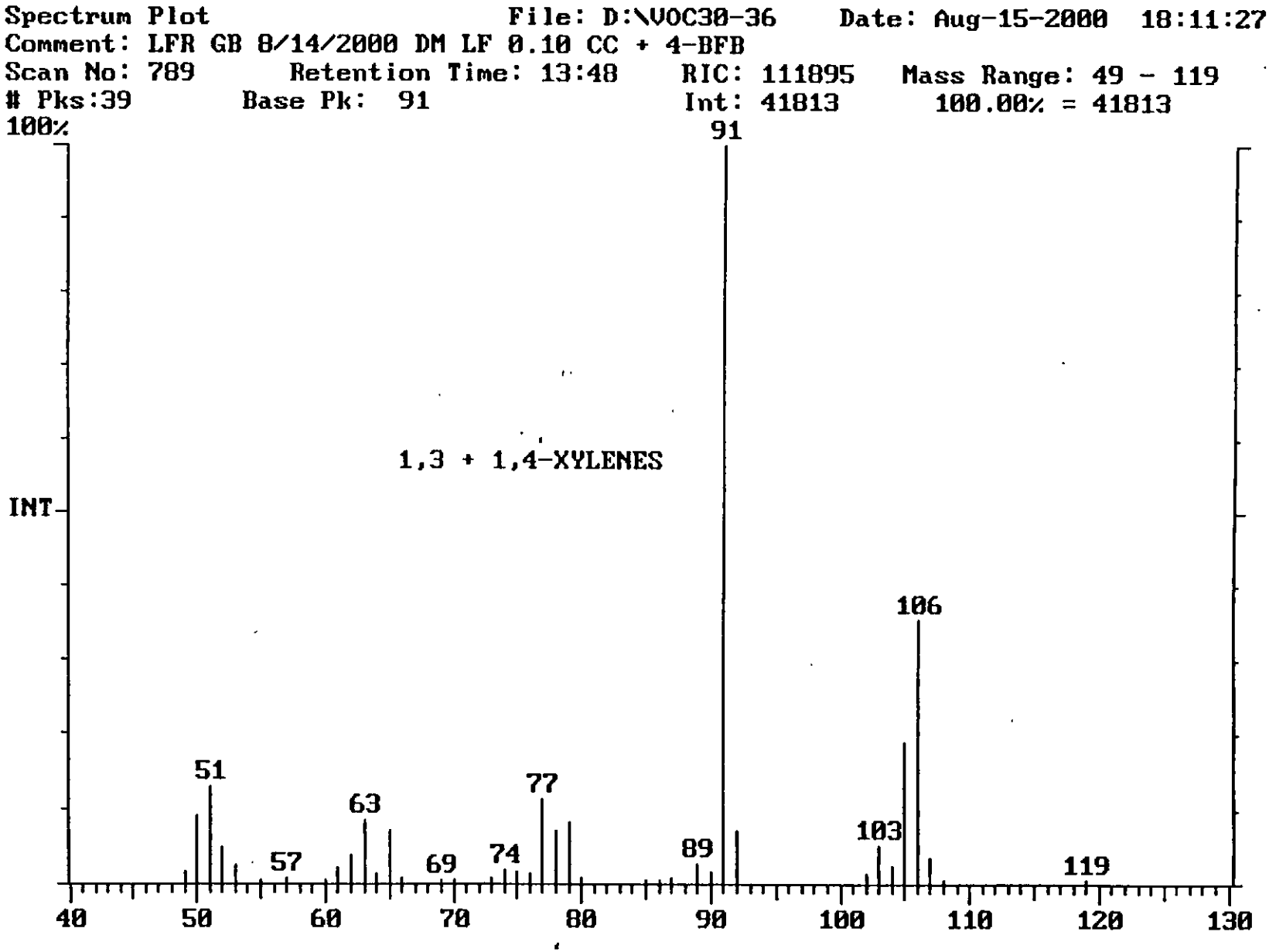

Chromatogram Plot
File: D:\VOC30-35
Date: Aug-15-2000 17:35:56
Comment: LAB AIR BLANK 0.50 CC + 4-BFB
Scan No: 1
Retention Time: 0:01
RIC: 0
Mass Range: 0 - 0
Plotted: 1 to 1600
Range: 1 to 1600
100% = 39661
100%
TOT
400
7:00
800
14:00
1200
21:00

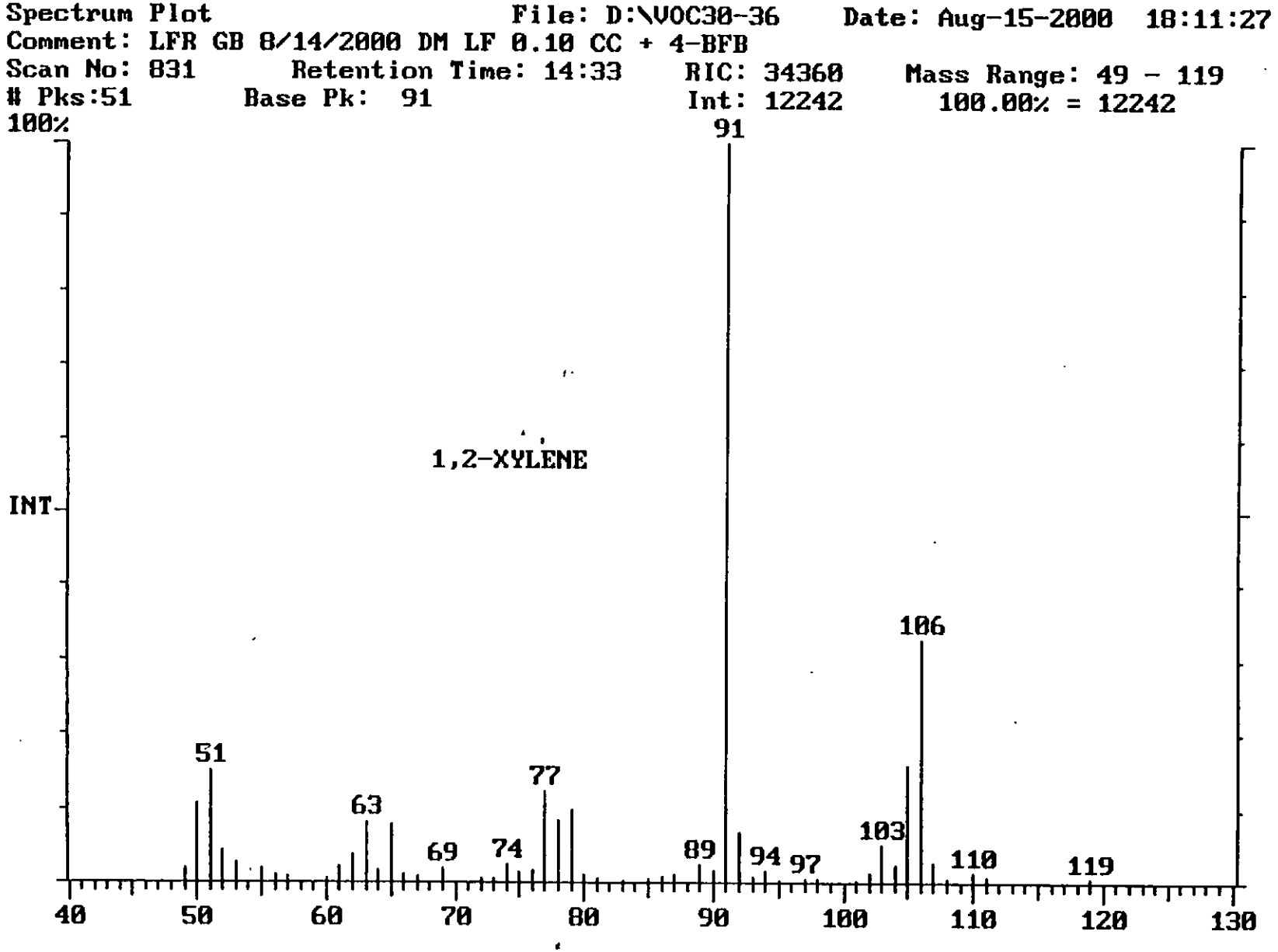
Chromatogram Plot File: D:\VOC30-36 Date: Aug-15-2000 18:11:27
Comment: LFR GB 8/14/2000 DM LF 0.10 CC + 4-BFB
Scan No: 1 Retention Time: 0:01 RIC: 0 Mass Range: 0 - 0
Plotted: 1 to 1600 Range: 1 to 1600 100% = 552634

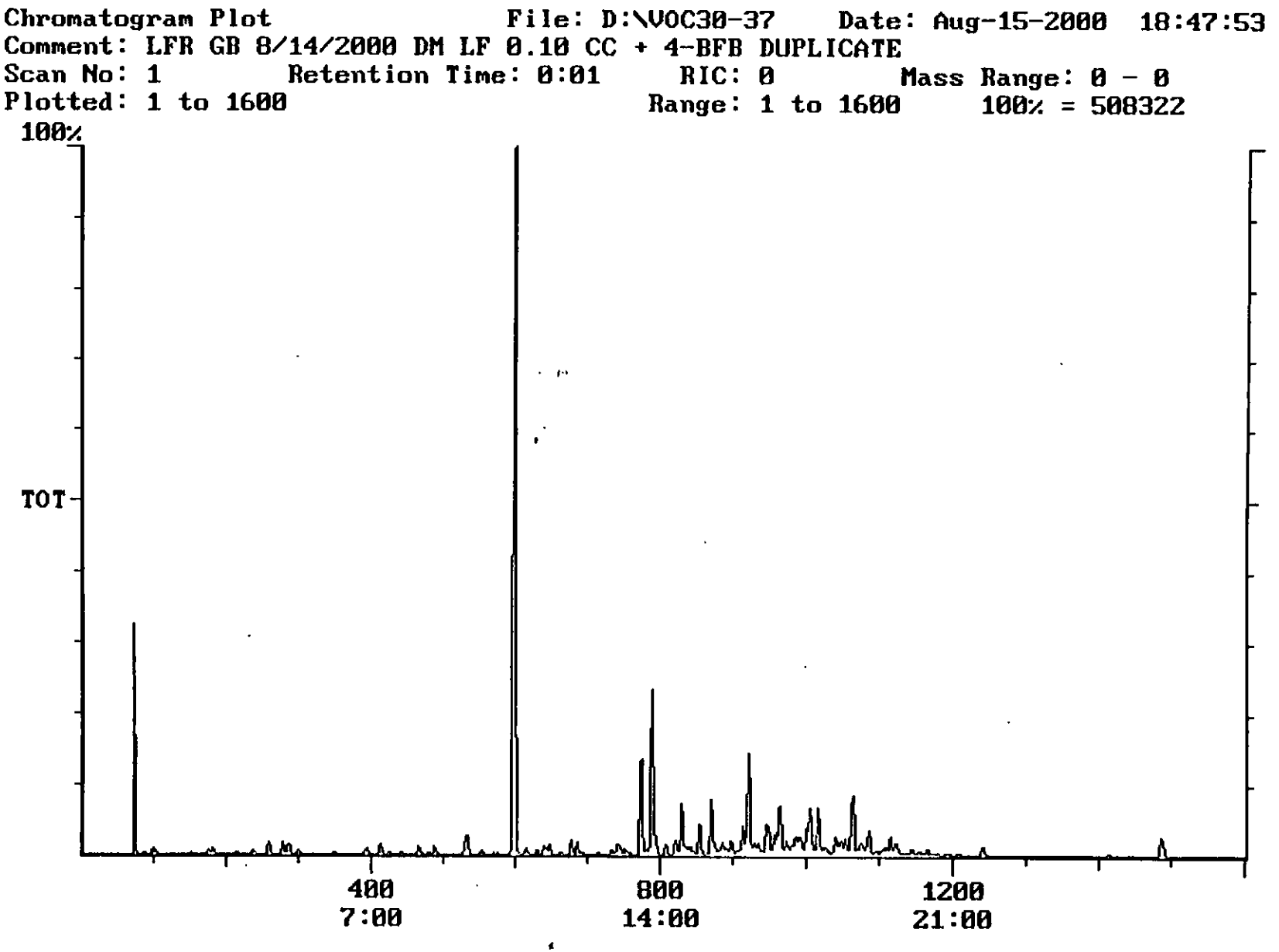



Spectrum Plot File: D:\VOC30-36 Date: Aug-15-2000 18:11:27
Comment: LFR GB 8/14/2000 DM LF 0.10 CC + 4-BFB
Scan No: 599 Retention Time: 10:29 RIC: 546791 Mass Range: 49 - 153
Pks:33 Base Pk: 91 Int: 250420 100.00% = 250420
100%
91
TOLUENE
INT
65
51
77
105
115
128
139
153
40
50
60
70
80
90
100
110
120
130
140
150
160

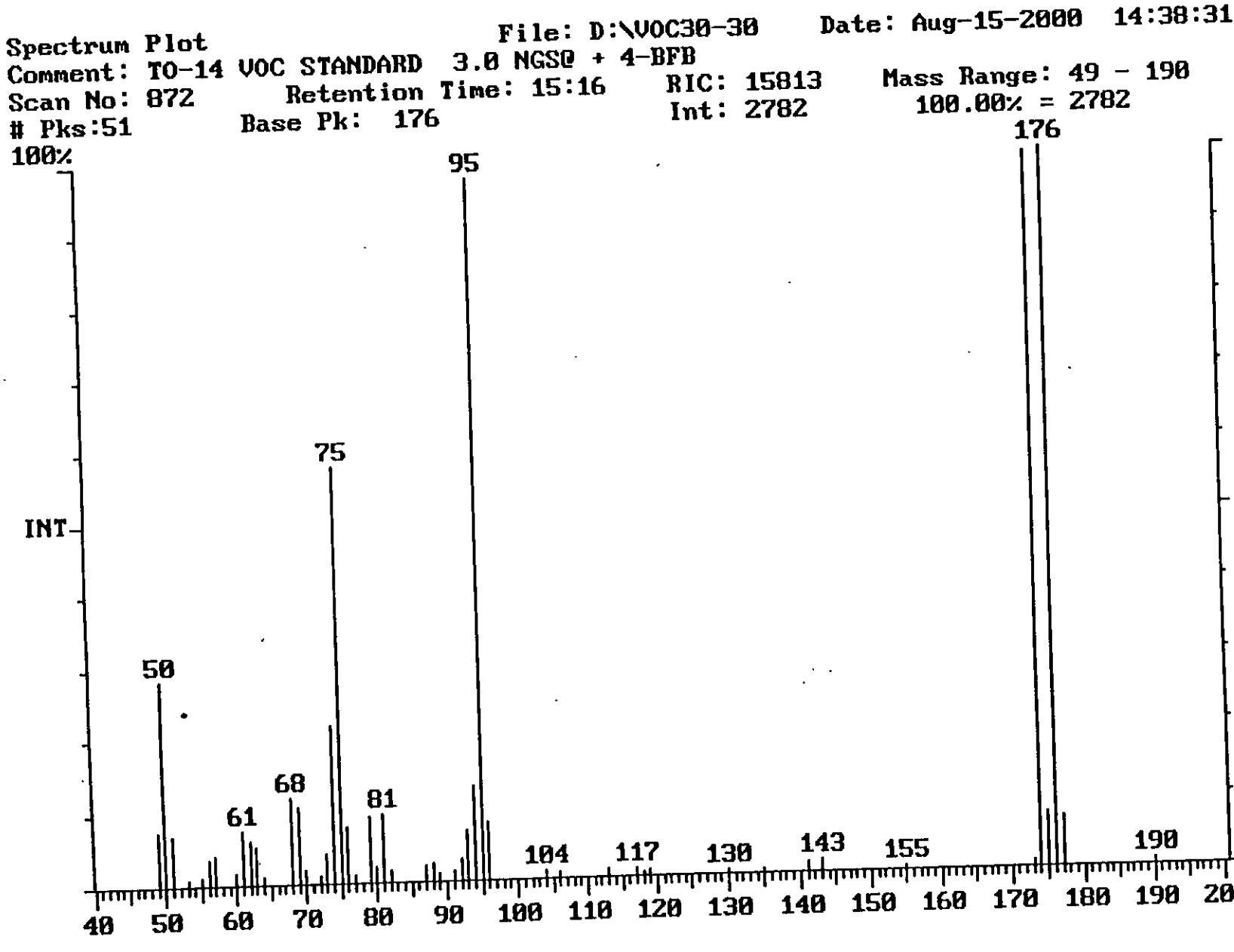

Spectrum Plot File: D:\VOC30-36 Date: Aug-15-2000 18:11:27
Comment: LFR GB 8/14/2000 DM LF 0.10 CC + 4-BFB
Scan No: 774 Retention Time: 13:33 RIC: 69881 Mass Range: 49 - 107
Pks:41 Base Pk: 91 Int: 29565 100.00% = 29565
100%
ETHYLBENZENE
INT
91
106
51
65
63
77
69
74
89
97
40
50
60
70
80
90
100
110
120


Spectrum Plot File: D:\VOC30-36 Date: Aug-15-2000 18:11:27
Comment: LFR GB 8/14/2000 DM LF 0.10 CC + 4-BFB
Scan No: 789 Retention Time: 13:48 RIC: 111895 Mass Range: 49 - 119
Pks:39 Base Pk: 91 Int: 41813 100.00% = 41813
100%
91
1,3 + 1,4-XYLENES
INT
106
51
77
63
103
57
69
74
89
119
40
50
60
70
80
90
100
110
120
130


Spectrum Plot
File: D:\VOC30-36
Date: Aug-15-2000 18:11:27
Comment: LFR GB 8/14/2000 DM LF 0.10 CC + 4-BFB
Scan No: 831
Retention Time: 14:33
RIC: 34360
Mass Range: 49 - 119
Pks:51
Base Pk: 91
Int: 12242
100.00% = 12242
100%
91
1,2-XYLENE
INT
106
51
77
63
69
74
89
94
97
103
110
119
40
50
60
70
80
90
100
110
120
130


Chromatogram Plot File: D:\VOC30-37 Date: Aug-15-2000 18:47:53
Comment: LFR GB 8/14/2000 DM LF 0.10 CC + 4-BFB DUPLICATE
Scan No: 1 Retention Time: 0:01 RIC: 0 Mass Range: 0 - 0
Plotted: 1 to 1600 Range: 1 to 1600 100% = 508322
100%
TOT
400
7:00
800
14:00
1200
21:00

SECTION 6.0
4-BROMOFLUOROBENZENE TUNING CHARACTERISTICS AND RUN LOGS FOR THE ANALYSIS OF TO-14 VOLATILE ORGANIC COMPOUNDS IN GAS SAMPLES


Spectrum Plot
File: D:\VOC30-30
Date: Aug-15-2000 14:38:31
Comment: TO-14 VOC STANDARD 3.0 NGS@ + 4-BFB
Scan No: 872
Retention Time: 15:16
RIC: 15813
Mass Range: 49 - 190
Pks:51
Base Pk: 176
Int: 2782
100.00% = 2782
100%
INT
176
95
75
50
68
61
81
104
117
130
143
155
190
40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200

Mass List File: D:\VOC30-30 Date: Aug-15-2000 14:38:31

Comment: TO-14 VOC STANDARD 3.0 NGS@ + 4-BFB

Scan No: 872 Retention Time: 15:16 RIC: 15813 Mass Range: 49 - 190

Peaks: 51 Mass of Base Peak: 176 Int: 2782 Threshold: 1.00%

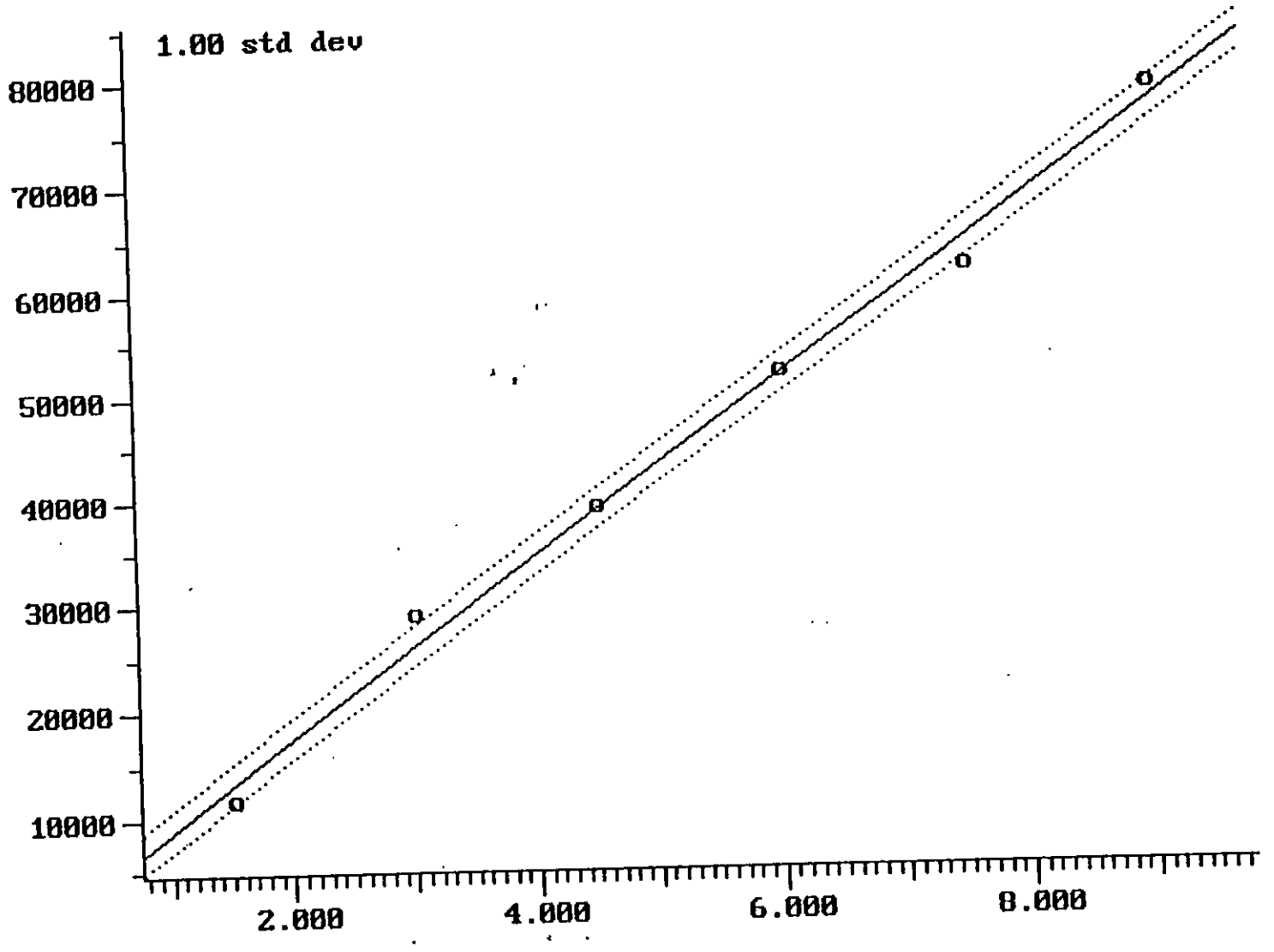
Mass	Intensity	% Base
49	200	7.19
50	782	28.11
51	190	6.83
56	95	3.41
57	110	3.95
60	42	1.51
61	203	7.30
62	167	6.00
63	143	5.14
68	328	11.79
69	287	10.32
70	52	1.87
73	113	4.06
74	603	21.68
75	1,602	57.58
76	212	7.62
79	252	9.06
80	58	2.08
81	255	9.17
82	45	1.62
87	57	2.05
88	68	2.44
91	32	1.15
92	83	2.98
93	187	6.72

Mass	Intensity	% Base
94	358	12.87
95	2,716	97.63
96	217	7.80
104	30	1.08
141	35	1.26
143	45	1.62
174	2,769	99.53
175	200	7.19
176	2,782	100.00
177	185	6.65

