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VOLUME I OF III

SUMMARY OF PREDESIGN AND ADDITIONAL STUDIES ANALYTICAL RESULTS

REFUSE HIDEAWAY LANDFILL
MIDDLETON, WISCONSIN

April 1998

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DEPT. OF NATURAL RESOURCES
SD HEADQUARTERS

Prepared For:
Refuse Hideaway PRP Group
Middleton, Wisconsin

•••

Prepared By:
Montgomery Watson
Madison, Wisconsin

Project No. 1242161.0125.8001

MONTGOMERY WATSON

MONTGOMERY WATSON

April 23, 1998

Ms. Beth Reiner
Remedial Project Manager
U.S. Environmental Protection Agency
Region 5
536 South Clark Street
Chicago, Illinois 60605

Re: Summary of Predesign and Additional Studies Analytical Results
Refuse Hideaway Landfill Site, Middleton, Wisconsin

Dear Ms. Reiner:

Enclosed are two copies of the Summary of Predesign and Additional Studies Analytical Results for the Refuse Hideaway Landfill Site in Middleton, Wisconsin. This summary is being provided as specified in your January 16, 1998 letter. As you requested during our telephone conversation on April 21, 1998, we have included the sample data laboratory report forms and field data (Volume II and III Appendices A and B) with only one copy.

The attached summary includes the following:

- A brief narrative highlighting key aspects of the data
- Tables summarizing the analytical results
- Drawings of the spatial distribution of contaminant concentrations
- Graphs of historical groundwater quality at many of the wells

We believe the data provide strong evidence that significant groundwater remediation is occurring as a result of previous source control measures and natural attenuation processes. No groundwater wells contained total volatile organic compounds (VOCs) at concentrations exceeding 200 ug/L and concentrations have declined significantly in many of the monitoring wells, especially those immediately downgradient of the landfill.

Please call with any questions you may have as you review this information.

Sincerely,

MONTGOMERY WATSON

Douglas J. Bach, P.E.
Project Manager

Enclosures: Summary of Predesign and Additional Studies Analytical Results

cc: Hank Kuehling, WDNR
Jewelle Keiser, CH_2M Hill
Members of the RHL PRP Group Technical and Steering Committees

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SUMMARY OF PREDESIGN AND ADDITIONAL STUDIES
ANALYTICAL RESULTS

REFUSE HIDEAWAY LANDFILL
MIDDLETON, WISCONSIN

April 1998

Prepared by: R Jeff Ramsby JAH — 4-22-98

R. Jeff Ramsby — Date
Hydrogeologist

4/22/98

Douglas J. Bach — Date
Project Manager

Approved by: 4/22/98

Kenneth J. Quinn, P.G. — Date
Principal Hydrogeologist

SUMMARY OF PREDESIGN AND ADDITIONAL STUDIES ANALYTICAL RESULTS

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SUMMARY OF PREDESIGN AND ADDITIONAL STUDIES ANALYTICAL RESULTS
Refuse Hideaway Landfill

Based on a preliminary review of the unvalidated data from the Predesign and Additional Studies sampling, Montgomery Watson offers the following observations:

Groundwater Analytical Results

- No groundwater samples contained total volatile organic compounds (VOCs) at concentrations above 200 ug/L.

- Total VOC concentrations in groundwater are generally declining, with the greatest rate of decline observed in monitoring wells located closest to and downgradient of the landfill (see wells P21S, P09S, P08S, P08D, P03S, P16S, P27S, P27D).

- Only two wells located close to and downgradient of the landfill (P16D and P21D) did not exhibit declines in VOC concentrations. One of these wells (P16D) is located in an area of low hydraulic conductivity (3.5×10^{-6} cm/sec). In addition, the flow path from the landfill to both of these wells is several hundred feet long (see cross section A-A' in the RI Report) due to flow a short distance upgradient of the landfill before migrating downgradient beneath the landfill.

- In general, the magnitude of the decline in chlorinated VOC concentrations is proportional to the hydraulic conductivity (K) of the material surrounding the well. This trend is illustrated by comparing wells P9S with P8S and P21S with P27S in the following table:

Well	K (cm/sec)	Total Chlorinated VOCs (1/91) in ug/L	Total Chlorinated VOCs (2/98) in ug/L	% Reduction in VOC Concentration
P09S	3×10^{-3}	678	9	98.7
P08S	1×10^{-4}	413	45	89.1
P21S	8.3×10^{-4}	819	1.2	99.9
P27S	2.8×10^{-4}	230	37.8	83.6

Landfill Leachate Analytical Results

- Only two extraction wells sampled within the landfill (GW09 and GW11) contained chlorinated VOCs at concentrations exceeding 200 ug/L.

- No PCE or TCE was detected above 1 ug/L in leachate samples.

Landfill Gas Analytical Results

- Chlorinated VOCs within the landfill are predominantly vinyl chloride and cis-1,2-DCE, consistent with the presence of strongly reducing conditions within the landfill. PCE and TCE are present only in the southeast corner of the landfill.

- The highest concentrations of PCE outside the landfill occurred in gas probes located to the northwest.

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Table 1
Unvalidated Groundwater Analytical Results
Refuse Hideaway Landfill
Middleton, Wisconsin

Parameter	UNIT	P-01D 2/11/98	P-01D DUP 2/11/98	P-01S 2/10/98	P-03S 2/11/98	P-04S 2/11/98	P-08BR 2/11/98	P-08D 2/11/98	P-08S 2/16/98	P-09D 2/13/98	P-09S 2/13/98
Volatiles											
Acetone	ug/L	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8
Methylene Chloride	ug/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Benzene	ug/L	<0.1	<0.1	<0.1	<0.1	0.2	0.1	<0.1	<0.1	3.3	0.1
Carbon Disulfide	ug/L	<0.4	<0.4	2.3	1	1	<0.4	<0.4	0.5	<0.4	<0.4
Chlorobenzene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	0.4	<0.2	<0.2	<0.2	<0.2
Chloromethane	ug/L	<0.5	<0.5	<0.5	<0.5	0.8	<0.5	<0.5	1	1.8	0.7
1,1,1-Trichloroethane	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	<0.2
1,1-Dichloroethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	2	6	<0.2
Chloroethane	ug/L	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	5.4	<0.7
Tetrachloroethene	ug/L	<0.2	<0.2	<0.2	0.3	<0.2	<0.2	2.6	2.5	<0.2	2.9
Trichloroethene	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	0.4	1.6	1.9	0.5	1.1
Cis-1,2-Dichloroethene	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	2.2	29	0.6	4
Trans-1,2-Dichloroethene	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	1.2	4.2	0.2
1,1-Dichloroethene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Vinyl Chloride	ug/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	6.7	<0.3	<0.3
1,2-Dichloropropane	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	2.8	<0.1
Chloroform	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
2-Butanone	ug/L	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3
Bromomethane	ug/L	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7
Ethylbenzene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Xylene, total	ug/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Styrene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1,1,2,2-Tetrachloroethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
1,1,2-Trichloroethane	ug/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
2-Hexanone	ug/L	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4
4-Methyl-2-pentanone	ug/L	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
Bromodichloromethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bromoform	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Carbon Tetrachloride	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
cis-1,3-Dichloropropene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-1,3-Dichloropropen	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Dibromochloromethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total VOCs	ug/L	ND	ND	2.3	1.3	2	0.9	6.4	44.8	24.8	9
Total VOCs - Blank susp	ug/L	ND	ND	ND	0.3	ND	0.4	6.4	43.3	19.7	8.2
Indicator Parameters											
Manganese	ug/L								486		
Calcium	mg/L								122		
Iron	mg/L								6.1		
Magnesium	mg/L								61.2		
Potassium	mg/L								0.9		
Sodium	mg/L								4.14		
Alkalinity, Total	mg/L								560		
Nitrogen, Nitrate	mg/L								0.29		
Sulfate, Total	mg/L								16.4		
Sulfide	mg/L								1.4		
Fluoride	mg/L								0.05		
Chloride, Total	mg/L								11.5		
Volatile Fatty Acids	mg/L								<3		
Dissolved Organic Carbo	mg/L								1.74		
Carbon Dioxide	mg/L								0.34		
Ethane	mg/L								0.002		
Ethene	mg/L								0.0064		
Methane	mg/L								0.76		
Hydrogen	nnmol								7.028		
Field Data											
GW Elev.	MSL	920.37		919.85	920.51	920.61	920.16	920.39	921.31	920.45	920.52
pH	SU	6.37		6.47	6.54	6.3	7.8	6.29	6.76	6.24	6.6
Temp. (S.C. meter)	°C	6		5.5	6.5	5.5	9.2	8	6.4	9.6	6.3
Spec. Cond.@ 25 deg.	umho/cm	720		1800	705	770	1180	880	1510	1880	1230
D.O.	mg/L	0.2		3	5.5	3.3	1.2	3.5	0.9	1.5	2.3
Temp (DO meter)	°C	8.7		8	6.4	7.8	9.2	9	6.4	9.6	5.7
RED-OX	eV	-98		-49	6	-69	50	77	-18	-119	106

Table 1
Unvalidated Groundwater Analytical Results
Refuse Hideaway Landfill
Middleton, Wisconsin

Parameter	UNIT	P-16D 2/18/98	P-16S 2/18/98	P-16S DUP 2/18/98	P-17S 2/26/98	P-17S DUP 2/26/98	P-18S 3/2/98	P-20SR 2/10/98	P-21BR 2/12/98	P-21D 2/12/98	P-21S 2/17/98
Volatiles											
Acetone	ug/L	<4.8	<4.8	<4.8	8	5.6	<4.8	<4.8	<4.8	<4.8	<4.8
Methylene Chloride	ug/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Benzene	ug/L	6.1	4.3	4.2	0.4	0.4	<0.1	<0.1	<0.1	1.8	<0.1
Carbon Disulfide	ug/L	<0.4	<0.4	<0.4	0.9	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Chlorobenzene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	ug/L	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chloromethane	ug/L	<0.5	0.5	1.3	1.8	11	1.8	<0.5	<0.5	<0.5	1.2
1,1,1-Trichloroethane	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/L	<0.2	<0.2	<0.2	1.2	1	<0.2	<0.2	<0.2	0.8	<0.2
1,1-Dichloroethane	ug/L	6	1.8	1.7	6.3	5.1	0.8	<0.2	<0.2	21	<0.2
Chloroethane	ug/L	2	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	8.6	<0.7
Tetrachloroethene	ug/L	0.2	<0.2	<0.2	7.1	6.8	11	3.7	<0.2	<0.2	<0.2
Trichloroethene	ug/L	11	1.8	1.8	14	13	2.2	0.2	0.2	1.2	<0.2
Cis-1,2-Dichloroethene	ug/L	26	110	105	58	57	1.6	<0.2	<0.2	120	<0.2
Trans-1,2-Dichloroethene	ug/L	1.2	1.1	1	<0.2	0.2	<0.2	<0.2	<0.2	6.5	<0.2
1,1-Dichloroethene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Vinyl Chloride	ug/L	7.1	4.8	<0.3	1.3	1.2	<0.3	<0.3	<0.3	16	<0.3
1,2-Dichloropropane	ug/L	1.2	5.6	5.1	3.3	2.8	<0.1	<0.1	<0.1	2.1	<0.1
Chloroform	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
2-Butanone	ug/L	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3
Bromomethane	ug/L	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7
Ethylbenzene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Xylene, total	ug/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Styrene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1,1,2,2-Tetrachloroethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
1,1,2-Trichloroethane	ug/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
2-Hexanone	ug/L	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4
4-Methyl-2-pentanone	ug/L	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
Bromodichloromethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bromoform	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Carbon Tetrachloride	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
cis-1,3-Dichloropropene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-1,3-Dichloropropen	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Dibromochloromethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total VOCs	ug/L	61	129.9	120.1	102.3	104.1	17.4	3.9	0.2	178	1.2
Total VOCs - Blank susp	ug/L	54.7	125.1	114.6	91.2	87.1	15.6	3.9	0.2	176.2	ND
Indicator Parameters											
Manganese	ug/L		303	288							1190
Calcium	mg/L		106	108							110
Iron	mg/L		<0.01	<0.01							0.889
Magnesium	mg/L		46.5	47.1							55.2
Potassium	mg/L		<0.5	<0.5							<0.5
Sodium	mg/L		2.89	3.02							4.47
Alkalinity, Total	mg/L		506	496							326
Nitrogen, Nitrate	mg/L		0.33	0.3							9.23
Sulfate, Total	mg/L		13.3	15.2							39.1
Sulfide	mg/L		<1	<1							<1
Fluoride	mg/L		0.09	0.08							0.12
Chloride, Total	mg/L		8.14	8.14							38.6
Volatile Fatty Acids	mg/L		16	<3							9
Dissolved Organic Carbo	mg/L		<3	14.7							6.46
Carbon Dioxide	mg/L		3.295	3.442							3.474
Ethane	mg/L		0.0002	0.0004							<0.0001
Ethene	mg/L		<0.005	<0.005							<0.005
Methane	mg/L		0.496	0.5							11
Hydrogen	nnmol										2.548
Field Data											
GW Elev.	MSL	918.61	925.82		933.47		920.73	920.76	918.76	919.96	922.31
pH	SU	6.27	6.21		6.55		6.68	6.48	6.5	6.16	6.43
Temp. (S.C. meter)	°C	5.2	3.2		11.5		5.3	5.5	7.5	8	4.6
Spec. Cond.@ 25 deg.	umho/cm	2350	1460		1870		1130	605	630	1740	1650
D. O.	mg/L	1.9	10.7		3.1		8.1	11.1	0.2	0.2	5.8
Temp (DO meter)	°C	5.2	3		11.5		5.3	9.2	10.4	10.2	4.6
ORED-OX	eV	-80	202		115		190	122	-89	30	106

Table 1
Unvalidated Groundwater Analytical Results
Refuse Hideaway Landfill
Middleton, Wisconsin

Parameter	UNIT	P-22D 2/24/98	P-22S 2/24/98	P-23D 2/10/98	P-23S 2/10/98	P-23S DUP 2/10/98	P-24D 3/3/98	P-24S 3/3/98	P-25BR 2/16/98	P-25D 2/17/98	P-25D DUP 2/17/98
Volatiles											
Acetone	ug/L	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8
Methylene Chloride	ug/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Benzene	ug/L	<0.1	0.3	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.3	0.3
Carbon Disulfide	ug/L	0.5	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Chlorobenzene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	ug/L	<0.2	0.4	0.3	<0.2	<0.2	<0.2	<0.2	<0.2	0.4	0.4
Chloromethane	ug/L	0.5	2	<0.5	0.5	0.6	<0.5	<0.5	0.8	0.8	<0.5
,1,1-Trichloroethane	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
,2-Dichloroethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
1,1-Dichloroethane	ug/L	0.6	0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	2.2	2.2
Chloroethane	ug/L	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7
Tetrachloroethene	ug/L	6.4	2.9	0.8	4.6	4.4	<0.2	<0.2	2	2	1.9
Trichloroethene	ug/L	1.8	0.9	<0.2	0.4	0.4	<0.2	<0.2	0.3	6.5	6.3
Cis-1,2-Dichloroethene	ug/L	7.8	4.4	<0.2	0.3	0.4	1.3	0.4	0.7	33	32
Trans-1,2-Dichloroethene	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.6	0.7
1,1-Dichloroethene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Vinyl Chloride	ug/L	<0.3	<0.3	<0.3	<0.3	<0.3	2.2	<0.3	<0.3	3.2	3.2
,2-Dichloropropane	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1	0.9
Chloroform	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
2-Butanone	ug/L	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3
Bromomethane	ug/L	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7
Ethylbenzene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Xylene, total	ug/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Styrene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1,1,2,2-Tetrachloroethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
1,2-Trichloroethane	ug/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
-Hexanone	ug/L	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4
4-Methyl-2-pentanone	ug/L	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
Bromodichloromethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bromoform	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Carbon Tetrachloride	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cis-1,3-Dichloropropene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-1,3-Dichloropropen	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Dibromochloromethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
otal VOCs	ug/L	17.6	11.3	1.2	5.8	5.8	3.5	0.4	3.8	50	47.9
Total VOCs - Blank susp	ug/L	16.6	8.6	0.8	5.3	5.2	3.5	0.4	3	48.5	47.2
dicator Parameters											
anganese	ug/L	<0.3									
alcium	mg/L	71.2									
Iron	mg/L	<0.01									
Magnesium	mg/L	37.3									
otassium	mg/L	0.5									
odium	mg/L	4.06									
Alkalinity, Total	mg/L	332									
Nitrogen, Nitrate	mg/L	0.76									
Sulfate, Total	mg/L	6.9									
lfide	mg/L	<1									
uoride	mg/L	0.13									
Chloride, Total	mg/L	4.3									
Volatile Fatty Acids	mg/L	5									
ssolved Organic Carbo	mg/L	<3									
rbon Dioxide	mg/L	1.789									
hane	mg/L	<0.0001									
Ethene	mg/L	<0.005									
Methane	mg/L	<0.00005									
ydrogen	nnmol	0.308									
ld Data											
GW Elev.	MSL	912.91	912.92	920.36	920.23				915.61	915.3	
pH	SU	6.99	7.35	6.6	6.48		7.03	6.73	7.19	6.77	
mp. (S.C. meter)	°C	9.2	9	7	6		7.8	8.4	9.8	10.3	
ec. Cond.@ 25 deg.	umho/cm	945	970	555	575		1100	1140	870	1250	
O.	mg/L	4.8	9.4	10.4	10.1		5.4	1.3	7	1	
Temp (DO meter)	°C	9.2	9.2	9.4	9.7		7.8	8.4	9.8	10.3	
RED-OX	eV	127	120	37	128		139	46	127	140	

Table 1
Unvalidated Groundwater Analytical Results
Refuse Hideaway Landfill
Middleton, Wisconsin

Parameter	UNIT	P-25S 2/17/98	P-26D 3/2/98	P-26S 3/2/98	P-27D 2/23/98	P-27S 2/23/98	P-28S 3/2/98	P-29S 2/26/98	P-29S DUP 2/26/98	P-30D 2/19/98	P-30I 2/18/98
Volatiles											
Acetone	ug/L	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8
Methylene Chloride	ug/L	0.5	<0.4	2	<0.4	<0.4	<0.4	1	1.4	<0.4	<0.4
Benzene	ug/L	0.4	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Carbon Disulfide	ug/L	<0.4	<0.4	0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Chlorobenzene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chloromethane	ug/L	<0.5	<0.5	0.6	<0.5	<0.5	12	0.5	2.7	<0.5	<0.5
1,1,1-Trichloroethane	ug/L	<1	<1	<1	1.3	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
1,1-Dichloroethane	ug/L	1.8	0.6	1.4	3	1.7	<0.2	<0.2	<0.2	<0.2	<0.2
Chloroethane	ug/L	2.3	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7
Tetrachloroethene	ug/L	<0.2	17	33	54	30	7.4	0.9	0.9	<0.2	<0.2
Trichloroethene	ug/L	0.6	1.6	5.1	8.4	4.7	0.6	<0.2	<0.2	<0.2	<0.2
Cis-1,2-Dichloroethene	ug/L	4.2	0.5	8.2	5.9	1.4	0.2	<0.2	<0.2	<0.2	<0.2
Trans-1,2-Dichloroethene	ug/L	0.8	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
1,1-Dichloroethene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Vinyl Chloride	ug/L	<0.3	<0.3	4	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
1,2-Dichloropropane	ug/L	<0.1	<0.1	<0.1	0.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chloroform	ug/L	<0.2	<0.2	<0.2	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
2-Butanone	ug/L	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3
Bromomethane	ug/L	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7
Ethylbenzene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Xylene, total	ug/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Styrene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1,1,2,2-Tetrachloroethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
1,1,2-Trichloroethane	ug/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
2-Hexanone	ug/L	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4
4-Methyl-2-pentanone	ug/L	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
Bromodichloromethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bromoform	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Carbon Tetrachloride	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
cis-1,3-Dichloropropene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-1,3-Dichloropropen	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Dibromochloromethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total VOCs	ug/L	10.6	19.7	54.8	73.2	37.8	20.2	2.4	5	ND	ND
Total VOCs - Blank susp	ug/L	9.7	19.7	51.7	73.2	37.8	8.2	0.9	0.9	ND	ND
Indicator Parameters											
Manganese	ug/L	<5				<0.3		0.3	<0.3		0.4
Calcium	mg/L	72.3				132		73.4	72.1		66.7
Iron	mg/L	<0.01				<0.01		<0.01	<0.01		<0.01
Magnesium	mg/L	37.3				62.7		39.2	38.6		34.5
Potassium	mg/L	<0.5				<0.5		<0.5	<0.5		0.6
Sodium	mg/L	6.82				3.74		4.52	5.34		4.48
Alkalinity, Total	mg/L	294				646					290
Nitrogen, Nitrate	mg/L	10.9				0.46					5.04
Sulfate, Total	mg/L	10.4				19					14.2
Sulfide	mg/L	<1				<1					<1
Fluoride	mg/L	0.18				0.74					0.1
Chloride, Total	mg/L	15.6				2.88					12.4
Volatile Fatty Acids	mg/L	14				18					<3
Dissolved Organic Carbo	mg/L	<1				3.7					<3
Carbon Dioxide	mg/L	0.52				10.5					6.345
Ethane	mg/L	<0.0001				<0.0001					<0.0001
Ethene	mg/L	<0.005				<0.005					<0.005
Methane	mg/L	0.0001				<0.00005					<0.00005
Hydrogen	nnmol	0.7				3.136					1.008
Field Data											
GW Elev.	MSL	918.43	923.37	929.03	917.92	918.27	922.05	923.27		909.04	909.03
pH	SU	6.93	6.98	6.67	6.62	6.59	6.95	7.08		7.2	7.16
Temp. (S.C. meter)	°C	8.3	7.4	9.3	9.2	9.4	9.4	10		9.1	9
Spec. Cond.@ 25 deg.	umho/cm	1020	1110	1400	1460	1380	1030	985		780	955
D.O.	mg/L	7.9	1.7	6.2	3	5.1	6	5.9		8.7	9.4
Temp (DO meter)	°C	8.3	7.4	9.1	9.4	9.4	9.4	10		9.1	9
RED-OX	eV	135	179	181	165	185	170	134		129	138

Table 1
Unvalidated Groundwater Analytical Results
Refuse Hideaway Landfill
Middleton, Wisconsin

Parameter	UNIT	P-31D 2/25/98	P-31IA 2/25/98	P-31IB 2/25/98	P-31S 2/25/98	P-31S DUP 2/25/98	P-32D 2/10/98	P-32S 2/13/98	P-33D 2/10/98	P-33S 2/10/98	P-34D 2/24/98
Volatiles											
Acetone	ug/L	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8
Methylene Chloride	ug/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Benzene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1
Carbon Disulfide	ug/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Chlorobenzene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chloromethane	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5
1,1,1-Trichloroethane	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
1,1-Dichloroethane	ug/L	<0.2	1.5	1.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chloroethane	ug/L	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7
Tetrachloroethene	ug/L	<0.2	13	13	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Trichloroethene	ug/L	<0.2	3.3	3.6	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cis-1,2-Dichloroethene	ug/L	<0.2	9.6	10	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Trans-1,2-Dichloroethene	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
1,1-Dichloroethene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Vinyl Chloride	ug/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
1,2-Dichloropropane	ug/L	<0.1	<0.1	0.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chloroform	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
2-Butanone	ug/L	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3
Bromomethane	ug/L	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7
Ethylbenzene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Xylene, total	ug/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Styrene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1,1,2,2-Tetrachloroethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
1,1,2-Trichloroethane	ug/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
2-Hexanone	ug/L	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4
4-Methyl-2-pentanone	ug/L	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
Bromodichloromethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bromoform	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Carbon Tetrachloride	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
cis-1,3-Dichloropropene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-1,3-Dichloropropen	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Dibromochloromethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total VOCs	ug/L	ND	27.4	28.5	ND	ND	ND	ND	0.6	0.1	ND
Total VOCs - Blank susp	ug/L	ND	27.4	28.5	ND	ND	ND	ND	ND	ND	ND
Indicator Parameters											
Manganese	ug/L		<0.3					<5			
Calcium	mg/L		80.4					87.8			
Iron	mg/L		<0.01					<0.01			
Magnesium	mg/L		43.1					43.9			
Potassium	mg/L		0.6					0.7			
Sodium	mg/L		10					14.9			
Alkalinity, Total	mg/L		364					397			
Nitrogen, Nitrate	mg/L		2.57					0.38			
Sulfate, Total	mg/L		15.1					11.5			
Sulfide	mg/L		8					<1			
Fluoride	mg/L		0.12					0.05			
Chloride, Total	mg/L		26.1					37.4			
Volatile Fatty Acids	mg/L		<3					<3			
Dissolved Organic Carbo	mg/L		<3					<1			
Carbon Dioxide	mg/L		7.448					0.574			
Ethane	mg/L		<0.0001					<0.0001			
Ethene	mg/L		<0.005					<0.005			
Methane	mg/L		<0.00005					0.0022			
Hydrogen	nnmol		0.168					1.036			
Field Data											
GW Elev.	MSL				910.4		918.02	919.58	920.73	921.88	923.68
pH	SU	7.18	6.75	6.98	7.46		7.97	6.73	8.06	6.17	7.28
Temp. (S.C. meter)	°C	9.1	9.1	9.2	7.2		9.4	9.1	9.4	5.5	9.4
Spec. Cond.@ 25 deg.	umho/cm	830	1200	1190	705		1040	1190	930	900	840
D. O.	mg/L	8.8	3.6	3	1.8		1.1	10.7	1.6	3.2	7.4
Temp (DO meter)	°C	9.1	9.1	9.2	7.2		9.4	9.1	9.4	8	9.4
RED-OX	eV	121	133	106	-88		62	116	19	-18	138

Table 1
Unvalidated Groundwater Analytical Results
Refuse Hideaway Landfill
Middleton, Wisconsin

Parameter	UNIT	P-34S 2/24/98	P-35D 2/23/98	P-35D DUP 2/23/98	P-35S 2/23/98	P-36D 2/11/98	P-36S 2/11/98	P-40D 2/19/98	P-401 2/19/98	P-41D 2/19/98	SCHULTZ 2/25/98
Volatiles											
Acetone	ug/L	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	12
Methylene Chloride	ug/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	1
Benzene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1
Carbon Disulfide	ug/L	0.7	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Chlorobenzene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	ug/L	<0.2	<0.2	<0.2	<0.2	0.8	<0.2	<0.2	<0.2	<0.2	0.8
Chloromethane	ug/L	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.9	<0.5	0.6
1,1,1-Trichloroethane	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
1,1-Dichloroethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.6	1	<0.2	<0.2
Chloroethane	ug/L	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7
Tetrachloroethene	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	5.6	9.2	<0.2	3
Trichloroethene	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	1.6	2.5	<0.2	0.5
Cis-1,2-Dichloroethene	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	5.2	8.9	<0.2	1.9
Trans-1,2-Dichloroethene	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
1,1-Dichloroethene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Vinyl Chloride	ug/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
1,2-Dichloropropane	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1
Chloroform	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
2-Butanone	ug/L	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3
Bromomethane	ug/L	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7
Ethylbenzene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Xylene, total	ug/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Styrene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1,1,2,2-Tetrachloroethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
1,1,2-Trichloroethane	ug/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
2-Hexanone	ug/L	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4
4-Methyl-2-pentanone	ug/L	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
Bromodichloromethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bromoform	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Carbon Tetrachloride	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
cis-1,3-Dichloropropene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-1,3-Dichloropropen	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Dibromochloromethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total VOCs	ug/L	1.3	ND	ND	ND	0.8	ND	13	22.7	ND	19.9
Total VOCs - Blank susp	ug/L	ND	ND	ND	ND	ND	ND	13	21.8	ND	5.4
Indicator Parameters											
Manganese	ug/L	0.3			<0.3				<0.3	0.6	
Calcium	mg/L	66.9			57.4				72.8	75.1	
Iron	mg/L	<0.01			<0.01				<0.01	<0.01	
Magnesium	mg/L	35.9			29.4				40.3	39.1	
Potassium	mg/L	0.5			<0.5				0.5	0.6	
Sodium	mg/L	5			4.13				4.97	5.11	
Alkalinity, Total	mg/L	294			280				347	323	
Nitrogen, Nitrate	mg/L	1.83			0.27				1.97	7.91	
Sulfate, Total	mg/L	17.3			15				15.3	19.8	
Sulfide	mg/L	<1			<1				<1	<1	
Fluoride	mg/L	0.12			0.14				0.08	0.08	
Chloride, Total	mg/L	2.12			1.21				6.78	17	
Volatile Fatty Acids	mg/L	7			<3				8	6	
Dissolved Organic Carbo	mg/L	3.28			<3				<3	<3	
Carbon Dioxide	mg/L	1			0.94				0.7099	0.551	
Ethane	mg/L	<0.0001			<0.0001				<0.0001	<0.0001	
Ethene	mg/L	<0.005			<0.005				<0.005	<0.005	
Methane	mg/L	<0.00005			<0.00005				0.0006	<0.00005	
Hydrogen	nnmol	0.42			0.728				21.7	1.148	
Field Data											
GW Elev.	MSL	926.78	919.01		920.34	920.77	920.61	909.3	909.73	905.86	
pH	SU	7.26	6.97		7.28	7.91	6.26	7.02	6.88	7.14	6.79
Temp. (S.C. meter)	°C	9.2	9		8.1	8.7	6	9	8.9	8.8	9.5
Spec. Cond.@ 25 deg.	umho/cm	910	890		765	935	580	935	1020	1020	625
D. O.	mg/L	9.3	7.4		7.7	1.2	0.9	8.2	7.2	9.2	
Temp (DO meter)	°C	9.2	9		8.1	8.7	7.1	9	8.9	8.8	
RED-OX	eV	125	149		150	-19	-67	132	142	154	

Table 1
Unvalidated Groundwater Analytical Results
Refuse Hideaway Landfill
Middleton, Wisconsin

Parameter	UNIT	SCHULTZ DUP 2/25/98	FB01 2/12/98	FB02 2/18/98	FB03 2/26/98	FB04 3/2/98	FB05 3/3/98	TB01 2/10/98	TB02 2/12/98	TB03 2/13/98	TB04 2/17/98
Volatiles											
Acetone	ug/L	8.7	<4.8	<4.8	20	18	20	<4.8	<4.8	<4.8	<4.8
Methylene Chloride	ug/L	1.5	<0.4	<0.4	0.5	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Benzene	ug/L	<0.1	0.1	0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Carbon Disulfide	ug/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	0.5	<0.4
Chlorobenzene	ug/L	<0.1	<0.1	0.2	0.2	0.2	0.2	0.3	<0.1	<0.1	0.1
Toluene	ug/L	0.4	0.2	0.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chloromethane	ug/L	1.3	<0.5	<0.5	0.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
1,1-Dichloroethane	ug/L	0.6	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chloroethane	ug/L	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7
Tetrachloroethene	ug/L	3.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Trichloroethene	ug/L	0.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cis-1,2-Dichloroethene	ug/L	2.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Trans-1,2-Dichloroethene	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
1,1-Dichloroethene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Vinyl Chloride	ug/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
1,2-Dichloropropane	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chloroform	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
2-Butanone	ug/L	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3
Bromomethane	ug/L	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7
Ethylbenzene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Xylene, total	ug/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Styrene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1,1,2,2-Tetrachloroethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
1,1,2-Trichloroethane	ug/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
2-Hexanone	ug/L	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4
4-Methyl-2-pentanone	ug/L	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
Bromodichloromethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bromoform	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Carbon Tetrachloride	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
cis-1,3-Dichloropropene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-1,3-Dichloropropen	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Dibromochloromethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total VOCs	ug/L	18.2	0.3	1.2	21.6	18.2	20.2	0.3	ND	0.5	0.1
Total VOCs - Blank susp	ug/L	6.3	ND	ND	ND	ND	ND	ND	ND	ND	ND
Indicator Parameters											
Manganese	ug/L				1.6						
Calcium	mg/L				<0.1						
Iron	mg/L				<0.01						
Magnesium	mg/L				<0.02						
Potassium	mg/L				<0.5						
Sodium	mg/L				<2						
Alkalinity, Total	mg/L										
Nitrogen, Nitrate	mg/L										
Sulfate, Total	mg/L										
Sulfide	mg/L										
Fluoride	mg/L										
Chloride, Total	mg/L										
Volatile Fatty Acids	mg/L										
Dissolved Organic Carbo	mg/L										
Carbon Dioxide	mg/L										
Ethane	mg/L										
Ethene	mg/L										
Methane	mg/L										
Hydrogen	nnmol										
Field Data											
GW Elev.	MSL										
pH	SU										
Temp. (S.C. meter)	°C										
Spec. Cond.@ 25 deg.	umho/cm										
D. O.	mg/L										
Temp (DO meter)	°C										
RED-OX	eV										

Table 1
Unvalidated Groundwater Analytical Results
Refuse Hideaway Landfill
Middleton, Wisconsin

Parameter	UNIT	TB05 2/18/98	TB06 2/18/98	TB07 2/19/98	TB08 2/23/98	TB09 2/23/98	TB10 2/25/98	TB11 2/25/98	TB12 2/26/98	TB13 3/3/98	Max Blank times 10x/5x
Volatiles											
Acetone	ug/L	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	22	13	17	1100
Methylene Chloride	ug/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	1.4	<0.4	<0.4	19
Benzene	ug/L	<0.1	0.5	0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	8
Carbon Disulfide	ug/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	2.5
Chlorobenzene	ug/L	<0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	14.5
Toluene	ug/L	<0.2	0.5	0.6	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	9
Chloromethane	ug/L	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	0.5	0.8	0.8	18.5
1,1,1-Trichloroethane	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	
1,2-Dichloroethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
1,1-Dichloroethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Chloroethane	ug/L	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	
Tetrachloroethene	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Trichloroethene	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Cis-1,2-Dichloroethene	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Trans-1,2-Dichloroethene	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
1,1-Dichloroethene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Vinyl Chloride	ug/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	
1,2-Dichloropropane	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Chloroform	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
2-Butanone	ug/L	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	
Bromomethane	ug/L	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	
Ethylbenzene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Xylene, total	ug/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	
Styrene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
1,1,2,2-Tetrachloroethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
1,1,2-Trichloroethane	ug/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	
2-Hexanone	ug/L	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	
4-Methyl-2-pentanone	ug/L	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	
Bromodichloromethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Bromoform	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Carbon Tetrachloride	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
cis-1,3-Dichloropropene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
trans-1,3-Dichloropropen	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Dibromochloromethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Total VOCs	ug/L	ND	1.9	1.3	0.2	0.2	0.2	24.1	14	18.1	
Total VOCs - Blank susp	ug/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Indicator Parameters											
Manganese	ug/L										
Calcium	mg/L										
Iron	mg/L										
Magnesium	mg/L										
Potassium	mg/L										
Sodium	mg/L										
Alkalinity, Total	mg/L										
Nitrogen, Nitrate	mg/L										
Sulfate, Total	mg/L										
Sulfide	mg/L										
Fluoride	mg/L										
Chloride, Total	mg/L										
Volatile Fatty Acids	mg/L										
Dissolved Organic Carbo	mg/L										
Carbon Dioxide	mg/L										
Ethane	mg/L										
Ethene	mg/L										
Methane	mg/L										
Hydrogen	nnmol										
Field Data											
GW Elev.	MSL										
pH	SU										
Temp. (S.C. meter)	°C										
Spec. Cond.@ 25 deg.	umho/cm										
D. O.	mg/L										
Temp (DO meter)	°C										
RED-OX	eV										

This table presents a summary of unvalidated analytical results for the Refuse Hideaway Landfill in Middleton, Wisconsin. Either the reported concentration or less than (<) the limit of detection is presented; a blank indicates the parameter was not analyzed for that sample.

VOCs detected in the field and trip blanks are presented above the solid black line. Results for these compounds are likely to be qualified according to the 10x (acetone & methylene chloride) and 5x (all others) validation rules. Total VOCs are calculated with and without these potential blank contaminants to allow for a preliminary evaluation of site conditions. These values are subject to qualification during validation, and should not be considered final.

Table 2
Unvalidated Leachate Analytical Results
Refuse Hideaway Landfill
Middleton, Wisconsin

Parameter	UNIT	LHGW04 2/18/98	LHGW05 2/18/98	LHGW08 2/18/98	LHGW09 2/18/98	LHGW11 2/18/98	LHGW12 2/18/98	LHGW13 2/18/98	LHGW13 DUP 2/18/98
Volatiles									
Acetone	ug/L	<4.8	<4.8	<4.8	<4.8	<4.8	9	5.6	<4.8
Methylene Chloride	ug/L	<0.4	<0.4	2	<0.4	<0.4	<0.4	<0.4	0.6
Benzene	ug/L	3.3	3.5	2.5	3	5	<0.1	2.8	2.7
Carbon Disulfide	ug/L	1.4	0.6	<0.4	12	28	12	2.2	<0.4
Chlorobenzene	ug/L	2.3	1.8	2.5	<0.1	<0.1	1.2	2.3	2.4
Toluene	ug/L	0.7	1.5	2.5	35	35	13	8.4	8.2
Chloromethane	ug/L	0.6	1.1	<0.5	150	250	1	1.6	<0.5
1,1,1-Trichloroethane	ug/L	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
1,1-Dichloroethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.4	0.3
Chloroethane	ug/L	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7
Tetrachloroethene	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Trichloroethene	ug/L	<0.2	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2
Cis-1,2-Dichloroethene	ug/L	0.2	0.4	1	58	<0.2	3.8	7.3	6.4
Trans-1,2-Dichloroethene	ug/L	0.4	0.8	<0.2	<0.2	<0.2	0.7	1	1
1,1-Dichloroethene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Vinyl Chloride	ug/L	<0.3	<0.3	<0.3	48	30	13	10	10
1,2-Dichloropropane	ug/L	0.3	1.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.7
Chloroform	ug/L	<0.2	<0.2	<0.2	26	45	<0.2	<0.2	<0.2
2-Butanone	ug/L	<3.3	<3.3	<3.3	220	780	3.9	<3.3	<3.3
Bromomethane	ug/L	<0.7	<0.7	<0.7	19	45	<0.7	<0.7	<0.7
Ethylbenzene	ug/L	7.1	73	24	23	25	20	40	31
Xylene, total	ug/L	3.4	48	33	66	72	23	45	45
Styrene	ug/L	<0.1	0.8	<0.1	2	<0.1	0.6	1	0.9
1,1,2,2-Tetrachloroethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
1,1,2-Trichloroethane	ug/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
2-Hexanone	ug/L	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4
4-Methyl-2-pentanone	ug/L	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
Bromodichloromethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bromoform	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Carbon Tetrachloride	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
cis-1,3-Dichloropropene	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-1,3-Dichloropropen	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Dibromochloromethane	ug/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total VOCs	ug/L	19.7	132.8	67.5	662	1315	101.2	127.6	109.4
Total VOCs - Blank susp	ug/L	11.4	124.3	58	462	997	65	104.7	95.5

This table presents a summary of unvalidated analytical results for the Refuse Hideaway Landfill in Middleton, Wisconsin. Either the reported concentration or less than (<) the limit of detection is presented; a blank indicates the parameter was not analyzed for that sample.

VOCs detected in the field and trip blanks are presented above the solid black line. Results for these compounds are likely to be qualified according to the 10x (acetone & methylene chloride) and 5x (all others) validation rules. Total VOCs are calculated with and without these potential blank contaminants to allow for a preliminary evaluation of site conditions. These values are subject to qualification during validation, and should not be considered final.

Table 3
Unvalidated Analytical Results For Well P-29S
Refuse Hideaway Landfill
Middleton, Wisconsin

Parameter	Units	P-29S 188336 RH-GWP29S-01 2/26/98	P-29S DUP 188337 RH-GWP29S-91 2/26/98	FB03 188339 RH-GWFB03-01 2/26/98
Volatiles				
Acetone	ug/L	< 4.8	< 4.8	20
Methylene Chloride	ug/L	1	1.4	0.5
Benzene	ug/L	< 0.1	< 0.1	< 0.1
Carbon Disulfide	ug/L	< 0.4	< 0.4	< 0.4
Chlorobenzene	ug/L	< 0.1	< 0.1	0.2
Toluene	ug/L	< 0.2	< 0.2	< 0.2
Chloromethane	ug/L	0.5	2.7	0.9
1,1,1-Trichloroethane	ug/L	< 1	< 1	< 1
1,2-Dichloroethane	ug/L	< 0.2	< 0.2	< 0.2
1,1-Dichloroethane	ug/L	< 0.2	< 0.2	< 0.2
Chloroethane	ug/L	< 0.7	< 0.7	< 0.7
Tetrachloroethene	ug/L	0.9	0.9	< 0.2
Trichloroethene	ug/L	< 0.2	< 0.2	< 0.2
Cis-1,2-Dichloroethene	ug/L	< 0.2	< 0.2	< 0.2
Trans-1,2-Dichloroethene	ug/L	< 0.2	< 0.2	< 0.2
1,1-Dichloroethene	ug/L	< 0.1	< 0.1	< 0.1
Vinyl Chloride	ug/L	< 0.3	< 0.3	< 0.3
1,2-Dichloropropane	ug/L	< 0.1	< 0.1	< 0.1
Chloroform	ug/L	< 0.2	< 0.2	< 0.2
2-Butanone	ug/L	< 3.3	< 3.3	< 3.3
Bromomethane	ug/L	< 0.7	< 0.7	< 0.7
Ethylbenzene	ug/L	< 0.1	< 0.1	< 0.1
Xylene, total	ug/L	< 0.3	< 0.3	< 0.3
Styrene	ug/L	< 0.1	< 0.1	< 0.1
1,1,2,2-Tetrachloroethane	ug/L	< 0.2	< 0.2	< 0.2
1,1,2-Trichloroethane	ug/L	< 0.3	< 0.3	< 0.3
2-Hexanone	ug/L	< 2.4	< 2.4	< 2.4
4-Methyl-2-pentanone	ug/L	< 1.8	< 1.8	< 1.8
Bromodichloromethane	ug/L	< 0.2	< 0.2	< 0.2
Bromoform	ug/L	< 0.2	< 0.2	< 0.2
Carbon Tetrachloride	ug/L	< 0.2	< 0.2	< 0.2
cis-1,3-Dichloropropene	ug/L	< 0.1	< 0.1	< 0.1
trans-1,3-Dichloropropene	ug/L	< 0.2	< 0.2	< 0.2
Dibromochloromethane	ug/L	< 0.2	< 0.2	< 0.2
Total VOCs	ug/L	2.4	5	21.6
Total VOCs - Blank suspect	ug/L	0.9	0.9	ND
Semivolatiles				
Phenol	ug/L	<0.53	<0.49	<0.49
bis(2-Chloroethyl) ether	ug/L	<1.3	<1.2	<1.2
2-Chlorophenol	ug/L	<0.93	<0.87	<0.87
1,3-Dichlorobenzene	ug/L	<2.7	<2.6	<2.6
1,4-Dichlorobenzene	ug/L	<2.5	<2.3	<2.3
1,2-Dichlorobenzene	ug/L	<2.3	<2.1	<2.1
2-Methylphenol	ug/L	<1.0	<0.96	<0.96
bis(2-Chloroisopropyl)ether	ug/L	<2.2	<2.0	<2.0
4-Methylphenol	ug/L	<0.97	<0.90	<0.90
N-Nitroso-di-n-dipropylamine	ug/L	<0.38	<0.36	<0.36
Hexachloroethane	ug/L	<2.7	<2.6	<2.6
Nitrobenzene	ug/L	<1.0	<0.96	<0.96
Isophorone	ug/L	<1.1	<0.99	<0.99
2-Nitrophenol	ug/L	<0.89	<0.83	<0.83

Table 3
Unvalidated Analytical Results For Well P-29S
Refuse Hideaway Landfill
Middleton, Wisconsin

Parameter	Units	P-29S 188336 RH-GWP29S-01 2/26/98	P-29S DUP 188337 RH-GWP29S-91 2/26/98	FB03 188339 RH-GWFB03-01 2/26/98
2,4-Dimethylphenol	ug/L	<1.1	<1.0	<1.0
bis(2-Chloroethoxy)methane	ug/L	<1.0	<0.94	<0.94
2,4-Dichlorophenol	ug/L	<0.99	<0.92	<0.92
1,2,4-Trichlorobenzene	ug/L	<2.9	<2.7	<2.7
Naphthalene	ug/L	<2.2	<2.0	<2.0
4-Chloroaniline	ug/L	<1.2	<1.1	<1.1
Hexachlorobutadiene	ug/L	<3.0	<2.8	<2.8
4-Chloro-3-methylphenol	ug/L	<1.0	<0.96	<0.96
2-Methylnaphthalene	ug/L	<2.0	<1.8	<1.8
Hexachlorocyclopentadiene	ug/L	<3.8	<3.6	<3.6
2,4,6-Trichlorophenol	ug/L	<0.78	<0.72	<0.72
2,4,5-Trichlorophenol	ug/L	<1.2	<1.1	<1.1
2-Chloronaphthalene	ug/L	<1.9	<1.7	<1.7
2-Nitroaniline	ug/L	<0.97	<0.90	<0.90
Dimethylphthalate	ug/L	<0.67	<0.62	<0.62
Acenaphthylene	ug/L	<1.5	<1.4	<1.4
2,6-Dinitrotoluene	ug/L	<1.0	<0.93	<0.93
3-Nitroaniline	ug/L	<1.2	<1.1	<1.1
Acenaphthene	ug/L	<1.4	<1.3	<1.3
2,4-Dinitrophenol	ug/L	<2.0	<1.8	<1.8
4-Nitrophenol	ug/L	<2.7	<2.6	<2.6
Dibenzofuran	ug/L	<1.8	<1.6	<1.6
2,4-Dinitrotoluene	ug/L	<0.77	<0.71	<0.71
Diethylphthalate	ug/L	<0.73	<0.67	<0.67
4-Chlorophenyl-phenylether	ug/L	<2.2	<2.0	<2.0
Fluorene	ug/L	<1.6	<1.5	<1.5
4-Nitroaniline	ug/L	<1.8	<1.6	<1.6
4,6-Dinitro-2-methylphenol	ug/L	<0.87	<0.81	<0.81
N-nitrosodiphenylamine	ug/L	<1.2	<1.1	<1.1
4-Bromophenyl-phenylether	ug/L	<1.9	<1.7	<1.7
Hexachlorobenzene	ug/L	<1.8	<1.6	<1.6
Pentachlorophenol	ug/L	<2.5	<2.3	<2.3
Phenanthrene	ug/L	<0.76	<0.70	<0.70
Anthracene	ug/L	<1.2	<1.1	<1.1
Carbazole	ug/L	<1.0	<0.95	<0.95
Di-n-butylphthalate	ug/L	<0.86	<0.80	<0.80
Fluoranthene	ug/L	<0.96	<0.89	<0.89
Pyrene	ug/L	<0.73	<0.67	<0.67
Butylbenzylphthalate	ug/L	<0.59	<0.55	<0.55
3,3'-Dichlorobenzidine	ug/L	<0.70	<0.65	<0.65
Benzo(a)anthracene	ug/L	<0.63	<0.58	<0.58
Chrysene	ug/L	<0.48	<0.45	<0.45
bis(2-Ethylhexyl)phthalate	ug/L	32	19	<1.2
Di-n-octylphthalate	ug/L	<2.5	<2.3	<2.3
Benzo(b)fluoranthene	ug/L	<2.4	<2.2	<2.2
Benzo(k)fluoranthene	ug/L	<2.5	<2.3	<2.3
Benzo(a)pyrene	ug/L	<1.4	<1.3	<1.3
Indeno(1,2,3-cd)pyrene	ug/L	<2.3	<2.1	<2.1
Dibenz(a,h)anthracene	ug/L	<2.4	<2.2	<2.2
Benzo(g,h,i)perylene	ug/L	<2.1	<1.9	<1.9

Table 3
Unvalidated Analytical Results For Well P-29S
Refuse Hideaway Landfill
Middleton, Wisconsin

Parameter	Units	P-29S 188336 RH-GWP29S-01 2/26/98	P-29S DUP 188337 RH-GWP29S-91 2/26/98	FB03 188339 RH-GWFB03-01 2/26/98
Pesticides/PCBs				
alpha-BHC	ug/L	<0.011	<0.0097	<0.0098
beta-BHC	ug/L	<0.015	<0.014	<0.014
delta-BHC	ug/L	<0.011	<0.0097	<0.0098
gamma-BHC (Lindane)	ug/L	<0.012	<0.011	<0.011
Heptachlor	ug/L	<0.018	<0.017	<0.017
Aldrin	ug/L	<0.012	<0.011	<0.011
Heptachlor epoxide	ug/L	<0.011	<0.0097	<0.0098
Endosulfan I	ug/L	<0.011	<0.0097	<0.0098
Dieldrin	ug/L	<0.031	<0.028	<0.028
4,4'-DDE	ug/L	<0.020	<0.018	<0.019
Endrin	ug/L	<0.032	<0.029	<0.029
Endosulfan II	ug/L	<0.018	<0.017	<0.017
4,4'-DDD	ug/L	<0.025	<0.023	<0.024
Endosulfan sulfate	ug/L	<0.018	<0.017	<0.017
4,4'-DDT	ug/L	<0.022	<0.020	<0.021
Methoxychlor	ug/L	<0.18	<0.17	<0.17
Endrin ketone	ug/L	<0.025	<0.023	<0.024
Endrin Aldehyde	ug/L	<0.018	<0.017	<0.017
alpha-Chlordane	ug/L	<0.0093	<0.0085	<0.0086
gamma-Chlordane	ug/L	<0.0089	<0.0083	<0.0083
Toxaphene	ug/L	<1.1	<0.97	<0.98
Aroclor-1016	ug/L	<0.31	<0.28	<0.28
Aroclor-1221	ug/L	<0.31	<0.28	<0.28
Aroclor-1232	ug/L	<0.31	<0.28	<0.28
Aroclor-1242	ug/L	<0.31	<0.28	<0.28
Aroclor-1248	ug/L	<0.31	<0.28	<0.28
Aroclor-1254	ug/L	<0.31	<0.28	<0.28
Aroclor-1260	ug/L	<0.31	<0.28	<0.28
Metals				
Arsenic	ug/L	< 1	< 1	< 1
Barium, Total	ug/L	30.8	29.9	< 0.5
Cadmium	ug/L	< 0.1	< 0.1	< 0.1
Calcium	mg/L	73.4	72.1	< 0.1
Chromium, Total	ug/L	1	< 1	< 1
Iron	mg/L	< 0.01	< 0.01	< 0.01
Lead, Total	ug/L	< 1	< 1	< 1
Magnesium	mg/L	39.2	38.6	< 0.02
Manganese	ug/L	0.3	< 0.3	1.6
Mercury	ug/L	< 0.2	< 0.2	< 0.2
Potassium	mg/L	< 0.5	< 0.5	< 0.5
Sodium	mg/L	4.52	5.34	< 2
Field Data				
GW Elev.	MSL	923.27		
pH	SU	7.08		
Temp. (S.C. meter)	°C	10		
Spec. Cond.@ 25 deg.	umho/cm	985		
D. O.	mg/L	5.9		
Temp (DO meter)	°C	10		
RED-OX	eV	134		

This table presents a summary of unvalidated analytical results for the Refuse Hideaway Landfill in Middleton, Wisconsin. Either the reported concentration or less than (<) the limit of detection is presented; a blank indicates the parameter was not analyzed for that sample.

VOCs detected in the field and trip blanks are presented above the solid black line. Results for these compounds are likely to be qualified accordi to the 10x (acetone & methylene chloride) and 5x (all others) validation rules. Total VOCs are calculated with and without these potential blank contaminants to allow for a preliminary evaluation of site conditions. These values are subject to qualification during validation, and should not be considered final.

Table 4
Unvalidated Landfill Gas Analytical Results
Refuse Hideaway Landfill
Middleton, Wisconsin

	Landfill Gas Probes											
	GP01 RH-LGGPO15-01 2/18/98		G02 RH-LGG02D-01 2/19/98		G03 RH-LGG03D-01 2/19/98		G04 RH-LGG04-01 2/19/98		GP04 RH-LGGP04-01 2/19/98		G05 RH-LGG05-01 2/19/98		GP10 RH-LGGP10-01 2/19/98		GP12 RH-LGGP12D-01 2/19/98		GP17 RH-LGGP17D-01 2/19/98		GP20 RH-LGGP20I2-01 2/19/98		GP23 RH-LGGP23I2-01 2/19/98	
Parameter	Conc	RDL	Conc	RDL	Conc	RDL	Conc	RDL	Conc	RDL	Conc	RDL	Conc	RDL	Conc	RDL	Conc	RDL	Conc	RDL	Conc	RDL
VOCs - ppb (v/v)																						
1,1,2,2-Tetrachloroethane	ND	2	ND	2	ND	17	ND	2	ND	2	ND	3.3	ND	2	ND	8.4	ND	4.4	ND	5.6	ND	8.4
1,1,1-Trichloroethane	ND	2	ND	2	ND	17	ND	2	ND	2	ND	3.3	ND	2	ND	8.4	ND	4.4	ND	5.6	ND	8.4
1,1,2-Trichloroethane	ND	2	ND	2	ND	17	ND	2	ND	2	ND	3.3	ND	2	ND	8.4	ND	4.4	ND	5.6	ND	8.4
1,1-Dichloroethane	ND	2	ND	2	98	17	5.7	2	ND	2	ND	3.3	8.7	2	61	8.4	ND	4.4	ND	5.6	43	8.4
1,2-Dichloroethane	ND	2	ND	2	ND	17	ND	2	ND	2	ND	3.3	ND	2	ND	8.4	ND	4.4	ND	5.6	ND	8.4
1,2-Dichloropropane	ND	2	ND	2	21	17	ND	2	ND	2	ND	3.3	12	2	12	8.4	ND	4.4	ND	5.6	ND	8.4
Chloroethane	ND	4	ND	4	ND	34	ND	4	ND	4	ND	6.6	ND	4	ND	17	ND	8.7	ND	11	ND	17
Chloromethane	ND	4	ND	4	ND	34	ND	4	ND	4	ND	6.6	ND	4	ND	17	ND	8.7	ND	11	ND	17
Tetrachloroethene	ND	2	3.2	2	1100	17	11	2	20	2	7.3	3.3	35	2	48	8.4	86	4.4	25	5.6	1400	8.4
Trichloroethene	ND	2	ND	2	150	17	ND	2	ND	2	3.4	3.3	16	2	ND	8.4	ND	4.4	ND	5.6	130	8.4
cis-1,2-Dichloroethene	2	2	2.2	2	200	17	3.6	2	ND	2	6.7	3.3	2	2	1000	8.4	19	4.4	ND	5.6	270	8.4
trans-1,2-Dichloroethene	ND	2	ND	2	ND	17	ND	2	ND	2	ND	3.3	ND	2	35	8.4	ND	4.4	ND	5.6	ND	8.4
1,1-Dichloroethene	ND	2	ND	2	ND	17	ND	2	ND	2	ND	3.3	ND	2	ND	8.4	ND	4.4	ND	5.6	ND	8.4
Vinyl chloride	ND	2	ND	2	ND	17	ND	2	ND	2	ND	3.3	ND	2	610	8.4	ND	4.4	ND	5.6	97	8.4
cis-1,3-Dichloropropene	ND	2	ND	2	ND	17	ND	2	ND	2	ND	3.3	ND	2	ND	8.4	ND	4.4	ND	5.6	ND	8.4
trans-1,3-Dichloropropene	ND	2	ND	2	ND	17	ND	2	ND	2	ND	3.3	ND	2	ND	8.4	ND	4.4	ND	5.6	ND	8.4
Chlorobenzene	2.7	2	ND	2	ND	17	ND	2	ND	2	ND	3.3	ND	2	ND	8.4	ND	4.4	ND	5.6	ND	8.4
1,2-Dichlorobenzene	ND	2	ND	2	ND	17	ND	2	ND	2	3.9	3.3	ND	2	ND	8.4	ND	4.4	ND	5.6	ND	8.4
1,3-Dichlorobenzene	ND	2	ND	2	ND	17	ND	2	ND	2	ND	3.3	ND	2	ND	8.4	ND	4.4	ND	5.6	ND	8.4
1,4-Dichlorobenzene	60	2	13	2	ND	17	22	2	16	2	51	3.3	25	2	15	8.4	9.3	4.4	8.5	5.6	ND	8.4
1,2,4-Trichlorobenzene	ND	20	ND	20	ND	170	ND	20	ND	20	ND	33	ND	20	ND	84	ND	44	ND	56	ND	84
Benzyl chloride	ND	10	ND	10	ND	84	ND	10	ND	10	ND	17	ND	10	ND	42	ND	22	ND	28	ND	42
Bromomethane	ND	2	ND	2	ND	17	ND	2	ND	2	ND	3.3	ND	2	ND	8.4	ND	4.4	ND	5.6	ND	8.4
Carbon disulfide	ND	10	ND	10	ND	84	ND	10	ND	10	ND	17	ND	10	ND	42	ND	22	ND	28	ND	42
Carbon tetrachloride	ND	2	ND	2	ND	17	ND	2	ND	2	ND	3.3	ND	2	ND	8.4	ND	4.4	ND	5.6	ND	8.4
Chloroform	ND	2	ND	2	ND	17	ND	2	ND	2	ND	3.3	ND	2	ND	8.4	ND	4.4	ND	5.6	ND	8.4
Bromodichloromethane	ND	2	ND	2	ND	17	ND	2	ND	2	ND	3.3	ND	2	ND	8.4	ND	4.4	ND	5.6	ND	8.4
Dibromochloromethane	ND	2	ND	2	ND	17	ND	2	ND	2	ND	3.3	ND	2	ND	8.4	ND	4.4	ND	5.6	ND	8.4
Bromoform	ND	2	ND	2	ND	17	ND	2	ND	2	ND	3.3	ND	2	ND	8.4	ND	4.4	ND	5.6	ND	8.4
Hexachlorobutadiene	ND	4	ND	4	ND	34	ND	4	ND	4	ND	6.6	ND	4	ND	17	ND	8.7	ND	11	ND	17
1,2-Dibromoethane (EDB)	ND	2	ND	2	ND	17	ND	2	ND	2	ND	3.3	ND	2	ND	8.4	ND	4.4	ND	5.6	ND	8.4
Methylene chloride	2	2	2	2	ND	17	ND	2	2	2	4.5	3.3	ND	2	14	8.4	ND	4.4	5.9	5.6	ND	8.4
Vinyl acetate	ND	10	ND	10	ND	84	ND	10	ND	10	ND	17	ND	10	ND	42	ND	22	ND	28	ND	42
Acetone	ND	10	ND	10	ND	84	ND	10	ND	10	ND	17	ND	10	ND	42	ND	22	ND	28	ND	42
2-Butanone	ND	10	ND	10	ND	84	ND	10	ND	10	ND	17	ND	10	ND	42	ND	22	ND	28	ND	42
2-Hexanone	ND	30	ND	30	ND	250	ND	30	ND	30	ND	50	ND	30	ND	130	ND	65	ND	84	ND	130
4-Methyl-2-pentanone	ND	10	ND	10	ND	84	ND	10	ND	10	ND	17	ND	10	ND	42	ND	22	ND	28	ND	42
4-Ethyltoluene	73	2	13	2	ND	17	26	2	20	2	81	3.3	29	2	12	8.4	10	4.4	9	5.6	ND	8.4
Benzene	ND	2	ND	2	ND	17	3.8	2	ND	2	ND	3.3	ND	2	99	8.4	ND	4.4	ND	5.6	ND	8.4
Ethylbenzene	120	2	18	2	17	17	46	2	28	2	86	3.3	40	2	40	8.4	18	4.4	13	5.6	13	8.4
Toluene	24	2	4.6	2	ND	17	11	2	8.9	2	33	3.3	10	2	20	8.4	5.6	4.4	ND	5.6	ND	8.4
Xylenes (total)	210	2	36	2	25	17	90	2	55	2	210	3.3	82	2	150	8.4	34	4.4	25	5.6	34	8.4
Styrene	ND	2	ND	2	ND	17	ND	2	2.3	2	ND	3.3	ND	2	20	8.4	34	4.4	6	5.6	ND	8.4
1,3,5-Trimethylbenzene	48	2	9.1	2	ND	17	18	2	13	2	50	3.3	20	2	ND	8.4	7.2	4.4	6.4	5.6	ND	8.4
1,2,4-Trimethylbenzene	120	2	24	2	ND	17	47	2	35	2	130	3.3	48	2	15	8.4	19	4.4	17	5.6	13	8.4
Dichlorodifluoromethane	ND	2	ND	2	210	17	17	2	ND	2	ND	3.3	ND	2	220	170	ND		ND		ND	
Trichloro-trifluoroethane	ND	2	ND	2	ND	17	ND	2	ND	2	ND	3.3	ND	2	9.6	8.4	ND	4.4	ND	5.6	ND	8.4
Dichloro-tetrafluoroethane	ND	2	ND	2	ND	17	ND	2	ND	2	ND	3.3	ND	2	10	8.4	12	4.4	22	5.6	27	8.4
Trichlorofluoromethane	ND	2	ND	2	29	17	ND	2	ND	2	ND	3.3	ND	2	17	8.4	13	4.4	6.2	5.6	26	8.4
Total VOCs	662		125		1850		301		200		667		328		2408		267		144		2053	

Table 4
Unvalidated Landfill Gas Analytical Results
Refuse Hideaway Landfill
Middleton, Wisconsin

	Landfill Gas Wells										
	GW01 RH-LGGW01-01 2/18/98	GW02 RH-LGGW02-01 2/18/98	GW03 RH-LGGW03-01 2/18/98	GW04 RH-LGGW04-01 2/18/98	GW05 RH-LGGW05-01 2/18/98	GW06 RH-LGGW06-01 2/18/98	GW07 RH-LGGW07-01 2/18/98	GW08 RH-LGGW08-01 2/18/98	GW09 RH-LGGW09-01 2/18/98	GW10 RH-LGGW10-01 2/18/98	GW11 RH-LGGW11-01 2/18/98
Parameter	Conc RDL	Conc RDL	Conc RDL	Conc RDL	Conc RDL	Conc RDL	Conc RDL	Conc RDL	Conc RDL	Conc RDL	Conc RDL
VOCs - ppb (v/v)											
1,1,2,2-Tetrachloroethane	ND 84	ND 67	ND 11	ND 8.4	ND 84	ND 67	ND 34	ND 34	ND 67	ND 34	ND 67
1,1,1-Trichloroethane	ND 84	ND 67	ND 11	ND 8.4	ND 84	ND 67	ND 34	ND 34	ND 67	ND 34	ND 67
1,1,2-Trichloroethane	ND 84	ND 67	ND 11	ND 8.4	ND 84	ND 67	ND 34	ND 34	ND 67	ND 34	ND 67
1,1-Dichloroethane	ND 84	110 67	ND 11	11 8.4	ND 84	ND 67	ND 34	ND 34	ND 67	ND 34	ND 67
1,2-Dichloroethane	ND 84	1400 67	ND 11	ND 8.4	ND 84	ND 67	ND 34	ND 34	ND 67	ND 34	ND 67
1,2-Dichloropropane	ND 84	540 67	ND 11	ND 8.4	ND 84	ND 67	ND 34	ND 34	ND 67	ND 34	ND 67
Chloroethane	ND 170	ND 130	52 22	47 17	ND 170	ND 130	ND 67	ND 67	ND 130	ND 67	ND 130
Chloromethane	ND 170	ND 130	ND 22	ND 17	ND 170	ND 130	ND 67	ND 67	ND 130	ND 67	ND 130
Tetrachloroethene	1100 84	1200 67	30 11	ND 8.4	ND 84	ND 67	ND 34	49 34	ND 67	ND 34	ND 67
Trichloroethene	240 84	600 67	ND 11	ND 8.4	ND 84	ND 67	ND 34	ND 34	ND 67	ND 34	ND 67
cis-1,2-Dichloroethene	1000 84	12000 67	88 11	50 8.4	ND 84	2000 67	ND 34	94 34	8700 67	1800 34	560 67
trans-1,2-Dichloroethene	ND 84	340 67	24 11	17 8.4	120 84	150 67	ND 34	200 34	220 67	140 34	84 67
1,1-Dichloroethene	ND 84	ND 67	ND 11	ND 8.4	ND 84	ND 67	ND 34	ND 34	ND 67	ND 34	ND 67
Vinyl chloride	2800 84	12000 340	180 11	160 8.4	1400 84	12000 340	440 34	22000 670	13000 340	11000 340	7100 170
cis-1,3-Dichloropropene	ND 84	ND 67	ND 11	ND 8.4	ND 84	ND 67	ND 34	ND 34	ND 67	ND 34	ND 67
trans-1,3-Dichloropropene	ND 84	ND 67	ND 11	ND 8.4	ND 84	ND 67	ND 34	ND 34	ND 67	ND 34	ND 67
Chlorobenzene	ND 84	ND 67	38 11	52 8.4	ND 84	72 67	110 34	73 34	ND 67	76 34	70 67
1,2-Dichlorobenzene	ND 84	ND 67	ND 11	11 8.4	ND 84	ND 67	ND 34	ND 34	ND 67	ND 34	ND 67
1,3-Dichlorobenzene	ND 84	ND 67	ND 11	ND 8.4	ND 84	ND 67	ND 34	ND 34	ND 67	ND 34	ND 67
1,4-Dichlorobenzene	160 84	160 67	36 11	160 8.4	270 84	160 67	100 34	190 34	230 67	220 34	160 67
1,2,4-Trichlorobenzene	ND 840	ND 670	ND 110	ND 84	ND 840	ND 670	ND 340	ND 340	ND 670	ND 340	ND 670
Benzyl chloride	ND 420	ND 340	ND 56	ND 42	ND 420	ND 340	ND 170	ND 170	ND 340	ND 170	ND 340
Bromomethane	ND 84	ND 67	ND 11	ND 8.4	ND 84	ND 67	ND 34	ND 34	ND 67	ND 34	ND 67
Carbon disulfide	ND 420	ND 340	ND 56	ND 42	ND 420	ND 340	ND 170	ND 170	ND 340	ND 170	ND 340
Carbon tetrachloride	ND 84	ND 67	ND 11	ND 8.4	ND 84	ND 67	ND 34	ND 34	ND 67	ND 34	ND 67
Chloroform	ND 84	ND 67	ND 11	ND 8.4	ND 84	ND 67	ND 34	ND 34	ND 67	ND 34	ND 67
Bromodichloromethane	ND 84	ND 67	ND 11	ND 8.4	ND 84	ND 67	ND 34	ND 34	ND 67	ND 34	ND 67
Dibromochloromethane	ND 84	ND 67	ND 11	ND 8.4	ND 84	ND 67	ND 34	ND 34	ND 67	ND 34	ND 67
Bromoform	ND 84	ND 67	ND 11	ND 8.4	ND 84	ND 67	ND 34	ND 34	ND 67	ND 34	ND 67
Hexachlorobutadiene	ND 170	ND 130	ND 22	ND 17	ND 170	ND 130	ND 67	ND 67	ND 130	ND 67	ND 130
1,2-Dibromoethane (EDB)	ND 84	ND 67	ND 11	ND 8.4	ND 84	ND 67	ND 34	ND 34	ND 67	ND 34	ND 67
Methylene chloride	ND 84	850 67	19 11	16 8.4	84 84	ND 67	51 34	51 34	72 67	40 34	72 67
Vinyl acetate	ND 420	ND 340	ND 56	ND 42	ND 420	ND 340	ND 170	ND 170	ND 340	ND 170	ND 340
Acetone	ND 420	1500 340	ND 56	ND 42	ND 420	ND 340	ND 170	ND 170	ND 340	ND 170	ND 340
2-Butanone	ND 420	810 340	ND 56	ND 42	ND 420	ND 340	ND 170	ND 170	ND 340	ND 170	ND 340
2-Hexanone	ND 1300	ND 1000	ND 170	ND 130	ND 1300	ND 1000	ND 510	ND 510	ND 1000	ND 510	ND 1000
4-Methyl-2-pentanone	ND 420	ND 340	ND 56	ND 42	ND 420	ND 340	ND 170	ND 170	ND 340	ND 170	ND 340
4-Ethyltoluene	560 84	480 67	86 11	190 8.4	810 84	670 67	740 34	860 34	1000 67	930 34	630 67
Benzene	120 84	320 67	110 11	110 8.4	200 84	230 67	180 34	280 34	220 67	230 34	210 67
Ethylbenzene	2400 84	2300 67	460 11	660 8.4	6800 84	4100 67	3500 34	3500 34	3200 67	4500 34	2500 67
Toluene	1000 84	3800 67	110 11	97 8.4	370 84	2100 67	210 34	3200 34	4500 67	2200 34	3300 67
Xylenes (total)	4300 84	4500 67	520 11	810 8.4	5200 84	5000 67	4900 34	5300 34	6600 67	5600 34	5000 67
Styrene	ND 84	ND 67	ND 11	ND 8.4	ND 84	ND 67	ND 34	ND 34	ND 170	ND 34	ND 67
1,3,5-Trimethylbenzene	330 84	290 67	52 11	130 8.4	530 84	390 67	440 34	540 34	610 67	600 34	360 67
1,2,4-Trimethylbenzene	590 84	520 67	72 11	310 8.4	900 84	680 67	710 34	1000 34	1200 67	1100 34	750 67
Dichlorodifluoromethane	890 84	650 67	ND 11	220 84	270 84	400 67	310 34	660 34	120 67	410 34	130 67
Trichloro-trifluoroethane	ND 84	ND 67	ND 11	ND 8.4	ND 84	ND 67	ND 34	ND 34	ND 67	ND 34	ND 67
Dichloro-tetrafluoroethane	120 84	93 67	70 11	70 8.4	ND 84	72 67	47 34	92 34	ND 67	68 34	ND 67
Trichlorofluoromethane	ND 84	ND 67	ND 11	ND 8.4	ND 84	ND 67	ND 34	ND 34	ND 67	ND 34	ND 67
Total VOCs	15610	44463	1947	3121	16954	28024	11738	38089	39672	28914	20926

Table 4
Unvalidated Landfill Gas Analytical Results
Refuse Hideaway Landfill
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	Landfill Gas Wells											
	GW11 DUP RH-LGGW11-91 2/18/98		GW12 RH-LGGW12-01 2/18/98		GW12 DUP RH-LGGW12-91 2/18/98		GW13 RH-LGGW13-01 2/18/98		GW13 DUP RH-LGGW13-91 2/18/98		Blank RH-LGBLANK-01 2/19/98	
Parameter	Conc	RDL	Conc	RDL	Conc	RDL	Conc	RDL	Conc	RDL	Conc	RDL
VOCs - ppb (v/v)												
1,1,2,2-Tetrachloroethane	ND	84	ND	84	ND	170	ND	170	ND	170	ND	2
1,1,1-Trichloroethane	ND	84	ND	84	ND	170	ND	170	ND	170	ND	2
1,1,2-Trichloroethane	ND	84	ND	84	ND	170	ND	170	ND	170	ND	2
1,1-Dichloroethane	ND	84	ND	84	ND	170	ND	170	ND	170	ND	2
1,2-Dichloroethane	ND	84	ND	84	ND	170	ND	170	ND	170	ND	2
1,2-Dichloropropane	ND	84	ND	84	ND	170	ND	170	ND	170	ND	2
Chloroethane	ND	170	ND	170	ND	340	ND	340	ND	340	ND	4
Chloromethane	ND	170	ND	170	ND	340	ND	340	ND	340	ND	4
Tetrachloroethene	ND	84	ND	84	ND	170	ND	170	ND	170	ND	2
Trichloroethene	ND	84	ND	84	ND	170	ND	170	ND	170	ND	2
cis-1,2-Dichloroethene	590	84	1300	84	1300	170	1200	170	1200	170	ND	2
trans-1,2-Dichloroethene	ND	84	130	84	ND	170	ND	170	ND	170	ND	2
1,1-Dichloroethene	ND	84	ND	84	ND	170	ND	170	ND	170	ND	2
Vinyl chloride	6900	84	9600	340	9200	170	8900	170	8500	170	ND	2
cis-1,3-Dichloropropene	ND	84	ND	84	ND	170	ND	170	ND	170	ND	2
trans-1,3-Dichloropropene	ND	84	ND	84	ND	170	ND	170	ND	170	ND	2
Chlorobenzene	ND	84	ND	84	ND	170	ND	170	ND	170	ND	2
1,2-Dichlorobenzene	ND	84	220	84	ND	170	ND	170	ND	170	ND	2
1,3-Dichlorobenzene	ND	84	ND	84	ND	170	ND	170	ND	170	ND	2
1,4-Dichlorobenzene	210	84	ND	84	ND	170	190	170	ND	170	ND	2
1,2,4-Trichlorobenzene	ND	840	ND	840	ND	1700	ND	1700	ND	1700	ND	20
Benzyl chloride	ND	420	ND	420	ND	840	ND	840	ND	840	ND	10
Bromomethane	ND	84	ND	84	ND	170	ND	170	ND	170	ND	2
Carbon disulfide	ND	420	ND	420	ND	840	ND	840	ND	840	ND	10
Carbon tetrachloride	ND	84	ND	84	ND	170	ND	170	ND	170	ND	2
Chloroform	ND	84	ND	84	ND	170	ND	170	ND	170	ND	2
Bromodichloromethane	ND	84	ND	84	ND	170	ND	170	ND	170	ND	2
Dibromochloromethane	ND	84	ND	84	ND	170	ND	170	ND	170	ND	2
Bromoform	ND	84	ND	84	ND	170	ND	170	ND	170	ND	2
Hexachlorobutadiene	ND	170	ND	170	ND	340	ND	340	ND	340	ND	4
1,2-Dibromoethane (EDB)	ND	84	ND	84	ND	170	ND	170	ND	170	ND	2
Methylene chloride	ND	84	ND	84	ND	170	ND	170	ND	170	2.1	2
Vinyl acetate	ND	420	ND	420	ND	840	ND	840	ND	840	ND	10
Acetone	ND	420	ND	420	ND	840	ND	840	ND	840	ND	10
2-Butanone	ND	420	ND	420	ND	840	ND	840	ND	840	ND	10
2-Hexanone	ND	1300	ND	1300	ND	2500	ND	2500	ND	2500	ND	30
4-Methyl-2-pentanone	ND	420	ND	420	ND	840	ND	840	ND	840	ND	10
4-Ethyltoluene	740	84	870	84	770	170	830	170	690	170	ND	2
Benzene	220	84	210	84	200	170	190	170	200	170	ND	2
Ethylbenzene	2800	84	4500	84	4400	170	4200	170	3900	170	ND	2
Toluene	3700	84	2400	84	2600	170	2500	170	2300	170	ND	2
Xylenes (total)	5700	84	6100	84	6100	170	5700	170	5200	170	ND	2
Styrene	ND	84	ND	84	ND	170	ND	170	ND	170	ND	2
1,3,5-Trimethylbenzene	410	84	510	84	500	170	540	170	440	170	ND	2
1,2,4-Trimethylbenzene	900	84	1000	84	890	170	960	170	800	170	ND	2
Dichlorodifluoromethane	130	84	310	84	330	170	320	170	300	170	ND	2
Trichloro-trifluoroethane	ND	84	ND	84	ND	170	ND	170	ND	170	ND	2
Dichloro-tetrafluoroethane	ND	84	ND	84	ND	170	ND	170	ND	170	ND	2
Trichlorofluoromethane	ND	84	ND	84	ND	170	ND	170	ND	170	ND	2
Total VOCs	22300		27150		26290		25530		23530		2.1	

Table 4
Unvalidated Landfill Gas Analytical Results
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	Landfill Gas Probes																					
	GP01 RH-LGGPO15-01 2/18/98		G02 RH-LGG02D-01 2/19/98		G03 RH-LGG03D-01 2/19/98		G04 RH-LGG04-01 2/19/98		GP04 RH-LGGP04-01 2/19/98		G05 RH-LGG05-01 2/19/98		GP10 RH-LGGP10-01 2/19/98		GP12 RH-LGGP12D-01 2/19/98		GP17 RH-LGGP17D-01 2/19/98		GP20 RH-LGGP20I2-01 2/19/98		GP23 RH-LGGP23I2-01 2/19/98	
Parameter	Conc	RDL	Conc	RDL	Conc	RDL	Conc	RDL	Conc	RDL	Conc	RDL	Conc	RDL	Conc	RDL	Conc	RDL	Conc	RDL	Conc	RDL
TICs - ppb (v/v)																						
Alkyl benzene (C10)	610																					
Alkyl benzene (C9)	300						110				240											
Branched alkane (C10)	540		90		65		140				310		110				1600		330		I30	
Branched alkane (C11)	660		150				240		220													
Branched alkane (C8)																						
Branched alkane (C9)									87													
Cycloalkane (C10)																						
Cycloalkane (C6)																					63	
Cycloalkene (C10)	210										120		77									
Decane	980		200		84		370		240		720		400						120			
Dodecane			49						110													
Ketone (C7)																						
No Match Found			253		370		449		365		1224		807		10790		2070		624		589	
Nonane	170		37				63		39				67		1100							
Substituted cycloalkane (C10)											910											
Substituted cycloalkane (C7)																						
Substituted cycloalkane (C8)															1600							
Substituted cycloalkane (C9)															2000						165	
Undecane	740		250		74		430		250		540		490				300		150		67	
EPA 15/16 - ppm (v/v)																						
Hydrogen sulfide	ND	0.2	ND	0.2	ND	0.2	ND	0.2	ND	0.2	ND	0.2	ND	0.2	ND	0.2	ND	0.2	0.22	0.2	ND	0.2

Table 4
Unvalidated Landfill Gas Analytical Results
Refuse Hideaway Landfill
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	Landfill Gas Wells																					
	GW01 RH-LGGW01-01 2/18/98		GW02 RH-LGGW02-01 2/18/98		GW03 RH-LGGW03-01 2/18/98		GW04 RH-LGGW04-01 2/18/98		GW05 RH-LGGW05-01 2/18/98		GW06 RH-LGGW06-01 2/18/98		GW07 RH-LGGW07-01 2/18/98		GW08 RH-LGGW08-01 2/18/98		GW09 RH-LGGW09-01 2/18/98		GW10 RH-LGGW10-01 2/18/98		GW11 RH-LGGW11-01 2/18/98	
Parameter	Conc	RDL	Conc	RDL	Conc	RDL	Conc	RDL	Conc	RDL	Conc	RDL	Conc	RDL	Conc	RDL	Conc	RDL	Conc	RDL	Conc	RDL
TICs - ppb (v/v)																						
Alkyl benzene (C10)																						
Alkyl benzene (C9)																						
Branched alkane (C10)	15500		9400		3600						29500		3600		8300				19600			
Branched alkane (C11)															1700							
Branched alkane (C8)			1800		820		1400															
Branched alkane (C9)																						
Cycloalkane (C10)																						
Cycloalkane (C6)	1800		5100								1200											
Cycloalkene (C10)	5800								5800		6500				20000		21000		16000		14000	
Decane	6700		5200				3200		8300		7900		6100		10000		10000		10000		6800	
Dodecane																						
Ketone (C7)															1000							
No Match Found	16000		20700		13400		18900		34600		15900		28520		30900		25700		17300		16480	
Nonane	4000				1600				3600				3800				3300		4200		2100	
Substituted cycloalkane (C10)																						
Substituted cycloalkane (C7)	1800										1500								1300			
Substituted cycloalkane (C8)			2000		1300		970										1100					
Substituted cycloalkane (C9)					1500																	
Undecane							1800		3600						4300		4400		4100		2000	
EPA 15/16 - ppm (v/v)																						
Hydrogen sulfide	7.1	2	16	4	320	100	870	200	850	200	780	200	190	40	190	50	950	200	1000	200	1600	200

Table 4
Unvalidated Landfill Gas Analytical Results
Refuse Hideaway Landfill
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	Landfill Gas Wells											
	GW11 DUP RH-LGGW11-91 2/18/98		GW12 RH-LGGW12-01 2/18/98		GW12 DUP RH-LGGW12-91 2/18/98		GW13 RH-LGGW13-01 2/18/98		GW13 DUP RH-LGGW13-91 2/18/98		Blank RH-LGBLANK-01 2/19/98	
Parameter	Conc	RDL	Conc	RDL	Conc	RDL	Conc	RDL	Conc	RDL	Conc	RDL
TICs - ppb (v/v)												
Alkyl benzene (C10)	4300								2500			
Alkyl benzene (C9)												
Branched alkane (C10)			5800		3100		16700		5600			
Branched alkane (C11)	1400											
Branched alkane (C8)												
Branched alkane (C9)												
Cycloalkane (C10)	14000		8600		9300		9900		9100			
Cycloalkane (C6)												
Cycloalkene (C10)												
Decane	7800		8100		6500		9300		7200			
Dodecane												
Ketone (C7)												
No Match Found	18400		27000		23810		23300		24300			
Nonane	2300		3200		2700		3400		2900			
Substituted cycloalkane (C10)												
Substituted cycloalkane (C7)												
Substituted cycloalkane (C8)			1100									
Substituted cycloalkane (C9)												
Undecane	3200		3600		2300		4200		3100			
EPA 15/16 - ppm (v/v)												
Hydrogen sulfide	1700	200	790	200	810	200	880	200	900	200	ND	0.2

Table 5

Summary of Historical Volatile Organic Compound Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Well	Date	Total VOCs	Chloromethane	Chloroethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1,1-Trichloroethane	Vinyl Chloride	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Trans-1,2-Dichloroethene	Trichloroethene	Tetrachloroethene	1,2-Dichloropropane	1,2,3-Trichloropropane	Chlorobenzene	Dichlorodifluoromethane	Trichlorofluoromethane	Carbon Disulfide	Methylene Chloride	Chloroform	Bromodichloromethane	Bromomethane
		UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
P-01D	1/15/91	2																		2			
	2/11/98	ND																					
P-01S	1/16/91	337																					
	2/10/98	2.3																	2.3				
P-03S	8/19/88	ND																					
	9/15/88	0.53					0.53																
	1/16/91	49						40									7						
	2/11/98	1.3											0.3						1				
P-04S	1/14/91	1																					
	2/11/98	2	0.8																1				
P-08BR	8/19/88	ND																					
	9/16/88	0.59					0.59																
	1/11/91	ND																					
	2/11/98	0.9										0.4											
P-08D	8/17/87	126.5									9.4	3	7.7										
	8/19/88	ND																					
	9/16/88	506.61		0.61	4.4			19			310	45	120							1.9			
	1/11/91	ND																					
	2/11/98	6.4								2.2		1.6	2.6										
P-08S	8/19/88	1006.26		1.2	7.5	1.2		31	0.86		540	110	310							2.1			
	9/16/88	1154.9		1.8	7.9	4.9	1.3	51	1.5		640	120	320							3			
	1/11/91	413			16			160			10	16	7	1			40						160
	2/16/98	44.8	1		2			6.7		29	1.2	1.9	2.5						0.5				
P-09D	8/18/88	333.77			6.2			92	0.77		230									4.8			
	8/19/88	449.5			4.4			26			270	36	110										
	9/15/88	309.5			4.2			91			210									4.3			
	1/16/91	485			16			32			13						170						
	2/13/98	24.8	1.8	5.4	6	0.2				0.6	4.2	0.5		2.8									
P-09S	8/18/88	348.36			29	4.5		56			120	29	70	5.7				0.66		7.8			
	9/15/88	344.7		1.2	50	5.4		53			110	19	48	7.7						6.2			
	1/15/91	678			30	41		440			32	9	16	21			35			4			11
	2/13/98	9	0.7							4	0.2	1.1	2.9										
P-16	8/17/87	87.4			3.8		4.8	5	2.1		19	8.7	44										
P-16D	8/18/88	3.58			0.73						0.85	2											
	9/14/88	7.37			1		0.67	1.1			1.4	2	1.2										
	1/15/91	57			6			19			1	10	3	1									
	2/18/98	61		2	6			7.1		26	1.2	11	0.2	1.2									
P-16S	8/19/88	188.3			13	0.7	4.6	4.4	3.3		78	17	64					1.5			1.8		
	9/16/88	257.26		0.93	17	0.83	5.8	6	3.1		110	23	86					1.5			3.1		
	2/18/98	129.9	0.5		1.8			4.8		110	1.1	1.8		5.6									

Table 5

Summary of Historical Volatile Organic Compound Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Well	Date	Dibromomethane	Tribromomethane	Acetone	2-Butanone	Benzene	Ethylbenzene	Toluene	Xylene, m+p-	Xylene, o-	Xylene, total	Styrene	N-Propylbenzene	Isopropylbenzene	N-Butylbenzene	tert-Butylbenzene	Isopropyltoluene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene
		UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
P-01D	1/15/91																		
	2/11/98																		
P-01S	1/16/91						31	115			191								
	2/10/98																		
P-03S	8/19/88																		
	9/15/88																		
	1/16/91							2											
	2/11/98																		
P-04S	1/14/91							1											
	2/11/98					0.2													
P-08BR	8/19/88																		
	9/16/88																		
	1/11/91																		
	2/11/98					0.1		0.4											
P-08D	8/17/87						15	1.4			90								
	8/19/88																		
	9/16/88					5.7													
	1/11/91																		
	2/11/98																		
P-08S	8/19/88					2.4													
	9/16/88					3.5													
	1/11/91					2		1											
	2/16/98																		
P-09D	8/18/88																		
	8/19/88					3.1													
	9/15/88																		
	1/16/91		250			4													
	2/13/98					3.3													
P-09S	8/18/88					14	6	5.7											
	9/15/88					19	8.3	9.8			7.1								
	1/15/91					20		8			11								
	2/13/98					0.1													
P-16	8/17/87																		
P-16D	8/18/88																		
	9/14/88																		
	1/15/91					7		7			3								
	2/18/98					6.1		0.2											
P-16S	8/19/88																		
	9/16/88																		
	2/18/98					4.3													

Table 5

Summary of Historical Volatile Organic Compound Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Well	Date	Total VOCs	Chloromethane	Chloroethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1,1-Trichloroethane	Vinyl Chloride	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Trans-1,2-Dichloroethene	Trichloroethene	Tetrachloroethene	1,2-Dichloropropane	1,2,3-Trichloropropane	Chlorobenzene	Dichlorodifluoromethane	Trichlorofluoromethane	Carbon Disulfide	Methylene Chloride	Chloroform	Bromodichloromethane	Bromomethane
		UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
P-17S	8/18/88	878.3			38	6.5	9.1	31	3		320	320	99	12				2.7		14	5.4		
	9/14/88	1003.9			56	4.8	4.9	35	1.2		440	320	81	13				1.9		6.3	6.3		
	1/9/91	297			21	5	5	68			3	28	14	10									36
	6/26/91	257			26	9	.5	57			2	51	18	14			15	28		1	3		
	10/25/91	107										65	16	14									
	5/14/92	167			20	4		27			2	47	15	15			1	12					
	10/8/92	2080.7			23	5.7	0.9	24		1900	1.4	54	18	17			2.7	16			1.6		
	5/19/93	193.856			22	4	2	25		18.928	2	28.928	50	13			6						
	5/20/94	251.1			10	2.3		10		180	0.9	18	9.4	6.7			0.9						
	10/5/94	443.4			12	3.2		8.6		360	0.7	20	10	9.6			1.4	0.5					
	5/17/95	152.9								110		20	13	5.1									
	11/7/95	170.67	0.39		8.2	1.8		4.1		110	0.42	22	13	4.2			0.41						
	5/28/96	137.68	0.52		6	1.4		4.4		92	0.34	17	9.2	3.6			0.73						
	11/11/96	124.56			6.2	1.1		4.1		83	0.33	14	9	3.3			0.68				0.18		
	2/26/98	102.3	1.8		6.3	1.2		1.3		58		14	7.1	3.3					0.9				
P-18	8/17/87	13.3										1.6	8.2					3.5					
P-18S	8/18/88	6.9											5.5					1.4					
	9/14/88	11.89					0.89	1.4				1.2	7.1					1.3					
	1/16/91	7											5					1					
	3/2/98	17.4	1.8		0.8					1.6		2.2	11										
P-19D	8/17/88	32.34			0.53			0.52			2.7	3.7	24					0.89					
	9/14/88	36.26			0.66		1.2	3.2			5.3	3.5	21					1.4					
P-19S	8/17/88	59.02			1			0.92			13	6.7	35					1.2					
	9/14/88	63.4			1.1		1.2	2.3			13	6.6	38					1.2					
P-20	8/17/87	51.7										6.5	39					6.2					
P-20S	8/17/88	60.98			0.78			1			1	5.6	51					1.6					
	9/14/88	58.7			0.6		1.2	2.8				4.7	48					1.4					
	12/10/90	3										3											
	1/7/91	2											2										
P-20SR	7/1/91	9											3				6						
	11/15/91	12											7										
	5/12/92	6											6										
	12/22/92	8											6				2						
	5/18/93	5											3				1				1		
	5/16/94	19.8										0.8	6				2.1	0.7		3.6			
	10/6/94	10.1										0.8	4.8				3.9						
	5/15/95	3.5											3.5										
	11/7/95	5.579	0.05		0.025					0.21		0.24	4				0.73	0.14					
	5/28/96	4.55	0.034		0.025					0.13		0.17	3.2				0.81	0.16					
	11/11/96	5.536			0.047					0.24		0.22	3.9				0.87	0.18			0.027		
	2/10/98	3.9										0.2	3.7										
P-21	8/17/87	1											1										
P-21BR	8/18/88	ND																					
	9/14/88	ND																					
	1/14/91	ND																					
	2/12/98	0.2										0.2											

Table 5

Summary of Historical Volatile Organic Compound Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Well	Date	Dibromomethane	Tribromomethane	Acetone	2-Butanone	Benzene	Ethylbenzene	Toluene	Xylene, m+p-	Xylene, o-	Xylene, total	Styrene	N-Propylbenzene	Isopropylbenzene	N-Butylbenzene	tert-Butylbenzene	Isopropyltoluene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene
		UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
P-17S	8/18/88					7.7	2.5	7.4											
	9/14/88					10	2.5	11			10								
	1/9/91					7	47	17			36								
	6/26/91					4	12	5			7								
	10/25/91						12												
	5/14/92					4	10	4			6								
	10/8/92					3	6.3	2.9			4.2								
	5/19/93					3	5	7			7								
	5/20/94					2.3	4.1	2.3	0.8	0.7								0.9	1.8
	10/5/94	9.6				1.8	0.7	1.4	0.8						0.6	0.8	0.9		0.8
	5/17/95					1.4	2.3											0.5	0.6
	11/7/95					1	1.1	1.2	0.83								0.44	1.1	0.48
	5/28/96					0.7	0.7	0.68										0.41	
	11/11/96					0.68	0.6	0.44	0.29	0.16								0.28	0.22
	2/26/98			8		0.4													
P-18	8/17/87																		
P-18S	8/18/88																		
	9/14/88																		
	1/16/91							1											
	3/2/98																		
P-19D	8/17/88																		
	9/14/88																		
P-19S	8/17/88					1.2													
	9/14/88																		
P-20	8/17/87																		
P-20S	8/17/88																		
	9/14/88																		
	12/10/90																		
	1/7/91																		
P-20SR	7/1/91																		
	11/15/91						1				4								
	5/12/92																		
	12/22/92																		
	5/18/93																		
	5/16/94						1.3		2.5				0.7			1.3			0.8
	10/6/94							0.6											
	5/15/95																		
	11/7/95							0.025									0.092	0.067	
	5/28/96							0.021											
	11/11/96							0.052											
	2/10/98																		
P-21	8/17/87																		
P-21BR	8/18/88																		
	9/14/88																		
	1/14/91																		
	2/12/98																		

Table 5

Summary of Historical Volatile Organic Compound Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Well	Date	Total VOCs	Chloromethane	Chloroethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1,1-Trichloroethane	Vinyl Chloride	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Trans-1,2-Dichloroethene	Trichloroethene	Tetrachloroethene	1,2-Dichloropropane	1,2,3-Trichloropropane	Chlorobenzene	Dichlorodifluoromethane	Trichlorofluoromethane	Carbon Disulfide	Methylene Chloride	Chloroform	Bromodichloromethane	Bromomethane
		UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
P-21D	8/17/87	26									26												
	8/18/88	161.69			5.5			67	0.59		84	1.8						1.1					
	9/15/88	217.61			6.1			94	0.7		110	2.5						0.61		3.7			
	1/14/91	73			1			14									36	20					
	2/12/98	178		8.6	21	0.8		16		120	6.5	1.2		2.1									
P-21S	8/18/88	51.07			0.7		0.77	42	0.7		2.5		4.4										
	9/15/88	40.41		1.1			0.61	31			3.5		4.2										
	1/14/91	819		11	40			525			12	7	3	3			25	177		1			
	6/28/91	837		8	36	4		470	1		14	6	4	2			90	190		3			
	11/15/91	134			72					25											37		
	5/12/92	142		2	18			56			6	5	2				1	48					
	11/16/92	78			16			41				6					10						
	5/19/93	247		103	21					53	5	20					39						3
	5/16/94	127.5		2.9	15.3			7.8		20	9	11.4					32			2.6	0.9		
	10/6/94	95.1	13	1.9	11.2			9.7		34	6.5	8.7											
	5/15/95	3																					
	11/7/95	29.328	0.036	1.6	5.7			4.4		9.6	2.8	2.2	0.17	0.1			0.091			0.054			
	5/28/96	7.586	0.049		0.83			0.95		4.4	0.4	0.41	0.12							0.035			
	11/11/96	27.078		0.8	3.9			3	0.034	14	1.8	1.9		0.079							0.028		
	2/17/98	1.2	1.2																				
P-22D	8/16/88	93.43			1.1		0.77		0.6		14	3.3	12					0.66					
	9/15/88	26.33			0.96		0.56	0.57			12	2.8	8.8					0.64					
	1/17/91	14			7								6										
	6/27/91	49										1	6				39	3					
	10/25/91	10										2	8										
	5/18/92	19			1							3	7				7			1			
	10/7/92	19								8		1	8				2						
	5/18/93	14								7			5				2						
	5/19/94	19.3							1	7.3		2.4	7.1				1.5						
	10/3/94	23.3	0.6							8.5		2.7	7.7	0.5			1.5	0.6					
	5/17/95	13.6								4.6		2.2	6.8										
	11/8/95	19.656			0.66	0.06	0.12	0.032		7	0.042	2.1	7.9	0.16			1.1	0.28		0.072			
	5/30/96	29.277	0.041		0.61	0.107	0.175	0.038		14.7	0.039	4.1	7.2	0.3			1.3	0.53		0.137			
	11/13/96	17.089			0.58	0.05				7	0.036	1.8	5.9	0.15			1.2	0.23		0.071	0.036		
	2/24/98	17.6	0.5		0.6					7.8		1.8	6.4						0.5				

Table 5

Summary of Historical Volatile Organic Compound Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Well	Date	Dibromomethane	Tribromomethane	Acetone	2-Butanone	Benzene	Ethylbenzene	Toluene	Xylene, m+p-	Xylene, o-	Xylene, total	Styrene	N-Propylbenzene	Isopropylbenzene	N-Butylbenzene	tert-Butylbenzene	Isopropyltoluene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene
		UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
P-21D	8/17/87																		
	8/18/88					1.7													
	9/15/88																		
	1/14/91					1		1											
	2/12/98					1.8													
P-21S	8/18/88																		
	9/15/88																		
	1/14/91					9		4			2								
	6/28/91					7		1			1								
	11/15/91																		
	5/12/92					4													
	11/16/92					4		1											
	5/19/93					3													
	5/16/94					8.9	3.1	3.5	6.2					0.7	0.6			1.5	1.1
	10/6/94					7.8		1.1	0.6					0.6					
	5/15/95					3													
	11/7/95					2.3		0.044		0.097				0.092				0.044	
	5/28/96					0.32		0.034										0.038	
	11/11/96					1.4		0.076						0.061					
	2/17/98																		
P-22D	8/16/88					61													
	9/15/88																		
	1/17/91							1											
	6/27/91																		
	10/25/91																		
	5/18/92																		
	10/7/92																		
	5/18/93																		
	5/19/94																		
	10/3/94	0.5						0.7											
	5/17/95																		
	11/8/95							0.13											
	5/30/96																		
	11/13/96							0.036											
	2/24/98																		

Table 5

Summary of Historical Volatile Organic Compound Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Well	Date	Total VOCs	Chloromethane	Chloroethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1,1-Trichloroethane	Vinyl Chloride	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Trans-1,2-Dichloroethene	Trichloroethene	Tetrachloroethene	1,2-Dichloropropane	1,2,3-Trichloropropane	Chlorobenzene	Dichlorodifluoromethane	Trichlorofluoromethane	Carbon Disulfide	Methylene Chloride	Chloroform	Bromodichloromethane	Bromomethane
		UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
P-22S	8/16/88	23.03			0.7		0.61		0.51		10	2.6	8					0.61					
	9/15/88	28.11			1		1.2	0.68			12	3.2	9.3					0.73					
	1/17/91	29			14							2	9				4						
	6/27/91	60										2	8				46	3		1			
	10/25/91	20			1							3	12					4					
	5/18/92	37			2							4	12				14	1		2	1	1	
	10/7/92	46					17			12		2	12				3						
	5/18/93	21								9		2	7				3						
	5/20/94	19							0.9	6.6		2.3	7.1				2.1						
	10/3/94	26.2	0.6							8.8		3.1	8.8	0.5			2.4	0.9					
	5/17/95	21								8.3		3.4	9.3										
	11/8/95	23.654			0.9	0.065	0.19	0.041		8.2	0.061	2.8	9.2	0.2			1.6	0.31		0.065			
	5/30/96	22.492	0.047		0.8	0.058	0.15	0.046		8.1	0.054	2.8	8.1	0.21			1.5	0.45		0.05	0.038		
	11/13/96	19.574			0.69	0.058	0.13			7.2	0.042	2.2	6.7	0.18			1.8	0.45		0.052	0.037		
	2/24/98	11.3	2		0.4					4.4		0.9	2.9										
P-23D	8/17/88	1.9											1.9										
	9/15/88	3.9											2.3							1.6			
	1/11/91	2																					
	2/10/98	1.2											0.8										
P-23S	8/17/88	28.8									8.5	5.3	15										
	9/15/88	33.78			1.3		1.3	0.78			14	3.7	12					0.7					
	1/11/91	3											2										
	2/10/98	5.8	0.5							0.3		0.4	4.6										
P-24D	8/19/88	ND																					
	9/16/88	ND																					
	1/15/91	ND																					
	3/3/98	3.5						2.2		1.3													
P-24E	6/16/88	ND																					
	8/19/88	ND																					
	9/16/88	1.6					1.6																
	1/15/91	ND																					
P-24S	3/3/98	0.4								0.4													
P-25BR	8/17/88	3.3											3.3										
	9/14/88	14.86			2.6		0.64	1.1			2.2	4.2	1.4	1.1				0.62					
	1/10/91	ND																					
	2/16/98	3.8	0.8							0.7		0.3	2										
P-25D	8/17/88	12.1			2.7						1.9	4	1.2	1.1									
	9/14/88	9.54			2.2		0.5	0.84			1.8	3.1	1.1										
	1/10/91	122																					
	2/17/98	50	0.8		2.2			3.2		33	0.6	6.5	2	1									
P-25S	8/17/88	ND																					
	9/14/88	ND																					
	1/10/91	ND																					
	2/17/98	10.6		2.3	1.8					4.2	0.8	0.6								0.5			
P-26D	8/15/88	75.8			1.4		1.2	5.2	1.3		3.2	6.4	46					8.6					
	1/9/91	105										2	28				53	7					
	1/11/91	10																					10
	3/2/98	19.7			0.6					0.5		1.6	17										

