3A

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: COMPUCHEM Contract: 501112

Lab Code: COMPU Case No.: 33902 SAS No.: SDG No.: 25403

Matrix Spike - Sample No.: MW-20S

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
2-butanone	25.00	26.08	104	7	25	20-300
trans-1,2-Dichloroethen	5.00	5.32	106	12	25	20-150
cis-1,2-Dichloroethene	5.00	5.49	110	4	25	20-150
Xylene (total)	15.00	16.82	112	8	25	20-150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 1 out of 34 outside limits
Spike Recovery: 0 out of 68 outside limits

COMMENTS:

3A

WATER VOLATILE LAB CONTROL SAMPLE RECOVERY

CLIENT SAMPLE

VLCS06

Lab Name: COMPUCHEM Contract: 501112

Lab Code: COMPU Case No.: 33902 SAS No.: SDG No.: 25403

Lab Sample ID: 916198 LCS Lot No.: SE115

Lab File ID: CN016198B54.D Date Analyzed: 10/23/98

Purge Volume: 25.0 (mL) Dilution Factor: 1.0

COMPOUND	AMOUNT ADDED (ug/L)	AMOUNT RECOVERED (ug/L)	%REC #	QC LIMITS
1,1,1-Trichloroethane	5.00	4.94	99	20-150
1,1,2-Trichloroethane	5.00	4.32	86	20-150
1,2-Dichloroethane	5.00	4.42	88	20-150
Benzene	5.00	4.66	93	20-150
Bromodichloromethane	5.00	4.45	89	20-150
Bromoform	5.00	4.31	86	20-150
Bromomethane	5.00	5.02	100	20-150
Carbon Tetrachloride	5.00	4.71	94	20-150
Carbon disulfide	5.00	4.88	98	20-150
Chloroethane	5.00	5.00	100	20-150
Dibromochloromethane	5.00	4.30	86	20-150
Styrene	5.00	4.36	87	20-150
Tetrachloroethene	5.00	4.72	94	20-150
Trichloroethene	5.00	4.62	92	20-150
cis-1,2-Dichloroethene	5.00	4.55	91	20-150
cis-1,3-Dichloropropene	5.00	4.39	88	20-150
trans-1,2-Dichloroethene	5.00	4.69	94	20-150
trans-1,3-Dichloropropene	5.00	3.62	72	20-150
Xylene (total)	15.00	14.37	96	20-150
Methylene Chloride	5.00	5.17	104	20-300
2-butanone	25.00	25.69	103	20-300
2-hexanone	25.00	22.83	91	20-300
4-Methyl-2-pentanone	25.00	22.77	91	20-300
Acetone	25.00	24.16	97	20-300
1,1,2,2-Tetrachloroethane	5.00	4.29	86	20-150
1,1-Dichloroethane	5.00	4.71	94	20-150
1,1-Dichloroethene	5.00	4.72	94	20-150
1,2-Dichloropropane	5.00	4.48	90	20-150
Chlorobenzene	5.00	4.52	90	20-150
Chloroform	5.00	4.56	91	20-150

Column to be used to flag LCS recovery with an asterisk.
* Values outside of QC limits.

3A

WATER VOLATILE LAB CONTROL SAMPLE RECOVERY

CLIENT SAMPLE NO.

VLCS06

Lab Name: COMPUCHEM Contract: 501112

Lab Code: COMPU Case No.: 33902 SAS No.: SDG No.: 25403

Lab Sample ID: 916198 LCS Lot No.: SE115

Lab File ID: CN016198B54.D Date Analyzed: 10/23/98

Purge Volume: 25.0 (mL) Dilution Factor: 1.0

COMPOUND	AMOUNT ADDED (ug/L)	AMOUNT RECOVERED (ug/L)	%REC #	QC LIMITS
Chloromethane	5.00	4.69	94	20-150
Ethylbenzene	5.00	4.61	92	20-150
Toluene	5.00	4.62	92	20-150
Vinyl Chloride	5.00	4.57	91	20-150

Column to be used to flag LCS recovery with an asterisk.
* Values outside of QC limits.

LCS Recovery: 0 outside limits out of 34 total.

COMMENTS:

3A

WATER VOLATILE LAB CONTROL SAMPLE RECOVERY

CLIENT SAMPLE NO.

VLCS34

Lab Name: COMPUCHEM Contract: 501112

Lab Code: COMPU Case No.: 33902 SAS No.: SDG No.: 25403

Lab Sample ID: 916243 LCS Lot No.: SE115

Lab File ID: CN016243A54.D Date Analyzed: 10/24/98

Purge Volume: 25.0 (mL) Dilution Factor: 1.0

COMPOUND	AMOUNT ADDED (ug/L)	AMOUNT RECOVERED (ug/L)	%REC #	QC LIMITS
1,1,1-Trichloroethane	5.00	4.53	90	20-150
1,1,2-Trichloroethane	5.00	4.89	98	20-150
1,2-Dichloroethane	5.00	4.84	97	20-150
Benzene	5.00	4.75	95	20-150
Bromodichloromethane	5.00	4.92	98	20-150
Bromoform	5.00	4.72	94	20-150
Bromomethane	5.00	4.48	90	20-150
Carbon Tetrachloride	5.00	4.45	89	20-150
Carbon disulfide	5.00	4.47	89	20-150
Chloroethane	5.00	4.58	92	20-150
Dibromochloromethane	5.00	4.85	97	20-150
Styrene	5.00	5.18	104	20-150
Tetrachloroethene	5.00	4.91	98	20-150
Trichloroethene	5.00	4.95	99	20-150
cis-1,2-Dichloroethene	5.00	4.41	88	20-150
cis-1,3-Dichloropropene	5.00	4.79	96	20-150
trans-1,2-Dichloroethene	5.00	4.47	89	20-150
trans-1,3-Dichloropropene	5.00	5.05	101	20-150
Xylene (total)	15.00	16.60	111	20-150
Methylene Chloride	5.00	4.39	88	20-300
2-butanone	25.00	19.20	77	20-300
2-hexanone	25.00	25.86	103	20-300
4-Methyl-2-pentanone	25.00	25.02	100	20-300
Acetone	25.00	18.69	75	20-300
1,1,2,2-Tetrachloroethane	5.00	5.19	104	20-150
1,1-Dichloroethane	5.00	4.41	88	20-150
1,1-Dichloroethene	5.00	4.38	88	20-150
1,2-Dichloropropane	5.00	5.15	103	20-150
Chlorobenzene	5.00	4.94	99	20-150
Chloroform	5.00	4.84	97	20-150

Column to be used to flag LCS recovery with an asterisk.
* Values outside of QC limits.

3A

WATER VOLATILE LAB CONTROL SAMPLE RECOVERY

CLIENT SAMPLE NO.

VLCS34

Lab Name: COMPUCHEM Contract: 501112

Lab Code: COMPU Case No.: 33902 SAS No.: SDG No.: 25403

Lab Sample ID: 916243 LCS Lot No.: SE115

Lab File ID: CN016243A54.D Date Analyzed: 10/24/98

Purge Volume: 25.0 (mL) Dilution Factor: 1.0

COMPOUND	AMOUNT ADDED (ug/L)	AMOUNT RECOVERED (ug/L)	%REC #	QC LIMITS
Chloromethane	5.00	4.34	87	20-150
Ethylbenzene	5.00	5.33	106	20-150
Toluene	5.00	5.05	101	20-150
Vinyl Chloride	5.00	4.30	86	20-150

Column to be used to flag LCS recovery with an asterisk.
* Values outside of QC limits.

LCS Recovery: 0 outside limits out of 34 total.

COMMENTS:

3A

WATER VOLATILE LAB CONTROL SAMPLE RECOVERY

CLIENT SAMPLE NO.

VLCS71

Lab Name: COMPUCHEM Contract: 501112

Lab Code: COMPU Case No.: 33902 SAS No.: SDG No.: 25403

Lab Sample ID: 915062 LCS Lot No.: SE115

Lab File ID: CN015062A56.D Date Analyzed: 10/23/98

Purge Volume: 25.0 (mL) Dilution Factor: 1.0

COMPOUND	AMOUNT ADDED (ug/L)	AMOUNT RECOVERED (ug/L)	%REC #	QC LIMITS
1,1,1-Trichloroethane	5.00	5.00	100	20-150
1,1,2-Trichloroethane	5.00	4.15	83	20-150
1,2-Dichloroethane	5.00	4.59	92	20-150
Benzene	5.00	4.70	94	20-150
Bromodichloromethane	5.00	4.79	96	20-150
Bromoform	5.00	4.44	89	20-150
Bromomethane	5.00	5.45	109	20-150
Carbon Tetrachloride	5.00	5.12	102	20-150
Carbon disulfide	5.00	4.71	94	20-150
Chloroethane	5.00	5.06	101	20-150
Dibromochloromethane	5.00	4.45	89	20-150
Styrene	5.00	4.69	94	20-150
Tetrachloroethene	5.00	5.17	103	20-150
Trichloroethene	5.00	4.87	97	20-150
cis-1,2-Dichloroethene	5.00	4.96	99	20-150
cis-1,3-Dichloropropene	5.00	4.22	84	20-150
trans-1,2-Dichloroethene	5.00	4.64	93	20-150
trans-1,3-Dichloropropene	5.00	4.36	87	20-150
Xylene (total)	15.00	16.52	110	20-150
Methylene Chloride	5.00	4.20	84	20-300
2-butanone	25.00	23.08	92	20-300
2-hexanone	25.00	18.72	75	20-300
4-Methyl-2-pentanone	25.00	19.78	79	20-300
Acetone	25.00	18.13	72	20-300
1,1,2,2-Tetrachloroethane	5.00	4.23	84	20-150
1,1-Dichloroethane	5.00	4.69	94	20-150
1,1-Dichloroethene	5.00	4.83	97	20-150
1,2-Dichloropropane	5.00	4.62	92	20-150
Chlorobenzene	5.00	4.77	95	20-150
Chloroform	5.00	4.84	97	20-150

Column to be used to flag LCS recovery with an asterisk.
* Values outside of QC limits.

3A

WATER VOLATILE LAB CONTROL SAMPLE RECOVERY

CLIENT SAMPLE NO.

VLCS71

Lab Name: COMPUCHEM Contract: 501112

Lab Code: COMPU Case No.: 33902 SAS No.: SDG No.: 25403

Lab Sample ID: 915062 LCS Lot No.: SE115

Lab File ID: CN015062A56.D Date Analyzed: 10/23/98

Purge Volume: 25.0 (mL) Dilution Factor: 1.0

COMPOUND	AMOUNT ADDED (ug/L)	AMOUNT RECOVERED (ug/L)	%REC #	QC LIMITS
Chloromethane	5.00	5.03	101	20-150
Ethylbenzene	5.00	4.77	95	20-150
Toluene	5.00	4.28	86	20-150
Vinyl Chloride	5.00	5.11	102	20-150

Column to be used to flag LCS recovery with an asterisk.
* Values outside of QC limits.

LCS Recovery: 0 outside limits out of 34 total.

COMMENTS:

3A

WATER VOLATILE LAB CONTROL SAMPLE RECOVERY

CLIENT SAMPLE NO.

VLCS06

Lab Name: COMPUCHEM Contract: 501112

Lab Code: COMPU Case No.: 33902 SAS No.: SDG No.: 25403

Lab Sample ID: 916198 LCS Lot No.: SE115

Lab File ID: CN016198B54.D Date Analyzed: 10/23/98

Purge Volume: 25.0 (mL) Dilution Factor: 1.0

COMPOUND	AMOUNT ADDED (ug/L)	AMOUNT RECOVERED (ug/L)	%REC #	QC LIMITS
1,1,1-Trichloroethane	5.00	4.94	99	20-150
1,1,2-Trichloroethane	5.00	4.32	86	20-150
1,2-Dichloroethane	5.00	4.42	88	20-150
Benzene	5.00	4.66	93	20-150
Bromodichloromethane	5.00	4.45	89	20-150
Bromoform	5.00	4.31	86	20-150
Bromomethane	5.00	5.02	100	20-150
Carbon Tetrachloride	5.00	4.71	94	20-150
Carbon disulfide	5.00	4.88	98	20-150
Chloroethane	5.00	5.00	100	20-150
Dibromochloromethane	5.00	4.30	86	20-150
Styrene	5.00	4.36	87	20-150
Tetrachloroethene	5.00	4.72	94	20-150
Trichloroethene	5.00	4.62	92	20-150
cis-1,2-Dichloroethene	5.00	4.55	91	20-150
cis-1,3-Dichloropropene	5.00	4.39	88	20-150
trans-1,2-Dichloroethene	5.00	4.69	94	20-150
trans-1,3-Dichloropropene	5.00	3.62	72	20-150
Xylene (total)	15.00	14.37	96	20-150
Methylene Chloride	5.00	5.17	104	20-300
2-butanone	25.00	25.69	103	20-300
2-hexanone	25.00	22.83	91	20-300
4-Methyl-2-pentanone	25.00	22.77	91	20-300
Acetone	25.00	24.16	97	20-300
1,1,2,2-Tetrachloroethane	5.00	4.29	86	20-150
1,1-Dichloroethane	5.00	4.71	94	20-150
1,1-Dichloroethene	5.00	4.72	94	20-150
1,2-Dichloropropane	5.00	4.48	90	20-150
Chlorobenzene	5.00	4.52	90	20-150
Chloroform	5.00	4.56	91	20-150

Column to be used to flag LCS recovery with an asterisk.
* Values outside of QC limits.

EPA Region 5 Records Ctr.
350066

SAMPLING AND ANALYSIS TO EVALUATE SOIL REMEDIATION DAYTON THERMAL PRODUCTS DIVISION DAYTON, OHIO

ACUSTAR INCORPORATED
CHRYSLER MOTORS CORPORATION

September 3, 1991

Revision 0.0

Prepared for:

Acustar, Inc.
1600 Webster Street
Dayton, Ohio 45404

Project 423023

JOHN MATHES & ASSOCIATES, INC.
East Park One Building
701 Rodi Road, Suite 101
Pittsburgh, Pennsylvania 15235-4559
(412) 824-0200

TABLE OF CONTENTS

		Page
1	INTRODUCTION	1
	1.1 Background Information	1
	1.2 Remediation Evaluation	3
2	PROCEDURES	4
3	RESULTS	7
	3.1 "Clean" Soil Stockpile	7
	3.2 TPH Vapor Extraction Bed	7
	3.2.1 VOCs	8
	3.2.2 TPH	8
	3.3 VOC Vapor Extraction Bed	9
	3.4 Quality Assurance/Quality Control	9
4	DISCUSSION	11
5	RECOMMENDATIONS	13

References

Tables

Figures

APPENDIX A - Approval to Operate Vapor Extraction System

APPENDIX B - Certificates of Analyses
Belmonte Park Laboratories

LIST OF TABLES

Table

1 Analytical Data Summary, Soil Remediation by Vapor Extraction

2 Analytical Data Summary, Soil Remediation Evaluation July 1991

3 Estimated Amount of VOCs Removed from Soils During Vapor Extraction

LIST OF FIGURES

Figure

1 Site Location Map

2 Conceptual Design Clean Soil Stockpile and Vapor Extraction Beds

3 Sampling Locations and Sampled Interval Thickness Clean Soil Stockpile

4 Sampling Locations and Sampled Interval Thickness TPH Vapor Extraction Bed

5 Sampling Locations and Sampled Interval Thickness VOC Vapor Extraction Bed

6 Total VOCs in Sampled Interval Clean Soil Stockpile

7 Total VOCs in Sampled Interval TPH Vapor Extraction Bed

8 Total Petroleum Hydrocarbons in Sampled Interval TPH Vapor Extraction Bed

9 Total VOCs in Sampled Interval VOC Vapor Extraction Bed

SAMPLING AND ANALYSIS
TO EVALUATE SOIL REMEDIATION
DAYTON THERMAL PRODUCTS DIVISION
DAYTON, OHIO

1 INTRODUCTION

On behalf of Acustar, Inc., John Mathes & Associates, Inc., (Mathes) is remediating contaminated soil by vapor extraction. The contaminated soil was excavated from the footprint of Building 59 at the Dayton Thermal Products Plant (Plant) in Dayton, Ohio (Figure 1). This report presents the sampling and analysis that was conducted to evaluate soil remediation.

1.1 Background Information

Previous site investigations at the Plant indicated that this soil was contaminated with volatile organic compounds (VOCs) and total petroleum hydrocarbons (TPH) from manufacturing activities that took place in the Old Maxwell Complex that was demolished to make way for Building 59.

Excavation of soil from the footprint of Building 59 and construction of vapor extraction beds began March 14, 1991. Remedial activities consisted of the following:

- construction of a stockpile of "clean" soil in the parking lot in the northeast portion of the property;
- construction of a vapor extraction bed north of Building 47 to treat soil contaminated predominantly with oily material and VOCs (TPH bed); and
- construction of an additional vapor extraction bed north of Building 47 to treat soil impacted predominantly with VOCs (VOC bed).

Vapor extraction beds consisted of a series of 4-inch diameter perforated piping connected with a manifold to

regenerative blowers (Figure 2). Both vapor extraction beds and the "clean" soil pile were covered with polyethylene sheeting. Six-inch diameter perforated piping, open to the atmosphere, was installed under the sheeting near the top of the beds to permit air inflow from the atmosphere to the soil in the two vapor extraction beds. The "clean" soil stockpile consists of soil covered with polyethylene having a series of perforated vent pipes extending the entire length of the pile to promote natural ventilation. These vent pipes are located about 12 feet from the base of the pile. Construction activities were completed on April 19, 1991.

The "clean" soil stockpile originally consisted of about 14,050 cubic yards (yd^3) of soil (as emplaced) containing no visible staining, less than 40 milligrams per kilogram (mg/kg) TPH, and less than 50 micrograms per kilogram (ug/kg) VOCs.

The VOC bed consists of about 6,070 yd^3 of soil (as emplaced) containing the highest concentrations of VOCs (up to a total of about 10,000 ug/kg). Two blowers (No. 1 and No. 2) were connected by manifolds to the piping at the base of the bed. Each blower moves 260 cubic feet per minute (ft^3/min) of air at a vacuum of about 7 inches of mercury.

The TPH bed consists of about 13,600 yd^3 of soil (as emplaced) containing the highest concentrations of TPH (from 40 to 3,500 mg/kg) and visibly stained soil. Two blowers (No. 3 and No. 4) were connected by manifolds to the piping at the base of the bed. Each blower moves 350 ft^3/min of air at a vacuum of about 7 inches of mercury.

Mathes sampled emissions for the remediation process and submitted the analytical data to the Regional Air Pollution Control Agency in Dayton, Ohio. Approval to operate the process was obtained on April 30, 1991 (Appendix A).

Subsequent sampling of air emissions from the blowers indicated, as anticipated, a decrease in contaminant concentration with time (Table 1). About two and one-half months has elapsed since contaminants (above the detection limits) have been observed in air emissions from the process.

1.2 Remediation Evaluation

Sampling of the soil stockpile and vapor extraction beds constructed at the Plant to remediate contaminated soil was conducted during the week of July 29, 1991, to evaluate the effectiveness of the treatment. The objective of sampling and analysis of the soil piles was to:

- evaluate the effectiveness of remedial activities;
- evaluate handling options; and
- estimate schedule for required activities.

2 PROCEDURES

Soil piles were evaluated by collecting representative samples using a sampling grid. Selection of the grid spacing was based on procedures outlined in Castanho (1987) and in Montgomery and Clayton (1987). These documents provide guidance on procedures for estimating sampling grid dimensions required to evaluate an area of known size. The actual number of samples composited for each soil pile was established by using the formula:

$$GI = \frac{\sqrt{A/\pi}}{2}$$

where:

GI = grid interval; and

A = area to be sampled.

Based on review of these documents and an estimate of the areas of each pile, the following grid intervals were calculated and selected:

Soil Pile	Sampling GI (Feet)
VOC Bed	32
TPH Bed	39
"Clean" Pile	41

Sample locations and thickness of soil sampled are indicated in Figures 3, 4, and 5. Where feasible, soil samples were collected using a hand-held auger (primarily in areas where total sample depth is less than about 10 feet). In areas where the piles were deeper than about 10 feet, boreholes were advanced using continuous split-spoon sampling procedures followed by hollow-stem augering to maintain an open hole. Total length of each borehole extended from the upper surface of the pile down to

the base of the contaminated soil. The entire length of recovered material from each borehole was screened in the field using an HNu photoionization detector (HNu meter) and composited for analysis.

The field portion of the investigation included the following activities:

- establishing a sampling grid having the required spacing across the soil piles to be evaluated;
- advancing soil boreholes for sample collection and analysis at 15 locations in the "clean" soil stockpile (Figure 3);
- advancing soil boreholes for sample collection and analysis at 15 locations in the TPH bed (Figure 4);
- advancing soil boreholes for sample collection and analysis at 18 locations in the VOC bed (Figure 5); and
- preparing quality assurance/quality control (QA/QC) samples to evaluate data quality.

Sampling devices were decontaminated between sampling events using a potable water/nonphosphate detergent bath and potable water rinse, followed by a high pressure steam rinse. All sampling devices and augers were steam cleaned prior to use at each location.

Upon completion of sampling, each soil test borehole was backfilled with remaining material obtained from that borehole (material not retained for analysis).

Soil samples from the "clean" soil stockpile and the VOC bed were analyzed for VOCs (Method 8240), while soil samples from the TPH bed were analyzed for VOCs (Method 8240) and TPH (Method 418.1). Four samples from the TPH bed were analyzed for TPH using modified Method 8015 to provide a basis of comparison of results for the two methods. QA/QC samples consisted of:

- equipment blanks prepared for each day during sampling activities; and

- trip blanks accompanying each sample shipment from the field location to the laboratory.

Drilling activities were conducted by Bowser-Morner, Inc., Dayton, Ohio. Mathes conducted all sampling activities. The laboratory portion of the investigation was conducted by Belmonte Park Laboratories, Dayton, Ohio.

3 RESULTS

Analytical results for the samples collected from the "clean" soil stockpile, the VOC vapor extraction bed, the TPH vapor extraction bed, and QA/QC samples are summarized in Table 2. Certificates of Analyses for all samples analyzed are presented in Appendix B.

3.1 "Clean" Soil Stockpile

Of the 15 samples analyzed from the "clean" soil stockpile:

- VOCs were not detected above the method detection limit in five samples (C-10, C-12, C-13, C-14, and C-15);
- only trichloroethene, ranging in concentration from 8.3 ug/kg to 54 ug/kg, was detected in six samples (C-1, C-2, C-4, C-5, C-9 and C-11);
- trichloroethene (64 ug/kg) and 1,1,1-trichloroethane (12 ug/kg) were detected in sample C-3; and
- trichloroethene (49, 52, and 46 ug/kg, respectively), 1,1,1-trichloroethane (14, 9.8, and 96 ug/kg, respectively) and tetrachloroethene (13, 21, and 9.8 ug/kg, respectively) were detected in samples C-6, C-7, and C-8.

All analytical data are summarized in Table 2. Data for total VOCs observed at each sampling location are indicated in Figure 6.

3.2 TPH Vapor Extraction Bed

Fifteen samples collected from the TPH vapor extraction bed were analyzed for VOCs and TPH. These data are summarized below.

3.2.1 VOCs

Of the 15 samples analyzed from the TPH extraction bed analyzed for VOCs:

- VOCs were not detected above the method detection limit in three samples (TP-3, TP-4, and TP-14);
- only trichloroethene, ranging in concentration from 8.6 ug/kg to 30 ug/kg, was detected in seven samples (TP-1, TP-2, TP-5, TP-9, TP-10, TP-12, and TP-15);
- trichloroethene (130 and 71 ug/kg, respectively) and 1,1,1-trichloroethane (6.9 and 8.1 ug/kg, respectively) were detected in samples TP-8 and TP-11;
- trichloroethene (86 ug/kg) and chloroform (6.1 ug/kg) were detected in sample TP-6;
- trichloroethene (71 ug/kg), 1,1,1-trichloroethane (8 ug/kg), and chloroform (8.9 ug/kg) were detected in sample TP-13;
- trichloroethene (67 ug/kg), tetrachloroethene (16 ug/kg), and chloroform (9.4 ug/kg) were detected in sample TP-7.

All analytical data are summarized in Table 2. Data for total VOCs observed at each sampling location are indicated in Figure 7.

3.2.2 TPH

TPH was identified in all 15 samples analyzed ranging in concentration from 17.5 mg/kg up to 6,170 mg/kg (Table 2; Figure 8). The four samples from the TPH bed analyzed for TPH using modified Method 8015 ranged in concentration from 35 mg/kg to 1,530 mg/kg (Figure 8).

3.3 VOC Vapor Extraction Bed

Of the 18 samples analyzed from the soil sampled from the VOC vapor extraction bed:

- VOCs were not detected above the method detection limit in seven samples (VO-1, VO-2, VO-4, VO-7, VO-12, VO-15, and VO-17);
- only trichloroethene, ranging in concentration from 4.3 ug/kg to 41 ug/kg, was detected in five samples (VO-3, VO-13, VO-14, VO-16, and VO-18);
- only tetrachloroethene (9 ug/kg) was detected in sample VO-10;
- trichloroethene (24 ug/kg), 1,1,1-trichloroethane (6 ug/kg), ethylbenzene (6.2 ug/kg), xylenes (38 ug/kg), and chloroform (12 ug/kg) were detected in sample VO-5;
- trichloroethene (4.3 ug/kg), ethylbenzene (2 ug/kg), and xylenes (94 ug/kg) were detected in sample VO-6;
- trichloroethene (54 ug/kg), 1,1,1-trichloroethane (17 ug/kg), and tetrachloroethene (10 ug/kg) were detected in sample VO-8;
- trichloroethene (32 ug/kg) and tetrachloroethene (9 ug/kg) were detected in sample VO-9; and
- 1,1,1-trichloroethane (13 ug/kg) and tetrachloroethene (7.8 ug/kg) were detected in sample VO-11.

All analytical data are summarized in Table 2. Data for total VOCs observed at each sampling location are indicated in Figure 9.

3.4 Quality Assurance/Quality Control

Trip blanks accompanying all shipments of samples from the field to the laboratory did not indicate the presence of VOCs above the method detection limit. Field blanks collected during

sampling did not indicate the presence of VOCs above the method detection limit. Based on these data, Mathes concludes that samples analyzed for this investigation represent conditions present in the soils samples and have not been affected by cross-contamination of samples or contamination during shipment of the samples.

4 DISCUSSION

In the three months of operation, vapor extraction has significantly reduced the VOC content of soils undergoing remediation. Based on initial analytical data prior to remedial activities (Mathes, 1991), the results of these analytical data, the volumes represented by each sampling location, and an assumed density of 1,200 kg/yd^3 of soil, the following amounts of VOCs remain in each of the soil piles:

- "clean" soil stockpile:
  - trichloroethene 0.52 pounds
  - 1,1,1-trichloroethane 0.28 pounds
  - tetrachloroethene 0.08 pounds
- VOC vapor extraction bed:
  - trichloroethene 0.16 pounds
  - 1,1,1-trichloroethane 0.04 pounds
  - tetrachloroethene 0.03 pounds
- TPH vapor extraction bed:
  - trichloroethene 1.20 pounds
  - 1,1,1-trichloroethane 0.11 pounds
  - tetrachloroethene 0.04 pounds

About 90 percent of the VOCs have been removed from the soils treated (Table 3). Trichloroethene has been reduced by about 88 percent, 1,1,1-trichloroethane reduced by 95 percent, tetrachloroethene reduced by 83 percent, and total 1,2-dichloroethene and 1,2-dichloroethene reduced each by 100 percent.

The Ohio Environmental Protection Agency policy to evaluate "How Clean is Clean?" requires that the cumulative risk posed by "clean" soil not exceed the 1×10^{-6} excess cancer risk level assuming Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) exposure parameters; however, future land use is not specified. Assuming this material will be landfilled at an uncontrolled construction debris landfill dictates a conservative approach be taken to evaluate potential for this material to pose future risk to the environment. An approach to

evaluate this risk is to use the concept of "drinkable leachate" as required for Resource Conservation and Recovery Act (RCRA) clean closure (USEPA, 1987). Using this scenario, calculated maximum levels for trichloroethene and tetrachloroethene, respectively, are 76 ug/kg and 228 ug/kg. Using these cleanup levels, all soil in both the "clean" soil stockpile and the VOC vapor extraction bed meet the clean closure criteria. Only one sample analyzed from the TPH vapor extraction bed does not meet these criteria; however, the average concentrations for soil in the TPH bed is significantly below these levels.

Mass balances could not be calculated for TPH in the TPH vapor extraction bed due to differences in the analytical methods used to evaluate initial concentrations as present concentrations. Levels of TPH observed in soil in the TPH vapor extraction bed are considerably higher than the regulatory limit of 40 mg/kg (petroleum contaminated soils). Therefore, soil in the TPH vapor extraction bed must either undergo additional remediation or be disposed of as a "Special - Petroleum Contaminated Waste."

Correlation between TPH analyses (EPA Method 418.1 and SW-846 Method 8015) was good for samples TP-3 and TP-5, indicating the hydrocarbons in these samples consist of molecules having carbon numbers ranging from C16 to C28. However, sample TP-4 indicated a TPH content of 375 mg/kg using Method EPA 418.1 compared to 1,530 mg/kg using SW-846 Method 8015 indicating a variation in the solubility or polar nature of the hydrocarbons. Similarly, sample TP-11 indicated a TPH content of 6,170 mg/kg using Method EPA 418.1 compared to 126 mg/kg using SW-846 Method 8015. Clearly, the types and amounts of hydrocarbons present in these samples are variable.

5 RECOMMENDATIONS

Soil stockpiled in the "clean" soil stockpile and soil treated in the VOC vapor extraction bed pose minimal threat to human health, based on the exposure scenario (most conservative) evaluated. Therefore, these materials can be landfilled at a construction debris landfill. If Acustar desires an even more conservative approach to soil handling, the following options should be evaluated:

- landfill as "Special Waste" in a controlled landfill such as Pinnacle Road Landfill;
- use the material on-site for landscaping or raising the elevation of the parking lot (or a combination of the two);
- continue operation of the vapor extraction system followed by landfilling or on-site use when remediation has attained satisfactory cleanup levels; or
- reduce the presently observed levels of VOCs using a more aggressive remediation approach, such as low temperature thermal stripping followed by landfilling or on-site use when remediation has attained satisfactory cleanup levels.

Soil being treated in the TPH vapor extraction bed <u>requires</u> additional remediation, treatment, or proper disposal. The following handling options should be evaluated for this material:

- landfill as "Special Waste" in a controlled landfill such as Pinnacle Road Landfill; and
- reduce the presently observed levels of TPH using a more aggressive remediation approach, such as low temperature thermal stripping or landfarming followed by landfilling or on-site use when remediation has attained satisfactory cleanup levels.

REFERENCES

Castanho, Martina. 1987. "Methods for Soil Sampling" in Comments Toxicology. Vol. 1, No. 3-4, p. 221-227.

Mathes, 1991. "Corrective Action Plan, Dayton Thermal Products Plant, Dayton Ohio," February 25, 1991.

Montgomery, D., and D. Clayton. 1987. "How Clean is Clean II" Interoffice Memo to Michigan Department of Natural Resources Hazardous Waste Permits Unit Staff dated May 5, 1987.

USEPA. 1987. "Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities" Final Rule, Federal Register, (52)53, March 19.

Table 1

ANALYTICAL DATA SUMMARY
SOIL REMEDIATION BY VAPOR EXTRACTION

ACUSTAR, INC.
DAYTON THERMAL PRODUCTS DIVISION
DAYTON, OHIO

Sample		Sampling Date	VOC 8240[1]	TPH 8015[2]
P1-1	Blower #1	04/19/91	ND	ND
P2-1	Blower #2	04/19/91	trichloroethene @ 2.0 mg/m^3 all others ND	ND
P3-1	Blower #3	04/19/91	1,1,1-trichloroethane @ 2.7 mg/m^3 trichloroethene @ 2.5 mg/m^3 all others ND	ND
P4-1	Blower #4	04/19/91	1,1,1-trichloroethane @ 2.1 mg/m^3 trichloroethene @ 3.3 mg/m^3 all others ND	ND
2-1A	Blower #1	04/24/91	ND	NA
2-2A	Blower #2	04/24/91	ND	NA
2-3A	Blower #3	04/24/92	NA	ND
2-4A	Blower #4	04/24/92	NA	ND
P1-3A	Blower #1	05/10/91	ND	NA
P2-3A	Blower #2	05/10/91	ND	NA
P3-3A	Blower #3	05/10/91	ND	NA
P4-3A	Blower #4	05/10/91	trichloroethene @ 2.2 mg/m^3	NA
P1-4A	Blower #1	05/24/91	ND	NA
P2-4A	Blower #2	05/24/91	ND	NA
P3-4A	Blower #3	05/24/91	NA	ND
P4-4A	Blower #4	05/24/91	NA	ND

Table 1 (Continued)

ANALYTICAL DATA SUMMARY
SOIL REMEDIATION BY VAPOR EXTRACTION

ACUSTAR, INC.
DAYTON THERMAL PRODUCTS DIVISION
DAYTON, OHIO

Sample	Sampling Date	VOC 8240[1]	TPH 8015[2]
P1-5A Blower #1	06/07/91	ND	NA
P2-5A Blower #2	06/07/91	ND	NA
P3-5A Blower #3	06/07/91	ND	ND
P4-5A Blower #4	06/07/91	ND	ND
P1-6A Blower #1	06/26/91	ND	NA
P2-6A Blower #2	06/26/91	ND	NA
P3-6A Blower #3	06/26/91	ND	NA
P4-6A Blower #4	06/26/91	ND	NA
P1 Blower #1	07/22/91	ND	NA
P2 Blower #2	07/22/91	ND	NA
P3 Blower #3	07/22/91	ND	NA
P4 Blower #4	07/22/91	ND	NA

(1) Volatile organic compounds (VOCs) analyzed using SW-846 Method 8240.
(2) Total petroleum hydrocarbons (TPH) analyzed using modified SW-846 Method 8015.
NA - Not analyzed.
ND - Not detected at the method detection limits, which vary for each compound (see Appendix B - Certificates of Analyses).

Blowers #1 and #2 are part of the VOC bed remediation system.
Blowers #3 and #4 are part of the TPH bed remediation system.

Table 2

ANAYTICAL DATA SUMMARY
SOIL REMEDIATION EVALUATION
JULY 1991

ACUSTAR, INC.
DAYTON THERMAL PRODUCTS PLANT
DAYTON, OHIO

Sample I.D.	All VOCs	TCE (ug/kg)	1,1,1-TCA (ug/kg)	PCE (ug/kg)	Ethylbenzene (ug/kg)	Xylenes (ug/kg)	Chloroform (ug/kg)	TPH[1] (mg/kg)
Clean Soil Pile								
C-1		8.3	--	--	--	--	--	NA
C-2		15	--	--	--	--	--	NA
C-3		64	12	--	--	--	--	NA
C-4		12	--	--	--	--	--	NA
C-5		54	--	--	--	--	--	NA
C-6		49	14	13	--	--	--	NA
C-7		52	9.8	21	--	--	--	NA
C-8		46	96	9.8	--	--	--	NA
C-9		12	--	--	--	--	--	NA
C-10	ND	--	--	--	--	--	--	NA
C-11		16	--	--	--	--	--	NA
C-12	ND	--	--	--	--	--	--	NA
C-13	ND	--	--	--	--	--	--	NA
C-14	ND	--	--	--	--	--	--	NA
C-15	ND	--	--	--	--	--	--	NA
VOC Vapor Extraction Bed								
VO-1	ND	--	--	--	--	--	--	NA
VO-2	ND	--	--	--	--	--	--	NA
VO-3		17	--	--	--	--	--	NA
VO-4	ND	--	--	--	--	--	--	NA
VO-5		24	6.0	--	6.2	38	12	NA
VO-6		4.3	--	--	2.0	94	--	NA
VO-7	ND	--	--	--	--	--	--	NA
VO-8		54	17	10	--	--	--	NA
VO-9		32	--	--	--	--	--	NA

Table 2 (Continued)

ANAYTICAL DATA SUMMARY
SOIL REMEDIATION EVALUATION
JULY 1991

ACUSTAR, INC.
DAYTON THERMAL PRODUCTS PLANT
DAYTON, OHIO

Sample I.D.	All VOCs	TCE (ug/kg)	1,1,1-TCA (ug/kg)	PCE (ug/kg)	Ethylbenzene (ug/kg)	Xylenes (ug/kg)	Chloroform (ug/kg)	TPH[1] (mg/kg)
VO-10		--	--	9.0	--	--	--	NA
VO-11		--	13	7.8	--	--	--	NA
VO-12	ND	--	--	--	--	--	--	NA
VO-13		43	--	--	--	--	--	NA
VO-14		41	--	--	--	--	--	NA
VO-15	ND	--	--	--	--	--	--	NA
VO-16		6.9	--	--	--	--	--	NA
VO-17	ND	--	--	--	--	--	--	NA
VO-18		39	--	--	--	--	--	NA
<u>TPH Vapor Extraction Bed</u>								
TP-1		8.8	--	--	--	--	--	93.2
TP-2		11	--	--	--	--	--	70.0
TP-3	ND	--	--	--	--	--	--	57.9 (35)
TP-4	ND	--	--	--	--	--	--	375 (1,530)
TP-5		9.2	--	--	--	--	--	125.5 (130)
TP-6		86	--	--	--	--	6.1	17.5
TP-7		67	16	11	--	--	9.4	96.2
TP-8		130	6.9	--	--	--	--	260
TP-9		30	--	--	--	--	--	98.2
TP-10		8.6	--	--	--	--	--	83.1
TP-11		78	8.1	--	--	--	--	6,170 (126)
TP-12		15	--	--	--	--	--	189
TP-13		71	8.0	--	--	--	8.9	158
TP-14	ND	--	--	--	--	--	--	539
TP-15		19	--	--	--	--	--	92.2

Table 2 (Continued)

ANAYTICAL DATA SUMMARY
SOIL REMEDIATION EVALUATION
JULY 1991

ACUSTAR, INC.
DAYTON THERMAL PRODUCTS PLANT
DAYTON, OHIO

Sample I.D.	All VOCs	TCE (ug/kg)	1,1,1-TCA (ug/kg)	PCE (ug/kg)	Ethylbenzene (ug/kg)	Xylenes (ug/kg)	Chloroform (ug/kg)	TPH[1] (mg/kg)
QA/QC Samples								
Trip Blanks								
07/29/91	ND							NA
07/31/91	ND							NA
08/01/91	ND							NA
Equipment Blanks								
07/29/91	ND							NA
07/31/91	ND							NA
08/01/91	ND							NA

VOCs - Volatile organic compounds (Priority Pollutant List).
NA - Not analyzed.
ND - No VOCs were detected at the method detection limit (see Appendix B - Certificates of Analysis).
-- Individual VOCs indicated were not detected at the method detection limit (see Appendix B - Certificates of Analyses).
1,1,1-TCA - 1,1,1-trichloroethane
TCE - Trichloroethene
PCE - Tetrachloroethene
TPH - Total Petroleum Hydrocarbons

Notes:

1 TPH analyzed using Method EPA 418.1. Four samples (TP-3, TP-4, TP-5, and TP-11) were analyzed for TPH using SW-846 modified Method 8015 to compare results using the two methods.

Table 3

CALCULATED AMOUNT OF VOCS PRESENT
IN SOIL REMEDIATED BY VAPOR EXTRACTION

ACUSTAR, INC.
DAYTON THERMAL PRODUCTS PLANT
DAYTON, OHIO

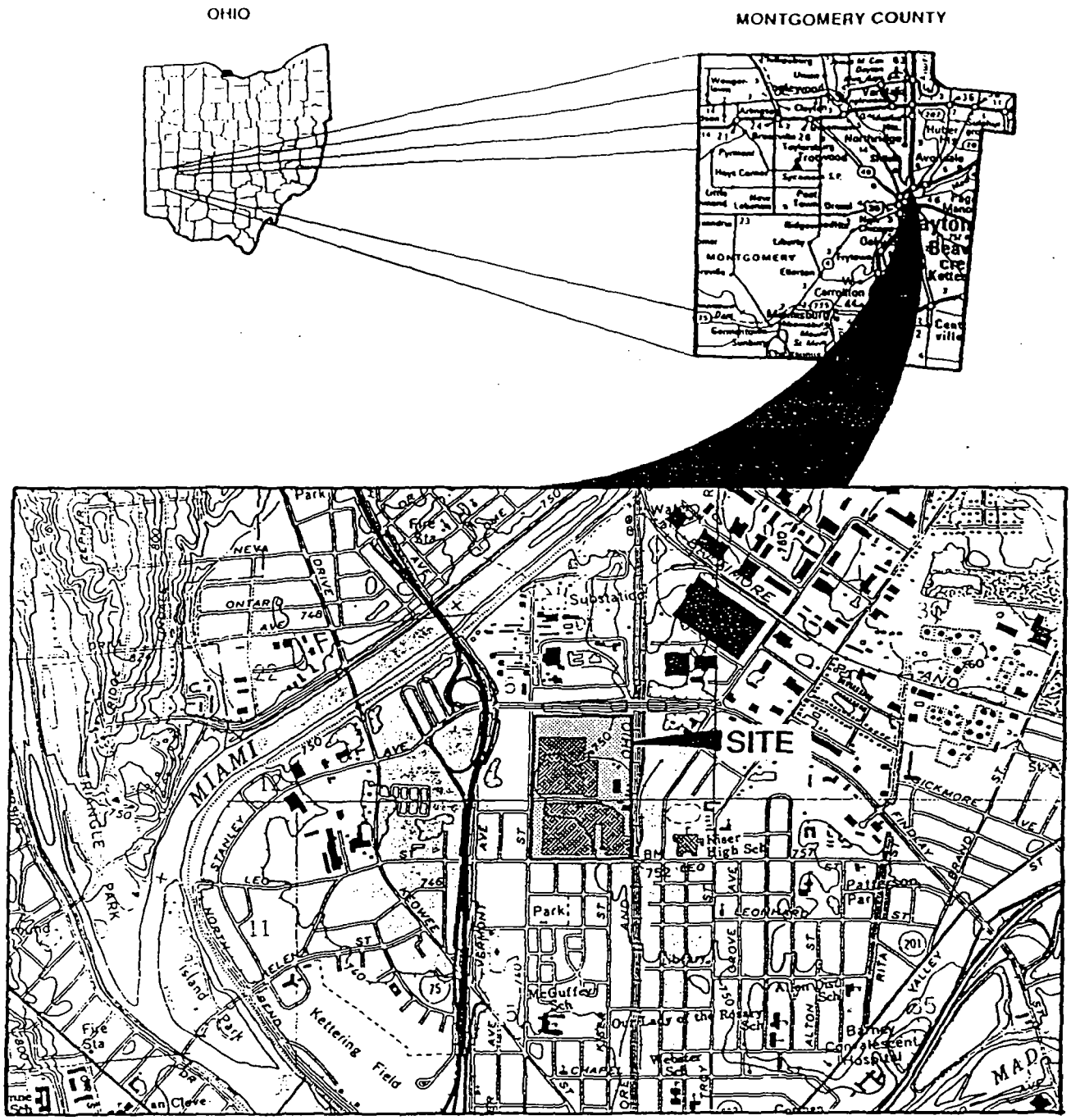
Parameter	Initial Amount (pounds)	Present Amount (pounds)	Percent Reduction
Trichloroethene	15.22	1.87	88
1,1,1-trichloroethane	8.77	0.43	95
Tetrachloroethene	0.88	0.15	83
Total 1,2-dichloroethene	0.95	0	100
1,1-dichloroethene	0.27	0	100
Total VOCs	26.09	2.45	91

PROJ. MANAGER

DOCUMENT MANAGER

CHECKED BY

DRAWN BY



John Mathes & Associates, Inc.

SITE LOCATION MAP

ACUSTAR
DAYTON, OHIO
423023

FIGURE 1

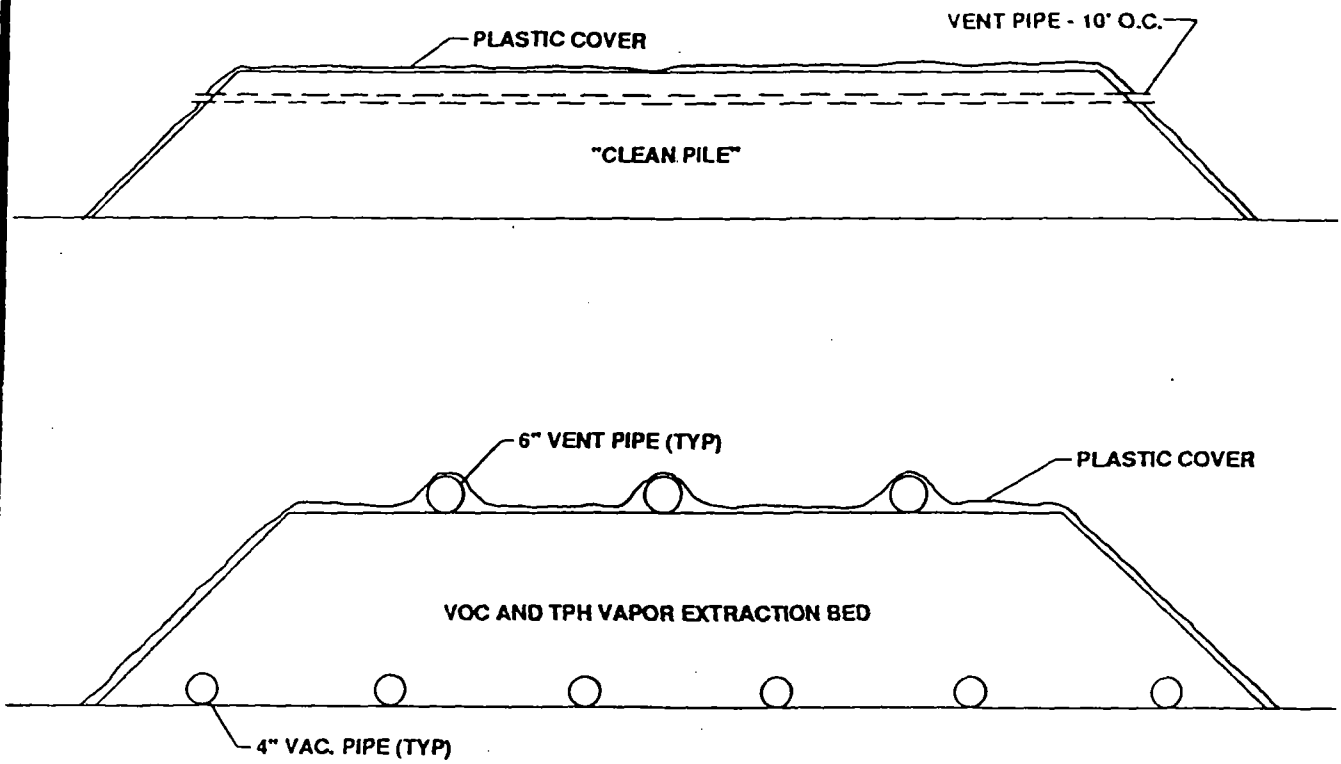
Modified from U.S.G.S Geoloical Survey, Dayton North, Ohio quadrangle, photo revised 1981.

PROJECT MANAGER

DOCUMENT MANAGER

CHECKED BY

DRAWN BY



NOTE: Each 750 feet of vacuum pipe is connected by valves and manifold to one blower unit.

APPROXIMATE DIMENSIONS:

"CLEAN" PILE - 210 x 115' x 19' (14,050 cubic yards)
VOC BED - 200' x 75' x 16' (6,070 cubic yards)
TPH BED - 195' x 140' x 32' (13,600 cubic yards)

SCALE IS VARIABLE

John Mathes & Associates, Inc.

CONCEPTUAL DESIGN
"CLEAN" SOIL STOCKPILE AND
VAPOR EXTRACTION BEDS

ACUSTAR
DAYTON, OHIO
423023

FIGURE 2

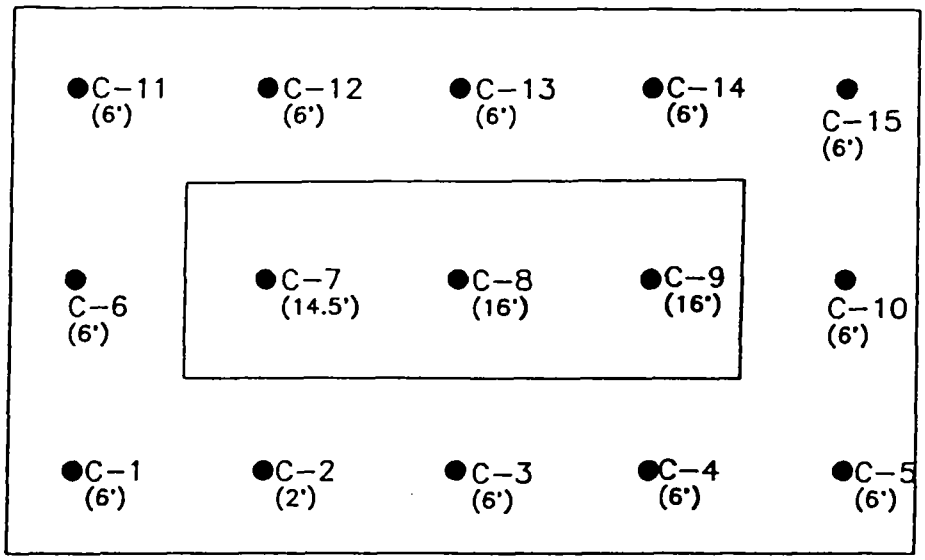
PROJECT MANAGER

DOCUMENT MANAGER

CHECKED BY

DRAWN BY

REV. DATE 9/3/91



EXPLANATION

C-1 (6') APPROXIMATE SAMPLE LOCATION AND NUMBER WITH THICKNESS OF SAMPLED INTERVAL IN PARENTHESES

0 40 80

SCALE IN FEET

N

John Mathes & Associates, Inc.

SAMPLING LOCATIONS AND SAMPLED INTERVAL THICKNESS "CLEAN" SOIL STOCKPILE

ACUSTAR
DAYTON, OHIO
423023

FIGURE 3

PROJECT MANAGER

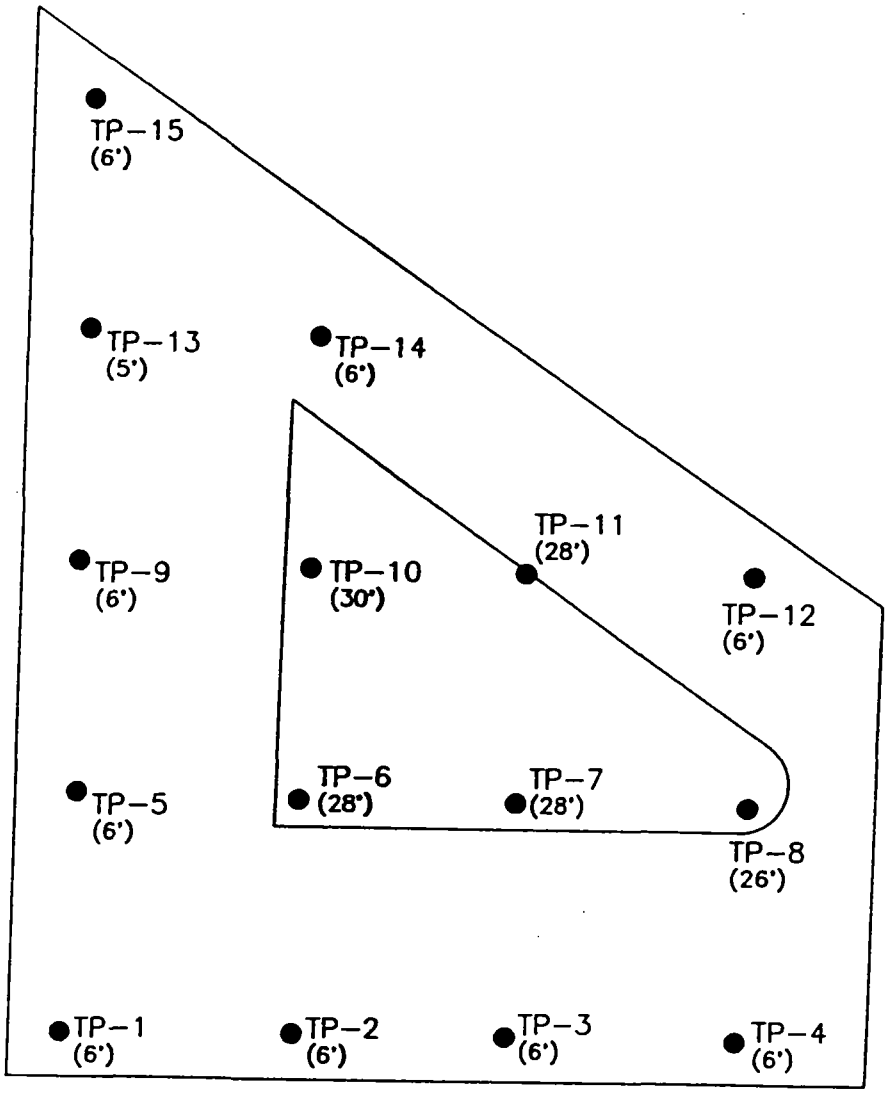
DOCUMENT MANAGER

CHECKED BY

DRAWN BY

H

REV. DATE 9/3/91



EXPLANATION

● TP-1 (6') APPROXIMATE SAMPLE LOCATION AND NUMBER WITH THICKNESS OF SAMPLED INTERVAL IN PARENTHESES

0 40 80

SCALE IN FEET

N

John Mathes & Associates, Inc.

SAMPLING LOCATIONS AND SAMPLED INTERVAL THICKNESS TPH VAPOR EXTRACTION BED

ACUSTAR
DAYTON, OHIO
423023

FIGURE 4

PROJECT MANAGER

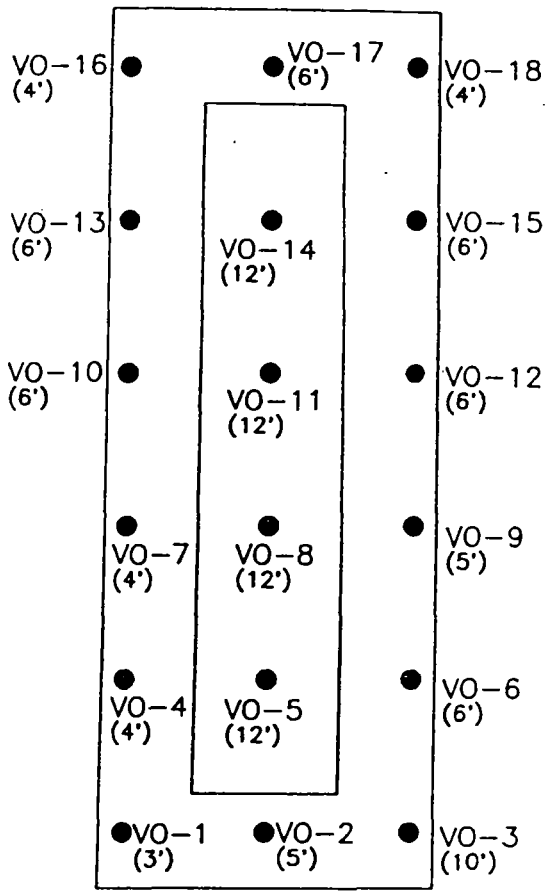
DOCUMENT MANAGER

CHECKED BY

DRAWN BY

H

REV. DATE 9/3/91



0 40 80

SCALE IN FEET

N

EXPLANATION

● VO-1 (3') APPROXIMATE SAMPLE LOCATION AND NUMBER WITH THICKNESS OF SAMPLED INTERVAL IN PARENTHESES

John Mathes & Associates, Inc.	
SAMPLING LOCATIONS AND SAMPLED INTERVAL THICKNESS VOC VAPOR EXTRACTION BED	
ACUSTAR DAYTON, OHIO 423023	FIGURE 5

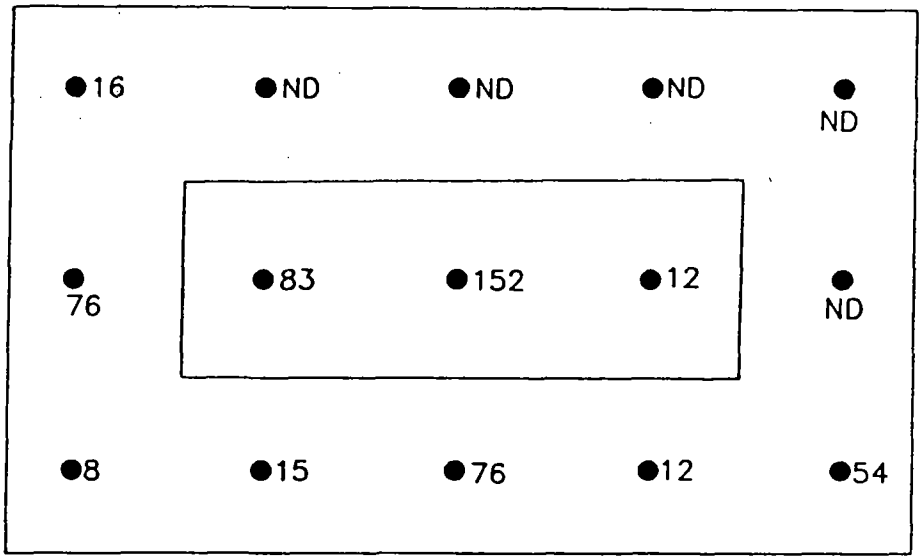
PROJECT MANAGER

DOCUMENT MANAGER

CHECKED BY

DRAWN BY

REV. DATE 9/3/91



EXPLANATION

●8 APPROXIMATE SAMPLE LOCATION WITH TOTAL VOLATILE ORGANIC COMPOUNDS (ug/kg) IN SAMPLED INTERVAL USING METHOD 8240

0 40 80

SCALE IN FEET

N

John Mathes & Associates, Inc.

TOTAL VOCs IN SAMPLED INTERVAL "CLEAN" SOIL STOCKPILE

ACUSTAR
DAYTON, OHIO
423023

FIGURE 6

PROJECT MANAGER

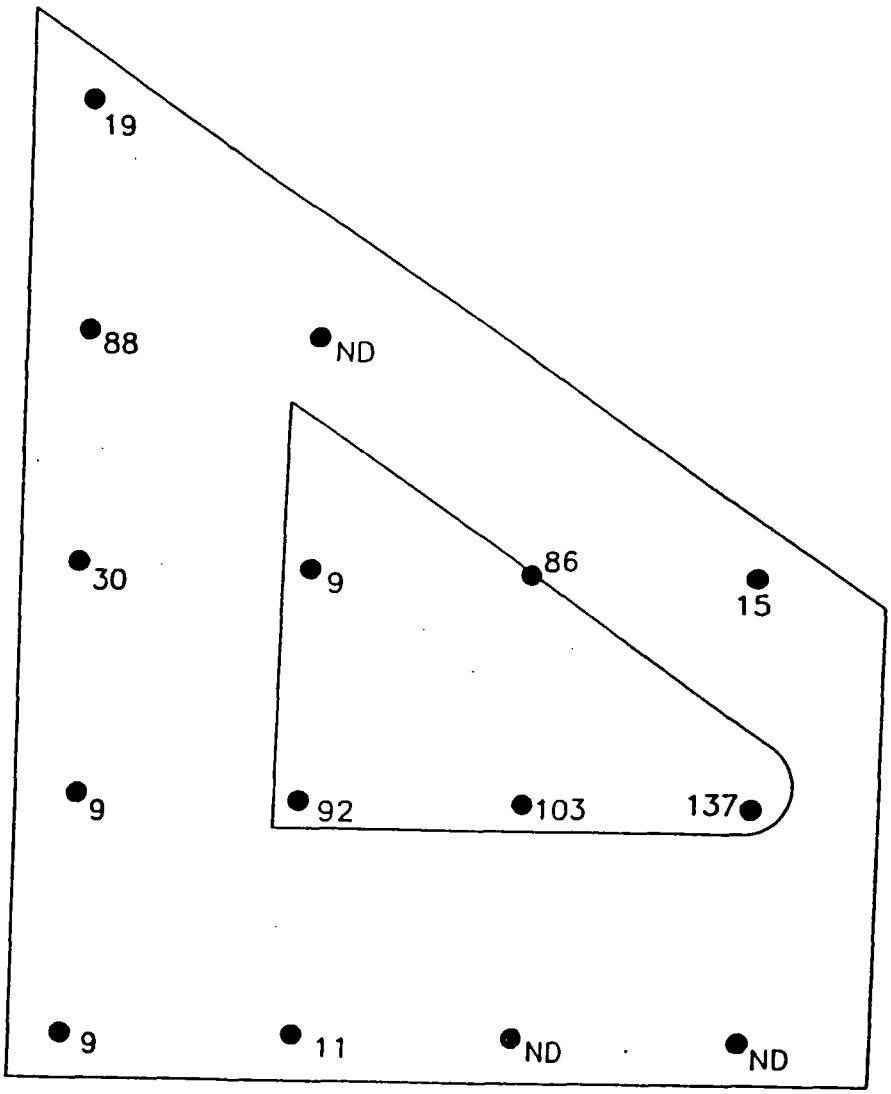
DOCUMENT MANAGER

CHECKED BY

DRAWN BY

H

REV. DATE 9/3/91



EXPLANATION

●9 APPROXIMATE SAMPLE LOCATION WITH TOTAL VOLATILE ORGANIC COMPOUNDS (ug/kg) IN SAMPLED INTERVAL USING METHOD 82.40

0 40 80

SCALE IN FEET

N

John Mathes & Associates, Inc.

TOTAL VOCs IN SAMPLED INTERVAL
TPH VAPOR EXTRACTION BED

ACUSTAR
DAYTON, OHIO
423023

FIGURE 7

PROJECT MANAGER

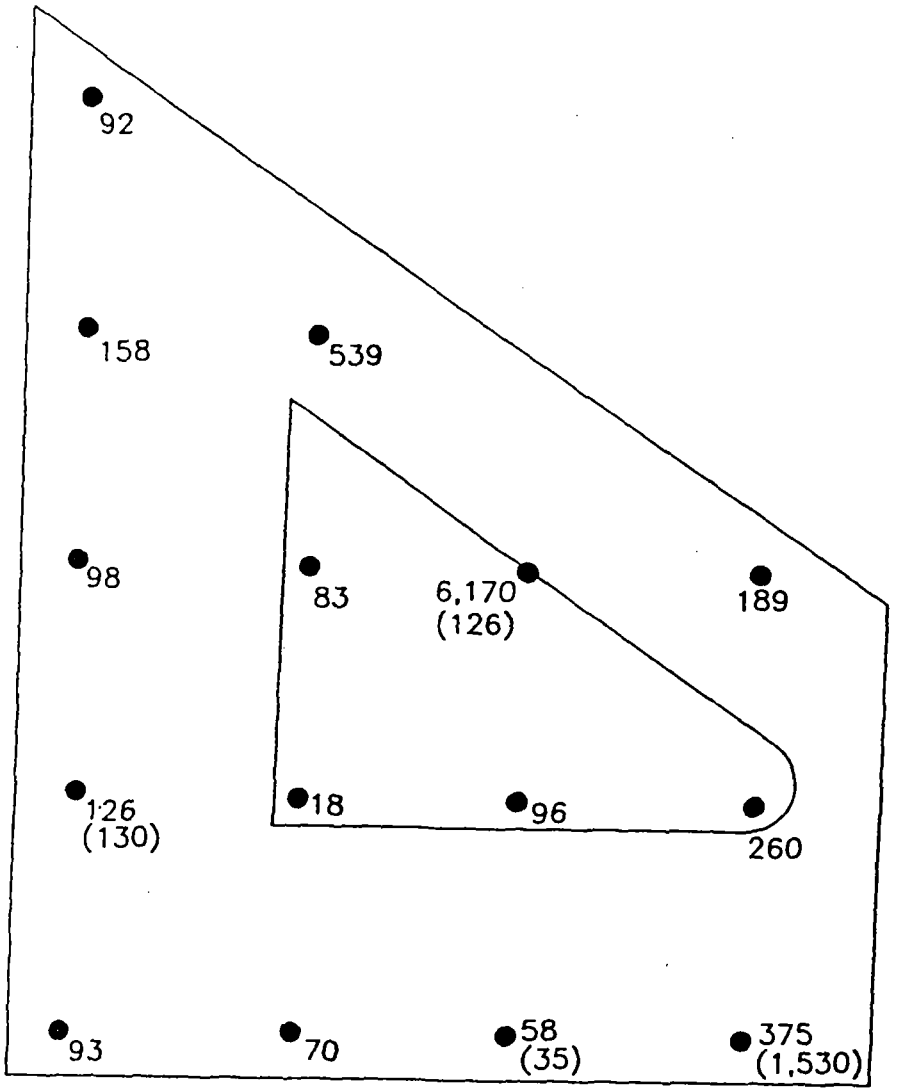
DOCUMENT MANAGER

CHECKED BY

DRAWN BY

H

REV. DATE 9/3/91



EXPLANATION

●93 APPROXIMATE SAMPLE LOCATION WITH TOTAL PETROLEUM HYDROCARBONS (mg/kg) IN SAMPLED INTERVAL USING METHOD 418.1 TPH RESULTS (mg/kg) FOR SELECTED SAMPLES USING METHOD 8015 INDICATED IN PARENTHESES

0 40 80

SCALE IN FEET

N

John Mathes & Associates, Inc.

TOTAL PETROLEUM HYDROCARBONS IN SAMPLED INTERVAL TPH VAPOR EXTRACTION BED

ACUSTAR
DAYTON, OHIO
423023

FIGURE 8

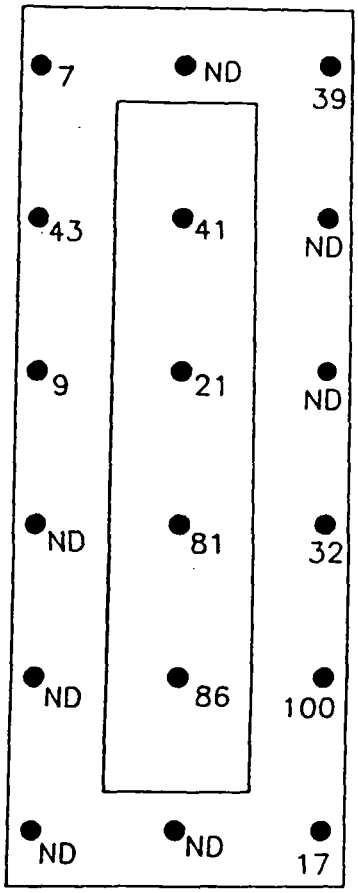
PROJECT MANAGER

DOCUMENT MANAGER

CHECKED BY

DRAWN BY

H REV. DATE 9/3/91



0 40 80

SCALE IN FEET

N

EXPLANATION

●ND APPROXIMATE SAMPLE LOCATION WITH TOTAL VOLATILE ORGANIC COMPOUNDS (ug/kg) IN SAMPLED INTERVAL USING METHOD 8240

John Mathes & Associates, Inc.

TOTAL VOCs IN SAMPLED INTERVAL
VOC VAPOR EXTRACTION BED

ACUSTAR
DAYTON, OHIO
423023

FIGURE 9

APPENDIX A

Approval to Operate Vapor Extraction System

REGIONAL AIR POLLUTION CONTROL AGENCY
Serving Clark, Darke, Greene, Miami, Montgomery & Preble Counties
451 W. Third Street, P.O. Box 972, Dayton, Ohio 45422, (513) 225-4435

May 22, 1991

David Fulbright
John Mathes & Associates, Inc.
210 West Sand Bank Road
P.O. Box 330
Columbia, IL 62236-0330

Dear Mr. Fulbright:

Thank you for the air sampling data from the vapor extraction system at Acustar Industries. Since the project is temporary and air emissions will be insignificant, we have determined this operation can be exempted from the requirements of obtaining a permit under the Ohio Administrative Code Rule 3745-31-03(A)(2).

We would like to make certain the understanding that this source is being exempted in part because it will operate for less than 18 months. It is not the case that you may wait 18 months before applying for a permit to install.

Please inform us of significant changes in the operation of this source.