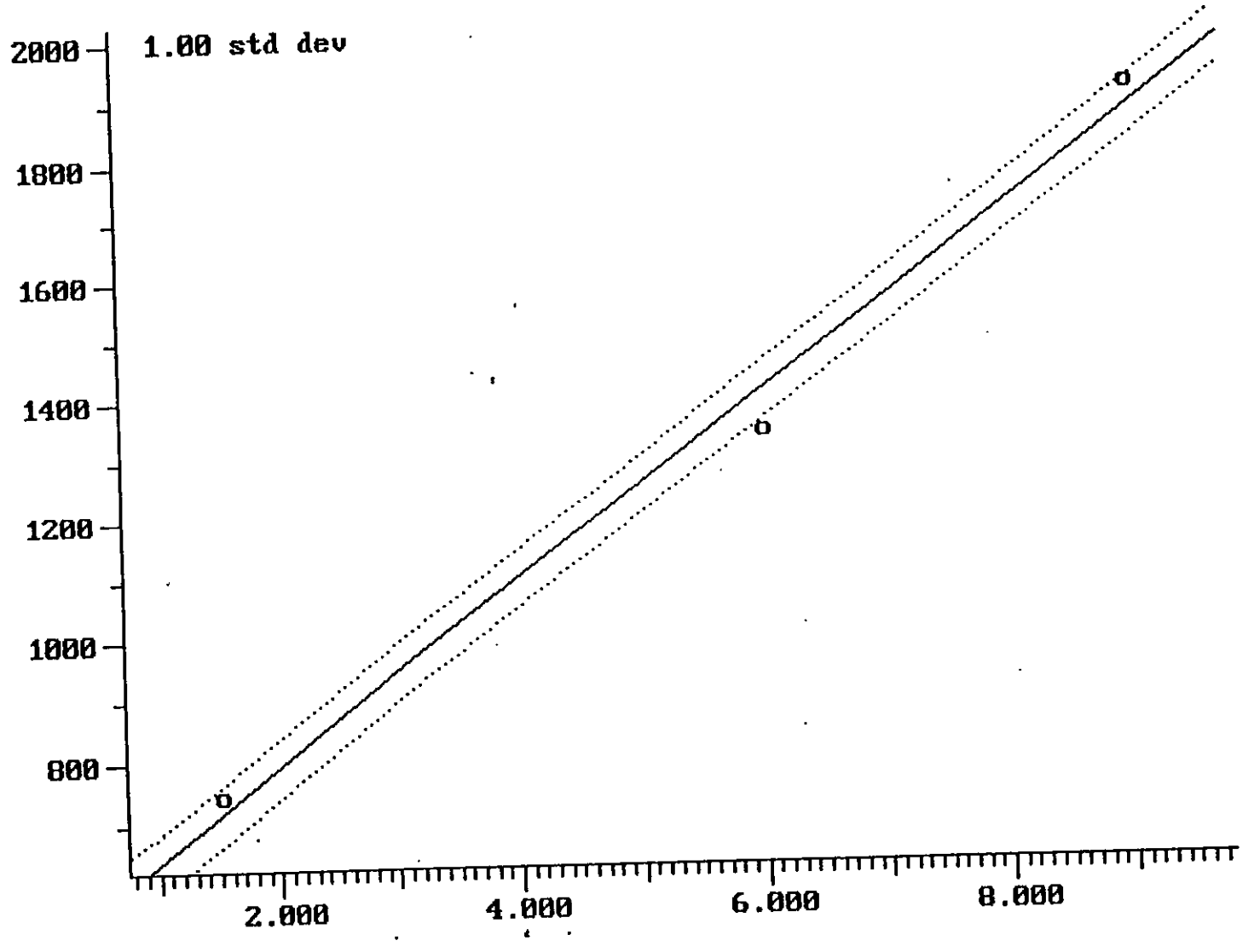
Mass	Intensity	% Base

SECTION 7.0
INITIAL CALIBRATION CHARTS AND TABLES FOR THE ANALYSIS OF TO-14 VOLATILE ORGANIC COMPOUNDS IN GAS SAMPLES

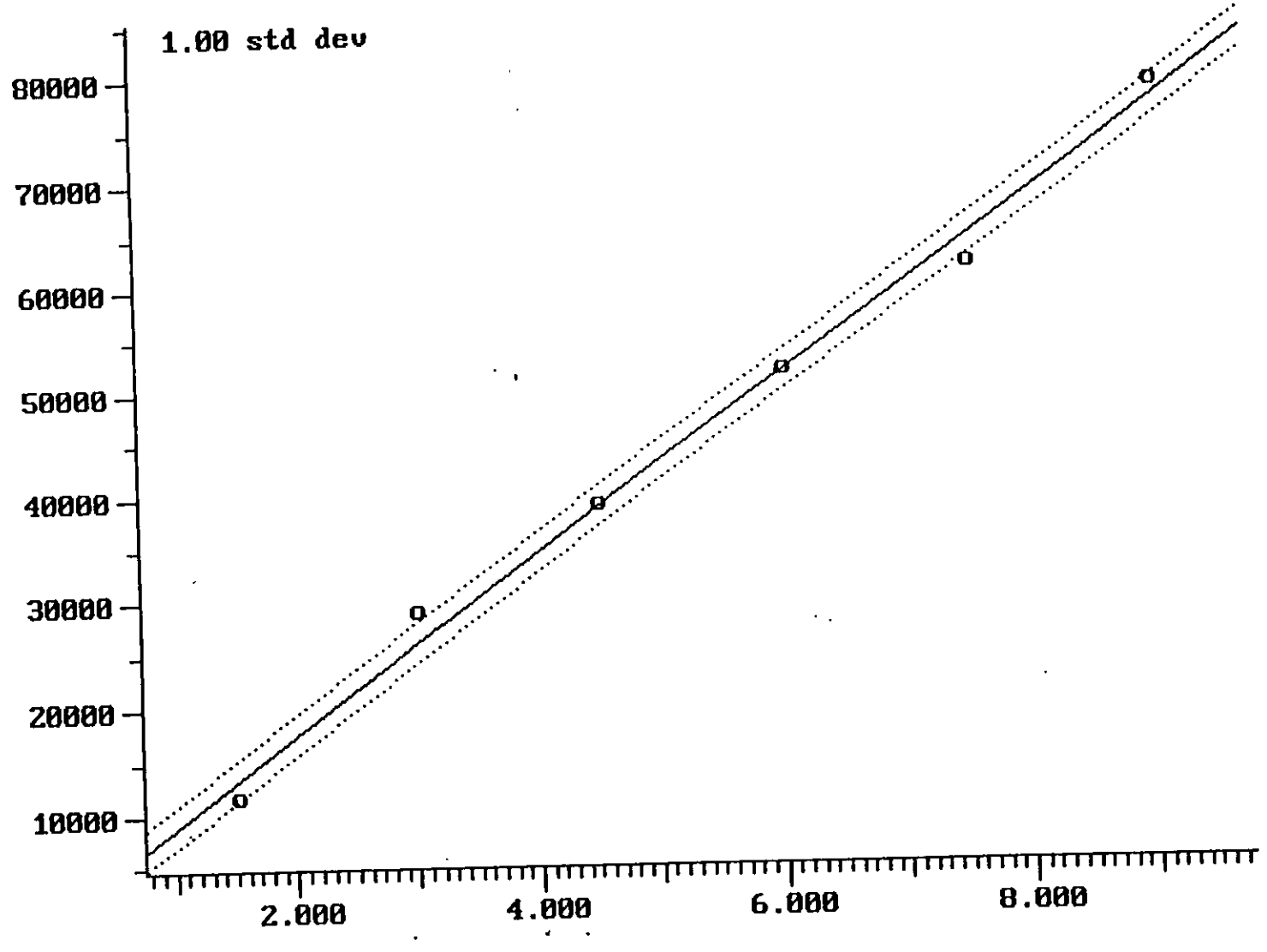
Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.996
Freon 12 Compound: 1 of 45 Standard Deviation: 1.875
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin¦Lin)



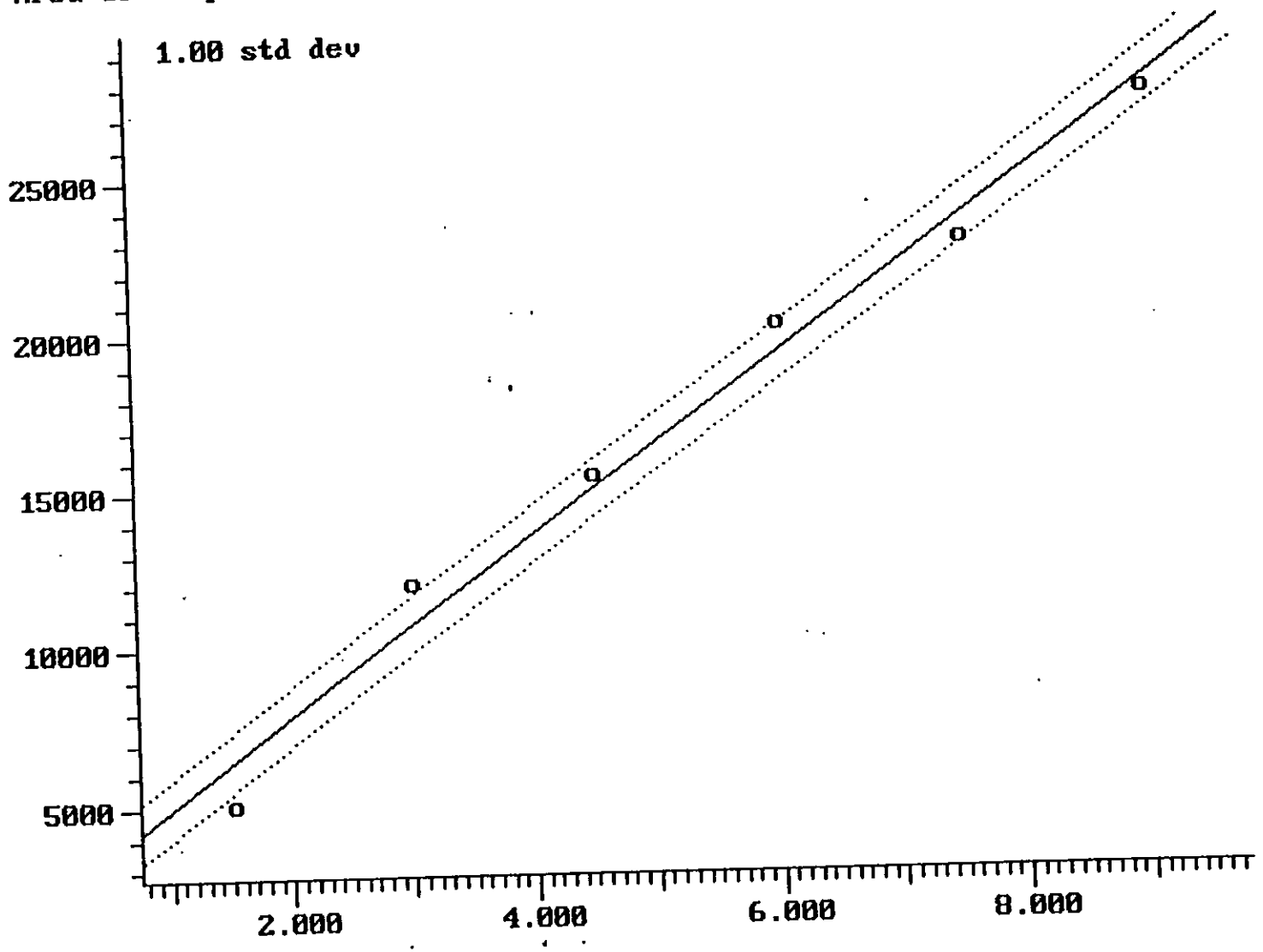
Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.995
Methyl Chloride Compound: 2 of 45 Standard Deviation: 0.047
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin!Lin)



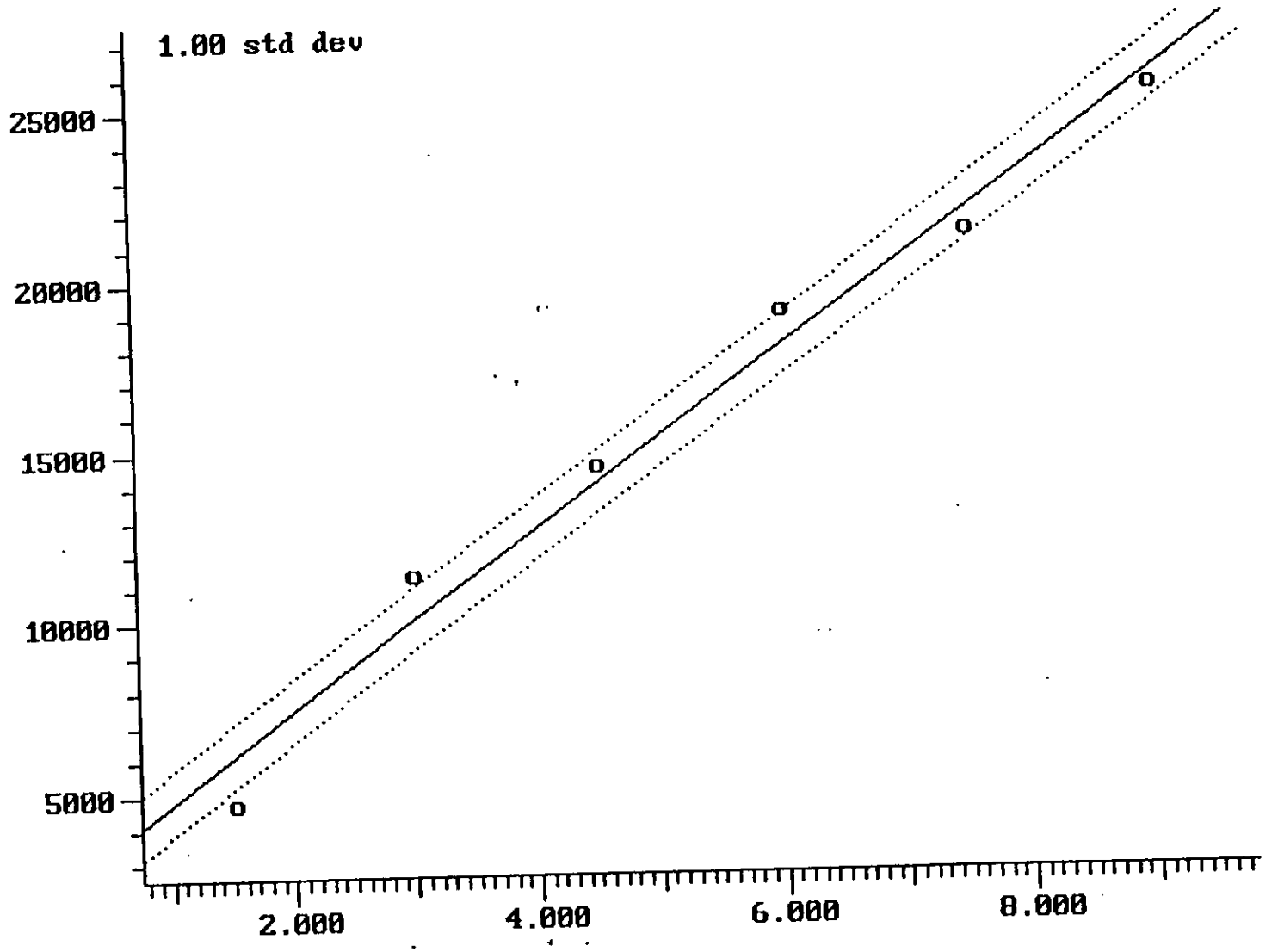
Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.996
Freon 114 Compound: 3 of 45 Standard Deviation: 1.875
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin!Lin)



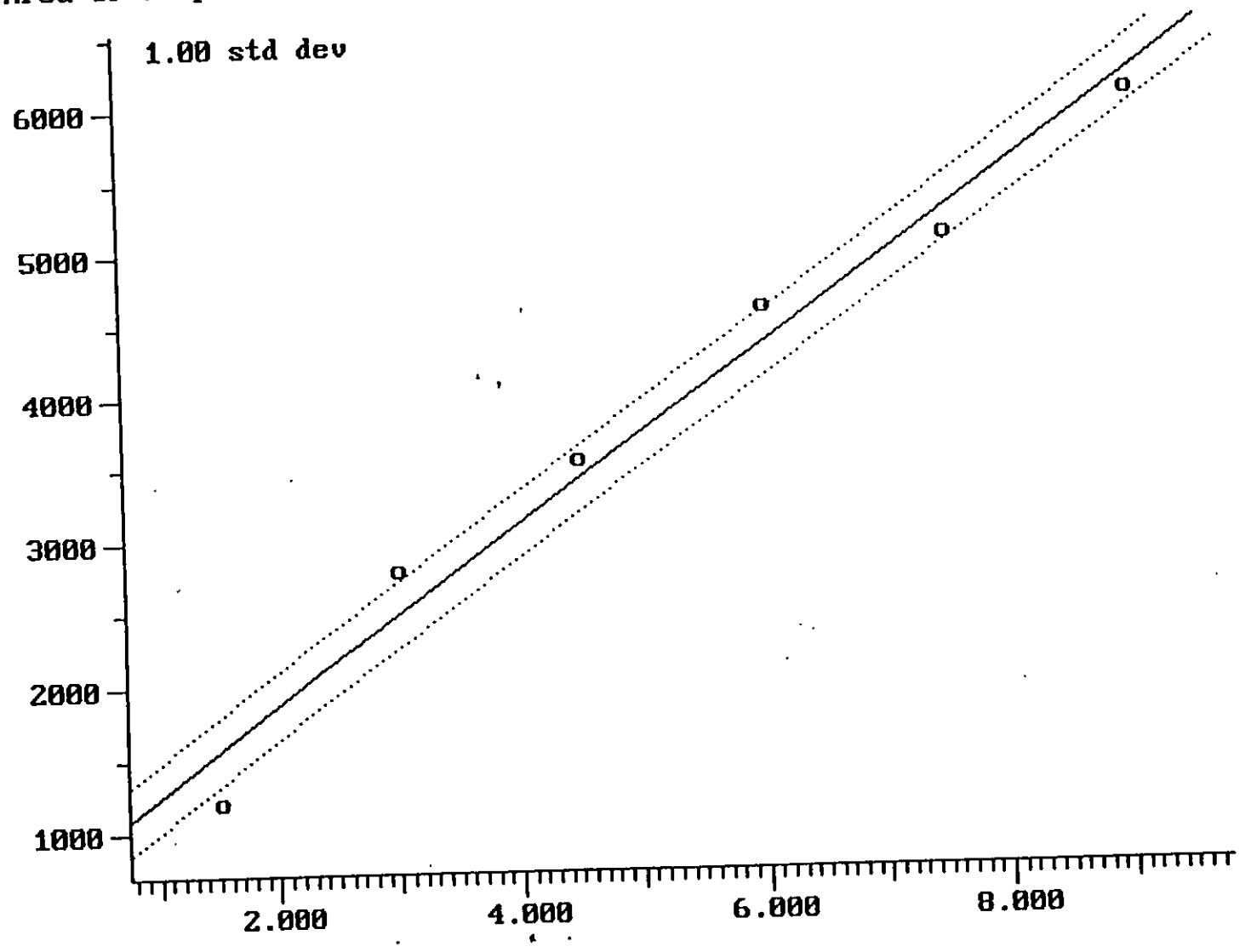
Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.992
Vinyl Chloride Compound: 4 of 45 Standard Deviation: 0.927
(Peak Area of Sample) vs (Amount of Sample Injected) (LiniLin)



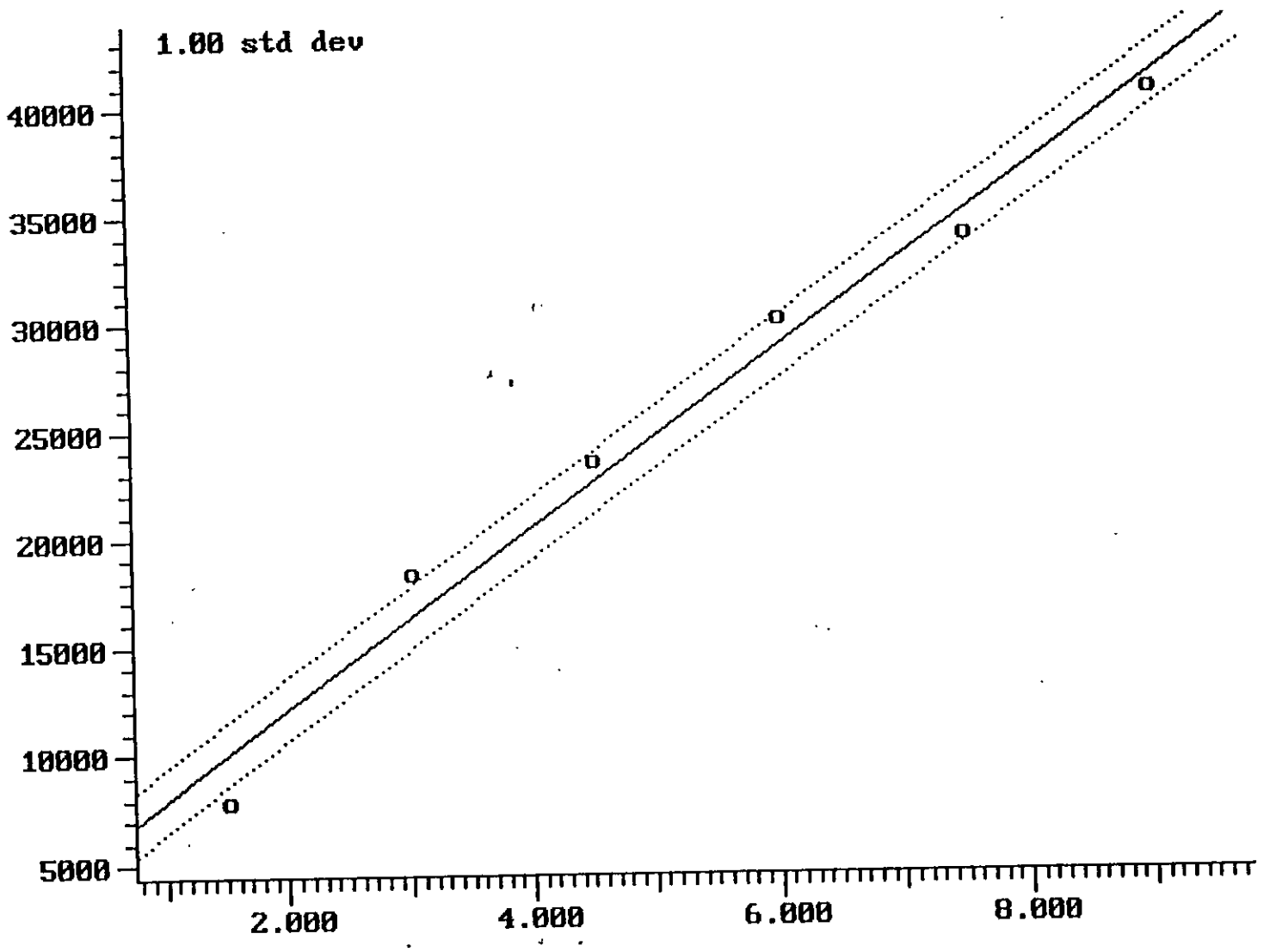
Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.990
Methyl Bromide Compound: 5 of 45 Standard Deviation: 0.943
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin!Lin)