Table 5

Summary of Historical Volatile Organic Compound Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Well	Date	Dibromomethane UG/L	Tribromomethane UG/L	Acetone UG/L	2-Butanone UG/L	Benzene UG/L	Ethylbenzene UG/L	Toluene UG/L	Xylene, m+p- UG/L	Xylene, o- UG/L	Xylene, total UG/L	Styrene UG/L	N-Propylbenzene UG/L	Isopropylbenzene UG/L	N-Butylbenzene UG/L	tert-Butylbenzene UG/L	Isopropyltoluene UG/L	1,2,4-Trimethylbenzene UG/L	1,3,5-Trimethylbenzene UG/L
P-22S	8/16/88																		
	9/15/88																		
	1/17/91																		
	6/27/91																		
	10/25/91																		
	5/18/92																		
	10/7/92																		
	5/18/93																		
	5/20/94																		
	10/3/94	0.5						0.6											
	5/17/95																		
	11/8/95					0.022													
	5/30/96					0.03		0.059											
	11/13/96							0.035											
	2/24/98					0.3		0.4											
P-23D	8/17/88																		
	9/15/88																		
	1/11/91							2											
	2/10/98					0.1		0.3											
P-23S	8/17/88																		
	9/15/88																		
	1/11/91							1											
	2/10/98																		
P-24D	8/19/88																		
	9/16/88																		
	1/15/91																		
	3/3/98																		
P-24E	6/16/88																		
	8/19/88																		
	9/16/88																		
	1/15/91																		
P-24S	3/3/98																		
P-25BR	8/17/88																		
	9/14/88							1											
	1/10/91																		
	2/16/98																		
P-25D	8/17/88					1.2													
	9/14/88																		
	1/10/91						14	58			50								
	2/17/98					0.3		0.4											
P-25S	8/17/88																		
	9/14/88																		
	1/10/91																		
	2/17/98					0.4													
P-26D	8/15/88					2.5													
	1/9/91							15											
	1/11/91																		
	3/2/98																		

Table 5

Summary of Historical Volatile Organic Compound Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Well	Date	Total VOCs	Chloromethane	Chloroethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1,1-Trichloroethane	Vinyl Chloride	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Trans-1,2-Dichloroethene	Trichloroethene	Tetrachloroethene	1,2-Dichloropropane	1,2,3-Trichloropropane	Chlorobenzene	Dichlorodifluoromethane	Trichlorofluoromethane	Carbon Disulfide	Methylene Chloride	Chloroform	Bromodichloromethane	Bromomethane
		UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
P-26S	9/26/88	52.6			0.6		1.7	2.5			1.4	3.3	36					5.2					
	1/11/91	212						10				7	38										
	3/2/98	54.8	0.6		1.4			4		8.2		5.1	33						0.4	2			
P-27D	8/16/88	29.63			0.51		0.52		0.5			2.1	20					2.3		3.7			
	9/14/88	94.02		1	1.8		3.2	9.6	0.52		4.2	7.7	56					8.6		1.4			
	1/17/91	221			11		6				1	11	99				93						
	6/26/91	445			4		5					14					260	40		2			
	10/24/91	228			4		4					21	150				16	33					
	5/15/92	193			4		4					17	130	1			16	21					
	10/6/92	107			2		9			7		15	54				20						
	5/17/93	83.464			1		3			6		32	6.464				24	7		4			
	5/19/94	115.8			3.1		2			7.6		12	78				10	3.1					
	10/4/94	192.5	2		2.8	2.9	3.3			8.4		12	113	0.7			37	8.5					
	5/17/95	64.4								2.8		8.6	53										
	11/9/95	81.63			2.4		1.2	0.22		5.8		9	57	0.24			2.9	1.9		0.78	0.19		
	5/30/96	65.97	0.21		2.1		0.98			3.8		7.6	47	0.28			2.3	1.3		0.4			
	11/13/96	62.291			2.2		1		0.078	4		7.3	42	0.29			2.7	1.7		0.66	0.22		
	2/23/98	73.2			3		1.3			5.9		8.4	54	0.4							0.2		
P-27S	8/16/88	171.9			3.9		4.7	4.1	2.7		12	19	110					9.3		4.4			
	1/17/91	230			4		5					12	114	1			53	37		3			
	6/25/91	363			5		6					17	130				150	48		7			
	10/24/91	225			4		4					21	150				14	30		2			
	5/15/92	175			3		4					16	120				11	19		2			
	10/6/92	109.464			2		3			7		15	64.464				18						
	5/17/93	150					1			3		8	120				13	5					
	5/19/94	67.9			2		1.4			2		7.2	51				2.7	1.6					
	10/5/94	55.1					0.8		1.1	2		4.4	38				5.3	2.1					
	5/17/95	42.3										5.3	37										
	11/9/95	51.45	0.28		1.4		0.84			1.6		5.3	39	0.25			1.4	1		0.18			
	5/30/96	43.567	0.052		1.5		0.7			1.5		4.6	32	0.23			1.7	1.1		0.11	0.075		
	11/13/96	34.708			1.3		0.6			0.86		4.2	25	0.27			1.3	0.92		0.088	0.088		
	2/23/98	37.8			1.7					1.4		4.7	30										
P-28S	8/15/88	1.7											1.7										
	9/13/88	41.4			1.1		1.9	1.4				3.2	29					2.6		2.2			
	3/2/98	20.2	12							0.2		0.6	7.4										
P-29S	3/21/91	106											2				100						
	6/25/91	1											1										
	6/27/91	163											2				159	1		1			
	5/15/92	5															5						
	10/6/92	3															3						
	5/19/93	5															5						
	5/20/94	4.6											0.9				3.7						
	10/5/94	9.5	0.6									0.7	1.3				6.3						
	5/17/95	ND																					
	11/8/95	4.145	0.044										1.3				2.3	0.46					
	5/30/96	5.06											1.3				3.2	0.56					
	11/13/96	4.497											0.96				2.9	0.53			0.056		
	2/26/98	2.4	0.5										0.9							1			

Table 5

Summary of Historical Volatile Organic Compound Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Well	Date	Dibromomethane	Tribromomethane	Acetone	2-Butanone	Benzene	Ethylbenzene	Toluene	Xylene, m+p-	Xylene, o-	Xylene, total	Styrene	N-Propylbenzene	Isopropylbenzene	N-Butylbenzene	tert-Butylbenzene	Isopropyltoluene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene
		UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
P-26S	9/26/88					1.9													
	1/11/91						14	66			77								
	3/2/98					0.1													
P-27D	8/16/88																		
	9/14/88																		
	1/17/91																		
	6/26/91							120											
	10/24/91																		
	5/15/92																		
	10/6/92																		
	5/17/93																		
	5/19/94																		
	10/4/94	0.7						1.2											
	5/17/95																		
	11/9/95																		
	5/30/96																		
	11/13/96					0.043		0.1											
	2/23/98																		
P-27S	8/16/88					1.8													
	1/17/91							1											
	6/25/91																		
	10/24/91																		
	5/15/92																		
	10/6/92																		
	5/17/93																		
	5/19/94																		
	10/5/94					0.5		0.9											
	5/17/95																		
	11/9/95					0.1		0.1											
	5/30/96																		
	11/13/96							0.082											
	2/23/98																		
P-28S	8/15/88																		
	9/13/88																		
	3/2/98																		
P-29S	3/21/91							4											
	6/25/91																		
	6/27/91																		
	5/15/92																		
	10/6/92																		
	5/19/93																		
	5/20/94																		
	10/5/94							0.6											
	5/17/95																		
	11/8/95																0.041		
	5/30/96																		
	11/13/96							0.051											
	2/26/98																		

Table 5

Summary of Historical Volatile Organic Compound Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Well	Date	Total VOCs	Chloromethane	Chloroethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1,1-Trichloroethane	Vinyl Chloride	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Trans-1,2-Dichloroethene	Trichloroethene	Tetrachloroethene	1,2-Dichloropropane	1,2,3-Trichloropropane	Chlorobenzene	Dichlorodifluoromethane	Trichlorofluoromethane	Carbon Disulfide	Methylene Chloride	Chloroform	Bromodichloromethane	Bromomethane
		UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
P-30D	11/16/90	ND																					
	12/12/90	ND																					
	12/23/91	ND																					
	5/7/92	ND																					
	1/11/93	2																		2			
	5/13/93	ND																					
	10/22/93	ND																					
	5/19/94	ND																					
	10/3/94	ND																					
	10/4/94	0.6																					
	5/15/95	ND																					
	11/7/95	ND																					
	5/29/96	0.16	0.077																	0.058			
	11/11/96	0.081																			0.034		
	2/19/98	ND																					
P-30I	11/19/90	ND																					
	12/12/90	ND																					
	6/28/91	ND																					
	12/23/91	ND																					
	5/7/92	1.7										1.1									0.6		
	12/22/92	ND																					
	5/21/93	ND																					
	5/18/94	2.6																		2.6			
	10/3/94	ND																					
	5/15/95	ND																					
	11/7/95	ND																					
	5/29/96	ND																					
	11/11/96	ND																					
	2/18/98	ND																					
P-30S	12/12/90	ND																					
P-31D	11/16/90	ND																					
	12/14/90	ND																					
	1/9/91	ND																					
	6/26/91	2																		2			
	6/28/91	ND																					
	11/14/91	ND																					
	5/11/92	2																					
	10/5/92	ND																					
	5/21/93	ND																					
	5/23/94	ND																					
	10/7/94	0.9															0.9						
	5/15/95	ND																					
	11/7/95	0.065	0.044																				
	5/28/96	0.043	0.043																				
	11/11/96	0.113																			0.057		
	2/25/98	ND																					

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Summary of Historical Volatile Organic Compound Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Well	Date	Dibromomethane	Tribromomethane	Acetone	2-Butanone	Benzene	Ethylbenzene	Toluene	Xylene, m+p-	Xylene, o-	Xylene, total	Styrene	N-Propylbenzene	Isopropylbenzene	N-Butylbenzene	tert-Butylbenzene	Isopropyltoluene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene
		UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
P-30D	11/16/90																		
	12/12/90																		
	12/23/91																		
	5/7/92																		
	1/11/93																		
	5/13/93																		
	10/22/93																		
	5/19/94																		
	10/3/94																		
	10/4/94							0.6											
	5/15/95																		
	11/7/95																		
	5/29/96							0.025											
	11/11/96							0.047											
	2/19/98																		
P-30I	11/19/90																		
	12/12/90																		
	6/28/91																		
	12/23/91																		
	5/7/92																		
	12/22/92																		
	5/21/93																		
	5/18/94																		
	10/3/94																		
	5/15/95																		
	11/7/95																		
	5/29/96																		
	11/11/96																		
	2/18/98																		
P-30S	12/12/90																		
P-31D	11/16/90																		
	12/14/90																		
	1/9/91																		
	6/26/91																		
	6/28/91																		
	11/14/91																		
	5/11/92							2											
	10/5/92																		
	5/21/93																		
	5/23/94																		
	10/7/94																		
	5/15/95																		
	11/7/95							0.021											
	5/28/96																		
	11/11/96							0.056											
	2/25/98																		

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Summary of Historical Volatile Organic Compound Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Well	Date	Total VOCs	Chloromethane	Chloroethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1,1-Trichloroethane	Vinyl Chloride	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Trans-1,2-Dichloroethene	Trichloroethene	Tetrachloroethene	1,2-Dichloropropane	1,2,3-Trichloropropane	Chlorobenzene	Dichlorodifluoromethane	Trichlorofluoromethane	Carbon Disulfide	Methylene Chloride	Chloroform	Bromodichloromethane	Bromomethane
		UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
P-31IA	11/16/90	11										2	9										
	12/13/90	ND																					
	12/14/90	20											12				8						
	1/9/91	13										2	11										
	6/26/91	51			1							2	13				28	6		1			
	11/14/91	17			1							2	13					1					
	5/11/92	26			1							3	13				3	4					
	10/5/92	34								10		4	15				5						
	5/21/93	48			1					22		3	15				3	4					
	5/23/94	40								16		3.7	14				4.2			2.1			
	10/7/94	31.7			0.9					12		3.5	10	0.7			3.3	0.6					
	5/15/95	23.7								5.8		3.9	14										
	11/7/95	26.604	0.038		1.5	0.094	0.2			9.3	0.066	3	10	0.36			1.4	0.37		0.14	0.05		
	5/28/96	31.032	0.076		1.6	0.14	0.22			9.9	0.076	3.6	12	0.33			2.2	0.59		0.14	0.16		
	11/11/96	29.413	0.058		1.5	0.083	0.2			9.7	0.065	3.5	11	0.29			2.3	0.51		0.11	0.056		
	2/25/98	27.4			1.5					9.6		3.3	13										
P-31IB	11/16/90	25			1							3	17					4					
	12/14/90	25											14				11						
	1/9/91	13										2	11										
	6/26/91	57			1							2	13				32	7		2			
	11/14/91	16			1							3	12										
	5/11/92	26			1							4	10				4	5					
	10/5/92	34								10		3	16				5						
	5/21/93	38			1					14		4	14				2	3					
	5/23/94	34.3			2.2		0.7			12		4.4	12	1.3			0.9	0.8					
	10/6/94	35.5			0.9					13		4.1	11	0.8			2.3	0.6					
	11/7/95	33.284			1.8	0.097	0.25			10	0.071	3.7	14	0.41			2.2	0.56		0.15	0.046		
	5/29/96	26.844	0.056		1.2	0.082	0.16			8.4	0.054	3.3	11	0.29			1.7	0.42		0.11	0.072		
	11/11/96	29.88			1.6	0.087	0.2			9.8	0.056	3.7	11	0.31			2.4	0.53		0.12	0.045		
	2/25/98	28.5			1.5					10		3.6	13	0.4									
P-31S	11/16/90	ND																					
	12/14/90	ND																					
	1/9/91	ND																					
	6/26/91	ND																					
	11/14/91	ND																					
	5/11/92	1																		1			
	10/5/92	ND																					
	10/28/93	ND																					
	5/20/94	ND																					
	10/6/94	1.3															0.7						
	5/15/95	ND																					
	11/7/95	0.757	0.039		0.048					0.34		0.16	0.17										
	5/28/96	0.084	0.048										0.036										
	11/11/96	0.422			0.04					0.14		0.089	0.12										
	2/25/98	ND																					
P-32D	12/13/90	ND																					
	1/8/91	ND																					
	2/10/98	ND																					

Table 5
Summary of Historical Volatile Organic Compound Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Well	Date	Dibromomethane	Tribromomethane	Acetone	2-Butanone	Benzene	Ethylbenzene	Toluene	Xylene, m+p-	Xylene, o-	Xylene, total	Styrene	N-Propylbenzene	Isopropylbenzene	N-Butylbenzene	tert-Butylbenzene	Isopropyltoluene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene
		UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
P-31IA	11/16/90																		
	12/13/90																		
	12/14/90																		
	1/9/91																		
	6/26/91																		
	11/14/91																		
	5/11/92							2											
	10/5/92																		
	5/21/93																		
	5/23/94																		
	10/7/94	0.7																	
	5/15/95																		
	11/7/95					0.04		0.046											
	5/28/96																		
	11/11/96							0.041											
	2/25/98																		
P-31IB	11/16/90																		
	12/14/90																		
	1/9/91																		
	6/26/91																		
	11/14/91																		
	5/11/92							2											
	10/5/92																		
	5/21/93																		
	5/23/94																		
	10/6/94	0.8				0.5		0.8	0.7										
	11/7/95																		
	5/29/96																		
	11/11/96							0.032											
	2/25/98																		
P-31S	11/16/90																		
	12/14/90																		
	1/9/91																		
	6/26/91																		
	11/14/91																		
	5/11/92																		
	10/5/92																		
	10/28/93																		
	5/20/94																		
	10/6/94							0.6											
	5/15/95																		
	11/7/95																		
	5/28/96																		
	11/11/96							0.033											
	2/25/98																		
P-32D	12/13/90																		
	1/8/91																		
	2/10/98																		

Table 5

Summary of Historical Volatile Organic Compound Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Well	Date	Total VOCs	Chloromethane	Chloroethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1,1-Trichloroethane	Vinyl Chloride	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Trans-1,2-Dichloroethene	Trichloroethene	Tetrachloroethene	1,2-Dichloropropane	1,2,3-Trichloropropane	Chlorobenzene	Dichlorodifluoromethane	Trichlorofluoromethane	Carbon Disulfide	Methylene Chloride	Chloroform	Bromodichloromethane	Bromomethane
		UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
P-32S	12/13/90	ND																					
	1/8/91	ND																					
	1/10/91	1																		1			
	2/13/98	ND																					
P-33D	12/10/90	ND																					
	2/10/98	0.6	0.6																				
P-33S	12/10/90	ND																					
	7/1/91	ND																					
	2/10/98	0.1																					
P-34D	1/10/91	4																					
	6/24/91	ND																					
	10/24/91	ND																					
	5/15/92	ND																					
	10/6/92	40			2					12		4	18				4						
	5/18/93	ND																					
	5/19/94	0.7					0.7																
	10/4/94	0.6																					
	5/17/95	ND																					
	11/8/95	0.044	0.044																				
	5/29/96	0.04	0.04																				
	11/12/96	0.152	0.053																		0.046		
	2/24/98	ND																					
P-34S	1/15/91	1																					
	6/24/91	ND																					
	10/24/91	ND																					
	5/14/92	ND																					
	10/6/92	ND																					
	5/13/93	ND																					
	10/19/93	ND																					
	5/19/94	ND																					
	10/4/94	0.6																					
	5/17/95	ND																					
	11/8/95	0.345	0.045														0.28			0.02			
	5/29/96	0.395	0.035														0.36						
	11/12/96	0.454															0.39						
	2/24/98	1.3	0.6																0.7				

Summary of Historical Volatile Organic Compound Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Well	Date	Dibromomethane	Tribromomethane	Acetone	2-Butanone	Benzene	Ethylbenzene	Toluene	Xylene, m+p-	Xylene, o-	Xylene, total	Styrene	N-Propylbenzene	Isopropylbenzene	N-Butylbenzene	tert-Butylbenzene	Isopropyltoluene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene
		UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
P-32S	12/13/90																		
	1/8/91																		
	1/10/91																		
	2/13/98																		
P-33D	12/10/90																		
	2/10/98																		
P-33S	12/10/90																		
	7/1/91																		
	2/10/98					0.1													
P-34D	1/10/91							2			2								
	6/24/91																		
	10/24/91																		
	5/15/92																		
	10/6/92																		
	5/18/93																		
	5/19/94																		
	10/4/94							0.6											
	5/17/95																		
	11/8/95																		
	5/29/96																		
	11/12/96							0.053											
	2/24/98																		
P-34S	1/15/91										1								
	6/24/91																		
	10/24/91																		
	5/14/92																		
	10/6/92																		
	5/13/93																		
	10/19/93																		
	5/19/94																		
	10/4/94							0.6											
	5/17/95																		
	11/8/95																		
	5/29/96																		
	11/12/96							0.064											
	2/24/98																		

Table 5

Summary of Historical Volatile Organic Compound Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Well	Date	Total VOCs	Chloromethane	Chloroethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1,1-Trichloroethane	Vinyl Chloride	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Trans-1,2-Dichloroethen	Trichloroethene	Tetrachloroethene	1,2-Dichloropropane	1,2,3-Trichloropropane	Chlorobenzene	Dichlorodifluoromethane	Trichlorofluoromethane	Carbon Disulfide	Methylene Chloride	Chloroform	Bromodichloromethane	Bromomethane
		UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
P-35D	1/17/91	ND																					
	6/26/91	ND																					
	10/24/91	ND																					
	5/15/92	ND																					
	10/6/92	ND																					
	5/17/93	ND																					
	10/19/93	ND																					
	5/19/94	ND																					
	10/5/94	1.1											0.5										
	5/17/95	ND																					
	11/8/95	0.033	0.033																				
	5/30/96	ND																					
	11/12/96	0.189	0.053																		0.053		
	2/23/98	ND																					
P-35S	1/17/91	ND																					
	6/25/91	ND																					
	10/24/91	ND																					
	5/15/92	ND																					
	10/6/92	ND																					
	5/13/93	ND																					
	10/19/93	ND																					
	5/19/94	ND																					
	10/5/94	0.7																					
	5/17/95	ND																					
	11/8/95	0.183	0.033														0.15						
	5/30/96	0.17															0.17						
	11/12/96	0.257															0.19						
	2/23/98	ND																					
P-36D	12/11/90	ND																					
	1/8/91	1																					
	2/11/98	0.8																					
P-36S	12/11/90	ND																					
	1/8/91	ND																					
	2/11/98	ND																					
P-38S	12/13/90	ND																					
	1/8/91	ND																					
P-39S	12/11/90	ND																					

Table 5

Summary of Historical Volatile Organic Compound Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Well	Date	Dibromomethane UG/L	Tribromomethane UG/L	Acetone UG/L	2-Butanone UG/L	Benzene UG/L	Ethylbenzene UG/L	Toluene UG/L	Xylene, m+p- UG/L	Xylene, o- UG/L	Xylene, total UG/L	Styrene UG/L	N-Propylbenzene UG/L	Isopropylbenzene UG/L	N-Butylbenzene UG/L	tert-Butylbenzene UG/L	Isopropyltoluene UG/L	1,2,4-Trimethylbenzene UG/L	1,3,5-Trimethylbenzene UG/L
P-35D	1/17/91																		
	6/26/91																		
	10/24/91																		
	5/15/92																		
	10/6/92																		
	5/17/93																		
	10/19/93																		
	5/19/94																		
	10/5/94							0.6											
	5/17/95																		
	11/8/95																		
	5/30/96																		
	11/12/96							0.083											
	2/23/98																		
P-35S	1/17/91																		
	6/25/91																		
	10/24/91																		
	5/15/92																		
	10/6/92																		
	5/13/93																		
	10/19/93																		
	5/19/94																		
	10/5/94							0.7											
	5/17/95																		
	11/8/95																		
	5/30/96																		
	11/12/96							0.067											
	2/23/98																		
P-36D	12/11/90																		
	1/8/91							1											
	2/11/98							0.8											
P-36S	12/11/90																		
	1/8/91																		
	2/11/98																		
P-38S	12/13/90																		
	1/8/91																		
P-39S	12/11/90																		

Table 5

Summary of Historical Volatile Organic Compound Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Well	Date	Total VOCs	Chloromethane	Chloroethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1,1-Trichloroethane	Vinyl Chloride	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Trans-1,2-Dichloroethene	Trichloroethene	Tetrachloroethene	1,2-Dichloropropane	1,2,3-Trichloropropane	Chlorobenzene	Dichlorodifluoromethane	Trichlorofluoromethane	Carbon Disulfide	Methylene Chloride	Chloroform	Bromodichloromethane	Bromomethane
		UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
P-40D	12/17/90	ND																					
	1/9/91	ND																					
	6/26/91	ND																					
	12/23/91	9																3		3			
	5/7/92	ND																					
	10/6/92	ND																					
	10/7/92	ND																					
	5/13/93	ND																					
	10/22/93	ND																					
	5/18/94	3.9								2		0.5	1.4										
	10/3/94	2.4								1			0.9										
	5/15/95	ND																					
	11/8/95	2.643	0.091		0.12					1		0.27	0.89	0.021			0.22			0.031			
	5/29/96	4.044	0.039		0.14					1.2		0.38	1.8	0.047			0.31	0.076		0.028			
	11/11/96	1.171			0.039					0.28		0.11	0.54				0.096				0.042		
	2/19/98	13			0.6					5.2		1.6	5.6										
P-40I	12/17/90	13			1							2	10										
	1/9/91	ND																					
	1/10/91	27			1							2	12				5						7
	6/26/91	66			1		1					2	13				35	8		6			
	12/23/91	23			1		1					2	4					4		3	1		
	5/7/92	27			2							4	14				3	4					
	10/7/92	33								11		3	15				4						
	5/21/93	35								11		3	16				2	3					
	5/18/94	16.1			0.8					6.1		2	7.2										
	10/3/94	22.6								7.5		2.4	8				3.4	0.7					
	5/15/95	8											8										
	11/8/95	20.239	0.082		0.74	0.052	0.16	0.036		6.6	0.042	2.2	8.3	0.16			1.3	0.39		0.12	0.057		
	5/29/96	19.608			0.68	0.051	0.16			6.6	0.047	2.1	7.9	0.16			1.4	0.4		0.11			
	11/11/96	18.701			0.67	0.05	0.13			6.8	0.035	2	6.8	0.17			1.5	0.38		0.095	0.035		
	2/19/98	22.7	0.9		1					8.9		2.5	9.2	0.2									
P-41D	11/20/90	ND																					
	11/30/90	ND																					
	12/13/90	ND																					
	7/1/91	ND																					
	11/15/91	ND																					
	5/11/92	0.8																					
	10/5/92	ND																					
	5/21/93	ND																					
	5/20/94	5.2																		5.2			
	10/4/94	ND																					
	5/15/95	ND																					
	11/7/95	0.089					0.089																
	5/29/96	ND																					
	11/11/96	0.1																					
	2/19/98	ND																					

Table 5

Summary of Historical Volatile Organic Compound Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Well	Date	Dibromomethane	Tribromomethane	Acetone	2-Butanone	Benzene	Ethylbenzene	Toluene	Xylene, m+p-	Xylene, o-	Xylene, total	Styrene	N-Propylbenzene	Isopropylbenzene	N-Butylbenzene	tert-Butylbenzene	Isopropyltoluene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene
		UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
P-40D	12/17/90																		
	1/9/91																		
	6/26/91																		
	12/23/91							3											
	5/7/92																		
	10/6/92																		
	10/7/92																		
	5/13/93																		
	10/22/93																		
	5/18/94																		
	10/3/94							0.5											
	5/15/95																		
	11/8/95																		
	5/29/96							0.024											
	11/11/96							0.064											
	2/19/98																		
P-40I	12/17/90																		
	1/9/91																		
	1/10/91																		
	6/26/91																		
	12/23/91							5			2								
	5/7/92																		
	10/7/92																		
	5/21/93																		
	5/18/94																		
	10/3/94							0.6											
	5/15/95																		
	11/8/95																		
	5/29/96																		
	11/11/96							0.036											
	2/19/98																		
P-41D	11/20/90																		
	11/30/90																		
	12/13/90																		
	7/1/91																		
	11/15/91																		
	5/11/92							0.8											
	10/5/92																		
	5/21/93																		
	5/20/94																		
	10/4/94																		
	5/15/95																		
	11/7/95																		
	5/29/96																		
	11/11/96							0.1											
	2/19/98																		

Table 5

Summary of Historical Volatile Organic Compound Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Well	Date	Total VOCs	Chloromethane	Chloroethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1,1-Trichloroethane	Vinyl Chloride	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Trans-1,2-Dichloroethene	Trichloroethene	Tetrachloroethene	1,2-Dichloropropane	1,2,3-Trichloropropane	Chlorobenzene	Dichlorodifluoromethane	Trichlorofluoromethane	Carbon Disulfide	Methylene Chloride	Chloroform	Bromodichloromethane	Bromomethane
		UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
P-41S	12/14/90	ND																					
P-42S	11/16/90	ND																					
	12/17/90	ND																					
	1/9/91	ND																					
PF-1	3/15/91	ND																					
Knoche	11/15/91	ND																					
	10/2/92	ND																					
	10/20/93	ND																					
	11/9/95	ND																					
	11/12/96	ND																					
RB-1	3/4/91	ND																					
Bula	6/27/91	ND																					
	5/11/92	0.7																					
	5/13/93	ND																					
	5/17/94	1.9																		1.9			
	5/16/95	0.51				0.51																	
	5/29/96	ND																					
RS-1	2/27/91	ND																					
Summers	6/27/91	ND																					
	5/13/93	ND																					
	5/17/94	2.8																		2.8			
	5/16/95	0.4				0.4																	
	5/29/96	ND																					
Sather	6/26/91	ND																					
Arvid	11/15/91	ND																					
	5/12/92	ND																					
	10/5/92	ND																					
	5/13/93	ND																					
	10/21/93	ND																					
	5/17/94	ND																					
	10/4/94	ND																					
	5/15/95	0.47				0.47																	
	11/9/95	ND																					
	5/30/96	ND																					
	11/12/96	0.26	0.16																				
Schultz	5/14/92	10.1								2		7.2			0.9								
New	5/29/96	10.15			0.68					2.6		0.84	4.9	0.13			1						
	2/25/98	19.9	0.6							1.9		0.5	3							1			
TW-3	8/19/88	ND																					
	9/15/88	1.1																					
	9/16/88	0.57					0.57																
TW-5	8/17/87	146		2	1				1		1	140	1										
TW-6	8/17/87	125			32						1	40	50										

Table 5

Summary of Historical Volatile Organic Compound Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Well	Date	Dibromomethane	Tribromomethane	Acetone	2-Butanone	Benzene	Ethylbenzene	Toluene	Xylene, m+p-	Xylene, o-	Xylene, total	Styrene	N-Propylbenzene	Isopropylbenzene	N-Butylbenzene	tert-Butylbenzene	Isopropyltoluene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene
		UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
P-41S	12/14/90																		
P-42S	11/16/90																		
	12/17/90																		
	1/9/91																		
PF-1	3/15/91																		
Knoche	11/15/91																		
	10/2/92																		
	10/20/93																		
	11/9/95																		
	11/12/96																		
RB-1	3/4/91																		
Bula	6/27/91																		
	5/11/92							0.7											
	5/13/93																		
	5/17/94																		
	5/16/95																		
	5/29/96																		
RS-1	2/27/91																		
Summers	6/27/91																		
	5/13/93																		
	5/17/94																		
	5/16/95																		
	5/29/96																		
Sather	6/26/91																		
Arvid	11/15/91																		
	5/12/92																		
	10/5/92																		
	5/13/93																		
	10/21/93																		
	5/17/94																		
	10/4/94																		
	5/15/95																		
	11/9/95																		
	5/30/96																		
	11/12/96							0.1											
Schultz	5/14/92																		
New	5/29/96																		
	2/25/98			12		0.1		0.8											
TW-3	8/19/88																		
	9/15/88					1.1													
	9/16/88																		
TW-5	8/17/87																		
TW-6	8/17/87					1		1											

Table 5

Summary of Historical Volatile Organic Compound Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Well	Date	Total VOCs	Chloromethane	Chloroethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1,1-Trichloroethane	Vinyl Chloride	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Trans-1,2-Dichloroethene	Trichloroethene	Tetrachloroethene	1,2-Dichloropropane	1,2,3-Trichloropropane	Chlorobenzene	Dichlorodifluoromethane	Trichlorofluoromethane	Carbon Disulfide	Methylene Chloride	Chloroform	Bromodichloromethane	Bromomethane
		UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
WB-1	2/28/91	ND																					
	3/4/91	ND																					
	6/27/91	1.3																		1.3			
	5/11/92	1																					
	5/13/93	ND																					
	5/18/94	ND																					
	5/15/95	0.39				0.39																	
	5/29/96	0.48															0.48						
Arne Thesen	12/23/91	ND																					
	10/2/92	ND																					
	10/20/93	ND																					
	10/4/94	ND																					
	11/9/95	ND																					
	11/12/96	0.15	0.15																				
DS-1 Sommers	2/25/91	ND																					
	11/14/91	ND																					
	5/15/92	ND																					
	10/2/92	ND																					
	10/20/93	ND																					
	10/4/94	ND																					
	11/8/95	ND																					
	11/12/96	0.13																					
	11/27/02	ND																					
DURAND	11/15/91	ND																					
	10/8/92	ND																					
	10/22/93	ND																					
	10/7/94	1.1																		1.1			
	11/9/95	0.07					0.07																
	11/12/96	ND																					
ES-1 Schulenber	2/28/91	ND																					
	11/14/91	ND																					
	10/5/92	ND																					
	10/22/93	ND																					
	10/4/94	ND																					
	11/8/95	0.065					0.065																
	11/12/96	ND																					
FR-1 Freidman	2/26/91	ND																					
	6/27/91	ND																					
	5/11/92	1.3																					
	5/13/93	ND																					
	5/29/96	ND																					
GL-1 Plummer	2/22/91	ND																					
	7/1/91	ND																					
	5/13/93	ND																					
	5/17/94	0.8					0.8																
	10/5/94	ND																					
	5/15/95	0.34				0.34																	
	5/29/96	ND																					

Summary of Historical Volatile Organic Compound Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Well	Date	Dibromomethane	Tribromomethane	Acetone	2-Butanone	Benzene	Ethylbenzene	Toluene	Xylene, m+p-	Xylene, o-	Xylene, total	Styrene	N-Propylbenzene	Isopropylbenzene	N-Butylbenzene	tert-Butylbenzene	Isopropyltoluene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene
		UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
WB-1	2/28/91																		
	3/4/91																		
	6/27/91																		
	5/11/92							1											
	5/13/93																		
	5/18/94																		
	5/15/95																		
	5/29/96																		
Arne Thesen	12/23/91																		
	10/2/92																		
	10/20/93																		
	10/4/94																		
	11/9/95																		
	11/12/96																		
DS-1 Sommers	2/25/91																		
	11/14/91																		
	5/15/92																		
	10/2/92																		
	10/20/93																		
	10/4/94																		
	11/8/95																		
	11/12/96							0.13											
	11/27/02																		
DURAND	11/15/91																		
	10/8/92																		
	10/22/93																		
	10/7/94																		
	11/9/95																		
	11/12/96																		
ES-1 Schulenber	2/28/91																		
	11/14/91																		
	10/5/92																		
	10/22/93																		
	10/4/94																		
	11/8/95																		
	11/12/96																		
FR-1 Freidman	2/26/91																		
	6/27/91																		
	5/11/92							1.3											
	5/13/93																		
	5/29/96																		
GL-1 Plummer	2/22/91																		
	7/1/91																		
	5/13/93																		
	5/17/94																		
	10/5/94																		
	5/15/95																		
	5/29/96																		

Table 5

Summary of Historical Volatile Organic Compound Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Well	Date	Total VOCs	Chloromethane	Chloroethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1,1-Trichloroethane	Vinyl Chloride	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Trans-1,2-Dichloroethene	Trichloroethene	Tetrachloroethene	1,2-Dichloropropane	1,2,3-Trichloropropane	Chlorobenzene	Dichlorodifluoromethane	Trichlorofluoromethane	Carbon Disulfide	Methylene Chloride	Chloroform	Bromodichloromethane	Bromomethane
		UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
LEACH. TNK	11/30/92	199.98						6.98															
LH-1	8/19/88	164.5			1.5			8.4			2.4			1.6		4.5							
	9/16/88	578.16		0.56	3			45			5.1			6.9		2.8							
LHGW04	2/18/98	19.7	0.6							0.2	0.4			0.3		2.3			1.4				
LHGW05	2/18/98	132.8	1.1							0.4	0.8	0.2		1.1		1.8			0.6				
LHGW08	2/18/98	67.5								1						2.5				2			
LHGW09	2/18/98	662	150					48		58									12		26		19
LHGW11	2/18/98	1315	250					30											28		45		45
LHGW12	2/18/98	101.2	1					13		3.8	0.7					1.2			12				
LHGW13	2/18/98	127.6	1.6		0.4			10		7.3	1					2.3			2.2				

Table 5

Summary of Historical Volatile Organic Compound Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Well	Date	Dibromomethane	Tribromomethane	Acetone	2-Butanone	Benzene	Ethylbenzene	Toluene	Xylene, m+p-	Xylene, o-	Xylene, total	Styrene	N-Propylbenzene	Isopropylbenzene	N-Butylbenzene	tert-Butylbenzene	Isopropyltoluene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene
		UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
LEACH. TNK	11/30/92				193														
LH-1	8/19/88					5.1	98	43											
	9/16/88					5.8	130	99			280								
LHGW04	2/18/98					3.3	7.1	0.7			3.4								
LHGW05	2/18/98					3.5	73	1.5			48	0.8							
LHGW08	2/18/98					2.5	24	2.5			33								
LHGW09	2/18/98				220	3	23	35			66	2							
LHGW11	2/18/98				780	5	25	35			72								
LHGW12	2/18/98			9	3.9		20	13			23	0.6							
LHGW13	2/18/98			5.6		2.8	40	8.4			45	1							

Table 6
Summary of Hydrogen Sampling Analysis
Refuse Hideaway Landfill
Middleton, Wisconsin

		Field Information							Lab Results		
Sampleid	Well ID	Date	Time	Flow Rate mLs/min	Volume Purged mLs	Manometer Bkgrd bars	Manometer Bomb bars	Barometeric Pressure mm Hg	Analyzed [1] H_2 ppm	Blank Value ppm	Hydrogen in Groundwater [2] nannomolars
RH-GWP32S-01	P32S	2/13/98	11:46	525	15700	-7	125	765.0	0.61	0.24	1.04
RH-GWN$_2$BLK01-01		2/13/98	12:20					765.0	0.24		
RH-GWAIRBLK01-01		2/13/98	12:30					765.0	0.41		
RH-GWP08S-01	P8S	2/16/98	12:53	460	13950	-7	216	764.0	2.75	0.24	7.03
RH-GWAIRBLK02-01		2/16/98	13:10					763.0	0.35		
RH-GWN$_2$BLK02-01		2/16/98	10:00					763.0	0.24		
RH-GWP25S-01	P25S	2/17/98	10:52	400	11500	-18	37	758.0	0.46	0.21	0.70
RH-GWAIRBLK03-01		2/17/98	11:50					758.0	0.44		
RH-GWN$_2$BLK03-01		2/17/98	11:45					758.0	0.21		
RH-GWP21S-01	P21S	2/17/98	15:45	200	5350	-12	19	755.4	1.12	0.21	2.55
RH-GWP30I-01	P30I	2/19/98	12:04	475	14400	-14	33	762.8	0.58	0.22	1.01
RH-GWAIRBLK04-01		2/19/98	12:40					762.8	0.34		
RH-GWN$_2$BLK04-01		2/19/98	12:45					762.8	0.22		
RH-GWP40I-01	P40I	2/20/98	11:20	500	15350	-11	39	763.0	8.03	0.28	21.7
RH-GWAIRBLK05-01		2/20/98	11:25					763.0	1.30		
RH-GWN$_2$BLK05-01		2/20/98	10:25					763.0	0.28		
RH-GWP41D-01	P41D	2/20/98	14:14	520	15620	-8	56	763.2	0.69	0.28	1.15
RH-GWP41D-91		2/20/98	14:54	500	15550	-8	56	763.2	1.32	0.28	2.91
RH-GWP35S-01	P35S	2/23/98	11:24	500	14700	-12	12	760.2	0.41	0.15	0.73
RH-GWN$_2$BLK06-01		2/23/98	10:40						0.15		
RH-GWAIRBLK06-01		2/23/98	10:45						0.34		
RH-GWP27S-01	P27S	2/23/98	14:13	480	14150	-12	22	759.0	1.27	0.15	3.14
RH-GWP22D-01	P22D	2/24/98	11:18	500	14450	-7	18	759.0	0.39	0.28	0.31
RH-GWAIRBLK07-01		2/24/98	10:35					759.0	0.25		
RH-GWN$_2$BLK07-01		2/24/98	10:30					759.0	0.28		
RH-GWP34S-01	P34S	2/24/98	14:14	520	14700	0	28	759.5	0.43	0.28	0.42
RH-GWP31IA-01	P31IA	2/25/98	10:58	500	14000	-6	38	765.5	0.34	0.28	0.17
RH-GWAIRBLK08-01		2/25/98	10:20						0.22		

This table presents a summary of hydrogen sampling and analysis for groundwater samples collected from the Refuse Hideaway Landfill. Hydrogen analysis was performed using the method "RSKSOP-196" by Management Technology Research Services (Mantech). Samples were collected by purging the hydrogen from a volume of groundwater into nitrogen. The nitrogen is then analyzed, and the value corrected to reflect the hydrogen concentration in groundwater. Hydrogen concentrations greater than 1.0 nannomolar indicate conditions appropriate for reductive dechlorination of TCE and DCE.

Footnotes:

1. Hydrogen concentration in ppm, as analyzed without corrections.
2. The concentration of hydrogen in the stripping bubble is calculated by subtracting the associated blank value from the analyzed H_2 concentration in N_2, then multiplying for the method dilution factor (3.5). This value is then scaled by a factor of 0.8 to calculate the equilibrium hydrogen concentration in nannomolar for groundwater from the well being sampled.

Table 7

Summary of Landfill Gas Sampling Field Parameters
Refuse Hideaway Landfill
Middleton, Wisconsin

Sample Location	Pressure (inches Hg)	Methane (%)
GW1	0.9	34.3
GW2	1.4	48.1
GW3	2.0	59.9
GW4	2.4	58.5
GW5	8.5 to 9.6	57.8
GW6	2.4	59.5
GW7	2.3	61.6
GW8	2.4	59.5
GW9	2.4	62.1
GW10	1.8	59.7
GW11	2.5	63.7
GW12	2.3	60.9
GW13	2.3	60.8
G1S	0.0	0.0
G2D	0.0	1.7
G3D	0.0	0.0
G4	0.0	0.0
G5	2.4	0.0
G17D	0.0	0.0
GP4	0.0	0.0
GP10	0.2	0.1
GP12D	0.0	35.3
GP20I2	0.0	0.2
GP23I2	0.0	3.4

Notes:
Field data collected on February 18 and 19, 1998 during landfill gas sampling.

RJR/rjr/JAH
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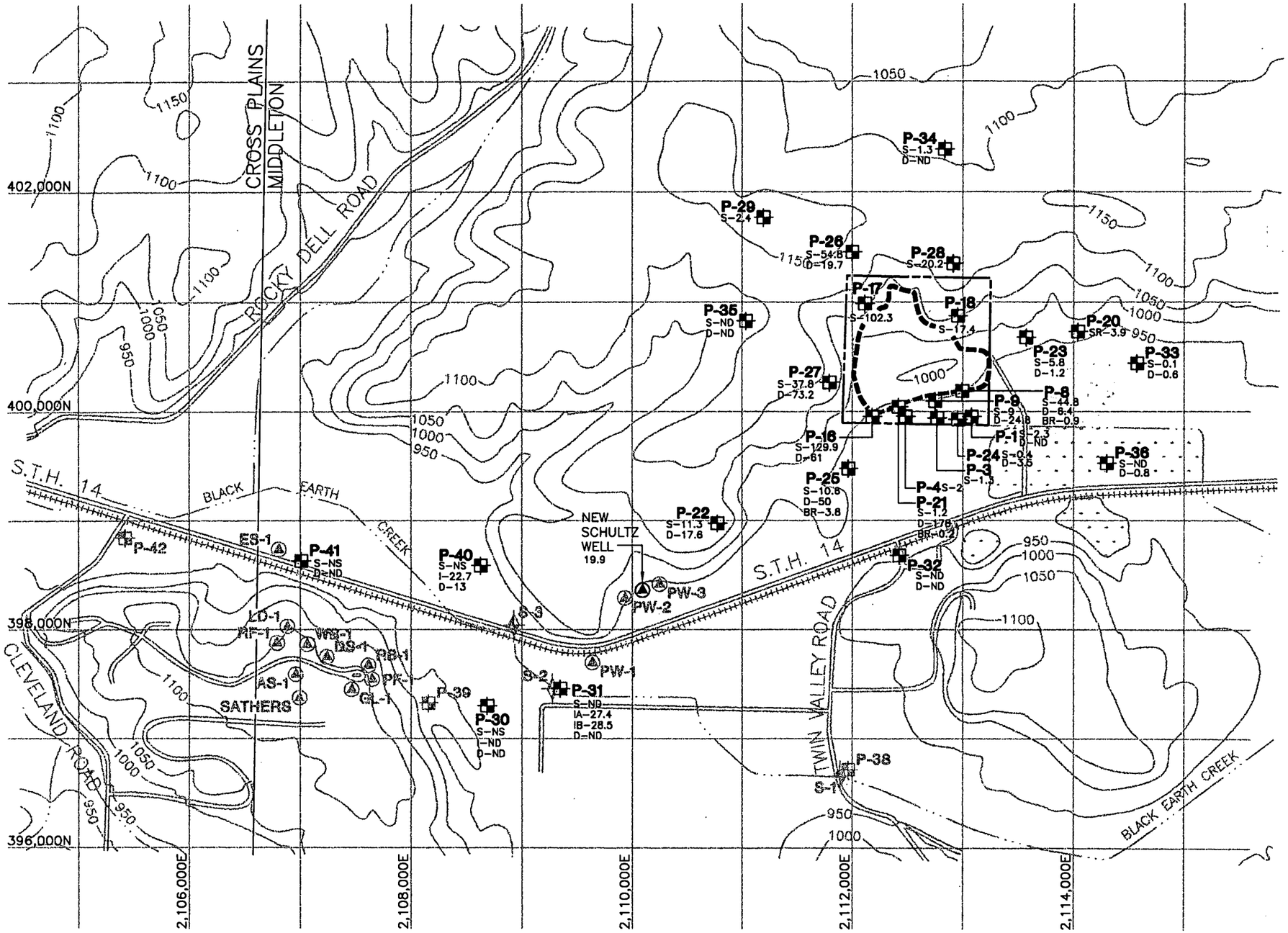

LEGEND

- REFUSE HIDEAWAY LANDFILL PROPERTY BOUNDARY
- FILL LIMITS
- P-34 S-1.3 D-ND — MONITORING WELL LOCATION, NUMBER, AND TOTAL VOC GROUNDWATER RESULTS IN ug/L
  S = SHALLOW
  I = INTERMEDIATE
  D = DEEP
- P-38 — MONITORING WELL LOCATION AND NUMBER (NOT SAMPLED)
- PW-1 — PRIVATE WELL LOCATION AND NUMBER (NOT SAMPLED)
- NEW SCHULTZ WELL LOCATION AND TOTAL VOC GROUNDWATER RESULTS IN ug/L
- S-1 — STAFF GAGE LOCATION AND NUMBER
- RAILROAD
- WETLANDS
- CREEK OR INTERMITTENT STREAM

NOTE

1. BASE MAP DEVELOPED FROM MARCH 1991 EXISTING CONDITIONS PLAN FOR REFUSE HIDEAWAY LANDFILL, PREPARED BY HYDRO-SEARCH, INC., DATED JUNE 20, 1994.
2. TOTAL GROUNDWATER VOC RESULTS OBTAINED FROM GROUNDWATER SAMPLING CONDUCTED BY MONTGOMERY WATSON DURING FEBRUARY AND MARCH 1998.

north

0 1000 2000

SCALE IN FEET

Developed By RJR
Drawn By DLF
Approved By
Date 4-22-98
Reference 1242161-01/120201-B1
Revisions

TOTAL VOCs - GROUNDWATER

PREDESIGN AND ADDITIONAL STUDIES
REFUSE HIDEAWAY LANDFILL
MIDDLETON, WISCONSIN

Drawing Number
1242161
01258001 B1

MONTGOMERY WATSON

Management Review
Other

Technical Review — 4-20-98
Project Manager — 4-20-98

QUALITY CONTROL
Graphic Standards DLF
Lead Professional RJR

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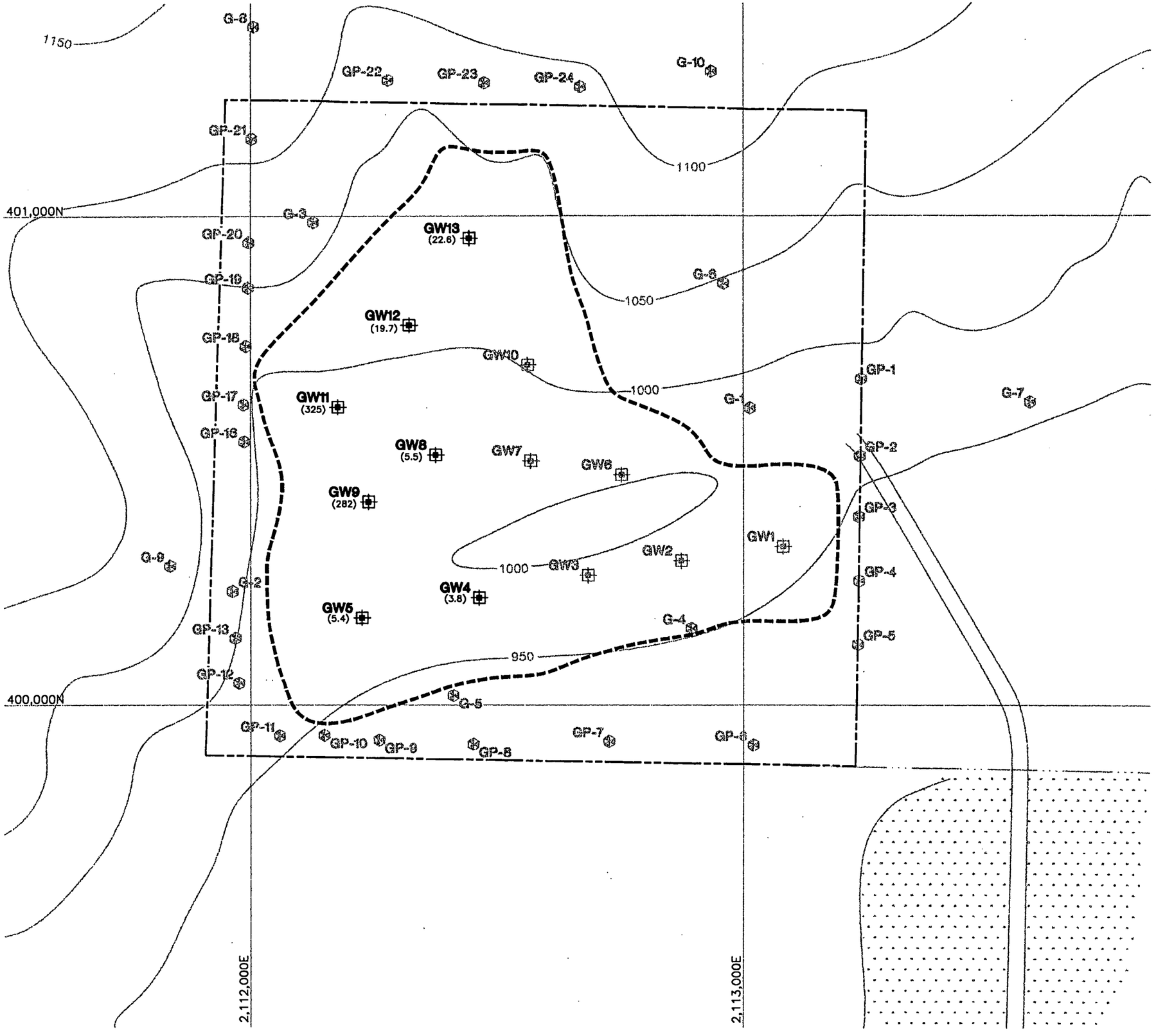

LEGEND

- REFUSE HIDEAWAY LANDFILL PROPERTY BOUNDARY
- FILL LIMITS
- GW13 (22.6) — EXISTING LEACHATE/GAS EXTRACTION WELL LOCATION, NUMBER, AND TOTAL CHLORINATED VOC LEACHATE RESULTS IN ug/L
- G-4 — GAS PROBE LOCATION AND NUMBER ("G" SERIES) (NOT SAMPLED)
- G-7 — GAS PROBE LOCATION AND NUMBER ("G" SERIES) (NOT SAMPLED)
- GP-23 — GAS PROBE LOCATION AND NUMBER ("GP" SERIES) (NOT SAMPLED)
- GP-11 — GAS PROBE LOCATION AND NUMBER ("GP" SERIES) (NOT SAMPLED)
- WETLANDS
- CREEK OR INTERMITTENT STREAM

NOTE

1. BASE MAP DEVELOPED FROM GAS PROBE AND LEACHATE/GAS EXTRACTION WELL LOCATION PLAN FOR REFUSE HIDEAWAY LANDFILL, PREPARED BY HYDRO-SEARCH, INC., DATED MARCH 21, 1994.
2. TOTAL CHLORINATED VOC LEACHATE RESULTS OBTAINED FROM LEACHATE SAMPLING CONDUCTED BY MONTGOMERY WATSON ON FEBRUARY 18, 1998.

north

0 200 400

SCALE IN FEET

Developed By RJR
Drawn By DLF
Approved By
Date 4.22.98
Reference 1242161.01\20201-B3
Revisions

TOTAL CHLORINATED VOCs - LEACHATE

PREDESIGN AND ADDITIONAL STUDIES
REFUSE HIDEAWAY LANDFILL
MIDDLETON, WISCONSIN

Drawing Number
1242161
01258001 B2

MONTGOMERY WATSON

Management Review — Other
Technical Review — 4-20-98
Project Manager — 4-20-98
Graphic Standards — DLF
Lead Professional — RJR
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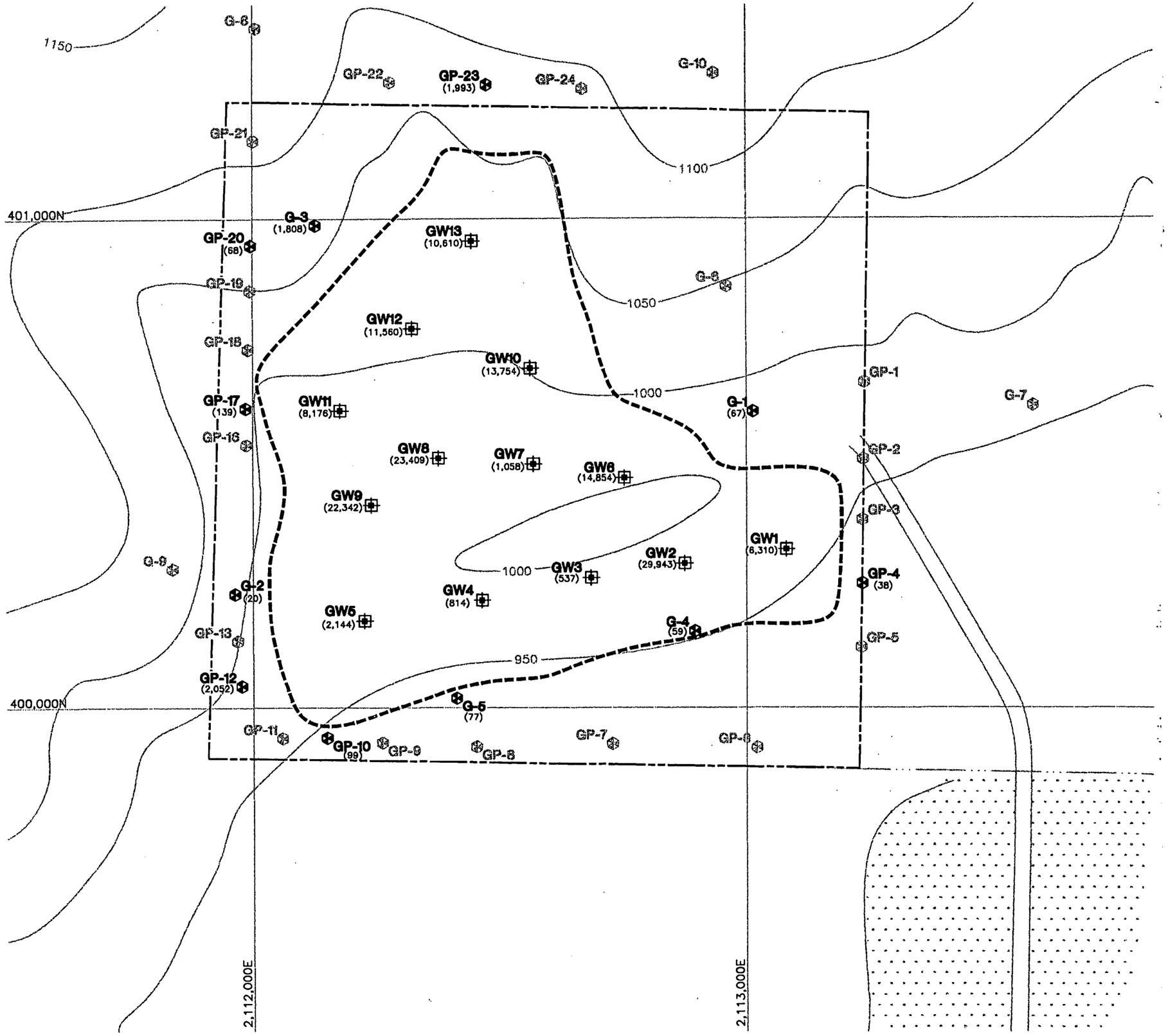

LEGEND

- REFUSE HIDEAWAY LANDFILL PROPERTY BOUNDARY
- FILL LIMITS
- GW13 (10,610) — EXISTING LEACHATE/GAS EXTRACTION WELL LOCATION, NUMBER, AND TOTAL CHLORINATED VOC LANDFILL GAS RESULTS IN ppb
- G-4 (59) — GAS PROBE LOCATION, NUMBER ("G" SERIES), AND TOTAL CHLORINATED VOC LANDFILL GAS RESULTS IN ppb
- G-7 — GAS PROBE LOCATION AND NUMBER ("G" SERIES) (NOT SAMPLED)
- GP-23 (1,993) — GAS PROBE LOCATION, NUMBER ("GP" SERIES), AND TOTAL CHLORINATED VOC LANDFILL GAS RESULTS IN ppb
- GP-11 — GAS PROBE LOCATION AND NUMBER ("GP" SERIES) (NOT SAMPLED)
- WETLANDS
- CREEK OR INTERMITTENT STREAM

NOTE

1. BASE MAP DEVELOPED FROM GAS PROBE AND LEACHATE/GAS EXTRACTION WELL LOCATION PLAN FOR REFUSE HIDEAWAY LANDFILL, PREPARED BY HYDRO-SEARCH, INC., DATED MARCH 21, 1994.
2. TOTAL CHLORINATED VOC LANDFILL GAS RESULTS OBTAINED FROM LANDFILL GAS SAMPLING CONDUCTED BY MONTGOMERY WATSON ON FEBRUARY 18, 19, AND 23, 1998.

north

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SCALE IN FEET

Management Review — Other
Technical Review — 4-20-98
Project Manager — 4-20-98
QUALITY CONTROL
Graphic Standards — DLF
Lead Professional — RJR

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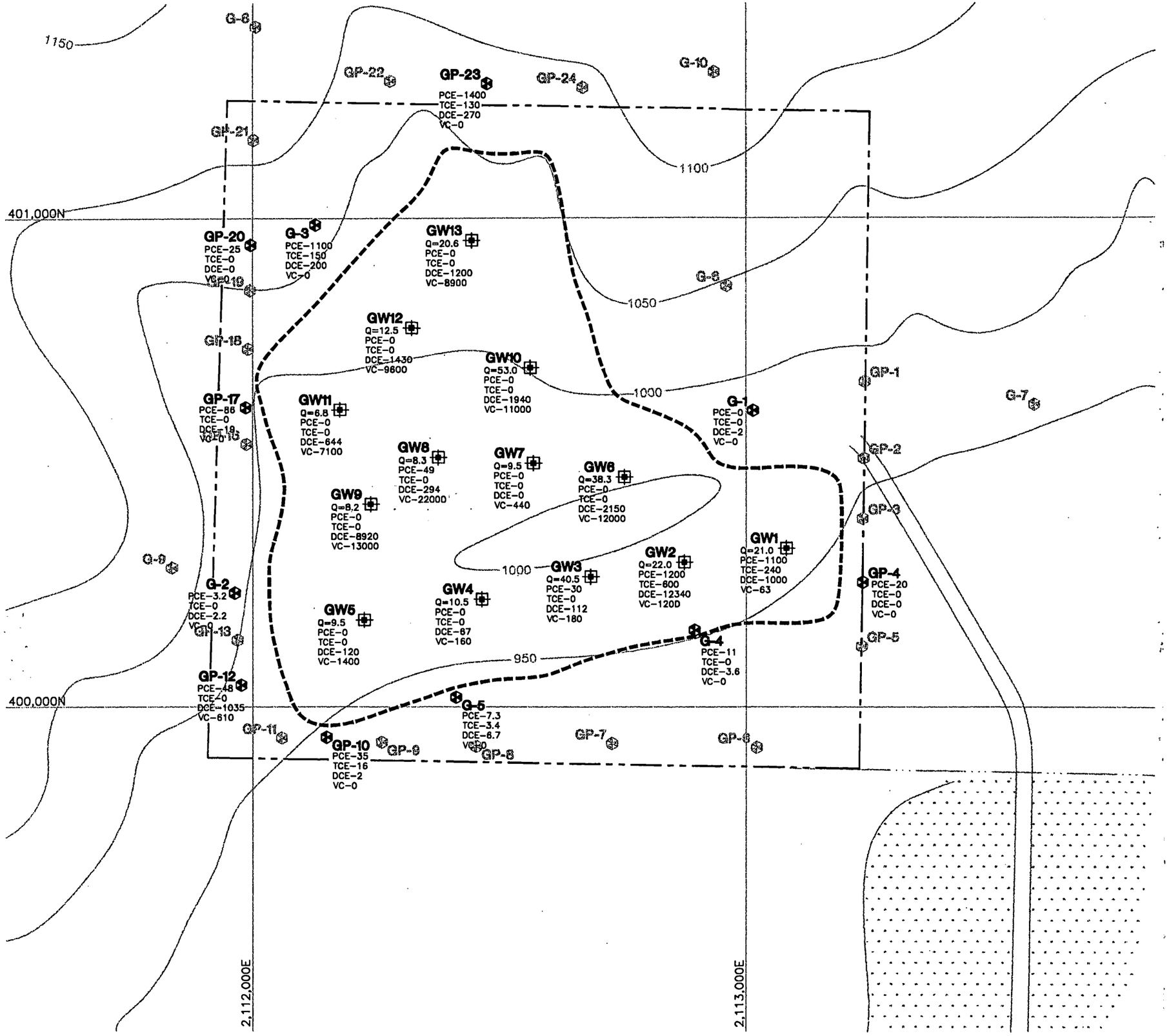
Date 4-22-98
Reference 1242161-01120201-B3
Revisions

TOTAL CHLORINATED VOCs - LANDFILL GAS

PREDESIGN AND ADDITIONAL STUDIES
REFUSE HIDEAWAY LANDFILL
MIDDLETON, WISCONSIN

Drawing Number
1242161
01258001 B3

MONTGOMERY WATSON



LEGEND

- REFUSE HIDEAWAY LANDFILL PROPERTY BOUNDARY
- FILL LIMITS
- **GW13** EXISTING LEACHATE/GAS EXTRACTION WELL LOCATION, NUMBER, GAS FLOW RATES IN cfm, AND CHLORINATED VOC LANDFILL GAS RESULTS IN ppb
- **G-4** GAS PROBE LOCATION, NUMBER ("G" SERIES), AND CHLORINATED VOC LANDFILL GAS RESULTS IN ppb
- **G-7** GAS PROBE LOCATION AND NUMBER ("G" SERIES) (NOT SAMPLED)
- **GP-23** GAS PROBE LOCATION, NUMBER ("GP" SERIES), AND CHLORINATED VOC LANDFILL GAS RESULTS IN ppb
- **GP-11** GAS PROBE LOCATION AND NUMBER ("GP" SERIES) (NOT SAMPLED)
- WETLANDS
- CREEK OR INTERMITTENT STREAM

NOTE

1. BASE MAP DEVELOPED FROM GAS PROBE AND LEACHATE/GAS EXTRACTION WELL LOCATION PLAN FOR REFUSE HIDEAWAY LANDFILL, PREPARED BY HYDRO-SEARCH, INC., DATED MARCH 21, 1994.
2. CHLORINATED VOC LANDFILL GAS RESULTS OBTAINED FROM LANDFILL GAS SAMPLING CONDUCTED BY MONTGOMERY WATSON ON FEBRUARY 18, 19, AND 23, 1998.
3. LANDFILL GAS FLOW RATES MEASURED BY ENVIRONMENTAL SAMPLING CORPORATION.

north

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SCALE IN FEET

Management Review | Other

Technical Review | Project Manager

Graphic Standards DLF 4-20-98 | Lead Professional RJR 4-20-98

QUALITY CONTROL

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Developed By RJR | Drawn By DLF/LCL

Approved By | Date 4-22-98

Reference (24)61.01/20201-B3

Revisions

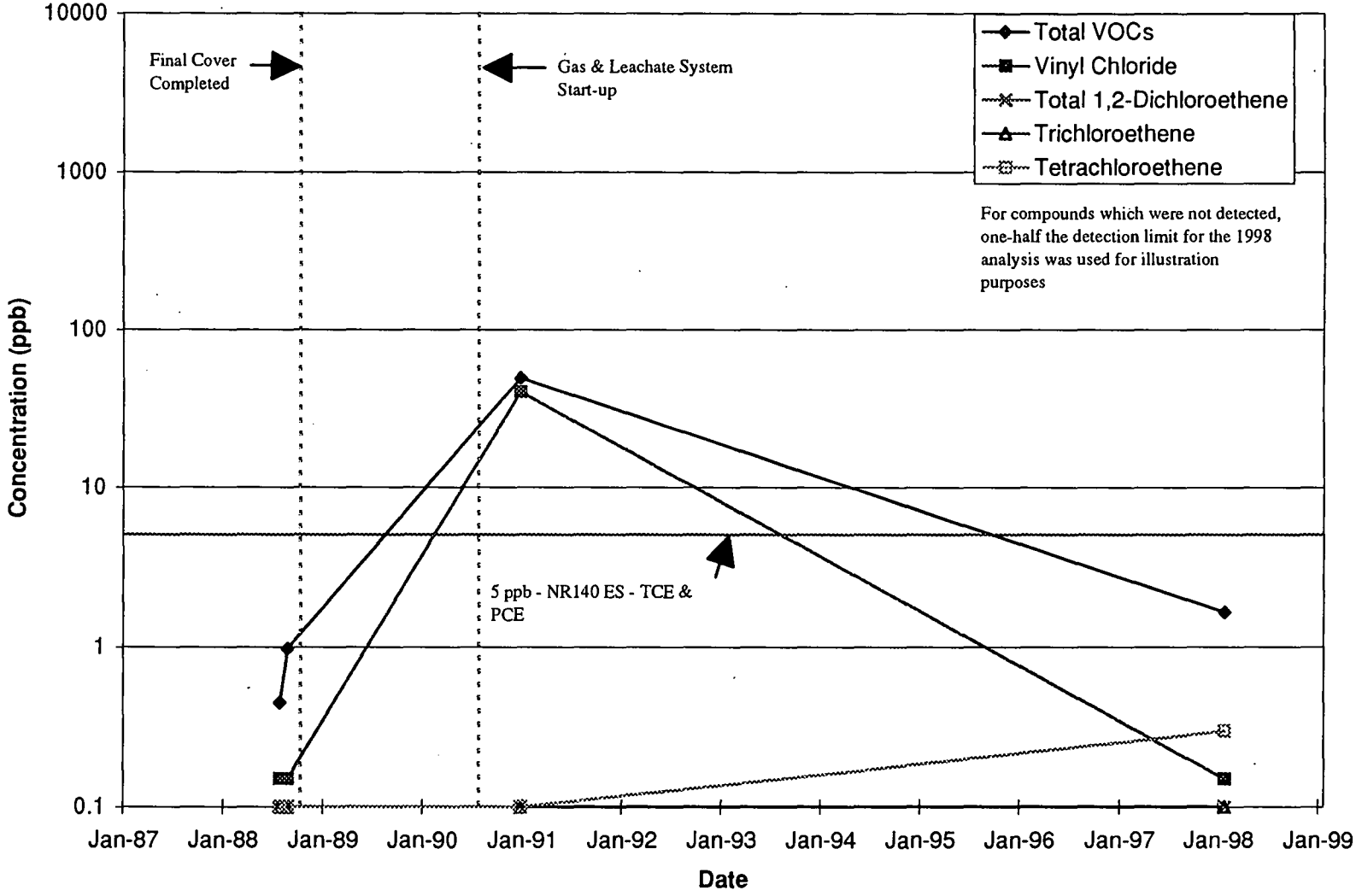
FLOW RATES AND CHLORINATED VOCs - LANDFILL GAS

PREDESIGN AND ADDITIONAL STUDIES
REFUSE HIDEAWAY LANDFILL
MIDDLETON, WISCONSIN

Drawing Number
1242161
01258001 B4

MONTGOMERY WATSON

P03S



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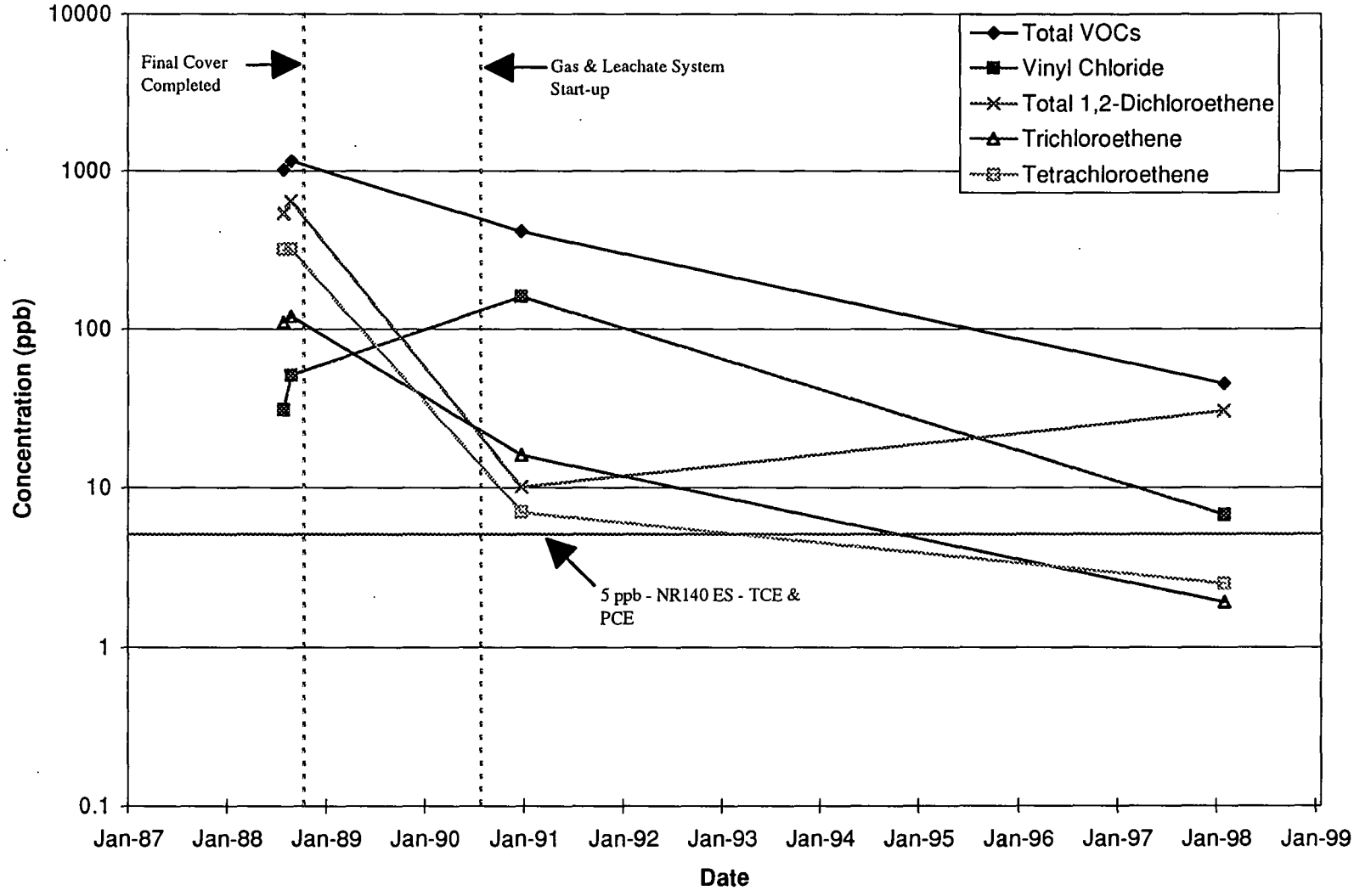
Note: Concentration scale is logarithmic.

P08S



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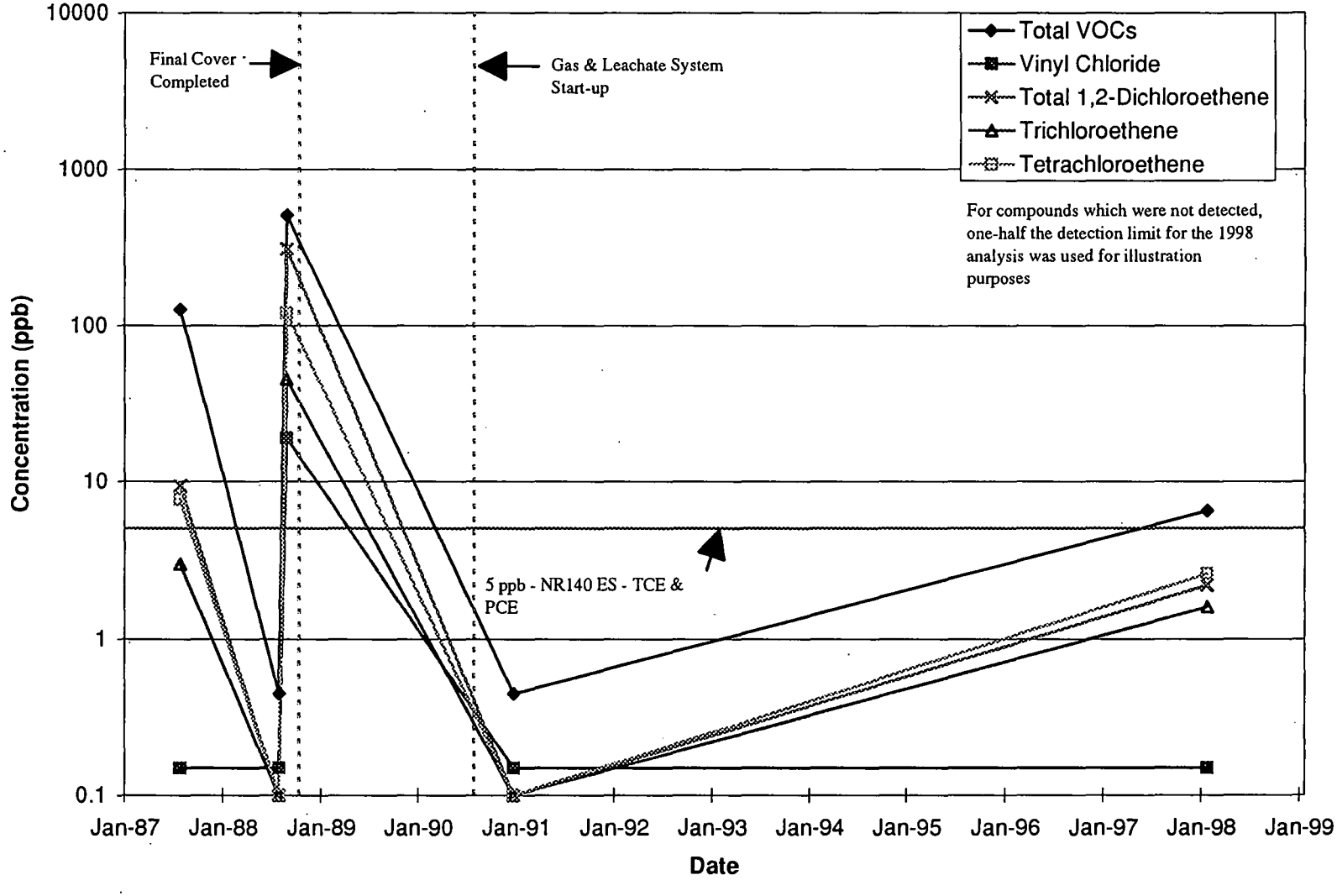

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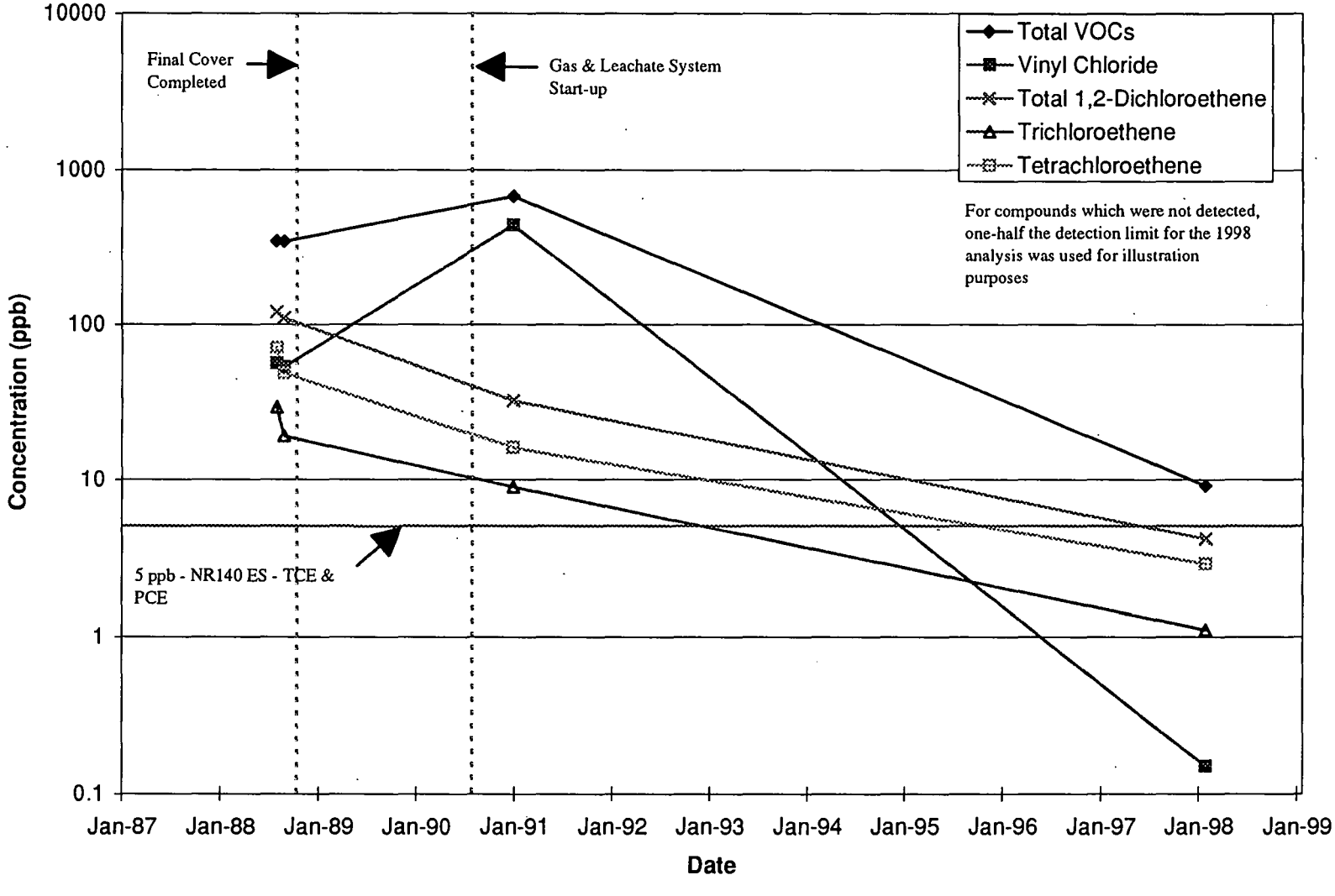

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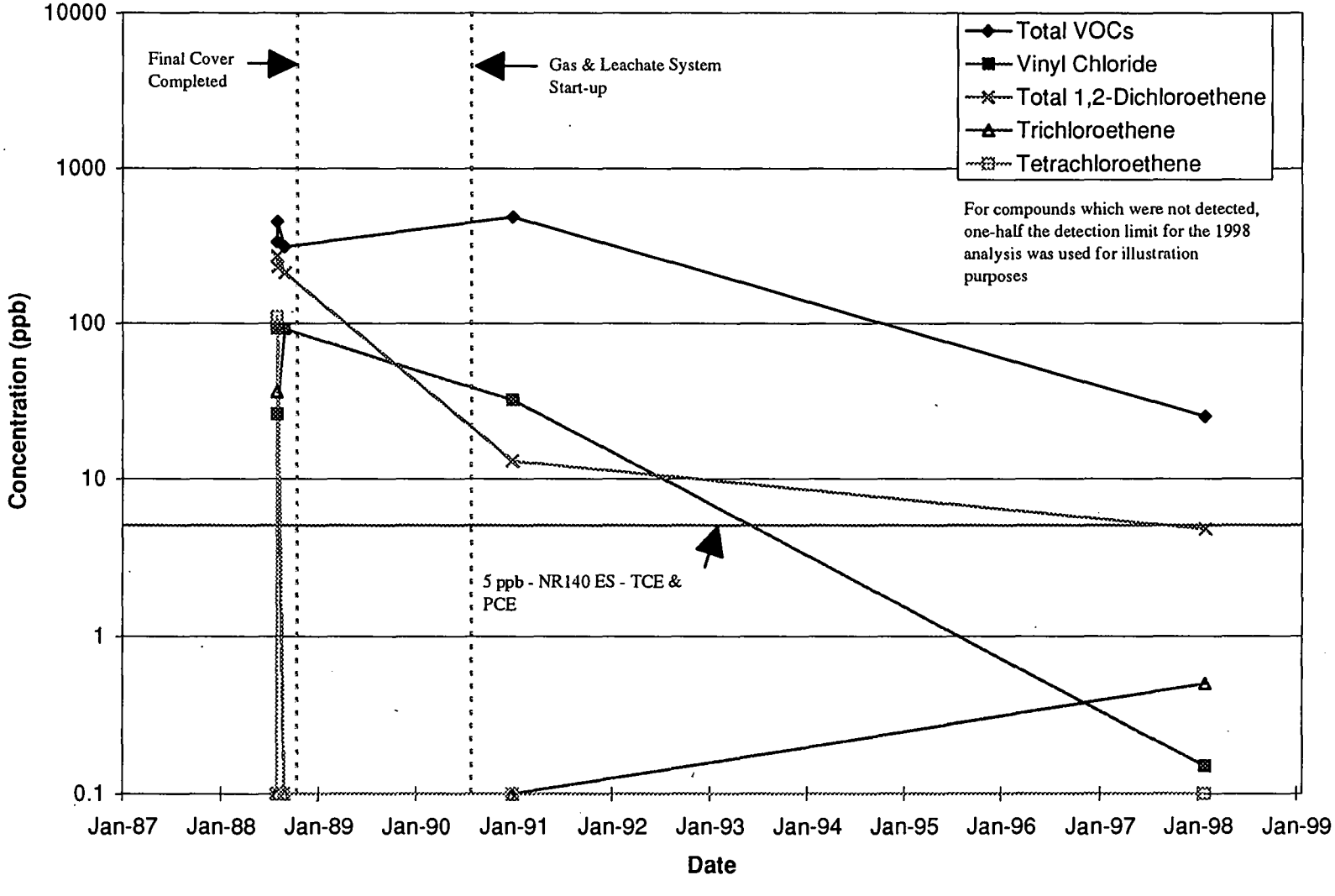

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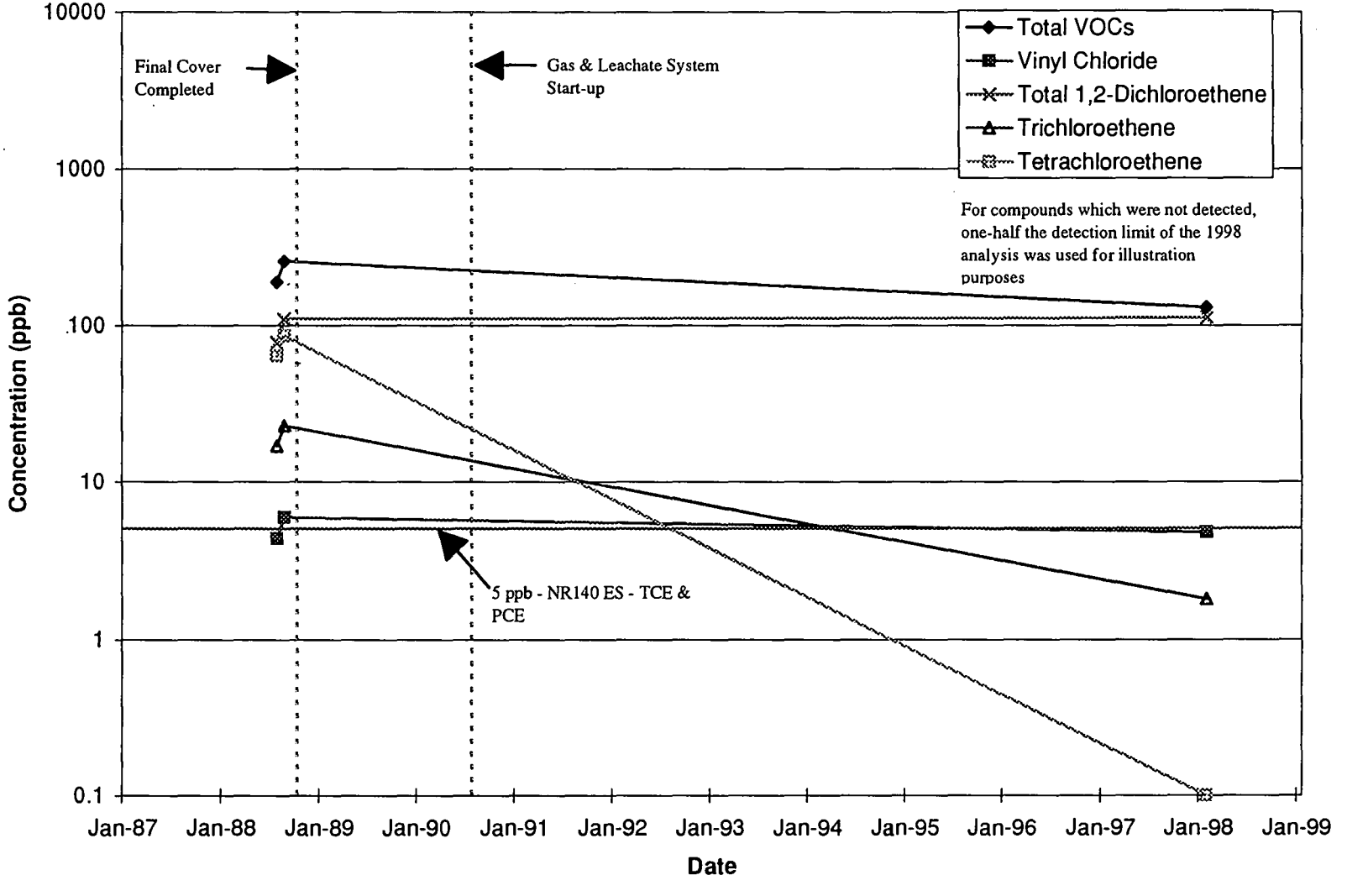

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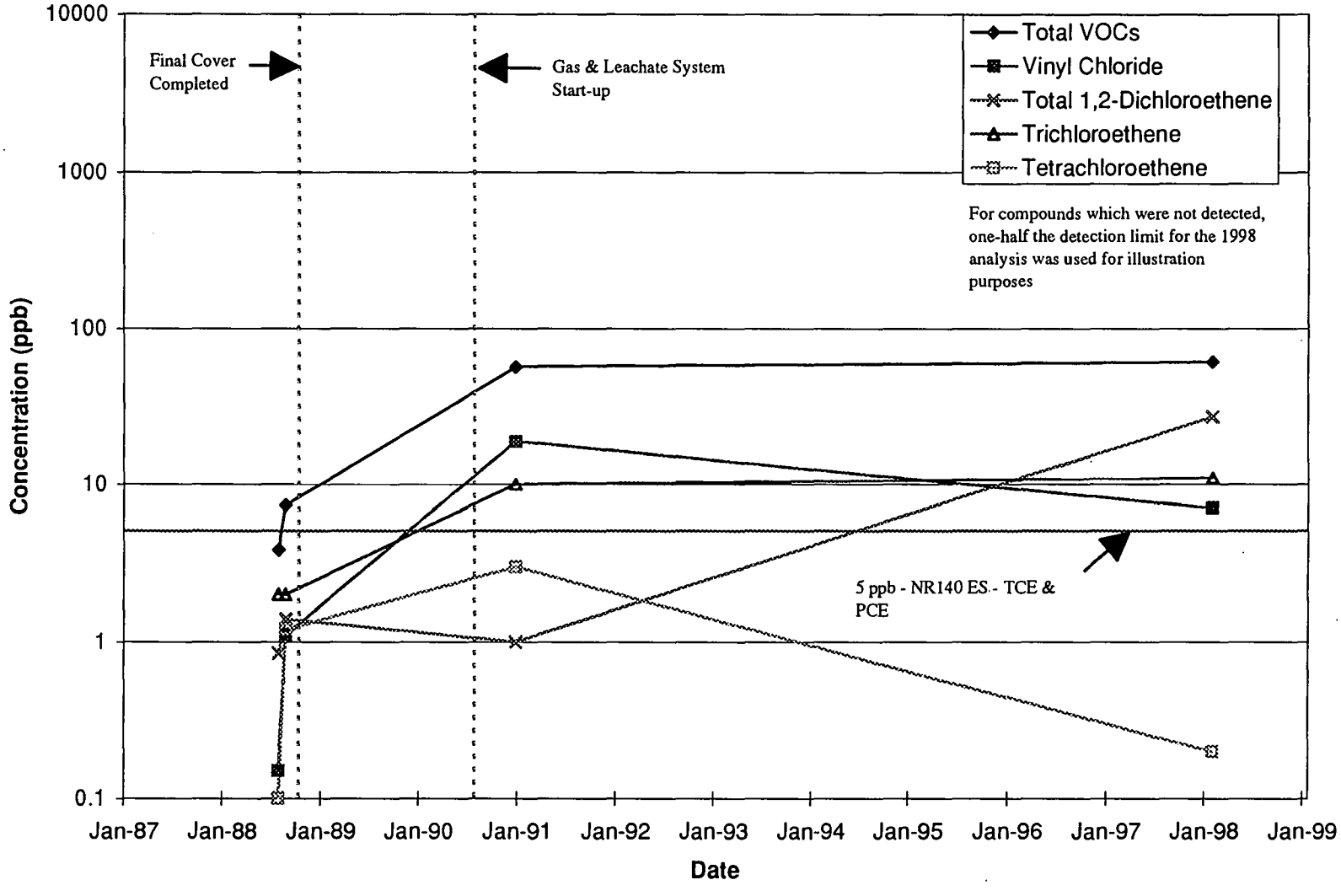

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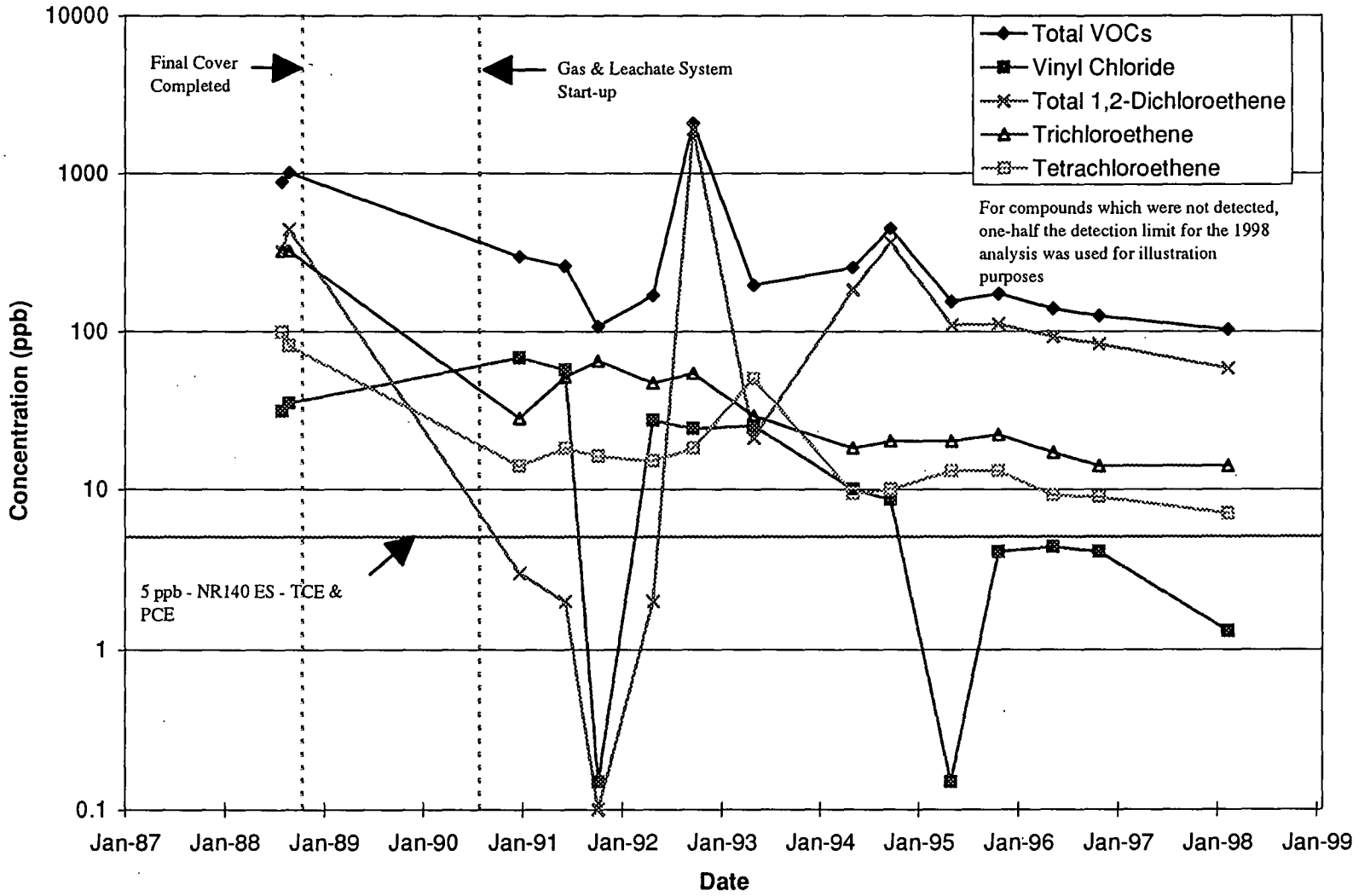

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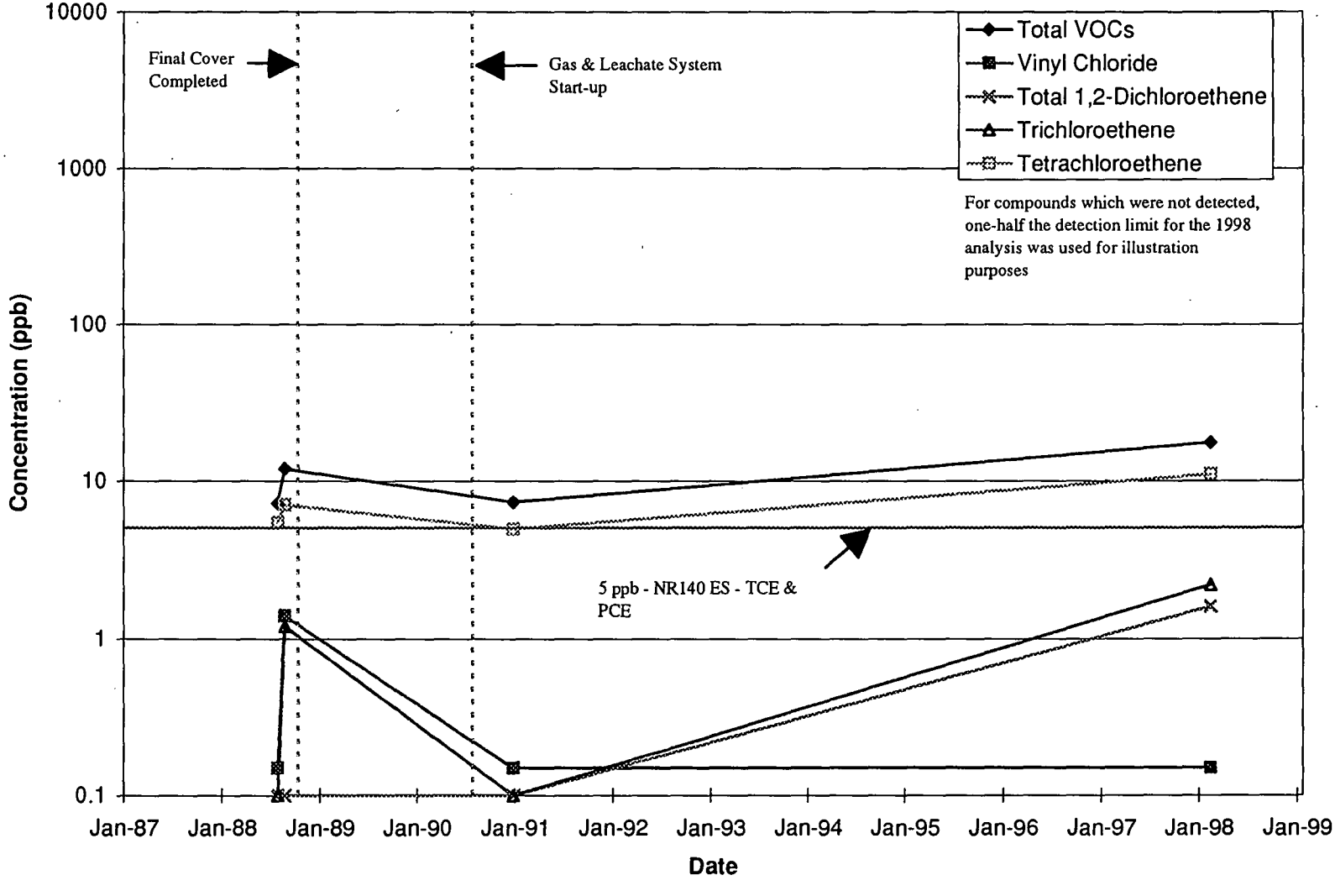