Sincerely,

Christopher Early

Christopher Early
Air Pollution Control Specialist
Abatement Unit

CE/rm

Sample: 04A TP_2 423023 6003 7/30 0900 Collected: 07/30/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/03/91	CG
ACROLEIN	< 50		UG/KG	08/03/91	CG
ACRYLONITRILE	< 50		UG/KG	08/03/91	CG
BENZENE	< 5		UG/KG	08/03/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/03/91	CG
BROMOFORM	< 5		UG/KG	08/03/91	CG
BROMOMETHANE	< 10		UG/KG	08/03/91	CG
2-BUTANONE	< 100		UG/KG	08/03/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/03/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/03/91	CG
CHLOROBENZENE	< 5		UG/KG	08/03/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/03/91	CG
CHLOROETHANE	< 10		UG/KG	08/03/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/03/91	CG
CHLOROFORM	< 5		UG/KG	08/03/91	CG
CHLOROMETHANE	< 10		UG/KG	08/03/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/03/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/03/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/03/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/03/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/03/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/03/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/03/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/03/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/03/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/03/91	CG
ETHYLBENZENE	< 5		UG/KG	08/03/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/03/91	CG
2-HEXANONE	< 50		UG/KG	08/03/91	CG
IODOMETHANE	< 5		UG/KG	08/03/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 816 & 817 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 1522/1774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 3550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING, APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D190
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
METHYLENE CHLORIDE	< 5		UG/KG	08/03/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/03/91	CG
STYRENE	< 5		UG/KG	08/03/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/03/91	CG
TETRACHLOROETHENE	< 5		UG/KG	08/03/91	CG
TOLUENE	< 5		UG/KG	08/03/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/KG	08/03/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/03/91	CG
TRICHLOROETHENE	11		UG/KG	08/03/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/03/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/03/91	CG
VINYL ACETATE	< 50		UG/KG	08/03/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/03/91	CG
XYLENE	< 5		UG/KG	08/03/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	82.3	Min: 70		Max: 121	
d8-TOLUENE	89.2	Min: 81		Max: 117	
4-BROMOMFLUOROBENZENE	83.8	Min: 74		Max: 121	

Sample: 05A TP_3 423023 6003 7/30 0910 Collected: 07/30/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/03/91	CG
ACROLEIN	< 50		UG/KG	08/03/91	CG
ACRYLONITRILE	< 50		UG/KG	08/03/91	CG
BENZENE	< 5		UG/KG	08/03/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/03/91	CG
BROMOFORM	< 5		UG/KG	08/03/91	CG
BROMOMETHANE	< 10		UG/KG	08/03/91	CG
2-BUTANONE	< 100		UG/KG	08/03/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/03/91	CG

ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
CARBON TETRACHLORIDE	< 5		UG/KG	08/03/91	CG
CHLOROBENZENE	< 5		UG/KG	08/03/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/03/91	CG
CHLOROETHANE	< 10		UG/KG	08/03/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/03/91	CG
CHLOROFORM	< 5		UG/KG	08/03/91	CG
CHLOROMETHANE	< 10		UG/KG	08/03/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/03/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/03/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/03/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/03/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/03/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/03/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/03/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/03/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/03/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/03/91	CG
ETHYLBENZENE	< 5		UG/KG	08/03/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/03/91	CG
2-HEXANONE	< 50		UG/KG	08/03/91	CG
IODOMETHANE	< 5		UG/KG	08/03/91	CG
METHYLENE CHLORIDE	< 5		UG/KG	08/03/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/03/91	CG
STYRENE	< 5		UG/KG	08/03/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/03/91	CG
TETRACHLOROETHENE	< 5		UG/KG	08/03/91	CG
TOLUENE	< 5		UG/KG	08/03/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/KG	08/03/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/03/91	CG
TRICHLOROETHENE	< 5		UG/KG	08/03/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/03/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/03/91	CG
VINYL ACETATE	< 50		UG/KG	08/03/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/03/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 816 & 817 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15221774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D340.
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
XYLENE	< 5		UG/KG	08/03/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	81.7	Min: 70	Max: 121		
d8-TOLUENE	89.9	Min: 81	Max: 117		
4-BROMOMFLUOROBENZENE	83.2	Min: 74	Max: 121		

Sample: 06A TP_3 423023 6003 7/30 0910 Collected: 08/01/91

Test Description	Result	Limit	Units	Analyzed	By
T.PETROL HYDROCARBON-418.1	57.9		MG/KG		RP

Sample: 07A TP_4 423023 6003 7/30 1015 Collected: 07/30/91

Test Description	Result	Limit	Units	Analyzed	By
T.PETROL HYDROCARBON-418.1	375		MG/KG		RP

Sample: 08A TP_4 423023 6003 7/30 1015 Collected: 07/30/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/03/91	CG
ACROLEIN	< 50		UG/KG	08/03/91	CG
ACRYLONITRILE	< 50		UG/KG	08/03/91	CG
BENZENE	< 5		UG/KG	08/03/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/03/91	CG
BROMOFORM	< 5		UG/KG	08/03/91	CG
BROMOMETHANE	< 10		UG/KG	08/03/91	CG
2-BUTANONE	< 100		UG/KG	08/03/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 3988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390.
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
CARBON DISULFIDE	< 100		UG/KG	08/03/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/03/91	CG
CHLOROBENZENE	< 5		UG/KG	08/03/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/03/91	CG
CHLOROETHANE	< 10		UG/KG	08/03/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/03/91	CG
CHLOROFORM	< 5		UG/KG	08/03/91	CG
CHLOROMETHANE	< 10		UG/KG	08/03/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/03/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/03/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/03/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/03/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/03/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/03/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/03/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/03/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/03/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/03/91	CG
ETHYLBENZENE	< 5		UG/KG	08/03/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/03/91	CG
2-HEXANONE	< 50		UG/KG	08/03/91	CG
IODOMETHANE	< 5		UG/KG	08/03/91	CG
METHYLENE CHLORIDE	< 5		UG/KG	08/03/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/03/91	CG
STYRENE	< 5		UG/KG	08/03/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/03/91	CG
TETRACHLOROETHENE	< 5		UG/KG	08/03/91	CG
TOLUENE	< 5		UG/KG	08/03/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/KG	08/03/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/03/91	CG
TRICHLOROETHENE	19		UG/KG	08/03/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/03/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/03/91	CG
VINYL ACETATE	< 50		UG/KG	08/03/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 3988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390.
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
VINYL CHLORIDE	< 10		UG/KG	08/03/91	CG
XYLENE	< 5		UG/KG	08/03/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	92.6	Min: 70	Max: 121		
d8-TOLUENE	87.2	Min: 81	Max: 117		
4-BROMOMFLUOROBENZENE	79.6	Min: 74	Max: 121		

Sample: 09A TP_5 423023 6003 7/30 1105 Collected: 07/30/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/03/91	CG
ACROLEIN	< 50		UG/KG	08/03/91	CG
ACRYLONITRILE	< 50		UG/KG	08/03/91	CG
BENZENE	< 5		UG/KG	08/03/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/03/91	CG
BROMOFORM	< 5		UG/KG	08/03/91	CG
BROMOMETHANE	< 10		UG/KG	08/03/91	CG
2-BUTANONE	< 100		UG/KG	08/03/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/03/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/03/91	CG
CHLOROBENZENE	< 5		UG/KG	08/03/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/03/91	CG
CHLOROETHANE	< 10		UG/KG	08/03/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/03/91	CG
CHLOROFORM	< 5		UG/KG	08/03/91	CG
CHLOROMETHANE	< 10		UG/KG	08/03/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/03/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/03/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/03/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/03/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/03/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390.
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
1,1-DICHLOROETHENE	< 5		UG/KG	08/03/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/03/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/03/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/03/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/03/91	CG
ETHYLBENZENE	< 5		UG/KG	08/03/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/03/91	CG
2-HEXANONE	< 50		UG/KG	08/03/91	CG
IODOMETHANE	< 5		UG/KG	08/03/91	CG
METHYLENE CHLORIDE	< 5		UG/KG	08/03/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/03/91	CG
STYRENE	< 5		UG/KG	08/03/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/03/91	CG
TETRACHLOROETHENE	< 5		UG/KG	08/03/91	CG
TOLUENE	< 5		UG/KG	08/03/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/KG	08/03/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/03/91	CG
TRICHLOROETHENE	~ 9.2		UG/KG	08/03/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/03/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/03/91	CG
VINYL ACETATE	< 50		UG/KG	08/03/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/03/91	CG
XYLENE	< 5		UG/KG	08/03/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	86.0	Min: 70	Max: 121		
d8-TOLUENE	82.6	Min: 81	Max: 117		
4-BROMOMFLUOROBENZENE	84.0	Min: 74	Max: 121		

Sample: 10A TP_5 423023 6003 7/30 1105 Collected: 07/30/91

Test Description	Result	Limit	Units	Analyzed	By
T.PETROL HYDROCARBON-418.1	125.5		MG/KG		RP

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390.
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Sample: 11A TP_9 423023 6003 7/30 1125 Collected: 07/30/91

Test Description	Result	Limit	Units	Analyzed	By
T.PETROL HYDROCARBON-418.1	98.2		MG/KG		RP

Sample: 12A TP_9 423023 6003 7/30 1125 Collected: 07/30/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/03/91	CG
ACROLEIN	< 50		UG/KG	08/03/91	CG
ACRYLONITRILE	< 50		UG/KG	08/03/91	CG
BENZENE	< 5		UG/KG	08/03/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/03/91	CG
BROMOFORM	< 5		UG/KG	08/03/91	CG
BROMOMETHANE	< 10		UG/KG	08/03/91	CG
2-BUTANONE	< 100		UG/KG	08/03/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/03/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/03/91	CG
CHLOROBENZENE	< 5		UG/KG	08/03/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/03/91	CG
CHLOROETHANE	< 10		UG/KG	08/03/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/03/91	CG
CHLOROFORM	< 5		UG/KG	08/03/91	CG
CHLOROMETHANE	< 10		UG/KG	08/03/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/03/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/03/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/03/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/03/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/03/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/03/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/03/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 3988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047711 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390.
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
1,2-DICHLOROPROPANE	< 5		UG/KG	08/03/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/03/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/03/91	CG
ETHYLBENZENE	< 5		UG/KG	08/03/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/03/91	CG
2-HEXANONE	< 50		UG/KG	08/03/91	CG
IODOMETHANE	< 5		UG/KG	08/03/91	CG
METHYLENE CHLORIDE	< 5		UG/KG	08/03/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/03/91	CG
STYRENE	< 5		UG/KG	08/03/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/03/91	CG
TETRACHLOROETHENE	< 5		UG/KG	08/03/91	CG
TOLUENE	< 5		UG/KG	08/03/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/KG	08/03/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/03/91	CG
TRICHLOROETHENE	30		UG/KG	08/03/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/03/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/03/91	CG
VINYL ACETATE	< 50		UG/KG	08/03/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/03/91	CG
XYLENE	< 5		UG/KG	08/03/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	102	Min: 70		Max: 121	
d8-TOLUENE	111	Min: 81		Max: 117	
4-BROMOFLUOROBENZENE	84.2	Min: 74		Max: 121	

Sample: 13A TP12 423023 6003 7/30 1325 Collected: 07/30/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/05/91	CG
ACROLEIN	< 50		UG/KG	08/05/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 9988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 3522374 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 004271 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 3550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING, APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #0190
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
ACRYLONITRILE	< 50		UG/KG	08/05/91	CG
BENZENE	< 5		UG/KG	08/05/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/05/91	CG
BROMOFORM	< 5		UG/KG	08/05/91	CG
BROMOMETHANE	< 10		UG/KG	08/05/91	CG
2-BUTANONE	< 100		UG/KG	08/05/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/05/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/05/91	CG
CHLOROBENZENE	< 5		UG/KG	08/05/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/05/91	CG
CHLOROETHANE	< 10		UG/KG	08/05/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/05/91	CG
CHLOROFORM	< 5		UG/KG	08/05/91	CG
CHLOROMETHANE	< 10		UG/KG	08/05/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/05/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/05/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/05/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/05/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/05/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/05/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/05/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/05/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/05/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/05/91	CG
ETHYLBENZENE	< 5		UG/KG	08/05/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/05/91	CG
2-HEXANONE	< 50		UG/KG	08/05/91	CG
IODOMETHANE	< 5		UG/KG	08/05/91	CG
METHYLENE CHLORIDE	< 5		UG/KG	08/05/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/05/91	CG
STYRENE	< 5		UG/KG	08/05/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/05/91	CG
TETRACHLOROETHENE	< 5		UG/KG	08/05/91	CG
TOLUENE	< 5		UG/KG	08/05/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15221774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047731 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D190
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
1,1,1-TRICHLOROETHANE	< 5		UG/KG	08/05/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/05/91	CG
TRICHLOROETHENE	15		UG/KG	08/05/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/05/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/05/91	CG
VINYL ACETATE	< 50		UG/KG	08/05/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/05/91	CG
XYLENE	< 5		UG/KG	08/05/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	84.2	Min: 70		Max: 121	
d8-TOLUENE	96.0	Min: 81		Max: 117	
4-BROMOMFLUOROBENZENE	103	Min: 74		Max: 121	

Sample: 14A TP12 423023 6003 7/30 1325 Collected: 07/30/91

Test Description	Result	Limit	Units	Analyzed	By
T.PETROL HYDROCARBON-418.1	189		MG/KG		RP

Sample: 15A TP11 423023 6003 7/30 1120 Collected: 07/30/91

Test Description	Result	Limit	Units	Analyzed	By
T.PETROL HYDROCARBON-418.1	6170		MG/KG		RP

Sample: 16A TP11 423023 6003 7/30 1120 Collected: 07/30/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/04/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 816 & 817 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. P188 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15221774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047731 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB264549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390.
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
ACROLEIN	< 50		UG/KG	08/04/91	CG
ACRYLONITRILE	< 50		UG/KG	08/04/91	CG
BENZENE	< 5		UG/KG	08/04/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/04/91	CG
BROMOFORM	< 5		UG/KG	08/04/91	CG
BROMOMETHANE	< 10		UG/KG	08/04/91	CG
2-BUTANONE	< 100		UG/KG	08/04/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/04/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/04/91	CG
CHLOROBENZENE	< 5		UG/KG	08/04/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/04/91	CG
CHLOROETHANE	< 10		UG/KG	08/04/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/04/91	CG
CHLOROFORM	15		UG/KG	08/04/91	CG
CHLOROMETHANE	< 10		UG/KG	08/04/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/04/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/04/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/04/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/04/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/04/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/04/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/04/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/04/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/04/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/04/91	CG
ETHYLBENZENE	< 5		UG/KG	08/04/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/04/91	CG
2-HEXANONE	< 50		UG/KG	08/04/91	CG
IODOMETHANE	< 5		UG/KG	08/04/91	CG
METHYLENE CHLORIDE	< 5		UG/KG	08/04/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/04/91	CG
STYRENE	< 5		UG/KG	08/04/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/04/91	CG
TETRACHLOROETHENE	< 5		UG/KG	08/04/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 816 & 817 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 3988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15221774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
TOLUENE	< 5		UG/KG	08/04/91	CG
1,1,1-TRICHLOROETHANE	8.1		UG/KG	08/04/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/04/91	CG
TRICHLOROETHENE	78		UG/KG	08/04/91	CG
TRICHLOROFLUOROMETHONE	< 5		UG/KG	08/04/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/04/91	CG
VINYL ACETATE	< 50		UG/KG	08/04/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/04/91	CG
XYLENE	< 5		UG/KG	08/04/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	108	Min: 70		Max: 121	
d8-TOLUENE	97.7	Min: 81		Max: 117	
4-BROMOMFLUOROBENZENE	92.3	Min: 74		Max: 121	

Sample: 17A TP-7 423023 6003 7/30 1340 Collected: 07/30/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/04/91	CG
ACROLEIN	< 50		UG/KG	08/04/91	CG
ACRYLONITRILE	< 50		UG/KG	08/04/91	CG
BENZENE	< 5		UG/KG	08/04/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/04/91	CG
BROMOFORM	< 5		UG/KG	08/04/91	CG
BROMOMETHANE	< 10		UG/KG	08/04/91	CG
2-BUTANONE	< 100		UG/KG	08/04/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/04/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/04/91	CG
CHLOROBENZENE	< 5		UG/KG	08/04/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/04/91	CG
CHLOROETHANE	< 10		UG/KG	08/04/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/04/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 816 & 817 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 5988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390.
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
CHLOROFORM	9.4		UG/KG	08/04/91	CG
CHLOROMETHANE	< 10		UG/KG	08/04/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/04/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/04/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/04/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/04/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/04/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/04/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/04/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/04/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/04/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/04/91	CG
ETHYLBENZENE	< 5		UG/KG	08/04/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/04/91	CG
2-HEXANONE	< 50		UG/KG	08/04/91	CG
IODOMETHANE	< 5		UG/KG	08/04/91	CG
METHYLENE CHLORIDE	< 5		UG/KG	08/04/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/04/91	CG
STYRENE	< 5		UG/KG	08/04/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/04/91	CG
TETRACHLOROETHENE	11		UG/KG	08/04/91	CG
TOLUENE	< 5		UG/KG	08/04/91	CG
1,1,1-TRICHLOROETHANE	16		UG/KG	08/04/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/04/91	CG
TRICHLOROETHENE	67		UG/KG	08/04/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/04/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/04/91	CG
VINYL ACETATE	< 50		UG/KG	08/04/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/04/91	CG
XYLENE	< 5		UG/KG	08/04/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	106	Min: 70		Max: 121	
d8-TOLUENE	103	Min: 81		Max: 117	
4-BROMOMFLUOROBENZENE	88.9	Min: 74		Max: 121	

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 816 & 817 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390.
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Sample: 18A TP-7 423023 6003 7/30 1340 Collected: 07/30/91

Test Description	Result	Limit	Units	Analyzed	By
T.PETROL HYDROCARBON-418.1	96.2		MG/KG		RP

Sample: 19A TP13 423023 6003 7/30 1400 Collected: 07/30/91

Test Description	Result	Limit	Units	Analyzed	By
T.PETROL HYDROCARBON-418.1	158		MG/KG		RP

Sample: 20A TP13 423023 6003 7/30 1400 Collected: 07/30/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/04/91	CG
ACROLEIN	< 50		UG/KG	08/04/91	CG
ACRYLONITRILE	< 50		UG/KG	08/04/91	CG
BENZENE	< 5		UG/KG	08/04/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/04/91	CG
BROMOFORM	< 5		UG/KG	08/04/91	CG
BROMOMETHANE	< 10		UG/KG	08/04/91	CG
2-BUTANONE	< 100		UG/KG	08/04/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/04/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/04/91	CG
CHLOROBENZENE	< 5		UG/KG	08/04/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/04/91	CG
CHLOROETHANE	< 10		UG/KG	08/04/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/04/91	CG
CHLOROFORM	8.9		UG/KG	08/04/91	CG
CHLOROMETHANE	< 10		UG/KG	08/04/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 3988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
DIBROMOMETHANE	< 5		UG/KG	08/04/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/04/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/04/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/04/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/04/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/04/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/04/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/04/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/04/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/04/91	CG
ETHYLBENZENE	< 5		UG/KG	08/04/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/04/91	CG
2-HEXANONE	< 50		UG/KG	08/04/91	CG
IODOMETHANE	< 5		UG/KG	08/04/91	CG
METHYLENE CHLORIDE	< 5		UG/KG	08/04/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/04/91	CG
STYRENE	< 5		UG/KG	08/04/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/04/91	CG
TETRACHLOROETHENE	< 5		UG/KG	08/04/91	CG
TOLUENE	< 5		UG/KG	08/04/91	CG
1,1,1-TRICHLOROETHANE	8.0		UG/KG	08/04/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/04/91	CG
TRICHLOROETHENE	71		UG/KG	08/04/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/04/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/04/91	CG
VINYL ACETATE	< 50		UG/KG	08/04/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/04/91	CG
XYLENE	< 5		UG/KG	08/04/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	91.9	Min: 70		Max: 121	
d8-TOLUENE	108	Min: 81		Max: 117	
4-BROMOMFLUOROBENZENE	82.2	Min: 74		Max: 121	

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 816 & 817 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Sample: 21A TP14 423023 6003 7/30 1530 Collected: 07/30/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/05/91	CG
ACROLEIN	< 50		UG/KG	08/05/91	CG
ACRYLONITRILE	< 50		UG/KG	08/05/91	CG
BENZENE	< 5		UG/KG	08/05/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/05/91	CG
BROMOFORM	< 5		UG/KG	08/05/91	CG
BROMOMETHANE	< 10		UG/KG	08/05/91	CG
2-BUTANONE	< 100		UG/KG	08/05/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/05/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/05/91	CG
CHLOROBENZENE	< 5		UG/KG	08/05/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/05/91	CG
CHLOROETHANE	< 10		UG/KG	08/05/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/05/91	CG
CHLOROFORM	< 5		UG/KG	08/05/91	CG
CHLOROMETHANE	< 10		UG/KG	08/05/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/05/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/05/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/05/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/05/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/05/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/05/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/05/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/05/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/05/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/05/91	CG
ETHYLBENZENE	< 5		UG/KG	08/05/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/05/91	CG
2-HEXANONE	< 50		UG/KG	08/05/91	CG
IODOMETHANE	< 5		UG/KG	08/05/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 816 & 817 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15221774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047731 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING, APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390.
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
METHYLENE CHLORIDE	< 5		UG/KG	08/05/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/05/91	CG
STYRENE	< 5		UG/KG	08/05/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/05/91	CG
TETRACHLOROETHENE	< 5		UG/KG	08/05/91	CG
TOLUENE	< 5		UG/KG	08/05/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/KG	08/05/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/05/91	CG
TRICHLOROETHENE	< 5		UG/KG	08/05/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/05/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/05/91	CG
VINYL ACETATE	< 50		UG/KG	08/05/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/05/91	CG
XYLENE	< 5		UG/KG	08/05/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	99.2	Min: 70	Max: 121		
d8-TOLUENE	97.2	Min: 81	Max: 117		
4-BROMOMFLUOROBENZENE	98.8	Min: 74	Max: 121		

Sample: 22A TP14 423023 6003 7/30 1530 Collected: 07/30/91

Test Description	Result	Limit	Units	Analyzed	By
T.PETROL HYDROCARBON-418.1	539		MG/KG		RP

Sample: 23A TP-6 423023 6003 7/30 1500 Collected: 07/30/91

Test Description	Result	Limit	Units	Analyzed	By
T.PETROL HYDROCARBON-418.1	17.5		MG/KG		RP

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15221774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Sample: 24A TP-6 423023 6003 7/30 1500 Collected: 07/30/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/04/91	CG
ACROLEIN	< 50		UG/KG	08/04/91	CG
ACRYLONITRILE	< 50		UG/KG	08/04/91	CG
BENZENE	< 5		UG/KG	08/04/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/04/91	CG
BROMOFORM	< 5		UG/KG	08/04/91	CG
BROMOMETHANE	< 10		UG/KG	08/04/91	CG
2-BUTANONE	< 100		UG/KG	08/04/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/04/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/04/91	CG
CHLOROBENZENE	< 5		UG/KG	08/04/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/04/91	CG
CHLOROETHANE	< 10		UG/KG	08/04/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/04/91	CG
CHLOROFORM	6.1		UG/KG	08/04/91	CG
CHLOROMETHANE	< 10		UG/KG	08/04/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/04/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/04/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/04/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/04/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/04/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/04/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/04/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/04/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/04/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/04/91	CG
ETHYLBENZENE	< 5		UG/KG	08/04/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/04/91	CG
2-HEXANONE	< 50		UG/KG	08/04/91	CG
IODOMETHANE	< 5		UG/KG	08/04/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390.
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
METHYLENE CHLORIDE	< 5		UG/KG	08/04/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/04/91	CG
STYRENE	< 5		UG/KG	08/04/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/04/91	CG
TETRACHLOROETHENE	12		UG/KG	08/04/91	CG
TOLUENE	< 5		UG/KG	08/04/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/KG	08/04/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/04/91	CG
TRICHLOROETHENE	86		UG/KG	08/04/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/04/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/04/91	CG
VINYL ACETATE	< 50		UG/KG	08/04/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/04/91	CG
XYLENE	< 5		UG/KG	08/04/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	95.6	Min: 70		Max: 121	
d8-TOLUENE	107	Min: 81		Max: 117	
4-BROMOMFLUOROBENZENE	91.6	Min: 74		Max: 121	

Sample: 25A TP15 423023 6003 7/31 0800 Collected: 07/31/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/04/91	CG
ACROLEIN	< 50		UG/KG	08/04/91	CG
ACRYLONITRILE	< 50		UG/KG	08/04/91	CG
BENZENE	< 5		UG/KG	08/04/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/04/91	CG
BROMOFORM	< 5		UG/KG	08/04/91	CG
BROMOMETHANE	< 10		UG/KG	08/04/91	CG
2-BUTANONE	< 100		UG/KG	08/04/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/04/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 816 & 817 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
CARBON TETRACHLORIDE	< 5		UG/KG	08/04/91	CG
CHLOROBENZENE	< 5		UG/KG	08/04/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/04/91	CG
CHLOROETHANE	< 10		UG/KG	08/04/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/04/91	CG
CHLOROFORM	11		UG/KG	08/04/91	CG
CHLOROMETHANE	< 10		UG/KG	08/04/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/04/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/04/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/04/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/04/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/04/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/04/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/04/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/04/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/04/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/04/91	CG
ETHYLBENZENE	< 5		UG/KG	08/04/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/04/91	CG
2-HEXANONE	< 50		UG/KG	08/04/91	CG
IODOMETHANE	< 5		UG/KG	08/04/91	CG
METHYLENE CHLORIDE	< 5		UG/KG	08/04/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/04/91	CG
STYRENE	< 5		UG/KG	08/04/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/04/91	CG
TETRACHLOROETHENE	< 5		UG/KG	08/04/91	CG
TOLUENE	< 5		UG/KG	08/04/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/KG	08/04/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/04/91	CG
TRICHLOROETHENE	19		UG/KG	08/04/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/04/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/04/91	CG
VINYL ACETATE	< 50		UG/KG	08/04/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/04/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 816 & 817 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1968 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047731 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390.
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
XYLENE	< 5		UG/KG	08/04/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	96.9	Min: 70		Max: 121	
d8-TOLUENE	99.6	Min: 81		Max: 117	
4-BROMOMFLUOROBENZENE	96.2	Min: 74		Max: 121	

Sample: 26A TP15 423023 6003 7/31 0800 Collected: 07/31/91

Test Description	Result	Limit	Units	Analyzed	By
T.PETROL HYDROCARBON-418.1	92.2		MG/KG		RP

Sample: 27A TP10 423023 6003 7/31 0850 Collected: 07/31/91

Test Description	Result	Limit	Units	Analyzed	By
T.PETROL HYDROCARBON-418.1	83.1		MG/KG		RP

Sample: 28A TP10 423023 6003 7/31 0850 Collected: 07/31/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/05/91	CG
ACROLEIN	< 50		UG/KG	08/05/91	CG
ACRYLONITRILE	< 50		UG/KG	08/05/91	CG
BENZENE	< 5		UG/KG	08/05/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/05/91	CG
BROMOFORM	< 5		UG/KG	08/05/91	CG
BROMOMETHANE	< 10		UG/KG	08/05/91	CG
2-BUTANONE	< 100		UG/KG	08/05/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 816 & 817 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047711 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 3550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
CARBON DISULFIDE	< 100		UG/KG	08/05/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/05/91	CG
CHLOROBENZENE	< 5		UG/KG	08/05/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/05/91	CG
CHLOROETHANE	< 10		UG/KG	08/05/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/05/91	CG
CHLOROFORM	< 5		UG/KG	08/05/91	CG
CHLOROMETHANE	< 10		UG/KG	08/05/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/05/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/05/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/05/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/05/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/05/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/05/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/05/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/05/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/05/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/05/91	CG
ETHYLBENZENE	< 5		UG/KG	08/05/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/05/91	CG
2-HEXANONE	< 50		UG/KG	08/05/91	CG
IODOMETHANE	< 5		UG/KG	08/05/91	CG
METHYLENE CHLORIDE	< 5		UG/KG	08/05/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/05/91	CG
STYRENE	< 5		UG/KG	08/05/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/05/91	CG
TETRACHLOROETHENE	< 5		UG/KG	08/05/91	CG
TOLUENE	< 5		UG/KG	08/05/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/KG	08/05/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/05/91	CG
TRICHLOROETHENE	8.6		UG/KG	08/05/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/05/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/05/91	CG
VINYL ACETATE	< 50		UG/KG	08/05/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1980 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15221774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 004773 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB2244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D190
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
VINYL CHLORIDE	< 10		UG/KG	08/05/91	CG
XYLENE	< 5		UG/KG	08/05/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	85.8	Min: 70	Max: 121		
d8-TOLUENE	87.4	Min: 81	Max: 117		
4-BROMOMFLUOROBENZENE	90.5	Min: 74	Max: 121		

Sample: 29A TP-8 423023 6003 7/31 1010 Collected: 07/31/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/05/91	CG
ACROLEIN	< 50		UG/KG	08/05/91	CG
ACRYLONITRILE	< 50		UG/KG	08/05/91	CG
BENZENE	< 5		UG/KG	08/05/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/05/91	CG
BROMOFORM	< 5		UG/KG	08/05/91	CG
BROMOMETHANE	< 10		UG/KG	08/05/91	CG
2-BUTANONE	< 100		UG/KG	08/05/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/05/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/05/91	CG
CHLOROBENZENE	< 5		UG/KG	08/05/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/05/91	CG
CHLOROETHANE	< 10		UG/KG	08/05/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/05/91	CG
CHLOROFORM	< 5		UG/KG	08/05/91	CG
CHLOROMETHANE	< 10		UG/KG	08/05/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/05/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/05/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/05/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/05/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/05/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 817 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390.
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
1,1-DICHLOROETHENE	< 5		UG/KG	08/05/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/05/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/05/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/05/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/05/91	CG
ETHYLBENZENE	< 5		UG/KG	08/05/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/05/91	CG
2-HEXANONE	< 50		UG/KG	08/05/91	CG
IODOMETHANE	< 5		UG/KG	08/05/91	CG
METHYLENE CHLORIDE	< 5		UG/KG	08/05/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/05/91	CG
STYRENE	< 5		UG/KG	08/05/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/05/91	CG
TETRACHLOROETHENE	< 5		UG/KG	08/05/91	CG
TOLUENE	< 5		UG/KG	08/05/91	CG
1,1,1-TRICHLOROETHANE	6.9		UG/KG	08/05/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/05/91	CG
TRICHLOROETHENE	130		UG/KG	08/05/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/05/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/05/91	CG
VINYL ACETATE	< 50		UG/KG	08/05/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/05/91	CG
XYLENE	< 5		UG/KG	08/05/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	95.8	Min: 70		Max: 121	
d8-TOLUENE	108	Min: 81		Max: 117	
4-BROMOMFLUOROBENZENE	98.6	Min: 74		Max: 121	

Sample: 30A TP-8 423023 6003 7/31 1010 Collected: 07/31/91

Test Description	Result	Limit	Units	Analyzed	By
T.PETROL HYDROCARBON-418.1	260		MG/KG		RP

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 3988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #0390.
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Sample: 31A TB 731 423023 6003 7/31 15 Collected: 07/31/91

Test Description	Result	Limit	Units	Analyzed	By
T.PETROL HYDROCARBON-418.1	< 5		MG/L		RP
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/L	08/01/91	CG
ACROLEIN	< 50		UG/L	08/01/91	CG
ACRYLONITRILE	< 50		UG/L	08/01/91	CG
BENZENE	< 5		UG/L	08/01/91	CG
BROMODICHLOROMETHANE	< 5		UG/L	08/01/91	CG
BROMOFORM	< 5		UG/L	08/01/91	CG
BROMOMETHANE	< 10		UG/L	08/01/91	CG
2-BUTANONE	< 100		UG/L	08/01/91	CG
CARBON DISULFIDE	< 100		UG/L	08/01/91	CG
CARBON TETRACHLORIDE	< 5		UG/L	08/01/91	CG
CHLOROBENZENE	< 5		UG/L	08/01/91	CG
CHLORODIBROMOMETHANE	< 5		UG/L	08/01/91	CG
CHLOROETHANE	< 10		UG/L	08/01/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/L	08/01/91	CG
CHLOROFORM	< 5		UG/L	08/01/91	CG
CHLOROMETHANE	< 10		UG/L	08/01/91	CG
DIBROMOMETHANE	< 5		UG/L	08/01/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/L	08/01/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/L	08/01/91	CG
1,1-DICHLOROETHANE	< 5		UG/L	08/01/91	CG
1,2-DICHLOROETHANE	< 5		UG/L	08/01/91	CG
1,1-DICHLOROETHENE	< 5		UG/L	08/01/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/L	08/01/91	CG
1,2-DICHLOROPROPANE	< 5		UG/L	08/01/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/L	08/01/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/L	08/01/91	CG
ETHYLBENZENE	< 5		UG/L	08/01/91	CG
ETHYL METHACRYLATE	< 5		UG/L	08/01/91	CG
2-HEXANONE	< 50		UG/L	08/01/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 3988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390.
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
IODOMETHANE	< 5		UG/L	08/01/91	CG
METHYLENE CHLORIDE	< 5		UG/L	08/01/91	CG
4-METHYL-2-PENTANONE	< 50		UG/L	08/01/91	CG
STYRENE	< 5		UG/L	08/01/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/L	08/01/91	CG
TETRACHLOROETHENE	< 5		UG/L	08/01/91	CG
TOLUENE	< 5		UG/L	08/01/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/L	08/01/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/L	08/01/91	CG
TRICHLOROETHENE	< 5		UG/L	08/01/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/L	08/01/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/L	08/01/91	CG
VINYL ACETATE	< 50		UG/L	08/01/91	CG
VINYL CHLORIDE	< 10		UG/L	08/01/91	CG
XYLENE	< 5		UG/L	08/01/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	86.9	Min: 76	Max: 114		
d8-TOLUENE	102	Min: 88	Max: 110		
4-BROMOMFLUOROBENZENE	88.9	Min: 86	Max: 115		

Sample: 32A WW 731 423023 6003 7/31 07 Collected: 07/31/91

Test Description	Result	Limit	Units	Analyzed	By
T.PETROL HYDROCARBON-418.1	< 5		MG/L		RP
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/L	08/01/91	CG
ACROLEIN	< 50		UG/L	08/01/91	CG
ACRYLONITRILE	< 50		UG/L	08/01/91	CG
BENZENE	< 5		UG/L	08/01/91	CG
BROMODICHLOROMETHANE	< 5		UG/L	08/01/91	CG
BROMOFORM	< 5		UG/L	08/01/91	CG
BROMOMETHANE	< 10		UG/L	08/01/91	CG

Test Description	Result	Limit	Units	Analyzed	By
2-BUTANONE	< 100		UG/L	08/01/91	CG
CARBON DISULFIDE	< 100		UG/L	08/01/91	CG
CARBON TETRACHLORIDE	< 5		UG/L	08/01/91	CG
CHLOROBENZENE	< 5		UG/L	08/01/91	CG
CHLORODIBROMOMETHANE	< 5		UG/L	08/01/91	CG
CHLOROETHANE	< 10		UG/L	08/01/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/L	08/01/91	CG
CHLOROFORM	< 5		UG/L	08/01/91	CG
CHLOROMETHANE	< 10		UG/L	08/01/91	CG
DIBROMOMETHANE	< 5		UG/L	08/01/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/L	08/01/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/L	08/01/91	CG
1,1-DICHLOROETHANE	< 5		UG/L	08/01/91	CG
1,2-DICHLOROETHANE	< 5		UG/L	08/01/91	CG
1,1-DICHLOROETHENE	< 5		UG/L	08/01/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/L	08/01/91	CG
1,2-DICHLOROPROPANE	< 5		UG/L	08/01/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/L	08/01/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/L	08/01/91	CG
ETHYLBENZENE	< 5		UG/L	08/01/91	CG
ETHYL METHACRYLATE	< 5		UG/L	08/01/91	CG
2-HEXANONE	< 50		UG/L	08/01/91	CG
IODOMETHANE	< 5		UG/L	08/01/91	CG
METHYLENE CHLORIDE	< 5		UG/L	08/01/91	CG
4-METHYL-2-PENTANONE	< 50		UG/L	08/01/91	CG
STYRENE	< 5		UG/L	08/01/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/L	08/01/91	CG
TETRACHLOROETHENE	< 5		UG/L	08/01/91	CG
TOLUENE	< 5		UG/L	08/01/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/L	08/01/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/L	08/01/91	CG
TRICHLOROETHENE	< 5		UG/L	08/01/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/L	08/01/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/L	08/01/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 846 & 847 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #0190
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
VINYL ACETATE	< 50		UG/L	08/01/91	CG
VINYL CHLORIDE	< 10		UG/L	08/01/91	CG
XYLENE	< 5		UG/L	08/01/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	88.7	Min: 76		Max: 114	
d8-TOLUENE	95.3	Min: 88		Max: 110	
4-BROMOMFLUOROBENZENE	88.3	Min: 86		Max: 115	

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 816 & 817 • U.S. DEPT. OF AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15221774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047713 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

H

BELMONTE PARK LABORATORIES
11 EAST MAIN STREET
TROTWOOD, OHIO 45426

Attn: M_LAKE
Phone: (513) 837-3744 FAX# 837-1071

JOHN MATHES & ASSOCIATES
210 WEST SAND BANK RD.
COLUMBIA, ILLINOIS 62236-0330

Attn: KATHLEEN BLAINE
Invoice Number:

Order #: 91-07-554
Date: 08/07/91 10:52
Work ID: 423023 6003 VO, TB, WW SAMP
Date Received: 07/31/91
Date Completed: 08/05/91

SAMPLE IDENTIFICATION

Sample Number	Sample Description	Sample Number	Sample Description
01	VO-1 423023 6003 7/29 1000	02	VO-2 423023 6003 7/29 1020
03	VO-3 423023 6003 7/29 1040	04	VO-4 423023 6003 7/29 1100
05	VO-6 423023 6003 7/29 1120	06	VO-7 423023 6003 7/29 1220
07	VO-9 423023 6003 7/29 1240	08	VO-10 423023 7/29 1300
09	TB 729 423023 7/29 1415	10	WW 729 423023 7/29 1000
11	VO-12 423023 7/30 0720	12	VO-13 423023 7/30 0745
13	VO-15 423023 7/30 0800	14	VO-16 423023 7/30 0810
15	VO-14 423023 7/30 0800	16	VO-17 423023 7/30 0820
17	VO-18 423023 7/30 0830	18	VO-11 423023 7/30 0825
19	VO-8 423023 6003 7/30 0845	20	VO-5 423023 6003 7/30 0910

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 3988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 1522374 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D190
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Belmonte Park Laboratories

ENCLOSED ARE THE RESULTS OF SPECIFIED SAMPLES SUBMITTED FOR ANALYSES. IF YOU HAVE ANY QUESTIONS, PLEASE ADVISE. USE THE "LAB #" FOR FASTER IDENTIFICATION.
OHIO EPA CERTIFICATION NUMBER : 836 & 837

Certified By
MATTHEW LAKE

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. OF AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 1523774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 004771 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D190
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Belmonte Park Laboratories

TEST RESULTS BY SAMPLE

Sample: 01A VO-1 423023 6003 7/29 1000 Collected: 07/29/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/02/91	CG
ACROLEIN	< 50		UG/KG	08/02/91	CG
ACRYLONITRILE	< 50		UG/KG	08/02/91	CG
BENZENE	< 5		UG/KG	08/02/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/02/91	CG
BROMOFORM	< 5		UG/KG	08/02/91	CG
BROMOMETHANE	< 10		UG/KG	08/02/91	CG
2-BUTANONE	< 100		UG/KG	08/02/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/02/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/02/91	CG
CHLOROBENZENE	< 5		UG/KG	08/02/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/02/91	CG
CHLOROETHANE	< 10		UG/KG	08/02/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/02/91	CG
CHLOROFORM	< 5		UG/KG	08/02/91	CG
CHLOROMETHANE	< 10		UG/KG	08/02/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/02/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/02/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/02/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/02/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/02/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/02/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/02/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/02/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/02/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/02/91	CG
ETHYLBENZENE	< 5		UG/KG	08/02/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/02/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 816 & 817 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 1522374 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 004771 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. RB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D190
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
2-HEXANONE	< 50		UG/KG	08/02/91	CG
IODOMETHANE	< 5		UG/KG	08/02/91	CG
METHYLENE CHLORIDE	< 5		UG/KG	08/02/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/02/91	CG
STYRENE	< 5		UG/KG	08/02/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/02/91	CG
TETRACHLOROETHENE	< 5		UG/KG	08/02/91	CG
TOLUENE	< 5		UG/KG	08/02/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/KG	08/02/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/02/91	CG
TRICHLOROETHENE	< 5		UG/KG	08/02/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/02/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/02/91	CG
VINYL ACETATE	< 50		UG/KG	08/02/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/02/91	CG
XYLENE	< 5		UG/KG	08/02/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	93.2	Min: 70	Max: 121		
d8-TOLUENE	91.1	Min: 81	Max: 117		
4-BROMOMFLUOROBENZENE	82.2	Min: 74	Max: 121		

Sample: 02A VO-2 423023 6003 7/29 1020 Collected: 07/29/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/05/91	CG
ACROLEIN	< 50		UG/KG	08/05/91	CG
ACRYLONITRILE	< 50		UG/KG	08/05/91	CG
BENZENE	< 5		UG/KG	08/05/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/05/91	CG
BROMOFORM	< 5		UG/KG	08/05/91	CG
BROMOMETHANE	< 10		UG/KG	08/05/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15221774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047233 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
2-BUTANONE	< 100		UG/KG	08/05/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/05/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/05/91	CG
CHLOROBENZENE	< 5		UG/KG	08/05/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/05/91	CG
CHLOROETHANE	< 10		UG/KG	08/05/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/05/91	CG
CHLOROFORM	< 5		UG/KG	08/05/91	CG
CHLOROMETHANE	< 10		UG/KG	08/05/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/05/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/05/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/05/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/05/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/05/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/05/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/05/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/05/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/05/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/05/91	CG
ETHYLBENZENE	< 5		UG/KG	08/05/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/05/91	CG
2-HEXANONE	< 50		UG/KG	08/05/91	CG
IODOMETHANE	< 5		UG/KG	08/05/91	CG
METHYLENE CHLORIDE	< 5		UG/KG	08/05/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/05/91	CG
STYRENE	< 5		UG/KG	08/05/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/05/91	CG
TETRACHLOROETHENE	< 5		UG/KG	08/05/91	CG
TOLUENE	< 5		UG/KG	08/05/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/KG	08/05/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/05/91	CG
TRICHLOROETHENE	< 5		UG/KG	08/05/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/05/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/05/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 8W & 817 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15221774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #0190.
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Belmonte Park Laboratories

Test Description	Result	Limit	Units	Analyzed	By
VINYL ACETATE	< 50		UG/KG	08/05/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/05/91	CG
XYLENE	< 5		UG/KG	08/05/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	103	Min: 70	Max:	121	
d8-TOLUENE	98.5	Min: 81	Max:	117	
4-BROMOMFLUOROBENZENE	90.9	Min: 74	Max:	121	

Sample: 03A VO-3 423023 6003 7/29 1040 Collected: 07/29/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/01/91	CG
ACROLEIN	< 50		UG/KG	08/01/91	CG
ACRYLONITRILE	< 50		UG/KG	08/01/91	CG
BENZENE	< 5		UG/KG	08/01/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/01/91	CG
BROMOFORM	< 5		UG/KG	08/01/91	CG
BROMOMETHANE	< 10		UG/KG	08/01/91	CG
2-BUTANONE	< 100		UG/KG	08/01/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/01/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/01/91	CG
CHLOROBENZENE	< 5		UG/KG	08/01/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/01/91	CG
CHLOROETHANE	< 10		UG/KG	08/01/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/01/91	CG
CHLOROFORM	< 5		UG/KG	08/01/91	CG
CHLOROMETHANE	< 10		UG/KG	08/01/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/01/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/01/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/01/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/01/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 1522774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390.
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
1,2-DICHLOROETHANE	< 5		UG/KG	08/01/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/01/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/01/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/01/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/01/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/01/91	CG
ETHYLBENZENE	< 5		UG/KG	08/01/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/01/91	CG
2-HEXANONE	< 50		UG/KG	08/01/91	CG
IODOMETHANE	< 5		UG/KG	08/01/91	CG
METHYLENE CHLORIDE	< 5		UG/KG	08/01/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/01/91	CG
STYRENE	< 5		UG/KG	08/01/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/01/91	CG
TETRACHLOROETHENE	< 5		UG/KG	08/01/91	CG
TOLUENE	< 5		UG/KG	08/01/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/KG	08/01/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/01/91	CG
TRICHLOROETHENE	17		UG/KG	08/01/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/01/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/01/91	CG
VINYL ACETATE	< 50		UG/KG	08/01/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/01/91	CG
XYLENE	< 5		UG/KG	08/01/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	88.5	Min: 70		Max: 121	
d8-TOLUENE	102	Min: 81		Max: 117	
4-BROMOMFLUOROBENZENE	78.5	Min: 74		Max: 121	

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Sample: 04A VO-4 423023 6003 7/29 1100 Collected: 07/29/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/03/91	CG
ACROLEIN	< 50		UG/KG	08/03/91	CG
ACRYLONITRILE	< 50		UG/KG	08/03/91	CG
BENZENE	< 5		UG/KG	08/03/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/03/91	CG
BROMOFORM	< 5		UG/KG	08/03/91	CG
BROMOMETHANE	< 10		UG/KG	08/03/91	CG
2-BUTANONE	< 100		UG/KG	08/03/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/03/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/03/91	CG
CHLOROBENZENE	< 5		UG/KG	08/03/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/03/91	CG
CHLOROETHANE	< 10		UG/KG	08/03/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/03/91	CG
CHLOROFORM	< 5		UG/KG	08/03/91	CG
CHLOROMETHANE	< 10		UG/KG	08/03/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/03/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/03/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/03/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/03/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/03/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/03/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/03/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/03/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/03/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/03/91	CG
ETHYLBENZENE	< 5		UG/KG	08/03/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/03/91	CG
2-HEXANONE	< 50		UG/KG	08/03/91	CG
IODOMETHANE	< 5		UG/KG	08/03/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS B36 & B37 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 3223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 004773 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D190
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
METHYLENE CHLORIDE	< 5		UG/KG	08/03/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/03/91	CG
STYRENE	< 5		UG/KG	08/03/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/03/91	CG
TETRACHLOROETHENE	< 5		UG/KG	08/03/91	CG
TOLUENE	< 5		UG/KG	08/03/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/KG	08/03/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/03/91	CG
TRICHLOROETHENE	< 5		UG/KG	08/03/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/03/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/03/91	CG
VINYL ACETATE	< 50		UG/KG	08/03/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/03/91	CG
XYLENE	< 5		UG/KG	08/03/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	84.2	Min: 70		Max: 121	
d8-TOLUENE	84.0	Min: 81		Max: 117	
4-BROMOMFLUOROBENZENE	85.1	Min: 74		Max: 121	

Sample: 05A VO-6 423023 6003 7/29 1120 Collected: 07/31/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/01/91	CG
ACROLEIN	< 50		UG/KG	08/01/91	CG
ACRYLONITRILE	< 50		UG/KG	08/01/91	CG
BENZENE	< 5		UG/KG	08/01/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/01/91	CG
BROMOFORM	< 5		UG/KG	08/01/91	CG
BROMOMETHANE	< 10		UG/KG	08/01/91	CG
2-BUTANONE	< 100		UG/KG	08/01/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/01/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D190
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
CARBON TETRACHLORIDE	< 5		UG/KG	08/01/91	CG
CHLOROBENZENE	< 5		UG/KG	08/01/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/01/91	CG
CHLOROETHANE	< 10		UG/KG	08/01/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/01/91	CG
CHLOROFORM	< 5		UG/KG	08/01/91	CG
CHLOROMETHANE	< 10		UG/KG	08/01/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/01/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/01/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/01/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/01/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/01/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/01/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/01/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/01/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/01/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/01/91	CG
ETHYLBENZENE	2.0		UG/KG	08/01/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/01/91	CG
2-HEXANONE	< 50		UG/KG	08/01/91	CG
IODOMETHANE	< 5		UG/KG	08/01/91	CG
METHYLENE CHLORIDE	< 5		UG/KG	08/01/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/01/91	CG
STYRENE	< 5		UG/KG	08/01/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/01/91	CG
TETRACHLOROETHENE	< 5		UG/KG	08/01/91	CG
TOLUENE	< 5		UG/KG	08/01/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/KG	08/01/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/01/91	CG
TRICHLOROETHENE	4.3		UG/KG	08/01/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/01/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/01/91	CG
VINYL ACETATE	< 50		UG/KG	08/01/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/01/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 816 & 817 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15221774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #0390.
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
XYLENE	94		UG/KG	08/01/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	82.4	Min: 70	Max: 121		
d8-TOLUENE	100	Min: 81	Max: 117		
4-BROMOMFLUOROBENZENE	76.4	Min: 74	Max: 121		

Sample: 06A VO-7 423023 6003 7/29 1220 Collected: 07/29/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/02/91	CG
ACROLEIN	< 50		UG/KG	08/02/91	CG
ACRYLONITRILE	< 50		UG/KG	08/02/91	CG
BENZENE	< 5		UG/KG	08/02/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/02/91	CG
BROMOFORM	< 5		UG/KG	08/02/91	CG
BROMOMETHANE	< 10		UG/KG	08/02/91	CG
2-BUTANONE	< 100		UG/KG	08/02/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/02/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/02/91	CG
CHLOROBENZENE	< 5		UG/KG	08/02/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/02/91	CG
CHLOROETHANE	< 10		UG/KG	08/02/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/02/91	CG
CHLOROFORM	< 5		UG/KG	08/02/91	CG
CHLOROMETHANE	< 10		UG/KG	08/02/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/02/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/02/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/02/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/02/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/02/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/02/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 816 & 817 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 1522174 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047233 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PR244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D190
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/02/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/02/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/02/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/02/91	CG
ETHYLBENZENE	< 5		UG/KG	08/02/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/02/91	CG
2-HEXANONE	< 50		UG/KG	08/02/91	CG
IODOMETHANE	< 5		UG/KG	08/02/91	CG
METHYLENE CHLORIDE	< 5		UG/KG	08/02/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/02/91	CG
STYRENE	< 5		UG/KG	08/02/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/02/91	CG
TETRACHLOROETHENE	< 5		UG/KG	08/02/91	CG
TOLUENE	< 5		UG/KG	08/02/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/KG	08/02/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/02/91	CG
TRICHLOROETHENE	< 5		UG/KG	08/02/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/02/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/02/91	CG
VINYL ACETATE	< 50		UG/KG	08/02/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/02/91	CG
XYLENE	< 5		UG/KG	08/02/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	87.9	Min: 70		Max: 121	
d8-TOLUENE	89.4	Min: 81		Max: 117	
4-BROMOMFLUOROBENZENE	75.9	Min: 74		Max: 121	

Sample: 07A VO-9 423023 6003 7/29 1240 Collected: 07/29/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/02/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 816 & 817 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 3988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15221774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
ACROLEIN	< 50		UG/KG	08/02/91	CG
ACRYLONITRILE	< 50		UG/KG	08/02/91	CG
BENZENE	< 5		UG/KG	08/02/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/02/91	CG
BROMOFORM	< 5		UG/KG	08/02/91	CG
BROMOMETHANE	< 10		UG/KG	08/02/91	CG
2-BUTANONE	< 100		UG/KG	08/02/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/02/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/02/91	CG
CHLOROBENZENE	< 5		UG/KG	08/02/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/02/91	CG
CHLOROETHANE	< 10		UG/KG	08/02/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/02/91	CG
CHLOROFORM	< 5		UG/KG	08/02/91	CG
CHLOROMETHANE	< 10		UG/KG	08/02/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/02/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/02/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/02/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/02/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/02/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/02/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/02/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/02/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/02/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/02/91	CG
ETHYLBENZENE	< 5		UG/KG	08/02/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/02/91	CG
2-HEXANONE	< 50		UG/KG	08/02/91	CG
IODOMETHANE	< 5		UG/KG	08/02/91	CG
METHYLENE CHLORIDE	< 5		UG/KG	08/02/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/02/91	CG
STYRENE	< 5		UG/KG	08/02/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/02/91	CG
TETRACHLOROETHENE	< 5		UG/KG	08/02/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 816 & 817 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15221774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 004773 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D190
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
TOLUENE	< 5		UG/KG	08/02/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/KG	08/02/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/02/91	CG
TRICHLOROETHENE	32		UG/KG	08/02/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/02/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/02/91	CG
VINYL ACETATE	< 50		UG/KG	08/02/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/02/91	CG
XYLENE	< 5		UG/KG	08/02/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	83.5	Min: 70		Max: 121	
d8-TOLUENE	87.5	Min: 81		Max: 117	
4-BROMOMFLUOROBENZENE	84.8	Min: 74		Max: 121	

Sample: 08A VO-10 423023 7/29 1300 Collected: 07/29/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/02/91	CG
ACROLEIN	< 50		UG/KG	08/02/91	CG
ACRYLONITRILE	< 50		UG/KG	08/02/91	CG
BENZENE	< 5		UG/KG	08/02/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/02/91	CG
BROMOFORM	< 5		UG/KG	08/02/91	CG
BROMOMETHANE	< 10		UG/KG	08/02/91	CG
2-BUTANONE	< 100		UG/KG	08/02/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/02/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/02/91	CG
CHLOROBENZENE	< 5		UG/KG	08/02/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/02/91	CG
CHLOROETHANE	< 10		UG/KG	08/02/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/02/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 816 & 817 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15221774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
CHLOROFORM	< 5		UG/KG	08/02/91	CG
CHLOROMETHANE	< 10		UG/KG	08/02/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/02/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/02/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/02/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/02/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/02/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/02/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/02/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/02/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/02/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/02/91	CG
ETHYLBENZENE	< 5		UG/KG	08/02/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/02/91	CG
2-HEXANONE	< 50		UG/KG	08/02/91	CG
IODOMETHANE	< 5		UG/KG	08/02/91	CG
METHYLENE CHLORIDE	< 5		UG/KG	08/02/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/02/91	CG
STYRENE	< 5		UG/KG	08/02/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/02/91	CG
TETRACHLOROETHENE	9.0		UG/KG	08/02/91	CG
TOLUENE	< 5		UG/KG	08/02/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/KG	08/02/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/02/91	CG
TRICHLOROETHENE	< 5		UG/KG	08/02/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/02/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/02/91	CG
VINYL ACETATE	< 50		UG/KG	08/02/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/02/91	CG
XYLENE	< 5		UG/KG	08/02/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	74.7	Min: 70		Max: 121	
d8-TOLUENE	83.7	Min: 81		Max: 117	
4-BROMOMFLUOROBENZENE	85.6	Min: 74		Max: 121	

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 816 & 817 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 1522374 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047231 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OF OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB2445491 • AMERICAN BOARD OF BIOANALYSIS CERT. #D190
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Sample: 09A TB 729 423023 7/29 1415 Collected: 07/29/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/L	08/03/91	CG
ACROLEIN	< 50		UG/L	08/03/91	CG
ACRYLONITRILE	< 50		UG/L	08/03/91	CG
BENZENE	< 5		UG/L	08/03/91	CG
BROMODICHLOROMETHANE	< 5		UG/L	08/03/91	CG
BROMOFORM	< 5		UG/L	08/03/91	CG
BROMOMETHANE	< 10		UG/L	08/03/91	CG
2-BUTANONE	< 100		UG/L	08/03/91	CG
CARBON DISULFIDE	< 100		UG/L	08/03/91	CG
CARBON TETRACHLORIDE	< 5		UG/L	08/03/91	CG
CHLOROBENZENE	< 5		UG/L	08/03/91	CG
CHLORODIBROMOMETHANE	< 5		UG/L	08/03/91	CG
CHLOROETHANE	< 10		UG/L	08/03/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/L	08/03/91	CG
CHLOROFORM	< 5		UG/L	08/03/91	CG
CHLOROMETHANE	< 10		UG/L	08/03/91	CG
DIBROMOMETHANE	< 5		UG/L	08/03/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/L	08/03/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/L	08/03/91	CG
1,1-DICHLOROETHANE	< 5		UG/L	08/03/91	CG
1,2-DICHLOROETHANE	< 5		UG/L	08/03/91	CG
1,1-DICHLOROETHENE	< 5		UG/L	08/03/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/L	08/03/91	CG
1,2-DICHLOROPROPANE	< 5		UG/L	08/03/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/L	08/03/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/L	08/03/91	CG
ETHYLBENZENE	< 5		UG/L	08/03/91	CG
ETHYL METHACRYLATE	< 5		UG/L	08/03/91	CG
2-HEXANONE	< 50		UG/L	08/03/91	CG
IODOMETHANE	< 5		UG/L	08/03/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 8436 & 8437 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15221774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047711 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM4252B001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #0390
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
METHYLENE CHLORIDE	< 5		UG/L	08/03/91	CG
4-METHYL-2-PENTANONE	< 50		UG/L	08/03/91	CG
STYRENE	< 5		UG/L	08/03/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/L	08/03/91	CG
TETRACHLOROETHENE	< 5		UG/L	08/03/91	CG
TOLUENE	< 5		UG/L	08/03/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/L	08/03/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/L	08/03/91	CG
TRICHLOROETHENE	< 5		UG/L	08/03/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/L	08/03/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/L	08/03/91	CG
VINYL ACETATE	< 50		UG/L	08/03/91	CG
VINYL CHLORIDE	< 10		UG/L	08/03/91	CG
XYLENE	< 5		UG/L	08/03/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	94.1	Min: 70		Max: 121	
d8-TOLUENE	81.3	Min: 81		Max: 117	
4-BROMOMFLUOROBENZENE	84.4	Min: 74		Max: 121	

Sample: 10A WW 729 423023 7/29 1000 Collected: 07/29/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/L	08/03/91	CG
ACROLEIN	< 50		UG/L	08/03/91	CG
ACRYLONITRILE	< 50		UG/L	08/03/91	CG
BENZENE	< 5		UG/L	08/03/91	CG
BROMODICHLOROMETHANE	< 5		UG/L	08/03/91	CG
BROMOFORM	< 5		UG/L	08/03/91	CG
BROMOMETHANE	< 10		UG/L	08/03/91	CG
2-BUTANONE	< 100		UG/L	08/03/91	CG
CARBON DISULFIDE	< 100		UG/L	08/03/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 816 & 817 • U.S. DEPT. OF AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15221274 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047731 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. RB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #0190
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
CARBON TETRACHLORIDE	< 5		UG/L	08/03/91	CG
CHLOROBENZENE	< 5		UG/L	08/03/91	CG
CHLORODIBROMOMETHANE	< 5		UG/L	08/03/91	CG
CHLOROETHANE	< 10		UG/L	08/03/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/L	08/03/91	CG
CHLOROFORM	< 5		UG/L	08/03/91	CG
CHLOROMETHANE	< 10		UG/L	08/03/91	CG
DIBROMOMETHANE	< 5		UG/L	08/03/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/L	08/03/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/L	08/03/91	CG
1,1-DICHLOROETHANE	< 5		UG/L	08/03/91	CG
1,2-DICHLOROETHANE	< 5		UG/L	08/03/91	CG
1,1-DICHLOROETHENE	< 5		UG/L	08/03/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/L	08/03/91	CG
1,2-DICHLOROPROPANE	< 5		UG/L	08/03/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/L	08/03/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/L	08/03/91	CG
ETHYLBENZENE	< 5		UG/L	08/03/91	CG
ETHYL METHACRYLATE	< 5		UG/L	08/03/91	CG
2-HEXANONE	< 50		UG/L	08/03/91	CG
IODOMETHANE	< 5		UG/L	08/03/91	CG
METHYLENE CHLORIDE	< 5		UG/L	08/03/91	CG
4-METHYL-2-PENTANONE	< 50		UG/L	08/03/91	CG
STYRENE	< 5		UG/L	08/03/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/L	08/03/91	CG
TETRACHLOROETHENE	< 5		UG/L	08/03/91	CG
TOLUENE	< 5		UG/L	08/03/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/L	08/03/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/L	08/03/91	CG
TRICHLOROETHENE	< 5		UG/L	08/03/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/L	08/03/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/L	08/03/91	CG
VINYL ACETATE	< 50		UG/L	08/03/91	CG
VINYL CHLORIDE	< 10		UG/L	08/03/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 816 & 817 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15221774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #0390
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
XYLENE	< 5		UG/L	08/03/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	90.1	Min: 70	Max: 121		
d8-TOLUENE	96.1	Min: 81	Max: 117		
4-BROMOMFLUOROBENZENE	100	Min: 74	Max: 121		

Sample: 11A VO-12 423023 7/30 0720 Collected: 07/31/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/02/91	CG
ACROLEIN	< 50		UG/KG	08/02/91	CG
ACRYLONITRILE	< 50		UG/KG	08/02/91	CG
BENZENE	< 5		UG/KG	08/02/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/02/91	CG
BROMOFORM	< 5		UG/KG	08/02/91	CG
BROMOMETHANE	< 10		UG/KG	08/02/91	CG
2-BUTANONE	< 100		UG/KG	08/02/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/02/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/02/91	CG
CHLOROBENZENE	< 5		UG/KG	08/02/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/02/91	CG
CHLOROETHANE	< 10		UG/KG	08/02/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/02/91	CG
CHLOROFORM	< 5		UG/KG	08/02/91	CG
CHLOROMETHANE	< 10		UG/KG	08/02/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/02/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/02/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/02/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/02/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/02/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/02/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 816 & 817 • U.S. DEPT. OF AGRICULTURE LABORATORY CODE NO. 3988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15221774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047731 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #0190.
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/02/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/02/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/02/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/02/91	CG
ETHYLBENZENE	< 5		UG/KG	08/02/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/02/91	CG
2-HEXANONE	< 50		UG/KG	08/02/91	CG
IODOMETHANE	< 5		UG/KG	08/02/91	CG
METHYLENE CHLORIDE	< 5		UG/KG	08/02/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/02/91	CG
STYRENE	< 5		UG/KG	08/02/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/02/91	CG
TETRACHLOROETHENE	< 5		UG/KG	08/02/91	CG
TOLUENE	< 5		UG/KG	08/02/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/KG	08/02/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/02/91	CG
TRICHLOROETHENE	< 5		UG/KG	08/02/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/02/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/02/91	CG
VINYL ACETATE	< 50		UG/KG	08/02/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/02/91	CG
XYLENE	< 5		UG/KG	08/02/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	85.9	Min: 70	Max: 121		
d8-TOLUENE	86.6	Min: 81	Max: 117		
4-BROMOMFLUOROBENZENE	85.4	Min: 74	Max: 121		

Sample: 12A VO-13 423023 7/30 0745 Collected: 07/30/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/02/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 816 & 812 • U.S. DEPT. OF AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15221774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047233 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #0190
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
ACROLEIN	< 50		UG/KG	08/02/91	CG
ACRYLONITRILE	< 50		UG/KG	08/02/91	CG
BENZENE	< 5		UG/KG	08/02/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/02/91	CG
BROMOFORM	< 5		UG/KG	08/02/91	CG
BROMOMETHANE	< 10		UG/KG	08/02/91	CG
2-BUTANONE	< 100		UG/KG	08/02/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/02/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/02/91	CG
CHLOROBENZENE	< 5		UG/KG	08/02/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/02/91	CG
CHLOROETHANE	< 10		UG/KG	08/02/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/02/91	CG
CHLOROFORM	< 5		UG/KG	08/02/91	CG
CHLOROMETHANE	< 10		UG/KG	08/02/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/02/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/02/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/02/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/02/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/02/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/02/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/02/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/02/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/02/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/02/91	CG
ETHYLBENZENE	< 5		UG/KG	08/02/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/02/91	CG
2-HEXANONE	< 50		UG/KG	08/02/91	CG
IODOMETHANE	< 5		UG/KG	08/02/91	CG
METHYLENE CHLORIDE	< 5		UG/KG	08/02/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/02/91	CG
STYRENE	< 5		UG/KG	08/02/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/02/91	CG
TETRACHLOROETHENE	< 5		UG/KG	08/02/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 846 & 817 • U.S. DEPT. OF AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15221774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047731 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #0390
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING

Test Description	Result	Limit	Units	Analyzed	By
TOLUENE	< 5		UG/KG	08/02/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/KG	08/02/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/02/91	CG
TRICHLOROETHENE	43		UG/KG	08/02/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/02/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/02/91	CG
VINYL ACETATE	< 50		UG/KG	08/02/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/02/91	CG
XYLENE	< 5		UG/KG	08/02/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	81.9	Min: 70		Max: 121	
d8-TOLUENE	88.0	Min: 81		Max: 117	
4-BROMOMFLUOROBENZENE	82.8	Min: 74		Max: 121	

Sample: 13A VO-15 423023 7/30 0800 Collected: 07/30/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/03/91	CG
ACROLEIN	< 50		UG/KG	08/03/91	CG
ACRYLONITRILE	< 50		UG/KG	08/03/91	CG
BENZENE	< 5		UG/KG	08/03/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/03/91	CG
BROMOFORM	< 5		UG/KG	08/03/91	CG
BROMOMETHANE	< 10		UG/KG	08/03/91	CG
2-BUTANONE	< 100		UG/KG	08/03/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/03/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/03/91	CG
CHLOROBENZENE	< 5		UG/KG	08/03/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/03/91	CG
CHLOROETHANE	< 10		UG/KG	08/03/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/03/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. OF AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223274 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #0390
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
CHLOROFORM	< 5		UG/KG	08/03/91	CG
CHLOROMETHANE	< 10		UG/KG	08/03/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/03/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/03/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/03/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/03/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/03/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/03/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/03/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/03/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/03/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/03/91	CG
ETHYLBENZENE	< 5		UG/KG	08/03/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/03/91	CG
2-HEXANONE	< 50		UG/KG	08/03/91	CG
IODOMETHANE	< 5		UG/KG	08/03/91	CG
METHYLENE CHLORIDE	< 5		UG/KG	08/03/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/03/91	CG
STYRENE	< 5		UG/KG	08/03/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/03/91	CG
TETRACHLOROETHENE	< 5		UG/KG	08/03/91	CG
TOLUENE	< 5		UG/KG	08/03/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/KG	08/03/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/03/91	CG
TRICHLOROETHENE	< 5		UG/KG	08/03/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/03/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/03/91	CG
VINYL ACETATE	< 50		UG/KG	08/03/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/03/91	CG
XYLENE	< 5		UG/KG	08/03/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	80.6	Min: 70	Max: 121		
d8-TOLUENE	92.5	Min: 81	Max: 117		
4-BROMOFLUOROBENZENE	93.4	Min: 74	Max: 121		

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 816 & 817 • U.S. DEPT. OF AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15221774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047731 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Sample: 14A VO-16 423023 7/30 0810 Collected: 07/30/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/02/91	CG
ACROLEIN	< 50		UG/KG	08/02/91	CG
ACRYLONITRILE	< 50		UG/KG	08/02/91	CG
BENZENE	< 5		UG/KG	08/02/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/02/91	CG
BROMOFORM	< 5		UG/KG	08/02/91	CG
BROMOMETHANE	< 10		UG/KG	08/02/91	CG
2-BUTANONE	< 100		UG/KG	08/02/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/02/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/02/91	CG
CHLOROBENZENE	< 5		UG/KG	08/02/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/02/91	CG
CHLOROETHANE	< 10		UG/KG	08/02/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/02/91	CG
CHLOROFORM	< 5		UG/KG	08/02/91	CG
CHLOROMETHANE	< 10		UG/KG	08/02/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/02/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/02/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/02/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/02/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/02/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/02/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/02/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/02/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/02/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/02/91	CG
ETHYLBENZENE	< 5		UG/KG	08/02/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/02/91	CG
2-HEXANONE	< 50		UG/KG	08/02/91	CG
IODOMETHANE	< 5		UG/KG	08/02/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 816 & 817 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 1522174 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047731 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D190
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
METHYLENE CHLORIDE	< 5		UG/KG	08/02/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/02/91	CG
STYRENE	< 5		UG/KG	08/02/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/02/91	CG
TETRACHLOROETHENE	< 5		UG/KG	08/02/91	CG
TOLUENE	< 5		UG/KG	08/02/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/KG	08/02/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/02/91	CG
TRICHLOROETHENE	6.9		UG/KG	08/02/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/02/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/02/91	CG
VINYL ACETATE	< 50		UG/KG	08/02/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/02/91	CG
XYLENE	< 5		UG/KG	08/02/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	75.6	Min: 70		Max: 121	
d8-TOLUENE	96.2	Min: 81		Max: 117	
4-BROMOFLUOROBENZENE	98.3	Min: 74		Max: 121	

Sample: 15A VO-14 423023 7/30 0800 Collected: 07/30/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/03/91	CG
ACROLEIN	< 50		UG/KG	08/03/91	CG
ACRYLONITRILE	< 50		UG/KG	08/03/91	CG
BENZENE	< 5		UG/KG	08/03/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/03/91	CG
BROMOFORM	< 5		UG/KG	08/03/91	CG
BROMOMETHANE	< 10		UG/KG	08/03/91	CG
2-BUTANONE	< 100		UG/KG	08/03/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/03/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1986 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15221774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047711 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #0390.
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
CARBON TETRACHLORIDE	< 5		UG/KG	08/03/91	CG
CHLOROBENZENE	< 5		UG/KG	08/03/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/03/91	CG
CHLOROETHANE	< 10		UG/KG	08/03/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/03/91	CG
CHLOROFORM	< 5		UG/KG	08/03/91	CG
CHLOROMETHANE	< 10		UG/KG	08/03/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/03/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/03/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/03/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/03/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/03/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/03/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/03/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/03/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/03/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/03/91	CG
ETHYLBENZENE	< 5		UG/KG	08/03/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/03/91	CG
2-HEXANONE	< 50		UG/KG	08/03/91	CG
IODOMETHANE	< 5		UG/KG	08/03/91	CG
METHYLENE CHLORIDE	< 5		UG/KG	08/03/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/03/91	CG
STYRENE	< 5		UG/KG	08/03/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/03/91	CG
TETRACHLOROETHENE	< 5		UG/KG	08/03/91	CG
TOLUENE	< 5		UG/KG	08/03/91	CG
1,1,1-TRICHLOROETHANE	5.5		UG/KG	08/03/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/03/91	CG
TRICHLOROETHENE	41		UG/KG	08/03/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/03/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/03/91	CG
VINYL ACETATE	< 50		UG/KG	08/03/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/03/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15221774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
XYLENE	< 5		UG/KG	08/03/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	86.0	Min: 70	Max: 121		
d8-TOLUENE	93.5	Min: 81	Max: 117		
4-BROMOMFLUOROBENZENE	96.7	Min: 74	Max: 121		

Sample: 16A VO-17 423023 7/30 0820 Collected: 07/30/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/02/91	CG
ACROLEIN	< 50		UG/KG	08/02/91	CG
ACRYLONITRILE	< 50		UG/KG	08/02/91	CG
BENZENE	< 5		UG/KG	08/02/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/02/91	CG
BROMOFORM	< 5		UG/KG	08/02/91	CG
BROMOMETHANE	< 10		UG/KG	08/02/91	CG
2-BUTANONE	< 100		UG/KG	08/02/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/02/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/02/91	CG
CHLOROBENZENE	< 5		UG/KG	08/02/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/02/91	CG
CHLOROETHANE	< 10		UG/KG	08/02/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/02/91	CG
CHLOROFORM	< 5		UG/KG	08/02/91	CG
CHLOROMETHANE	< 10		UG/KG	08/02/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/02/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/02/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/02/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/02/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/02/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/02/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 816 & 817 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15221774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #0190.
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/02/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/02/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/02/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/02/91	CG
ETHYLBENZENE	< 5		UG/KG	08/02/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/02/91	CG
2-HEXANONE	< 50		UG/KG	08/02/91	CG
IODOMETHANE	< 5		UG/KG	08/02/91	CG
METHYLENE CHLORIDE	< 5		UG/KG	08/02/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/02/91	CG
STYRENE	< 5		UG/KG	08/02/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/02/91	CG
TETRACHLOROETHENE	< 5		UG/KG	08/02/91	CG
TOLUENE	< 5		UG/KG	08/02/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/KG	08/02/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/02/91	CG
TRICHLOROETHENE	< 5		UG/KG	08/02/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/02/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/02/91	CG
VINYL ACETATE	< 50		UG/KG	08/02/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/02/91	CG
XYLENE	< 5		UG/KG	08/02/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	96.3	Min: 70		Max: 121	
d8-TOLUENE	96.1	Min: 81		Max: 117	
4-BROMOFLUOROBENZENE	94.9	Min: 74		Max: 121	

Sample: 17A VO-18 423023 7/30 0830 Collected: 07/30/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/02/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 1523774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING, APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
ACROLEIN	< 50		UG/KG	08/02/91	CG
ACRYLONITRILE	< 50		UG/KG	08/02/91	CG
BENZENE	< 5		UG/KG	08/02/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/02/91	CG
BROMOFORM	< 5		UG/KG	08/02/91	CG
BROMOMETHANE	< 10		UG/KG	08/02/91	CG
2-BUTANONE	< 100		UG/KG	08/02/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/02/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/02/91	CG
CHLOROBENZENE	< 5		UG/KG	08/02/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/02/91	CG
CHLOROETHANE	< 10		UG/KG	08/02/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/02/91	CG
CHLOROFORM	< 5		UG/KG	08/02/91	CG
CHLOROMETHANE	< 10		UG/KG	08/02/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/02/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/02/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/02/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/02/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/02/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/02/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/02/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/02/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/02/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/02/91	CG
ETHYLBENZENE	< 5		UG/KG	08/02/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/02/91	CG
2-HEXANONE	< 50		UG/KG	08/02/91	CG
IODOMETHANE	< 5		UG/KG	08/02/91	CG
METHYLENE CHLORIDE	< 5		UG/KG	08/02/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/02/91	CG
STYRENE	< 5		UG/KG	08/02/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/02/91	CG
TETRACHLOROETHENE	< 5		UG/KG	08/02/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 816 & 817 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15221774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D190
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Belmonte Park Laboratories

Test Description		Result	Limit	Units	Analyzed	By
TOLUENE		< 5		UG/KG	08/02/91	CG
1,1,1-TRICHLOROETHANE		< 5		UG/KG	08/02/91	CG
1,1,2-TRICHLOROETHANE		< 5		UG/KG	08/02/91	CG
TRICHLOROETHENE		39		UG/KG	08/02/91	CG
TRICHLOROFLUOROMETHANE		< 5		UG/KG	08/02/91	CG
1,2,3-TRICHLOROPROPANE	U	< 5		UG/KG	08/02/91	CG
VINYL ACETATE		< 50		UG/KG	08/02/91	CG
VINYL CHLORIDE		< 10		UG/KG	08/02/91	CG
XYLENE		< 5		UG/KG	08/02/91	CG
Surrogates						
d4-1,2-DICHLOROETHANE		88.5	Min: 70	Max: 121		
d8-TOLUENE		102	Min: 81	Max: 117		
4-BROMOFLUOROBENZENE		88.5	Min: 74	Max: 121		