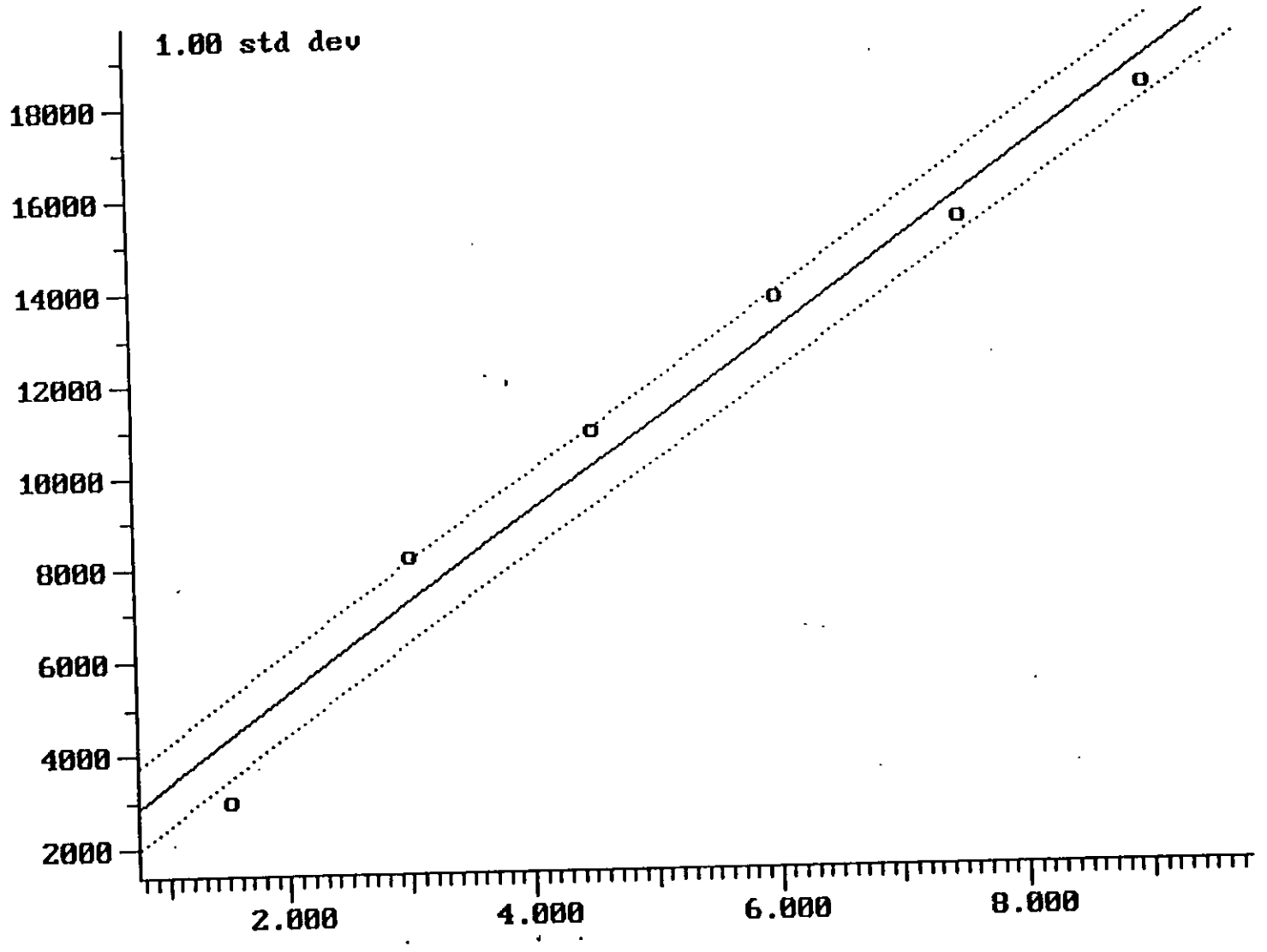
Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.989
Ethyl Chloride Compound: 6 of 45 Standard Deviation: 0.237
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin!Lin)



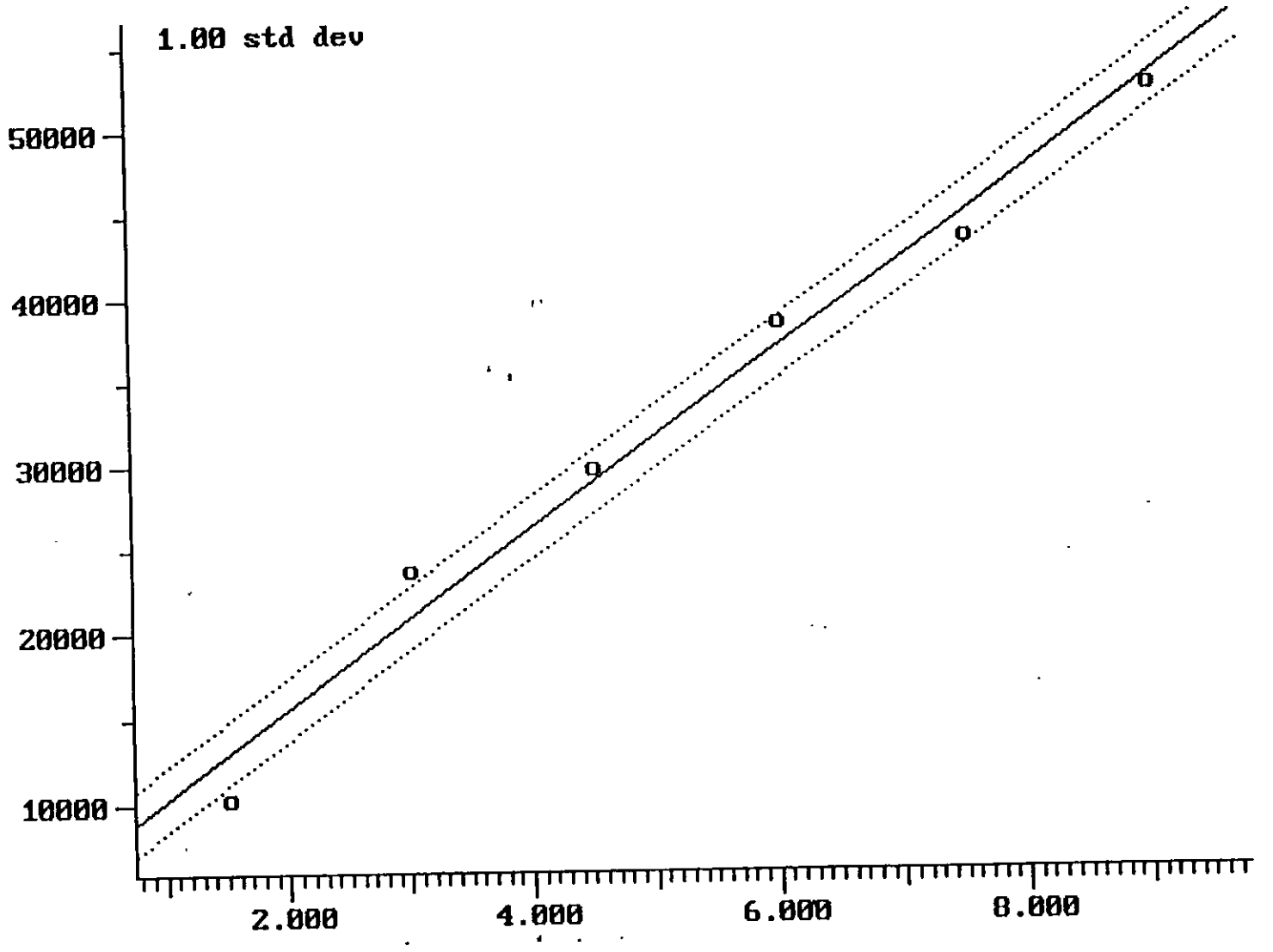
Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.991
Freon 11 Compound: 7 of 45 Standard Deviation: 1.457
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin!Lin)



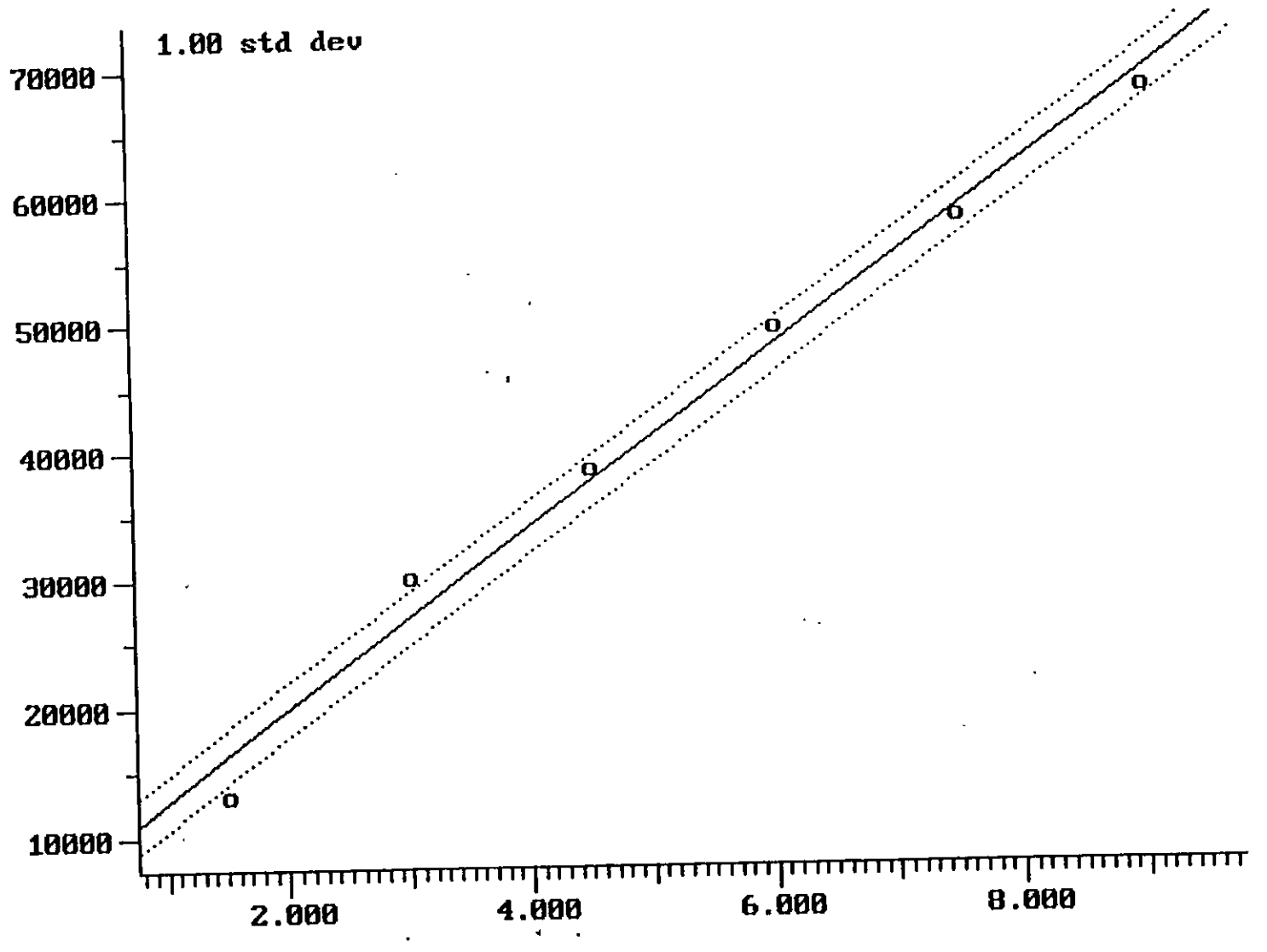
Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.985
Ethyl Ether Compound: 8 of 45 Standard Deviation: 0.863
(Peak Area of Sample) vs (Amount of Sample Injected) (LiniLin)



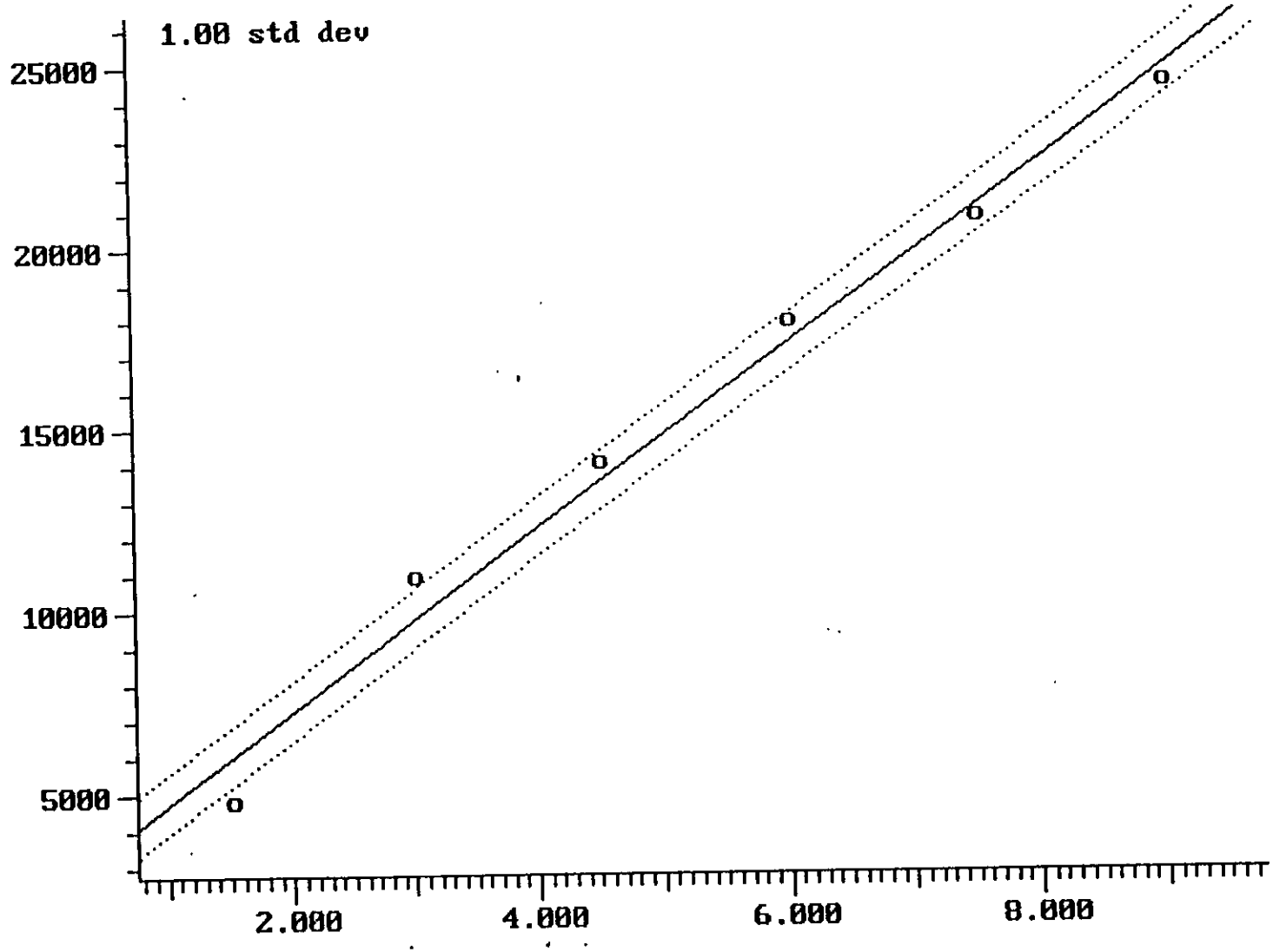
Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.991
1,1-Dichloroethene Compound: 9 of 45 Standard Deviation: 1.823
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin!Lin)



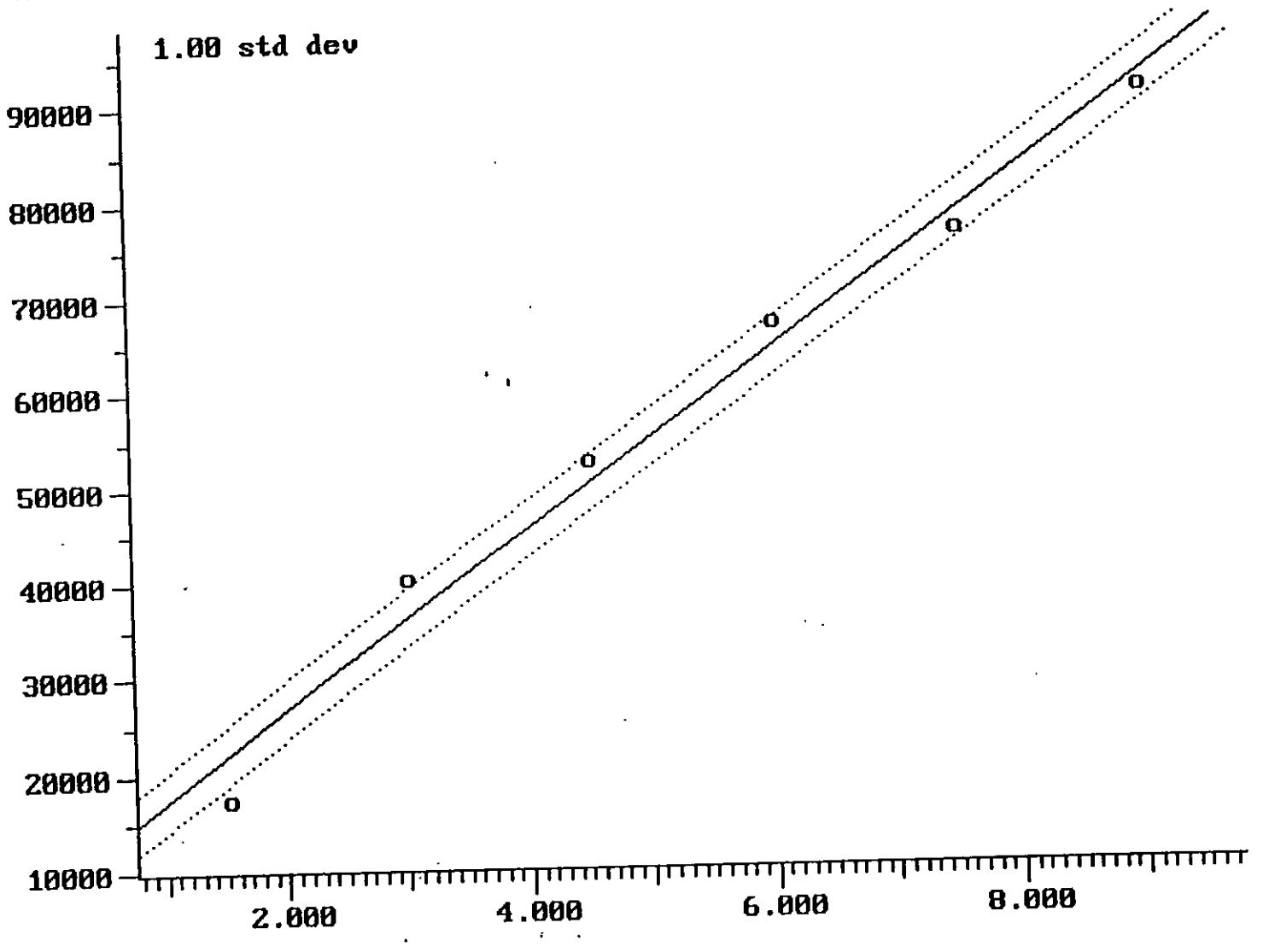
Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.994
Methylene Chloride Compound: 10 of 45 Standard Deviation: 2.024
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin¦Lin)



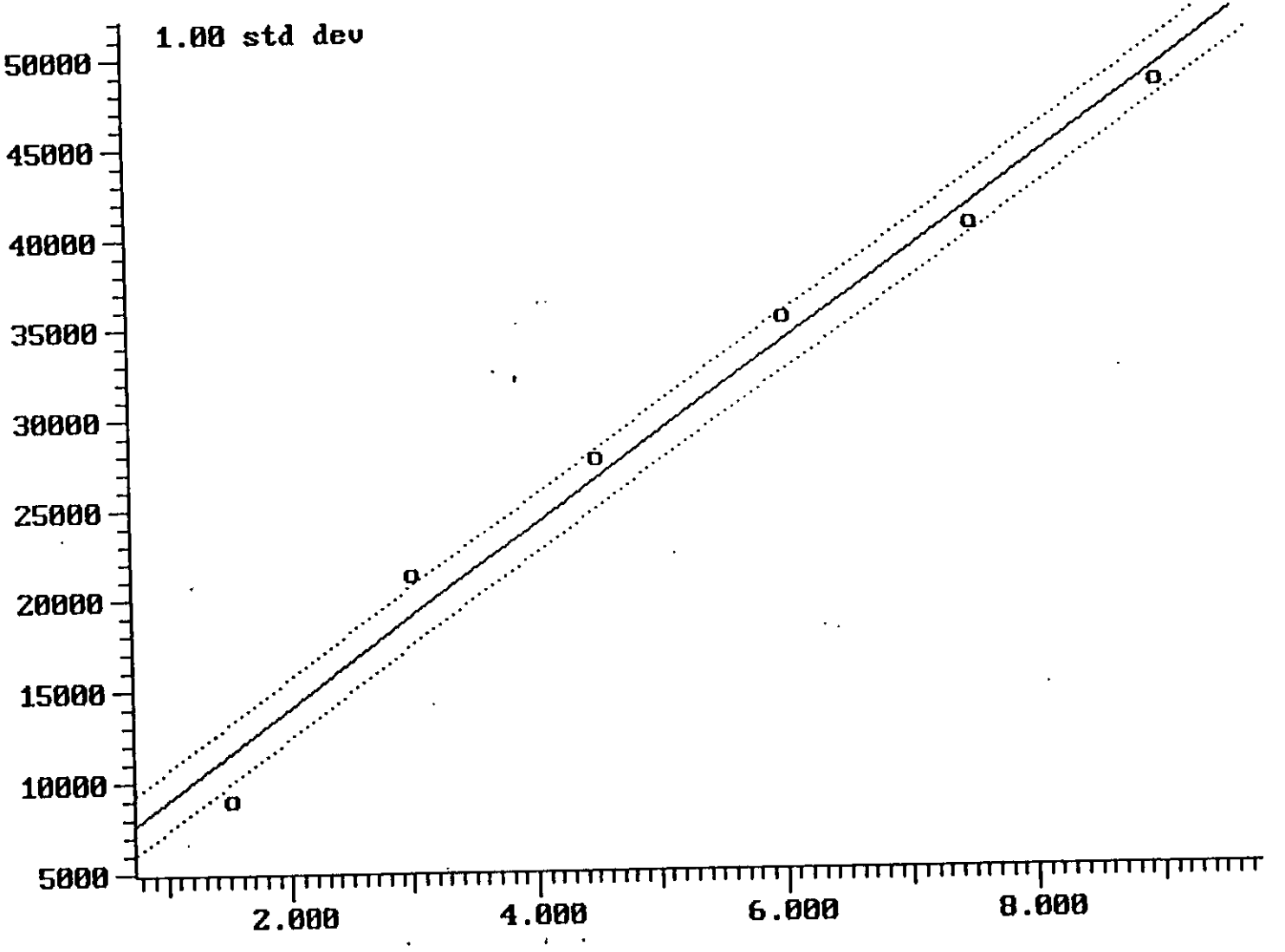
Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.993
Freon 113 Compound: 11 of 45 Standard Deviation: 0.783
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin!Lin)



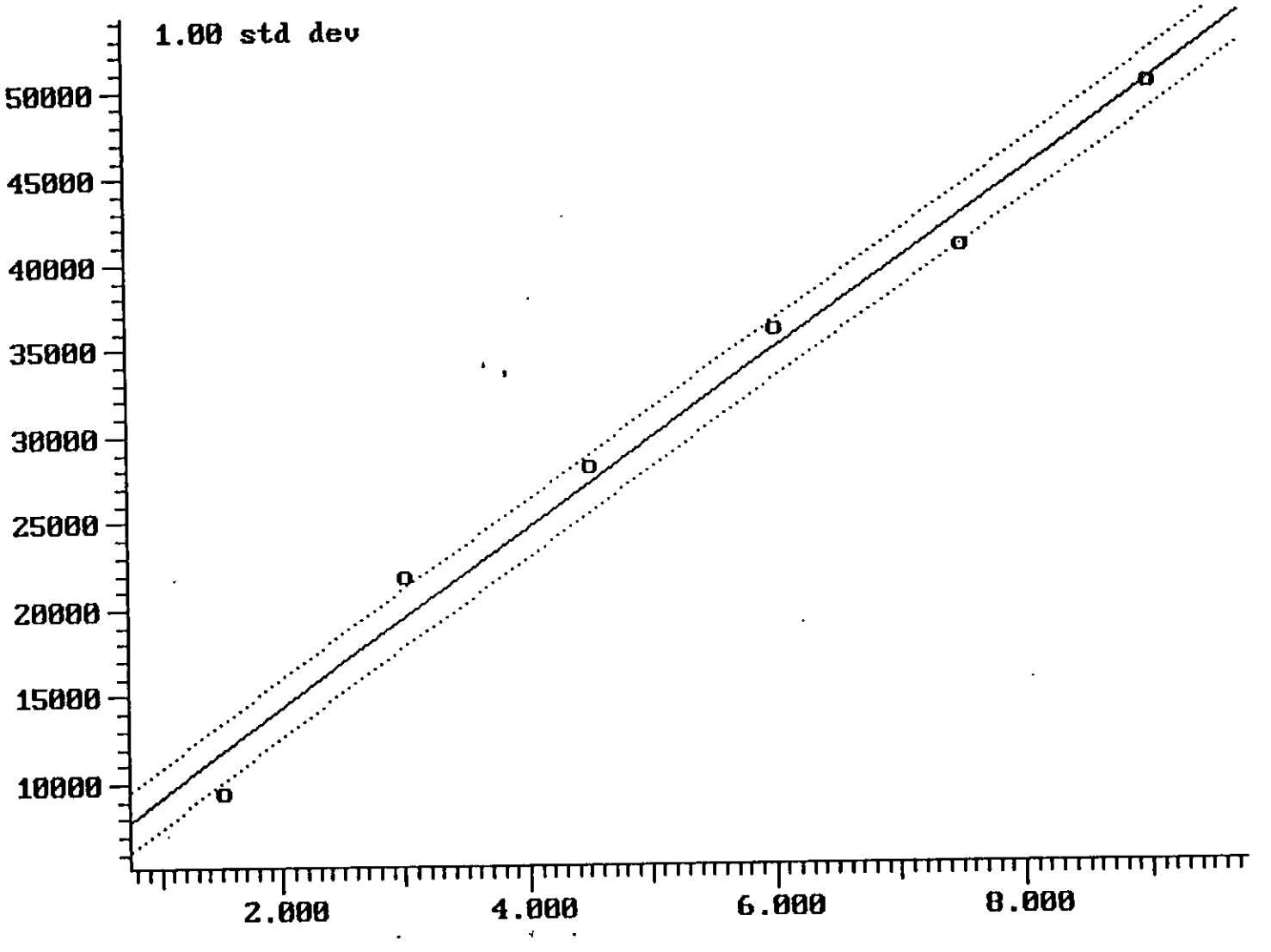
Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.992
Carbon Disulfide Compound: 12 of 45 Standard Deviation: 3.042
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin!Lin)