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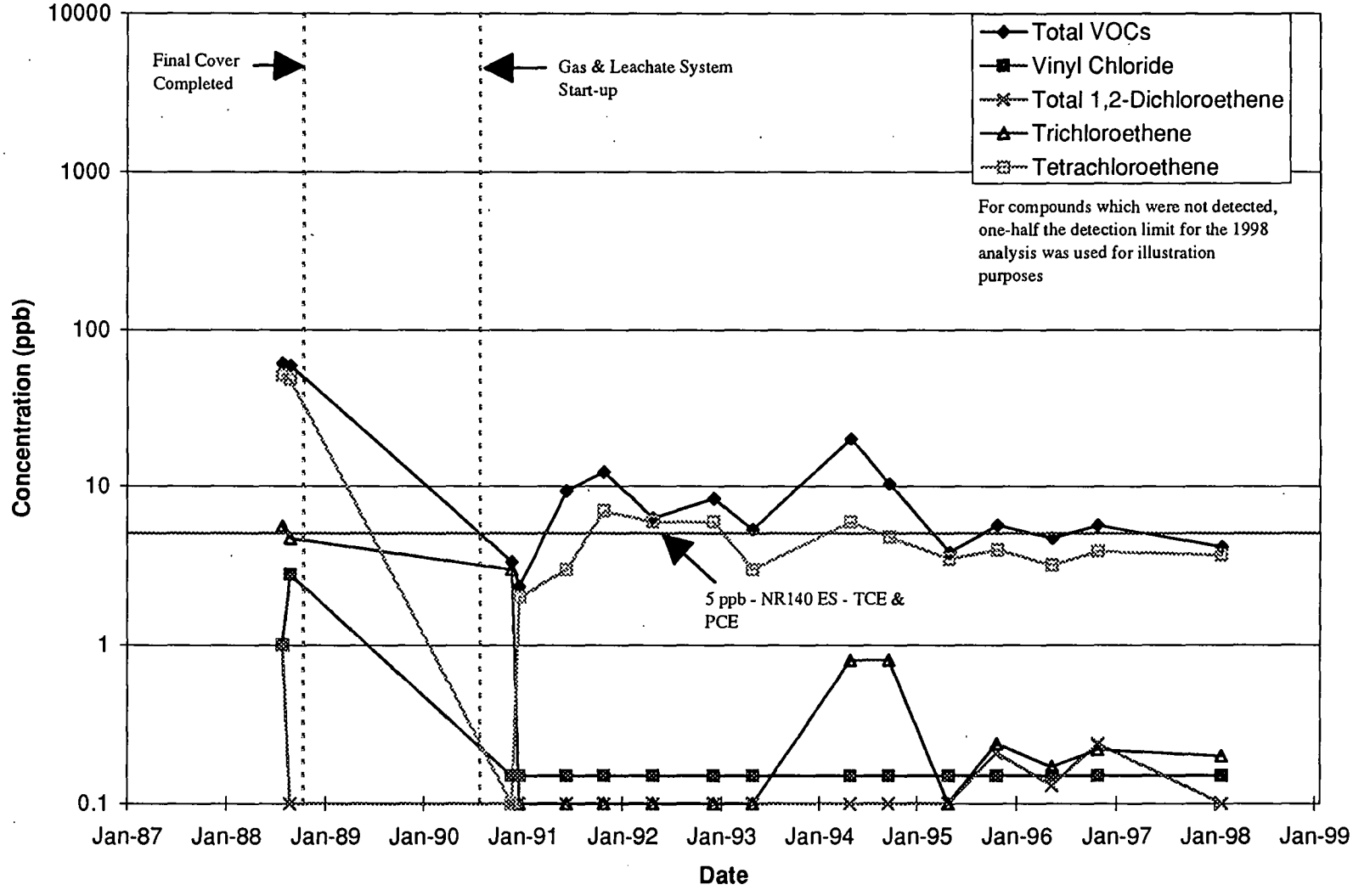

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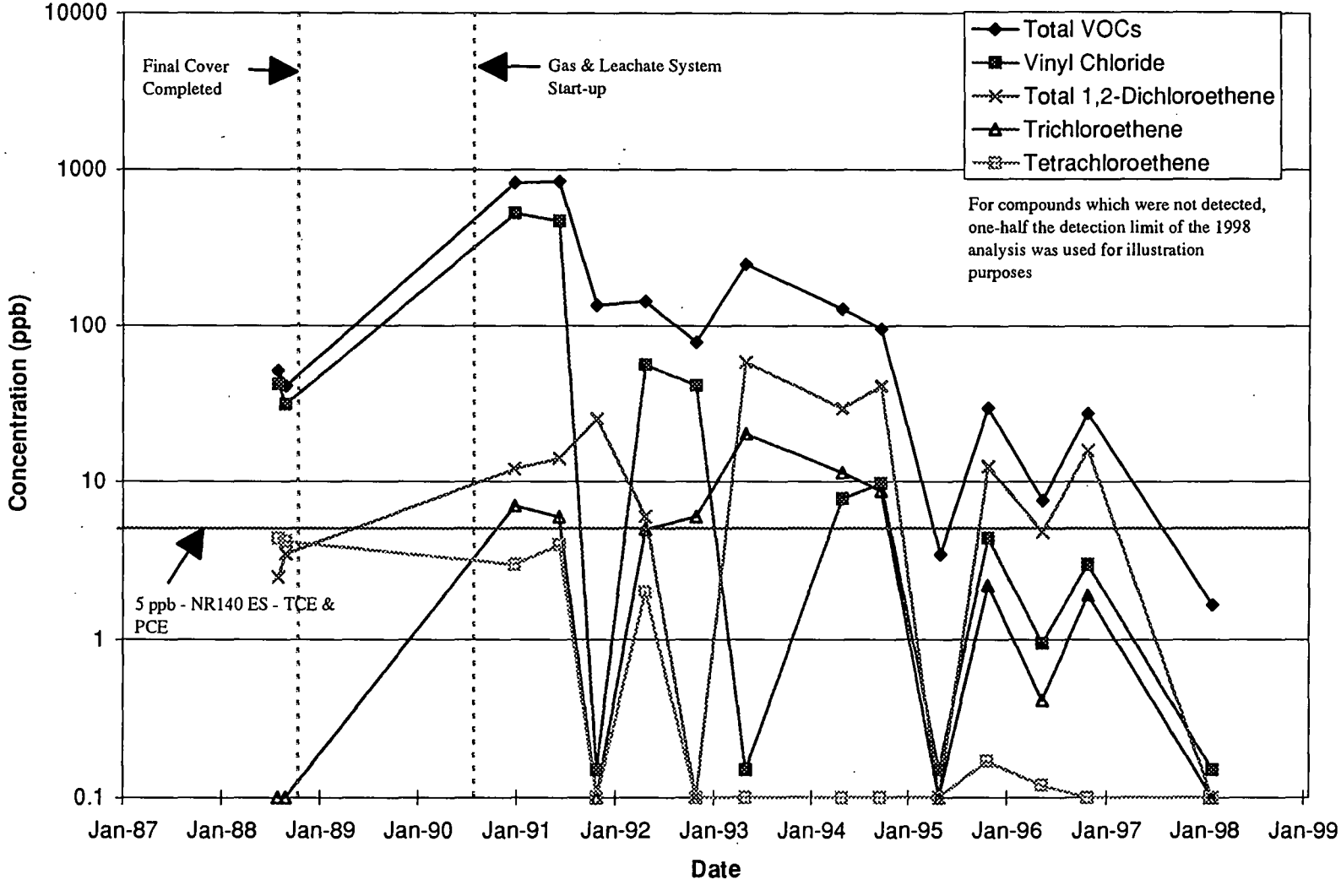

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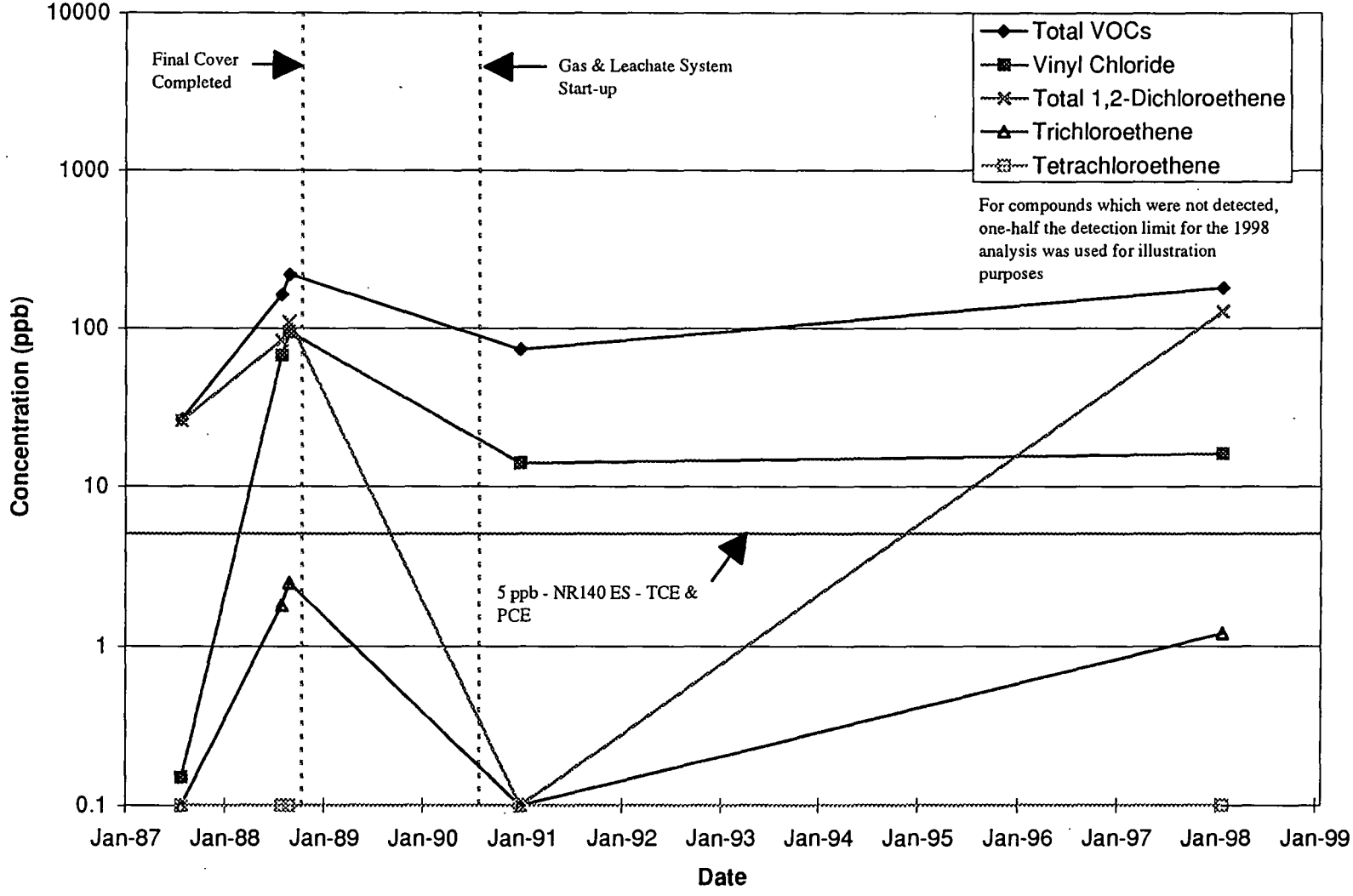

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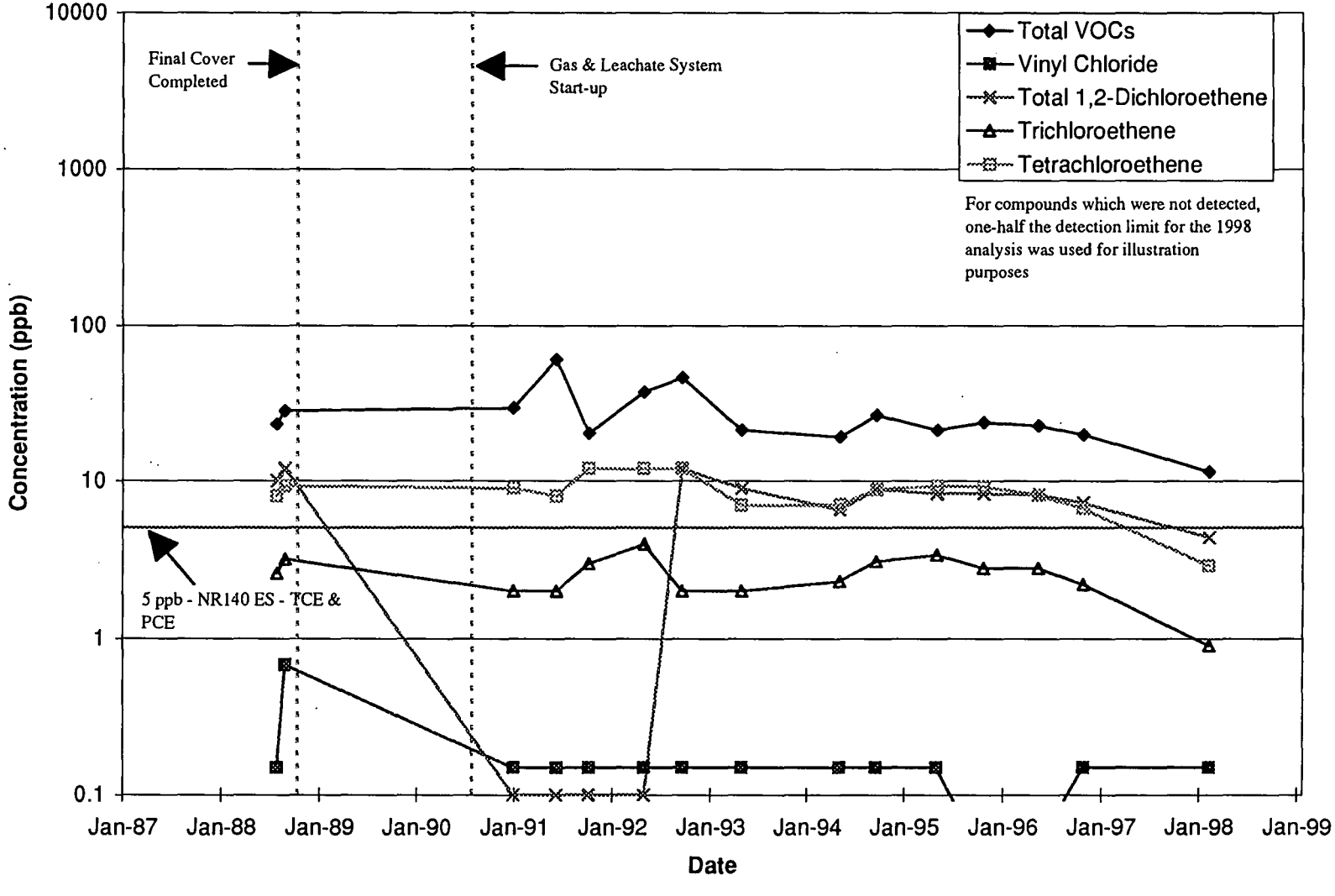

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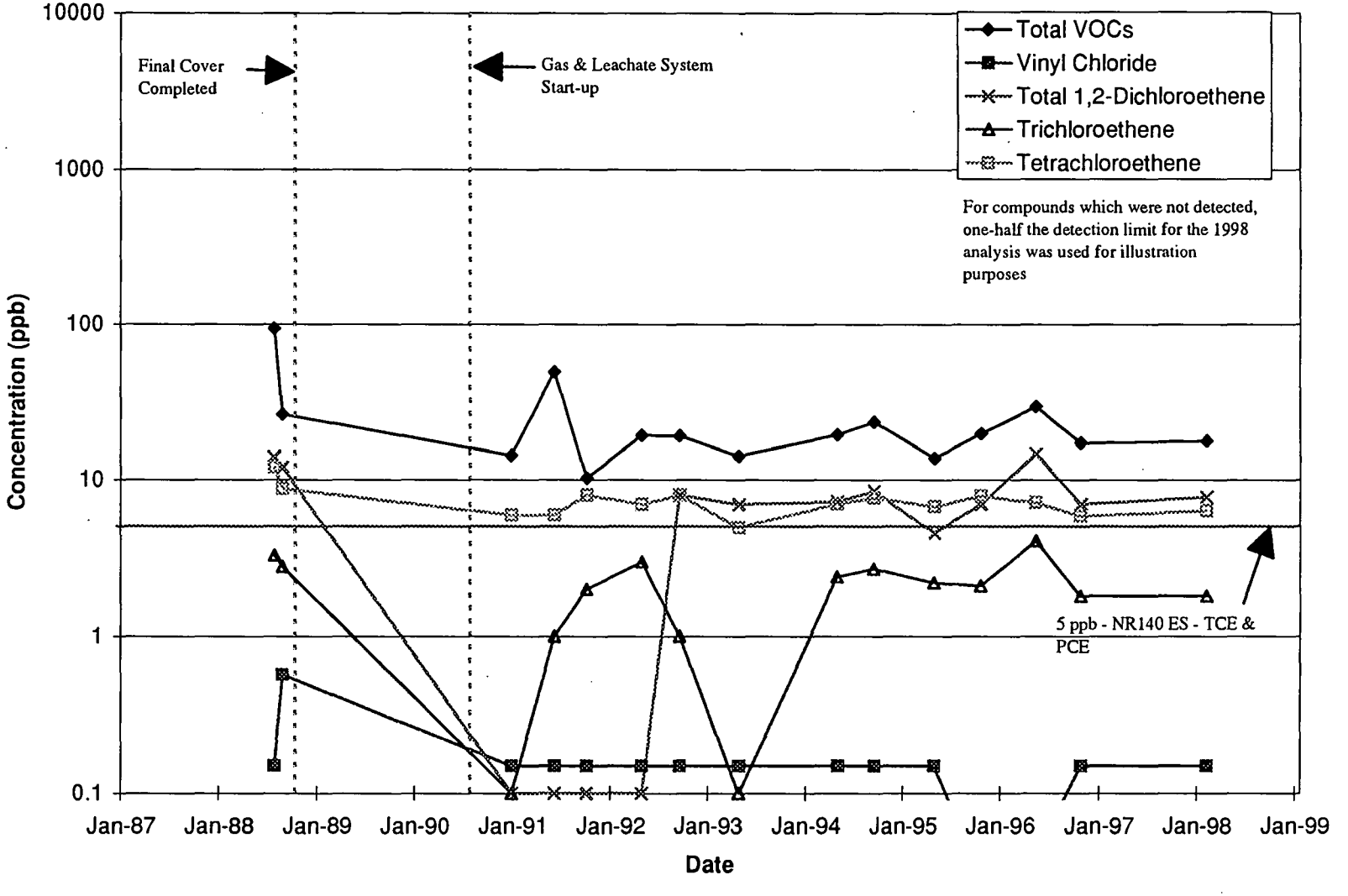

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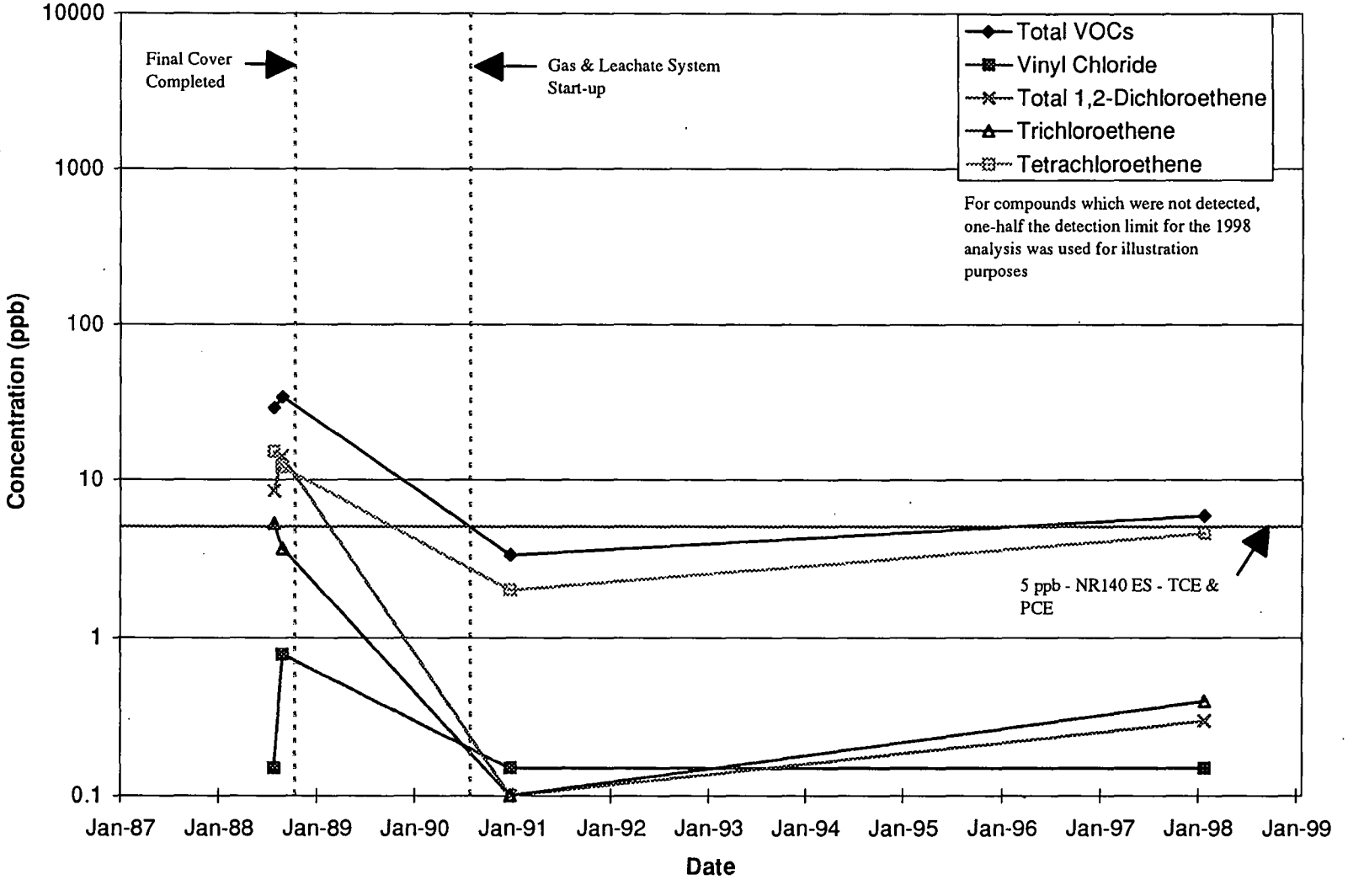

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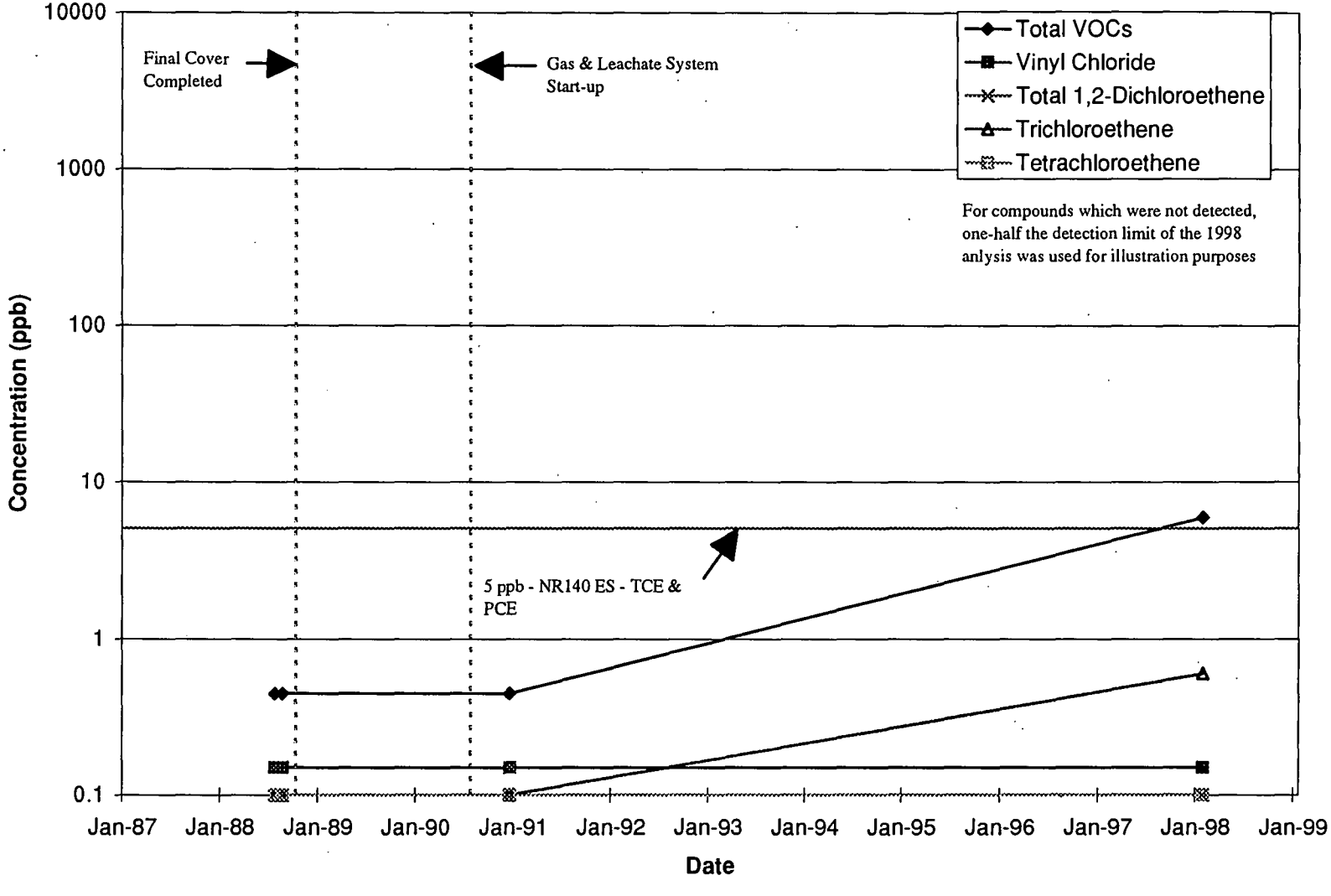

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Note: Concentration scale is logarithmic.

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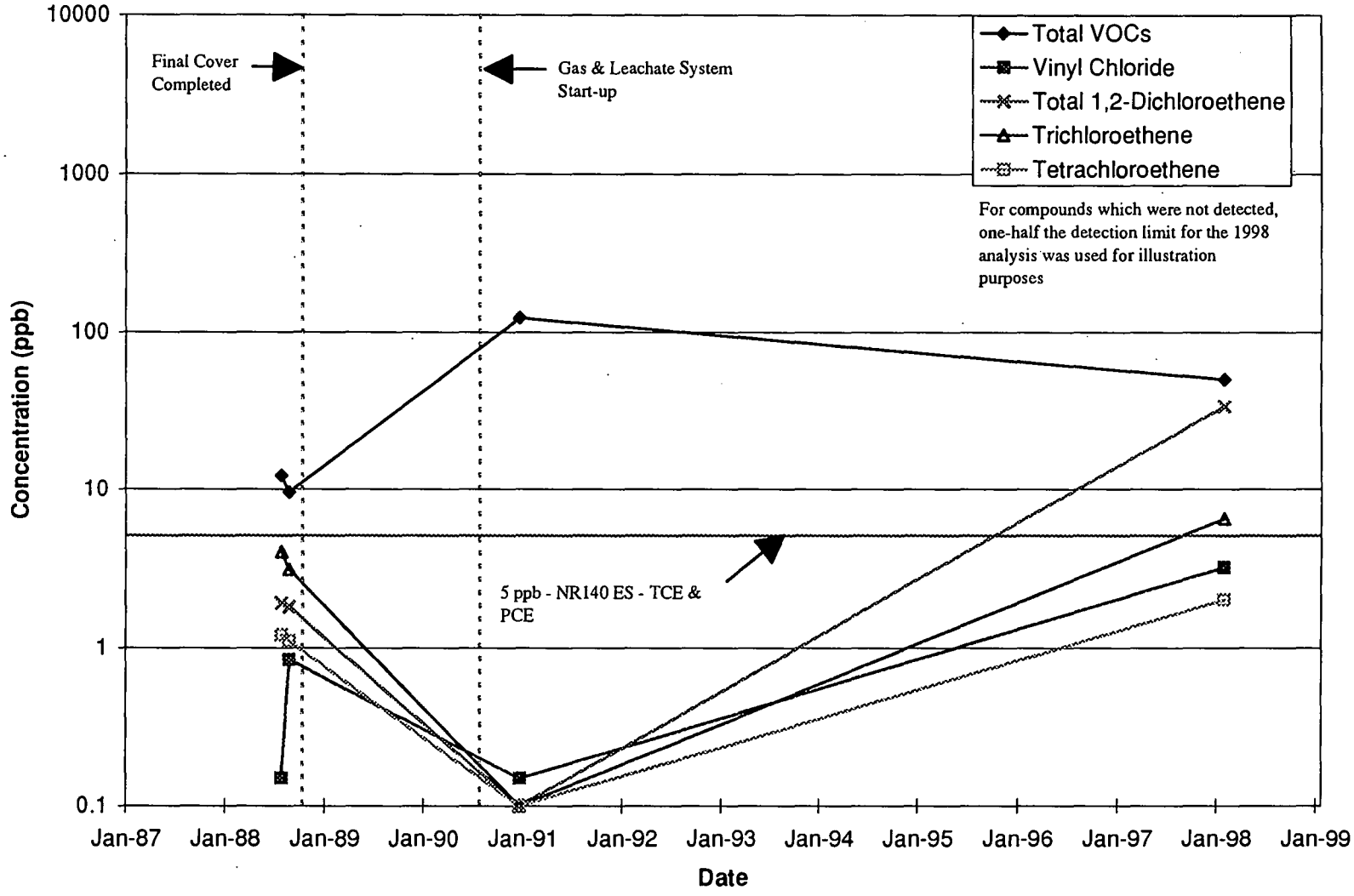

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Note: Concentration scale is logarithmic.

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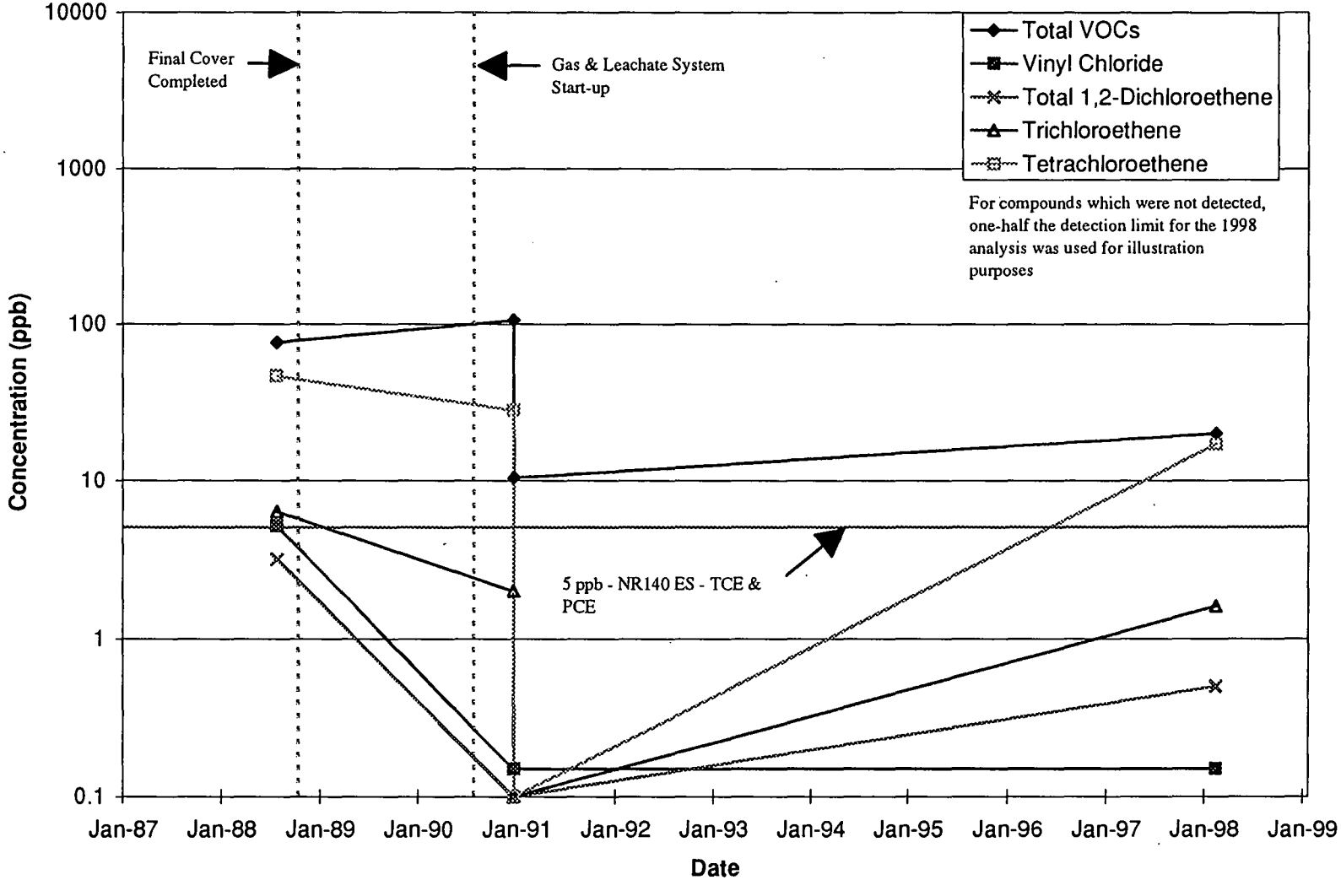

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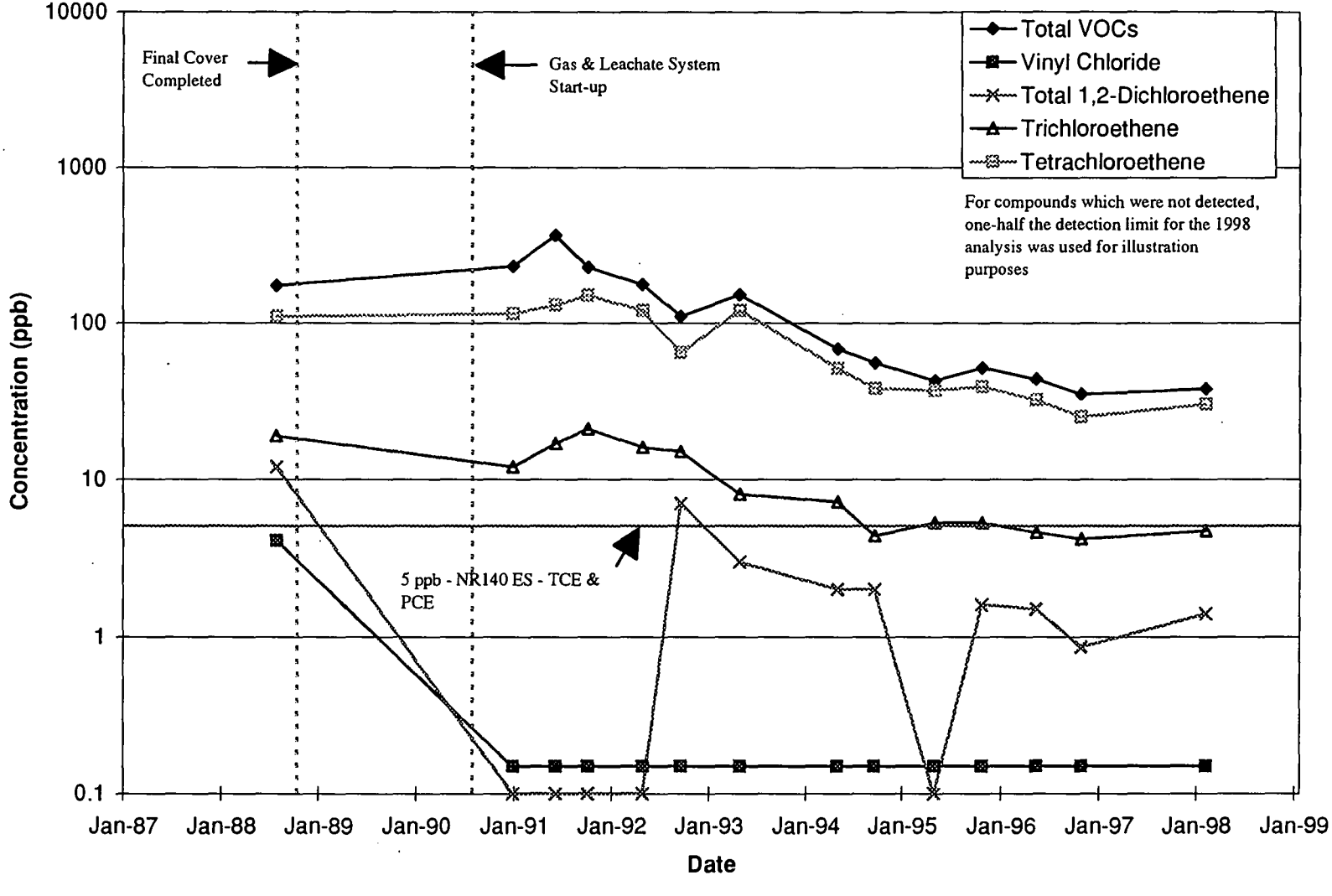

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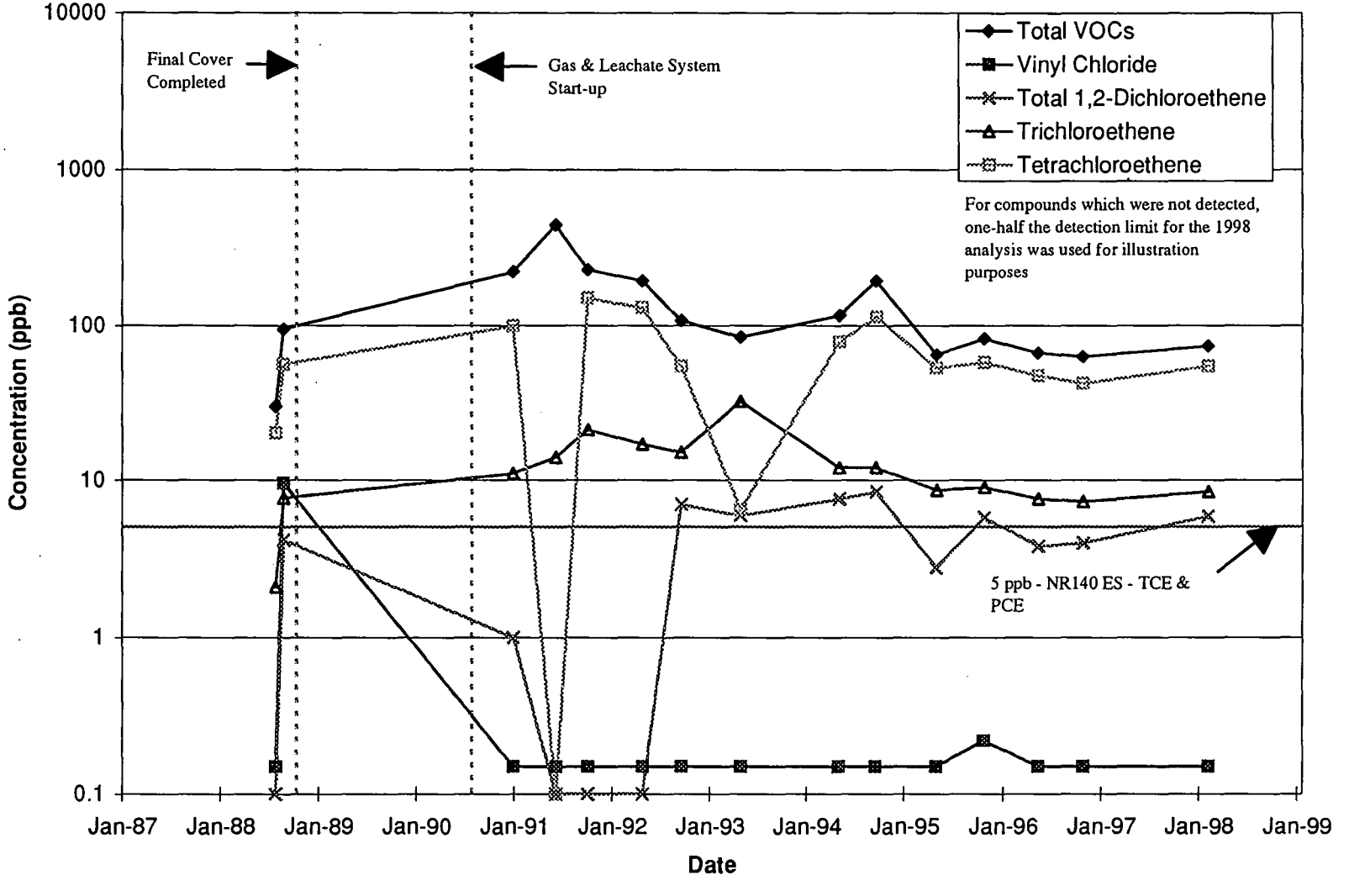

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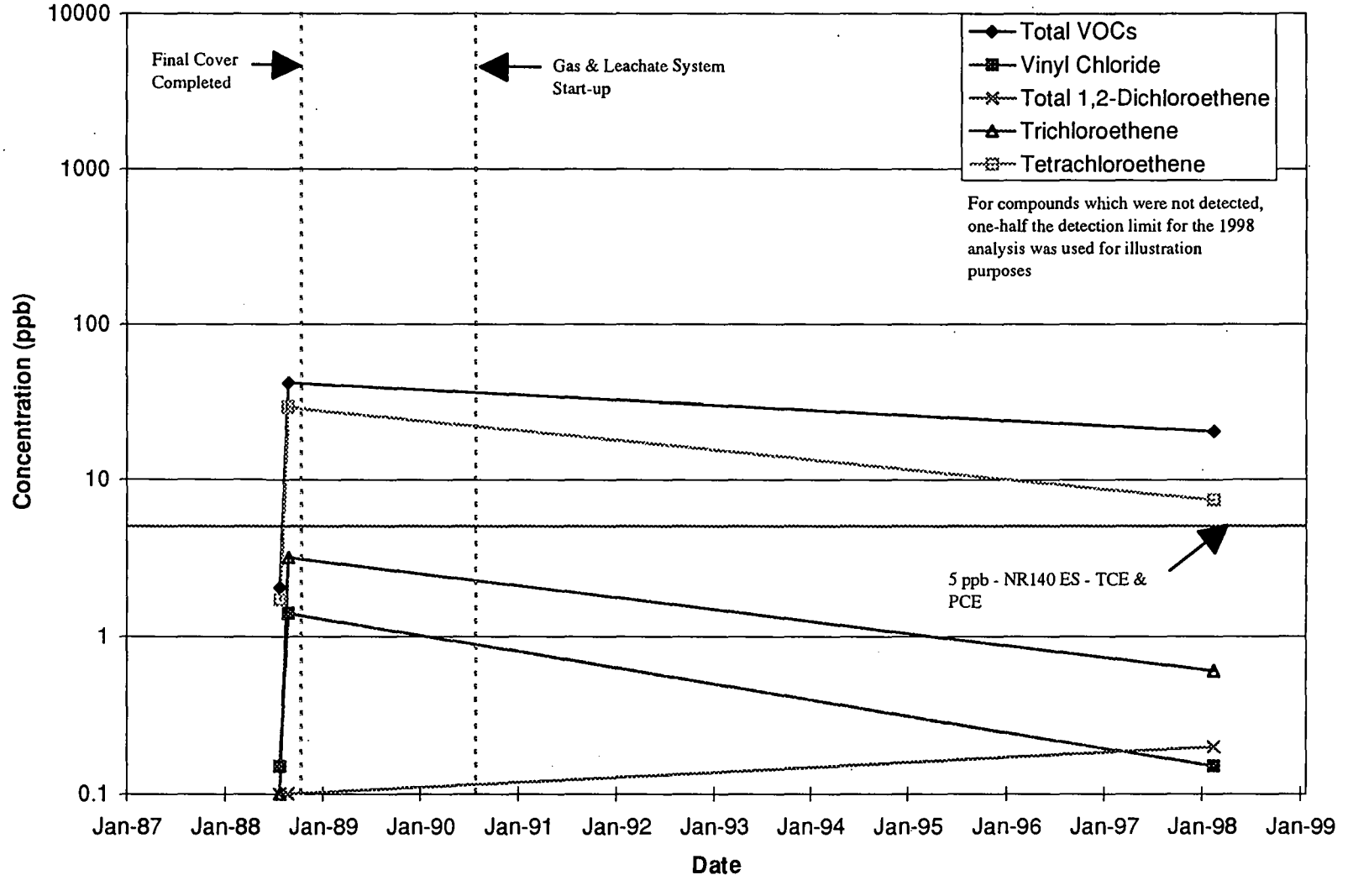

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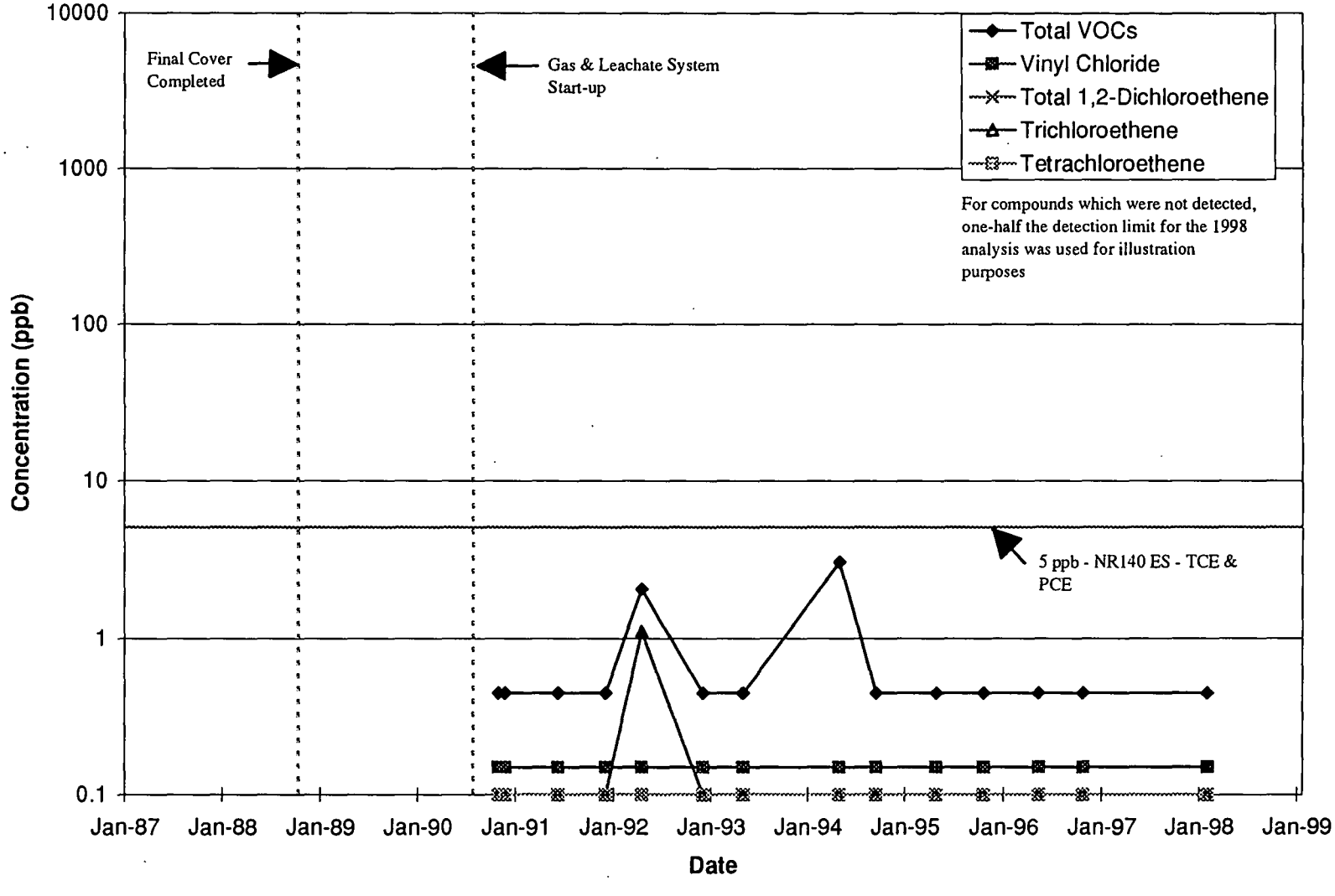

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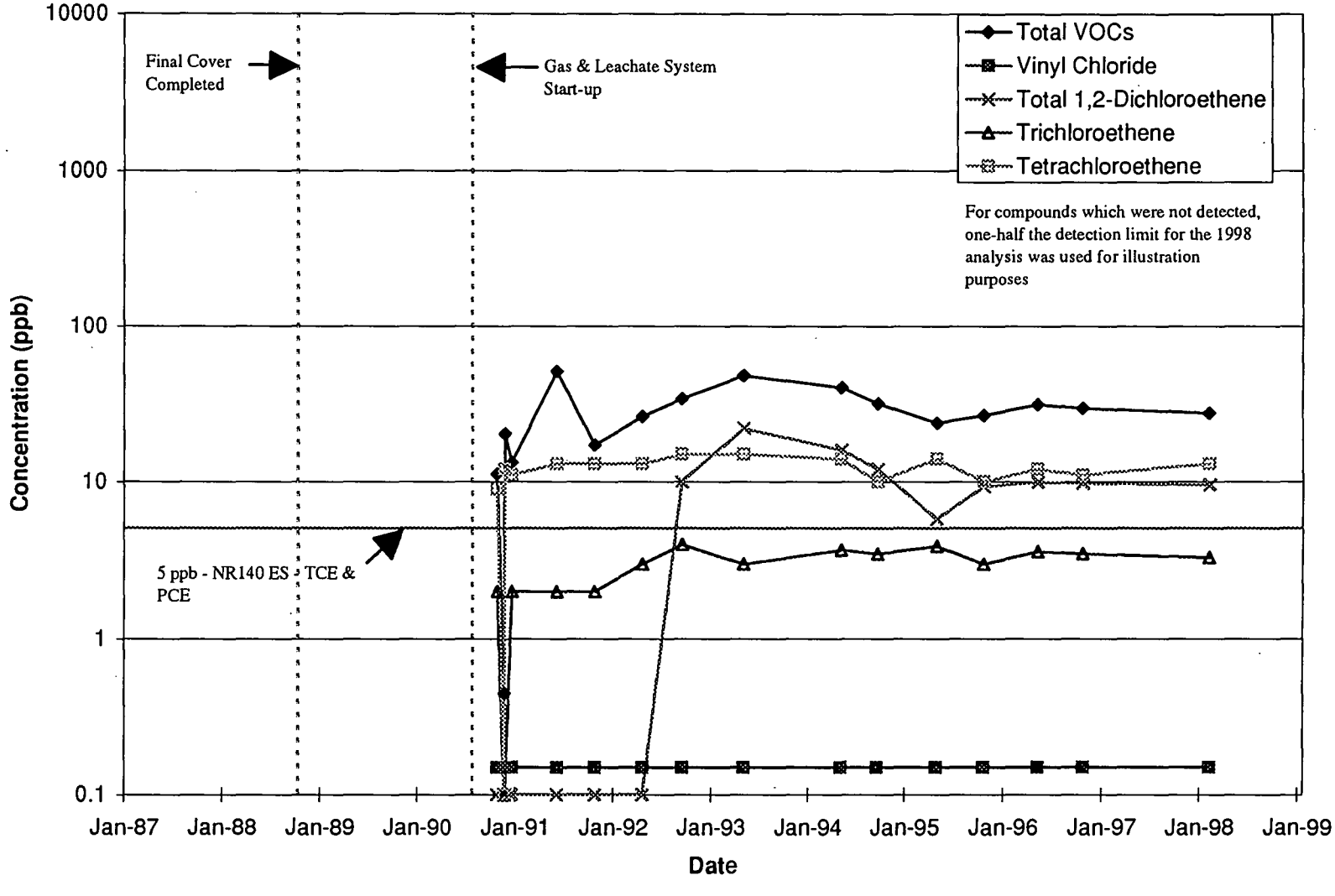

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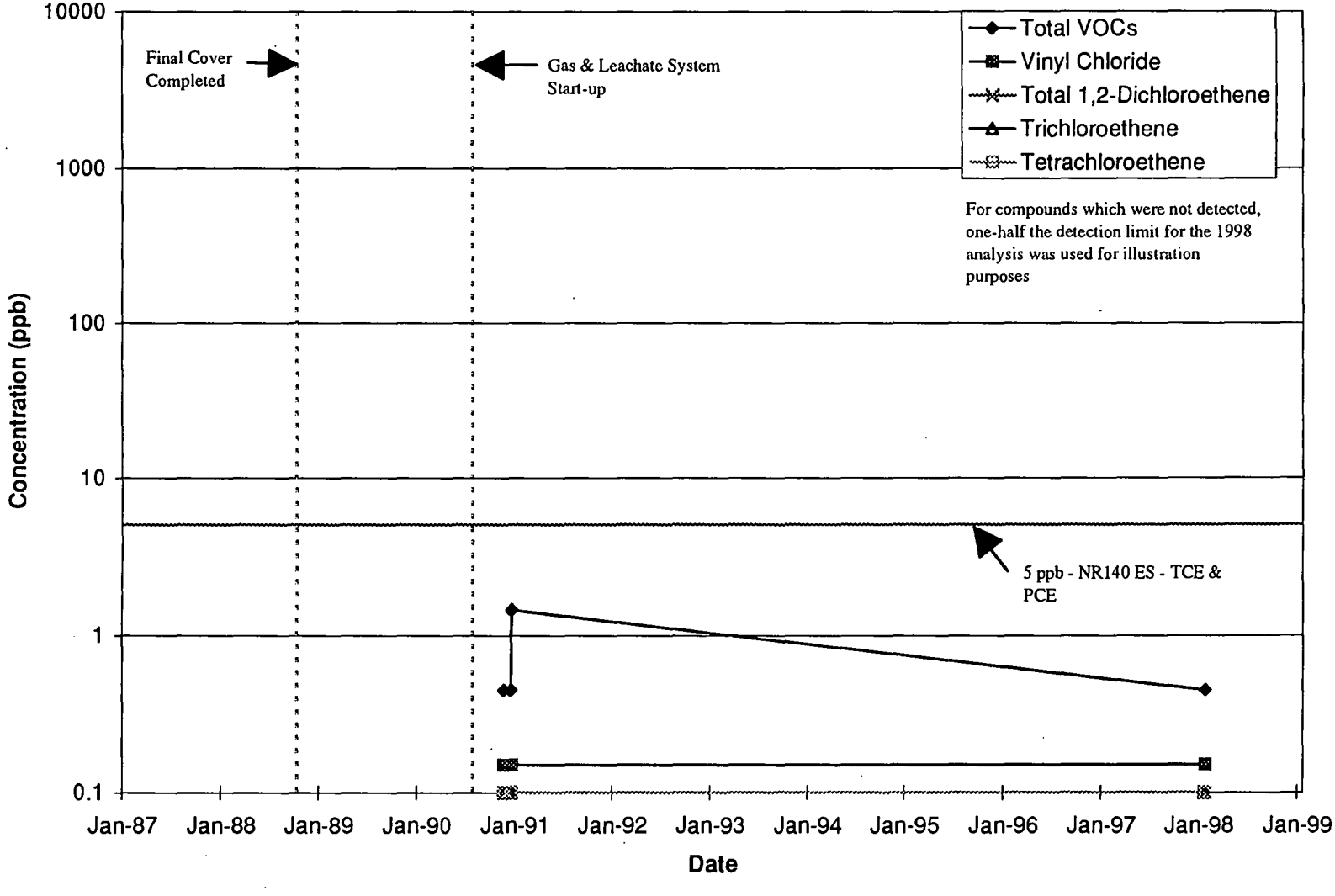

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Note: Concentration scale is logarithmic.

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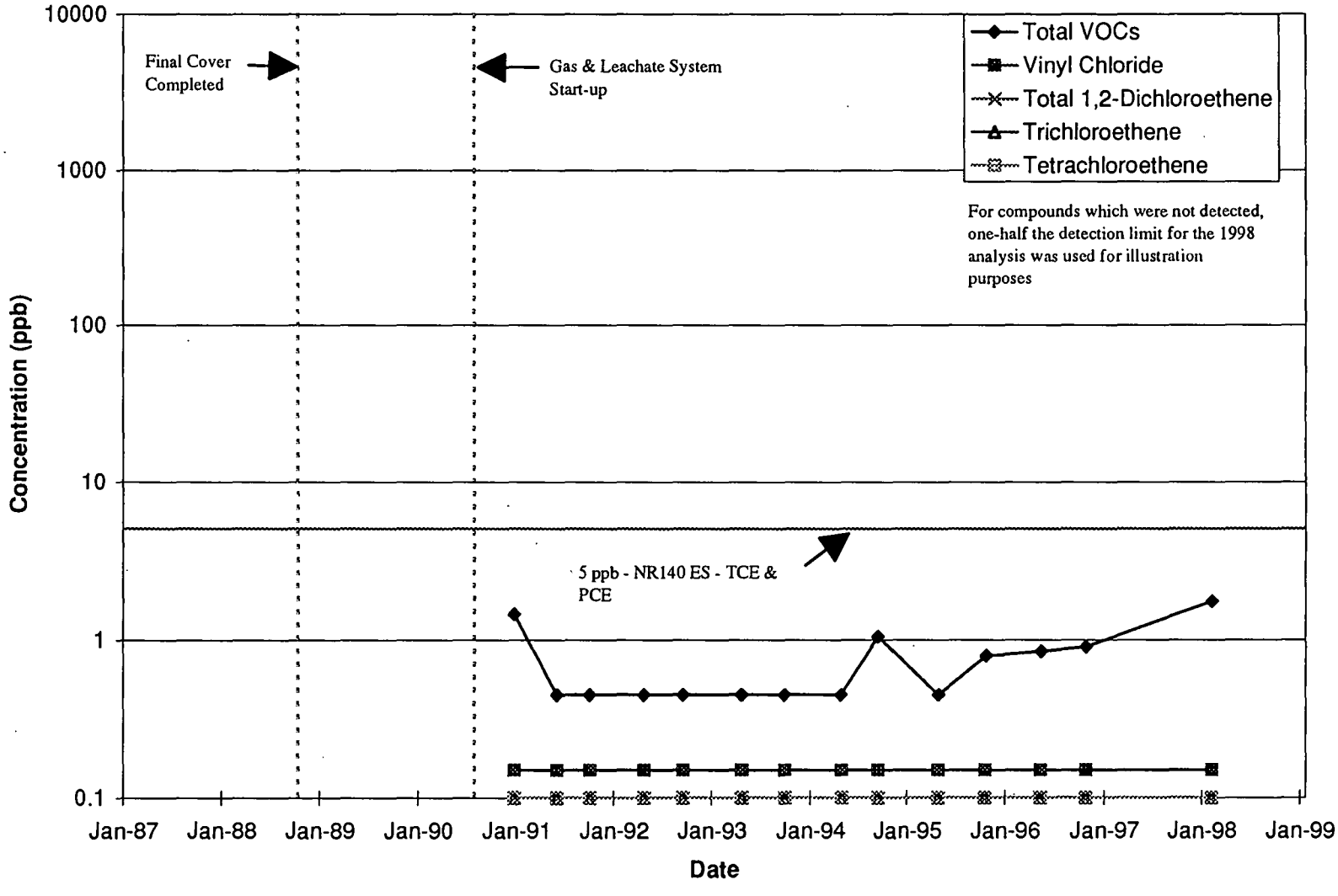

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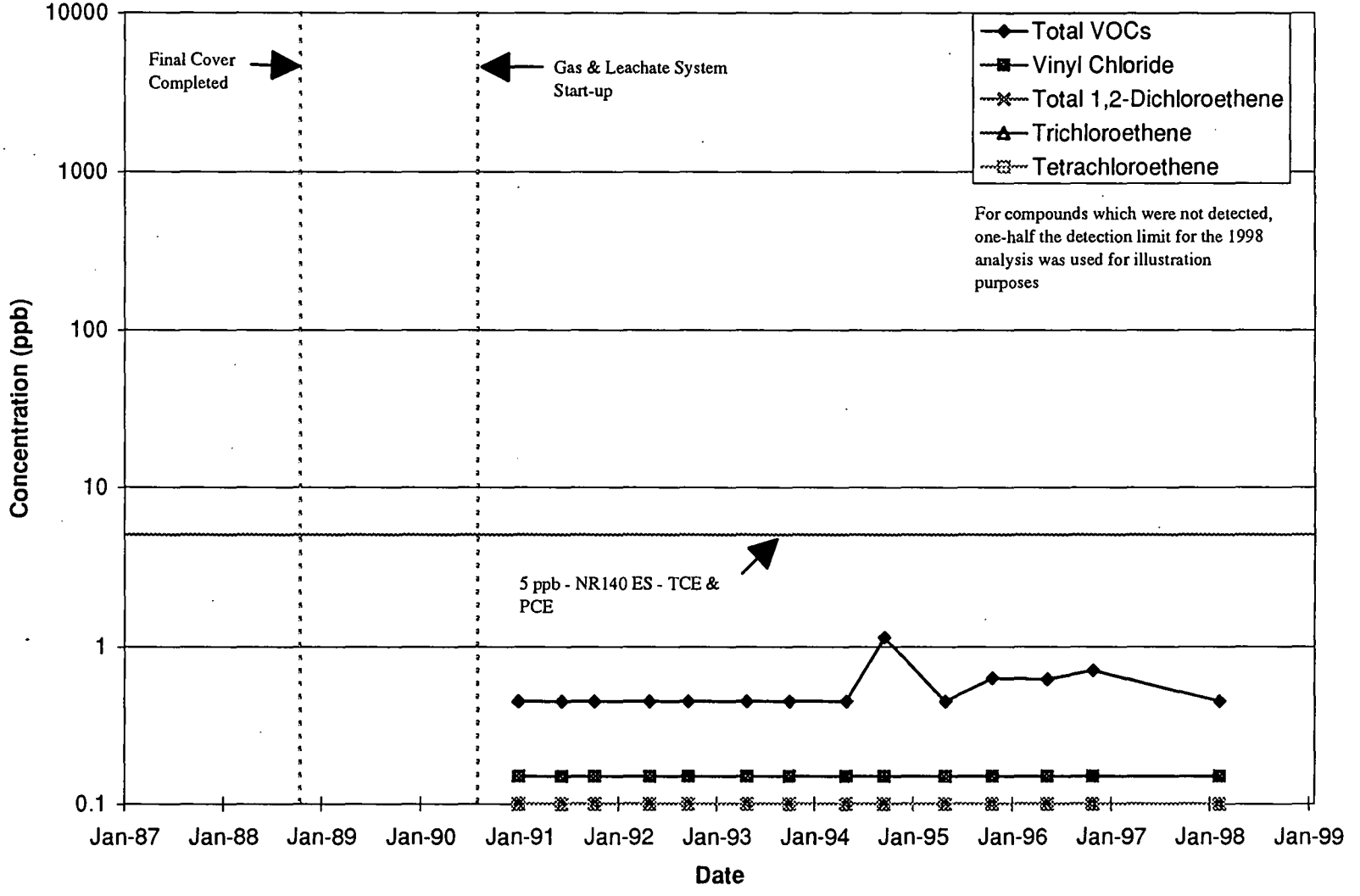

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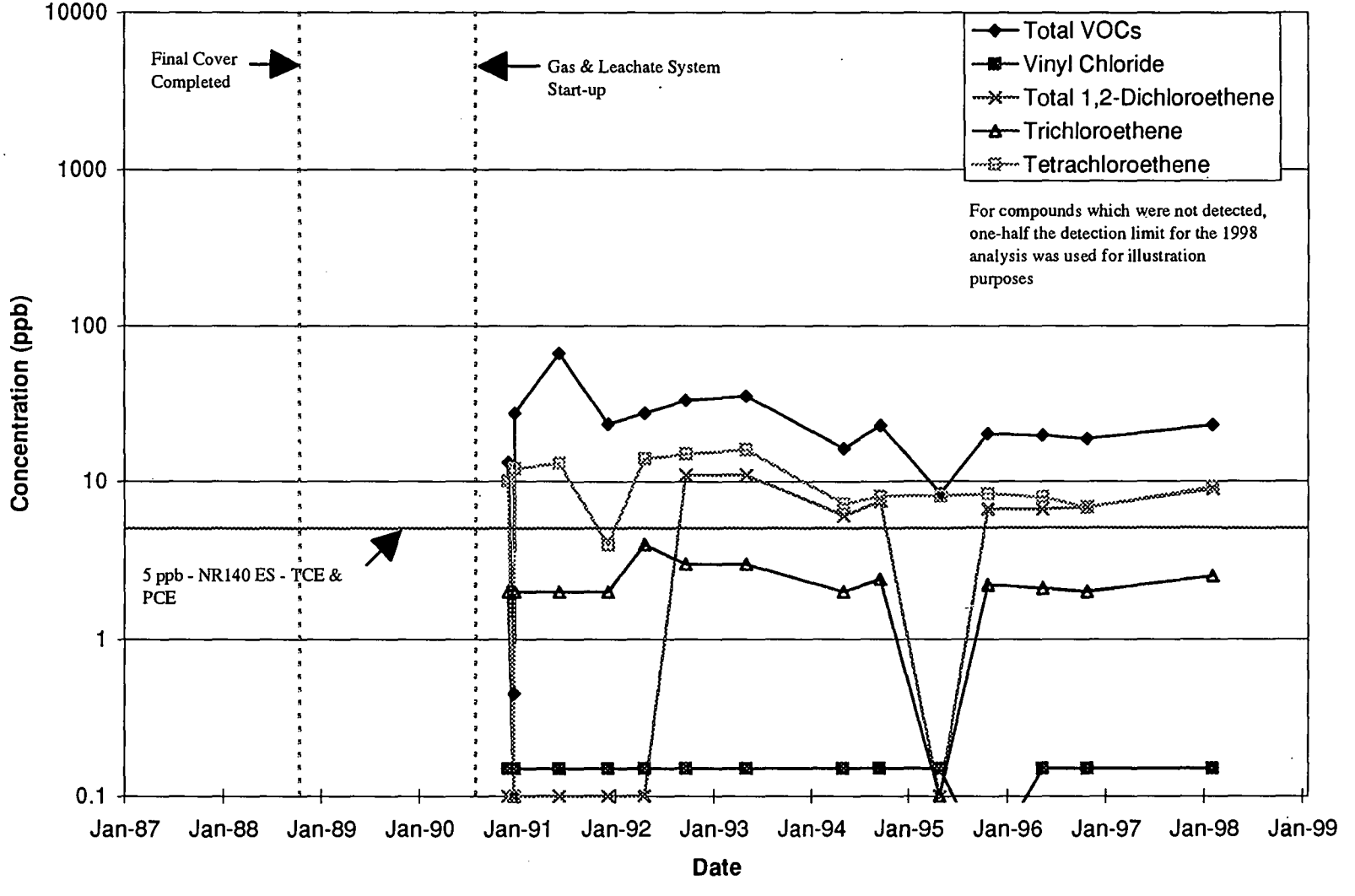

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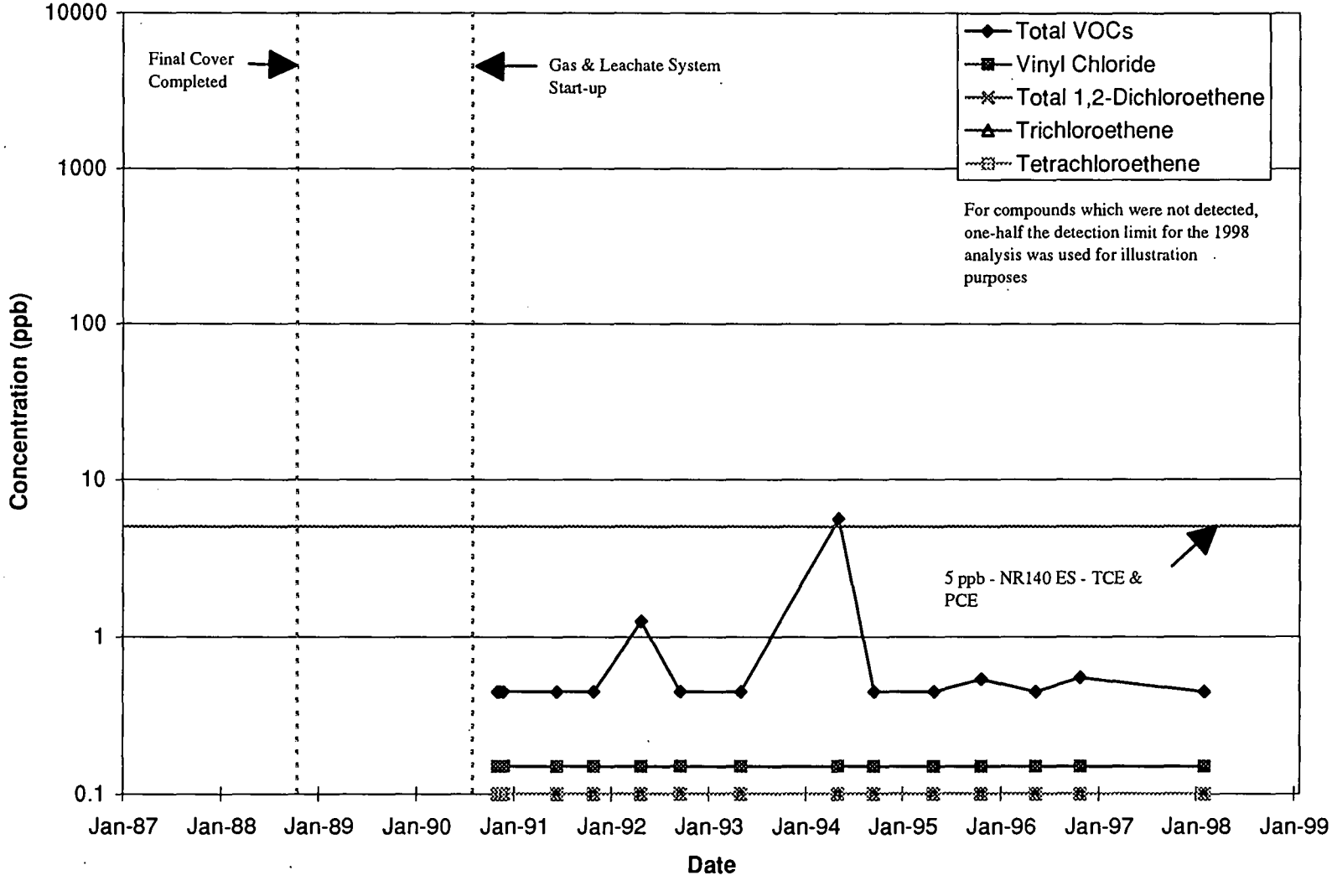

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Note: Concentration scale is logarithmic.

PREDESIGN AND ADDITIONAL STUDIES REPORT

REFUSE HIDEAWAY LANDFILL
MIDDLETON, WISCONSIN

July 1998

Prepared For:
Refuse Hideaway Landfill
Middleton, Wisconsin
•••
Prepared By:
Montgomery Watson
Madison, Wisconsin

RECEIVED
JUL 28 1998
DEPT. OF NATURAL RESOURCES
SD HEADQUARTERS

Project No. 1242161.01258001

MONTGOMERY WATSON

MONTGOMERY WATSON

July 27, 1998

Ms. Beth Reiner
Remedial Project Manager
Office of Superfund
U.S. EPA, Region V
77 West Jackson Boulevard
Chicago, Illinois 60604

Re: Predesign and Additional Studies Report
Refuse Hideaway Landfill
Middleton, Wisconsin

Dear Ms. Reiner:

Enclosed for your review are two (2) copies of the *Predesign and Additional Studies Report* for the Refuse Hideaway Landfill site. This report is submitted on behalf of the Refuse Hideaway PRP Group as specified in Section IX.B.3. of the Administrative Order on Consent (AOC) The report is submitted to assist you in issuing a written determination as to whether a remedy change is appropriate for the site, as provided in Section IX.B.5 of the AOC.

Montgomery Watson and members of the PRP Technical Group are available to meet with you to further discuss this report, if appropriate. Please call with any questions you may have in the meantime.

Sincerely,

MONTGOMERY WATSON

Douglas J. Bach, P.E.
Project Manager

Enclosure: Predesign and Additional Studies Report

cc: Hank Kuehling, WDNR
Jewell Keiser, CH2M-Hill
Members of the RHL PRP Group Technical and Steering Committees

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One Science Court
P.O. Box 5385
Madison, Wisconsin
53705-0385

Tel: 608 231 4747
Fax: 608 231 4777

PREDESIGN AND ADDITIONAL STUDIES REPORT

REFUSE HIDEAWAY LANDFILL
MIDDLETON, WISCONSIN

July 1998

Prepared by: Patrick H. Lytle (PHL) — 7/27/98

Patrick H. Lytle — Date
Associate Environmental Engineer

R. J. Ramsby (RJR) — 7/27/98

R. Jeff Ramsby, P.G. — Date
Hydrogeologist

Approved by: — 7.27.98

Douglas J. Bach, P.E. — Date
Supervising Engineer

Kenneth J. Quinn — 7/27/98

Kenneth J. Quinn, P.G. — Date
Principal Hydrogeologist

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EXECUTIVE SUMMARY

This *Predesign and Additional Studies Report* was prepared on behalf of the Refuse Hideaway PRP Group, and provides an analysis of the groundwater, leachate, and landfill gas studies conducted during February and March 1998 at the Refuse Hideaway Landfill (RHL) site. The purpose of the Additional Studies activities were to evaluate changes in landfill and groundwater conditions since completion of the Remedial Investigation (RI), Feasibility Study (FS), and Record of Decision (ROD), that may support a change in the remedy from the ROD specified groundwater extraction and treatment system. Predesign activities (extraction well installation, aquifer pumping test, injection test, and treatability studies) were deferred indefinitely by the U.S. EPA based on preliminary results of Additional Studies. Following review of this report, the U.S. EPA will a issue written determination as to whether a remedy change is appropriate for the site, as provided in Section IX.B.5 of the Administrative Order on Consent.

Based on information provided in the ROD, the Refuse Hideaway Landfill was licensed for waste disposal between 1974 and 1988, and received an estimated 1.5 million cubic yards of waste. Volatile Organic Compounds (VOCs) were detected in private residential wells in 1988, and the landfill was closed and covered with a soil cap later that year. The landfill owner declared bankruptcy in 1989. Between 1989 and 1993, the Wisconsin Department of Natural Resources performed investigation and response actions at the site, including the installation of landfill gas and leachate extraction systems. The site was named to the NPL in 1992, and the RI and FS were completed in February 1995. The ROD was signed in June 1995, and specified groundwater extraction, treatment, and injection for areas with total VOC concentrations exceeding 200 ug/L.

The results of the Additional Studies sampling showed significant decreases in total VOC and chlorinated VOC concentrations in landfill gas and groundwater since the last complete round of sampling in 1991. Concentrations of tetrachloroethene (PCE) and trichloroethene (TCE) decreased by several orders of magnitude (e.g., PCE decreased from 26 ppm (v/v) to 1.2 ppm(v/v)). The greatest decreases in VOC concentrations in groundwater were observed in monitoring wells closest to the landfill. No monitoring well contained total VOC concentrations exceeding the ROD-specified 200 ug/L criteria for groundwater extraction and treatment. Analysis of natural attenuation parameters indicated that conditions appropriate for degradation of PCE and TCE are present within and probably beneath the landfill. Conditions appropriate for degradation of DCE and vinyl chloride are present in the groundwater around and downgradient of the landfill.

Evaluation and interpretation of the Additional Studies data confirm that VOCs are being removed from the landfill and groundwater at a significant rate. The mass removal of contaminants is summarized in the following table.

Summary of Mass Reduction

Mass Removal Mechanism	Since 1990/1991 VOC Mass Removed (lbs of VOCs)
Landfill Gas Extraction	26,300
Leachate Extraction	4
Natural Degradation in Groundwater - Source Area	202

Calculation of landfill gas extraction rates indicate that over 26,000 lbs of total VOCs and over 15,000 lbs of chlorinated VOCs have been removed from the landfill since 1991. The rate of VOC removal through landfill gas has decreased over time, which parallels the overall decline in the concentration of VOCs present within the landfill. VOC removal through leachate extraction is much less significant, although it is an important mechanism to prevent VOC migration from the landfill. The mass of total VOCs removed from groundwater due to natural attenuation processes between 1991 and 1998 is 289 lbs.

The area of greatest VOC mass removal in groundwater is the area closest to the landfill, where 202 lbs of total VOCs were removed. The calculated average half life for VOC removal is 5.6 years, based on a mass-based analysis. For comparison, the expected VOC mass removal rate for the ROD-specified groundwater extraction system was estimated to be at a maximum of 11.9 lbs of VOCs/year, based on present groundwater data. However, the concentration of VOCs in extracted water typically decreases rapidly, so it is expected the mass removal rate would decline.

The mechanisms for the significant reduction in VOCs observed at the RHL site vary for each media present. Within the landfill, VOCs are directly removed through the landfill gas extraction system, and to a lesser extent, the leachate extraction system. Also within the landfill, reductive dechlorination of chlorinated VOCs degrades a significant portion of the contaminants of concern, including PCE and TCE. Reductive dechlorination processes also occur in the saturated and unsaturated zones beneath the landfill. Downgradient of the landfill, aerobic processes further degrade the daughter products of reductive dechlorination (dichloroethane and vinyl chloride), as well as aromatic organic compounds, such as benzene and toluene.

The significant rates of VOC removal documented by the evaluation of the results of the Additional Studies indicates that remediation through landfill gas extraction and natural attenuation has been highly effective at reducing the mass and concentration of VOCs, both within the landfill and in the groundwater. In addition, the ROD specified remedy of groundwater extraction and treatment would be insignificant in comparison to remediation through the existing source controls and natural attenuation processes.

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1.0 INTRODUCTION

This *Predesign and Additional Studies Report* was prepared on behalf of the Refuse Hideaway PRP Group, and provides an analysis of the groundwater, leachate, and landfill gas studies conducted during February and March 1998 at the Refuse Hideaway Landfill (RHL) site in the Town of Middleton, Dane County, Wisconsin (see Figure 1-1). These studies were proposed to evaluate changes in landfill and groundwater conditions since completion of the Remedial Investigation (RI) in September 1994, the Feasibility Study (FS) in February 1995, and the signing of the Record of Decision (ROD) in June 1995. The purpose of gathering additional data on changes in landfill and groundwater conditions was to support a possible reevaluation of the appropriateness of the groundwater extraction and treatment system specified in the ROD.

The additional studies were included as an integral part of the *Predesign and Additional Studies Workplan* (Montgomery Watson, October 1997), which was approved by the U.S. EPA in its January 16, 1998 letter to Douglas Bach of Montgomery Watson. That letter also outlined an alternate sequence for implementation of the schedule, deferring Predesign Studies (extraction well installation, aquifer pumping test, groundwater injection test, and treatability studies) until the results of the Additional Studies were known. The unvalidated data from the Additional Studies were submitted to the U.S. EPA and the Wisconsin Department of Natural Resources (WDNR) on April 23, 1998 in the *Summary of Predesign and Additional Studies Analytical Results*. Based on its review of that summary, the U.S. EPA verbally agreed to indefinitely delay further Predesign Studies and the implementation of the ROD-specified groundwater extraction and treatment system, pending review of this *Predesign and Additional Studies Report*. Following its review of this report, the U.S. EPA will provide a written determination as to whether a remedy change is appropriate for the site, as provided in Section IX.B.5. of the Administrative Order on Consent (AOC, U.S. EPA Docket No. V-W-C-396).

1.1 ADDITIONAL STUDIES OBJECTIVES AND SCOPE

The Additional Studies portion of the *Predesign and Additional Studies Work Plan* were designed to evaluate changes in landfill and groundwater conditions since the completion of the RI/FS and ROD, which may indicate that the remedy should be changed. Specifically, the objectives for the Additional Studies listed in the Work Plan included the following:

- Documentation of changes in groundwater quality in the vicinity of the RHL site.
- Quantification of the effect of source control measures on downgradient water quality.
- Identification and evaluation of biodegradation processes within groundwater.

- Evaluation of the processes that may have led to VOCs present in the new Schultz well.

The scope of work for Additional Studies outlined in the *Predesign and Additional Studies Work Plan* is summarized below:

- Sampling and analysis of 51 monitoring wells for VOCs and for the field parameters of pH, conductivity, temperature, dissolved oxygen and oxidation-reduction potential (redox).
- Sampling and analysis of 7 leachate extraction wells for VOCs.
- Sampling and VOC analysis (method TO-14) of landfill gas from the 13 landfill gas extraction wells and 11 landfill gas probes.
- Measurement of groundwater and leachate elevations.
- Sampling and analysis for natural attenuation parameters in 13 site wells selected to represent various biogeochemical zones within the plume. Natural attenuation parameters include Ca, Mg, Fe, Na, K, Mn, total alkalinity, Cl, nitrate-N, $S0_4$, H_2S, dissolved organic carbon (DOC), CO_2, ethene, ethane, methane, hydrogen, and volatile fatty acids.
- Measurement of vertical flow in the new Schultz well using highly sensitive measurement techniques, to determine if a breach in the well annular space or its casing may be providing a pathway for vertical migration of VOCs from the sand and gravel aquifer to the underlying Mount Simon Sandstone.

Deviations from the methods outlined in the Field Sampling Plan (FSP) for the Predesign and Additional Studies are described in Appendix A.

The remainder of this report is presented under the following headings:

Section 2.0 Site Background and Additional Studies Objectives
Section 3.0 Results of Additional Studies
Section 4.0 Data Evaluation and Interpretation
Section 5.0 Conclusions

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2.0 SITE BACKGROUND AND ADDITIONAL STUDIES OBJECTIVES

2.1 SITE HISTORY

Based on information contained in the ROD, the Refuse Hideaway Landfill was licensed for waste disposal between 1974 and 1988. An estimated 1.5 million cubic yards of municipal, commercial, and industrial wastes were disposed at the site. In early 1988, volatile organic compounds (VOCs) were detected in three private residential wells, approximately one-half mile southwest of the landfill. In late 1988, the landfill was closed and covered with a soil cap consisting of 2 feet of clay, 2½ feet of cover soil, and 6 inches of top soil. In January 1989, the landfill owner declared bankruptcy.

In March 1989, the state of Wisconsin continued the investigation and remediation of the landfill. Between 1989 and 1993, the WDNR completed the following actions at the site:

- Improvements and maintenance to the soil cap, which had eroded in some areas in Fall 1992.
- Installation of point-of-entry treatment systems at two private water supply wells in August 1991.
- Installation of a landfill gas and leachate extraction system.
- Sampling and analysis of 53 private water supplies within one mile of the site.
- Conducting a routine groundwater monitoring program at the site.

The Refuse Hideaway Landfill was added to the National Priorities List (NPL) in October 1992. In October 1993, the WDNR, in cooperation with the U.S. EPA, initiated a Remedial Investigation/Feasibility Study (RI/FS) of the site. The RI was completed in September 1994 and the FS in February 1995. Continuing activities at the site have included operation and maintenance of the landfill gas and leachate extraction systems, and routine sampling of 21 monitoring wells for VOCs.

The ROD for the site was signed in June 1995, and specified a site remedy consisting of the following actions:

- Deed restrictions and zoning modifications
- Warning signs posted around the perimeter of the property.
- Maintenance of the existing landfill cap.

- Operation and maintenance of the existing landfill gas and leachate extraction systems.

- Groundwater monitoring of selected monitoring wells and private home wells.

- Extraction of the most highly contaminated groundwater (>200 ppb total VOCs) in the vicinity of the landfill and treatment of groundwater to meet applicable discharge standards.

- Injection of the treated water upgradient of the landfill to promote in situ biodegradation.

- Monitoring and evaluation of the effectiveness of the system in achieving progress toward cleanup standards.

- Supply a point-of-entry treatment system for private wells in the area exhibiting contaminants originating from RHL with concentrations exceeding NR 140 Enforcement Standards.

- Construction of a community water supply well if more cost effective than the previous action.

2.2 SITE SETTING

The description of the site setting included in this report is a condensed version from the September 1994, RI Report completed by Hydro-Search, Inc. (HSI) of Brookfield, Wisconsin. Current information from the Additional Studies was added where appropriate.

2.2.1 Surface Features

Regional topographic variation is extreme in Dane County near RHL (Figure 2-1). Local topographic relief in excess of 200 ft is common in the vicinity of the landfill. Bluffs with peak elevations often greater than 1,150 ft mean sea level (msl) are present along the north and west sides of the landfill, while the south and east sides of the landfill have ground surface elevations as low as 930 ft msl. (USGS Cross Plains 7.5 minute quadrangle).

2.2.2 Surface Water Hydrology

The RHL is located in the easternmost section of the upper Black Earth Creek drainage basin (see Figure 2-1). The Black Earth Creek drainage basin has an area of 46 square miles in Dane County, with an eastern extent reaching to about 1 mile east of the landfill. The southern edge of the drainage basin is coincident with the east-west trending topographic ridge paralleling Black Earth Creek, approximately 1 mile to the south of the creek valley. The western boundary extends nearly to the town of Black Earth, while the

northern boundary has the most irregularity, encompassing two northeast to southwest trending valleys to the northwest of the landfill.

2.2.3 Geology

The geology in the vicinity of RHL has been described in detail in the RI Report. The following is a brief summary of the information. Regionally, unconsolidated deposits of glacial origin consisting of till, outwash, and glacial lake sediments cover the area, often reaching thicknesses of several hundred feet. Bedrock in the area consists of Cambrian sandstones overlain in some areas by Ordovician dolomites. Beneath the Cambrian sandstone, is the Precambrian bedrock consisting of rhyolite, granite, and basalt at depths greater than 1,000 ft.

The site geology was interpreted from borehole logs prepared during monitor well installation by RMT and HSI. Figure 2-2 is a cross section location map with cross sections based on RMT and HSI work shown on Figures 2-3 and 2-4.

Unconsolidated Deposits

Unconsolidated deposits of Pleistocene glacial and lacustrine origin are present in the vicinity of the RHL. Glacial materials include both outwash and till; lacustrine sediments consist primarily of layered clay and silt. Thickness of the unconsolidated deposits encountered during the investigation range from 5 ft thick on the north side of the landfill, at the P-17S location, to greater than 250 ft approximately ½ mile southwest of the landfill, at the P-31 location. Composition and thickness variability is illustrated in the cross sections. Results of grain size analyses indicated the samples were variable in composition ranging from fine-grained samples with 98% clay and silt to coarse-grained samples with 46% gravel and 48% sand, although most samples consisted of a mixture of fine and coarse grains.

Bedrock

Bedrock in the RHL area consists of Ordovician Prairie Du Chien Dolomite, which caps the bluffs of the region but is absent in the valleys. Up to 105 ft of dolomite is present at P-17S, on the bluff to the northwest of the landfill. Cambrian sandstone of the Trempealeau Group underlies the dolomite. The bedrock is exposed at the ground surface in some areas of the landfill and at a road cut along U.S. Highway 14 to the southwest of the landfill. Fracturing of the bedrock is visible in the outcrops and the loss of drilling fluids while boring confirm that fracturing extends at depth within the bedrock.

Soils

The surficial soils across the site were identified in the Soil Survey of Dane County, prepared by the U.S. Department of Agriculture Soil Conservation Service (USDA SCS, 1978). Based on this information, there are two main soil types in the area of the landfill.

The soils on the northern portion of the landfill are part of the Kidder soils. These soils range from sandy clay loam to sandy loam. The Kidder soils are moderately permeable and are subject to a severe erosion hazard. The soil in the southern portion of the site is mainly part of the Dodge silt loam, which is also moderately permeable with a severe hazard of erosion. Other units in the area include the Troxel silt loam, the St. Charles silt loam, and the Radford silt loam.

2.2.4 Hydrogeology

The hydrogeology of the RHL is described in detail in the RI Report. The following is a brief summary of the regional and site specific conditions.

2.2.4.1 Regional Hydrogeology. The source of most of the groundwater in the Black Earth Creek drainage basin is direct infiltration of precipitation, however some groundwater enters the area as underflow from the south. In 1963, Cline estimated that about 7 in., of the 30 in. of average annual precipitation, recharged the groundwater reservoir. Cline's study indicated that the groundwater generally moves toward the creek where it is discharged, while some of the groundwater moves out of the basin as underflow beneath the creek valley.

In the RHL area, the water table can occur in the unconsolidated deposits or in the bedrock. The sandstone of late Cambrian age and the sand and gravel of the outwash deposits appear to be hydraulically connected. Groundwater occurs under unconfined conditions in most of the area. However, in some areas where till or lacustrine deposits overlie sandstone or outwash, the groundwater in the sandstone and outwash is commonly partially confined by the less permeable deposits and is under a small hydrostatic pressure (Cline, 1963).

The direction of regional groundwater flow coincides with the flow direction of Black Earth Creek valley, flowing from the northeast to the southwest (see the regional water table map in Figure 3-8 of the RI Report). A regional groundwater divide is indicated approximately three-quarters of a mile to the east of the RHL (Olcott, 1973).

2.2.4.2 Site Hydrogeology

2.2.4.2.1 Site Hydrogeology - A water table map was produced using measurements collected on February 9, 1998 and is shown on Figure 2-5. The water table configuration is generally consistent with historic measurements. Groundwater flow at the site is described in Section 3.6.2.1 of the RI Report. The groundwater measurements collected on February 9, 1998 are generally several feet lower than those collected in 1991, however, groundwater flow directions are very similar to those reported in the RI Report. Groundwater flows radially from a groundwater high located directly to the northwest of the limits of fill at well P17S. Generally flow beneath the landfill is to the southeast, south, and southwest with predominant flow outside of the limits of fill to the southwest, consistent with regional flow to the southwest.

Based on the elevation difference between groundwater level measurements and leachate head elevations, it appears that leachate within the landfill is not hydraulically connected to groundwater.

2.2.4.3 Groundwater Velocities.

Section 3.6.2.4 of the RI Report describes groundwater flow velocities through the various materials at the site. The water level measurements collected during the Additional Studies investigation indicated that the gradients and configuration is similar to those reported in the RI. Therefore, velocities calculated for the RI Report are applicable to current conditions at the site. As stated in the RI Report, the velocities calculated do not account for preferential flow through fractures in the bedrock, therefore, the estimated velocities and distances traveled may be underestimated. The following table summarizes estimated groundwater velocities and the distance traveled between 1990 and 1998.

Groundwater Velocities and Travel Distances

General Site Area	Material	Velocities (ft/yr.)[1]	Distance (ft, 8 yrs)
Well P17S to well P31S	Sand and Gravel	265 to 530	2120 to 4240
	Dolomite	310 to 1,561	2480 to 12488
	Sandstone	122 to 610	976 to 4880
Well P17S to well P27S	Dolomite	613 to 3051	4904 to 24408
Well 27S to well P42S	Sand and Gravel	88 to 196	704 to 1568
	Dolomite	40 to 226	320 to 1808

1 Reported on page 3-16 of the RI Report.

As shown in this table, groundwater flow rates indicate that groundwater has probably traveled a minimum of approximately 1,000 ft (P17S-P31S through sandstone) within the 8 year time frame. Migration through the sand and gravel in this area is at least 200 ft. Therefore, it can be concluded that groundwater present north of the landfill in 1990 has migrated to south of the landfill in 1998.

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3.0 RESULTS OF ADDITIONAL STUDIES

Results of the Predesign and Additional Studies Investigation are based on validated analytical data. An Analytical Data Validation Summary is included as Appendix B of this report.

3.1 LANDFILL

Sampling conducted within the landfill consists of sampling leachate from the leachate extraction wells, landfill gas from 13 landfill gas extraction wells, and 11 gas probes.

3.1.1 Leachate VOCs

Seven gas extraction wells were sampled for leachate during the February 1998 sampling round. An eighth well (GW07) was not sampled due to low well volume. Leachate accumulates and is extracted only in the western portion of the landfill.

The results of this sampling are included in Table 3.1 and are summarized on Figure 3-1. Total VOC results in these wells ranged from non-detectable to 1,300 ug/L. Total chlorinated VOCs ranged from non-detectable to 325 ug/L. Comparison to historical VOC data is difficult, because leachate from the gas head wells has generally not been sampled. Data presented in the RI from 1988 for wells LH-1 and LH-2 for VOCs ranged from 200 ug/L to 610 ug/L. Total chlorinated VOC concentrations ranged from 52 ug/L to 123 ug/L.

3.1.2 Landfill Gas

Landfill gas sampling was conducted to determine the concentration of VOCs in the landfill gas, determine the conditions within the landfill, and to estimate the rate of VOCs being removed from the landfill. Table 3.2 summarizes the VOCs from sampling of the landfill gas extraction wells and gas probes. Chlorinated VOC results are summarized on Figure 3-2 with the flow rate (in cubic feet/minute) from each extraction well. Table 3.3 summarizes the landfill gas pressures and methane concentrations. The rate of VOC removal from the landfill is summarized in section 4.

Comparison of chlorinated VOCs in the landfill gas system prior to the RI Report (1990 and 1991) and in 1998 shows a major reduction in PCE and TCE concentrations, as shown in the following table.

Landfill Gas System
Chlorinated VOCs

	PCE ppm (v/v)	TCE ppm (v/v)	Vinyl Chloride ppm (v/v)
RI Maximum Values	26	23	61
1998 Maximum Values	1.4	0.6	22

This table indicates that PCE and TCE are being effectively removed from the landfill. This is also clearly evident from distribution of PCE and TCE within the landfill. PCE is not detected in 8 of the 13 extraction wells sampled and TCE is not detected at 9 of the 13 extraction wells sampled. GW1 and GW2 contain most of the PCE and TCE within the landfill gas sampled. These wells are located in the area where the lower vinyl chloride concentration is also present. The areas with the highest vinyl chloride (GW6, GW8, and GW10) also have the lowest PCE and TCE concentrations. These observed distributions of PCE, TCE, and vinyl chloride are consistent with biodegradation within the landfill, as described in Section 4.

The presence of gas pressure within the landfill and the presence of methane at concentrations of 50% to 60% is a clear indication that methanogenesis is occurring within the landfill (see Table 3.3).

3.2 GROUNDWATER VOCS

This section summarizes the results of groundwater monitoring studies for volatile organic compounds. A complete summary of historical VOC concentrations is presented in Table 3.4. This includes data from monitoring and private wells, from as early as 1988 to February 1998. Graphs of historical VOC levels for those wells with sufficient sampling to evaluate data trends are presented in Appendix C.

Table 3.5 shows a summary of 1998 Wisconsin Administrative Code NR 140 Enforcement Standard (ES) exceedances for compounds listed in the Record of Decision (ROD) for RHL. This table shows that the number of ES exceedances has dropped from 61 wells, pre-1998 to 28 wells in 1998. The percentage drop in ES exceedances at near source wells is even greater, dropping from 38 wells in pre-1998 to 13 wells in 1998. This demonstrates a strong trend towards compliance, both near the source and downgradient.

Concentration decreases were most evident in monitoring wells near the landfill. The graphs in Appendix C illustrate the declines that have occurred. Some of these decreases are quite significant. For example, well P-1S (near the source) registers a decrease in VOCs from 340 ug/L in January 1991 to 2.3 ug/L in February 1998, and P21S dropped from 820 ug/L to 1.2 ug/L VOCs in 1998.

Monitoring wells near the landfill have shown decreasing PCE concentrations followed by subsequent decreases of TCE, DCE, and vinyl chloride levels (wells P-17S, P-21S, and P27-D, for example). The sequential nature of the observed decreases in chlorinated VOCs suggests biological degradation is occurring (see detailed discussion in Section 4).

These concentration decreases have been accompanied by a virtual cessation of plume migration downgradient. The estimated horizontal extent of the plume in 1988, 1991, and 1998 is shown in Figures 3-3, 3-4, and 3-5, respectively. Iso-concentration plots of the estimated plume boundaries in 1988, 1991 and 1998 show the plume has not advanced in the last 10 years. These figures indicate stable or decreasing VOC concentrations near the leading (southwest) edge of the plume. This indicates the plume has reached stability due to natural attenuation, through either dispersion or natural degradation.

These maps illustrate both a reduction in the size of the plume and a marked decrease in the total VOC concentrations near the source. The 200 ug/L contour (orange fill) shifts, but occupies approximately the same area in the 1988 and 1991 maps. By 1998, however (since the addition of source control) there is no area above 200 ug/L. The highest VOC concentration is 178 ug/L (at well P21D). As mentioned previously, the RHL ROD specified groundwater extraction only for areas exceeding 200 ug/L total VOCs.

In 1991, the plume is shown to be present a significant distance upgradient of the landfill (1,400 ft north of the landfill). Groundwater flow directions have been consistently shown to be to the south, southwest or southeast in this area, never to the north (see water table map, Figure 2-5 of this report and maps in the RI). In addition, the 1998 iso-concentration map shows this plume to be dissipating. These observations indicate that VOC migration upgradient had to occur through some mechanism other than groundwater flow and was a temporary release. The only mechanisms apparent are through either leachate migration in a bedrock fracture above the water table or through landfill gas migration. Due to the concentrations present in this area (up to 210 ug/L total VOCs, P26S in 1991 and 1900 ug/L total VOCs at well P17S in 1992), migration of leachate through a bedding plane fracture zone above the water table is the most likely scenario. Landfill gas migration is not expected to account for VOC concentrations this high.