Sample: 18A VO-11 423023 7/30 0825 Collected: 07/30/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/03/91	CG
ACROLEIN	< 50		UG/KG	08/03/91	CG
ACRYLONITRILE	< 50		UG/KG	08/03/91	CG
BENZENE	< 5		UG/KG	08/03/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/03/91	CG
BROMOFORM	< 5		UG/KG	08/03/91	CG
BROMOMETHANE	< 10		UG/KG	08/03/91	CG
2-BUTANONE	< 100		UG/KG	08/03/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/03/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/03/91	CG
CHLOROBENZENE	< 5		UG/KG	08/03/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/03/91	CG
CHLOROETHANE	< 10		UG/KG	08/03/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/03/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 816 & 817 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 1522174 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. RB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D190
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
CHLOROFORM	< 5		UG/KG	08/03/91	CG
CHLOROMETHANE	< 10		UG/KG	08/03/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/03/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/03/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/03/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/03/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/03/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/03/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/03/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/03/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/03/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/03/91	CG
ETHYLBENZENE	< 5		UG/KG	08/03/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/03/91	CG
2-HEXANONE	< 50		UG/KG	08/03/91	CG
IODOMETHANE	< 5		UG/KG	08/03/91	CG
METHYLENE CHLORIDE	< 5		UG/KG	08/03/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/03/91	CG
STYRENE	< 5		UG/KG	08/03/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/03/91	CG
TETRACHLOROETHENE	7.8		UG/KG	08/03/91	CG
TOLUENE	< 5		UG/KG	08/03/91	CG
1,1,1-TRICHLOROETHANE	13		UG/KG	08/03/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/03/91	CG
TRICHLOROETHENE	73		UG/KG	08/03/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/03/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/03/91	CG
VINYL ACETATE	< 50		UG/KG	08/03/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/03/91	CG
XYLENE	< 5		UG/KG	08/03/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	79.3	Min: 70		Max: 121	
d8-TOLUENE	97.0	Min: 81		Max: 117	
4-BROMOMFLUOROBENZENE	92.1	Min: 74		Max: 121	

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 816 & 817 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15221774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 004773 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 3550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390.
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Sample: 19A VO-8 423023 6003 7/30 0845 Collected: 07/30/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/03/91	CG
ACROLEIN	< 50		UG/KG	08/03/91	CG
ACRYLONITRILE	< 50		UG/KG	08/03/91	CG
BENZENE	< 5		UG/KG	08/03/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/03/91	CG
BROMOFORM	< 5		UG/KG	08/03/91	CG
BROMOMETHANE	< 10		UG/KG	08/03/91	CG
2-BUTANONE	< 100		UG/KG	08/03/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/03/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/03/91	CG
CHLOROBENZENE	< 5		UG/KG	08/03/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/03/91	CG
CHLOROETHANE	< 10		UG/KG	08/03/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/03/91	CG
CHLOROFORM	< 5		UG/KG	08/03/91	CG
CHLOROMETHANE	< 10		UG/KG	08/03/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/03/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/03/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/03/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/03/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/03/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/03/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/03/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/03/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/03/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/03/91	CG
ETHYLBENZENE	< 5		UG/KG	08/03/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/03/91	CG
2-HEXANONE	< 50		UG/KG	08/03/91	CG
IODOMETHANE	< 5		UG/KG	08/03/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390.
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
METHYLENE CHLORIDE	< 5		UG/KG	08/03/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/03/91	CG
STYRENE	< 5		UG/KG	08/03/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/03/91	CG
TETRACHLOROETHENE	10		UG/KG	08/03/91	CG
TOLUENE	< 5		UG/KG	08/03/91	CG
1,1,1-TRICHLOROETHANE	17		UG/KG	08/03/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/03/91	CG
TRICHLOROETHENE	54		UG/KG	08/03/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/03/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/03/91	CG
VINYL ACETATE	< 50		UG/KG	08/03/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/03/91	CG
XYLENE	< 5		UG/KG	08/03/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	74.2	Min: 70		Max: 121	
d8-TOLUENE	96.8	Min: 81		Max: 117	
4-BROMOFLUOROBENZENE	96.7	Min: 74		Max: 121	

Sample: 20A VO-5 423023 6003 7/30 0910 Collected: 07/30/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/04/91	CG
ACROLEIN	< 50		UG/KG	08/04/91	CG
ACRYLONITRILE	< 50		UG/KG	08/04/91	CG
BENZENE	< 5		UG/KG	08/04/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/04/91	CG
BROMOFORM	< 5		UG/KG	08/04/91	CG
BROMOMETHANE	< 10		UG/KG	08/04/91	CG
2-BUTANONE	< 100		UG/KG	08/04/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/04/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 816 & 817 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING: APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D190
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
CARBON TETRACHLORIDE	< 5		UG/KG	08/04/91	CG
CHLOROBENZENE	< 5		UG/KG	08/04/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/04/91	CG
CHLOROETHANE	< 10		UG/KG	08/04/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/04/91	CG
CHLOROFORM	12		UG/KG	08/04/91	CG
CHLOROMETHANE	< 10		UG/KG	08/04/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/04/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/04/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/04/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/04/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/04/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/04/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/04/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/04/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/04/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/04/91	CG
ETHYLBENZENE	6.2		UG/KG	08/04/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/04/91	CG
2-HEXANONE	< 50		UG/KG	08/04/91	CG
IODOMETHANE	< 5		UG/KG	08/04/91	CG
METHYLENE CHLORIDE	< 5		UG/KG	08/04/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/04/91	CG
STYRENE	< 5		UG/KG	08/04/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/04/91	CG
TETRACHLOROETHENE	< 5		UG/KG	08/04/91	CG
TOLUENE	< 5		UG/KG	08/04/91	CG
1,1,1-TRICHLOROETHANE	6.0		UG/KG	08/04/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/04/91	CG
TRICHLOROETHENE	24		UG/KG	08/04/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/04/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/04/91	CG
VINYL ACETATE	< 50		UG/KG	08/04/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/04/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 816 & 817 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15221774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. RB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D190
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
XYLENE	38		UG/KG	08/04/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	90.0	Min: 70		Max: 121	
d8-TOLUENE	83.1	Min: 81		Max: 117	
4-BROMOMFLUOROBENZENE	84.2	Min: 74		Max: 121	

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. OF AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15221774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047233 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D190
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

BELMONTE PARK LABORATORIES
11 EAST MAIN STREET
TROTWOOD, OHIO 45426

Attn: M_LAKE
Phone: (513) 837-3744 FAX# 837-1071

JOHN MATHES & ASSOCIATES
210 WEST SAND BANK RD.
COLUMBIA, ILLINOIS 62236-0330

Attn: JIM PINTA / KATHLEEN BLAINE
Invoice Number:

Order #: 91-08-016
Date: 08/07/91 11:45
Work ID: 423023 6003 C-1 THRU 15 TB WW
Date Received: 08/01/91
Date Completed: 08/06/91

SAMPLE IDENTIFICATION

Sample Number	Sample Description
01	C-1 423023 6003 7/31 0950
03	C-3 423023 6003 7/31 1410
05	C-5 423023 6003 7/31 0825
07	C-7 423023 6003 7/31 1330
09	C-9 423023 6003 7/31 1420
11	C-11 423023 6003 8/1 1400
13	C-13 423023 6003 8/1 1500
15	C-15 423023 6003 8/1 0935
17	WW-81 423023 6003 8/1 0800

Sample Number	Sample Description
02	C-2 423023 6003 7/31 1400
04	C-4 423023 6003 7/31 1500
06	C-6 423023 6003 7/31 1430
08	C-8 423023 6003 7/31 1400
10	C-10 423023 6003 8/1 0855
12	C-12 423023 6003 8/1 1335
14	C-14 423023 6003 8/1 1230
16	TB-81 423023 6003 8/1 0800

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 3988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 004773 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D190
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

ENCLOSED ARE THE RESULTS OF SPECIFIED SAMPLES SUBMITTED FOR ANALYSES. IF YOU HAVE ANY QUESTIONS, PLEASE ADVISE. USE THE "LAB #" FOR FASTER IDENTIFICATION.
OHIO EPA CERTIFICATION NUMBER : 836 & 837

Certified By
MATTHEW LAKE

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 1522774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #0190
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

TEST RESULTS BY SAMPLE

Sample: 01A C-1 423023 6003 7/31 0950 Collected: 07/31/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/05/91	CG
ACROLEIN	< 50		UG/KG	08/05/91	CG
ACRYLONITRILE	< 50		UG/KG	08/05/91	CG
BENZENE	< 5		UG/KG	08/05/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/05/91	CG
BROMOFORM	< 5		UG/KG	08/05/91	CG
BROMOMETHANE	< 10		UG/KG	08/05/91	CG
2-BUTANONE	< 100		UG/KG	08/05/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/05/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/05/91	CG
CHLOROBENZENE	< 5		UG/KG	08/05/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/05/91	CG
CHLOROETHANE	< 10		UG/KG	08/05/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/05/91	CG
CHLOROFORM	< 5		UG/KG	08/05/91	CG
CHLOROMETHANE	< 10		UG/KG	08/05/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/05/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/05/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/05/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/05/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/05/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/05/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/05/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/05/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/05/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/05/91	CG
ETHYLBENZENE	< 5		UG/KG	08/05/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/05/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 3988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 8047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1880 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42[illegible] • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. [illegible] • AMERICAN BOARD OF BIOANALYSIS CERT. #[illegible]
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
2-HEXANONE	< 50		UG/KG	08/05/91	CG
IODOMETHANE	< 5		UG/KG	08/05/91	CG
METHYLENE CHLORIDE	< 5		UG/KG	08/05/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/05/91	CG
STYRENE	< 5		UG/KG	08/05/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/05/91	CG
TETRACHLOROETHENE	< 5		UG/KG	08/05/91	CG
TOLUENE	< 5		UG/KG	08/05/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/KG	08/05/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/05/91	CG
TRICHLOROETHENE	8.3		UG/KG	08/05/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/05/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/05/91	CG
VINYL ACETATE	< 50		UG/KG	08/05/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/05/91	CG
XYLENE	< 5		UG/KG	08/05/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	111	Min: 70		Max: 121	
d8-TOLUENE	105	Min: 81		Max: 117	
4-BROMOMFLUOROBENZENE	96.7	Min: 74		Max: 121	

Sample: 02A C-2 423023 6003 7/31 1400 Collected: 07/31/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/05/91	CG
ACROLEIN	< 50		UG/KG	08/05/91	CG
ACRYLONITRILE	< 50		UG/KG	08/05/91	CG
BENZENE	< 5		UG/KG	08/05/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/05/91	CG
BROMOFORM	< 5		UG/KG	08/05/91	CG
BROMOMETHANE	< 10		UG/KG	08/05/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. [illegible] • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER [illegible] • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS [illegible] • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER [illegible] • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. [illegible] • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. [illegible] • AMERICAN BOARD OF BIOANALYSIS CERT. [illegible]
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
2-BUTANONE	< 100		UG/KG	08/05/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/05/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/05/91	CG
CHLOROBENZENE	< 5		UG/KG	08/05/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/05/91	CG
CHLOROETHANE	< 10		UG/KG	08/05/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/05/91	CG
CHLOROFORM	< 5		UG/KG	08/05/91	CG
CHLOROMETHANE	< 10		UG/KG	08/05/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/05/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/05/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/05/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/05/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/05/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/05/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/05/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/05/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/05/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/05/91	CG
ETHYLBENZENE	< 5		UG/KG	08/05/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/05/91	CG
2-HEXANONE	< 50		UG/KG	08/05/91	CG
IODOMETHANE	< 5		UG/KG	08/05/91	CG
METHYLENE CHLORIDE	< 5		UG/KG	08/05/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/05/91	CG
STYRENE	< 5		UG/KG	08/05/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/05/91	CG
TETRACHLOROETHENE	< 5		UG/KG	08/05/91	CG
TOLUENE	< 5		UG/KG	08/05/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/KG	08/05/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/05/91	CG
TRICHLOROETHENE	~15		UG/KG	08/05/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/05/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/05/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 3988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 8847733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM4252[illegible] • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D398.
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
VINYL ACETATE	< 50		UG/KG	08/05/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/05/91	CG
XYLENE	< 5		UG/KG	08/05/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	96.9	Min: 70	Max: 121		
d8-TOLUENE	99.9	Min: 81	Max: 117		
4-BROMOMFLUOROBENZENE	104	Min: 74	Max: 121		

Sample: 03A C-3 423023 6003 7/31 1410 Collected: 07/31/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/05/91	CG
ACROLEIN	< 50		UG/KG	08/05/91	CG
ACRYLONITRILE	< 50		UG/KG	08/05/91	CG
BENZENE	< 5		UG/KG	08/05/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/05/91	CG
BROMOFORM	< 5		UG/KG	08/05/91	CG
BROMOMETHANE	< 10		UG/KG	08/05/91	CG
2-BUTANONE	< 100		UG/KG	08/05/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/05/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/05/91	CG
CHLOROBENZENE	< 5		UG/KG	08/05/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/05/91	CG
CHLOROETHANE	< 10		UG/KG	08/05/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/05/91	CG
CHLOROFORM	< 5		UG/KG	08/05/91	CG
CHLOROMETHANE	< 5		UG/KG	08/05/91	CG
DIBROMOMETHANE	< 10		UG/KG	08/05/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/05/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/05/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/05/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. JM88 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1530 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. P0244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #0388.
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
1,2-DICHLOROETHANE	< 5		UG/KG	08/05/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/05/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/05/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/05/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/05/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/05/91	CG
ETHYLBENZENE	< 5		UG/KG	08/05/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/05/91	CG
2-HEXANONE	< 50		UG/KG	08/05/91	CG
IODOMETHANE	< 5		UG/KG	08/05/91	CG
METHYLENE CHLORIDE	< 5		UG/KG	08/05/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/05/91	CG
STYRENE	< 5		UG/KG	08/05/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/05/91	CG
TETRACHLOROETHENE	10		UG/KG	08/05/91	CG
TOLUENE	< 5		UG/KG	08/05/91	CG
1,1,1-TRICHLOROETHANE	12		UG/KG	08/05/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/05/91	CG
TRICHLOROETHENE	64		UG/KG	08/05/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/05/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/05/91	CG
VINYL ACETATE	< 50		UG/KG	08/05/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/05/91	CG
XYLENE	< 5		UG/KG	08/05/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	98.9	Min: 70	Max: 121		
d8-TOLUENE	105	Min: 81	Max: 117		
4-BROMOMFLUOROBENZENE	96.2	Min: 74	Max: 121		

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 3988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390.
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Sample: 04A C-4 423023 6003 7/31 1500 Collected: 07/31/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/05/91	CG
ACROLEIN	< 50		UG/KG	08/05/91	CG
ACRYLONITRILE	< 50		UG/KG	08/05/91	CG
BENZENE	< 5		UG/KG	08/05/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/05/91	CG
BROMOFORM	< 5		UG/KG	08/05/91	CG
BROMOMETHANE	< 10		UG/KG	08/05/91	CG
2-BUTANONE	< 100		UG/KG	08/05/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/05/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/05/91	CG
CHLOROBENZENE	< 5		UG/KG	08/05/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/05/91	CG
CHLOROETHANE	< 10		UG/KG	08/05/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/05/91	CG
CHLOROFORM	< 5		UG/KG	08/05/91	CG
CHLOROMETHANE	< 10		UG/KG	08/05/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/05/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/05/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/05/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/05/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/05/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/05/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/05/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/05/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/05/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/05/91	CG
ETHYLBENZENE	< 5		UG/KG	08/05/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/05/91	CG
2-HEXANONE	< 50		UG/KG	08/05/91	CG
IODOMETHANE	< 5		UG/KG	08/05/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 816 & 817 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390.
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
METHYLENE CHLORIDE	< 5		UG/KG	08/05/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/05/91	CG
STYRENE	< 5		UG/KG	08/05/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/05/91	CG
TETRACHLOROETHENE	< 5		UG/KG	08/05/91	CG
TOLUENE	< 5		UG/KG	08/05/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/KG	08/05/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/05/91	CG
TRICHLOROETHENE	12		UG/KG	08/05/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/05/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/05/91	CG
VINYL ACETATE	< 50		UG/KG	08/05/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/05/91	CG
XYLENE	< 5		UG/KG	08/05/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	93.1	Min: 70		Max: 121	
d8-TOLUENE	103	Min: 81		Max: 117	
4-BROMOMFLUOROBENZENE	107	Min: 74		Max: 121	

Sample: 05A C-5 423023 6003 7/31 0825 Collected: 07/31/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/05/91	CG
ACROLEIN	< 50		UG/KG	08/05/91	CG
ACRYLONITRILE	< 50		UG/KG	08/05/91	CG
BENZENE	< 5		UG/KG	08/05/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/05/91	CG
BROMOFORM	< 5		UG/KG	08/05/91	CG
BROMOMETHANE	< 10		UG/KG	08/05/91	CG
2-BUTANONE	< 100		UG/KG	08/05/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/05/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #0390
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
CARBON TETRACHLORIDE	< 5		UG/KG	08/05/91	CG
CHLOROBENZENE	< 5		UG/KG	08/05/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/05/91	CG
CHLOROETHANE	< 10		UG/KG	08/05/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/05/91	CG
CHLOROFORM	< 5		UG/KG	08/05/91	CG
CHLOROMETHANE	< 10		UG/KG	08/05/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/05/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/05/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/05/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/05/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/05/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/05/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/05/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/05/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/05/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/05/91	CG
ETHYLBENZENE	< 5		UG/KG	08/05/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/05/91	CG
2-HEXANONE	< 50		UG/KG	08/05/91	CG
IODOMETHANE	< 5		UG/KG	08/05/91	CG
METHYLENE CHLORIDE	< 5		UG/KG	08/05/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/05/91	CG
STYRENE	< 5		UG/KG	08/05/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/05/91	CG
TETRACHLOROETHENE	< 5		UG/KG	08/05/91	CG
TOLUENE	< 5		UG/KG	08/05/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/KG	08/05/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/05/91	CG
TRICHLOROETHENE	54		UG/KG	08/05/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/05/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/05/91	CG
VINYL ACETATE	< 50		UG/KG	08/05/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/05/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 817 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390.
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
XYLENE	< 5		UG/KG	08/05/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	102	Min: 70	Max: 121		
d8-TOLUENE	110	Min: 81	Max: 117		
4-BROMOMFLUOROBENZENE	92.9	Min: 74	Max: 121		

Sample: 06A C-6 423023 6003 7/31 1430 Collected: 07/31/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/05/91	CG
ACROLEIN	< 50		UG/KG	08/05/91	CG
ACRYLONITRILE	< 50		UG/KG	08/05/91	CG
BENZENE	< 5		UG/KG	08/05/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/05/91	CG
BROMOFORM	< 5		UG/KG	08/05/91	CG
BROMOMETHANE	< 10		UG/KG	08/05/91	CG
2-BUTANONE	< 100		UG/KG	08/05/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/05/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/05/91	CG
CHLOROBENZENE	< 5		UG/KG	08/05/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/05/91	CG
CHLOROETHANE	< 10		UG/KG	08/05/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/05/91	CG
CHLOROFORM	< 5		UG/KG	08/05/91	CG
CHLOROMETHANE	< 10		UG/KG	08/05/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/05/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/05/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/05/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/05/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/05/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/05/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 816 & 817 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/05/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/05/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/05/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/05/91	CG
ETHYLBENZENE	< 5		UG/KG	08/05/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/05/91	CG
2-HEXANONE	< 50		UG/KG	08/05/91	CG
IODOMETHANE	< 5		UG/KG	08/05/91	CG
METHYLENE CHLORIDE	< 5		UG/KG	08/05/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/05/91	CG
STYRENE	< 5		UG/KG	08/05/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/05/91	CG
TETRACHLOROETHENE	13		UG/KG	08/05/91	CG
TOLUENE	< 5		UG/KG	08/05/91	CG
1,1,1-TRICHLOROETHANE	14		UG/KG	08/05/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/05/91	CG
TRICHLOROETHENE	49		UG/KG	08/05/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/05/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/05/91	CG
VINYL ACETATE	< 50		UG/KG	08/05/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/05/91	CG
XYLENE	< 5		UG/KG	08/05/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	97.7	Min: 70		Max: 121	
d8-TOLUENE	102	Min: 81		Max: 117	
4-BROMOMFLUOROBENZENE	103	Min: 74		Max: 121	

Sample: 07A C-7 423023 6003 7/31 1330 Collected: 07/31/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/06/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 3988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 3550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #0390
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
ACROLEIN	< 50		UG/KG	08/06/91	CG
ACRYLONITRILE	< 50		UG/KG	08/06/91	CG
BENZENE	< 5		UG/KG	08/06/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/06/91	CG
BROMOFORM	< 5		UG/KG	08/06/91	CG
BROMOMETHANE	< 10		UG/KG	08/06/91	CG
2-BUTANONE	< 100		UG/KG	08/06/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/06/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/06/91	CG
CHLOROBENZENE	< 5		UG/KG	08/06/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/06/91	CG
CHLOROETHANE	< 10		UG/KG	08/06/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/06/91	CG
CHLOROFORM	< 5		UG/KG	08/06/91	CG
CHLOROMETHANE	< 10		UG/KG	08/06/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/06/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/06/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/06/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/06/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/06/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/06/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/06/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/06/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/06/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/06/91	CG
ETHYLBENZENE	< 5		UG/KG	08/06/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/06/91	CG
2-HEXANONE	< 50		UG/KG	08/06/91	CG
IODOMETHANE	< 5		UG/KG	08/06/91	CG
METHYLENE CHLORIDE	< 5		UG/KG	08/06/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/06/91	CG
STYRENE	< 5		UG/KG	08/06/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/06/91	CG
TETRACHLOROETHENE	21		UG/KG	08/06/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 817 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #0390
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
TOLUENE	< 5		UG/KG	08/06/91	CG
1,1,1-TRICHLOROETHANE	9.8		UG/KG	08/06/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/06/91	CG
TRICHLOROETHENE	52		UG/KG	08/06/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/06/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/06/91	CG
VINYL ACETATE	< 50		UG/KG	08/06/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/06/91	CG
XYLENE	< 5		UG/KG	08/06/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	102	Min: 70		Max: 121	
d8-TOLUENE	100	Min: 81		Max: 117	
4-BROMOMFLUOROBENZENE	112	Min: 74		Max: 121	

Sample: 08A C-8 423023 6003 7/31 1400 Collected: 07/31/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/06/91	CG
ACROLEIN	< 50		UG/KG	08/06/91	CG
ACRYLONITRILE	< 50		UG/KG	08/06/91	CG
BENZENE	< 5		UG/KG	08/06/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/06/91	CG
BROMOFORM	< 5		UG/KG	08/06/91	CG
BROMOMETHANE	< 10		UG/KG	08/06/91	CG
2-BUTANONE	< 100		UG/KG	08/06/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/06/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/06/91	CG
CHLOROBENZENE	< 5		UG/KG	08/06/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/06/91	CG
CHLOROETHANE	< 10		UG/KG	08/06/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/06/91	CG

Test Description	Result	Limit	Units	Analyzed	By
CHLOROFORM	< 5		UG/KG	08/06/91	CG
CHLOROMETHANE	< 10		UG/KG	08/06/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/06/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/06/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/06/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/06/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/06/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/06/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/06/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/06/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/06/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/06/91	CG
ETHYLBENZENE	< 5		UG/KG	08/06/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/06/91	CG
2-HEXANONE	< 50		UG/KG	08/06/91	CG
IODOMETHANE	< 5		UG/KG	08/06/91	CG
METHYLENE CHLORIDE	< 5		UG/KG	08/06/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/06/91	CG
STYRENE	< 5		UG/KG	08/06/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/06/91	CG
TETRACHLOROETHENE	9.8		UG/KG	08/06/91	CG
TOLUENE	< 5		UG/KG	08/06/91	CG
1,1,1-TRICHLOROETHANE	96		UG/KG	08/06/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/06/91	CG
TRICHLOROETHENE	46		UG/KG	08/06/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/06/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/06/91	CG
VINYL ACETATE	< 50		UG/KG	08/06/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/06/91	CG
XYLENE	< 5		UG/KG	08/06/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	118	Min: 70	Max: 121		
d8-TOLUENE	102	Min: 81	Max: 117		
4-BROMOMFLUOROBENZENE	107	Min: 74	Max: 121		

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 3988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047731 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Sample: 09A C-9 423023 6003 7/31 1420 Collected: 07/31/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/06/91	CG
ACROLEIN	< 50		UG/KG	08/06/91	CG
ACRYLONITRILE	< 50		UG/KG	08/06/91	CG
BENZENE	< 5		UG/KG	08/06/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/06/91	CG
BROMOFORM	< 5		UG/KG	08/06/91	CG
BROMOMETHANE	< 10		UG/KG	08/06/91	CG
2-BUTANONE	< 100		UG/KG	08/06/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/06/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/06/91	CG
CHLOROBENZENE	< 5		UG/KG	08/06/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/06/91	CG
CHLOROETHANE	< 10		UG/KG	08/06/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/06/91	CG
CHLOROFORM	< 5		UG/KG	08/06/91	CG
CHLOROMETHANE	< 10		UG/KG	08/06/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/06/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/06/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/06/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/06/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/06/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/06/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/06/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/06/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/06/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/06/91	CG
ETHYLBENZENE	< 5		UG/KG	08/06/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/06/91	CG
2-HEXANONE	< 50		UG/KG	08/06/91	CG
IODOMETHANE	< 5		UG/KG	08/06/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 846 & 847 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15221774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047731 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
METHYLENE CHLORIDE	< 5		UG/KG	08/06/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/06/91	CG
STYRENE	< 5		UG/KG	08/06/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/06/91	CG
TETRACHLOROETHENE	< 5		UG/KG	08/06/91	CG
TOLUENE	< 5		UG/KG	08/06/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/KG	08/06/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/06/91	CG
TRICHLOROETHENE	12		UG/KG	08/06/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/06/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/06/91	CG
VINYL ACETATE	< 50		UG/KG	08/06/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/06/91	CG
XYLENE	< 5		UG/KG	08/06/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	88.4	Min: 70		Max: 121	
d8-TOLUENE	101	Min: 81		Max: 117	
4-BROMOMFLUOROBENZENE	93.6	Min: 74		Max: 121	

Sample: 10A C-10 423023 6003 8/1 0855 Collected: 08/01/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/06/91	CG
ACROLEIN	< 50		UG/KG	08/06/91	CG
ACRYLONITRILE	< 50		UG/KG	08/06/91	CG
BENZENE	< 5		UG/KG	08/06/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/06/91	CG
BROMOFORM	< 5		UG/KG	08/06/91	CG
BROMOMETHANE	< 10		UG/KG	08/06/91	CG
2-BUTANONE	< 100		UG/KG	08/06/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/06/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 816 & 817 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15221774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D190
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
CARBON TETRACHLORIDE	< 5		UG/KG	08/06/91	CG
CHLOROBENZENE	< 5		UG/KG	08/06/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/06/91	CG
CHLOROETHANE	< 10		UG/KG	08/06/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/06/91	CG
CHLOROFORM	< 5		UG/KG	08/06/91	CG
CHLOROMETHANE	< 10		UG/KG	08/06/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/06/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/06/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/06/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/06/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/06/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/06/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/06/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/06/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/06/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/06/91	CG
ETHYLBENZENE	< 5		UG/KG	08/06/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/06/91	CG
2-HEXANONE	< 50		UG/KG	08/06/91	CG
IODOMETHANE	< 5		UG/KG	08/06/91	CG
METHYLENE CHLORIDE	< 5		UG/KG	08/06/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/06/91	CG
STYRENE	< 5		UG/KG	08/06/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/06/91	CG
TETRACHLOROETHENE	< 5		UG/KG	08/06/91	CG
TOLUENE	< 5		UG/KG	08/06/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/KG	08/06/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/06/91	CG
TRICHLOROETHENE	< 5		UG/KG	08/06/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/06/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/06/91	CG
VINYL ACETATE	< 50		UG/KG	08/06/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/06/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
XYLENE	< 5		UG/KG	08/06/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	112	Min: 70	Max: 121		
d8-TOLUENE	101	Min: 81	Max: 117		
4-BROMOMFLUOROBENZENE	91.7	Min: 74	Max: 121		

Sample: 11A C-11 423023 6003 8/1 1400 Collected: 08/01/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/06/91	CG
ACROLEIN	< 50		UG/KG	08/06/91	CG
ACRYLONITRILE	< 50		UG/KG	08/06/91	CG
BENZENE	< 5		UG/KG	08/06/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/06/91	CG
BROMOFORM	< 5		UG/KG	08/06/91	CG
BROMOMETHANE	< 10		UG/KG	08/06/91	CG
2-BUTANONE	< 100		UG/KG	08/06/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/06/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/06/91	CG
CHLOROBENZENE	< 5		UG/KG	08/06/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/06/91	CG
CHLOROETHANE	< 10		UG/KG	08/06/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/06/91	CG
CHLOROFORM	< 5		UG/KG	08/06/91	CG
CHLOROMETHANE	< 10		UG/KG	08/06/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/06/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/06/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/06/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/06/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/06/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/06/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 3988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15221774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/06/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/06/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/06/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/06/91	CG
ETHYLBENZENE	< 5		UG/KG	08/06/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/06/91	CG
2-HEXANONE	< 50		UG/KG	08/06/91	CG
IODOMETHANE	< 5		UG/KG	08/06/91	CG
METHYLENE CHLORIDE	< 5		UG/KG	08/06/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/06/91	CG
STYRENE	< 5		UG/KG	08/06/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/06/91	CG
TETRACHLOROETHENE	< 5		UG/KG	08/06/91	CG
TOLUENE	< 5		UG/KG	08/06/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/KG	08/06/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/06/91	CG
TRICHLOROETHENE	16		UG/KG	08/06/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/06/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/06/91	CG
VINYL ACETATE	< 50		UG/KG	08/06/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/06/91	CG
XYLENE	< 5		UG/KG	08/06/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	114	Min: 70		Max: 121	
d8-TOLUENE	99.8	Min: 81		Max: 117	
4-BROMOMFLUOROBENZENE	101	Min: 74		Max: 121	

Sample: 12A C-12 423023 6003 8/1 1335 Collected: 08/01/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/06/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 816 & 817 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #0390
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
ACROLEIN	< 50		UG/KG	08/06/91	CG
ACRYLONITRILE	< 50		UG/KG	08/06/91	CG
BENZENE	< 5		UG/KG	08/06/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/06/91	CG
BROMOFORM	< 5		UG/KG	08/06/91	CG
BROMOMETHANE	< 10		UG/KG	08/06/91	CG
2-BUTANONE	< 100		UG/KG	08/06/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/06/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/06/91	CG
CHLOROBENZENE	< 5		UG/KG	08/06/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/06/91	CG
CHLOROETHANE	< 10		UG/KG	08/06/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/06/91	CG
CHLOROFORM	< 5		UG/KG	08/06/91	CG
CHLOROMETHANE	< 10		UG/KG	08/06/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/06/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/06/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/06/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/06/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/06/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/06/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/06/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/06/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/06/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/06/91	CG
ETHYLBENZENE	< 5		UG/KG	08/06/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/06/91	CG
2-HEXANONE	< 50		UG/KG	08/06/91	CG
IODOMETHANE	< 5		UG/KG	08/06/91	CG
METHYLENE CHLORIDE	< 5		UG/KG	08/06/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/06/91	CG
STYRENE	< 5		UG/KG	08/06/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/06/91	CG
TETRACHLOROETHENE	< 5		UG/KG	08/06/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 3988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
TOLUENE	< 5		UG/KG	08/06/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/KG	08/06/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/06/91	CG
TRICHLOROETHENE	< 5		UG/KG	08/06/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/06/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/06/91	CG
VINYL ACETATE	< 50		UG/KG	08/06/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/06/91	CG
XYLENE	< 5		UG/KG	08/06/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	94.4	Min: 70		Max: 121	
d8-TOLUENE	99.9	Min: 81		Max: 117	
4-BROMOMFLUOROBENZENE	92.2	Min: 74		Max: 121	

Sample: 13A C-13 423023 6003 8/1 1500 Collected: 08/01/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/06/91	CG
ACROLEIN	< 50		UG/KG	08/06/91	CG
ACRYLONITRILE	< 50		UG/KG	08/06/91	CG
BENZENE	< 5		UG/KG	08/06/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/06/91	CG
BROMOFORM	< 5		UG/KG	08/06/91	CG
BROMOMETHANE	< 10		UG/KG	08/06/91	CG
2-BUTANONE	< 100		UG/KG	08/06/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/06/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/06/91	CG
CHLOROBENZENE	< 5		UG/KG	08/06/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/06/91	CG
CHLOROETHANE	< 10		UG/KG	08/06/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/06/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390.
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
CHLOROFORM	< 5		UG/KG	08/06/91	CG
CHLOROMETHANE	< 10		UG/KG	08/06/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/06/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/06/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/06/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/06/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/06/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/06/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/06/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/06/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/06/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/06/91	CG
ETHYLBENZENE	< 5		UG/KG	08/06/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/06/91	CG
2-HEXANONE	< 50		UG/KG	08/06/91	CG
IODOMETHANE	< 5		UG/KG	08/06/91	CG
METHYLENE CHLORIDE	< 5		UG/KG	08/06/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/06/91	CG
STYRENE	< 5		UG/KG	08/06/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/06/91	CG
TETRACHLOROETHENE	< 5		UG/KG	08/06/91	CG
TOLUENE	< 5		UG/KG	08/06/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/KG	08/06/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/06/91	CG
TRICHLOROETHENE	< 5		UG/KG	08/06/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/06/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/06/91	CG
VINYL ACETATE	<50		UG/KG	08/06/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/06/91	CG
XYLENE	< 5		UG/KG	08/06/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	95.3	Min: 70		Max: 121	
d8-TOLUENE	103	Min: 81		Max: 117	
4-BROMOMFLUOROBENZENE	94.1	Min: 74		Max: 121	

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 9988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15221774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 004771 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB1244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #0190
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING

Sample: 14A C-14 423023 6003 8/1 1230 Collected: 08/01/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/06/91	CG
ACROLEIN	< 50		UG/KG	08/06/91	CG
ACRYLONITRILE	< 50		UG/KG	08/06/91	CG
BENZENE	< 5		UG/KG	08/06/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/06/91	CG
BROMOFORM	< 5		UG/KG	08/06/91	CG
BROMOMETHANE	< 10		UG/KG	08/06/91	CG
2-BUTANONE	< 100		UG/KG	08/06/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/06/91	CG
CARBON TETRACHLORIDE	< 5		UG/KG	08/06/91	CG
CHLOROBENZENE	< 5		UG/KG	08/06/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/06/91	CG
CHLOROETHANE	< 10		UG/KG	08/06/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/06/91	CG
CHLOROFORM	< 5		UG/KG	08/06/91	CG
CHLOROMETHANE	< 10		UG/KG	08/06/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/06/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/06/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/06/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/06/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/06/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/06/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/06/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/06/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/06/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/06/91	CG
ETHYLBENZENE	< 5		UG/KG	08/06/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/06/91	CG
2-HEXANONE	< 50		UG/KG	08/06/91	CG
IODOMETHANE	< 5		UG/KG	08/06/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 816 & 817 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
METHYLENE CHLORIDE	< 5		UG/KG	08/06/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/06/91	CG
STYRENE	< 5		UG/KG	08/06/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/06/91	CG
TETRACHLOROETHENE	< 5		UG/KG	08/06/91	CG
TOLUENE	< 5		UG/KG	08/06/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/KG	08/06/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/06/91	CG
TRICHLOROETHENE	< 5		UG/KG	08/06/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/06/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/06/91	CG
VINYL ACETATE	< 50		UG/KG	08/06/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/06/91	CG
XYLENE	< 5		UG/KG	08/06/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	94.7	Min: 70		Max: 121	
d8-TOLUENE	101	Min: 81		Max: 117	
4-BROMOMFLUOROBENZENE	94.0	Min: 74		Max: 121	

Sample: 15A C-15 423023 6003 8/1 0935 Collected: 08/01/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/KG	08/06/91	CG
ACROLEIN	< 50		UG/KG	08/06/91	CG
ACRYLONITRILE	< 50		UG/KG	08/06/91	CG
BENZENE	< 5		UG/KG	08/06/91	CG
BROMODICHLOROMETHANE	< 5		UG/KG	08/06/91	CG
BROMOFORM	< 5		UG/KG	08/06/91	CG
BROMOMETHANE	< 10		UG/KG	08/06/91	CG
2-BUTANONE	< 100		UG/KG	08/06/91	CG
CARBON DISULFIDE	< 100		UG/KG	08/06/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15221774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D190
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
CARBON TETRACHLORIDE	< 5		UG/KG	08/06/91	CG
CHLOROBENZENE	< 5		UG/KG	08/06/91	CG
CHLORODIBROMOMETHANE	< 5		UG/KG	08/06/91	CG
CHLOROETHANE	< 10		UG/KG	08/06/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/KG	08/06/91	CG
CHLOROFORM	< 5		UG/KG	08/06/91	CG
CHLOROMETHANE	< 10		UG/KG	08/06/91	CG
DIBROMOMETHANE	< 5		UG/KG	08/06/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/KG	08/06/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/KG	08/06/91	CG
1,1-DICHLOROETHANE	< 5		UG/KG	08/06/91	CG
1,2-DICHLOROETHANE	< 5		UG/KG	08/06/91	CG
1,1-DICHLOROETHENE	< 5		UG/KG	08/06/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/KG	08/06/91	CG
1,2-DICHLOROPROPANE	< 5		UG/KG	08/06/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/KG	08/06/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/KG	08/06/91	CG
ETHYLBENZENE	< 5		UG/KG	08/06/91	CG
ETHYL METHACRYLATE	< 5		UG/KG	08/06/91	CG
2-HEXANONE	< 50		UG/KG	08/06/91	CG
IODOMETHANE	< 5		UG/KG	08/06/91	CG
METHYLENE CHLORIDE	< 5		UG/KG	08/06/91	CG
4-METHYL-2-PENTANONE	< 50		UG/KG	08/06/91	CG
STYRENE	< 5		UG/KG	08/06/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/KG	08/06/91	CG
TETRACHLOROETHENE	< 5		UG/KG	08/06/91	CG
TOLUENE	< 5		UG/KG	08/06/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/KG	08/06/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/KG	08/06/91	CG
TRICHLOROETHENE	< 5		UG/KG	08/06/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/KG	08/06/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/KG	08/06/91	CG
VINYL ACETATE	< 50		UG/KG	08/06/91	CG
VINYL CHLORIDE	< 10		UG/KG	08/06/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 816 & 817 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #0390
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
XYLENE	< 5		UG/KG	08/06/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	102	Min: 70	Max: 121		
d8-TOLUENE	97.6	Min: 81	Max: 117		
4-BROMOMFLUOROBENZENE	98.8	Min: 74	Max: 121		

Sample: 16A TB-81 423023 6003 8/1 0800 Collected: 08/01/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/L	08/06/91	CG
ACROLEIN	< 50		UG/L	08/06/91	CG
ACRYLONITRILE	< 50		UG/L	08/06/91	CG
BENZENE	< 5		UG/L	08/06/91	CG
BROMODICHLOROMETHANE	< 5		UG/L	08/06/91	CG
BROMOFORM	< 5		UG/L	08/06/91	CG
BROMOMETHANE	< 10		UG/L	08/06/91	CG
2-BUTANONE	< 100		UG/L	08/06/91	CG
CARBON DISULFIDE	< 100		UG/L	08/06/91	CG
CARBON TETRACHLORIDE	< 5		UG/L	08/06/91	CG
CHLOROBENZENE	< 5		UG/L	08/06/91	CG
CHLORODIBROMOMETHANE	< 5		UG/L	08/06/91	CG
CHLOROETHANE	< 10		UG/L	08/06/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/L	08/06/91	CG
CHLOROFORM	< 5		UG/L	08/06/91	CG
CHLOROMETHANE	< 10		UG/L	08/06/91	CG
DIBROMOMETHANE	< 5		UG/L	08/06/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/L	08/06/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/L	08/06/91	CG
1,1-DICHLOROETHANE	< 5		UG/L	08/06/91	CG
1,2-DICHLOROETHANE	< 5		UG/L	08/06/91	CG
1,1-DICHLOROETHENE	< 5		UG/L	08/06/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 816 & 817 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390.
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
trans-1,2-DICHLOROETHENE	< 5		UG/L	08/06/91	CG
1,2-DICHLOROPROPANE	< 5		UG/L	08/06/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/L	08/06/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/L	08/06/91	CG
ETHYLBENZENE	< 5		UG/L	08/06/91	CG
ETHYL METHACRYLATE	< 5		UG/L	08/06/91	CG
2-HEXANONE	< 50		UG/L	08/06/91	CG
IODOMETHANE	< 5		UG/L	08/06/91	CG
METHYLENE CHLORIDE	< 5		UG/L	08/06/91	CG
4-METHYL-2-PENTANONE	< 50		UG/L	08/06/91	CG
STYRENE	< 5		UG/L	08/06/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/L	08/06/91	CG
TETRACHLOROETHENE	< 5		UG/L	08/06/91	CG
TOLUENE	< 5		UG/L	08/06/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/L	08/06/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/L	08/06/91	CG
TRICHLOROETHENE	< 5		UG/L	08/06/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/L	08/06/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/L	08/06/91	CG
VINYL ACETATE	< 50		UG/L	08/06/91	CG
VINYL CHLORIDE	< 10		UG/L	08/06/91	CG
XYLENE	< 5		UG/L	08/06/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	110	Min: 78		Max: 121	
d8-TOLUENE	96.9	Min: 81		Max: 117	
4-BROMOMFLUOROBENZENE	97.2	Min: 74		Max: 121	

Sample: 17A WW-81 423023 6003 8/1 0800 Collected: 08/01/91

Test Description	Result	Limit	Units	Analyzed	By
VOLATILE ORGANICS 8240					
ACETONE	< 100		UG/L	08/06/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15221374 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D190.
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
ACROLEIN	< 50		UG/L	08/06/91	CG
ACRYLONITRILE	< 50		UG/L	08/06/91	CG
BENZENE	< 5		UG/L	08/06/91	CG
BROMODICHLOROMETHANE	< 5		UG/L	08/06/91	CG
BROMOFORM	< 5		UG/L	08/06/91	CG
BROMOMETHANE	< 10		UG/L	08/06/91	CG
2-BUTANONE	< 100		UG/L	08/06/91	CG
CARBON DISULFIDE	< 100		UG/L	08/06/91	CG
CARBON TETRACHLORIDE	< 5		UG/L	08/06/91	CG
CHLOROBENZENE	< 5		UG/L	08/06/91	CG
CHLORODIBROMOMETHANE	< 5		UG/L	08/06/91	CG
CHLOROETHANE	< 10		UG/L	08/06/91	CG
2-CHLOROETHYL VINYL ETHER	< 10		UG/L	08/06/91	CG
CHLOROFORM	< 5		UG/L	08/06/91	CG
CHLOROMETHANE	< 10		UG/L	08/06/91	CG
DIBROMOMETHANE	< 5		UG/L	08/06/91	CG
1,4-DICHLORO-2-BUTENE	< 100		UG/L	08/06/91	CG
DICHLORODIFLUOROMETHANE	< 5		UG/L	08/06/91	CG
1,1-DICHLOROETHANE	< 5		UG/L	08/06/91	CG
1,2-DICHLOROETHANE	< 5		UG/L	08/06/91	CG
1,1-DICHLOROETHENE	< 5		UG/L	08/06/91	CG
trans-1,2-DICHLOROETHENE	< 5		UG/L	08/06/91	CG
1,2-DICHLOROPROPANE	< 5		UG/L	08/06/91	CG
cis-1,3-DICHLOROPROPENE	< 5		UG/L	08/06/91	CG
trans-1,3-DICHLOROPROPENE	< 5		UG/L	08/06/91	CG
ETHYLBENZENE	< 5		UG/L	08/06/91	CG
ETHYL METHACRYLATE	< 5		UG/L	08/06/91	CG
2-HEXANONE	< 50		UG/L	08/06/91	CG
IODOMETHANE	< 5		UG/L	08/06/91	CG
METHYLENE CHLORIDE	< 5		UG/L	08/06/91	CG
4-METHYL-2-PENTANONE	< 50		UG/L	08/06/91	CG
STYRENE	< 5		UG/L	08/06/91	CG
1,1,2,2-TETRACHLOROETHANE	< 5		UG/L	08/06/91	CG
TETRACHLOROETHENE	< 5		UG/L	08/06/91	CG

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 1988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15221774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047731 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42526001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT #D390.
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Test Description	Result	Limit	Units	Analyzed	By
TOLUENE	< 5		UG/L	08/06/91	CG
1,1,1-TRICHLOROETHANE	< 5		UG/L	08/06/91	CG
1,1,2-TRICHLOROETHANE	< 5		UG/L	08/06/91	CG
TRICHLOROETHENE	< 5		UG/L	08/06/91	CG
TRICHLOROFLUOROMETHANE	< 5		UG/L	08/06/91	CG
1,2,3-TRICHLOROPROPANE	< 5		UG/L	08/06/91	CG
VINYL ACETATE	< 50		UG/L	08/06/91	CG
VINYL CHLORIDE	< 10		UG/L	08/06/91	CG
XYLENE	< 5		UG/L	08/06/91	CG
Surrogates					
d4-1,2-DICHLOROETHANE	109	Min: 70	Max: 121		
d8-TOLUENE	97.5	Min: 81	Max: 117		
4-BROMOMFLUOROBENZENE	99.3	Min: 74	Max: 121		

CERTIFICATIONS
OHIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. of AGRICULTURE LABORATORY CODE NO. 3988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR MEMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 259 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO. PB244549 • AMERICAN BOARD OF BIOANALYSIS CERT. #D390
ALL REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS. ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: JOHN MATHES & ASSOCIATES, INC.
210 WEST SAND BANK ROAD P.O. BOX 330
COLUMBIA, IL 62236-0330
ATTN: KATHY BLAINE

REPORT: 262201TP(67)
DATE : 08-27-91

SAMPLE MATRIX : SOIL
ATAS # : 2622.01
DATE SUBMITTED : 08-21-91
DATE EXTRACTED : 08-26-91
DATE ANALYZED : 08-26-91
METHOD REFERENCE: METHOD 8015
PROJECT : #423023 ACUSTAR DAYTON
SAMPLE ID : TP-3

RESULTS REPORTED IN mg/Kg OR PARTS PER MILLION(PPM)

PARAMETER	DET. LIMIT	UNIT	RESULTS
TOTAL EXTRACTABLE HYDROCARBONS			
GASOLINE C6-C10	1.0	mg/Kg	ND
DIESEL C10-C22	1.0	mg/Kg	ND
KEROSENE C9-C18	1.0	mg/Kg	ND
JP-4 C6-C14	1.0	mg/Kg	ND
NAPHTHA C6-C12	1.0	mg/Kg	ND
#6 FUEL OIL C12-C24	1.0	mg/Kg	ND
MISCELLANEOUS C16-C28 (1)	1.0	mg/Kg	35.1

QA/QC SURROGATE RECOVERY

* NAPHTHALENE 81 %

(1) = ANALYSIS SHOWS MISCELLANEOUS PEAKS WHICH CANNOT BE IDENTIFIED AS ANY SPECIFIC PATTERN. THE RESPONSE FACTOR FOR DIESEL WAS USED.
(2) = PATTERN IS SIMILAR BUT NOT IDENTICAL TO STANDARD.
ND = NOT DETECTED ABOVE QUANTITATION LIMIT
NA = NOT APPLICABLE
= NOT QUANTIFIABLE DUE TO MATRIX INTERFERENCE

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: JOHN MATHES & ASSOCIATES, INC.
210 WEST SAND BANK ROAD P.O. BOX 330
COLUMBIA, IL 62236-0330
ATTN: KATHY BLAINE

REPORT: 262202TP(67)
DATE : 08-27-91

SAMPLE MATRIX : SOIL
ATAS # : 2622.02
DATE SUBMITTED : 08-21-91
DATE EXTRACTED : 08-26-91
DATE ANALYZED : 08-27-91
METHOD REFERENCE: METHOD 8015
PROJECT : #423023 ACUSTAR DAYTON
SAMPLE ID : TP-4

RESULTS REPORTED IN mg/Kg OR PARTS PER MILLION(PPM)

PARAMETER	DET. LIMIT	UNIT	RESULTS
TOTAL EXTRACTABLE HYDROCARBONS			
GASOLINE C6-C10	1.0	mg/Kg	ND
DIESEL C10-C22	1.0	mg/Kg	ND
KEROSENE C9-C18	1.0	mg/Kg	ND
JP-4 C6-C14	1.0	mg/Kg	ND
NAPHTHA C6-C12	1.0	mg/Kg	ND
#6 FUEL OIL C12-C24	1.0	mg/Kg	ND
MISCELLANEOUS C16-C28 (1)	1.0	mg/Kg	1530.0

QA/QC SURROGATE RECOVERY

* NAPHTHALENE 90 %

(1) = ANALYSIS SHOWS MISCELLANEOUS PEAKS WHICH CANNOT BE IDENTIFIED AS ANY SPECIFIC PATTERN. THE RESPONSE FACTOR FOR DIESEL WAS USED.
(2) = PATTERN IS SIMILAR BUT NOT IDENTICAL TO STANDARD.
ND = NOT DETECTED ABOVE QUANTITATION LIMIT
NA = NOT APPLICABLE
= NOT QUANTIFIABLE DUE TO MATRIX INTERFERENCE

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: JOHN MATHES & ASSOCIATES, INC.
210 WEST SAND BANK ROAD P.O. BOX 330
COLUMBIA, IL 62236-0330
ATTN: KATHY BLAINE

REPORT: 262203TP(67)
DATE : 08-27-91

SAMPLE MATRIX : SOIL
ATAS # : 2622.03
DATE SUBMITTED : 08-21-91
DATE EXTRACTED : 08-26-91
DATE ANALYZED : 08-26-91
METHOD REFERENCE: METHOD 8015
PROJECT : #423023 ACUSTAR DAYTON
SAMPLE ID : TP-5

RESULTS REPORTED IN mg/Kg OR PARTS PER MILLION(PPM)

PARAMETER	DET. LIMIT	UNIT	RESULTS
TOTAL EXTRACTABLE HYDROCARBONS			
GASOLINE C6-C10	1.0	mg/Kg	ND
DIESEL C10-C22	1.0	mg/Kg	ND
KEROSENE C9-C18	1.0	mg/Kg	ND
JP-4 C6-C14	1.0	mg/Kg	ND
NAPHTHA C6-C12	1.0	mg/Kg	ND
#6 FUEL OIL C12-C24	1.0	mg/Kg	ND
MISCELLANEOUS C16-C28 (1)	1.0	mg/Kg	130.0

QA/QC SURROGATE RECOVERY

* NAPHTHALENE 85 %

(1) = ANALYSIS SHOWS MISCELLANEOUS PEAKS WHICH CANNOT BE IDENTIFIED AS ANY SPECIFIC PATTERN. THE RESPONSE FACTOR FOR DIESEL WAS USED.
(-) = PATTERN IS SIMILAR BUT NOT IDENTICAL TO STANDARD.
ND = NOT DETECTED ABOVE QUANTITATION LIMIT
NA = NOT APPLICABLE
= NOT QUANTIFIABLE DUE TO MATRIX INTERFERENCE

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: JOHN MATHES & ASSOCIATES, INC.
210 WEST SAND BANK ROAD P.O. BOX 330
COLUMBIA, IL 62236-0330
ATTN: KATHY BLAINE

REPORT: 262204TP(67)
DATE : 08-27-91

SAMPLE MATRIX : SOIL
ATAS # : 2622.04
DATE SUBMITTED : 08-21-91
DATE EXTRACTED : 08-26-91
DATE ANALYZED : 08-26-91
METHOD REFERENCE: METHOD 8015
PROJECT : #423023 ACUSTAR DAYTON
SAMPLE ID : TP-11

RESULTS REPORTED IN mg/Kg OR PARTS PER MILLION(PPM)

PARAMETER	DET. LIMIT	UNIT	RESULTS
TOTAL EXTRACTABLE HYDROCARBONS			
GASOLINE C6-C10	1.0	mg/Kg	ND
DIESEL C10-C22	1.0	mg/Kg	ND
KEROSENE C9-C18	1.0	mg/Kg	ND
JP-4 C6-C14	1.0	mg/Kg	ND
NAPHTHA C6-C12	1.0	mg/Kg	ND
#5 FUEL OIL C12-C24	1.0	mg/Kg	ND
MISCELLANEOUS C16-C28 (1)	1.0	mg/Kg	126.0

QA/QC SURROGATE RECOVERY

* NAPHTHALENE 87 %

(1) = ANALYSIS SHOWS MISCELLANEOUS PEAKS WHICH CANNOT BE IDENTIFIED AS ANY SPECIFIC PATTERN. THE RESPONSE FACTOR FOR DIESEL WAS USED.
(2) = PATTERN IS SIMILAR BUT NOT IDENTICAL TO STANDARD.
ND = NOT DETECTED ABOVE QUANTITATION LIMIT
N/A = NOT APPLICABLE
* = NOT QUANTIFIABLE DUE TO MATRIX INTERFERENCE

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

LABORATORY QUALITY CONTROL SEQUENCE

METHOD : MODIFIED 8015
SEQUENCE DATE : 08-26-91

LABORATORY BLANK

MATRIX : SOIL
SAMPLE AMOUNT : 20.0 g
ANALYSIS DATE : 08-26-91
ANALYSIS TIME : 16:18

DILUTION FACTOR: 1.0

COMPOUND	DET. LIMIT	UNIT	RESULTS
TOTAL EXTRACTABLE HYDROCARBONS			
GASOLINE	1.0	mg/Kg	ND
NAPHTHA	1.0	mg/Kg	ND
KEROSENE	1.0	mg/Kg	ND
BUNKER C/#6 FUEL OIL	1.0	mg/Kg	ND
DIESEL FUEL	1.0	mg/Kg	ND
JP-4	1.0	mg/Kg	ND

SURROGATE RECOVERY (NAPTHALENE): 84.0 %

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RESULTS

COMPOUND	SPIKE CONC. (mg/Kg)	3651.01 SAMPLE CONC. (mg/Kg)	3651.01 MS MARTIX SPIKE CONC. (mg/Kg)	PERCENT RECOVERY
KEROSENE	200	0	151	76.0 %

	3651.01 MSD MATRIX SPIKE DUPLICATE CONC. (mg/Kg)	PERCENT RECOVERY	RELATIVE PERCENT DIFFERENCE
KEROSENE	141	71.0 %	7 %

= NOT DETECTED ABOVE QUANTITATION LIMIT

C...IN...-CUSTODY RECORD

PAGE 1 OF 1

John Mathes & Associates, Inc.
701 Rodi Road, Suite 101
Pittsburgh, PA 15235-4586

PROJECT NAME	ACUSTAR DAYTON
PROJECT NUMBER	423023
MAJOR TASK	6003
SAMPLERS	JERRY WHITTINGTON
LAB DESTINATION	ATAS LABS

C.O.C. SERIAL 0525

SAMPLE ID	DATE MM/DD/YY	MILITARY TIME	NO. OF CONTAINERS	TYPE OF CONTAINERS 8OZ GLASS	WD 8-21-91 AATS IN					PRESERVATIVES ICED	PRESERVATIVES CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
TP-3	7/30/91	0830	1	1	2622.01					X		TPH "REMARK"
TP-4	7/30/91	0830	1	1	2622.02					X		TPH 5 day
TP-5	7/30/91	0830	1	1	2622.03					X		TPH TURNAROUND
TP-11	7/30/91	0830	1	1	2622.04					X		TPH
	/ /											8015 per KB 8/21/91
	/ /											
	/ /											
	/ /											
	/ /											
	/ /											
	/ /											
	/ /											
	/ /											
	/ /											

RELINQUISHED BY DATE	TIME	SIGNATURE	RECEIVED BY DATE	TIME	SIGNATURE
8/20/91	1530	Jerry Whittington	8/21/91	09:25	[signature]
/ /					
/ /					

SHIPPING NOTES
FAX Copys To Dr PINTA (ANALYSIS)
412 824-0480

LAB NOTES

WHITE - LABORATORY COPY BLUE - LABORATORY COPY

OhioEPA
State of Ohio Environmental Protection Agency

STREET ADDRESS:
Lazarus Government Center
122 S. Front Street
Columbus, Ohio 43215

TELE: (614) 644-3020 FAX: (614) 644-3184

MAILING ADDRESS:
P.O. Box 1049
Columbus, OH 43216-1049

June 2, 2004

Re: Ohio EPA Permit No. 1IN00089*ED
Facility Name: Dayton Thermal Products

Behr
Dayton Thermal Products
1600 Webster Street
Dayton, Ohio 45404

Ladies and Gentlemen:

Transmitted herewith is one copy of final Modification to the above-referenced permit. This modification is effective on June 1, 2004.

If you have any questions, please contact the Ohio EPA Southwest District Office.

Patti L. Smith

Patti L. Smith, Supervisor
Permit Processing Unit
Division of Surface Water

PLS/dks

Enclosure

CERTIFIED MAIL

cc: Southwest District Office
S. Kemper, DSW
Journal Room
File

Bob Taft, Governor
Jennette Bradley, Lieutenant Governor
Christopher Jones, Director

Printed on Recycled Paper

Ohio EPA is an Equal Opportunity Employer

Ohio Environmental Protection Agency
Modification of National Pollutant Discharge
Elimination System (NPDES) Permit

Issue Date: April 8, 2004 Existing Permit No.: 1IN00089*DD

Effective Date: June 1, 2004 Application No.: OH0009199

Entity Name: Behr Dayton Thermal Products

Facility Location: 1600 Webster Street, Dayton, Ohio, Montgomery County

In accordance with Rule 3745-33-04 (D) of the Ohio Administrative Code, the above referenced NPDES permit is hereby modified as follows:

Revision

Add director's decision statment on page 1; add reporting codes 03864 - 1,2-Cis - Dichloroethene, 34506 - 1,1,1-Trichlorethane, 39175 - Vinal Chloride, 39180- Trichlorethylene, 61 162 - 1,1,-Dichloroethene and 78389 - Tetrachloroethene with limits and loadings, and add "Loadings calculated based on 0.288 mgd flow" to notes section for outfall 1IN00089002.

Attached is the modified NPDES permit.

All terms and conditions of the existing permit not recommended for modification by this document will remain in effect. Any modified term or condition contained in this modification shall supersede, on the date this modification is effective, the existing respective term or condition of the permit.

When the modification is effective, the Ohio EPA permit number will be changed to 1IN00089*ED. The application number will remain OH0009199.

Christopher Jones
Director

Application No. OH0009199

Modification Issue Date: April 8, 2004

Modification Effective Date: June 1, 2004

Expiration Date: September 30, 2006

Ohio Environmental Protection Agency
Authorization to Discharge Under the
National Pollutant Discharge Elimination System

In compliance with the provisions of the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et. seq., hereinafter referred to as the "Act"), and the Ohio Water Pollution Control Act (Ohio Revised Code Section 6111),

Behr
Dayton Thermal Products

is authorized by the Ohio Environmental Protection Agency, hereinafter referred to as "Ohio EPA," to discharge from the Dayton Thermal Products wastewater treatment works located at 1600 Webster Street, Dayton, Ohio, Montgomery County and discharging to The Great Miami River via storm sewer in accordance with the conditions specified in Parts I, II, III, IV, V, and VI of this permit.

In accordance with the antidegradation rule, OAC 3745-1-05, I have determined that a lowering of water quality in the Great Miami River is necessary. Provision (D)(1)(d) was applied to this application. This provision excludes the need for the submittal and subsequent review of technical alternatives and social and economic issues related to the degradation. Other rule provisions, however, including public participation and appropriate intergovernmental coordination were required and considered prior to reaching this decision.

This permit is conditioned upon payment of applicable fees as required by Section 3745.11 of the Ohio Revised Code.

This permit and the authorization to discharge shall expire at midnight on the expiration date shown above. In order to receive authorization to discharge beyond the above date of expiration, the permittee shall submit such information and forms as are required by the Ohio EPA no later than 180 days prior to the above date of expiration.

Christopher Jones
Director

Total Pages: 28

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 1IN00089001. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Final Outfall - 001 - Final

Effluent Characteristic	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day					
Parameter	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly	Measuring Frequency	Sampling Type	Monitoring Months
00010 - Water Temperature - C	-	-	-	-	-	-	-	1 / 2 Weeks	Continuous	All
00050 - Flow Rate - MGD	-	-	-	-	-	-	-	1/Day	24hr Total	All
1941 - pH, Maximum - S.U.	9.0	-	-	-	-	-	-	1 / 2 Weeks	Grab	All
1942 - pH, Minimum - S.U.	-	6.5	-	-	-	-	-	1 / 2 Weeks	Grab	All

Notes for Station Number 1IN00089001:

This discharge is limited to non-contact cooling water and storm runoff; it is to be free of process wastes and other contaminants.

Sampling shall be performed when discharging. If NO DISCHARGE OCCURS DURING THE ENTIRE MONTH, report "AL" in the first column of the first day of the month on the 4500 Form (Monthly Operating Report). A signature is still required.

Use of a maximum indicating thermometer for temperature is acceptable.

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 1IN00089002. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Final Outfall - 002 - Final

Effluent Characteristic	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day					
Parameter	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly	Measuring Frequency	Sampling Type	Monitoring Months
00010 - Water Temperature - C	-	-	-	-	-	-	-	1 / 2 Weeks	Continuous	All
00530 - Total Suspended Solids - mg/l	45	-	-	30	-	-	-	1/Month	24hr Composite	All
3864 - 1,2-Cis-Dichloroethene - ug/l	5.0	-	-	-	0.0054	-	-	1/Month	Grab	All
4506 - 1,1,1-Trichloroethane - ug/l	5.0	-	-	-	0.0054	-	-	1/Month	Grab	All
9175 - Vinyl Chloride - ug/l	5.0	-	-	-	0.0054	-	-	1/Month	Grab	All
9180 - Trichloroethylene - ug/l	5.0	-	-	-	0.054	-	-	1/Month	Grab	All
50050 - Flow Rate - MGD	-	-	-	-	-	-	-	1/Day	24hr Total	All
1162 - 1,1-Dichloroethene - ug/l	5.0	-	-	-	0.0054	-	-	1/Month	Grab	All
1941 - pH, Maximum - S.U.	9.0	-	-	-	-	-	-	1/Month	Grab	All
1942 - pH, Minimum - S.U.	-	6.5	-	-	-	-	-	1/Month	Grab	All
389 - Tetrachloroethene - ug/l	5.0	-	-	-	0.0054	-	-	1/Month	Grab	All

otes for Station Number 1IN00089002:

adings calculated based on 0.288 mgd flow.
is discharge is limited to non-contact cooling water, cooling tower blowdown, storm water runoff, and treated groundwater remediation ater; it is to be free of other process wastes and other contaminants.
mpling shall be performed when discharging. If NO DISCHARGE OCCURS DURING THE ENTIRE MONTH, report "AL" in the first lumn of the first day of the month on the 4500 Form (Monthly Operating Report). A signature is still required.
e of a maximum indicating thermometer for temperature is acceptable.

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 1IN00089003. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Final Outfall - 003 - Final

Effluent Characteristic	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day					
Parameter	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly	Measuring Frequency	Sampling Type	Monitoring Months
)0010 - Water Temperature - C	-	-	-	-	-	-	-	1 / 2 Weeks	Continuous	All
50050 - Flow Rate - MGD	-	-	-	-	-	-	-	1/Day	24hr Total	All
51941 - pH, Maximum - S.U.	9.0	-	-	-	-	-	-	1 / 2 Weeks	Grab	All
51942 - pH, Minimum - S.U.	-	6.5	-	-	-	-	-	1 / 2 Weeks	Grab	All

Notes for Station Number 1IN00089003:

This discharge is limited to non-contact cooling water and storm runoff; it is to be free of process wastes and other contaminants.

ampling shall be performed when discharging. If NO DISCHARGE OCCURS DURING THE ENTIRE MONTH, report "AL" in the first olumn of the first day of the month on the 4500 Form (Monthly Operating Report). A signature is still required.

se of a maximum indicating thermometer for temperature is acceptable.

Part II, OTHER REQUIREMENTS

A. Description of the location of the required sampling stations are as follows:

Sampling Station	Description of Location
1IN00089001	At manhole adjacent to Leo Street prior to discharge to city storm sewer (Lat: 39 47' 12"; Long: 84 10' 50")
1IN00089002	At manhole adjacent to Webster Street prior to discharge to city storm sewer (Lat: 39 47' 05": Long: 84 10' 50")
1IN00089003	At manhole adjacent to Leo Street prior to discharge to city storm sewer (Lat: 39 46' 58:; Long: 84 10' 50")

B. This permit shall be modified, or alternatively, revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) of the Clean Water Act, if the effluent standard or limitation so issued or approved.

1. Contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
2. Controls any pollutant not limited in the permit.

The permit as modified or reissued under this paragraph shall also contain any other requirements of the Act then applicable.

C. All parameters, except flow, need not be monitored on days when the plant is not normally staffed (Saturdays, Sundays, and Holidays). On those days, report "AN" on the monthly report form.

D. In the event that the permittee's operation requires the use of cooling or boiler water treatment additives that are discharged to surface waters of the state, written permission must be obtained from the director of the Ohio EPA prior to use. Reporting and testing requirements to apply for permission to use additives can be obtained from the Ohio EPA, Central Office, Division of Surface Water, Water Resources Management Section. Reported information will be used to evaluate whether the use of the additive(s) at concentrations expected in the final discharge will be harmful or inimical to aquatic life.

PART III - GENERAL CONDITIONS

1.□DEFINITIONS

"Daily load" is the total discharge by weight during any calendar day. If only one sample is taken during a day, the weight of pollutant discharge calculated from it is the daily load.

"Daily concentration" means the arithmetic average of all the determinations of concentration made during the day. If only one sample is taken during the day, its concentration is the daily concentration. Coliform bacteria limitations compliance shall be determined using the geometric mean.

"Weekly load" is the total discharge by weight during any 7-day period divided by the number of days in that 7-day period that the facility was in operation. If only one sample is taken in a 7-day period, the weight of pollutant discharge calculated from it is the 7-day load. If more than one sample is taken during the 7-day period, the 7-day load is calculated by determining the daily load for each day sampled, totaling the daily loads for the 7-day period, and dividing by the number of days sampled.

"Weekly concentration" means the arithmetic average of all the determinations of daily concentration limitation made during the 7-day period. If only one sample is taken during the 7-day period, its concentration is the 7-day concentration for that 7-day period. Coliform bacteria limitations compliance shall be determined using the geometric mean.

"Monthly load" is the total discharge by weight during all days in a calander month divided by the number of days that the facility was in operation during that month. If only one sample is taken during the month the weight of pollutant discharge calculated from it is the monthly load. If more than one sample is taken during the month, the monthly load is calculated by determining the daily load for each day sampled, totaling the daily loads for the month and dividing by the number of days sampled.

"Monthly concentration" means the arithmetic average of all the determinations of daily concentration made during any calender month. If only one sample is taken during the month, its concentration is the monthly concentration for that period. Coliform bacteria limitations compliance shall be determined using the geometric mean.

"85 percent removal" means the arithmetic mean of the values for effluent samples collected in a period of 30 consecutive days shall not exceed 15 percent of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period.

"Absolute Limitations" Compliance with limitations having descriptions of "shall not be less than," "nor greater than," "shall not exceed," "minimum," or "maximum" shall be determined from any single value for effluent samples and/or measurements collected.

"Net concentration" shall mean the difference between the concentration of a given substance in a sample taken of the discharge and the concentration of the same substances in a sample taken at the intake which supplies water to the given process. For the purpose of this definition, samples that are taken to determine the net concentration shall always be 24-hour composite samples made up of at least six increments taken at regular intervals throughout the plant day.

"Net load" shall mean the difference between the load of a given substance as calculated from a sample taken of the discharge and the load of the same substance in a sample taken at the intake which supplies water to given process. For purposes of this definition, samples that are taken to determine the net Loading shall always be 24-hour composite samples made up of at least six increments taken at regular intervals throughout the plant day.

"MGD" means million gallons per day.

"mg/l" means milligrams per liter.

"ug/l" means micrograms per liter.

"ng/l" means nanograms per liter.

"S.U." means standard pH unit.

"kg/day" means kilograms per day.

"Reporting Code" is a five digit number used by the Ohio EPA in processing reported data. The reporting code does not imply the type of analysis used nor the sampling techniques employed.

"Quarterly (1/Quarter) sampling frequency" means the sampling shall be done in the months of March, June, August, and December, unless specificially identified otherwise in the Effluent Limitations and Monitoring Requirements table.

"Yearly (1/Year) sampling frequency" means the sampling shall be done in the month of September, unless specificially identified otherwise in the effluent limitations and monitoring requirements table.

"Semi-annual (2/Year) sampling frequency" means the sampling shall be done during the months of June and December, unless specificially identified otherwise.

"Winter" shall be considered to be the period from November 1 through April 30.

"Bypass" means the intentional diversion of waste streams from any portion of the treatment facility.

"Summer" shall be considered to be the period from May 1 through October 31.

"Severe property damage" means substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

"Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

2. GENERAL EFFLUENT LIMITATIONS

The effluent shall, at all times, be free of substances:

A. In amounts that will settle to form putrescent, or otherwise objectionable, sludge deposits; or that will adversely affect aquatic life or water fowl;

B. Of an oily, greasy, or surface-active nature, and of other floating debris, in amounts that will form noticeable accumulations of scum, foam or sheen;

C. In amounts that will alter the natural color or odor of the receiving water to such degree as to create a nuisance;

D. In amounts that either singly or in combination with other substances are toxic to human, animal, or aquatic life;

E. In amounts that are conducive to the growth of aquatic weeds or algae to the extent that such growths become inimical to more desirable forms of aquatic life, or create conditions that are unsightly, or constitute a nuisance in any other fashion;

F. In amounts that will impair designated instream or downstream water uses.

3. FACILITY OPERATION AND QUALITY CONTROL

All wastewater treatment works shall be operated in a manner consistent with the following:

A. At all times, the permittee shall maintain in good working order and operate as efficiently as possible all treatment or control facilities or systems installed or used by the permittee necessary to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with conditions of the permit.

B. The permittee shall effectively monitor the operation and efficiency of treatment and control facilities and the quantity and quality of the treated discharge.

C. Maintenance of wastewater treatment works that results in degradation of effluent quality shall be scheduled during non-critical water quality periods and shall be carried out in a manner approved by Ohio EPA as specified in the Paragraph in the PART III entitled, "UNAUTHORIZED DISCHARGES".

4. REPORTING

A. Monitoring data required by this permit may be submitted in hardcopy format on the Ohio EPA 4500 report form pre-printed by Ohio EPA or an approved facsimile. Ohio EPA 4500 report forms for each individual sampling station are to be received no later than the 15th day of the month following the month-of-interest. The original report form must be signed and mailed to:

Ohio Environmental Protection Agency
Lazarus Government Center
Division of Surface Water
Enforcement Section ES/MOR
P.O. Box 1049
Columbus, Ohio 43216-1049

Monitoring data may also be submitted electronically using Ohio EPA developed SWIMware software. Data must be transmitted to Ohio EPA via electronic mail or the bulletin board system by the 20th day of the month following the month-of-interest. A Surface Water Information Management System (SWIMS) Memorandum of Agreement (MOA) must be signed by the responsible official and submitted to Ohio EPA to receive an authorized Personal Identification Number (PIN) prior to sending data electronically. A hardcopy of the Ohio EPA 4500 form must be generated via SWIMware, signed and maintained onsite for records retention purposes.

B. If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified below, the results of such monitoring shall be included in the calculation and reporting of the values required in the reports specified above.

C. Analyses of pollutants not required by this permit, except as noted in the preceding paragraph, shall not be reported on Ohio EPA report form (4500) but records shall be retained as specified in the paragraph entitled "RECORDS RETENTION".

5. SAMPLING AND ANALYTICAL METHOD

Samples and measurements taken as required herein shall be representative of the volume and nature monitored flow. Test procedures for the analysis of pollutants shall conform to regulation 40 CFR 136, "Test Procedures For The Analysis of Pollutants" unless other test procedures have been specified in this permit. The permittee shall periodically calibrate and perform maintenance procedures on all monitoring and instrumentation at intervals to insure accuracy of measurements.

6. RECORDING OF RESULTS

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

A. The exact place and date of sampling; (time of sampling not required on EPA 4500)

B. The person(s) who performed the sampling or measurements;

C. The date the analyses were performed on those samples;

D. The person(s) who performed the analyses;

E. The analytical techniques or methods used; and

F. The results of all analyses and measurements.

7. RECORDS RETENTION

The permittee shall retain all of the following records for the wastewater treatment works for a minimum of three years, including:

A. All sampling and analytical records (including internal sampling data not reported);

B. All original recordings for any continuous monitoring instrumentation;

C. All instrumentation, calibration and maintenance records;

D. All plant operation and maintenance records;

E. All reports required by this permit; and

F. Records of all data used to complete the application for this permit for a period of at least three years from the date of the sample, measurement, report, or application.