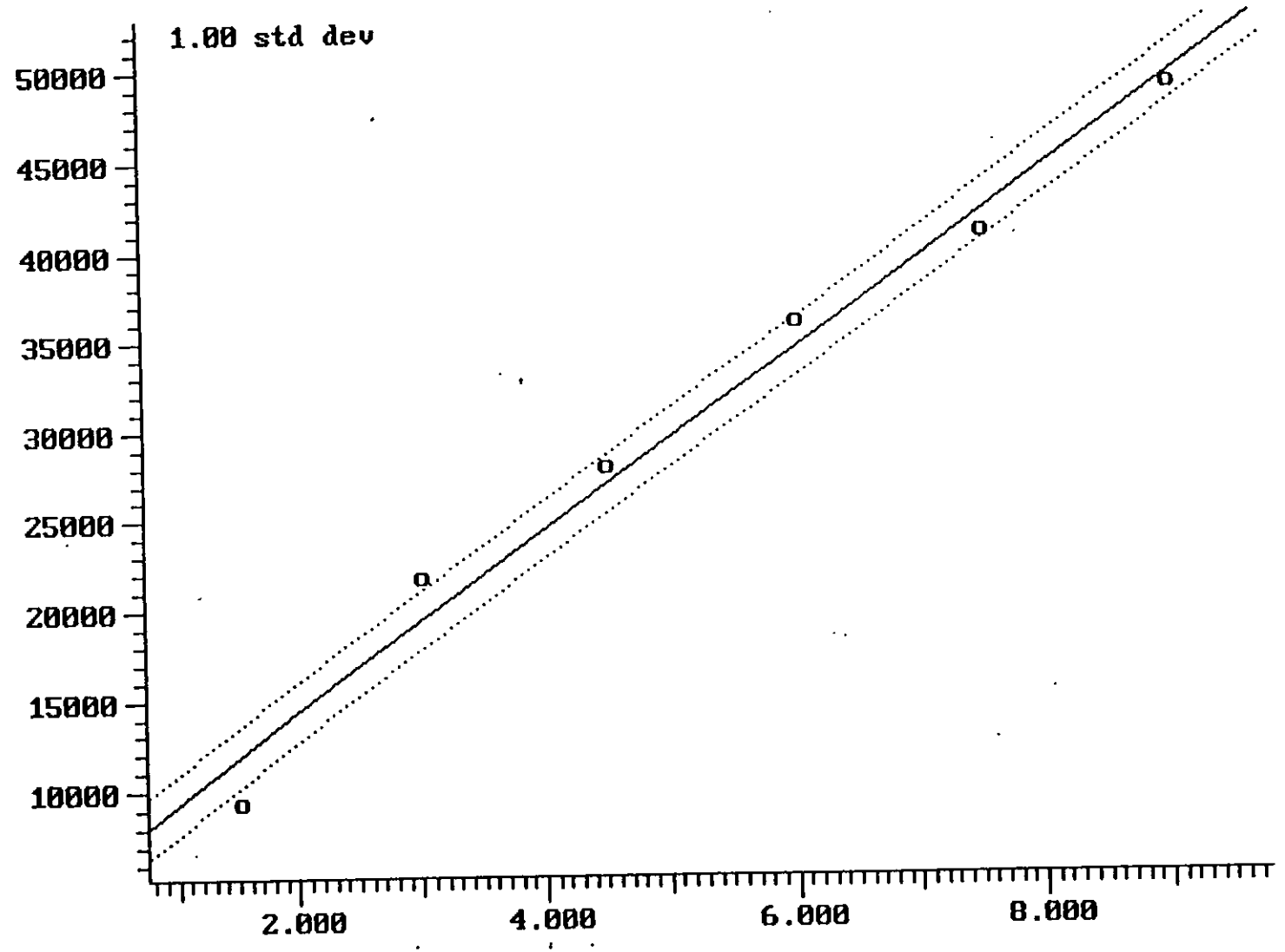
Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.992
Cis-1,2-Dichloroethene Compound: 13 of 45 Standard Deviation: 1.621
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin!Lin)



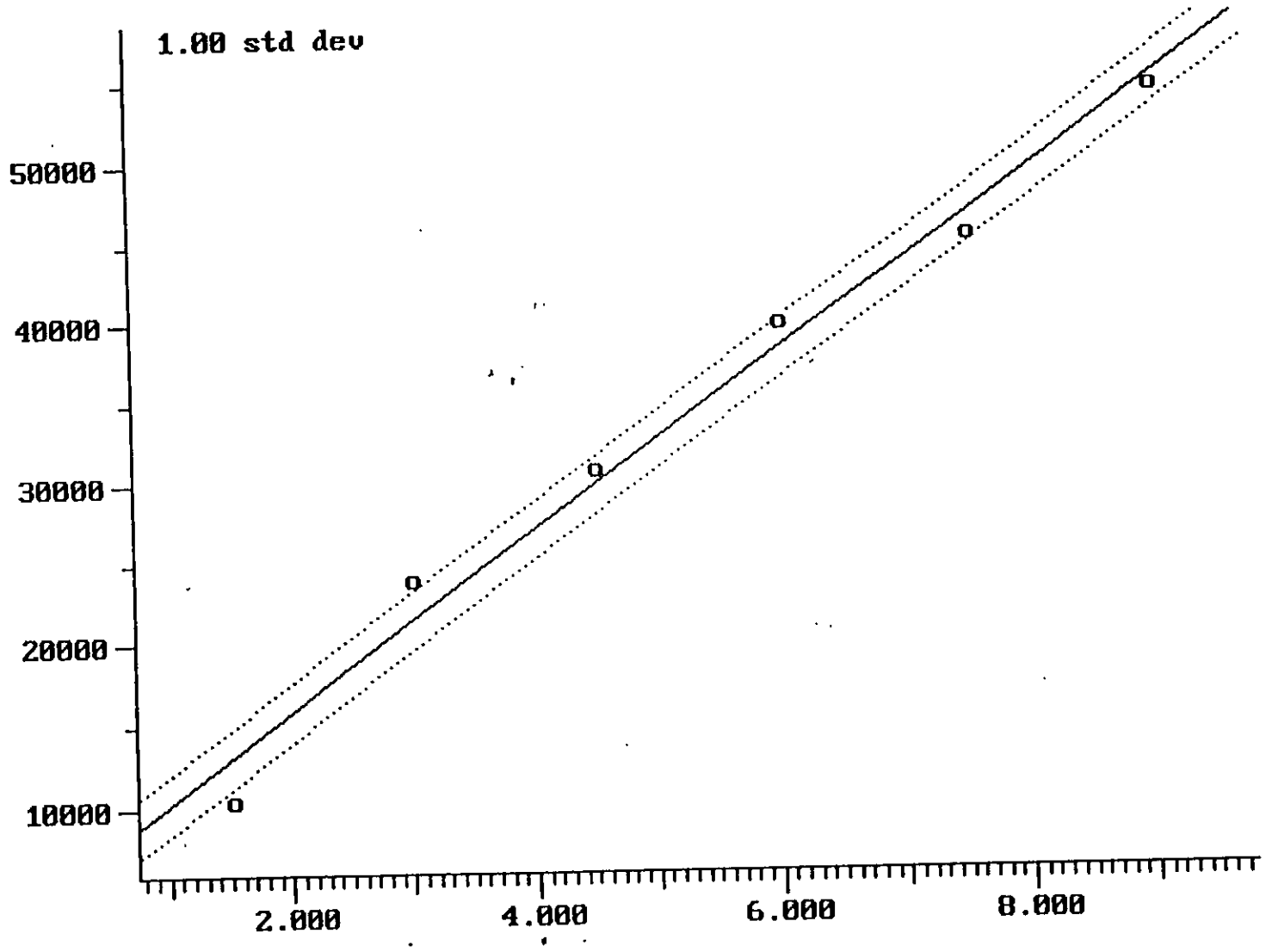
Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.992
1,1-Dichloroethane Compound: 14 of 45 Standard Deviation: 1.622
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin!Lin)



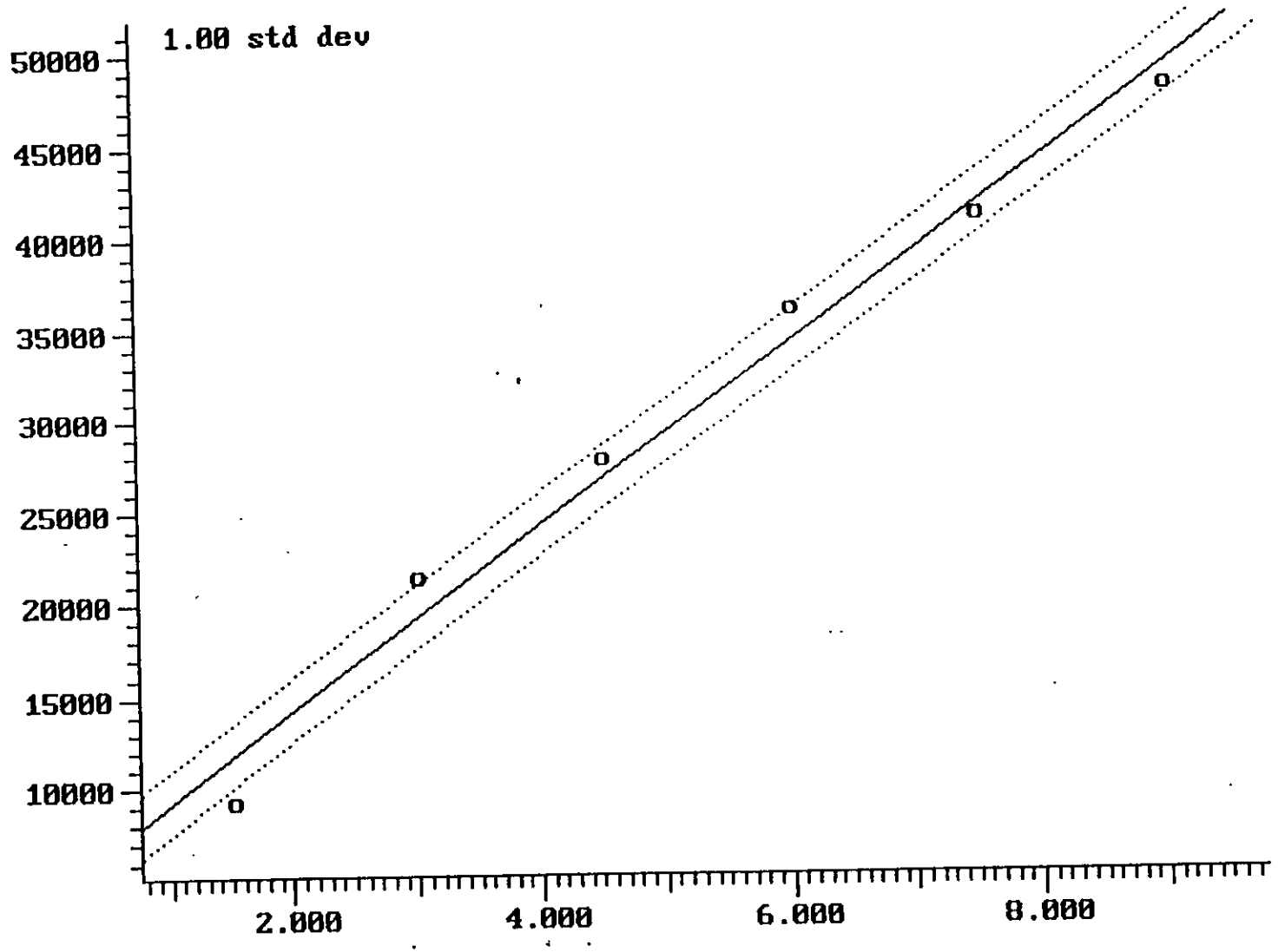
Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.992
Trans-1,2-Dichloroethene Compound: 15 of 45 Standard Deviation: 1.651
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin!Lin)



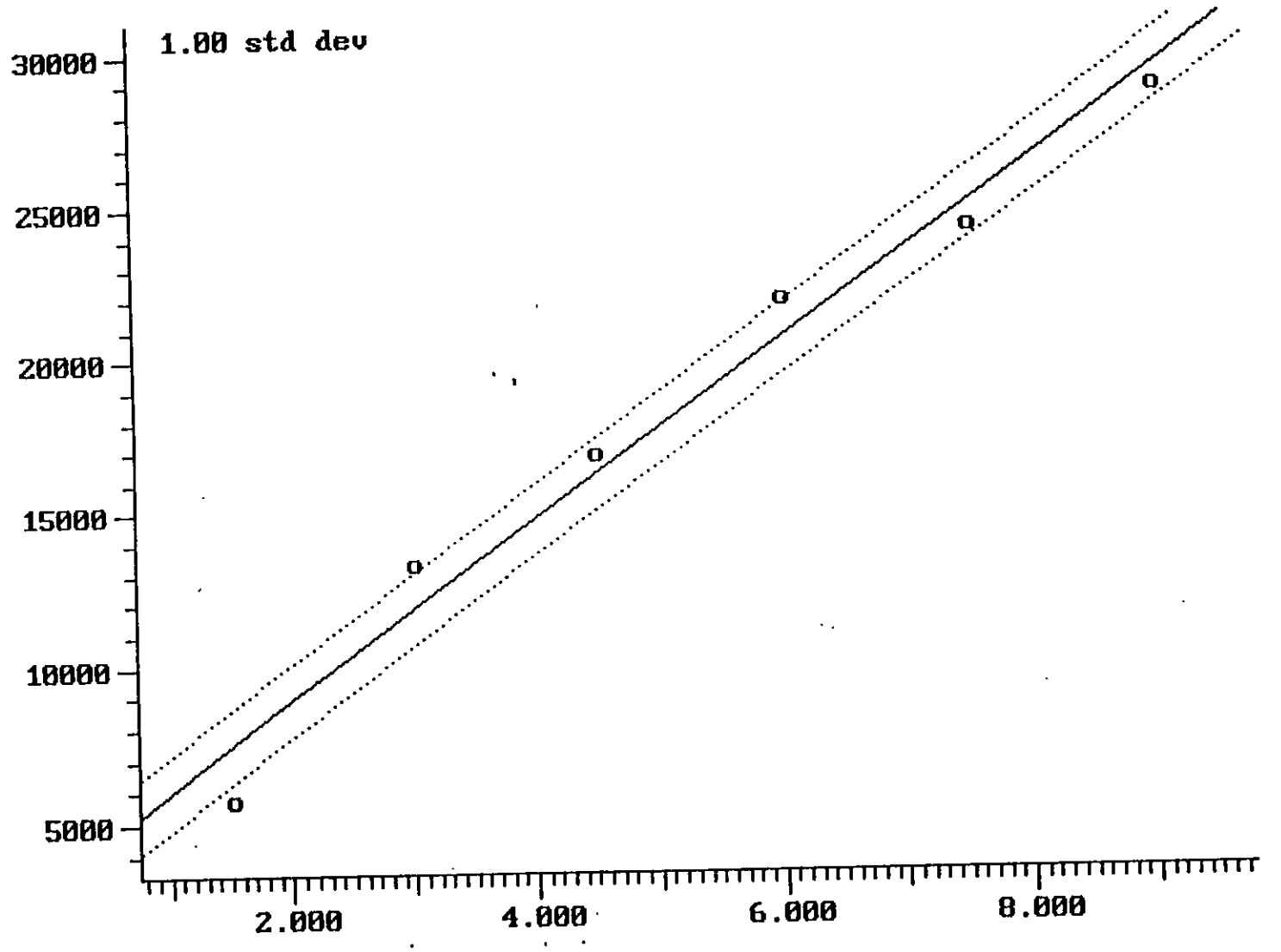
Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.992
Chloroform Compound: 16 of 45 Standard Deviation: 1.762
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin!Lin)



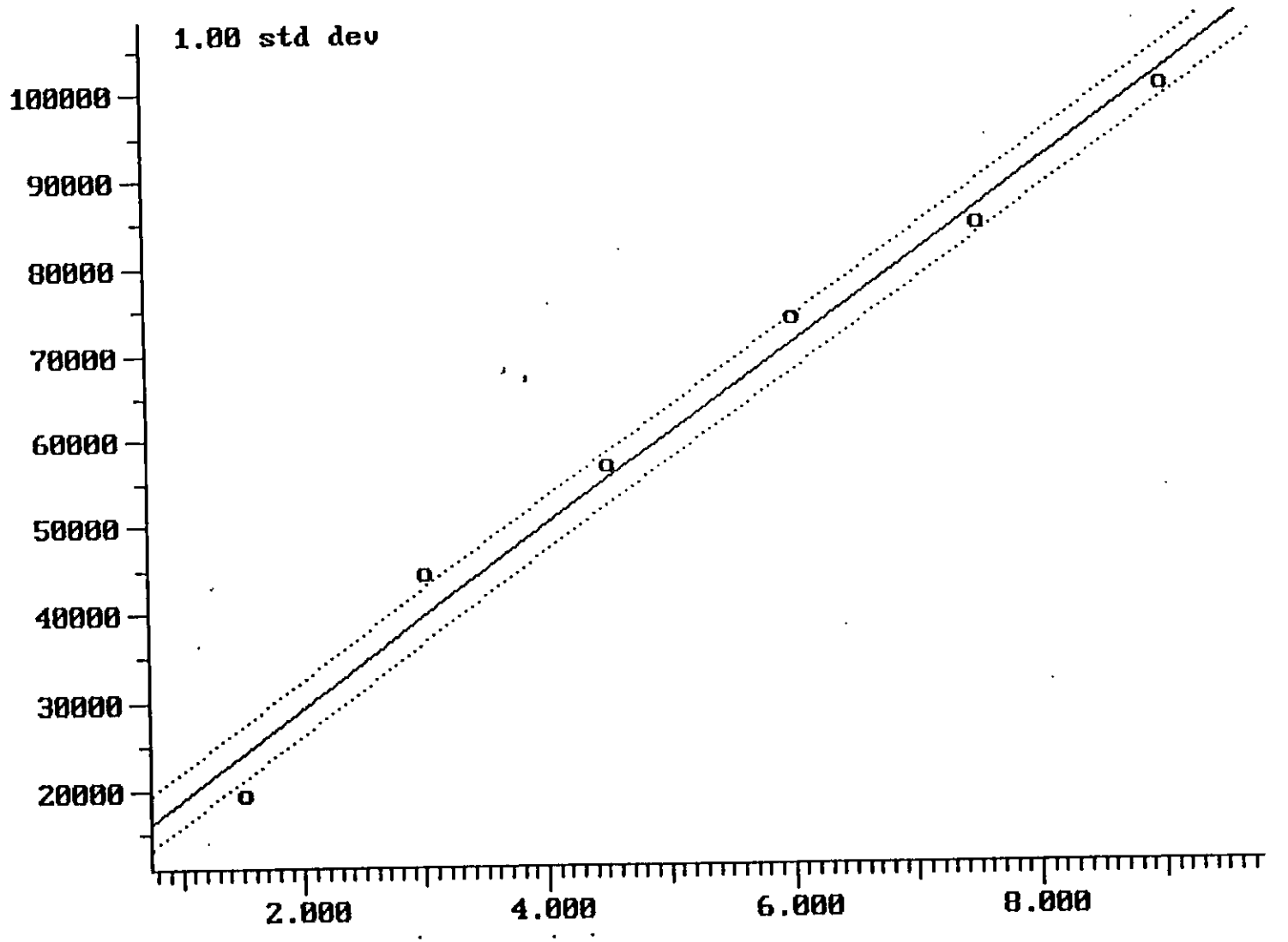
Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.992
1,2-Dichloroethane Compound: 17 of 45 Standard Deviation: 1.675
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin|Lin)



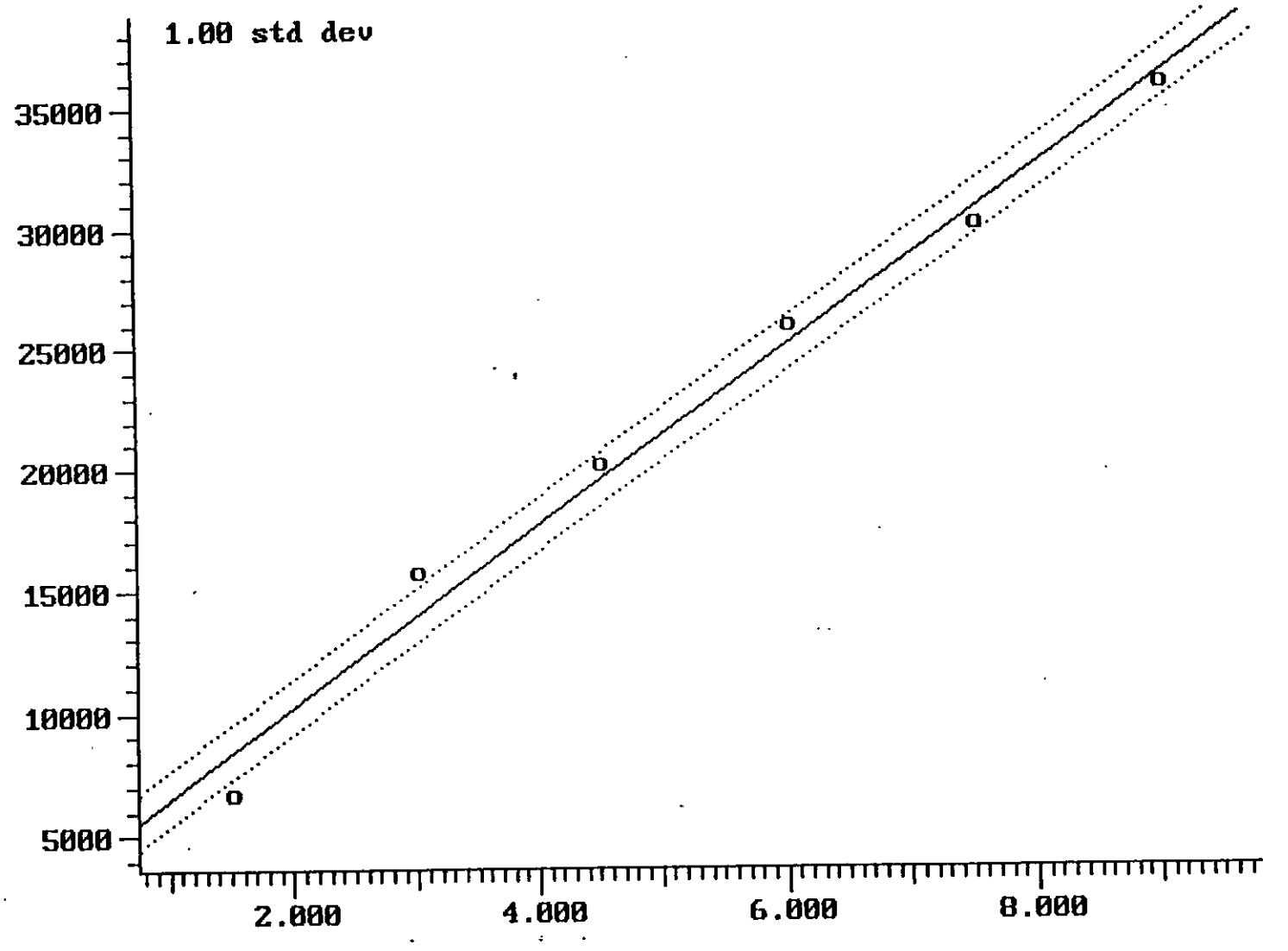
Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.988
1,1,1-Trichloroethane Compound: 18 of 45 Standard Deviation: 1.163
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin!Lin)