These upgradient VOCs were probably caused by an increase in leachate head above the base of the landfill to some level where a continuous horizontal fracture was encountered. Migration to the north occurred prior to 1993. After 1993, operation of the leachate extraction system started to reduce the leachate levels within the landfill. Leachate head levels were recorded in the landfill at elevations as high as 28 ft above the landfill base in 1992 (see RI Report, Appendix A). These levels have been reduced by up to 22 ft in 1998. Five years of operation of the leachate extraction system have apparently eliminated the source of VOCs to the north of the landfill. VOC concentrations in groundwater have substantially reduced in the interim.

Migration of the VOCs that were present within the area north of the landfill in 1991 are migrating to the south. Much of this "upgradient" plume has migrated and continues to

migrate in groundwater beneath the landfill. It is shown that migration of VOCs upgradient of the landfill occurred before 1991. Therefore, these high concentrations have been migrating for a minimum of 8 years. Based on the groundwater flow rates within the bedrock and glacial outwash, the concentrations from north of the landfill should be present 1,900 ft to the south. Based on the monitoring well results shown on the isoconcentration map for 1998, the concentrations present north of the landfill in 1991 have not appeared downgradient of the landfill, indicating degradation of these constituents has occurred below the landfill.

There is some limited evidence of the VOCs that were present north of the landfill in 1991 being present south of the landfill in 1998. The graphs of VOCs for wells P16S, P16D, P21S and P21D shows a level or slight increase in concentration of DCE from 1988 to the 1998 sampling event at 90, 26, 10, and 100 ug/L, respectively (see graphs in Appendix C). While the concentration in the "upgradient" plume in 1991 contained significant concentrations of PCE and TCE (See graph for P17S and P26S in Appendix C), the downgradient VOCs at P16S, P16D, P21S and P21D do not show similar levels of PCE and TCE. This indicates that degradation is occurring in the groundwater below the landfill (see discussion in Section 4).

3.3 GROUNDWATER NATURAL ATTENUATION PARAMETERS

Certain aquifer conditions have been shown to either enhance or impede various natural attenuation processes in groundwater (Wiedemeier et al 1995; Wiedemeier et al 1997). Chlorinated solvents biodegradation occurs via different processes (see discussion in Section 4) under aerobic, anaerobic or reducing conditions. The rate and extent of natural attenuation reactions depend upon a number of parameters. This section describes the results of these natural attenuation parameters. The sampling round conducted in February 1998 analyzed 13 wells for a variety of these parameters, including nitrate-nitrogen, ethane, ethene, hydrogen (12 wells), redox potential, and dissolved oxygen. The results of this sampling are shown in Figure 3-6 and listed in Table 3.6.

Select natural attenuation parameters, shown on Figure 3-6, indicate that the groundwater conditions around and downgradient of the RHL are generally aerobic. This is shown by consistency between the measurements of redox potential, dissolved oxygen (D.O.), and nitrate concentrations. Redox potential is a measure of the ability for the groundwater to either reduce or oxidize constituents within the groundwater. Reducing conditions are shown by negative redox values while oxidizing conditions are shown by positive values. As shown on Figure 3-6, almost all the wells show weakly reducing to oxidizing conditions (>-69 mv to <179 mv). The only exception to this is at well P08S, which shows a moderate to strong reducing condition (-119 mv). D.O., a direct measure of dissolved oxygen in groundwater, showed values greater than 4.8 mg/L at all wells except P8S. P8S had a DO of 0.9 mg/L, indicating anoxic (probably anaerobic) conditions. Nitrate, sulfate and sulfide concentrations (lab analysis parameters) were consistent with the DO and redox

observations, the groundwater is aerobic at all locations around the landfill, except at well P8S, where anaerobic conditions were observed.

Hydrogen levels were highest, for the most part, near the south edge of the landfill. Concentrations ranged from 0.7 nonomoles/l to 7.0 nonomoles/l. Hydrogen levels present in the groundwater at concentrations >1nm indicate that reductive degradation is possible (Wiedemeier, 1996). The hydrogen concentrations at well P08S is the highest observed at the site, except for P40I, over 1 mile downgradient. This is consistent with the presence of the strongest reducing conditions at well P8S. The hydrogen concentrations in other wells adjacent to the landfill are the highest observed at the site, probably indicating that the hydrogen concentration upgradient, beneath the landfill, is higher.

In summary, the natural degradation parameters indicate strong reducing conditions, with the presence of hydrogen at well P8S. All other wells adjacent to the landfill indicate aerobic conditions downgradient of the landfill. The hydrogen data at the southern edge of the landfill indicate that reducing conditions are probably present upgradient, beneath the landfill. Well P08S is probably the downgradient edge of the reducing conditions present beneath the landfill.

3.4 NEW SCHULTZ WELL INVESTIGATION

This section presents the results of groundwater sampling and geophysical logging using a heat pulse flow meter conducted at the new Schultz well (Schultz well) during the Additional Studies portion of the Predesign activities.

3.4.1 Groundwater Sampling

Based on detections of VOCs from sampling conducted in April 1992 and June 1996, the Schultz well was sampled and analyzed for VOCs to evaluate whether VOC remain in the well, which is completed in the Mount Simon Sandstone. Previous sampling detected total VOCs at approximately 10 ug/L. Results of groundwater sampling conducted at the Schultz well during the Additional Studies indicate VOC concentrations consistent with previous sampling events. Total VOCs were detected at 13 ug/L in February 1998.

A summary of VOC concentrations for the new Schultz well is included in Table 3.4. Deviations from field methods included in the Field Sampling Plan (FSP) during groundwater sampling of the Schultz well are detailed in Appendix A of this report.

3.4.2 Flow Meter Logging

A heat pulse flow meter was used to determine if vertical flow was occurring within the well casing, suggesting a breach. Additionally, the area just below the base of the well casing was logged to determine if there was vertical flow occurring which would suggest the well annular space was not adequately sealed. Vertical flow at either of these locations would suggest groundwater was migrating downward from the Eau Claire sandstone, above the shaley Eau Claire Facies, into the Mount Simon sandstone located below the shaley Eau Claire Facies, within which the Schultz well is completed.

Flow recorded within the well was insignificant, indicating that there was not a breach in the casing and the well annular space is adequately sealed. Results are presented in communication received from Dr. Kenneth Bradbury of the Wisconsin Geologic and Natural History Survey included in Appendix D.

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4.0 DATA EVALUATION AND INTERPRETATION

Section 3 documents that improvements in quality of groundwater, landfill gas and landfill leachate have occurred through time. This section quantifies the rate of extraction of VOCs from the landfill gas and landfill leachate and estimates the rate of change occurring within the groundwater quality. These changes in groundwater quality are due to several mechanisms occurring within the landfill and the groundwater. Knowing the mechanisms in operation is essential to determine whether these processes will continue in the future. This chapter closes with a description of the mechanisms that are operating to cause these changes in concentrations.

4.1 VOC REDUCTION EVALUATION

4.1.1 Leachate and Landfill Gas Extraction Systems

4.1.1.1 Leachate Extraction System. Historical leachate pumping data from the RI Report indicates that in 1992 and 1993 approximately 229,990 gal and 144,588 gal. of leachate were removed from the landfill, respectively. This results in an average yearly leachate removal rate of approximately 187,289 gal. Since the leachate extraction system started operation in July 1991, and was upgraded in 1996, the system would have extracted approximately an average annual volume of 187,289 gal of leachate for the first five years of operation. The five year total removal would have been approximately 936,445 gal.

Based on WDNR records for the 11 month period of July 1997 through May 1998 approximately 457,950 gal were extracted. Assuming that this removal rate was similar to that for the two years following the extraction system upgrade, the quantity of leachate removed in the two years of operation would have been approximately 997,600 gal. The total quantity of leachate extracted by the extraction system from July 1991 through July 1998 is approximately 1,934,045 gal.

A total VOC concentration of 199.98 ug/L was measured at the leachate tank on November 30, 1992. An average concentration of 346.5 ug/L was calculated for the leachate samples taken on February 18, 1998. Since the volumes contributed by each well are not known, this value is assumed representative for the cumulative volume in the tank. The average of these two total concentration values is approximately 273.24 ug/L. In order to calculate the total pounds of VOCs removed from the landfill by the leachate extraction system a total VOC concentration value of 250 ug/L is used. Assuming 2,000,000 gal. of leachate has been extracted from the landfill, the total pounds of VOCs removed is approximately 4 lb.

4.1.1.2 Landfill Gas Extraction System. The landfill gas extraction system was started in July, 1991 and has been sampled for full VOC analyses on three occasions, June 11, 1990 during a gas system test, August 2, 1991 during full scale operation and February 18, 1998 during this study. Results of the mass removal estimates are presented in Table 4.1 (1990 and 1991) and in Table 4.2 (1998). These estimates use the analytical results and the

flow rates from the entire system (1990 and 1991) or individual wells (1998). Non-methane VOC removals from each date are as follows:

Landfill Gas Extraction System
Extraction Estimates

	Flow Rate (cfm)	VOC Removal Rate (lbs/yr)	Chlorinated VOC Removal Rate (lbs/yr)
June 1990 System Test	100	3,669	3,370
August 1991	430	5, 889	2251
February 1998	261	810	328
		lbs over 7.6 years	lbs over 7.6 years
Total Mass Removed		26,300	15,087

These results show conclusively that the landfill gas system has been effective at reducing VOCs from the landfill gas. Even though the extraction system is not operating at as high a rate in 1998 as in 1990, the rate of VOC removal has declined dramatically. This probably is due to the decline in VOC concentration in leachate, landfill gas and within the waste mass as a whole.

Total VOCs and total chlorinated VOCs removed from the landfill over the 7.6 years of operation is also very significant (26,300 lbs and 15,087 lbs, respectively). It should also be recognized that a significant amount of the mass removed from the landfill is in the form of degraded PCE and TCE (i.e., DCE, vinyl chloride and the non-analyzed degradation products of vinyl chloride). Therefore, this estimate is a minimum value. Converting just the DCE and vinyl chloride back to ½ PCE and ½ TCE would almost double the mass removed.

The 15,087 lbs of chlorinated VOCs removed through the landfill gas system can be roughly equated to 1,400 gals of solvents (assuming an average specific gravity of 1.3). A significant amount of the chlorinated VOCs in the landfill gas are present as degradation products of parent compounds (i.e., DCE and vinyl chloride).

4.1.2 Groundwater

Section 3 has demonstrated that the concentrations in the groundwater have generally reduced through time. This section quantifies the reduction in VOC concentrations and the mass of VOCs in the groundwater, assuming a logarithmic decay (first order rate decay). This is a reasonable assumption based on the straight line decline shown on many of the semi-log graphs shown in Appendix C. The decay rate constants presented in this analysis are shown as %/yr. This can be described as the decrease in contaminants as a percentage each year. Commonly, decay rates are described using half lives, where one half life is the time to reach ½ the current concentration, or ½ the mass of contaminant. For example, an initial mass of 12 lbs decaying at a first order rate constant of 69.3 %/year is decaying with

a half life of 1 year. The mass after one year of decay would be 6 lbs, 3 lbs after 2 years, 1.5 lbs after 3 yrs., and so on. (1 year half life has a decay rate constant of 69.3%/year, not 50%/yr, because it is logarithmic decay, not linear).

The decay rates and half lives can be estimated from the observed data using two methods. The first method is using the decline in concentration observed at individual wells. This decay is apparent on many of the graphs in Appendix C, and is quantified in the Concentration-Based Decay Rate Estimates section. Another method is to use the decline in mass of the entire plume or within parts of the plume. This method uses the iso-concentration contours mapped in 1991 and in 1998 (Figures 3-4 and 3-5) and is quantified in the Mass-Based Decay Rate Estimates section.

4.1.2.1 Concentration-Based Decay Rate Estimates. The individual-well decay rate constants were calculated from historic data since January 1991. These constants are summarized in Table 4.2. The average of the non-negative rate constants was 32%/yr, corresponding to an average half life of 2.16 years. There was a fairly wide variation in degradation rates due to differences in well location, screened depth, and hydrogeologic parameters. Overall, however, the data indicates a steady trend of decreasing contaminant concentrations.

4.1.2.2 Mass-Based Decay Rate Estimates. Mass estimations indicate a significant overall reduction in contaminants as well, from a total of 490 lbs in 1991 to only 201 lbs in 1998 (see Table 4.3). This corresponds to a decay rate of 12%/yr or a mass half life of 5.6 years. The greatest rate of decay occurred in the area of the plume's source, with a lower decay rate downgradient. The source area showed a decay rate of 19%/yr while downgradient showed only a 7%/yr decay rate.

While this suggests lower rates of decay than the concentration-based estimates, it is likely more indicative of the actual rate of contaminant destruction, since dilution and other non-destructive mechanisms do not affect the result. Total mass reduction by area shows similar trends—from 272 lbs to 70 lbs near the source and 218 lbs to 131 lbs in the downgradient portion.

The primary observation drawn from this is that the mass is declining both near the source and downgradient of the landfill. This indicates that:

- The plume is not simply moving downgradient, it is being degraded
- The landfill is no longer not acting as a significant source of contaminant mass to the groundwater.

An understanding of the mechanisms behind these decay rates is presented in Section 4 to help confirm whether these rates of decay will continue.

4.1.2.3 VOC Mass Removal Through Groundwater Extraction. The expected rate of VOC mass removal through the ROD-specified groundwater extraction remedy was calculated for comparison to VOC mass removal through mechanisms already occurring at the site. The FS assumed four extraction wells, with three wells pumping at 10 gpm and one well pumping at 15 gpm, for a total extraction rate of 45 gpm. The February 1998 data from monitoring wells located closest to each of the four proposed extraction wells was used to estimate the expected influent concentration at the extraction wells. Using this approach, the expected rate of VOC mass removal from the ROD-specified groundwater extraction system would be at a rate of 11.9 lbs/yr initially upon startup of the extraction system. However, the concentration of VOCs in extracted water typically dilutes rapidly, so it is expected the mass removal rate would decline.

4.2 VOC MASS REDUCTION MECHANISMS

VOCs have been shown to be present at RHL in landfill gas, leachate, and groundwater. The reduction of VOC concentrations in these subsurface environments can occur through many mechanisms, including; dispersion, adsorption, volatilization, extraction, and biological or chemical degradation. Limited dispersion and adsorption are occurring at RHL, as shown by the extent of VOCs present at the site. The remaining mechanisms (volatilization, extraction and degradation) result in the removal of VOCs from the site.

Mass reduction can be occurring in each of the media where VOCs are found to be present landfill gas, leachate, and groundwater. Figure 4-1 illustrates the mechanisms occurring within each media. These include removal of VOCs in the landfill gas extraction, leachate extraction and through biological degradation. The mechanisms occurring within each media are briefly described in the following sections.

4.2.1 Landfill Gas Extraction

The current landfill gas extraction system was installed to satisfy the requirement of controlling methane within the landfill gas. However, as shown through the landfill gas analysis (see section 3.1) there has been a significant concentration of VOCs present within the landfill gas. The presence of VOCs within the landfill gas is to be expected due to their volatile nature. The concentration of VOCs within the landfill gas is dependent on the concentration of the source of VOCs within the waste mass and on the rate of landfill gas extraction. In addition, the concentration of VOCs within the landfill gas is interrelated to the VOC concentration in leachate. The lower the VOCs in the landfill gas, the lower the VOC concentration will be in the leachate.

Section 4.1 has shown that the landfill gas extraction system has removed a significant mass of VOCs and chlorinated VOCs from the landfill (a minimum of 26,300 lbs and 15,087 lbs, respectively). This indicates that the mass of VOCs present with the landfill has been reduced substantially.

4.2.2 Leachate Extraction

Extracting leachate containing VOCs has the direct benefit of removing VOCs from within the landfill. However, as shown in the analysis of leachate at RHL, the concentration of VOCs in leachate is relatively low (e.g., the highest is cis-1,2-DCE at 58 ug/L). The historical leachate concentration had to be higher to result in the historical groundwater concentrations. The currently very low leachate concentrations are due to:

- The large mass of VOCs having been removed through the landfill gas system
- The effect of the landfill gas extraction system keeping the VOCs in the vapor phase, not in the liquid phase
- Degradation of VOCs in the anaerobic landfill environment (see discussion in section 4.2.3)

4.2.3 Biological Degradation

4.2.3.1 Aromatic VOCs. Aromatic organics (e.g., benzene, toluene, ethylbenzene, xylene) typically degrade through direct metabolism in the presence of some electron donor (e.g., oxygen in aerobic environments, nitrates in slightly anaerobic systems). Aerobic environments are shown to occur within the groundwater system in most areas. As shown in Figure 4-1 an aerobic environment is present even near the edge of the landfill, extending downgradient of the landfill. Degradation of aromatic organics in the aerobic groundwater explains the lack of aromatic organics at locations downgradient of the landfill, past well nest W25.

4.2.3.2 Chlorinated VOCs, General Discussion. Chlorinated VOCs biodegradation occurs through three primary mechanisms: reductive dehalogenation, electron donor reactions and co-metabolism (Wiedemeier, 1996). Reductive halogenation is the sequential removal of chlorine from a higher chlorinated VOC, producing the sequence of degradation from PCE to TCE to DCE to vinyl chloride, and ultimately to ethene. This biological process uses the chlorinated VOC as an electron acceptor in an anaerobic environment (i.e., microbes metabolizing natural organics, in the lack of oxygen, will degrade PCE as part of this process). Landfill leachate is an ideal source of these natural organics. Wiedemeier (1996) states that in the presence of landfill leachate this degradation, "results in the rapid and extensive degradation of the highly chlorinated solvents such as PCE, TCE and DCE." However, this process may accumulate the lower chlorinated VOCs (cis-1,2-DCE and vinyl chloride) because of their slower degradation rate in anaerobic conditions.

Electron donor reactions is a process where bacteria obtain energy from an organic compound (i.e., microbes metabolizing a VOC in the presence of oxygen). Vinyl chloride can be degraded through this reaction to CO_2 and water in an aerobic environment. DCE can be degraded through either the reductive dechlorination or electron donor reactions, but is shown to occur more slowly than the other compounds.

Co-metabolism can degrade certain chlorinated VOCs by the enzymes or other factors associated with biological activity unrelated to the chlorinated VOCs. Co-metabolism has been shown to occur in aerobic environments, and may occur in anaerobic environments as well. Wiedemeier (1996) reports that TCE, DCE, and vinyl chloride are susceptible to degradation under this process, and that DCE and vinyl chloride are more susceptible than TCE. PCE is reported as not being susceptible to degradation under this mechanism. It is assumed for the purposes of this report that co-metabolism is not a primary method for degradation of VOCs at RHL. However, this does not rule out the possibility that it is occurring.

Wiedemeier (1996) describes the most fortuitous scenario for degradation of chlorinated VOCs is the presence of an anthropogenic organic substrates (e.g., landfill leachate) in an anaerobic environment followed by an aerobic environment. In this scenario, PCE and TCE are degraded rapidly. DCE is degraded less rapidly. Vinyl chloride is then oxidized to CO_2 in the aerobic environment. As shown in the following sections this is exactly what is happening at RHL.

4.2.3.3 Reductive Dehalogenation in the RHL Waste Mass. As shown in Figure 4-1 the anaerobic conditions that favor destruction of PCE and TCE are illustrated to be present within the landfill, in the unsaturated zone below the landfill, and in the groundwater beneath the landfill. The methane generating conditions within the landfill provide a very strong reducing condition and is an ideal environment for the degradation of the higher chlorinated VOCs of concern at RHL (PCE, TCE, and DCE). However, vinyl chloride could accumulate within this environment. This is definitively shown in the landfill gas analyses (see Figure 3-2) and leachate analyses (see Table 3.1, p. 42) that shows PCE and TCE to be nearly entirely removed from the landfill gas and leachate. Vinyl chloride is shown to be the predominant VOC in the landfill gas and DCE and vinyl chloride are present at low concentrations in the leachate. PCE and TCE are shown to be almost entirely removed from the waste mass, although there are likely to be isolated areas present within the waste mass that continue to leach PCE and TCE. However, the very large source of carbon within RHL is sufficient to fuel reductive dehalogenation for a longer time than the mass of VOCs will be present.

4.2.3.4 Reductive Dehalogenation in the Unsaturated Zone below RHL. No data has been collected on the status of the unsaturated zone below the RHL (drilling through a landfill base for this data would be inappropriate) although, it is expected that this area would also be anaerobic and would promote reductive dehalogenation. The presence of a small saturated zone at the base of RHL helps to limit the ability of the landfill gas system to pull O_2 beneath the RHL, thereby, maintaining reducing conditions within the unsaturated zone beneath the RHL. This is also supported by the presence of anaerobic conditions in at least one well adjacent to the RHL (see following discussion). Therefore, it can be assumed that reductive dehalogenation is also occurring within the unsaturated zone beneath the RHL.

4.2.3.5 Reductive Dehalogenation in the Saturated Zone Below RHL. Reducing conditions in the groundwater beneath the RHL are shown to extend to one well adjacent to RHL (well W08S, D.O.<1 mg/L, redox -119 mv) indicating that this well is under reducing conditions. It is expected that the groundwater beneath and adjacent to a landfill would have reducing conditions, especially for a landfill without an engineered liner. Therefore, the aerobic conditions at wells P16S, P21S (D.O. concentrations > 5.8 mg/L, redox >100 mv) is considered unusual. These aerobic conditions are probably due to the recharge of aerated water running off the large slope on the south side of the landfill (see illustration on Figure 3-1). This surface water runoff should be highly aerobic and recharges the groundwater at the toe of the landfill. Based on these conditions, it is expected that reductive dehalogenation is occurring within the saturated zone beneath the RHL.

4.2.3.6 Aerobic Degradation in Saturated Zone Downgradient of RHL. The groundwater downgradient of RHL is shown to be aerobic at nearly all wells sampled (D.O. >1 mg/L and redox >0 mv). Under these conditions the degradation of DCE and vinyl chloride are shown to occur through direct oxidation (i.e., the bugs will eat DCE and vinyl chloride).

These decay rates were computed from observed VOC concentrations. VOC concentrations indicate that the PCE, TCE, DCE, and vinyl chloride are degrading. The environments in which these compounds are degrading show that PCE, TCE, and some DCE are degrading through reductive dehalogenation within and below the landfill. DCE and vinyl chloride are shown to be degrading aerobically in the aerobic zones downgradient of the landfill.

It appears that natural attenuation has produced significant decreases in contaminant concentrations near the source. Control of the landfill as a source area has stabilized and prevented further migration near the distal end of the plume. In addition, the mass removal rate by degradation within the entire plume (41 lbs/year) is significantly higher than what would likely be obtained by a pump and treat system installed near the source. From these observations, it appears that natural attenuation, combined with continued monitoring and source control, presents an efficient, expeditious, and protective alternative to engineered remediation methods at the Refuse Hideaway Landfill site.

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5.0 CONCLUSIONS

Based on the results and analysis of the Additional Studies conducted at the Refuse Hideaway Landfill Site, Montgomery Watson concludes the following:

- Leachate levels within the landfill have been lowered by up to 22 ft due to operation of the leachate extraction system. In addition, the leachate does not appear to be hydraulically connected to groundwater, based on the difference in elevation between recorded leachate heads and groundwater level measurements.

- Concentrations of chlorinated VOCs in landfill gas have decreased dramatically since the 1991 sampling. The decrease is most dramatic for PCE and TCE, indicating that reductive dechlorination of these compounds is occurring within the landfill.

- No monitoring wells contained total VOCs in excess of 200 ug/L, the level specified in the ROD as requiring groundwater extraction and treatment.

- VOCs that have historically been detected north (upgradient) of the landfill are likely due to past release of leachate into a horizontal fracture in the bedrock adjacent to the landfill's northern edge. This release likely occurred when leachate levels were significantly higher, prior to the start-up of the leachate extraction system in 1993.

- Results for natural attenuation parameters in groundwater indicate generally aerobic conditions, with the exception of monitoring well P-8S, which is located close to the landfill's southern edge.

- Groundwater monitoring results for VOCs at the new Schultz well indicated a concentration consistent with previous analytical results for this well and heat-pulse flow meter logging of the new Schultz ~~the~~ well indicated the well and its annular space are probably not a conduit for the migration of VOCs.

- The landfill gas extraction system has removed an estimated 26,300 lbs of total VOCs and 15,087 lbs of chlorinated VOCs from the landfill since start-up of the system in 1991. Mass removal through landfill gas extraction continues to be the most significant removal mechanism, although the rate has declined with declining mass of VOCs within the landfill.

- An evaluation of the decay rate of total VOCs within groundwater indicated an average half life of 2.16 yrs, when calculated for individual monitoring wells, and an average half life of 5.6 yrs when calculated based on mass estimates within the total plume area.

- Estimates of total VOC mass reduction within the plume indicate a decline in total VOC mass of 289 lbs from 1991 to 1998. Mass reduction in the area nearest the source accounted for 202 lb of the decline.

- The mechanisms responsible for the reduction in total VOCs and chlorinated VOCs at the Refuse Hideaway Landfill are likely to be different for various media present at the site. These mechanisms include:

  - Direct removal through landfill gas and leachate extraction

  - Reductive dehalogenation of chlorinated VOCs in the landfill waste mass and in the zone beneath the landfill

  - Aerobic degradation of DCE, vinyl chloride, and aromatic organic compounds in groundwater downgradient of the landfill.

- The predicted VOC removal rate through the ROD-specified remedy would be insignificant in comparison to removal rates through existing source control and natural attenuation processes.

In summary, the results and analysis of the Additional Studies at the Refuse Hideaway Landfill site indicate that natural attenuation has produced significant decreases in contaminant concentrations and mass near the source. Control of the landfill as a source area has stabilized and prevented further migration near the distal end of the plume. The mass removal rate by existing source control measures and natural attenuation mechanisms is far greater than what would be anticipated through implementation of the ROD-specified groundwater extraction system. Based on these observations, natural attenuation, combined with continued monitoring and source control, provides an efficient, expeditious, and protective alternative to the ROD-specified alternative at the Refuse Hideaway Landfill Site.

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Table 3.1
Validated Leachate Analytical Results - Volatiles
Refuse Hideaway Landfill
Middleton,Wisconsin

Parameter	UNIT	RH-LHGW04-01 187460 2/18/98 CONC	LQ/DV(	RDL	RH-LHGW05-01 187461 2/18/98 CONC	LQ/DV(	RDL	RH-LHGW08-01 187455 2/18/98 CONC	LQ/DV(	RDL	RH-LHGW09-01 187456 2/18/98 CONC	LQ/DV(	RDL	RH-LHGW11-01 187457 2/18/98 CONC	LQ/DV(	RDL	RH-LHGW12-01 187458 2/18/98 CONC	LQ/DV(	RDL
Volatiles																			
Chloromethane	ug/L	0.6	/	0.5	1.1	/	0.5		U/	0.5	150	/	0.5	250	/	0.5	1	/	0.5
Bromomethane	ug/L		U/	0.7		U/	0.7		U/	0.7	19	/J	0.7	45	/J	0.7		U/	0.7
Vinyl Chloride	ug/L		U/	0.3		U/	0.3		U/	0.3	48	/	0.3	30	/	0.3	13	/	0.3
Chloroethane	ug/L		U/	0.7		U/	0.7		U/	0.7		U/	0.7		U/	0.7		U/	0.7
Methylene Chloride	ug/L		U/	0.4		U/	0.4		/U	2		U/	0.4		U/	0.4		U/	0.4
Acetone	ug/L		U/	4.8		U/	4.8		U/	4.8		U/	4.8		U/	4.8	9	/J	4.8
Carbon Disulfide	ug/L		/U	1.4		/U	0.6		U/	0.4		/U	12		/U	28	12	/J	0.4
1,1-Dichloroethene	ug/L		U/	0.1		U/	0.1		U/	0.1		U/	0.1		U/	0.1		U/	0.1
1,1-Dichloroethane	ug/L		U/	0.2		U/	0.2		U/	0.2		U/	0.2		U/	0.2		U/	0.2
Cis-1,2-Dichloroethene	ug/L	0.2	/	0.2	0.4	/	0.2	1	/	0.2	58	/	0.2		U/	0.2	3.8	/	0.2
Trans-1,2-Dichloroethene	ug/L	0.4	/	0.2	0.8	/	0.2		U/	0.2		U/	0.2		U/	0.2	0.7	/	0.2
Chloroform	ug/L		U/	0.2		U/	0.2		U/	0.2	26	/	0.2	45	/	0.2		U/	0.2
1,2-Dichloroethane	ug/L		U/	0.2		U/	0.2		U/	0.2		U/	0.2		U/	0.2		U/	0.2
2-Butanone	ug/L		U/	3.3		U/	3.3		U/	3.3	220	/J	3.3	780	/J	3.3	3.9	/J	3.3
1,1,1-Trichloroethane	ug/L		U/	1		U/	1		U/	1		U/	1		U/	1		U/	1
Carbon Tetrachloride	ug/L		U/	0.2		U/	0.2		U/	0.2		U/	0.2		U/	0.2		U/	0.2
Bromodichloromethane	ug/L		U/	0.2		U/	0.2		U/	0.2		U/	0.2		U/	0.2		U/	0.2
1,2-Dichloropropane	ug/L	0.3	/	0.1	1.1	/	0.1		U/	0.1		U/	0.1		U/	0.1		U/	0.1
cis-1,3-Dichloropropene	ug/L		U/	0.1		U/	0.1		U/	0.1		U/	0.1		U/	0.1		U/	0.1
Trichloroethene	ug/L		U/	0.2	0.2	/	0.2		U/	0.2		U/	0.2		U/	0.2		U/	0.2
Dibromochloromethane	ug/L		U/	0.2		U/	0.2		U/	0.2		U/	0.2		U/	0.2		U/	0.2
1,1,2-Trichloroethane	ug/L		U/	0.3		U/	0.3		U/	0.3		U/	0.3		U/	0.3		U/	0.3
Benzene	ug/L	3.3	/	0.1	3.5	/	0.1	2.5	/	0.1	3	/	0.1	5	/	0.1		U/	0.1
trans-1,3-Dichloropropene	ug/L		U/	0.2		U/	0.2		U/	0.2		U/	0.2		U/	0.2		U/	0.2
Bromoform	ug/L		U/	0.2		U/	0.2		U/	0.2		U/	0.2		U/	0.2		U/	0.2
4-Methyl-2-pentanone	ug/L		U/	1.8		U/	1.8		U/	1.8		U/	1.8		U/	1.8		U/	1.8
2-Hexanone	ug/L		U/	2.4		U/	2.4		U/	2.4		U/	2.4		U/	2.4		U/	2.4
Tetrachloroethene	ug/L		U/	0.2		U/	0.2		U/	0.2		U/	0.2		U/	0.2		U/	0.2
1,1,2,2-Tetrachloroethane	ug/L		U/	0.2		U/	0.2		U/	0.2		U/	0.2		U/	0.2		U/	0.2
Toluene	ug/L	0.7	/	0.2	1.5	/	0.2	2.5	/	0.2	35	/	0.2	35	/	0.2	13	/	0.2
Chlorobenzene	ug/L	2.3	/	0.1	1.8	/	0.1	2.5	/	0.1		U/	0.1		U/	0.1	1.2	/	0.1
Ethylbenzene	ug/L	7.1	/	0.1	73	/	0.1	24	/	0.1	23	/	0.1	25	/	0.1	20	/	0.1
Styrene	ug/L		U/	0.1	0.8	/	0.1		U/	0.1	2	/	0.1		U/	0.1	0.6	/	0.1
Xylene, total	ug/L	3.4	/	0.3	48	/	0.3	33	/	0.3	66	/	0.3	72	/	0.3	23	/	0.3
Field Measurements																			
Groundwater Elevation	ft.																		
pH	SU																		
Specific Conductivity @ 25 C	mmoh/cm																		
Water Temperature	deg C																		
Redox Potential	mV																		
Dissolved Oxygen	mg/L																		

Table 3.1
Validated Leachate Analytical Results - Volatiles
Refuse Hideaway Landfill
Middleton,Wisconsin

		RH-LHGW04-01			RH-LHGW05-01			RH-LHGW08-01			RH-LHGW09-01			RH-LHGW11-01			RH-LHGW12-01		
		187460			187461			187455			187456			187457			187458		
		2/18/98			2/18/98			2/18/98			2/18/98			2/18/98			2/18/98		
Parameter	UNIT	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL
VOCs - Quantified Detects																			
1,2,4-Trimethylbenzene	ug/L	1	JN/Q		12	JN/Q		4.4	JN/Q		11	JN/Q		1.9	JN/Q		7.5	JN/Q	
1,2-Dichlorobenzene	ug/L	1.3	JN/Q		3.4	JN/Q		1.6	JN/Q		1.1	JN/Q					0.75	JN/Q	
1,4-Dichlorobenzene	ug/L	15	JN/Q		12	JN/Q		8	JN/Q		11	JN/Q		20	JN/Q		8.8	JN/Q	
1,3,5-Trimethylbenzene	ug/L	0.19	JN/Q		3.5	JN/Q		1.7	JN/Q		3.7	JN/Q		4.2	JN/Q		2	JN/Q	
1,3-Dichlorobenzene	ug/L																		
Bromobenzene	ug/L	0.49	JN/Q		0.34	JN/Q											0.31	JN/Q	
Dichlorodifluoromethane	ug/L				4.1	JN/Q													
Di isopropyl ether	ug/L	0.29	JN/Q		0.43	JN/Q													
Isopropylbenzene	ug/L	2.5	JN/Q		7.4	JN/Q		1	JN/Q		2.2	JN/Q		2.8	JN/Q		1.2	JN/Q	
N-Butylbenzene	ug/L	0.37	JN/Q		38	JN/Q											0.28	JN/Q	
N-Propylbenzene	ug/L	2.7	JN/Q		1.9	JN/Q		0.8	JN/Q		2.2	JN/Q		3.2	JN/Q		1	JN/Q	
Naphthalene	ug/L	19	JN/Q		12	JN/Q		11	JN/Q		15	JN/Q		26	JN/Q		20	JN/Q	
p-Isopropyltoluene	ug/L	0.2	JN/Q		2.3	JN/Q		1.4	JN/Q		3.6	JN/Q		7	JN/Q		3	JN/Q	
Tetrahydrofuran	ug/L	1300	JN/Q		730	JN/Q		1270	JN/Q		150	JN/Q		290	JN/Q		450	JN/Q	
VOC-TICs																			
1,2,3-Trimethylbenzene	ug/L				3.3	JN/											3	JN/	
1,3-Oxathiolane	ug/L	12	JN/					18	JN/								6.6	JN/	
1,4-Dioxane	ug/L	3.4	JN/																
1,3,3-t-Bicyclo[2.2.1]hep	ug/L	5.6	JN/														13	JN/	
1,7,7-t-Bicyclo[2.2.1]hep	ug/L	4.2	JN/														27	JN/	
1-Ethyl-2-methylbenzene	ug/L				4.1	JN/													
2,4-Dimethyl-3-pentanone	ug/L	15	JN/		27	JN/		43	JN/		34	JN/		30	JN/		23	JN/	
2-Butenylbenzene	ug/L	4.7	JN/																
2-Methyl-5-(1-methylcyclo	ug/L																3	JN/	
2-Pentanone	ug/L										18	JN/		82	JN/				
3,7,7-t-Bicyclo[4.2.0]hep	ug/L																6.3	JN/	
3-methylbutanal	ug/L				5.6	JN/											4.5	JN/	
Acetic Acid	ug/L													98	JN/				
bicyclo[2.2.1]heptan-2-on	ug/L				46	JN/		61	JN/		56	JN/		94	JN/				
Indane	ug/L	2.8	JN/																
Trimethylsilanol	ug/L	23	JN/		25	JN/											13	JN/	
Unknown	ug/L													96	J/				
Unknown @ 10.18 min	ug/L	2.5	J/																
Unknown @ 10.30 min	ug/L																		
Unknown @ 10.32 min	ug/L																		
Unknown @ 26.69 min	ug/L							11	J/										
Unknown @ 28.47 min	ug/L				5.4	J/													
Unknown @ 28.48 min	ug/L																		
Unknown @ 29.44 min	ug/L				4.2	J/													
Unknown @ 29.45 min	ug/L							5.1	J/										
Unknown @ 6.23 min	ug/L							7.2	J/										
Unknown @ 8.47 min	ug/L							11	J/										

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Refuse Hideaway Landfill
Middleton,Wisconsin

		RH-LHGW13-01 187459 2/18/98			RH-LHGW13-91 187462 2/18/98		
Parameter	UNIT	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL
Volatiles							
Chloromethane	ug/L	1.6	/	0.5		U/	0.5
Bromomethane	ug/L		U/	0.7		U/	0.7
Vinyl Chloride	ug/L	10	/	0.3	10	/	0.3
Chloroethane	ug/L		U/	0.7		U/	0.7
Methylene Chloride	ug/L		U/	0.4		/U	0.6
Acetone	ug/L	5.6	/J	4.8		U/	4.8
Carbon Disulfide	ug/L		/U	2.2		U/	0.4
1,1-Dichloroethene	ug/L		U/	0.1		U/	0.1
1,1-Dichloroethane	ug/L	0.4	/	0.2	0.3	/	0.2
Cis-1,2-Dichloroethene	ug/L	7.3	/	0.2	6.4	/	0.2
Trans-1,2-Dichloroethene	ug/L	1	/	0.2	1	/	0.2
Chloroform	ug/L		U/	0.2		U/	0.2
1,2-Dichloroethane	ug/L		U/	0.2		U/	0.2
2-Butanone	ug/L		U/	3.3		U/	3.3
1,1,1-Trichloroethane	ug/L		U/	1		U/	1
Carbon Tetrachloride	ug/L		U/	0.2		U/	0.2
Bromodichloromethane	ug/L		U/	0.2		U/	0.2
1,2-Dichloropropane	ug/L		U/	0.1	0.7	/	0.1
cis-1,3-Dichloropropene	ug/L		U/	0.1		U/	0.1
Trichloroethene	ug/L		U/	0.2	0.2	/	0.2
Dibromochloromethane	ug/L		U/	0.2		U/	0.2
1,1,2-Trichloroethane	ug/L		U/	0.3		U/	0.3
Benzene	ug/L	2.8	/	0.1	2.7	/	0.1
trans-1,3-Dichloropropene	ug/L		U/	0.2		U/	0.2
Bromoform	ug/L		U/	0.2		U/	0.2
4-Methyl-2-pentanone	ug/L		U/	1.8		U/	1.8
2-Hexanone	ug/L		U/	2.4		U/	2.4
Tetrachloroethene	ug/L		U/	0.2		U/	0.2
1,1,2,2-Tetrachloroethane	ug/L		U/	0.2		U/	0.2
Toluene	ug/L	8.4	/	0.2	8.2	/	0.2
Chlorobenzene	ug/L	2.3	/	0.1	2.4	/	0.1
Ethylbenzene	ug/L	40	/	0.1	30	/	0.1
Styrene	ug/L	1	/	0.1	0.9	/	0.1
Xylene, total	ug/L	45	/	0.3	45	/	0.3
Field Measurements							
Groundwater Elevation	ft.						
pH	SU						
Specific Conductivity @ 25 C	mmoh/cr						
Water Temperature	deg C						
Redox Potential	mV						
Dissolved Oxygen	mg/L						

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		RH-LHGW13-01			RH-LHGW13-91		
		187459			187462		
		2/18/98			2/18/98		
Parameter	UNIT	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL
VOCs - Quantified Detects							
1,2,4-Trimethylbenzene	ug/L	10	JN/Q		10	JN/Q	
1,2-Dichlorobenzene	ug/L	0.98	JN/Q		0.97	JN/Q	
1,4-Dichlorobenzene	ug/L	14	JN/Q		14	JN/Q	
1,3,5-Trimethylbenzene	ug/L	3.7	JN/Q		3.7	JN/Q	
1,3-Dichlorobenzene	ug/L	0.13	JN/Q		0.1	JN/Q	
Bromobenzene	ug/L	0.65	JN/Q		0.68	JN/Q	
Dichlorodifluoromethane	ug/L						
Di isopropyl ether	ug/L						
Isopropylbenzene	ug/L	2.4	JN/Q				
N-Butylbenzene	ug/L	0.41	JN/Q		0.41	JN/Q	
N-Propylbenzene	ug/L	2.1	JN/Q		2.1	JN/Q	
Naphthalene	ug/L	17	JN/Q		15	JN/Q	
p-Isopropyltoluene	ug/L	1.5	JN/Q		1.4	JN/Q	
Tetrahydrofuran	ug/L	790	JN/Q		614	JN/Q	
VOC-TICs							
1,2,3-Trimethylbenzene	ug/L						
1,3-Oxathiolane	ug/L	4.1	JN/		3.1	JN/	
1,4-Dioxane	ug/L	3	JN/		3	JN/	
1,3,3-t-Bicyclo[2.2.1]hep	ug/L	15	JN/				
1,7,7-t-Bicyclo[2.2.1]hep	ug/L	11	JN/				
1-Ethyl-2-methylbenzene	ug/L						
2,4-Dimethyl-3-pentanone	ug/L	26	JN/		22	JN/	
2-Butenylbenzene	ug/L						
2-Methyl-5-(1-methylcyclo	ug/L						
2-Pentanone	ug/L						
3,7,7-t-Bicyclo[4.2.0]hep	ug/L	2.8	JN/				
3-methylbutanal	ug/L						
Acetic Acid	ug/L						
bicyclo[2.2.1]heptan-2-on	ug/L				19.6	JN/	
Indane	ug/L						
Trimethylsilanol	ug/L	25	JN/		18	JN/	
Unknown	ug/L						
Unknown @ 10.18 min	ug/L						
Unknown @ 10.30 min	ug/L				7.2	J/	
Unknown @ 10.32 min	ug/L	6.8	J/				
Unknown @ 26.69 min	ug/L						
Unknown @ 28.47 min	ug/L						
Unknown @ 28.48 min	ug/L				3.2	J/	
Unknown @ 29.44 min	ug/L						
Unknown @ 29.45 min	ug/L						
Unknown @ 6.23 min	ug/L						
Unknown @ 8.47 min	ug/L						

Table 3.2
Validated Landfill Gas Analytical Results
Refuse Hidaway Landfill
Middleton, Wisconsin

Parameter	UNIT	G02 2/19/98 CONC	LQ/DVQ	RDL	G03 2/19/98 CONC	LQ/DVQ	RDL	G04 2/19/98 CONC	LQ/DVQ	RDL	G05 2/19/98 CONC	LQ/DVQ	RDL	GP01 2/18/98 CONC	LQ/DVQ	RDL	GP04 2/19/98 CONC	LQ/DVQ	RDL
Tetrachloroethene	ppb (v/v)	3.2	/	2	1100	/	17	11	/	2	7.3	/	3.3		U/	2	20	/	2
Trichloroethene	ppb (v/v)		U/	2	150	/	17		U/	2	3.4	/	3.3		U/	2		U/	2
trans-1,2-Dichloroethene	ppb (v/v)		U/	2		U/	17		U/	2		U/	3.3		U/	2		U/	2
cis-1,2-Dichloroethene	ppb (v/v)	2.2	/	2	200	/	17	3.6	/	2	6.7	/	3.3	2	/	2		U/	2
1,1-Dichloroethene	ppb (v/v)		U/	2		U/	17		U/	2		U/	3.3		U/	2		U/	2
Vinyl chloride	ppb (v/v)		U/	2		U/	17		U/	2		U/	3.3		U/	2		U/	2
1,1,2,2-Tetrachloroethane	ppb (v/v)		U/	2		U/	17		U/	2		U/	3.3		U/	2		U/	2
1,1,1-Trichloroethane	ppb (v/v)		U/	2		U/	17		U/	2		U/	3.3		U/	2		U/	2
1,1,2-Trichloroethane	ppb (v/v)		U/	2		U/	17		U/	2		U/	3.3		U/	2		U/	2
1,1-Dichloroethane	ppb (v/v)		U/	2	98	/	17	5.7	/	2		U/	3.3		U/	2		U/	2
1,2-Dichloroethane	ppb (v/v)		U/	2		U/	17		U/	2		U/	3.3		U/	2		U/	2
Chloroethane	ppb (v/v)		U/	4		U/	34		U/	4		U/	6.6		U/	4		U/	4
Chloromethane	ppb (v/v)		U/	4		U/	34		U/	4		U/	6.6		U/	4		U/	4
trans-1,3-Dichloropropene	ppb (v/v)		U/	2		U/	17		U/	2		U/	3.3		U/	2		U/	2
cis-1,3-Dichloropropene	ppb (v/v)		U/	2		U/	17		U/	2		U/	3.3		U/	2		U/	2
1,2-Dichloropropane	ppb (v/v)		U/	2	21	/	17		U/	2		U/	3.3		U/	2		U/	2
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ppb (v/v)		U/	2		U/	17		U/	2		U/	3.3		U/	2		U/	2
1,1,2-Trichloro-1,2,2-trifluoroethane	ppb (v/v)		U/	2		U/	17		U/	2		U/	3.3		U/	2		U/	2
Dichlorodifluoromethane	ppb (v/v)		U/	2	210	/	17	17	/	2		U/	3.3		U/	2		U/	2
Trichlorofluoromethane	ppb (v/v)		U/	2	29	/	17		U/	2		U/	3.3		U/	2		U/	2
Acetone	ppb (v/v)		U/	10		U/	84		U/	10		U/	17		U/	10		U/	10
2-Butanone	ppb (v/v)		U/	10		U/	84		U/	10		U/	17		U/	10		U/	10
4-Methyl-2-pentanone	ppb (v/v)		U/	10		U/	84		U/	10		U/	17		U/	10		U/	10
2-Hexanone	ppb (v/v)		U/	30		U/	250		U/	30		U/	50		U/	30		U/	30
Benzene	ppb (v/v)		U/	2		U/	17	3.8	/	2		U/	3.3		U/	2		U/	2
Toluene	ppb (v/v)	4.6	/	2		U/	17	11	/	2	33	/	3.3	24	/	2	8.9	/	2
Ethylbenzene	ppb (v/v)	18	/	2	17	/	17	46	/	2	86	/	3.3	120	/	2	28	/	2
Xylenes (total)	ppb (v/v)	36	/	2	25	/	17	90	/	2	210	/	3.3	210	/	2	55	/	2
Styrene	ppb (v/v)		U/	2		U/	17		U/	2		U/	3.3		U/	2	2.3	/	2
4-Ethyltoluene	ppb (v/v)	13	/	2		U/	17	26	/	2	81	/	3.3	73	/	2	20	/	2
1,3,5-Trimethylbenzene	ppb (v/v)	9.1	/	2		U/	17	18	/	2	50	/	3.3	48	/	2	13	/	2
1,2,4-Trimethylbenzene	ppb (v/v)	24	/	2		U/	17	47	/	2	130	/	3.3	120	/	2	35	/	2
1,2,4-Trichlorobenzene	ppb (v/v)		U/	20		U/	170		U/	20		U/	33		U/	20		U/	20
1,3-Dichlorobenzene	ppb (v/v)		U/	2		U/	17		U/	2		U/	3.3		U/	2		U/	2
1,4-Dichlorobenzene	ppb (v/v)	13	/	2		U/	17	22	/	2	51	/	3.3	60	/	2	16	/	2
1,2-Dichlorobenzene	ppb (v/v)		U/	2		U/	17		U/	2	3.9	/	3.3		U/	2		U/	2
Chlorobenzene	ppb (v/v)		U/	2		U/	17		U/	2		U/	3.3	2.7	/	2		U/	2
Carbon tetrachloride	ppb (v/v)		U/	2		U/	17		U/	2		U/	3.3		U/	2		U/	2
Chloroform	ppb (v/v)		U/	2		U/	17		U/	2		U/	3.3		U/	2		U/	2
Methylene chloride	ppb (v/v)	2	/	2		U/	17		U/	2	4.5	/	3.3	2	/	2	2	/	2

Table 3.2
Validated Landfill Gas Analytical Results
Refuse Hidaway Landfill
Middleton, Wisconsin

Parameter	UNIT	G02 2/19/98 CONC	LQ/DVQ	RDL	G03 2/19/98 CONC	LQ/DVQ	RDL	G04 2/19/98 CONC	LQ/DVQ	RDL	G05 2/19/98 CONC	LQ/DVQ	RDL	GP01 2/18/98 CONC	LQ/DVQ	RDL	GP04 2/19/98 CONC	LQ/DVQ	RDL
Carbon disulfide	ppb (v/v)		U/	10		U/	84		U/	10		U/	17		U/	10		U/	10
Vinyl acetate	ppb (v/v)		U/	10		U/	84		U/	10		U/	17		U/	10		U/	10
Bromodichloromethane	ppb (v/v)		U/	2		U/	17		U/	2		U/	3.3		U/	2		U/	2
Dibromochloromethane	ppb (v/v)		U/	2		U/	17		U/	2		U/	3.3		U/	2		U/	2
Bromoform	ppb (v/v)		U/	2		U/	17		U/	2		U/	3.3		U/	2		U/	2
1,2-Dibromoethane (EDB)	ppb (v/v)		U/	2		U/	17		U/	2		U/	3.3		U/	2		U/	2
Bromomethane	ppb (v/v)		U/	2		U/	17		U/	2		U/	3.3		U/	2		U/	2
Benzyl chloride	ppb (v/v)		U/	10		U/	84		U/	10		U/	17		U/	10		U/	10
Hexachlorobutadiene	ppb (v/v)		U/	4		U/	34		U/	4		U/	6.6		U/	4		U/	4
Hydrogen sulfide	ppb (v/v)		U/	0.2		U/	0.2		U/	0.2		U/	0.2		U/	0.2		U/	0.2
TICs																			
Alkyl benzene (C9)	ppb (v/v)							110	J/		240	J/		300	J/				
Alkyl benzene (C10)	ppb (v/v)													610	J/				
Branched alkane (C9)	ppb (v/v)																87	J/	
Branched alkane (C8)	ppb (v/v)																		
Branched alkane (C11)	ppb (v/v)	150	J/					240	J/					660	J/		220	J/	
Branched alkane (C10)	ppb (v/v)	90	J/		65	J/		140	J/		310	J/		540	J/				
Cycloalkane (C6)	ppb (v/v)																		
Cycloalkane (C10)	ppb (v/v)																		
Cycloalkene (C10)	ppb (v/v)										120	J/		210	J/				
Decane	ppb (v/v)	200	J/		84	J/		370	J/		720	J/		980	J/		240	J/	
Dodecane	ppb (v/v)	49	J/														110	J/	
Ketone (C7)	ppb (v/v)																		
Nonane	ppb (v/v)	37	J/					63	J/					170	J/		39	J/	
Substituted cycloalkane (C9)	ppb (v/v)																		
Substituted cycloalkane (C8)	ppb (v/v)																		
Substituted cycloalkane (C7)	ppb (v/v)																		
Substituted cycloalkane (C10)	ppb (v/v)										910	J/							
Undecane	ppb (v/v)	250	J/		74	J/		430	J/		540	J/		740	J/		250	J/	
No Match Found	ppb (v/v)	253	J/		370	J/		449	J/		1224	J/					365	J/	

Table 3.2
Validated Landfill Gas Analytical Results
Refuse Hidaway Landfill
Middleton, Wisconsin

Parameter	UNIT	GP10 2/19/98 CONC	LQ/DVQ	RDL	GP12 2/19/98 CONC	LQ/DVQ	RDL	GP17 2/19/98 CONC	LQ/DVQ	RDL	GP20 2/19/98 CONC	LQ/DVQ	RDL	GP23 2/19/98 CONC	LQ/DVQ	RDL	GW01 2/18/98 CONC	LQ/DVQ	RDL
Tetrachloroethene	ppb (v/v)	35	/	2	48	/	8.4	86	/	4.4	25	/	5.6	1400	/	8.4	1100	/	84
Trichloroethene	ppb (v/v)	16	/	2		U/	8.4		U/	4.4		U/	5.6	130	/	8.4	240	/	84
trans-1,2-Dichloroethene	ppb (v/v)		U/	2	35	/	8.4		U/	4.4		U/	5.6		U/	8.4		U/	84
cis-1,2-Dichloroethene	ppb (v/v)	2	/	2	1000	/	8.4	19	/	4.4		U/	5.6	270	/	8.4	1000	/	84
1,1-Dichloroethene	ppb (v/v)		U/	2		U/	8.4		U/	4.4		U/	5.6		U/	8.4		U/	84
Vinyl chloride	ppb (v/v)		U/	2	610	/	8.4		U/	4.4		U/	5.6	97	/	8.4	2800	/	84
1,1,2,2-Tetrachloroethane	ppb (v/v)		U/	2		U/	8.4		U/	4.4		U/	5.6		U/	8.4		U/	84
1,1,1-Trichloroethane	ppb (v/v)		U/	2		U/	8.4		U/	4.4		U/	5.6		U/	8.4		U/	84
1,1,2-Trichloroethane	ppb (v/v)		U/	2		U/	8.4		U/	4.4		U/	5.6		U/	8.4		U/	84
1,1-Dichloroethane	ppb (v/v)	8.7	/	2	61	/	8.4		U/	4.4		U/	5.6	43	/	8.4		U/	84
1,2-Dichloroethane	ppb (v/v)		U/	2		U/	8.4		U/	4.4		U/	5.6		U/	8.4		U/	84
Chloroethane	ppb (v/v)		U/	4		U/	17		U/	8.7		U/	11		U/	17		U/	170
Chloromethane	ppb (v/v)		U/	4		U/	17		U/	8.7		U/	11		U/	17		U/	170
trans-1,3-Dichloropropene	ppb (v/v)		U/	2		U/	8.4		U/	4.4		U/	5.6		U/	8.4		U/	84
cis-1,3-Dichloropropene	ppb (v/v)		U/	2		U/	8.4		U/	4.4		U/	5.6		U/	8.4		U/	84
1,2-Dichloropropane	ppb (v/v)	12	/	2	12	/	8.4		U/	4.4		U/	5.6		U/	8.4		U/	84
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ppb (v/v)		U/	2	10	/	8.4	12	/	4.4	22	/	5.6	27	/	8.4	120	/	84
1,1,2-Trichloro-1,2,2-trifluoroethane	ppb (v/v)		U/	2	9.6	/	8.4		U/	4.4		U/	5.6		U/	8.4		U/	84
Dichlorodifluoromethane	ppb (v/v)		U/	2	220	D/	170		U/	2		U/	2		U/	2	890	/	84
Trichlorofluoromethane	ppb (v/v)		U/	2	17	/	8.4	13	/	4.4	6.2	/	5.6	26	/	8.4		U/	84
Acetone	ppb (v/v)		U/	10		U/	42		U/	22		U/	28		U/	42		U/	420
2-Butanone	ppb (v/v)		U/	10		U/	42		U/	22		U/	28		U/	42		U/	420
4-Methyl-2-pentanone	ppb (v/v)		U/	10		U/	42		U/	22		U/	28		U/	42		U/	420
2-Hexanone	ppb (v/v)		U/	30		U/	130		U/	65		U/	84		U/	130		U/	1300
Benzene	ppb (v/v)		U/	2	99	/	8.4		U/	4.4		U/	5.6		U/	8.4	120	/	84
Toluene	ppb (v/v)	10	/	2	20	/	8.4	5.6	/	4.4		U/	5.6		U/	8.4	1000	/	84
Ethylbenzene	ppb (v/v)	40	/	2	40	/	8.4	18	/	4.4	13	/	5.6	13	/	8.4	2400	/	84
Xylenes (total)	ppb (v/v)	82	/	2	150	/	8.4	34	/	4.4	25	/	5.6	34	/	8.4	4300	/	84
Styrene	ppb (v/v)		U/	2	20	/	8.4	34	/	4.4	6	/	5.6		U/	8.4		U/	84
4-Ethyltoluene	ppb (v/v)	29	/	2	12	/	8.4	10	/	4.4	9	/	5.6		U/	8.4	560	/	84
1,3,5-Trimethylbenzene	ppb (v/v)	20	/	2		U/	8.4	7.2	/	4.4	6.4	/	5.6		U/	8.4	330	/	84
1,2,4-Trimethylbenzene	ppb (v/v)	48	/	2	15	/	8.4	19	/	4.4	17	/	5.6	13	/	8.4	590	/	84
1,2,4-Trichlorobenzene	ppb (v/v)		U/	20		U/	84		U/	44		U/	56		U/	84		U/	840
1,3-Dichlorobenzene	ppb (v/v)		U/	2		U/	8.4		U/	4.4		U/	5.6		U/	8.4		U/	84
1,4-Dichlorobenzene	ppb (v/v)	25	/	2	15	/	8.4	9.3	/	4.4	8.5	/	5.6		U/	8.4	160	/	84
1,2-Dichlorobenzene	ppb (v/v)		U/	2		U/	8.4		U/	4.4		U/	5.6		U/	8.4		U/	84
Chlorobenzene	ppb (v/v)		U/	2		U/	8.4		U/	4.4		U/	5.6		U/	8.4		U/	84
Carbon tetrachloride	ppb (v/v)		U/	2		U/	8.4		U/	4.4		U/	5.6		U/	8.4		U/	84
Chloroform	ppb (v/v)		U/	2		U/	8.4		U/	4.4		U/	5.6		U/	8.4		U/	84
Methylene chloride	ppb (v/v)		U/	2	14	/	8.4		U/	4.4	5.9	/	5.6		U/	8.4		U/	84

Table 3.2
Validated Landfill Gas Analytical Results
Refuse Hidaway Landfill
Middleton, Wisconsin

Parameter	UNIT	GP10 2/19/98 CONC	LQ/DVQ	RDL	GP12 2/19/98 CONC	LQ/DVQ	RDL	GP17 2/19/98 CONC	LQ/DVQ	RDL	GP20 2/19/98 CONC	LQ/DVQ	RDL	GP23 2/19/98 CONC	LQ/DVQ	RDL	GW01 2/18/98 CONC	LQ/DVQ	RDL
Carbon disulfide	ppb (v/v)		U/	10		U/	42		U/	22		U/	28		U/	42		U/	420
Vinyl acetate	ppb (v/v)		U/	10		U/	42		U/	22		U/	28		U/	42		U/	420
Bromodichloromethane	ppb (v/v)		U/	2		U/	8.4		U/	4.4		U/	5.6		U/	8.4		U/	84
Dibromochloromethane	ppb (v/v)		U/	2		U/	8.4		U/	4.4		U/	5.6		U/	8.4		U/	84
Bromoform	ppb (v/v)		U/	2		U/	8.4		U/	4.4		U/	5.6		U/	8.4		U/	84
1,2-Dibromoethane (EDB)	ppb (v/v)		U/	2		U/	8.4		U/	4.4		U/	5.6		U/	8.4		U/	84
Bromomethane	ppb (v/v)		U/	2		U/	8.4		U/	4.4		U/	5.6		U/	8.4		U/	84
Benzyl chloride	ppb (v/v)		U/	10		U/	42		U/	22		U/	28		U/	42		U/	420
Hexachlorobutadiene	ppb (v/v)		U/	4		U/	17		U/	8.7		U/	11		U/	17		U/	170
Hydrogen sulfide	ppb (v/v)		U/	0.2		U/	0.2	0.22	/	0.2		U/	0.2		U/	0.2	7.1	/	0.2
TICs																			
Alkyl benzene (C9)	ppb (v/v)																		
Alkyl benzene (C10)	ppb (v/v)																		
Branched alkane (C9)	ppb (v/v)																		
Branched alkane (C8)	ppb (v/v)																		
Branched alkane (C11)	ppb (v/v)																		
Branched alkane (C10)	ppb (v/v)	110	J/					1600	J/		330	J/		130	J/		15500	J/	
Cycloalkane (C6)	ppb (v/v)													63	J/		1800	J/	
Cycloalkane (C10)	ppb (v/v)																		
Cycloalkene (C10)	ppb (v/v)	77	J/														5800	J/	
Decane	ppb (v/v)	400	J/								120	J/					6700	J/	
Dodecane	ppb (v/v)																		
Ketone (C7)	ppb (v/v)																		
Nonane	ppb (v/v)	67	J/		1100	J/											4000	J/	
Substituted cycloalkane (C9)	ppb (v/v)				2000	J/								165	J/				
Substituted cycloalkane (C8)	ppb (v/v)				1600	J/													
Substituted cycloalkane (C7)	ppb (v/v)																1800	J/	
Substituted cycloalkane (C10)	ppb (v/v)																		
Undecane	ppb (v/v)	490	J/					300	J/		150	J/		67	J/				
No Match Found	ppb (v/v)	807	J/		10790	J/		2070	J/		624	J/		589	J/		16000	J/	

Table 3.2
Validated Landfill Gas Analytical Results
Refuse Hidaway Landfill
Middleton, Wisconsin

Parameter	UNIT	GW02 2/18/98 CONC	LQ/DVQ	RDL	GW03 2/18/98 CONC	LQ/DVQ	RDL	GW04 2/18/98 CONC	LQ/DVQ	RDL	GW05 2/18/98 CONC	LQ/DVQ	RDL	GW06 2/18/98 CONC	LQ/DVQ	RDL	GW07 2/18/98 CONC	LQ/DVQ	RDL
Tetrachloroethene	ppb (v/v)	1200	/	67	30	/	11		U/	8.4		U/	84		U/	67		U/	34
Trichloroethene	ppb (v/v)	600	/	67		U/	11		U/	8.4		U/	84		U/	67		U/	34
trans-1,2-Dichloroethene	ppb (v/v)	340	/	67	24	/	11	17	/	8.4	120	/	84	150	/	67		U/	34
cis-1,2-Dichloroethene	ppb (v/v)	12000	/	67	88	/	11	50	/	8.4		U/	84	2000	/	67		U/	34
1,1-Dichloroethene	ppb (v/v)		U/	67		U/	11		U/	8.4		U/	84		U/	67		U/	34
Vinyl chloride	ppb (v/v)	12000	D/	340	180	/	11	160	/	8.4	1400	/	84	12000	D/	340	440	/	34
1,1,2,2-Tetrachloroethane	ppb (v/v)		U/	67		U/	11		U/	8.4		U/	84		U/	67		U/	34
1,1,1-Trichloroethane	ppb (v/v)		U/	67		U/	11		U/	8.4		U/	84		U/	67		U/	34
1,1,2-Trichloroethane	ppb (v/v)		U/	67		U/	11		U/	8.4		U/	84		U/	67		U/	34
1,1-Dichloroethane	ppb (v/v)	110	/	67		U/	11	11	/	8.4		U/	84		U/	67		U/	34
1,2-Dichloroethane	ppb (v/v)	1400	/	67		U/	11		U/	8.4		U/	84		U/	67		U/	34
Chloroethane	ppb (v/v)		U/	130	52	/	22	47	/	17		U/	170		U/	130		U/	67
Chloromethane	ppb (v/v)		U/	130		U/	22		U/	17		U/	170		U/	130		U/	67
trans-1,3-Dichloropropene	ppb (v/v)		U/	67		U/	11		U/	8.4		U/	84		U/	67		U/	34
cis-1,3-Dichloropropene	ppb (v/v)		U/	67		U/	11		U/	8.4		U/	84		U/	67		U/	34
1,2-Dichloropropane	ppb (v/v)	540	/	67		U/	11		U/	8.4		U/	84		U/	67		U/	34
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ppb (v/v)	93	/	67	70	/	11	70	/	8.4		U/	84	72	/	67	47	/	34
1,1,2-Trichloro-1,2,2-trifluoroethane	ppb (v/v)		U/	67		U/	11		U/	8.4		U/	84		U/	67		U/	34
Dichlorodifluoromethane	ppb (v/v)	650	/	67		U/	11	220	D/	84	270	/	84	400	/	67	310	/	34
Trichlorofluoromethane	ppb (v/v)		U/	67		U/	11		U/	8.4		U/	84		U/	67		U/	34
Acetone	ppb (v/v)	1500	/	340		U/	56		U/	42		U/	420		U/	340		U/	170
2-Butanone	ppb (v/v)	810	/	340		U/	56		U/	42		U/	420		U/	340		U/	170
4-Methyl-2-pentanone	ppb (v/v)		U/	340		U/	56		U/	42		U/	420		U/	340		U/	170
2-Hexanone	ppb (v/v)		U/	1000		U/	170		U/	130		U/	1300		U/	1000		U/	510
Benzene	ppb (v/v)	320	/	67	110	/	11	110	/	8.4	200	/	84	230	/	67	180	/	34
Toluene	ppb (v/v)	3800	/	67	110	/	11	97	/	8.4	370	/	84	2100	/	67	210	/	34
Ethylbenzene	ppb (v/v)	2300	/	67	460	/	11	660	/	8.4	6800	/	84	4100	/	67	3500	/	34
Xylenes (total)	ppb (v/v)	4500	/	67	520	/	11	810	/	8.4	5200	/	84	5000	/	67	4900	/	34
Styrene	ppb (v/v)		U/	67		U/	11		U/	8.4		U/	84		U/	67		U/	34
4-Ethyltoluene	ppb (v/v)	480	/	67	86	/	11	190	/	8.4	810	/	84	670	/	67	740	/	34
1,3,5-Trimethylbenzene	ppb (v/v)	290	/	67	52	/	11	130	/	8.4	530	/	84	390	/	67	440	/	34
1,2,4-Trimethylbenzene	ppb (v/v)	520	/	67	72	/	11	310	/	8.4	900	/	84	680	/	67	710	/	34
1,2,4-Trichlorobenzene	ppb (v/v)		U/	670		U/	110		U/	84		U/	840		U/	670		U/	340
1,3-Dichlorobenzene	ppb (v/v)		U/	67		U/	11		U/	8.4		U/	84		U/	67		U/	34
1,4-Dichlorobenzene	ppb (v/v)	160	/	67	36	/	11	160	/	8.4	270	/	84	160	/	67	100	/	34
1,2-Dichlorobenzene	ppb (v/v)		U/	67		U/	11	11	/	8.4		U/	84		U/	67		U/	34
Chlorobenzene	ppb (v/v)		U/	67	38	/	11	52	/	8.4		U/	84	72	/	67	110	/	34
Carbon tetrachloride	ppb (v/v)		U/	67		U/	11		U/	8.4		U/	84		U/	67		U/	34
Chloroform	ppb (v/v)		U/	67		U/	11		U/	8.4		U/	84		U/	67		U/	34
Methylene chloride	ppb (v/v)	850	/	67	19	/	11	16	/	8.4	84	/	84		U/	67	51	/	34

Table 3.2
Validated Landfill Gas Analytical Results
Refuse Hidaway Landfill
Middleton, Wisconsin

Parameter	UNIT	GW02 2/18/98 CONC	LQ/DVQ	RDL	GW03 2/18/98 CONC	LQ/DVQ	RDL	GW04 2/18/98 CONC	LQ/DVQ	RDL	GW05 2/18/98 CONC	LQ/DVQ	RDL	GW06 2/18/98 CONC	LQ/DVQ	RDL	GW07 2/18/98 CONC	LQ/DVQ	RDL
Carbon disulfide	ppb (v/v)		U/	340		U/	56		U/	42		U/	420		U/	340		U/	170
Vinyl acetate	ppb (v/v)		U/	340		U/	56		U/	42		U/	420		U/	340		U/	170
Bromodichloromethane	ppb (v/v)		U/	67		U/	11		U/	8.4		U/	84		U/	67		U/	34
Dibromochloromethane	ppb (v/v)		U/	67		U/	11		U/	8.4		U/	84		U/	67		U/	34
Bromoform	ppb (v/v)		U/	67		U/	11		U/	8.4		U/	84		U/	67		U/	34
1,2-Dibromoethane (EDB)	ppb (v/v)		U/	67		U/	11		U/	8.4		U/	84		U/	67		U/	34
Bromomethane	ppb (v/v)		U/	67		U/	11		U/	8.4		U/	84		U/	67		U/	34
Benzyl chloride	ppb (v/v)		U/	340		U/	56		U/	42		U/	420		U/	340		U/	170
Hexachlorobutadiene	ppb (v/v)		U/	130		U/	22		U/	17		U/	170		U/	130		U/	67
Hydrogen sulfide	ppb (v/v)	16	/	0.2	320	/	0.2	870	/	0.2	850	/	0.2	780	/	0.2	190	/	0.2
TICs																			
Alkyl benzene (C9)	ppb (v/v)																		
Alkyl benzene (C10)	ppb (v/v)																		
Branched alkane (C9)	ppb (v/v)																		
Branched alkane (C8)	ppb (v/v)	1800	J/		820	J/		1400	J/										
Branched alkane (C11)	ppb (v/v)																		
Branched alkane (C10)	ppb (v/v)	9400	J/		3600	J/								29500	J/		3600	J/	
Cycloalkane (C6)	ppb (v/v)	5100	J/											1200	J/				
Cycloalkane (C10)	ppb (v/v)																		
Cycloalkene (C10)	ppb (v/v)										5800	J/		6500	J/				
Decane	ppb (v/v)	5200	J/					3200	J/		8300	J/		7900	J/		6100	J/	
Dodecane	ppb (v/v)																		
Ketone (C7)	ppb (v/v)																		
Nonane	ppb (v/v)				1600	J/					3600	J/					3800	J/	
Substituted cycloalkane (C9)	ppb (v/v)				1500	J/													
Substituted cycloalkane (C8)	ppb (v/v)	2000	J/		1300	J/		970	J/										
Substituted cycloalkane (C7)	ppb (v/v)													1500	J/				
Substituted cycloalkane (C10)	ppb (v/v)																		
Undecane	ppb (v/v)							1800	J/		3600	J/							
No Match Found	ppb (v/v)	20700	J/		13400	J/		18900	J/		34600	J/		15900	J/		28520	J/	

Table 3.2
Validated Landfill Gas Analytical Results
Refuse Hidaway Landfill
Middleton, Wisconsin

Parameter	UNIT	GW08 2/18/98 CONC	LQ/DVQ	RDL	GW09 2/18/98 CONC	LQ/DVQ	RDL	GW10 2/18/98 CONC	LQ/DVQ	RDL	GW11 2/18/98 CONC	LQ/DVQ	RDL	GW11 DUP 2/18/98 CONC	LQ/DVQ	RDL	GW12 2/18/98 CONC	LQ/DVQ	RDL
Tetrachloroethene	ppb (v/v)	49	/	34		U/	67		U/	34		U/	67		U/	84		U/	84
Trichloroethene	ppb (v/v)		U/	34		U/	67		U/	34		U/	67		U/	84		U/	84
trans-1,2-Dichloroethene	ppb (v/v)	200	/	34	220	/	67	140	/	34	84	/	67		U/	84	130	/	84
cis-1,2-Dichloroethene	ppb (v/v)	94	/	34	8700	/	67	1800	/	34	560	/	67	590	/	84	1300	/	84
1,1-Dichloroethene	ppb (v/v)		U/	34		U/	67		U/	34		U/	67		U/	84		U/	84
Vinyl chloride	ppb (v/v)	22000	D/	670	13000	D/	340	11000	D/	340	7100	D/	170	6900	/	84	9600	D/	340
1,1,2,2-Tetrachloroethane	ppb (v/v)		U/	34		U/	67		U/	34		U/	67		U/	84		U/	84
1,1,1-Trichloroethane	ppb (v/v)		U/	34		U/	67		U/	34		U/	67		U/	84		U/	84
1,1,2-Trichloroethane	ppb (v/v)		U/	34		U/	67		U/	34		U/	67		U/	84		U/	84
1,1-Dichloroethane	ppb (v/v)		U/	34		U/	67		U/	34		U/	67		U/	84		U/	84
1,2-Dichloroethane	ppb (v/v)		U/	34		U/	67		U/	34		U/	67		U/	84		U/	84
Chloroethane	ppb (v/v)		U/	67		U/	130		U/	67		U/	130		U/	170		U/	170
Chloromethane	ppb (v/v)		U/	67		U/	130		U/	67		U/	130		U/	170		U/	170
trans-1,3-Dichloropropene	ppb (v/v)		U/	34		U/	67		U/	34		U/	67		U/	84		U/	84
cis-1,3-Dichloropropene	ppb (v/v)		U/	34		U/	67		U/	34		U/	67		U/	84		U/	84
1,2-Dichloropropane	ppb (v/v)		U/	34		U/	67		U/	34		U/	67		U/	84		U/	84
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ppb (v/v)	92	/	34		U/	67	68	/	34		U/	67		U/	84		U/	84
1,1,2-Trichloro-1,2,2-trifluoroethane	ppb (v/v)		U/	34		U/	67		U/	34		U/	67		U/	84		U/	84
Dichlorodifluoromethane	ppb (v/v)	660	/	34	120	/	67	410	/	34	130	/	67	130	/	84	310	/	84
Trichlorofluoromethane	ppb (v/v)		U/	34		U/	67		U/	34		U/	67		U/	84		U/	84
Acetone	ppb (v/v)		U/	170		U/	340		U/	170		U/	340		U/	420		U/	420
2-Butanone	ppb (v/v)		U/	170		U/	340		U/	170		U/	340		U/	420		U/	420
4-Methyl-2-pentanone	ppb (v/v)		U/	170		U/	340		U/	170		U/	340		U/	420		U/	420
2-Hexanone	ppb (v/v)		U/	510		U/	1000		U/	510		U/	1000		U/	1300		U/	1300
Benzene	ppb (v/v)	280	/	34	220	/	67	230	/	34	210	/	67	220	/	84	210	/	84
Toluene	ppb (v/v)	3200	/	34	4500	/	67	2200	/	34	3300	/	67	3700	/	84	2400	/	84
Ethylbenzene	ppb (v/v)	3500	/	34	3200	/	67	4500	/	34	2500	/	67	2800	/	84	4500	/	84
Xylenes (total)	ppb (v/v)	5300	/	34	6600	/	67	5600	/	34	5000	/	67	5700	/	84	6100	/	84
Styrene	ppb (v/v)		U/	34		UG/	170		U/	34		U/	67		U/	84		U/	84
4-Ethyltoluene	ppb (v/v)	860	/	34	1000	/	67	930	/	34	630	/	67	740	/	84	870	/	84
1,3,5-Trimethylbenzene	ppb (v/v)	540	/	34	610	/	67	600	/	34	360	/	67	410	/	84	510	/	84
1,2,4-Trimethylbenzene	ppb (v/v)	1000	/	34	1200	/	67	1100	/	34	750	/	67	900	/	84	1000	/	84
1,2,4-Trichlorobenzene	ppb (v/v)		U/	340		U/	670		U/	340		U/	670		U/	840		U/	840
1,3-Dichlorobenzene	ppb (v/v)		U/	34		U/	67		U/	34		U/	67		U/	84		U/	84
1,4-Dichlorobenzene	ppb (v/v)	190	/	34	230	/	67	220	/	34	160	/	67	210	/	84		U/	84
1,2-Dichlorobenzene	ppb (v/v)		U/	34		U/	67		U/	34		U/	67		U/	84	220	/	84
Chlorobenzene	ppb (v/v)	73	/	34		U/	67	76	/	34	70	/	67		U/	84		U/	84
Carbon tetrachloride	ppb (v/v)		U/	34		U/	67		U/	34		U/	67		U/	84		U/	84
Chloroform	ppb (v/v)		U/	34		U/	67		U/	34		U/	67		U/	84		U/	84
Methylene chloride	ppb (v/v)	51	/	34	72	/	67	40	/	34	72	/	67		U/	84		U/	84

Table 3.2
Validated Landfill Gas Analytical Results
Refuse Hidaway Landfill
Middleton, Wisconsin

Parameter	UNIT	GW08 2/18/98 CONC	LQ/DVQ	RDL	GW09 2/18/98 CONC	LQ/DVQ	RDL	GW10 2/18/98 CONC	LQ/DVQ	RDL	GW11 2/18/98 CONC	LQ/DVQ	RDL	GW11 DUP 2/18/98 CONC	LQ/DVQ	RDL	GW12 2/18/98 CONC	LQ/DVQ	RDL
Carbon disulfide	ppb (v/v)		U/	170		U/	340		U/	170		U/	340		U/	420		U/	420
Vinyl acetate	ppb (v/v)		U/	170		U/	340		U/	170		U/	340		U/	420		U/	420
Bromodichloromethane	ppb (v/v)		U/	34		U/	67		U/	34		U/	67		U/	84		U/	84
Dibromochloromethane	ppb (v/v)		U/	34		U/	67		U/	34		U/	67		U/	84		U/	84
Bromoform	ppb (v/v)		U/	34		U/	67		U/	34		U/	67		U/	84		U/	84
1,2-Dibromoethane (EDB)	ppb (v/v)		U/	34		U/	67		U/	34		U/	67		U/	84		U/	84
Bromomethane	ppb (v/v)		U/	34		U/	67		U/	34		U/	67		U/	84		U/	84
Benzyl chloride	ppb (v/v)		U/	170		U/	340		U/	170		U/	340		U/	420		U/	420
Hexachlorobutadiene	ppb (v/v)		U/	67		U/	130		U/	67		U/	130		U/	170		U/	170
Hydrogen sulfide	ppb (v/v)	190	/	0.2	950	/	0.2	1000	/	0.2	1600	/	0.2	1700	/	0.2	790	/	0.2
TICs																			
Alkyl benzene (C9)	ppb (v/v)																		
Alkyl benzene (C10)	ppb (v/v)													4300	J/				
Branched alkane (C9)	ppb (v/v)																		
Branched alkane (C8)	ppb (v/v)																		
Branched alkane (C11)	ppb (v/v)	1700	J/											1400	J/				
Branched alkane (C10)	ppb (v/v)	8300	J/					19600	J/								5800	J/	
Cycloalkane (C6)	ppb (v/v)																		
Cycloalkane (C10)	ppb (v/v)													14000	J/		8600	J/	
Cycloalkene (C10)	ppb (v/v)	20000	J/		21000	J/		16000	J/		14000	J/							
Decane	ppb (v/v)	10000	J/		10000	J/		10000	J/		6800	J/		7800	J/		8100	J/	
Dodecane	ppb (v/v)																		
Ketone (C7)	ppb (v/v)	1000	J/																
Nonane	ppb (v/v)				3300	J/		4200	J/		2100	J/		2300	J/		3200	J/	
Substituted cycloalkane (C9)	ppb (v/v)																		
Substituted cycloalkane (C8)	ppb (v/v)				1100	J/											1100	J/	
Substituted cycloalkane (C7)	ppb (v/v)							1300	J/										
Substituted cycloalkane (C10)	ppb (v/v)																		
Undecane	ppb (v/v)	4300	J/		4400	J/		4100	J/		2000	J/		3200	J/		3600	J/	
No Match Found	ppb (v/v)	30900	J/		25700	J/		17300	J/		16480	J/		18400	J/		27000	J/	

Table 3.2
Validated Landfill Gas Analytical Results
Refuse Hidaway Landfill
Middleton, Wisconsin

Parameter	UNIT	GW12 DUP 2/18/98			GW13 2/18/98			GW13 DUP 2/18/98			LGBlank 2/19/98		
		CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL	CONC	LQ/DVQ	RDL
Tetrachloroethene	ppb (v/v)		U/	170		U/	170		U/	170		U/	2
Trichloroethene	ppb (v/v)		U/	170		U/	170		U/	170		U/	2
trans-1,2-Dichlorocthene	ppb (v/v)		U/	170		U/	170		U/	170		U/	2
cis-1,2-Dichloroethene	ppb (v/v)	1300	/	170	1200	/	170	1200	/	170		U/	2
1,1-Dichlorocthene	ppb (v/v)		U/	170		U/	170		U/	170		U/	2
Vinyl chloride	ppb (v/v)	9200	/	170	8900	/	170	8500	/	170		U/	2
1,1,2,2-Tetrachloroethane	ppb (v/v)		U/	170		U/	170		U/	170		U/	2
1,1,1-Trichloroethane	ppb (v/v)		U/	170		U/	170		U/	170		U/	2
1,1,2-Trichloroethane	ppb (v/v)		U/	170		U/	170		U/	170		U/	2
1,1-Dichloroethane	ppb (v/v)		U/	170		U/	170		U/	170		U/	2
1,2-Dichloroethane	ppb (v/v)		U/	170		U/	170		U/	170		U/	2
Chloroethane	ppb (v/v)		U/	340		U/	340		U/	340		U/	4
Chloromethane	ppb (v/v)		U/	340		U/	340		U/	340		U/	4
trans-1,3-Dichloropropene	ppb (v/v)		U/	170		U/	170		U/	170		U/	2
cis-1,3-Dichloropropene	ppb (v/v)		U/	170		U/	170		U/	170		U/	2
1,2-Dichloropropane	ppb (v/v)		U/	170		U/	170		U/	170		U/	2
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ppb (v/v)		U/	170		U/	170		U/	170		U/	2
1,1,2-Trichloro-1,2,2-trifluoroethane	ppb (v/v)		U/	170		U/	170		U/	170		U/	2
Dichlorodifluoromethane	ppb (v/v)	330	/	170	320	/	170	300	/	170		U/	2
Trichlorofluoromethane	ppb (v/v)		U/	170		U/	170		U/	170		U/	2
Acetone	ppb (v/v)		U/	840		U/	840		U/	840		U/	10
2-Butanone	ppb (v/v)		U/	840		U/	840		U/	840		U/	10
4-Methyl-2-pentanone	ppb (v/v)		U/	840		U/	840		U/	840		U/	10
2-Hexanone	ppb (v/v)		U/	2500		U/	2500		U/	2500		U/	30
Benzene	ppb (v/v)	200	/	170	190	/	170	200	/	170		U/	2
Toluene	ppb (v/v)	2600	/	170	2500	/	170	2300	/	170		U/	2
Ethylbenzene	ppb (v/v)	4400	/	170	4200	/	170	3900	/	170		U/	2
Xylenes (total)	ppb (v/v)	6100	/	170	5700	/	170	5200	/	170		U/	2
Styrene	ppb (v/v)		U/	170		U/	170		U/	170		U/	2
4-Ethyltoluene	ppb (v/v)	770	/	170	830	/	170	690	/	170		U/	2
1,3,5-Trimethylbenzene	ppb (v/v)	500	/	170	540	/	170	440	/	170		U/	2
1,2,4-Trimethylbenzene	ppb (v/v)	890	/	170	960	/	170	800	/	170		U/	2
1,2,4-Trichlorobenzene	ppb (v/v)		U/	1700		U/	1700		U/	1700		U/	20
1,3-Dichlorobenzene	ppb (v/v)		U/	170		U/	170		U/	170		U/	2
1,4-Dichlorobenzene	ppb (v/v)		U/	170	190	/	170		U/	170		U/	2
1,2-Dichlorobenzene	ppb (v/v)		U/	170		U/	170		U/	170		U/	2
Chlorobenzene	ppb (v/v)		U/	170		U/	170		U/	170		U/	2
Carbon tetrachloride	ppb (v/v)		U/	170		U/	170		U/	170		U/	2
Chloroform	ppb (v/v)		U/	170		U/	170		U/	170		U/	2
Methylene chloride	ppb (v/v)		U/	170		U/	170		U/	170	2.1	/	2

Table 3.2
Validated Landfill Gas Analytical Results
Refuse Hidaway Landfill
Middleton, Wisconsin

Parameter	UNIT	GW12 DUP 2/18/98 CONC	LQ/DVQ	RDL	GW13 2/18/98 CONC	LQ/DVQ	RDL	GW13 DUP 2/18/98 CONC	LQ/DVQ	RDL	LGBlank 2/19/98 CONC	LQ/DVQ	RDL
Carbon disulfide	ppb (v/v)		U/	840		U/	840		U/	840		U/	10
Vinyl acetate	ppb (v/v)		U/	840		U/	840		U/	840		U/	10
Bromodichloromethane	ppb (v/v)		U/	170		U/	170		U/	170		U/	2
Dibromochloromethane	ppb (v/v)		U/	170		U/	170		U/	170		U/	2
Bromoform	ppb (v/v)		U/	170		U/	170		U/	170		U/	2
1,2-Dibromoethane (EDB)	ppb (v/v)		U/	170		U/	170		U/	170		U/	2
Bromomethane	ppb (v/v)		U/	170		U/	170		U/	170		U/	2
Benzyl chloride	ppb (v/v)		U/	840		U/	840		U/	840		U/	10
Hexachlorobutadiene	ppb (v/v)		U/	340		U/	340		U/	340		U/	4
Hydrogen sulfide	ppb (v/v)	810	/	0.2	880	/	0.2	900	/	0.2		U/	0.2
TICs													
Alkyl benzene (C9)	ppb (v/v)												
Alkyl benzene (C10)	ppb (v/v)							2500	J/				
Branched alkane (C9)	ppb (v/v)												
Branched alkane (C8)	ppb (v/v)												
Branched alkane (C11)	ppb (v/v)												
Branched alkane (C10)	ppb (v/v)	3100	J/		16700	J/		5600	J/				
Cycloalkane (C6)	ppb (v/v)												
Cycloalkane (C10)	ppb (v/v)	9300	J/		9900	J/		9100	J/				
Cycloalkene (C10)	ppb (v/v)												
Decane	ppb (v/v)	6500	J/		9300	J/		7200	J/				
Dodecane	ppb (v/v)												
Ketone (C7)	ppb (v/v)												
Nonane	ppb (v/v)	2700	J/		3400	J/		2900	J/				
Substituted cycloalkane (C9)	ppb (v/v)												
Substituted cycloalkane (C8)	ppb (v/v)												
Substituted cycloalkane (C7)	ppb (v/v)												
Substituted cycloalkane (C10)	ppb (v/v)												
Undecane	ppb (v/v)	2300	J/		4200	J/		3100	J/				
No Match Found	ppb (v/v)	23810	J/		23300	J/		24300	J/				

Table 3.3

Summary of Landfill Gas Sampling Field Parameters
Refuse Hideaway Landfill
Middleton, Wisconsin

Sample Location	Pressure (inches Hg)	Methane (%)
GW1	0.9	34.3
GW2	1.4	48.1
GW3	2.0	59.9
GW4	2.4	58.5
GW5	8.5 to 9.6	57.8
GW6	2.4	59.5
GW7	2.3	61.6
GW8	2.4	59.5
GW9	2.4	62.1
GW10	1.8	59.7
GW11	2.5	63.7
GW12	2.3	60.9
GW13	2.3	60.8
G1S	0.0	0.0
G2D	0.0	1.7
G3D	0.0	0.0
G4	0.0	0.0
G5	2.4	0.0
G17D	0.0	0.0
GP4	0.0	0.0
GP10	0.2	0.1
GP12D	0.0	35.3
GP20I2	0.0	0.2
GP23I2	0.0	3.4

Notes:
Field data collected on February 18 and 19, 1998 during landfill gas sampling.