These periods will be extended during the course of any unresolved litigation, or when requested by the Regional Administrator or the Ohio EPA. The three year period for retention of records shall start from the date of sample, measurement, report, or application.

8. AVAILABILITY OF REPORTS

Except for data determined by the Ohio EPA to be entitled to confidential status, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the appropriate district offices of the Ohio EPA. Both the Clean Water Act and Section 6111.05 Ohio Revised Code state that effluent data and receiving water quality data shall not be considered confidential.

9. DUTY TO PROVIDE INFORMATION

The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking, and reissuing, or terminating the permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

10. RIGHT OF ENTRY

The permittee shall allow the Director or an authorized representative upon presentation of credentials and other documents as may be required by law to:

A. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit.

B. Have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit.

C. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit.

D. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

11. UNAUTHORIZED DISCHARGES

A. Bypassing or diverting of wastewater from the treatment works is prohibited unless:

1. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

2. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of downtime. This condition is not satisfied if adequate back up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

3. The permittee submitted notices as required under paragraph D. of this section,

B. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass.

C. The Director may approve an unanticipated bypass after considering its adverse effects, if the Director determines that it has met the three conditions listed in paragraph 11.A. of this section.

D. The permittee shall submit notice of an unanticipated bypass as required in section 12. A.

E. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded if that bypass is for essential maintenance to assure efficient operation.

12. NONCOMPLIANCE NOTIFICATION

A. The permittee shall by telephone report any of the following within twenty-four (24) hours of discovery at (toll free) 1-800-282-9378:

1. Any noncompliance which may endanger health or the environment;

2. Any unanticipated bypass which exceeds any effluent limitation in the permit; or

3. Any upset which exceeds any effluent limitation in the permit.

4. Any violation of a maximum daily discharge limitation for any of the pollutants listed by the Director in the permit.

B. For the telephone reports required by Part 12.A., the following information must be included:

1. The times at which the discharge occurred, and was discovered;

2. The approximate amount and the characteristics of the discharge;

3. The stream(s) affected by the discharge;

4. The circumstances which created the discharge;

5. The names and telephone numbers of the persons who have knowledge of these circumstances;

6. What remedial steps are being taken; and

7. The names and telephone numbers of the persons responsible for such remedial steps.

C. These telephone reports shall be confirmed in writing within five days of the discovery of the discharge and/or noncompliance and submitted to the appropriate Ohio EPA district office. The report shall include the following:

1. The limitation(s) which has been exceeded;

2. The extent of the exceedance(s);

3. The cause of the exceedance(s);

4. The period of the exceedance(s) including exact dates and times;

5. If uncorrected, the anticipated time the exceedance(s) is expected to continue, and

6. Steps being taken to reduce, eliminate, and/or prevent occurrence of the exceedance(s).

D. Compliance Schedule Events:

If the permittee is unable to meet any date for achieving an event, as specified in the schedule of compliance, the permittee shall submit a written report to the appropriate district office of the Ohio EPA within 14 days of becoming aware of such situation. The report shall include the following:

1. The compliance event which has been or will be violated;

2. The cause of the violation;

3. The remedial action being taken;

4. The probable date by which compliance will occur; and

5. The probability of complying with subsequent and final events as scheduled.

E. The permittee shall report all instances of noncompliance not reported under paragraphs A, B, or C of this section, at the time monitoring reports are submitted. The reports shall contain the information listed in paragraphs B and C of this section.

F. Where the permittee becomes aware that it failed to submit any relevant application or submitted incorrect information in a permit application or in any report to the director, it shall promptly submit such facts or information.

13. RESERVED

14. DUTY TO MITIGATE

The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

15. AUTHORIZED DISCHARGES

All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit more frequently than, or at a level in excess of, that authorized by this permit shall constitute a violation of the terms and conditions of this permit. Such violations may result in the imposition of civil and/or criminal penalties as provided for in Section 309 of the Act and Ohio Revised Code Sections 6111.09 and 6111.99.

16. DISCHARGE CHANGES

The following changes must be reported to the appropriate Ohio EPA district office as soon as practicable:

A. For all treatment works, any significant change in character of the discharge which the permittee knows or has reason to believe has occurred or will occur which would constitute cause for modification or revocation and reissuance. The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. Notification of permit changes or anticipated noncompliance does not stay any permit condition.

B. For publicly owned treatment works:

1. Any proposed plant modification, addition, and/or expansion that will change the capacity or efficiency of the plant;

2. The addition of any new significant industrial discharge; and

3. Changes in the quantity or quality of the wastes from existing tributary industrial discharges which will result in significant new or increased discharges of pollutants.

C. For non-publicly owned treatment works any proposed facility expansions, production increases, or process modifications, which will result in new, different, or increased discharges of pollutants.

Following this notice, modifications to the permit may be made to reflect any necessary changes in permit conditions, including any necessary effluent limitations for any pollutants not identified and limited herein. A determination will also be made as to whether a National Environmental Policy Act (NEPA) review will be required. Sections 6111.44 and 6111.45, Ohio Revised Code, require that plans for treatment works or improvements to such works be approved by the Director of the Ohio EPA prior to initiation of construction.

D. In addition to the reporting requirements under 40 CFR 122.41(l) and per 40 CFR 122.42(a), all existing manufacturing, commercial mining, and silvicultural dischargers must notify the Director as soon as they know or have reason to believe:

1. That any activity has occurred or will occur which would result in the discharge on a routine or frequent basis of any toxic pollutant which is not limited in the permit. If that discharge will exceed the highest of the "notification levels" specified in 40 CFR Sections 122.42(a)(1)(i) through 122.42(a)(1)(iv).

2. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the "notification levels" specified in 122.42(a)(2)(i) through 122.42(a)(2)(iv).

17. TOXIC POLLUTANTS

The permittee shall comply with effluent standards or prohibitions established under Section 307 (a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement. Following establishment of such standards or prohibitions, the Director shall modify this permit and so notify the permittee.

18. PERMIT MODIFICATION OR REVOCATION

A. After notice and opportunity for a hearing, this permit may be modified or revoked, by the Ohio EPA, in whole or in part during its term for cause including, but not limited to, the following:

1. Violation of any terms or conditions of this permit;

2. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts; or

3. Change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge.

B. Pursuant to rule 3745-33-04, Ohio Administrative Code, the permittee may at any time apply to the Ohio EPA for modification of any part of this permit. The filing of a request by the permittee for a permit modification or revocation does not stay any permit condition. The application for modification should be received by the appropriate Ohio EPA district office at least ninety days before the date on which it is desired that the modification become effective. The application shall be made only on forms approved by the Ohio EPA.

19. TRANSFER OF OWNERSHIP OR CONTROL

This permit may be transferred or assigned and a new owner or successor can be authorized to discharge from this facility, provided the following requirements are met:

A. The permittee shall notify the succeeding owner or successor of the existence of this permit by a letter, a copy of which shall be forwarded to the appropriate Ohio EPA district office. The copy of that letter will serve as the permittee's notice to the Director of the proposed transfer. The copy of that letter shall be received by the appropriate Ohio EPA district office sixty (60) days prior to the proposed date of transfer;

B. A written agreement containing a specific date for transfer of permit responsibility and coverage between the current and new permittee (including acknowledgement that the existing permittee is liable for violations up to that date, and that the new permittee is liable for violations from that date on) shall be submitted to the appropriate Ohio EPA district office within sixty days after receipt by the district office of the copy of the letter from the permittee to the succeeding owner;

At anytime during the sixty (60) day period between notification of the proposed transfer and the effective date of the transfer, the Director may prevent the transfer if he concludes that such transfer will jeopardize compliance with the terms and conditions of the permit. If the Director does not prevent transfer, he will modify the permit to reflect the new owner.

20. OIL AND HAZARDOUS SUBSTANCE LIABILITY

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Clean Water Act.

21. SOLIDS DISPOSAL

Collected screenings, slurries, sludges, and other solids shall be disposed of in such a manner as to prevent entry of those wastes into waters of the state. For publicly owned treatment works, these shall be disposed of in accordance with the approved Ohio EPA Sludge Management Plan.

22. CONSTRUCTION AFFECTING NAVIGABLE WATERS

This permit does not authorize or approve the construction of any onshore or offshore physical structures or facilities or the undertaking of any work in any navigable waters.

23. CIVIL AND CRIMINAL LIABILITY

Except as exempted in the permit conditions on UNAUTHORIZED DISCHARGES or UPSETS, nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance.

24. STATE LAWS AND REGULATIONS

Nothing in this permit shall be construed to preclude the institution of any legal action nor relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authority preserved by Section 510 of the Clean Water Act.

25. PROPERTY RIGHTS

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations.

26. UPSET

The provisions of 40 CFR Section 122.41(n), relating to "Upset," are specifically incorporated herein by reference in their entirety. For definition of "upset," see Part III, Paragraph 1, DEFINITIONS.

27. SEVERABILITY

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

28. SIGNATORY REQUIREMENTS

All applications submitted to the Director shall be signed and certified in accordance with the requirements of 40 CFR 122.22.

All reports submitted to the Director shall be signed and certified in accordance with the requirements of 40 CFR Section 122.22.

29. OTHER INFORMATION

A. Where the permittee becomes aware that it failed to submit any relevant facts in a permit application or submitted incorrect information in a permit application or in any report to the Director, it shall promptly submit such facts or information.

B. ORC 6111.99 provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $25,000 per violation.

C. ORC 6111.99 states that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than $25,000 per violation.

D. ORC 6111.99 provides that any person who violates Sections 6111.04, 6111.042, 6111.05, or division (A) of Section 6111.07 of the Revised Code shall be fined not more than $25,000 or imprisoned not more than one year, or both.

30. NEED TO HALT OR REDUCE ACTIVITY

40 CFR 122.41(c) states that it shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with conditions of this permit.

31. APPLICABLE FEDERAL RULES

All references to 40 CFR in this permit mean the version of 40 CFR which is effective as of the effective date of this permit.

32. AVAILABILITY OF PUBLIC SEWERS

Not withstanding the issuance or non-issuance of an NPDES permit to a semi-public disposal system, whenever the sewage system of a publicly owned treatment works becomes available and accessible, the permittee operating any semi-public disposal system shall abandon the semi-public disposal system and connect it into the publicly owned treatment works.

Part IV. STORM WATER POLLUTION PREVENTION PLANS

A storm water pollution prevention plan (plan) shall be developed to address each outfall that discharges to waters of the state that contains storm water associated with industrial activity. Storm water pollution prevention plans shall be prepared in accordance with good engineering practices. The plan shall identify potential sources of pollution which may reasonably be expected to affect the quality of storm water discharges associated with industrial activity from the facility. In addition, the plan shall describe and ensure the implementation of practices which are to be used to reduce the pollutants in storm water discharges associated with industrial activity at the facility and to assure compliance with the terms and conditions of this permit. Facilities must implement the provisions of the storm water pollution prevention plan required under this part as a condition of this permit.

A. Deadlines for Plan Preparation and Compliance.

1. The plan for a storm water discharge associated with industrial activity:

   a. shall be prepared within six months of the effective date of this permit (and updated as appropriate);
   b. shall provide for implementation and compliance with the terms of the plan within twelve months of the effective date of this permit.

2. Upon a showing of good cause, the Director may establish a later date for preparing and compliance with a plan for a storm water discharge associated with industrial activity.

B. Signature and Plan Review.

1. The plan shall be signed in accordance with Part VI, and be retained on-site at the facility which generates the storm water discharge.

2. The permittee shall make plans available upon request to the Ohio EPA Director, or authorized representative, or Regional Administrator of U.S. EPA, or in the case of a storm water discharge associated with industrial activity which discharges through a municipal separate storm sewer system, to the operator of the municipal system.

3. The Director may notify the permittee at any time that the plan does not meet one or more of the minimum requirements of this Part. Within 30 days of such notification from the Director, the permittee shall make the required changes to the plan and shall submit to the Director a written certification that the requested changes have been made.

4. All storm water pollution prevention plans required under this permit are considered reports that shall be available to the public under Section 308(b) of the Act. The permittee may claim any portion of a storm water pollution plan as confidential in accordance with 40 CFR Part 2 and does not have to release any portion of the plan describing facility security measures (such as provided for in Part IV.D.7.b.(8) of this permit). An interested party wishing a copy of a discharger's SWP3 will have to contact the Ohio EPA to obtain a copy.

C. Keeping Plans Current.

The permittee shall amend the plan whenever there is a change in design, construction, operation, or maintenance, that has a significant effect on the potential for the discharge of pollutants to the waters of the State or if the storm water pollution prevention plan proves to be ineffective in eliminating or significantly minimizing pollutants from sources identified under Part IV.D.2 of this permit, or otherwise achieving the general objectives of controlling pollutants in storm water discharges associated with industrial activity. Amendments to the plan may be reviewed by Ohio EPA in the same manner as Part IV.B above.

D. Contents of Plan.

The plan shall include, at a minimum, the following items:

1. Pollution Prevention Team - Each plan shall identify a specific individual or individuals within the facility organization as members of a storm water Pollution Prevention Team that are responsible for developing the storm water pollution prevention plan and assisting the facility or plant manager in its implementation, maintenance, and revision. The plan shall clearly identify the responsibilities of each team member. The activities and responsibilities of the team shall address all aspects of the facility's storm water pollution prevention plan.

2. Description of Potential Pollutant Sources. Each plan shall provide a description of potential sources which may reasonably be expected to add significant amounts of pollutants to storm water discharges or which may result in the discharge of pollutants during dry weather from separate storm sewers draining the facility. Each plan shall identify all activities and significant materials which may potentially be significant pollutant sources. Each plan shall include, at a minimum:

D. (continued)

a. Drainage.

(1) A site map indicating an outline of the drainage area of each storm water outfall, each existing structural control measure to reduce pollutants in storm water runoff, surface water bodies, locations where significant materials are exposed to precipitation, locations where major spills or leaks identified under Part IV.D.2.c of this permit have occurred, and the locations of the following activities where such activities are exposed to precipitation: fueling stations, vehicle

and equipment maintenance and/or cleaning areas, loading/unloading areas, locations used for the treatment, storage or disposal of wastes, liquid storage tanks, processing areas and storage areas.

(2) For each area of the facility that generates storm water discharges associated with industrial activity with a reasonable potential for containing significant amounts of pollutants, a prediction of the direction of flow, and an estimate of the types of pollutants which are likely to be present in storm water discharges associated with industrial activity. Flows with a significant potential for causing erosion shall be identified.

b. Inventory of Exposed Materials. An inventory of the types of materials handled at the site that potentially may be exposed to precipitation. Such inventory shall include a narrative description of significant materials that have been handled, treated, stored or disposed in a manner to allow exposure to storm water between the time of three years prior to the date of the issuance of this permit and the present; method and location of on-site storage or disposal; materials management practices employed to minimize contact of materials with storm water runoff between the time of three years prior to the date of the issuance of this permit and the present; the location and a description of existing structural and non-structural control measures to reduce pollutants in storm water runoff; and a description of any treatment the storm water receives.

c. Spills and Leaks. A list of significant spills and significant leaks of toxic or hazardous pollutants that occurred at the facility after the date of three years prior to the effective date of this permit.

d. Sampling Data. A summary of existing discharge sampling data describing pollutants in storm water discharges from the facility.

e. Risk Identification and Summary of Potential Pollutant Sources. A narrative description of the potential pollutant sources at the following areas: loading and unloading operations; outdoor storage activities; outdoor manufacturing or processing activities; significant dust or particulate generating processes; and on-site waste disposal practices. The description shall specifically list any significant potential source of pollutants at the site and for each potential source, any pollutant or pollutant parameter (e.g. biochemical oxygen demand, etc.) of concerns shall be identified.

3. Measures and Controls. Each facility covered by this permit shall develop a description of storm water management controls appropriate for the facility, and implement such controls. The appropriateness and priorities of controls in a plan shall reflect identified potential sources of pollutants at the facility. The description of storm water management controls shall address the following minimum components, including a schedule for implementing such controls:

a. Good Housekeeping - Good housekeeping requires the maintenance of a clean, orderly facility.

b. Preventive Maintenance - A preventive maintenance program shall involve inspection and maintenance of storm water management devices (e.g. cleaning oil/water separators, catch basins) as well as inspecting and testing facility equipment and systems to uncover conditions that could cause breakdowns or failures resulting in discharges of pollutants to surface waters, and ensuring appropriate maintenance of such equipment and systems.

c. Spill Prevention and Response Procedures - Areas where potential spills can occur, and their accompanying drainage points shall be identified clearly in the storm water pollution prevention plan. Where appropriate, specifying material handling procedures, storage requirements, and use of equipment such as diversion valves in the plan should be considered. Procedures for cleaning up spills shall be identified in the plan and made available to the appropriate personnel. The necessary equipment to implement a clean up should be available to personnel.

D. (continued)

d. Inspections - In addition to or as part of the comprehensive site evaluation required under Part IV.4. of this permit, qualified facility personnel shall be identified to inspect designated equipment and areas of the facility at appropriate intervals specified in the plan. A set of tracking or follow-up procedures shall be used to ensure that appropriate actions are taken in response to the inspections. Records of inspections shall be maintained.

e. Employee Training - Employee training programs shall inform personnel at all levels of responsibility of the components and goals of the storm water pollution prevention plan. Training should address topics such as spill response, good housekeeping and material management practices. The plan shall identify periodic dates for such training.

f. Recordkeeping and Internal Reporting Procedures - A description of incidents such as spills, or other discharges, along with other information describing the quality and quantity of storm water discharges shall be included in the plan required under this part. Inspections and maintenance activities shall be documented and records of such activities shall be incorporated into the plan.

g. Non-Storm Water Discharges

(1) The plan shall include a certification that the discharge has been tested or evaluated for the presence of non-storm water discharges. The certification shall include the identification of potential significant sources of non-storm water at the site, a description of the results of any test and/or evaluation for the presence of non-storm water discharges, the evaluation criteria or testing method used, the date of any testing and/or evaluation, and the on-site drainage points that were directly observed during the test. Such certification may not be feasible if the facility operating the storm water discharge associated with industrial activity does not have access to an outfall, manhole, or other point of access to the ultimate conduit which receives the discharge. In such cases, the source identification section of the storm water pollution plan shall indicate why the certification required by this part was not feasible, along with the identification of potential significant sources of non-storm water at the site. A discharger that is unable to provide the certification required by this paragraph must notify in accordance with Part IV.A of this permit.

(2) Except for flows from fire fighting activities, sources of non-storm water listed in Part VI of this permit that are combined with storm water discharges associated with industrial activity must be identified in the plan. The plan shall identify and ensure the implementation of appropriate pollution prevention measures for the non-storm water component(s) of the discharge.

h. Sediment and Erosion Control - The plan shall identify areas which, due to topography, activities, or other factors, have a high potential for significant soil erosion, and identify measures to limit erosion.

i. Management of Runoff - The plan shall contain a narrative consideration of the appropriateness of traditional storm water management practices (practices other than those which control the source of pollutants) used to divert, infiltrate, reuse, or otherwise manage storm water runoff in a manner that reduces pollutants in storm water discharges from the site. The plan shall provide that measures determined to be reasonable and appropriate shall be implemented and maintained. The potential of various sources at the facility to contribute pollutants to storm water discharges associated with industrial activity (see Parts IV.D.2.(b), (d) and (e) of this permit) shall be considered when determining reasonable and appropriate measures. Appropriate measures may include: including vegetative swales and practices, reuse of collected storm water (such as for a process or as an irrigation source), inlet controls (such as oil/water separators), snow management activities, infiltration devices, and wet detention/retention devices.

4. Comprehensive Site Compliance Evaluation. Qualified personnel shall conduct site compliance evaluations at appropriate intervals specified in the plan, but, except as provided in paragraph IV.D.4.d, in no case less than once a year. Such evaluations shall provide:

a. Material handling areas and other potential sources of pollution identified in the plan in accordance with paragraph IV.D.2 of this permit shall be visually inspected for evidence of, or the potential for, pollutants entering the drainage system. Structural storm water management measures, sediment and control measures, and other structural pollution prevention measures identified in the plan shall be observed to ensure that they are operating correctly. A visual inspection of equipment needed to implement the plan, such as spill response equipment, shall be made.

D. (continued)

b. Based on the results of the inspection, the description of potential pollutant sources identified in the plan in accordance with paragraph IV.D.2 of this permit and pollution prevention measures and controls identified in the plan in accordance with paragraph IV.D.3 of this permit shall be revised as appropriate within two weeks of such inspection and shall provide for implementation of any changes to the plan in a timely manner, but in no case more than twelve weeks after the inspection.

c. A report summarizing the scope of the inspection, personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the storm water pollution prevention plan, and actions taken in accordance with paragraph IV.D.4.b of the permit shall be made and retained as part of the storm water pollution prevention plan for at least three years. The report shall be signed in accordance with Part VI.B of this permit.

5. Additional requirements for storm water discharges associated with industrial activity through municipal separate storm sewer systems serving a population of 100,000 or more.

In addition to the applicable requirements of this permit, facilities covered by this permit must comply with applicable requirements in municipal storm water management programs developed under NPDES permits issued for the discharge of the municipal separate storm sewer system that receives the facility's discharge, provided the discharger has been notified of such conditions.

6. Consistency with other plans. Storm water pollution prevention plans may reflect requirements for Spill Prevention Control and Countermeasure (SPCC) plans developed for the facility under section 311 of the Act or Best Management Practices (BMP) Programs otherwise required by a NPDES permit for the facility as long as such requirement is incorporated into the storm water pollution prevention plan.

7. Additional requirements for storm water discharges associated with industrial activity from facilities subject to SARA Title III, Section 313 requirements are not applicable to Section 313 water priority chemicals in gaseous or non-soluble liquid or solid [at atmospheric pressure and temperature] forms. In addition to the requirements of Parts IV.D.1 through 4 of this permit and other applicable conditions of this permit, storm water pollution prevention plans for facilities subject to reporting requirements under SARA Title III, Section 313 for chemicals which are classified as "Section 313 water priority chemicals" in accordance with the definition in Part VI of this permit, shall describe and ensure the implementation of practices which are necessary to provide for conformance with the following guidelines:

a. In areas where Section 313 water priority chemicals are stored, processed or otherwise handled, appropriate containment, drainage control and/or diversionary structures shall be provided. At a minimum, one of the following preventive systems or its equivalent shall be used:

(1) Curbing, culverting, gutters, sewers or other forms of drainage control to prevent or minimize the potential for storm water run-on to come into contact with significant sources of pollutants; or
(2) Roofs, covers or other forms of appropriate protection to prevent storage piles from exposure to storm water, and wind blowing.

b. In addition to the minimum standards listed under Part IV.D.7.a of this permit, the storm water pollution prevention plan shall include a complete discussion of measures taken to conform with the following applicable guidelines, other effective storm water pollution prevention procedures, and applicable State rules, regulations and guidelines:

(1) Liquid storage areas where storm water comes into contact with any equipment, tank, container, or other vessel used for Section 313 water priority chemicals.

(a) No tank or container shall be used for the storage of a Section 313 water priority chemical unless its material and construction are compatible with the material stored and conditions of storage such as pressure and temperature, etc.

(b) Liquid storage areas for Section 313 water priority chemicals shall be operated to minimize discharges of Section 313 chemicals. Appropriate measures to minimize discharges of Section 313 chemicals may include secondary containment provided for at least the entire contents of the largest single tank plus sufficient freeboard to allow for precipitation, a strong spill contingency and integrity testing plan, and/or other equivalent measures.

D. (continued)

(2) Material storage areas for Section 313 water priority chemicals other than liquids. Material storage areas for Section 313 water priority chemicals other than liquids which are subject to runoff, leaching, or wind blowing shall incorporate drainage or other control features which will minimize the discharge of Section 313 water priority chemicals by reducing storm water contact with Section 313 water priority chemicals.

(3) Truck and rail car loading and unloading areas for liquid Section 313 water priority chemicals. Truck and rail car loading and unloading areas for liquid Section 313 water priority chemicals shall be operated to minimize discharges of Section 313 water priority chemicals. Appropriate measures to minimize discharges of Section 313 chemicals may include: the placement and maintenance of drip pans where spillage may occur (such as hose connections, hose reels and filler nozzles) for use when making and breaking hose connections; a strong spill contingency and integrity testing plan; and/or other equivalent measures.

(4) In facility areas where Section 313 water priority chemicals are transferred, processed or otherwise handled. Processing equipment and materials handling equipment shall be operated so as to minimize discharges of Section 313 water priority chemicals. Materials used in piping and equipment shall be compatible with the substances handled. Drainage from process and materials handling areas shall be designed as described in paragraphs (a), (b) and (c) of this section. Additional protection such as covers or guards to prevent wind blowing, spraying or releases from pressure relief vents from causing a discharge of Section 313 water priority chemicals to the drainage system, and overhangs or door skirts to enclose trailer ends at truck loading/unloading docks shall be provided as appropriate. Visual inspections or leak tests shall be provided for overhead piping conveying Section 313 water priority chemicals without secondary containment.

(5) Discharges from areas covered by paragraphs (1), (2), (3) or (4).

(a) Drainage from areas covered by paragraphs (1), (2), (3) or (4) of this part should be restrained by valves or other positive means to prevent the discharge of a spill or other excessive leakage of Section 313 water priority chemicals. Where containment units are employed, such units may be emptied by pumps or ejectors; however, these shall be manually activated.

(b) Flapper-type drain valves shall not be used to drain containment areas. Valves used for the drainage of containment areas should, as far as is practical, be of manual, open-and-closed design.

(c) If facility drainage is not engineered as above, the final discharge of all in-facility storm sewers shall be equipped to be equivalent with a diversion system that could, in the event of an uncontrolled spill of Section 313 water priority chemicals, return the spilled material to the facility.

(d) Records shall be kept of the frequency and estimated volume (in gallons) of discharges from containment areas.

(6) Facility site runoff other than from areas covered by (1), (2), (3) or (4). Other areas of the facility (those not addressed in paragraphs (1), (2), (3) or (4)), from which runoff which may contain Section 313 water priority chemicals or spills of Section 313 water priority chemicals could cause a discharge shall incorporate the necessary drainage or other control features to prevent discharge of spilled or improperly disposed material and ensure the mitigation of pollutants in runoff or leachate.

D. (continued)

(7) Preventive maintenance and housekeeping. All areas of the facility shall be inspected at specific intervals for leaks or conditions that could lead to discharges of Section 313 water priority chemicals or direct contact of storm water with raw materials, intermediate materials, waste materials or products. In particular, facility piping, pumps, storage tanks and bins, pressure vessels, process and material handling equipment, and material bulk storage area shall be examined for any conditions or failures which could cause a discharge. Inspection shall include examination for leaks, wind blowing, corrosion, support or foundation failure, or other forms of deterioration or non-containment. Inspection intervals shall be specified in the plan and shall be based on design and operational experience. Different areas may require different inspection intervals. Where a leak or other condition is discovered which may result in significant releases of Section 313 water priority chemicals to the drainage system, corrective action shall be immediately taken or the unit or process shut down until corrective action can be taken. When a leak or non-containment of a Section 313 water priority chemical has occurred, contaminated soil, debris, or other material must be promptly removed and disposed in accordance with Federal, State, and local requirements and as described in the plan.

(8) Facility security. Facilities shall have the necessary security systems to prevent accidental or intentional entry which could cause a discharge. Security systems described in the plan shall address fencing, lighting, vehicular traffic control, and securing of equipment and buildings.

(9) Training. Facility employees and contractor personnel using the facility shall be trained in and informed of preventive measures at the facility. Employee training shall be conducted at intervals specified in the plan, but not less than once per year, in matters of pollution control laws and regulations, and in the storm water pollution prevention plan and the particular features of the facility and its operation which are designed to minimize discharges of Section 313 water priority chemicals. The plan shall designate a person who is accountable for spill prevention at the facility and who will set up the necessary spill emergency procedures and reporting requirements so that spills and emergency releases of Section 313 water priority chemicals can be isolated and contained before a discharge of a Section 313 water priority chemical can occur. Contractor or temporary personnel shall be informed of facility operation and design features in order to prevent discharges or spills from occurring.

8. Additional Requirements for Salt Storage. Storage piles of salt used for deicing or other commercial or industrial purposes and which generate a storm water discharge associated with industrial activity which is discharged to surface waters of the State shall be enclosed or covered to prevent exposure to precipitation, except for exposure resulting from adding or removing materials from the pile within two years of the effective date of this permit. Piles do not need to be enclosed or covered where storm water from the pile is not discharged to surface waters of the State.

Part V. NUMERIC EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

A. Coal Pile Runoff Effluent Limitations. Any discharge of coal pile runoff is authorized to discharge as of the effective date of this permit and shall comply with the following effluent limitations as expeditiously as practicable, but no later than three years after the effective date of this permit. Coal pile runoff shall not be diluted with storm water or other flow in order to meet these limitations.

Units	Parameter	Daily Minimum	Daily Maximum
mg/l	Total Suspended Solids	-	50
S.U.	pH	6.0	9.0

Any untreated overflow from facilities designed, constructed and operated to treat the volume of coal pile runoff which is associated with 10 year, 24-hour rainfall event shall not be subject to the limitation for Total Suspended Solids. It is the permittee's responsibility to demonstrate to the Ohio EPA that a 10-year, 24-hour rainfall event has occurred and the volume of the overflow to which the Total Suspended Solids effluent limitation does not apply.

B. Monitoring Requirements. Only the activities described in the following matrix and associated definitions are required to conduct monitoring. The monitoring required in the following matrix shall be conducted annually. Monitoring shall be initiated within twelve months of the effective date of this permit and henceforth on an annual basis, weather conditions permitting. A permittee may, in lieu of annual monitoring, certify that industrial materials are not exposed to storm water; such certification shall be submitted to the Ohio EPA upon request of the Director.

1. MONITORING REQUIREMENTS MATRIX

Reporting Units	Parameter	INDUSTRIAL ACTIVITY CATEGORIES											
		a	b[1,2]	c	d	e	f	g	h	i[2]	j	k	l[1]
mg/l	Oil and Grease		X	X	X	X	X	X	X	X	X	X	X
mg/l	5-day Biochemical Oxygen Demand		X							X		X	
mg/l	Chemical Oxygen Demand		X	X	X	X	X		X	X			X
mg/l	Total Suspended Solids		X		X	X	X	X	X	X	X	X	X
mg/l	Total Kjeldahl Nitrogen			X								X	
mg/l	Phosphorus											X	
S.U.	pH		X	X	X	X	X	X	X	X	X	X	X
TU$_a$	Acute Toxicity												
Hours	Duration of Storm Event		X	X	X	X	X	X	X	X	X	X	X
Inches	Precipitation		X	X	X	X	X	X	X	X	X	X	X
Hours	Duration Between Storm Events*		X	X	X	X	X	X	X	X	X	X	X
Gallons	Volume (est)		X	X	X	X	X	X	X	X	X	X	X
mg/l	Nitrate-Nitrogen												
mg/l	Nitrite-Nitrogen												
ug/l	Lead, Total		X	X					X				
ug/l	Cadmium, Total		X[3]	X									
ug/l	Copper, Total		X[3]				X	X	X		X		
ug/l	Arsenic, Total		X[3]	X			X						
ug/l	Chromium, Total		X[3]	X			X						
mg/l	Ammonia												
ug/l	Magnesium, Total			X									

Part V. NUMERIC EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

B. (continued)

Reporting Units	Parameter	INDUSTRIAL ACTIVITY CATEGORIES											
		a	b[1,2]	c	d	e	f	g	h	i[2]	j	k	l[1]
ug/l	Magnesium, Dissolved			X									
mg/l	Total Dissolved Solids			X									
mg/l	Total Organic Carbon			X									
ug/l	Barium, Total			X									
mg/l	Cyanide, Total			X									
ug/l	Mercury, Total			X									
ug/l	Selenium, Total			X									
ug/l	Silver, Total			X									
ug/l	Pentachlorophenol				X								
ug/l	Nickel, Total							X			X		
ug/l	Zinc, Total							X			X		
#/100ml	Fecal Coliform											X	

* Time between the storm event when sampling is being conducted and the last storm event producing rainfall greater than 0.1 inches.
(1) and any pollutant limited in an effluent guideline or categorical pretreatment standard which the facility is subject.
(2) and the primary ingredient used in the deicing materials used at the site (e.g., ethylene glycol, urea, etc.).
(3) Facilities that are classified as SIC 33 only because they manufacture pure silicon and/or semiconductor grade silicon are not required to monitor for this parameter.

2. Industrial Activity Categories Definitions

a. Section 313 of SARA Title III Facilities. As of the effective date of this permit, facilities with storm water discharges associated with industrial activity that are subject to requirements to report releases into the environment under Section 313 of SARA Title III for chemicals which are classified as 'Section 313 water priority chemicals' are not (as they may have been in a previous permit) required to monitor storm water that is discharged from the facility unless required by paragraphs V.B.2.b through B.2.l.

b. Primary Metal Industries. Facilities with storm water discharges associated with industrial activity classified as Standard Industrial Classification (SIC) 33 (Primary Metal Industry) are required to monitor such storm water that is discharged from the facility.

c. Land Disposal Units/Incinerators/BIFs. Facilities with storm water discharges associated with industrial activity from any active or inactive landfill, land application sites or open dump without a stabilized final cover that has received any industrial wastes from a facility with a Standard Industrial Classification (SIC) of between 20-39 (manufacturing); and incinerators (including Boilers and Industrial Furnaces (BIFs)) that burn hazardous waste and operate under interim status or a permit under Subtitle C of RCRA, are required to monitor such storm water that is discharged from the facility.

d. Wood Treatment Using Chlorophenolic Formulations. Facilities with storm water discharges associated with industrial activity from areas that are used for wood treatment, wood surface application or storage of treated or surface protected wood at any wood preserving or wood surface facilities are required to monitor such storm water that is discharged from the facility.

e. Wood Treatment Using Creosote Formulations. Facilities with storm water discharges associated with industrial activity from areas that are used for wood treatment, wood surface application or storage of treated or surface protected wood at any wood preserving or wood surface facilities are required to monitor such storm water that is discharged from the facility.

B. (continued)

f. Wood Treatment Using Chromium-Arsenic Formulations. Facilities with storm water discharges associated with industrial activity from areas that are used for wood treatment, wood surface application or storage of treated or surface protected wood at any wood preserving or wood surface facilities are required to monitor such storm water that is discharged from the facility.

g. Coal Pile Runoff. Facilities with storm water discharges associated with industrial activity from coal pile runoff are required to monitor such storm water that is discharged from the facility.

h. Battery Reclaimers. Facilities with storm water discharges associated with industrial activity from areas used for storage of lead acid batteries, reclamation products, or waste products, and areas used for lead acid battery reclamation (including material handling activities) at facilities that reclaim lead acid batteries are required to monitor such storm water that is discharged from the facility.

i. Airports. At airports with over 50,000 flight operations per year, facilities with storm water discharges associated with industrial activity from areas where aircraft or airport deicing operations occur (including runways, taxiways, ramps, and dedicated aircraft deicing stations) are required to monitor such storm water that is discharged from the facility.

j. Coal-fired Steam Electric Facilities. Facilities with storm water discharges associated with industrial activity from coal handling sites at coal fired steam electric power generating facilities (other than discharges in whole or in part from coal piles subject to storm water effluent guidelines at 40 CFR 423 - which are not eligible for coverage under this permit) are required to monitor such storm water that is discharged from the facility.

k. Animal Handling / Meat Packing. Facilities with storm water discharges associated with industrial activity from animal handling areas, manure management (or storage) areas, and production waste management (or storage) areas that are exposed to precipitation at meat packing plants, poultry packing plants, and facilities that manufacture animal and marine fats and oils, are required to monitor such storm water that is discharged from the facility.

l. Additional Facilities. Facilities with storm water discharges associated with industrial activity that:

(1) come in contact with storage piles for solid chemicals used as raw materials that are exposed to precipitation at facilities classified as SIC 30 (Rubber and Miscellaneous Plastics Products) or SIC 28 (Chemicals and Allied Products);

(2) are from those areas at automobile junkyards with any of the following: (A) over 250 auto/truck bodies with drivelines (engine, transmission, axles, and wheels), 250 drivelines, or any combination thereof (in whole or in parts) are exposed to storm water; (B) over 500 auto/truck units (bodies with or without drivelines in whole or in parts) are stored exposed to storm water; or (C) over 100 units per year are dismantled and drainage or storage of automotive fluids occurs in areas exposed to storm water;

(3) come into contact with lime storage piles that are exposed to storm water at lime manufacturing facilities;

(4) are from oil handling sites at oil fired steam electric power generating facilities;

(5) are from cement manufacturing facilities and cement kilns (other than discharges in whole or in part from material storage piles subject to storm water effluent guidelines at 40 CFR 411 - which are not eligible for coverage under this permit);

(6) are from ready-mixed concrete facilities; or

(7) are from ship building and repairing facilities;

are required to monitor such storm water discharged from the facility.

B. (continued)

3. Sample Type. Take a minimum of one grab sample from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. The grab sample shall be taken during the first thirty minutes of the discharge. If the collection of a grab sample during the first thirty minutes is impracticable, a grab sample can be taken during the first hour of the discharge, and the discharger shall submit with the monitoring report a description of why a grab sample during the first thirty minutes was impracticable.

4. Sampling Waiver. When a discharger is unable to collect samples due to adverse climatic conditions, the discharger must submit in lieu of sampling data a description of why samples could not be collected, including available documentation of the event. Adverse climatic conditions which may prohibit the collection of samples includes weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc.) or otherwise make the collection of a sample impracticable (drought, extended frozen conditions, etc.).

5. Representative Discharge. When a facility has two or more outfalls that, based on a consideration of features and activities within the area drained by the outfall, the permittee reasonably believes discharge substantially identical effluents, the permittee may test the effluent of one of such outfalls and report that the quantitative data also applies to the substantially identical outfalls. In addition, for each outfall that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area (e.g. low (under 40%), medium (40% to 65%) or high (above 65%)) shall be provided.

C. **Toxicity Testing.** Not Required.

D. **Alternative Certification of "Not Present or No Exposure."** You are not subject to the analytical monitoring requirement of this part provided: you make a certification for a given outfall, or on a pollutant-by-pollutant basis in lieu of monitoring required under this part, that material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, industrial machinery or operations, or significant materials from past industrial activity that are located in areas of the facility within the drainage area of the outfall are not presently exposed to storm water and are not expected to be exposed to storm water for the certification period; and your certification is signed in accordance with Attachment VI.G and retained in the SWP3. If you cannot certify for an entire period, you must note the date exposure was eliminated and perform any monitoring required up until that date.

Part VI. OTHER STORM WATER REQUIREMENTS, DEFINITIONS AND AUTHORIZATION

A. **Failure to Certify.** Any facility that is unable to provide the certification required under paragraph IV.D.3.g.(1) (testing for non-storm water discharges), must notify the Director within 180 days of the effective date of this permit. Such notification shall describe: the procedure of any test conducted for the presence of non-storm water discharges; the results of such test or other relevant observations; potential sources of non-storm water discharges to the storm sewer; and why adequate tests for such storm sewers were not feasible.

B. **Signatory Requirements.** See Part III.28.

C. **Definitions.**

"Section 313 water priority chemical" means a chemical or chemical categories which are: 1) are listed at 40 CFR 372.65 pursuant to Section 313 of Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986, also titled the Emergency Planning and Community Right-to-Know Act of 1986; 2) are present at or above threshold levels at a facility subject to SARA Title III, Section 313 reporting requirements; and 3) that meet at least one of the following criteria: (i) are listed in Appendix D of 40 CFR 122 on either Table II (organic priority pollutants), Table III (certain metals, cyanides, and phenols) or Table V (certain toxic pollutants and hazardous substances); (ii) are listed as a hazardous substance pursuant to section 311(b)(2)(A) of the Act at 40 CFR 116.4; or (iii) are pollutants for which EPA has published acute or chronic water quality criteria.

"Significant materials" includes, but is not limited to: raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under section 101(14) of CERCLA; any chemical the facility is required to report pursuant to Section 313 of Title III of SARA; fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with storm water discharges.

"Significant spills" includes, but is not limited to: releases of oil or hazardous substances in excess of reportable quantities under section 311 of the Clean Water Act (see 40 CFR 110.10 and CFR 117.21) or section 102 of CERCLA (see 40 CFR 302.4).

"Storm Water" means storm water runoff, snow melt runoff, and surface runoff and drainage.

"Definition of Storm Water Associated with Industrial Activity" means the discharge from any conveyance which is used for collecting and conveying storm water and which is directly related to manufacturing, processing or raw materials storage areas at an industrial plant. The term does not include discharges from facilities or activities excluded from the NPDES program. For the categories of industries identified in subparagraphs (i) through (x) of this subsection, the term includes, but is not limited to, storm water discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material handling sites; refuse sites; sites used for the application or disposal of process waste waters (as defined at 40 CFR 401); sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials, and intermediate and finished products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to storm water. For the categories of industries identified in subparagraph (xi), the term includes only storm water discharges from all areas listed in the previous sentence (except access roads) where material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, or industrial machinery are exposed to storm water. For the purposes of this paragraph, material handling activities include the: storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, finished product, by-product or waste product. The term excludes areas located on plant lands separate from the plant's industrial activities, such as office buildings and accompanying parking lots as long as the drainage from the excluded areas is not mixed with storm water drained from the above described areas. Industrial facilities (including industrial facilities that are Federally or municipally owned or operated that meet the description of the facilities listed in this paragraph (i)-(xi)) include those facilities designated under 40 CFR 122.26(a)(1)(v). The following categories of facilities are considered to be engaging in "industrial activity" for purposes of this subsection:

(i) Facilities subject to storm water effluent limitations guidelines, new source performance standards, or toxic pollutant effluent standards under 40 CFR Subchapter N (except facilities with toxic pollutant effluent standards which are exempted under category (xi) of this paragraph);

(ii) Facilities classified as Standard Industrial Classifications 24 (except 2434), 26 (except 265 and 267), 28 (except 283 and 285) 29, 311, 32 (except 323), 33, 3441, 373;

C. (continued)

(iii) Facilities classified as Standard Industrial Classifications 10 through 14 (mineral industry) including active or inactive mining operations (except for areas of coal mining operations meeting the definition of a reclamation area under 40 CFR 434.11(l)) and oil and gas exploration, production, processing, or treatment operations, or transmission facilities that discharge storm water contaminated by contact with or that has come into contact with, any overburden, raw material, intermediate products, finished products, byproducts or waste products located on the site of such operations; inactive mining operations are mining sites that are not being actively mined, but which have an identifiable owner/operator;

(iv) Hazardous waste treatment, storage, or disposal facilities, including those that are operating under interim status or a permit under Subtitle C of RCRA;

(v) Landfills, land application sites, and open dumps that have received any industrial wastes (waste that is received from any of the facilities described under this subsection) including those that are subject to regulation under Subtitle D of RCRA;

(vi) Facilities involved in the recycling of materials, including metal scrapyards, battery reclaimers, salvage yards, and automobile junkyards, including but not limited to those classified as Standard Industrial Classification 5015 and 5093;

(vii) Steam electric power generating facilities, including coal handling sites;

(viii) Transportation facilities classified as Standard Industrial Classifications 40, 41, 42 (except 4221-25), 43, 44, 45, and 5171 which have vehicle maintenance shops, equipment cleaning operations, or airport deicing operations. Only those portions of the facility that are either involved in vehicle maintenance (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations, airport deicing operations, or which are otherwise identified under paragraphs (i)-(vii) or (ix)-(xi) of this subsection are associated with industrial activity;

(ix) Treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated to the disposal of sewage sludge that are located within the confines of the facility, with a design flow of 1.0 mgd or more, or required to have an approved pretreatment program under 40 CFR 403. Not included are farm lands, domestic gardens or lands used for sludge management where sludge is beneficially reused and which are not physically located in the confines of the facility, or areas that are in compliance with 40 CFR 503;

(x) Construction activity - This category of industrial activity is not regulated under this permit.

(xi) Facilities under Standard Industrial Classifications 20, 21, 22, 23, 2434, 25, 265, 267, 27, 283, 285, 30, 31 (except 311), 34 (except 3441), 35, 36, 37 (except 373), 38, 39, 4221-25, (and which are not otherwise included within categories (ii)-(x)).

"SWPPP" means storm water pollution prevention plan to be completed as a condition of this permit (see Part IV of this permit).

"Time-weighted composite" means a composite sample consisting of a mixture of equal volume aliquots collected at a constant time interval.

"Waste pile" means any non-containerized accumulation of solid, non-flowing waste that is used for treatment or storage.

"10-year, 24-hour precipitation event" means the maximum 24-hour precipitation event with a probable reoccurrence interval of once in 10 years. This information is available in "Weather Bureau Technical Paper No. 40,", May 1961 and "NOAA Atlas 2," 1973 for the 11 Western States, and may be obtained from the National Climatic Center of the Environmental Data Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce.

"Bypass" means the intentional diversion of waste streams from any portion of the treatment facility.

"Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

STATUS REPORT

SITE:	Dayton Thermal Products Dayton, Ohio
DATE:	6/24/2002
CURRENT OPERATING LOCATION:	Building 40B

This is a status report for the Dayton Soil Vapor Extraction System for the period 11/07/01 to 6/19/02. The following describes the activities and results for the period:

Remediation System

- The system was reinstalled on 11/06/01, and restarted the following day.
- Downtime for the SVE system has occurred primarily due to low sump levels in the system as a result of the water supply from Building 40B being interrupted. Other downtime came about as a result of low pH caused by a lack of sodium hydroxide, pH-balancing issues caused by an electrical circuit irregularity that allowed the pump to continue supplying the system even while it was shut down, and difficulties in making adjustments for proper recirculation pump pressure.
- In general, standard monitoring has taken place on a weekly basis; operational data are summarized in Table 1.
- SVE influent air and system effluent air were sampled on 11/08/01, 11/13/01 and 12/18/01. Results of these analyses are included in Table 2
- A site visit was made in March 2002 to repair a leak in the system, balance the pH and restore the water in the scrubber sump tank to the proper level after an interruption in water service to the make-up line.
- Catalytic Combustion made a site visit in April to resolve the low recirculation pressure issue and rectify the pH pump wiring problem.
- LBG, Catalytic, and EarthTech made a site visit May 15th in order to familiarize EarthTech with the SVE system and equipment.
- Catalytic Combustion contracted with Freedom Electric to troubleshoot a problem with the Catox Unit; an loose electrical connection was diagnosed and repaired on June 3rd and the system was restarted.
- The system has been functioning normally since June 3rd.
- Estimated mass removed by the SVE system from reinstallation until 6/24/02 is 340 pounds based on an estimated 79 days of extraction at a rate of approx. 4.3 lbs/day for an estimated total mass removed of 2590 pounds. Total mass removed is summarized in Figure 1.
- System has currently been operating for three weeks without incident.

Planned Activities

- Look into other potential sources of make-up water in order to avoid any future possible interruptions that may cause shutdowns.
- Finish installation of plumbing, tightness testing and site preparation at Building 50 in advance of relocating the Building 40B system equipment to the new site.
- Collect air samples to determine extraction rates and update system efficiency.

TABLE 1

DAYTON THERMAL PRODUCTS
DAYTON, OHIO

OPERATION HISTORY SINCE REINSTALL

DATE	APPROXIMATE TIME	SYSTEM STATUS	COMMENTS	SENSAPHONE FAX RECEIVED? (OFF ONLY)
11/7/2001	10:00 AM	OFF	System Installation Starts	N
	1:00 PM	OFF	Catox Unit Placed	N
	3:45 PM	OFF	Scrubber Unloaded	N
11/8/2001	3:00 PM	OFF	Plumbing Completed	N
	3:45 PM	OFF	Preheat Started	N
	9:15 PM	ON	System Started	N
11/9/2001	11:00 AM	ON	Summa Samples Collected	
11/13/2001	10:00 AM	ON	Summa Samples Collected	
12/2/2001	8:00 AM	OFF	Low pH	N
12/12/2001	9:00 AM	ON	System Restarted	N
12/18/2001	10:00 AM	ON	Summa Samples Collected	
12/26/2001	1:00 PM	ON	Chart Recorder Difficulties	N
12/31/2001	8:00 AM	OFF	Low Sump Level	N
1/17/2002	10:00 AM	ON	System Restarted, Leak in System Repaired, Phone Line to Sensaphone Repaired (still unable to dial out long distance)	N
1/24/2002	6:00 AM	OFF	Low Recirc. Pressure	N
2/21/2002	10:00 AM	OFF	Installed New Recirc. Pressure Switch- Still Non-Functional.	N
3/19/2002	3:00 PM	OFF	Site Visit by Steve Pitsch from CCC to Inspect and Repair System.	N
3/20/2002	9:00 AM	ON	System Restarted	N
3/24/2002	11:30 PM	OFF	Low Sump Level	N
3/27/2002	9:30 AM	ON	System Restarted- New NaOH Placed in Containment	N
3/29/2002	12:00 PM	OFF	Low Sump Level	N
4/4/2002	10:00 AM	ON	System Restarted	N
4/15/2002	12:00 PM	OFF	Low Sump Level	N
4/23/2002	3:00 PM	ON	System Restarted	N
4/27/2002	4:00 AM	OFF	Low Sump Level	N
5/2/2002	3:30 PM	ON	System Restarted	N
5/3/2002	5:00 AM	OFF	Low Sump Level	N
5/7/2002	10:00 AM	ON	System Restarted	N
5/8/2002	1:00 AM	OFF	Low Sump Level	N
5/14/2002	3:30 PM	ON	System Restarted	N
5/14/2002	10:00 PM	OFF	Catox Unit Failure	N
6/3/2002	8:00 AM	ON	Freedom Electric Finds and Repairs Loose Wire. System Restarted	N
6/24/2002	3:00 PM	ON	System Running	

TABLE 2

DAIMLERCHRYSLER CORPORATION
DAYTON THERMAL PRODUCTS PLANT
DAYTON, OHIO

MASS RECOVERED SINCE SYSTEM START-UP

Sample Location	Date	Average Flow Rate (cfm)	Days Of System Operation**	VINYL CHLORIDE Conc. (ug/L)	VINYL CHLORIDE Pounds Recovered	1,1-DICHLOROETHENE Conc. (ug/L)	1,1-DICHLOROETHENE Pounds Recovered	FREON 113 Conc. (ug/L)	FREON 113 Pounds Recovered	1,1-DICHLOROETHANE Conc. (ug/L)	1,1-DICHLOROETHANE Pounds Recovered	cis-1,2-DICHLOROETHENE Conc. (ug/L)	cis-1,2-DICHLOROETHENE Pounds Recovered	1,1,1-TRICHLOROETHANE Conc. (ug/L)	1,1,1-TRICHLOROETHANE Pounds Recovered	TRI-CHLOROETHENE Conc. (ug/L)	TRI-CHLOROETHENE Pounds Recovered	TETRA-CHLOROETHENE Conc. (ug/L)	TETRA-CHLOROETHENE Pounds Recovered	TOTAL VOCS Conc. (ug/L)	TOTAL VOCS Bdday	TOTAL VOCS Pounds Recovered
SVE EFF	15-Aug-98	506	18	ND		ND		ND		119.00	13.83	38.00	27.85	23.00	16.74	160.00	116.43	180.00	130.96	429.00	19.19	305.53
SVE EFF	9-Sep-98	506	28	ND		ND		ND		8.00	8.91	32.00	37.84	24.00	28.38	360.00	425.60	400.00	472.99	821.00	37.34	978.81
SVE EFF	10-Nov-98	564	31	ND		ND		ND		11.00	1.87	8.00	4.73	6.50	10.22	30.00	61.32	146.00	72.33	96.50	4.84	150.19
SVE EFF	3-Feb-99	437	31	ND		ND		ND		10.00	12.18	21.00	25.57	9.60	11.69	78.00	94.97	92.00	112.02	210.60	8.27	256.43
SVE EFF	10-Mar-99	437	21	NT		NT		NT		ND		4.50	3.71	9.10	7.51	65.00	53.61	74.00	61.04	152.60	5.99	125.87
SVE EFF	5-Apr-99	515	3	NT		NT		NT		ND		3.70	0.51	6.60	0.92	43.00	5.97	49.00	6.80	102.30	4.74	14.21
SVE EFF	13-May-99	506	38	NT		NT		NT		ND		1.60	2.77	2.80	4.84	25.00	43.21	25.00	43.21	54.40	2.47	94.02
SVE EFF	15-Oct-99	567	39	NT		NT		NT		1.60	3.18	2.80	5.57	5.80	11.53	26.00	51.68	24.00	47.70	60.20	3.07	119.65
CATOX EFF	15-Oct-99	567	39	NT		NT		NT		ND		ND		ND		1.10	2.19	3.80	7.55	4.90	0.25	9.74
%EFFICIENCY										100.00		100.00		100.00		95.77		84.17		91.86		
SVE EFF	15-Dec-99	527	16	4.00	3.03	3.00	2.27	44.00	33.35	4.00	3.03	19.40	14.70	25.00	18.95	82.00	62.15	75.60	57.30	257.00	12.17	194.77
CATOX EFF	15-Dec-99	527	16	ND		ND		22.00	16.67	ND		0.70	0.53	0.80	0.61	3.10	2.35	17.50	13.26	44.10	2.09	33.42
%EFFICIENCY				100.00		100.00		50.00		100.00		96.39		96.80		96.22		76.85		82.84		
SVE EFF	13-Jan-00	567	1	5.00	0.25	2.00	0.10	30.00	1.53	4.00	0.20	13.90	0.71	13.90	0.71	37.20	1.90	33.90	1.73	139.90	7.13	7.13
CATOX EFF	13-Jan-00	567	1	ND		ND		15.00	0.76	ND		0.80	0.04	ND		2.70	0.14	9.30	0.47	27.80	1.42	1.42
%EFFICIENCY				100.00		100.00		50.00		100.00		94.24		100.00		92.74		72.57		80.13		
SVE EFF	8-Nov-01	430	1	1.61	0.06	0.44	0.02	17.15	0.86	2.26	0.09	26.51	1.02	7.77	0.30	31.70	1.23	35.62	1.38	123.06	4.76	4.76
SCRUB. EFF	8-Nov-01	430	1	ND		ND		0.19	0.01	0.00		0.05	0.00	0.01		0.01	0.00	0.34	0.01	0.50	0.02	0.02
%EFFICIENCY				100.00		100.00		98.89		100.00		99.81		99.87		99.97		99.05		99.52		
SVE EFF	13-Nov-01	430	5	0.04	0.01	0.60	0.12	6.70	1.29	1.65	0.32	11.04	2.13	12.76	2.47	38.26	7.39	52.38	10.12	123.43	4.77	23.85
SCRUB. EFF	13-Nov-01	430	5	ND		ND		0.22	0.04	0.00		0.00	0.00	0.00		0.01	0.00	0.02	0.00	0.25	0.01	0.05
%EFFICIENCY				100.00		100.00		96.72		100.00		100.00		100.00		99.97		99.96		99.80		
SVE EFF	18-Dec-01	430	23	ND		0.35	0.31	1.95	1.73	1.03	0.92	4.86	4.32	13.87	12.33	45.91	40.81	53.08	47.18	121.05	4.68	107.80
SCRUB. EFF	18-Dec-01	430	23	ND		ND		0.12	0.11	ND		ND		ND		0.01	0.01	0.02	0.02	0.15	0.01	0.13
%EFFICIENCY						100.00		93.85		100.00		100.00		100.00		99.98		99.96		99.88		
SINCE LAST SAMPLE		430	50																			
TOTAL			330		3.36		2.82		38.57		99.32		134.22		138.57		998.35		1084.77			2374.88

Notes:

Granular Activated Carbon, Effluent ND

No Emission Control

After System Reinstall (11/07/01)

cfm: Cubic feet per minute

ug/L: Micrograms per liter

VOCs: Volatile organic compounds

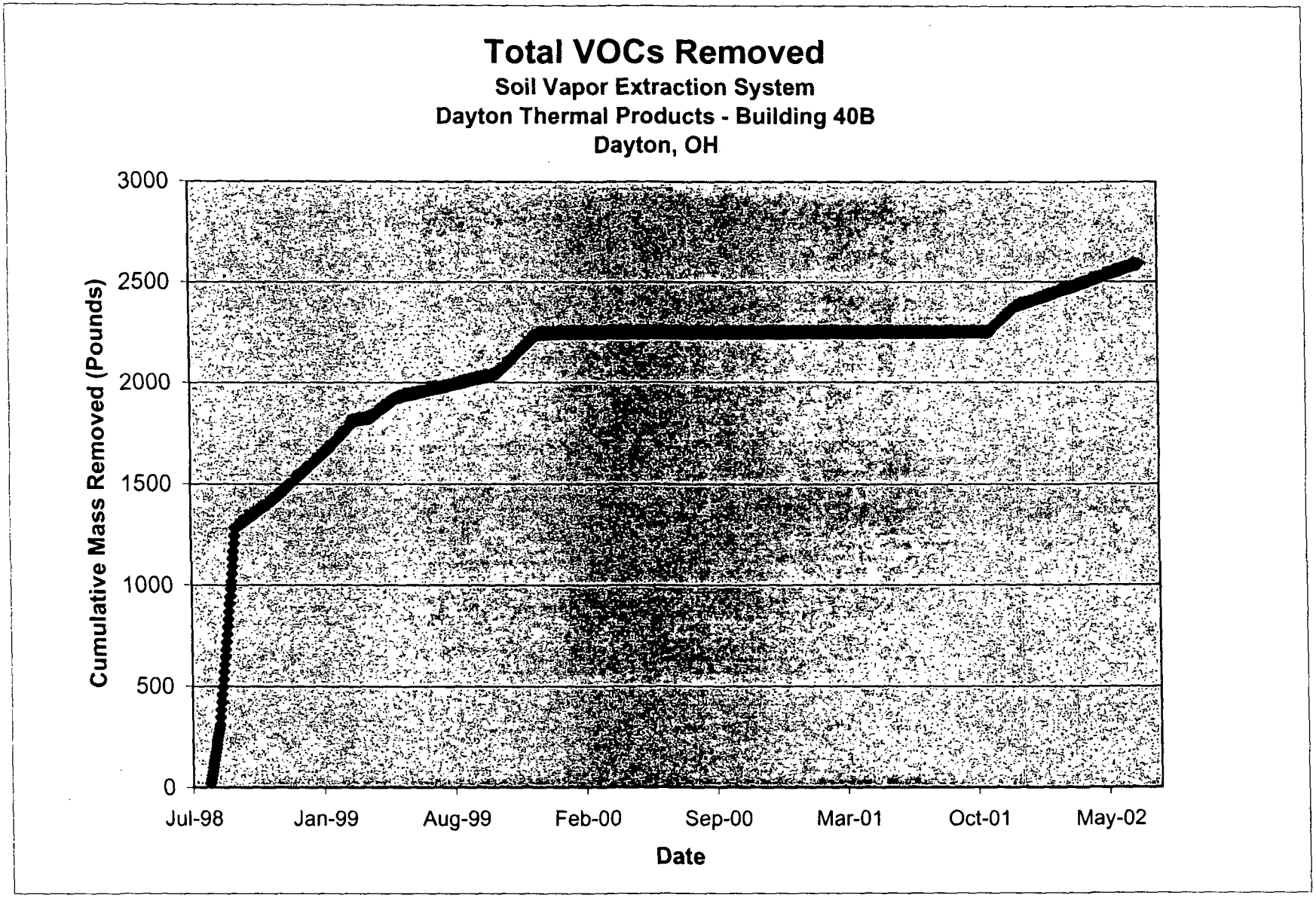
conc: Concentration

ND: Non Detect

NT: Not Tested

**Accounts for Downtime

Figure 1



Cumulaitve Removed Chart 1

SAMPLE CALCULATION

Problem: Calculate mass removed for Dayton SVE system.

Influent

Flow Rate = 430 scfm
Hours in Period = 1200
Estimated total VOC concentration = 122 ug/l

Mass Removal Equation:

$$\frac{flow\_rate * hours\_of\_operation * average\_concentration * 60(\text{min}/hour) * 28.32(l/ft\text{^}3)}{1x10\text{^}9(ug/kg) * 0.4536(kg/lb)}$$

$$\frac{430scfm * 1200h * 122ug/l * 60 * 28.32}{1x10\text{^}9 * 0.4536} = 234.6lbs$$

QSOURCE

JULY 1993 REVISION OF THE

SITE ASSESSMENT REPORT

OF

GEM CITY CHEMICALS, INC.

DAYTON, OHIO

DERR FILE

EPA Region 5 Records Ctr.
350067

RECEIVED
OHIO EPA
JUL 29 1993
SOUTHWEST DISTRICT

JULY 1993 REVISION OF THE

SITE ASSESSMENT REPORT

OF

GEM CITY CHEMICALS, INC.

DAYTON, OHIO

Prepared for:

Gem City Chemicals, Inc.
1287 Air City Drive
P. O. Box 251
Dayton, Ohio, 45404

Prepared by:

QSOURCE ENVIRONMENTAL SERVICES, INC.
2490 Technical Drive
P. O. Box 3004
Miamisburg, Ohio 45343-3004

Prepared by:

J. Michael Clinch, Ph.D.
Environmental Geologist

Reviewed by:

Michael D. Morris
Project Manager

Reviewed by:

Alison Hudson
QA/QC Officer

Approved by:

David Stewart
President, Gem City Chemicals, Inc.

July 28, 1993

I93004

TABLE OF CONTENTS

SECTION		PAGE
1.0	FACILITY BACKGROUND	1
1.1	Site Location and Description	1
1.2	Site History	4
1.2.1	Chemical Handling Areas	5
1.2.2	Chemicals Handled	6
1.2.3	Underground Storage Tanks	7
1.2.4	Investigation and Remediation Efforts	7
1.2.4.1	Soil Sampling	9
1.2.4.2	Soil Gas Survey	9
1.2.4.3	Ground-Water Monitoring	12
1.2.4.4	Ground-Water Recovery and Treatment System	12
1.2.4.5	Soil Vapor Extraction System	22
1.2.4.6	Hard-Surfacing Program	22
1.2.4.7	Additional Investigations for the Revised SAR	22
2.0	HYDROGEOLOGIC CONDITIONS	24
2.1	Description of Regional Hydrogeology	24
2.1.1	Estimated Depth to Bedrock and Lithology	24
2.1.2	Regional Geomorphology	25
2.1.3	Regional Structural Features	27
2.1.4	Regional Stratigraphic Units	27
2.1.5	Well Yields	27
2.1.6	References	28
2.2	Site Stratigraphy	28
2.3	Hydraulic Connections	32
2.4	Ground-Water Velocity and Horizontal and Vertical Flow Directions	33
2.5	Evaluation of Factors Affecting Ground-Water Movement	36

TABLE OF CONTENTS (cont'd)

SECTION		PAGE
3.0	EFFECTIVENESS OF THE GROUND-WATER MONITORING SYSTEM	39
	3.1 Number of Wells	39
	3.2 Well and Piezometer Locations	39
	3.3 Well and Piezometer Construction	39
	3.4 Potentiometric Maps	39
	3.5 Effectiveness of the Ground-Water Recovery System	42
	3.6 Ground Water Chemical Monitoring Effectiveness	42
4.0	EFFECTIVENESS OF THE GROUND WATER TREATMENT SYSTEM	54
	4.1 Methods Used to Determine the Effectiveness of the Treatment System	54
	4.2 Location and Depth of the Recovery Well	54
	4.3 Aquifer Parameters	54
	4.4 Area of Capture	55
	4.5 Prevention of Off-Site Migration	55
	4.6 Air Stripper Design and Installation	55
	4.7 Design and Construction of the Recovery System	56
	4.8 Efficiency of the Air Stripper	56
	4.9 Effectiveness in Removal of VOCs from the Ground Water	58
5.0	EFFECTIVENESS OF THE VAPOR EXTRACTION SYSTEM	59
	5.1 Design and Installation	59
	5.2 Emissions Testing	59
	5.3 Removal Efficiency	59
	5.4 Effectiveness	61
6.0	SUMMARY	63
	6.1 Summary of Remediation Activities to Date	63
	6.2 Recommended Additional Remediation Activities	64
	6.3 Conclusions	66

EXHIBITS
(bound separately)

✓	EXHIBIT A	TANK REMOVAL DOCUMENTATION
Not Copied	EXHIBIT B	PERMITS TO INSTALL
Not Copied	EXHIBIT C	TABULATED WATER LEVELS
✓	EXHIBIT D	QUARTERLY POTENTIOMETRIC SURFACE MAPS
partial	EXHIBIT E	REGIONAL WELL LOGS
✓	EXHIBIT F	ON-SITE TEST BORING LOGS
✓	EXHIBIT G	AS-BUILT DIAGRAMS
✓	EXHIBIT H	AQUIFER TEST DATA
Not Copied	EXHIBIT I	OPERATIONS DATA
✓	EXHIBIT J	VOC REMOVAL CALCULATIONS
Not Copied	EXHIBIT K	NACD RESPONSIBLE DISTRIBUTION PROCESS GUIDING PRINCIPLES AND IMPLEMENTATION GUIDE
Not Copied	EXHIBIT L	STANDARD OPERATING PROCEDURES AND VARIATIONS FROM PROTOCOL
✓	EXHIBIT M	TEST BORING LOGS, AS-BUILT DIAGRAMS AND POTENTIOMETRIC DATA
Not Copied	EXHIBIT N	SAMPLING LOGS, CHAIN-OF-CUSTODY FORMS AND LABORATORY RESULTS

JULY 1993 REVISION OF THE

SITE ASSESSMENT REPORT

OF

GEM CITY CHEMICALS, INC.

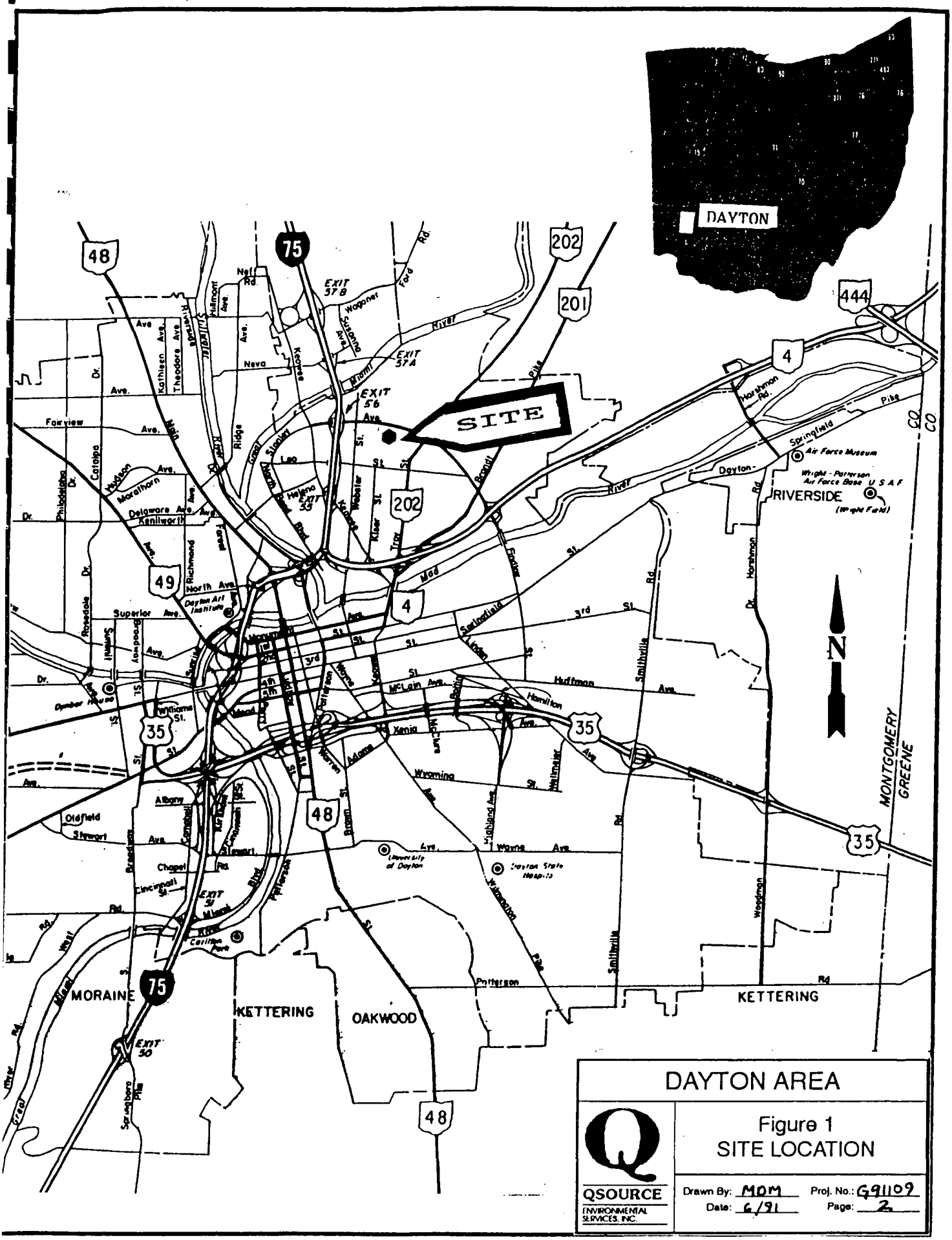
1.0 FACILITY BACKGROUND

Gem City Chemicals, Inc. is a chemical distribution, blending and repackaging facility which is located in Dayton, Ohio. The company has been operating from this facility, located in a heavily-industrialized section of Dayton, for over twenty years. On July 6, 1992, Gem City Chemicals, Inc. entered into a consensual order with the Ohio Environmental Protection Agency (OEPA) to investigate the effectiveness of its existing ground-water monitoring program and ground-water recovery and treatment system. A Site Assessment Report (SAR) was submitted pursuant to that order on August 5, 1992. Following review of the SAR by OEPA, Gem City Chemicals was required to provide additional information needed by OEPA to assess the current system. The proposal per Administrative Order on Consent and reply to OEPA Comments was submitted to OEPA on November 20, 1992. Following a technical meeting with OEPA, a Revised SAR Proposal per the Administrative Order on Consent was submitted on December 18, 1992 and was approved by OEPA on December 25, 1993. The first revision of the Site Assessment Report including the required information and describing additional investigations that were undertaken to obtain that data was submitted to OEPA on March 1, 1993. Gem City Chemicals, Inc. received written comments to the Revised Site Assessment Report on June 22, 1993. In these comments, OEPA requested additions, clarifications and revisions of several technical issues. This revised Site Assessment Report incorporates those changes.

1.1 Site Location and Description

The Gem City Chemicals, Inc. facility is located at 1287 Air City Avenue, at Stanley Avenue, which is within the City of Dayton, Montgomery County, Ohio. This location corresponds to approximately 39°47'13" north latitude and 84°10'28" west longitude. The downtown Dayton area is approximately 2 miles to the south. The general site location is shown in Figure 1.

The site has several large buildings, sheds, outside drum storage areas and aboveground storage tanks on approximately 3 acres of a 7 acre parcel. The ground between the buildings is gravel covered and partly paved. Approximately 50% of all chemical storage and handling areas are hard-surfaced. The locations of the property lines, buildings and streets are shown in Figure 2, along with the current usage of the work areas and buildings. The area formerly and presently used for the handling and storage of chemicals is also delineated in Figure 2.