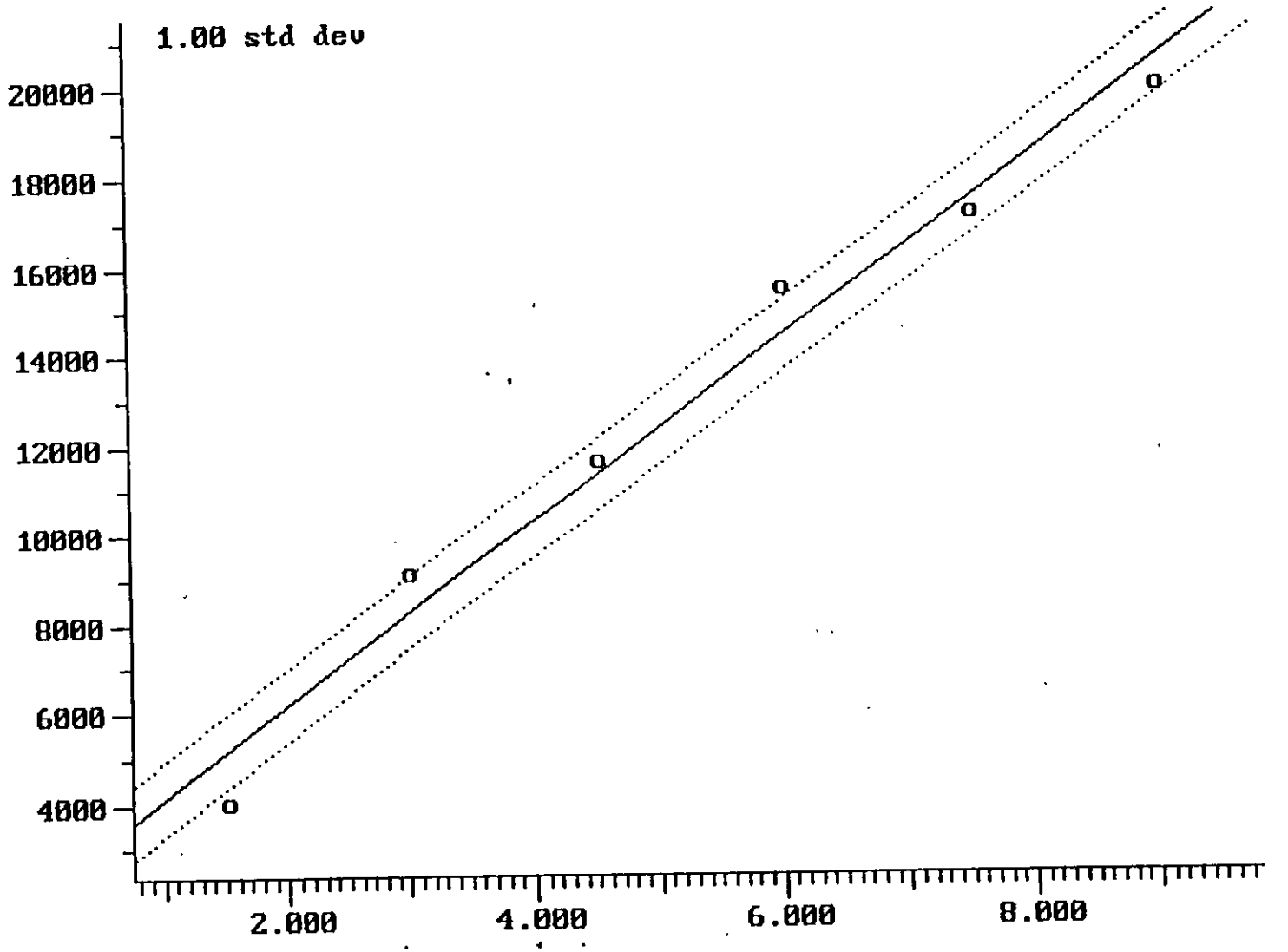
Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.993
Benzene Compound: 19 of 45 Standard Deviation: 3.199
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin|Lin)



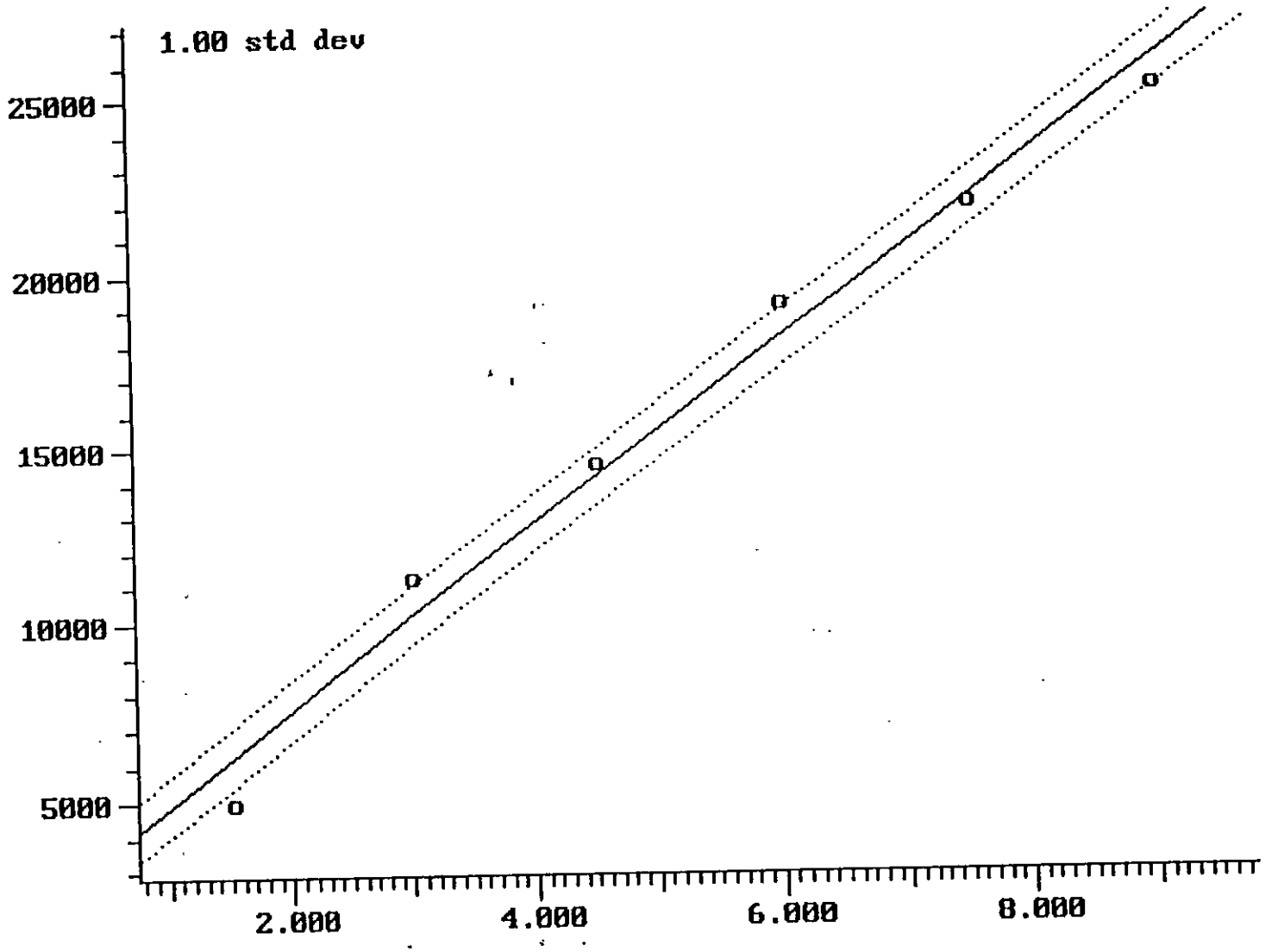
Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.993
Carbontetrachloride Compound: 20 of 45 Standard Deviation: 1.122
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin!Lin)



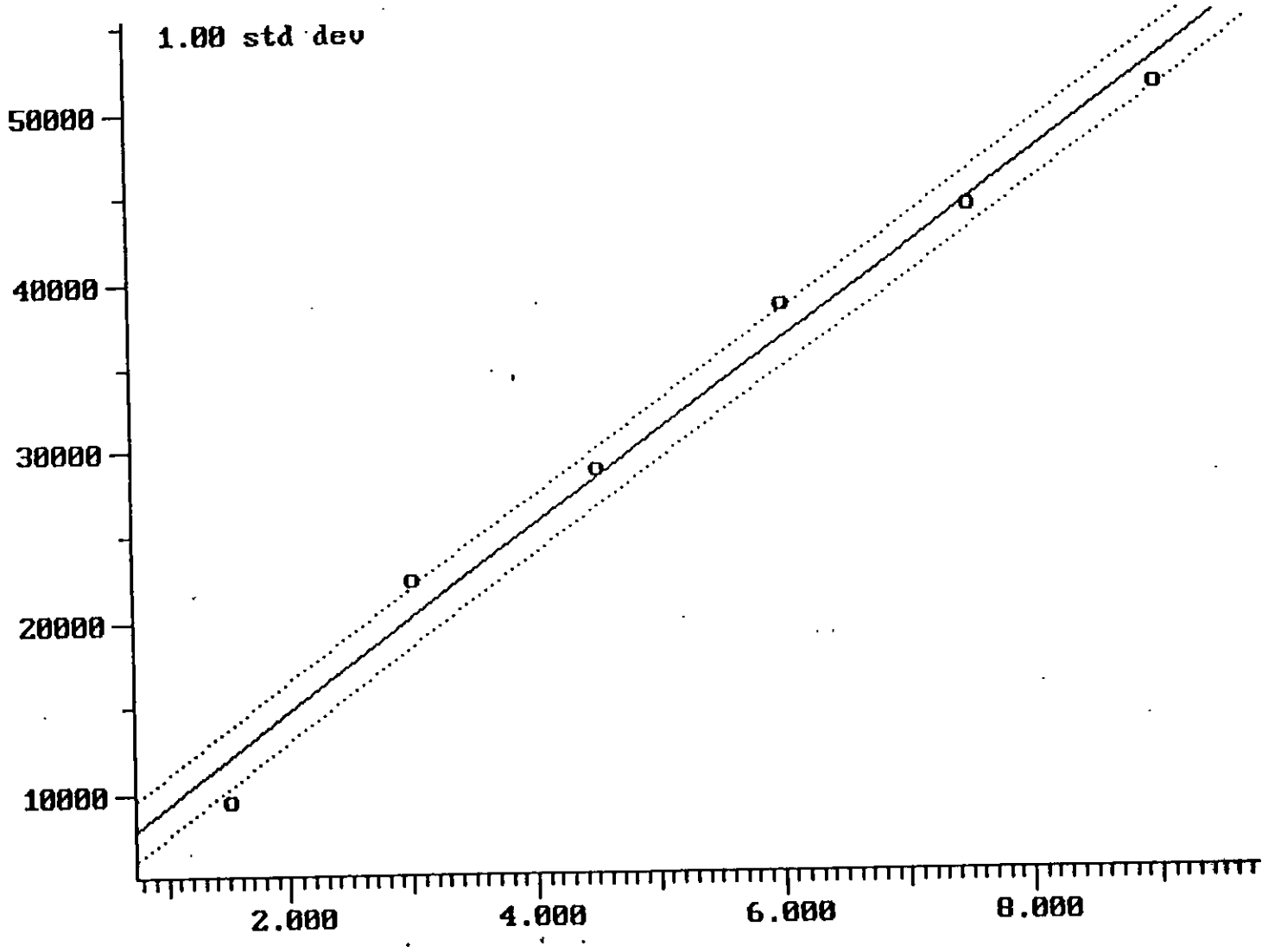
Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.989
1,2-Dichloropropane Compound: 21 of 45 Standard Deviation: 0.798
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin|Lin)



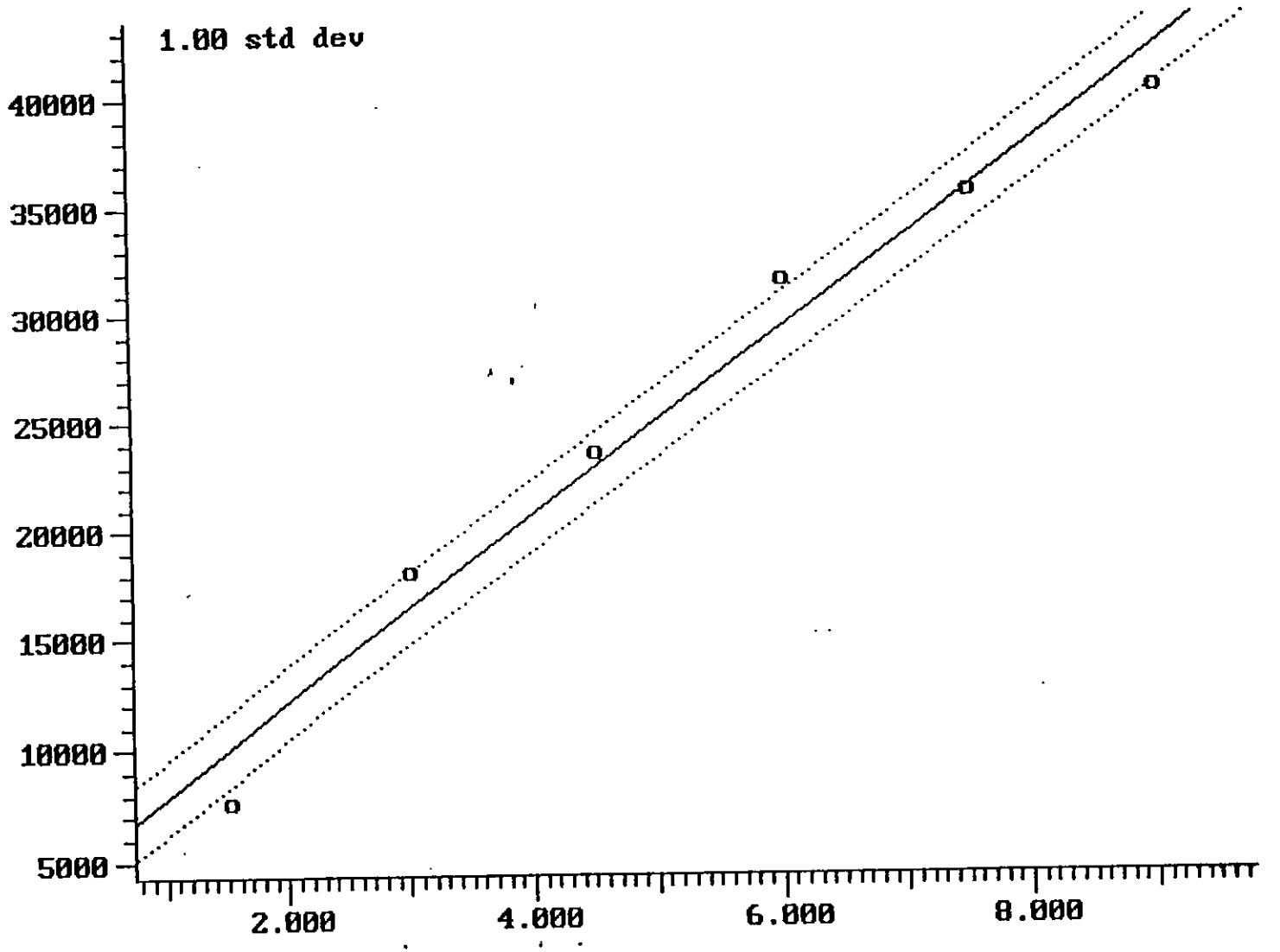
Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.992
Trichloroethene Compound: 22 of 45 Standard Deviation: 0.863
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin!Lin)



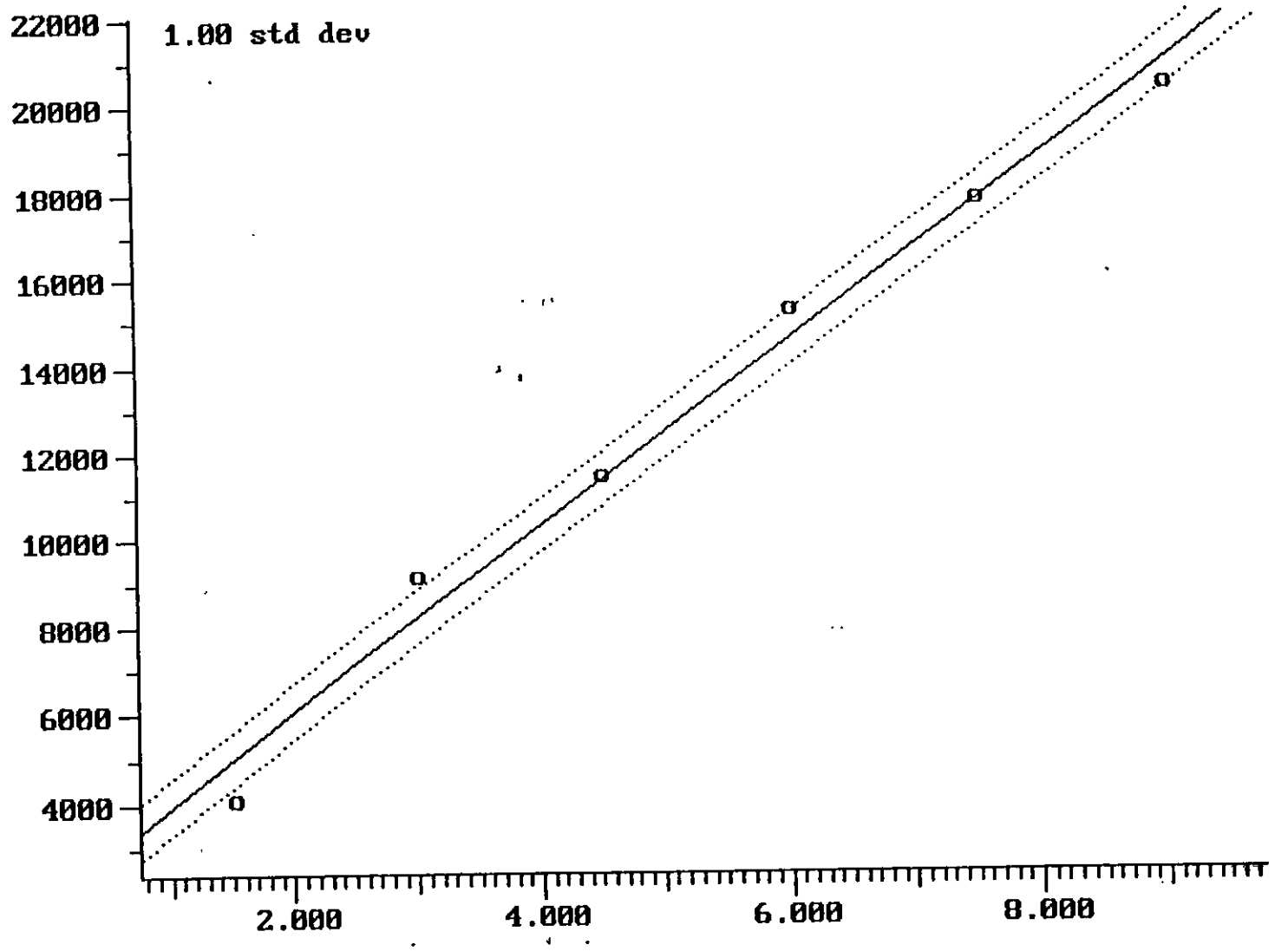
Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.993
Cis-1,3-Dichloropropene Compound: 23 of 45 Standard Deviation: 1.690
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin!Lin)



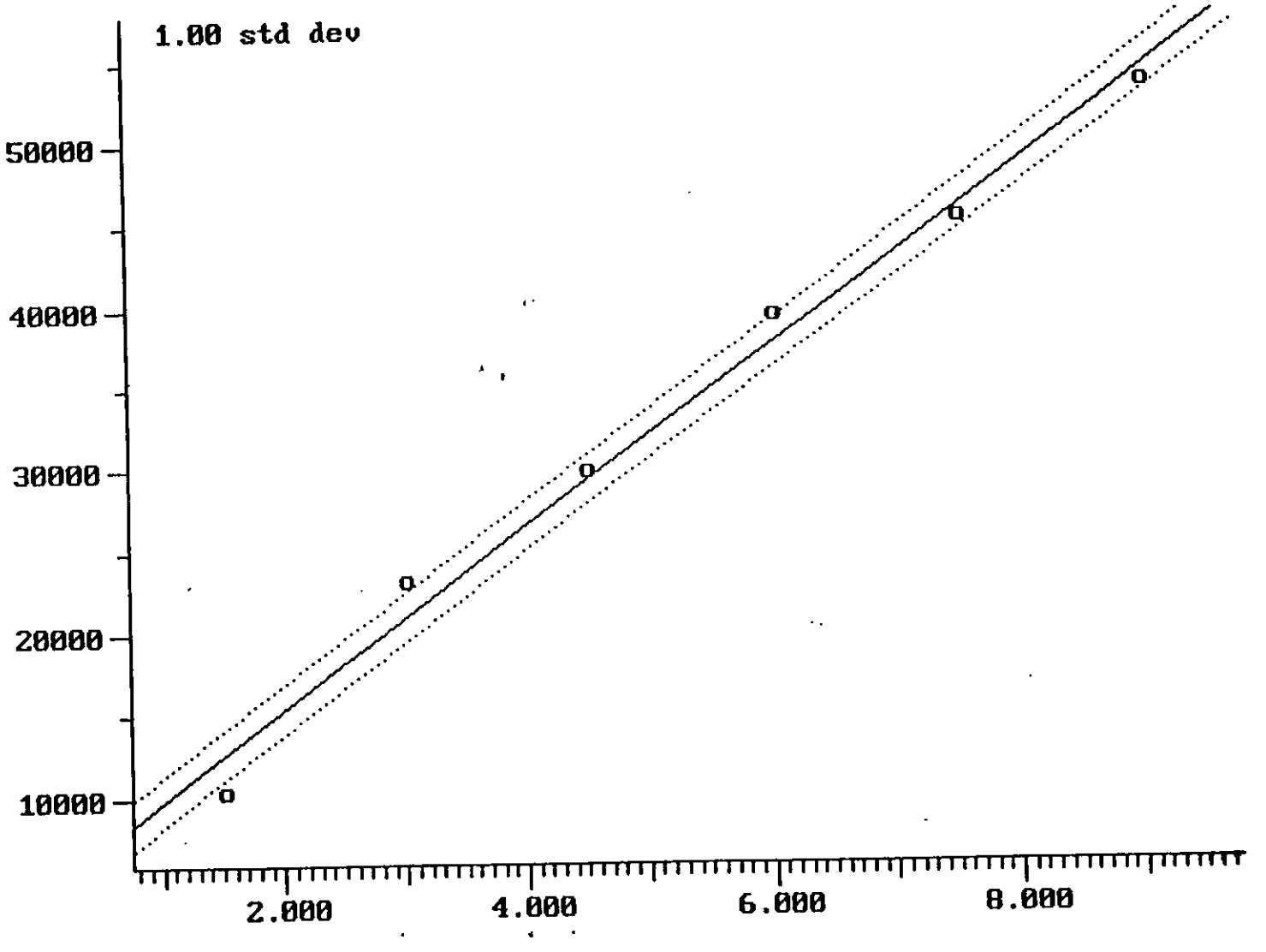
Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.988
Trans-1,3-Dichloropropene Compound: 24 of 45 Standard Deviation: 1.680
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin!Lin)