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Total VOCs ug/L	PCE Conc	RDL	TCE Conc	RDL	cis-1,2-DCE Conc	RDL	trans-1,2-DCE Conc	RDL	1,1-DCE Conc	RDL	Vinyl Chloride Conc	RDL	1,1,1-TCA Conc	RDL	1,1-DCA Conc	RDL	1,2-DCA Conc	RDL	Chloro ethane Conc	RDL	1,2-Dichloro propane Conc	RDL	1,3-Dichloro benzene Conc	RDL	1,4-Dichloro benzene Conc	RDL	Chloro benzene Conc	RDL
Results in ug/L	ES		5		5		70		100		7		0.2		200		850		5		400		5		1250		75		100	
	PAL		0.5		0.5		7		20		0.7		0.02		40		85		0.5		80		0.5		125		15		20	
P-1D	Jan-91	2.0		2		2		NA		2		2		20		2		2		2		2		2		4		4		2
	Feb-98	ND		0.2		0.2		0.2		0.2		0.1		0.3		1		0.2		0.2		0.7		0.1		NA		NA		0.1
P-1S	Jan-91	340		2		2		NA		2		2		20		2		2		2		2		2		4		4		2
	Feb-98	2.3		0.2		0.2		0.2		0.2		0.1		0.3		1		0.2		0.2		0.7		0.1		NA		NA		0.1
P-3S	Aug-88	ND		1		1		NA		1		0.5		0.5		0.5		0.5		0.5		0.5		1		1		1		0.5
	Sep-88	0.53		1		1		NA		1		0.5		0.5	0.53	NR		0.5		0.5		0.5		1		1		1		0.5
	Jan-91	49		1		1		NA		1		1	40	NR		1		1		1		1		1		2		2		1
	Feb-98	1.3	0.3	0.2		0.2		0.2		0.2		0.1		0.3		1		0.2		0.2		0.7		0.1		NA		NA		0.1
P-4S	Jan-91	1.0		1		1		NA		1		1		10		1		1		1		1		1		2		2		1
	Feb-98	1.8		0.2		0.2		0.2		0.2		0.1		0.3		1		0.2		0.2		0.7		0.1		NA		NA		0.1
P-8BR	Aug-88	ND		1		1		NA		1		0.5		0.5		0.5		0.5		0.5		0.5		1		1		1		0.5
	Sep-88	0.59		1		1		NA		1		0.5		0.5	0.59	NR		0.5		0.5		0.5		1		1		1		0.5
	Jan-91	ND		1		1		NA		1		1		10		1		1		1		1		1		2		2		1
	Feb-98	0.80		0.2	0.4	0.2		0.2		0.2		0.1		0.3		1		0.2		0.2		0.7		0.1		NA		NA		0.1
P-8S	Aug-88	1,000	310	NR	110	NR		NA	540	NR	0.86	NR	31	NR		0.5	7.5	NR	1.2	NR	1.2	NR		1		1		1		0.5
	Sep-88	1,200	320	NR	120	NR		NA	640	NR	1.5	NR	51	NR	1.3	NR	7.9	NR	4.9	NR	1.8	NR		1		1		1		0.5
	Jan-91	410	7	NR	16	NR		NA	10	NR		1	160	NR		1	16	NR		1		NA	1	NR		2		2		1
	Feb-98	44	2.5	0.2	1.9	0.2	29	0.2	1.2	0.2		0.1	6.7	0.3		1	2	0.2		0.2		0.7		0.1		NA		NA		0.1
8D-DEEP	Aug-87	130	7.7	NR	3	NR		NA	9.4	NR		1		NA		1		1		1		2		1		2		2		2
	Aug-88	ND		NA		NA		NA		1		0.5		0.5		0.5		0.5		0.5		0.5		1		NA		NA		NA
	Sep-88	510	120	NR	45	NR		NA	310	NR		0.5	19	NR		0.5	4.4	NR		0.5	0.61	NR		1		1		1		0.5
	Jan-91	ND		1		1		NA		1		1		10		1		1		1		1		1		2		2		1
	Feb-98	6.4	2.6	0.2	1.6	0.2	2.2	0.2		0.2		0.1		0.3		1		0.2		0.2		0.7		0.1		NA		NA		0.1
P-9D	Aug-88	330		1		1		NA	230	NR	0.77	NR	92	NR		0.5	6.2	NR		0.5		0.5		1		1		1		0.5
	Aug-88	450	110	NR	36	NR		NA	270	NR		0.5	26	NR		0.5	4.4	NR		0.5		0.5		0.1		1		1		0.5
	Sep-88	310		1		1		NA	210	NR		0.5	91	NR		0.5	4.2	NR		0.5		0.5		1		1		1		0.5
	Jan-91	490		1		1		NA	13	NR		1	32	NR		1	16	NR		1		NA		1		2		2		1
	Feb-98	26		0.2	0.5	0.2	0.6	0.2	4.2	0.2		0.1		0.3		1	6	0.2	0.2	0.2	5.1	0.7	2.8	0.1		NA		NA		0.1
P-9S	Aug-88	350	70	NR	29	NR		NA	120	NR		0.5	56	NR		0.5	29	NR	4.5	NR		0.5	5.7	NR		1		1		0.5
	Sep-88	340	48	NR	19	NR		NA	110	NR		0.5	53	NR		0.5	50	NR	5.4	NR	1.2	NR	7.7	NR		1		1		0.5
	Jan-91	680	16	NR	9	NR		NA	32	NR		1	440	NR		1	30	NR	41	NR		NA	21	NR		2		2		1
	Feb-98	9.0	2.9	0.2	1.1	0.2	4	0.2	0.2	0.2		0.1		0.3		1		0.2		0.2		0.7		0.1		NA		NA		0.1
P-16	Aug-87	87	44	NR	8.7	NR		NA	19	NR	2.1	NR	5	NR	4.8	NR	3.8	NR		1		2		1		2		2		2
P-16D	Aug-88	3.6		1	2	NR		NA	0.85	NR		0.5		0.5		0.5	0.73	NR		0.5		0.5		1		1		1		0.5
	Sep-88	7.4	1.2	NR	2	NR		NA	1.4	NR		0.5	1.1	NR	0.67	NR	1	NR		0.5		0.5		1		1		1		0.5
	Jan-91	57	3	NR	10	NR		NA	1	NR		1	19	NR		1	6	NR		1		1	1	NR		2		2		1
	Feb-98	61	0.2	0.2	11	0.2	26	0.2	1.2	0.2		0.1	7.1	0.3		1	6	0.2		0.2	2	0.7	1.2	0.1		NA		NA		0.1
P-16S	Aug-88	190	64	NR	17	NR		NA	78	NR	3.3	NR	4.4	NR	4.6	NR	13	NR	0.7	NR		0.5		1		1		1		0.5
	Sep-88	260	86	NR	23	NR		NA	110	NR	3.1	NR	6	NR	5.8	NR	17	NR	0.83	NR	0.93	NR		1		1		1		0.5
	Feb-98	130		0.2	1.8	0.2	110	0.2	1.1	0.2		0.1	4.8	0.3		1	1.8	0.2		0.2		0.7	5.6	0.1		NA		NA		0.1

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Bromo dichloro methane Conc RDL	Bromo methane Conc RDL	Chloroform Conc RDL	Methylene Chloride Conc RDL	Chloro methane Conc RDL	Dichloro difluoro methane Conc RDL	Trichloro fluoro methane Conc RDL	Benzene Conc RDL	Ethyl benzene Conc RDL	Toluene Conc RDL	Xylene, total Conc RDL	Styrene Conc RDL	2-Butanone Conc RDL	Acetone Conc RDL	Naphthalene Conc RDL
Results in ug/L	ES	0.6	10	6	5	3	1000	3490	5	700	343	620	100	460	1000	40
	PAL	0.06	1	0.6	0.5	0.3	200	698	0.5	140	68.6	124	10	90	200	8
P-1D	Jan-91	4	20	2	2 NR	20	2	2	2	2	2	2	NA	NA	NA	NA
	Feb-98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
P-1S	Jan-91	4	20	2	2	20	2	2	2	31 NR	115 NR	191 NR	NA	NA	NA	NA
	Feb-98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
P-3S	Aug-88	0.5	0.5	0.5	1	0.5	NA	0.5	1	1	1	NA	NA	NA	NA	NA
	Sep-88	0.5	0.5	0.5	1	0.5	NA	0.5	1	1	1	3	NA	NA	NA	NA
	Jan-91	2	10	1	1	10	7 NR	1	1	1	2 NR	1	NA	NA	NA	NA
	Feb-98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
P-4S	Jan-91	2	10	1	1	10	1	1	1	1	1 NR	1	NA	NA	NA	NA
	Feb-98	0.2	0.7	0.2	0.4	0.8 0.5	NA	NA	0.2	0.1	0.2	0.3	0.1	3.3	4.8	NA
P-8BR	Aug-88	0.5	0.5	0.5	1	0.5	NA	0.5	1	1	1	NA	NA	NA	NA	NA
	Sep-88	0.5	0.5	0.5	1	0.5	NA	0.5	1	1	1	3	NA	NA	NA	NA
	Jan-91	2	10	1	1	10	1	1	1	1	1	1	NA	NA	NA	NA
	Feb-98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.2	0.1	0.4 0.2	0.3	0.1	3.3	4.8	NA
P-8S	Aug-88	0.5	0.5	0.5	2.1 NR	0.5	NA	0.5	2.4 NR	1	1	NA	NA	NA	NA	NA
	Sep-88	0.5	0.5	0.5	3 NR	0.5	NA	0.5	3.5 NR	1	1	3	NA	NA	NA	NA
	Jan-91	2	160 NR	1	1	10	40 NR	1	2 NR	1	1 NR	1	NA	NA	NA	NA
	Feb-98	0.2	0.7	0.2	0.4	1 0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
8D-DEEP	Aug-87	1.5	50	1	NA	NA	NA	1	1	15 NR	1.4 NR	90 NR	2	12	NA	NA
	Aug-88	0.5	0.5	0.5	1	0.5	NA	0.5	NA	NA	NA	NA	NA	NA	NA	NA
	Sep-88	0.5	0.5	0.5	1.9 NR	0.5	NA	0.5	5.7 NR	1	1	3	NA	NA	NA	NA
	Jan-91	2	10	1	1	10	1	1	1	1	1	1	NA	NA	NA	NA
	Feb-98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
P-9D	Aug-88	0.5	0.5	0.5	4.8 NR	0.5	NA	0.5	1	1	1	NA	NA	NA	NA	NA
	Aug-88	0.5	0.5	0.5	1	0.5	NA	0.5	3.1 NR	1	1	NA	NA	NA	NA	NA
	Sep-88	0.5	0.5	0.5	4.3 NR	0.5	NA	0.5	1	1	1	3	NA	NA	NA	NA
	Jan-91	2	10	1	1	10	170 NR	1	4 NR	1	1	1	NA	NA	NA	NA
	Feb-98	0.2	0.7	0.2	0.4	1.8 0.5	NA	NA	3.3 0.1	0.1	0.2	0.3	0.1	1.2 3.3	4.8	NA
P-9S	Aug-88	0.5	0.5	0.5	7.8 NR	0.5	NA	0.66 NR	14 NR	6 NR	5.7 NR	NA	NA	NA	NA	NA
	Sep-88	0.5	0.5	0.5	6.2 NR	0.5	NA	0.5	19 NR	8.3 NR	9.8 NR	7.1 NR	NA	NA	NA	NA
	Jan-91	2	11 NR	1	4 NR	10	35 NR	1	20 NR	1	8 NR	11 NR	NA	NA	NA	NA
	Feb-98	0.2	0.7	0.2	0.4	0.7 0.5	NA	NA	0.1 0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
P-16	Aug-87	1.5	50	1	NA	NA	NA	1	1	1	1	2	2	12	NA	NA
P-16D	Aug-88	0.5	0.5	0.5	1	0.5	NA	0.5	1	1	1	NA	NA	NA	NA	NA
	Sep-88	0.5	0.5	0.5	1	0.5	NA	0.5	1	1	1	3	NA	NA	NA	NA
	Jan-91	2	10	1	1	10	1	1	7 NR	1	7 NR	3 NR	NA	NA	NA	NA
	Feb-98	0.2	0.7	0.2	0.4	0.5	NA	NA	6.1 0.1	0.1	0.2 0.2	0.3	0.1	3.3	4.8	NA
P-16S	Aug-88	0.5	0.5	1.8 NR	1	0.5	NA	1.5 NR	1	1	1	NA	NA	NA	NA	NA
	Sep-88	0.5	0.5	3.1 NR	1	0.5	NA	1.5 NR	1	1	1	3	NA	NA	NA	NA
	Feb-98	0.2	0.7	0.2	0.4	0.5 0.5	NA	NA	4.3 0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Bis(2-Ethylhexyl) Phthalate Conc RDL	1,2,3-Trichloro-propane Conc RDL	Carbon Disulfide Conc RDL	Tribromo methane Conc RDL	Dibromo methane Conc RDL	N-Propyl benzene Conc RDL	1,2,4-Trimethyl benzene Conc RDL	1,3,5-Trimethyl benzene Conc RDL	Isopropyl benzene Conc RDL	Isopropyl toluene Conc RDL	N-Butyl benzene Conc RDL	tert-Butyl benzene Conc RDL
Results in ug/L	ES	6											
	PAL	0.6											
P-1D	Jan-91	NA	NA	NA	4	NA	NA	NA	NA	NA	NA	NA	NA
	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-1S	Jan-91	NA	NA	NA	4	NA	NA	NA	NA	NA	NA	NA	NA
	Feb-98	NA	NA	2.3 0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-3S	Aug-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Sep-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Feb-98	NA	NA	1 0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-4S	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Feb-98	NA	NA	1 0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-8BR	Aug-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Sep-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-8S	Aug-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Sep-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Feb-98	NA	NA	0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
8D-DEEP	Aug-87	NA	NA	5	5	NA	NA	NA	NA	1	NA	NA	NA
	Aug-88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Sep-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-9D	Aug-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Aug-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Sep-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	250 NR	NA	NA	NA	NA	NA	NA	NA	NA
	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-9S	Aug-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Sep-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-16	Aug-87	NA	NA	5	5	NA	NA	NA	NA	1	NA	NA	NA
P-16D	Aug-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Sep-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-16S	Aug-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Sep-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Total VOCs ug/L	PCE Conc	RDL	TCE Conc	RDL	cis-1,2-DCE Conc	RDL	trans-1,2-DCE Conc	RDL	1,1-DCE Conc	RDL	Vinyl Chloride Conc	RDL	1,1,1-TCA Conc	RDL	1,1-DCA Conc	RDL	1,2-DCA Conc	RDL	Chloro ethane Conc	RDL	1,2-Dichloro propane Conc	RDL	1,3-Dichloro benzene Conc	RDL	1,4-Dichloro benzene Conc	RDL	Chloro benzene Conc	RDL
Results in ug/L	ES		5		5		70		100		7		0.2		200		850		5		400		5		1250		75		100	
	PAL		0.5		0.5		7		20		0.7		0.02		40		85		0.5		80		0.5		125		15		20	
P-17S	Aug-88	880	99	NR	320	NR		NA	320	NR	3	NR	31	NR	9.1	NR	38	NR	6.5	NR	0.5		12	NR	1		3.6	NR	0.5	
	Sep-88	1,000	81	NR	320	NR		NA	440	NR	1.2	NR	35	NR	4.9	NR	56	NR	4.8	NR	0.5		13	NR	1		2.9	NR	0.5	
	Jan-91	300	14	NR	28	NR		NA	3	NR		1	68	NR	5	NR	21	NR	5	NR	NA		10	NR	4		6	NR	1	
	Jun-91	260	18	NR	51	NR		NA	2	NR		1	57	NR	5	NR	26	NR	9	NR	1		14	NR	2		6	NR	1	
	Oct-91	110	16	NR	65	NR		NA		1		1		50		1		1		1	1		14	NR	20			20	1	
	May-92	170	15	NR	47	NR		NA	2	NR		1	27	NR		1	20	NR	4	NR	1		15	NR	1		5	NR	1	
	Oct-92	2,100	18	NR	54	NR	1900	NR	1.4	NR		1	24	NR	0.9	NR	23	NR	5.7	NR	1		17	NR	1		7.6	NR	1	
	May-93	200	50	NR	28.93	NR	18.93	NR	2	NR		1	25	NR	2	NR	22	NR	4	NR	1		13	NR	1		5	NR	1	
	Oct-93	ND		NA		NA		NA		NA	NA			NA		NA		NA		NA	NA			NA	NA			NA	NA	
	May-94	260	9.4	0.5	18	0.5	180	6	0.9	0.7		0.5	10	0.5		0.5	10	0.6	2.3	0.5	0.5		6.7	0.5	0.5		3.9	0.6	0.5	
	Oct-94	450	10	0.5	20	0.5	360	6	0.7	0.7		0.5	8.6	0.5		0.5	12	0.6	3.2	0.5	0.5		9.6	0.5	0.5		4.3	0.6	0.5	
	May-95	160	13	NR	20	NR	110	NR		0.79		0.79		1		0.51		0.46		0.43	2.8		5.1	NR	0.41		4.6	NR	0.26	
	Nov-95	180	13	NR	22	NR	110	NR	0.42	NR		0.29	4.1	NR		0.26	8.2	NR	1.8	NR	11		4.2	NR	0.38		4.4	NR	0.3	
	May-96	140	9.2	NR	17	NR	92	NR	0.34	NR		0.29	4.4	NR		0.26	6	NR	1.4	NR	11		3.6	NR	0.38		3.2	NR	0.3	
	Nov-96	130	9	NR	14	NR	83	NR	0.33	NR		0.12	4.1	NR		0.44	6.2	NR	1.1	NR	2.8		3.3	NR	0.16		2.8	NR	0.24	
	Feb-98	92	7.1	0.2	14	0.2	58	0.2		0.2		0.1	1.3	0.3		1	6.3	0.2	1.2	0.2	0.7		3.3	0.1	NA			NA	0.1	
P-18	Aug-87	13	8.2	NR	1.6	NR		NA		1		1		NA		1		1		1	2		1		2			2	2	
P-18S	Aug-88	6.9	5.5	NR		1		NA		0.5		0.5		0.5		0.5		0.5		0.5	0.5		1		1			1	0.5	
	Sep-88	12	7.1	NR	1.2	NR		NA		1		0.5	1.4	NR	0.89	NR		0.5		0.5	0.5		1		1			1	0.5	
	Jan-91	7.0	5	NR		1		NA		1		1		10		1		1		1	1		1		2			2	1	
	Mar-98	16	11	0.2	2.2	0.2	1.6	0.2		0.2		0.1		0.3		1	0.8	0.2		0.2	0.7			0.1	NA			NA	0.1	
P-19D	Aug-88	32	24	NR	3.7	NR		NA	2.7	NR		0.5	0.52	NR		0.5	0.53	NR		0.5	0.5		1		1			1	0.5	
	Sep-88	36	21	NR	3.5	NR		NA	5.3	NR		0.5	3.2	NR	1.2	NR	0.66	NR		0.5	0.5		1		1			1	0.5	
P-19S	Aug-88	59	35	NR	6.7	NR		NA	13	NR		0.5	0.92	NR		0.5	1	NR		0.5	0.5		1		1			1	0.5	
	Sep-88	63	38	NR	6.6	NR		NA	13	NR		0.5	2.3	NR	1.2	NR	1.1	NR		0.5	0.5		1		1			1	0.5	
P-20	Aug-87	52	39	NR	6.5	NR		NA		1		1		NA		1		1		1	2		1		2			2	2	
P-20S	Aug-88	61	51	NR	5.6	NR		NA	1	NR		0.5	1	NR		0.5	0.78	NR		0.5	0.5		1		1			1	0.5	
	Sep-88	59	48	NR	4.7	NR		NA		1		0.5	2.8	NR	1.2	NR	0.6	NR		0.5	0.5		1		1			1	0.5	
	Dec-90	3.0		1	3	NR		NA		1		1		10		1		1		1	1		1		2			2	1	
	Jan-91	2.0	2	NR		1		NA		1		1		10		1		1		1	1		1		2			2	1	
P-20SR	Jul-91	9.0	3	NR		1		NA		1		1		5		1		1		1	1		1		2			2	1	
	Nov-91	12	7	NR		1		1		1		1		1		1		1		1	1		1		1			1	1	
	May-92	6.0	6	NR		1		NA		1		1		1		1		1		1	1		1		1			1	1	
	Dec-92	8.0	6	NR		1		1		1		1		1		1		1		1	1		1		1			1	1	
	May-93	5.0	3	NR		1		1		1		1		1		1		1		1	1		1		1			1	1	
	May-93	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	NA		NA		NA			NA	NA	
	Oct-93	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	NA		NA		NA			NA	NA	
	May-94	20	6	0.5	0.8	0.5		0.6		0.7		0.5		0.5		0.5		0.6		0.5	0.5		0.5		0.5			0.6	0.5	
	Oct-94	10	4.8	0.5	0.8	0.5		0.6		0.7		0.5		0.5		0.5		0.6		0.5	0.5		0.5		0.5			0.6	0.5	
	May-95	3.5	3.5	NR		0.71		0.69		0.79		0.79		1		0.51		0.46		0.43	2.8		0.3		0.41			0.29	0.26	
	Nov-95	5.7	4	NR	0.24	NR	0.21	NR		0.026		0.029		0.026		0.026	0.025	NR		0.029	1.1		0.021		0.038			0.052	0.03	
	May-96	4.6	3.2	NR	0.17	NR	0.13	NR		0.026		0.029		0.026		0.026	0.025	NR		0.029	1.1		0.021		0.038			0.052	0.03	
	Nov-96	5.5	3.9	NR	0.22	NR	0.24	NR		0.032		0.025		0.045		0.087	0.047	NR		0.022	0.57		0.023		0.033			0.051	0.049	
	Feb-98	3.9	3.7	0.2	0.2	0.2		0.2		0.2		0.1		0.3		1		0.2		0.2	0.7		0.1		NA			NA	0.1	
P-21	Aug-87	1.0	1	NR		1		NA		1		1		NA		1		1		1	2		1		2			2	2	
P-21BR	Aug-88	ND		1		1		NA		1		0.5		0.5		0.5		0.5		0.5	0.5		1		1			1	0.5	
	Sep-88	ND		1		1		NA		1		0.5		0.5		0.5		0.5		0.5	0.5		1		1			1	0.5	
	Jan-91	ND		1		1		NA		1		1		10		1		1		1	1		1		2			2	1	
	Feb-98	0.20		0.2	0.2	0.2		0.2		0.2		0.1		0.3		1		0.2		0.2	0.7		0.1		NA			NA	0.1	

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Bromo dichloro methane Conc	RDL	Bromo methane Conc	RDL	Chloroform Conc	RDL	Methylene Chloride Conc	RDL	Chloro methane Conc	RDL	Dichloro difluoro methane Conc	RDL	Trichloro fluoro methane Conc	RDL	Benzene Conc	RDL	Ethyl benzene Conc	RDL	Toluene Conc	RDL	Xylene, total Conc	RDL	Styrene Conc	RDL	2-Butanone Conc	RDL	Acetone Conc	RDL	Naphthalene Conc	RDL
Results in ug/L	ES	0.6		10		6		5		3		1000		3490		5		700		343		620		100		460		1000		40	
	PAL	0.06		1		0.6		0.5		0.3		200		698		0.5		140		68.6		124		10		90		200		8	
P-17S	Aug-88	0.5		0.5		5.4	NR	14	NR		0.5		NA	2.7	NR	7.7	NR	2.5	NR	7.4	NR		NA	NA		NA		NA		NA	
	Sep-88	0.5		0.5		6.3	NR	6.3	NR		0.5		NA	1.9	NR	10	NR	2.5	NR	11	NR	10	NR	NA		NA		NA		NA	
	Jan-91	4		36	NR	1		1			20		10		1	7	NR	47	NR	17	NR	36	NR	NA		NA		NA		NA	
	Jun-91	2		10		3	NR	1	NR		10	15	NR	28	NR	4	NR	12	NR	5	NR	7	NR	NA		NA		NA		NA	
	Oct-91	20		100		1		1			100		50		1		1	12	NR	1			NA	NA		NA		NA		NA	
	May-92	1		1		1		1			1	1	NR	12	NR	4	NR	10	NR	4	NR	6	NR	NA		NA		NA		NA	
	Oct-92	1		1		1.6	NR	1			1	2.7	NR	16	NR	3	NR	6.3	NR	2.9	NR	4.2	NR	NA		NA		NA		NA	
	May-93	1		1		1		2			1	6	NR		1	3	NR	5	NR	7	NR	7	NR	NA		NA		NA		5	
	Oct-93	NA		NA		NA		NA			NA		NA		NA		NA		NA		NA,		NA	NA		NA		NA		5	
	May-94	0.5		0.5		0.5		2			0.5	0.9	0.5		0.5	2.3	0.5	4.1	0.5	2.3	0.5	1.5	0.5	0.6		NA		NA		0.7	
	Oct-94	0.5		0.5		0.5		2			0.5	1.4	0.5	0.5	0.5	1.8	0.5	0.7	0.5	1.4	0.5	0.8	0.5	0.6		NA		NA		0.7	
	May-95	0.56		1.8		0.4		2			0.64		0.71		0.94	1.4	NR	2.3	NR		2.5		0.26	0.32		NA		NA		3.3	
	Nov-95	0.19		0.45		0.37		0.2		0.39	NR	0.41	NR		0.71	1	NR	1.1	NR	1.2	NR	0.83	0.54	0.48		NA		NA		0.56	
	May-96	0.19		0.45		0.37		0.2		0.52	NR	0.73	NR		0.71	0.7	NR	0.7	NR	0.68	NR		0.54	0.48		NA		NA		0.56	
	Nov-96	0.17		0.38		0.18	NR	0.12			0.24	0.68	NR		0.27	0.68	NR	0.6	NR	0.44	NR	0.45	NR	0.12		NA		NA		0.58	
	Feb-98	0.2		0.7		0.2		0.4			1.8		NA		NA	0.4	0.1		0.1		0.2		0.3	0.1		3.3		8		NA	
P-18	Aug-87	1.5		50		1		NA			NA		NA	3.5	NR		1		1		1		2	2		12		NA		NA	
P-18S	Aug-88	0.5		0.5		0.5		1			0.5		NA	1.4	NR		1		1		1		NA	NA		NA		NA		NA	
	Sep-88	0.5		0.5		0.5		1			0.5		NA	1.3	NR		1		1		1		3	NA		NA		NA		NA	
	Jan-91	2		10		1		1			10		1	1	NR		1		1	1	NR		1	NA		NA		NA		NA	
	Mar-98	0.2		0.7		0.2		0.4			1.8		NA		NA		0.1		0.1		0.2		0.3	0.1		3.3		4.8		NA	
P-19D	Aug-88	0.5		0.5		0.5		1			0.5		NA	0.89	NR		1		1		1		NA	NA		NA		NA		NA	
	Sep-88	0.5		0.5		0.5		1			0.5		NA	1.4	NR		1		1		1		3	NA		NA		NA		NA	
P-19S	Aug-88	0.5		0.5		0.5		1			0.5		NA	1.2	NR	1.2	NR		1		1		NA	NA		NA		NA		NA	
	Sep-88	0.5		0.5		0.5		1			0.5		NA	1.2	NR		1		1		1		3	NA		NA		NA		NA	
P-20	Aug-87	1.5		50		1		NA			NA		NA	6.2	NR		1		1		1		2	2		12		NA		NA	
P-20S	Aug-88	0.5		0.5		0.5		1			0.5		NA	1.6	NR		1		1		1		NA	NA		NA		NA		NA	
	Sep-88	0.5		0.5		0.5		1			0.5		NA	1.4	NR		1		1		1		3	NA		NA		NA		NA	
	Dec-90	2		10		1		1			10		1		1		1		1		1		1	NA		NA		NA		NA	
	Jan-91	2		10		1		1			10		1		1		1		1		1		1	NA		NA		NA		NA	
P-20SR	Jul-91	2		10		1		1			10	6	NR		1		1		1		1		1	NA		NA		NA		NA	
	Nov-91	1		1		1		1			1		1		1		1	1	NR		1	4	NR	NA		NA		NA		NA	
	May-92	1		1		1		1			1		1		1		1		1		1		1	NA		NA		NA		NA	
	Dec-92	1		1		1		1			1	2	NR		1		1		1		1		1	NA		NA		NA		NA	
	May-93	1		1		1	NR	2			1	1	NR		1		1		1		1		1	NA		NA		NA		NA	
	May-93	NA		NA		NA		NA			NA		NA		NA		NA		NA		NA		NA	NA		NA		NA		5	
	Oct-93	NA		NA		NA		NA			NA		NA		NA		NA		NA		NA		NA	NA		NA		NA		5	
	May-94	0.5		0.5		0.5		3.6	2		0.5	2.1	0.5	0.7	0.5		0.5	1.3	0.5		0.5	2.5	0.5	0.6		NA		NA		0.7	
	Oct-94	0.5		0.5		0.5		2			0.5	3.9	0.5		0.5		0.5		0.5	0.6	0.5		0.5	0.6		NA		NA		0.7	
	May-95	0.56		1.8		0.4		2			0.64		0.71		0.94		0.41		0.15		2.5		0.49	0.32		NA		NA		3.3	
	Nov-95	0.019		0.045		0.037		0.02		0.05	NR	0.73	NR	0.14	NR		0.02		0.028	0.025	NR		0.05	0.048		NA		NA	0.072	NR	
	May-96	0.019		0.045		0.037		0.02		0.034	NR	0.81	NR	0.16	NR		0.02		0.028	0.021	NR		0.05	0.048		NA		NA		0.056	
	Nov-96	0.034		0.075		0.027	NR	0.024			0.049	0.87	NR	0.18	NR		0.016		0.024	0.052	NR		0.052	0.025		NA		NA		0.12	
	Feb-98	0.2		0.7		0.2		0.4			0.5		NA		NA		0.1		0.1		0.2		0.3	0.1		3.3		4.8		NA	
P-21	Aug-87	1.5		50		1		NA			NA		NA		1		1		1		1		2	2		12		NA		NA	
P-21BR	Aug-88	0.5		0.5		0.5		1			0.5		NA		0.5		1		1		1		NA	NA		NA		NA		NA	
	Sep-88	0.5		0.5		0.5		1			0.5		NA		0.5		1		1		1		3	NA		NA		NA		NA	
	Jan-91	2		10		1		1			10		1		1		1		1		1		1	NA		NA		NA		NA	
	Feb-98	0.2		0.7		0.2		0.4			0.5		NA		NA		0.1		0.1		0.2		0.3	0.1		3.3		4.8		NA	

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton,Wisconsin

Sampleid	Date	Bis(2-Ethylhexyl) Phthalate Conc RDL	1,2,3-Trichloro-propane Conc RDL	Carbon Disulfide Conc RDL	Tribromo methane Conc RDL	Dibromo methane Conc RDL	N-Propyl benzene Conc RDL	1,2,4-Trimethyl benzene Conc RDL	1,3,5-Trimethyl benzene Conc RDL	Isopropyl benzene Conc RDL	Isopropyl toluene Conc RDL	N-Butyl benzene Conc RDL	tert-Butyl benzene Conc RDL
Results in ug/L	ES	6											
	PAL	0.6											
P-17S	Aug-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Sep-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	4	NA	NA	NA	NA	NA	NA	NA	NA
	Jun-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-91	NA	NA	NA	20	NA	NA	NA	NA	NA	NA	NA	NA
	May-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-93	5	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-93	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	May-94	NA	0.5	NA	0.5	0.5	0.5	0.9 0.9	1.8 0.5	0.5	0.6	0.5	0.5
	Oct-94	NA	0.5	NA	0.5	9.6 0.5	0.5	0.9	0.8 0.5	0.5	0.9 0.6	0.6 0.5	0.8 0.5
	May-95	NA	0.94	NA	0.78	0.45	0.57	0.5 NR	0.6 NR	0.57	0.54	0.68	0.59
	Nov-95	NA	0.54	NA	0.28	0.28	0.44	1.1 NR	0.48 NR	0.23	0.44 NR	0.33	0.38
	May-96	NA	0.54	NA	0.28	0.28	0.44	0.41 NR	0.28	0.23	0.36	0.33	0.38
	Nov-96	NA	0.18	NA	0.18	0.38	0.14	0.28 NR	0.22 NR	0.12	0.19	0.16	0.17
	Feb-98	NA	NA	0.9	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-18	Aug-87	NA	NA	5	5	NA	NA	NA	NA	1	NA	NA	NA
P-18S	Aug-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Sep-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Mar-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-19D	Aug-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Sep-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
P-19S	Aug-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Sep-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
P-20	Aug-87	NA	NA	5	5	NA	NA	NA	NA	1	NA	NA	NA
P-20S	Aug-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Sep-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Dec-90	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
P-20SR	Jul-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Nov-91	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Dec-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-93	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-93	13 5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-93	5 5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	May-94	NA	0.5	NA	0.5	0.5	0.7 0.5	0.9	0.8 0.5	0.5	0.6	0.5	1.3 0.5
	Oct-94	NA	0.5	NA	0.5	0.5	0.5	0.9	0.5	0.5	0.6	0.5	0.5
	May-95	NA	0.94	NA	0.78	0.45	0.57	0.38	0.53	0.57	0.54	0.68	0.59
	Nov-95	NA	0.054	NA	0.028	0.028	0.044	0.067 NR	0.028	0.023	0.092 NR	0.033	0.038
	May-96	NA	0.054	NA	0.028	0.028	0.044	0.035	0.028	0.023	0.036	0.033	0.038
	Nov-96	NA	0.037	NA	0.036	0.076	0.029	0.032	0.025	0.025	0.038	0.031	0.034
	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-21	Aug-87	NA	NA	5	5	NA	NA	NA	NA	1	NA	NA	NA
P-21BR	Aug-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Sep-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Total VOCs ug/L	PCE Conc	RDL	TCE Conc	RDL	cis-1,2-DCE Conc	RDL	trans-1,2-DCE Conc	RDL	1,1-DCE Conc	RDL	Vinyl Chloride Conc	RDL	1,1,1-TCA Conc	RDL	1,1-DCA Conc	RDL	1,2-DCA Conc	RDL	Chloro ethane Conc	RDL	1,2-Dichloro propane Conc	RDL	1,3-Dichloro benzene Conc	RDL	1,4-Dichloro benzene Conc	RDL	Chloro benzene Conc	RDL
Results in ug/L	ES		5		5		70		100		7		0.2		200		850		5		400		5		1250		75		100	
	PAL		0.5		0.5		7		20		0.7		0.02		40		85		0.5		80		0.5		125		15		20	
P-21D	Aug-87	26		1		1		NA	26	NR		1		NA		1		1		1		2		1		2		2		2
	Aug-88	160		1	1.8	NR		NA	84	NR	0.59	NR	67	NR		0.5	5.5	NR		0.5		0.5		1		1		1		0.5
	Sep-88	220		1	2.5	NR		NA	110	NR	0.7	NR	94	NR		0.5	6.1	NR		0.5		0.5		1		1		1		0.5
	Jan-91	73		1		1		NA		1		1	14	NR		1	1	NR		1		1		1		2		2		1
	May-93	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
	Oct-93	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
	Feb-98	180		0.2	1.2	0.2	120	0.2	6.5	0.2		0.1	16	0.3		1	21	0.2	0.8	0.2	8.6	0.7	2.1	0.1		NA		NA		0.1
P-21S	Aug-88	51	4.4	NR		1		NA	2.5	NR	0.7	NR	42	NR	0.77	NR	0.7	NR		0.5		0.5		1		1		1		0.5
	Sep-88	40	4.2	NR		1		NA	3.5	NR		0.5	31	NR	0.61	NR		0.5		0.5	1.1	NR		1		1		1		0.5
	Jan-91	820	3	NR	7	NR		NA	12	NR		1	525	NR		1	40	NR		1	11	NR	3	NR		2		2		1
	Jun-91	840	4	NR	6	NR		NA	14	NR	1	NR	470	NR		1	36	NR	4	NR	8	NR	2	NR		2		2		1
	Nov-91	130		1		1	25	NR		1		1		1		1	72	NR		1		1		1		1		1		1
	May-92	140	2	NR	5	NR		NA	6	NR		1	56	NR		1	18	NR		1	2	NR		1		1		1		1
	Nov-92	78		1	6	NR		1		1		1	41	NR		1	16	NR		1		1		1		1		1		1
	May-93	250		1	20	NR	53	NR	5	NR		1		1		1	21	NR		1	103	NR		1		1		1		1
	Oct-93	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
	May-94	130		0.5	11.4	1	20	0.6	9	1.4		0.5	7.8	1		0.5	15.3	1.2		0.5	2.9	0.5		0.5		0.5		0.6		0.5
	Oct-94	95		0.5	8.7	1	34	1.2	6.5	1.4		0.5	9.7	1		0.5	11.2	1.2		0.5	1.9	1		0.5		0.5		0.6		0.5
	May-95	3.0		0.42		0.71		0.69		0.79		0.79		1		0.51		0.46		0.43		2.8		0.3		0.41		0.29		0.26
	Nov-95	29	0.17	NR	2.2	NR	9.6	NR	2.8	NR		0.029	4.4	NR		0.026	5.7	NR		0.029	1.6	NR	0.1	NR		0.038		0.052		0.03
	May-96	7.6	0.12	NR	0.41	NR	4.4	NR	0.4	NR		0.029	0.95	NR		0.026	0.83	NR		0.029		1.1		0.021		0.038		0.052		0.03
	Nov-96	27		0.039	1.9	NR	14	NR	1.8	NR	0.034	NR	3	NR		0.087	3.9	NR		0.022	0.8	NR	0.079	NR		0.033		0.051		0.049
	Feb-98	1.2		0.2		0.2		0.2		0.2		0.1		0.3		1		0.2		0.2		0.7		0.1		NA		NA		0.1
P-22D	Aug-88	93	12	NR	3.3	NR		NA	14	NR	0.6	NR		0.5	0.77	NR	1.1	NR		0.5		0.5		1		1		1		0.5
	Sep-88	26	8.8	NR	2.8	NR		NA	12	NR		0.5	0.57	NR	0.56	NR	0.96	NR		0.5		0.5		1		1		1		0.5
	Jan-91	14	6	NR		1		NA		1		1		10		1	7	NR		1		1		1		2		2		1
	Jun-91	49	6	NR	1	NR		NA		1		1		5		1		1		1		1		1		2		2		1
	Oct-91	10	8	NR	2	NR		NA		1		1		5		1		1		1		1		1		2		2		1
	May-92	19	7	NR	3	NR		NA		1		1		1		1	1	NR		1		1		1		1		1		1
	Oct-92	19	8	NR	1	NR	8	NR		1		1		1		1		1		1		1		1		1		1		1
	May-93	14	5	NR		1	7	NR		1		1		1		1		1		1		1		1		1		1		1
	May-93	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
	Oct-93	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
	May-94	19	7.1	0.5	2.4	0.5	7.3	0.6		0.7	1	0.5		0.5		0.5		0.6		0.5		0.5		0.5		0.5		0.6		0.5
	Oct-94	23	7.7	0.5	2.7	0.5	8.5	0.6		0.7		0.5		0.5		0.5		0.6		0.5		0.5	0.5	0.5		0.5		0.6		0.5
	May-95	14	6.8	NR	2.2	NR	4.6	NR		0.79		0.79		1		0.51		0.46		0.43		2.8		0.3		0.41		0.29		0.26
	Nov-95	20	7.9	NR	2.1	NR	7	NR	0.042	NR		0.029	0.032	NR	0.12	NR	0.66	NR	0.06	NR		1.1	0.16	NR		0.038		0.052		0.03
	May-96	29	7.2	NR	4.1	NR	14.7	NR	0.039	NR		0.029	0.038	0.026	0.175	NR	0.61	NR	0.107	NR		1.1	0.3	NR		0.038		0.052		0.03
	Nov-96	17	5.9	NR	1.8	NR	7	NR	0.036	NR		0.025		0.045		0.087	0.58	NR	0.05	NR		0.57	0.15	NR		0.033		0.051		0.049
	Feb-98	17	6.4	0.2	1.8	0.2	7.8	0.2		0.2		0.1		0.3		1	0.6	0.2		0.2		0.7		0.1		NA		NA		0.1

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Bromo dichloro niethane Conc RDL	Bromo methane Conc RDL	Chloroform Conc RDL	Methylene Chloride Conc RDL	Chloro methane Conc RDL	Dichloro difluoro methane Conc RDL	Trichloro fluoro methane Conc RDL	Benzene Conc RDL	Ethyl benzene Conc RDL	Toluene Conc RDL	Xylene, total Conc RDL	Styrene Conc RDL	2-Butanone Conc RDL	Acetone Conc RDL	Naphthalene Conc RDL
Results in ug/L	ES	0.6	10	6	5	3	1000	3490	5	700	343	620	100	460	1000	40
	PAL	0.06	1	0.6	0.5	0.3	200	698	0.5	140	68.6	124	10	90	200	8
P-21D	Aug-87	1.5	50	1	NA	NA	NA	1	1	1	1	2	2	12	NA	NA
	Aug-88	0.5	0.5	0.5	1	0.5	NA	1.1 NR	1.7 NR	1	1	NA	NA	NA	NA	NA
	Sep-88	0.5	0.5	0.5	3.7 NR	0.5	NA	0.61 NR	1	1	1	3	NA	NA	NA	NA
	Jan-91	2	10	1	1	10	36 NR	20 NR	1 NR	1	1 NR	1	NA	NA	NA	NA
	May-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5
	Oct-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5
	Feb-98	0.2	0.7	0.2	0.4	0.5	NA	NA	1.8 0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
P-21S	Aug-88	0.5	0.5	0.5	1	0.5	NA	0.5	1	1	1	NA	NA	NA	NA	NA
	Sep-88	0.5	0.5	0.5	1	0.5	NA	0.5	1	1	1	3	NA	NA	NA	NA
	Jan-91	2	10	1	1 NR	10	25 NR	177 NR	9 NR	1	4 NR	2 NR	NA	NA	NA	NA
	Jun-91	2	10	1	3 NR	10	90 NR	190 NR	7 NR	1	1 NR	1 NR	NA	NA	NA	NA
	Nov-91	1	1	37 NR	1	1	1	1	1	1	1	1	NA	NA	NA	NA
	May-92	1	1	1	1	1	1 NR	48 NR	4 NR	1	1	1	NA	NA	NA	NA
	Nov-92	1	1	1	1	1	10 NR	1	4 NR	1	1 NR	1	NA	NA	NA	NA
	May-93	1	3 NR	1	2	1	39 NR	1	3 1	1	1	1	NA	NA	NA	5
	Oct-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5
	May-94	0.5	0.5	0.9 1	2.6 4	0.5	32 1	0.5	8.9 1	3.1 1	3.5 1	6.2 1	0.6	NA	NA	0.7
	Oct-94	0.5	0.5	0.5	2	13 1	0.5	0.5	7.8 1	0.5	1.1 1	0.6 0.5	0.6	NA	NA	0.7
	May-95	0.56	1.8	0.4	2	0.64	0.71	0.94	3 NR	0.15	2.5	0.49	0.32	NA	NA	3.3
	Nov-95	0.019	0.045	0.037	0.054 NR	0.036 NR	0.091 NR	0.071	2.3 NR	0.028	0.044 NR	0.097 0.05	0.048	NA	NA	0.056
	May-96	0.019	0.045	0.037	0.035 NR	0.049 NR	0.037	0.071	0.32 NR	0.028	0.034 NR	0.05	0.048	NA	NA	0.056
	Nov-96	0.034	0.075	0.028 NR	0.024	0.049	0.03	0.054	1.4 NR	0.024	0.076 NR	0.052	0.025	NA	NA	0.12
	Feb-98	0.2	0.7	0.2	0.4	1.2 0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
P-22D	Aug-88	0.5	0.5	0.5	1	0.5	NA	0.66 NR	61 NR	1	1	NA	NA	NA	NA	NA
	Sep-88	0.5	0.5	0.5	1	0.5	NA	0.64 NR	1	1	1	3	NA	NA	NA	NA
	Jan-91	2	10	1	1	10	1	1	1	1	1 NR	1	NA	NA	NA	NA
	Jun-91	2	10	1	1	10	39 NR	3 NR	1	1	1	1	NA	NA	NA	NA
	Oct-91	2	10	1	1	10	5	1	1	1	1	1	NA	NA	NA	NA
	May-92	1	1	1	1 NR	1	7 NR	1	1	1	1	1	NA	NA	NA	NA
	Oct-92	1	1	1	2	1	2 NR	1	1	1	1	1	NA	NA	NA	NA
	May-93	1	1	1	2	1	2 NR	1	1	1	1	1	NA	NA	NA	NA
	May-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5
	Oct-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5
	May-94	0.5	0.5	0.5	2	0.5	1.5 0.5	0.5	0.5	0.5	0.5	0.5	0.6	NA	NA	0.7
	Oct-94	0.5	0.5	0.5	2	0.6 0.5	1.5 0.5	0.6 0.5	0.5	0.5	0.7 0.5	0.5	0.6	NA	NA	0.7
	May-95	0.56	1.8	0.4	2	0.64	0.71	0.94	0.41	0.15	2.5	0.49	0.32	NA	NA	3.3
	Nov-95	0.019	0.045	0.037	0.072 NR	0.031	1.1 NR	0.28 NR	0.02	0.028	0.13 NR	0.05	0.048	NA	NA	0.056
	May-96	0.019	0.045	0.037	0.137 NR	0.041 0.031	1.3 NR	0.53 NR	0.02	0.028	0.021	0.05	0.048	NA	NA	0.056
	Nov-96	0.034	0.075	0.036 NR	0.071 NR	0.049	1.2 NR	0.23 NR	0.016	0.024	0.036 NR	0.052	0.025	NA	NA	0.12
	Feb-98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Bis(2-Ethylhexyl) Phthalate Conc RDL	1,2,3-Trichloro-propane Conc RDL	Carbon Disulfide Conc RDL	Tribromo methane Conc RDL	Dibromo methane Conc RDL	N-Propyl benzene Conc RDL	1,2,4-Trimethyl benzene Conc RDL	1,3,5-Trimethyl benzene Conc RDL	Isopropyl benzene Conc RDL	Isopropyl toluene Conc RDL	N-Butyl benzene Conc RDL	tert-Butyl benzene Conc RDL
Results in ug/L	ES	6											
	PAL	0.6											
P-21D	Aug-87	NA	NA	5	5	NA	NA	NA	NA	1	NA	NA	NA
	Aug-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Sep-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	May-93	4 5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-93	5 5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-21S	Aug-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Sep-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Jun-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Nov-91	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Nov-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-93	5	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-93	1 5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	May-94	NA	0.5	NA	0.5	0.5	0.5	1.5 1.8	1.1 1	0.7 1	0.6	0.6 1	0.5
	Oct-94	NA	0.5	NA	0.5	0.5	0.5	0.9	0.5	0.6 1	0.6	0.5	0.5
	May-95	NA	0.94	NA	0.78	0.45	0.57	0.38	0.53	0.57	0.54	0.68	0.59
	Nov-95	NA	0.054	NA	0.028	0.028	0.044	0.044 NR	0.028	0.092 NR	0.036	0.033	0.038
	May-96	NA	0.054	NA	0.028	0.028	0.044	0.038 NR	0.028	0.023	0.036	0.033	0.038
	Nov-96	NA	0.037	NA	0.036	0.076	0.029	0.032	0.025	0.061 NR	0.038	0.031	0.034
	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-22D	Aug-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Sep-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Jun-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	May-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-93	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-93	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-93	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	May-94	NA	0.5	NA	0.5	0.5	0.5	0.9	0.5	0.5	0.6	0.5	0.5
	Oct-94	NA	0.5	NA	0.5	0.5 0.5	0.5	0.9	0.5	0.5	0.6	0.5	0.5
	May-95	NA	0.94	NA	0.78	0.45	0.57	0.38	0.53	0.57	0.54	0.68	0.59
	Nov-95	NA	0.054	NA	0.028	0.028	0.044	0.035	0.028	0.023	0.036	0.033	0.038
	May-96	NA	0.054	NA	0.028	0.028	0.044	0.035	0.028	0.023	0.036	0.033	0.038
	Nov-96	NA	0.037	NA	0.036	0.076	0.029	0.032	0.025	0.025	0.038	0.031	0.034
	Feb-98	NA	NA	0.5 0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Total VOCs ug/L	PCE Conc	RDL	TCE Conc	RDL	cis-1,2-DCE Conc	RDL	trans-1,2-DCE Conc	RDL	1,1-DCE Conc	RDL	Vinyl Chloride Conc	RDL	1,1,1-TCA Conc	RDL	1,1-DCA Conc	RDL	1,2-DCA Conc	RDL	Chloro ethane Conc	RDL	1,2-Dichloro propane Conc	RDL	1,3-Dichloro benzene Conc	RDL	1,4-Dichloro benzene Conc	RDL	Chloro benzene Conc	RDL
Results in ug/L	ES	I	5		5		70		100		7		0.2		200		850		5		400		5		1250		75		100	
	PAL		0.5		0.5		7		20		0.7		0.02		40		85		0.5		80		0.5		125		15		20	
P-22S	Aug-88	23	8	NR	2.6	NR		NA	10	NR	0.51	NR		0.5	0.61	NR	0.7	NR		0.5		0.5		1		1		1		0.5
	Sep-88	28	9.3	NR	3.2	NR		NA	12	NR		0.5	0.68	NR	1.2	NR	1	NR		0.5		0.5		1		1		1		0.5
	Jan-91	29	9	NR	2	NR		NA		1		1		10		1	14	NR		1		1		1		2		2		1
	Jun-91	60	8	NR	2	NR		NA		1		1		5		1		1		1		1		1		2		2		1
	Oct-91	20	12	NR	3	NR		NA		1		1		5		1	1	NR		1		1		1		2		2		1
	May-92	37	12	NR	4	NR		NA		1		1		1		1	2	NR		1		1		1		1		1		1
	Oct-92	46	12	NR	2	NR	12	NR		1		1		1	17	NR		1		1		1		1		1		1		1
	May-93	21	7	NR	2	NR	9	NR		1		1		1		1		1		1		1		1		1		1		1
	May-93	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
	Oct-93	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
	May-94	19	7.1	0.5	2.3	0.5	6.6	0.6		0.7	0.9	0.5		0.5		0.5		0.6		0.5		0.5		0.5		0.5		0.6		0.5
	Oct-94	26	8.8	0.5	3.1	0.5	8.8	0.6		0.7		0.5		0.5		0.5		0.6		0.5		0.5	0.5	0.5		0.5		0.6		0.5
	May-95	21	9.3	NR	3.4	NR	8.3	NR		0.79		0.79		1		0.51		0.46		0.43		2.8		0.3		0.41		0.29		0.26
	Nov-95	24	9.2	NR	2.8	NR	8.2	NR	0.061	NR		0.029	0.041	NR	0.19	NR	0.9	NR	0.065	NR		1.1	0.2	NR		0.038		0.052		0.03
	May-96	22	8.1	NR	2.8	NR	8.1	NR	0.054	NR		0.029	0.046	NR	0.15	NR	0.8	NR	0.058	NR		1.1	0.21	NR		0.038		0.052		0.03
	Nov-96	20	6.7	NR	2.2	NR	7.2	NR	0.042	NR		0.025		0.045	0.13	NR	0.69	NR	0.058	NR		0.57	0.18	NR		0.033		0.051		0.049
	Feb-98	8.6	2.9	0.2	0.9	0.2	4.4	0.2		0.2		0.1		0.3		1	0.4	0.2		0.2		0.7		0.1		NA		NA		0.1
P-23D	Aug-88	1.9	1.9	NR		1		NA		1		0.5		0.5		0.5		0.5		0.5		0.5		1		1		1		0.5
	Sep-88	3.9	2.3	NR		1		NA		1		0.5		0.5		0.5		0.5		0.5		0.5		1		1		1		0.5
	Jan-91	2.0		1		1		NA		1		1		10		1		1		1		1		1		2		2		1
	Feb-98	1.1	0.8	0.2		0.2		0.2		0.2		0.1		0.3		1		0.2		0.2		0.7		0.1		NA		NA		0.1
P-23S	Aug-88	29	15	NR	5.3	NR		NA	8.5	NR		0.5		0.5		0.5		0.5		0.5		0.5		1		1		1		0.5
	Sep-88	34	12	NR	3.7	NR		NA	14	NR		0.5	0.78	NR	1.3	NR	1.3	NR		0.5		0.5		1		1		1		0.5
	Jan-91	3.0	2	NR		1		NA		1		1		10		1		1		1		1		1		2		2		1
	Feb-98	5.8	4.6	0.2	0.4	0.2	0.3	0.2		0.2		0.1		0.3		1		0.2		0.2		0.7		0.1		NA		NA		0.1
P-24D	Aug-88	ND		1		1		NA		1		0.5		0.5		0.5		0.5		0.5		0.5		1		1		1		0.5
	Sep-88	ND		1		1		NA		1		0.5		0.5		0.5		0.5		0.5		0.5		1		1		1		0.5
	Jan-91	ND		1		1		NA		1		1		10		1		1		1		1		1		2		2		1
	Mar-98	3.5		0.2		0.2	1.3	0.2		0.2		0.1	2.2	0.3		1		0.2		0.2		0.7		0.1		NA		NA		0.1
P-24S or	Jun-88	ND		1		1		NA		NA		NA		NA		NA		NA		NA		NA		NA		1		1		0.5
	Aug-88	ND		1		1		NA		1		0.5		0.5		0.5		0.5		0.5		0.5		1		1		1		0.5
	Sep-88	1.6		NA		NA		NA		1		0.5		0.5	1.6	NR		0.5		0.5		0.5		1		NA		NA		NA
	Jan-91	ND		1		1		NA		1		1		10		1		1		1		1		1		2		2		1
	Mar-98	0.40		0.2		0.2	0.4	0.2		0.2		0.1		0.3		1		0.2		0.2		0.7		0.1		NA		NA		0.1
P-25BR	Aug-88	3.3	3.3	NR		1		NA		1		0.5		0.5		0.5		0.5		0.5		0.5		1		1		1		0.5
	Sep-88	16	1.4	NR	4.2	NR		NA	2.2	NR		0.5	1.1	NR	0.64	NR	2.6	NR		0.5		0.5	1.1	NR	1	NR		1		0.5
	Jan-91	ND		1		1		NA		1		1		10		1		1		1		1		1		2		2		1
	Feb-98	3.8	2	0.2	0.3	0.2	0.7	0.2		0.2		0.1		0.3		1		0.2		0.2		0.7		0.1		NA		NA		0.1
P-25D	Aug-88	12	1.2	NR	4	NR		NA	1.9	NR		0.5		0.5		0.5	2.7	NR		0.5		0.5	1.1	NR		1		1		0.5
	Sep-88	9.5	1.1	NR	3.1	NR		NA	1.8	NR		0.5	0.84	NR	0.5	NR	2.2	NR		0.5		0.5		1		1		1		0.5
	Jan-91	120		1		1		NA		1		1		10		1		1		1		1		1		2		2		1
	Feb-98	50	2	0.2	6.5	0.2	33	0.2	0.6	0.2		0.1	3.2	0.3		1	2.2	0.2		0.2		0.7	1	0.1		NA		NA		0.1
P-25S	Aug-88	ND		1		1		NA		1		0.5		0.5		0.5		0.5		0.5		0.5		1		1		1		0.5
	Sep-88	ND		1		1		NA		1		0.5		0.5		0.5		0.5		0.5		0.5		1		1		1		0.5
	Jan-91	ND		1		1		NA		1		1		10		1		1		1		1		1		2		2		1
	Feb-98	10		0.2	0.6	0.2	4.2	0.2	0.8	0.2		0.1		0.3		1	1.8	0.2		0.2	2.3	0.7		0.1		NA		NA		0.1

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Bromo dichloro methane Conc RDL	Bromo methane Conc RDL	Chloroform Conc RDL	Methylene Chloride Conc RDL	Chloro methane Conc RDL	Dichloro difluoro methane Conc RDL	Trichloro fluoro methane Conc RDL	Benzene Conc RDL	Ethyl benzene Conc RDL	Toluene Conc RDL	Xylene, total Conc RDL	Styrene Conc RDL	2-Butanone Conc RDL	Acetone Conc RDL	Naphthalene Conc RDL
Results in ug/L	ES	0.6	10	6	5	3	1000	3490	5	700	343	620	100	460	1000	40
	PAL	0.06	1	0.6	0.5	0.3	200	698	0.5	140	68.6	124	10	90	200	8
P-22S	Aug-88	0.5	0.5	0.5	1	0.5	NA	0.61 NR	1	1	1	NA	NA	NA	NA	NA
	Sep-88	0.5	0.5	0.5	1	0.5	NA	0.73 NR	1	1	1	3	NA	NA	NA	NA
	Jan-91	2	10	1	1	10	4 NR	1	1	1	1	1	NA	NA	NA	NA
	Jun-91	2	10	1	1 NR	10	46 NR	3 NR	1	1	1	1	NA	NA	NA	NA
	Oct-91	2	10	1	1	10	5	4 NR	1	1	1	1	NA	NA	NA	NA
	May-92	1 NR	1	1 NR	2 NR	1	14 NR	1 NR	1	1	1	1	NA	NA	NA	NA
	Oct-92	1	1	1	2	1	3 NR	1	1	1	1	1	NA	NA	NA	NA
	May-93	1	1	1	2	1	3 NR	1	1	1	1	1	NA	NA	NA	NA
	May-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5
	Oct-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5
	May-94	0.5	0.5	0.5	2	0.5	2.1 0.5	0.5	0.5	0.5	0.5	0.5	0.6	NA	NA	0.7
	Oct-94	0.5	0.5	0.5	2	0.6 0.5	2.4 0.5	0.9 0.5	0.5	0.5	0.6 0.5	0.5	0.6	NA	NA	0.7
	May-95	0.56	1.8	0.4	2	0.64	0.71	0.94	0.41	0.15	2.5	0.49	0.32	NA	NA	3.3
	Nov-95	0.019	0.045	0.037	0.065 NR	0.031	1.6 NR	0.31 NR	0.022 NR	0.028	0.021	0.05	0.048	NA	NA	0.056
	May-96	0.019	0.045	0.038 NR	0.05 NR	0.047 NR	1.5 NR	0.45 NR	0.03 NR	0.028	0.059 NR	0.05	0.048	NA	NA	0.056
	Nov-96	0.034	0.075	0.037 NR	0.052 NR	0.049	1.8 NR	0.45 NR	0.016	0.024	0.035 NR	0.052	0.025	NA	NA	0.12
	Feb-98	0.2	0.7	0.2	0.4	2	NA	NA	0.3	0.1	0.4	0.3	0.1	3.3	4.8	NA
P-23D	Aug-88	0.5	0.5	0.5	1	0.5	NA	0.5	1	1	1	NA	NA	NA	NA	NA
	Sep-88	0.5	0.5	0.5	1.6 NR	0.5	NA	0.5	1	1	1	3	NA	NA	NA	NA
	Jan-91	2	10	1	1	10	1	1	1	1	2 NR	1	NA	NA	NA	NA
	Feb-98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.1	0.1	0.3 0.2	0.3	0.1	3.3	4.8	NA
P-23S	Aug-88	0.5	0.5	0.5	1	0.5	NA	0.5	1	1	1	NA	NA	NA	NA	NA
	Sep-88	0.5	0.5	0.5	1	0.5	NA	0.7 NR	1	1	1	3	NA	NA	NA	NA
	Jan-91	2	10	1	1	10	1	1	1	1	1 NR	1	NA	NA	NA	NA
	Feb-98	0.2	0.7	0.2	0.4	0.5 0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
P-24D	Aug-88	0.5	0.5	0.5	1	0.5	NA	0.5	1	1	1	NA	NA	NA	NA	NA
	Sep-88	0.5	0.5	0.5	1	0.5	NA	0.5	1	1	1	3	NA	NA	NA	NA
	Jan-91	2	10	1	1	10	1	1	1	1	1	1	NA	NA	NA	NA
	Mar-98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
P-24E	Jun-88	NA	NA	NA	NA	NA	NA	NA	1	1	1	3	NA	NA	NA	NA
	Aug-88	0.5	0.5	0.5	1	0.5	NA	0.5	1	1	1	NA	NA	NA	NA	NA
	Sep-88	0.5	0.5	0.5	1	0.5	NA	0.5	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	2	10	1	1	10	1	1	1	1	1	1	NA	NA	NA	NA
	Mar-98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
P-25BR	Aug-88	0.5	0.5	0.5	1	0.5	NA	0.5	1	1	1	NA	NA	NA	NA	NA
	Sep-88	0.5	0.5	0.5	1	0.5	NA	0.62 NR	1	1	1 NR	3	NA	NA	NA	NA
	Jan-91	2	10	1	1	10	1	1	1	1	1	1	NA	NA	NA	NA
	Feb-98	0.2	0.7	0.2	0.4	0.8 0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
P-25D	Aug-88	0.5	0.5	0.5	1	0.5	NA	0.5	1.2 NR	1	1	NA	NA	NA	NA	NA
	Sep-88	0.5	0.5	0.5	1	0.5	NA	0.5	1	1	1	3	NA	NA	NA	NA
	Jan-91	2	10	1	1	10	1	1	1	14 NR	58 NR	50 NR	NA	NA	NA	NA
	Feb-98	0.2	0.7	0.2	0.4	0.8 0.5	NA	NA	0.3 0.1	0.1	0.4 0.2	0.3	0.1	3.3	4.8	NA
P-25S	Aug-88	0.5	0.5	0.5	1	0.5	NA	0.5	1	1	1	NA	NA	NA	NA	NA
	Sep-88	0.5	0.5	0.5	1	0.5	NA	0.5	1	1	1	3	NA	NA	NA	NA
	Jan-91	2	10	1	1	10	1	1	1	1	1	1	NA	NA	NA	NA
	Feb-98	0.2	0.7	0.2	0.5	0.5	NA	NA	0.4 0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Bis(2-Ethylhexyl) Phthalate Conc RDL	1,2,3-Trichloro-propane Conc RDL	Carbon Disulfide Conc RDL	Tribromo methane Conc RDL	Dibromo methane Conc RDL	N-Propyl benzene Conc RDL	1,2,4-Trimethyl benzene Conc RDL	1,3,5-Trimethyl benzene Conc RDL	Isopropyl benzene Conc RDL	Isopropyl toluene Conc RDL	N-Butyl benzene Conc RDL	tert-Butyl benzene Conc RDL
Results in ug/L	ES	6											
	PAL	0.6											
P-22S	Aug-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Sep-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Jun-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	May-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-93	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-93	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-93	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	May-94	NA	0.5	NA	0.5	0.5	0.5	0.9	0.5	0.5	0.6	0.5	0.5
	Oct-94	NA	0.5	NA	0.5	0.5	0.5	0.9	0.5	0.5	0.6	0.5	0.5
	May-95	NA	0.94	NA	0.78	0.45	0.57	0.38	0.53	0.57	0.54	0.68	0.59
	Nov-95	NA	0.054	NA	0.028	0.028	0.044	0.035	0.028	0.023	0.036	0.033	0.038
	May-96	NA	0.054	NA	0.028	0.028	0.044	0.035	0.028	0.023	0.036	0.033	0.038
	Nov-96	NA	0.037	NA	0.036	0.076	0.029	0.032	0.025	0.025	0.038	0.031	0.034
	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-23D	Aug-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Sep-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-23S	Aug-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Sep-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-24D	Aug-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Sep-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Mar-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-24E	Jun-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Aug-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Sep-88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Mar-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-25BR	Aug-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Sep-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-25D	Aug-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Sep-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-25S	Aug-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Sep-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Total VOCs ug/L	PCE Conc	RDL	TCE Conc	RDL	cis-1,2-DCE Conc	RDL	trans-1,2-DCE Conc	RDL	1,1-DCE Conc	RDL	Vinyl Chloride Conc	RDL	1,1,1-TCA Conc	RDL	1,1-DCA Conc	RDL	1,2-DCA Conc	RDL	Chloro ethane Conc	RDL	1,2-Dichloro propane Conc	RDL	1,3-Dichloro benzene Conc	RDL	1,4-Dichloro benzene Conc	RDL	Chloro benzene Conc	RDL
Results in ug/L	ES		5		5		70		100		7		0.2		200		850		5		400		5		1250		75		100	
	PAL		0.5		0.5		7		20		0.7		0.02		40		85		0.5		80		0.5		125		15		20	
P-26D	Aug-88	76	46	NR	6.4	NR		NA	3.2	NR	1.3	NR	5.2	NR	1.2	NR	1.4	NR		0.5		0.5		1		1		1		0.5
	Jan-91	110	28	NR	2	NR		NA		1		1		5		1		1		1		NA		1		2		2		NA
	Jan-91	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		1
	May-93	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
	Oct-93	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
	Mar-98	20	17	0.2	1.6	0.2	0.5	0.2		0.2		0.1		0.3		1	0.6	0.2		0.2		0.7		0.1		NA		NA		0.1
P-26S	Sep-88	53	36	NR	3.3	NR		NA	1.4	NR		0.5	2.5	NR	1.7	NR	0.6	NR		0.5		0.5		1		1		1		0.5
	Jan-91	210	38	NR	7	NR		NA		1		1	10	NR		1		1		1		1		1		2		2		1
	May-93	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
	Oct-93	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
	Mar-98	52	33	0.2	5.1	0.2	8.2	0.2		0.2		0.1	4	0.3		1	1.4	0.2		0.2		0.7		0.1		NA		NA		0.1
P-27D	Aug-88	30	20	NR	2.1	NR		NA		1	0.5	NR		0.5	0.52	NR	0.51	NR		0.5		0.5		1		1		1		0.5
	Sep-88	94	56	NR	7.7	NR		NA	4.2	NR	0.52	NR	9.6	NR	3.2	NR	1.8	NR		0.5	1	NR		1		1		1		0.5
	Jan-91	220	99	NR	11	NR		NA	1	NR		1		10	6	NR	11	NR		1		1		1		2		2		1
	Jun-91	450		1	14	NR		NA		1		1		5	5	NR	4	NR		1		1		1		2		2		1
	Oct-91	230	150	NR	21	NR		NA		1		1		5	4	NR	4	NR		1		1		1		2		2		1
	May-92	190	130	NR	17	NR		NA		1		1		1	4	NR	4	NR		1		1	1	NR		1		1		1
	Oct-92	110	54	NR	15	NR	7	NR		1		1		1	9	NR	2	NR		1		1		1		1		1		1
	May-93	83	6.464	NR	32	NR	6	NR		1		1		1	3	NR	1	NR		1		1		1		1		1		1
	May-93	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
	Oct-93	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
	May-94	120	78	2.5	12	0.5	7.6	0.6		0.7		0.5		0.5	2	0.5	3.1	0.6		0.5		0.5		0.5		0.5		0.6		0.5
	Oct-94	190	113	5	12	0.5	8.4	0.6		0.7		0.5		0.5	3.3	1	2.8	1.2	2.9	1		0.5	0.7	0.5		0.5	0.6	1.2		0.5
	May-95	64	53	NR	8.6	NR	2.8	NR		0.79		0.79		1		0.51		0.46		0.43		2.8		0.3		0.41		0.29		0.26
	Nov-95	82	57	NR	9	NR	5.8	NR		0.13		0.14	0.22	NR	1.2	NR	2.4	NR		0.14		5.7	0.24	NR		0.19		0.26		0.15
	May-96	66	47	NR	7.6	NR	3.8	NR		0.13		0.14		0.13	0.98	NR	2.1	NR		0.14		5.7	0.28	NR		0.19		0.26		0.15
	Nov-96	62	42	NR	7.3	NR	4	NR		0.08	0.078	NR		0.11	1	NR	2.2	NR		0.055		1.4	0.29	NR		0.082		0.13		0.12
	Feb-98	73	54	0.2	8.4	0.2	5.9	0.2		0.2		0.1		0.3	1.3	1	3	0.2		0.2		0.7	0.4	0.1		NA		NA		0.1
P-27S	Aug-88	170	110	NR	19	NR		NA	12	NR	2.7	NR	4.1	NR	4.7	NR	3.9	NR		0.5		0.5		1		1		1		0.5
	Jan-91	230	114	NR	12	NR		NA		1		1		10	5	NR	4	NR		1		1	1	NR		2		2		1
	Jun-91	360	130	NR	17	NR		NA		1		1		5	6	NR	5	NR		1		1		1		2		2		1
	Oct-91	230	150	NR	21	NR		NA		1		1		5	4	NR	4	NR		1		1		1		2		2		1
	May-92	180	120	NR	16	NR		NA		1		1		1	4	NR	3	NR		1		1		1		1		1		1
	Oct-92	110	64.46	NR	15	NR	7	NR		1		1		1	3	NR	2	NR		1		1		1		1		1		1
	May-93	150	120	NR	8	NR	3	NR		1		1		1	1	NR		1		1		1		1		1		1		1
	May-93	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
	Oct-93	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
	May-94	68	51	0.5	7.2	0.5	2	0.6		0.7		0.5		0.5	1.4	0.5	2	0.6		0.5		0.5		0.5		0.5		0.6		0.5
	Oct-94	55	38	0.5	4.4	0.5	2	0.6		0.7	1.1	0.5		0.5	0.8	0.5		0.6		0.5		0.5		0.5		0.5		0.6		0.5
	May-95	42	37	NR	5.3	NR		0.69		0.79		0.79		1		0.51		0.46		0.43		2.8		0.3		0.41		0.29		0.26
	Nov-95	51	39	NR	5.3	NR	1.6	NR		0.13		0.14		0.13	0.84	NR	1.4	NR		0.14		5.7	0.25	NR		0.19		0.26		0.15
	May-96	44	32	NR	4.6	NR	1.5	NR		0.026		0.029		0.026	0.7	NR	1.5	NR		0.029		1.1	0.23	NR		0.038		0.052		0.03
	Nov-96	35	25	NR	4.2	NR	0.86	NR		0.064		0.05		0.09	0.6	NR	1.3	NR		0.044		1.1	0.27	NR		0.066		0.1		0.098
	Feb-98	38	30	0.2	4.7	0.2	1.4	0.2		0.2		0.1		0.3		1	1.7	0.2		0.2		0.7		0.1		NA		NA		0.1
P-28S	Aug-88	1.7	1.7	NR		1		NA		1		0.5		0.5		0.5		0.5		0.5		0.5		1		1		1		0.5
	Sep-88	41	29	NR	3.2	NR		NA		1		0.5	1.4	NR	1.9	NR	1.1	NR		0.5		0.5		1		1		1		0.5
	Mar-98	8.2	7.4	0.2	0.6	0.2	0.2	0.2		0.2		0.1		0.3		1		0.2		0.2		0.7		0.1		NA		NA		0.1

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Bromo dichloro methane Conc RDL	Bromo methane Conc RDL	Chloroform Conc RDL	Methylene Chloride Conc RDL	Chloro methane Conc RDL	Dichloro difluoro methane Conc RDL	Trichloro fluoro methane Conc RDL	Benzene Conc RDL	Ethyl benzene Conc RDL	Toluene Conc RDL	Xylene, total Conc RDL	Styrene Conc RDL	2-Butanone Conc RDL	Acetone Conc RDL	Naphthalene Conc RDL
Results in ug/L	ES	0.6	10	6	5	3	1000	3490	5	700	343	620	100	460	1000	40
	PAL	0.06	1	0.6	0.5	0.3	200	698	0.5	140	68.6	124	10	90	200	8
P-26D	Aug-88	0.5	0.5	0.5	1	0.5	NA	8.6 NR	2.5 NR	1	1	NA	NA	NA	NA	NA
	Jan-91	NA	NA	1	1	10	53 NR	7 NR	NA	1	15 NR	1	NA	NA	NA	NA
	Jan-91	2	10 NR	NA	NA	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA
	May-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5
	Oct-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5
	Mar-98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
P-26S	Sep-88	0.5	0.5	0.5	1	0.5	NA	5.2 NR	1.9 NR	1	1	3	NA	NA	NA	NA
	Jan-91	2	10	1	1	10	1	1	1	14 NR	66 NR	77 NR	NA	NA	NA	NA
	May-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA,	NA	NA	NA	NA	5
	Oct-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5
	Mar-98	0.2	0.7	0.2	2	0.6	NA	NA	0.1 0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
P-27D	Aug-88	0.5	0.5	0.5	3.7 NR	0.5	NA	2.3 NR	1	1	1	NA	NA	NA	NA	NA
	Sep-88	0.5	0.5	0.5	1.4 NR	0.5	NA	8.6 NR	1	1	1	3	NA	NA	NA	NA
	Jan-91	2	10	1	1	10	93 NR	1	1	1	1	1	NA	NA	NA	NA
	Jun-91	2	10	1	2 NR	10	260 NR	40 NR	1	1	120 NR	1	NA	NA	NA	NA
	Oct-91	2	10	1	1	10	16 NR	33 NR	1	1	1	1	NA	NA	NA	NA
	May-92	1	1	1	1	1	16 NR	21 NR	1	1	1	1	NA	NA	NA	NA
	Oct-92	1	1	1	2	1	20 NR	1	1	1	1	1	NA	NA	NA	NA
	May-93	1	1	1	4 NR	1	24 NR	7 NR	1	1	1	1	NA	NA	NA	NA
	May-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5
	Oct-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5
	May-94	0.5	0.5	0.5	2	0.5	10 0.5	3.1 0.5	0.5	0.5	0.5	0.5	0.6	NA	NA	0.7
	Oct-94	0.5	0.5	0.5	2	2 1	37 1	8.5 1	0.5	0.5	1.2 1	0.5	0.6	NA	NA	0.7
	May-95	0.56	1.8	0.4	2	0.64	0.71	0.94	0.41	0.15	2.5	0.49	0.32	NA	NA	3.3
	Nov-95	0.095	0.22	0.19 NR	0.78 NR	0.16	2.9 NR	1.9 NR	0.1	0.14	0.1	0.25	0.24	NA	NA	0.28
	May-96	0.095	0.22	0.18	0.4 NR	0.21 NR	2.3 NR	1.3 NR	0.1	0.14	0.1	0.25	0.24	NA	NA	0.28
	Nov-96	0.085	0.19	0.22 NR	0.66 NR	0.12	2.7 NR	1.7 NR	0.043 NR	0.06	0.1 NR	0.13	0.062	NA	NA	0.29
	Feb-98	0.2	0.7	0.2 0.2	0.4	0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
P-27S	Aug-88	0.5	0.5	0.5	4.4 NR	0.5	NA	9.3 NR	1.8 NR	1	1	NA	NA	NA	NA	NA
	Jan-91	2	10	1	3 NR	10	53 NR	37 NR	1	1	1 NR	1	NA	NA	NA	NA
	Jun-91	2	10	1	7 NR	10	150 NR	48 NR	1	1	1	1	NA	NA	NA	NA
	Oct-91	2	10	1	2 NR	10	14 NR	30 NR	1	1	1	1	NA	NA	NA	NA
	May-92	1	1	1	2 NR	1	11 NR	19 NR	1	1	1	1	NA	NA	NA	NA
	Oct-92	1	1	1	2	1	18 NR	1	1	1	1	1	NA	NA	NA	NA
	May-93	1	1	1	2	1	13 NR	5 NR	1	1	1	1	NA	NA	NA	NA
	May-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5
	Oct-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5
	May-94	0.5	0.5	0.5	2	0.5	2.7 0.5	1.6 0.5	0.5	0.5	0.5	0.5	0.6	NA	NA	0.7
	Oct-94	0.5	0.5	0.5	2	0.5	5.3 0.5	2.1 0.5	0.5 0.5	0.5	0.9 0.5	0.5	0.6	NA	NA	0.7
	May-95	0.56	1.8	0.4	2	0.64	0.71	0.94	0.41	0.15	2.5	0.49	0.32	NA	NA	3.3
	Nov-95	0.095	0.22	0.18	0.18 NR	0.28 NR	1.4 NR	1 NR	0.1 NR	0.14	0.1 NR	0.25	0.24	NA	NA	0.28
	May-96	0.019	0.045	0.075 NR	0.11 NR	0.052 NR	1.7 NR	1.1 NR	0.02	0.028	0.021	0.05	0.048	NA	NA	0.056
	Nov-96	0.068	0.15	0.088 NR	0.088 NR	0.098	1.3 NR	0.92 NR	0.032	0.048	0.082 NR	0.1	0.05	NA	NA	0.23
	Feb-98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
P-28S	Aug-88	0.5	0.5	0.5	1	0.5	NA	0.5	1	1	1	NA	NA	NA	NA	NA
	Sep-88	0.5	0.5	0.5	2.2 NR	0.5	NA	2.6 NR	1	1	1	3	NA	NA	NA	NA
	Mar-98	0.2	0.7	0.2	0.4	12	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Bis(2-Ethylhexyl) Phthalate Conc RDL	1,2,3-Trichloro-propane Conc RDL	Carbon Disulfide Conc RDL	Tribromo methane Conc RDL	Dibromo methane Conc RDL	N-Propyl benzene Conc RDL	1,2,4-Trimethyl benzene Conc RDL	1,3,5-Trimethyl benzene Conc RDL	Isopropyl benzene Conc RDL	Isopropyl toluene Conc RDL	N-Butyl benzene Conc RDL	tert-Butyl benzene Conc RDL
Results in ug/L	ES	6											
	PAL	0.6											
P-26D	Aug-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	May-93	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-93	18 5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Mar-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-26S	Sep-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	May-93	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-93	14 5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Mar-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-27D	Aug-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Sep-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Jun-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	May-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-93	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-93	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-93	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	May-94	NA	0.5	NA	0.5	0.5	0.5	0.9	0.5	0.5	0.6	0.5	0.5
	Oct-94	NA	0.5	NA	0.5	0.7 0.5	0.5	0.9	0.5	0.5	0.6	0.5	0.5
	May-95	NA	0.94	NA	0.78	0.45	0.57	0.38	0.53	0.57	0.54	0.68	0.59
	Nov-95	NA	0.27	NA	0.14	0.14	0.22	0.18	0.14	0.12	0.18	0.16	0.19
	May-96	NA	0.27	NA	0.14	0.14	0.22	0.18	0.14	0.12	0.18	0.16	0.19
	Nov-96	NA	0.092	NA	0.09	0.19	0.072	0.08	0.062	0.062	0.095	0.078	0.085
	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-27S	Aug-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Jun-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	May-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-93	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-93	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-93	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	May-94	NA	0.5	NA	0.5	0.5	0.5	0.9	0.5	0.5	0.6	0.5	0.5
	Oct-94	NA	0.5	NA	0.5	0.5	0.5	0.9	0.5	0.5	0.6	0.5	0.5
	May-95	NA	0.94	NA	0.78	0.45	0.57	0.38	0.53	0.57	0.54	0.68	0.59
	Nov-95	NA	0.27	NA	0.14	0.14	0.22	0.18	0.14	0.12	0.18	0.16	0.19
	May-96	NA	0.054	NA	0.028	0.028	0.044	0.035	0.028	0.023	0.036	0.033	0.038
	Nov-96	NA	0.074	NA	0.072	0.15	0.058	0.064	0.05	0.05	0.076	0.062	0.068
	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-28S	Aug-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Sep-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Mar-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Total VOCs ug/L	PCE Conc	RDL	TCE Conc	RDL	cis-1,2-DCE Conc	RDL	trans-1,2-DCE Conc	RDL	1,1-DCE Conc	RDL	Vinyl Chloride Conc	RDL	1,1,1-TCA Conc	RDL	1,1-DCA Conc	RDL	1,2-DCA Conc	RDL	Chloro ethane Conc	RDL	1,2-Dichloro propane Conc	RDL	1,3-Dichloro benzene Conc	RDL	1,4-Dichloro benzene Conc	RDL	Chloro benzene Conc	RDL
Results in ug/L	ES		5		5		70		100		7		0.2		200		850		5		400		5		1250		75		100	
	PAL		0.5		0.5		7		20		0.7		0.02		40		85		0.5		80		0.5		125		15		20	
P-29S	Mar-91	110	2	NR	1		NA		1		1		10		1		1		1		1		1		2		2		1	
	Jun-91	1.0	1	NR	1		NA		1		1		5		1		1		1		1		1		2		2		1	
	Jun-91	160	2	NR	1		NA		1		1		5		1		1		1		1		1		2		2		1	
	May-92	5.0	1		1		NA		1		1		1		1		1		1		1		1		1		1		1	
	Oct-92	3.0	1		1		1		1		1		1		1		1		1		1		1		1		1		1	
	May-93	5.0	1		1		1		1		1		1		1		1		1		1		1		1		1		1	
	Oct-93	NA	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	May-94	4.6	0.9	0.5	0.5		0.6		0.7		0.5		0.5		0.5		0.6		0.5		0.5		0.5		0.5		0.6		0.5	
	Oct-94	9.5	1.3	0.5	0.7	0.5	0.6		0.7		0.5		0.5		0.5		0.6		0.5		0.5		0.5		0.5		0.6		0.5	
	May-95	ND		0.42		0.71	0.69		0.79		0.79		1		0.51		0.46		0.43		2.8		0.3		0.41		0.29		0.26	
	Nov-95	4.1	1.3	NR		0.025	0.032		0.026		0.029		0.026		0.026		0.02		0.029		1.1		0.021		0.038		0.052		0.03	
	May-96	5.1	1.3	NR		0.025	0.032		0.026		0.029		0.026		0.026		0.02		0.029		1.1		0.021		0.038		0.052		0.03	
	Nov-96	4.5	0.96	NR		0.03	0.028		0.032		0.025		0.045		0.087		0.028		0.022		0.57		0.023		0.033		0.051		0.049	
	Feb-98	33	0.9	0.2		0.2	0.2		0.2		0.1		0.3		1		0.2		0.2		0.7		0.1		2.7		2.5		0.1	
P-30D	Nov-90	ND		1		1	NA		1		1		10		1		1		1		1		1		2		2		1	
	Dec-90	ND		1		1	NA		1		1		10		1		1		1		1		1		2		2		1	
	Dec-91	ND		1		1	NA		1		1		1		1		1		1		1		1		1		1		1	
	May-92	ND		1		1	NA		1		1		1		1		1		1		1		1		1		1		1	
	Jan-93	2.0		1		1	1		1		1		1		1		1		1		1		1		1		1		1	
	May-93	ND		1		1	1		1		1		1		1		1		1		1		1		1		1		1	
	Oct-93	ND		1		1	NA		1		1		1		1		1		1		1		1		1		1		1	
	May-94	ND		0.5		0.5	0.6		0.7		0.5		0.5		0.5		0.6		0.5		0.5		0.5		0.5		0.6		0.5	
	Oct-94	ND		0.5		0.5	0.5		0.5		0.5		0.3		0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.5	
	Oct-94	0.60		0.5		0.5	0.6		0.7		0.5		0.5		0.5		0.6		0.5		0.5		0.5		0.5		0.6		0.5	
	May-95	ND		0.42		0.71	0.69		0.79		0.79		1		0.51		0.46		0.43		2.8		0.3		0.41		0.29		0.26	
	Nov-95	ND		0.031		0.025	0.032		0.026		0.029		0.026		0.026		0.02		0.029		1.1		0.021		0.038		0.052		0.03	
	May-96	0.16		0.031		0.025	0.032		0.026		0.029		0.026		0.026		0.02		0.029		1.1		0.021		0.038		0.052		0.03	
	Nov-96	0.081		0.039		0.03	0.028		0.032		0.025		0.045		0.087		0.028		0.022		0.57		0.023		0.033		0.051		0.049	
	Feb-98	ND		0.2		0.2	0.2		0.2		0.1		0.3		1		0.2		0.2		0.7		0.1		NA		NA		0.1	
P-30I	Nov-90	ND		1		1	NA		1		1		10		1		1		1		1		1		2		2		1	
	Dec-90	ND		1		1	NA		1		1		10		1		1		1		1		1		2		2		1	
	Jun-91	ND		1		1	NA		1		1		5		1		1		1		1		1		2		2		1	
	Dec-91	ND		1		1	1		1		1		1		1		1		1		1		1		1		1		1	
	May-92	1.7		1	1.1	NR	1		1		1		1		1		1		1		1		1		1		1		1	
	Dec-92	ND		1		1	1		1		1		1		1		1		1		1		1		1		1		1	
	May-93	NA		NA		NA	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	May-93	ND		0.5		0.5	0.5		0.5		0.5		0.3		0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.5	
	Oct-93	NA		NA		NA	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	May-94	2.6		0.5		0.5	0.5		0.5		0.5		0.3		0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.5	
	Oct-94	ND		0.5		0.5	0.5		0.5		0.5		0.3		0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.5	
	May-95	ND		0.42		0.71	0.69		0.79		0.79		1		0.51		0.46		0.43		2.8		0.3		0.41		0.29		0.26	
	Nov-95	ND		0.07		0.07	0.09		0.05		0.09		0.09		0.06		0.1		0.09		0.14		0.08		0.24		0.22		0.1	
	May-96	ND		0.095		0.086	0.081		0.094		0.083		0.11		0.1		0.075		0.09		0.16		0.12		0.12		0.12		0.13	
	Nov-96	ND		0.095		0.086	0.081		0.094		0.083		0.11		0.1		0.075		0.09		0.16		0.12		0.12		0.12		0.13	
	Feb-98	ND		0.2		0.2	0.2		0.2		0.1		0.3		1		0.2		0.2		0.7		0.1		NA		NA		0.1	
P-30S	Dec-90	ND		1		1	NA		1		1		10		1		1		1		1		1		2		2		1	

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Bromo dichloro methane Conc RDL	Bromo methane Conc RDL	Chloroform Conc RDL	Methylene Chloride Conc RDL	Chloro methane Conc RDL	Dichloro difluoro methane Conc RDL	Trichloro fluoro methane Conc RDL	Benzene Conc RDL	Ethyl benzene Conc RDL	Toluene Conc RDL	Xylene, total Conc RDL	Styrene Conc RDL	2-Butanone Conc RDL	Acetone Conc RDL	Naphthalene Conc RDL
Results in ug/L	ES	0.6	10	6	5	3	1000	3490	5	700	343	620	100	460	1000	40
	PAL	0.06	1	0.6	0.5	0.3	200	698	0.5	140	68.6	124	10	90	200	8
P-29S	Mar-91	2	10	1	1	10	100 NR	1	1	1	4 NR	1	NA	NA	NA	NA
	Jun-91	2	10	1	1	10	5	1	1	1	1	1	NA	NA	NA	NA
	Jun-91	2	10	1	1	10	159 NR	1 NR	1	1	1	1	NA	NA	NA	NA
	May-92	1	1	1	1	1	5 NR	1	1	1	1	1	NA	NA	NA	NA
	Oct-92	1	1	1	2	1	3 NR	1	1	1	1	1	NA	NA	NA	NA
	May-93	1	1	1	2	1	5 NR	1	1	1	1	1	NA	NA	NA	5
	Oct-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5
	May-94	0.5	0.5	0.5	2	0.5	3.7 0.5	0.5	0.5	0.5	0.5	0.5	0.6	NA	NA	0.7
	Oct-94	0.5	0.5	0.5	2	0.6 0.5	6.3 0.5	0.5	0.5	0.5	0.6 0.5	0.5	0.6	NA	NA	0.7
	May-95	0.56	1.8	0.4	2	0.64	0.71	0.94	0.41	0.15	2.5	0.49	0.32	NA	NA	3.3
	Nov-95	0.019	0.045	0.037	0.02	0.044 NR	2.3 NR	0.46 NR	0.02	0.028	0.021	0.05	0.048	NA	NA	0.056
	May-96	0.019	0.045	0.037	0.02	0.031	3.2 NR	0.56 NR	0.02	0.028	0.021	0.05	0.048	NA	NA	0.056
	Nov-96	0.034	0.075	0.056 NR	0.024	0.049	2.9 NR	0.53 NR	0.016	0.024	0.051 NR	0.052	0.025	NA	NA	0.12
	Feb-98	0.2	0.7	0.2	1	0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	2.2
P-30D	Nov-90	2	10	1	1	10	1	1	1	1	1	1	NA	NA	NA	NA
	Dec-90	2	10	1	1	10	1	1	1	1	1	1	NA	NA	NA	NA
	Dec-91	1	1	1	1	1	1	1	1	1	1	1	NA	NA	NA	NA
	May-92	1	1	1	1	1	1	1	1	1	1	1	NA	NA	NA	NA
	Jan-93	1	1	1	2 NR	1	1	1	1	1	1	1	NA	NA	NA	NA
	May-93	1	1	1	2	1	1	1	1	1	1	1	NA	NA	NA	NA
	Oct-93	1	1	1	2	1	1	1	1	1	1	1	NA	NA	NA	NA
	May-94	0.5	0.5	0.5	2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	NA	NA	0.7
	Oct-94	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	Oct-94	0.5	0.5	0.5	2	0.5	0.5	0.5	0.5	0.5	0.6 0.5	0.5	0.6	NA	NA	0.7
	May-95	0.56	1.8	0.4	2	0.64	0.71	0.94	0.41	0.15	2.5	0.49	0.32	NA	NA	3.3
	Nov-95	0.019	0.045	0.037	0.02	0.031	0.037	0.071	0.02	0.028	0.021	0.05	0.048	NA	NA	0.056
	May-96	0.019	0.045	0.037	0.058 NR	0.077 NR	0.037	0.071	0.02	0.028	0.025 NR	0.05	0.048	NA	NA	0.056
	Nov-96	0.034	0.075	0.034 NR	0.024	0.049	0.03	0.054	0.016	0.024	0.047 NR	0.052	0.025	NA	NA	0.12
	Feb-98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
P-30I	Nov-90	2	10	1	1	10	1	1	1	1	1	1	NA	NA	NA	NA
	Dec-90	2	10	1	1	10	1	1	1	1	1	1	NA	NA	NA	NA
	Jun-91	2	10	1	1	10	5	1	1	1	1	1	NA	NA	NA	NA
	Dec-91	1	1	1	1	1	NA	NA	1	1	1	1	1	NA	NA	NA
	May-92	1	1	0.6 NR	1	1	NA	NA	1	1	1	1	1	NA	NA	NA
	Dec-92	1	1	1	1	1	1	1	1	1	1	1	NA	NA	NA	NA
	May-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5
	May-93	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	Oct-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5
	May-94	0.5	0.5	0.5	2.6 2	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	Oct-94	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	May-95	0.56	1.8	0.4	2	0.64	0.71	0.94	0.41	0.15	2.5	0.49	0.32	NA	NA	3.3
	Nov-95	0.08	0.06	0.07	0.18	0.07	NA	NA	0.07	0.2	0.11	0.56	0.19	NA	NA	NA
	May-96	0.089	0.17	0.088	0.14	0.14	0.088	0.088	0.084	0.1	0.098	0.22	0.15	NA	NA	0.19
	Nov-96	0.089	0.17	0.088	0.14	0.14	0.088	0.088	0.084	0.1	0.098	0.22	0.15	NA	NA	0.19
	Feb-98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
P-30S	Dec-90	2	10	1	1	10	1	1	1	1	1	1	NA	NA	NA	NA

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Bis(2-Ethylhexyl) Phthalate Conc RDL	1,2,3-Trichloro-propane Conc RDL	Carbon Disulfide Conc RDL	Tribromo methane Conc RDL	Dibromo methane Conc RDL	N-Propyl benzene Conc RDL	1,2,4-Trimethyl benzene Conc RDL	1,3,5-Trimethyl benzene Conc RDL	Isopropyl benzene Conc RDL	Isopropyl toluene Conc RDL	N-Butyl benzene Conc RDL	tert-Butyl benzene Conc RDL
Results in ug/L	ES	6											
	PAL	0.6											
P-29S	Mar-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Jun-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Jun-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	May-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-93	5	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-93	1 5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	May-94	NA	0.5	NA	0.5	0.5	0.5	0.9	0.5	0.5	0.6	0.5	0.5
	Oct-94	NA	0.5	NA	0.5	0.5	0.5	0.9	0.5	0.5	0.6	0.5	0.5
	May-95	NA	0.94	NA	0.78	0.45	0.57	0.38	0.53	0.57	0.54	0.68	0.59
	Nov-95	NA	0.054	NA	0.028	0.028	0.044	0.035	0.028	0.023	0.041 NR	0.033	0.038
	May-96	NA	0.054	NA	0.028	0.028	0.044	0.035	0.028	0.023	0.036	0.033	0.038
	Nov-96	NA	0.037	NA	0.036	0.076	0.029	0.032	0.025	0.025	0.038	0.031	0.034
	Feb-98	32 1.3	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-30D	Nov-90	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Dec-90	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Dec-91	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-93	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-93	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-93	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-94	NA	0.5	NA	0.5	0.5	0.5	0.9	0.5	0.5	0.6	0.5	0.5
	Oct-94	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	Oct-94	NA	0.5	NA	0.5	0.5	0.5	0.9	0.5	0.5	0.6	0.5	0.5
	May-95	NA	0.94	NA	0.78	0.45	0.57	0.38	0.53	0.57	0.54	0.68	0.59
	Nov-95	NA	0.054	NA	0.028	0.028	0.044	0.035	0.028	0.023	0.036	0.033	0.038
	May-96	NA	0.054	NA	0.028	0.028	0.044	0.035	0.028	0.023	0.036	0.033	0.038
	Nov-96	NA	0.037	NA	0.036	0.076	0.029	0.032	0.025	0.025	0.038	0.031	0.034
	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-30I	Nov-90	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Dec-90	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Jun-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Dec-91	NA	1	NA	1	1	NA	NA	NA	NA	NA	NA	NA
	May-92	NA	1	NA	1	1	NA	NA	NA	NA	NA	NA	NA
	Dec-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-93	1 5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	May-93	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	Oct-93	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	May-94	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	Oct-94	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	May-95	NA	0.94	NA	0.78	0.45	0.57	0.38	0.53	0.57	0.54	0.68	0.59
	Nov-95	NA	0.21	NA	0.11	0.1	NA	NA	NA	NA	NA	NA	NA
	May-96	NA	0.22	NA	0.13	0.13	0.12	0.12	0.095	0.11	0.11	0.086	0.16
	Nov-96	NA	0.22	NA	0.13	0.13	0.12	0.12	0.095	0.11	0.11	0.086	0.16
	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-30S	Dec-90	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Total VOCs ug/L	PCE Conc RDL	TCE Conc RDL	cis-1,2-DCE Conc RDL	trans-1,2-DCE Conc RDL	1,1-DCE Conc RDL	Vinyl Chloride Conc RDL	1,1,1-TCA Conc RDL	1,1-DCA Conc RDL	1,2-DCA Conc RDL	Chloro ethane Conc RDL	1,2-Dichloro propane Conc RDL	1,3-Dichloro benzene Conc RDL	1,4-Dichloro benzene Conc RDL	Chloro benzene Conc RDL
Results in ug/L	ES		5	5	70	100	7	0.2	200	850	5	400	5	1250	75	100
	PAL		0.5	0.5	7	20	0.7	0.02	40	85	0.5	80	0.5	125	15	20
P-31D	Nov-90	ND	1	1	NA	1	1	10	1	1	1	1	1	2	2	1
	Dec-90	ND	1	1	NA	1	1	10	1	1	1	1	1	2	2	1
	Jan-91	ND	1	1	NA	1	1	10	1	1	1	1	1	2	2	1
	Jun-91	2.0	1	1	NA	1	1	5	1	1	1	1	1	2	2	1
	Jun-91	ND	1	1	NA	1	1	5	1	1	1	1	1	2	2	1
	Nov-91	ND	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	May-92	2.0	1	1	NA	1	1	1	1	1	1	1	1	1	1	1
	Oct-92	ND	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	May-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	May-93	ND	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Oct-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	May-94	ND	0.5	0.5	0.6	0.7	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.6	0.5
	Oct-94	0.90	0.5	0.5	0.6	0.7	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.6	0.5
	May-95	ND	0.42	0.71	0.69	0.79	0.79	1	0.51	0.46	0.43	2.8	0.3	0.41	0.29	0.26
	Nov-95	0.065	0.031	0.025	0.032	0.026	0.029	0.026	0.026	0.02	0.029	1.1	0.021	0.038	0.052	0.03
	May-96	0.043	0.031	0.025	0.032	0.026	0.029	0.026	0.026	0.02	0.029	1.1	0.021	0.038	0.052	0.03
	Nov-96	0.11	0.039	0.03	0.028	0.032	0.025	0.045	0.087	0.028	0.022	0.57	0.023	0.033	0.051	0.049
	Feb-98	ND	0.2	0.2	0.2	0.2	0.1	0.3	1	0.2	0.2	0.7	0.1	NA	NA	0.1
P-31IA	Nov-90	11	9 NR	2 NR	NA	1	1	10	1	1	1	1	1	2	2	1
	Dec-90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1	NA	NA	NA	1
	Dec-90	20	12 NR	1	NA	1	1	10	1	1	1	NA	1	2	2	NA
	Jan-91	13	11 NR	2 NR	NA	1	1	10	1	1	1	1	1	2	2	1
	Jun-91	51	13 NR	2 NR	NA	1	1	5	1	1 NR	1	1	1	2	2	1
	Nov-91	17	13 NR	2 NR	1	1	1	1	1	1 NR	1	1	1	1	1	1
	May-92	26	13 NR	3 NR	NA	1	1	1	1	1 NR	1	1	1	1	1	1
	Oct-92	34	15 NR	4 NR	10 NR	1	1	1	1	1	1	1	1	1	1	1
	May-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	May-93	48	15 NR	3 NR	22 NR	1	1	1	1	1 NR	1	1	1	1	1	1
	Oct-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	May-94	40	14 0.5	3.7 0.5	16 0.6	0.7	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.6	0.5
	Oct-94	32	10 0.5	3.5 0.5	12 0.6	0.7	0.5	0.5	0.5	0.9 0.6	0.5	0.5	0.7 0.5	0.5	0.6	0.5
	May-95	24	14 NR	3.9 NR	5.8 NR	0.79	0.79	1	0.51	0.46	0.43	2.8	0.3	0.41	0.29	0.26
	Nov-95	27	10 NR	3 NR	9.3 NR	0.066 NR	0.029	0.026	0.2 NR	1.5 NR	0.094 NR	1.1	0.36 NR	0.038	0.052	0.03
	May-96	31	12 NR	3.6 NR	9.9 NR	0.076 NR	0.029	0.026	0.22 NR	1.6 NR	0.14 NR	1.1	0.33 NR	0.038	0.052	0.03
	Nov-96	29	11 NR	3.5 NR	9.7 NR	0.065 NR	0.025	0.045	0.2 NR	1.5 NR	0.083 NR	0.57	0.29 NR	0.033	0.051	0.049
	Feb-98	27	13 0.2	3.3 0.2	9.6 0.2	0.2	0.1	0.3	1	1.5 0.2	0.2	0.7	0.1	NA	NA	0.1

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Bromo dichloro methane Conc RDL	Bromo methane Conc RDL	Chloroform Conc RDL	Methylene Chloride Conc RDL	Chloro methane Conc RDL	Dichloro difluoro methane Conc RDL	Trichloro fluoro methane Conc RDL	Benzene Conc RDL	Ethyl benzene Conc RDL	Toluene Conc RDL	Xylene, total Conc RDL	Styrene Conc RDL	2-Butanone Conc RDL	Acetone Conc RDL	Naphthalene Conc RDL
Results in ug/L	ES	0.6	10	6	5	3	1000	3490	5	700	343	620	100	460	1000	40
	PAL	0.06	1	0.6	0.5	0.3	200	698	0.5	140	68.6	124	10	90	200	8
P-31D	Nov-90	2	10	1	1	10	1	1	1	1	1	1	NA	NA	NA	NA
	Dec-90	2	10	1	1	10	1	1	1	1	1	1	NA	NA	NA	NA
	Jan-91	2	10	1	1	10	1	1	1	1	1	1	NA	NA	NA	NA
	Jun-91	2	10	1	2 NR	10	5	1	1	1	1	1	NA	NA	NA	NA
	Jun-91	2	10	1	1	10	5	1	1	1	1	1	NA	NA	NA	NA
	Nov-91	1	1	1	1	1	1	1	1	1	1	1	NA	NA	NA	NA
	May-92	1	1	1	1	1	1	1	1	1	2 NR	1	NA	NA	NA	NA
	Oct-92	1	1	1	2	1	1	1	1	1	1	1	NA	NA	NA	NA
	May-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5
	May-93	1	1	1	2	1	1	1	1	1	1	1	NA	NA	NA	NA
	Oct-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5
	May-94	0.5	0.5	0.5	2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	NA	NA	0.7
	Oct-94	0.5	0.5	0.5	2	0.5	0.9 0.5	0.5	0.5	0.5	0.5	0.5	0.6	NA	NA	0.7
	May-95	0.56	1.8	0.4	2	0.64	0.71	0.94	0.41	0.15	2.5	0.49	0.32	NA	NA	3.3
	Nov-95	0.019	0.045	0.037	0.02	0.044 NR	0.037	0.071	0.02	0.028	0.021 NR	0.05	0.048	NA	NA	0.056
	May-96	0.019	0.045	0.037	0.02	0.043 NR	0.037	0.071	0.02	0.028	0.021	0.05	0.048	NA	NA	0.056
	Nov-96	0.034	0.075	0.057 NR	0.024	0.049	0.03	0.054	0.016	0.024	0.056 NR	0.052	0.025	NA	NA	0.12
	Feb-98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
P-31IA	Nov-90	2	10	1	1	10	1	1	1	1	1	1	NA	NA	NA	NA
	Dec-90	2	10	NA	NA	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA
	Dec-90	NA	NA	1	1	10	8 NR	1	NA	1	1	1	NA	NA	NA	NA
	Jan-91	2	10	1	1	10	1	1	1	1	1	1	NA	NA	NA	NA
	Jun-91	2	10	1	1 NR	10	28 NR	6 NR	1	1	1	1	NA	NA	NA	NA
	Nov-91	1	1	1	1	1	1	1 NR	1	1	1	1	NA	NA	NA	NA
	May-92	1	1	1	1	1	3 NR	4 NR	1	1	2 NR	1	NA	NA	NA	NA
	Oct-92	1	1	1	2	1	5 NR	1	1	1	1	1	NA	NA	NA	NA
	May-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5
	May-93	1	1	1	2	1	3 NR	4 NR	1	1	1	1	NA	NA	NA	NA
	Oct-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5
	May-94	0.5	0.5	0.5	2.1 2	0.5	4.2 0.5	0.5	0.5	0.5	0.5	0.5	0.6	NA	NA	0.7
	Oct-94	0.5	0.5	0.5	2	0.5	3.3 0.5	0.6 0.5	0.5	0.5	0.5	0.5	0.6	NA	NA	0.7
	May-95	0.56	1.8	0.4	2	0.64	0.71	0.94	0.41	0.15	2.5	0.49	0.32	NA	NA	3.3
	Nov-95	0.019	0.045	0.05 NR	0.14 NR	0.038 NR	1.4 NR	0.37 NR	0.04 NR	0.028	0.046 NR	0.05	0.048	NA	NA	0.056
	May-96	0.019	0.045	0.16 NR	0.14 NR	0.076 NR	2.2 NR	0.59 NR	0.02	0.028	0.021	0.05	0.048	NA	NA	0.056
	Nov-96	0.034	0.075	0.056 NR	0.11 NR	0.058 NR	2.3 NR	0.51 NR	0.016	0.024	0.041 NR	0.052	0.025	NA	NA	0.12
	Feb-98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Bis(2-Ethylhexyl) Phthalate Conc RDL	1,2,3-Trichloro-propane Conc RDL	Carbon Disulfide Conc RDL	Tribromo methane Conc RDL	Dibromo methane Conc RDL	N-Propyl benzene Conc RDL	1,2,4-Trimethyl benzene Conc RDL	1,3,5-Trimethyl benzene Conc RDL	Isopropyl benzene Conc RDL	Isopropyl toluene Conc RDL	N-Butyl benzene Conc RDL	tert-Butyl benzene Conc RDL
Results in ug/L	ES	6											
	PAL	0.6											
P-31D	Nov-90	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Dec-90	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Jun-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Jun-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Nov-91	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-93	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	May-93	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-93	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	May-94	NA	0.5	NA	0.5	0.5	0.5	0.9	0.5	0.5	0.6	0.5	0.5
	Oct-94	NA	0.5	NA	0.5	0.5	0.5	0.9	0.5	0.5	0.6	0.5	0.5
	May-95	NA	0.94	NA	0.78	0.45	0.57	0.38	0.53	0.57	0.54	0.68	0.59
	Nov-95	NA	0.054	NA	0.028	0.028	0.044	0.035	0.028	0.023	0.036	0.033	0.038
	May-96	NA	0.054	NA	0.028	0.028	0.044	0.035	0.028	0.023	0.036	0.033	0.038
	Nov-96	NA	0.037	NA	0.036	0.076	0.029	0.032	0.025	0.025	0.038	0.031	0.034
	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-31A	Nov-90	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Dec-90	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Dec-90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Jun-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Nov-91	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-93	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	May-93	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-93	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	May-94	NA	0.5	NA	0.5	0.5	0.5	0.9	0.5	0.5	0.6	0.5	0.5
	Oct-94	NA	0.5	NA	0.5	0.7 0.5	0.5	0.9	0.5	0.5	0.6	0.5	0.5
	May-95	NA	0.94	NA	0.78	0.45	0.57	0.38	0.53	0.57	0.54	0.68	0.59
	Nov-95	NA	0.054	NA	0.028	0.028	0.044	0.035	0.028	0.023	0.036	0.033	0.038
	May-96	NA	0.054	NA	0.028	0.028	0.044	0.035	0.028	0.023	0.036	0.033	0.038
	Nov-96	NA	0.037	NA	0.036	0.076	0.029	0.032	0.025	0.025	0.038	0.031	0.034
	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Total VOCs ug/L	PCE Conc	RDL	TCE Conc	RDL	cis-1,2-DCE Conc	RDL	trans-1,2-DCE Conc	RDL	1,1-DCE Conc	RDL	Vinyl Chloride Conc	RDL	1,1,1-TCA Conc	RDL	1,1-DCA Conc	RDL	1,2-DCA Conc	RDL	Chloro ethane Conc	RDL	1,2-Dichloro propane Conc	RDL	1,3-Dichloro benzene Conc	RDL	1,4-Dichloro benzene Conc	RDL	Chloro benzene Conc	RDL
Results in ug/L	ES		5		5		70		100		7		0.2		200		850		5		400		5		1250		75		100	
	PAL		0.5		0.5		7		20		0.7		0.02		40		85		0.5		80		0.5		125		15		20	
P-31IB	Nov-90	25	17	NR	3	NR		NA	1		1		10		1		1	NR	1		1		1		2		2		1	
	Dec-90	25	14	NR		1		NA	1		1		10		1		1		1		1		1		2		2		1	
	Jan-91	13	11	NR	2	NR		NA	1		1		10		1		1		1		1		1		2		2		1	
	Jun-91	57	13	NR	2	NR		NA	1		1		5		1		1	NR	1		1		1		2		2		1	
	Nov-91	16	12	NR	3	NR		1	1		1		1		1		1	NR	1		1		1		1		1		1	
	May-92	26	10	NR	4	NR		NA	1		1		1		1		1	NR	1		1		1		1		1		1	
	Oct-92	34	16	NR	3	NR	10	NR	1		1		1		1		1		1		1		1		1		1		1	
	May-93	NA		NA		NA		NA	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	May-93	38	14	NR	4	NR	14	NR	1		1		1		1		1	NR	1		1		1		1		1		1	
	Oct-93	NA		NA		NA		NA	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	May-94	34	12	0.5	4.4	0.5	12	0.6		0.7	0.5		0.5		0.7	0.5	2.2	0.6		0.5	0.5		1.3	0.5	0.5		0.6		0.5	
	Oct-94	36	11	0.5	4.1	0.5	13	0.6		0.7	0.5		0.5			0.5	0.9	0.6		0.5	0.5		0.8	0.5	0.5		0.6		0.5	
	Nov-95	33	14	NR	3.7	NR	10	NR	0.071	NR	0.029		0.026		0.25	NR	1.8	NR	0.097	NR	1.1		0.41	NR	0.038		0.052		0.03	
	May-96	27	11	NR	3.3	NR	8.4	NR	0.054	NR	0.029		0.026		0.16	NR	1.2	NR	0.082	NR	1.1		0.29	NR	0.038		0.052		0.03	
	Nov-96	30	11	NR	3.7	NR	9.8	NR	0.056	NR	0.025		0.045		0.2	NR	1.6	NR	0.087	NR	0.57		0.31	NR	0.033		0.051		0.049	
	Feb-98	29	13	0.2	3.6	0.2	10	0.2		0.2	0.1		0.3		1		1.5	0.2		0.2	0.7		0.4	0.1	NA		NA		0.1	
P-31S	Nov-90	ND		1		1		NA	1		1		10		1		1		1		1		1		2		2		1	
	Dec-90	ND		1		1		NA	1		1		10		1		1		1		1		1		2		2		1	
	Jan-91	ND		1		1		NA	1		1		10		1		1		1		1		1		2		2		1	
	Jun-91	ND		1		1		NA	1		1		5		1		1		1		1		1		2		2		1	
	Nov-91	ND		1		1		1	1		1		1		1		1		1		1		1		1		1		1	
	May-92	0		1		1		NA	1		1		1		1		1		1		1		1		1		1		1	
	Oct-92	ND		1		1		1	1		1		1		1		1		1		1		1		1		1		1	
	Oct-93	ND		1		1		NA	1		1		1		1		1		1		1		1		1		1		1	
	May-94	ND		0.5		0.5		0.6		0.7	0.5		0.5		0.5		0.6		0.5		0.5		0.5		0.5		0.6		0.5	
	Oct-94	1.3		0.5		0.5		0.6		0.7	0.5		0.5		0.5		0.6		0.5		0.5		0.5		0.5		0.6		0.5	
	May-95	ND		0.42		0.71		0.69		0.79	0.79		1		0.51		0.46		0.43		2.8		0.3		0.41		0.29		0.26	
	Nov-95	0.76	0.17	NR	0.16	NR	0.34	NR		0.026	0.029		0.026		0.026		0.048	NR		0.029	1.1			0.021	0.038		0.052		0.03	
	May-96	0.084	0.036	NR		0.025		0.032		0.026	0.029		0.026		0.026			0.02		0.029	1.1			0.021	0.038		0.052		0.03	
	Nov-96	0.42	0.12	NR	0.089	NR	0.14	NR		0.032	0.025		0.045		0.087		0.04	NR		0.022	0.57			0.023	0.033		0.051		0.049	
	Feb-98	ND		0.2		0.2		0.2		0.2	0.1		0.3		1			0.2		0.2	0.7			0.1	NA		NA		0.1	
P-32D	Dec-90	ND		1		1		NA	1		1		10		1		1		1		1		1		2		2		1	
	Jan-91	ND		1		1		NA	1		1		10		1		1		1		1		1		2		2		1	
	Feb-98	ND		0.2		0.2		0.2		0.2	0.1		0.3		1			0.2		0.2	0.7			0.1	NA		NA		0.1	
P-32S	Dec-90	ND		1		1		NA	1		1		10		1		1		1		1		1		2		2		1	
	Jan-91	NA		NA		NA		NA	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	Jan-91	1.0		1		1		NA	1		1		10		1		1		1		1		1		2		2		1	
	Feb-98	ND		0.2		0.2		0.2		0.2	0.1		0.3		1			0.2		0.2	0.7			0.1	NA		NA		0.1	
P-33D	Dec-90	ND		5		5		NA	5		5		50		5			5		5	5			5	10		10		5	
	Feb-98	0.60		0.2		0.2		0.2		0.2	0.1		0.3		1			0.2		0.2	0.7			0.1	NA		NA		0.1	
P-33S	Dec-90	ND		1		1		NA	1		1		10		1		1		1		1		1		2		2		1	
	Jul-91	ND		1		1		NA	1		1		5		1		1		1		1		1		2		2		1	
	Feb-98	ND		0.2		0.2		0.2		0.2	0.1		0.3		1			0.2		0.2	0.7			0.1	NA		NA		0.1	