DAYTON
SITE
MORAINE
KETTERING
OAKWOOD
KETTERING
RIVERSIDE
MONTGOMERY
GREENE
N
DAYTON AREA
Figure 1
SITE LOCATION
QSOURCE
ENVIRONMENTAL SERVICES, INC.
Drawn By: MDM
Proj. No.: G91109
Date: 6/91
Page: 2

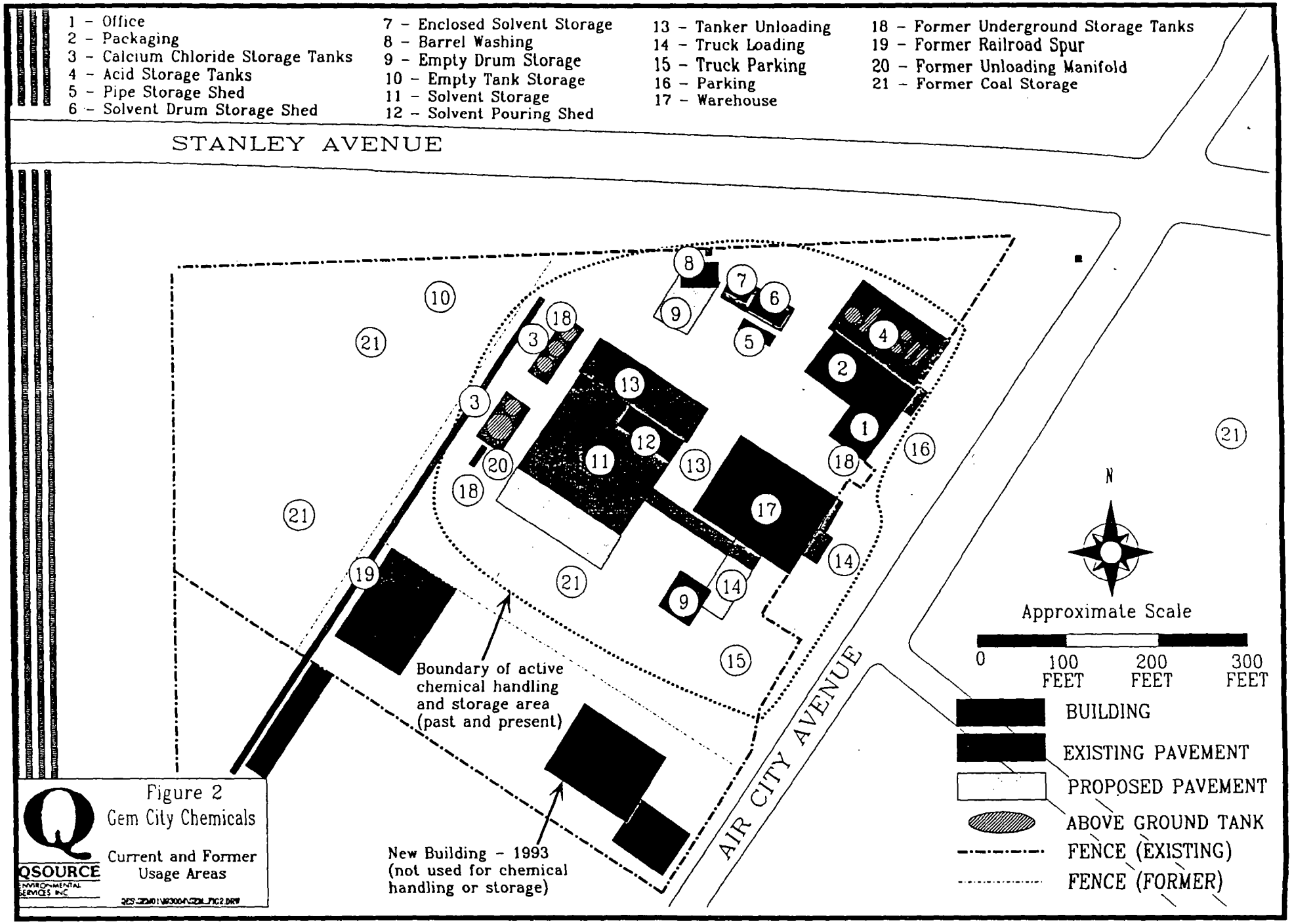


Figure 2
Gem City Chemicals
Current and Former Usage Areas

The surface elevation of the site is 750±5 feet above mean sea level (MSL) according to the USGS 7½ minute series, Dayton North Quadrangle, topographic map. The site is located within a closed depression; any surface drainage from the site is captured at either a catch basin located near the middle of the northern property line or a catch basin near the intersection of Stanley Avenue and Air City Avenue. The site is between the Great Miami River and the Mad River and directly overlies the Miami Valley Aquifer which has been designated as a Sole Source Aquifer. It is approximately 1 mile south of the City of Dayton's Miami Well Field and is at the southern edge of the cone of depression in the water table caused by the pumping at those wells. The City's Mad River Well Field is approximately 2 miles to the east and does not receive recharge from Gem City Chemicals, Inc. In addition to the municipal water wells, there are a number of private industrial wells in the area.

The area is mostly industrial with some commercial and residential areas to the south and east. The industrial neighbors range from small to quite large; many of the industries are engaged in significant usage and storage of chemicals. The area south of the Miami well field has a long history of industrial use and also of ground-water quality problems. OEPA is currently requiring investigations and/or remediation of a number of sites in and near the well fields and in the vicinity of Gem City Chemicals, Inc. One such site is a bulk oil storage terminal area, located approximately one half mile northeast of Gem City Chemicals, Inc. Other sites being investigated include industrial facilities where chlorinated solvents may have been released into the ground water. In August of 1988, the City of Dayton adopted a Well Field Protection Program to protect it's well fields and drinking water supplies from future contamination. The southern limit of the Miami Well Field Protection Overlay District is Stanley Avenue which is the northern boundary of Gem City Chemicals, Inc. Therefore, Gem City Chemicals, Inc. is located outside of the Wellfield Protection Overlay District.

1.2 Site History

Prior to 1969, Air City Fuels occupied the property now owned by Gem City Chemicals, Inc. and used the entire property for the storage of coal and fuel oil. A railroad siding extended into the property, as shown in Figure 2. Coal was unloaded from railroad cars and stored in piles on either side of the railroad siding. The coal was transported from the property by trucks, which exited the property via Air City Avenue. Underground storage tanks containing both leaded and unleaded gasoline were located southeast of the office building. These tanks were later removed by Gem City Chemicals Inc. Gem City Chemicals, Inc. has operated at the site since 1969. The railroad siding was taken out of service in 1982 and removed from the site in 1989. The property was originally leased from CSX Real Estate. Following abandonment of the railroad spur, Gem City Chemicals, Inc. returned control of much of the property to CSX Real Estate. Two fences were constructed, one along the line of the former railroad siding, and a second separating the actively-used portion of the property from the southern corner of the property. All operations occurred within the limits of these fences. The fences were removed after Gem City Chemicals, Inc. purchased the property in September 1989. Since that time, Gem City Chemicals has restricted the storage and handling of chemicals to this approximately three acres.

The operations of Gem City Chemicals, Inc. involve distribution of industrial chemicals. This primarily entails the purchase of a variety of chemical products in truck load quantities and

resale of these products to industrial accounts in less than truck load amounts. Many of the liquid chemical products are repackaged for resale into tote tanks, drums, and smaller containers to meet customer requirements. A small portion of the present operations includes preparation of blended products. Gem City Chemicals, Inc. is not considered a manufacturer and operates under Standard Industrial Classification (SIC) Code 5161 - Chemicals and Allied Products.

1.2.1 Chemical Handling Areas

During the entire time that the property has been operated by Gem City Chemicals, Inc. all chemical handling and chemical storage has taken place within the boundary shown in Figure 2. Areas to the south and west have been used for the storage of empty containers, drums and pallets. Bulk chemicals were delivered to the facility initially by both trains and trucks and were stored in the area between the railroad siding and the warehouse and packaging buildings, due to the proximity of these areas to sites where the chemicals were repackaged, blended and prepared for shipment. Clean, reconditioned drums were stored to the south of the warehouse building, again for convenience in handling.

Chemicals delivered by rail included drums of dry and liquid chemicals, which were unloaded by forklift, and bulk liquids, which were transferred into above-ground storage tanks (for liquid calcium chloride) or underground storage tanks (for flammable solvents). These tanks were located adjacent to the tracks.

Chemicals delivered by truck have included drums of dry and liquid chemicals, which have been unloaded by forklift, and bulk liquids, which have been unloaded directly into the bulk holding tanks. Bulk liquid calcium chloride unloading has occurred at the above-ground storage tanks located to the northwest of the solvent storage pad. Bulk acid unloading has occurred at the above-ground storage tanks located to the northeast of the packaging building. In the past, bulk solvents were unloaded into drums at a station immediately behind the warehouse, adjacent to the solvent storage pad, or into the underground storage tank manifold. Bulk solvents are now unloaded within a paved, diked pad located adjacent to the solvent storage pad. Drummed chemicals are unloaded at the solvent storage pad and the solvent drum storage shed.

All chemical repackaging and blending has historically been conducted at two locations on the site: in and around the pouring shed in the solvent drum storage area and in the packaging building.

All chemical storage has occurred within the area bounded by the acid storage tanks to the northeast, the office and the warehouse buildings on the southeast, the railroad siding on the northwest and the solvent storage pad and warehouse building on the southwest. Prior to 1982, this was done because this area was the most convenient and efficient location for the storage and handling of the chemicals. The more remote portions of the property, to the west of the railroad siding and in the southern corner of the property, were used for the occasional storage of empty drums and for truck parking.

Liquid chemicals are handled in either steel or polyethylene drums and in smaller sized plastic and metal containers. All steel drums, generally used for solvents, are sent off-site for reconditioning prior to reuse. Most of the tote tanks and drums are supplied to the customers on a deposit (returnable) basis. The used polyethylene drums (containing inorganic residues from acids and bases) have historically been washed, prior to reuse, at a drum washing station located near the northern property line. The rinsate is discharged by permit into the City sanitary sewer system, after on-site treatment.

1.2.2 Chemicals Handled

Chemicals handled at the facility include a large amount of acids, followed in volume by solvents, calcium chloride and caustics. Chemicals handled by Gem City Chemicals, Inc. include:

Acids

hydrochloric	sulfuric	nitric	oxalic
phosphoric	chromic	acetic	hydrofluoric

Solvents

butyl acetate	1,1,1-trichloroethane (1,1,1 TCA)	isopropyl alcohol
butyl alcohol	ethyl acetate	ethyl alcohol
methyl alcohol	methyl ethyl ketone (MEK)	glycol ethers
methylene chloride	methyl isobutyl ketone (MIBK)	mineral spirits
toluene	tetrachloroethylene (PERC)	acetone
xylene	trichloroethylene (TCE)	naphtha
freon	ethylene glycol	acetates

Others: Dry & Liquids

formaldehyde	sodium hypochlorite	cyanides
dry calcium chloride	dry sodium hydroxide	ammonium hydroxide
liquid calcium chloride	liquid sodium hydroxide	ferric chloride
ammonia	soda ash	calcium hypochlorite
lime	urea	phosphates
sodium nitrate	copper sulfate	sodium silicate
sodium hyposulfite	potassium permanganate	sodium bisulfite

1.2.3 Underground Storage Tanks

Underground storage tanks were formerly used on the site for flammable solvents delivered by rail and leaded and unleaded gasoline. The underground storage tanks for chemicals were used to store stoddard solvent, methyl alcohol, methyl ethyl ketone, xylene, acetone, toluene and isopropyl alcohol. Chlorinated solvents were never stored in these tanks. These tanks were located in the area now occupied by the above-ground calcium chloride tanks. These eight tanks were installed by Gem City Chemicals, Inc. between 1969 and 1978. Gem City Chemicals, Inc. reports that these tanks were installed according to the then-applicable City of Dayton Fire Department codes. Precautions against leakage included: cathodic protection of the tanks, asphaltic coatings on tanks and plumbing, a washed-sand bed beneath and around the tanks, and pressure testing upon installation.

The two tanks used for storage of regular and unleaded gasoline, were in use at the time Gem City Chemicals, Inc. began operations at the site in 1969, and no information concerning their installation is available.

According to information supplied by Gem City Chemicals, Inc. these tanks were removed from the property in April and May of 1986, pursuant to a permit issued by the City of Dayton. The tank removal was conducted according to prevailing regulations. Information supplied by Gem City Chemicals, Inc. regarding the removal of the tanks is included in Exhibit A. Gem City Chemicals, Inc. reports that no evidence of tank leakage was observed during removal.

1.2.4 Investigation and Remediation Efforts

During the course of a voluntary site assessment in 1987, Gem City Chemicals, Inc. became aware of the presence of volatile organic compounds in the soil and ground water at the site and initiated a voluntary investigation to determine the environmental condition of the property. A voluntary remediation plan was developed and implemented, based on the findings of the investigation. Ohio EPA reviewed the investigation results and remediation plan in July 1989. Ohio EPA required additional testing and monitoring of the site as part of the permitting requirements for the soil vapor venting and the ground-water extraction and treatment systems. Permits for the discharge of treated ground water and discharge of vapors from the extraction wells and the stripper tower were applied for by Gem City Chemicals, Inc. and issued by the appropriate agencies.

Air permits for vapor releases from the large, aboveground storage tanks were issued by OEPA in 1975 and 1984. Air permits for storage tanks included #1824 (1-10-84), #2672 (1-10-84), #1789 (1-10-84), #2031 (1-10-84), #1830 (1-10-84), #1805 (1-10-84). Copies of these permits are included in Exhibit B.

Gem City Chemicals, Inc. filed as a small quantity generator and transporter and received an identification number on August 13, 1986. The EPA identification number for the facility is OH0004472940.

A permit for a pretreatment system for pH neutralization (application No. 05-1893) was issued by OEPA on June 25, 1986. Permit to Install (PTI) for air emissions from the five vapor extraction wells (application No. 08-1681) was issued by OEPA on February 8, 1989. This permit was renewed in January, 1993. OEPA's letter of November 3, 1989 permitted the interim operation of the stripping tower and the discharge of the treated waters to the city storm sewer. Discharge to the city storm sewer was applied for on September 22, 1989 and permitted by a Special Privilege Permit granted by the City on November 17, 1989. Permit to Install (PTI) for air emissions from the stripping tower (application No. 08-1900) was issued by OEPA on December 6, 1989. Permit to Install (PTI) the ground-water treatment system (application No. 05-3994) was issued by OEPA on January 29, 1991. The final NPDES discharge permit for the treated water from the stripper tower was issued on May 30, 1991. Copies of relevant permits are included in Exhibit B.

The presence of some of the volatile organic compounds in the soil and ground water underlying the Gem City Chemicals, Inc. facility may be the result of incidental small spills and leaks which have occurred over many years. Interviews with employees indicated that there had been overfilling of tanks on several occasions, but these releases involved acids. Prior to initiation of the pretreatment system, the drum washing operation released some waters with acids or bases, but not any solvents. Incidental solvent releases may have occurred during truck unloading, drum filling operations or during storage of the drums. Most of these operations occurred in areas located to the northwest and south of the warehouse. As discussed earlier, Gem City Chemicals, Inc. is located in an industrial area, and many other facilities in the area may have released chlorinated solvents and other VOCs into the ground water. Depending on prior ground-water flow directions and the location of these possible off-site releases, VOCs may have migrated and/or may be migrating onto the site through ground water flow.

1.2.4.1 Soil Sampling

Initial voluntary soil sampling was performed at the site on June 3, 1987 at 12 locations. The sampling locations are shown on Figure 3, and the gas chromatography results are included as Table 1. The results were quantified for 10 organic chemicals that were known to be stored on the site.

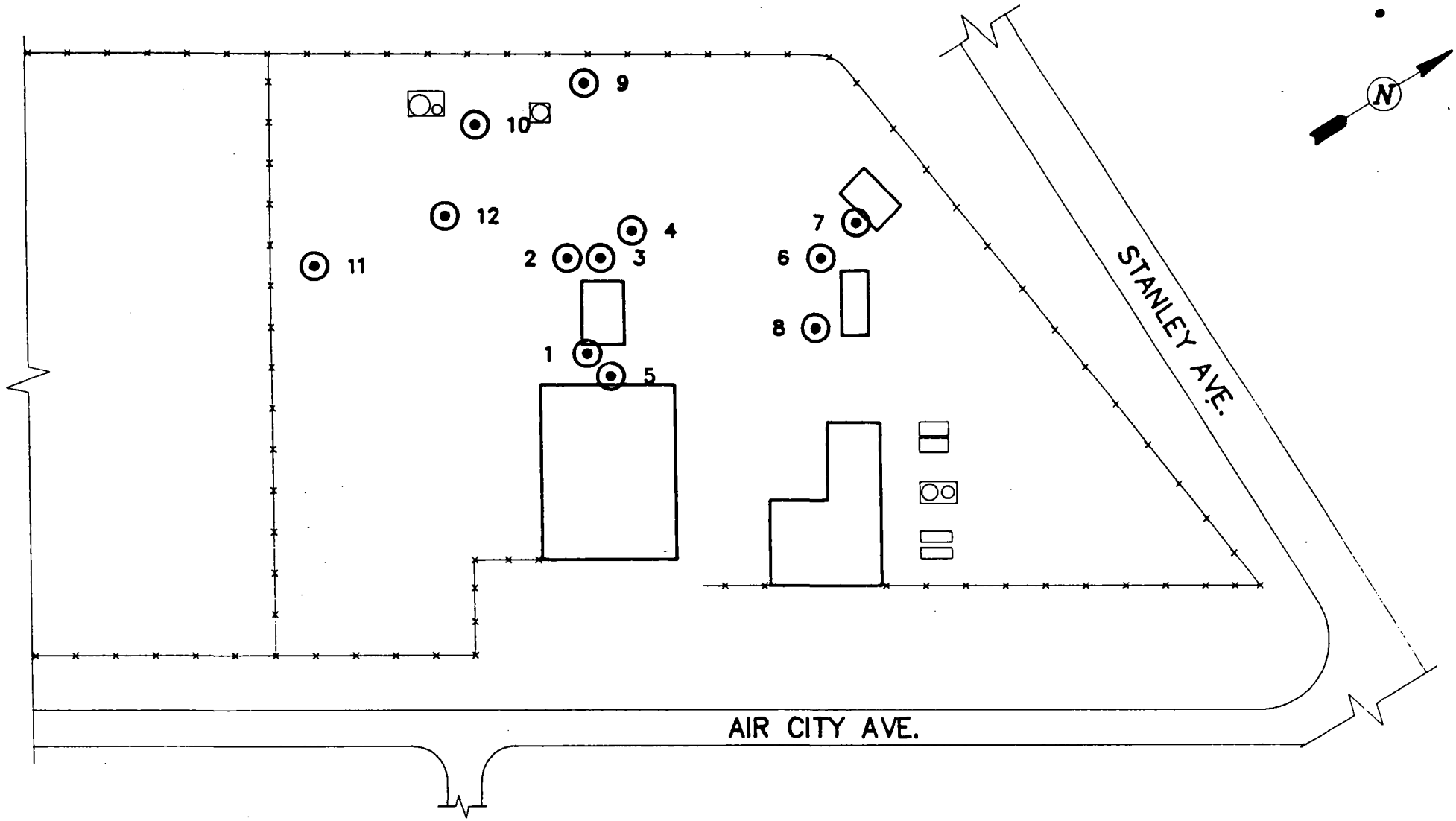
Table 1 Initial Soil Sampling Results
Results in $\mu g/g$ (ppm)

Sample Location	1	2	3	4	5	6	7	8	9	10	11	12
methylene chloride	BDL	BDL	16.0	11.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
tetrachloroethylene	167.	76.0	554.	17.0	6.3	5.8	4.7	BDL	1.7	BDL	BDL	BDL
trichloroethylene	60.0	16.0	141.	7.7	12.0	5.6	BDL	1.2	77.0	BDL	BDL	3.4
1,1,1-trichloroethane	6.2	5.6	6.5	14.0	BDL	1.8	BDL	BDL	BDL	BDL	BDL	BDL
methyl alcohol	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
isopropyl alcohol	BDL	BDL	9.3	669.	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Acetone	BDL	121.	105.	628.	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Toluene	BDL	53.0	111.	33.0	BDL	BDL	BDL	BDL	12.0	BDL	BDL	BDL
Xylene	BDL	28.0	115.	21.0	BDL	4.6	BDL	BDL	BDL	BDL	BDL	BDL
methyl ethyl ketone	BDL	31.0	23.0	43.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

BDL = Below Detection Limits

1.2.4.2 Soil Gas Survey

A soil gas survey was conducted in and around the site in July 1988 at 40 locations. Results of the gas chromatography analysis of gas pulled from the probes were reported for trichloroethylene, tetrachloroethylene and 1,1,1-trichloroethane. The locations and results are shown in Figure 4.



LEGEND

⊙ SOIL SAMPLING LOCATION

QSOURCE ENGINEERING, INC.

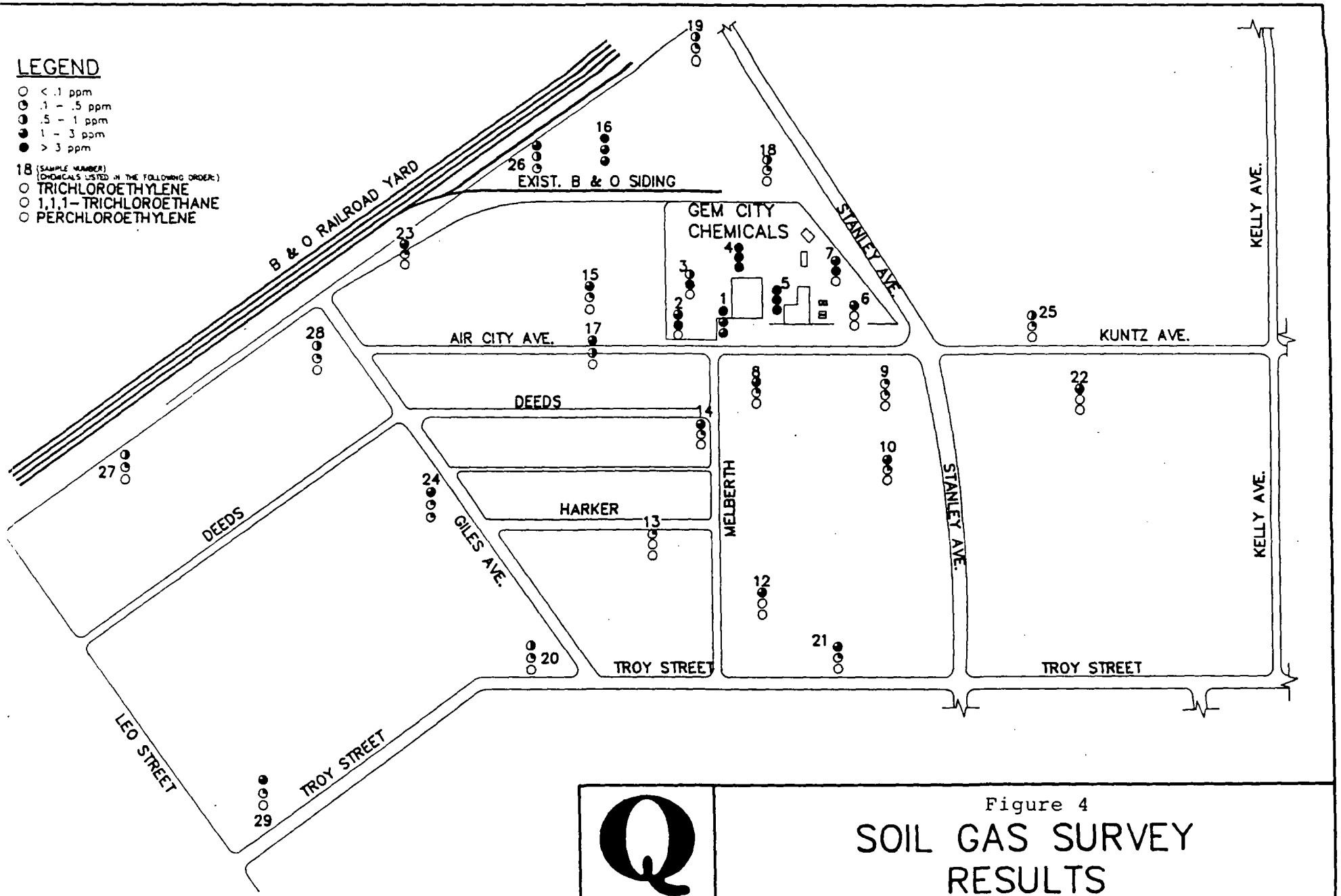
Figure 3

SOIL SAMPLE LOCATIONS

GEM CITY CHEMICALS, INC.
DAYTON, OHIO

162.89010	2-16-89	L.E.F.

ACAD: 89C10R04/2-16-89/1:1



QSOURCE ENGINEERING, INC.

Figure 4

SOIL GAS SURVEY RESULTS

GEM CITY CHEMICALS, INC.
DAYTON, OHIO

162.89010	2-16-89	L.E.F.

89010R05, 2-20-89/1:1

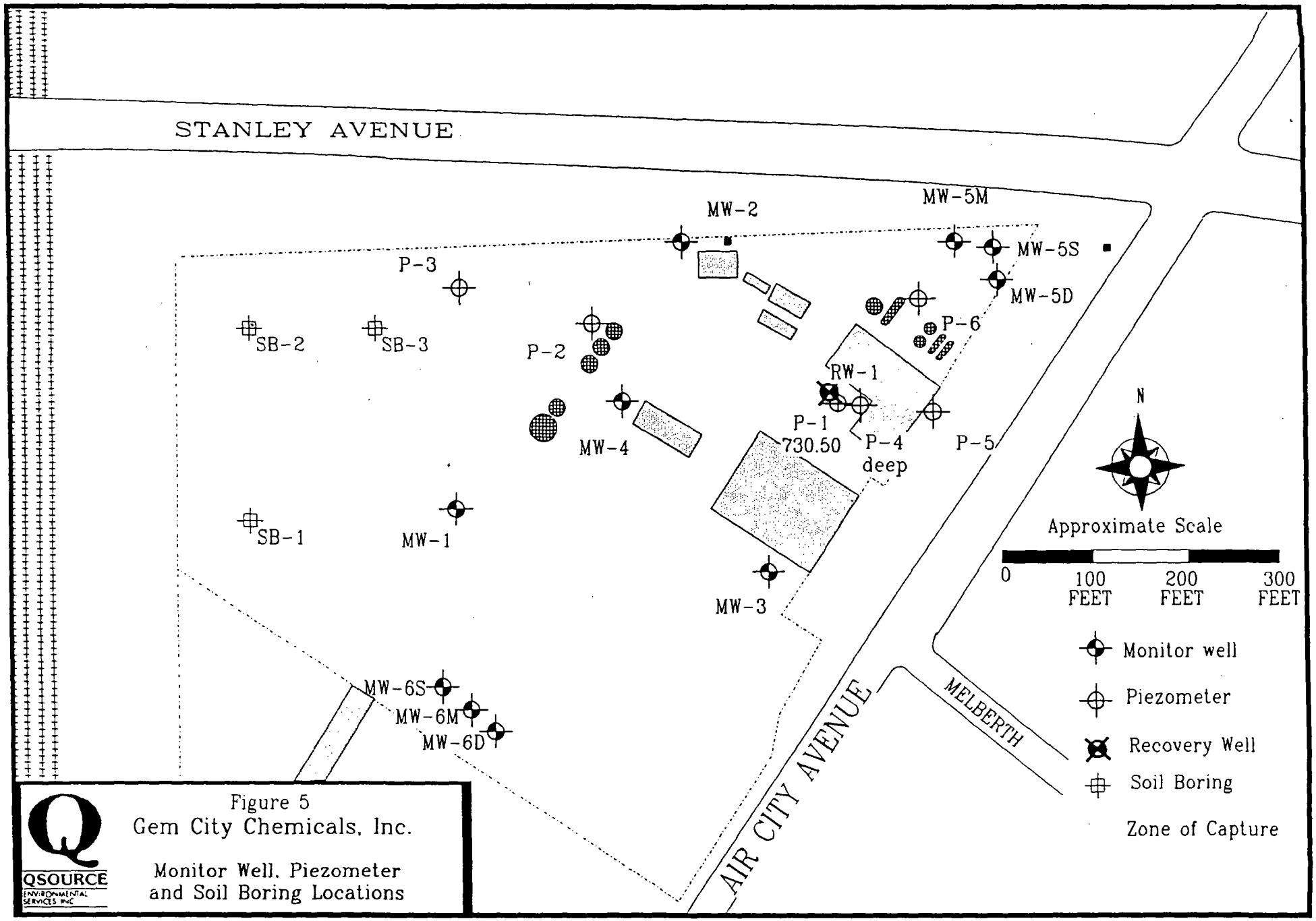


Figure 5
Gem City Chemicals, Inc.

Monitor Well, Piezometer and Soil Boring Locations

1.2.4.3 Ground-Water Monitoring

A total of ten monitor wells have been installed at this site to monitor ground-water quality. The monitor well locations are shown in Figure 5. During installation of the first four wells, ground-water samples were taken and analyzed for TCE, used as an indicator parameter for the presence of VOCs. Screen depths were set to match the zones with the highest concentrations of TCE. Ground-water samples from the four then-completed wells were collected and more fully analyzed in May 1988. Two additional clusters of monitor wells (a total of 6 wells) were installed in September 1988. For one year, samples were collected quarterly and are now collected semi-annually. Ground water samples from all ten wells were collected and analyzed in September 1988, October 1989, February, May, August and November of 1990, March and October of 1991, April and October of 1992 and June of 1993. Constituents detected in the monitor wells include: acetone, benzene, chloroform, 1,1-dichloroethane, 1,2-dichloroethane, 1,1-dichloroethene, cis-1,2-dichloroethene, trans-1,2-dichloroethene, ethylbenzene, hexachlorobutadiene, tetrachloroethene, toluene, 1,2,3-trichlorobenzene, 1,2,4-trichlorobenzene, 1,1,1-trichloroethane, trichloroethene, and vinyl chloride. Analysis results are shown in Table 2.

1.2.4.4 Ground-Water Recovery and Treatment System

An air stripper column treatment facility and a ground-water recovery well were installed in late 1989 and then put on-line in early 1990 with weekly monitoring of the effluent, pursuant to the SWDO/OEPA request and NPDES permit requirements. Water elevations in all the monitor wells have been taken on a weekly basis since early 1990. A summary of the water level data is included in Table 3 and the full table of water level measurements is included in Exhibit C. The measured water levels in the monitor wells and in a piezometer located adjacent to the recovery well for the period between February 1990 and February 1993 and for all of the monitoring wells and newly-installed piezometers since that data are shown in Figure 6. Weekly potentiometric surface maps have been drawn and submitted to OEPA for review since early 1990. Approximately 120 weekly potentiometric surface maps have been submitted to the OEPA for review. One map per quarter has been selected and included in Exhibit D in order to demonstrate that the cone of depression induced by the recovery well has been maintained under the site. Five additional piezometers were installed at the Gem City Chemicals, Inc. facility as part of the field work in support of this Revised SAR. Four of these piezometers were installed at the same depth as the wells used to generate the potentiometric surface maps included in Exhibit D. Water levels in the existing monitor well network, the existing piezometer and the newly-installed piezometers were measured on February 8 and 23, 1993 and were used to generate the potentiometric surface map shown in Figure 7. This map also shows the estimated extent of the zone of capture and the directions of ground water flow within this zone and the minimum zone of capture, based on the limits of the monitoring data and a conservative interpretation of the extent of the potentiometric surface contours between P-2 and P-3. This minimum zone

Table 2 continued

MW-3

	OEPA WQ stds		5/2/88	9/20/88	8/24/89	2/13/90	5/8/90	8/16/90	11/8/90	3/19/91	10/2/91	4/29/92	11/6/92	6/18/93
Acetone			ntf	ntf	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Benzene	fMCL	5	bdl	ntf	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Chloroform			bdl	ntf	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	3.7	bdl
Dichlorodifluoromethane			bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	17.
Dichloroethane (1,1)			25.1	74.2	45.	10.	15.	13.	23.	32.	12.	bdl	48.	47.
Dichloroethane (1,2)	fMCL	5	17.5	bdl	bdl	bdl	bdl	bdl	bdl	95.	52.	bdl	2.9	1.3
Dichloroethene (1,1)	fMCL	7	53.7	94.7	152.	34.	58.	39.	95.	100.	45.	bdl	115.	116.
Dichloroethene (cis 1,2)	pMCL	100	61.5	40.	ntf	ntf	bdl	ntf	ntf	90.	46.	123.	137.	166.
Dichloroethene (trans 1,2)	pMCL	70	1.55	bdl	ntf	ntf	bdl	ntf	ntf	bdl	bdl	bdl	7.4	13.
Dichloroethene(1,2 total)	pMCL	70	63.1	40.	90.	31.	41.	36.	54.	90.	46.	123.	144.4	179.
Ethylbenzene	pMCL	700	bdl	ntf	9.	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Hexachlorobutadiene			ntf	ntf	ntf	ntf	ntf	ntf	ntf	bdl	bdl	bdl	bdl	bdl
Tetrachloroethene	fMCL	5	bdl	bdl	20.	28.	81.	142.	558.	490.	241.	532.	445.	76.
Toluene	pMCL	2000	bdl	ntf	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Trichlorobenzene (1,2,3)			ntf	ntf	ntf	ntf	ntf	ntf	ntf	bdl	bdl	bdl	bdl	bdl
Trichlorobenzene (1,2,4)	pMCL	9	ntf	ntf	ntf	ntf	ntf	ntf	ntf	bdl	bdl	bdl	bdl	bdl
Trichloroethane (1,1,1)	fMCL	200	165.	518.	396.	298.	513.	420.	1085.	740.	198.	293.	1100.	596.
Trichloroethene	fMCL	5	70.4	357.	160.	170.	221.	218.	195.	435.	189.	350.	274.	72.
Vinyl Chloride	fMCL	2	5.77	ntf	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	4.9

MW-4

	OEPA WQ stds		5/2/88	9/20/88	8/24/89	2/13/90	5/8/90	8/16/90	11/8/90	3/19/91	10/2/91	4/29/92	11/6/92	6/17/93
Acetone			ntf	ntf	ntf	bdl	bdl	ntf	bdl	bdl	3.0	bdl	bdl	bdl
Benzene	fMCL	5	.3	2.6	bdl	bdl	bdl	ntf	bdl	bdl	bdl	bdl	bdl	bdl
Chloroform			9.05	ntf	bdl	bdl	bdl	ntf	bdl	1.3	bdl	bdl	2.8	2.6
Dichloroethane (1,1)			7.2	.9	8.	bdl	bdl	bdl	bdl	3.1	bdl	58.	11.	3.2
Dichloroethane (1,2)	fMCL	5	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	97.	bdl	.7
Dichloroethene (1,1)	fMCL	7	bdl	ntf	11.	bdl	bdl	bdl	bdl	bdl	bdl	89.	23.	8.7
Dichloroethene (cis 1,2)	pMCL	100	13.4	3.2	ntf	ntf	ntf	ntf	ntf	9.3	11.	bdl	20.	13.
Dichloroethene (trans 1,2)	pMCL	70	.24	.6	ntf	ntf	ntf	ntf	ntf	bdl	bdl	bdl	bdl	bdl
Dichloroethene(1,2 total)	pMCL	70	13.6	3.8	24.	13.	8.0	16.	6.0	9.3	11.	bdl	20.	13.
Ethylbenzene	pMCL	700	bdl	ntf	bdl	bdl	bdl	ntf	bdl	bdl	bdl	bdl	bdl	bdl
Hexachlorobutadiene			ntf	ntf	ntf	ntf	ntf	ntf	ntf	bdl	bdl	bdl	bdl	bdl
Tetrachloroethene	fMCL	5	7.2	4.1	11.	9.	15.	10.	15.	13.	17.	82.	26.	12.
Toluene	pMCL	2000	bdl	.9	bdl	bdl	bdl	ntf	bdl	bdl	bdl	bdl	bdl	bdl
Trichlorobenzene (1,2,3)			ntf	ntf	ntf	ntf	ntf	ntf	ntf	bdl	bdl	bdl	bdl	bdl
Trichlorobenzene (1,2,4)	pMCL	9	ntf	ntf	ntf	ntf	ntf	ntf	ntf	bdl	bdl	bdl	bdl	bdl
Trichloroethane (1,1,1)	fMCL	200	13.1	3.2	55.	50.	38.	88.	24.	15.	12.	910.	326.	79.
Trichloroethene	fMCL	5	53.5	66.2	88.	90.	85.	82.	65.	92.	67.	bdl	83.	53.
Vinyl Chloride	fMCL	2	bdl	ntf	bdl	bdl	bdl	ntf	bdl	bdl	bdl	bdl	bdl	bdl

fMCL = Final Maximum Contaminant Level
pMCL = Proposed Maximum Contaminant Level
BDL = Below Detection Limit
NTF = Not Tested For

Table 2
Gem City Chemicals, Inc.
Ground Water Quality

MW-1

Parameter (ug/L)	OEPA WQ stds	5/2/88	9/20/88	8/24/89	2/13/90	5/8/90	8/16/90	11/8/90	3/19/91	10/2/91	4/29/92	11/6/92	6/17/93
Acetone		ntf	ntf	ntf	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Benzene	fMCL 5	bdl	1.6	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Chloroform		.99	11.8	7.	10.0	19.0	bdl	bdl	4.0	5.5	bdl	bdl	bdl
Dichloroethane (1,1)		1.7	2.3	bdl	bdl	bdl	bdl	bdl	1.6	bdl	99.	16.	3.4
Dichloroethane (1,2)	fMCL 5	bdl	bdl	bdl	bdl	bdl	bdl	bdl	1.3	bdl	120.	bdl	bdl
Dichloroethene (1,1)	fMCL 7	5.	1.2	5.	bdl	bdl	bdl	bdl	bdl	bdl	108.	33.	6.9
Dichloroethene (cis 1,2)	pMCL 100	23.8	7.1	ntf	ntf	bdl	ntf	ntf	5.3	14.0	131.	26.	8.4
Dichloroethene (trans 1,2)	pMCL 70	.44	bdl	ntf	ntf	bdl	ntf	ntf	bdl	bdl	bdl	bdl	bdl
Dichloroethene(1,2 total)	pMCL 70	24.2	7.1	10.	5.0	bdl	bdl	bdl	5.3	14.0	131.	26.	8.4
Ethylbenzene	pMCL 700	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Hexachlorobutadiene		ntf	ntf	ntf	ntf	ntf	ntf	ntf	ntf	bdl	bdl	bdl	bdl
Tetrachloroethene	fMCL 5	2.5	1.4	bdl	bdl	bdl	bdl	bdl	1.5	bdl	bdl	bdl	4.0
Toluene	pMCL 2000	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Trichlorobenzene (1,2,3)		ntf	ntf	ntf	ntf	ntf	ntf	ntf	ntf	bdl	bdl	bdl	bdl
Trichlorobenzene (1,2,4)	pMCL 9	ntf	ntf	ntf	ntf	ntf	ntf	ntf	ntf	bdl	bdl	bdl	bdl
Trichloroethane (1,1,1)	fMCL 200	20.	7.1	22.	25.0	14.0	8.0	14.0	11.0	11.0	1360.	409.	76.
Trichloroethene	fMCL 5	25.1	117.	62.	81.	93.	92.	85.	100.	197.	247.	108.	45.
Vinyl Chloride	fMCL 2	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl

MW-2

	OEPA WQ stds	5/2/88	9/20/88	8/24/89	2/13/90	5/8/90	8/16/90	11/8/90	3/19/91	10/2/91	4/29/92	11/6/92	6/17/93
Acetone		ntf	ntf	ntf	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Benzene	fMCL 5	1.3	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Chloroform		.64	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Dichloroethane (1,1)		.4	.7	bdl	bdl	bdl	bdl	bdl	1.3	bdl	2.6	4.5	bdl
Dichloroethane (1,2)	fMCL 5	bdl	bdl	bdl	bdl	bdl	bdl	bdl	1.0	bdl	bdl	bdl	bdl
Dichloroethene (1,1)	fMCL 7	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	2.9	5.7	1.1
Dichloroethene (cis 1,2)	pMCL 100	2.1	1.5	bdl	ntf	ntf	ntf	ntf	5.2	bdl	5.5	11.	2.2
Dichloroethene (trans 1,2)	pMCL 70	bdl	bdl	bdl	ntf	ntf	ntf	ntf	bdl	bdl	bdl	bdl	bdl
Dichloroethene(1,2 total)	pMCL 70	2.1	1.5	8.	6.0	bdl	9.0	bdl	5.2	bdl	5.5	11.	2.2
Ethylbenzene	pMCL 700	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Hexachlorobutadiene		ntf	ntf	ntf	ntf	ntf	ntf	ntf	bdl	bdl	bdl	bdl	bdl
Tetrachloroethene	fMCL 5	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Toluene	pMCL 2000	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Trichlorobenzene (1,2,3)		ntf	ntf	ntf	ntf	ntf	ntf	ntf	bdl	bdl	bdl	bdl	bdl
Trichlorobenzene (1,2,4)	pMCL 9	ntf	ntf	ntf	ntf	ntf	ntf	ntf	bdl	bdl	bdl	bdl	bdl
Trichloroethane (1,1,1)	fMCL 200	7.31	5.1	5.	18.	bdl	32.	bdl	8.0	7.6	15.	24.	13.
Trichloroethene	fMCL 5	34.2	56.5	33.	38.	27.	36.	21.	23.	36.	29.	23.	23.
Vinyl Chloride	fMCL 2	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl

fMCL = Final Maximum Contaminant Level
pMCL = Proposed Maximum Contaminant Level
bdl = Below Detection Limit
ntf = Not Tested For

Table 2 continued

MW-5s

	OEPA WQ stds	5/2/88	9/20/88	8/24/89	2/13/90	5/8/90	8/16/90	11/8/90	3/19/91	10/2/91	4/29/92	11/6/92	6/17/93
Acetone			ntf	ntf	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Benzene	fMCL 5		ntf	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Chloroform			ntf	31.	13.	17.	16.	bdl	6.5	12.	bdl	bdl	bdl
Dichloroethane (1,1)			ntf	24.	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Dichloroethane (1,2)	fMCL 5		ntf	bdl	bdl	bdl	bdl	bdl	28.	19.	5.7	bdl	bdl
Dichloroethene (1,1)	fMCL 7		ntf	50.	6.	10.	14.	9.	14.	bdl	5.0	bdl	bdl
Dichloroethene (cis 1,2)	pMCL 100		2000.	ntf	ntf	ntf	ntf	ntf	89.	26.	6.9	9.2	bdl
Dichloroethene (trans 1,2)	pMCL 70		ntf	ntf	ntf	ntf	ntf	ntf	bdl	bdl	bdl	bdl	bdl
Dichloroethene(1,2 total)	pMCL 70		2000.	372.	158.	243.	250.	66.	89.	26.	6.9	9.2	bdl
Ethylbenzene	pMCL 700		ntf	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Hexachlorobutadiene			ntf	ntf	ntf	ntf	ntf	ntf	bdl	bdl	bdl	bdl	bdl
Tetrachloroethene	fMCL 5		ntf	bdl	bdl	bdl	bdl	37.	bdl	bdl	bdl	bdl	bdl
Toluene	pMCL 2000		ntf	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Trichlorobenzene (1,2,3)			ntf	ntf	ntf	ntf	ntf	ntf	bdl	bdl	bdl	bdl	bdl
Trichlorobenzene (1,2,4)	pMCL 9		ntf	ntf	ntf	ntf	ntf	ntf	bdl	bdl	bdl	bdl	bdl
Trichloroethane (1,1,1)	fMCL 200		1830.	315.	142.	364.	443.	255.	227.	87.	80.	86.	35.
Trichloroethene	fMCL 5		413.	250.	158.	340.	438.	394.	187.	163.	168.	119.	46.
Vinyl Chloride	fMCL 2		ntf	9.	bdl	bdl	ntf	bdl	bdl	bdl	bdl	bdl	bdl

MW-5m

	OEPA WQ stds	5/2/88	9/20/88	8/24/89	2/13/90	5/8/90	8/16/90	11/8/90	3/19/91	10/2/91	4/29/92	11/6/92	6/17/93
Acetone			ntf	ntf	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Benzene	fMCL 5		ntf	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Chloroform			28.3	bdl	bdl	bdl	bdl	bdl	bdl	11.	bdl	16.	bdl
Dichloroethane (1,1)			20.5	20.	bdl	bdl	21.	18.	11.	bdl	4.2	9.6	bdl
Dichloroethane (1,2)	fMCL 5		ntf	bdl	bdl	bdl	bdl	bdl	26.	36.	9.6	bdl	bdl
Dichloroethene (1,1)	fMCL 7		86.4	24.	bdl	10.	58.	61.	26.	50.	bdl	28.	bdl
Dichloroethene (cis 1,2)	pMCL 100		67.1	ntf	ntf	ntf	ntf	ntf	98.	75.	26.	44.	33.
Dichloroethene (trans 1,2)	pMCL 70		ntf	ntf	ntf	ntf	ntf	ntf	bdl	bdl	1.1	bdl	bdl
Dichloroethene(1,2 total)	pMCL 70		67.1	119.	24.	79.	120.	137.	98.	75.	27.1	44.	33.
Ethylbenzene	pMCL 700		ntf	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Hexachlorobutadiene			ntf	ntf	ntf	ntf	ntf	ntf	bdl	bdl	bdl	bdl	bdl
Tetrachloroethene	fMCL 5		6.	8.	bdl	bdl	9.	11.	9.5	bdl	6.0	8.1	bdl
Toluene	pMCL 2000		ntf	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Trichlorobenzene (1,2,3)			ntf	ntf	ntf	ntf	ntf	ntf	bdl	bdl	bdl	bdl	bdl
Trichlorobenzene (1,2,4)	pMCL 9		ntf	ntf	ntf	ntf	ntf	ntf	bdl	bdl	bdl	bdl	bdl
Trichloroethane (1,1,1)	fMCL 200		575.	137.	79.	198.	421.	535.	210.	142.	64.	278.	161.
Trichloroethene	fMCL 5		597.	88.	35.	143.	217.	227.	140.	157.	81.	171.	170.
Vinyl Chloride	fMCL 2		ntf	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl

fMCL = Final Maximum Contaminant Level
pMCL = Proposed Maximum Contaminant Level
bdl = Below Detection Limits
ntf = Not Tested For

Table 2 continued

MW-5d

	OEPA WQ stds	5/2/88	9/20/88	8/24/89	2/13/90	5/8/90	8/16/90	11/8/90	3/19/91	10/2/91	4/29/92	11/6/92	6/17/93
Acetone			ntf	ntf	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Benzene	fMCL 5		ntf	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Chloroform			ntf	bdl	bdl	bdl	bdl	bdl	bdl	11.	bdl	8.4	.7
Dichloroethane (1,1)			55.3	10.	6.	bdl	10.	9.	12.	10.	14.	10.	7.4
Dichloroethane (1,2)	fMCL 5		ntf	bdl	bdl	bdl	bdl	bdl	24.	31.	40.	bdl	.9
Dichloroethene (1,1)	fMCL 7		14.2	5.	bdl	bdl	6.	bdl	11.	bdl	bdl	8.2	6.9
Dichloroethene (cis 1,2)	pMCL 100		14.	ntf	ntf	ntf	ntf	ntf	26.	26.	22.	8.1	17.
Dichloroethene (trans 1,2)	pMCL 70		ntf	ntf	ntf	ntf	ntf	ntf	bdl	bdl	bdl	bdl	1.9
Dichloroethene(1,2 total)	pMCL 70		14.	bdl	6.	bdl	12.	12.	26.	26.	22.	8.1	18.9
Ethylbenzene	pMCL 700		ntf	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Hexachlorobutadiene			ntf	bdl	ntf	ntf	ntf	ntf	bdl	bdl	bdl	bdl	bdl
Tetrachloroethene	fMCL 5		ntf	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Toluene	pMCL 2000		ntf	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Trichlorobenzene (1,2,3)			ntf	bdl	ntf	ntf	ntf	ntf	ntf	bdl	bdl	bdl	bdl
Trichlorobenzene (1,2,4)	pMCL 9		ntf	bdl	ntf	ntf	ntf	ntf	ntf	bdl	bdl	bdl	bdl
Trichloroethane (1,1,1)	fMCL 200		209.	68.	97.	176.	174.	221.	185.	127.	310.	204.	104.
Trichloroethene	fMCL 5		35.	15.	19.	33.	49.	46.	52.	69.	102.	41.	31.
Vinyl Chloride	fMCL 2		ntf	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl

MW-6S

	OEPA WQ stds	5/2/88	9/20/88	8/24/89	2/13/90	5/8/90	8/16/90	11/8/90	3/19/91	10/2/91	4/29/92	11/6/92	6/18/93
Acetone			ntf	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Benzene	fMCL 5		ntf	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Carbon Tetrachloride	fMCL 100		ntf	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	7.5
Chloroform			28.3	20.	9.	22.	17.	15.	12.	22.	6.3	7.5	bdl
Dichloroethane (1,1)	DL 1		4.3	bdl	7.	bdl	bdl	bdl	bdl	bdl	3.5	bdl	bdl
Dichloroethane (1,2)	fMCL 5		ntf	bdl	bdl	bdl	bdl	bdl	12.	bdl	4.6	bdl	bdl
Dichloroethene (1,1)	fMCL 7		2.7	bdl	20.	bdl	bdl	bdl	bdl	bdl	1.6	bdl	bdl
Dichloroethene (cis 1,2)	pMCL 100		5.3	ntf	ntf	ntf	ntf	ntf	6.2	bdl	4.0	bdl	bdl
Dichloroethene (trans 1,2)	pMCL 70		ntf	ntf	ntf	ntf	ntf	ntf	bdl	bdl	bdl	bdl	bdl
Dichloroethene(1,2 total)	pMCL 70		5.3	9.	31.	bdl	bdl	bdl	6.2	bdl	4.0	bdl	bdl
Ethylbenzene	pMCL 700		ntf	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Hexachlorobutadiene			ntf	ntf	ntf	ntf	ntf	ntf	bdl	bdl	bdl	bdl	bdl
Tetrachloroethene	fMCL 5		ntf	bdl	15.	bdl	bdl	bdl	bdl	bdl	2.4	bdl	bdl
Toluene	pMCL 2000		ntf	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Trichlorobenzene (1,2,3)			ntf	ntf	ntf	ntf	ntf	ntf	bdl	bdl	bdl	bdl	bdl
Trichlorobenzene (1,2,4)	pMCL 9		ntf	ntf	ntf	ntf	ntf	ntf	bdl	bdl	bdl	bdl	bdl
Trichloroethane (1,1,1)	fMCL 200		135.	70.	332.	111.	85.	146.	94.	73.	63.	99.	42.
Trichloroethene	fMCL 5		169.	71.	99.	84.	71.	95.	62.	62.	59.	99.	bdl
Vinyl Chloride	fMCL 2		ntf	bdl	bdl	bdl	ntf	bdl	bdl	bdl	bdl	bdl	bdl

fMCL = Final Maximum Contaminant Level
pMCL = Proposed Maximum Contaminant Level
bdl = Below Detection Limit
ntf = not tested For

Table 2 continued

MW-6m

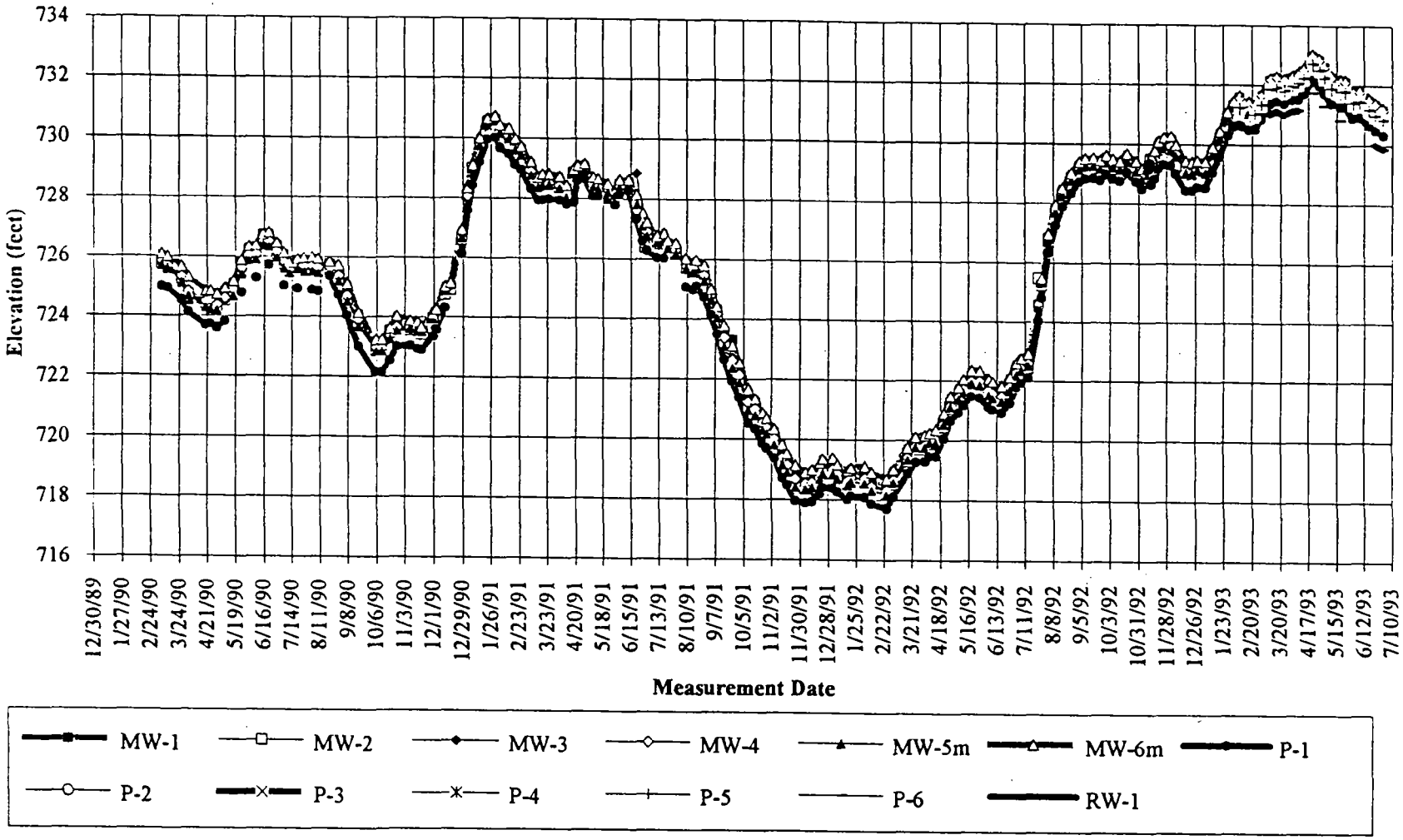
	OEPA WQ stds	5/2/88	9/20/88	8/24/89	2/13/90	5/8/90	8/16/90	11/8/90	3/19/91	10/2/91	4/29/92	11/6/92	6/18/93
Acetone			ntf	ntf	bdl	83.	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Benzene	fMCL 5		ntf	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Chloroform			ntf	ntf	bdl	bdl	bdl	bdl	bdl	11.	bdl	bdl	bdl
Dichloroethane (1,1)			16.9	10.	6.	bdl	bdl	6.	3.8	bdl	27.	17.	bdl
Dichloroethane (1,2)	fMCL 5		ntf	bdl	bdl	bdl	bdl	bdl	7.6	15.	47.	bdl	bdl
Dichloroethene (1,1)	fMCL 7		89.	36.	20.	bdl	13.	25.	6.6	13.	92.	56.	bdl
Dichloroethene (cis 1,2)	pMCL 100		38.7	ntf	ntf	ntf	ntf	ntf	17.	26.	273.	34.	bdl
Dichloroethene (trans 1,2)	pMCL 70		ntf	ntf	ntf	ntf	ntf	ntf	1.5	bdl	bdl	bdl	bdl
Dichloroethene(1,2 total)	pMCL 70		38.7	30.	31.	13.	27.	38.	18.5	26.	273.	34.	bdl
Ethylbenzene	pMCL 700		ntf	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Hexachlorobutadiene			ntf	ntf	ntf	ntf	ntf	ntf	bdl	bdl	bdl	bdl	bdl
Tetrachloroethene	fMCL 5		7.6	38.	29.	bdl	39.	96.	33.	49.	848.	240.	119.
Toluene	pMCL 2000		ntf	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Trichlorobenzene (1,2,3)			ntf	ntf	ntf	ntf	ntf	ntf	bdl	bdl	bdl	bdl	bdl
Trichlorobenzene (1,2,4)	pMCL 9		ntf	ntf	ntf	ntf	ntf	ntf	bdl	bdl	bdl	bdl	bdl
Trichloroethane (1,1,1)	fMCL 200		837.	226.	233.	25.	164.	335.	56.	66.	845.	723.	190.
Trichloroethene	fMCL 5		178.	95.	105.	92.	89.	115.	47.	89.	378.	123.	75.
Vinyl Chloride	fMCL 2		ntf	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl

MW-6D

	OEPA WQ stds	5/2/88	9/20/88	8/24/89	2/13/90	5/8/90	8/16/90	11/8/90	3/19/91	10/2/91	4/29/92	11/6/92	6/18/93
Acetone			ntf	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Benzene	fMCL 5		bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Chloroform			bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Dichloroethane (1,1)			bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Dichloroethane (1,2)	fMCL 5		ntf	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Dichloroethene (1,1)	fMCL 7		bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Dichloroethene (cis 1,2)	pMCL 100		bdl	bdl	bdl	ntf	ntf	ntf	bdl	bdl	bdl	bdl	bdl
Dichloroethene (trans 1,2)	pMCL 70		bdl	bdl	bdl	ntf	ntf	ntf	bdl	bdl	bdl	bdl	bdl
Dichloroethene(1,2 total)	pMCL 70		bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Ethylbenzene	pMCL 700		ntf	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Hexachlorobutadiene			ntf	ntf	ntf	ntf	ntf	ntf	4.2	bdl	bdl	bdl	bdl
Tetrachloroethene	fMCL 5		bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Toluene	pMCL 2000		bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Trichlorobenzene (1,2,3)			ntf	ntf	ntf	ntf	ntf	ntf	4.0	bdl	bdl	bdl	bdl
Trichlorobenzene (1,2,4)	pMCL 9		ntf	ntf	ntf	ntf	ntf	ntf	3.4	bdl	bdl	bdl	bdl
Trichloroethane (1,1,1)	fMCL 200		3.1	bdl	bdl	bdl	8.	bdl	bdl	bdl	bdl	1.2	bdl
Trichloroethene	fMCL 5		.6	bdl	bdl	bdl	5.	bdl	2.4	bdl	bdl	1.1	bdl
Vinyl Chloride	fMCL 2		ntf	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl

fMCL = Final Maximum Contaminant Level
pMCL = Proposed Maximum Contaminant Level
bdl = Below Detection Limits
ntf = Not Tested For

Figure 6 - Gem City Chemicals, Inc.
Potentiometric Surface Values



of capture, as determined from potentiometric data, extends beneath the entire actively-used portion of the property.

Table 3 - Summary of Water Level Measurements

WELL NUMBER	MINIMUM WATER ELEVATION	AVERAGE WATER ELEVATION	MAXIMUM WATER ELEVATION	WATER LEVEL FEB. 8, 1993	WATER LEVEL FEB. 23, 1993	VARIABILITY OF WATER LEVELS
MW-1	718.45	725.47	731.55	731.55	731.29	13.10
MW-2	718.17	725.32	731.28	731.28	731.08	13.11
MW-3	718.28	725.34	731.38	731.38	731.07	13.10
MW-4	718.33	725.41	731.40	731.40	731.10	13.07
MW-5S	718.14	725.29	731.27	731.27	731.07	13.13
MW-5M	718.19	725.31	731.35	731.35	731.11	13.16
MW-5D	718.09	725.26	731.31	731.31	731.11	13.22
MW-6S	718.48	725.55	731.44	731.44	731.17	12.96
MW-6M	718.62	725.67	731.64	731.64	731.36	13.02
MW-6D	718.67	725.66	731.62	731.62	731.34	12.95
P-1	717.40	723.46	730.62	730.62	730.50	13.22
P-2				731.39	731.15	
P-3				731.37	731.14	
P-4				731.17	730.93	
P-5				731.22	731.00	
P-6				731.21	731.01	

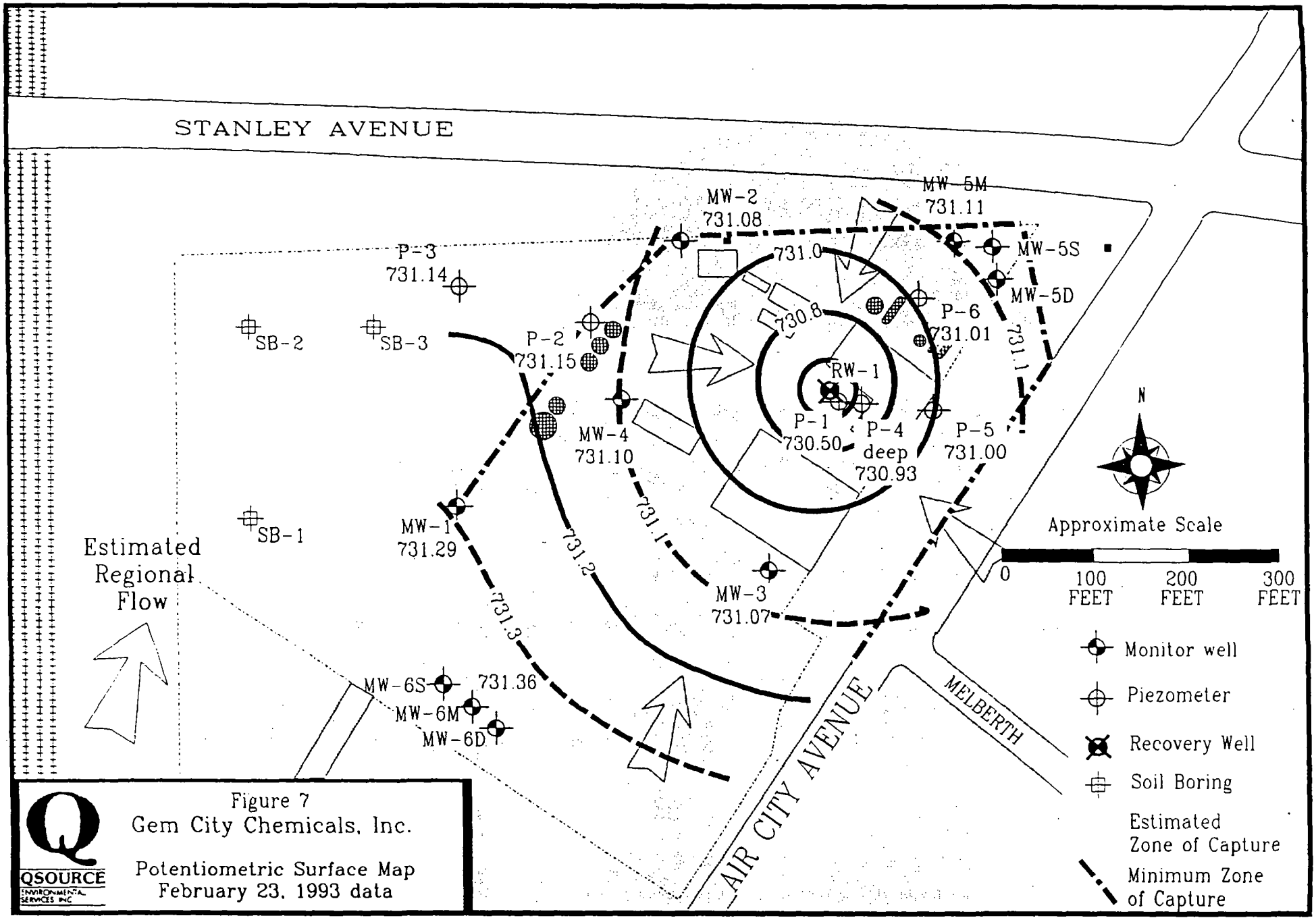


Figure 7
Gem City Chemicals, Inc.

Potentiometric Surface Map
February 23, 1993 data

1.2.4.5 Soil Vapor Extraction System

Five soil vapor extraction wells were installed in 1989. Emissions from these wells were measured monthly until the wells were shut down in July 1991. The soil vapor extraction wells were effective at removing the volatile organic compounds from the vadose zone. High concentrations of VOCs were measured in the discharge during the first several months after the system started operating. After the soil venting system had been in operation for approximately one year, the concentration of volatile organic compounds being removed by the system declined. Effectiveness of the soil vapor extraction system is discussed in Section 5.0. The wells were temporarily turned off when no detectable concentrations of volatiles could be measured in their discharge. All soil vapor extraction wells were completely shut down during the fall of 1991. One vapor extraction well was abandoned and removed in July 1992 to allow for paving of a portion of the site. The remaining vapor extraction wells were briefly restarted in August, 1992 and the discharges were measured after a day of operation. No significant concentrations of VOCs (defined as 5 ppm or less, and at or below background reading on a PID) were detected. Three of the four remaining vapor extraction wells were then decommissioned by removing the blower equipment and the well casing, and filling the well boring with a cement-bentonite grout. The last vapor extraction well was decommissioned in the same manner in June, 1993. Gem City Chemicals, Inc. has renewed the permits for five vapor extraction wells, to allow for potential re-installation at different locations in the future. No decision has been made as to when or whether the vapor extraction wells will be re-installed.

1.2.4.6 Hard-Surfacing Program

In June 1990, Gem City Chemicals, Inc. began hard-surfacing active portions of the site where chemical storage and handling take place, in order to prevent any possible releases into the environment and increase the effectiveness of the vapor extraction system. To date, approximately 50% of the active portion of the property has been hard-surfaced.

1.2.4.7 Additional Investigations for the Revised SAR

To collect the additional information required for this revised Site Assessment Report, the following additional investigations were conducted:

To determine if soils in the western portion of the property were a source of any VOCs, three shallow test borings were completed in the unused western portion of the site, at locations shown in Figure 5. The number of test borings and soil samples to be taken, and their approximate locations, were discussed with representatives of the OEPA in the field prior to the start of field investigations. The unused portion of the property beyond the old railroad right-of-way and monitoring network was subdivided into three approximately equal areas, and

each test boring was located near the center of one of these areas. The exact location for each boring was selected by observing where surface runoff was likely to be ponded. The materials encountered in each test boring were logged and described, and one sample from each test boring was submitted for laboratory analysis. The soil samples were chosen to represent the most-likely sample to be contaminated, based on the presence of fine-grained soil and/or fill materials present above the coarser-grained sands and gravels, and based on the highest readings obtained by field screening of the samples with a Photo-Ionizing Detector (PID). As shown by the laboratory testing results in Exhibit N, no volatile organic compounds (VOCs) were detected in the soil samples submitted. Therefore, there is no evidence from this limited sampling that the VOCs present in the ground water originated from this portion of the Gem City Chemicals, Inc. facility.

To further define the potentiometric surface, five additional piezometers were installed at locations specified in the Revised SAR Proposal and agreed to by representatives of OEPA. Four piezometers were screened at a depth of 50 feet, to match the screen interval of the monitor wells used in determining the potentiometric surface. The fifth piezometer was screened at the bottom of the aquifer, in order to determine whether or not water from the bottom of the aquifer was being captured by the partially-penetrating recovery well. The top-of-casing elevations of the newly-installed piezometers and existing monitor wells were determined by surveying, the depth to water was measured, and a potentiometric surface map was compiled based on this data.

The standard operating procedures used for the completion of the test borings, the logging of the samples and installation of the piezometers were previously submitted to OEPA. They are incorporated as Exhibit L. Also included as part of Exhibit L is a description of modifications to the installation protocol that were adopted due to field conditions. These variations were described to and approved by representatives of OEPA in telephone conversations during the course of field work. Test boring logs and as-built diagrams are included as Exhibit M. The sampling logs, chain-of-custody form and laboratory report for VOC sampling is included in Exhibit N.

2.0 HYDROGEOLOGIC CONDITIONS

The following discussion of the regional geology and site conditions was prepared from published geologic literature and from on-site investigations.

2.1 Description of Regional Hydrogeology

There are no published scientific reports that describe the surficial geology or hydrogeology of the Gem City Chemicals, Inc. facility in detail. However, several published sources contain well log information which can be used to interpret the local and regional hydrogeology. Bernhagen (1945) recorded the location and stratigraphy of a number of water wells in Montgomery County. Norris, Cross and Goldthwait (1948) continued this work and described the regional stratigraphy, geologic history and water resources for the county. Norris and Spieker (1966) updated this information by logging additional wells, collecting information on pumping rates, and monitoring the water levels and piezometric surfaces on the different aquifers. All three of these reports include at least some well log information. Graphical well logs and maps of the locations of the logged wells from these studies are included in Exhibit E.

In addition, the Ohio Department of Natural Resources (ODNR), Division of Water maintains a comprehensive file of water well logs, submitted by the well drillers. Periodically, the locations of these wells are verified by the Division of Water, and the resulting located well files are made available for study. A map showing the locations of the located wells in the vicinity of Gem City Chemicals, Inc. and copies of the ODNR well logs are included in Exhibit E.

Several consultants reports have been submitted to the City of Dayton which contain information concerning the subsurface stratigraphy, ground-water levels and the direction of ground water flow. The most relevant of these reports to Gem City Chemicals, Inc. are the Miami Well Field Study, Vol. 1 and the Miami South Source Investigation, both prepared by CH2M Hill.

2.1.1 Estimated Depth to Bedrock and Lithology

The depth to bedrock at the Gem City Chemicals, Inc. facility is estimated to be over 270 feet, based on the depth of several deep wells in the immediate vicinity that do not reach bedrock. The rock type present beneath the facility is mapped as the Ordovician Richmond Group, a sequence of interbedded shales and limestones.

The exact depth to bedrock cannot be determined at this time. Few wells in the immediate vicinity of Gem City Chemicals, Inc. reach bedrock, as adequate supplies of ground water are obtained from shallower wells in the overburden. One well within the City of Dayton Miami South Wellfield is 242 feet deep. The elevation of the bottom of the well of approximately 503 feet above mean sea level (MSL). This well ended in till layer, which is thought to overlie bedrock. A second well, located 1/2 mile southwest of Gem City Chemicals, Inc. reached bedrock at an elevation of 470 feet MSL. Based on an estimated bedrock elevation of 490 feet MSL, and a surface elevation of 760 feet MSL, the total depth to bedrock is estimated to be 270 feet. This site, as well as much of downtown Dayton, is located on a buried valley (glacial or preglacial valleys cut into

bedrock that were filled with glacial sediments). Bedrock topography mapping, reported in Clinch (1991 a, b) suggests that Gem City Chemicals, Inc. is located near the junction between a tributary, north-south buried valley, and the main buried valley located beneath the City of Dayton, which roughly lies along the path of the modern Mad River.

Although no samples of bedrock from the valley floor beneath Gem City Chemicals, Inc. are available, the bedrock present beneath the site is thought to be the shales and interbedded limestones of the Richmond Group. This assumption is based on the thickness of this group (450 feet) and the elevation of the contact between this unit and the overlying Brassfield Limestone, at about 900 feet MSL. In surface exposures, the Richmond Group consists of soft, bluish colored shale, with 1-5 inch thick interbeds of dense, crystalline limestone, which may make up 25 to 50% of the total rock thickness. Wells drilled in these lithologies rarely yield sufficient water for more than domestic supply, and the local bedrock can be considered an aquitard.

2.1.2 Regional Geomorphology

A sketch map of the geomorphic units in the immediate vicinity of the Gem City Chemicals, Inc. facility is included as Figure 8. The Gem City Chemicals, Inc. facility is located on a flat-topped terrace remnant at an elevation of 760 feet MSL. This terrace is an erosional remnant of the Mad River Outwash, a glacial outwash gravel unit that can be traced through discontinuous terrace remnants northward to Urbana and southward down the Miami River. Generally, the surficial materials in these terrace remnants consist of coarse sand and gravel, although other sediment types may also be present in the subsurface. In some areas, the Mad River Outwash may be overlain by a thin layer of windblown loess, which is composed of silt sized particles. This terrace remnant is bordered on the north, west and south by the floodplains of the Miami and Mad Rivers. These floodplains have been incised into the Mad River Outwash by approximately 35 feet. Floodplain sediments are approximately 20 feet thick, and are generally composed of finer-grained sand and gravels than those found in the outwash terraces.