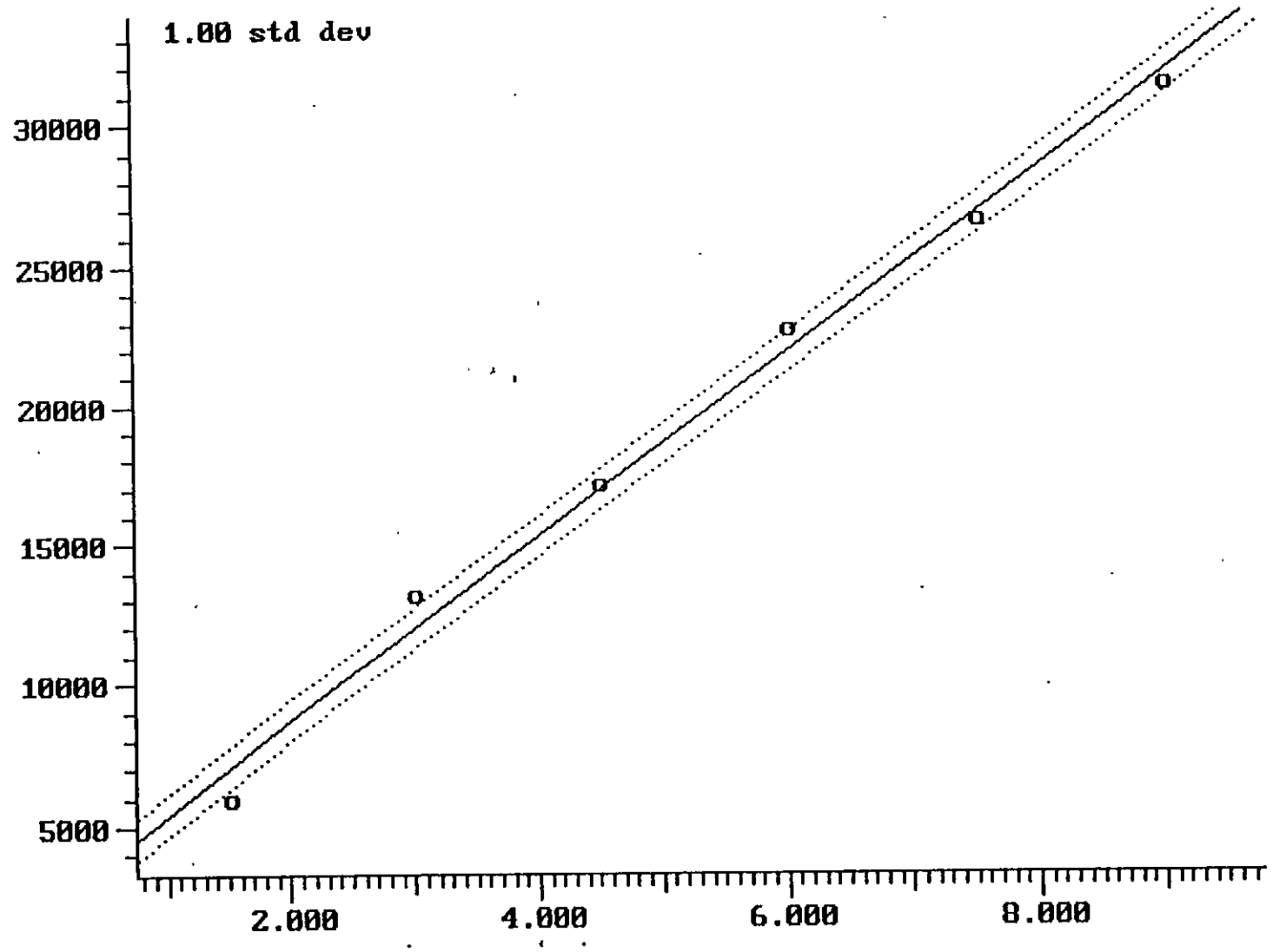
Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.993
1,1,2-Trichloroethane Compound: 25 of 45 Standard Deviation: 0.642
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin!Lin)



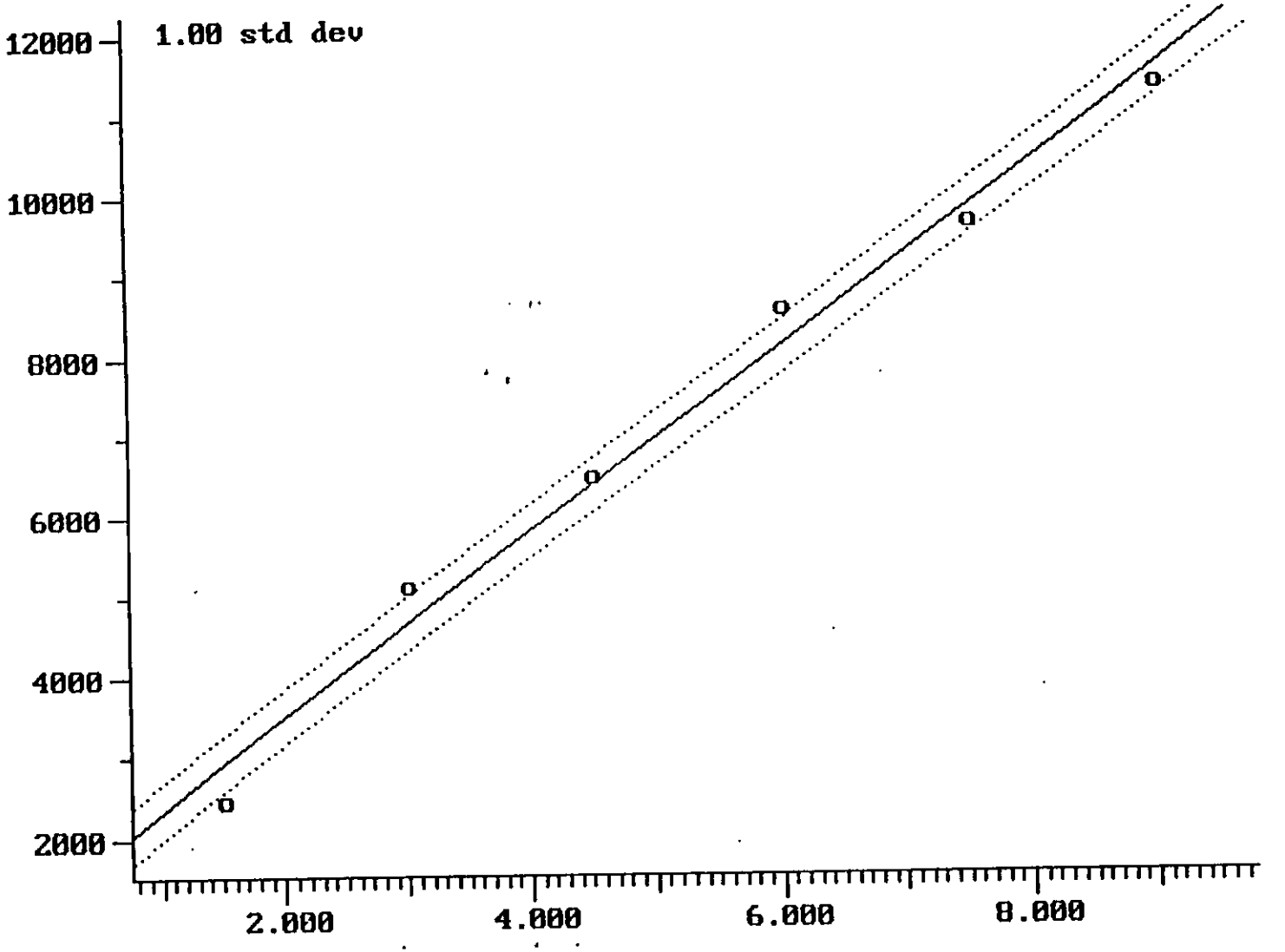
Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.994
Toluene Compound: 26 of 45 Standard Deviation: 1.547
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin!Lin)

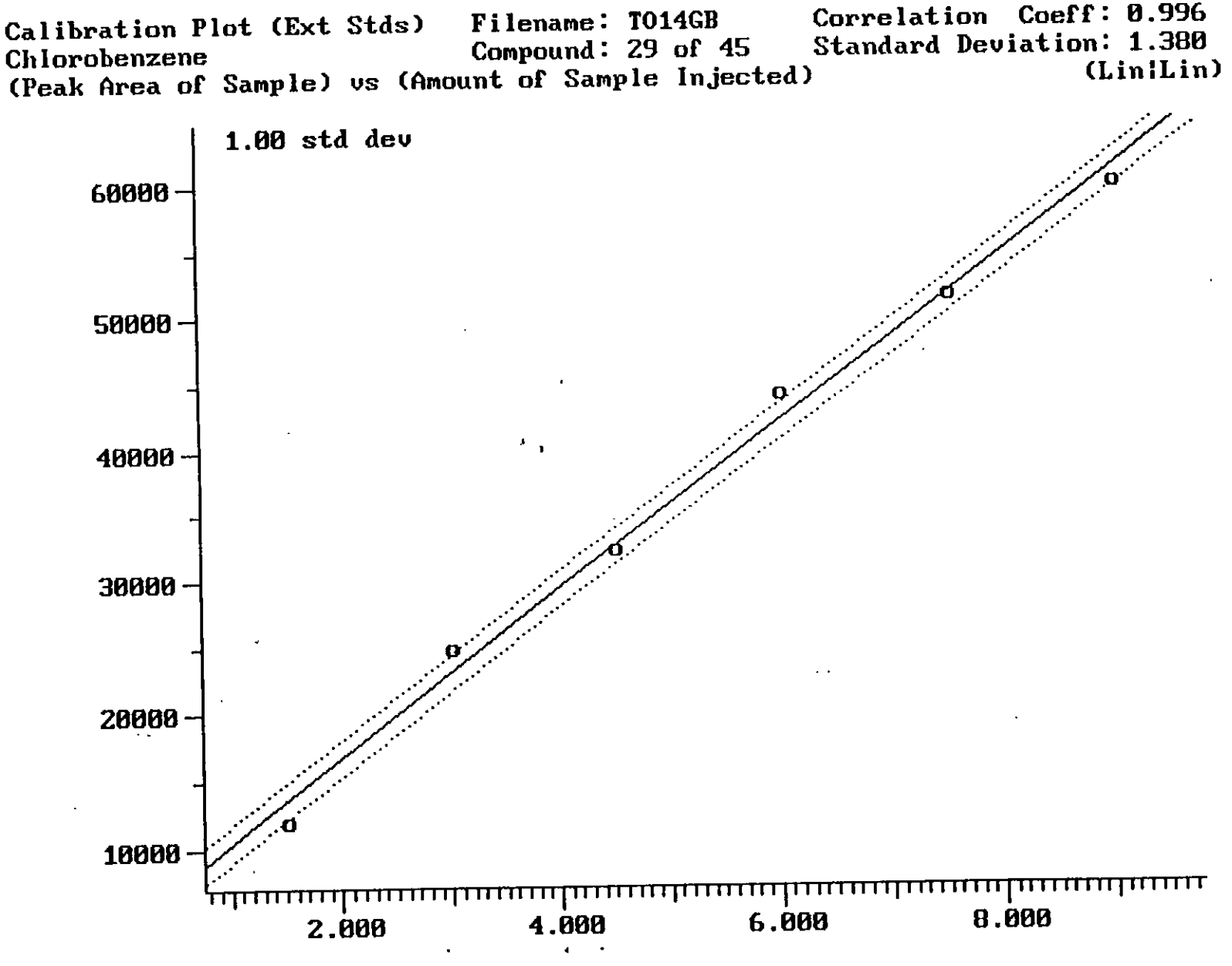


Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.996
1,2-Dibromoethane Compound: 27 of 45 Standard Deviation: 0.768
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin!Lin)

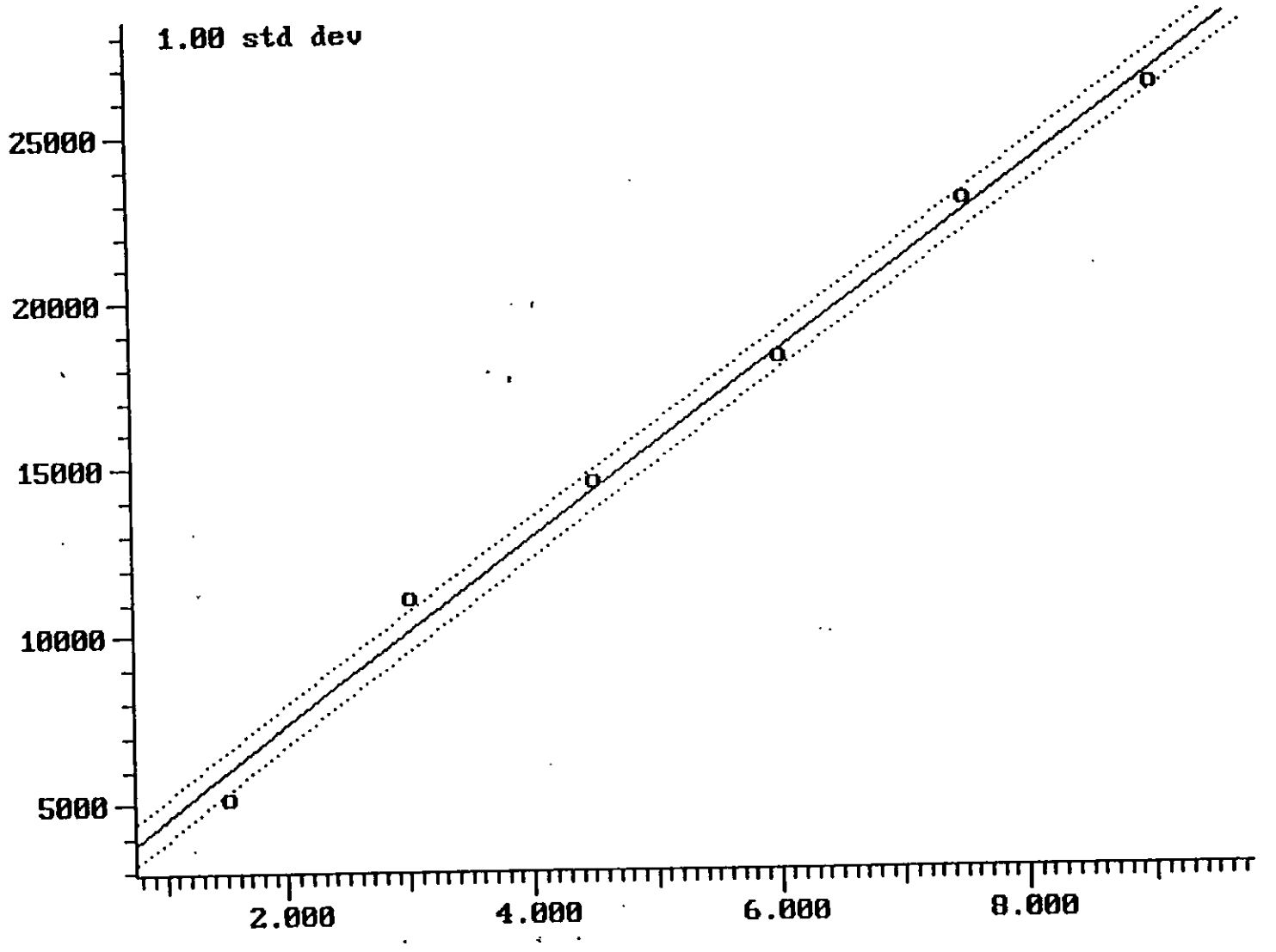


Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.993
Tetrachloroethene Compound: 28 of 45 Standard Deviation: 0.342
(Peak Area of Sample) vs (Amount of Sample Injected) (LiniLin)

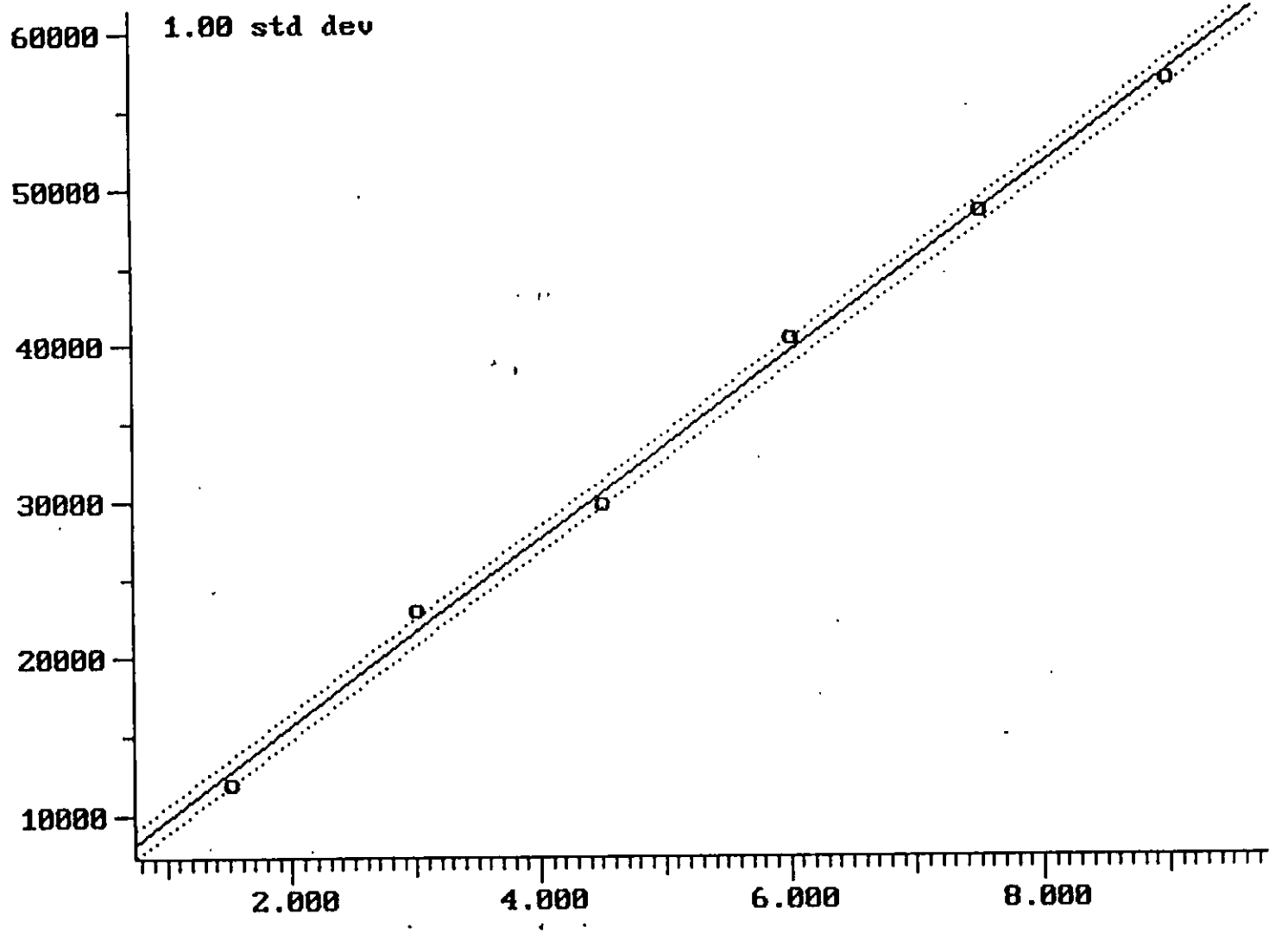



Calibration Plot (Ext Stds)
Chlorobenzene
(Peak Area of Sample) vs (Amount of Sample Injected)
Filename: T014GB
Compound: 29 of 45
Correlation Coeff: 0.996
Standard Deviation: 1.380
(Lin¦Lin)
1.00 std dev
60000
50000
40000
30000
20000
10000
2.000
4.000
6.000
8.000

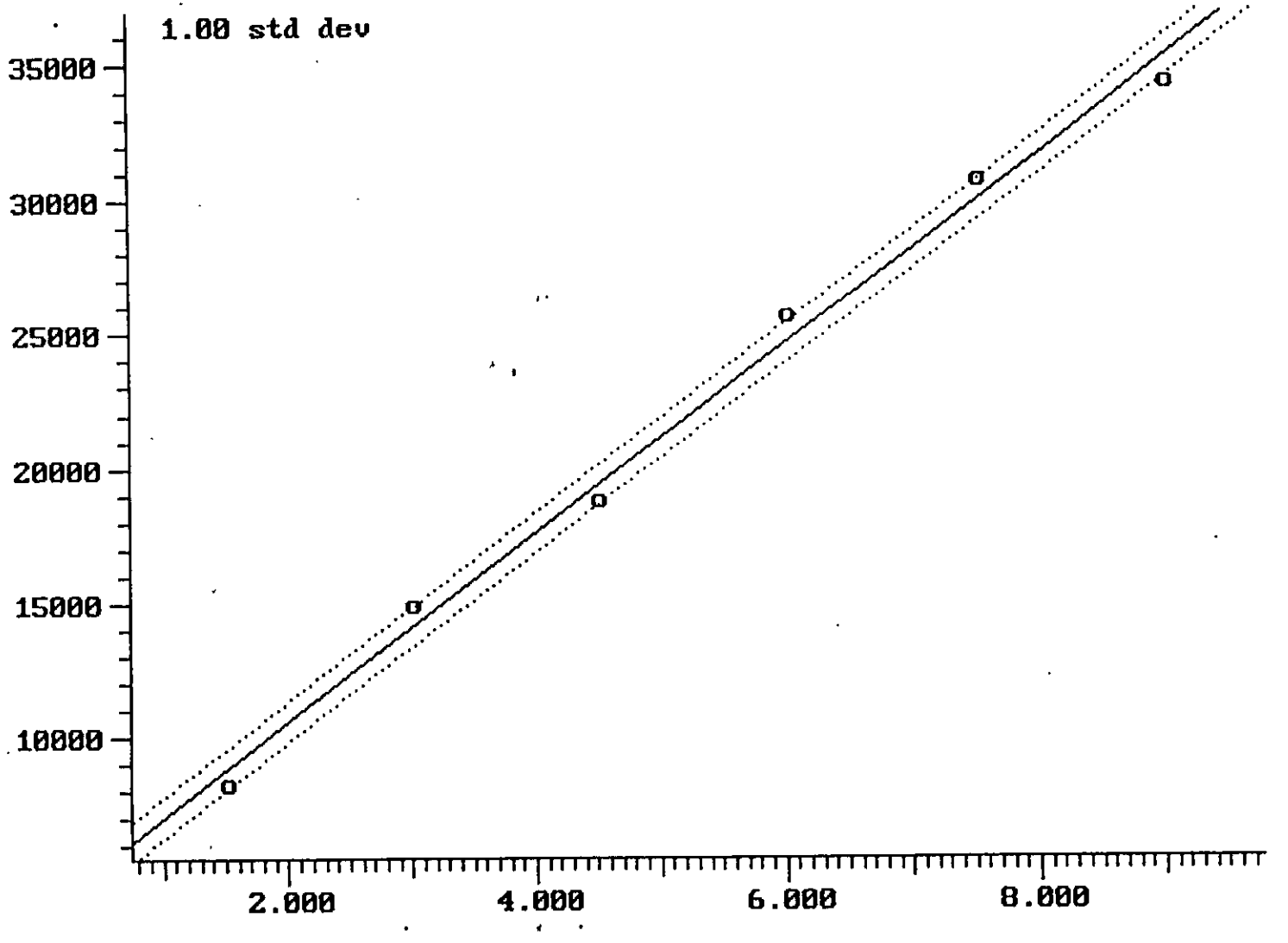
Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.997
Ethylbenzene Compound: 30 of 45 Standard Deviation: 0.577
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin!Lin)