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Bromo dichloro methane Conc RDL	Bromo methane Conc RDL	Chloroform Conc RDL	Methylene Chloride Conc RDL	Chloro methane Conc RDL	Dichloro difluoro methane Conc RDL	Trichloro fluoro methane Conc RDL	Benzene Conc RDL	Ethyl benzene Conc RDL	Toluene Conc RDL	Xylene, total Conc RDL	Styrene Conc RDL	2-Butanone Conc RDL	Acetone Conc RDL	Naphthalene Conc RDL
Results in ug/L	ES	0.6	10	6	5	3	1000	3490	5	700	343	620	100	460	1000	40
	PAL	0.06	1	0.6	0.5	0.3	200	698	0.5	140	68.6	124	10	90	200	8
P-31IB	Nov-90	2	10	1	1	10	1	4 NR	1	1	1	1	NA	NA	NA	NA
	Dec-90	2	10	1	1	10	11 NR	1	1	1	1	1	NA	NA	NA	NA
	Jan-91	2	10	1	1	10	1	1	1	1	1	1	NA	NA	NA	NA
	Jun-91	2	10	1	2 NR	10	32 NR	7 NR	1	1	1	1	NA	NA	NA	NA
	Nov-91	1	1	1	1	1	1	1	1	1	1	1	NA	NA	NA	NA
	May-92	1	1	1	1	1	4 NR	5 NR	1	1	2 NR	1	NA	NA	NA	NA
	Oct-92	1	1	1	2	1	5 NR	1	1	1	1	1	NA	NA	NA	NA
	May-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5
	May-93	1	1	1	2	1	2 NR	3 NR	1	1	1	1	NA	NA	NA	NA
	Oct-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5
	May-94	0.5	0.5	0.5	2	0.5	0.9 0.5	0.8 0.5	0.5	0.5	0.5	0.5	0.6	NA	NA	0.7
	Oct-94	0.5	0.5	0.5	2	0.5	2.3 0.5	0.6 0.5	0.5 0.5	0.5	0.8 0.5	0.7 0.5	0.6	NA	NA	0.7
	Nov-95	0.019	0.045	0.046 NR	0.15 NR	0.031	2.2 NR	0.56 NR	0.02	0.028	0.021	0.05	0.048	NA	NA	0.056
	May-96	0.019	0.045	0.072 NR	0.11 NR	0.056 NR	1.7 NR	0.42 NR	0.02	0.028	0.021	0.05	0.048	NA	NA	0.056
	Nov-96	0.034	0.075	0.045 NR	0.12 NR	0.049	2.4 NR	0.53 NR	0.016	0.024	0.032 NR	0.052	0.025	NA	NA	0.12
	Feb-98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
P-31S	Nov-90	2	10	1	1	10	1	1	1	1	1	1	NA	NA	NA	NA
	Dec-90	2	10	1	1	10	1	1	1	1	1	1	NA	NA	NA	NA
	Jan-91	2	10	1	1	10	1	1	1	1	1	1	NA	NA	NA	NA
	Jun-91	2	10	1	1	10	5	1	1	1	1	1	NA	NA	NA	NA
	Nov-91	1	1	1	1	1	1	1	1	1	1	1	NA	NA	NA	NA
	May-92	1	1	1	1 NR	1	1	1	1	1	1	1	NA	NA	NA	NA
	Oct-92	1	1	1	2	1	1	1	1	1	1	1	NA	NA	NA	NA
	Oct-93	1	1	1	2	1	1	1	1	1	1	1	NA	NA	NA	NA
	May-94	0.5	0.5	0.5	2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	NA	NA	0.7
	Oct-94	0.5	0.5	0.5	2	0.5	0.7 0.5	0.5	0.5	0.5	0.6 0.5	0.5	0.6	NA	NA	0.7
	May-95	0.56	1.8	0.4	2	0.64	0.71	0.94	0.41	0.15	2.5	0.49	0.32	NA	NA	3.3
	Nov-95	0.019	0.045	0.037	0.02	0.039 NR	0.037	0.071	0.02	0.028	0.021	0.05	0.048	NA	NA	0.056
	May-96	0.019	0.045	0.037	0.02	0.048 NR	0.037	0.071	0.02	0.028	0.021	0.05	0.048	NA	NA	0.056
	Nov-96	0.034	0.075	0.027	0.024	0.049	0.03	0.054	0.016	0.024	0.033 NR	0.052	0.025	NA	NA	0.12
	Feb-98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
P-32D	Dec-90	2	10	1	1	10	1	1	1	1	1	1	NA	NA	NA	NA
	Jan-91	2	10	1	1	10	1	1	1	1	1	1	NA	NA	NA	NA
	Feb-98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
P-32S	Dec-90	2	10	1	1	10	1	1	1	1	1	1	NA	NA	NA	NA
	Jan-91	NA	NA	NA	NA	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA
	Jan-91	2	10	1	1 NR	10	1	1	NA	1	1	1	NA	NA	NA	NA
	Feb-98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
P-33D	Dec-90	10	50	5	5	50	5	5	5	5	5	5	NA	NA	NA	NA
	Feb-98	0.2	0.7	0.2	0.4	0.6 0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
P-33S	Dec-90	2	10	1	1	10	1	1	1	1	1	1	NA	NA	NA	NA
	Jul-91	2	10	1	1	10	5	1	1	1	1	1	NA	NA	NA	NA
	Feb-98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Bis(2-Ethylhexyl) Phthalate Conc RDL	1,2,3-Trichloro-propane Conc RDL	Carbon Disulfide Conc RDL	Tribromo methane Conc RDL	Dibromo methane Conc RDL	N-Propyl benzene Conc RDL	1,2,4-Trimethyl benzene Conc RDL	1,3,5-Trimethyl benzene Conc RDL	Isopropyl benzene Conc RDL	Isopropyl toluene Conc RDL	N-Butyl benzene Conc RDL	tert-Butyl benzene Conc RDL
Results in ug/L	ES	6											
	PAL	0.6											
P-31IB	Nov-90	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Dec-90	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Jun-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Nov-91	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-93	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	May-93	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-93	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	May-94	NA	0.5	NA	0.5	0.5	0.5	0.9	0.5	0.5	0.6	0.5	0.5
	Oct-94	NA	0.5	NA	0.5	0.8 0.5	0.5	0.9	0.5	0.5	0.6	0.5	0.5
	Nov-95	NA	0.054	NA	0.028	0.028	0.044	0.035	0.028	0.023	0.036	0.033	0.038
	May-96	NA	0.054	NA	0.028	0.028	0.044	0.035	0.028	0.023	0.036	0.033	0.038
	Nov-96	NA	0.037	NA	0.036	0.076	0.029	0.032	0.025	0.025	0.038	0.031	0.034
	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-31S	Nov-90	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Dec-90	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Jun-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Nov-91	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-93	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-94	NA	0.5	NA	0.5	0.5	0.5	0.9	0.5	0.5	0.6	0.5	0.5
	Oct-94	NA	0.5	NA	0.5	0.5	0.5	0.9	0.5	0.5	0.6	0.5	0.5
	May-95	NA	0.94	NA	0.78	0.45	0.57	0.38	0.53	0.57	0.54	0.68	0.59
	Nov-95	NA	0.054	NA	0.028	0.028	0.044	0.035	0.028	0.023	0.036	0.033	0.038
	May-96	NA	0.054	NA	0.028	0.028	0.044	0.035	0.028	0.023	0.036	0.033	0.038
	Nov-96	NA	0.037	NA	0.036	0.076	0.029	0.032	0.025	0.025	0.038	0.031	0.034
	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-32D	Dec-90	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-32S	Dec-90	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-33D	Dec-90	NA	NA	NA	10	NA	NA	NA	NA	NA	NA	NA	NA
	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-33S	Dec-90	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Jul-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Total VOCs ug/L	PCE Conc RDL	TCE Conc RDL	cis-1,2-DCE Conc RDL	trans-1,2-DCE Conc RDL	1,1-DCE Conc RDL	Vinyl Chloride Conc RDL	1,1,1-TCA Conc RDL	1,1-DCA Conc RDL	1,2-DCA Conc RDL	Chloro ethane Conc RDL	1,2-Dichloro propane Conc RDL	1,3-Dichloro benzene Conc RDL	1,4-Dichloro benzene Conc RDL	Chloro benzene Conc RDL
Results in ug/L	ES		5	5	70	100	7	0.2	200	850	5	400	5	1250	75	100
	PAL		0.5	0.5	7	20	0.7	0.02	40	85	0.5	80	0.5	125	15	20
P-34D	Jan-91	4.0	1	1	NA	1	1	10	1	1	1	1	1	2	2	1
	Jun-91	ND	1	1	NA	1	1	10	1	1	1	1	1	2	2	1
	Oct-91	ND	1	1	NA	1	1	5	1	1	1	1	1	2	2	1
	May-92	ND	1	1	NA	1	1	1	1	1	1	1	1	1	1	1
	Oct-92	40	18 NR	4 NR	12 NR	1	1	1	1	2 NR	1	1	1	1	1	1
	May-93	ND	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	May-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	May-94	0.70	0.5	0.5	0.6	0.7	0.5	0.5	0.7 0.5	0.6	0.5	0.5	0.5	0.5	0.6	0.5
	Oct-94	0.60	0.5	0.5	0.6	0.7	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.6	0.5
	May-95	ND	0.42	0.71	0.69	0.79	0.79	1	0.51	0.46	0.43	2.8	0.3	0.41	0.29	0.26
	Nov-95	0.044	0.031	0.025	0.032	0.026	0.029	0.026	0.026	0.02	0.029	1.1	0.021	0.038	0.052	0.03
	May-96	0.040	0.031	0.025	0.032	0.026	0.029	0.026	0.026	0.02	0.029	1.1	0.021	0.038	0.052	0.03
	Nov-96	0.15	0.039	0.03	0.028	0.032	0.025	0.045	0.087	0.028	0.022	0.57	0.023	0.033	0.051	0.049
	Feb-98	ND	0.2	0.2	0.2	0.2	0.1	0.3	1	0.2	0.2	0.7	0.1	NA	NA	0.1
P-34S	Jan-91	0	1	1	NA	1	1	10	1	1	1	1	1	2	2	1
	Jun-91	ND	1	1	NA	1	1	10	1	1	1	1	1	2	2	1
	Oct-91	ND	1	1	NA	1	1	5	1	1	1	1	1	2	2	1
	May-92	ND	1	1	NA	1	1	1	1	1	1	1	1	1	1	1
	Oct-92	ND	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	May-93	ND	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Oct-93	ND	1	1	NA	1	1	1	1	1	1	1	1	1	1	1
	May-94	ND	0.5	0.5	0.6	0.7	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.6	0.5
	Oct-94	0.60	0.5	0.5	0.6	0.7	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.6	0.5
	May-95	ND	0.42	0.71	0.69	0.79	0.79	1	0.51	0.46	0.43	2.8	0.3	0.41	0.29	0.26
	Nov-95	0.35	0.031	0.025	0.032	0.026	0.029	0.026	0.026	0.02	0.029	1.1	0.021	0.038	0.052	0.03
	May-96	0.40	0.031	0.025	0.032	0.026	0.029	0.026	0.026	0.02	0.029	1.1	0.021	0.038	0.052	0.03
	Nov-96	0.45	0.039	0.03	0.028	0.032	0.025	0.045	0.087	0.028	0.022	0.57	0.023	0.033	0.051	0.049
	Feb-98	0.70	0.2	0.2	0.2	0.2	0.1	0.3	1	0.2	0.2	0.7	0.1	NA	NA	0.1
P-35D	Jan-91	ND	1	1	NA	1	1	10	1	1	1	1	1	2	2	1
	Jun-91	ND	1	1	NA	1	1	5	1	1	1	1	1	2	2	1
	Oct-91	ND	1	1	NA	1	1	5	1	1	1	1	1	2	2	1
	May-92	ND	1	1	NA	1	1	1	1	1	1	1	1	1	1	1
	Oct-92	ND	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	May-93	ND	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Oct-93	ND	1	1	NA	1	1	1	1	1	1	1	1	1	1	1
	May-94	ND	0.5	0.5	0.6	0.7	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.6	0.5
	Oct-94	1.1	0.5 0.5	0.5	0.6	0.7	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.6	0.5
	May-95	ND	0.42	0.71	0.69	0.79	0.79	1	0.51	0.46	0.43	2.8	0.3	0.41	0.29	0.26
	Nov-95	0.033	0.031	0.025	0.032	0.026	0.029	0.026	0.026	0.02	0.029	1.1	0.021	0.038	0.052	0.03
	May-96	ND	0.031	0.025	0.032	0.026	0.029	0.026	0.026	0.02	0.029	1.1	0.021	0.038	0.052	0.03
	Nov-96	0.19	0.039	0.03	0.028	0.032	0.025	0.045	0.087	0.028	0.022	0.57	0.023	0.033	0.051	0.049
	Feb-98	ND	0.2	0.2	0.2	0.2	0.1	0.3	1	0.2	0.2	0.7	0.1	NA	NA	0.1

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Bromo dichloro methane Conc RDL	Bromo methane Conc RDL	Chloroform Conc RDL	Methylene Chloride Conc RDL	Chloro methane Conc RDL	Dichloro difluoro methane Conc RDL	Trichloro fluoro methane Conc RDL	Benzene Conc RDL	Ethyl benzene Conc RDL	Toluene Conc RDL	Xylene, total Conc RDL	Styrene Conc RDL	2-Butanone Conc RDL	Acetone Conc RDL	Naphthalene Conc RDL
Results in ug/L	ES	0.6	10	6	5	3	1000	3490	5	700	343	620	100	460	1000	40
	PAL	0.06	1	0.6	0.5	0.3	200	698	0.5	140	68.6	124	10	90	200	8
P-34D	Jan-91	2	10	1	1	10	1	1	1	1	2 NR	2 NR	NA	NA	NA	NA
	Jun-91	2	10	1	1	10	5	1	1	1	1	1	NA	NA	NA	NA
	Oct-91	2	10	1	1	10	5	1	1	1	1	1	NA	NA	NA	NA
	May-92	1	1	1	1	1	1	1	1	1	1	1	NA	NA	NA	NA
	Oct-92	1	1	1	1	1	4 NR	1	1	1	1	1	NA	NA	NA	NA
	May-93	1	1	1	2	1	1	1	1	1	1	1	NA	NA	NA	NA
	May-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5
	Oct-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5
	May-94	0.5	0.5	0.5	2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	NA	NA	0.7
	Oct-94	0.5	0.5	0.5	2	0.5	0.5	0.5	0.5	0.5	0.6 0.5	0.5	0.6	NA	NA	0.7
	May-95	0.56	1.8	0.4	2	0.64	0.71	0.94	0.41	0.15	2.5	0.49	0.32	NA	NA	3.3
	Nov-95	0.019	0.045	0.037	0.02	0.044 NR	0.037	0.071	0.02	0.028	0.021	0.05	0.048	NA	NA	0.056
	May-96	0.019	0.045	0.037	0.02	0.04 NR	0.037	0.071	0.02	0.028	0.021	0.05	0.048	NA	NA	0.056
	Nov-96	0.034	0.075	0.046 NR	0.024	0.053 NR	0.03	0.054	0.016	0.024	0.053 NR	0.052	0.025	NA	NA	0.12
	Feb-98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
P-34S	Jan-91	2	10	1	1	10	5	1	1	1	1	1 NR	NA	NA	NA	NA
	Jun-91	2	10	1	1	10	5	1	1	1	1	1	NA	NA	NA	NA
	Oct-91	2	10	1	1	10	5	1	1	1	1	1	NA	NA	NA	NA
	May-92	1	1	1	1	1	1	1	1	1	1	1	NA	NA	NA	NA
	Oct-92	1	1	1	2	1	1	1	1	1	1	1	NA	NA	NA	NA
	May-93	1	1	1	2	1	1	1	1	1	1	1	NA	NA	NA	NA
	Oct-93	1	1	1	2	1	1	1	1	1	1	1	NA	NA	NA	NA
	May-94	0.5	0.5	0.5	2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	NA	NA	0.7
	Oct-94	0.5	0.5	0.5	2	0.5	0.5	0.5	0.5	0.5	0.6 0.5	0.5	0.6	NA	NA	0.7
	May-95	0.56	1.8	0.4	2	0.64	0.71	0.94	0.41	0.15	2.5	0.49	0.32	NA	NA	3.3
	Nov-95	0.019	0.045	0.037	0.02 NR	0.045 NR	0.28 NR	0.071	0.02	0.028	0.021	0.05	0.048	NA	NA	0.056
	May-96	0.019	0.045	0.037	0.02	0.035 NR	0.36 NR	0.071	0.02	0.028	0.021	0.05	0.048	NA	NA	0.056
	Nov-96	0.034	0.075	0.027	0.024	0.049	0.39 NR	0.054	0.016	0.024	0.064 NR	0.052	0.025	NA	NA	0.12
	Feb-98	0.2	0.7	0.2	0.4	0.6	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
P-35D	Jan-91	2	10	1	1	10	5	1	1	1	1	1	NA	NA	NA	NA
	Jun-91	2	10	1	1	10	5	1	1	1	1	1	NA	NA	NA	NA
	Oct-91	2	10	1	1	10	5	1	1	1	1	1	NA	NA	NA	NA
	May-92	1	1	1	1	1	1	1	1	1	1	1	NA	NA	NA	NA
	Oct-92	1	1	1	2	1	1	1	1	1	1	1	NA	NA	NA	NA
	May-93	1	1	1	2	1	1	1	1	1	1	1	NA	NA	NA	NA
	Oct-93	1	1	1	2	1	1	1	1	1	1	1	NA	NA	NA	NA
	May-94	0.5	0.5	0.5	2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	NA	NA	0.7
	Oct-94	0.5	0.5	0.5	2	0.5	0.5	0.5	0.5	0.5	0.6 0.5	0.5	0.6	NA	NA	0.7
	May-95	0.56	1.8	0.4	2	0.64	0.71	0.94	0.41	0.15	2.5	0.49	0.32	NA	NA	3.3
	Nov-95	0.019	0.045	0.037	0.02	0.033 NR	0.037	0.071	0.02	0.028	0.021	0.05	0.048	NA	NA	0.056
	May-96	0.019	0.045	0.037	0.02	0.031	0.037	0.071	0.02	0.028	0.021	0.05	0.048	NA	NA	0.056
	Nov-96	0.034	0.075	0.053 0.027	0.024	0.053 0.049	0.03	0.054	0.016	0.024	0.083 NR	0.052	0.025	NA	NA	0.12
	Feb-98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Bis(2-Ethylhexyl) Phthalate Conc RDL	1,2,3-Trichloro-propane Conc RDL	Carbon Disulfide Conc RDL	Tribromo methane Conc RDL	Dibromo methane Conc RDL	N-Propyl benzene Conc RDL	1,2,4-Trimethyl benzene Conc RDL	1,3,5-Trimethyl benzene Conc RDL	Isopropyl benzene Conc RDL	Isopropyl toluene Conc RDL	N-Butyl benzene Conc RDL	tert-Butyl benzene Conc RDL
Results in ug/L	ES	6											
	PAL	0.6											
P-34D	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Jun-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	May-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-93	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-93	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-93	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	May-94	NA	0.5	NA	0.5	0.5	0.5	0.9	0.5	0.5	0.6	0.5	0.5
	Oct-94	NA	0.5	NA	0.5	0.5	0.5	0.9	0.5	0.5	0.6	0.5	0.5
	May-95	NA	0.94	NA	0.78	0.45	0.57	0.38	0.53	0.57	0.54	0.68	0.59
	Nov-95	NA	0.054	NA	0.028	0.028	0.044	0.035	0.028	0.023	0.036	0.033	0.038
	May-96	NA	0.054	NA	0.028	0.028	0.044	0.035	0.028	0.023	0.036	0.033	0.038
	Nov-96	NA	0.037	NA	0.036	0.076	0.029	0.032	0.025	0.025	0.038	0.031	0.034
	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-34S	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Jun-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	May-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-93	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-93	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-94	NA	0.5	NA	0.5	0.5	0.5	0.9	0.5	0.5	0.6	0.5	0.5
	Oct-94	NA	0.5	NA	0.5	0.5	0.5	0.9	0.5	0.5	0.6	0.5	0.5
	May-95	NA	0.94	NA	0.78	0.45	0.57	0.38	0.53	0.57	0.54	0.68	0.59
	Nov-95	NA	0.054	NA	0.028	0.028	0.044	0.035	0.028	0.023	0.036	0.033	0.038
	May-96	NA	0.054	NA	0.028	0.028	0.044	0.035	0.028	0.023	0.036	0.033	0.038
	Nov-96	NA	0.037	NA	0.036	0.076	0.029	0.032	0.025	0.025	0.038	0.031	0.034
	Feb-98	NA	NA	0.7 0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-35D	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Jun-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	May-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-93	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-93	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-94	NA	0.5	NA	0.5	0.5	0.5	0.9	0.5	0.5	0.6	0.5	0.5
	Oct-94	NA	0.5	NA	0.5	0.5	0.5	0.9	0.5	0.5	0.6	0.5	0.5
	May-95	NA	0.94	NA	0.78	0.45	0.57	0.38	0.53	0.57	0.54	0.68	0.59
	Nov-95	NA	0.054	NA	0.028	0.028	0.044	0.035	0.028	0.023	0.036	0.033	0.038
	May-96	NA	0.054	NA	0.028	0.028	0.044	0.035	0.028	0.023	0.036	0.033	0.038
	Nov-96	NA	0.037	NA	0.036	0.076	0.029	0.032	0.025	0.025	0.038	0.031	0.034
	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Total VOCs ug/L	PCE Conc	RDL	TCE Conc	RDL	cis-1,2-DCE Conc	RDL	trans-1,2-DCE Conc	RDL	1,1-DCE Conc	RDL	Vinyl Chloride Conc	RDL	1,1,1-TCA Conc	RDL	1,1-DCA Conc	RDL	1,2-DCA Conc	RDL	Chloro ethane Conc	RDL	1,2-Dichloro propane Conc	RDL	1,3-Dichloro benzene Conc	RDL	1,4-Dichloro benzene Conc	RDL	Chloro benzene Conc	RDL
Results in ug/L	ES		5		5		70		100		7		0.2		200		850		5		400		5		1250		75		100	
	PAL		0.5		0.5		7		20		0.7		0.02		40		85		0.5		80		0.5		125		15		20	
P-35S	Jan-91	ND	1		1		NA		1		1		10		1		1		1		1		1		2		2		1	
	Jun-91	ND	1		1		NA		1		1		5		1		1		1		1		1		2		2		1	
	Oct-91	ND	1		1		NA		1		1		5		1		1		1		1		1		2		2		1	
	May-92	ND	1		1		NA		1		1		1		1		1		1		1		1		1		1		1	
	Oct-92	ND	1		1		1		1		1		1		1		1		1		1		1		1		1		1	
	May-93	ND	1		1		1		1		1		1		1		1		1		1		1		1		1		1	
	Oct-93	ND	1		1		NA		1		1		1		1		1		1		1		1		1		1		1	
	May-94	ND	0.5		0.5		0.6		0.7		0.5		0.5		0.5		0.6		0.5		0.5		0.5		0.5		0.6		0.5	
	Oct-94	0.70	0.5		0.5		0.6		0.7		0.5		0.5		0.5		0.6		0.5		0.5		0.5		0.5		0.6		0.5	
	May-95	ND	0.42		0.71		0.69		0.79		0.79		1		0.51		0.46		0.43		2.8		0.3		0.41		0.29		0.26	
	Nov-95	0.18	0.031		0.025		0.032		0.026		0.029		0.026		0.026		0.02		0.029		1.1		0.021		0.038		0.052		0.03	
	May-96	0.17	0.031		0.025		0.032		0.026		0.029		0.026		0.026		0.02		0.029		1.1		0.021		0.038		0.052		0.03	
	Nov-96	0.26	0.039		0.03		0.028		0.032		0.025		0.045		0.087		0.028		0.022		0.57		0.023		0.033		0.051		0.049	
	Feb-98	ND	0.2		0.2		0.2		0.2		0.1		0.3		1		0.2		0.2		0.7		0.1		NA		NA		0.1	
P-36D	Dec-90	ND	1		1		NA		1		1		10		1		1		1		1		1		2		2		1	
	Jan-91	0	1		1		NA		1		1		10		1		1		1		1		1		2		2		1	
	Feb-98	0.80	0.2		0.2		0.2		0.2		0.1		0.3		1		0.2		0.2		0.7		0.1		NA		NA		0.1	
P-36S	Dec-90	ND	1		1		NA		1		1		10		1		1		1		1		1		2		2		1	
	Jan-91	ND	1		1		NA		1		1		10		1		1		1		1		1		2		2		1	
	Feb-98	ND	0.2		0.2		0.2		0.2		0.1		0.3		1		0.2		0.2		0.7		0.1		NA		NA		0.1	
P-38S	Dec-90	ND	1		1		NA		1		1		10		1		1		1		1		1		2		2		1	
	Jan-91	ND	1		1		NA		1		1		10		1		1		1		1		1		2		2		1	
P-39S	Dec-90	ND	1		1		NA		1		1		10		1		1		1		1		1		2		2		1	
P-40D	Dec-90	ND	1		1		NA		1		1		10		1		1		1		1		1		2		2		1	
	Jan-91	ND	1		1		NA		1		1		5		1		1		1		1		1		2		2		1	
	Jun-91	ND	1		1		NA		1		1		5		1		1		1		1		1		2		2		1	
	Dec-91	9.0	1		1		NA		1		1		1		1		1		1		1		1		1		1		1	
	May-92	ND	1		1		NA		1		1		1		1		1		1		1		1		1		1		1	
	Oct-92	ND	1		1		1		1		1		1		1		1		1		1		1		1		1		1	
	Oct-92	ND	1		1		1		1		1		1		1		1		1		1		1		1		1		1	
	May-93	ND	1		1		1		1		1		1		1		1		1		1		1		1		1		1	
	Oct-93	ND	1		1		NA		1		1		1		1		1		1		1		1		1		1		1	
	May-94	3.9	1.4	0.5	0.5	0.5	2	0.6	0.7		0.5		0.5		0.5		0.6		0.5		0.5		0.5		0.5		0.6		0.5	
	Oct-94	2.4	0.9	0.5		0.5	1	0.6	0.7		0.5		0.5		0.5		0.6		0.5		0.5		0.5		0.5		0.6		0.5	
	May-95	ND		0.42		0.71		0.69	0.79		0.79		1		0.51		0.46		0.43		2.8		0.3		0.41		0.29		0.26	
	Nov-95	2.6	0.89	NR	0.27	NR	1	NR	0.026		0.029		0.026		0.026		0.12	NR	0.029		1.1		0.021	NR	0.038		0.052		0.03	
	May-96	4.0	1.8	NR	0.38	NR	1.2	NR	0.026		0.029		0.026		0.026		0.14	NR	0.029		1.1		0.047	NR	0.038		0.052		0.03	
	Nov-96	1.2	0.54	NR	0.11	NR	0.28	NR	0.032		0.025		0.045		0.087		0.039	NR	0.022		0.57		0.023		0.033		0.051		0.049	
	Feb-98	13	5.6	0.2	1.6	0.2	5.2	0.2	0.2		0.1		0.3		1		0.6	0.2	0.2		0.7		0.1		NA		NA		0.1	

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Bromo dichloro methane Conc RDL	Bromo methane Conc RDL	Chloroform Conc RDL	Methylene Chloride Conc RDL	Chloro methane Conc RDL	Dichloro difluoro methane Conc RDL	Trichloro fluoro methane Conc RDL	Benzene Conc RDL	Ethyl benzene Conc RDL	Toluene Conc RDL	Xylene, total Conc RDL	Styrene Conc RDL	2-Butanone Conc RDL	Acetone Conc RDL	Naphthalene Conc RDL
Results in ug/L	ES	0.6	10	6	5	3	1000	3490	5	700	343	620	100	460	1000	40
	PAL	0.06	1	0.6	0.5	0.3	200	698	0.5	140	68.6	124	10	90	200	8
P-35S	Jan-91	2	10	1	1	10	5	1	1	1	1	1	NA	NA	NA	NA
	Jun-91	2	10	1	1	10	5	1	1	1	1	1	NA	NA	NA	NA
	Oct-91	2	10	1	1	10	5	1	1	1	1	1	NA	NA	NA	NA
	May-92	1	1	1	1	1	1	1	1	1	1	1	NA	NA	NA	NA
	Oct-92	1	1	1	2	1	1	1	1	1	1	1	NA	NA	NA	NA
	May-93	1	1	1	2	1	1	1	1	1	1	1	NA	NA	NA	NA
	Oct-93	1	1	1	2	1	1	1	1	1	1	1	NA	NA	NA	NA
	May-94	0.5	0.5	0.5	2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	NA	NA	0.7
	Oct-94	0.5	0.5	0.5	2	0.5	0.5	0.5	0.5	0.5	0.7	0.5	0.6	NA	NA	0.7
	May-95	0.56	1.8	0.4	2	0.64	0.71	0.94	0.41	0.15	2.5	0.49	0.32	NA	NA	3.3
	Nov-95	0.019	0.045	0.037	0.02	0.033 NR	0.15 NR	0.071	0.02	0.028	0.021	0.05	0.048	NA	NA	0.056
	May-96	0.019	0.045	0.037	0.02	0.031	0.17 NR	0.071	0.02	0.028	0.021	0.05	0.048	NA	NA	0.056
	Nov-96	0.034	0.075	0.027	0.024	0.049	0.19 NR	0.054	0.016	0.024	0.067 NR	0.052	0.025	NA	NA	0.12
	Feb-98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
P-36D	Dec-90	2	10	1	1	10	1	1	1	1	1	1	NA	NA	NA	NA
	Jan-91	2	10	1	1	10	1	1	1	1	1 NR	1	NA	NA	NA	NA
	Feb-98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.1	0.1	0.8 0.2	0.3	0.1	3.3	4.8	NA
P-36S	Dec-90	2	10	1	1	10	1	1	1	1	1	1	NA	NA	NA	NA
	Jan-91	2	10	1	1	10	1	1	1	1	1	1	NA	NA	NA	NA
	Feb-98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
P-38S	Dec-90	2	10	1	1	10	1	1	1	1	1	1	NA	NA	NA	NA
	Jan-91	2	10	1	1	10	1	1	1	1	1	1	NA	NA	NA	NA
P-39S	Dec-90	2	10	1	1	10	1	1	1	1	1	1	NA	NA	NA	NA
P-40D	Dec-90	2	10	1	1	10	1	1	1	1	1	1	NA	NA	NA	NA
	Jan-91	2	10	1	1	10	5	1	1	1	1	1	NA	NA	NA	NA
	Jun-91	2	10	1	1	10	5	1	1	1	1	1	NA	NA	NA	NA
	Dec-91	1	1	1	3 NR	1	1	3 NR	1	1	3 NR	1	NA	NA	NA	NA
	May-92	1	1	1	1	1	1	1	1	1	1	1	NA	NA	NA	NA
	Oct-92	1	1	1	2	1	1	1	1	1	1	1	NA	NA	NA	NA
	Oct-92	1	1	1	2	1	1	1	1	1	1	1	NA	NA	NA	NA
	May-93	1	1	1	2	1	1	1	1	1	1	1	NA	NA	NA	NA
	Oct-93	1	1	1	2	1	1	1	1	1	1	1	NA	NA	NA	NA
	May-94	0.5	0.5	0.5	2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	NA	NA	0.7
	Oct-94	0.5	0.5	0.5	2	0.5	0.5	0.5	0.5	0.5	0.5 0.5	0.5	0.6	NA	NA	0.7
	May-95	0.56	1.8	0.4	2	0.64	0.71	0.94	0.41	0.15	2.5	0.49	0.32	NA	NA	3.3
	Nov-95	0.019	0.045	0.037	0.031 NR	0.091 NR	0.22 NR	0.071	0.02	0.028	0.021	0.05	0.048	NA	NA	0.056
	May-96	0.019	0.045	0.037	0.028 NR	0.039 NR	0.31 NR	0.076 NR	0.02	0.028	0.024 NR	0.05	0.048	NA	NA	0.056
	Nov-96	0.034	0.075	0.042 NR	0.024	0.049	0.096 NR	0.054	0.016	0.024	0.064 NR	0.052	0.025	NA	NA	0.12
	Feb-98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Bis(2-Ethylhexyl) Phthalate Conc RDL	1,2,3-Trichloro-propane Conc RDL	Carbon Disulfide Conc RDL	Tribromo methane Conc RDL	Dibromo methane Conc RDL	N-Propyl benzene Conc RDL	1,2,4-Trimethyl benzene Conc RDL	1,3,5-Trimethyl benzene Conc RDL	Isopropyl benzene Conc RDL	Isopropyl toluene Conc RDL	N-Butyl benzene Conc RDL	tert-Butyl benzene Conc RDL
Results in ug/L	ES	6											
	PAL	0.6											
P-35S	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Jun-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	May-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-93	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-93	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-94	NA	0.5	NA	0.5	0.5	0.5	0.9	0.5	0.5	0.6	0.5	0.5
	Oct-94	NA	0.5	NA	0.5	0.5	0.5	0.9	0.5	0.5	0.6	0.5	0.5
	May-95	NA	0.94	NA	0.78	0.45	0.57	0.38	0.53	0.57	0.54	0.68	0.59
	Nov-95	NA	0.054	NA	0.028	0.028	0.044	0.035	0.028	0.023	0.036	0.033	0.038
	May-96	NA	0.054	NA	0.028	0.028	0.044	0.035	0.028	0.023	0.036	0.033	0.038
	Nov-96	NA	0.037	NA	0.036	0.076	0.029	0.032	0.025	0.025	0.038	0.031	0.034
	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-36D	Dec-90	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-36S	Dec-90	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-38S	Dec-90	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
P-39S	Dec-90	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
P-40D	Dec-90	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Jun-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Dec-91	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-93	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-93	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-94	NA	0.5	NA	0.5	0.5	0.5	0.9	0.5	0.5	0.6	0.5	0.5
	Oct-94	NA	0.5	NA	0.5	0.5	0.5	0.9	0.5	0.5	0.6	0.5	0.5
	May-95	NA	0.94	NA	0.78	0.45	0.57	0.38	0.53	0.57	0.54	0.68	0.59
	Nov-95	NA	0.054	NA	0.028	0.028	0.044	0.035	0.028	0.023	0.036	0.033	0.038
	May-96	NA	0.054	NA	0.028	0.028	0.044	0.035	0.028	0.023	0.036	0.033	0.038
	Nov-96	NA	0.037	NA	0.036	0.076	0.029	0.032	0.025	0.025	0.038	0.031	0.034
	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Total VOCs ug/L	PCE Conc	RDL	TCE Conc	RDL	cis-1,2-DCE Conc	RDL	trans-1,2-DCE Conc	RDL	1,1-DCE Conc	RDL	Vinyl Chloride Conc	RDL	1,1,1-TCA Conc	RDL	1,1-DCA Conc	RDL	1,2-DCA Conc	RDL	Chloro ethane Conc	RDL	1,2-Dichloro propane Conc	RDL	1,3-Dichloro benzene Conc	RDL	1,4-Dichloro benzene Conc	RDL	Chloro benzene Conc	RDL
Results in ug/L	ES		5		5		70		100		7		0.2		200		850		5		400		5		1250		75		100	
	PAL		0.5		0.5		7		20		0.7		0.02		40		85		0.5		80		0.5		125		15		20	
P-40I	Dec-90	13	10	1	2	1		NA		1	1		10			1	1	1		1	1		1		2		2		1	
	Jan-91	ND		1		1		NA		1	1		5			1		1		1	1		1		2		2		1	
	Jan-91	27	12	NR	2	NR		NA		1	1		5			1	1	NR		1	NA		1		2		2		1	
	Jun-91	66	13	NR	2	NR		NA		1	1		5		1	NR	1	NR		1	1		1		2		2		1	
	Dec-91	23	4	NR	2	NR		NA		1	1		1		1	NR	1	NR		1	1		1		1		1		1	
	May-92	27	14	NR	4	NR		NA		1	1		1			1	2	NR		1	1		1		1		1		1	
	Oct-92	33	15	NR	3	NR	11	NR		1	1		1			1		1		1	1		1		1		1		1	
	May-93	NA		NA		NA		NA		NA	NA		NA			NA		NA		NA	NA		NA		NA		NA		NA	
	May-93	35	16	NR	3	NR	11	NR		1	1		1			1		1		1	1		1		1		1		1	
	Oct-93	NA		NA		NA		NA		NA	NA		NA			NA		NA		NA	NA		NA		NA		NA		NA	
	May-94	16	7.2	0.5	2	0.5	6.1	0.6		0.7	0.5		0.5			0.5	0.8	0.6		0.5	0.5		0.5		0.5		0.6		0.5	
	Oct-94	23	8	0.5	2.4	0.5	7.5	0.6		0.7	0.5		0.5			0.5		0.6		0.5	0.5		0.5		0.5		0.6		0.5	
	May-95	8.0	8	NR		0.71		0.69		0.79	0.79		1			0.51		0.46		0.43	2.8		0.3		0.41		0.29		0.26	
	Nov-95	20	8.3	NR	2.2	NR	6.6	NR	0.042	NR	0.029		0.036	NR	0.16	NR	0.74	NR	0.052	NR	1.1		0.16	NR	0.038		0.052		0.03	
	May-96	20	7.9	NR	2.1	NR	6.6	NR	0.047	NR	0.029		0.026		0.16	NR	0.68	NR	0.051	NR	1.1		0.16	NR	0.038		0.052		0.03	
	Nov-96	19	6.8	NR	2	NR	6.8	NR	0.035	NR	0.025		0.045		0.13	NR	0.67	NR	0.05	NR	0.57		0.17	NR	0.033		0.051		0.049	
	Feb-98	22	9.2	0.2	2.5	0.2	8.9	0.2		0.2	0.1		0.3			1	1	0.2		0.2	0.7		0.2	0.1	NA		NA		0.1	
P-41D	Nov-90	ND		1		1		NA		1	1		10			1		1		1	1		1		2		2		1	
	Nov-90	ND		1		1		NA		1	1		10			1		1		1	1		1		2		2		1	
	Dec-90	ND		1		1		NA		1	1		10			1		1		1	1		1		2		2		1	
	Jul-91	ND		1		1		NA		1	1		5			1		1		1	1		1		2		2		1	
	Nov-91	ND		0.5		0.5		0.5		0.5	0.5		0.3			0.5		0.5		0.5	0.5		0.5		0.5		0.5		0.5	
	May-92	0.80		1		1		1		1	1		1			1		1		1	1		1		1		1		1	
	Oct-92	ND		0.5		0.5		0.5		0.5	0.5		0.3			0.5		0.5		0.5	0.5		0.5		0.5		0.5		0.5	
	May-93	NA		NA		NA		NA		NA	NA		NA			NA		NA		NA	NA		NA		NA		NA		NA	
	May-93	ND		0.5		0.5		0.5		0.5	0.5		0.3			0.5		0.5		0.5	0.5		0.5		0.5		0.5		0.5	
	Oct-93	NA		NA		NA		NA		NA	NA		NA			NA		NA		NA	NA		NA		NA		NA		NA	
	May-94	5.2		0.5		0.5		0.5		0.5	0.5		0.3			0.5		0.5		0.5	0.5		0.5		0.5		0.5		0.5	
	Oct-94	ND		0.5		0.5		0.5		0.5	0.5		0.3			0.5		0.5		0.5	0.5		0.5		0.5		0.5		0.5	
	May-95	ND		0.42		0.71		0.69		0.79	0.79		1			0.51		0.46		0.43	2.8		0.3		0.41		0.29		0.26	
	Nov-95	0.089		0.07		0.07		0.09		0.05	0.09		0.09		0.089	NR		0.1		0.09	0.14		0.08		0.24		0.22		0.1	
	May-96	ND		0.095		0.086		0.081		0.094	0.083		0.11			0.1		0.075		0.09	0.16		0.12		0.12		0.12		0.13	
	Nov-96	(0 ND)		0.095		0.086		0.081		0.094	0.083		0.11			0.1		0.075		0.09	0.16		0.12		0.12		0.12		0.13	
	Feb-98	ND		0.2		0.2		0.2		0.2	0.1		0.3			1		0.2		0.2	0.7		0.1		NA		NA		0.1	
P-41S	Dec-90	ND		1		1		NA		1	1		10			1		1		1	1		1		2		2		1	
P-42S	Nov-90	ND		1		1		NA		1	1		10			1		1		1	1		1		2		2		1	
	Dec-90	ND		1		1		NA		1	1		10			1		1		1	1		1		2		2		1	
	Jan-91	ND		1		1		NA		1	1		5			1		1		1	1		1		2		2		1	
PAUZE /Schultz/ Noles	May-93	ND		NA		NA		NA		NA	NA		NA			NA		NA		NA	NA		NA		NA		NA		NA	
	Oct-93	92		NA		NA		NA		NA	NA		NA			NA		NA		NA	NA		NA		NA		NA		NA	
PF-1	Mar-91	ND		0.5		0.5		0.5		0.5	0.5		0.3			0.5		0.5		0.5	0.5		0.5		0.5		0.5		0.5	
Knoche	Nov-91	ND		0.5		0.5		0.5		0.5	0.5		0.3			0.5		0.5		0.5	0.5		0.5		0.5		0.5		0.5	
	Oct-92	ND		0.5		0.5		0.5		0.5	0.5		0.3			0.5		0.5		0.5	0.5		0.5		0.5		0.5		0.5	
	Oct-93	ND		0.5		0.5		0.5		0.5	0.5		0.3			0.5		0.5		0.5	0.5		0.5		0.5		0.5		0.5	
	Nov-95	ND		0.07		0.07		0.09		0.05	0.09		0.09			0.06		0.1		0.09	0.14		0.08		0.24		0.22		0.1	
	Nov-96	ND		0.095		0.086		0.081		0.094	0.083		0.11			0.1		0.075		0.09	0.16		0.12		0.12		0.12		0.13	

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Bromo dichloro methane Conc RDL	Bromo methane Conc RDL	Chloroform Conc RDL	Methylene Chloride Conc RDL	Chloro methane Conc RDL	Dichloro difluoro methane Conc RDL	Trichloro fluoro methane Conc RDL	Benzene Conc RDL	Ethyl benzene Conc RDL	Toluene Conc RDL	Xylene, total Conc RDL	Styrene Conc RDL	2-Butanone Conc RDL	Acetone Conc RDL	Naphthalene Conc RDL
Results in ug/L	ES	0.6	10	6	5	3	1000	3490	5	700	343	620	100	460	1000	40
	PAL	0.06	1	0.6	0.5	0.3	200	698	0.5	140	68.6	124	10	90	200	8
P-401	Dec-90	2	10	1	1	10	1	1	1	1	1	1	NA	NA	NA	NA
	Jan-91	2	10	1	1	10	5	1	1	1	1	1	NA	NA	NA	NA
	Jan-91	2	7 NR	1	1	10	5 NR	1	1	1	1	1	NA	NA	NA	NA
	Jun-91	2	10	1	6 NR	10	35 NR	8 NR	1	1	1	1	NA	NA	NA	NA
	Dec-91	1	1	1 NR	3 NR	1	1	4 NR	1	1	5 NR	2 NR	NA	NA	NA	NA
	May-92	1	1	1	1	1	3 NR	4 NR	1	1	1	1	NA	NA	NA	NA
	Oct-92	1	1	1	1	2	4 NR	1	1	1	1	1	NA	NA	NA	NA
	May-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5
	May-93	1	1	1	2	1	2 NR	3 NR	1	1	1	1	NA	NA	NA	NA
	Oct-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5
	May-94	0.5	0.5	0.5	2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	NA	NA	0.7
	Oct-94	0.5	0.5	0.5	2	0.5	3.4 0.5	0.7 0.5	0.5	0.5	0.6 0.5	0.5	0.6	NA	NA	0.7
	May-95	0.56	1.8	0.4	2	0.64	0.71	0.94	0.41	0.15	2.5	0.26	0.32	NA	NA	3.3
	Nov-95	0.019	0.045	0.057 NR	0.12 NR	0.082 NR	1.3 NR	0.39 NR	0.02	0.028	0.021	0.054	0.048	NA	NA	0.056
	May-96	0.019	0.045	0.037	0.11 NR	0.031	1.4 NR	0.4 NR	0.02	0.028	0.021	0.054	0.048	NA	NA	0.056
	Nov-96	0.034	0.075	0.035 NR	0.095 NR	0.049	1.5 NR	0.38 NR	0.016	0.024	0.036 NR	0.028	0.025	NA	NA	0.12
	Feb-98	0.2	0.7	0.2	0.4	0.9	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
P-41D	Nov-90	2	10	1	1	10	1	1	1	1	1	1	NA	NA	NA	NA
	Nov-90	2	10	1	1	10	1	1	1	1	1	1	NA	NA	NA	NA
	Dec-90	2	10	1	1	10	1	1	1	1	1	1	NA	NA	NA	NA
	Jul-91	2	10	1	1	10	5	1	1	1	1	1	NA	NA	NA	NA
	Nov-91	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	May-92	1	1	1	1	1	NA	NA	1	1	0.8 NR	1	1	NA	NA	NA
	Oct-92	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	May-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5
	May-93	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	Oct-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5
	May-94	0.5	0.5	0.5	5.2 2	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	Oct-94	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	May-95	0.56	1.8	0.4	2	0.64	0.71	0.94	0.41	0.15	2.5	0.49	0.32	NA	NA	3.3
	Nov-95	0.08	0.06	0.07	0.18	0.07	NA	NA	0.07	0.2	0.11	0.56	0.19	NA	NA	NA
	May-96	0.089	0.17	0.088	0.14	0.14	0.088	0.088	0.084	0.1	0.098	0.22	0.15	NA	NA	0.19
	Nov-96	0.089	0.17	0.088	0.14	0.14	0.088	0.088	0.084	0.1	0.1 NR	0.22	0.15	NA	NA	0.19
	Feb-98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
P-41S	Dec-90	2	10	1	1	10	1	1	1	1	1	1	NA	NA	NA	NA
P-42S	Nov-90	2	10	1	1	10	1	1	1	1	1	1	NA	NA	NA	NA
	Dec-90	2	10	1	1	10	1	1	1	1	1	1	NA	NA	NA	NA
	Jan-91	2	10	1	1	10	5	1	1	1	1	1	NA	NA	NA	NA
PAUZE	May-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5
	Oct-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5
PF-1	Mar-91	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
Knoche	Nov-91	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	Oct-92	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	Oct-93	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	Nov-95	0.08	0.06	0.07	0.18	0.07	NA	NA	0.07	0.2	0.11	0.56	0.19	NA	NA	NA
	Nov-96	0.089	0.17	0.088	0.14	0.14	0.088	0.088	0.084	0.1	0.098	0.22	0.15	NA	NA	0.19

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Bis(2-Ethylhexyl) Phthalate Conc RDL	1,2,3-Trichloro-propane Conc RDL	Carbon Disulfide Conc RDL	Tribromo methane Conc RDL	Dibromo methane Conc RDL	N-Propyl benzene Conc RDL	1,2,4-Trimethyl benzene Conc RDL	1,3,5-Trimethyl benzene Conc RDL	Isopropyl benzene Conc RDL	Isopropyl toluene Conc RDL	N-Butyl benzene Conc RDL	tert-Butyl benzene Conc RDL
Results in ug/L	ES	6											
	PAL	0.6											
P-40I	Dec-90	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Jun-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Dec-91	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-92	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	May-93	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	May-93	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-93	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	May-94	NA	0.5	NA	0.5	0.5	0.5	0.9	0.5	0.5	0.6	0.5	0.5
	Oct-94	NA	0.5	NA	0.5	0.5	0.5	0.9	0.5	0.5	0.6	0.5	0.5
	May-95	NA	0.94	NA	0.78	0.45	0.57	0.38	0.53	0.57	0.54	0.68	0.59
	Nov-95	NA	0.054	NA	0.028	0.028	0.044	0.035	0.028	0.023	0.036	0.033	0.038
	May-96	NA	0.054	NA	0.028	0.028	0.044	0.035	0.028	0.023	0.036	0.033	0.038
	Nov-96	NA	0.037	NA	0.036	0.076	0.029	0.032	0.025	0.025	0.038	0.031	0.034
	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-41D	Nov-90	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Nov-90	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Dec-90	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Jul-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Nov-91	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	May-92	NA	1	NA	1	1	NA	NA	NA	NA	NA	NA	NA
	Oct-92	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	May-93	1 5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	May-93	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	Oct-93	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	May-94	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	Oct-94	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	May-95	NA	0.94	NA	0.78	0.45	0.57	0.38	0.53	0.57	0.54	0.68	0.59
	Nov-95	NA	0.21	NA	0.11	0.1	NA	NA	NA	NA	NA	NA	NA
	May-96	NA	0.22	NA	0.13	0.13	0.12	0.12	0.095	0.11	0.11	0.086	0.16
	Nov-96	NA	0.22	NA	0.13	0.13	0.12	0.12	0.095	0.11	0.11	0.086	0.16
	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-41S	Dec-90	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
P-42S	Nov-90	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Dec-90	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
	Jan-91	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA
PAUZE	May-93	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-93	92 5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PF-1	Mar-91	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
Knoche	Nov-91	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	Oct-92	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	Oct-93	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	Nov-95	NA	0.21	NA	0.11	0.1	NA	NA	NA	NA	NA	NA	NA
	Nov-96	NA	0.22	NA	0.13	0.13	0.12	0.12	0.095	0.11	0.11	0.086	0.16

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton,Wisconsin

Sampleid	Date	Total VOCs ug/L	PCE Conc RDL	TCE Conc RDL	cis-1,2-DCE Conc RDL	trans-1,2-DCE Conc RDL	1,1-DCE Conc RDL	Vinyl Chloride Conc RDL	1,1,1-TCA Conc RDL	1,1-DCA Conc RDL	1,2-DCA Conc RDL	Chloro ethane Conc RDL	1,2-Dichloro propane Conc RDL	1,3-Dichloro benzene Conc RDL	1,4-Dichloro benzene Conc RDL	Chloro benzene Conc RDL
Results in ug/L	ES		5	5	70	100	7	0.2	200	850	5	400	5	1250	75	100
	PAL		0.5	0.5	7	20	0.7	0.02	40	85	0.5	80	0.5	125	15	20
RB-1	Mar-91	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Bula	Jun-91	ND	0.05	0.05	0.05	0.05	0.05	0.3	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	May-92	0.70	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	May-93	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	May-94	1.9	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	May-95	0.51	0.1	0.13	0.22	0.17	0.15	0.1	0.1	0.11	0.51 NR	0.23	0.12	0.1	0.1	0.1
	May-96	ND	0.095	0.086	0.081	0.094	0.083	0.11	0.1	0.075	0.09	0.16	0.12	0.12	0.12	0.13
RS-1	Feb-91	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Summers	Jun-91	ND	0.05	0.05	0.05	0.05	0.05	0.3	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	May-93	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	May-94	2.8	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	May-95	0.40	0.1	0.13	0.22	0.17	0.15	0.1	0.1	0.11	0.4 NR	0.23	0.12	0.1	0.1	0.1
	May-96	ND	0.095	0.086	0.081	0.094	0.083	0.11	0.1	0.075	0.09	0.16	0.12	0.12	0.12	0.13
Sather	Jun-91	ND	0.05	0.05	0.05	0.05	0.05	0.3	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Arvid	Nov-91	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	May-92	ND	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Oct-92	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	May-93	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	Oct-93	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	May-94	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	Oct-94	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	May-95	0.47	0.1	0.13	0.22	0.17	0.15	0.1	0.1	0.11	0.47 NR	0.23	0.12	0.1	0.1	0.1
	Nov-95	ND	0.07	0.07	0.09	0.05	0.09	0.09	0.06	0.1	0.09	0.14	0.08	0.24	0.22	0.1
	May-96	ND	0.095	0.086	0.081	0.094	0.083	0.11	0.1	0.075	0.09	0.16	0.12	0.12	0.12	0.13
	Nov-96	0.26	0.095	0.086	0.081	0.094	0.083	0.11	0.1	0.075	0.09	0.16	0.12	0.12	0.12	0.13
Schultz	May-92	10	1	7.2 NR	2 NR	1	1	1	1	1	1	1	1	1	1	1
New	May-96	10	4.9 NR	0.84 NR	2.6 NR	0.094	0.083	0.11	0.1	0.68 NR	0.09	0.16	0.13 NR	0.12	0.12	0.13
	Feb-98	13	6.1 0.4	0.5 0.2	4 0.4	0.2	0.1	0.3	1	0.6 0.4	0.2	0.7	0.1	NA	NA	0.3
STPPLWTH	May-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-93	45	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TW-3	Aug-88	ND	1	1	NA	1	0.5	0.5	0.5	0.5	0.5	0.5	1	1	1	0.5
	Sep-88	1.1	1	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	1	1	0.5
	Sep-88	0.57	NA	NA	NA	1	0.5	0.5	0.57 NR	0.5	0.5	0.5	1	NA	NA	NA
TW-5	Aug-87	150	1 NR	140 NR	NA	1 NR	1 1	NA	1	1 NR	1	2 2	1	2	2	2
TW-6	Aug-87	130	50 NR	40 NR	NA	1 NR	1	NA	1	32 NR	1	2	1	2	2	2
WB-1	Feb-91	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	Mar-91	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	Jun-91	1.3	0.05	0.05	0.05	0.05	0.05	0.3	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	May-92	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	May-93	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	May-94	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	May-95	0.39	0.1	0.13	0.22	0.17	0.15	0.1	0.1	0.11	0.39 NR	0.23	0.12	0.1	0.1	0.1
	May-96	0.48	0.095	0.086	0.081	0.094	0.083	0.11	0.1	0.075	0.09	0.16	0.12	0.12	0.12	0.13
(ROUNDS)	Nov-92	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	Oct-93	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	Oct-94	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	Nov-95	ND	0.07	0.07	0.09	0.05	0.09	0.09	0.06	0.1	0.09	0.14	0.08	0.24	0.22	0.1
	Nov-96	ND	0.095	0.086	0.081	0.094	0.083	0.11	0.1	0.075	0.09	0.16	0.12	0.12	0.12	0.13

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Bromo dichloro methane Conc RDL	Bromo methane Conc RDL	Chloroform Conc RDL	Methylene Chloride Conc RDL	Chloro methane Conc RDL	Dichloro difluoro methane Conc RDL	Trichloro fluoro methane Conc RDL	Benzene Conc RDL	Ethyl benzene Conc RDL	Toluene Conc RDL	Xylene, total Conc RDL	Styrene Conc RDL	2-Butanone Conc RDL	Acetone Conc RDL	Naphthalene Conc RDL
Results in ug/L	ES	0.6	10	6	5	3	1000	3490	5	700	343	620	100	460	1000	40
	PAL	0.06	1	0.6	0.5	0.3	200	698	0.5	140	68.6	124	10	90	200	8
RB-1	Mar-91	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
Bula	Jun-91	0.05	0.05	0.05	1	0.05	NA	NA	0.05	0.05	0.05	0.05	0.05	NA	NA	NA
	May-92	1	1	1	1	1	NA	NA	1	1	0.7 NR	1	1	NA	NA	NA
	May-93	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	May-94	0.5	0.5	0.5	1.9 1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	May-95	0.1	0.5	0.1	1.7	0.13	0.1	0.1	0.1	0.1	0.11	0.1	0.1	NA	NA	NA
	May-96	0.089	0.17	0.088	0.14	0.14	0.088	0.088	0.084	0.1	0.098	0.22	0.15	NA	NA	0.19
RS-1	Feb-91	0.5	0.5	0.5	0.1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
Summers	Jun-91	0.05	0.05	0.05	1	0.05	NA	NA	0.05	0.05	0.09	0.05	0.05	NA	NA	NA
	May-93	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	May-94	0.5	0.5	0.5	2.8 1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	May-95	0.1	0.5	0.1	1.7	0.13	0.1	0.1	0.1	0.1	0.11	0.1	0.1	NA	NA	NA
	May-96	0.089	0.17	0.088	0.14	0.14	0.088	0.088	0.084	0.1	0.098	0.22	0.15	NA	NA	0.19
Sather	Jun-91	0.05	0.05	0.05	1	0.05	NA	NA	0.05	0.05	0.05	0.05	0.05	NA	NA	NA
Arvid	Nov-91	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	May-92	1	1	1	1	1	NA	NA	1	1	1	1	1	NA	NA	NA
	Oct-92	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	May-93	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	Oct-93	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	May-94	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	Oct-94	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	May-95	0.1	0.5	0.1	1.7	0.13	0.1	0.1	0.1	0.1	0.11	0.1	0.1	NA	NA	NA
	Nov-95	0.08	0.06	0.07	0.18	0.07	NA	NA	0.07	0.2	0.11	0.56	0.19	NA	NA	NA
	May-96	0.089	0.17	0.088	0.14	0.14	0.088	0.088	0.084	0.1	0.098	0.22	0.15	NA	NA	0.19
	Nov-96	0.089	0.17	0.088	0.14	0.16 NR	0.088	0.088	0.084	0.1	0.1 NR	0.22	0.15	NA	NA	0.19
Schultz	May-92	1	1	1	1	1	NA	NA	1	1	1	1	1	NA	NA	NA
New	May-96	0.089	0.17	0.088	0.14	0.14	1 NR	0.088	0.084	0.1	0.098	0.22	0.15	NA	NA	0.19
	Feb-98	0.2	0.7	0.2	2.5	1.9	NA	NA	0.1 0.2	0.1	1.2 0.4	0.3	0.1	3.3	20.7	NA
STPPLWTH	May-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5
	Oct-93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5
TW-3	Aug-88	0.5	0.5	0.5	1	0.5	NA	0.5	1	1	1	NA	NA	NA	NA	NA
	Sep-88	NA	NA	NA	NA	NA	NA	NA	1.1 NR	1	1	3	NA	NA	NA	NA
	Sep-88	0.5	0.5	0.5	1	0.5	NA	0.5	NA	NA	NA	NA	NA	NA	NA	NA
TW-5	Aug-87	1.5	50	1	NA	NA	NA	1	1	1	1	2	2	12	NA	NA
TW-6	Aug-87	1.5	50	1	NA	NA	NA	1	1 NR	1	1 NR	2	2	12	NA	NA
WB-1	Feb-91	0.5	0.5	0.5	0.5	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	Mar-91	0.5	0.5	0.5	5	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	Jun-91	0.05	0.05	0.05	1.3 NR	0.05	NA	NA	0.05	0.05	0.05	0.05	0.05	NA	NA	NA
	May-92	1	1	1	1	1	NA	NA	1	1	1 NR	1	1	NA	NA	NA
	May-93	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	May-94	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	May-95	0.1	0.5	0.1	1.7	0.13	0.1	0.1	0.1	0.1	0.11	0.1	0.1	NA	NA	NA
	May-96	0.089	0.17	0.088	0.14	0.14	0.48 NR	0.088	0.084	0.1	0.098	0.22	0.15	NA	NA	0.19
(ROUNDS)	Nov-92	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	Oct-93	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	Oct-94	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	Nov-95	0.08	0.06	0.07	0.18	0.07	NA	NA	0.07	0.2	0.11	0.56	0.19	NA	NA	NA
	Nov-96	0.089	0.17	0.088	0.14	0.14	0.088	0.088	0.084	0.1	0.098	0.22	0.15	NA	NA	0.19

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Bis(2-Ethylhexyl) Phthalate Conc RDL	1,2,3-Trichloro-propane Conc RDL	Carbon Disulfide Conc RDL	Tribromo methane Conc RDL	Dibromo methane Conc RDL	N-Propyl benzene Conc RDL	1,2,4-Trimethyl benzene Conc RDL	1,3,5-Trimethyl benzene Conc RDL	Isopropyl benzene Conc RDL	Isopropyl toluene Conc RDL	N-Butyl benzene Conc RDL	tert-Butyl benzene Conc RDL
Results in ug/L	ES	6											
	PAL	0.6											
RB-1	Mar-91	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
Bula	Jun-91	NA	0.05	NA	0.05	0.05	NA	NA	NA	NA	NA	NA	NA
	May-92	NA	1	NA	1	1	NA	NA	NA	NA	NA	NA	NA
	May-93	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	May-94	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	May-95	NA	0.14	NA	0.24	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1
	May-96	NA	0.22	NA	0.13	0.13	0.12	0.12	0.095	0.11	0.11	0.086	0.16
RS-1	Feb-91	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
Summers	Jun-91	NA	0.05	NA	0.05	0.05	NA	NA	NA	NA	NA	NA	NA
	May-93	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	May-94	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	May-95	NA	0.14	NA	0.24	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1
	May-96	NA	0.22	NA	0.13	0.13	0.12	0.12	0.095	0.11	0.11	0.086	0.16
Sather	Jun-91	NA	0.05	NA	0.05	0.05	NA	NA	NA	NA	NA	NA	NA
Arvid	Nov-91	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	May-92	NA	1	NA	1	1	NA	NA	NA	NA	NA	NA	NA
	Oct-92	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	May-93	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	Oct-93	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	May-94	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	Oct-94	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	May-95	NA	0.14	NA	0.24	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1
	Nov-95	NA	0.21	NA	0.11	0.1	NA	NA	NA	NA	NA	NA	NA
	May-96	NA	0.22	NA	0.13	0.13	0.12	0.12	0.095	0.11	0.11	0.086	0.16
	Nov-96	NA	0.22	NA	0.13	0.13	0.12	0.12	0.095	0.11	0.11	0.086	0.16
Schultz	May-92	NA	0.9 NR	NA	1	1	NA	NA	NA	NA	NA	NA	NA
New	May-96	NA	0.22	NA	0.13	0.13	0.12	0.12	0.095	0.11	0.11	0.086	0.16
	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
STPPLWTH	May-93	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Oct-93	45 5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TW-3	Aug-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Sep-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Sep-88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TW-5	Aug-87	NA	NA	5	5	NA	NA	NA	NA	1	NA	NA	NA
TW-6	Aug-87	NA	NA	5	5	NA	NA	NA	NA	1	NA	NA	NA
WB-1	Feb-91	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	Mar-91	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	Jun-91	NA	0.05	NA	0.05	0.05	NA	NA	NA	NA	NA	NA	NA
	May-92	NA	1	NA	1	1	NA	NA	NA	NA	NA	NA	NA
	May-93	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	May-94	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	May-95	NA	0.14	NA	0.24	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1
	May-96	NA	0.22	NA	0.13	0.13	0.12	0.12	0.095	0.11	0.11	0.086	0.16
(ROUNDS)	Nov-92	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	Oct-93	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	Oct-94	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	Nov-95	NA	0.21	NA	0.11	0.1	NA	NA	NA	NA	NA	NA	NA
	Nov-96	NA	0.22	NA	0.13	0.13	0.12	0.12	0.095	0.11	0.11	0.086	0.16

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Total VOCs ug/L	PCE Conc RDL	TCE Conc RDL	cis-1,2-DCE Conc RDL	trans-1,2-DCE Conc RDL	1,1-DCE Conc RDL	Vinyl Chloride Conc RDL	1,1,1-TCA Conc RDL	1,1-DCA Conc RDL	1,2-DCA Conc RDL	Chloro ethane Conc RDL	1,2-Dichloro propane Conc RDL	1,3-Dichloro benzene Conc RDL	1,4-Dichloro benzene Conc RDL	Chloro benzene Conc RDL
Results in ug/L	ES		5	5	70	100	7	0.2	200	850	5	400	5	1250	75	100
	PAL		0.5	0.5	7	20	0.7	0.02	40	85	0.5	80	0.5	125	15	20
Arne	Dec-91	ND	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Thesen	Oct-92	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	Oct-93	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	Oct-94	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	Nov-95	ND	0.07	0.07	0.09	0.05	0.09	0.09	0.06	0.1	0.09	0.14	0.08	0.24	0.22	0.1
	Nov-96	0.15	0.095	0.086	0.081	0.094	0.083	0.11	0.1	0.075	0.09	0.16	0.12	0.12	0.12	0.13
DS-1	Feb-91	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Sommers	Nov-91	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	May-92	ND	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Oct-92	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	Oct-93	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	Oct-94	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	Nov-95	ND	0.07	0.07	0.09	0.05	0.09	0.09	0.06	0.1	0.09	0.14	0.08	0.24	0.22	0.1
	Nov-96	0.13	0.095	0.086	0.081	0.094	0.083	0.11	0.1	0.075	0.09	0.16	0.12	0.12	0.12	0.13
	Nov-02	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
DURAND	Nov-91	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	Oct-92	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	Oct-93	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	Oct-94	1.1	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	Nov-95	0.070	0.07	0.07	0.09	0.05	0.09	0.09	0.07 NR	0.1	0.09	0.14	0.08	0.24	0.22	0.1
	Nov-96	ND	0.095	0.086	0.081	0.094	0.083	0.11	0.1	0.075	0.09	0.16	0.12	0.12	0.12	0.13
ES-1	Feb-91	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Schulenberg	Nov-91	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	Oct-92	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	Oct-93	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	Oct-94	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	Nov-95	0.065	0.07	0.07	0.09	0.05	0.09	0.09	0.065 NR	0.1	0.09	0.14	0.08	0.24	0.22	0.1
	Nov-96	ND	0.095	0.086	0.081	0.094	0.083	0.11	0.1	0.075	0.09	0.16	0.12	0.12	0.12	0.13
FR-1	Feb-91	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Friedman	Jun-91	ND	0.05	0.05	0.05	0.05	0.05	0.3	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	May-92	1.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	May-93	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	May-96	ND	0.095	0.086	0.081	0.094	0.083	0.11	0.1	0.075	0.09	0.16	0.12	0.12	0.12	0.13
GL-1	Feb-91	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Plummer	Jul-91	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	May-93	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	May-94	0.80	0.5	0.5	0.5	0.5	0.5	0.3	0.8 0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	Oct-94	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	May-95	0.34	0.1	0.13	0.22	0.17	0.15	0.1	0.1	0.11	0.34 NR	0.23	0.12	0.1	0.1	0.1
	May-96	ND	0.095	0.086	0.081	0.094	0.083	0.11	0.1	0.075	0.09	0.16	0.12	0.12	0.12	0.13
Leach. Tnk	Nov-92	200	5	2	NA	NA	4	6.98 NR	NA	NA	5	NA	NA	NA	5	20
LH-1	Aug-88	200	1	1	NA	2.4 NR	0.5	8.4 NR	0.5	1.5 NR	0.5	0.5	1.6 NR	1	35 NR	4.5 NR
	Sep-88	610	1	1	NA	5.1 NR	0.5	45 NR	0.5	3 NR	0.5	0.56 NR	6.9 NR	1	32 NR	2.8 NR
GWFB01	Feb-98	0.30	0.2	0.2	0.2	0.2	0.1	0.3	1	0.2	0.2	0.7	0.1	NA	NA	0.1
GWFB02	Feb-98	1.2	0.2	0.2	0.2	0.2	0.1	0.3	1	0.2	0.2	0.7	0.1	NA	NA	0.2 0.1
GWFB03	Feb-98	21	0.2	0.2	0.2	0.2	0.1	0.3	1	0.2	0.2	0.7	0.1	2.7	2.5	0.2 0.1
GWFB04	Mar-98	18	0.2	0.2	0.2	0.2	0.1	0.3	1	0.2	0.2	0.7	0.1	NA	NA	0.2 0.1
GWFB05	Mar-98	20	0.2	0.2	0.2	0.2	0.1	0.3	1	0.2	0.2	0.7	0.1	NA	NA	0.2 0.1
GWP17S Dup	Feb-98	88	6.8 0.2	13 0.2	57 0.2	0.2 0.2	0.1	1.2 0.3	1	5.1 0.2	1 0.2	0.7	2.8 0.1	NA	NA	0.1
GWP1D Dup	Feb-98	ND	0.2	0.2	0.2	0.2	0.1	0.3	1	0.2	0.2	0.7	0.1	NA	NA	0.1

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Bromo dichloro methane Conc RDL	Bromo methane Conc RDL	Chloroform Conc RDL	Methylene Chloride Conc RDL	Chloro methane Conc RDL	Dichloro difluoro methane Conc RDL	Trichloro fluoro methane Conc RDL	Benzene Conc RDL	Ethyl benzene Conc RDL	Toluene Conc RDL	Xylene, total Conc RDL	Styrene Conc RDL	2-Butanone Conc RDL	Acetone Conc RDL	Naphthalene Conc RDL
Results in ug/L	ES	0.6	10	6	5	3	1000	3490	5	700	343	620	100	460	1000	40
	PAL	0.06	1	0.6	0.5	0.3	200	698	0.5	140	68.6	124	10	90	200	8
Arne	Dec-91	1	1	1	1	1	NA	NA	1	1	1	1	1	NA	NA	NA
Thesen	Oct-92	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	Oct-93	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	Oct-94	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	Nov-95	0.08	0.06	0.07	0.18	0.07	NA	NA	0.07	0.2	0.11	0.56	0.19	NA	NA	NA
	Nov-96	0.089	0.17	0.088	0.14	0.15 NR	0.088	0.088	0.084	0.1	0.098	0.13	0.15	NA	NA	0.19
DS-1	Feb-91	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
Sommers	Nov-91	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	May-92	1	1	1	1	1	NA	NA	1	1	1	1	1	NA	NA	NA
	Oct-92	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	Oct-93	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	Oct-94	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	Nov-95	0.08	0.06	0.07	0.18	0.07	NA	NA	0.07	0.2	0.11	0.56	0.19	NA	NA	NA
	Nov-96	0.089	0.17	0.088	0.14	0.14	0.088	0.088	0.084	0.1	0.13 NR	0.13	0.15	NA	NA	0.19
	Nov-02	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
DURAND	Nov-91	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	Oct-92	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	Oct-93	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	Oct-94	0.5	0.5	0.5	1.1 1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	Nov-95	0.08	0.06	0.07	0.18	0.07	NA	NA	0.07	0.2	0.11	0.56	0.19	NA	NA	NA
	Nov-96	0.089	0.17	0.088	0.14	0.14	0.088	0.088	0.084	0.1	0.098	0.13	0.15	NA	NA	0.19
ES-1	Feb-91	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
Schulenberg	Nov-91	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	Oct-92	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	Oct-93	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	Oct-94	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	Nov-95	0.08	0.06	0.07	0.18	0.07	NA	NA	0.07	0.2	0.11	0.56	0.19	NA	NA	NA
	Nov-96	0.089	0.17	0.088	0.14	0.14	0.088	0.088	0.084	0.1	0.098	0.13	0.15	NA	NA	0.19
FR-1	Feb-91	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
Friedman	Jun-91	0.05	0.05	0.05	1	0.05	NA	NA	0.05	0.05	0.05	0.05	0.05	NA	NA	NA
	May-92	1	1	1	1	1	NA	NA	1	1	1.3 NR	1	1	NA	NA	NA
	May-93	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	May-96	0.089	0.17	0.088	0.14	0.14	0.088	0.088	0.084	0.1	0.098	0.13	0.15	NA	NA	0.19
GL-1	Feb-91	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
Plummer	Jul-91	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	May-93	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	May-94	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	Oct-94	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	May-95	0.1	0.5	0.1	1.7	0.13	0.1	0.1	0.1	0.1	0.11	0.11	0.1	NA	NA	NA
	May-96	0.089	0.17	0.088	0.14	0.14	0.088	0.088	0.084	0.1	0.098	0.13	0.15	NA	NA	0.19
Leach. Tnk	Nov-92	NA	NA	5	NA	NA	NA	NA	2	NA	NA	NA	NA	193 NR	NA	NA
LH-1	Aug-88	0.5	0.5	0.5	1	0.5	NA	0.5	5.1 NR	98 NR	43 NR	NA	NA	NA	NA	NA
	Sep-88	0.5	0.5	0.5	1	0.5	NA	0.5	5.8 NR	130 NR	99 NR	280 NR	NA	NA	NA	NA
GWFB01	Feb-98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.1 0.1	0.1	0.2 0.2	0.3	0.1	3.3	4.8	NA
GWFB02	Feb-98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.5 0.1	0.1	0.5 0.2	0.3	0.1	3.3	4.8	NA
GWFB03	Feb-98	0.2	0.7	0.2	0.5 0.4	0.9	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	20 4.8	2.2
GWFB04	Mar-98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	18 4.8	NA
GWFB05	Mar-98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	20 4.8	NA
GWP17S Dup	Feb-98	0.2	0.7	0.2	0.4	11	NA	NA	0.4 0.1	0.1	0.2	0.3	0.1	3.3	5.6	NA
GWP1D Dup	Feb-98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Bis(2-Ethylhexyl) Phthalate Conc RDL	1,2,3-Trichloro-propane Conc RDL	Carbon Disulfide Conc RDL	Tribromo methane Conc RDL	Dibromo methane Conc RDL	N-Propyl benzene Conc RDL	1,2,4-Trimethyl benzene Conc RDL	1,3,5-Trimethyl benzene Conc RDL	Isopropyl benzene Conc RDL	Isopropyl toluene Conc RDL	N-Butyl benzene Conc RDL	tert-Butyl benzene Conc RDL
Results in ug/L	ES	6											
	PAL	0.6											
Arne	Dec-91	NA	1	NA	1	1	NA	NA	NA	NA	NA	NA	NA
Thesen	Oct-92	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	Oct-93	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	Oct-94	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	Nov-95	NA	0.21	NA	0.11	0.1	NA	NA	NA	NA	NA	NA	NA
	Nov-96	NA	0.22	NA	0.13	0.13	0.12	0.12	0.095	0.11	0.11	0.086	0.16
DS-1	Feb-91	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
Sommers	Nov-91	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	May-92	NA	1	NA	1	1	NA	NA	NA	NA	NA	NA	NA
	Oct-92	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	Oct-93	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	Oct-94	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	Nov-95	NA	0.21	NA	0.11	0.1	NA	NA	NA	NA	NA	NA	NA
	Nov-96	NA	0.22	NA	0.13	0.13	0.12	0.12	0.095	0.11	0.11	0.086	0.16
	Nov-02	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
DURAND	Nov-91	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	Oct-92	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	Oct-93	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	Oct-94	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	Nov-95	NA	0.21	NA	0.11	0.1	NA	NA	NA	NA	NA	NA	NA
	Nov-96	NA	0.22	NA	0.13	0.13	0.12	0.12	0.095	0.11	0.11	0.086	0.16
ES-1	Feb-91	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
Schulenberg	Nov-91	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	Oct-92	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	Oct-93	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	Oct-94	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	Nov-95	NA	0.21	NA	0.11	0.1	NA	NA	NA	NA	NA	NA	NA
	Nov-96	NA	0.22	NA	0.13	0.13	0.12	0.12	0.095	0.11	0.11	0.086	0.16
FR-1	Feb-91	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
Friedman	Jun-91	NA	0.05	NA	0.05	0.05	NA	NA	NA	NA	NA	NA	NA
	May-92	NA	1	NA	1	1	NA	NA	NA	NA	NA	NA	NA
	May-93	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	May-96	NA	0.22	NA	0.13	0.13	0.12	0.12	0.095	0.11	0.11	0.086	0.16
GL-1	Feb-91	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
Plummer	Jul-91	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	May-93	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	May-94	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	Oct-94	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	May-95	NA	0.14	NA	0.24	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1
	May-96	NA	0.22	NA	0.13	0.13	0.12	0.12	0.095	0.11	0.11	0.086	0.16
Leach. Tnk	Nov-92	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LH-1	Aug-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
	Sep-88	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA
GWFB01	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
GWFB02	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
GWFB03	Feb-98	1.3	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
GWFB04	Mar-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
GWFB05	Mar-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
GWP17S Dup	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
GWP1D Dup	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Total VOCs ug/L	PCE Conc RDL	TCE Conc RDL	cis-1,2-DCE Conc RDL	trans-1,2-DCE Conc RDL	1,1-DCE Conc RDL	Vinyl Chloride Conc RDL	1,1,1-TCA Conc RDL	1,1-DCA Conc RDL	1,2-DCA Conc RDL	Chloro ethane Conc RDL	1,2-Dichloro propane Conc RDL	1,3-Dichloro benzene Conc RDL	1,4-Dichloro benzene Conc RDL	Chloro benzene Conc RDL
Results in ug/L	ES		5	5	70	100	7	0.2	200	850	5	400	5	1250	75	100
	PAL		0.5	0.5	7	20	0.7	0.02	40	85	0.5	80	0.5	125	15	20
GWP23S Dup	Feb-98	5.8	4.4 0.2	0.4 0.2	0.4 0.2	0.2	0.1	0.3	1	0.2	0.2	0.7	0.1	NA	NA	0.1
GWP25D Dup	Feb-98	48	1.9 0.2	6.3 0.2	32 0.2	0.7 0.2	0.1	3.2 0.3	1	2.2 0.2	0.2	0.7	0.9 0.1	NA	NA	0.1
GWP29S Dup	Feb-98	20	0.9 0.2	0.2	0.2	0.2	0.1	0.3	1	0.2	0.2	0.7	0.1	2.7	2.5	0.1
GWP31S Dup	Feb-98	ND	0.2	0.2	0.2	0.2	0.1	0.3	1	0.2	0.2	0.7	0.1	NA	NA	0.1
GWP35D Dup	Feb-98	ND	0.2	0.2	0.2	0.2	0.1	0.3	1	0.2	0.2	0.7	0.1	NA	NA	0.1
LHGW04	Feb-98	18	0.2	0.2	0.2 0.2	0.4 0.2	0.1	0.3	1	0.2	0.2	0.7	0.3 0.1	NA	NA	2.3 0.1
LHGW05	Feb-98	130	0.2	0.2 0.2	0.4 0.2	0.8 0.2	0.1	0.3	1	0.2	0.2	0.7	1.1 0.1	NA	NA	1.8 0.1
LHGW08	Feb-98	66	0.2	0.2	1 0.2	0.2	0.1	0.3	1	0.2	0.2	0.7	0.1	NA	NA	2.5 0.1
LHGW09	Feb-98	650	0.2	0.2	58 0.2	0.2	0.1	48 0.3	1	0.2	0.2	0.7	0.1	NA	NA	0.1
LHGW11	Feb-98	1,300	0.2	0.2	0.2	0.2	0.1	30 0.3	1	0.2	0.2	0.7	0.1	NA	NA	0.1
LHGW12	Feb-98	100	0.2	0.2	3.8 0.2	0.7 0.2	0.1	13 0.3	1	0.2	0.2	0.7	0.1	NA	NA	1.2 0.1
LHGW13	Feb-98	130	0.2	0.2	7.3 0.2	1 0.2	0.1	10 0.3	1	0.4 0.2	0.2	0.7	0.1	NA	NA	2.3 0.1
LHGW13 Dup	Feb-98	110	0.2	0.2 0.2	6.4 0.2	1 0.2	0.1	10 0.3	1	0.3 0.2	0.2	0.7	0.7 0.1	NA	NA	2.4 0.1
LHGWP16S Dup	Feb-98	120	0.2	1.8 0.2	105 0.2	1 0.2	0.1	4.8 0.3	1	1.7 0.2	0.2	0.7	5.1 0.1	NA	NA	0.1
TRIP BLANK	10/20/93	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	10/28/93	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	5/17/94	3.9	0.5	0.5	0.5	0.5	0.5	0.3	1.3 0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	5/20/94	ND	0.5	0.5	0.6	0.7	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.6	0.5
	5/23/94	ND	0.5	0.5	0.6	0.7	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.6	0.5
	10/4/94	ND	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	10/7/94	0.60	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	5/10/95	0.88	0.52	0.84	0.91	0.96	0.94	1.1	0.61	0.57	0.44 0.43	3.03	0.42	0.51	0.39	0.36
	11/9/95	0.042	0.07	0.07	0.032	0.05	0.09	0.026	0.06	0.1	0.029	1.1	0.021	0.24	0.052	0.03
	5/29/96	ND	0.095	0.086	0.081	0.094	0.083	0.11	0.1	0.075	0.09	0.16	0.12	0.12	0.12	0.13
	5/30/96	0.024	0.031	0.025	0.032	0.026	0.029	0.026	0.026	0.02	0.029	1.1	0.021	0.038	0.052	0.03
	11/13/96	0.11	0.039	0.03	0.028	0.032	0.025	0.045	0.087	0.028	0.022	0.57	0.023	0.033	0.051	0.049
	2/10/98	0.30	0.2	0.2	0.2	0.2	0.1	0.3	1	0.2	0.2	0.7	0.1	NA	NA	0.3 0.1
	2/12/98	ND	0.2	0.2	0.2	0.2	0.1	0.3	1	0.2	0.2	0.7	0.1	NA	NA	0.1
	2/13/98	0.50	0.2	0.2	0.2	0.2	0.1	0.3	1	0.2	0.2	0.7	0.1	NA	NA	0.1
	2/17/98	0	0.2	0.2	0.2	0.2	0.1	0.3	1	0.2	0.2	0.7	0.1	NA	NA	0.1 0.1
	2/18/98	1.9	0.2	0.2	0.2	0.2	0.1	0.3	1	0.2	0.2	0.7	0.1	NA	NA	0.2 0.2
	2/19/98	1.3	0.2	0.2	0.2	0.2	0.1	0.3	1	0.2	0.2	0.7	0.1	NA	NA	0.2 0.1
	2/23/98	0.20	0.2	0.2	0.2	0.2	0.1	0.3	1	0.2	0.2	0.7	0.1	NA	NA	0.2 0.1
	2/25/98	24	0.2	0.2	0.2	0.2	0.1	0.3	1	0.2	0.2	0.7	0.1	NA	NA	0.2 0.1
	2/26/98	14	0.2	0.2	0.2	0.2	0.1	0.3	1	0.2	0.2	0.7	0.1	NA	NA	0.2 0.1
	3/3/98	18	0.2	0.2	0.2	0.2	0.1	0.3	1	0.2	0.2	0.7	0.1	NA	NA	0.3 0.1

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton,Wisconsin

Sampleid	Date	Bromo dichloro methane Conc RDL	Bromo methane Conc RDL	Chloroform Conc RDL	Methylene Chloride Conc RDL	Chloro methane Conc RDL	Dichloro difluoro methane Conc RDL	Trichloro fluoro methane Conc RDL	Benzene Conc RDL	Ethyl benzene Conc RDL	Toluene Conc RDL	Xylene, total Conc RDL	Styrene Conc RDL	2-Butanone Conc RDL	Acetone Conc RDL	Naphthalene Conc RDL
Results in ug/L	ES	0.6	10	6	5	3	1000	3490	5	700	343	620	100	460	1000	40
	PAL	0.06	1	0.6	0.5	0.3	200	698	0.5	140	68.6	124	10	90	200	8
GWP23S Dup	Feb-98	0.2	0.7	0.2	0.4	0.6 0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
GWP25D Dup	Feb-98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.3 0.1	0.1	0.4 0.2	0.3	0.1	3.3	4.8	NA
GWP29S Dup	Feb-98	0.2	0.7	0.2	1.4	2.7	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	2.2
GWP31S Dup	Feb-98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
GWP35D Dup	Feb-98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
LHGW04	Feb-98	0.2	0.7	0.2	0.4	0.6 0.5	NA	NA	3.3 0.1	7.1 0.1	0.7 0.2	3.4 0.3	0.1	3.3	4.8	NA
LHGW05	Feb-98	0.2	0.7	0.2	0.4	1.1 0.5	NA	NA	3.5 0.1	73 0.1	1.5 0.2	48 0.3	0.8 0.1	3.3	4.8	NA
LHGW08	Feb-98	0.2	0.7	0.2	2	0.5	NA	NA	2.5 0.1	24 0.1	2.5 0.2	33 0.3	0.1	3.3	4.8	NA
LHGW09	Feb-98	0.2	19 0.7	26 0.2	0.4	150 0.5	NA	NA	3 0.1	23 0.1	35 0.2	66 0.3	2 0.1	220 3.3	4.8	NA
LHGW11	Feb-98	0.2	45 0.7	45 0.2	0.4	250 0.5	NA	NA	5 0.1	25 0.1	35 0.2	72 0.3	0.1	780 3.3	4.8	NA
LHGW12	Feb-98	0.2	0.7	0.2	0.4	1 0.5	NA	NA	0.1	20 0.1	13 0.2	23 0.3	0.6 0.1	3.9 3.3	9 4.8	NA
LHGW13	Feb-98	0.2	0.7	0.2	0.4	1.6 0.5	NA	NA	2.8 0.1	40 0.1	8.4 0.2	45 0.3	1 0.1	3.3	5.6 4.8	NA
LHGW13 Dup	Feb-98	0.2	0.7	0.2	0.6	0.5	NA	NA	2.7 0.1	30 0.1	8.2 0.2	45 0.3	0.9 0.1	3.3	4.8	NA
LHGWP16S Dup	Feb-98	0.2	0.7	0.2	0.4	1.3 0.5	NA	NA	4.2 0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
TRIP BLANK	10/20/93	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	10/28/93	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	5/17/94	0.5	0.5	0.5	2.6 1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	5/20/94	0.5	0.5	0.5	2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	NA	NA	0.7
	5/23/94	0.5	0.5	0.5	2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	NA	NA	0.7
	10/4/94	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.5	0.5	0.5	NA	NA	NA
	10/7/94	0.5	0.5	0.5	1	0.5	NA	NA	0.5	0.5	0.6 0.5	0.5	0.5	NA	NA	NA
	5/10/95	0.66	2.3	0.44 0.4	3.7	0.77	0.81	1.04	0.51	0.25	2.61	0.59	0.42	NA	NA	3.3
	11/9/95	0.019	0.045	0.037	0.02	0.031	0.037	0.071	0.07	0.028	0.11	0.56	0.048	NA	NA	0.056
	5/29/96	0.089	0.17	0.088	0.14	0.14	0.088	0.088	0.084	0.1	0.098	0.22	0.15	NA	NA	0.19
	5/30/96	0.019	0.045	0.037	0.024 NR	0.031	0.037	0.071	0.02	0.028	0.021	0.05	0.048	NA	NA	0.056
	11/13/96	0.034	0.075	0.027	0.024	0.049	0.03	0.054	0.016	0.024	0.11 NR	0.052	0.025	NA	NA	0.12
	2/10/98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
	2/12/98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
	2/13/98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
	2/17/98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
	2/18/98	0.2	0.7	0.2	0.4	0.7 1	NA	NA	0.5 0.2	0.1	0.5 0.4	0.3	0.1	3.3	4.8	NA
	2/19/98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.5 0.1	0.1	0.6 0.2	0.3	0.1	3.3	4.8	NA
	2/23/98	0.2	0.7	0.2	0.4	0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	4.8	NA
	2/25/98	0.2	0.7	0.2	1.4 0.8	0.5 1	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	22 9.6	NA
	2/26/98	0.2	0.7	0.2	0.4	0.8 0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	13 4.8	NA
	3/3/98	0.2	0.7	0.2	0.4	0.8 0.5	NA	NA	0.1	0.1	0.2	0.3	0.1	3.3	17 4.8	NA

Table 3.4
Summary of Historical VOC Detects
Refuse Hideaway Landfill
Middleton, Wisconsin

Sampleid	Date	Bis(2-Ethylhexyl) Phthalate Conc RDL	1,2,3-Trichloro-propane Conc RDL	Carbon Disulfide Conc RDL	Tribromo methane Conc RDL	Dibromo methane Conc RDL	N-Propyl benzene Conc RDL	1,2,4-Trimethyl benzene Conc RDL	1,3,5-Trimethyl benzene Conc RDL	Isopropyl benzene Conc RDL	Isopropyl toluene Conc RDL	N-Butyl benzene Conc RDL	tert-Butyl benzene Conc RDL
Results in ug/L	ES	6											
	PAL	0.6											
GWP23S Dup	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
GWP25D Dup	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
GWP29S Dup	Feb-98	19 1.3	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
GWP31S Dup	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
GWP35D Dup	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
LHGW04	Feb-98	NA	NA	1.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
LHGW05	Feb-98	NA	NA	0.6	NA	NA	NA	NA	NA	NA	NA	NA	NA
LHGW08	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
LHGW09	Feb-98	NA	NA	12	NA	NA	NA	NA	NA	NA	NA	NA	NA
LHGW11	Feb-98	NA	NA	28	NA	NA	NA	NA	NA	NA	NA	NA	NA
LHGW12	Feb-98	NA	NA	12 0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
LHGW13	Feb-98	NA	NA	2.2	NA	NA	NA	NA	NA	NA	NA	NA	NA
LHGW13 Dup	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
LHGWP16S Dup	Feb-98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
TRIP BLANK	10/20/93	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	10/28/93	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	5/17/94	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	5/20/94	NA	0.5	NA	0.5	0.5	0.5	0.9	0.5	0.5	0.6	0.5	0.5
	5/23/94	NA	0.5	NA	0.5	0.5	0.5	0.9	0.5	0.5	0.6	0.5	0.5
	10/4/94	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	10/7/94	NA	0.5	NA	0.5	0.5	NA	NA	NA	NA	NA	NA	NA
	5/10/95	NA	1.08	NA	1.02	0.65	0.67	0.58	0.63	0.67	0.64	0.78	0.69
	11/9/95	NA	0.21	NA	0.028	0.1	0.044	0.035	0.028	0.023	0.042 NR	0.033	0.038
	5/29/96	NA	0.22	NA	0.13	0.13	0.12	0.12	0.095	0.11	0.11	0.086	0.16
	5/30/96	NA	0.054	NA	0.028	0.028	0.044	0.035	0.028	0.023	0.036	0.033	0.038
	11/13/96	NA	0.037	NA	0.036	0.076	0.029	0.032	0.025	0.025	0.038	0.031	0.034
	2/10/98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
	2/12/98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
	2/13/98	NA	NA	0.5 0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
	2/17/98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
	2/18/98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
	2/19/98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
	2/23/98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
	2/25/98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
	2/26/98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
	3/3/98	NA	NA	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA

This table presents a summary of available historical results for VOC analyses of samples from Refuse Hideaway Landfill. All results prior to 1998 were taken from the WDNR data. All results are in ug/L.

Conc. = reported sample concentration. A blank indicates the compound was not detected, unless the RDL is "NA".
RDL = Reported detection limit. For WDNR data, if the RDL was not reported, then the LOD was reported.
NA = No analytical data avaliable.
NR = No RDL or LOD reported by the WDNR.