An end moraine is present to the northeast of Gem City Chemicals, Inc. in Mad River Township. This end moraine was mapped as a thin to thick layer of till overlying sand and gravel by Goldthwait (Norris, Cross and Goldthwait, 1948) and by Forsyth (Norris and Spieker, 1966). The Mad River Outwash was deposited around and above the end moraine, and it is reasonable to assume that the till and outwash of this end moraine may be preserved beneath the outwash gravels at Gem City Chemicals, Inc.

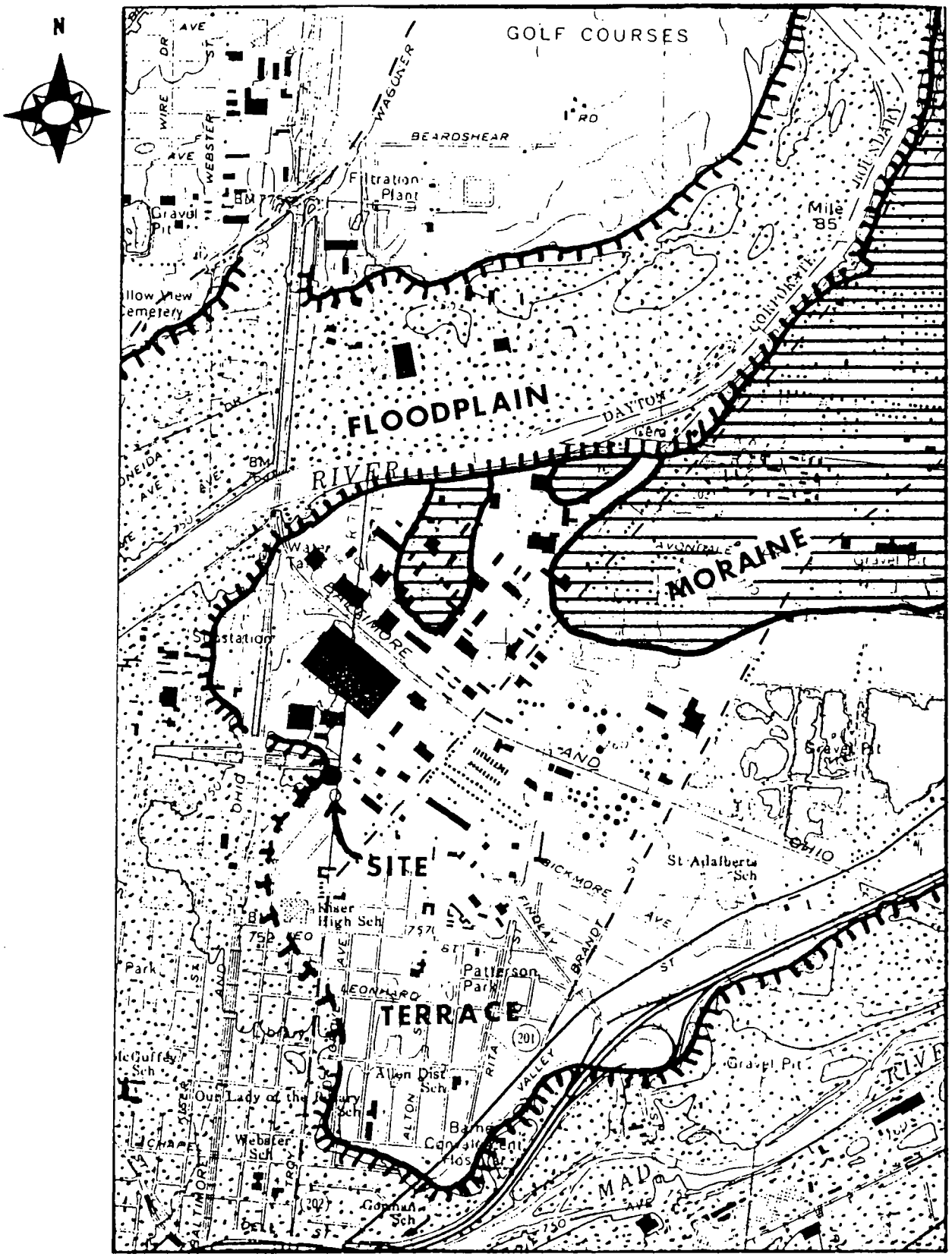


Figure 8
Gem City Chemicals
Geomorphic Map
(1" = 2000')

QSOURCE
ENVIRONMENTAL SERVICES INC

2.1.3 Regional Structural Features

Dayton lies near the crest of the Cincinnati Arch, a broad, gentle anticlinal feature of the bedrock units with an axial trend of approximately N 30° E, and gentle dips on the flanks of the Arch to the northwest and to the east. Measured bedrock dips in Montgomery County are extremely gentle, averaging about 5 feet per mile. The site is near the crest and has little or no dip.

2.1.4 Regional Stratigraphic Units

Regional studies, including Norris and Spieker (1966) and the CH2M Hill reports suggest that the uppermost unconsolidated unit present at the site is a thick, permeable, sand-and-gravel outwash deposit, up to 80 feet thick. Discontinuous till lenses were encountered in some wells in the vicinity of Gem City Chemicals, Inc., at depths of 40 to 50 feet. This unconfined aquifer is generally underlain by a till layer, present as a continuous layer at an average depth of 80 feet at Gem City Chemicals, Inc. The published studies suggest that this till layer may be discontinuous, on a regional scale. At some locations, the till is reported to be a thick, massive unit, while at other sites, the till unit consists of a zone of alternate tills and stratified sand and gravel. At other locations in the region, no till units were detected, either due to non-deposition or due to erosion when the overlying sands and gravels were deposited. The presence or absence of this till layer plays an important role in determining the direction and rate of regional ground water flow.

Regional studies also indicate that a second aquifer unit underlies the till, composed of fine to medium sand, sand and gravel, and fine to coarse gravel. Where thick till separates the surface sand and gravel aquifer from this second aquifer unit, this aquifer is partially confined, and artesian pressures may be present. Where the till layer is thin or missing, the surface aquifer and the second aquifer act as a single, unconfined aquifer. All six deep test borings to date at Gem City Chemicals, Inc. indicate that the till layer is present at the site. In some deeper wells throughout the Dayton area, evidence suggests that there may be other till layers within this second aquifer unit, as well as other, deeper aquifers.

2.1.5 Well Yields

Water well yields for some wells drilled prior to 1960 are published in Norris and Spieker (1966). Water yields for wells within one mile of Gem City Chemicals, Inc. range from a low of 20 gpm at a domestic supply well (well #209) to a maximum of 1000 gpm from a well drilled into the lower sand and gravel aquifer, 0.15 miles west of Gem City Chemicals, Inc. (well #212). Data for most of the production wells in the City of Dayton Miami South Wellfield were not available in Norris and Spieker, with the exception of well T-2. During an aquifer test, it was pumped at a rate of 2,283 gpm. Schmidt (1986) has estimated that the yields in areas adjacent to the Miami and Mad Rivers, to the north, south and west of the site, are typically in excess of 500 to 1000 gpm, or more, while yields from the area immediately adjacent to Gem City Chemicals, Inc. may be from 100 to 500 gpm.

2.1.6 References

Bernhagen, R. J. (1945) Record of wells in Montgomery County: Ohio Water Resources Board Bull. 1

Clinch, J. M. (1991 a) Bedrock Topography Mapping and the Drainage History of Southwestern Ohio; Geological Society of America, Abstracts with Program, Vol. 23, No. 3, p. 8

Clinch, J. M. (1991 b) Bedrock Topography Mapping of Southwest Ohio: Procedures, Results and a few Speculations on the Teays Problem; Ohio Journal of Science, V. 91, No. 2, p. 34

Norris, S. E., Cross, W. P., and Goldthwait, R. P. (1948) The water resources of Montgomery County, Ohio: ODNR Div. of Water Bull. 12, 83 p.

Norris, S. E., and Spieker, A. M. (1966) Ground-Water Resources of the Dayton Area, Ohio: U. S. Geological Survey Prof. Paper 1808, 161 p.

Schmidt, J.J., (1986) Ground-Water Resources of Montgomery County; ODNR Division of Water Map

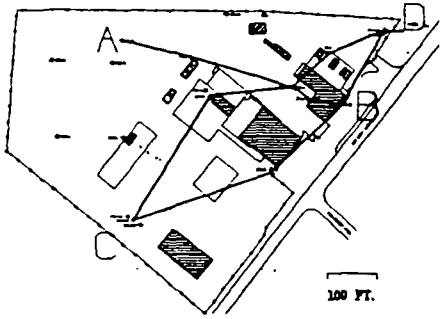
CH2M Hill, Inc. (1986) Miami Well Field Study

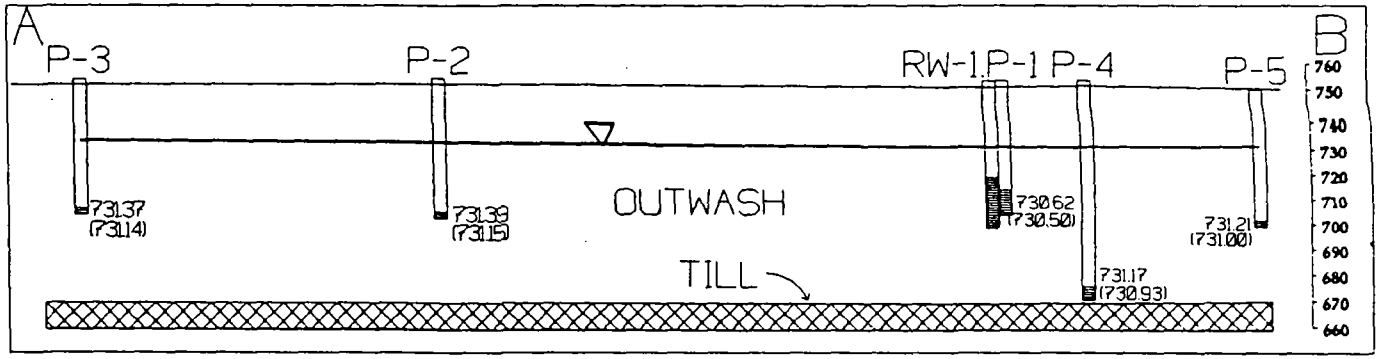
CH2M Hill, Inc. (1988) Miami South Source Investigation

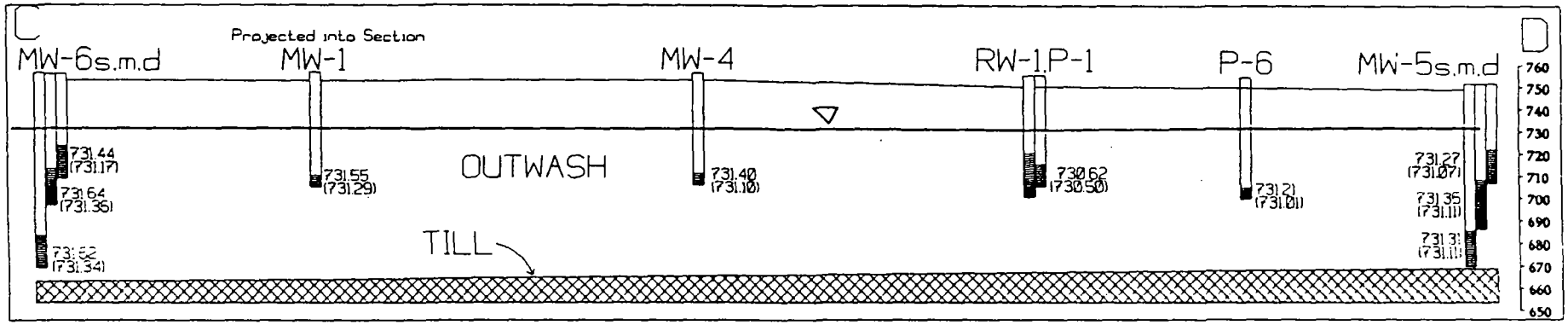
2.2 Site Stratigraphy

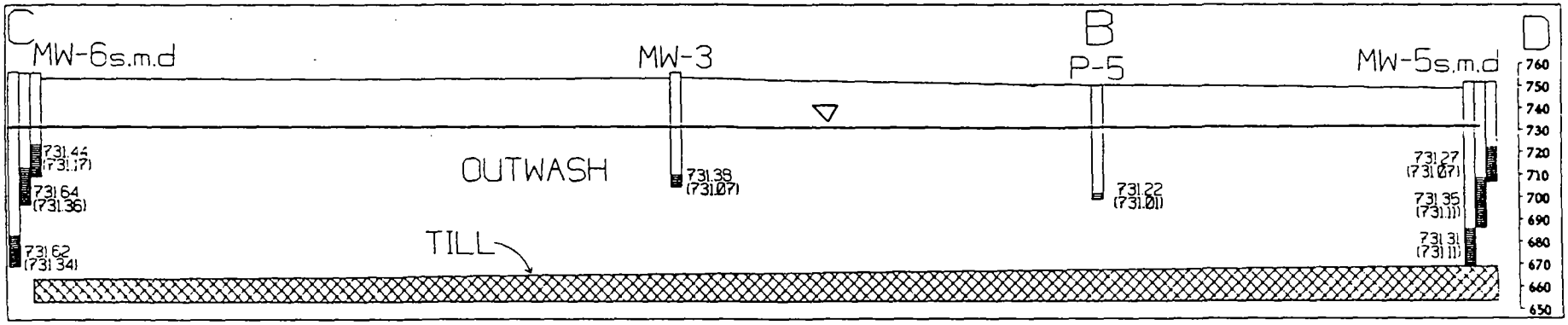
Since 1988, a total of twenty four test borings at thirteen locations have been drilled at Gem City Chemicals, Inc. Copies of the original boring logs are included as Exhibit F, and copies of the recently-completed test borings are included as Exhibit M. These logs indicate that the surface material at the site consists of between 80 feet and 90 feet of permeable, coarse to fine sand and gravel, overlying a continuous layer of dense, silt-rich till. A thin layer described as a "clay streak", and originally interpreted to be till, was reported in the test borings drilled during installation of the northern well cluster and the production well. This layer is approximately 2 feet thick and was detected between 15 and 19 feet below grade. A layer of oxidized, laminated fine sand and silt was encountered at this depth in several of the newly-completed test borings. Based on direct observations, the layer is interpreted to be a finer-grained fluvial layer within the uppermost layer of outwash materials. Figure 9 shows three cross sections of the site, two northeast-southwest cross-sections, and an east-west cross section.

LOCATION OF SECTIONS









HORIZONTAL SCALE (IN FEET)
NO VERTICAL EXAGGERATION

0 10 200

FIGURE 9
GEM CITY CHEMICALS, INC.
GEOLOGIC CROSS SECTIONS

QSOURCE

Drawn by: J. M. Clinch, Ph. D.

Project No. 193004

Date: July 12, 1993

- POTENTIOMETRIC SURFACE BASED ON FEB 8, 1993 DATA
- POTENTIOMETRIC VALUES SHOWN ADJACENT TO THE WELL SCREEN POSITION (FEB 23, 1993 VALUES IN PARENTHESES)

Figure 9 also shows the location of the screened interval for each of the wells located within the plane of each cross section, the profile of the potentiometric surface, and the values for the potentiometric surface elevation from each well or piezometer.

Wells W-1, W-2, W-3 and W-4 were drilled by Ohio Drilling Company of Massillon, Ohio, in 1987. The logs for these wells are included in Exhibit F; however, it is difficult to interpret these logs with certainty for two reasons. First, the wells were drilled using cable tool techniques, which do not return the relatively undisturbed samples for logging purposes that split spoon sampling does. Secondly, it is possible that a portion of the material descriptions is inaccurate and may need to be reinterpreted. This is especially apparent for material descriptions that include clay as part of the description. Frequently, when local water well drillers mention "clay" as part of their material descriptions, it signifies a compact, silty glacial till consisting largely of silt, some fine to medium sand, and trace to abundant pebbles, cobbles and boulders. However, local sand and gravel deposits often contain small, but significant, percentages of silt which can discolor wash water from cable tool operations to the extent that the deposit can be misclassified as having significant amounts of "clay" present. Taking these two factors into consideration, it is possible to reinterpret the logs supplied by the Ohio Drilling Company. The surface material in all four wells is sand with varying amounts of pebble to cobble-sized gravel, and trace amounts of silt ("clay" in the original logs). A till layer (described as either "Sand, Clay and Stones" or as "Sand & Clay Hardpan") was detected at a depth of 78 feet below ground surface in W-1, at 75 feet in W-2, and at 83 feet in W-3. Well 4, or W-4, was not drilled to the same depth as the other three wells, and thus no till layer was detected. In addition, a thin layer (5 feet thick) of "Sand & Clay Hardpan" was detected at a depth of 30 feet in W-3 but not in the other wells. There is some suggestion from the language of the sample descriptions that the average grain size of the sand and gravel deposit changes vertically, but these changes cannot be proven with certainty, or matched from well to well.

In previous reports, reference has been made to test borings made by the Ohio Department of Highways Testing Laboratory. These test borings were made in abutments for an overpass along Stanley Avenue. The surface elevation on the boring logs and the total depth of the borings suggest that the entire boring is in fill material. If this is so, no information about the site can be obtained from the borings.

Six test borings were completed at two locations on the site by Moody's of Dayton and G.J.Thelen, under contract to Qsource, in August 1988. At each location, a cluster of borings, which included shallow, intermediate and deep test borings, were drilled and completed as monitor wells. The lithologic descriptions for the shallow and intermediate borings are nearly identical to those for the deep borings, so only the deep boring results will be presented here. All six logs are included in Exhibit F.

Wells numbered W-5S, W-5M and W-5D are located near the intersection of Stanley Avenue and Air City Avenue, northeast of the Gem City Chemicals, Inc. office building. Materials detected in this test boring location include: 2 feet of clay (or perhaps silt) topsoil interpreted to be loess, 13 feet of sand and gravel, 2 feet of clay/silt, 63 additional feet of sand and gravel, and at least 5 feet of dense clay (or silt) "hardpan", or till. The deep test boring terminated at 85 feet, without penetrating the entire thickness of the till.

Wells numbered W-6S, W-6M and W-6D are located southeast of the Gem City Chemicals, Inc. office building. The materials detected in the deep test boring include: 90 feet of sand and gravel, overlying dense clay "hardpan", or till. The size of the sand and gravel changes at different levels in the deep boring, but these changes could not be correlated to the size variations in the other borings at this cluster location.

The presence of clay at the surface, in the thin layer at a depth of 15 feet and at depth in these two deep borings is questionable, as true clay-sized material is rare in Montgomery County. More likely, the material consists of silt, with trace amounts of fine sand and clay. It is also likely that a small percentage of silt was present in the sand and gravel deposits, again based on the typical composition of sand and gravel in southwestern Ohio.

The five vapor extraction wells were drilled to depths of 22 to 22.5 feet, through surface fill, overlying sand and gravel. None of these wells were drilled deep enough to encounter any of the other units found on site. The recovery well was drilled by Moody's of Dayton in March 1989. This well encountered 8 feet of clay and gravel beneath a concrete slab, overlying sand and gravel to a depth of 65 feet. A two-foot thick streak, or layer, of "clay" was observed at a depth of 19 feet. A copy of the ODNR well log, containing the stratigraphic information, is included in Exhibit F.

Three shallow and five deep test borings were completed at Gem City Chemicals, Inc. during January 1993. Logs for these test borings are included in Exhibit M. The interpretation of these logs was aided by the presence of an open excavation, made by the City of Dayton Department of Water at the intersection of Melberth and Air City Drive, for the purpose of completing a sewer connection. Features visible from the ground surface within this pit are described in a pit log, which is also included in Exhibit M.

Based on these newly-acquired logs, the following units are present beneath the Gem City Chemicals, Inc. facility:

1) The surface of the property is covered by a thin, disturbed layer composed of fine-grained loess, coal fragments and regraded fill materials. This layer is typically thin, from one to four feet thick across the site. Backfill materials, consisting of well-sorted medium sand were present at the site of test boring P-2. Based on material supplied by Gem City Chemicals, Inc., and included in Exhibit A, this was the site of five underground storage tanks which were removed in 1986.

2) The uppermost natural materials present at the site consist of a sand-and gravel deposit, interpreted to be deposited within a braided-stream channel. Materials recovered from the split spoon samples consisted of medium-to-coarse sand and small pebbles, grading downward into coarser-grained granules and pebbles. Coarser pebbles (to 4" diameter) were brought up in the auger flights, and some stones up to 6" long were observed in the excavated sewer connection pit. No bedding or structure was visible in the split spoon samples, due to disturbance of the sample while the spoons were driven. Based on the pit exposure, this uppermost unit is crudely bedded, with alternate, planar beds consisting of coarse

(2" to 6") clasts with interstitial fine sands and silt, and laminated coarse sands, granules and pebbles. Interstitial spaces within the coarse pebbles and cobbles are typically filled by medium-to-fine sand and little silt, interpreted to have been deposited as fillings of the open-work gravels. The thickness of this uppermost sand-and-coarse-gravel channel deposit is approximately 20 feet.

3) A thin, oxidized layer of fine sand to silt was encountered in test borings P-2, P-3, and P-4 at a depth of approximately 20 feet. The unit is faintly to prominently laminated. A "clay streak" or "silty clay" layer was observed in test boring logs for the MW-5 cluster and the recovery well RW-1. Where present, the thickness of the layer varies between 6 inches and 2 feet. The unit is interpreted to be a slack-water deposit formed in an abandoned channel or shallow lake, present on the surface of the outwash plain. This unit was locally truncated or completely eroded during deposition of the coarse-grained channel deposit described above.

4) From a depth of approximately 20 feet to the bottom of the uppermost aquifer, the outwash deposit is composed of interbedded coarse sand to granules, with subordinate amounts of pebbles, and trace silt. While no bedding structures were visible within this unit, evidence for both coarsening-upward and fining-upward cycles, up to 1 foot thick were observed. Coarser pebbles did not appear to be present; there were few cases where high blow counts attributable to large clasts were recorded, and the total recovery within the split spoon samples was generally high.

5) A very compact, silty lodgment till was encountered at a depth of 82 feet in test boring P-4. This till consists of dark gray silt, with little fine to coarse sand and trace pebbles, and is massive to sheared. There is no evidence for water flow through the till along the shears; while the overlying granular materials were saturated, the recovered samples of till contained no free water.

2.3 Hydraulic Connections

Based on the cross sections shown in Figure 9, all monitor wells are screened within a single aquifer unit. This unconfined aquifer extends from the ground-water table to a low-permeability till horizon, which is located at a depth of between 75 and 90 feet below the ground surface. The till was encountered in all six of the borings made on-site that reached a depth of 80 to 90 feet. The thickness of this till layer beneath the site is unknown, as no borings were advanced through the entire till thickness. However, the till is at least 11 feet thick at the site of MW-1. A nearby production well was drilled through the till, which was reported to be 18 feet thick. Based on the test boring information available, the till layer appears to be continuous across the actively-used portion of the site. In addition, examination of the publicly-available well logs for properties within 1/2 mile of the site shows that a thin-to-thick till layer was detected at depths of 80 to 100 feet at all sites where wells were installed at these depths or greater, which suggests that the till layer is continuous under the entire site and within 1/2 mile of Gem City Chemicals, Inc.

A thin, finer-grained sandy silt layer (1-2 feet) was detected within this aquifer in several of the borings on-site. About half of the well logs for properties north of the Gem City Chemicals, Inc. facility and within 1/2 mile record the presence of a shallow layer, generally assumed to be a till at similar elevations. Where present, the layer is generally above the ground-water table. The presence or absence of this layer may affect recharge flow directions and rates within this unconfined, surface aquifer on a local or regional scale. The absence of the discontinuous layer over most of the site suggests that it has no major effect on local flow directions or rates.

Regional studies suggest that a second aquifer is present beneath the till layer beneath Gem City Chemicals Inc., and that recharge into the underlying aquifer is through gaps or discontinuities within the till layer. Based on the available on-site data, and on well logs for sites in the vicinity, there is no evidence of a gap in the till layer within 1/2 mile of the site. Therefore, according to the available data, there is no apparent local connection between the unconfined surface aquifer and the deeper, confined aquifer.

2.4 Ground-Water Velocity and Horizontal and Vertical Flow Directions

Contour maps of the upper aquifer ground-water surface presented in the Norris and Spieker (1966) and CH2M Hill reports, cited earlier, suggest that the regional flow direction was originally towards the southwest, parallel to the flow of the Miami River, but is now to the north, due to the influence of the City of Dayton Miami South Wellfield, which was installed in the early 1960's. This regional flow can be modified, based on the influence of nearby pumping wells, or by variations in local recharge. Water levels measured on-site prior to installation and activation of the recovery well indicate a fairly flat water table, with only a slight gradient. The pre-pumping levels suggest ground-water flow in the upper aquifer to the northeast. The ground-water table gradient across the site at that time was 0.0004 ft/foot (2 feet/mile). The ground-water flow direction in the upper aquifer is now radially inward, towards the recovery well, as shown by the weekly potentiometric surface measurements made since the recovery well operations began. The present potentiometric surface gradient in the area surrounding the pumping well is approximately 0.002 feet/foot.

Relatively little aquifer testing has been done in the vicinity of the Gem City Chemicals, Inc. Regional-scale and local-scale modelling studies have generally been conducted by assuming values for hydraulic conductivity, storativity, saturated thickness, based on earlier reports, and adjusting the conductivity values during a model calibration phase.

Values for the aquifer parameters obtained through this process as part of a model developed by CH2M Hill in 1972, and used to plan for development at the Miami South Well Field are:

Upper Aquifer

Hydraulic Conductivity	-	0.003 ft/sec (260 ft/day, 2021 GPD/ft^2)
Storativity	-	0.2 ft/ft

Till Layers

Hydraulic Conductivity	-	0.44×10^{-6} ft/sec (0.04 ft/day, 0.3 GPD/ft^2)
Storativity	-	0 ft/ft

Lower Aquifer

Hydraulic Conductivity	-	0.001 ft/sec (87 ft/day, 710 GPD/ft^2)
Storativity	-	0.00001 ft/ft

This model assumed a 50 foot thick saturated zone in the upper aquifer, and variable thicknesses for the till and lower aquifer; consequently the transmissivity values were not calculated directly. All values were calculated assuming that each of the layers within the model are homogeneous and isotropic. Due to the directions of flow that are calculated from this model, the calculated hydraulic conductivities are likely to reflect the horizontal conductivity in the "upper" and "lower" aquifers, and the vertical conductivity through the till. Considerable local variability from these values is likely across the region.

During the pump test conducted at Gem City Chemicals, Inc. on February 21, 1990, the recovery well was pumped at a rate of 340 gallons per minute, and the water level in a piezometer installed 3.5 feet away from the pumping well was monitored. The drawdown was 0.75 feet after 450 minutes of pumping. This gives a value for transmissivity of 52,900 ft^2/day or 395,000 gpd/ft. and conductivity of 0.226 cm./sec (755 ft./day). This value is approximately 3 times the average value calculated from model studies. The effective porosity of the silty sands and gravels found in the Dayton area is estimated to be 20%. The storativity is estimated to be 0.10 to 0.20, based on the estimated effective porosity.

Based on these values, the pre-pumping ground-water flow velocity is estimated to be approximately 1.2 feet per day. The current flow velocity in the area surrounding the pumping well is estimated to be 6.4 feet per day.

$$V_{prior} = \frac{K\frac{\Delta h}{\Delta l}}{n_e} = \frac{755\frac{ft.}{day} * 0.0004\frac{ft.}{foot}}{0.20} = 1.2\frac{ft.}{day}$$

$$V_{pumping} = \frac{K\frac{\Delta h}{\Delta l}}{n_e} = \frac{755\frac{ft.}{day} * 0.002\frac{ft.}{foot}}{0.20} = 6.4\frac{ft.}{day}$$

The potentiometric surface elevations have been measured in the two well clusters located at the northeast and southwestern limits of Gem City Chemicals, Inc. The levels measured in the three wells in each cluster are similar, which indicates that the ground-water flow is nearly horizontal at both locations.

Since the recovery well RW-1 is not screened across the entire saturated thickness of the upper aquifer, Gem City Chemicals, Inc. was required to install a single piezometer screened at the bottom of the aquifer and located near the recovery well. Piezometer P-4 was installed and screened at the base of the aquifer, at a depth of between 77 and 82 feet. Potentiometric levels measured in this piezometer were to be compared to the values obtained from P-1 (located adjacent to the recovery well screen), in order to evaluate whether or not water from the base of the aquifer was being captured by the recovery well. On February 8, 1993, the potentiometric surface value measured from P-4 was 731.17 feet msl, while the value measured from P-1 was 730.62 feet msl. Therefore, there is a localized upward flow present in the area immediately surrounding the recovery well, induced by water withdrawal from the partially-penetrating recovery well.

Due to the presence of the till layer separating the valley fill deposits into "upper" and "lower" aquifer systems, the direction of ground-water flow must be evaluated separately for each of the two layers. As described above, a low-permeability till layer is present beneath Gem City Chemicals, Inc. and for at least 1/2 mile surrounding the site. This till layer effectively isolates the uppermost, unconfined aquifer at Gem City Chemicals, Inc. from any deeper, confined aquifers that may be present.

Ground-water flow directions in the lower aquifer have changed considerably during the past thirty years, due to changes in water usage in the surrounding areas. Potentiometric maps compiled by Norris and Spieker (1966) for 1959 and 1960 (prior to the time when the Miami South Wellfield began operations) show ground-water flow to the southwest, towards a wide cone of depression developed beneath the central business district of Dayton, and also towards industrial facility water supply wells to the southwest. A major cone of depression had developed beneath the Miami South Wellfield following the beginning of production of water from the wellfield, in the early 1960's. Maps compiled by CH2M Hill for 1972 and for 1986 show this cone of depression. The location of Gem City Chemicals, Inc. appears to be on or near a divide between these two cones of depression, and the direction of ground-water flow at the site could be either to the north or to the south, or it could fluctuate depending on recharge

variations and variability in the pumping rates at either the industrial water supply wells or in the city wellfields.

2.5 Evaluation of Factors Affecting Ground-Water Movement

Ground-water movement in this part of Dayton is either towards the Miami River (north and west of the site) or towards the Mad River (south of the site). The ground-water divide between these two flow systems has been near or under this site. The gradients in either direction are very low, and the divide can shift.

Based on the historical potentiometric surface maps from Norris and others (1966) and the CH2M Hill reports and on the data generated as part of the ongoing remediation efforts at Gem City Chemicals, Inc., the factors affecting local ground-water movement include variable pumping rates by major ground-water users surrounding the site, variations in local recharge, and pumping the on-site recovery well.

Historical data suggest that the flow direction in the upper aquifer was initially to the southwest, parallel to the Miami River flow direction, and that the broad, poorly-defined divide between southwest and northward flow was located to the north of the site. Flow directions appear to have changed following the installation of the City of Dayton Miami South Wellfield in the early 1960s. The ground-water flow divide originally located north of the site shifted to the south, and flow directions at the site changed, shifting to the northeast. Variations in the pumping rate at the wellfield may cause changes in the flow direction at the site in the future. The potential for future shifts in the position of ground-water divides is high because the gradient across the area surrounding the site is nearly flat.

Additional changes in ground-water flow directions or rates may be caused by variations in the amount of on-site recharge, which can be inferred from the data shown in Figure 6. According to the weekly potentiometric surface measurements made on-site since March 1990, the elevation of the ground-water surface has varied by approximately 12 feet, reaching a high of slightly over 730 feet MSL in January 1991 and a low of slightly over 718 feet in February 1992. The variations reflect changes that normally occur on a yearly cycle in the local unconfined aquifers, with a rising ground-water table during the winter and spring and a falling ground-water table during the summer and fall. This natural cycle can be modified by short-term droughts or periods of excess moisture; the lows in December through the beginning of March correspond to a moderate drought in southeastern Ohio, while levels are currently rising (in July 1992) in response to higher-than-normal rainfall. On this small site, variations in recharge do not appear to affect the direction of ground-water flow to the recovery well. However, they do affect the overall elevation of the ground-water table and the total saturated thickness of the aquifer, and may have a minor effect on the size of the ground-water cone of depression.

The most important factors affecting ground-water movement on the site are the presence of the recovery well in the center of the site, and the removal and treatment of approximately 300 gallons of water per minute. The result of the pumping has been the formation of a broad, shallow cone of depression on-site. This cone of depression is clearly evident in the potentiometric map shown as Figure 7, in the selected potentiometric maps included as Exhibit C, and in all of the potentiometric maps submitted to the OEPA as part of the quarterly

remediation monitoring results. The presence of the cone of depression is also evident in Figure 6, a plot of the potentiometric surface elevation values at the monitor wells and piezometer P-1 with time. According to this chart, the potentiometric surface elevation at the piezometer (located adjacent to the recovery well) is nearly a foot lower at any point in time than that for any of the monitor wells on-site.

The creation of this cone of depression has led to a radially-inward flow pattern, towards the recovery well, and present beneath the actively-used portions of the site. The sidegradient limit of the cone of depression induced by the recovery well extends beyond the location of P-2, and therefore, the zone of capture extends across the entire actively-used portion of the facility. Qsource believes that the zone of capture is normally beyond P-2 for a couple of reasons. Contour lines on the potentiometric surface are not expected to make sharp angles for sand and gravel aquifers and broad curves would cover more of the area. Also, those initial readings represented the configuration of the cone of depression during the time of highest water levels. As water levels fall, the cone of depression will spread. Water level records for this site demonstrate a 14 foot decrease in water levels (21% of the aquifer thickness) is expected from these high levels. In fact, since the time of the initial readings, potentiometric levels at P-3 have been consistently higher than at P-2. This induced flow pattern means that the site no longer contributes water to the regional flow system downgradient of the site. All precipitation that infiltrates into the ground and percolates downward to the ground-water table within the radius of influence now flows inward, toward the recovery well. In addition, all ground water that flows towards the cone of depression from upgradient sites will also be captured by the recovery well. Any contaminants that may be present from upgradient sources will be detected in the monitor wells, pumped out of the aquifer at the recovery well, and treated in the air stripper. Thus, while the site will have no effect on the ground-water quality downgradient of the cone of depression, due to the remediation efforts, the site is affected by changes in ground-water quality located upgradient of the site.

While it is theoretically possible that chlorinated hydrocarbons might migrate in different directions than the ground-water flow directions, the VOCs present in the ground water beneath the Gem City Chemicals, Inc. are migrating with the ground water and are being contained and remediated by the recovery well and air stripper system. Chlorinated hydrocarbons may migrate in different directions than the ground-water flow, due to the density difference between the compounds and water and due to the relatively low solubility of the compounds in water. Tetrachloroethene, trichloroethene, 1,1,1-trichloroethane and most of their breakdown products have densities higher than that of water and have solubilities of between 0.15 and 9 parts per thousand. Due to the density contrast and low solubility, these compounds are known as Dense, Non-Aqueous Phase Liquids or "DNAPLS". In cases of massive, catastrophic releases, these compounds tend to sink to the bottom of an aquifer system, and migrate downslope as a separate, non-aqueous phase. The saturated thickness of the aquifer usually contains relatively constant concentrations of the compounds, present as separate droplets trapped between soil particles, at a concentration known as the residual saturation.

However, the site history, the chemical sampling performed during the installation of the first four monitoring wells, and the long-term monitoring of the MW-5 and MW-6 cluster indicate that no separate phase is present beneath Gem City Chemicals, Inc. No massive release of chlorinated solvents is reported to have taken place. In addition, as shown in Table 4, a

comparison between the solubility of the chlorinated hydrocarbons and the maximum concentrations ever measured in the on-site monitoring wells, the concentrations of VOCs present in the ground water are far below the maximum solubilities for the compounds. This indicates that the compounds are dissolved and are moving with the ground water and are not migrating as a separate phase. Finally, the concentrations of chlorinated solvents are generally highest at shallow or intermediate depths and decline downward to near non-detect values near the bottom of the aquifer. The concentrations of trichloroethene were monitored during the drilling and installation of MW-1 through MW-4. While the total depth to the bottom of the aquifer was between 75 and 80 feet at each well site, the maximum TCE concentration was found at a depth of about 45 feet. Either the shallow or the intermediate-depth wells at the MW-5 and MW-6 cluster have historically had the highest VOC concentrations. These results indicate that the VOCs are traveling as a dissolved phase within the ground water, and that the ground-water flow direction can be used to predict the migration direction of the VOCs. Those VOCs present at high concentrations immediately beneath the ground water table are likely to have originated at Gem City Chemicals, Inc. The cases where the water samples from the intermediate-level wells have higher concentrations than those for samples from either shallower or deeper level wells on the upgradient side of the property probably indicate migration of the compounds from off-property locations.

Compound	Solubility (ug/l at a given temperature)	Specific gravity (water = 1.00)	Maximum concentration observed at GCC (ug/l)
Chlorinated Ethanes			
1,1,1-Trichloroethane	4,400,000 at 20° C	1.35	1830
1,2-Dichloroethane	8,690,000 at 20° C 9,200,000 at 0° C	1.25	120
1,1-Dichloroethane	5,500,000 at 20° C	1.174	99
Chlorinated Ethenes			
Tetrachloroethene	150,000 at 20° C	1.626	848
Trichloroethene	1,100,000 at 20° C	1.46	597
cis-1,2-Dichloroethene	800,000 at 20° C	1.28	2000
trans-1,2-Dichloroethene	600,000 at 20° C	1.26	24
1,1-Dichlorooethene	400,000 at 20°C	1.218	152
Vinyl Chloride	1,100,000 at 20° C	0.9121	9

3.0 EFFECTIVENESS OF THE GROUND-WATER MONITORING SYSTEM

3.1 Number of Wells

A total of eleven wells and six piezometers have been installed at Gem City Chemicals, Inc. as part of the ground-water monitoring system. Ten monitor wells have been installed at six sites at Gem City Chemicals, Inc. A single, large diameter recovery well has also been installed, and a piezometer is located adjacent to the recovery well, in order to monitor the potentiometric surface level. An additional five piezometers were installed in January 1993 to further delineate the extent of the ground-water cone of depression and demonstrate that no further off-property migration of contaminants is occurring.

3.2 Well and Piezometer Locations

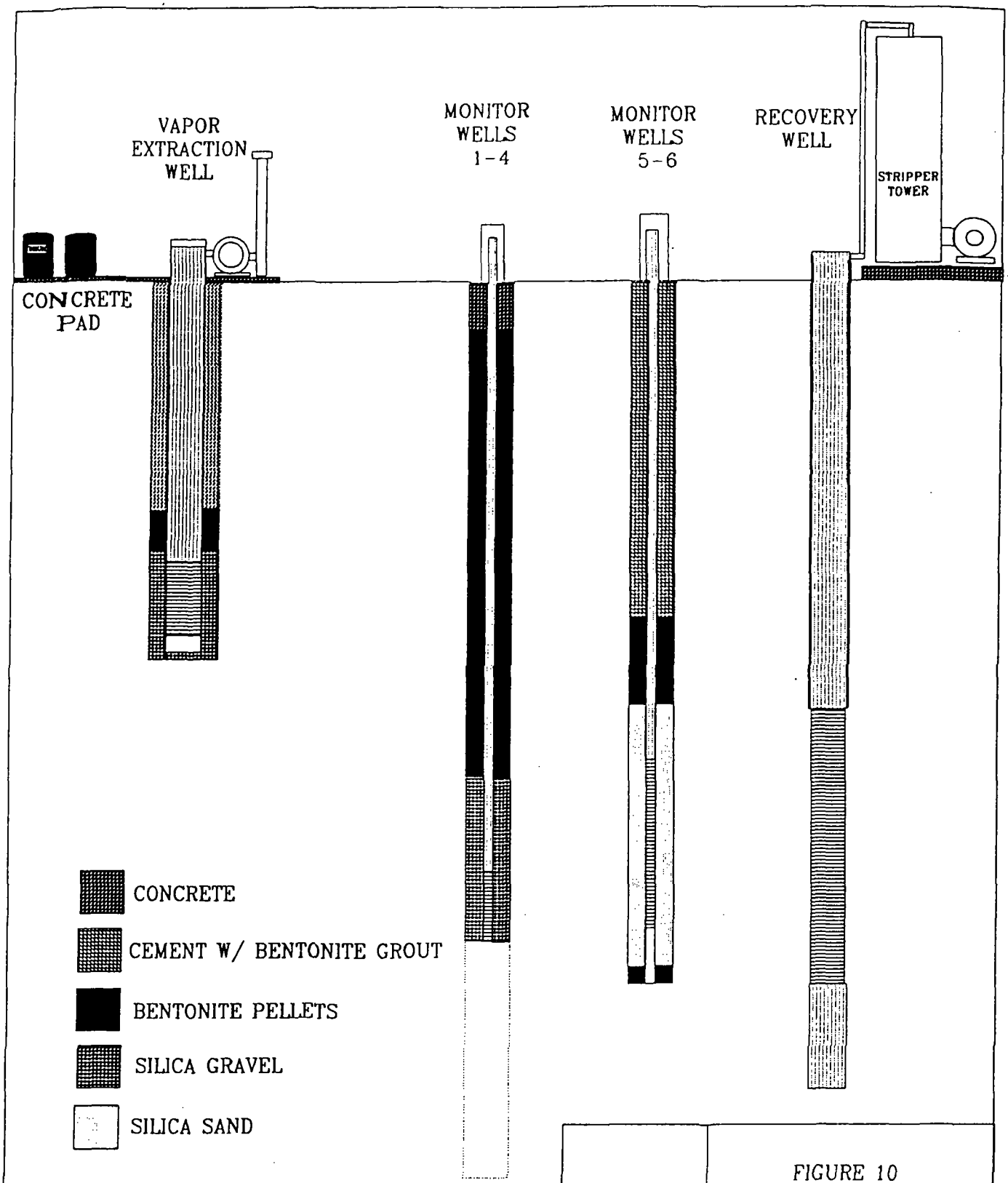
The location of the monitor wells, recovery well and piezometers are shown in Figure 5. Four single wells are located surrounding the portion of the site used for chemicals storage and transfer, and two clusters of three wells each are located to the northeast and southwest of the active portion of the site. A single recovery well is located near the center of the site, and a piezometer has been installed adjacent to the recovery well in order to monitor the drawdown induced by the recovery well. Additional piezometers are located to the west, north and east of the recovery well in order to provide additional potentiometric surface data. A single piezometer is located near the recovery well, and screened at the base of the aquifer, to demonstrate that the recovery well is withdrawing water from the base of the aquifer.

3.3 Well and Piezometer Construction

As-built diagrams for the monitor wells, the recovery well and the piezometers are included in Exhibit G and M. Figure 10 shows the typical construction details for the monitor wells, the recovery well and the vapor extraction wells installed at the site. Table 5 is a summary of the relevant information concerning each of the wells installed on the site, including the elevation of the top of casing, the total depth and screened interval, and the date installed.

3.4 Potentiometric Maps

As part of the ongoing monitoring program instituted by Gem City Chemicals, Inc., the depth to water and potentiometric surface elevation measurements have been determined weekly since March 1990. These levels are tabulated in Exhibit C. Potentiometric maps have been constructed from this data, using the potentiometric surface elevation data from piezometer P-1, monitor wells MW-1 through MW-4, and MW-5m and MW-6m. The potentiometric surface elevation determined from the intermediate well at each cluster was chosen for contouring because the screened interval at these two wells most closely approximates the screened interval at the other monitor wells, and because the ground water appears to flow horizontally.



QSOURCE ENVIRONMENTAL SERVICES, INC.

FIGURE 10

GEM CITY CHEMICALS

WELL TYPICALS

TABLE 5

SUMMARY OF MONITOR WELL INFORMATION

WELL ID	TOC ELEVATION	GROUND ELEVATION	ELEVATION PROTECTIVE STEEL RISER	COLLECTION ZONE	DRILL DEPTH	AV.DEPTH TO WATER FROM TOC	AVERAGE WATER ELEVATION	WELL CONSTR. MATERIAL	CASING DIA.	DATE INSTALLED	DRILLER
MW-1	754.87	752.63	756.28	42' - 47'	89'	30.01	725.47	GS & SS	2"	11/87	Ohio Drill
MW-2	753.69	751.28	754.82	42.3'- 47.3'	81'	29.91	725.32	GS & SS	2"	12/87	Ohio Drill
MW-3	755.88	753.94	757.25	43.5'- 48.5'	85'	31.22	725.34	GS & SS	2"	12/87	Ohio Drill
MW-4	754.95	753.05	756.22	42' - 47'	45'	30.16	725.41	GS & SS	2"	1/88	Ohio Drill
MW-5s	751.20	748.51	751.37	27' - 42'	50'	25.91	725.29	PVC & SS	2"	8/88	G.J.Thelen
MW-5m	751.53	748.68	751.61	40.5'- 62.5'	60'	26.22	725.31	PVC	2"	8/88	G.J.Thelen
MW-5d	751.16	748.47	751.31	63.5'- 79'	85'	25.90	725.26	PVC & SS	2"	9/88	Moody's
MW-6s	754.97	753.04	755.75	29.5'- 44'	48'	29.42	725.55	PVC	2"	9/88	G.J.Thelen
MW-6m	755.55	752.86	755.54	40' - 56'	60'	29.38	725.67	PVC	2"	8/88	G.J.Thelen
MW-6d	755.77	753.15	756.09	70' - 84'	90'	30.11	725.66	PVC	2"	9/89	Moody's
RW-1	753.47	n/a	n/a	30' - 50'	65'	n/a	n/a	GS	8"	9/89	Moody's
P-1	754.51	n/a	none	34' - 50'	n/a	29.81	724.70	PVC	2"	1/89	Moody's
P-2	754.57	n/a	n/a	48.0'-50.2'	50'	23.18*	731.39*	PVC	1 1/4"	1/93	Moody's
P-3	754.29	n/a	n/a	46.6'-48.8'	50'	22.92*	731.37*	PVC	1 1/4"	1/93	Moody's
P-4	753.56	n/a	n/a	47.6'-49.8'	82'	22.39*	731.17*	PVC	2"	1/93	Moody's
P-5	749.93	n/a	n/a	76.0'-81.0'	50'	18.71*	731.22*	PVC	1 1/4"	1/93	Moody's
P-6	752.91	n/a	n/a	47.6'-49.8'	50'	21.70*	731.21*	PVC	1 1/4"	1/93	Moody's
VE-1	752.90	n/a	none	19.5' - 22'	22.3'	20.792**	732.108**	PVC	4"	10/88	Mathes
VE-2	752.85	n/a	none	19.5' - 22'	22'	20.146**	732.704**	PVC	4"	10/88	Mathes
VE-3	753.75	n/a	none	19.5' - 22'	22.5'	21.333**	732.417**	PVC	4"	10/88	Mathes
VE-4	753.98	n/a	none	19.5' - 22'	22'	20.833**	733.147**	PVC	4"	10/88	Mathes
VE-5	754.33	n/a	none	19.5' - 22'	n/a	21.146**	733.184**	PVC	4"	10/88	Mathes

* on 02-08-93
** on 06-30-89
n/a = not available

QSOURCE

A comparison between potentiometric surface data for each of the wells in the two well clusters shows that there is little difference in the potentiometric surface elevations, and no difference in the resulting potentiometric surface maps.

The potentiometric surface maps and supporting data have been submitted to the Ohio EPA for review on a monthly basis since early 1990. Selected examples of the 120 maps submitted to the OEPA are included as Exhibit D. Figure 7 is a potentiometric surface map prepared using data from the existing monitoring well network and the newly-installed piezometers.

3.5 Effectiveness of the Ground-Water Recovery System

The effectiveness of the control of off-site migration is evaluated using potentiometric surface maps. The newly-compiled potentiometric map, shown as Figure 7, the example maps included as Exhibit D and the 120 potentiometric maps, compiled weekly and submitted to the Ohio EPA, demonstrate that the recovery well installed on-site has induced a cone of depression that extends beneath a substantial portion of Gem City Chemicals, Inc., including all areas of past and current chemical storage and transfer. A plot of potentiometric surface elevations with time, included as Figure 6, shows that the water level in P-1, adjacent to the pumping well has consistently been as much as one foot lower than levels measured in other wells on-site. This demonstrates that the cone of depression beneath the site has been consistently maintained for over two years, independent of the natural fluctuations in ground-water levels during that period of time. The potentiometric maps, the ground-water flow directions determined from these maps, and the plot of potentiometric surface elevations with time demonstrate that the ground-water control system is successful in preventing the off-site migration of ground water.

3.6 Ground Water Chemical Monitoring Effectiveness

The ground-water quality beneath Gem City Chemicals, Inc. is monitored by periodic sampling of all of the monitor wells and analysis of the samples for VOCs. The four then existing monitor wells were initially sampled in May 1988. All ten monitor wells were sampled in September 1988, following installation of the MW-5 and MW-6 well clusters. All wells were resampled in August 1989. Quarterly sampling and analysis was initiated in 1990 and continued for one year. All wells are currently sampled on a semi-annual basis, with one sample taken in late winter/early spring, when ground water levels are highest, and another sample taken in late autumn, when ground water levels are lowest. The analytical results obtained to date are summarized in Table 2. Copies of all laboratory results have been submitted to the OEPA for review, attached to the monthly progress reports. Based on the distribution of the monitor wells, these data adequately monitor the water quality for the entire area beneath the past and currently-active chemical storage and transfer areas.

In order to evaluate the changes in water quality with time across the site, charts have been prepared showing the concentrations of the chlorinated ethane family (1,1,1-trichloroethane and its' breakdown products) and the chlorinated ethene family (tetrachloroethene, trichloroethene and their breakdown products) in each well with time. For the sake of clarity, three separate charts have been prepared for each chemical family. The first chart for each chemical family shows the concentrations in water samples from wells located upgradient from the actively-used portion of the site, and regionally upgradient from the recovery well (MW-1 and the three wells

in the MW-6 cluster). The second chart for each chemical family shows the concentrations in water samples from the two wells within the actively-used portion of the site, and regionally upgradient from the recovery well (MW-3 and MW-4). The third chart for each chemical family shows the concentrations in water samples from wells regionally downgradient from the facility, and regionally downgradient from the recovery well (MW-2 and the three wells in the MW-5 cluster). As shown by the potentiometric surface mapping in Figure 7, all of the monitoring wells are now "upgradient" from the recovery well, due to the size of the cone of depression and zone of capture induced by the recovery well. An arrow on each of these charts indicates the time that the recovery well and treatment system began operations. In order to facilitate comparisons, the vertical scale on all three of the charts is the same.

Figure 11 shows the charts for concentrations of chlorinated ethanes, while Figure 12 includes the charts for concentrations of chlorinated ethenes. In addition, similar charts were prepared for each of the major chlorinated compounds that are typically found. A line representing the Maximum Contaminant Level (if established) in Figures 13, 14 and 15 show the concentrations with time of 1,1,1-trichloroethane, 1,2-dichloroethane and 1,1-dichloroethane. Figures 16, 17, 18 and 19 show the concentrations of tetrachloroethene, trichloroethene, total 1,2-dichloroethene and 1,1-dichloroethene. Total 1,2-dichloroethene was plotted instead of plotting the two separate isomers of 1,2-dichloroethene, because much of the historic data were reported as total values. Inspection of the more recent analytical data suggests that over 90% of the total 1,2-dichloroethene is composed of the cis-1,2-dichloroethene isomer. However, for comparison purposes only, the total 1,2-dichloroethene value is compared to the MCL for trans-1,2-dichloroethene, the isomer with the lower MCL.

These charts of concentrations of solvents with time clearly indicate that the ground-water recovery and treatment system at the Gem City Chemicals, Inc. facility is effectively preventing the further off-property migration of VOCs and has made progress in remediating the ground water beneath the facility.

The data also indicate that remediation efforts may be hampered by the presence of elevated levels of VOCs detected in the upgradient wells, and presumed to be flowing under the Gem City Chemicals, Inc. facility from unknown, upgradient sources. These conclusions are supported by the following evidence.

1) The concentrations of chlorinated ethanes and ethenes were originally highest in the shallow well of the MW-5 cluster, prior to the onset of remediation. These levels were falling, which may have been due to the monitoring the passing of a high concentration slug that was moving through the site in the aquifer. Following installation of the recovery well, ground water flow has locally been reversed at the MW-5 cluster and is now flowing towards the recovery well, as shown by the potentiometric surface maps. Following the start of remediation, the chlorinated ethane and ethene levels initially rose in samples from both MW-5s and MW-5m, and then fell. This may have been evidence that the recovery system was able to pull back part of the slug that has passed. The water now entering the site has lower concentrations of chlorinated solvents than are present in wells on-site and have concentrations comparable with, or lower than concentrations found in the upgradient wells. The chlorinated solvent

concentrations are now typically lower in samples from MW-5s than in samples from MW-5m. The most likely explanations for this pattern of continuing decrease in concentration with time are 1) a steady dilution due to the inflow of regionally downgradient and sidegradient ground water into the recovery system, and 2) dilution and downward flushing of VOCs in the shallow ground water due to infiltration within the zone of capture at and beyond MW-5 cluster.

2) Moderate concentrations of 1,1,1-trichloroethane and trichloroethene, at levels above the MCLs, have been present in samples from the upgradient wells, MW-1, and shallow and intermediate level wells in the MW-6 cluster. However, the concentrations of these compounds have risen substantially then fallen over the course of the last three sampling events. In addition, tetrachloroethene and several breakdown products (dichloroethenes and dichloroethanes) have also been detected in samples from these wells. These wells are regionally upgradient from the actively-used portion of the site, and the MW-6 cluster is located only 50 feet from the southwestern property limit. The best explanation for the observed pattern of VOC concentrations with time is that the chlorinated solvents detected in these wells originate from an unknown, upgradient source. During these sampling events, the ground water quality in these upgradient wells is worse than that in the regionally downgradient wells.

3) The chlorinated solvent concentrations measured in samples from MW-3 and MW-4 have fluctuated with time, with neither an increasing or decreasing trend apparent until recently. Historically, the solvent content in samples from MW-4 have been below the MCLs for all compounds except for trichloroethene. Over the past two sampling periods, the VOC concentrations in samples from both wells has risen, with an especially noticeable rise in the content of chlorinated ethanes (1,1,1-TCA) in samples from MW-4. As was the case for the regionally upgradient wells, the increase in concentrations was also characterized by increases in the concentration of tetrachloroethene and breakdown products (dichloroethenes and dichloroethanes). While these two wells are located within the portion of the facility where solvents are, or have been stored, they are also located between the regionally upgradient wells and the recovery well. It is likely that the same upgradient source is responsible for the increase in VOC content in MW-3 and MW-4, as well as in MW-1 and the MW-6 cluster.

Figure 11 - Gem City Chemicals, Inc.
Sum of Concentrations of Chlorinated Ethanes

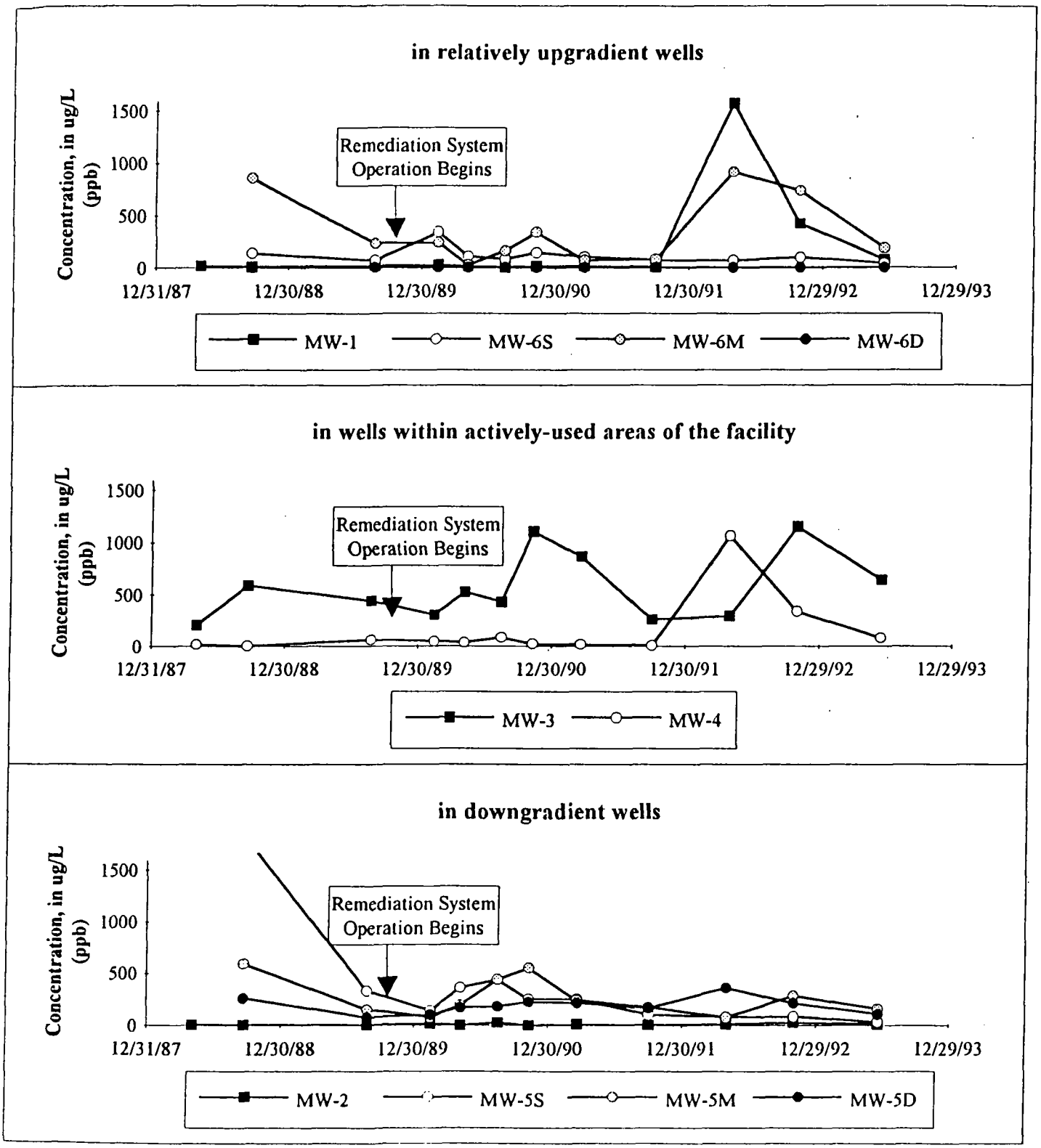


Figure 12 - Gem City Chemicals, Inc.
Sum of Concentrations of Chlorinated Ethenes

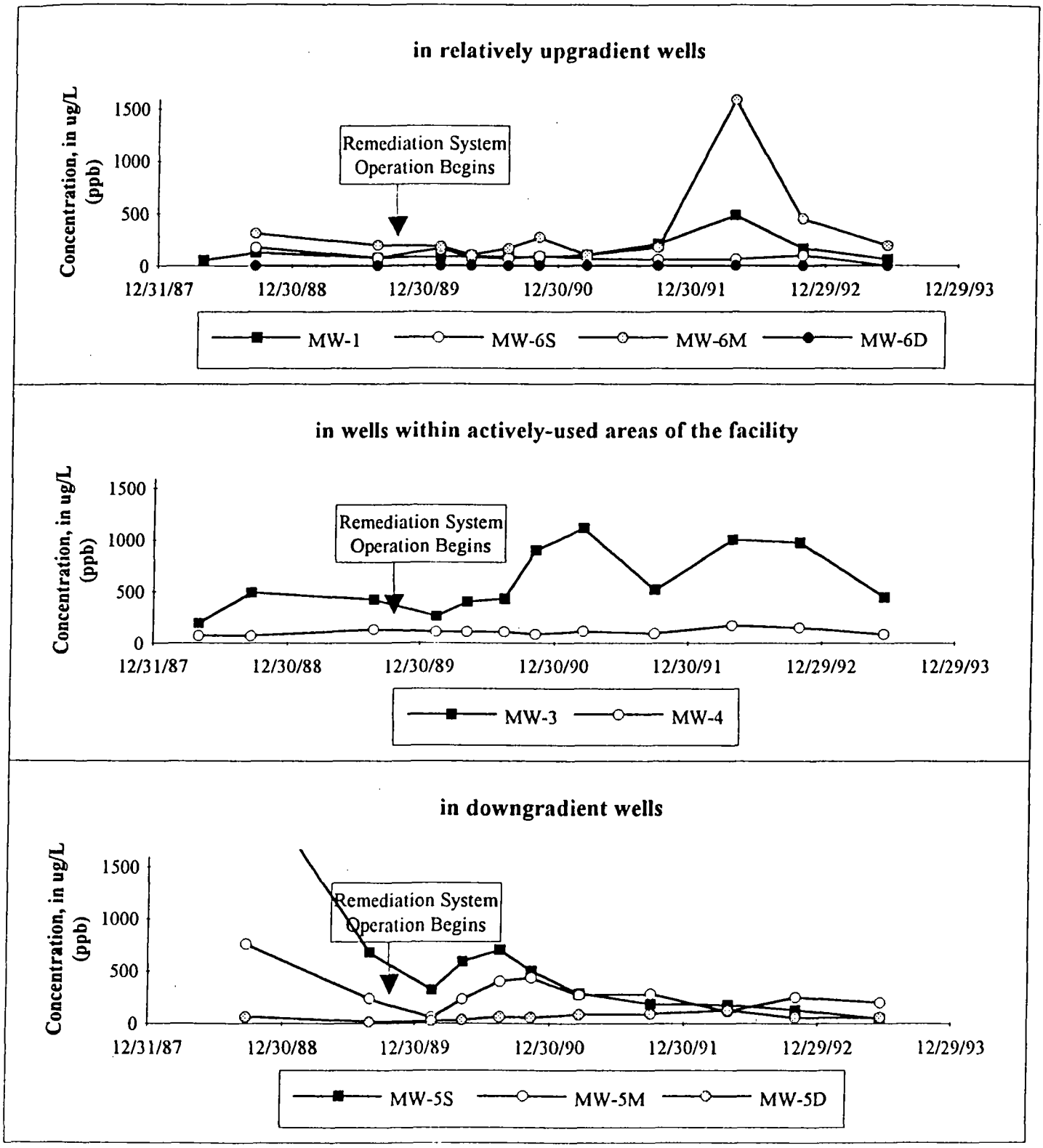


Figure 13 - Gem City Chemicals, Inc.
Concentrations of 1,1,1-Trichloroethane
MCL for 1,1,1-Trichloroethane = 200 ppb

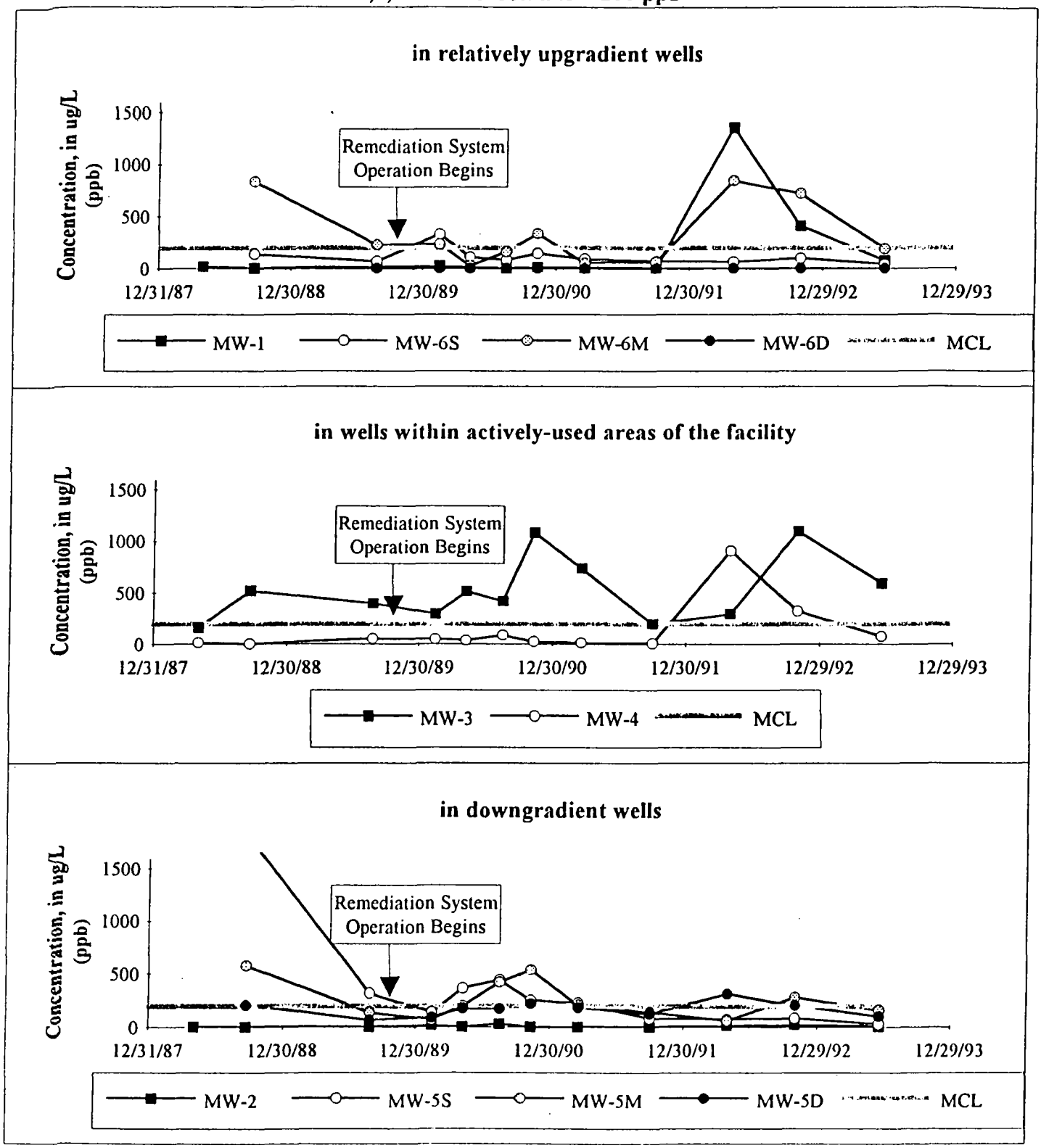


Figure 14 - Gem City Chemicals, Inc.
Concentrations of 1,2-Dichloroethane
MCL for 1,2-Dichloroethane = 5 ppb

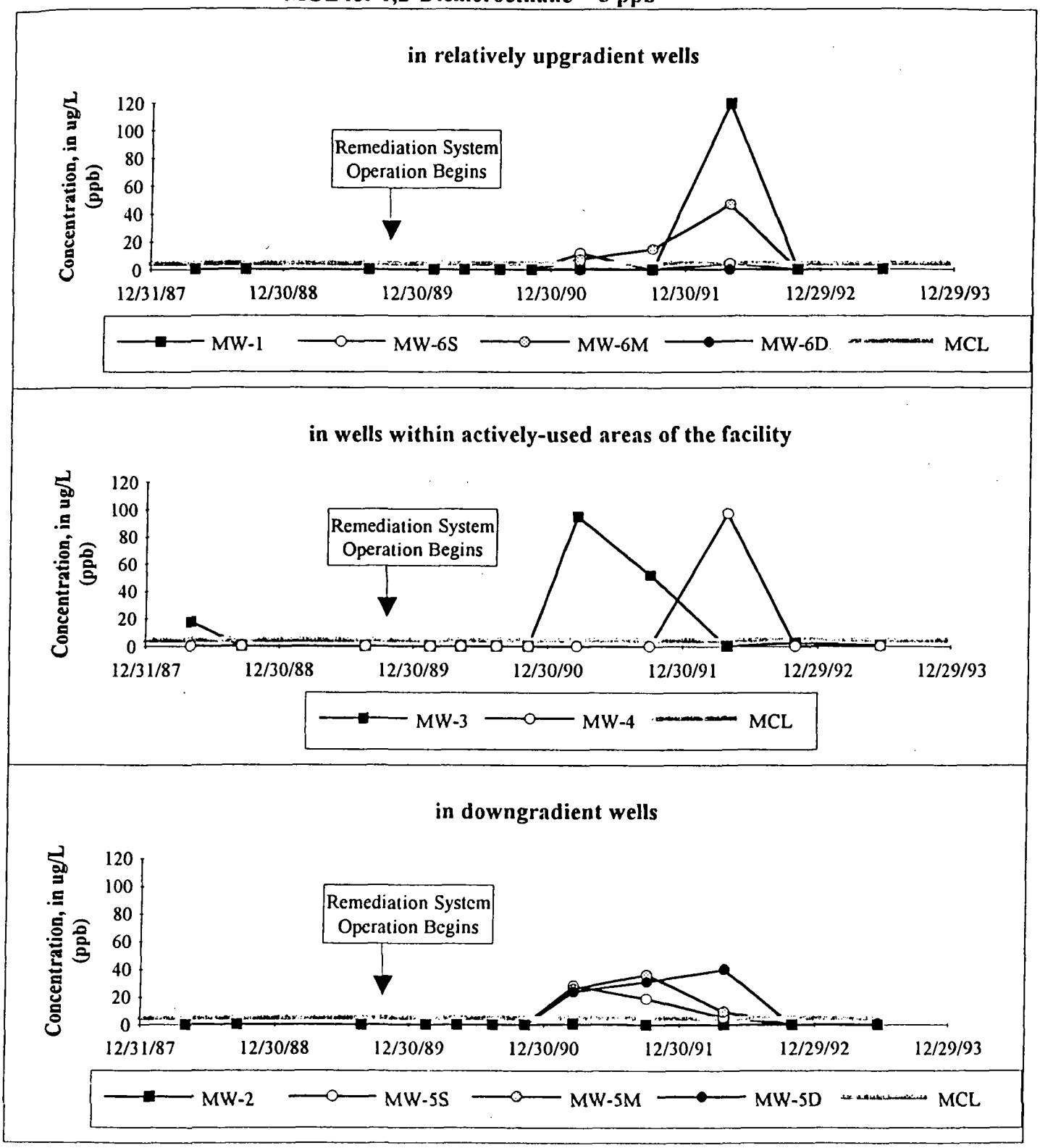


Figure 15 - Gem City Chemicals, Inc.
Concentrations of 1,1-Dichloroethane
Note - No MCL established

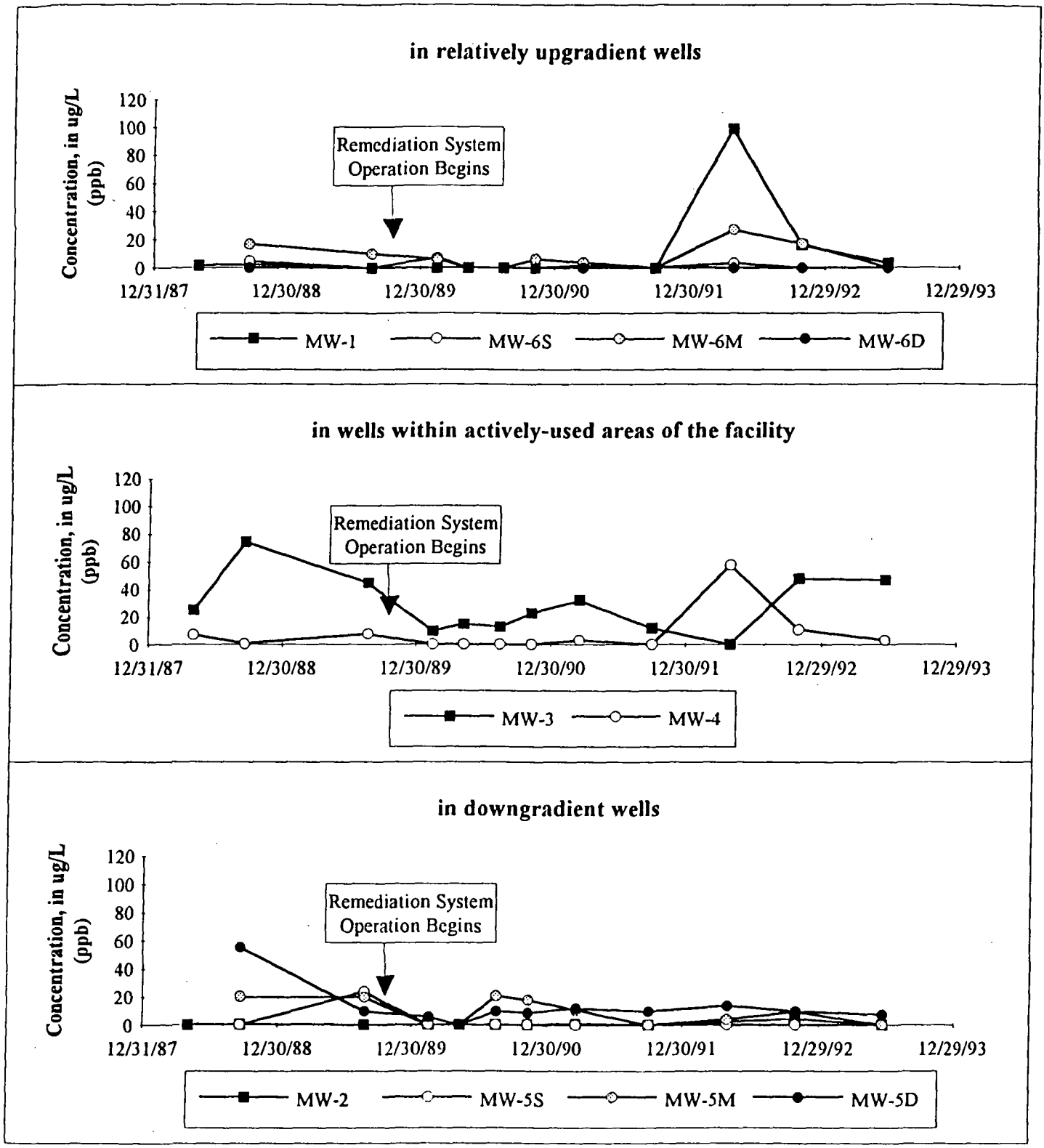


Figure 16 - Gem City Chemicals, Inc.
Concentrations of Tetrachloroethene
MCL for Tetrachloroethene = 5