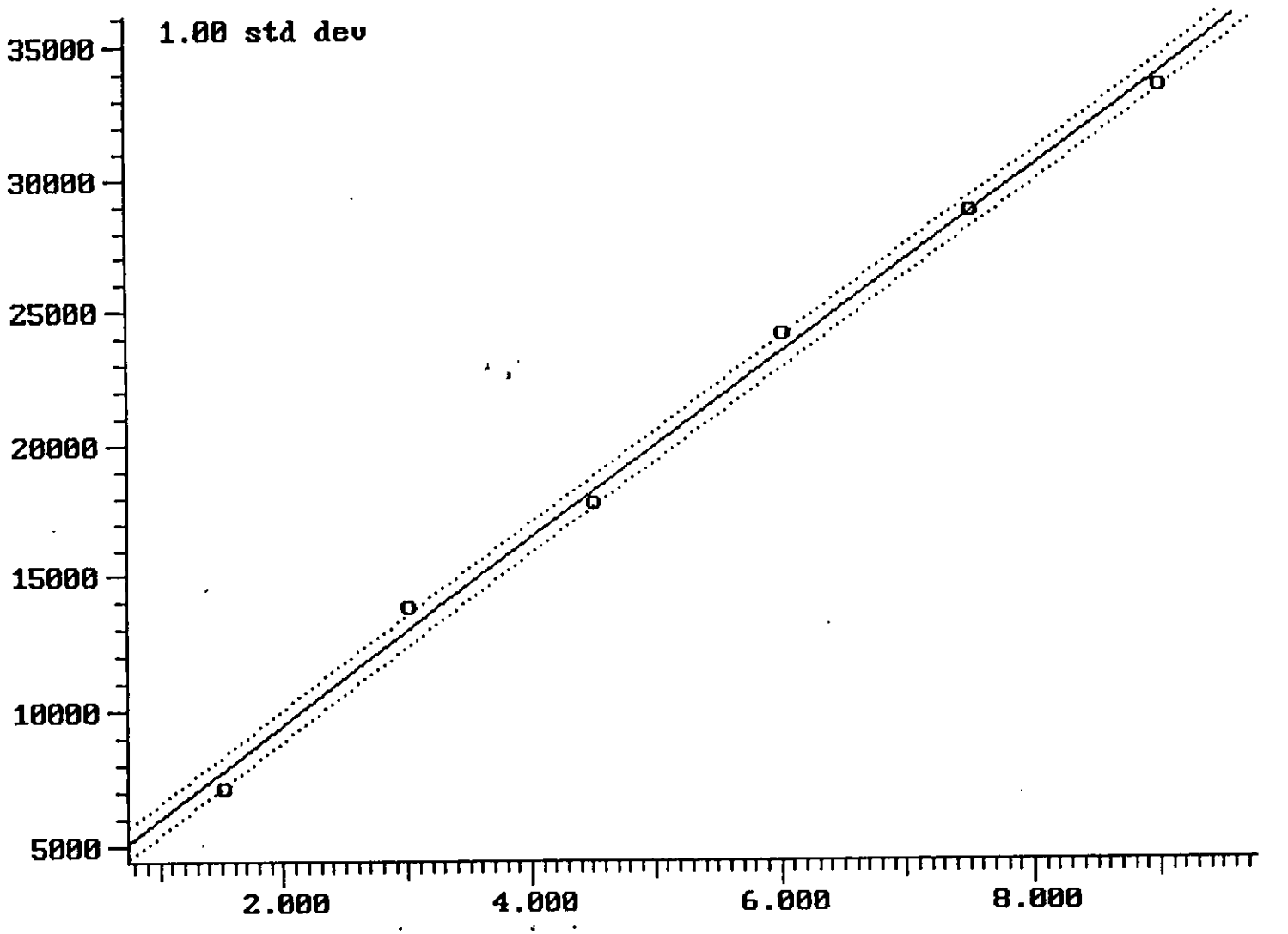
Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.999
Styrene Compound: 32 of 45 Standard Deviation: 0.809
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin|Lin)



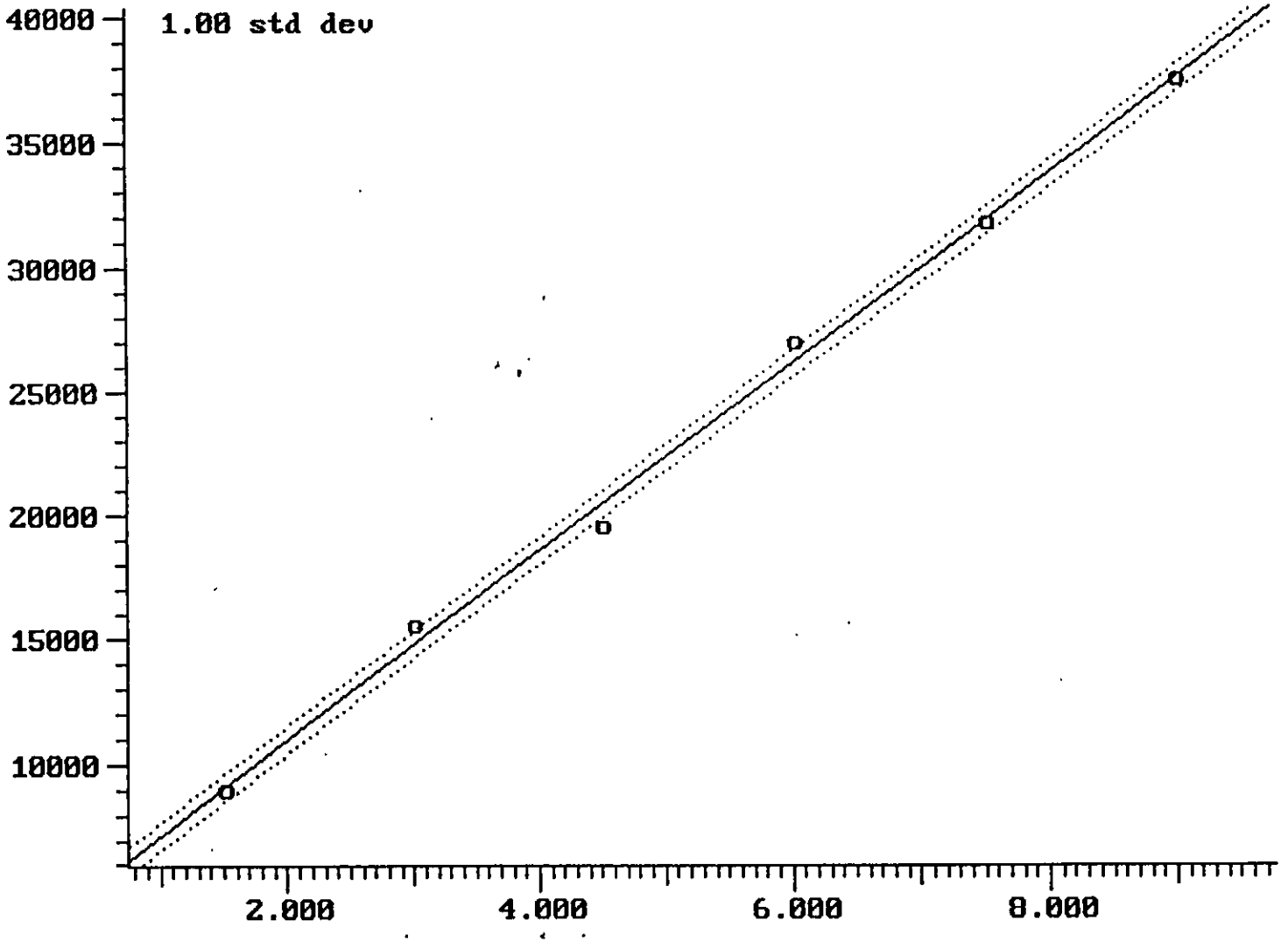
Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.996
1,1,2,2-Tetrachloroethane Compound: 33 of 45 Standard Deviation: 0.786
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin!Lin)



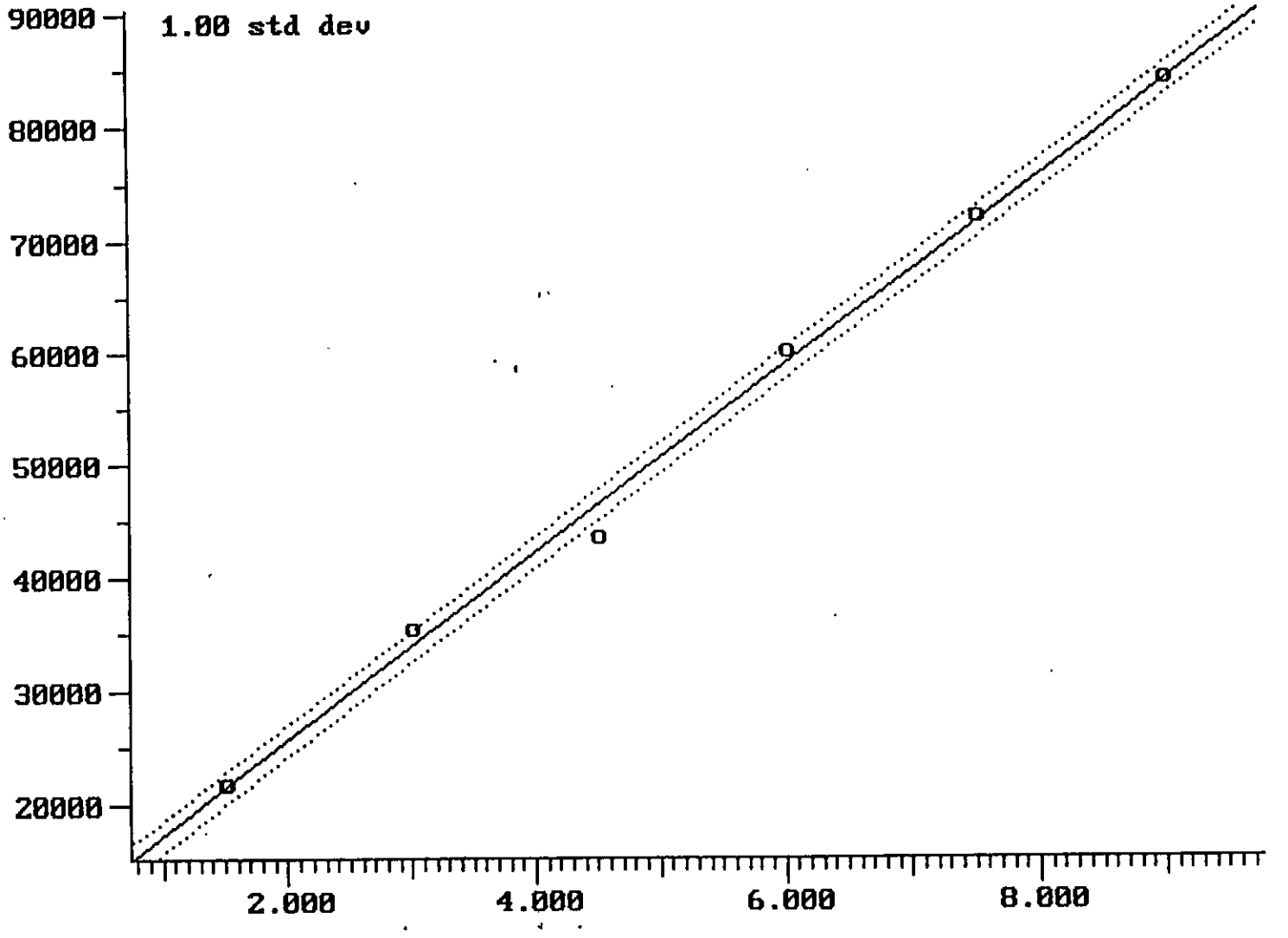
Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.998
1,2-Xylene Compound: 34 of 45 Standard Deviation: 0.579
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin!Lin)



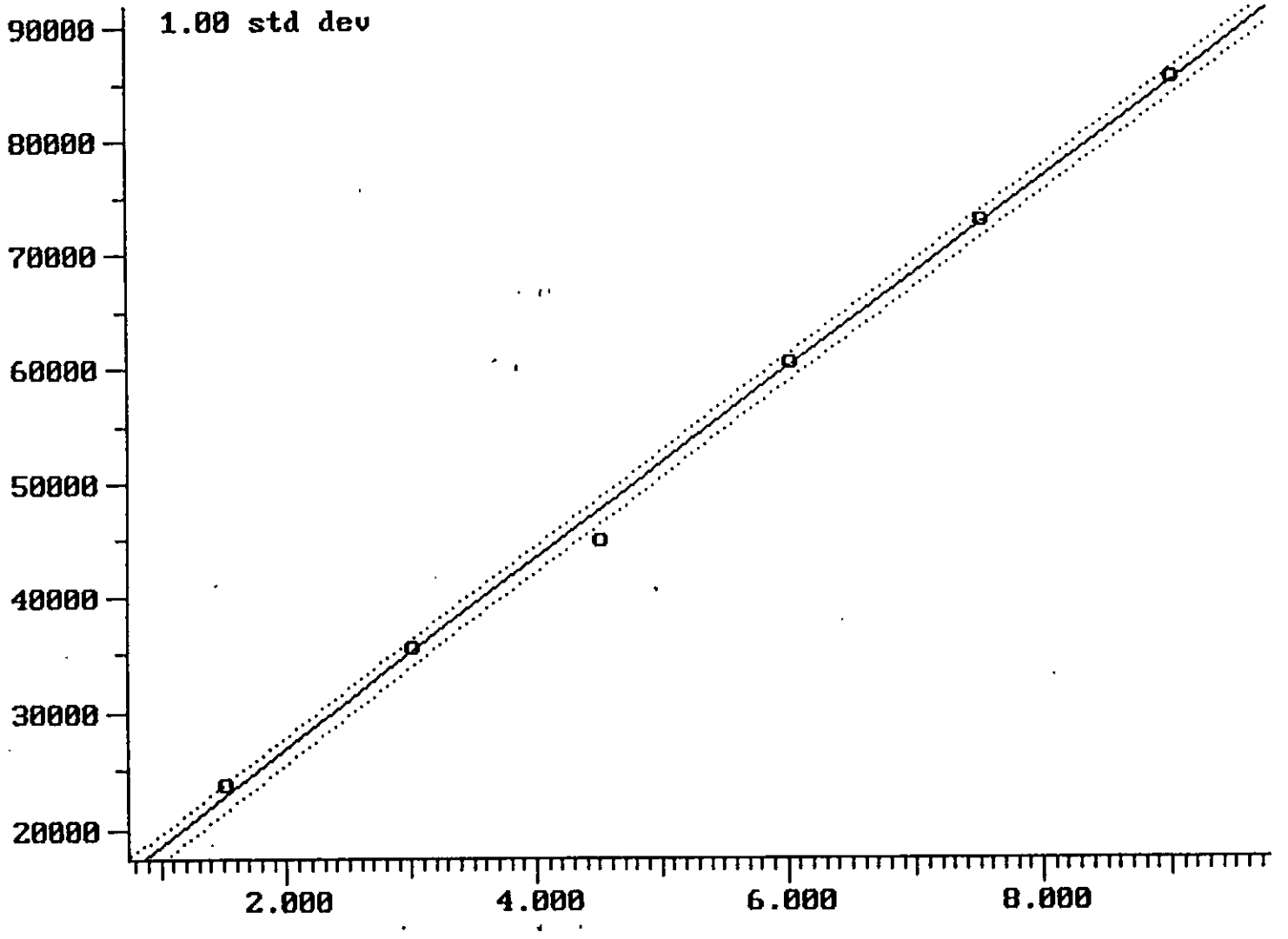
Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.998
4-Bromofluorobenzene Compound: 35 of 45 Standard Deviation: 0.585
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin!Lin)



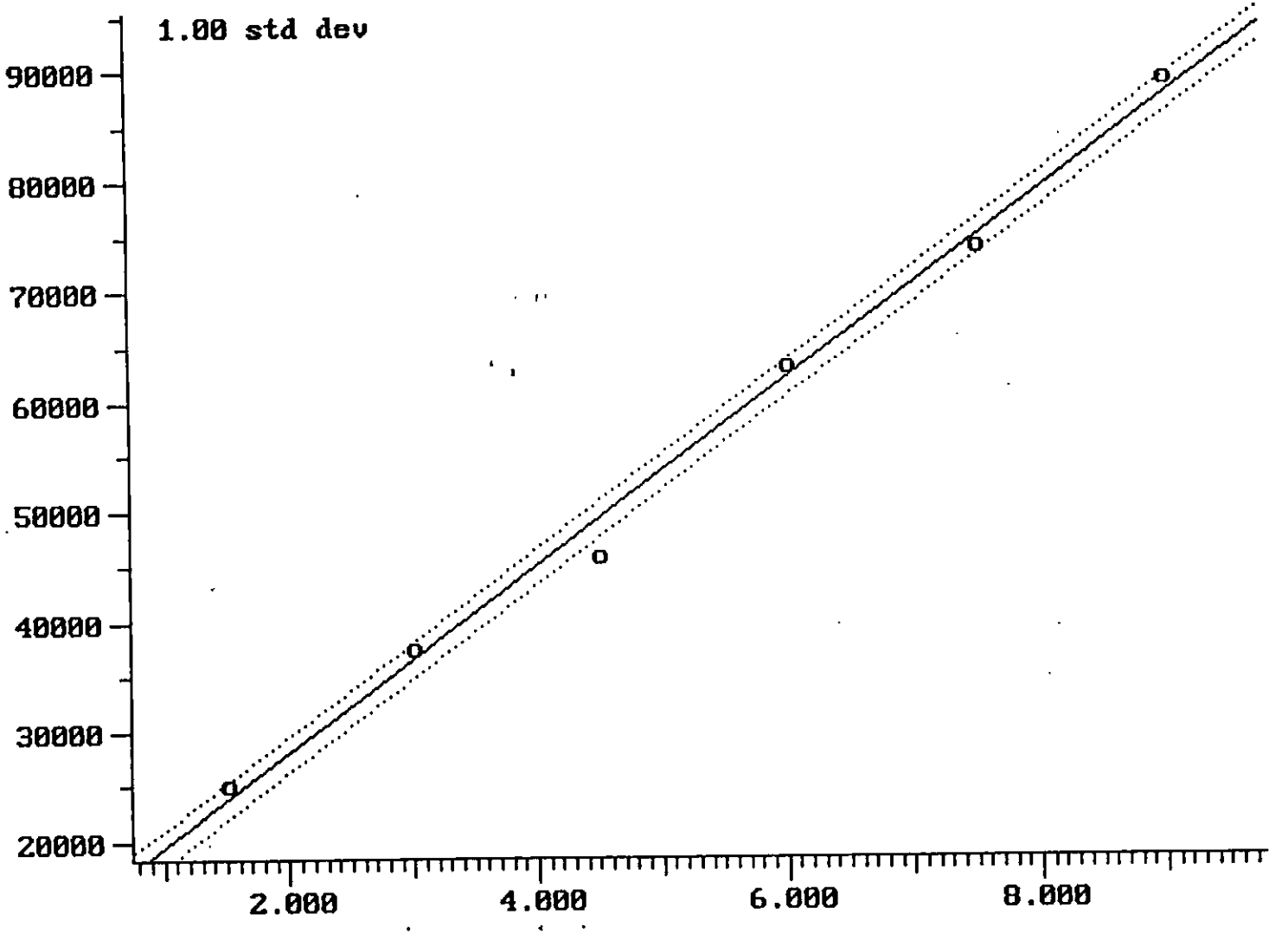
Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.998
Benzylchloride Compound: 36 of 45 Standard Deviation: 1.452
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin!Lin)



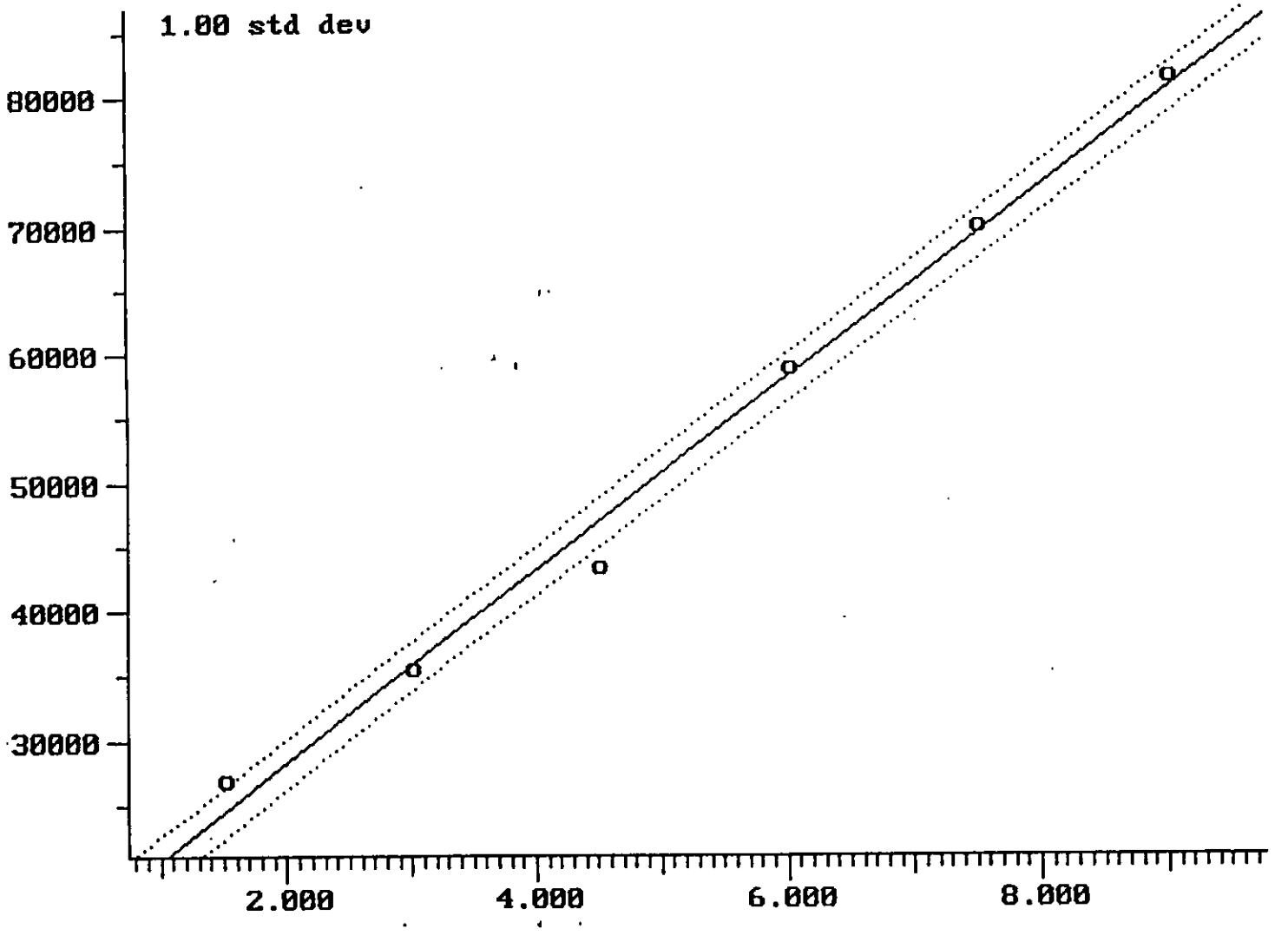
Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.998
4-Ethyltoluene Compound: 37 of 45 Standard Deviation: 1.225
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin¦Lin)