TABLE 3.5

Groundwater Enforcement Standard Exceedances
Refuse Hideaway Landfill
Middleton, Wisconsin

Well Location	PCE		TCE		1,2-DCE		Vinyl Chloride		1,2-DCA		1,2-Dichloropropane	
	Historical	*Feb-98*	*Historical*	*Feb-98*	*Historical*	*Feb-98*	*Historical*	*Feb-98*	*Historical*	*Feb-98*	*Historical*	*Feb-98*
Source Area												
P-3S							X					
P-8S	X		X		X		X	X				
8D-DEEP	X		X		X		X					
P-9S	X		X		X		X		X		X	
P-9D	X		X		X		X					
P-16S	X		X		X	X	X	X				X
P-16D			X	X			X	X				
P-17S	X	X	X	X	X		X	X	X		X	
P-18S	X	X					X					
P-21S			X				X					
P-21D	X				X	X	X	X				
P-24D								X				
Subtotal	**8**	**2**	**8**	**2**	**7**	**2**	**11**	**6**	**2**	**0**	**2**	**1**
Near Source												
P-23S	X		X				X					
P-24D								X				
P-25D				X			X	X				
P-25BR							X					
P-26S	X	X		X			X	X				
P-26D	X	X	X				X					
P-27S	X	X	X				X					
P-27D	X	X	X	X			X					
P-34D	X											
Subtotal	**6**	**4**	**4**	**3**	**0**	**0**	**7**	**3**	**0**	**0**	**0**	**0**
Downgradient												
P-22S	X						X					
P-22D		X					X					
P-31IA	X	X										
P-31IB	X	X										
P-40I	X	X										
P-40D		X										
Subtotal	**4**	**5**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**
GRAND TOTAL	**18**	**11**	**12**	**5**	**7**	**2**	**20**	**9**	**2**	**0**	**2**	**1**

Total Pre-1998 Exceedances: 61
Total 1998 Exceedances: 28

Table 3.6
Validated Groundwater Results - Additional Studies Summary
Refuse Hideaway Landfill
Middleton, Wisconsin

Parameter	UNIT	RH-GWP08S-01 187123 2/16/98 CONC	LQ/DVQ	RDL	RH-LHGWP16S-01 187466 2/18/98 CONC	LQ/DVQ	RDL	RH-LHGWP16S-91 187467 2/18/98 CONC	LQ/DVQ	RDL	RH-GWP21S-01 187242 2/17/98 CONC	LQ/DVQ	RDL	RH-GWP22D-01 188048 2/24/98 CONC	LQ/DVQ	RDL	RH-GWP25S-01 187239 2/17/98 CONC	LQ/DVQ	RDL
Field Measurements																			
Groundwater Elevation	ft.	921.31	/	0.01	925.82	/	0.01				922.31	/	0.01	912.91	/	0.01	918.43	/	0.01
pH	SU	6.76	/	0.05	6.21	/	0.05				6.43	/	0.05	6.99	/	0.05	6.93	/	0.05
Specific Conductivity @ 25 C	mmoh/cı	1510	/	10	1460	/	10				1650	/	10	945	/	10	1020	/	10
Water Temperature	deg C	6.4	/	0.5	3.2	/	0.5				4.6	/	0.5	9.2	/	0.5	8.3	/	0.5
Redox Potential	mV	-119	/	1	115	/	1				127	/	1	120	/	1	179	/	1
Dissolved Oxygen	mg/L	0.9	/	1	10.7	/	1				5.8	/	1	4.8	/	1	7.9	/	1
Metals																			
Arsenic	ug/L																		
Barium, Total	ug/L																		
Cadmium	ug/L																		
Chromium, Total	ug/L																		
Lead, Total	ug/L																		
Mercury	ug/L																		
Manganese	ug/L	486	/	5	303	/	5	288	/	5	1190	/	5		U/	0.3		U/	5
Groundwater Quality Indicators																			
Alkalinity, total	mg/L	560	/	50	506	/	50	496	/	50	326	/	50	332	/	50	295	/	50
Chloride, Total	mg/L	11.5	/	0.5	8.14	/	0.5	8.14	/	0.5	38.6	/	0.5	4.3	/	0.5	15.6	/	0.5
Fluoride	mg/L	0.05	/	0.05	0.09	/	0.05	0.08	/	0.05	0.12	/	0.05	0.13	/	0.05	0.18	/	0.05
Nitrogen, Nitrate	mg/L	0.29	/	0.14	0.33	J/	0.14	0.3	/	0.14	9.23	/	0.14	0.76	/	0.14	10.9	/	0.14
Sulfide	mg/L	1.4	/	1	0.4	/	1	0.4	/	1	0.4	/	1		U/	1	0.8	/	1
Sulfate, total	mg/L	16.4	/	1	13.3	/	1	15.2	/	1	39.1	/	1	6.9	/	1	10.4	/	1
Volatile Fatty Acids	mg/L		U/	3	17	/J	3		U/UJ	3	9	/	3	10	/	3	15	/	3
Calcium	mg/L	122	/	1	106	/	1	108	/	1	110	/	1	71.2	/	0.1	72.3	/	1
Iron	mg/L	6.1	/	0.01		U/	0.01		U/	0.01	0.889	/	0.01		U/	0.01		U/	0.01
Magnesium	mg/L	61.2	/	0.1	46.5	/	0.1	47.1	/	0.1	55.2	/	0.1	37.3	/	0.02	37.3	/	0.1
Potassium	mg/L	0.9	/	0.5	0.3	/	0.5	0.3	/	0.5	0.3	/	0.5	0.5	/	0.5	0.3	/	0.5
Sodium	mg/L	4.1	/	2	2.89	/	2	3.02	/	2	4.47	/	2	4.06	/	2	6.82	/	2
Natural Attenuation Parameters																			
Dissolved Organic Carbon	mg/L	1.74	/	1		U/	3	14.7	/	3	6.46	/	3		U/	3		U/	1
Methane	mg/L	0.76	/	0.00005	0.496	/	0.00005	0.5	/	0.00005	11	/	5E-05		U/	5E-05	0.0001	/	5E-05
Ethane	mg/L	0.002	/	0.0001	0.0002	/	0.0001	0.0004	/	0.0001		U/	0.0001		U/	0.0001		U/	0.0001
Ethene	mg/L	0.0064	/	0.005		U/	0.005		U/	0.005		U/	0.005		U/	0.005		U/	0.005
Carbon Dioxide	mg/L	0.34	/	0.3	3.295	/	0.3	3.442	/	0.3	3.474	/	0.3	1.789	/	0.066	0.52	/	0.3
Hydrogen	nmol	7.028	/	0.1							2.548	/	0.1	0.308	/	0.1	0.7	/	0.1

Table 3.6
Validated Groundwater Results - Additional Studies Summary
Refuse Hideaway Landfill
Middleton, Wisconsin

Parameter	UNIT	RH-GWP08S-01 187123 2/16/98 CONC LQ/DVQ RDL	RH-LHGWP16S-01 187466 2/18/98 CONC LQ/DVQ RDL	RH-LHGWP16S-91 187467 2/18/98 CONC LQ/DVQ RDL	RH-GWP21S-01 187242 2/17/98 CONC LQ/DVQ RDL	RH-GWP22D-01 188048 2/24/98 CONC LQ/DVQ RDL	RH-GWP25S-01 187239 2/17/98 CONC LQ/DVQ RDL

Table 3.6
Validated Groundwater Results - Additional Studies Summary
Refuse Hideaway Landfill
Middleton, Wisconsin

Parameter	UNIT	RH-GWP27S-01 187861 2/23/98 CONC	LQ/DVQ	RDL	RH-GWP29S-01 188336 2/26/98 CONC	LQ/DVQ	RDL	RH-GWP29S-91 188337 2/26/98 CONC	LQ/DVQ	RDL	RH-GWP30I-01 187573 2/18/98 CONC	LQ/DVQ	RDL	RH-GWP31IA-01 188117 2/25/98 CONC	LQ/DVQ	RDL	RH-GWP32S-01 186870 2/13/98 CONC	LQ/DVQ	RDL	RH-GWP34S-01 188050 2/24/98 CONC	LQ/DVQ	RDL
Field Measurements																						
Groundwater Elevation	ft.	918.27	/	0.01	923.27	/	0.01				909.03	/	0.01	6.75	/	0.05	919.58	/	0.01	926.78	/	0.01
pH	SU	6.59	/	0.05	7.08	/	0.05				7.16	/	0.05	1200	/	10	6.73	/	0.05	7.26	/	0.05
Specific Conductivity @ 25 C	mmoh/cı	1380	/	10	985	/	10				955	/	10	9.1	/	0.5	1190	/	10	910	/	10
Water Temperature	deg C	9.4	/	0.5	10	/	0.5				9	/	0.5	106	/	1	9.1	/	0.5	9.2	/	0.5
Redox Potential	mV	170	/	1	129	/	1				121	/	1	3.6	/	1	19	/	1	149	/	1
Dissolved Oxygen	mg/L	5.1	/	1	5.9	/	1				9.4	/	1				10.7	/	1	9.3	/	1
Metals																						
Arsenic	ug/L					US/UJ	1		US/UJ	1												
Barium, Total	ug/L				30.8	/	0.5	29.9	/	0.5												
Cadmium	ug/L					U/	0.1		U/UJ	0.1												
Chromium, Total	ug/L				1	/	1		U/	1												
Lead, Total	ug/L					U/	1		U/	1												
Mercury	ug/L					U/	0.2		U/	0.2												
Manganese	ug/L		U/	0.3		/U	0.3		U/	0.3	0.4	/	0.3		U/	0.3		U/	5	0.3	/	0.3
Groundwater Quality Indicators																						
Alkalinity, total	mg/L	646	/	50							290	/	50	364	/	50	397	/	50	294	/	50
Chloride, Total	mg/L	2.88	/	0.5							12.4	/	0.5	26.1	/	0.5	37.4	/	0.5	2.12	/	0.5
Fluoride	mg/L	0.74	/	0.05							0.1	/	0.05	0.12	/	0.05	0.05	/	0.05	0.12	/	0.05
Nitrogen, Nitrate	mg/L	0.46	/	0.14							5.04	/	0.14	2.57	/	0.14	0.38	/	0.14	1.83	/	0.14
Sulfide	mg/L		U/	1								U/	1	8	/	1		U/	1		U/	1
Sulfate, total	mg/L	19	/	1							14.2	/	1	15.1	/	1	11.5	/	1	17.3	/	1
Volatile Fatty Acids	mg/L	23	/	3							6	/	3		U/	3		U/	3	14	/	3
Calcium	mg/L	132	/	0.1	73.4	/	0.1	72.1	/	0.1	66.7	/	0.1	80.4	/	0.1	87.8	/	1	66.9	/	0.1
Iron	mg/L		U/	0.01		U/	0.01		U/	0.01		U/	0.01		U/	0.01		U/	0.01		U/	0.01
Magnesium	mg/L	62.7	/	0.02	39.2	/	0.02	38.6	/	0.02	34.5	/	0.02	43.1	/	0.02	43.9	/	0.1	35.9	/	0.02
Potassium	mg/L		U/	0.5	0.4	/	0.1	0.4	/	0.1	0.6	/	0.5	0.6	/	0.5	0.7	/	0.5	0.5	/	0.5
Sodium	mg/L	3.74	/	2	4.52	/	2	5.34	/	2	4.48	/	2	10	/	2	14.9	/	2	5	/	2
Natural Attenuation Parameters																						
Dissolved Organic Carbon	mg/L	3.7	/	3								U/	3		U/	3		U/	3	3.28	/	3
Methane	mg/L		U/	5E-05								U/	5E-05		U/	5E-05	0.0022	/	5E-05		U/	5E-05
Ethane	mg/L		U/	0.0001								U/	0.0001		U/	0.0001		U/	0.0001		U/	0.0001
Ethene	mg/L		U/	0.005								U/	0.005		U/	0.005		U/	0.005		U/	0.005
Carbon Dioxide	mg/L	10.502	/	0.066							6.345	/	0.066	7.448	/	0.066	0.574	U/	0.3	1.006	/	0.066
Hydrogen	nmol	3.136	/	0.1							1.008	/	0.1	0.168	/	0.1	1.036	/	0.1	0.42	/	0.1

Table 3.6
Validated Groundwater Results - Additional Studies Summary
Refuse Hideaway Landfill
Middleton, Wisconsin

Parameter	UNIT	RH-GWP27S-01 187861 2/23/98 CONC	LQ/DVQ	RDL	RH-GWP29S-01 188336 2/26/98 CONC	LQ/DVQ	RDL	RH-GWP29S-91 188337 2/26/98 CONC	LQ/DVQ	RDL	RH-GWP30I-01 187573 2/18/98 CONC	LQ/DVQ	RDL	RH-GWP31IA-01 188117 2/25/98 CONC	LQ/DVQ	RDL	RH-GWP32S-01 186870 2/13/98 CONC	LQ/DVQ	RDL	RH-GWP34S-01 188050 2/24/98 CONC	LQ/DVQ	RDL

Table 3.6
Validated Groundwater Results - Additional Studies Summary
Refuse Hideaway Landfill
Middleton, Wisconsin

Parameter	UNIT	RH-GWP35S-01 187859 2/23/98 CONC	LQ/DVQ	RDL	RH-GWP40I-01 187813 2/19/98 CONC	LQ/DVQ	RDL	RH-GWP41D-01 187815 2/19/98 CONC	LQ/DVQ	RDL	RH-GWFB03-01 188339 2/26/98 CONC	LQ/DVQ	RDL
Field Measurements													
Groundwater Elevation	ft.	920.34	/	0.01	909.73	/	0.01	905.86	/	0.01			
pH	SU	7.28	/	0.05	6.88	/	0.05	7.14	/	0.05			
Specific Conductivity @ 25 C	mmoh/cr	765	/	10	1020	/	10	1020	/	10			
Water Temperature	deg C	8.1	/	0.5	8.9	/	0.5	8.8	/	0.5			
Redox Potential	mV	-19	/	1	154	/	1	-69	/	1			
Dissolved Oxygen	mg/L	7.7	/	1	7.2	/	1	9.2	/	1			
Metals													
Arsenic	ug/L											US/UJ	1
Barium, Total	ug/L											U/	0.5
Cadmium	ug/L											U/UJ	0.1
Chromium, Total	ug/L											U/	1
Lead, Total	ug/L											U/	1
Mercury	ug/L											U/	0.2
Manganese	ug/L		U/	0.3		U/	0.3	0.6	/	0.3	1.6	/	0.3
Groundwater Quality Indicators													
Alkalinity, total	mg/L	280	/	50	347	/	50	323	/	50			
Chloride, Total	mg/L	1.21	/	0.5	6.78	/	0.5	17	/	0.5			
Fluoride	mg/L	0.14	/	0.05	0.08	/	0.05	0.08	/	0.05			
Nitrogen, Nitrate	mg/L	0.27	/	0.14	1.97	/	0.14	7.91	/	0.14			
Sulfide	mg/L		U/	1		U/	1		U/	1			
Sulfate, total	mg/L	15	/	1	15.3	/	1	19.8	/	1			
Volatile Fatty Acids	mg/L		U/	3	11	/	3	4	/	3			
Calcium	mg/L	57.4	/	0.1	72.8	/	0.1	75.1	/	0.1		U/	0.1
Iron	mg/L		U/	0.01		U/	0.01		U/	0.01		U/	0.01
Magnesium	mg/L	29.4	/	0.02	40.3	/	0.02	39.1	/	0.02		U/	0.02
Potassium	mg/L		U/	0.5	0.5	/	0.5	0.6	/	0.5		U/	0.5
Sodium	mg/L	4.13	/	2	4.97	/	2	5.11	/	2		U/	2
Natural Attenuation Parameters													
Dissolved Organic Carbon	mg/L		U/	3		U/	3		U/	3			
Methane	mg/L		U/	5E-05	0.0006	/	5E-05		U/	5E-05			
Ethane	mg/L		U/	0.0001		U/	0.0001		U/	0.0001			
Ethene	mg/L		U/	0.005		U/	0.005		U/	0.005			
Carbon Dioxide	mg/L	0.939	/	0.066	0.7099	/	0.066	0.551	/	0.066			
Hydrogen	nmol	0.728	/	0.1	21.7	/	0.1	1.148	/	0.1			

Table 3.6
Validated Groundwater Results - Additional Studies Summary
Refuse Hideaway Landfill
Middleton, Wisconsin

Parameter	UNIT	RH-GWP35S-01 187859 2/23/98 CONC	LQ/DVQ	RDL	RH-GWP40I-01 187813 2/19/98 CONC	LQ/DVQ	RDL	RH-GWP41D-01 187815 2/19/98 CONC	LQ/DVQ	RDL	RH-GWFB03-01 188339 2/26/98 CONC	LQ/DVQ	RDL

Table 4.1

Historical VOC Detections and Extraction Rates
Refuse Hideaway Landfill

Sampling Location Sample Description		Flare Inlet (GW01 and GW02)		Flare Inlet Ave. (tests 1, 2 and 3)		Flare Inlet Ave. (tests 1, 2 and 3)		Flare Inlet Ave. (tests 1, 2 and 3)	
Gas Flow (cfm)		100		430		317		367	
Sampling Date		06/11/90		08/02/91		06/08/93		12/19/96	
Parameter	Molecular Weight (g/mol)	Concen. (ppb v/v)	Mass Extracted (lb/yr)	Concen. (ppb v/v)	Mass Extracted (lb/yr)	Concen. (ppb v/v)	Mass Extracted (lb/yr)	Concen. (ppb v/v)	Mass Extracted (lb/yr)
VOCs									
1,1-Dichloroethene	97	110,000	1,559.2						
1,2-Dichloroethane	99	3,750	54.3						
Tetrachloroethene	166	26,000	630.7	6,100	593.9				
Trichloroethene	131	22,500	430.7	2,333	180.5				
cis-1,2-Dichloroethene	97			10,333	588.7				
Vinyl chloride	63	60,000	552.4	22,333	820.8	ND	ND	ND	ND
1,4-Dichlorobenzene	147			773	66.8				
Methylene chloride	85	11,500	142.8						
Acetone	58			6,200	211.1				
2-Butanone	72	2,700	28.4						
Benzene	78	1,800	20.5	1,020	46.8	2,200	68.0	ND	ND
Ethylbenzene	106	3,250	50.3	8,100	504.6				
Toluene	92	24,500	329.4	21,333	1156.3				
Xylenes (total)	106	6,550	101.5	18,400	1146.7				
Styrene	104			1,233	75.3				
1,3,5-Trimethylbenzene	181			950	67.0				
1,2,4-Trimethylbenzene	181			2,233	157.7				
Dichlorodifluoromethane (Freon 12)	122	3,550	63.3	3,833	272.4				
Trichlorofluoromethane (Freon 11)	137	260	5.2						
Total VOCs (lb/yr)		**3,969**		**5,889**		NA		NA	
Total Chlorinated VOCs (lb/yr)		**3,370**		**2,251**					

NOTES

1. The 06/11/90 sampling was performed at the flare inlet with only wells GW01 and GW02 installed and operating.
2. All sampling rounds, other than the 06/11/90 round, were performed at the flare inlet and assumed with all 13 gas extraction wells operating.
3. The mass extraction rates were calculated for the 06/11/90 sampling data using the mole. wt. and the estimated flow rate.
4. The mass extraction rates were calculated by the sampling labs for the 08/02/91, 06/08/93, and the 12/19/96 sampling rounds.
5. The total VOCs extracted (lb/yr) are the calculated sum of the individual contaminant results.

Table 4.2

Landfill Gas VOC Extraction Rates
Refuse Hideaway Landfill

		Landfill Gas Wells															
Sampling Location		GW01		GW02		GW03		GW04		GW05		GW06		GW07		GW08	
Sample Location Designation		RH-LGGW01-01		RH-LGGW02-01		RH-LGGW03-01		RH-LGGW04-01		RH-LGGW05-01		RH-LGGW06-01		RH-LGGW07-01		RH-LGGW08-01	
Gas Flow (cfm)		21.0		22.0		40.5		10.5		9.5		38.3		9.5		8.3	
Parameter	Molecular Weight (g/mol)	2/18/98 Conc	Mass Extracted (lb/yr)	2/18/98 Conc	Mass Extracted (lb/yr)	2/18/98 Conc	Mass Extracted (lb/yr)	2/18/98 Conc	Mass Extracted (lb/yr)	2/18/98 Conc	Mass Extracted (lb/yr)	2/18/98 Conc	Mass Extracted (lb/yr)	2/18/98 Conc	Mass Extracted (lb/yr)	2/18/98 Conc	Mass Extracted (lb/yr)
VOCs - ppb (v/v)																	
1,1-Dichloroethane	99			110	0.35			11	0.02								
1,2-Dichloroethane	99			1400	4.44												
1,2-Dichloropropane	113			540	1.95												
Chloroethane	65					52	0.20	47	0.05								
Tetrachloroethene	166	1100	5.58	1200	6.37	30	0.29									49	0.10
Trichloroethene	131	240	0.96	600	2.52												
cis-1,2-Dichloroethene	97	1000	2.96	12000	37.25	88	0.50	50	0.07			2000	10.81			94	0.11
trans-1,2-Dichloroethene	97			340	1.06	24	0.14	17	0.03	120	0.16	150	0.81			200	0.23
Vinyl chloride	63	2800	5.39	12000	24.19	180	0.67	160	0.15	1400	1.22	12000	42.11	440	0.38	22000	16.73
Chlorobenzene	113					38	0.25	52	0.09			72	0.45	110	0.17	73	0.10
1,2-Dichlorobenzene	147							11	0.02								
1,4-Dichlorobenzene	147	160	0.72	160	0.75	36	0.31	160	0.36	270	0.55	160	1.31	100	0.20	190	0.34
Methylene chloride	85			850	2.31	19	0.10	16	0.02	84	0.10			51	0.06	51	0.05
Acetone	58			1500	2.78												
2-Butanone	72			810	1.87												
4-Ethyltoluene	120	560	2.05	480	1.84	86	0.61	190	0.35	810	1.34	670	4.48	740	1.23	860	1.25
Benzene	78	120	0.29	320	0.80	110	0.51	110	0.13	200	0.22	230	1.00	180	0.19	280	0.26
Ethylbenzene	106	2400	7.77	2300	7.80	460	2.87	660	1.07	6800	9.96	4100	24.21	3500	5.13	3500	4.48
Toluene	92	1000	2.81	3800	11.19	110	0.60	97	0.14	370	0.47	2100	10.76	210	0.27	3200	3.55
Xylenes (total)	106	4300	13.92	4500	15.26	520	3.25	810	1.31	5200	7.62	5000	29.52	4900	7.18	5300	6.78
Styrene	104																
1,3,5-Trimethylbenzene	181	330	1.82	290	1.68	52	0.55	130	0.36	530	1.33	390	3.93	440	1.10	540	1.18
1,2,4-Trimethylbenzene	181	590	3.26	520	3.01	72	0.77	310	0.86	900	2.25	680	6.86	710	1.78	1000	2.19
Dichlorodifluoromethane	122	890	3.32	650	2.54			220	0.41	270	0.46	400	2.72	310	0.52	660	0.97
Dichloro-tetrafluoroethane	122	120	0.45	93	0.36	70	0.50	70	0.13			72	0.49	47	0.08	92	0.14
Total VOCs (lb/year)	NA	**51.3**		**130.3**		**12.1**		**5.6**		**25.7**		**139.5**		**18.3**		**38.5**	
Total Chlorinated VOC (lb/yr)		**19.4**		**84.1**		**3.0**		**1.4**		**2.5**		**58.7**		**1.4**		**18.8**	

Table 4.2

Landfill Gas VOC Extraction Rates
Refuse Hideaway Landfill

		Landfill Gas Wells										
Sampling Location		GW09		GW10		GW11		GW12		GW13		TOTAL
Sample Location Designation		RH-LGGW09-01		RH-LGGW10-01		RH-LGGW11-01		RH-LGGW12-01		RH-LGGW13-01		Extracted
Gas Flow (cfm)		8.2		53.0		6.8		12.5		20.6		260.7
Parameter	Molecular Weight (g/mol)	2/18/98 Conc	Mass Extracted (lb/yr)	2/18/98 Conc	Mass Extracted (lb/yr)	2/18/98 Conc	Mass Extracted (lb/yr)	2/18/98 Conc	Mass Extracted (lb/yr)	2/18/98 Conc	Mass Extracted (lb/yr)	Mass Extracted (lb/yr)
VOCs - ppb (v/v)												
1,1-Dichloroethane	99											0.37
1,2-Dichloroethane	99											4.44
1,2-Dichloropropane	113											1.95
Chloroethane	65											0.25
Tetrachloroethene	166											12.34
Trichloroethene	131											3.48
cis-1,2-Dichloroethene	97	8700	10.07	1800	13.46	560	0.54	1300	2.29	1200	3.49	81.55
trans-1,2-Dichloroethene	97	220	0.25	140	1.05	84	0.08	130	0.23			4.03
Vinyl chloride	63	13000	9.77	11000	53.42	7100	4.42	9600	11.00	8900	16.80	186.26
Chlorobenzene	113			76	0.66	70	0.08					1.81
1,2-Dichlorobenzene	147							220	0.59			0.61
1,4-Dichlorobenzene	147	230	0.40	220	2.49	160	0.23			190	0.84	8.51
Methylene chloride	85	72	0.07	40	0.26	72	0.06					3.03
Acetone	58											2.78
2-Butanone	72											1.87
4-Ethyltoluene	120	1000	1.43	930	8.60	630	0.75	870	1.90	830	2.98	28.81
Benzene	78	220	0.20	230	1.38	210	0.16	210	0.30	190	0.44	5.89
Ethylbenzene	106	3200	4.05	4500	36.77	2500	2.62	4500	8.67	4200	13.34	128.74
Toluene	92	4500	4.94	2200	15.60	3300	3.00	2400	4.01	2500	6.89	64.23
Xylenes (total)	106	6600	8.34	5600	45.76	5000	5.24	6100	11.76	5700	18.10	174.05
Styrene	104											
1,3,5-Trimethylbenzene	181	610	1.32	600	8.37	360	0.64	510	1.68	540	2.93	26.90
1,2,4-Trimethylbenzene	181	1200	2.59	1100	15.35	750	1.34	1000	3.29	960	5.21	48.74
Dichlorodifluoromethane	122	120	0.17	410	3.86	130	0.16	310	0.69	320	1.17	16.98
Dichloro-tetrafluoroethane	122			68	0.64							2.79
Total VOCs (lb/year)	NA		**43.6**		**207.7**		**19.3**		**46.4**		**72.2**	**810.4**
Total Chlorinated VOC (lb/yr)			**20.7**		**75.8**		**5.6**		**14.8**		**22.3**	**328.4**

TABLE 4.3

Well Based Decay Rates
Refuse Hideaway Landfill

Monitoring Location	Location	Total VOCs Jan-91	Total VOCs Feb-98	Decay Rate (k) (%/year)	Half Life (years)
Source Area					
P08S	Sand and Gravel	413	45	31	2.21
P09S	Sand and Gravel	678	9	61	1.14
P16S	Sand and Gravel	257	130	7	9.55
P16D	Sand and Gravel	57	61	-1	NA
P17S	Bedrock	297	102	15	4.60
P21S	Sand and Gravel	819	1	77	0.90
P21D	Sand and Gravel	73	178	-13	NA
Near Source					
P27S	Bedrock	230	38	33	2.11
P27D	Bedrock	221	73	22	3.16
Downgradient					
P31IA	Sand and Gravel	13	27	-3	NA
P40I	Bedrock	27	23	11	6.33
Average:				**32**	**2.16**

Notes:
P16S early data from Sept. 16, 1988
Decay rates computed from regression analysis for all dates between 1991 and 1998
Negative decay rate due to concentration increase at well.
NA = Half lives not applicable where concentration increases
Averages include only wells where concentration has decreased.

TABLE 4.4

Mass Based Decay Rates
Refuse Hideaway Landfill

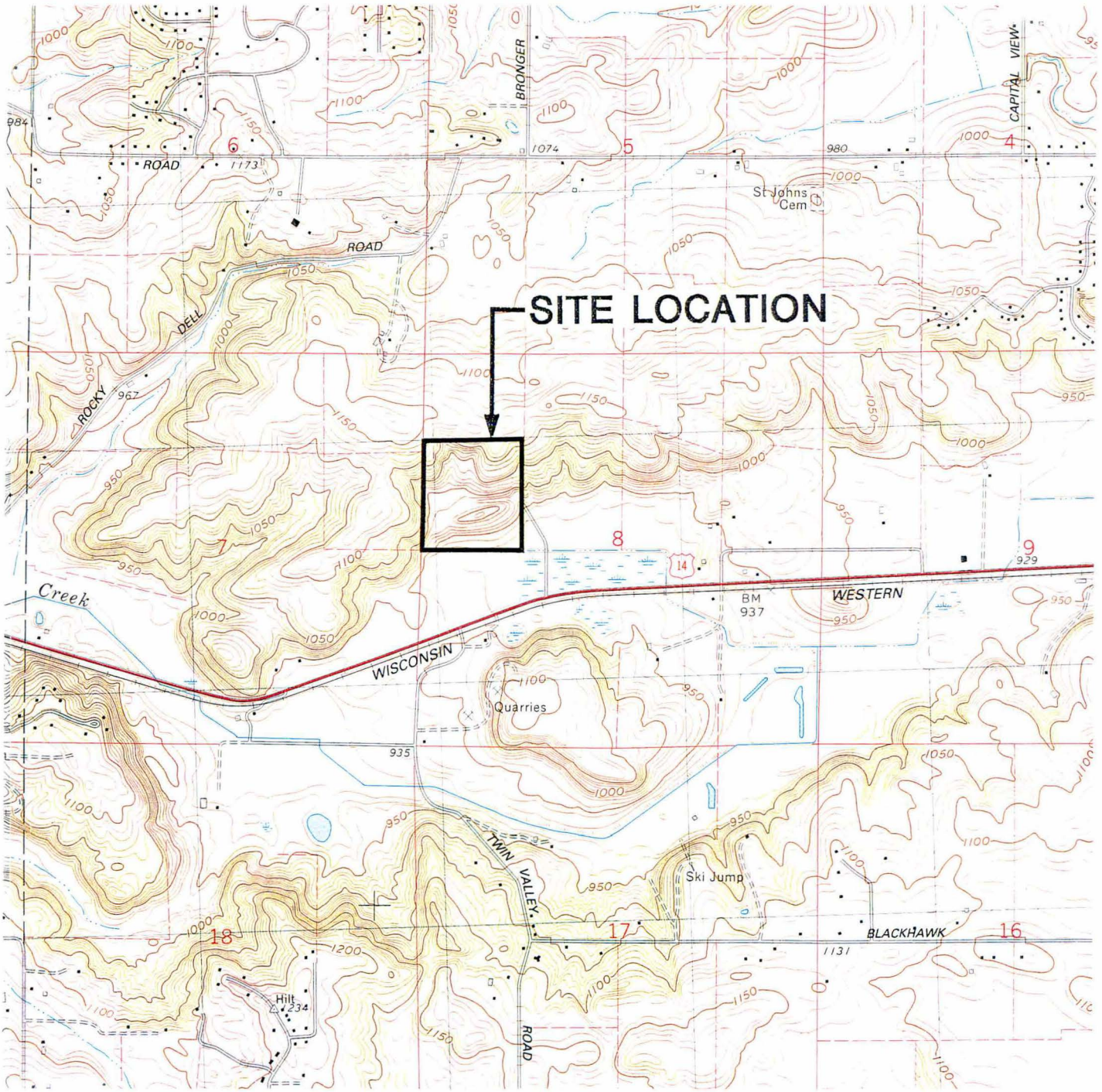
Region	Initial VOC Mass (lbs)	Final VOC Mass (lbs)	Elapsed Time 1/91-2/98 (days)	Decay Rate (k) (%/year)	Half Life (years)
Entire Plume	490	201	2620	12	5.6
Source	272	70	2620	19	3.7
Bedrock	95	32	2620	15	4.6
Sand & Gravel	177	38	2620	21	3.2
Downgradient	218	131	2620	7	9.8

Notes:

1. VOC=Volatile Organic Compounds
2. $k = (\ln(M_o) - \ln(M_f))/(\Delta t)*100$
3. Half Life = $\ln(0.5)/(-k)*100$
4. Source area is the approximate RHL property, defined by the following area
   N: 399,900 - 401,300
   E: 2,111,900 - 2,113,200
5. Bedrock porosity=0.1
6. Sand & Gravel porosity=0.3

R07E | R08E

T7N



QUALITY CONTROL

Graphic Standards	DLF	7-20-98
Lead Professional	RJR	7-20-98
Technical Review		
Project Manager	DJB	7-20-98
Management Review		
Other		

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NOTE

BASE MAP DEVELOPED FROM THE MIDDLETON, WISCONSIN 7.5 MINUTE U.S.G.S. TOPOGRAPHIC QUADRANGLE MAP, DATED 1983.

QUADRANGLE LOCATION

north

0 2000 4000

SCALE IN FEET

Developed By	RJR	Drawn By	DLF
Approved By	Doug J. Bach	Date	7/20/98
Reference			
Revisions			

SITE LOCATION MAP

PREDESIGN AND ADDITIONAL STUDIES
REFUSE HIDEAWAY LANDFILL
MIDDLETON, WISCONSIN

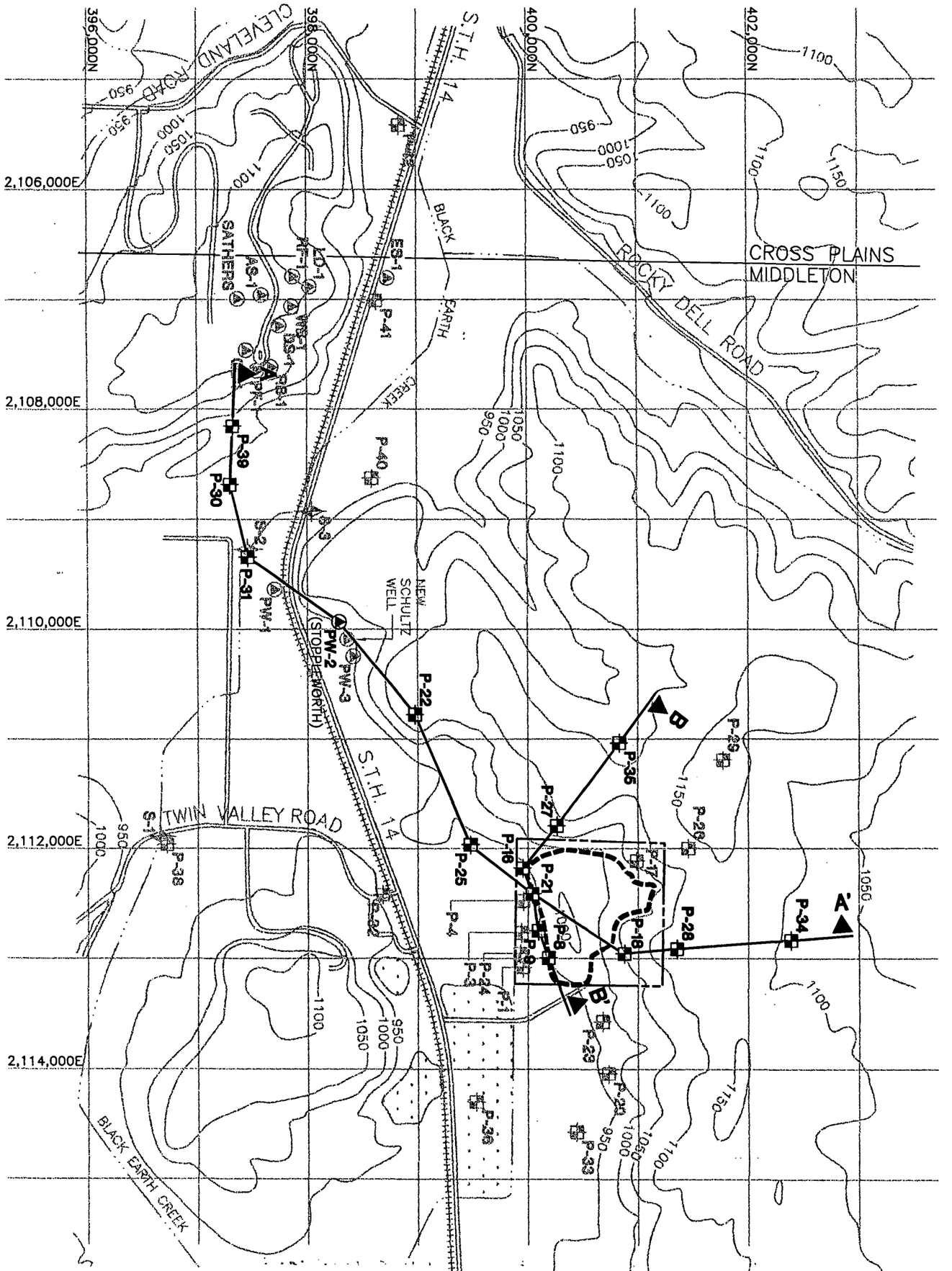
Drawing Number

Figure 2-1

MONTGOMERY WATSON

This document has been developed for a specific application and may not be used without the written approval of Montgomery Watson.

QUALITY CONTROL				
Graphic Standards	DLF	7-23-98	Technical Review	
Lead Professional	PHL	7-23-98	Project Manager	KJQ 7-23-98
			Management Review	
			Other	



LEGEND

- REFUSE HIDEAWAY LANDFILL PROPERTY BOUNDARY
- FILL LIMITS
- P-34 MONITORING WELL LOCATION AND NUMBER
- PW-1 PRIVATE WELL LOCATION AND NUMBER
- S-1 STAFF GAGE LOCATION AND NUMBER
- RAILROAD
- WETLANDS
- CREEK OR INTERMITTENT STREAM
- A A' CROSS SECTION LOCATION

NOTE

BASE MAP DEVELOPED FROM MARCH 1991 EXISTING CONDITIONS PLAN FOR REFUSE HIDEAWAY LANDFILL, PREPARED BY HYDRO-SEARCH, INC., DATED JUNE 20, 1994.

north

0 1000 2000

SCALE IN FEET

CROSS SECTION LOCATION MAP

PREDESIGN AND ADDITIONAL STUDIES
REFUSE HIDEAWAY LANDFILL
MIDDLETON, WISCONSIN

MONTGOMERY WATSON

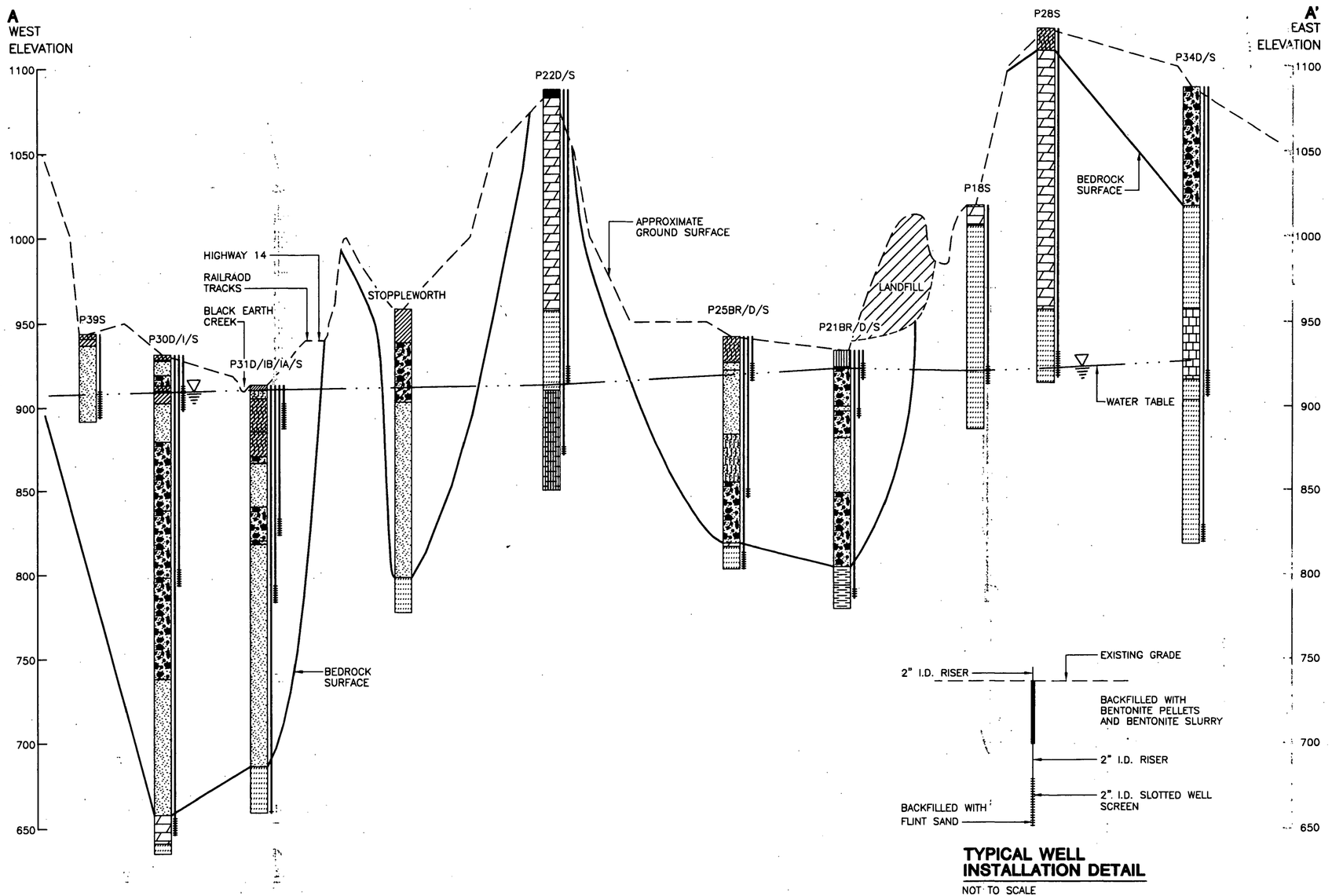
Drawing Number: Figure 2-2

Developed By PHL Drawn By DLF

Approved By [signature] Date 7/24/98

Reference 1242161.01120201-B1

Revisions



TYPICAL WELL INSTALLATION DETAIL

NOT TO SCALE

LEGEND

- TOPSOIL
- SAND WITH LOW SILT AND CLAY CONTENT (SP OR SW), MAY ALSO INCLUDE SW-SM, SW-SC, SP-SM AND SP-SC
- SILTY SAND (SM), MAY ALSO INCLUDE SP-SM AND SW-SM
- SAND AND GRAVEL WITH LOW SILT AND CLAY CONTENT (SP/GP OR SW/GW), MAY ALSO INCLUDE SW-SM/GW-GM, SW-SC/GW-GC, SP-SM/GP-GM, AND SP-SC/GP-GC
- SAND AND GRAVEL, SOME CLAY (SC/GC), MAY ALSO INCLUDE SW-SC/GW-GC AND SP-SC/GP-GC
- SILT, NON-PLASTIC OR LOW PLASTICITY (ML)
- SILTY CLAY, LOW PLASTICITY (CL-ML)
- LEAN CLAY, MODERATE PLASTICITY (CL)
- DOLOMITE
- LIMESTONE
- SILTSTONE
- SANDSTONE

NOTES

1. THE STRATUM LINES ARE BASED ON INTERPOLATION BETWEEN BORINGS AND MAY NOT REPRESENT ACTUAL SUBSURFACE CONDITIONS.
2. CROSS SECTION LOCATIONS ARE SHOWN ON DRAWING B9.
3. FOR THE PURPOSE OF ILLUSTRATING SUBSOIL CONDITIONS ON THE CROSS SECTIONS, SOME OF THE BORING LOGS HAVE BEEN SIMPLIFIED. FOR A DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT INDIVIDUAL BORINGS, REFER TO SOIL BORING LOGS, APPENDIX _ OF TEXT.
4. FOR COMPLETE MONITORING WELL INSTALLATION DETAILS REFER TO APPENDIX _ OF TEXT.
5. HORIZONTAL DISTANCES ARE MEASURED WITH RESPECT TO THE CENTER OF EACH SOIL BORING LOCATION.
6. EXISTING GROUND SURFACE WAS TAKEN FROM DRAWING B9.
7. ELEVATIONS ARE SHOWN IN REFERENCE TO U.S.G.S. DATUM.
8. QUESTION MARKS AT THE CONTACTS BETWEEN SUBSOIL TYPES INDICATES THE CONTACTS ARE INFERRED.

CROSS SECTION SCALE

SCALE IN FEET
VERTICAL EXAGGERATION: TWELVE TIMES

QUALITY CONTROL | Graphic Standards DLF 7-23-98 | Lead Professional PHL 7-23-98 | Technical Review KJO 7-23-98 | PM Review | Management Review | Other

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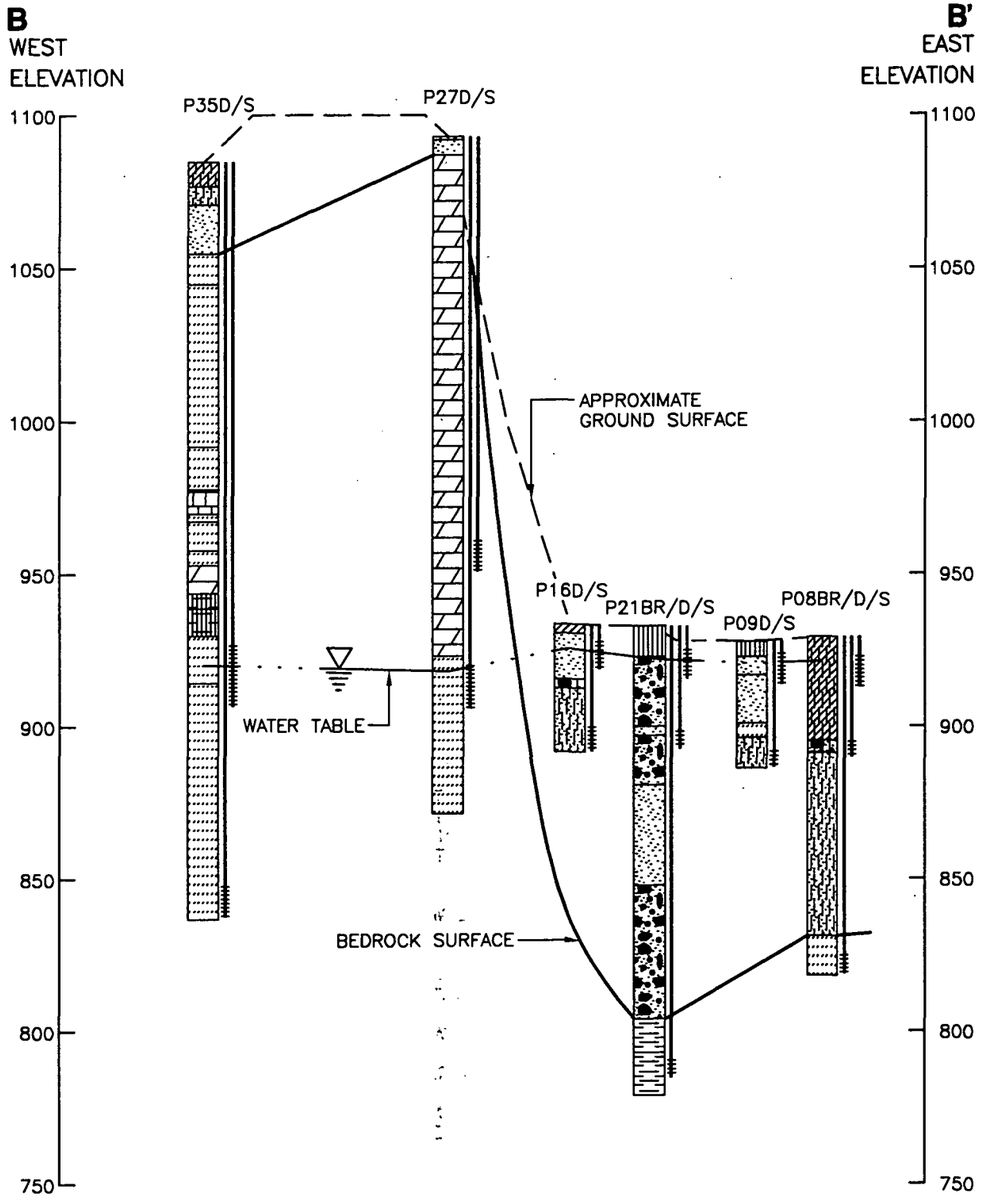
Developed By PHL | Drawn By DLF | Approved By | Date 7/24/98 | Reference | Revisions

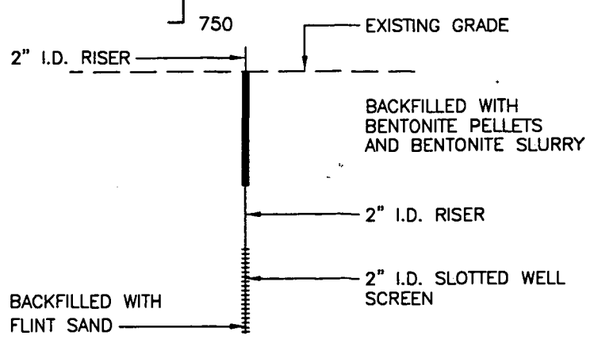
CROSS SECTION A-A'

PREDESIGN AND ADDITIONAL STUDIES
REFUSE HIDEAWAY LANDFILL
MIDDLETON, WISCONSIN

Drawing Number
Figure 2-3

MONTGOMERY WATSON





TYPICAL WELL INSTALLATION DETAIL

NOT TO SCALE

LEGEND

- SAND WITH LOW SILT AND CLAY CONTENT (SP OR SW), MAY ALSO INCLUDE SW-SM, SW-SC, SP-SM AND SP-SC
- SILTY SAND (SM), MAY ALSO INCLUDE SP-SM AND SW-SM
- SAND AND GRAVEL WITH LOW SILT AND CLAY CONTENT (SP/GP OR SW/GW), MAY ALSO INCLUDE SW-SM/GW-GM, SW-SC/GW-GC, SP-SM/GP-GM, AND SP-SC/GP-GC
- SILT, NON-PLASTIC OR LOW PLASTICITY (ML)
- SILTY CLAY, LOW PLASTICITY (CL-ML)
- LEAN CLAY, MODERATE PLASTICITY (CL)
- DOLOMITE
- LIMESTONE
- SILTSTONE
- SANDSTONE

NOTES

1. THE STRATUM LINES ARE BASED ON INTERPOLATION BETWEEN BORINGS AND MAY NOT REPRESENT ACTUAL SUBSURFACE CONDITIONS.
2. CROSS SECTION LOCATIONS ARE SHOWN ON DRAWING B9.
3. FOR THE PURPOSE OF ILLUSTRATING SUBSOIL CONDITIONS ON THE CROSS SECTIONS, SOME OF THE BORING LOGS HAVE BEEN SIMPLIFIED. FOR A DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT INDIVIDUAL BORINGS, REFER TO SOIL BORING LOGS, APPENDIX _ OF TEXT.
4. FOR COMPLETE MONITORING WELL INSTALLATION DETAILS REFER TO APPENDIX _ OF TEXT.
5. HORIZONTAL DISTANCES ARE MEASURED WITH RESPECT TO THE CENTER OF EACH SOIL BORING LOCATION.
6. EXISTING GROUND SURFACE WAS TAKEN FROM DRAWING B9.
7. ELEVATIONS ARE SHOWN IN REFERENCE TO U.S.G.S. DATUM.
8. QUESTION MARKS AT THE CONTACTS BETWEEN SUBSOIL TYPES INDICATES THE CONTACTS ARE INFERRED.

CROSS SECTION SCALE

50
0
0 600 1200

SCALE IN FEET
VERTICAL EXAGGERATION: TWELVE TIMES

Management Review
Other
Technical Review 7-23-98
Project Manager KJQ 7-23-98
QUALITY CONTROL
Graphic Standards DLF
Lead Professional PHL

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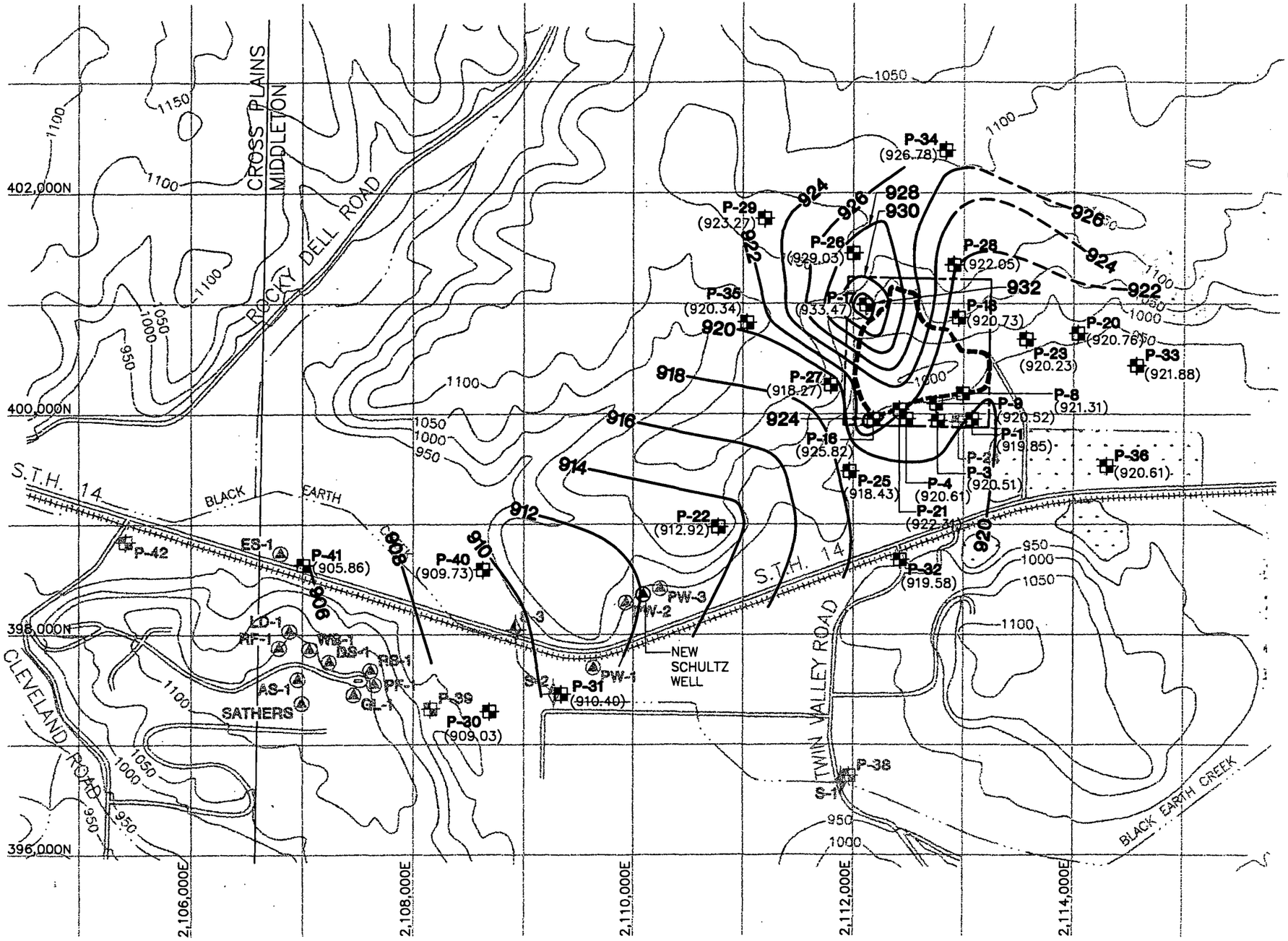
Developed By PHL
Drawn By DLF
Approved By
Date 7/24/98
Reference
Revisions

CROSS SECTION B-B'
PREDESIGN AND ADDITIONAL STUDIES
REFUSE HIDEAWAY LANDFILL
MIDDLETON, WISCONSIN

Drawing Number
Figure 2-4

MONTGOMERY WATSON



LEGEND

- REFUSE HIDEAWAY LANDFILL PROPERTY BOUNDARY
- FILL LIMITS
- P-34 (926.78) MONITORING WELL LOCATION, NUMBER, AND WATER TABLE ELEVATION
- —920— WATER TABLE ELEVATION (CONTOUR INTERVAL: TWO FOOT, DASHED WHERE INFERRED)
- P-33 MONITORING WELL LOCATION AND NUMBER
- PW-1 PRIVATE WELL LOCATION AND NUMBER
- NEW SCHULTZ WELL LOCATION
- S-1 STAFF GAGE LOCATION AND NUMBER
- RAILROAD
- WETLANDS
- CREEK OR INTERMITTENT STREAM

NOTES

1. BASE MAP DEVELOPED FROM MARCH 1991 EXISTING CONDITIONS PLAN FOR REFUSE HIDEAWAY LANDFILL, PREPARED BY HYDRO-SEARCH, INC., DATED JUNE 20, 1994.
2. WATER TABLE ELEVATIONS OBTAINED BY MONTGOMERY WATSON ON FEBRUARY 9, 1998.

north

0 1000 2000

SCALE IN FEET

Management Review
Other

Technical Review
Project Manager KJQ 7-13-98

Graphic Standards DLF 7-13-98
Lead Professional RJR 7-13-98

QUALITY CONTROL

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Developed By RJR
Drawn By DLF
Approved By
Date 7/24/98
Reference
Revisions

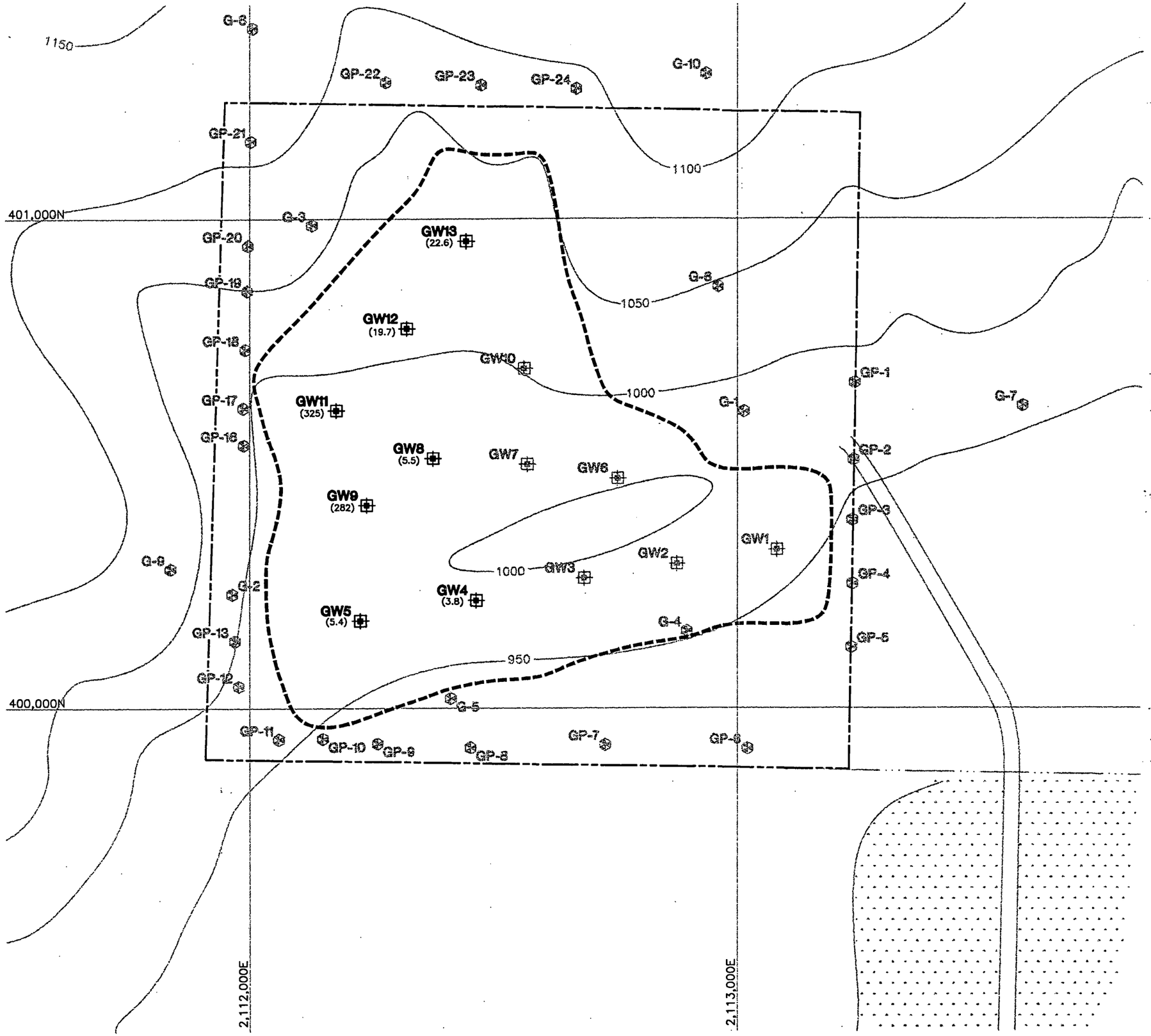
WATER TABLE MAP (FEBRUARY 8, 1998)

PREDESIGN AND ADDITIONAL STUDIES
REFUSE HIDEAWAY LANDFILL
MIDDLETON, WISCONSIN

Drawing Number

Figure 2-5

MONTGOMERY WATSON



LEGEND

- REFUSE HIDEAWAY LANDFILL PROPERTY BOUNDARY
- FILL LIMITS
- GW13 (22.6) — EXISTING LEACHATE/GAS EXTRACTION WELL LOCATION, NUMBER, AND TOTAL CHLORINATED VOC LEACHATE RESULTS IN ug/L
- G-4 — GAS PROBE LOCATION AND NUMBER ("G" SERIES) (NOT SAMPLED)
- G-7 — GAS PROBE LOCATION AND NUMBER ("G" SERIES) (NOT SAMPLED)
- GP-23 — GAS PROBE LOCATION AND NUMBER ("GP" SERIES) (NOT SAMPLED)
- GP-11 — GAS PROBE LOCATION AND NUMBER ("GP" SERIES) (NOT SAMPLED)
- WETLANDS
- CREEK OR INTERMITTENT STREAM

NOTE

1. BASE MAP DEVELOPED FROM GAS PROBE AND LEACHATE/GAS EXTRACTION WELL LOCATION PLAN FOR REFUSE HIDEAWAY LANDFILL, PREPARED BY HYDRO-SEARCH, INC., DATED MARCH 21, 1994.
2. TOTAL CHLORINATED VOC LEACHATE RESULTS OBTAINED FROM LEACHATE SAMPLING CONDUCTED BY MONTGOMERY WATSON ON FEBRUARY 18, 1998.

north

0 200 400

SCALE IN FEET

Developed By RJR
Drawn By DLF
Approved By
Date 4/24/98
Reference 1242161.01120201-B3
Revisions

TOTAL CHLORINATED VOCs - LEACHATE

PREDESIGN AND ADDITIONAL STUDIES
REFUSE HIDEAWAY LANDFILL
MIDDLETON, WISCONSIN

Drawing Number

Figure 3-1

MONTGOMERY WATSON

Management Review	Other		
Technical Review	DJB	4-22-98	
Project Manager			
Graphic Standards	DLF	4-20-98	
Lead Professional	RJR	4-20-98	
QUALITY CONTROL			

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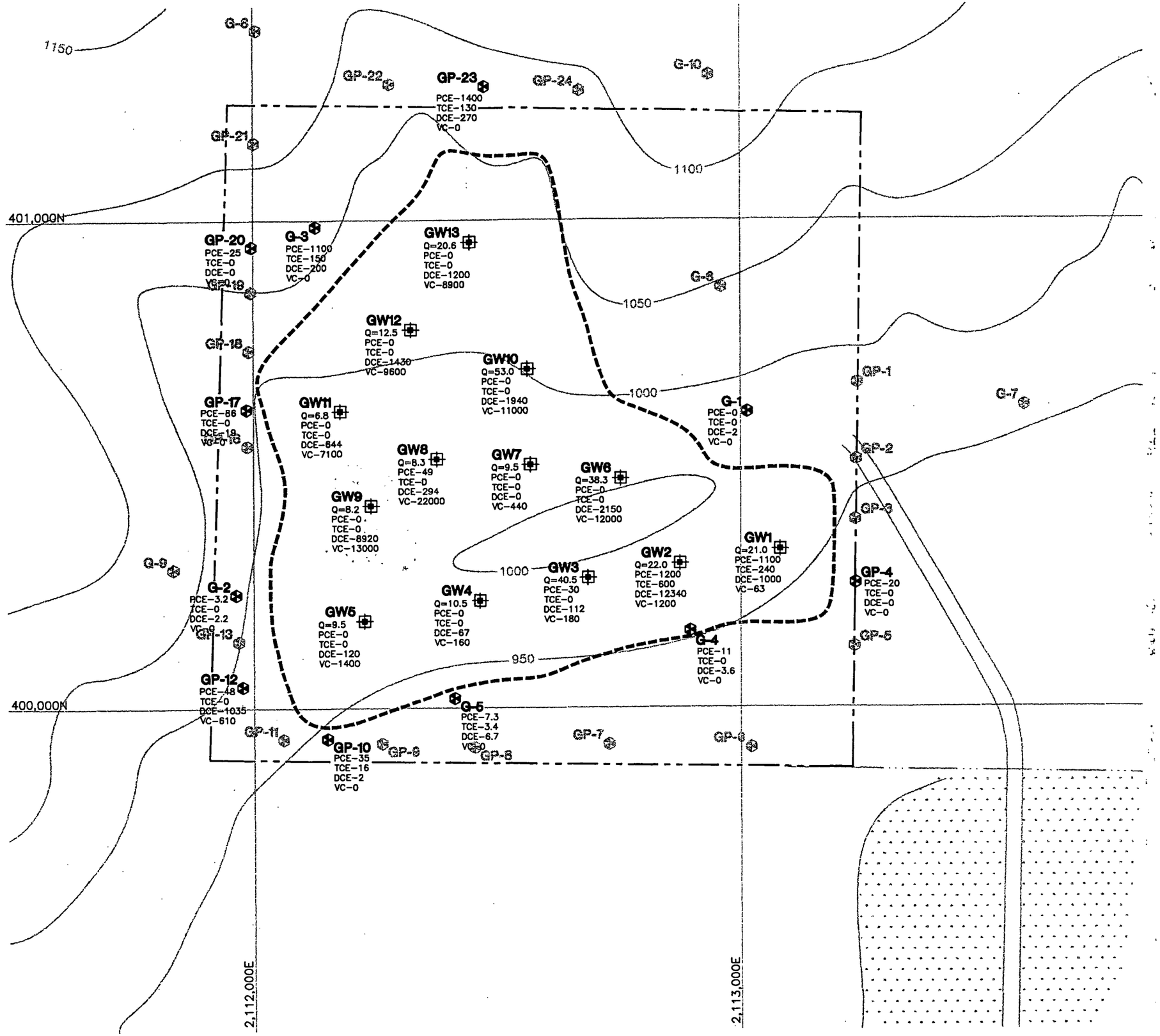

LEGEND

- REFUSE HIDEAWAY LANDFILL PROPERTY BOUNDARY
- FILL LIMITS
- **GW13** — EXISTING LEACHATE/GAS EXTRACTION WELL LOCATION, NUMBER, GAS FLOW RATES IN cfm, AND CHLORINATED VOC LANDFILL GAS RESULTS IN ppb
- **G-4** — GAS PROBE LOCATION, NUMBER ("G" SERIES), AND CHLORINATED VOC LANDFILL GAS RESULTS IN ppb
- **G-7** — GAS PROBE LOCATION AND NUMBER ("G" SERIES) (NOT SAMPLED)
- **GP-23** — GAS PROBE LOCATION, NUMBER ("GP" SERIES), AND CHLORINATED VOC LANDFILL GAS RESULTS IN ppb
- **GP-11** — GAS PROBE LOCATION AND NUMBER ("GP" SERIES) (NOT SAMPLED)
- WETLANDS
- CREEK OR INTERMITTENT STREAM

NOTE

1. BASE MAP DEVELOPED FROM GAS PROBE AND LEACHATE/GAS EXTRACTION WELL LOCATION PLAN FOR REFUSE HIDEAWAY LANDFILL, PREPARED BY HYDRO-SEARCH, INC., DATED MARCH 21, 1994.
2. CHLORINATED VOC LANDFILL GAS RESULTS OBTAINED FROM LANDFILL GAS SAMPLING CONDUCTED BY MONTGOMERY WATSON ON FEBRUARY 18, 19, AND 23, 1998.
3. LANDFILL GAS FLOW RATES MEASURED BY ENVIRONMENTAL SAMPLING CORPORATION.

north

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SCALE IN FEET

Management Review — Other
Technical Review — Project Manager KJO 7-23-98
Graphic Standards DLF 4-20-98
Lead Professional RJR 4-20-98
QUALITY CONTROL

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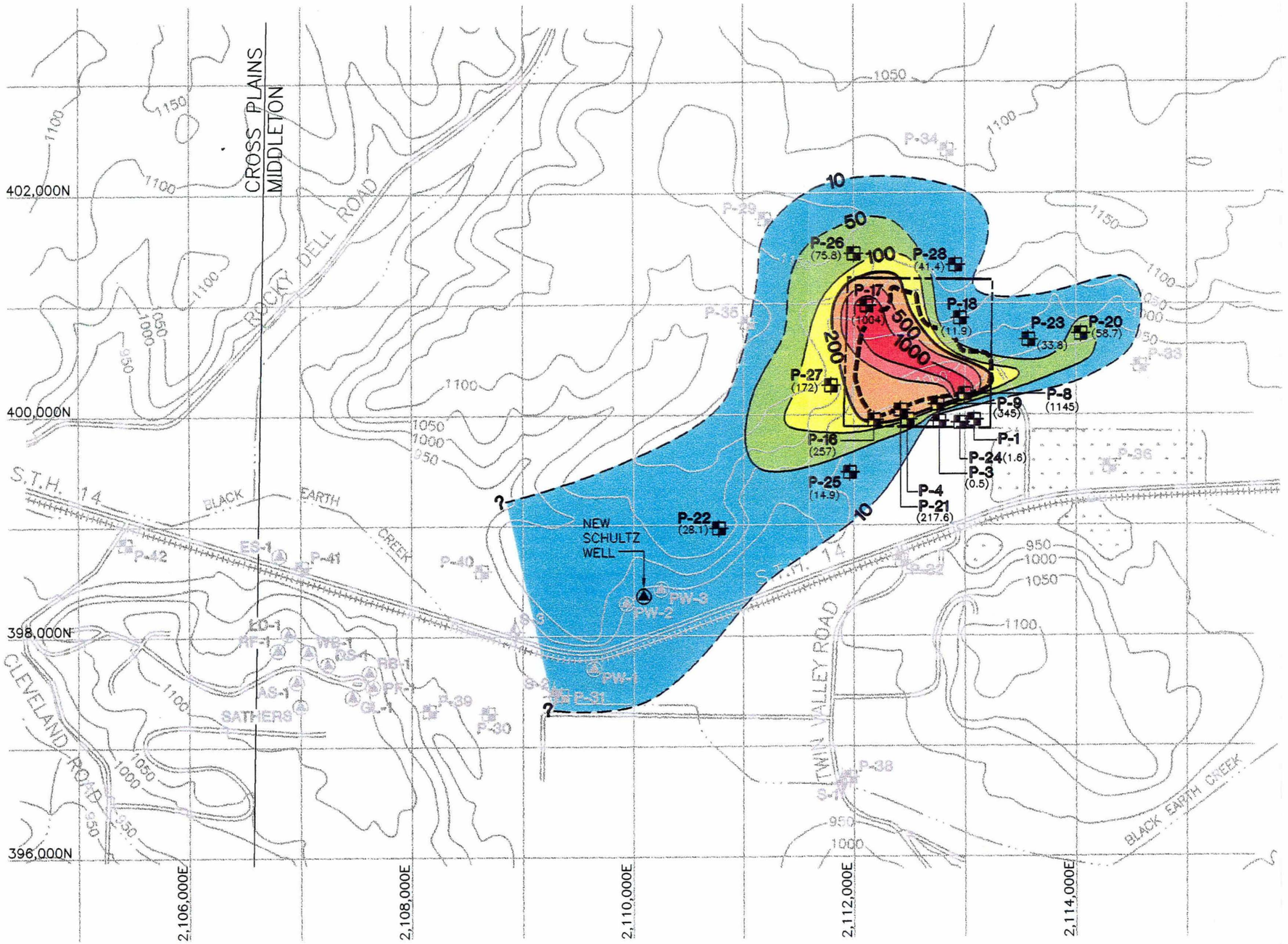
Developed By RJR
Drawn By DLF/LCL
Approved By
Date 7/24/98
Reference 1242161.01120201-B3
Revisions

FLOW RATES AND CHLORINATED VOCs - LANDFILL GAS

PREDESIGN AND ADDITIONAL STUDIES
REFUSE HIDEAWAY LANDFILL
MIDDLETON, WISCONSIN

Drawing Number
Figure 3-2

MONTGOMERY WATSON



LEGEND

- REFUSE HIDEAWAY LANDFILL PROPERTY BOUNDARY
- FILL LIMITS
- P-28 (41.4) MONITORING WELL LOCATION, NUMBER, AND TOTAL VOC CONCENTRATION RESULTS (ug/L)
- P-36 MONITORING WELL LOCATION AND NUMBER (NOT SAMPLED)
- PW-1 PRIVATE WELL LOCATION AND NUMBER (NOT SAMPLED)
- NEW SCHULTZ WELL LOCATION
- S-1 STAFF GAGE LOCATION AND NUMBER
- RAILROAD
- WETLANDS
- CREEK OR INTERMITTENT STREAM
- 10 ISO-CONCENTRATION CONTOUR (CONTOUR INTERVAL: VARIES, DASHED WHERE INFERRED)
  - >1000 ug/L
  - 500 – 1000 ug/L
  - 200 – 500 ug/L
  - 100 – 200 ug/L
  - 50 – 100 ug/L
  - 10 – 50 ug/L

NOTES

1. BASE MAP DEVELOPED FROM MARCH 1991 EXISTING CONDITIONS PLAN FOR REFUSE HIDEAWAY LANDFILL, PREPARED BY HYDRO-SEARCH, INC., DATED JUNE 20, 1994.
2. DATA USED FOR ISO-CONCENTRATION MAP FROM SEPTEMBER 1988 SAMPLING EPISODE. IF NO SEPTEMBER 1988 EPISODE OCCURRED, THE CLOSEST SAMPLING DATE IN 1991 WAS USED.
3. WHERE WELL NESTS OCCUR, THE WELL WITH THE HIGHEST TOTAL VOC CONCENTRATION WAS USED FOR PLOTTING.
4. MONITORING WELLS P29 THROUGH P42 INSTALLED AFTER THE 1988 SAMPLING EPISODES.

north

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SCALE IN FEET

Developed By MDP
Drawn By DLF
Approved By
Date 7/24/98
Reference 1242161.01258001-B1
Revisions

TOTAL VOCs - GROUNDWATER - 1988

PREDESIGN AND ADDITIONAL STUDIES
REFUSE HIDEAWAY LANDFILL
MIDDLETON, WISCONSIN

Drawing Number

Figure 3-3

MONTGOMERY WATSON

Management Review
Other
Technical Review
Project Manager KJQ 5-14-98
QUALITY CONTROL
Graphic Standards DLF 5-14-98
Lead Professional MDP 5-14-98

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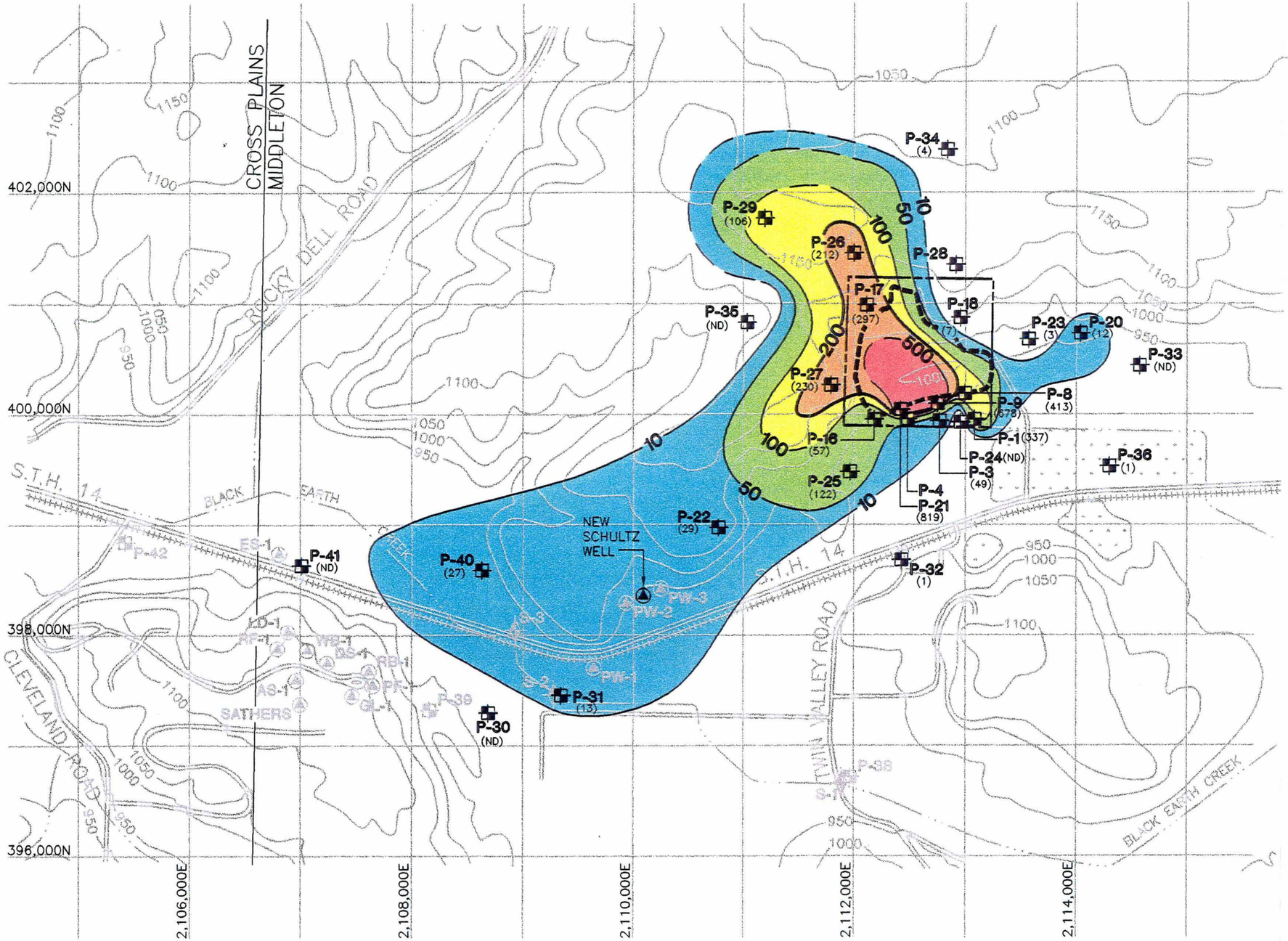

LEGEND

- REFUSE HIDEAWAY LANDFILL PROPERTY BOUNDARY
- FILL LIMITS
- P-34 (4) MONITORING WELL LOCATION, NUMBER, AND TOTAL VOC CONCENTRATION RESULTS (ug/L)
- P-38 MONITORING WELL LOCATION AND NUMBER (NOT SAMPLED)
- PW-1 PRIVATE WELL LOCATION AND NUMBER (NOT SAMPLED)
- NEW SCHULTZ WELL LOCATION
- S-1 STAFF GAGE LOCATION AND NUMBER
- RAILROAD
- WETLANDS
- CREEK OR INTERMITTENT STREAM
- 10 ISO-CONCENTRATION CONTOUR (CONTOUR INTERVAL: VARIES, DASHED WHERE INFERRED)
  - >500 ug/L
  - 200 – 500 ug/L
  - 100 – 200 ug/L
  - 50 – 100 ug/L
  - 10 – 50 ug/L

NOTES

1. BASE MAP DEVELOPED FROM MARCH 1991 EXISTING CONDITIONS PLAN FOR REFUSE HIDEAWAY LANDFILL, PREPARED BY HYDRO-SEARCH, INC., DATED JUNE 20, 1994.
2. DATA USED FOR ISO-CONCENTRATION MAP FROM JANUARY 1991 SAMPLING EPISODE. IF NO JANUARY EPISODE OCCURRED, THE EARLIEST SAMPLING TIME IN 1991 WAS USED.
3. WHERE WELL NESTS OCCUR, THE WELL WITH THE HIGHEST TOTAL VOC CONCENTRATION WAS USED FOR PLOTTING.

north

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SCALE IN FEET

Developed By MDP
Drawn By DLF
Approved By [signature] Date 7/24/98
Reference 1242161.01258001-B1
Revisions

TOTAL VOCs - GROUNDWATER - 1991

PREDESIGN AND ADDITIONAL STUDIES
REFUSE HIDEAWAY LANDFILL
MIDDLETON, WISCONSIN

Drawing Number

Figure 3-4

MONTGOMERY WATSON

Management Review
Other
Technical Review KJQ 5-14-98
Project Manager 5-14-98
Graphic Standards DLF 5-14-98
Professional MDP
QUALITY CONTROL

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QUALITY CONTROL
Graphic Standards DLF 5-14-98
Lead Professional MDP 5-14-98
Technical Review KJQ
Project Manager 5-14-98
Management Review
Other
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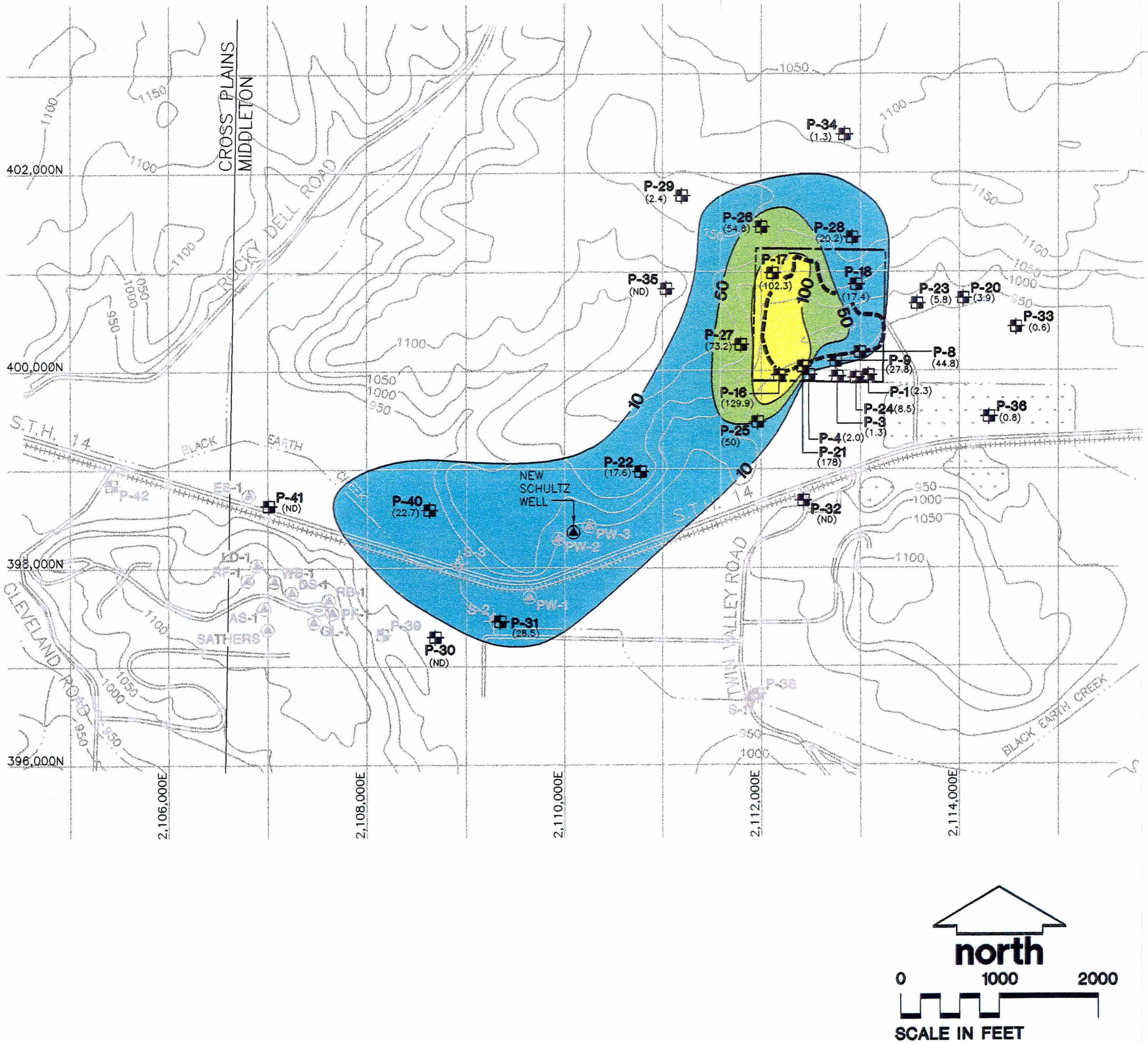

LEGEND

- REFUSE HIDEAWAY LANDFILL PROPERTY BOUNDARY
- FILL LIMITS
- P-34 (1.3) MONITORING WELL LOCATION, NUMBER, AND TOTAL VOC CONCENTRATION RESULTS (ug/L)
- P-38 MONITORING WELL LOCATION AND NUMBER (NOT SAMPLED)
- PW-1 PRIVATE WELL LOCATION AND NUMBER (NOT SAMPLED)
- (19.9) NEW SCHULTZ WELL LOCATION AND TOTAL VOC CONCENTRATION RESULT (ug/L)
- S-1 STAFF GAGE LOCATION AND NUMBER
- RAILROAD
- WETLANDS
- CREEK OR INTERMITTENT STREAM
- —10— ISO-CONCENTRATION CONTOUR (CONTOUR INTERVAL: VARIES, DASHED WHERE INFERRED)
- >100 ug/L - <200 ug/L
- 50 - 100 ug/L
- 10 - 50 ug/L

NOTES

1. BASE MAP DEVELOPED FROM MARCH 1991 EXISTING CONDITIONS PLAN FOR REFUSE HIDEAWAY LANDFILL, PREPARED BY HYDRO-SEARCH, INC., DATED JUNE 20, 1994.
2. DATA USED FOR ISO-CONCENTRATION MAP FROM FEBRUARY AND MARCH 1998. DATA WAS BLANK CORRECTED BUT, THE VALIDATION PROCESS WAS NOT COMPLETED AT THE TIME OF ISO-CONCENTRATION MAP COMPLETION.
3. WHERE WELL NESTS OCCUR, THE WELL WITH THE HIGHEST TOTAL VOC CONCENTRATION WAS USED FOR PLOTTING.

Developed By MDP Drawn By DLF
Approved By [signature] Date 7/24/98
Reference 1242161.01258001-B1
Revisions

TOTAL VOCs - GROUNDWATER - 1998

PREDESIGN AND ADDITIONAL STUDIES
REFUSE HIDEAWAY LANDFILL
MIDDLETON, WISCONSIN

Drawing Number
Figure 3-5

MONTGOMERY WATSON

Management Review	
Technical Review	7-23-98
Project Manager KJO	7-23-98
Graphic Standards DLF	7-23-98
Lead Professional PHL	7-23-98
QUALITY CONTROL	

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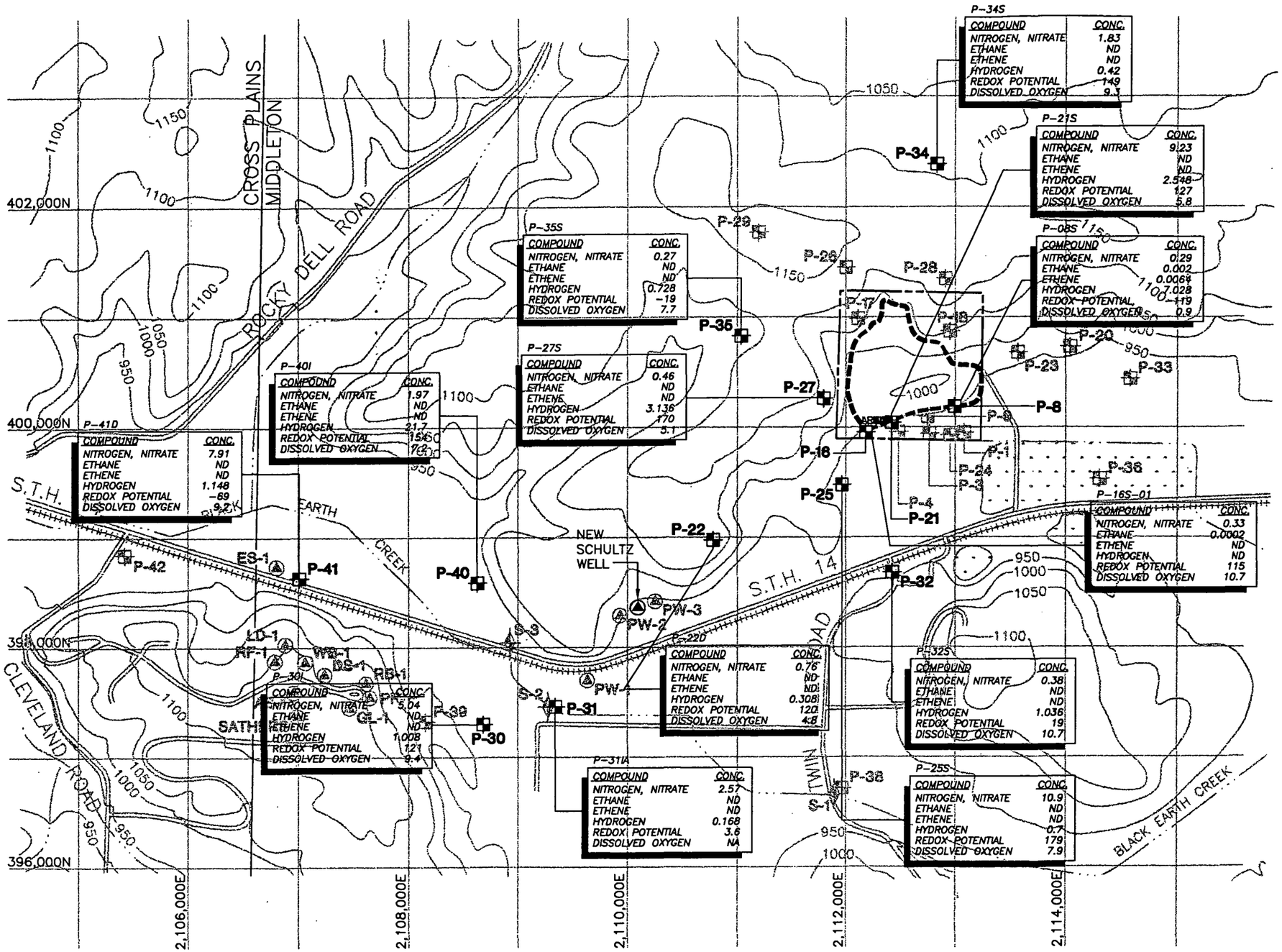

LEGEND

- REFUSE HIDEAWAY LANDFILL PROPERTY BOUNDARY
- FILL LIMITS
- P-34 MONITORING WELL LOCATION AND NUMBER
  - S = SHALLOW
  - I = INTERMEDIATE
  - D = DEEP

P-34S		Well Number
COMPOUND	CONC.	
NITROGEN, NITRATE	1.83	Nitrogen, Nitrate in mg/L
ETHANE	ND	Ethane in mg/L
ETHENE	ND	Ethene in mg/L
HYDROGEN	0.42	Hydrogen in nmol
REDOX POTENTIAL	149	Redox Potential in mV
DISSOLVED OXYGEN	9.3	Dissolved Oxygen in mg/L

- ND NO DETECT
- NA NOT ANALYZED
- P-38 MONITORING WELL LOCATION AND NUMBER (NOT SAMPLED)
- PW-1 PRIVATE WELL LOCATION AND NUMBER (NOT SAMPLED)
- S-1 STAFF GAGE LOCATION AND NUMBER
- RAILROAD
- WETLANDS
- CREEK OR INTERMITTENT STREAM

NOTES

1. BASE MAP DEVELOPED FROM MARCH 1991 EXISTING CONDITIONS PLAN FOR REFUSE HIDEAWAY LANDFILL, PREPARED BY HYDRO-SEARCH, INC., DATED JUNE 20, 1994.
2. NATURAL ATTENUATION PARAMETER RESULTS OBTAINED FROM GROUND-WATER SAMPLING CONDUCTED BY MONTGOMERY WATSON DURING FEBRUARY 1998.

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SCALE IN FEET

Developed By PHL
Drawn By DLF
Approved By
Date 7/24/98
Reference 1242161.01120201-B1
Revisions

NATURAL ATTENUATION PARAMETERS

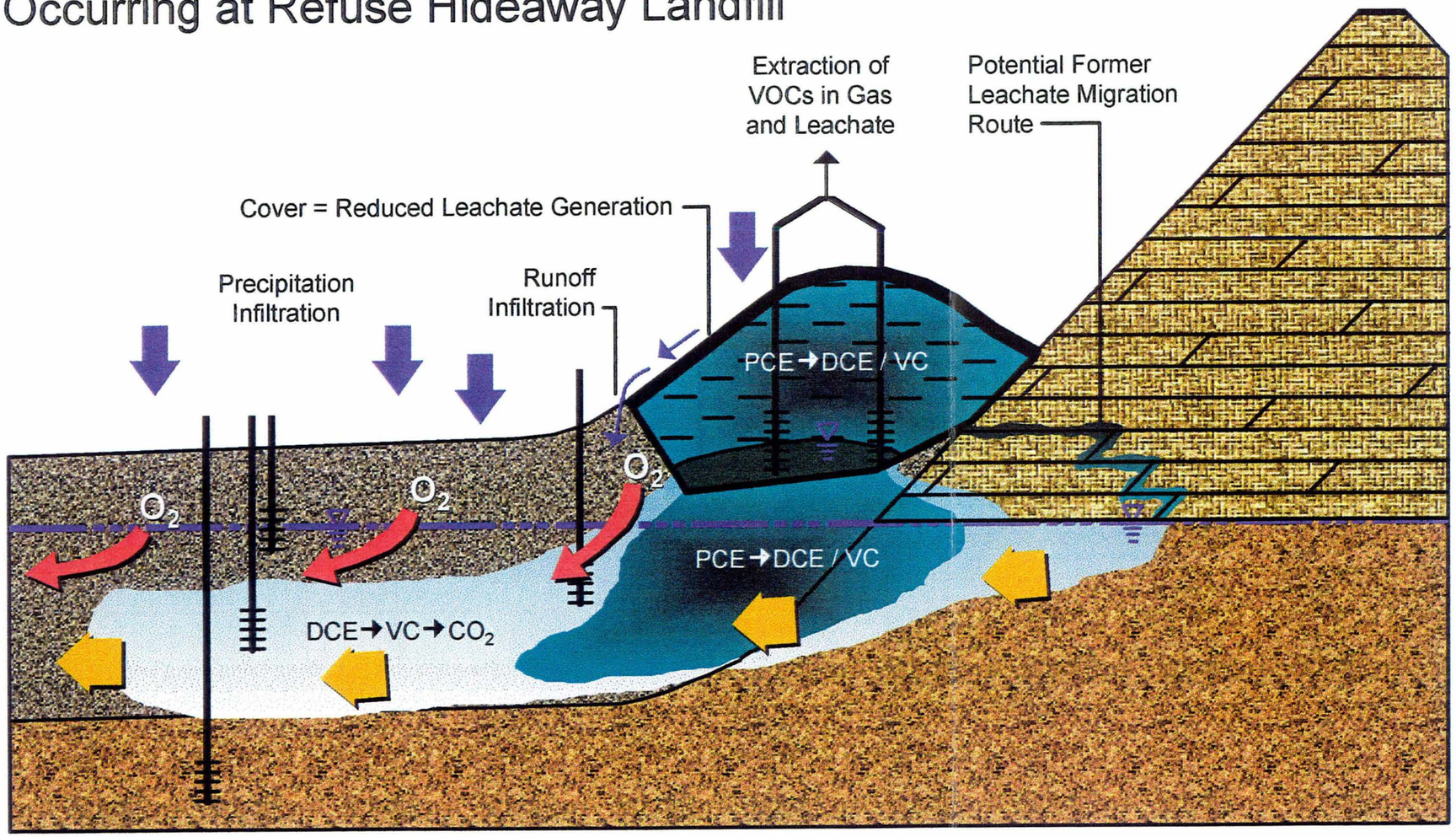
PREDESIGN AND ADDITIONAL STUDIES
REFUSE HIDEAWAY LANDFILL
MIDDLETON, WISCONSIN

Drawing Number

Figure 3-6

MONTGOMERY WATSON

Conceptual Presentation of Migration and Degradation Processes Occurring at Refuse Hideaway Landfill



Refuse

Alluvium

Bedrock

Dolomite

Sandstone

Anaerobic Degradation

Aerobic Degradation

Anaerobic Degradation/Reaction Rates

PCE → TCE → DCE → Vinyl Chloride → Ethene
Fast *Fast* *Moderate* *Slow*

Aerobic Degradation/Reaction Rate

DCE and Vinyl Chloride → CO_2 and Water
Fast

O_2 Diffusion of Oxygen into Groundwater

Groundwater Flow Direction

Drawn By	LCL	
Developed By	KJQ	
Approved By		Date 7/24/98
Reference		
Revisions		

CONCEPTUAL PRESENTATION OF MIGRATION AND DEGRADATION PROCESSES OCCURRING AT REFUSE HIDEAWAY LANDFILL

PREDESIGN AND ADDITIONAL STUDIES
REFUSE HIDEAWAY LANDFILL
MIDDLETON, WISCONSIN

Drawing Number

Figure 4-1

MONTGOMERY WATSON

Management Review	Other		
Technical Review	Project Manager KJQ	7-23-98	
QUALITY CONTROL	Graphic Standards LCL		
	Lead Professional	7-23-98	

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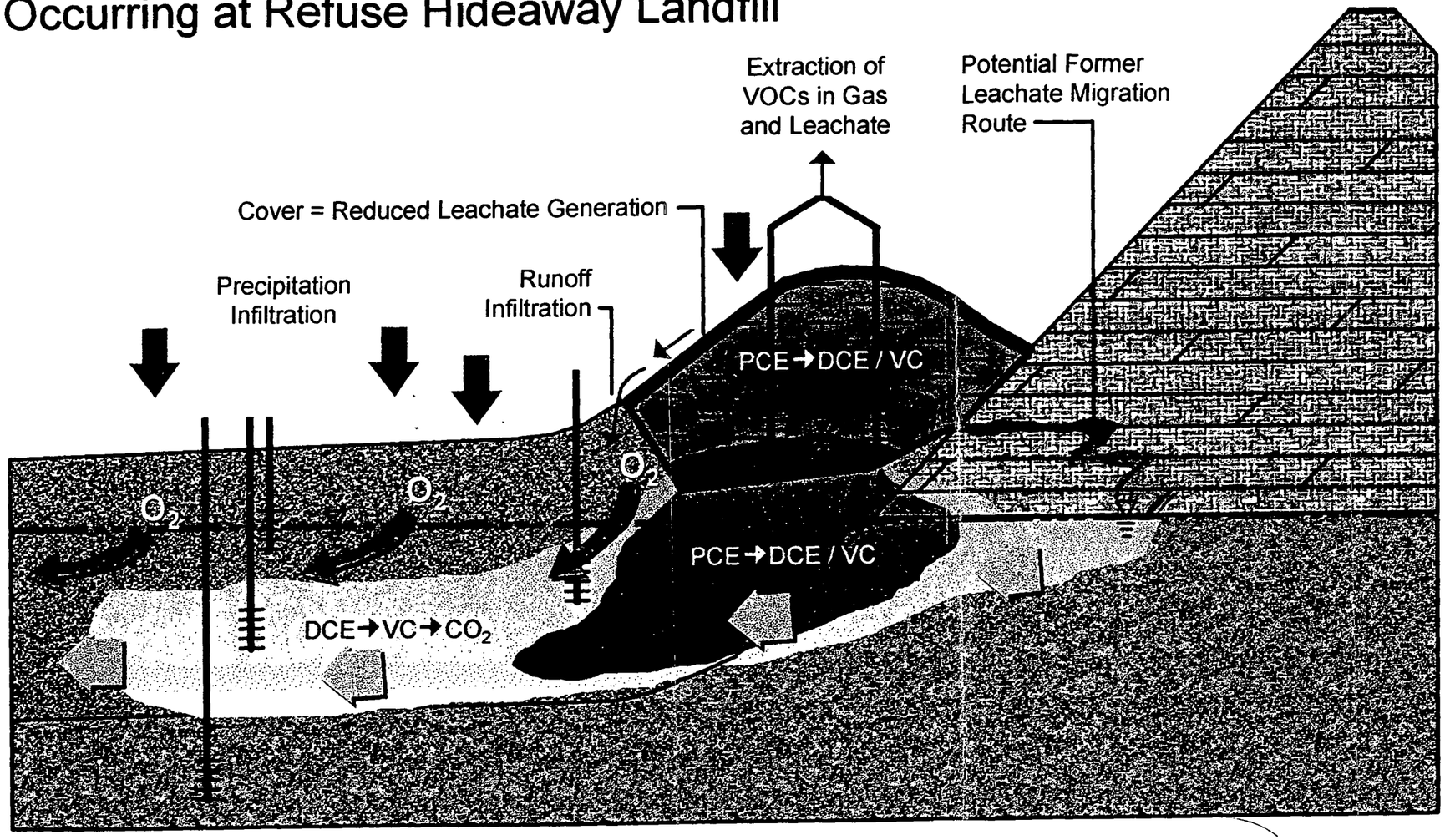
Conceptual Presentation of Migration and Degradation Processes Occurring at Refuse Hideaway Landfill



Refuse

Alluvium

Bedrock

Dolomite

Sandstone

Anaerobic Degradation

Aerobic Degradation

Anaerobic Degradation/Reaction Rates

PCE $\xrightarrow[Fast]{}$ TCE $\xrightarrow[Fast]{}$ DCE $\xrightarrow[Moderate]{}$ Vinyl Chloride $\xrightarrow[Slow]{}$ Ethene

Aerobic Degradation/Reaction Rate

DCE and Vinyl Chloride $\xrightarrow[Fast]{}$ CO_2 and Water

O_2 Diffusion of Oxygen into Groundwater

Groundwater Flow Direction

Management Review	Other		
Technical Review	Project Manager KJQ	7-23-98	
7-23-98	Graphic Standards LCL		
QUALITY CONTROL	Lead Professional		

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Developed By KJQ Drawn By LCL

Approved By [signature] Date 7/24/98

Reference

Revisions

CONCEPTUAL PRESENTATION OF MIGRATION AND DEGRADATION PROCESSES OCCURRING AT REFUSE HIDEAWAY LANDFILL

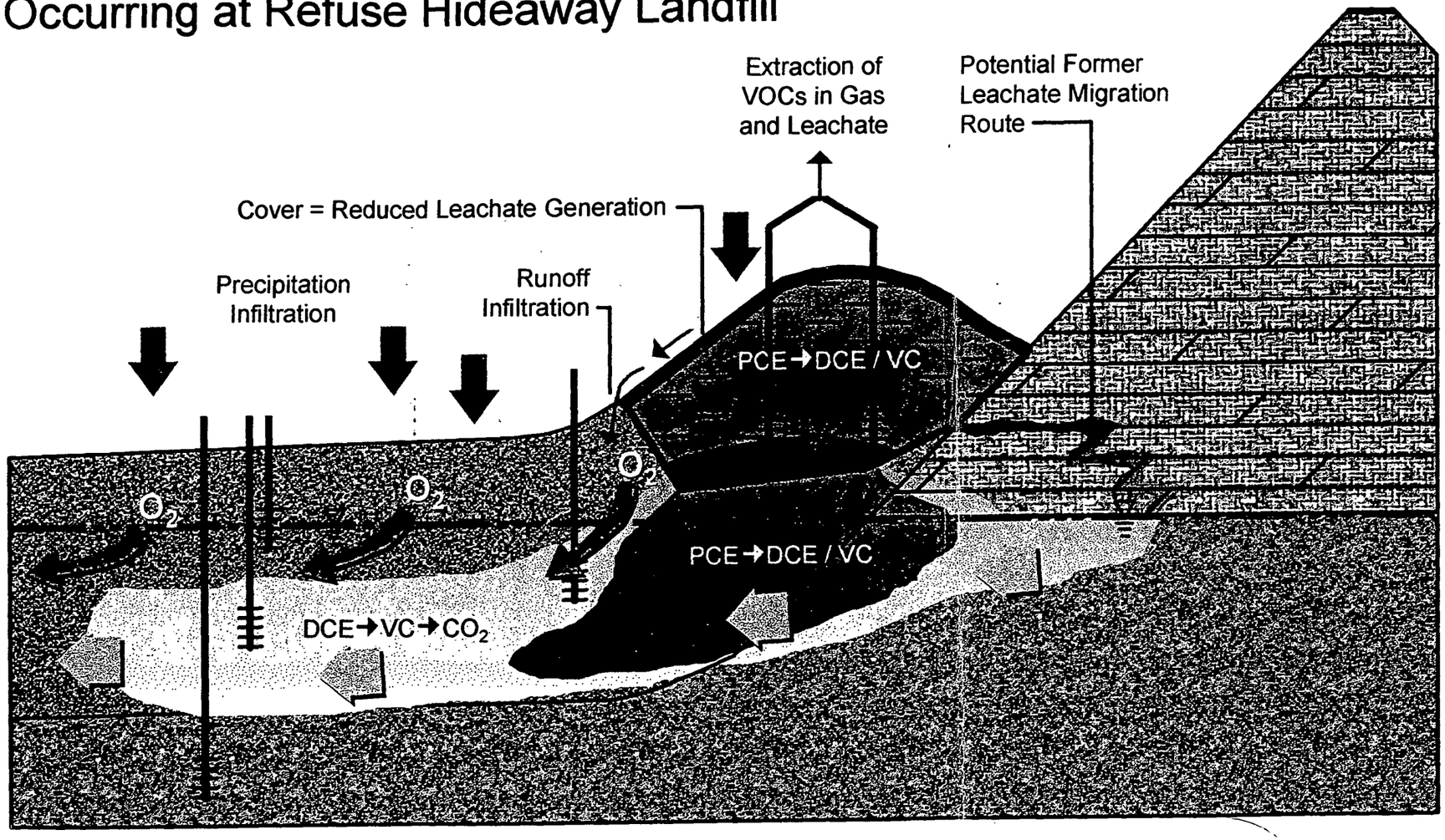
PREDISIGN AND ADDITIONAL STUDIES
REFUSE HIDEAWAY LANDFILL
MIDDLETON, WISCONSIN

Drawing Number

Figure 4-1

MONTGOMERY WATSON

Conceptual Presentation of Migration and Degradation Processes Occurring at Refuse Hideaway Landfill



Refuse

Alluvium

Bedrock

Dolomite

Sandstone

Anaerobic Degradation

Aerobic Degradation

Anaerobic Degradation/Reaction Rates

PCE $\xrightarrow[Fast]{}$ TCE $\xrightarrow[Fast]{}$ DCE $\xrightarrow[Moderate]{}$ Vinyl Chloride $\xrightarrow[Slow]{}$ Ethene

Aerobic Degradation/Reaction Rate

DCE and Vinyl Chloride $\xrightarrow[Fast]{}$ CO_2 and Water

O_2 Diffusion of Oxygen into Groundwater

Groundwater Flow Direction

Developed By KJQ Drawn By LCL

Approved By [signature] Date 7/24/98

Reference

Revisions

CONCEPTUAL PRESENTATION OF MIGRATION AND DEGRADATION PROCESSES OCCURRING AT REFUSE HIDEAWAY LANDFILL

PREDISIGN AND ADDITIONAL STUDIES
REFUSE HIDEAWAY LANDFILL
MIDDLETON, WISCONSIN

Drawing Number

Figure 4-1

MONTGOMERY WATSON

Management Review
Other
Technical Review 7-23-98
Project Manager KJQ 7-23-98
QUALITY CONTROL
Graphic Standards LCL
Lead Professional

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A

SUMMARY OF DEVIATIONS FROM THE FIELD SAMPLING PLAN

APPENDIX A

SUMMARY OF DEVIATIONS FROM THE FIELD SAMPLING PLAN

This Appendix includes methods used during water level measurements, groundwater, leachate, and landfill gas sampling, and heat pulse flow meter logging of the new Shultz well which deviated slightly from methods outlined in the Predesign and Additional Studies Work Plan.