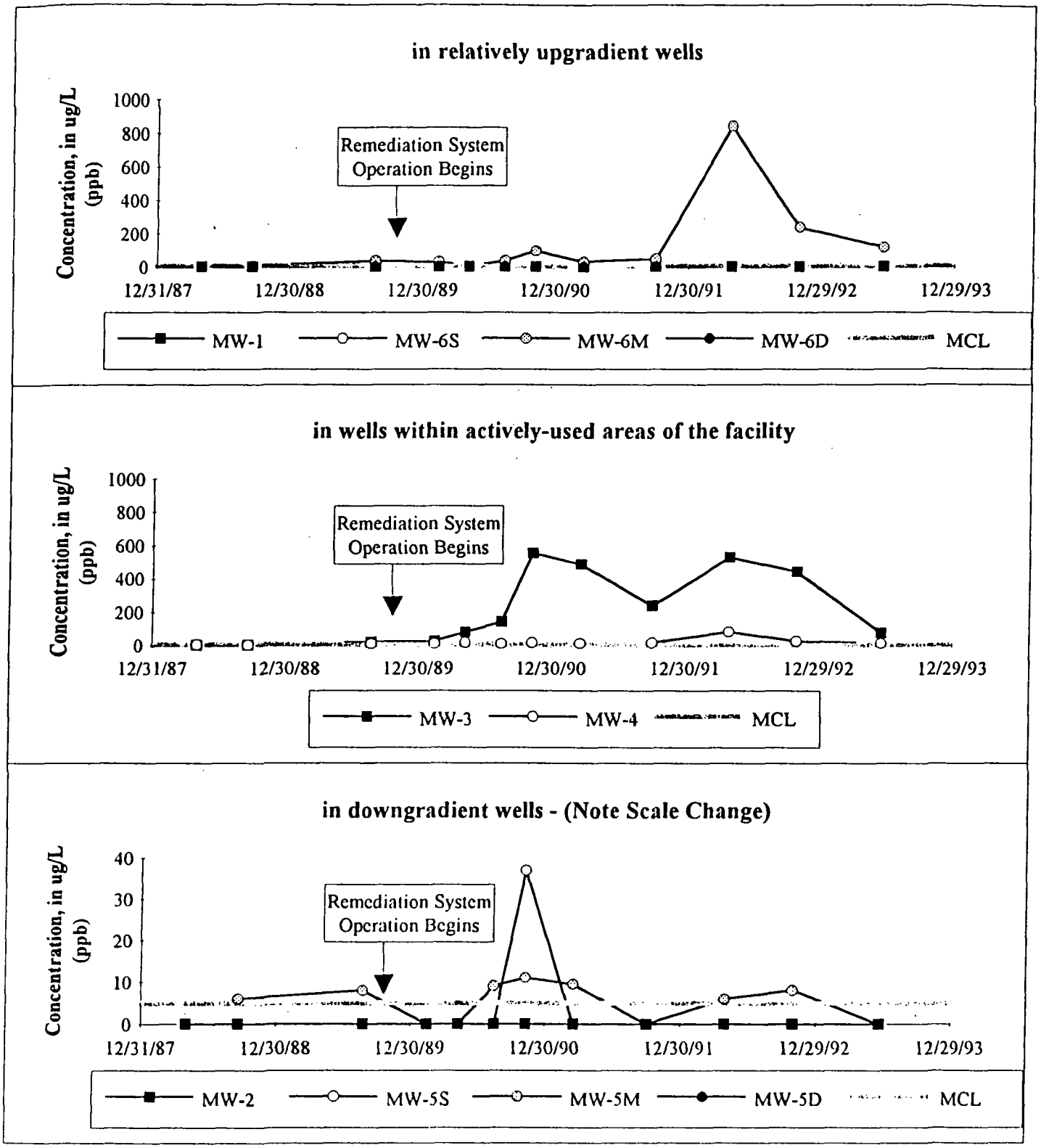


Figure 17 - Gem City Chemicals, Inc.
Concentrations of Trichloroethene
MCL for Trichloroethene = 5 ppb

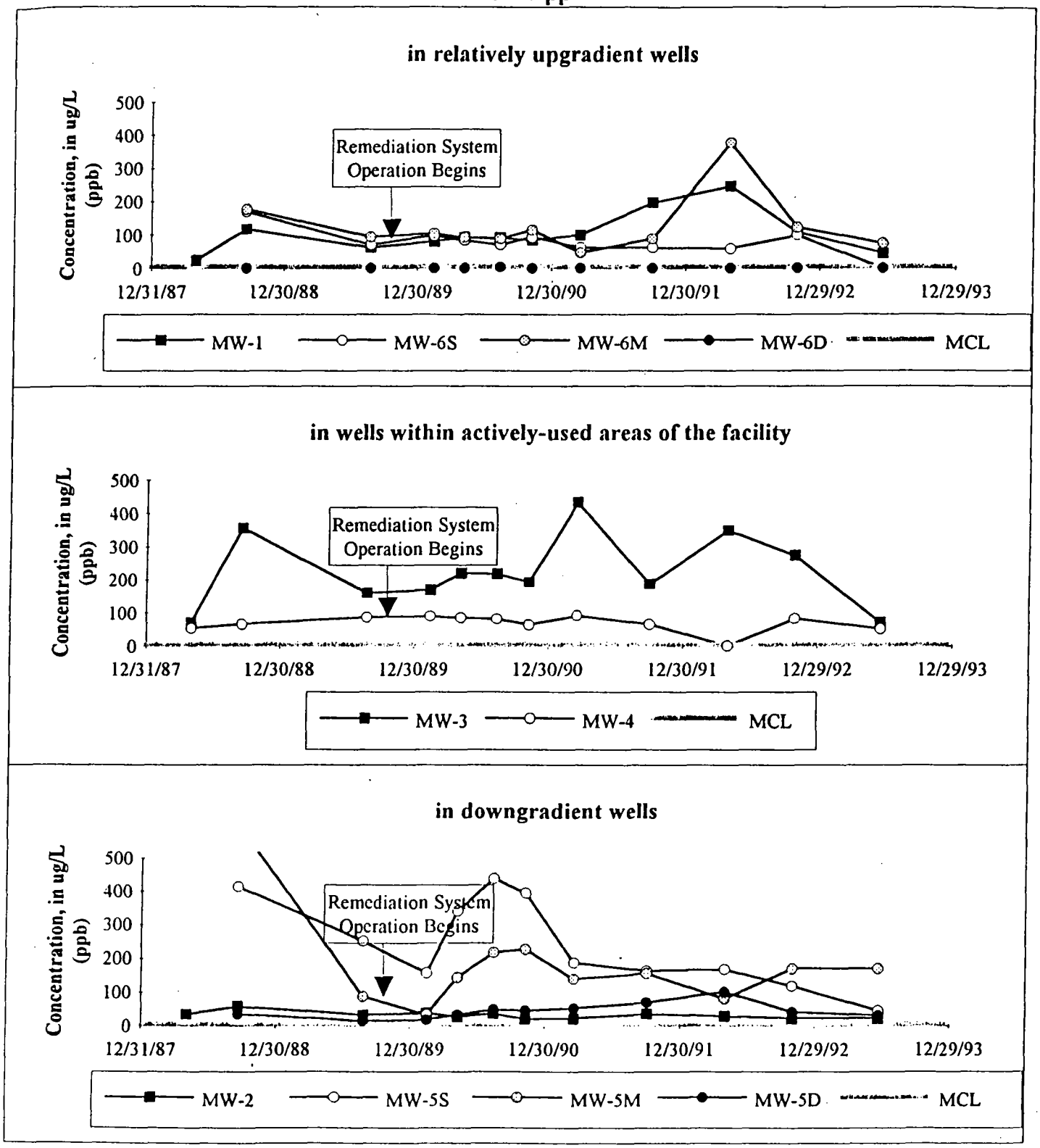


Figure 18 - Gem City Chemicals, Inc.
Concentrations of total 1,2-Dichloroethene
MCL for trans-1,2-Dichloroethene shown = 70 ppb

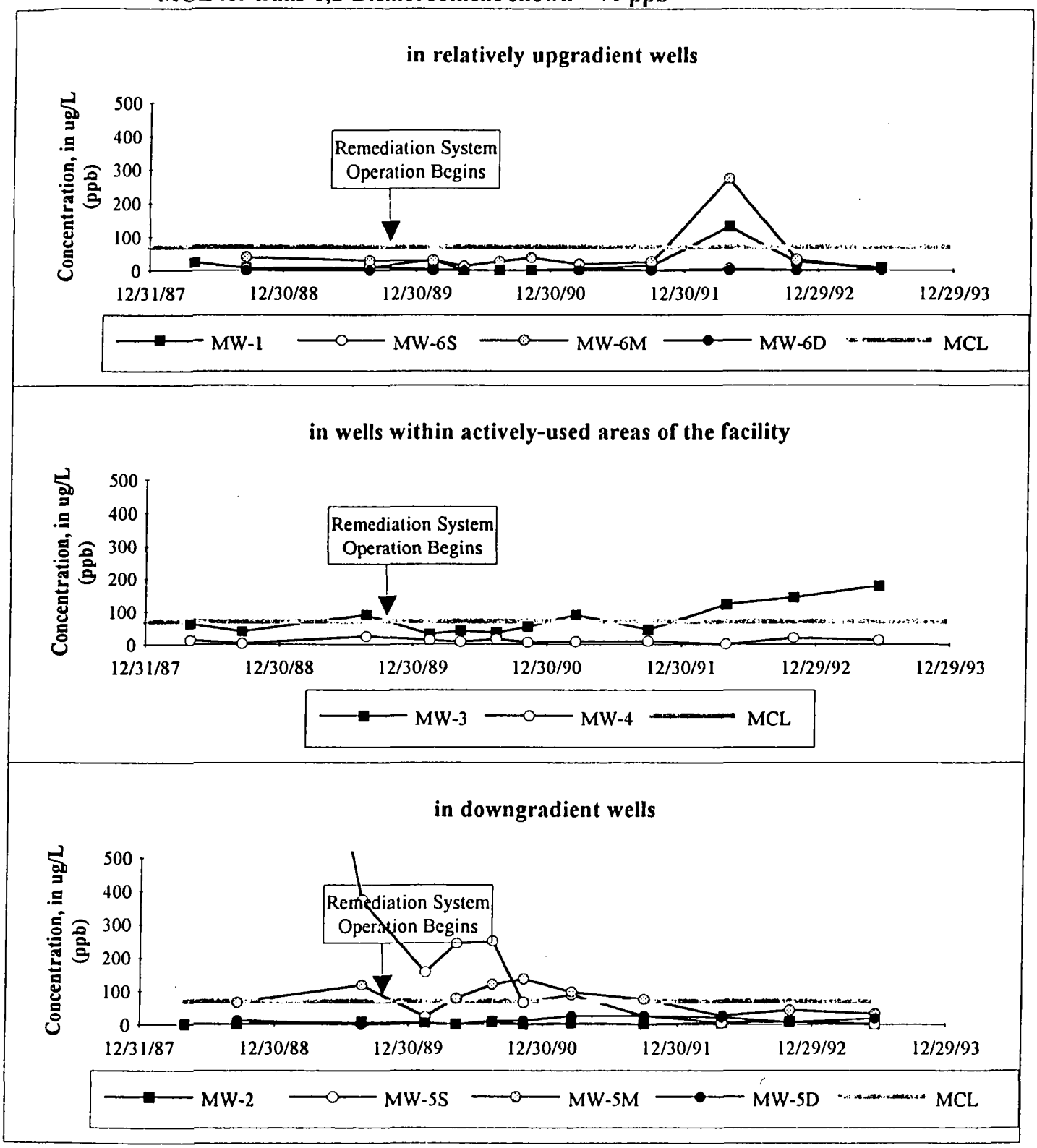
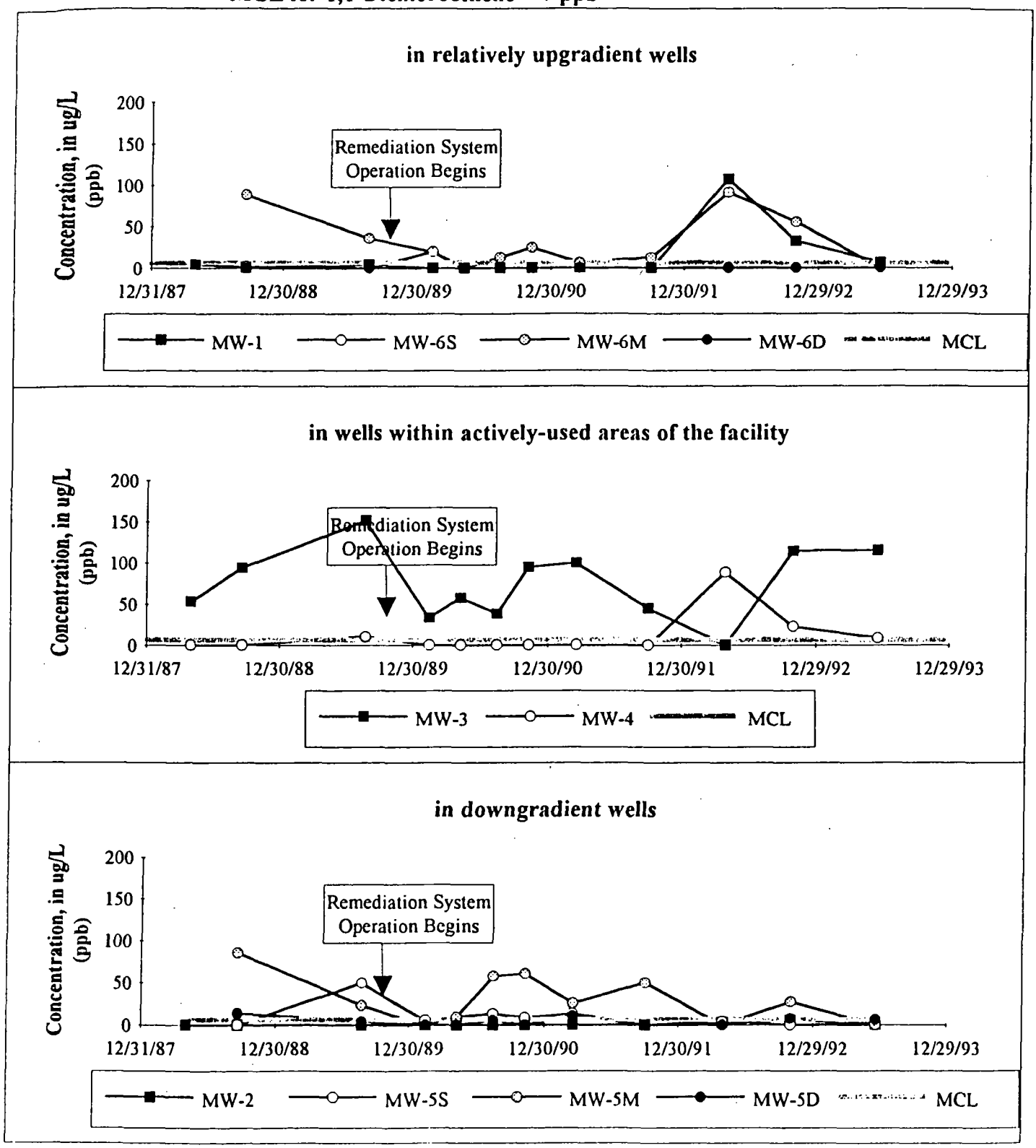


Figure 19 - Gem City Chemicals, Inc.
Concentrations of 1,1-Dichloroethene
MCL for 1,1-Dichloroethene = 7 ppb



4.0 EFFECTIVENESS OF THE GROUND WATER TREATMENT SYSTEM

4.1 Methods Used to Determine the Effectiveness of the Treatment System

The ground-water treatment system at Gem City Chemicals, Inc. includes: a pumping well on-site that prevents the off-site migration of ground water containing VOCs and recovers that ground water, an air stripper tower for the treatment of the pumped water, and discharge of the treated water in the storm sewer, pursuant to an NPDES permit. The effectiveness of the recovery well in preventing off-site migration has been evaluated through the use of potentiometric maps, constructed on a weekly basis and submitted to OEPA for review on a monthly basis since early 1990. The pumping rate has been monitored on a daily basis. The removal of VOCs by the air stripper and discharge of the treated water to the storm sewer system has been monitored by weekly sampling of the air stripper effluent for pH, temperature, total dissolved solids and total organic carbon, monthly monitoring of VOCs, and semi-annual monitoring for semi-volatile compounds since December 1989. The level of VOCs in the monitor wells was initially measured quarterly and is now measured semi-annually. Monthly reports describing the monitoring and remediation activities at Gem City Chemicals, Inc. have been forwarded to the Ohio EPA for review since early 1990.

4.2 Location and Depth of the Recovery Well

The location of the recovery well is near the center of the actively-used portion of the site, as is shown on Figures 5 and 7. The depth of the recovery well is 50 feet. The well log is included in Exhibit F. The as-built diagram is included in Exhibit G.

4.3 Aquifer Parameters

A single aquifer test was performed on February 21, 1990, following installation of the recovery well, in order to determine the aquifer parameters and the pumping rate necessary to ensure that the actively-used portion of Gem City Chemicals, Inc. was underlain by the cone of depression that would be induced. This test was performed by measuring the static water levels at a pumping well and at observation wells prior to pumping, then removing water from the pumping well at a measured rate, and monitoring the lowering of the water level in the wells over time, until a new, stable level was reached. Based on the pumping rate, the total drawdown in the observation well, the distance between the pumping well and the drawdown well, the transmissivity and hydraulic conductivity of the aquifer material was calculated.

During the pump test, the recovery well was pumped at a rate of 340 gallons per minute, and the water level in a piezometer installed 3.5 feet away from the pumping well was monitored. The drawdown was 0.75 feet after 450 minutes of pumping. This gives a value for transmissivity of 52,848 ft^2/day or 395,365 gpd/ft. and conductivity of 0.226 cm/sec. The details of the aquifer test are included as Exhibit H.

4.4 Area of Capture

The area of capture for the recovery well can be documented from the weekly potentiometric surface mapping and from Figure 7, based on the newly-installed piezometers. According to these maps, the best estimate of the radius of influence is approximately 300 feet. The resulting zone of capture underlies the entire actively-operated area of Gem City Chemicals, Inc. The area beyond the zone of capture, in the westernmost portion of the Gem City Chemicals, Inc. property, that was not used by Gem City Chemicals Inc. for VOC storage, shows no evidence of VOCs in the soil and is therefore not a potential source for the VOCs present in the ground water.

4.5 Prevention of Off-Site Migration

As shown by the potentiometric mapping, shown in Figure 7 and Exhibit C, both the best estimate for the zone of capture and the minimum estimate for the zone of capture underlie the entire actively-operated area of Gem City Chemicals, Inc. and extends to or beyond the facility boundaries to the north and east of the site. This zone of capture causes all ground-water flow to converge toward the recovery well. This effectively prevents the migration of contaminants off-site, as no ground water from within the area influenced by the cone of depression can flow off-site. A plot of potentiometric surface elevations with time, included as Figure 6, shows that the water level in P-1, adjacent to the pumping well has consistently been as much as one foot lower than levels measured in other wells on-site. This demonstrates that the cone of depression beneath the site has been consistently maintained for over two years, independent of the natural fluctuations in ground-water levels during that period of time. The potentiometric maps, the ground-water flow directions determined from these maps, and the plot of potentiometric surface elevations with time demonstrate that the ground-water control system is successful in preventing the off-site migration of ground water.

4.6 Air Stripper Design and Installation

The air stripper at the site is located adjacent to the recovery well. The tower was manufactured by Duall Industries, Inc. The tower design selected was a 42 inch diameter, 32 foot tower, filled with 24 feet of select packing material. The pump, with a rated capacity of 250 to 300 gpm, supplies water to the top of the column, and an air blower supplies 1500 cubic feet per minute of air to the bottom of the tower. An access port allows for sampling of the air stripper effluent and influent water. Flow is monitored with influent pressure and flow gages. The system was installed and tested in December 1989, and began full operation in early 1990. Operational records are included as Exhibit I. Effluent from the system flows into a City of Dayton storm sewer. OEPA's letter of November 3, 1989 permitted the interim operation of the stripping tower and the discharge of the treated waters to the city storm sewer. Discharge to the city storm sewer was applied for on September 22, 1989 and permitted by a Special Privilege Permit granted by the City on November 17, 1989. Discharge is to a catch basin on the north side of the site, near the drum washing shed. The storm sewer runs along Stanley Avenue to the Mad River, where it outfalls. Permit to Install (PTI) for air emissions from the stripping tower (application No. 08-1900) was issued by the OEPA on December 6, 1989. Permit to Install (PTI) the ground-water treatment system (application No. 05-3994) was issued by the OEPA on January 29, 1991. A draft of the final NPDES discharge permit for the treated

water from the stripper tower was issued on March 19, 1991. The final permit was issued on May 30, 1991.

4.7 Design and Construction of the Recovery System

The design of the system was based on the volume of water to be pumped from the recovery well, the VOC content of the influent water, and the effluent VOC limits. The recovery well was installed in October 1989 by Moody's of Dayton. It has an 8 inch diameter, galvanized steel casing and is screened from 30 to 50 feet below grade. A 20 horsepower, 230 volt, 3 phase Franklin motor and a Goulds 300L30 pump, with 5 stages and a rated capacity of 300 gpm was installed at a depth of 50 feet.

4.8 Efficiency of the Air Stripper

Although the efficiency was checked during start-up of the system, no regularly-scheduled monitoring information is available to determine the efficiency of the air stripper system on a regular basis. Weekly monitoring of the effluent is required for the NPDES permit, and analytical values have consistently been well below the discharge limits. Based on the assumed high values for VOCs detected in the initial ground-water sampling, and the consistently low values in the air stripper effluent, the system has been operating properly, and the efficiency has been assumed to be high. This is supported by the limited efficiency data, for three time periods, that have been obtained. The stripper efficiency estimates for these three occasions is presented below. Samples were taken from both the stripper influent and effluent on December 13, 1989 for the start-up efficiency calculation. A sample was inadvertently taken from the air stripper influent, instead of from the effluent port, on October 11, 1990. For comparison purposes, these values were compared to the effluent sample obtained on October 19, 1990. Finally, in order to estimate the efficiency of VOC removal, the influent to the stripper was sampled on June 9, 1992 and analyzed. These values were compared to those for the effluent sample, taken on June 5, 1992. Tables 6, 7 and 8 are comparisons of the influent to effluent analytical values, and the efficiency of the stripper, as measured by the percentage of VOC removed. The efficiency value could not be calculated directly for several of the compounds detected in the influent sample, as the corresponding value in the effluent sample was below detection limits. For the remaining compounds, the air stripper efficiency varied between 95% and 99%. Estimates for the overall system efficiency were made by comparing the sum of the concentrations of all detected VOCs from the influent sample to the sum of all detected in the effluent sample. In order to account for the non-detect data for the effluent samples, a value of 1/2 the detection limit was used for the non-detect effluent data. The calculated efficiency of the system for these three dates using this approach is between 97 and 98%. Recent cleaning should improve this efficiency.

Table 6 - Comparison of Air Stripper Influent vs. Effluent Water Quality

Gem City Chemicals, Inc. - December 1989

PARAMETER ($\mu g/\ell$)	Influent	Effluent	Efficiency
1,1-Dichloroethane	10	<5	>50.%
1,1-Dichloroethene	21	<5	>75.%
1,2-Dichloroethene (total)	66	<5	>92.%
Tetrachloroethene	13	<5	>62.%
1,1,1-Trichloroethane	237	<5	>98.%
Trichloroethene	124	<5	>96.%
Total VOCs	481	15	97.%

Table 7 - Comparison of Air Stripper Influent vs. Effluent Water Quality

Gem City Chemicals, Inc. - October, 1990

PARAMETER ($\mu g/\ell$)	Influent	Effluent	Efficiency
1,1-Dichloroethane	9	<5	8>50.%
1,1-Dichloroethene	33	<5	>85.%
1,2-Dichloroethene (total)	53	<5	>90.%
Tetrachloroethene	130	<5	>96.%
1,1,1-Trichloroethane	349	6	98.3.%
Trichloroethene	246	<5	>98.%
Total VOCs	820	15.5	98.%

Table 8 - Comparison of Air Stripper Influent vs. Effluent Water Quality

Gem City Chemicals, Inc. - June, 1992

PARAMETER ($\mu g/\ell$)	Influent	Effluent	Efficiency
Chloroform	1.0	<0.5	>50.%
4-Chlorotoluene	3.7	<1.0	>73.%
1,1-Dichloroethane	15	<1.0	>93.%
1,2-Dichloroethane	7.9	<0.5	>94.%
1,1-Dichloroethene	18	<1.0	>94.%
cis-1,2-Dichloroethene	72	3.5	**95.%**
trans-1,2-Dichloroethene	3.1	<1.0	>68.%
Tetrachloroethene	98	1.5	**97.5%**
1,1,1-Trichloroethane	163	2.1	**99.%**
1,1,2-Trichloroethane	0.4	<0.2	>50.%
Trichloroethene	121	2.7	**98.%**
Vinyl Chloride	3.0	<1.0	>67.%
Total VOCs	506	12.9	**97.5%**

4.9 Effectiveness in Removal of VOCs from the Ground Water

The removal of volatile organic compounds by the recovery well and air stripper system is estimated by the difference between the VOC content of ground water at the site and the concentration in the effluent, times the amount of water pumped from the ground during the time the well system has been operating. The system, operating for 40 months between November 1989 and February 1993, has been pumping about 300 gallons of water per minute during that time period, for a total of about 525,000,000 gallons of water, or 4,381,000,000 pounds of water. The total VOC concentration in the water pumped from the recovery well over the span of this project is not known but is estimated to be between 500 ppb and 2,000 ppb on the basis of the VOC content for samples from other monitor wells on the site. A value of 1,000 ppb is assumed for the purposes of this estimate. The VOC content in the effluent is consistently below the 10 ppb discharge limits, and a value of 0 is assumed for this calculation. Based on these numbers, approximately 4,400 pounds of VOCs have been removed from the ground water, with the range estimated to be between 2,200 and 8,800 pounds. The three influent samples, which may or may not be representative of ground water being pumped through the system, contain between 480 and 820 ppb of total VOCs. The full calculation, showing all assumptions is included in Exhibit J. Based on these limited data, the total amount of VOCs removed is

probably less than the calculated value, and is estimated to be between 2,200 and 4,400 pounds, with a most likely value of 3,300 pounds.

5.0 EFFECTIVENESS OF THE VAPOR EXTRACTION SYSTEM

5.1 Design and Installation

To remove the volatile organic compounds from the vadose zone (the soil zone above the water table), five vapor extraction wells were installed in October 1988. Locations of the vapor extraction wells are shown in Figure 20. Figure 10 shows the typical design of these installations. Well construction details are provided in Table 4. The five vapor extraction wells were installed in shallow borings and are constructed from 4" diameter PVC casing, with a 2.5 foot screen, installed at a nominal depth of 19.5 to 22 feet below the ground surface. This depth was at to slightly above the ground-water table at the time the wells were installed. Air is extracted from each well with a Regenair Model R6325A blower, with a rated maximum flow rate of 206 cubic feet of air per minute. Discharge of the extracted air is from a PVC stack, at an elevation of 8 feet above the ground surface. Permit to Install (PTI) for air emissions from the five vapor extraction wells (application No. 08-1681) was issued February 8, 1989.

5.2 Emissions Testing

Emissions from the vapor extraction wells were measured monthly and has been summarized in Table 8. Through August 1990, effluent air was tested with a organic vapor analyzer (OVA) calibrated to and reported as methane. After that date a photoionization detector (PID) calibrated to and reported as benzene was used.

5.3 Removal Efficiency

Initial removal of VOCs by the soil vapor extraction wells was very high. Extraction rates had to be reduced initially to remain within discharge limits. Concentration of VOCs in the discharged air dropped and all blowers rates were set back to design rates. Vapor extraction wells were shut down during the aquifer evaluation testing. Blowers on several of the wells had to be replaced during the first year. After a year and a half of operation, concentrations of VOCs in the discharge air had fallen below detection levels and four of the five vapor extraction wells were turned off. All vapor extraction wells were restarted in July of 1991 but concentrations fell below detection levels within a week. The radius of influence was not determined at the time of installation. Vapor extraction well VE-3 was decommissioned (the below ground well was abandoned by removal and grouting) in July 1992, to allow for additional paving of the chemical storage and handling area. The remaining vapor extraction wells were briefly restarted in August, 1992 and the discharges were measured after a day of operation. No significant concentrations of VOCs were detected. Three of the four remaining vapor extraction wells were then decommissioned.

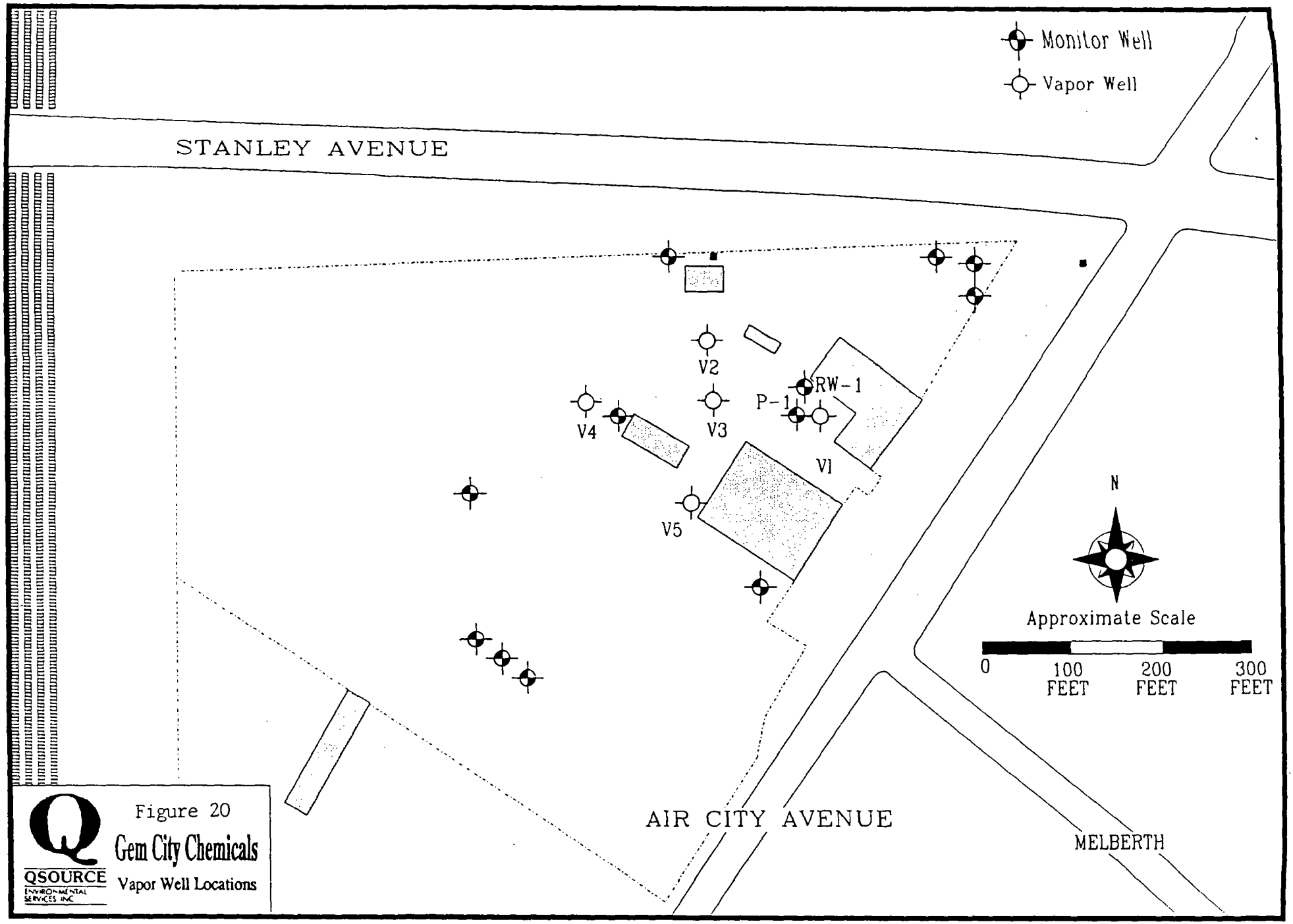


Figure 20
Gem City Chemicals
Vapor Well Locations

QSOURCE
ENVIRONMENTAL SERVICES INC

5.4 Effectiveness

The effectiveness of the vapor extraction system can be estimated from the monitoring data by assuming that the PID or OVA reading is equal to the effluent concentration of VOCs and is an estimate for the effluent for the entire month. The total amount of VOCs removed is equal to the product of the number of vapor extraction wells in operation, the flow rate for each blower (200 cubic feet per minute), the density of air, and the average VOC effluent content for the wells. The monthly estimates for VOC removal from the vadose zone are shown in Table 9. The total estimate for VOC removal from the vadose zone is approximately 1100 pounds.

Table 8 Emissions from the Vapor Extraction wells

DATE	VE-1	VE-2	VE-3	VE-4	VE-5	DATE	VE-1	VE-2	VE-3	VE-4	VE-5
4/28/89	160	160	64	140	85	6/90	BDL	BDL	BDL	OFF	BDL
5/15/89	120	135	14	65	25	7/90	OFF	BDL	BDL	BDL	OFF
6/2/89	OFF	120	12	44	OFF	8/90	BDL	BDL	BDL	BDL	BDL
6/30/89	OFF	95	9	OFF	OFF	9/90	OFF	OFF	OFF	2	OFF
7/27/89	OFF	76	15	OFF	OFF	10/90	OFF	OFF	OFF	4	OFF
8/17/89	OFF	61	7	12	42	11/90	OFF	OFF	OFF	5.4	OFF
9/25/89	68	44	9	4	25	12/90	OFF	OFF	OFF	9.2	OFF
10/18/89	22	39	6	BDL	16	1/91	OFF	OFF	OFF	11.7	OFF
11/22/89	BDL	35	7	3	6	2/91	OFF	OFF	OFF	2.0	OFF
12/20/89	BDL	BDL	5	BDL	BDL	3/91	OFF	OFF	OFF	1.5	OFF
1/9/90	BDL	20	3	BDL	BDL	4/91	OFF	OFF	OFF	0.5	OFF
2/90	OFF	OFF	OFF	OFF	OFF	5/91	OFF	OFF	OFF	0.5	OFF
3/90	OFF	OFF	OFF	OFF	OFF	6/91	OFF	OFF	OFF	4.2	OFF
4/90	n/a	n/a	n/a	n/a	n/a	7/91	0.5	10	1.5	2.5	BDL
5/90	BDL	BDL	BDL	BDL	BDL	7/91*	0.1	0.1	0.0	0.0	0.0

* Extra reading on 7/17/91 using an OVA

Table 9 Vapor Extraction System - VOC Removal Estimate

MONTH	NO. OF OPERATING WELLS	AVG. CONC. VOC'S IN AIR (ppm)	TOTAL AIR FLOW RATE (CFM) WELLS * 200	WEIGHT REMOVED (lbs.)
April 1989	5	121.8	1000	400
May 1989	5	71.8	1000	236
June 1989	2 - 3	56	500	92
July 1989	2	45.5	400	60
August 1989	4	24.4	800	64
September 1989	5	30	1000	98
October 1989	5	16.6	1000	55
November 1989	5	10.2	1000	33
December 1989	5	1	1000	3
January 1990	5	4.6	1000	15
February 1990	0	0	0	0
March 1990	0	0	0	0
April 1990	0	0	0	0
May 1990	5	0	1000	0
June 1990	4	0	800	0
July 1990	3	0	600	0
August 1990	5	0	1000	0
September 1990	1	2	200	1
October 1990	1	11	200	7
November 1990	1	5.4	200	4
December 1990	1	9.2	200	6
January 1991	1	11.7	200	8
February 1991	1	2	200	1
March 1991	1	3	200	2
April 1991	1	1.5	200	1
May 1991	1	0.5	200	0
June 1991	1	4.2	200	3
July 1991	5	1.4	1000	5
Estimate of volatile products removed (in pounds)				1094

6.0 SUMMARY

6.1 Summary of Remediation Activities to Date

As summarized in this Site Assessment report, Gem City Chemicals Inc. has undertaken a number of voluntary investigation and remediation activities and has reported the results of these activities to OEPA for review.

Ten underground storage tanks which were either in service at the time that Gem City Chemicals, Inc. began operations in 1969 or which were later installed by Gem City Chemicals, Inc., were removed in April and May 1986, pursuant to a permit issued by the City of Dayton. Gem City Chemicals, Inc. reports that there was no evidence of tank leakage at the time that the tanks were removed, and that the tanks were never used to store chlorinated solvents.

Five vapor extraction wells were installed within the active working area of the site in October 1988. A Permit to Install for air emissions from the wells (application No. 08-1681) was issued by the OEPA on February 8, 1989. These wells were operated continuously from April 1989 to January 1990, and have been operated intermittently since that time. These wells have removed an estimated 1100 pounds of VOCs from the vadose zone, the majority of that during the first seven months of operations.

A ground-water remediation system, consisting of a pumping well located in the center of the active portion of the site and an air stripper tower was installed between September and December 1989. OEPA's letter of November 3, 1989 permitted the interim operation of the stripping tower and the discharge of the treated waters to the city storm sewer. Discharge to the city storm sewer was applied for on September 22, 1989 and permitted by a Special Privilege Permit granted by the City on November 17, 1989. Permit to Install (PTI) for air emissions from the stripping tower (application No. 08-1900) was issued by OEPA on December 6, 1989. Permit to Install (PTI) the ground-water treatment system (application No. 05-3994) was issued by OEPA on January 29, 1991. A draft of the final NPDES discharge permit for the treated water from the stripper tower was issued on March 19, 1991 and the final permit was issued on May 30, 1991. Water samples of the air stripper effluent have been taken and analyzed, on a weekly basis for several indicator parameters, and for VOCs on a monthly schedule. The pumping well and air stripper tower have been operated nearly continuously from November 1989 until the present date. The monthly effluent monitoring results and a limited number of air stripper efficiency estimates that have been made indicate that the system is about 98% efficient in removing VOCs from the water. A most-likely estimated 3,300 pounds of VOCs have been removed from the ground water to date.

9Ten monitor wells and six piezometers have been installed at eleven locations on the site. The depth to water in these wells has been measured weekly, and potentiometric maps of the site have been prepared using these data. These maps show that removal of water from the recovery well has induced a cone of depression beneath the actively-used portions of the site, and is effectively preventing the off-site migration of VOCs. Water quality samples have been taken from these wells and analyzed on a regular basis.

Data generated during these remediation activities have been submitted to the OEPA for review on a monthly basis since early 1990.

In June 1990, Gem City Chemicals, Inc. initiated an ongoing program to pave and dike the areas where chemicals are stored and transferred. The areas that have been paved to date are shown in Figure 21.

Gem City Chemicals, Inc. is a member of the National Association of Chemical Distributors. The NACD has issued a document entitled "NACD Responsible Distribution Process" which consists of a set of eight guiding principles and an Implementation Guide. Gem City Chemicals, Inc. accepted these guiding principles as part of its operating policies on February 7, 1992 and is implementing these principles through environmental education of all employees, as part of the regularly-scheduled health and safety meetings using materials from the NACD Responsible Distribution Process Implementation Guide. Copies of the "NACD Responsible Distribution Process Guiding Principles" and "NACD Responsible Distribution Process Implementation Guide" are included as Exhibit K.

6.2 Recommended Additional Remediation Activities

Gem City Chemicals, Inc. remains committed to resolving the environmental conditions at the Air City Avenue property. Its records show that it has moved aggressively and voluntarily to address this matter, with the assistance and oversight of Ohio EPA. Gem City Chemicals, Inc.'s continuing goal is to direct financial resources towards remediation of existing conditions and hard-surfacing all chemical-handling areas to reduce future exposure. Other remediation activities supervised by OEPA at other sites suggest that the Air City Avenue property is one small part of a much broader, regional issue in this part of Dayton. Gem City Chemicals, Inc. believes that its investigatory efforts have adequately defined the environmental issues associated with the site. Gem City Chemicals, Inc. further believes that its remediation activities to date have effectively prevented off-property migration and removed significant quantities of VOCs from the ground water and vadose zone. Therefore, Gem City Chemicals, Inc. does not believe that any changes are needed in the existing ground-water recovery and treatment system. Gem City Chemicals, Inc. further believes that the additional remedial activities proposed herein will allow for the effective final remediation of the site in the relative near-term.

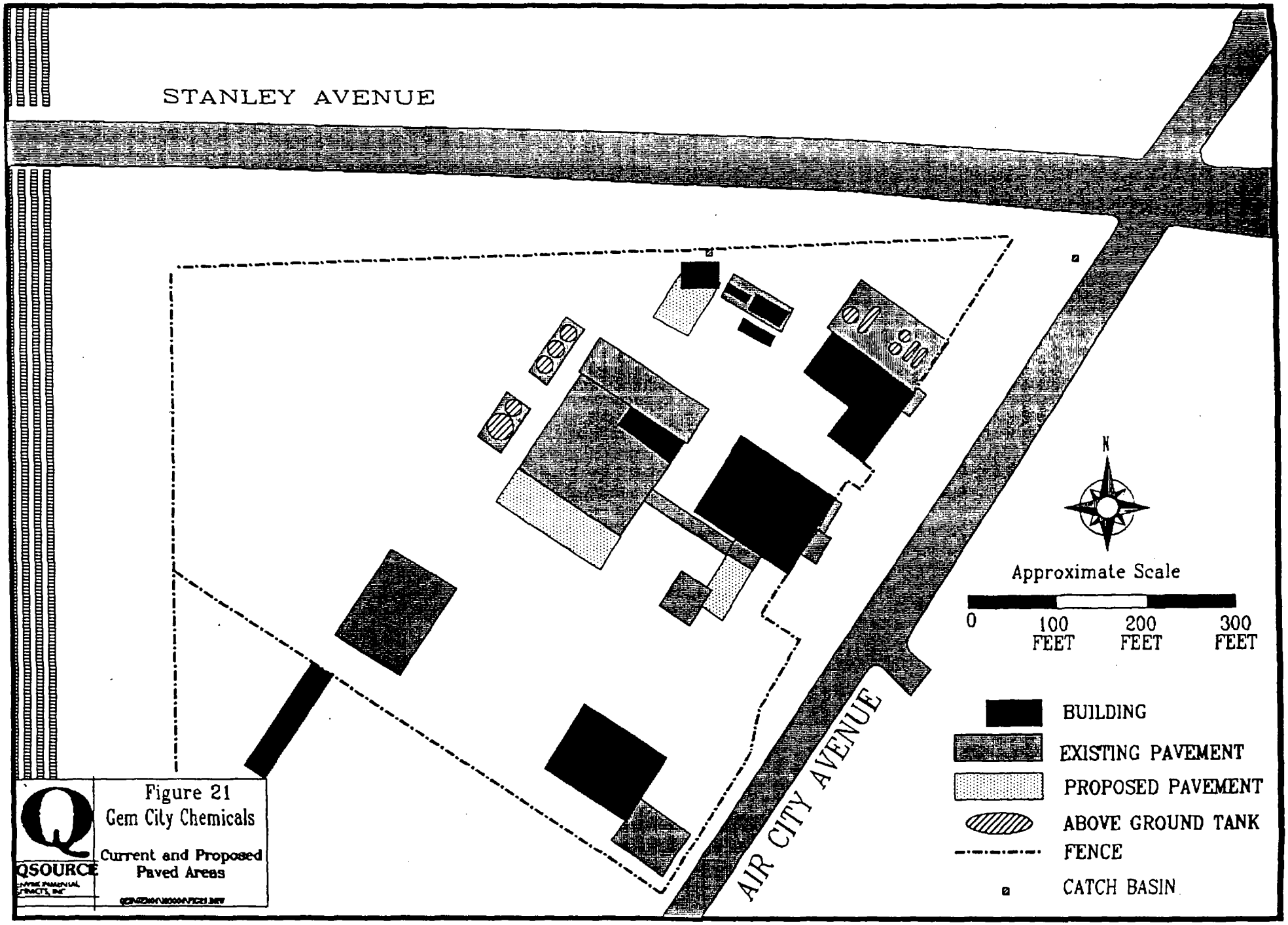


Figure 21
Gem City Chemicals
Current and Proposed Paved Areas

Monitor wells should continue to be monitored on a semi-annual basis, during seasonal high and low periods. Monitor wells need to be monitored for VOCs only. In addition, the recovery well influent into the stripper should be monitored monthly. In the future, Gem City Chemicals, Inc. believes that the frequency of monitoring can be reduced significantly. All work and storage areas should be paved, to prevent any possible releases from percolating into the ground. In addition, the paving will increase the effectiveness of any vapor extraction system. The proposed locations for additional paving are shown in Figure 21. Gem City Chemicals, Inc. understands that this work is discretionary, and outside the purview of the Administrative Orders on Consent. The recovery well and air stripper should continue to be operated as they have in the past.

6.3 Conclusions

Gem City Chemicals, Inc. has been operating at the Air City Avenue facility since 1969. The operation buys chemicals in bulk and repackages them for resale. The site is located on a very permeable geologic formation. The facility is in an industrial area of Dayton that has had many ground-water problems. The data indicate that some volatile organic chemicals have percolated into the soil and into the ground water underlying the site. Some of these VOCs may have come from Gem City Chemicals, Inc., and some may be the result of ground-water contamination from other sites. Gem City Chemicals, Inc. became aware of the problem during an internal assessment of operations in 1987. Gem City Chemicals, Inc. initiated its own investigation to determine the extent of the problem, developed and implemented a subsequent voluntary remedial program, and has regularly reported the results of this program to OEPA.

Gem City Chemicals, Inc. investigations have included soil gas surveys, soil sampling and aquifer testing. Currently Gem City Chemicals, Inc. is monitoring water quality at ten monitor wells which have been installed and are regularly sampled.

The remedial actions taken to date have been successful. The installation and operation of the recovery well prevents the off-property migration of VOCs in ground water and has succeeded in removing significant quantities of VOCs from the ground water. Based on the success of the system to date, there are no deficiencies in the recovery and treatment system. Gem City Chemicals, Inc. does not believe that any changes are needed in the existing ground-water recovery and treatment system. The five vapor extraction systems have succeeded in removing significant quantities of VOCs from the soils in areas where they are located.

Future measures proposed here (continued monitoring, continued operation of the recovery well) will minimize or eliminate the potential for future problems. Continued hard surfacing will prevent accidental releases into the environment and prevent the downward flushing of vadose zone VOCs during precipitation events. Gem City Chemicals, Inc.'s continued monitoring and remediation program will assure that there will not be a threat to ground water from this site.

EXHIBIT A

TANK REMOVAL DOCUMENTATION

UNDERGROUND STORAGE TANK HISTORY
Gem City Chemicals, Inc.

Products Held in UGST's:

Fuels:	Capacity	Years in Service
Diesel	6000g	15
Regular gas	4000g	* unknown
Unleaded gas	2000g	* unknown
Solvents:		
Acetone	6000g	8
Isopropyl Alcohol.	8000g	8
Methyl Alcohol	8000g	8
Stoddard Solvent (Mineral Spirits).	8000g	14
Methyl Ethyl Ketone.	8000g	8
Toluol	8000g	8
Xylol	8000g	8

NOTES:

1. With the exception of the 4000 gallon regular gas tank and the 2000 gallon unleaded tank, all tanks were buried in accordance with codes established by City of Dayton Fire Department for flammable liquids including:

   A. Cathodic protection
   B. Washed sand bed
   C. Asphaltic coating on tanks & plumbing
   D. Pressure tested upon installation

2. All tanks were removed by 5-5-86;
   See attached "Underground Storage Tank Removal"

*3. The regular and unleaded gas tanks were in service when Gem City Chemicals began operations on the property in 1969. We therefore, have no established history on these tanks.

4. All tanks were of steel construction.

Gem City Chemicals, Inc.

1287 AIR CITY AVE. P.O. BOX 251
DAYTON OHIO 45404
513 224-0711

Underground Storage Tank Removal

Solvent Storage Tanks: Removed by 4-26-86

On this date GCC's seven underground solvent storage tanks were removed by Henry Jergens Contractor, Inc.

Soil samples were taken by David Stewart from the sand directly beneath each tank. Care was taken to obtain representative samples of the soil under each tank to determine if any of the tanks had leaked materials.

There was no evidence from the soil samples or by close visual inspection of each tank that any of the tanks had leaked product.

The soil samples will be maintained indefinitely on GCC's retained sample shelf.

Photographs were taken to document the tank removal. They will be kept in the "GCC Underground Storage Photos" binder in the safe.

The Methyl Alcohol storage tank will be kept for GCC's above ground (with dike) diesel fuel storage. All other tanks were hauled away by Henry Jergens for disposal.

Soil samples were taken of the backfill furnished by Henry Jergens. These samples will also be maintained on the GCC retained sample shelf for an indefinite period.

Fuel Storage Tanks: Removed by 5-5-86

On this date GCC's three underground fuel tanks were removed by Henry Jergens Contractor, Inc.

Soil samples and photos were taken in line with procedures followed above for solvent tanks.

There was no evidence of leakage from any of the tanks.

David A. Stewart
5-6-86

BULK SOLVENT STORAGE SYSTEMS

A AREA: Above Ground (140 - 149)

Blend Tank (#3303) Brown . . . . . #140
Calcium Chloride System (#2238) Blue . . . . . #142
Note: West of solvent druming shed

B AREA: Under Ground Solvent Area (150 - 159)

MEK . . . . . (#1 Tank - #3252) White . . . . . #150
Xylol . . . . . (#2 Tank - #3753) Black . . . . . #151
Acetone . . . (#3 Tank - #3979) Red . . . . . #152
Toluol . . . . (#4 Tank - #2661) Gray . . . . . #153
IS/AL . . . . (#5 Tank - #2002) Green . . . . . #154

Note:
(1) Tanks are positioned north to south, #1 thru #5.

(2) Dust caps on 3" dia. fill lines near track run #1 thru #5, north to south, corresponding with under ground tanks only.

C AREA: Under Ground Tanks (160 - 169)

Stoddard Solvent . . (#1 Tank - #2126) Yellow . . . . . #160
Methanol . . . . . (#2 Tank - #2259) Orange . . . . . #161
Open Area . . . . . (#3 Area - #2314) . . . . . #162
Open Area . . . . . (#4 Area - #2396) . . . . . #163

Note:
(1) Tanks are installed #1 thru #4, east to west.

(2) Valves on east stanchion #1 thru #4 run north to south.

(3) Dust cap locks on 3" fill line stanchion near track, #1 thru #4, run south to north.

(4) Valves on 2" pump manifold, #1 thru #4, run south to north.

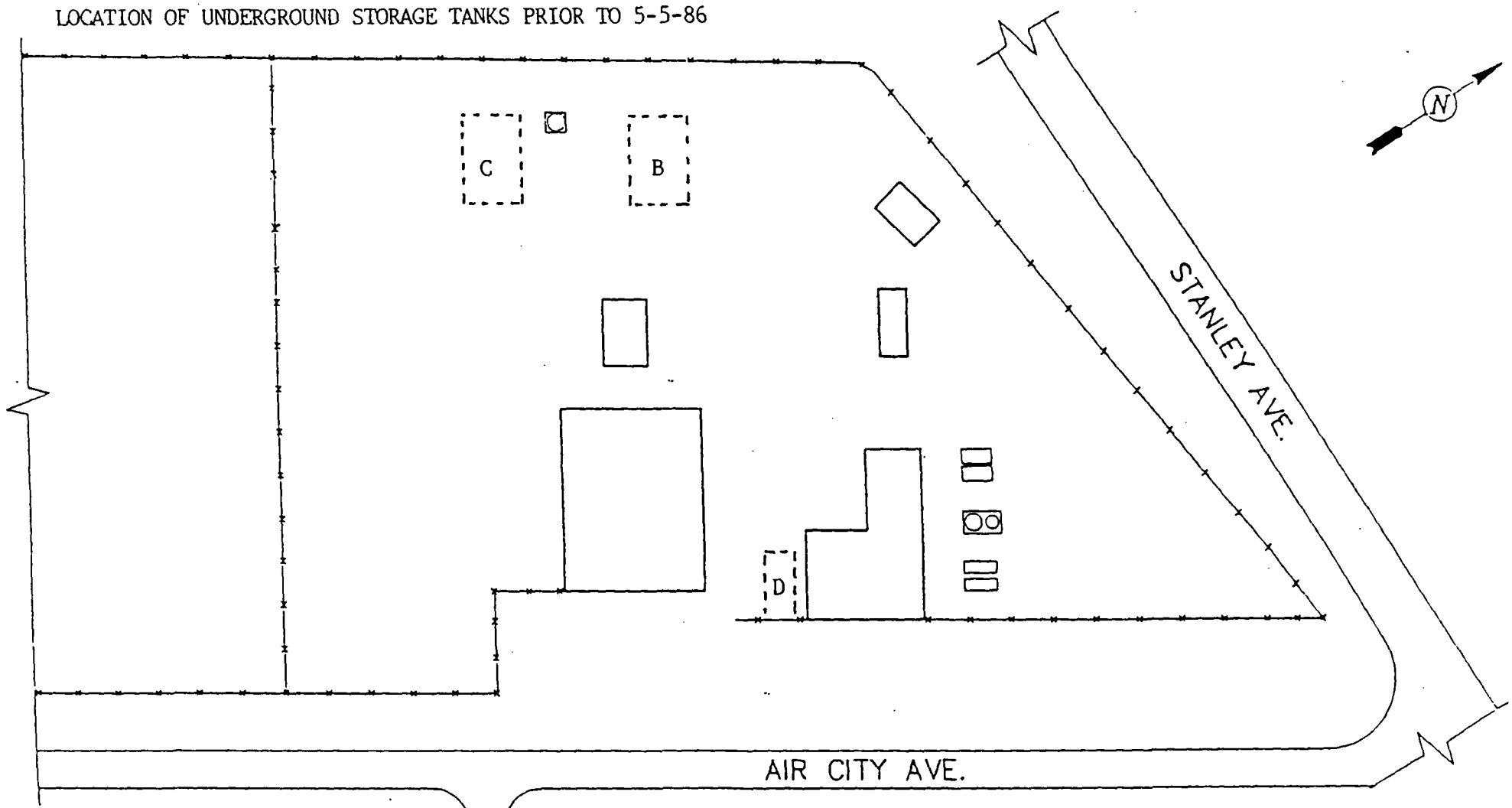
(5) South of drum storage yard.

D AREA: Under Ground Fuel Area (170 - 179)

Regular Gas . . . . (4000g tank - #2281) . . . . . #170
Unleaded Gas . . . . (2000g tank - #0643) . . . . . #171
Diesel . . . . . (6000g tank - #2396) . . . . . #172

Note: South of office building.

LOCATION OF UNDERGROUND STORAGE TANKS PRIOR TO 5-5-86



Underground Storage Tank Locations:
All tanks were removed by 5-5-86

AREA B			AREA C			AREA D		
Product	Capacity	Years In Service	Product	Capacity	Years In Service	Product	Capacity	Years In Service
MEK	8000 gal	8	Stoddard Solvent	8000 gal	14	Diesel	6000 gal	15
Xylene	8000 gal	8	Methyl Alcohol	8000 gal	14	Unleaded	2000 gal	unknown
Acetone	6000 gal	8				Regular	4000 gal	unknown
Toluene	8000 gal	8						
Isopropyl Alcohol	8000 gal	8						

EXHIBIT D

QUARTERLY POTENTIOMETRIC SURFACE MAPS

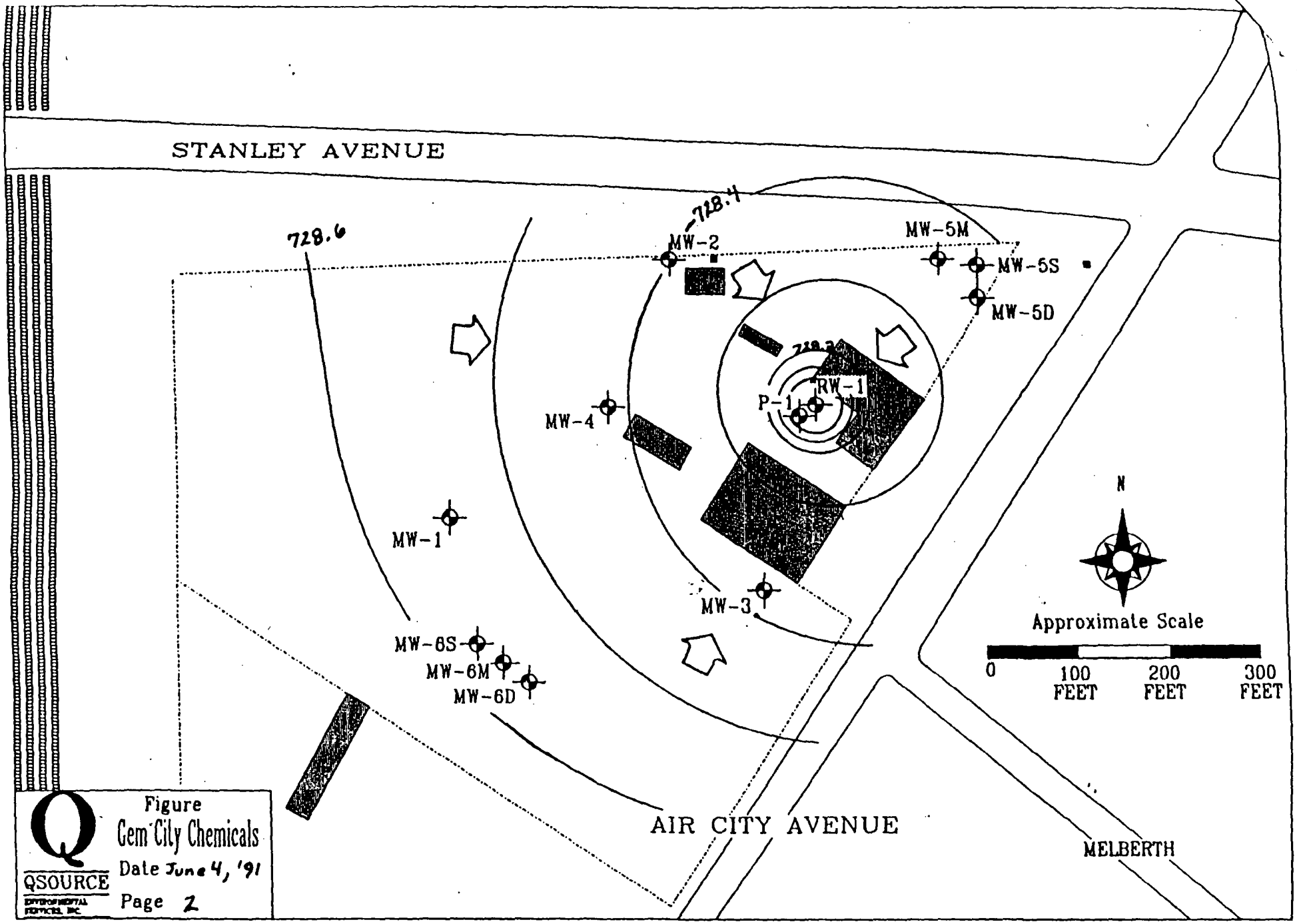


Figure
Gem City Chemicals
Date June 4, '91
Page 2

QSOURCE
ENVIRONMENTAL SERVICES, INC.

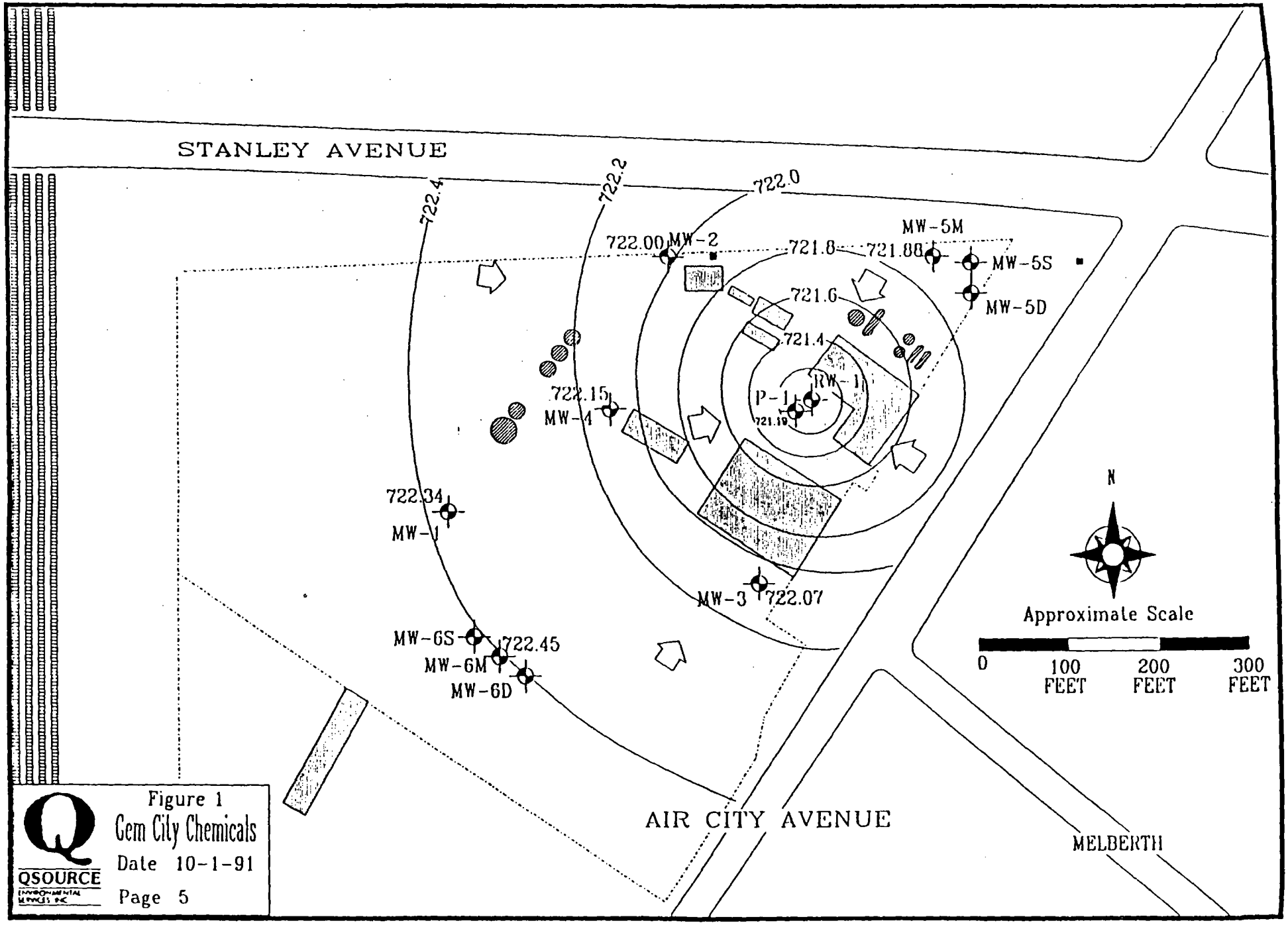


Figure 1
Gem City Chemicals
Date 10-1-91
Page 5

QSOURCE

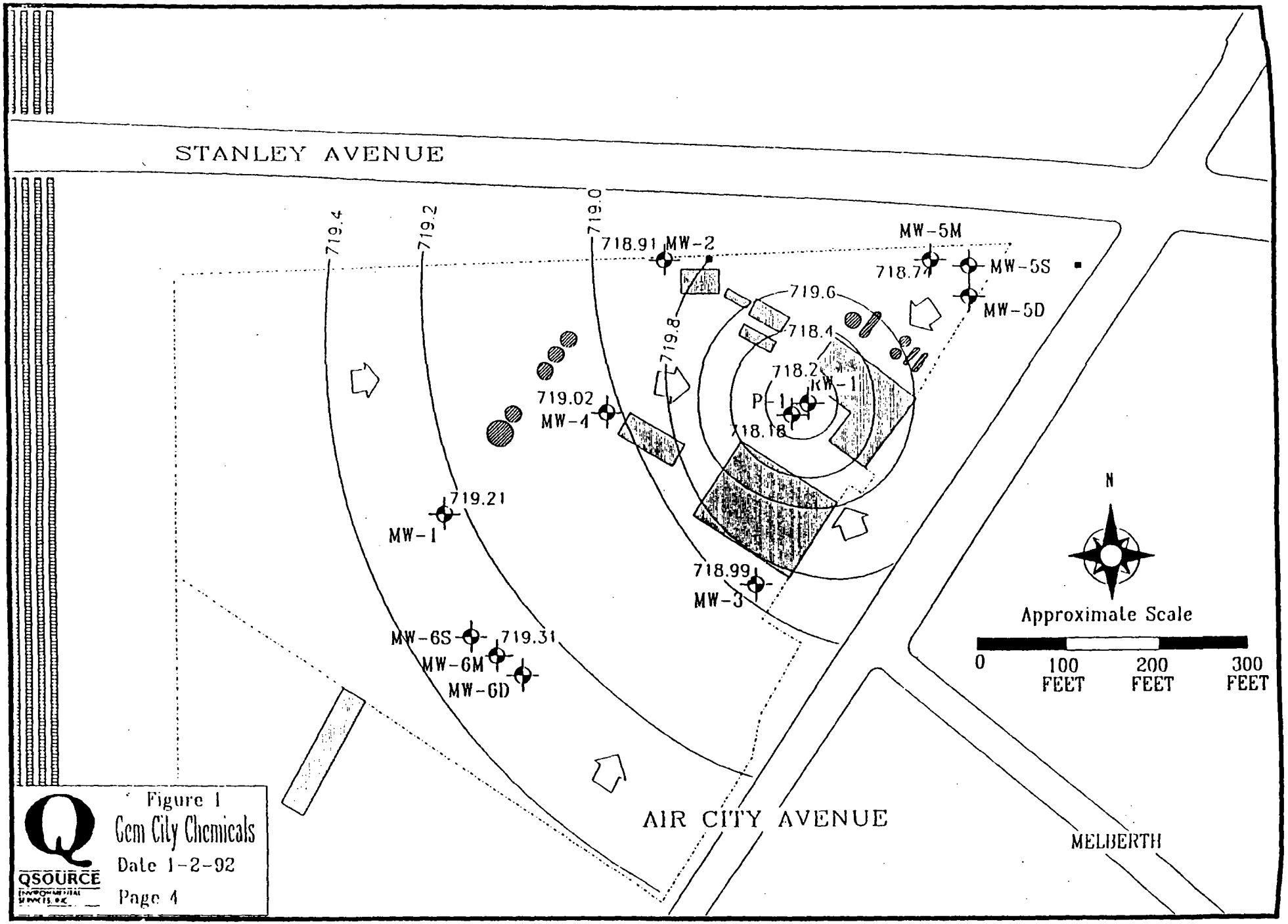


Figure 1
Gem City Chemicals
Date 1-2-92
Page 4

QSOURCE

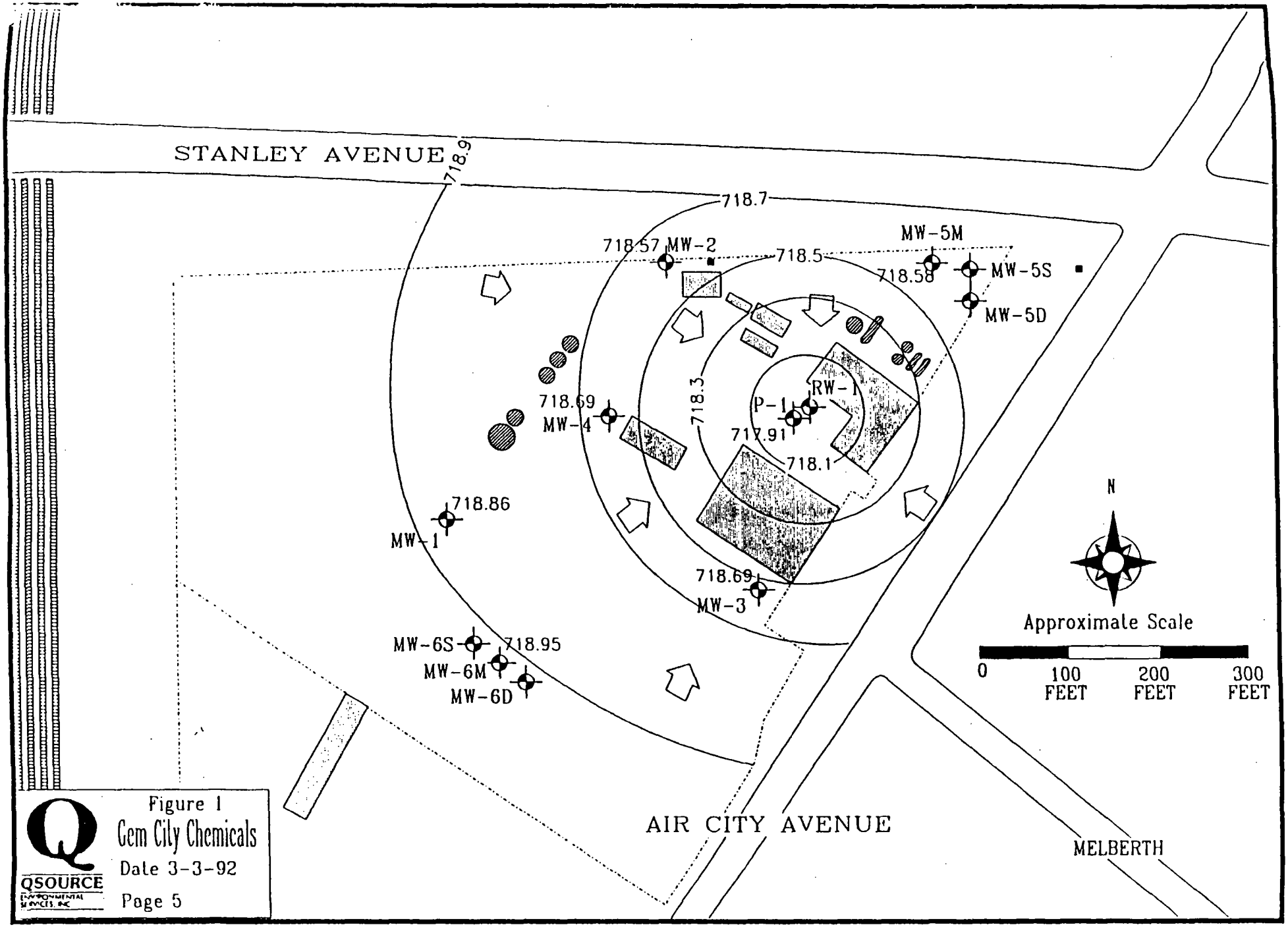
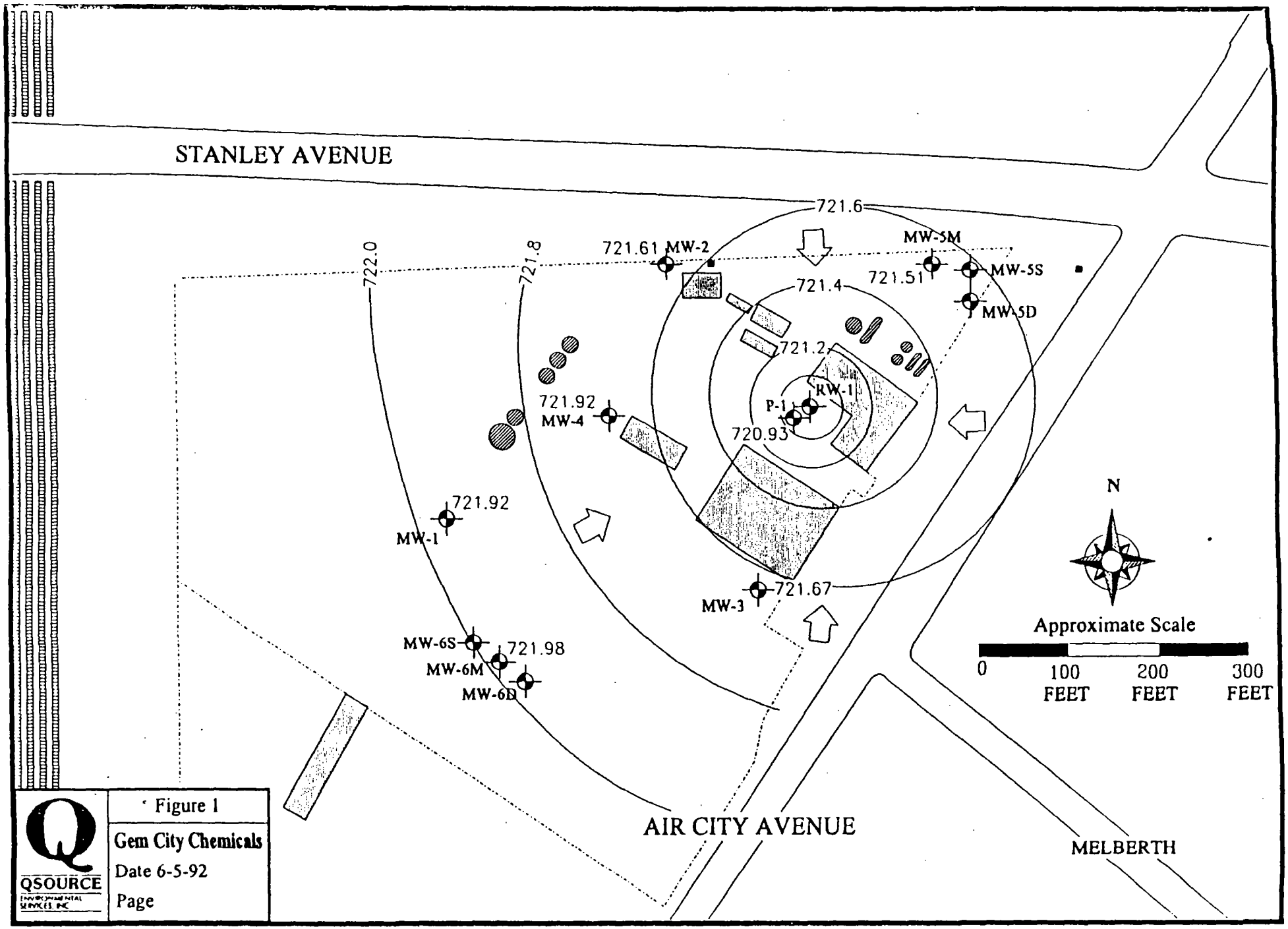


Figure 1
Gem City Chemicals
Date 3-3-92
Page 5

QSOURCE ENVIRONMENTAL SERVICES, INC



QSOURCE ENVIRONMENTAL SERVICES, INC

Figure 1

Gem City Chemicals

Date 6-5-92

Page

EXHIBIT E

REGIONAL WELL LOGS

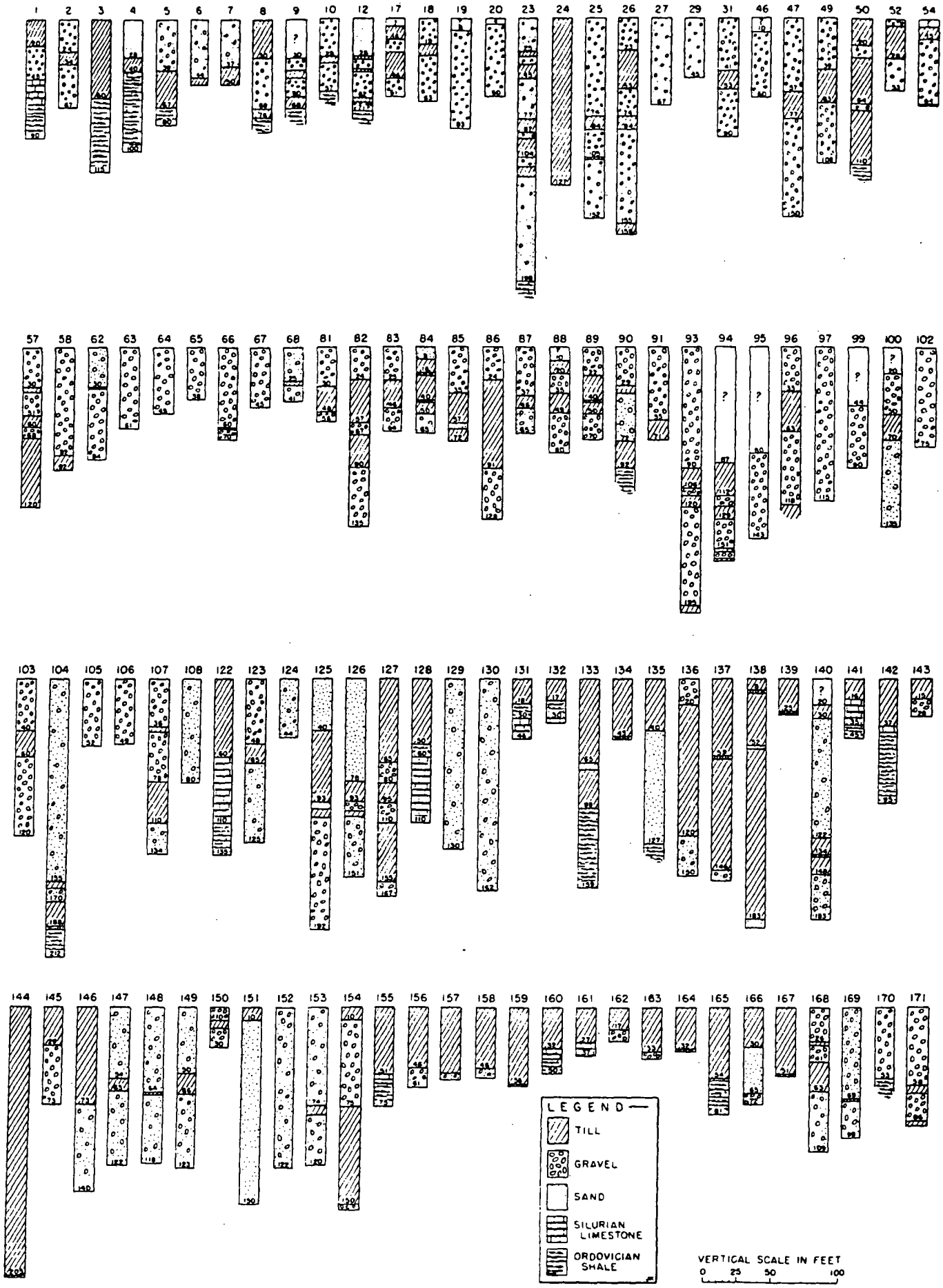


Plate 48-A. Logs of wells in Montgomery County, Ohio. Well numbers refer to locations shown on plate 2.