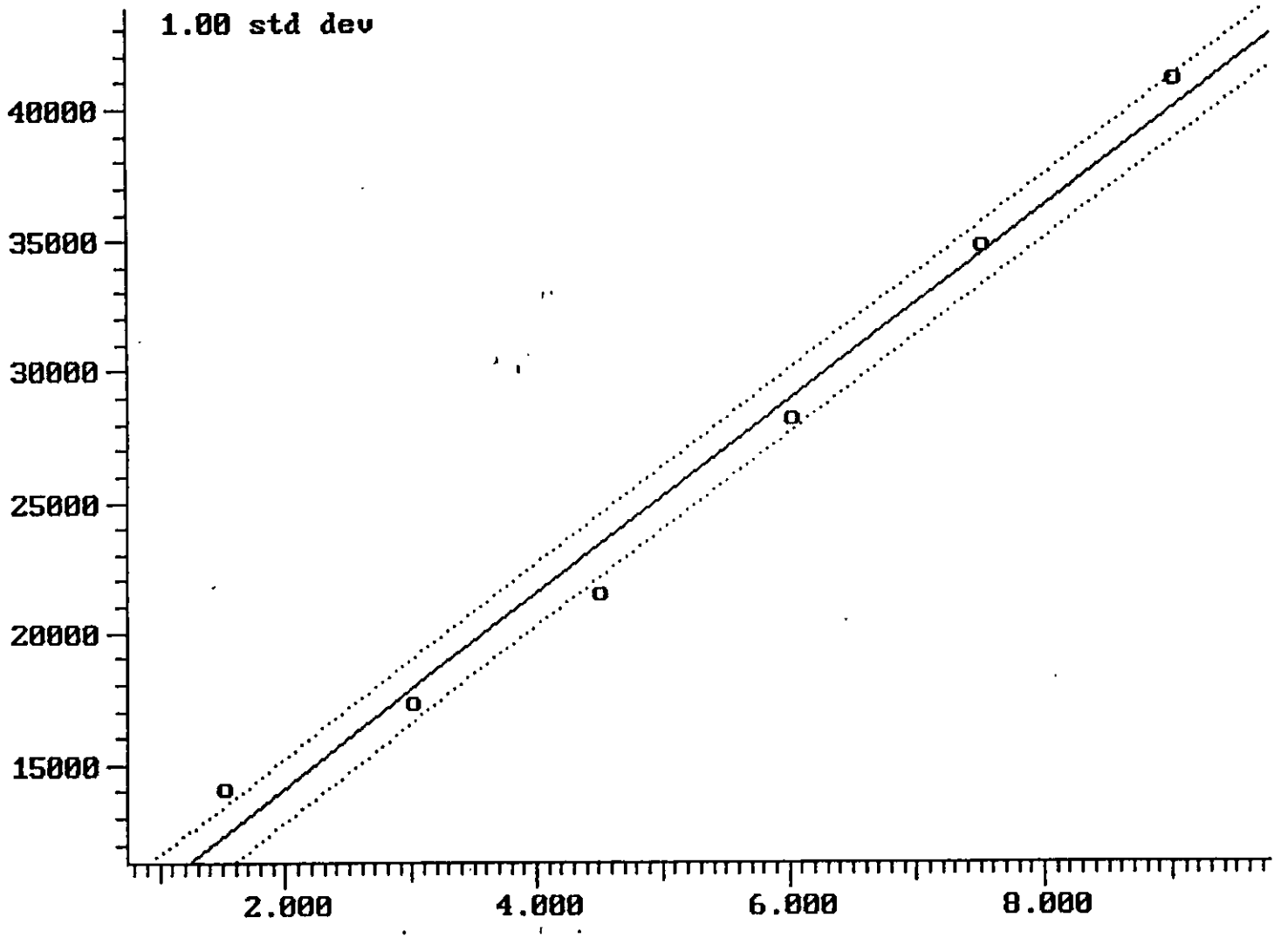
Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.997
1,3,5-Trimethylbenzene Compound: 38 of 45 Standard Deviation: 1.725
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin!Lin)



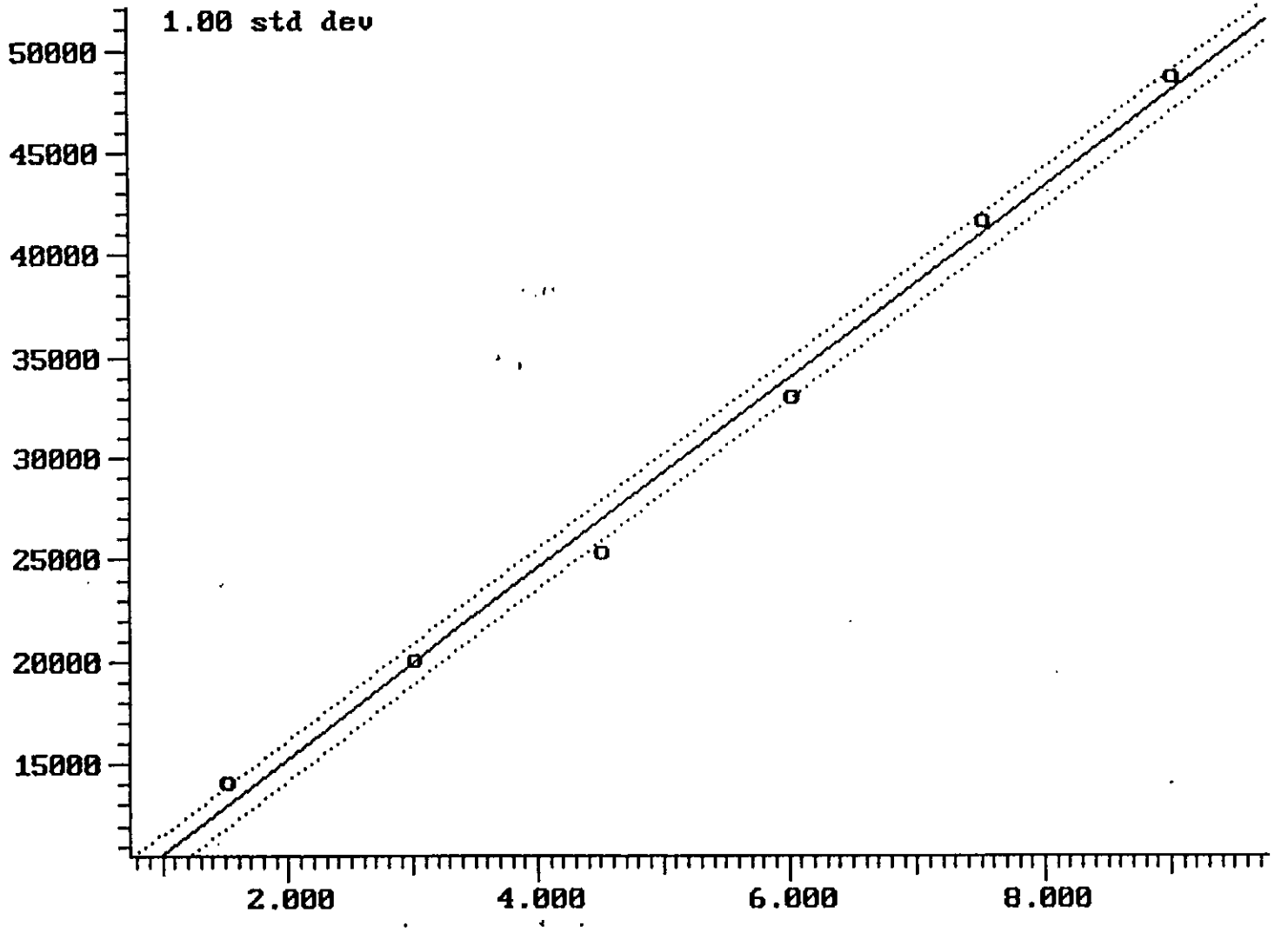
Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.995
1,2,4-Trimethylbenzene Compound: 39 of 45 Standard Deviation: 1.830
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin|Lin)



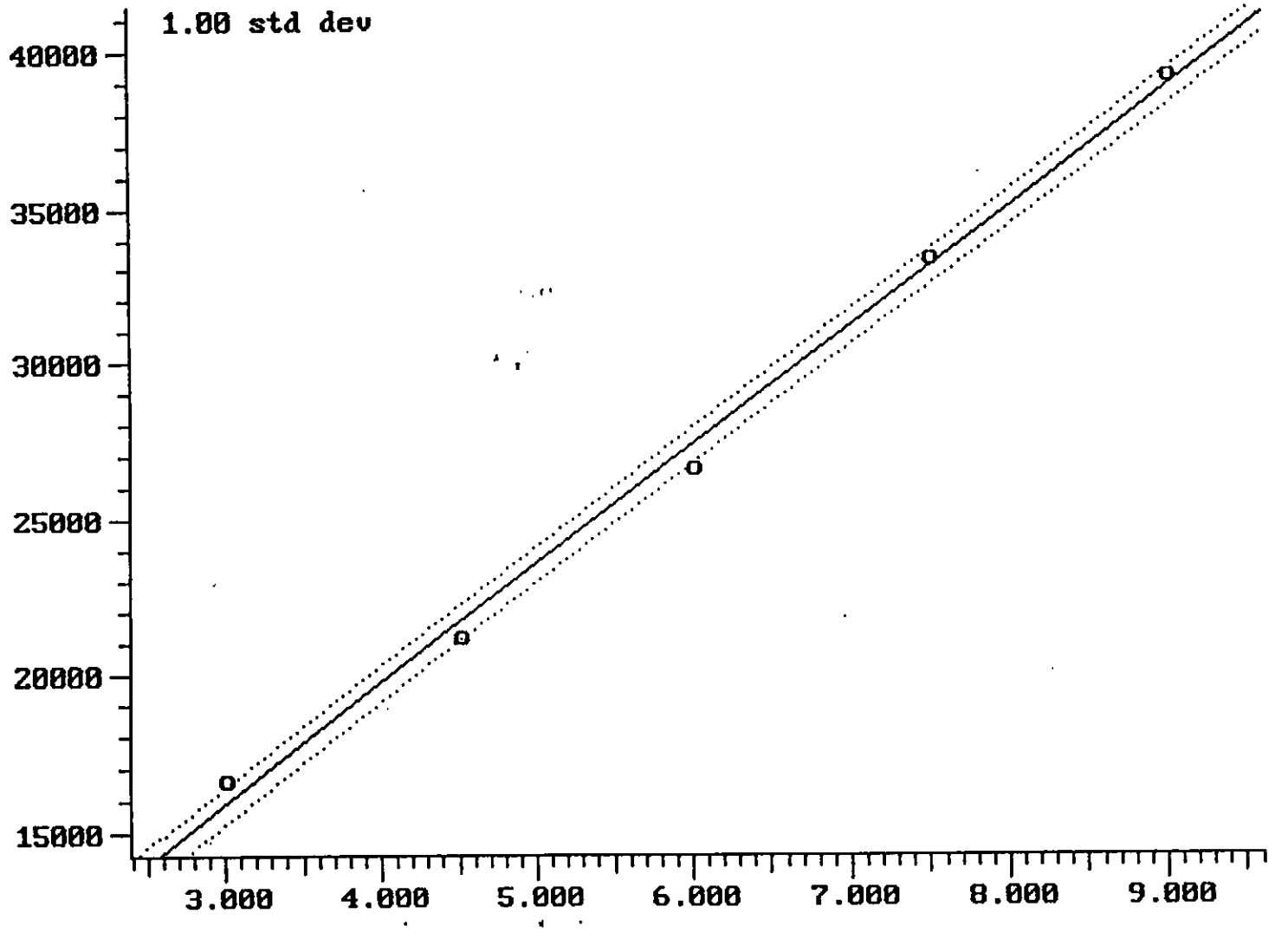
Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.992
1,3-Dichlorobenzene Compound: 40 of 45 Standard Deviation: 1.216
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin!Lin)



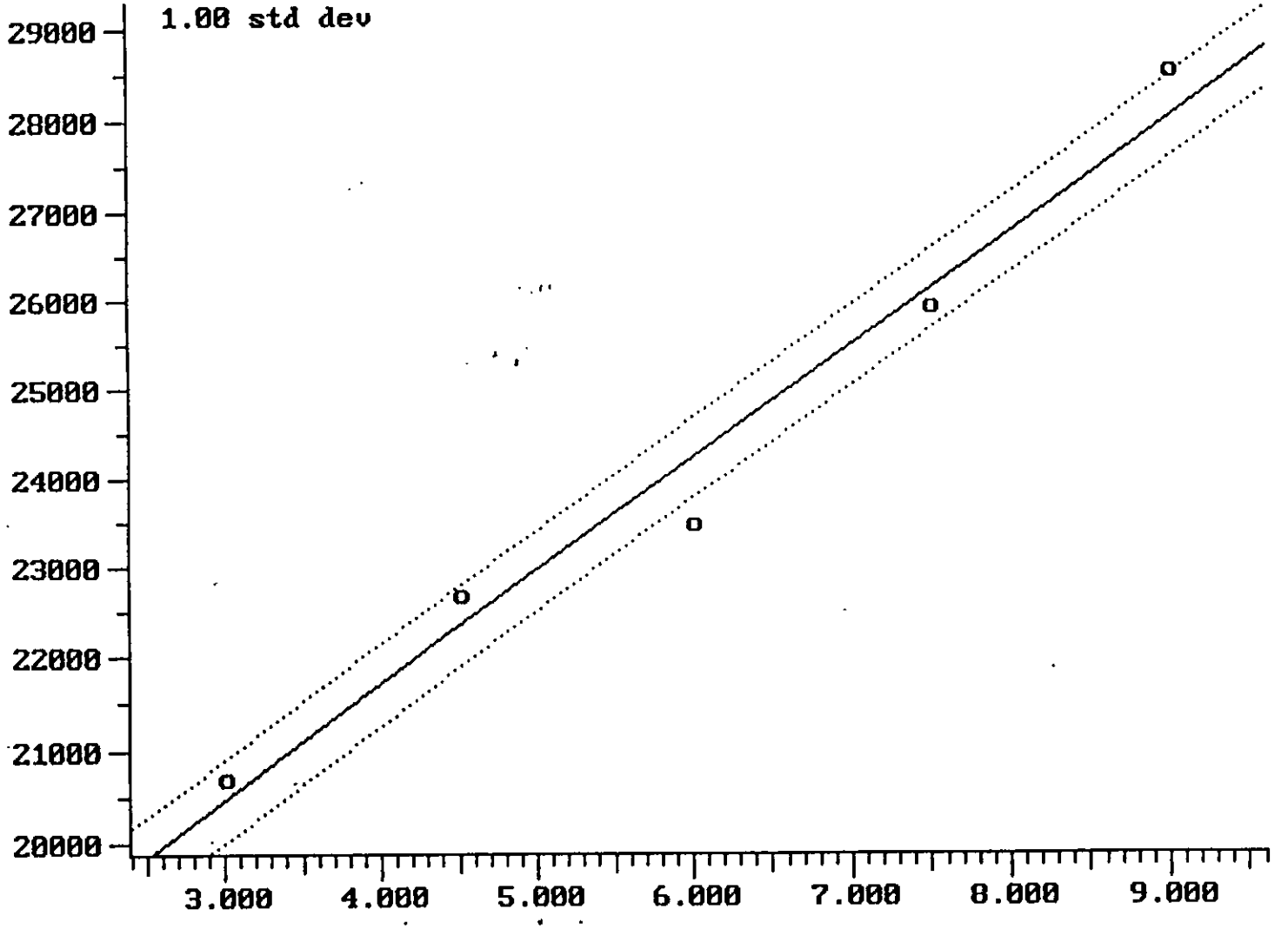
Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.997
1,4-Dichlorobenzene Compound: 41 of 45 Standard Deviation: 0.982
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin!Lin)



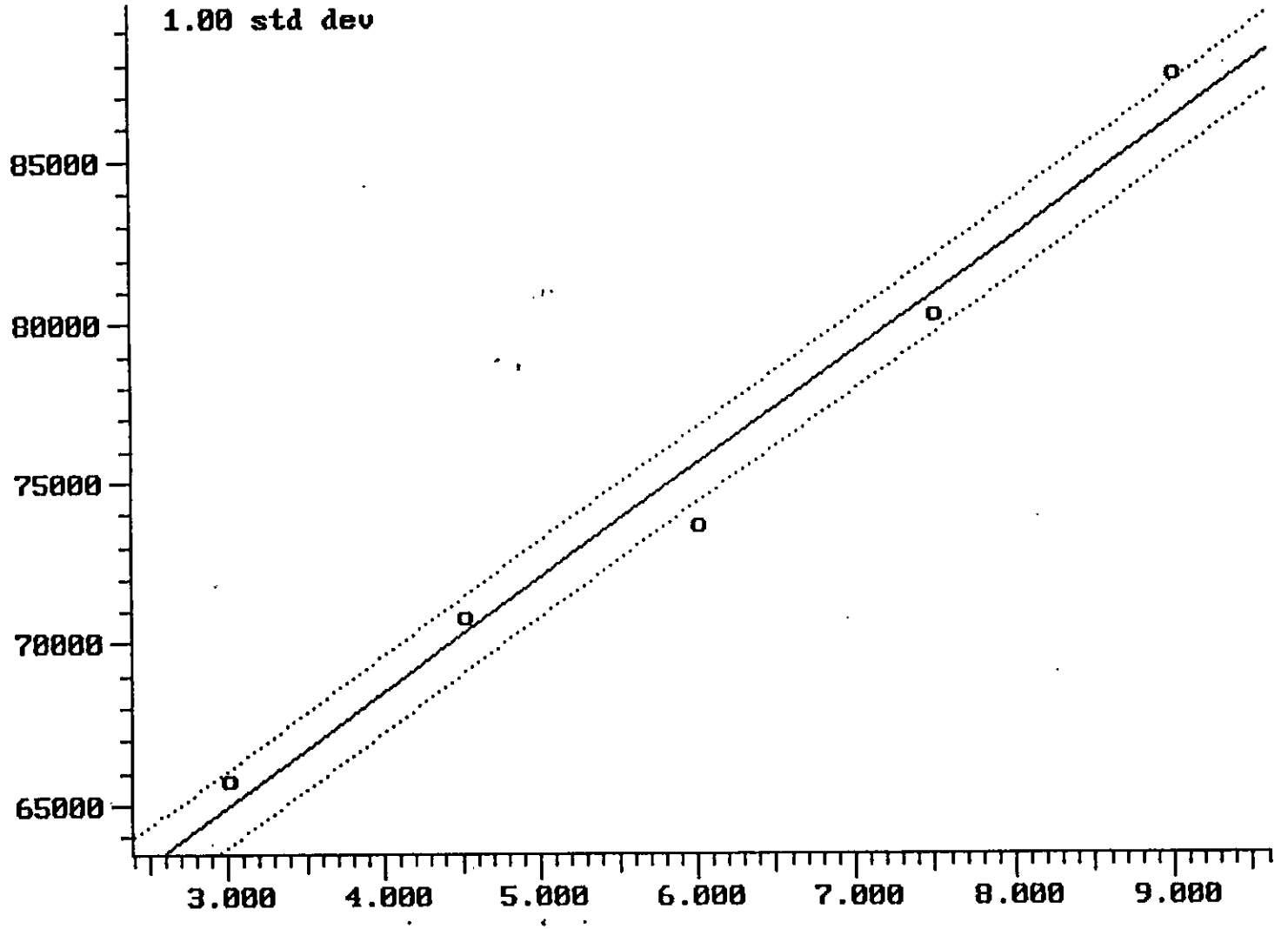
Calibration Plot (Ext Stds) Filename: TO14GB Correlation Coeff: 0.998
1,2-Dichlorobenzene Compound: 42 of 45 Standard Deviation: 0.546
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin!Lin)



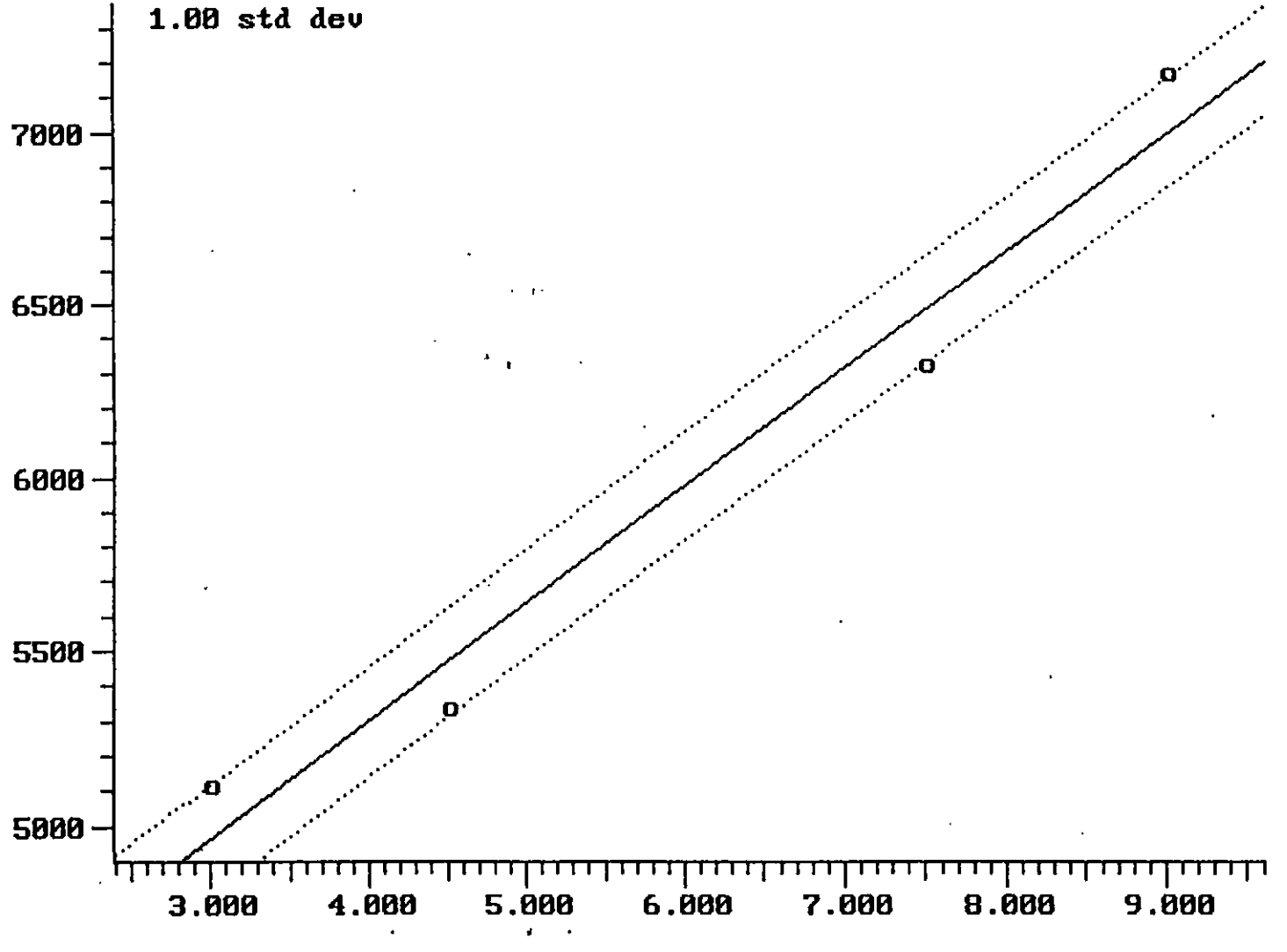
Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.986
1,2,4-Trichlorobenzene Compound: 43 of 45 Standard Deviation: 0.458
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin¦Lin)



Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.987
Naphthalene Compound: 44 of 45 Standard Deviation: 1.213
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin!Lin)



Calibration Plot (Ext Stds) Filename: T014GB Correlation Coeff: 0.982
Hexachlorobutadiene Compound: 45 of 45 Standard Deviation: 0.156
(Peak Area of Sample) vs (Amount of Sample Injected) (Lin|Lin)



SECTION 8.0
CHAIN OF CUSTODY AND FIELD SAMPLING FORMS

AirRecon®

Chain of Custody Record

Page 1 of 1

	DUE DATE: Draft	Final
Emergency Rush ≤ 5 Bus. Days		
Rush ≤ 10 Business Days		
Normal ≤ 15 Business Days		

5 Johnson Drive, P.O. Box 130
Raritan, NJ 08869
(908) 526-1000 / FAX (908) 526-7886

AirRecon Job #: 311-00142-00-000

City/State:

Project Manager: JSG ext.

P. O. Number:

Samples Submitted to: [X] AirRecon Lab [ ] Other

Container Type
B. Gas Bag
D. Petri Dish
E. Method 25 Tank
F. Method 25 Trap
G. Glass
N. NIOSH Tube
P Plastic Bottle
S. Summa Canister
T. VOST Tube
V. VOC Vial
X. XAD-2 Trap
O. Other

Sample Type
1. Liquid
2. Gas
3. Filter
4. Charcoal
5. Resin
6. Other

Requested Analysis / Method

Sample Identification	Filter #	Sample Type	Container Type	Container Size	Sampling Information Date	Sampling Information Tech	Reagents and/or Preservatives	MS 18 list of 42 compounds (provided)	Lab ID #
Bag #1		2	B	8L	8/14/00	JSG		X	

Special Instructions:

Submitted By: John Jansen	Date: 8/14/00	Received By:	Date:
Relinquished By:	Date:	Received By:	Date:
Relinquished By:	Date:	Received By:	Date: 8/15/00

QA/QC Report Package
Compliance: NJDEP [ ]
Non-compliance: Method [ ] Normal [X]