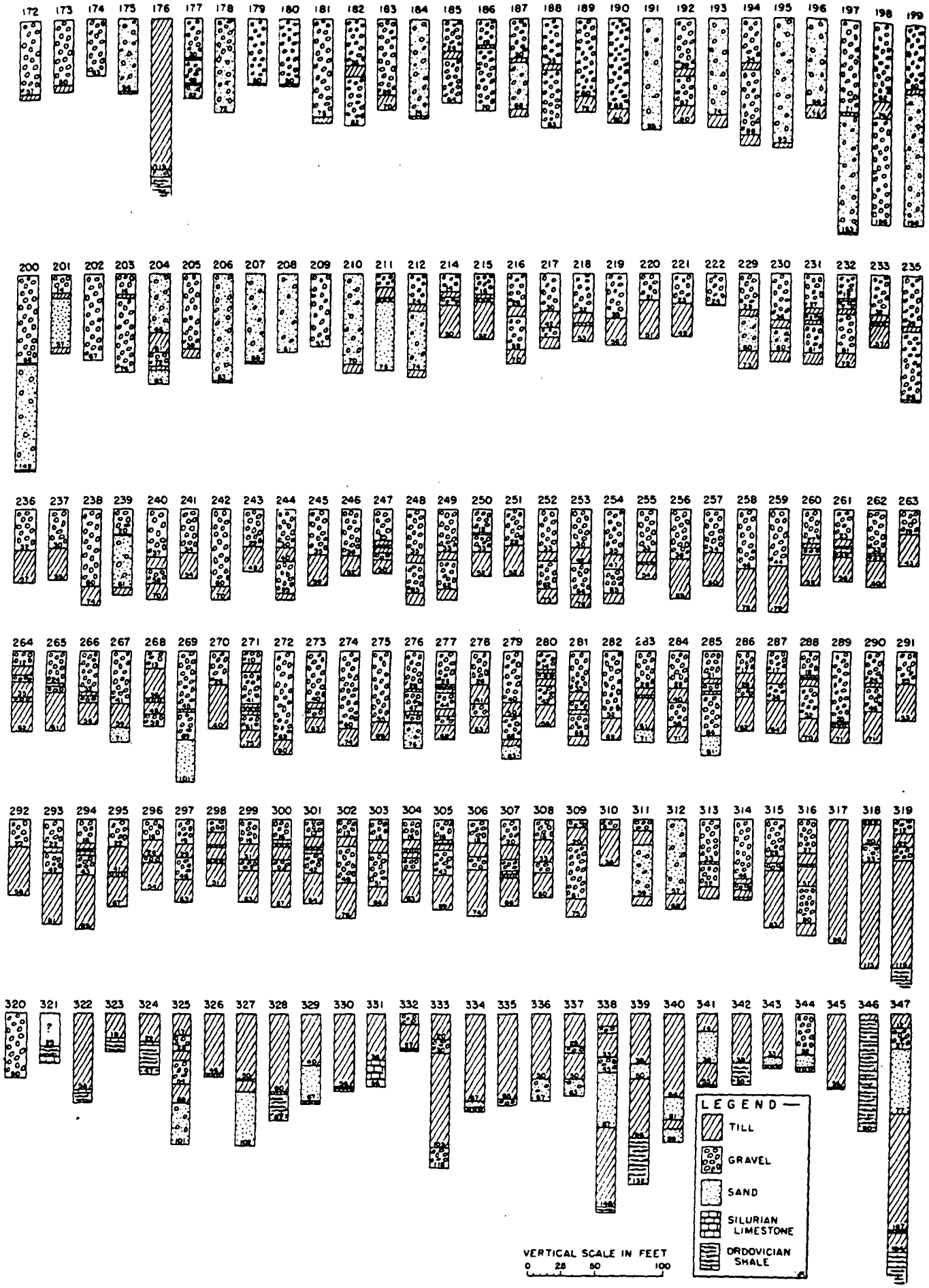


Plate 48-B. Logs of wells in Montgomery County, Ohio. Well numbers refer to locations shown on plate 2.

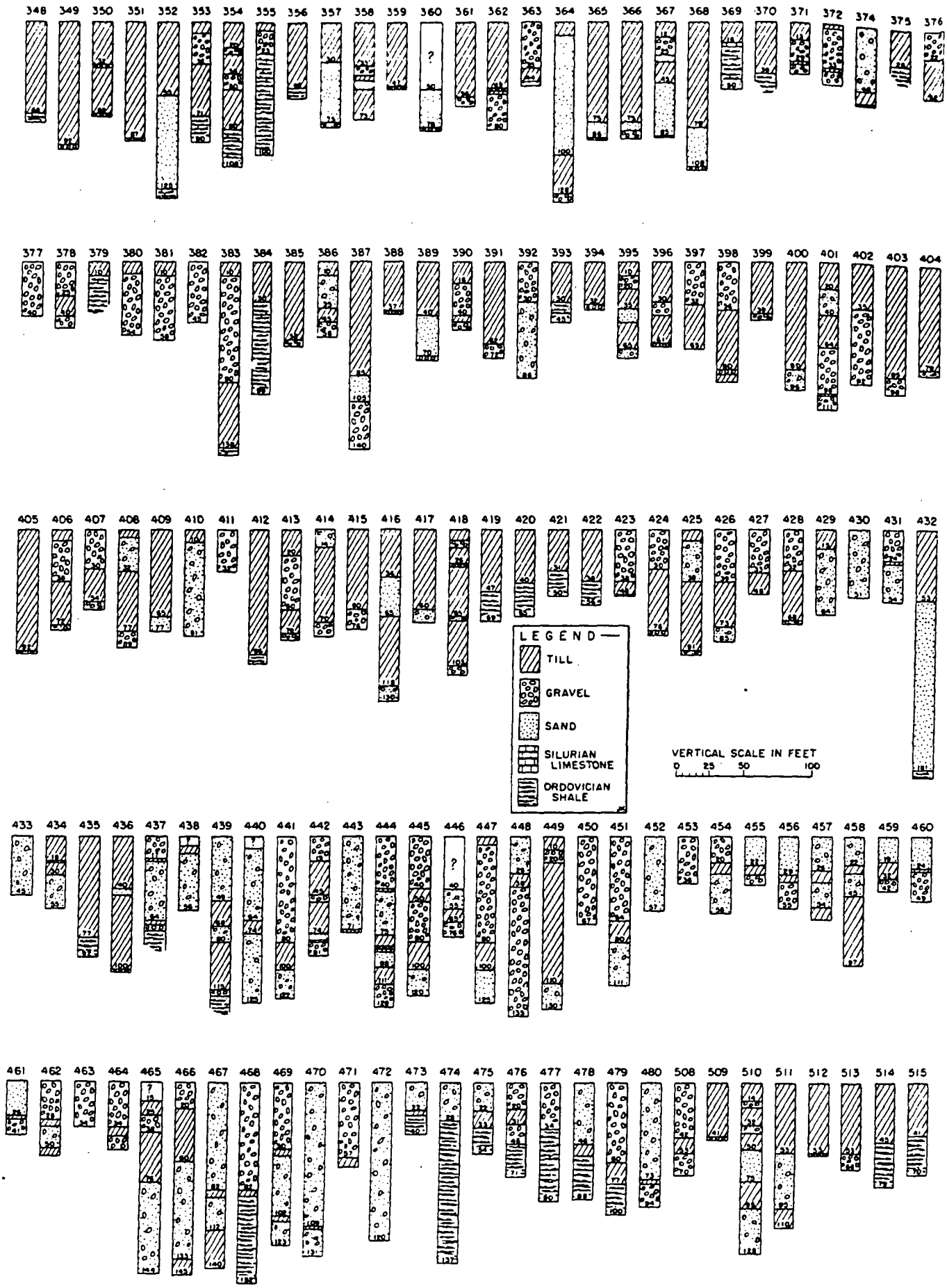


Plate 48-C. Logs of wells in Montgomery County, Ohio. Well numbers refer to locations shown on plate 2.

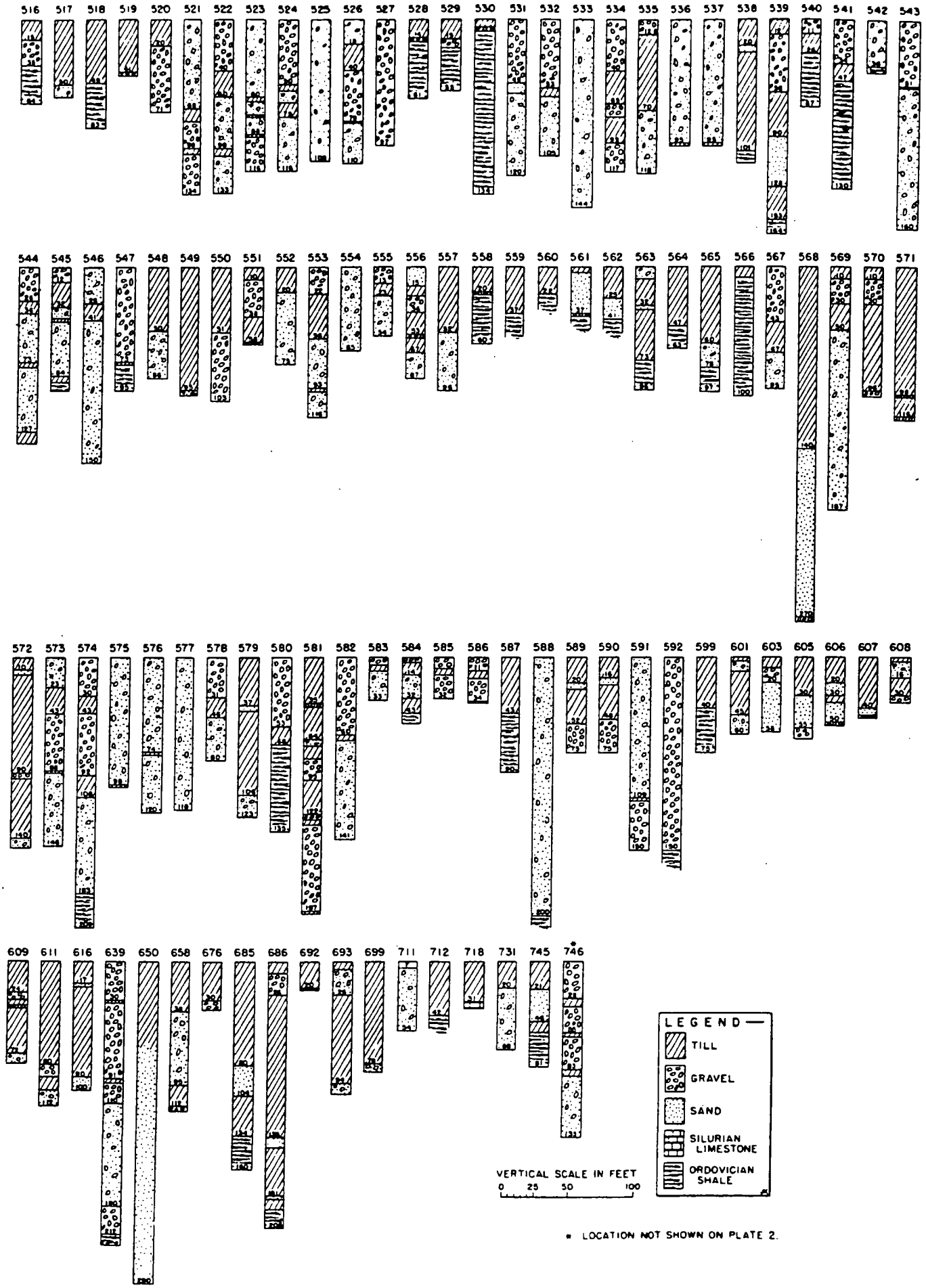


Plate 48-D. Logs of wells in Montgomery County, Ohio. Well numbers refer to locations shown on plate 2.

EXHIBIT F

ON-SITE TEST BORING LOGS

THE OHIO DRILLING CO.

INCORPORATED

MASSILLON, OHIO

MW1

DRILLED FOR Gem City Chemicals, Inc. - Dayton, Ohio HOLE NO. 1- 3"
Test Hole

DRILLED BY Glyn Davis DRILLER COMPLETED November 6, 19 87

LOCATION Near southwest corner of plant site

THICKNESS OF STRATA	STRATA	TOTAL DEPTH	HEAVED	WATER FROM SURFACE
5 ft.	Dry Sand, Gravel & Clay	25 ft.		
11 ft.	Dry Sand, Gravel & Less Clay	36 ft.		
2 ft.	Sand, Fine Sand, Gravel & Clay	78 ft.		29' 5"
11 ft.	Sand, Clay & Stones	89 ft.		
	Pumped for water samples at following depths:			
	1) 35' - 37'			
	2) 40' - 43'			
	3) 48' - 51'			
	4) 55' - 58'			
	5) 61' - 64'			
	6) 68' - 71'			
	7) 71' - 73'			
	8) 78' - 83'			
	9) 87' - 89'			

THE OHIO DRILLING CO.

INCORPORATED

MASSILLON, OHIO

MW 2

DRILLED FOR Gem City Chemicals, Inc. - Dayton, Ohio HOLE NO. 2 - 5" Test Hole

DRILLED BY Alan Graber DRILLER COMPLETED December 4, 19 87

LOCATION Northwest of drum flushing shed

...NS OF STRATA	STRATA	TOTAL DEPTH	HEAVED	WATER FROM SURFACE
35 ft.	Brown Fine Sand, Small Gravel & Clay	35 ft.		30 ft.
... ft.	Brown Sand, Small Gravel & Clay	50 ft.		
5 ft.	Brown Sand & Clay	55 ft.		
ft.	Brown Sand, Gravel & Clay	75 ft.		
6 ft.	Grey Sandy Clay with Stones	81 ft.		
	Pumped for water samples at following depths:			
	1) 40 ft.			
	2) 50 ft.			
	3) 60 ft.			
	4) 70 ft.			

THE OHIO DRILLING CO.

INCORPORATED

MASSILLON, OHIO

MW-3

DRILLED FOR Gem City Chemicals, Inc. - Dayton, Ohio HOLE NO. 3- 5" Test Hole

DRILLED BY Alan Graber DRILLER COMPLETED December 10, 19 87

LOCATION Northeast corner of lot south of warehouse

THICKNESS OF STRATA	STRATA	TOTAL DEPTH	HEAVED	WATER FROM SURFACE
25 ft.	Brown Sand, Small Gravel & Clay	25 ft.		
5 ft.	Brown Sand, Clay & Stones	30 ft.		30 ft.
5 ft.	Brown Sand & Clay Hardpan	35 ft.		
5 ft.	Brown Sand, Clay & Stones	40 ft.		
38 ft.	Brown Sand, Small Gravel & Clay	78 ft.		
5 ft.	Grey Sand, Small Gravel & Clay	83 ft.		
2 ft.	Grey Sand & Clay Hardpay	85 ft.		
	Pumped for water samples at following depths:			
	1) 41 ft.			
	2) 50 ft.			
	3) 59 ft.			
	4) 69 ft.			
	5) 78 ft.			

THE OHIO DRILLING CO.

INCORPORATED

MASSILLON, OHIO

MW4

FOR ~~Con City Chemicals, Inc. - Dayton, Ohio~~ HOLE NO. 4 - 5" Test Hole

BY Alan Graber DRILLER COMPLETED January 6, 19 88

In aisle between drum storage areas

No. of Strata	Strata	Total Depth	Heaved	Water from Surface
8 ft.	Sand, Clay & Gravel	8 ft.		
32 ft.	Sand, Clay & Small Stones	40 ft.		32 ft.
5 ft.	Sand, Gravel & Clay	45 ft.		
	Pumped for water sample at depth of 40 ft.			

LOG OF BORING

MW-5s

PROJECT NUMBER:	PROJECT NAME: Gem City Chemicals	
BORING NUMBER: MW5-S	ELEVATION:	DATE STARTED: 8/9/88
COORDINATES:		DATE COMPLETED: 8/14/88
DRILLING METHODS: H.S.A. with S.S.S.		PAGE: 1 OF 1
ENGINEER/GEOLOGIST: G. Clyburn		GWL: 32 AT HRS.
DRILLER: G.J. Thelen		

DEPTH	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER	RECOVERY	DESCRIPTION	USCS SYMBOL	PROFILE	CASING BLOWS PER	ROCK RECOVERY % / RQD%	REMARKS
				black clay topsoil					
				course sand and gravel					
5	5	16-15-10							
	10	10-26-12		fine to medium tan sand with medium gravel, dry					
10									
	15	12-20-21							
15				grey silty clay, dry					
	20	36-34-31		fine to course tan sand with gravel, dry					
20									
	25	38-39-31							
25									
	30	24-29-38		medium to course sand with large gravel moist at 30'					
30				wet at 32'					
	35	23-28-19							
35									
	40	34-45-41							
40				fine sand and gravel, wet					
	45	26-41-24							
45									

NOTES:

Bottom of boring at 50'

QSOURCE ENGINEERING, INC.

LOG OF BORING

MW-5m

PROJECT NUMBER:	PROJECT NAME: Gem City Chemicals	
BORING NUMBER: MW5-M	ELEVATION:	DATE STARTED: 8/18/88
COORDINATES:		DATE COMPLETED: 8/26/88
DRILLING METHODS: H.S.A. with S.S.S.		PAGE: 1 OF 2
ENGINEER/GEOLOGIST: G. Clyburn		GWL: AT HRS.
DRILLER: G. J. Thelen		

DEPTH	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER	RECOVERY	DESCRIPTION	USCS SYMBOL	PROFILE	CASING BLOWS PER	ROCK RECOVERY % / RQD%	REMARKS
				black clay top soil		NA	NA	NA	
5	5	14-9-12		course sand and gravel					
10	10	21-15-9		fine to medium tan sand with medium gravel, dry					
15	15	6-23-16		greysilty clay, dry					
20	20	34-37-30		fine to very course tan sand with gravel, dry					
25	25	36-48-37		medium to course sand with large gravel moist at 30' 6" wet at 32' 8"					
30	30	29-36-21							
35	35	24-24-27							
40	40	34-12-21							
45	45	21-23-30		fine sand and gravel, wet					
	50	20-28-34							

NOTES:

QSOURCE ENGINEERING, INC.

LOG OF BORING, cont.

PROJECT NUMBER:	PROJECT NAME: Gem City Chemicals	
BORING NUMBER: MW5-M	ELEVATION:	DATE STARTED: 8/18/88
COORDINATES:		DATE COMPLETED: 8/26/88
DRILLING METHODS: H.S.A. with S.S.S		PAGE: 2 OF 2
ENGINEER/GEOLOGIST: G. Clyburn		GWL: 32'8" AT HRS.
DRILLER: G.J. Thelen		

DEPTH	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER	RECOVERY	DESCRIPTION	USCS SYMBOL	PROFILE	CASING BLOWS PER	ROCK RECOVERY % / RQD%	REMARKS
				course grey sand and gravel					
55	55	21-34-28							
60	60	20-30-31							
65									

NOTES:
Bottom of Boring at 60'

QSOURCE ENGINEERING, INC.

LOG OF BORING

MW-5d

PROJECT NUMBER:	PROJECT NAME: Gem City Chemicals	
BORING NUMBER: MW5-D	ELEVATION:	DATE STARTED: 9/6/88
COORDINATES:		DATE COMPLETED: 9/7/88
DRILLING METHODS: H.S.A. with S.S.S.		PAGE: 1 OF 2
ENGINEER/GEOLOGIST: G. Clyburn		GWL: 32' AT HRS.
DRILLER: Moody's of Dayton Inc.		

DEPTH	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER	RECOVERY	DESCRIPTION	USCS SYMBOL	PROFILE	CASING BLOWS PER	ROCK RECOVERY % / RQD%	REMARKS
				black clay top soil		NA	NA	NA	
				course sand and gravel					
5	5	10-8-7							
				fine to medium tan sand with medium gravel, dry					
10	10	14-16-22							
15	15	34-38-21							
				grey clay/silt,dry					
20	20	30-31-37		fine to very course tan sand with gravel,dry					
25	25	54-60-68							
				medium to course sand with large gravel moist at 30'					
30	30	24-28-38		wet at 32"					
35									
40									
45				fine sand and gravel, wet					

NOTES: Split spoon samples were taken at 18" intervals

QSOURCE ENGINEERING, INC.

LOG OF BORING, cont.

PROJECT NUMBER:	PROJECT NAME: Gem City Chemicals	
BORING NUMBER: MW 5- D	ELEVATION:	DATE STARTED: 9/6/88
COORDINATES:		DATE COMPLETED: 9/7/88
DRILLING METHODS: H.S.A. with S.S.S		PAGE: 2 OF 2
ENGINEER/GEOLOGIST: G.Clyburn		GWL: AT HRS.
DRILLER: Moody's of Dayton, INc.		

DEPTH	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER	RECOVERY	DESCRIPTION	USCS SYMBOL	PROFILE	CASING BLOWS PER	ROCK RECOVERY % / RQD%	REMARKS
				course grey sand and gravel	N	NA	NA	NA	
55									
60									
65									
70									
75									
80	80	100-108 156		dense, grey clay "hardpan"					
85									
90									
95									

NOTES:

Bottom of boring at 85'

QSOURCE ENGINEERING, INC.

MOODY'S
of Dayton, Inc.

P.O. Box 123
4359 Infirmary Road
Miamisburg, Ohio 45342
513-859-4482

TEST BORING FIELD LOG

RECEIVED
SEP 20 1988
OSCURE ENGR. INC

MW 5d

CUSTOMER: Gem City Chemical BORING NO.: MW N80 PAGE: 1

NAME & LOCATION: Stanley Ave & Air City Drive JOB NO.: 48338

DATE STARTED: 9/6/88 DATE FINISHED: 9/7/88 SURFACE ELEV.:

WEATHER: good DRILLER: Williams CREW: Bond

DEPTH	MATERIAL DESCSRIPTION AND REMARKS	SAMPLE NO	SAMPLE TYPE	DEPTH	BLOW COUNT	'N' BLOWS PER FT.	REC
[illegible]	Topsoil			0 - 5			
[illegible]	Dirty sand and gravel	1	SS	5 - 6.5	10-8-7		
[illegible]-15'	Sand	2	SS	10 - 11.5	14-16-22		
15-16'	Clay streak	3	SS	15 - 16.5	34-38-21		
		4	SS	20 - 21.5	30-31-37		
16-80	Sand	5	SS	25 - 26.5	54-60-68		
		6	SS	30 - 31.5	24-28-38		
80'	Tight gray clay	7	SS	80 - 81.5	100-108-156		
	Augers to 80', S.S. to 81.5'						
	Augered to 30'. Pulled augers and put in						
	plug and run to 80'.						
	2" PVC well set at 80'.						

METHOD OF DRILLING:
AUGER: X SIZE: 4¼
ROTARY: SIZE(S):
AIR MUD WATER
OTHER: CME-75
MACHINE:

WATER LEVELS:
INITIAL
COMPLETION
24 HR.
OTHER

TYPE AND SIZE SAMPLER:
A. SPLIT SPOON (2")
B. SHELBY TUBE ( )
C. NX CORE
D. OTHER:

LOG OF BORING

MW-6s

PROJECT NUMBER:	PROJECT NAME: Gem City Chemicals	
BORING NUMBER: MW6-S	ELEVATION:	DATE STARTED: 9/5/88
COORDINATES:		DATE COMPLETED: 9/7/88
DRILLING METHODS: H.S.A. with S.S.S.		PAGE: 1 OF 1
ENGINEER/GEOLOGIST: G. Clyburn		GWL: 32'6" AT HRS.
DRILLER: G.J. Thelen		

DEPTH	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER	RECOVERY	DESCRIPTION	USCS SYMBOL	PROFILE	CASING BLOWS PER	ROCK RECOVERY % / RQD%	REMARKS
				black stained course sand and gravel, dry		NA	NA	NA	
5				course sand and gravel, dry					
10									
15									
20				fineto medium brown sand and gravel, dry					
25				moist at 30'					
30				wet at 32'6"					
35									
40				medium to course sand with large gravel					
45									

NOTES:

Bottom of boring at 48'

QSOURCE ENGINEERING, INC.

LOG OF BORING

MW-6m

PROJECT NUMBER:	PROJECT NAME: Gem City Chemicals	
BORING NUMBER: MW6-M	ELEVATION:	DATE STARTED: 8/28/88
COORDINATES:		DATE COMPLETED: 8/31/88
DRILLING METHODS: H.S.A. with S.S.S.		PAGE: 1 OF 2
ENGINEER/GEOLOGIST: G.Clyburn		GWL: 32' AT HRS.
DRILLER: G.J. Thelen		

DEPTH	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER	RECOVERY	DESCRIPTION	USCS SYMBOL	PROFILE	CASING BLOWS PER	ROCK RECOVERY % / RQD%	REMARKS
				black stained course sand with large gravel dry		NA	NA	NA	
5	5	26-34-12		course sand and gravel, dry					
10	10	21-23-31							
15	15	12-23-27							
20	20	24-24-31							
25	25	21-36-30		fine to medium brown sand and gravel, dry					
30	30	6-21-15		moist at 30'5"					
				wet at 32'					
35	35	12-26-31							
40	40	18-28-31		medium to course sand with large gravel					
45	45	21-9-25							

NOTES:

QSOURCE ENGINEERING, INC.

LOG OF BORING, cont.

PROJECT NUMBER:	PROJECT NAME: Gem City Chemicals	
BORING NUMBER: MW6-M	ELEVATION:	DATE STARTED: 8/28/88
COORDINATES:		DATE COMPLETED: 8/31/88
DRILLING METHODS: H.S.A. with S.S.S.		PAGE: 2 OF 2
ENGINEER/GEOLOGIST: G. Clyburn		GWL: 33' AT HRS.
DRILLER: G. J. Thelen		

DEPTH	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER	RECOVERY	DESCRIPTION	USCS SYMBOL	PROFILE	CASING BLOWS PER	ROCK RECOVERY % / RQD%	REMARKS
				course grey sand and gravel, wet					
55	55	34-31-30							
60	60	21-28-25							
65									

NOTES: Bottom of boring at 60'

QSOURCE ENGINEERING, INC.

LOG OF BORING

MW 6-D

PROJECT NUMBER:	PROJECT NAME: Gem City Chemicals	
BORING NUMBER: MW6-D	ELEVATION:	DATE STARTED: 9/1/88
COORDINATES:		DATE COMPLETED: 9/5/88
DRILLING METHODS: H.S.A. with S.S.S.		PAGE: 1 OF 2
ENGINEER/GEOLOGIST: G. Clyburn		GWL: 32' AT HRS.
DRILLER: Moody's of Dayton, INC.		

DEPTH	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER	RECOVERY	DESCRIPTION	USCS SYMBOL	PROFILE	CASING BLOWS PER	ROCK RECOVERY % / RQD%	REMARKS
				black stained course sand with large gravel dry		NA	NA	NA	
5				course sand and gravel dry					
10									
15									
20				fine to medium brown sand and gravel, dry					
25									
30				moist at 30'					
				wet at 32'					
35				medium to course sand with large gravel					
40									
45									

NOTES:

QSOURCE ENGINEERING, INC.

LOG OF BORING, cont.

PROJECT NUMBER:	PROJECT NAME: Gem City Chemicals	
BORING NUMBER: MW6-D	ELEVATION:	DATE STARTED: 9/1/88
COORDINATES:		DATE COMPLETED: 9/5/88
DRILLING METHODS: H.S.A. with S.S.S.		PAGE: 2 OF 2
ENGINEER/GEOLOGIST: G. Clyburn		GWL: 32 AT HRS.
DRILLER: Moody's of Dayton, Inc.		

DEPTH	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER	RECOVERY	DESCRIPTION	USCS SYMBOL	PROFILE	CASING BLOWS PER	ROCK RECOVERY % / RQD%	REMARKS
				course grey sand and gravel, wet					
55									
60									
65									
70									
75									
80									
85	85	35-60-68							
				medium to course grey sand and gravel, wet					
90	90	48-70-127							
				dense grey clay "hardpan"					
95									

NOTES:

Bottom of boring at 90'

QSOURCE ENGINEERING, INC.

MOODY'S of Dayton, Inc.

P.O. Box 123
4359 Infirmary Road
Miamisburg, Ohio 45342
513-859-4482

TEST BORING FIELD LOG

MW 6.d

CUSTOMER: Gem City chemical BORING NO.: MW 90 S PAGE: 1

NAME & LOCATION: Stanley Ave & Air City Drive JOB NO.: 48338

DATE STARTED: 9/1/88 DATE FINISHED: 9/5/88 SURFACE ELEV.:

WEATHER: Good DRILLER: Williams CREW: Bond

DEPTH	MATERIAL DESCSRIPTION AND REMARKS	SAMPLE NO	SAMPLE TYPE	DEPTH	BLOW COUNT	'N' BLOWS PER FT.	REC
0-5'	Black dirty sand and gravel						
5-20'	Coarse sand and gravel						
20-35'	Brown sand and gravel						
35-85'	Gray sand and gravel						
85-90'	Sand	1	SS	85 - 87	35-60-68		
90'	Gray clay	2	SS	90 - 91.7	100/3 48-70-127		
	Augers to 90'						
	S.S. to 91'9"						
	2" PVC well set at 90'.						

METHOD OF DRILLING:
AUGER: X SIZE: 4½
ROTARY: SIZE(S):
AIR MUD WATER
OTHER:
MACHINE: CME-75

WATER LEVELS:
INITIAL
COMPLETION
24 HR
OTHER

TYPE AND SIZE SAMPLER:
A. SPLIT SPOON (2")
B. SHELBY TUBE ( )
C. NX CORE
D. OTHER:

County Permit No.

NO CARBON PAPER NECESSARY - SELF-TRANSCRIBING

WELL LOG AND DRILLING REPORT

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Fountain Square
Columbus, Ohio 43224

ORIGINAL

557913

RW-1

COUNTY Montgomery TOWNSHIP _____ SECTION OF TOWNSHIP _____

OWNER Gem City Chemical ADDRESS 1287 Air City Drive, Dayton, Ohio

LOCATION OF PROPERTY Same

CONSTRUCTION DETAILS

Casing diameter 8" Length of casing 30'

Type of screen Galvanized Length of screen 20'

Type of pump Goulds 300L30

Capacity of pump 300 GPM

Depth of pump setting 50'

Date of completion 3/89

BAILING OR PUMPING TEST
(specify one by circling)

Test rate N/A gpm Duration of test _____

Drawdown _____ ft Date _____

Static level (depth to water) 30'

Quality (clear, cloudy, taste, odor) _____

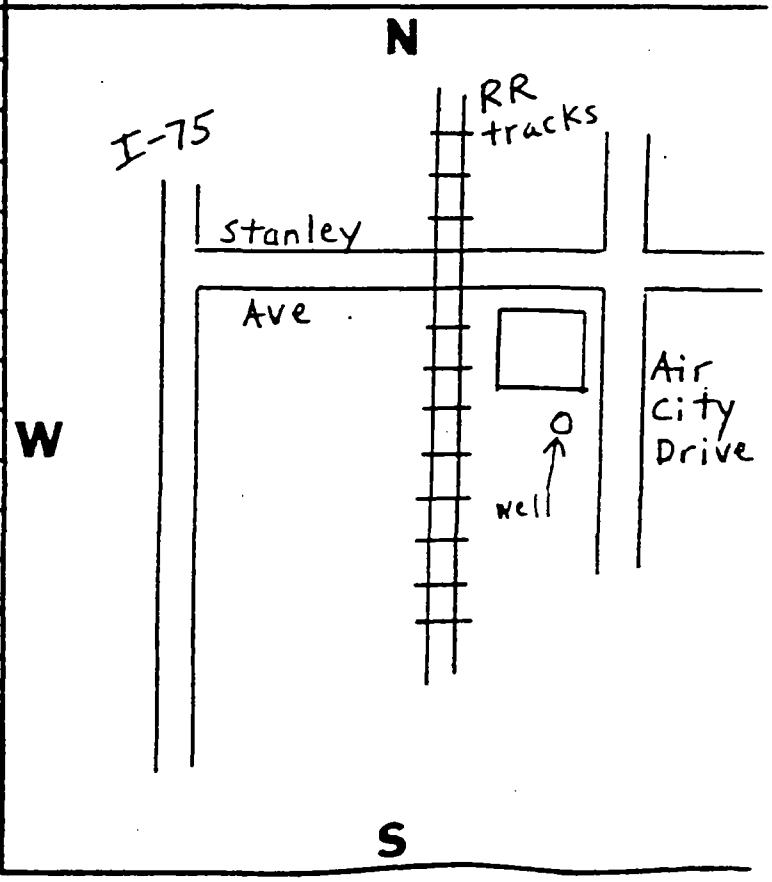
Pump installed by Moody's of Dayton, Inc.

WELL LOG*

Formations: sandstone, shale, limestone, gravel, clay	From	To
Concrete	0 ft	1 ft
Clay and gravel	1	8
Sand and gravel	8	19
Clay streak	19	21
Sand and gravel	21	60
Coarse sand, few gravel	60	65
Set 8" telescoping screen		
(30 slot) from 30'-50'.		
7" sump set from 50'-57'.		
Air developed 9 hours.		

SKETCH SHOWING LOCATION

Locate in reference to numbered state highways, street intersections, county roads, etc.



DRILLING FIRM Moody's of Dayton, Inc. DATE 9/21/89

ADDRESS P.O. Box 509, Miamisburg, OH 45343 SIGNED Doug Wagner

*If additional space is needed to complete well log, use next consecutive numbered form.

EXHIBIT G

AS-BUILT DIAGRAMS

QSOURCE ENVIRONMENTAL SERVICES, INC.

SUBSURFACE EXPLORATION LOG

PIT OR BORING # P-2
PAGE 1 OF 3

PROJECT Gem City Chemicals, Inc. PROJECT # 193004

GENERAL SITE LOCATION 1287 Air City Avenue

STATE Ohio COUNTY Montgomery CITY/TWP Dayton SEC

LOCATION ON THE SITE Northwest corner, northern $CaCL_2$ tanks

METHOD(S) 4 1/4" HSA RIG CME-75 HOLE DIA. 9 " SAMPLER & SIZE 2"x24" Split Spoon

DRILLING CO. Moody's of Dayton DRILLERS P. Ridder, J. D. Hobbs LOGGED BY J. Michael Clinch

DATE STARTED 1/15/93 DATE FINISHED 1/15/93

x BORING COMPLETED AS A piezometer, P-3 OR _ BACKFILLED DATE / / MATERIAL

DEPTH TO WATER: Encountered at 22 ', At completion N.A. ', On 2/8/93 water was at 23.18' (TOC)

DEPTH	SAMPLE INFORMATION #	TYPE	FROM / TO	REC	BLOW CT ADV RATE	ELEV.	MATERIAL / DRILLING AND OTHER NOTES
							surface: gravel fill
0							
1	1	SS	0'-2'	1.4'	14 6 5 4		SAND, medium, little pebbles, little silt, moist, 2.5 Y 5/4, farker at top (4/1), disturbed (fill), PID = 0.15
3	2	SS	2'-4'	0.4'	3 2 3 4		SAND, medium, little silt, little pebbles, moist, loose, PID = 0.2 (BACKFILL MATERIAL)
5	3	SS	4'-6'	0.9'	3 1 2 2		SAND, medium to coarse, little very coarse sand, trace silt, loose, 2.5 Y 4/2, PID = 0 (BACKFILL MATERIAL)
7	4	SS	6'-8'	1.2'	1 2 1 2		SAND, medium to coarse (BACKFILL MATERIAL) PID = 0.5
9	5	SS	8'-10'	1.1'	WOR 2 2 4		SAND, medium to coarse (BACKFILL MATERIAL) PID = 0.3

2490 Technical Drive · Miamisburg, Ohio 45343 · (513) 866-1711 · (800) 356-9039 · FAX (513) 866-7473

QSOURCE ENVIRONMENTAL SERVICES, INC.

SUBSURFACE EXPLORATION LOG

PROJECT Gem City Chemicals, Inc. PROJECT # 193004

PIT OR BORING # P-2

PAGE 2 OF 3

DEPTH	SAMPLE INFORMATION #	TYPE	FROM / TO	REC	BLOW CT ADV RATE	ELEV	MATERIAL / DRILLING AND OTHER NOTES
10							
					3		6" SAND (BACKFILL MATERIAL) PID = 0
	6	SS	10'-12'	0.9'	2		sharp contact
					9		5" SAND, fine to medium, and PEBBLES, trace
12					13		silt, moist, 2.5 Y 7/4
					23		SAND, coarse, some pebbles to 1", some very
	7	SS	12'-14'	1.3'	25		coarse sand and granules, trace fine sand,
					30		trace silt, moist, 2.5 Y 7/6, PID = 0
14					34		
					18		SAND, medium to coarse, some very coarse sand
	8	SS	14'-16'	1.1'	25		and pebbles, little fine sand, trace silt,
					27		moist, 2.5 Y 7/6, PID = 0.2
16					29		
					20		SAME AS ABOVE, PID = 0.1
	9	SS	16'-18'	1.5'	30		
					42		
18					40		
					50		0.8' PEBBLES and SAND, med. to coarse,
	10	SS	18'-20'	1.6'	29		trace silt
					24		0.2' SILT and very fine SAND, laminated, wet, 2.5 Y 6/6, PID = 0.1
20					23		0.6' SAND, medium, planar bedding
					13		SAND, medium, trace coarse sand, trace fine
	11	SS	20'-22'	1.4'	16		sand, 2.5 Y 6/4, moist to wet, PID = 0
					19		
22					26		
					19		SAND, coarse to very coarse, some medium sand,
	12	SS	22'-24'	1.8'	15		trace silt, faint and indistinct, silt
					19		laminae, 2.5 Y 6/6, saturated, PID = 0.2
24					21		
					12		1.1 SAME AS ABOVE
	13	SS	24'-26'	1.8'	18		
					33		0.7 SAND, very coarse, and PEBBLES, little
26					33		fine to medium sand, little silt, PID = 0.2
					35		SAND, very coarse, little pebbles (to 1") in
	14	SS	26'-28'	1.6'	56		thin, discrete layers, some fine to medium
					62		sand, little silt, saturated
28					30		
					13		SAND, coarse, some fine to medium sand,
	15	SS	28'-30'	1.8'	18		little granules, trace pebbles, trace silt,
					26		saturated, 2.5 Y 6/4
30					35		

NOTES:

2490 Technical Drive · Miamisburg, Ohio 45343 · (513) 866-1711 · (800) 356-9089 · FAX (513) 866-7473

QSOURCE ENVIRONMENTAL SERVICES, INC.

SUBSURFACE EXPLORATION LOG

PROJECT Gem City Chemicals PROJECT # I93004

PIT OR BORING # P-2

PAGE 3 OF 3

DEPTH	SAMPLE INFORMATION #	TYPE	FROM / TO	REC	BLOW CT ADV RATE	ELEV	MATERIAL / DRILLING AND OTHER NOTES
30							
					9		SAND, medium to coarse, little pebbles and
	16	SS	30'-32'	1.4'	10		granules, little fine sand, trace silt
					22		2.5 Y 6/6, saturated, coarsening upward
32					20		cycles over 1 foot
					20		SAND, medium to coarse, with pebble zones,
	17	SS	32'-34'	1.6'	30		little fine sand, trace silt, coarsening
					28		upward over 1.5' to 2'
34					34		
					28		SAME AS ABOVE, with a single, 0.5' thick
	18	SS	34'-36'	1.6'	20		pebble zone, 2.5 Y 6/6
					26		
36					30		
					18		SAME AS ABOVE, cycle thickness about 1.5'
	19	SS	36'-38'	2.0'	18		
					30		
38					34		
					30		GRANULES and PEBBLES, some very coarse sand,
	20	SS	38'-40'	1.9'	33		and coarse sand, little fine sand, trace
					24		silt, 2.5 Y 5/4, saturated
40					21		
					8		SAND, coarse to very coarse, some granules,
	21	SS	40'-42'	1.9'	11		little pebbles, little fine to medium sand,
					21		trace silt, fining upward from pebbles to
42					28		a thin fine sand zone
					78		COBBLE ZONE (NO RECOVERY, HIGH BLOW COUNT)
	22	SS	42'-44'	1.3'	19		0.5' SAND, coarse to very coarse, trace silt
					14		0.8' PEBBLES, little granules, trace silt
44					30		trace sand, saturated
					35		1.0' SAME AS ABOVE
	23	SS	44'-46'	1.7'	33		
					48		0.7' GRANULES and very coarse SAND, little
46					43		pebbles, little f.-m. sand, little silt
					30		PEBBLES, some granules and very coarse sand,
	24	SS	46'-48'	1.5'	25		little fine sand, little silt
					21		
48					22		
					40		SAND, coarse to very coarse, some granules,
	25	SS	48'-50'	1.7'	21		little fine to medium sand, trace silt,
					22		some pebbles in 2" thick zones separated
50					24		by 6 inches
							END OF BORING AT 50'

NOTES:

2490 Technical Drive · Miamisburg, Ohio 45343 · (513) 866-1711 · (800) 356-9039 · FAX (513) 866-7473

QSOURCE ENVIRONMENTAL SERVICES, INC.

SUBSURFACE EXPLORATION LOG

PIT OR BORING # P-3
PAGE 1 OF 3

PROJECT Gem City Chemicals, Inc. PROJECT # 193004

GENERAL SITE LOCATION 1287 Air City Avenue

STATE Ohio COUNTY Montgomery CITY/TWP Dayton SEC

LOCATION ON THE SITE 197' E of west fence, 53' S of north fence, in line with P-1 and P-2 site

METHOD(S) 4 1/4" HSA RIG CME-75 HOLE DIA. 9 " SAMPLER & SIZE 2"x24" Split Spoon

DRILLING CO. Moody's of Dayton DRILLERS P. Ridder, J. D. Hobbs LOGGED BY J. Michael Clinch

DATE STARTED 1/13/93 DATE FINISHED 1/13/93

X BORING COMPLETED AS A piezometer P-3 OR _ BACKFILLED DATE / / MATERIAL

DEPTH TO WATER: Encountered at 22 ', At completion 22.8 ', On 2/8/93 water was at 22.92' (TOC)

DEPTH	SAMPLE INFORMATION #	TYPE	FROM / TO	REC	BLOW CT ADV RATE	ELEV.	MATERIAL / DRILLING AND OTHER NOTES
							surface: Grass, weeds, coal fragments
0							
1	1	SS	0' - 2'	1.0'	13, 9, 5, 7		7" COAL FRAGMENTS, little silt, one pebble PID = 0
2							5" SILT, little fine to medium sand, moist 10 YR 3/4, PID = 0
3	2	SS	2' - 4'	0.9'	11, 8, 7, 8		SAND, medium to fine, some pebbles to 1", little coarse to very coarse sand, trace silt dry to moist, 2.5 Y 7/6 (silt color) PID = 0
4							
5	3	SS	4' - 6'	1.1'	10, 12, 16, 19		SAND, medium to coarse, and PEBBLES (1/2" to 1"), little fine sand, little granules, trace silt, moist, 2.5 Y 7/6 PID = 0
6							
7	4	SS	6' - 8'	1.3'	18, 29, 36, 37		SAND, coarse to medium, and PEBBLES, some granules, trace silt, dry to moist 2.5 Y 6/4-8/4, PID = 0 (pebbles to 2" in auger flights)
8							
9	5	SS	8' - 10'	1.3'	10, 15, 17, 22		PEBBLES (1/2" - 1") and SAND, coarse to medium, some granules, trace silt, moist, with minor wet intervals, 2.5 Y 6/6, PID = 0 (material coarsening downward, rig chatter)
10							

2490 Technical Drive · Miamisburg, Ohio 45343 · (513) 866-1711 · (800) 356-9039 · FAX (513) 866-7473

QSOURCE ENVIRONMENTAL SERVICES, INC.

SUBSURFACE EXPLORATION LOG

PROJECT Gem City Chemicals, Inc. PROJECT # 193004

PIT OR BORING # P - 3

PAGE 2 OF 3

DEPTH	SAMPLE INFORMATION #	TYPE	FROM / TO	REC	BLOW CT ADV RATE	ELEV	MATERIAL / DRILLING AND OTHER NOTES
10							
					16		SAND, coarse to very coarse, some pebbles (1"
	6	SS	10' - 12'	1.3'	22		and pebble fragments (broken) little fine to
					25		medium sand, trace silt, moist
12					32		2.5 Y 6/4, PID = 0
					15		GRANULES, some pebbles, some coarse to very
	7	SS	12' - 14'	1.4'	15		coarse sand, trace fine sand, trace silt,
					20		moist, 2.5 Y 6/6, PID = 0
14					20		
					18		GRANULES and PEBBLES (1/4" TO 1"), some very
	8	SS	14' - 16'	1.1'	17		coarse sand, trace silt, trace pebble frags.
					13		2.5 Y 7/6 (silt color) PID = 0
16					14		
					20		PEBBLES (to 3/4") and GRANULES, some very
	9	SS	16' - 18'	1.6'	19		coarse sand, trace fine sand, trace silt
					23		2.5 Y 7/6 (silt color) PID = 0
18					35		
					15		1.2' PEBBLES and GRANULES (same as above)
	10	SS	18' - 20'	1.5'	51		(Interpretation - channel deposit)
					60		PID = 0
20					108		0.3' SAND, medium, bedded, oxidized 5 YR 5/8
					36		SAND, medium to fine, some pebbles and frags.,
	11	SS	20'-20.9'	0.8'	100/4"		trace silt, laminated, 10 YR 7/4, oxidized to
							5 YR 5/8, moist, PID = 0
22							(Heavy rig chatter and bucking)
					32		PEBBLES and SAND, fine to coarse, little silt,
	12	SS	22' - 24'	1.4'	37		saturated, 10 YR 6/6, oxidized zones
					50		PID = 0.5 (associated with water)
24					47		
					25		SAND, coarse to very coarse, little granules
	13	SS	24' - 26'	1.6'	30		trace silt, saturated, 10 YR 6/6,
					33		PID = 0.35
26					58		
					32		0.9' GRANULES, some coarse to very coarse sand
	14	SS	26' - 28'	1.8'	29		SHARP CONTACT
					31		0.9' SAND, medium, trace fine sand, trace silt
28					60		saturated, 10 YR 6/6, PID = 0.25
					31		SAND, medium to coarse, some pebbles, little
	15	SS	28' - 30'	1.9'	22		fine sand, trace silt, saturated
					22		10 YR 6/6, PID = 0.4
30					32		

NOTES:

2490 Technical Drive · Miamisburg, Ohio 45343 · (513) 866-1711 · (800) 356-9089 · FAX (513) 866-7473

QSOURCE ENVIRONMENTAL SERVICES, INC.

SUBSURFACE EXPLORATION LOG

PROJECT Gem City Chemicals PROJECT # I93004

PIT OR BORING # P - 3

PAGE 3 OF 3

DEPTH	SAMPLE INFORMATION #	TYPE	FROM / TO	REC	BLOW CT ADV RATE	ELEV	MATERIAL / DRILLING AND OTHER NOTES
30							
					22		SAND, very coarse, some granules and pebbles,
	16	SS	30' - 32'	1.9'	35		little fine to medium sand, trace silt,
					24		saturated, 2.5 Y 7/4, PID = 0.45
32					27		
					13		GRANULES, some pebbles, little very coarse
	17	SS	32' - 34'	1.8'	12		to medium sand, trace silt, saturated
					15		2.5 Y 6/6, PID = 0.3
34					15		
					15		16" SAME AS ABOVE
	18	SS	34' - 36'	1.8'	14		PID = 0.20
					16		SHARP CONTACT
36					19		5" SAND, medium, trace silt
					13		SAND, medium to coarse, little fine sand, trace
	19	SS	36' - 38'	1.6'	15		silt, one pebble zone 2" thick, saturated,
					15		2.5 Y 6/6, PID = 0.27
38					17		
					17		SAME AS ABOVE, SIMILAR PEBBLE ZONE
	20	SS	38' - 40'	1.7'	20		PID = 0.17
					22		
40					42		
					30		0.6' SAME AS ABOVE
	21	SS	40' - 42'	1.8'	32		0.9' PEBBLES, some interstitial silt
					34		saturated, PID = 0.22
42					55		0.3' SAND, coarse, and PEBBLES, trace silt
					18		GRANULES, some pebbles, little coarse to medium
	22	SS	42' - 44'	2.0'	18		sand, trace silt, 5 Y 7/3, one zone oxidized
					21		to 7.5 YR 6/8, saturated
44					19		
					14		GRANULES and PEBBLES, little medium to coarse
	23	SS	44' - 46'	1.5'	12		sand, trace silt, saturated, PID = 0.6
					15		
46					30		
					23		SAME AS ABOVE
	24	SS	46' - 48'	1.4'	20		one siltier zone, 3" thick
					20		
48					28		
					16		SAME AS ABOVE
	25	SS	48' - 50'	1.4'	24		
					37		
50					30		END OF BORING AT 50'

NOTES:

2490 Technical Drive · Miamisburg, Ohio 45343 · (513) 866-1711 · (800) 356-9039 · FAX (513) 866-7473

QSOURCE ENVIRONMENTAL SERVICES, INC.

SUBSURFACE EXPLORATION LOG

PIT OR BORING # P-4, P-4A
PAGE 1 OF 5

PROJECT Gem City Chemicals, Inc. PROJECT # 193004

GENERAL SITE LOCATION 1287 Air City Avenue

STATE Ohio COUNTY Montgomery CITY/TWP Dayton SEC

LOCATION ON THE SITE 35 feet southeast of recovery well, behind office building

METHOD(S) 6 1/4" HSA RIG CME-75 HOLE DIA. 12" SAMPLER & SIZE 2"x24" Split Spoon

DRILLING CO. Moody's of Dayton DRILLERS P. Ridder, J. D. Hobbs LOGGED BY J. Michael Clinch

DATE STARTED 1/19/93 DATE FINISHED 1/27/93

x BORING COMPLETED AS A piezometer, P-4 OR _ BACKFILLED DATE / / MATERIAL

DEPTH TO WATER: Encountered at 22 ', At completion N.A. ', On 2/8/93 water was at 22.39' (TOC)

DEPTH	SAMPLE INFORMATION #	TYPE	FROM / TO	REC	BLOW CT ADV RATE	ELEV.	MATERIAL / DRILLING AND OTHER NOTES
							surface: 1 1/2" gravel fill
0							----------
					19		3" GRAVEL FILL
1	1	SS	0'-2'	1.7'	4		11" COAL DUST and SILT
					7		6" BRICK FRAGMENTS
2					10		PID = 0.15
					5		SILT, little angular pebbles, little fine
3	2	SS	2'-4'	0.9'	5		sand, moist, 10 YR 4/4, PID = 0.20
					7		
4					10		
					10		SAND, medium to coarse, and PEBBLES (to 1 1/2")
5	3	SS	4'-6'	1.3'	14		some granules, trace silt, moist, 10 YR 6/6
					16		PID = 0
6					21		
					20		SAND, coarse, and PEBBLES, some granules, little
7	4	SS	6'-8'	1.4'	21		fine to medium sand, trace silt, 10 YR 7/6
					25		moist to dry, PID = 0.5
8					29		(Cobbles to 4.5" in flight return)
					13		SAND, coarse, PEBBLES and broken pebble
9	5	SS	8'-10'	1.2'	90		fragments (to 3"), some granules, little silt
					26		as pebble coatings, little fine to medium sand
10					27		moist, PID = 0

2490 Technical Drive · Miamisburg, Ohio 45343 · (513) 866-1711 · (800) 356-9039 · FAX (513) 866-7473

QSOURCE ENVIRONMENTAL SERVICES, INC.

SUBSURFACE EXPLORATION LOG

PROJECT Gem City Chemicals, Inc. PROJECT # 193004

PIT OR BORING # P-4, P-4A

PAGE 2 OF 5

DEPTH	SAMPLE INFORMATION #	TYPE	FROM / TO	REC	BLOW CT ADV RATE	ELEV	MATERIAL / DRILLING AND OTHER NOTES
10							
					25		PEBBLES, PEBBLE FRAGMENTS(to 2") and SAND,
	6	SS	10'-12'	1.4'	34		medium, some granules, little fine sand,
					52		trace silt, dry, 2.5 Y 6/4, PID = 0.07
12					40		
					22		PEBBLES and GRANULES, some medium to fine sand,
	7	SS	12'-14'	1.4'	22		trace silt in interstices, moist, 2.5 Y 6/4
					16		PID = 0
14					16		
					11		GRANULES, some pebbles, little sand, trace
	8	SS	14'-16'	1.3'	9		silt, wet, PID = 0
					16		
16					27		
					30		PEBBLES and GRANULES, some medium to fine
	9	SS	16'-18'	1.4'	25		sand and silt (interstitial), 2.5 Y 6/3
					30		PID = 0
18					30		
					23		0.5' same as above
	10	SS	18'-20'	1.4'	22		0.25' SAND, very fine, little silt, oxidized
					26		0.7' SAND, medium, well-sorted, moist
20					30		PID = 0.3
					13		SAND, medium, faint planar bedding, moist,
	11	SS	20'-22'	1.4'	14		saturated in tip, 2.5 Y 6/6,
					20		PID = 0.5
22					26		
					16		0.9' SAME AS ABOVE, fining upward, saturated
	12	SS	22'-24'	1.9'	21		
					30		1.0' SAND, coarse to very coarse, little f.-m.
24					30		sand, few pebbles, trace silt, PID = 0.27
					23		SAND, very coarse, some granules, little
	13	SS	24'-26'	1.7'	23		pebbles, few fine to medium sand, trace silt
					29		saturated, PID = 0.5
26					29		-- coarsening downward to --
					27		0.7' GRANULES, some very coarse sand, few
	14	SS	26'-28'	1.7'	40		pebbles, little silt, PID = 0.35
					30		1.0 SAND, medium to coarse, few pebbles, trace
28					30		silt, saturated
					25		SAND, medium, few granules, few pebbles, trace
	15	SS	28'-30'	1.9'	25		silt, with one 5" bed of PEBBLES, little
					21		interstitial silt, 2.5 Y 5/4, saturated
30					22		PID = 0.30

NOTES:

2490 Technical Drive · Miamisburg, Ohio 45343 · (513) 866-1711 · (800) 356-9089 · FAX (513) 866-7473

QSOURCE ENVIRONMENTAL SERVICES, INC.

SUBSURFACE EXPLORATION LOG

PROJECT Gem City Chemicals PROJECT # 193004

PIT OR BORING # P-4, P-4A

PAGE 3 OF 5

DEPTH	SAMPLE INFORMATION #	TYPE	FROM / TO	REC	BLOW CT ADV RATE	ELEV	MATERIAL / DRILLING AND OTHER NOTES
30							
					11		SAND, medium, trace fine to coarse sand, trace
	16	SS	30'-32'	1.5'	25		silt, one bed of coarse sand and pebbles,
					21		saturated, 2.5 Y 5/3, PID = 0.38
32					20		
					18		SAND, medium, little coarse sand and granules,
	17	SS	32'-34'	1.6'	25		few pebbles, trace silt, two thin pebble
					33		zones (with interstitial silt), PID =0.50
34					36		
					22		SAND, very coarse, some granules, little
	18	SS	34'-36'	1.8'	28		pebbles, few fine to coarse sand, trace silt
					29		PID = 0.50
36					33		
					10		SAME AS ABOVE, minor pebble-rich beds
	19	SS	36'-38'	1.9'	20		PIID = 0.3
					25		
38					40		
					25		SAND, coarse to medium, little granules,
	20	SS	38'-40'	1.9'	40		little pebbles, few fine sand, trace silt,
					30		coarsening to SAND and PEBBLES downward
40					35		PID = 0.75
					20		0.3' SAND and PEBBLES
	21	SS	40'-42'	1.8'	27		1.5' PEBBLES, little granules, little fine to
					27		coarse sand, few silt, 2.5 Y 6/4
42					25		PID = 0.55
					22		SAME AS ABOVE, PID = 0.7
	22	SS	42'-44'	1.6'	35		
					33		
44					35		
					15		GRANULES, some very coarse sand, little fine
	23	SS	44'-46'	1.6'	27		to medium sand, trace silt, minor siltier
					27		intervals, saturated, 2.5 Y 6/6, PID = 0.5
46					32		
					15		GRANULES and PEBBLES, little medium to coarse
	24	SS	46'-48'	1.3'	10		sand, few silt, PID = 0.8
					11		
48					20		
					28		GRANULES, some pebbles, some very coarse sand,
	25	SS	48'-50'	1.2'	21		little fine to medium sand, few silt
					20		PID = 0.25
50					23		

NOTES:

2490 Technical Drive · Miamisburg, Ohio 45343 · (513) 866-1711 · (800) 356-9039 · FAX (513) 866-7473

QSOURCE ENVIRONMENTAL SERVICES, INC.

SUBSURFACE EXPLORATION LOG

PROJECT Gem City Chemicals PROJECT # 193004

PIT OR BORING # P-4, P-4A

PAGE 4 OF 5

DEPTH	SAMPLE INFORMATION #	TYPE	FROM / TO	REC	BLOW CT ADV RATE	ELEV	MATERIAL / DRILLING AND OTHER NOTES
50							
					19		GRANULES and PEBBLES, some very coarse sand
	26	SS	50'-52'	1.3'	18		little fine to medium sand, trace silt,
					22		more interstitial silt in discrete zones,
52					23		saturated, 2.5 Y 6/6, PID = 0.35
					80		(COBBLE - NOT RECOVERED)
	27	SS	52'-54'	1.3'	40		PEBBLES, some medium sand, little granules,
					24		few silt, 2.5 Y 6/6, PID = 0.31
54					30		
					30		SAND, medium to coarse, little granules,
	28	SS	54'-56'	1.9'	45		little pebbles, few silt, 2.5 Y 6/6
					37		oxidized zones (10 YR 6/8), saturated
56					40		PID = 0.2
					60		SAME AS ABOVE, with some broken pebble
	29	SS	56'-58'	1.4'	50		and cobble fragments, PID = 0.2
					60		
58					50		
					19		SAND, coarse, well-sorted, few 1" diameter
	30	SS	58'-60'	1.7'	24		pebbles at tip and in one thin zone, trace
					50		silt with pebbles, PID = 0.25
60					40		
					22		SAND, coarse to very coarse, few granules,
	31	SS	60'-62'	1.6'	25		trace silt, trace fine pebbles in SS tip,
					40		2.5 Y 6/6, saturated, PID = 0.20
62					30		
					16		PEBBLES, and broken fragments, little coarse
	32	SS	62'-64'	1.3'	40		to very coarse sand, little granules, few
					55		silt - coarsening downward -
64					50		PID = 0.2
					15		SAND, very coarse, little fine to medium sand,
	33	SS	64'-66'	1.4'	33		trace granules, trace silt
					33		
66					33		
					20		1.0' SAND, very coarse, and GRANULES, little
	34	SS	66'-68'	1.7'	19		fine to medium sand, trace silt
					36		0.7' GRANULES and PEBBLES, little sand, few
68					30		silt (minor blowin prior to sampling)
					27		SAND, very coarse, some pebbles, little
	35	SS	68'-70'	1.6'	50		granules, little fine to medium sand, trace
					50		silt, 2.5 Y 6/6, PID = 0.6
70					80		

NOTES:

2490 Technical Drive · Miamisburg, Ohio 45343 · (513) 866-1711 · (800) 356-9039 · FAX (513) 866-7473

QSOURCE ENVIRONMENTAL SERVICES, INC.

SUBSURFACE EXPLORATION LOG

PROJECT Gem City Chemicals PROJECT # 193004

PIT OR BORING # P-4, P-4A

PAGE 5 OF 5

DEPTH	SAMPLE INFORMATION #	TYPE	FROM / TO	REC	BLOW CT ADV RATE	ELEV	MATERIAL / DRILLING AND OTHER NOTES
70							
					75		1.0' SAND, very coarse, little granules, little pebbles, trace silt
	36	3" SS	70'-72'	1.6'	65		
					65		0.6' GRANULES and PEBBLES (to 2"), little sand few silt, PID = 1.0
72					90		
							AUGERS LOCKED AT 72', DUE TO BLOWIN AND SAND LOCKING AROUND FLIGHTS DURING SAMPLING - AUGERS REVERSED OUT OF HOLE TO 50 FEET, AND
74							HOLE REDRILLED TO 78' - BLOWIN MATERIAL FROM THIS INTERVAL SAMPLED BY SAND BAILER
							BLOWIN SAMPLE - SAND, very coarse, and PEBBLES
76							(to 1.5"), trace silt
78							spoon full - blowin of sand and gravel
	37	3"SS	78'-78.5'	0.5'	250/6"		SAND, very coarse, and PEBBLES (to 1.5"), some granules, little fine to medium sand, tr. silt
							END OF BORING P-4 - AUGERS SAND-LOCKED
80							HOLE ABANDONED, AND REDRILLED 5' SOUTH AS BORING P-4A - AUGER REFUSAL AT 81.25'
81							
	38	3"SS	81.3'-82'	0.7'	60		SILT, little fine to medium sand, trace
82					100/3"		granules, compact, sheared, moist, 5 Y 4/3 (interpretation - LODGMENT TILL)
							END OF BORING P-4A AT 81.25'
84							
86							
88							
90							

NOTES: P-4 backfilled by natural collapse to a depth of 15', and by cuttings and cement to the ground surface

2490 Technical Drive · Miamisburg, Ohio 45343 · (513) 866-1711 · (800) 356-9039 · FAX (513) 866-7473

QSOURCE ENVIRONMENTAL SERVICES, INC.

SUBSURFACE EXPLORATION LOG

PIT OR BORING # P-5
PAGE 1 OF 3

PROJECT Gem City Chemicals, Inc. PROJECT # 193004

GENERAL SITE LOCATION 1287 Air City Avenue

STATE Ohio COUNTY Montgomery CITY/TWP Dayton SEC

LOCATION ON THE SITE Front of office building, between entrance doors, in former planting area

METHOD(S) 6 1/4" HSA RIG CME-75 HOLE DIA. 12" SAMPLER & SIZE 2"x24" Split Spoon

DRILLING CO. Moody's of Dayton DRILLERS P. Ridder, J. D. Hobbs LOGGED BY J. Michael Clinch

DATE STARTED 1/23/93 DATE FINISHED 1/23/93

x BORING COMPLETED AS A piezometer, P-5 OR _ BACKFILLED DATE / / MATERIAL

DEPTH TO WATER: Encountered at 20 ', At completion N.A. ', On 2/8/93 water was at 18.71' (TOC)

DEPTH	SAMPLE INFORMATION #	TYPE	FROM / TO	REC	BLOW CT ADV RATE	ELEV.	MATERIAL / DRILLING AND OTHER NOTES
							surface: loose topsoil, plant roots
0							6"-12" loose topsoil
1							SAND, medium, some fine to coarse sand, and some pebbles (to 3"x2"x2"), trace silt, dry, 10 YR 7/4 (logged from auger flight return
2							
3							
4							
5	1	SS	4'-6'	1.3'	12, 27, 36, 37		SAND, coarse to very coarse, some pebbles to 2" (broken fragments in spoon), little granules, few f.-m. sand, trace silt, dry 10 YR 7/3, silt 10 YR 5/6, PID = 0
6							
7							HEAVY RIG CHATTER, PEBBLES UP TO 4" IN FLIGHT RETURNS
8							
9							
10	2	SS	9'-11'	0.9'	42, 30		PEBBLES, to 2", some fine to medium sand, trace silt, dry, 10 YR 7/4, PID = 0.05

2490 Technical Drive · Miamisburg, Ohio 45343 · (513) 866-1711 · (800) 356-9039 · FAX (513) 866-7473