WATER/LIQUID LEVEL MEASUREMENTS

Water levels were collected from all monitoring wells intended for sampling on a single day, except for wells with Cherne balls installed. Based on the design of the combination Landfill gas/leachate extraction wells, liquid levels could not be directly obtained from the well. Leachate head levels were obtained from Environmental Sampling Corp., which measured the levels on February 18, 1998 using back-pressure on an airline method. Leachate elevations were estimated by adding the measured leachate head level to the base grade elevations from the RMT In-Field Conditions report dated January 1988.

Water levels were not measured at the gas probes based on no surveyed elevations existing for the probes.

GROUNDWATER SAMPLING

Monitoring wells were sampled using dedicated systems, if in existence. If the dedicated systems did not exist, the wells were sampled using either a submersible pump or a stainless steel bailer. Methods used for groundwater sampling which did not conform to methods detailed in the FSP include the following:

- At locations where stainless steel bailers were used, dissolved oxygen and Eh were measured using an aliquot of purged water following removal of the three well volumes. These measurements were not completed in the wells due to a potential for equipment damage.

- Stainless steel bailers were used for sampling at wells P1S, P1D, P3S, and P4S. These wells are 1.25 in galvanized wells which were not able to be sampled using either the bladder or Grundfos pump.

- Hydrogen sampling was not completed at well P16S based on the recharge of the well being insufficient to allow for representative sample collection.

Wells sampled for natural attenuation which did not have a dedicated system were sampled using a bladder pump, for consistency with the wells with dedicated systems. The Grundfos pump was not used for hydrogen sampling.

Groundwater sampling at the new Schultz well was conducted in accordance with methods detailed in the FSP. The well was purged using a submersible pump and the sample was collected using a stainless steel bailer.

LEACHATE SAMPLING

Based on the design of the combination gas/leachate wells, a leachate sample was not able to be collected using a stainless steel bailer as described in the FSP. Samples were collected by detaching the discharge hose from the well and filling a clean polyethylene bottle as the pump cycled. The flow rate from the discharge piping was too great to directly fill the 40 ml glass VOC sample bottles, therefore, an aliquot of the collected sample was then immediately transferred from the polyethylene bottle into the 40 ml glass VOC sample bottles. A sample was not able to be collected from well GW7 based on the pump not cycling. Therefore, field measurements were collected at the surface from an aliquot of extracted leachate rather than from within the extraction well.

LANDFILL GAS SAMPLING

The landfill gas extraction system went down on February 16, 1998 at 1315 hrs. and was not restarted prior to collecting the samples on February 18, 1998. Landfill gas samples were collected in Summa canisters from the landfill gas wells and gas probes according to methods outlined in the FSP. Probes were purged between 2 to 5 min., depending on the depth of the probe. At gas probe locations where there were more than one probe, samples were collected from the probe which indicated the highest methane readings. The landfill gas extraction system was restarted on February 19, 1998 at 1130 hrs.

H_2S samples were collected in Tedlar bags using a SKC pump to fill the bags at locations where the gas well or probe was not actively venting. At locations where the gas well or probe was actively venting the use of the SKC pump was not required.

Gas probe GP10 was resampled for H_2S due to a flat Tedlar bag upon receipt by the laboratory. Gas probe GP23I was resampled for H_2S due to the hold time being missed by the laboratory.

HEAT PULSE FLOW METER LOGGING - SHULTZ WELL

Conditions measured during the initial attempts of logging indicated there was flow occurring within the casing. The measured flow was determined to be caused by moving the logging tool through the casing to different depths. On subsequent tests the tool was maintained for approximately 5 min prior to collecting the measurement. This allowed flow created by movement of the tool to return to static conditions. (See letter and well log from Dr. Kenneth Bradbury of the Wisconsin Geologic and Natural History Survey, included as Appendix C of this report)

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B

DATA VALIDATION SUMMARY

APPENDIX B

ANALYTICAL DATA VALIDATION SUMMARY

Analytical data generated for the Refuse Hideaway Landfill Predesign and Additional Studies Work Plan has been computerized in a format organized to facilitate data review and evaluation. The results of groundwater, leachate and landfill gas sampling and analysis are organized by sample type (i.e., groundwater, leachate and landfill gas) and by volatile organic compounds (VOCs) and natural attenuation parameters. Field results are included with the VOC results, because all locations had both VOCs and field screening performed. Results for semivolatiles are included in a separate table (Table B3) due to the limited number of samples. All compounds included in the analysis are presented for each sample. Each sample has three columns: 1) concentration detected (identified by the appropriate units), 2) laboratory qualifiers and data validation qualifiers (LQ/DVQ), and 3) reported detection limit (RDL). In the case of Wisconsin analyses, the limit of detection (LOD) is reported as the RDL. RDLs have been corrected for any dilutions and for percent moisture for soils. Note that a blank in the concentration column indicates the compound was not detected.

Note that computerized analytical results have been validated, while historical data downloaded from the WDNR-Bureau of Waste Management Environmental Monitoring Database are not validated (as required by Wisconsin Administrative Code Chapter NR 507.26). The analytical data was validated as required by the approved Quality Assurance Project Plan (QAPP) for the Refuse Hideaway Landfill (October 1997).

SUMMARY OF DATA QUALIFIER DEFINITIONS

Laboratory qualified data are flagged by the performing laboratory. Data may be further qualified by Montgomery Watson personnel during the data validation process. Data qualifiers are letter or symbol codes as outlined below. If data are qualified, the qualifiers are presented with results. The laboratory qualifiers (LQ) and data validation qualifiers (DVQ) are presented with the data, separated by a "/".

Laboratory Qualifier Definitions

The following qualifiers were used by laboratories performing the various analyses. The qualifiers defined below are presented in the "LQ" column adjacent to the result. Note: all possible relevant qualifiers potentially used by the laboratory for metals, VOC, and SVOC analysis are included here as a complete reference of EPA qualifiers, whether they apply to these specific results or not.

The laboratory-provided qualifiers will include:

- Non-detects
- Concentration below required detection limit
- Estimated concentration due to poor QC data
- Concentration of chemical also found in the laboratory blank.

Laboratory Qualifiers for Organic Analysis

- U - Indicates the compound was analyzed for, but was not detected. The sample quantitation limit is corrected for dilution and, in the case of soil samples, for percent moisture.

- J - The associated numerical value is an estimated quantity, because the value was less than the limit of quantitation (LOQ). TICs are flagged as estimated (J).

- N - Indicates presumptive evidence of a compound. This flag is only used for TICs where a specific compound identification is based on a mass spectral library search.

- B - This flag is used when the compound is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

- E - This flag identifies a compound where the concentration exceeded the calibration range of the instrument for that specific analysis. If one or more compounds have a response greater than full scale, the sample or extract must be diluted and re-analyzed. If the dilution of the extract cause any compounds identified in the first analysis to be below the calibration range in the second analysis, then the results of both analyses are reported.

- D - This flag identifies a compound that was identified in an analysis at a secondary dilution factor.

- P - This flag is used for a pesticide/PCB target compound when there is greater than 25% difference for the detected concentrations between the two GC columns. The lower of the two values is reported.

- C - This flag applies to pesticide/PCB results where the identification has been confirmed by GC/MS.

- A - This flag indicates that a TIC is a suspected aldol condensation product.

- X - X, Y, and Z flags may be used by the laboratory to properly define the results. In this project, X is used to indicate results that were manually calculated (as opposed to computer generated) by the laboratory.

Laboratory Qualifiers for Inorganic Analyses

- B - This flag is applied to a value greater than or equal to the instrument detection limit (IDL or LOD), but less than the Practical Quantitation Limit (PQL or LOQ). (Note: The "B" laboratory qualifier for inorganics is used by the EPA to indicate the result is 'bracketed' by the LOD and LOQ. This laboratory qualifier does not indicate blank contamination for inorganic analyses.)

- U - Indicates analyte was analyzed for, but was not detected. The value reported is the instrument detection limit value (e.g., 10U).

- E - Indicates the value is estimated due to the presence of interference.

- S - Indicates the value was determined by the method of standard addition.

- M - Indicates duplicate injection precision for furnace analysis was not met.

- N - Indicates spike sample recovery was not within control limits.

- * - Indicates duplicate analysis was not within control limits.

- + - Indicates the correlation coefficient for method of standard addition was less than 0.995.

- W - Post-digestion spike for Furnace AA analysis was out of control limits (85-115%), while sample absorbence was less than 50% of spike absorbence.

Data Validation Qualifier Definitions

The data validation process was performed with specific project needs in mind. Data quality objectives and intended data usage, as outlined in the QAPP, were referred to. The data validation qualifiers defined below are presented with the data under the "DVQ" column.

The data validation/review qualifiers will indicate whether the data are:

- Usable as a quantitative concentration
- Usable with caution as an estimated concentration
- Unusable due to out-of-control QC results.

The following qualifiers were used by Montgomery Watson personnel in the validation of laboratory results. Field QC samples (trip blanks, field blanks, field duplicates) were also evaluated during the data validation process. Validation of organics data was performed using *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*, U.S. EPA, February 1994. Inorganics data validation was performed using *USEPA Contract Laboratory Program National Functional Guideline for Inorganic Data Review*, U.S. EPA, February 1994.

Data Validation Qualifiers for Organic Analyses

- J - The associated numerical value is an estimated quantity, because quality control criteria were not met and/or because the value was less than the CRQL. TICs are flagged as estimated (J).

- U - Indicates compound was analyzed for, but was not detected. The associated value is the sample quantitation limit. The sample quantitation limit may be elevated due to contamination detected in laboratory blanks, field blanks, or, in the case of VOCs, trip blanks.

- UJ - Indicates the compound was analyzed for, but was not detected. The associated numerical value is an estimated quantitation limit.

- R - Quality control indicates the result is not usable (compound may or may not be present).

- Q - This non-EPA qualifier was applied to volatile organic compounds detected in samples that were included in the initial and continuing calibrations, but were not part of the site specific target compound list. The compound list included in the calibration is that approved by the WDNR for the SOP included in the approved QAPP. Results for the non-target compounds are considered both qualitatively and quantitatively valid, because the compounds were included in all calibrations, and met retention time and spectral identification criteria. Due to the nature of the software used to generate the report forms, these additional compounds were not included on the report forms (Form I-VOC), but instead are listed on the tentatively identified compound (TIC) list (Form 1-VOA-TIC). A summary table of the target and non-target compound lists, LODs, and LOQs is included following this text (Table B1). Note that sample specific limits would be adjusted for any dilution and correction factors. All non-target compounds detected in the samples are presented in the Summary of Data Validation Qualified Results (Table B2).

Data Qualifiers for Inorganic Analyses

- J - The associated numerical value is an estimated quantity because quality control criteria were not met (i.e., out of control (low or high) spike recoveries, interferences in serial dilution, or poor correlation coefficients).

- R - Quality control data indicates that the value is not usable (analyte may or may not be present).

- U - Indicates analyte was analyzed for, but was not detected. The associated value is the sample quantitation limit. The sample quantitation limit may be elevated due to contamination detected in laboratory blanks or field blanks.

- UJ - The analyte was analyzed for, but was not detected. The associate numerical value is an estimated quantitation limit.

SUMMARY OF QUALIFIED DATA

Data qualified "J" (estimated) during the validation/review process is considered acceptable for use in site evaluation, and is not discussed here. A complete list of qualified analytical results is presented in the attached Summary of Data Validation Qualified Results (Table B2).

Overall data quality was acceptable for this project. No significant instrument related problems were observed. Overall instrument calibration QC was acceptable, although some VOC results were qualified "J" (estimated) due to percent difference QC exceedences. Some metals results for arsenic and cadmium were qualified "J" (estimated) due to calibration QC exceedences.

Only results qualified as "R" (unusable) are considered unacceptable for use in site evaluation. No analytical data was qualified during the review/validation processes as unusable.

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Table B-1
VOC LODs and LOQs
Refuse Hideaway Landfill
Middleton, Wisconsin

List	Compound	LOD ug/L	LOQ ug/L
TCL	Chloromethane	0.5	1.5
TCL	Bromomethane	0.7	2.3
TCL	Vinyl Chloride	0.3	1.1
TCL	Chloroethane	0.7	2.3
TCL	Methylene Chloride	0.4	1.3
TCL	Acetone	4.8	16
TCL	Carbon Disulfide	0.4	1.3
TCL	1,1-Dichloroethene	0.1	0.3
TCL	1,1-Dichloroethane	0.2	0.5
TCL	Cis-1,2-Dichloroethene	0.2	0.7
TCL	Trans-1,2-Dichloroethene	0.2	0.7
TCL	Chloroform	0.2	0.5
TCL	1,2-Dichloroethane	0.2	0.6
TCL	2-Butanone	3.3	11
TCL	1,1,1-Trichloroethane	1.0	3.1
TCL	Carbon Tetrachloride	0.2	0.5
TCL	Bromodichloromethane	0.2	0.7
TCL	1,2-Dichloropropane	0.1	0.4
TCL	cis-1,3-Dichloropropene	0.1	0.3
TCL	Trichloroethene	0.2	0.6
TCL	Dibromochloromethane	0.2	0.7
TCL	1,1,2-Trichloroethane	0.3	0.8
TCL	Benzene	0.1	0.3
TCL	trans-1,3-Dichloropropene	0.2	0.5
TCL	Bromoform	0.2	0.5
TCL	4-Methyl-2-pentanone	1.8	6.1
TCL	2-Hexanone	2.4	7.9
TCL	Tetrachloroethene	0.2	0.5
TCL	1,1,2,2-Tetrachloroethane	0.2	0.7
TCL	Toluene	0.2	0.7
TCL	Chlorobenzene	0.1	0.3
TCL	Ethylbenzene	0.1	0.4
TCL	Styrene	0.1	0.4
TCL	Xylene, total	0.3	0.9
non-target	Dichlorodifluoromethane	0.4	1.2
non-target	Trichlorofluoromethane **	0.6	2.1
non-target	Methyl Tert Butyl Ether **	0.3	0.9
non-target	Di isopropyl ether **	0.2	0.7
non-target	2,2-Dichloropropane	0.2	0.7
non-target	Bromochloromethane	0.3	0.8
non-target	Tetrahydrofuran **	2.4	7.8
non-target	1,1-Dichloropropene	0.2	0.6
non-target	Dibromomethane	0.2	0.7
non-target	2-Chloroethyl vinyl ether	0.1	0.4
non-target	1,3-Dichloropropane	0.1	0.4
non-target	1,2-Dibromoethane	0.2	0.6

Table B-1
VOC LODs and LOQs
Refuse Hideaway Landfill
Middleton, Wisconsin

List	Compound		LOD ug/L	LOQ ug/L
non-target	1,1,1,2-Tetrachloroethane		0.2	0.7
non-target	Isopropylbenzene	**	0.1	0.4
non-target	Bromobenzene	**	0.2	0.5
non-target	1,2,3-Trichloropropane		0.3	1.0
non-target	N-Propylbenzene	**	0.1	0.4
non-target	2-Chlorotoluene		0.1	0.4
non-target	1,3,5-Trimethylbenzene	**	0.1	0.3
non-target	4-Chlorotoluene		0.1	0.4
non-target	s-Butylbenzene		0.2	0.5
non-target	1,2,4-Trimethylbenzene	**	0.2	0.5
non-target	t-Butylbenzene		0.1	0.3
non-target	1,3-Dichlorobenzene	**	0.1	0.4
non-target	p-Isopropyltoluene	**	0.1	0.4
non-target	1,4-Dichlorobenzene	**	0.1	0.3
non-target	1,2-Dichlorobenzene	**	0.1	0.4
non-target	N-Butylbenzene	**	0.2	0.5
non-target	1,2-Dibromo-3-chloropropane		0.3	0.9
non-target	1,2,4-Trichlorobenzene	**	0.2	0.6
non-target	Hexachlorobutadiene	**	0.2	0.5
non-target	Naphthalene	**	0.1	0.4
non-target	1,2,3-Trichlorobenzene	**	0.2	0.5
total only	Xylene, m+p-		0.2	0.6
total only	Xylene, o-		0.1	0.3

This table presents a summary of volatile organic compounds (VOCs) included in the analysis of samples from the Refuse Hideaway Landfill. The QAPP required the analysis of the 'CLP' list parameters, and the laboratory included the non-target compounds, which are part of the approved WDNR method.

** = Detected in at least one of the samples.

Table B-2
Summary of Data Validation Qualified Results
Refuse Hideaway Landfill
Middleton, Wisconsin

SDG	Labno	Date	Sample	Test	Parameter	UNIT	DVQ	LQ	CONC	RDL	LOD	LOQ	Comment
2	187460	2/18/98	RH-LHGW04-01	VOCT	p-Isopropyltoluene	ug/L	Q		0.2				Non-target cmpd, quant. by std cal.
2	187461	2/18/98	RH-LHGW05-01	VOCT	p-Isopropyltoluene	ug/L	Q		2.3				Non-target cmpd, quant. by std cal.
2	187455	2/18/98	RH-LHGW08-01	VOCT	p-Isopropyltoluene	ug/L	Q		1.4				Non-target cmpd, quant. by std cal.
2	187456	2/18/98	RH-LHGW09-01	VOCT	p-Isopropyltoluene	ug/L	Q		3.6				Non-target cmpd, quant. by std cal.
2	187457	2/18/98	RH-LHGW11-01	VOCT	p-Isopropyltoluene	ug/L	Q		7				Non-target cmpd, quant. by std cal.
2	187458	2/18/98	RH-LHGW12-01	VOCT	p-Isopropyltoluene	ug/L	Q		3				Non-target cmpd, quant. by std cal.
2	187459	2/18/98	RH-LHGW13-01	VOCT	p-Isopropyltoluene	ug/L	Q		1.5				Non-target cmpd, quant. by std cal.
2	187462	2/18/98	RH-LHGW13-91	VOCT	p-Isopropyltoluene	ug/L	Q		1.4				Non-target cmpd, quant. by std cal.
1	186866	2/12/98	RH-GWP21D-01	VOCT	Tetrahydrofuran	ug/L	Q		41				Non-target cmpd, quant. by std cal.
2	187240	2/17/98	RH-GWP25D-01	VOCT	Tetrahydrofuran	ug/L	Q		4.5				Non-target cmpd, quant. by std cal.
2	187241	2/17/98	RH-GWP25D-91	VOCT	Tetrahydrofuran	ug/L	Q		4				Non-target cmpd, quant. by std cal.
2	187122	2/13/98	RH-GWP9D-01	VOCT	Tetrahydrofuran	ug/L	Q		35				Non-target cmpd, quant. by std cal.
2	187460	2/18/98	RH-LHGW04-01	VOCT	Tetrahydrofuran	ug/L	Q		1300				Non-target cmpd, quant. by std cal.
2	187461	2/18/98	RH-LHGW05-01	VOCT	Tetrahydrofuran	ug/L	Q		730				Non-target cmpd, quant. by std cal.
2	187455	2/18/98	RH-LHGW08-01	VOCT	Tetrahydrofuran	ug/L	Q		1270				Non-target cmpd, quant. by std cal.
2	187456	2/18/98	RH-LHGW09-01	VOCT	Tetrahydrofuran	ug/L	Q		150				Non-target cmpd, quant. by std cal.
2	187457	2/18/98	RH-LHGW11-01	VOCT	Tetrahydrofuran	ug/L	Q		290				Non-target cmpd, quant. by std cal.
2	187458	2/18/98	RH-LHGW12-01	VOCT	Tetrahydrofuran	ug/L	Q		450				Non-target cmpd, quant. by std cal.
2	187459	2/18/98	RH-LHGW13-01	VOCT	Tetrahydrofuran	ug/L	Q		790				Non-target cmpd, quant. by std cal.
2	187462	2/18/98	RH-LHGW13-91	VOCT	Tetrahydrofuran	ug/L	Q		614				Non-target cmpd, quant. by std cal.
2	187465	2/18/98	RH-LHGWP16D-01	VOCT	Tetrahydrofuran	ug/L	Q		21				Non-target cmpd, quant. by std cal.
6	188787	3/2/98	RH-GWP26D-01	VOCT	Trichlorofluoromethane	ug/L	Q		7.1				Non-target cmpd, quant. by std cal.
2	187122	2/13/98	RH-GWP9D-01	VOCT	(E)-2-Nonenal	ug/L	JN		6.9				Est. conc., tentative ID. (TIC)
2	187461	2/18/98	RH-LHGW05-01	VOCT	1,2,3-Trimethylbenzene	ug/L	JN		3.3				Est. conc., tentative ID. (TIC)
2	187458	2/18/98	RH-LHGW12-01	VOCT	1,2,3-Trimethylbenzene	ug/L	JN		3				Est. conc., tentative ID. (TIC)
2	187460	2/18/98	RH-LHGW04-01	VOCT	1,3,3-t-Bicyclo[2.2.1]hep	ug/L	JN		5.6				Est. conc., tentative ID. (TIC)
2	187458	2/18/98	RH-LHGW12-01	VOCT	1,3,3-t-Bicyclo[2.2.1]hep	ug/L	JN		13				Est. conc., tentative ID. (TIC)
2	187460	2/18/98	RH-LHGW04-01	VOCT	1,3-Oxathiolane	ug/L	JN		12				Est. conc., tentative ID. (TIC)
2	187455	2/18/98	RH-LHGW08-01	VOCT	1,3-Oxathiolane	ug/L	JN		18				Est. conc., tentative ID. (TIC)
2	187458	2/18/98	RH-LHGW12-01	VOCT	1,3-Oxathiolane	ug/L	JN		6.6				Est. conc., tentative ID. (TIC)
2	187459	2/18/98	RH-LHGW13-01	VOCT	1,3-Oxathiolane	ug/L	JN		4.1				Est. conc., tentative ID. (TIC)
2	187462	2/18/98	RH-LHGW13-91	VOCT	1,3-Oxathiolane	ug/L	JN		3.1				Est. conc., tentative ID. (TIC)
2	187460	2/18/98	RH-LHGW04-01	VOCT	1,4-Dioxane	ug/L	JN		3.4				Est. conc., tentative ID. (TIC)
2	187459	2/18/98	RH-LHGW13-01	VOCT	1,4-Dioxane	ug/L	JN		3				Est. conc., tentative ID. (TIC)
2	187462	2/18/98	RH-LHGW13-91	VOCT	1,4-Dioxane	ug/L	JN		3				Est. conc., tentative ID. (TIC)
2	187460	2/18/98	RH-LHGW04-01	VOCT	1,7,7-t-Bicyclo[2.2.1]hep	ug/L	JN		4.2				Est. conc., tentative ID. (TIC)
2	187458	2/18/98	RH-LHGW12-01	VOCT	1,7,7-t-Bicyclo[2.2.1]hep	ug/L	JN		27				Est. conc., tentative ID. (TIC)
2	187459	2/18/98	RH-LHGW13-01	VOCT	1,7,7-t-Bicyclo[2.2.1]hep	ug/L	JN		11				Est. conc., tentative ID. (TIC)
2	187461	2/18/98	RH-LHGW05-01	VOCT	1-Ethyl-2-methylbenzene	ug/L	JN		4.1				Est. conc., tentative ID. (TIC)
2	187460	2/18/98	RH-LHGW04-01	VOCT	2,4-Dimethyl-3-pentanone	ug/L	JN		15				Est. conc., tentative ID. (TIC)
2	187461	2/18/98	RH-LHGW05-01	VOCT	2,4-Dimethyl-3-pentanone	ug/L	JN		27				Est. conc., tentative ID. (TIC)
2	187455	2/18/98	RH-LHGW08-01	VOCT	2,4-Dimethyl-3-pentanone	ug/L	JN		43				Est. conc., tentative ID. (TIC)
2	187456	2/18/98	RH-LHGW09-01	VOCT	2,4-Dimethyl-3-pentanone	ug/L	JN		34				Est. conc., tentative ID. (TIC)
2	187457	2/18/98	RH-LHGW11-01	VOCT	2,4-Dimethyl-3-pentanone	ug/L	JN		30				Est. conc., tentative ID. (TIC)
2	187458	2/18/98	RH-LHGW12-01	VOCT	2,4-Dimethyl-3-pentanone	ug/L	JN		23				Est. conc., tentative ID. (TIC)
2	187459	2/18/98	RH-LHGW13-01	VOCT	2,4-Dimethyl-3-pentanone	ug/L	JN		26				Est. conc., tentative ID. (TIC)
2	187462	2/18/98	RH-LHGW13-91	VOCT	2,4-Dimethyl-3-pentanone	ug/L	JN		22				Est. conc., tentative ID. (TIC)
2	187460	2/18/98	RH-LHGW04-01	VOCT	2-Butenylbenzene	ug/L	JN		4.7				Est. conc., tentative ID. (TIC)
2	187458	2/18/98	RH-LHGW12-01	VOCT	2-Methyl-5-(1-methylcyclo	ug/L	JN		3				Est. conc., tentative ID. (TIC)

Table B-2
Summary of Data Validation Qualified Results
Refuse Hideaway Landfill
Middleton, Wisconsin

SDG	Labno	Date	Sample	Test	Parameter	UNIT	DVQ	LQ	CONC	RDL	LOD	LOQ	Comment
2	187456	2/18/98	RH-LHGW09-01	VOCT	2-Pentanone	ug/L	JN		18				Est. conc., tentative ID. (TIC)
2	187457	2/18/98	RH-LHGW11-01	VOCT	2-Pentanone	ug/L	JN		82				Est. conc., tentative ID. (TIC)
2	187122	2/13/98	RH-GWP9D-01	VOCT	2-Pentyl-thiophene	ug/L	JN		3.1				Est. conc., tentative ID. (TIC)
2	187458	2/18/98	RH-LHGW12-01	VOCT	3,7,7-t-Bicyclo[4.2.0]hep	ug/L	JN		6.3				Est. conc., tentative ID. (TIC)
2	187459	2/18/98	RH-LHGW13-01	VOCT	3,7,7-t-Bicyclo[4.2.0]hep	ug/L	JN		2.8				Est. conc., tentative ID. (TIC)
2	187461	2/18/98	RH-LHGW05-01	VOCT	3-methylbutanal	ug/L	JN		5.6				Est. conc., tentative ID. (TIC)
2	187458	2/18/98	RH-LHGW12-01	VOCT	3-Methylbutanal	ug/L	JN		4.5				Est. conc., tentative ID. (TIC)
2	187457	2/18/98	RH-LHGW11-01	VOCT	Acetic Acid	ug/L	JN		98				Est. conc., tentative ID. (TIC)
2	187468	2/18/98	TRIP BLANK (05)	VOCT	Acetic Acid	ug/L	JN		1.4				Est. conc., tentative ID. (TIC)
1	186868	2/12/98	RH-GWFB01-01	VOCT	Acetonitrile	ug/L	JN		6.1				Est. conc., tentative ID. (TIC)
6	188788	3/2/98	RH-GWFB04-01	VOCT	Acetonitrile	ug/L	JN		4.7				Est. conc., tentative ID. (TIC)
6	188791	3/3/98	RH-GWFB05-01	VOCT	Acetonitrile	ug/L	JN		3.2				Est. conc., tentative ID. (TIC)
1	186889	2/11/98	RH-GWP08BR-01	VOCT	Acetonitrile	ug/L	JN		3				Est. conc., tentative ID. (TIC)
1	186888	2/11/98	RH-GWP08D-01	VOCT	Acetonitrile	ug/L	JN		5.9				Est. conc., tentative ID. (TIC)
1	186882	2/11/98	RH-GWP1D-01	VOCT	Acetonitrile	ug/L	JN		1.1				Est. conc., tentative ID. (TIC)
1	186883	2/11/98	RH-GWP1D-91	VOCT	Acetonitrile	ug/L	JN		1.8				Est. conc., tentative ID. (TIC)
1	186867	2/12/98	RH-GWP21BR-01	VOCT	Acetonitrile	ug/L	JN		2.3				Est. conc., tentative ID. (TIC)
1	186874	2/10/98	RH-GWP23S-91	VOCT	Acetonitrile	ug/L	JN	B	3.9				Est. conc., tentative ID. (TIC)
1	186877	2/10/98	RH-GWP32D-01	VOCT	Acetonitrile	ug/L	JN	B	1.3				Est. conc., tentative ID. (TIC)
1	186878	2/10/98	RH-GWP33D-01	VOCT	Acetonitrile	ug/L	JN	B	1.9				Est. conc., tentative ID. (TIC)
1	186887	2/11/98	RH-GWP36D-01	VOCT	Acetonitrile	ug/L	JN		2.9				Est. conc., tentative ID. (TIC)
6	188335	2/25/98	RH-GWTB11-01	VOCT	Acetonitrile	ug/L	JN		1.6				Est. conc., tentative ID. (TIC)
1	186884	2/11/98	RH-GWP03S-01	VOCT	Benzene ethanamine	ug/L	JN		3.1				Est. conc., tentative ID. (TIC)
2	187461	2/18/98	RH-LHGW05-01	VOCT	bicyclo[2.2.1]heptan-2-on	ug/L	JN		18				Est. conc., tentative ID. (TIC)
2	187461	2/18/98	RH-LHGW05-01	VOCT	bicyclo[2.2.1]heptan-2-on	ug/L	JN		28				Est. conc., tentative ID. (TIC)
2	187455	2/18/98	RH-LHGW08-01	VOCT	bicyclo[2.2.1]heptan-2-on	ug/L	JN		24				Est. conc., tentative ID. (TIC)
2	187455	2/18/98	RH-LHGW08-01	VOCT	bicyclo[2.2.1]heptan-2-on	ug/L	JN		37				Est. conc., tentative ID. (TIC)
2	187456	2/18/98	RH-LHGW09-01	VOCT	bicyclo[2.2.1]heptan-2-on	ug/L	JN		21				Est. conc., tentative ID. (TIC)
2	187456	2/18/98	RH-LHGW09-01	VOCT	bicyclo[2.2.1]heptan-2-on	ug/L	JN		35				Est. conc., tentative ID. (TIC)
2	187457	2/18/98	RH-LHGW11-01	VOCT	bicyclo[2.2.1]heptan-2-on	ug/L	JN		42				Est. conc., tentative ID. (TIC)
2	187457	2/18/98	RH-LHGW11-01	VOCT	bicyclo[2.2.1]heptan-2-on	ug/L	JN		52				Est. conc., tentative ID. (TIC)
2	187462	2/18/98	RH-LHGW13-91	VOCT	bicyclo[2.2.1]heptan-2-on	ug/L	JN		10.8				Est. conc., tentative ID. (TIC)
2	187462	2/18/98	RH-LHGW13-91	VOCT	bicyclo[2.2.1]heptan-2-on	ug/L	JN		8.8				Est. conc., tentative ID. (TIC)
1	186866	2/12/98	RH-GWP21D-01	VOCT	Ether	ug/L	JN		34				Est. conc., tentative ID. (TIC)
2	187122	2/13/98	RH-GWP9D-01	VOCT	Heptanal	ug/L	JN		12				Est. conc., tentative ID. (TIC)
1	186879	2/10/98	RH-GWP01S-01	VOCT	Hexane	ug/L	JN		1.6				Est. conc., tentative ID. (TIC)
1	186884	2/11/98	RH-GWP03S-01	VOCT	Hexane	ug/L	JN		1.1				Est. conc., tentative ID. (TIC)
1	186885	2/11/98	RH-GWP04S-01	VOCT	Hexane	ug/L	JN		2.2				Est. conc., tentative ID. (TIC)
1	186877	2/10/98	RH-GWP32D-01	VOCT	Hexane	ug/L	JN		1				Est. conc., tentative ID. (TIC)
1	186870	2/13/98	RH-GWP32S-01	VOCT	Hexane	ug/L	JN		1.2				Est. conc., tentative ID. (TIC)
1	186878	2/10/98	RH-GWP33D-01	VOCT	Hexane	ug/L	JN		2.4				Est. conc., tentative ID. (TIC)
1	186871	2/10/98	RH-GWTB01-01	VOCT	Hexane	ug/L	JN		2.3				Est. conc., tentative ID. (TIC)
3	188047	2/23/98	RH-GWTBO9-01	VOCT	Hexane	ug/L	JN		1.6				Est. conc., tentative ID. (TIC)
2	187243	2/17/98	TRIP BLANK (04)	VOCT	Hexane	ug/L	JN		2.3				Est. conc., tentative ID. (TIC)
2	187460	2/18/98	RH-LHGW04-01	VOCT	Indane	ug/L	JN		2.8				Est. conc., tentative ID. (TIC)
6	188786	3/2/98	RH-GWP26S-01	VOCT	Nonanal	ug/L	JN		5.9				Est. conc., tentative ID. (TIC)
1	186884	2/11/98	RH-GWP03S-01	VOCT	Octa cyclotetrasiloxane	ug/L	JN		1.1				Est. conc., tentative ID. (TIC)
1	186885	2/11/98	RH-GWP04S-01	VOCT	Octa cyclotetrasiloxane	ug/L	JN		1.1				Est. conc., tentative ID. (TIC)
1	186874	2/10/98	RH-GWP23S-91	VOCT	Octa cyclotetrasiloxane	ug/L	JN		1.2				Est. conc., tentative ID. (TIC)

Table B-2
Summary of Data Validation Qualified Results
Refuse Hideaway Landfill
Middleton, Wisconsin

SDG	Labno	Date	Sample	Test	Parameter	UNIT	DVQ	LQ	CONC	RDL	LOD	LOQ	Comment
3	187861	2/23/98	RH-GWP27S-01	VOCT	Octa cyclotetrasiloxane	ug/L	JN		2.6				Est. conc., tentative ID. (TIC)
2	187122	2/13/98	RH-GWP9D-01	VOCT	Pentanal	ug/L	JN		6				Est. conc., tentative ID. (TIC)
2	187460	2/18/98	RH-LHGW04-01	VOCT	Trimethylsilanol	ug/L	JN		23				Est. conc., tentative ID. (TIC)
2	187461	2/18/98	RH-LHGW05-01	VOCT	Trimethylsilanol	ug/L	JN		25				Est. conc., tentative ID. (TIC)
2	187458	2/18/98	RH-LHGW12-01	VOCT	Trimethylsilanol	ug/L	JN		13				Est. conc., tentative ID. (TIC)
2	187459	2/18/98	RH-LHGW13-01	VOCT	Trimethylsilanol	ug/L	JN		25				Est. conc., tentative ID. (TIC)
2	187462	2/18/98	RH-LHGW13-91	VOCT	Trimethylsilanol	ug/L	JN		18				Est. conc., tentative ID. (TIC)
2	187122	2/13/98	RH-GWP9D-01	VOCT	Undecane	ug/L	JN		2.2				Est. conc., tentative ID. (TIC)
2	187466	2/18/98	RH-LHGWP16S-01	IND	Volatile Fatty Acids	mg/L	J		17	3	NA	NA	Lab Duplicate QC exceeded
2	187467	2/18/98	RH-LHGWP16S-91	IND	Volatile Fatty Acids	mg/L	UJ	U		3	NA	NA	Lab Duplicate QC exceeded
6	188339	2/26/98	RH-GWFB03-01	MTL	Arsenic	ug/L	UJ	US		1	1	3	ICV/CCV criteria exceeded
6	188336	2/26/98	RH-GWP29S-01	MTL	Arsenic	ug/L	UJ	US		1	1	3	ICV/CCV criteria exceeded
6	188337	2/26/98	RH-GWP29S-91	MTL	Arsenic	ug/L	UJ	US		1	1	3	ICV/CCV criteria exceeded
6	188339	2/26/98	RH-GWFB03-01	MTL	Cadmium	ug/L	UJ	U		0.1	0.10	0.33	ICV/CCV criteria exceeded
6	188337	2/26/98	RH-GWP29S-91	MTL	Cadmium	ug/L	UJ	U		0.1	0.10	0.33	ICV/CCV criteria exceeded
6	188336	2/26/98	RH-GWP29S-01	MTL	Manganese	ug/L	U			0.3	0.3	1.0	Detected in associated blank
6	188336	2/26/98	RH-GWP29S-01	SVOC	bis(2-Ethylhexyl)phthalate	ug/L	J		32	1.3	1.3	4.1	Field Dup QC criteria exceeded
6	188337	2/26/98	RH-GWP29S-91	SVOC	bis(2-Ethylhexyl)phthalate	ug/L	J		19	1.3	1.2	3.8	Field Dup QC criteria exceeded

This table presents a summary of analytical results from the February 1998 sampling event at the Refuse Hideaway Landfill Site that were qualified during the data validation process.

SDG = Sample Delivery Group
DVQ = Data Validation Qualifier
- U = Undetected
- J = Estimated
- UJ = Undetected RDL estimated
- N = tentative identification (tentatively identified compound from library search)
- Q = Quantified by standard calibration procedure. This flag is used for compounds included in the initial and continuing calibration, but not presented in the QAPP target compound list. These results are qualified as usable, and are not estimated.

LQ = Laboratory Qualifier
- U = Undetected
- J = Estimated
- S = Method of Standard Additions
- B = Also detected in associated blank

RDL = Reported Detection Limit. Note the RDL may be adjusted when the sample result is less than 5x or 10x the associated blank concentrations.
LOD = Limit of detection
LOQ = Limit of Quantitation

Table 3.3

Summary of Landfill Gas Sampling Field Parameters
Refuse Hideaway Landfill
Middleton, Wisconsin

Sample Location	Pressure (inches Hg)	Methane (%)
GW1	0.9	34.3
GW2	1.4	48.1
GW3	2.0	59.9
GW4	2.4	58.5
GW5	8.5 to 9.6	57.8
GW6	2.4	59.5
GW7	2.3	61.6
GW8	2.4	59.5
GW9	2.4	62.1
GW10	1.8	59.7
GW11	2.5	63.7
GW12	2.3	60.9
GW13	2.3	60.8
G1S	0.0	0.0
G2D	0.0	1.7
G3D	0.0	0.0
G4	0.0	0.0
G5	2.4	0.0
G17D	0.0	0.0
GP4	0.0	0.0
GP10	0.2	0.1
GP12D	0.0	35.3
GP20I2	0.0	0.2
GP23I2	0.0	3.4

Notes:
Field data collected on February 18 and 19, 1998 during landfill gas sampling.

Table B-2
Summary of Data Validation Qualified Results
Refuse Hideaway Landfill
Middleton, Wisconsin

SDG	Labno	Date	Sample	Test	Parameter	UNIT	DVQ	LQ	CONC	RDL	LOD	LOQ	Comment
1	186868	2/12/98	RH-GWFB01-01	VOC	2-Butanone	ug/L	UJ	U		3.3	3.3	11	ICV/CCV criteria exceeded
1	186879	2/10/98	RH-GWP01S-01	VOC	2-Butanone	ug/L	UJ	U		3.3	3.3	11	ICV/CCV criteria exceeded
1	186884	2/11/98	RH-GWP03S-01	VOC	2-Butanone	ug/L	UJ	U		3.3	3.3	11	ICV/CCV criteria exceeded
1	186885	2/11/98	RH-GWP04S-01	VOC	2-Butanone	ug/L	UJ	U		3.3	3.3	11	ICV/CCV criteria exceeded
1	186889	2/11/98	RH-GWP08BR-01	VOC	2-Butanone	ug/L	UJ	U		3.3	3.3	11	ICV/CCV criteria exceeded
1	186888	2/11/98	RH-GWP08D-01	VOC	2-Butanone	ug/L	UJ	U		3.3	3.3	11	ICV/CCV criteria exceeded
1	186882	2/11/98	RH-GWP1D-01	VOC	2-Butanone	ug/L	UJ	U		3.3	3.3	11	ICV/CCV criteria exceeded
1	186883	2/11/98	RH-GWP1D-91	VOC	2-Butanone	ug/L	UJ	U		3.3	3.3	11	ICV/CCV criteria exceeded
1	186876	2/10/98	RH-GWP20SR-01	VOC	2-Butanone	ug/L	UJ	U		3.3	3.3	11	ICV/CCV criteria exceeded
1	186867	2/12/98	RH-GWP21BR-01	VOC	2-Butanone	ug/L	UJ	U		3.3	3.3	11	ICV/CCV criteria exceeded
1	186866	2/12/98	RH-GWP21D-01	VOC	2-Butanone	ug/L	UJ	U		3.3	3.3	11	ICV/CCV criteria exceeded
1	186875	2/10/98	RH-GWP23D-01	VOC	2-Butanone	ug/L	UJ	U		3.3	3.3	11	ICV/CCV criteria exceeded
1	186873	2/10/98	RH-GWP23S-01	VOC	2-Butanone	ug/L	UJ	U		3.3	3.3	11	ICV/CCV criteria exceeded
1	186874	2/10/98	RH-GWP23S-91	VOC	2-Butanone	ug/L	UJ	U		3.3	3.3	11	ICV/CCV criteria exceeded
1	186877	2/10/98	RH-GWP32D-01	VOC	2-Butanone	ug/L	UJ	U		3.3	3.3	11	ICV/CCV criteria exceeded
1	186870	2/13/98	RH-GWP32S-01	VOC	2-Butanone	ug/L	UJ	U		3.3	3.3	11	ICV/CCV criteria exceeded
1	186878	2/10/98	RH-GWP33D-01	VOC	2-Butanone	ug/L	UJ	U		3.3	3.3	11	ICV/CCV criteria exceeded
1	186872	2/10/98	RH-GWP33S-01	VOC	2-Butanone	ug/L	UJ	U		3.3	3.3	11	ICV/CCV criteria exceeded
1	186887	2/11/98	RH-GWP36D-01	VOC	2-Butanone	ug/L	UJ	U		3.3	3.3	11	ICV/CCV criteria exceeded
1	186886	2/11/98	RH-GWP36S-01	VOC	2-Butanone	ug/L	UJ	U		3.3	3.3	11	ICV/CCV criteria exceeded
1	186871	2/10/98	RH-GWTB01-01	VOC	2-Butanone	ug/L	UJ	U		3.3	3.3	11	ICV/CCV criteria exceeded
1	186869	2/12/98	TRIP BLANK 02	VOC	2-Butanone	ug/L	UJ	U		3.3	3.3	11	ICV/CCV criteria exceeded
2	187122	2/13/98	RH-GWP9D-01	VOC	2-Butanone	ug/L	J		1.2	3.3	3.3	11	ICV/CCV criteria exceeded
2	187456	2/18/98	RH-LHGW09-01	VOC	2-Butanone	ug/L	J		220	3.3	3.3	11	ICV/CCV criteria exceeded
2	187457	2/18/98	RH-LHGW11-01	VOC	2-Butanone	ug/L	J		780	3.3	3.3	11	ICV/CCV criteria exceeded
2	187458	2/18/98	RH-LHGW12-01	VOC	2-Butanone	ug/L	J		3.9	3.3	3.3	11	ICV/CCV criteria exceeded
1	186868	2/12/98	RH-GWFB01-01	VOC	4-Methyl-2-pentanone	ug/L	UJ	U		1.8	1.8	6.1	ICV/CCV criteria exceeded
1	186879	2/10/98	RH-GWP01S-01	VOC	4-Methyl-2-pentanone	ug/L	UJ	U		1.8	1.8	6.1	ICV/CCV criteria exceeded
1	186884	2/11/98	RH-GWP03S-01	VOC	4-Methyl-2-pentanone	ug/L	UJ	U		1.8	1.8	6.1	ICV/CCV criteria exceeded
1	186885	2/11/98	RH-GWP04S-01	VOC	4-Methyl-2-pentanone	ug/L	UJ	U		1.8	1.8	6.1	ICV/CCV criteria exceeded
1	186889	2/11/98	RH-GWP08BR-01	VOC	4-Methyl-2-pentanone	ug/L	UJ	U		1.8	1.8	6.1	ICV/CCV criteria exceeded
1	186888	2/11/98	RH-GWP08D-01	VOC	4-Methyl-2-pentanone	ug/L	UJ	U		1.8	1.8	6.1	ICV/CCV criteria exceeded
1	186882	2/11/98	RH-GWP1D-01	VOC	4-Methyl-2-pentanone	ug/L	UJ	U		1.8	1.8	6.1	ICV/CCV criteria exceeded
1	186883	2/11/98	RH-GWP1D-91	VOC	4-Methyl-2-pentanone	ug/L	UJ	U		1.8	1.8	6.1	ICV/CCV criteria exceeded
1	186876	2/10/98	RH-GWP20SR-01	VOC	4-Methyl-2-pentanone	ug/L	UJ	U		1.8	1.8	6.1	ICV/CCV criteria exceeded
1	186867	2/12/98	RH-GWP21BR-01	VOC	4-Methyl-2-pentanone	ug/L	UJ	U		1.8	1.8	6.1	ICV/CCV criteria exceeded
1	186866	2/12/98	RH-GWP21D-01	VOC	4-Methyl-2-pentanone	ug/L	UJ	U		1.8	1.8	6.1	ICV/CCV criteria exceeded
1	186875	2/10/98	RH-GWP23D-01	VOC	4-Methyl-2-pentanone	ug/L	UJ	U		1.8	1.8	6.1	ICV/CCV criteria exceeded
1	186873	2/10/98	RH-GWP23S-01	VOC	4-Methyl-2-pentanone	ug/L	UJ	U		1.8	1.8	6.1	ICV/CCV criteria exceeded
1	186874	2/10/98	RH-GWP23S-91	VOC	4-Methyl-2-pentanone	ug/L	UJ	U		1.8	1.8	6.1	ICV/CCV criteria exceeded
1	186877	2/10/98	RH-GWP32D-01	VOC	4-Methyl-2-pentanone	ug/L	UJ	U		1.8	1.8	6.1	ICV/CCV criteria exceeded
1	186870	2/13/98	RH-GWP32S-01	VOC	4-Methyl-2-pentanone	ug/L	UJ	U		1.8	1.8	6.1	ICV/CCV criteria exceeded
1	186878	2/10/98	RH-GWP33D-01	VOC	4-Methyl-2-pentanone	ug/L	UJ	U		1.8	1.8	6.1	ICV/CCV criteria exceeded
1	186872	2/10/98	RH-GWP33S-01	VOC	4-Methyl-2-pentanone	ug/L	UJ	U		1.8	1.8	6.1	ICV/CCV criteria exceeded
1	186887	2/11/98	RH-GWP36D-01	VOC	4-Methyl-2-pentanone	ug/L	UJ	U		1.8	1.8	6.1	ICV/CCV criteria exceeded
1	186886	2/11/98	RH-GWP36S-01	VOC	4-Methyl-2-pentanone	ug/L	UJ	U		1.8	1.8	6.1	ICV/CCV criteria exceeded
1	186871	2/10/98	RH-GWTB01-01	VOC	4-Methyl-2-pentanone	ug/L	UJ	U		1.8	1.8	6.1	ICV/CCV criteria exceeded
1	186869	2/12/98	TRIP BLANK 02	VOC	4-Methyl-2-pentanone	ug/L	UJ	U		1.8	1.8	6.1	ICV/CCV criteria exceeded

Table B-2
Summary of Data Validation Qualified Results
Refuse Hideaway Landfill
Middleton, Wisconsin

SDG	Labno	Date	Sample	Test	Parameter	UNIT	DVQ	LQ	CONC	RDL	LOD	LOQ	Comment
1	186868	2/12/98	RH-GWFB01-01	VOC	Acetone	ug/L	UJ	U		4.8	4.8	16	ICV/CCV criteria exceeded
1	186879	2/10/98	RH-GWP01S-01	VOC	Acetone	ug/L	UJ	U		4.8	4.8	16	ICV/CCV criteria exceeded
1	186884	2/11/98	RH-GWP03S-01	VOC	Acetone	ug/L	UJ	U		4.8	4.8	16	ICV/CCV criteria exceeded
1	186885	2/11/98	RH-GWP04S-01	VOC	Acetone	ug/L	UJ	U		4.8	4.8	16	ICV/CCV criteria exceeded
1	186889	2/11/98	RH-GWP08BR-01	VOC	Acetone	ug/L	UJ	U		4.8	4.8	16	ICV/CCV criteria exceeded
1	186888	2/11/98	RH-GWP08D-01	VOC	Acetone	ug/L	UJ	U		4.8	4.8	16	ICV/CCV criteria exceeded
1	186882	2/11/98	RH-GWP1D-01	VOC	Acetone	ug/L	UJ	U		4.8	4.8	16	ICV/CCV criteria exceeded
1	186883	2/11/98	RH-GWP1D-91	VOC	Acetone	ug/L	UJ	U		4.8	4.8	16	ICV/CCV criteria exceeded
1	186876	2/10/98	RH-GWP20SR-01	VOC	Acetone	ug/L	UJ	U		4.8	4.8	16	ICV/CCV criteria exceeded
1	186867	2/12/98	RH-GWP21BR-01	VOC	Acetone	ug/L	UJ	U		4.8	4.8	16	ICV/CCV criteria exceeded
1	186866	2/12/98	RH-GWP21D-01	VOC	Acetone	ug/L	UJ	U		4.8	4.8	16	ICV/CCV criteria exceeded
1	186875	2/10/98	RH-GWP23D-01	VOC	Acetone	ug/L	UJ	U		4.8	4.8	16	ICV/CCV criteria exceeded
1	186873	2/10/98	RH-GWP23S-01	VOC	Acetone	ug/L	UJ	U		4.8	4.8	16	ICV/CCV criteria exceeded
1	186874	2/10/98	RH-GWP23S-91	VOC	Acetone	ug/L	UJ	U		4.8	4.8	16	ICV/CCV criteria exceeded
1	186877	2/10/98	RH-GWP32D-01	VOC	Acetone	ug/L	UJ	U		4.8	4.8	16	ICV/CCV criteria exceeded
1	186870	2/13/98	RH-GWP32S-01	VOC	Acetone	ug/L	UJ	U		4.8	4.8	16	ICV/CCV criteria exceeded
1	186878	2/10/98	RH-GWP33D-01	VOC	Acetone	ug/L	UJ	U		4.8	4.8	16	ICV/CCV criteria exceeded
1	186872	2/10/98	RH-GWP33S-01	VOC	Acetone	ug/L	UJ	U		4.8	4.8	16	ICV/CCV criteria exceeded
1	186887	2/11/98	RH-GWP36D-01	VOC	Acetone	ug/L	UJ	U		4.8	4.8	16	ICV/CCV criteria exceeded
1	186886	2/11/98	RH-GWP36S-01	VOC	Acetone	ug/L	UJ	U		4.8	4.8	16	ICV/CCV criteria exceeded
1	186871	2/10/98	RH-GWTB01-01	VOC	Acetone	ug/L	UJ	U		4.8	4.8	16	ICV/CCV criteria exceeded
1	186869	2/12/98	TRIP BLANK 02	VOC	Acetone	ug/L	UJ	U		4.8	4.8	16	ICV/CCV criteria exceeded
2	187458	2/18/98	RH-LHGW12-01	VOC	Acetone	ug/L	J		9	4.8	4.8	16	ICV/CCV criteria exceeded
2	187459	2/18/98	RH-LHGW13-01	VOC	Acetone	ug/L	J		5.6	4.8	4.8	16	ICV/CCV criteria exceeded
6	188339	2/26/98	RH-GWFB03-01	VOC	Acetone	ug/L	J		20	4.8	4.8	16	ICV/CCV criteria exceeded
6	188788	3/2/98	RH-GWFB04-01	VOC	Acetone	ug/L	J		18	4.8	4.8	16	ICV/CCV criteria exceeded
6	188791	3/3/98	RH-GWFB05-01	VOC	Acetone	ug/L	J		20	4.8	4.8	16	ICV/CCV criteria exceeded
6	188779	2/26/98	RH-GWP17S-01	VOC	Acetone	ug/L	U			8	4.8	16	Detected in associated blank
6	188780	2/26/98	RH-GWP17S-91	VOC	Acetone	ug/L	U			5.6	4.8	16	Detected in associated blank
6	188334	2/25/98	RH-GWSW-91	VOC	Acetone	ug/L	U			8.7	4.8	16	Detected in associated blank
6	188335	2/25/98	RH-GWTB11-01	VOC	Acetone	ug/L	J		22	4.8	4.8	16	ICV/CCV criteria exceeded
6	188781	2/26/98	RH-GWTB12-01	VOC	Acetone	ug/L	J		13	4.8	4.8	16	ICV/CCV criteria exceeded
6	188792	3/3/98	RH-GWTB13-01	VOC	Acetone	ug/L	J		17	4.8	4.8	16	ICV/CCV criteria exceeded
1	186885	2/11/98	RH-GWP04S-01	VOC	Benzene	ug/L	U			0.2	0.1	0.3	Detected in associated blank
1	186889	2/11/98	RH-GWP08BR-01	VOC	Benzene	ug/L	U			0.2	0.1	0.3	Detected in associated blank
1	186875	2/10/98	RH-GWP23D-01	VOC	Benzene	ug/L	U			0.1	0.1	0.3	Detected in associated blank
1	186872	2/10/98	RH-GWP33S-01	VOC	Benzene	ug/L	U			0.1	0.1	0.3	Detected in associated blank
3	188049	2/24/98	RH-GWP22S-01	VOC	Benzene	ug/L	U			0.3	0.1	0.3	Detected in associated blank
1	186868	2/12/98	RH-GWFB01-01	VOC	Bromomethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186879	2/10/98	RH-GWP01S-01	VOC	Bromomethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186884	2/11/98	RH-GWP03S-01	VOC	Bromomethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186885	2/11/98	RH-GWP04S-01	VOC	Bromomethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186889	2/11/98	RH-GWP08BR-01	VOC	Bromomethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186888	2/11/98	RH-GWP08D-01	VOC	Bromomethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186882	2/11/98	RH-GWP1D-01	VOC	Bromomethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186883	2/11/98	RH-GWP1D-91	VOC	Bromomethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186876	2/10/98	RH-GWP20SR-01	VOC	Bromomethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186867	2/12/98	RH-GWP21BR-01	VOC	Bromomethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186866	2/12/98	RH-GWP21D-01	VOC	Bromomethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded

Table B-2
Summary of Data Validation Qualified Results
Refuse Hideaway Landfill
Middleton, Wisconsin

SDG	Labno	Date	Sample	Test	Parameter	UNIT	DVQ	LQ	CONC	RDL	LOD	LOQ	Comment
1	186875	2/10/98	RH-GWP23D-01	VOC	Bromomethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186873	2/10/98	RH-GWP23S-01	VOC	Bromomethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186874	2/10/98	RH-GWP23S-91	VOC	Bromomethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186877	2/10/98	RH-GWP32D-01	VOC	Bromomethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186870	2/13/98	RH-GWP32S-01	VOC	Bromomethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186878	2/10/98	RH-GWP33D-01	VOC	Bromomethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186872	2/10/98	RH-GWP33S-01	VOC	Bromomethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186887	2/11/98	RH-GWP36D-01	VOC	Bromomethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186886	2/11/98	RH-GWP36S-01	VOC	Bromomethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186871	2/10/98	RH-GWTB01-01	VOC	Bromomethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186869	2/12/98	TRIP BLANK 02	VOC	Bromomethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
2	187456	2/18/98	RH-LHGW09-01	VOC	Bromomethane	ug/L	J		19	0.7	0.7	2.3	ICV/CCV criteria exceeded
2	187457	2/18/98	RH-LHGW11-01	VOC	Bromomethane	ug/L	J		45	0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186868	2/12/98	RH-GWFB01-01	VOC	Carbon Disulfide	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186879	2/10/98	RH-GWP01S-01	VOC	Carbon Disulfide	ug/L	J		2.3	0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186884	2/11/98	RH-GWP03S-01	VOC	Carbon Disulfide	ug/L	J		1	0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186885	2/11/98	RH-GWP04S-01	VOC	Carbon Disulfide	ug/L	J		1	0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186889	2/11/98	RH-GWP08BR-01	VOC	Carbon Disulfide	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186888	2/11/98	RH-GWP08D-01	VOC	Carbon Disulfide	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186882	2/11/98	RH-GWP1D-01	VOC	Carbon Disulfide	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186883	2/11/98	RH-GWP1D-91	VOC	Carbon Disulfide	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186876	2/10/98	RH-GWP20SR-01	VOC	Carbon Disulfide	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186867	2/12/98	RH-GWP21BR-01	VOC	Carbon Disulfide	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186866	2/12/98	RH-GWP21D-01	VOC	Carbon Disulfide	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186875	2/10/98	RH-GWP23D-01	VOC	Carbon Disulfide	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186873	2/10/98	RH-GWP23S-01	VOC	Carbon Disulfide	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186874	2/10/98	RH-GWP23S-91	VOC	Carbon Disulfide	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186877	2/10/98	RH-GWP32D-01	VOC	Carbon Disulfide	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186870	2/13/98	RH-GWP32S-01	VOC	Carbon Disulfide	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186878	2/10/98	RH-GWP33D-01	VOC	Carbon Disulfide	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186872	2/10/98	RH-GWP33S-01	VOC	Carbon Disulfide	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186887	2/11/98	RH-GWP36D-01	VOC	Carbon Disulfide	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186886	2/11/98	RH-GWP36S-01	VOC	Carbon Disulfide	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186871	2/10/98	RH-GWTB01-01	VOC	Carbon Disulfide	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186869	2/12/98	TRIP BLANK 02	VOC	Carbon Disulfide	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
2	187123	2/16/98	RH-GWP08S-01	VOC	Carbon Disulfide	ug/L	U			0.5	0.5	1.3	Detected in associated blank
2	187460	2/18/98	RH-LHGW04-01	VOC	Carbon Disulfide	ug/L	U			1.4	0.4	1.3	Detected in associated blank
2	187461	2/18/98	RH-LHGW05-01	VOC	Carbon Disulfide	ug/L	U			0.6	0.4	1.3	Detected in associated blank
2	187456	2/18/98	RH-LHGW09-01	VOC	Carbon Disulfide	ug/L	U			12	12	1.3	Detected in associated blank
2	187457	2/18/98	RH-LHGW11-01	VOC	Carbon Disulfide	ug/L	U			28	0.4	1.3	Detected in associated blank
2	187458	2/18/98	RH-LHGW12-01	VOC	Carbon Disulfide	ug/L	J		12	0.4	0.4	1.3	ICV/CCV criteria exceeded
2	187459	2/18/98	RH-LHGW13-01	VOC	Carbon Disulfide	ug/L	U			2.2	0.4	1.3	Detected in associated blank
3	188048	2/24/98	RH-GWP22D-01	VOC	Carbon Disulfide	ug/L	J		0.5	0.4	0.4	1.3	ICV/CCV criteria exceeded
3	188050	2/24/98	RH-GWP34S-01	VOC	Carbon Disulfide	ug/L	J		0.7	0.4	0.4	1.3	ICV/CCV criteria exceeded
6	188779	2/26/98	RH-GWP17S-01	VOC	Carbon Disulfide	ug/L	U			0.9	0.4	1.3	Detected in associated blank
6	188786	3/2/98	RH-GWP26S-01	VOC	Carbon Disulfide	ug/L	U			0.4	0.4	1.3	Detected in associated blank
3	188046	2/23/98	RH-GWP27D-01	VOC	Carbon Tetrachloride	ug/L	UJ	U		0.2	0.2	0.5	ICV/CCV criteria exceeded
3	187861	2/23/98	RH-GWP27S-01	VOC	Carbon Tetrachloride	ug/L	UJ	U		0.2	0.2	0.5	ICV/CCV criteria exceeded
3	187860	2/23/98	RH-GWTB08-01	VOC	Carbon Tetrachloride	ug/L	UJ	U		0.2	0.2	0.5	ICV/CCV criteria exceeded

Table B-2
Summary of Data Validation Qualified Results
Refuse Hideaway Landfill
Middleton, Wisconsin

SDG	Labno	Date	Sample	Test	Parameter	UNIT	DVQ	LQ	CONC	RDL	LOD	LOQ	Comment
3	188047	2/23/98	RH-GWTBO9-01	VOC	Carbon Tetrachloride	ug/L	UJ	U		0.2	0.2	0.5	ICV/CCV criteria exceeded
6	188779	2/26/98	RH-GWP17S-01	VOC	Carbon Tetrachloride	ug/L	UJ	U		0.2	0.2	0.5	ICV/CCV criteria exceeded
6	188780	2/26/98	RH-GWP17S-91	VOC	Carbon Tetrachloride	ug/L	UJ	U		0.2	0.2	0.5	ICV/CCV criteria exceeded
1	186868	2/12/98	RH-GWFB01-01	VOC	Chloroethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186879	2/10/98	RH-GWP01S-01	VOC	Chloroethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186884	2/11/98	RH-GWP03S-01	VOC	Chloroethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186885	2/11/98	RH-GWP04S-01	VOC	Chloroethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186889	2/11/98	RH-GWP08BR-01	VOC	Chloroethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186888	2/11/98	RH-GWP08D-01	VOC	Chloroethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186882	2/11/98	RH-GWP1D-01	VOC	Chloroethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186883	2/11/98	RH-GWP1D-91	VOC	Chloroethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186876	2/10/98	RH-GWP20SR-01	VOC	Chloroethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186867	2/12/98	RH-GWP21BR-01	VOC	Chloroethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186866	2/12/98	RH-GWP21D-01	VOC	Chloroethane	ug/L	J		8.6	0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186875	2/10/98	RH-GWP23D-01	VOC	Chloroethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186873	2/10/98	RH-GWP23S-01	VOC	Chloroethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186874	2/10/98	RH-GWP23S-91	VOC	Chloroethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186877	2/10/98	RH-GWP32D-01	VOC	Chloroethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186870	2/13/98	RH-GWP32S-01	VOC	Chloroethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186878	2/10/98	RH-GWP33D-01	VOC	Chloroethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186872	2/10/98	RH-GWP33S-01	VOC	Chloroethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186887	2/11/98	RH-GWP36D-01	VOC	Chloroethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186886	2/11/98	RH-GWP36S-01	VOC	Chloroethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186871	2/10/98	RH-GWTB01-01	VOC	Chloroethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
1	186869	2/12/98	TRIP BLANK 02	VOC	Chloroethane	ug/L	UJ	U		0.7	0.7	2.3	ICV/CCV criteria exceeded
2	187239	2/17/98	RH-GWP25S-01	VOC	Chloroethane	ug/L	J		2.3	0.7	0.7	2.3	ICV/CCV criteria exceeded
2	187122	2/13/98	RH-GWP9D-01	VOC	Chloroethane	ug/L	J		5.1	0.7	0.7	2.3	ICV/CCV criteria exceeded
2	187465	2/18/98	RH-LHGWP16D-01	VOC	Chloroethane	ug/L	J		2	0.7	0.7	2.3	ICV/CCV criteria exceeded
2	187466	2/18/98	RH-LHGWP16S-01	VOC	Chloromethane	ug/L	J		0.5	0.5	0.5	1.5	ICV/CCV criteria exceeded
2	187467	2/18/98	RH-LHGWP16S-91	VOC	Chloromethane	ug/L	J		1.3	0.5	0.5	1.5	ICV/CCV criteria exceeded
3	188048	2/24/98	RH-GWP22D-01	VOC	Chloromethane	ug/L	U			0.5	0.5	1.5	Detected in associated blank
3	188049	2/24/98	RH-GWP22S-01	VOC	Chloromethane	ug/L	U			2	0.5	1.5	Detected in associated blank
3	188050	2/24/98	RH-GWP34S-01	VOC	Chloromethane	ug/L	U			0.6	0.5	1.5	Detected in associated blank
3	187813	2/19/98	RH-GWP401-01	VOC	Chloromethane	ug/L	U			0.9	0.5	1.5	Detected in associated blank
6	188339	2/26/98	RH-GWFB03-01	VOC	Chloromethane	ug/L	U			0.9	0.5	1.5	Detected in associated blank
6	188779	2/26/98	RH-GWP17S-01	VOC	Chloromethane	ug/L	U			1.8	0.5	1.5	Detected in associated blank
6	188780	2/26/98	RH-GWP17S-91	VOC	Chloromethane	ug/L	U			11	0.5	1.5	Detected in associated blank
6	188782	3/2/98	RH-GWP18S-01	VOC	Chloromethane	ug/L	U			1.8	0.5	1.5	Detected in associated blank
6	188786	3/2/98	RH-GWP26S-01	VOC	Chloromethane	ug/L	U			0.6	0.5	1.5	Detected in associated blank
6	188785	3/2/98	RH-GWP28S-01	VOC	Chloromethane	ug/L	U			12	0.5	1.5	Detected in associated blank
6	188336	2/26/98	RH-GWP29S-01	VOC	Chloromethane	ug/L	U			0.5	0.5	1.5	Detected in associated blank
6	188337	2/26/98	RH-GWP29S-91	VOC	Chloromethane	ug/L	U			2.7	0.5	1.5	Detected in associated blank
6	188333	2/25/98	RH-GWSW-01	VOC	Chloromethane	ug/L	U			0.6	0.5	1.5	Detected in associated blank
6	188334	2/25/98	RH-GWSW-91	VOC	Chloromethane	ug/L	U			1.3	0.5	1.5	Detected in associated blank
1	186868	2/12/98	RH-GWFB01-01	VOC	Methylene Chloride	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186879	2/10/98	RH-GWP01S-01	VOC	Methylene Chloride	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186884	2/11/98	RH-GWP03S-01	VOC	Methylene Chloride	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186885	2/11/98	RH-GWP04S-01	VOC	Methylene Chloride	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186889	2/11/98	RH-GWP08BR-01	VOC	Methylene Chloride	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded

Table B-2
Summary of Data Validation Qualified Results
Refuse Hideaway Landfill
Middleton, Wisconsin

SDG	Labno	Date	Sample	Test	Parameter	UNIT	DVQ	LQ	CONC	RDL	LOD	LOQ	Comment
1	186888	2/11/98	RH-GWP08D-01	VOC	Methylene Chloride	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186882	2/11/98	RH-GWP1D-01	VOC	Methylene Chloride	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186883	2/11/98	RH-GWP1D-91	VOC	Methylene Chloride	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186876	2/10/98	RH-GWP20SR-01	VOC	Methylene Chloride	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186867	2/12/98	RH-GWP21BR-01	VOC	Methylene Chloride	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186866	2/12/98	RH-GWP21D-01	VOC	Methylene Chloride	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186875	2/10/98	RH-GWP23D-01	VOC	Methylene Chloride	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186873	2/10/98	RH-GWP23S-01	VOC	Methylene Chloride	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186874	2/10/98	RH-GWP23S-91	VOC	Methylene Chloride	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186877	2/10/98	RH-GWP32D-01	VOC	Methylene Chloride	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186870	2/13/98	RH-GWP32S-01	VOC	Methylene Chloride	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186878	2/10/98	RH-GWP33D-01	VOC	Methylene Chloride	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186872	2/10/98	RH-GWP33S-01	VOC	Methylene Chloride	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186887	2/11/98	RH-GWP36D-01	VOC	Methylene Chloride	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186886	2/11/98	RH-GWP36S-01	VOC	Methylene Chloride	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186871	2/10/98	RH-GWTB01-01	VOC	Methylene Chloride	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
1	186869	2/12/98	TRIP BLANK 02	VOC	Methylene Chloride	ug/L	UJ	U		0.4	0.4	1.3	ICV/CCV criteria exceeded
2	187239	2/17/98	RH-GWP25S-01	VOC	Methylene Chloride	ug/L	U			0.5	0.4	1.3	Detected in associated blank
2	187455	2/18/98	RH-LHGW08-01	VOC	Methylene Chloride	ug/L	U			2	0.4	1.3	Detected in associated blank
2	187462	2/18/98	RH-LHGW13-91	VOC	Methylene Chloride	ug/L	U			0.6	0.4	1.3	Detected in associated blank
6	188786	3/2/98	RH-GWP26S-01	VOC	Methylene Chloride	ug/L	U			2	0.4	1.3	Detected in associated blank
6	188336	2/26/98	RH-GWP29S-01	VOC	Methylene Chloride	ug/L	U			1	0.4	1.3	Detected in associated blank
6	188337	2/26/98	RH-GWP29S-91	VOC	Methylene Chloride	ug/L	U			1.4	0.4	1.3	Detected in associated blank
6	188334	2/25/98	RH-GWSW-91	VOC	Methylene Chloride	ug/L	U			1.5	0.4	1.3	Detected in associated blank
3	188049	2/24/98	RH-GWP22S-01	VOC	Toluene	ug/L	U			0.4	0.2	0.7	Detected in associated blank
6	188336	2/26/98	RH-GWP29S-01	VOCT	1,2,3-Trichlorobenzene	ug/L	Q		0.29				Non-target cmpd, quant. by std cal.
6	188337	2/26/98	RH-GWP29S-91	VOCT	1,2,3-Trichlorobenzene	ug/L	Q		0.48				Non-target cmpd, quant. by std cal.
6	188336	2/26/98	RH-GWP29S-01	VOCT	1,2,4-Trichlorobenzene	ug/L	Q		0.19				Non-target cmpd, quant. by std cal.
6	188337	2/26/98	RH-GWP29S-91	VOCT	1,2,4-Trichlorobenzene	ug/L	Q		0.24				Non-target cmpd, quant. by std cal.
2	187460	2/18/98	RH-LHGW04-01	VOCT	1,2,4-Trimethylbenzene	ug/L	Q		1				Non-target cmpd, quant. by std cal.
2	187461	2/18/98	RH-LHGW05-01	VOCT	1,2,4-Trimethylbenzene	ug/L	Q		12				Non-target cmpd, quant. by std cal.
2	187455	2/18/98	RH-LHGW08-01	VOCT	1,2,4-Trimethylbenzene	ug/L	Q		4.4				Non-target cmpd, quant. by std cal.
2	187456	2/18/98	RH-LHGW09-01	VOCT	1,2,4-Trimethylbenzene	ug/L	Q		11				Non-target cmpd, quant. by std cal.
2	187457	2/18/98	RH-LHGW11-01	VOCT	1,2,4-Trimethylbenzene	ug/L	Q		1.9				Non-target cmpd, quant. by std cal.
2	187458	2/18/98	RH-LHGW12-01	VOCT	1,2,4-Trimethylbenzene	ug/L	Q		7.5				Non-target cmpd, quant. by std cal.
2	187459	2/18/98	RH-LHGW13-01	VOCT	1,2,4-Trimethylbenzene	ug/L	Q		10				Non-target cmpd, quant. by std cal.
2	187462	2/18/98	RH-LHGW13-91	VOCT	1,2,4-Trimethylbenzene	ug/L	Q		10				Non-target cmpd, quant. by std cal.
6	188337	2/26/98	RH-GWP29S-91	VOCT	1,2-Dichlorobenzene	ug/L	Q		0.14				Non-target cmpd, quant. by std cal.
2	187460	2/18/98	RH-LHGW04-01	VOCT	1,2-Dichlorobenzene	ug/L	Q		1.3				Non-target cmpd, quant. by std cal.
2	187461	2/18/98	RH-LHGW05-01	VOCT	1,2-Dichlorobenzene	ug/L	Q		3.4				Non-target cmpd, quant. by std cal.
2	187455	2/18/98	RH-LHGW08-01	VOCT	1,2-Dichlorobenzene	ug/L	Q		1.6				Non-target cmpd, quant. by std cal.
2	187456	2/18/98	RH-LHGW09-01	VOCT	1,2-Dichlorobenzene	ug/L	Q		1.1				Non-target cmpd, quant. by std cal.
2	187458	2/18/98	RH-LHGW12-01	VOCT	1,2-Dichlorobenzene	ug/L	Q		0.75				Non-target cmpd, quant. by std cal.
2	187459	2/18/98	RH-LHGW13-01	VOCT	1,2-Dichlorobenzene	ug/L	Q		0.98				Non-target cmpd, quant. by std cal.
2	187462	2/18/98	RH-LHGW13-91	VOCT	1,2-Dichlorobenzene	ug/L	Q		0.97				Non-target cmpd, quant. by std cal.
2	187459	2/18/98	RH-LHGW13-01	VOCT	1,3,3-t-Bicyclo[2.2.1]hep	ug/L	JN		15				Est. conc., tentative ID. (TIC)
2	187460	2/18/98	RH-LHGW04-01	VOCT	1,3,5-Trimethylbenzene	ug/L	Q		0.19				Non-target cmpd, quant. by std cal.
2	187461	2/18/98	RH-LHGW05-01	VOCT	1,3,5-Trimethylbenzene	ug/L	Q		3.5				Non-target cmpd, quant. by std cal.
2	187455	2/18/98	RH-LHGW08-01	VOCT	1,3,5-Trimethylbenzene	ug/L	Q		1.7				Non-target cmpd, quant. by std cal.

Table B-2
Summary of Data Validation Qualified Results
Refuse Hideaway Landfill
Middleton, Wisconsin

SDG	Labno	Date	Sample	Test	Parameter	UNIT	DVQ	LQ	CONC	RDL	LOD	LOQ	Comment
2	187456	2/18/98	RH-LHGW09-01	VOCT	1,3,5-Trimethylbenzene	ug/L	Q		3.7				Non-target cmpd, quant. by std cal.
2	187457	2/18/98	RH-LHGW11-01	VOCT	1,3,5-Trimethylbenzene	ug/L	Q		4.2				Non-target cmpd, quant. by std cal.
2	187458	2/18/98	RH-LHGW12-01	VOCT	1,3,5-Trimethylbenzene	ug/L	Q		2				Non-target cmpd, quant. by std cal.
2	187459	2/18/98	RH-LHGW13-01	VOCT	1,3,5-Trimethylbenzene	ug/L	Q		3.7				Non-target cmpd, quant. by std cal.
2	187462	2/18/98	RH-LHGW13-91	VOCT	1,3,5-Trimethylbenzene	ug/L	Q		3.7				Non-target cmpd, quant. by std cal.
6	188337	2/26/98	RH-GWP29S-91	VOCT	1,3-Dichlorobenzene	ug/L	Q		0.14				Non-target cmpd, quant. by std cal.
2	187459	2/18/98	RH-LHGW13-01	VOCT	1,3-Dichlorobenzene	ug/L	Q		0.13				Non-target cmpd, quant. by std cal.
2	187462	2/18/98	RH-LHGW13-91	VOCT	1,3-Dichlorobenzene	ug/L	Q		0.1				Non-target cmpd, quant. by std cal.
6	188779	2/26/98	RH-GWP17S-01	VOCT	1,4-Dichlorobenzene	ug/L	Q		2.3				Non-target cmpd, quant. by std cal.
2	187241	2/17/98	RH-GWP25D-91	VOCT	1,4-Dichlorobenzene	ug/L	Q		0.36				Non-target cmpd, quant. by std cal.
6	188336	2/26/98	RH-GWP29S-01	VOCT	1,4-Dichlorobenzene	ug/L	Q		0.14				Non-target cmpd, quant. by std cal.
6	188337	2/26/98	RH-GWP29S-91	VOCT	1,4-Dichlorobenzene	ug/L	Q		0.19				Non-target cmpd, quant. by std cal.
2	187460	2/18/98	RH-LHGW04-01	VOCT	1,4-Dichlorobenzene	ug/L	Q		15				Non-target cmpd, quant. by std cal.
2	187461	2/18/98	RH-LHGW05-01	VOCT	1,4-Dichlorobenzene	ug/L	Q		12				Non-target cmpd, quant. by std cal.
2	187455	2/18/98	RH-LHGW08-01	VOCT	1,4-Dichlorobenzene	ug/L	Q		8				Non-target cmpd, quant. by std cal.
2	187456	2/18/98	RH-LHGW09-01	VOCT	1,4-Dichlorobenzene	ug/L	Q		11				Non-target cmpd, quant. by std cal.
2	187457	2/18/98	RH-LHGW11-01	VOCT	1,4-Dichlorobenzene	ug/L	Q		20				Non-target cmpd, quant. by std cal.
2	187458	2/18/98	RH-LHGW12-01	VOCT	1,4-Dichlorobenzene	ug/L	Q		8.8				Non-target cmpd, quant. by std cal.
2	187459	2/18/98	RH-LHGW13-01	VOCT	1,4-Dichlorobenzene	ug/L	Q		14				Non-target cmpd, quant. by std cal.
2	187462	2/18/98	RH-LHGW13-91	VOCT	1,4-Dichlorobenzene	ug/L	Q		14				Non-target cmpd, quant. by std cal.
2	187460	2/18/98	RH-LHGW04-01	VOCT	Bromobenzene	ug/L	Q		0.49				Non-target cmpd, quant. by std cal.
2	187461	2/18/98	RH-LHGW05-01	VOCT	Bromobenzene	ug/L	Q		0.34				Non-target cmpd, quant. by std cal.
2	187458	2/18/98	RH-LHGW12-01	VOCT	Bromobenzene	ug/L	Q		0.31				Non-target cmpd, quant. by std cal.
2	187459	2/18/98	RH-LHGW13-01	VOCT	Bromobenzene	ug/L	Q		0.65				Non-target cmpd, quant. by std cal.
2	187462	2/18/98	RH-LHGW13-91	VOCT	Bromobenzene	ug/L	Q		0.68				Non-target cmpd, quant. by std cal.
6	188779	2/26/98	RH-GWP17S-01	VOCT	Di isopropyl ether	ug/L	Q		1				Non-target cmpd, quant. by std cal.
1	186866	2/12/98	RH-GWP21D-01	VOCT	Di isopropyl ether	ug/L	Q		0.86				Non-target cmpd, quant. by std cal.
2	187460	2/18/98	RH-LHGW04-01	VOCT	Di isopropyl ether	ug/L	Q		0.29				Non-target cmpd, quant. by std cal.
2	187461	2/18/98	RH-LHGW05-01	VOCT	Di isopropyl ether	ug/L	Q		0.43				Non-target cmpd, quant. by std cal.
1	186889	2/11/98	RH-GWP08BR-01	VOCT	Dichlorodifluoromethane	ug/L	Q		0.6				Non-target cmpd, quant. by std cal.
2	187123	2/16/98	RH-GWP08S-01	VOCT	Dichlorodifluoromethane	ug/L	Q		4.3				Non-target cmpd, quant. by std cal.
6	188782	3/2/98	RH-GWP18S-01	VOCT	Dichlorodifluoromethane	ug/L	Q		3.2				Non-target cmpd, quant. by std cal.
1	186876	2/10/98	RH-GWP20SR-01	VOCT	Dichlorodifluoromethane	ug/L	Q		1				Non-target cmpd, quant. by std cal.
1	186867	2/12/98	RH-GWP21BR-01	VOCT	Dichlorodifluoromethane	ug/L	Q		0.47				Non-target cmpd, quant. by std cal.
1	186866	2/12/98	RH-GWP21D-01	VOCT	Dichlorodifluoromethane	ug/L	Q		2				Non-target cmpd, quant. by std cal.
3	188048	2/19/98	RH-GWP22D-01	VOCT	Dichlorodifluoromethane	ug/L	Q		1.2				Non-target cmpd, quant. by std cal.
3	188049	2/19/98	RH-GWP22S-01	VOCT	Dichlorodifluoromethane	ug/L	Q		0.53				Non-target cmpd, quant. by std cal.
1	186873	2/10/98	RH-GWP23S-01	VOCT	Dichlorodifluoromethane	ug/L	Q		0.79				Non-target cmpd, quant. by std cal.
1	186874	2/10/98	RH-GWP23S-91	VOCT	Dichlorodifluoromethane	ug/L	Q		0.84				Non-target cmpd, quant. by std cal.
2	187238	2/16/98	RH-GWP25BR-01	VOCT	Dichlorodifluoromethane	ug/L	Q		0.48				Non-target cmpd, quant. by std cal.
2	187240	2/17/98	RH-GWP25D-01	VOCT	Dichlorodifluoromethane	ug/L	Q		0.9				Non-target cmpd, quant. by std cal.
2	187241	2/17/98	RH-GWP25D-91	VOCT	Dichlorodifluoromethane	ug/L	Q		0.73				Non-target cmpd, quant. by std cal.
6	188787	3/2/98	RH-GWP26D-01	VOCT	Dichlorodifluoromethane	ug/L	Q		18				Non-target cmpd, quant. by std cal.
6	188786	3/2/98	RH-GWP26S-01	VOCT	Dichlorodifluoromethane	ug/L	Q		3.9				Non-target cmpd, quant. by std cal.
3	187861	2/23/98	RH-GWP27S-01	VOCT	Dichlorodifluoromethane	ug/L	Q		1.4				Non-target cmpd, quant. by std cal.
6	188785	3/2/98	RH-GWP28S-01	VOCT	Dichlorodifluoromethane	ug/L	Q		0.84				Non-target cmpd, quant. by std cal.
6	188336	2/26/98	RH-GWP29S-01	VOCT	Dichlorodifluoromethane	ug/L	Q		2.6				Non-target cmpd, quant. by std cal.
6	188337	2/26/98	RH-GWP29S-91	VOCT	Dichlorodifluoromethane	ug/L	Q		2.5				Non-target cmpd, quant. by std cal.
3	188050	2/19/98	RH-GWP34S-01	VOCT	Dichlorodifluoromethane	ug/L	Q		0.51				Non-target cmpd, quant. by std cal.

Table B-2
Summary of Data Validation Qualified Results
Refuse Hideaway Landfill
Middleton, Wisconsin

SDG	Labno	Date	Sample	Test	Parameter	UNIT	DVQ	LQ	CONC	RDL	LOD	LOQ	Comment
3	187814	2/19/98	RH-GWP40D-01	VOCT	Dichlorodifluoromethane	ug/L	Q		1.1				Non-target cmpd, quant. by std cal.
3	187813	2/19/98	RH-GWP40I-01	VOCT	Dichlorodifluoromethane	ug/L	Q		1.7				Non-target cmpd, quant. by std cal.
2	187122	2/13/98	RH-GWP9D-01	VOCT	Dichlorodifluoromethane	ug/L	Q		9.4				Non-target cmpd, quant. by std cal.
3	188333	2/19/98	RH-GWSW-01	VOCT	Dichlorodifluoromethane	ug/L	Q		0.54				Non-target cmpd, quant. by std cal.
3	188334	2/19/98	RH-GWSW-91	VOCT	Dichlorodifluoromethane	ug/L	Q		0.44				Non-target cmpd, quant. by std cal.
6	188335	2/25/98	RH-GWTB11-01	VOCT	Dichlorodifluoromethane	ug/L	Q		0.11				Non-target cmpd, quant. by std cal.
2	187461	2/18/98	RH-LHGW05-01	VOCT	Dichlorodifluoromethane	ug/L	Q		4.1				Non-target cmpd, quant. by std cal.
2	187465	2/18/98	RH-LHGWP16D-01	VOCT	Dichlorodifluoromethane	ug/L	JN		0.91				Est. conc., tentative ID. (TIC)
2	187466	2/18/98	RH-LHGWP16S-01	VOCT	Dichlorodifluoromethane	ug/L	Q		0.15				Non-target cmpd, quant. by std cal.
2	187467	2/18/98	RH-LHGWP16S-91	VOCT	Dichlorodifluoromethane	ug/L	Q		0.17				Non-target cmpd, quant. by std cal.
6	188336	2/26/98	RH-GWP29S-01	VOCT	Hexachlorobutadiene	ug/L	Q		0.29				Non-target cmpd, quant. by std cal.
6	188337	2/26/98	RH-GWP29S-91	VOCT	Hexachlorobutadiene	ug/L	Q		0.32				Non-target cmpd, quant. by std cal.
2	187460	2/18/98	RH-LHGW04-01	VOCT	Isopropylbenzene	ug/L	Q		2.5				Non-target cmpd, quant. by std cal.
2	187461	2/18/98	RH-LHGW05-01	VOCT	Isopropylbenzene	ug/L	Q		7.4				Non-target cmpd, quant. by std cal.
2	187455	2/18/98	RH-LHGW08-01	VOCT	Isopropylbenzene	ug/L	Q		1				Non-target cmpd, quant. by std cal.
2	187456	2/18/98	RH-LHGW09-01	VOCT	Isopropylbenzene	ug/L	Q		2.2				Non-target cmpd, quant. by std cal.
2	187457	2/18/98	RH-LHGW11-01	VOCT	Isopropylbenzene	ug/L	Q		2.8				Non-target cmpd, quant. by std cal.
2	187458	2/18/98	RH-LHGW12-01	VOCT	Isopropylbenzene	ug/L	Q		1.2				Non-target cmpd, quant. by std cal.
2	187459	2/18/98	RH-LHGW13-01	VOCT	Isopropylbenzene	ug/L	Q		2.4				Non-target cmpd, quant. by std cal.
2	187466	2/18/98	RH-LHGWP16S-01	VOCT	Isopropylbenzene	ug/L	Q		0.11				Non-target cmpd, quant. by std cal.
6	188779	2/26/98	RH-GWP17S-01	VOCT	Methyl Tert Butyl Ether	ug/L	Q		1				Non-target cmpd, quant. by std cal.
6	188337	2/26/98	RH-GWP29S-91	VOCT	N-Butylbenzene	ug/L	Q		0.11				Non-target cmpd, quant. by std cal.
2	187460	2/18/98	RH-LHGW04-01	VOCT	n-Butylbenzene	ug/L	Q		0.37				Non-target cmpd, quant. by std cal.
2	187461	2/18/98	RH-LHGW05-01	VOCT	n-Butylbenzene	ug/L	Q		38				Non-target cmpd, quant. by std cal.
2	187458	2/18/98	RH-LHGW12-01	VOCT	n-Butylbenzene	ug/L	Q		0.28				Non-target cmpd, quant. by std cal.
2	187459	2/18/98	RH-LHGW13-01	VOCT	n-Butylbenzene	ug/L	Q		0.41				Non-target cmpd, quant. by std cal.
2	187462	2/18/98	RH-LHGW13-91	VOCT	n-Butylbenzene	ug/L	Q		0.41				Non-target cmpd, quant. by std cal.
2	187460	2/18/98	RH-LHGW04-01	VOCT	N-Propylbenzene	ug/L	Q		2.7				Non-target cmpd, quant. by std cal.
2	187461	2/18/98	RH-LHGW05-01	VOCT	N-Propylbenzene	ug/L	Q		1.9				Non-target cmpd, quant. by std cal.
2	187455	2/18/98	RH-LHGW08-01	VOCT	N-Propylbenzene	ug/L	Q		0.8				Non-target cmpd, quant. by std cal.
2	187456	2/18/98	RH-LHGW09-01	VOCT	N-Propylbenzene	ug/L	Q		2.2				Non-target cmpd, quant. by std cal.
2	187457	2/18/98	RH-LHGW11-01	VOCT	N-Propylbenzene	ug/L	Q		3.2				Non-target cmpd, quant. by std cal.
2	187458	2/18/98	RH-LHGW12-01	VOCT	N-Propylbenzene	ug/L	Q		1				Non-target cmpd, quant. by std cal.
2	187459	2/18/98	RH-LHGW13-01	VOCT	N-Propylbenzene	ug/L	Q		2.1				Non-target cmpd, quant. by std cal.
2	187462	2/18/98	RH-LHGW13-91	VOCT	N-Propylbenzene	ug/L	Q		2.1				Non-target cmpd, quant. by std cal.
1	186885	2/11/98	RH-GWP04S-01	VOCT	Naphthalene	ug/L	Q		0.11				Non-target cmpd, quant. by std cal.
6	188786	3/2/98	RH-GWP26S-01	VOCT	Naphthalene	ug/L	Q		0.17				Non-target cmpd, quant. by std cal.
6	188336	2/26/98	RH-GWP29S-01	VOCT	Naphthalene	ug/L	Q		0.33				Non-target cmpd, quant. by std cal.
6	188337	2/26/98	RH-GWP29S-91	VOCT	Naphthalene	ug/L	Q		0.85				Non-target cmpd, quant. by std cal.
2	187460	2/18/98	RH-LHGW04-01	VOCT	Naphthalene	ug/L	Q		19				Non-target cmpd, quant. by std cal.
2	187461	2/18/98	RH-LHGW05-01	VOCT	Naphthalene	ug/L	Q		12				Non-target cmpd, quant. by std cal.
2	187455	2/18/98	RH-LHGW08-01	VOCT	Naphthalene	ug/L	Q		11				Non-target cmpd, quant. by std cal.
2	187456	2/18/98	RH-LHGW09-01	VOCT	Naphthalene	ug/L	Q		15				Non-target cmpd, quant. by std cal.
2	187457	2/18/98	RH-LHGW11-01	VOCT	Naphthalene	ug/L	Q		26				Non-target cmpd, quant. by std cal.
2	187458	2/18/98	RH-LHGW12-01	VOCT	Naphthalene	ug/L	Q		20				Non-target cmpd, quant. by std cal.
2	187459	2/18/98	RH-LHGW13-01	VOCT	Naphthalene	ug/L	Q		17				Non-target cmpd, quant. by std cal.
2	187462	2/18/98	RH-LHGW13-91	VOCT	Naphthalene	ug/L	Q		15				Non-target cmpd, quant. by std cal.
2	187465	2/18/98	RH-LHGWP16D-01	VOCT	Naphthalene	ug/L	Q		0.12				Non-target cmpd, quant. by std cal.

Table B-2
Summary of Data Validation Qualified Results
Refuse Hideaway Landfill
Middleton, Wisconsin

SDG	Labno	Date	Sample	Test	Parameter	UNIT	DVQ	LQ	CONC	RDL	LOD	LOQ	Comment
2	187460	2/18/98	RH-LHGW04-01	VOCT	p-Isopropyltoluene	ug/L	Q		0.2				Non-target cmpd, quant. by std cal.
2	187461	2/18/98	RH-LHGW05-01	VOCT	p-Isopropyltoluene	ug/L	Q		2.3				Non-target cmpd, quant. by std cal.
2	187455	2/18/98	RH-LHGW08-01	VOCT	p-Isopropyltoluene	ug/L	Q		1.4				Non-target cmpd, quant. by std cal.
2	187456	2/18/98	RH-LHGW09-01	VOCT	p-Isopropyltoluene	ug/L	Q		3.6				Non-target cmpd, quant. by std cal.
2	187457	2/18/98	RH-LHGW11-01	VOCT	p-Isopropyltoluene	ug/L	Q		7				Non-target cmpd, quant. by std cal.
2	187458	2/18/98	RH-LHGW12-01	VOCT	p-Isopropyltoluene	ug/L	Q		3				Non-target cmpd, quant. by std cal.
2	187459	2/18/98	RH-LHGW13-01	VOCT	p-Isopropyltoluene	ug/L	Q		1.5				Non-target cmpd, quant. by std cal.
2	187462	2/18/98	RH-LHGW13-91	VOCT	p-Isopropyltoluene	ug/L	Q		1.4				Non-target cmpd, quant. by std cal.
1	186866	2/12/98	RH-GWP21D-01	VOCT	Tetrahydrofuran	ug/L	Q		41				Non-target cmpd, quant. by std cal.
2	187240	2/17/98	RH-GWP25D-01	VOCT	Tetrahydrofuran	ug/L	Q		4.5				Non-target cmpd, quant. by std cal.
2	187241	2/17/98	RH-GWP25D-91	VOCT	Tetrahydrofuran	ug/L	Q		4				Non-target cmpd, quant. by std cal.
2	187122	2/13/98	RH-GWP9D-01	VOCT	Tetrahydrofuran	ug/L	Q		35				Non-target cmpd, quant. by std cal.
2	187460	2/18/98	RH-LHGW04-01	VOCT	Tetrahydrofuran	ug/L	Q		1300				Non-target cmpd, quant. by std cal.
2	187461	2/18/98	RH-LHGW05-01	VOCT	Tetrahydrofuran	ug/L	Q		730				Non-target cmpd, quant. by std cal.
2	187455	2/18/98	RH-LHGW08-01	VOCT	Tetrahydrofuran	ug/L	Q		1270				Non-target cmpd, quant. by std cal.
2	187456	2/18/98	RH-LHGW09-01	VOCT	Tetrahydrofuran	ug/L	Q		150				Non-target cmpd, quant. by std cal.
2	187457	2/18/98	RH-LHGW11-01	VOCT	Tetrahydrofuran	ug/L	Q		290				Non-target cmpd, quant. by std cal.
2	187458	2/18/98	RH-LHGW12-01	VOCT	Tetrahydrofuran	ug/L	Q		450				Non-target cmpd, quant. by std cal.
2	187459	2/18/98	RH-LHGW13-01	VOCT	Tetrahydrofuran	ug/L	Q		790				Non-target cmpd, quant. by std cal.
2	187462	2/18/98	RH-LHGW13-91	VOCT	Tetrahydrofuran	ug/L	Q		614				Non-target cmpd, quant. by std cal.
2	187465	2/18/98	RH-LHGWP16D-01	VOCT	Tetrahydrofuran	ug/L	Q		21				Non-target cmpd, quant. by std cal.
6	188787	3/2/98	RH-GWP26D-01	VOCT	Trichlorofluoromethane	ug/L	Q		7.1				Non-target cmpd, quant. by std cal.
2	187122	2/13/98	RH-GWP9D-01	VOCT	(E)-2-Nonenal	ug/L	JN		6.9				Est. conc., tentative ID. (TIC)
2	187461	2/18/98	RH-LHGW05-01	VOCT	1,2,3-Trimethylbenzene	ug/L	JN		3.3				Est. conc., tentative ID. (TIC)
2	187458	2/18/98	RH-LHGW12-01	VOCT	1,2,3-Trimethylbenzene	ug/L	JN		3				Est. conc., tentative ID. (TIC)
2	187460	2/18/98	RH-LHGW04-01	VOCT	1,3,3-t-Bicyclo[2.2.1]hep	ug/L	JN		5.6				Est. conc., tentative ID. (TIC)
2	187458	2/18/98	RH-LHGW12-01	VOCT	1,3,3-t-Bicyclo[2.2.1]hep	ug/L	JN		13				Est. conc., tentative ID. (TIC)
2	187460	2/18/98	RH-LHGW04-01	VOCT	1,3-Oxathiolane	ug/L	JN		12				Est. conc., tentative ID. (TIC)
2	187455	2/18/98	RH-LHGW08-01	VOCT	1,3-Oxathiolane	ug/L	JN		18				Est. conc., tentative ID. (TIC)
2	187458	2/18/98	RH-LHGW12-01	VOCT	1,3-Oxathiolane	ug/L	JN		6.6				Est. conc., tentative ID. (TIC)
2	187459	2/18/98	RH-LHGW13-01	VOCT	1,3-Oxathiolane	ug/L	JN		4.1				Est. conc., tentative ID. (TIC)
2	187462	2/18/98	RH-LHGW13-91	VOCT	1,3-Oxathiolane	ug/L	JN		3.1				Est. conc., tentative ID. (TIC)
2	187460	2/18/98	RH-LHGW04-01	VOCT	1,4-Dioxane	ug/L	JN		3.4				Est. conc., tentative ID. (TIC)
2	187459	2/18/98	RH-LHGW13-01	VOCT	1,4-Dioxane	ug/L	JN		3				Est. conc., tentative ID. (TIC)
2	187462	2/18/98	RH-LHGW13-91	VOCT	1,4-Dioxane	ug/L	JN		3				Est. conc., tentative ID. (TIC)
2	187460	2/18/98	RH-LHGW04-01	VOCT	1,7,7-t-Bicyclo[2.2.1]hep	ug/L	JN		4.2				Est. conc., tentative ID. (TIC)
2	187458	2/18/98	RH-LHGW12-01	VOCT	1,7,7-t-Bicyclo[2.2.1]hep	ug/L	JN		27				Est. conc., tentative ID. (TIC)
2	187459	2/18/98	RH-LHGW13-01	VOCT	1,7,7-t-Bicyclo[2.2.1]hep	ug/L	JN		11				Est. conc., tentative ID. (TIC)
2	187461	2/18/98	RH-LHGW05-01	VOCT	1-Ethyl-2-methylbenzene	ug/L	JN		4.1				Est. conc., tentative ID. (TIC)
2	187460	2/18/98	RH-LHGW04-01	VOCT	2,4-Dimethyl-3-pentanone	ug/L	JN		15				Est. conc., tentative ID. (TIC)
2	187461	2/18/98	RH-LHGW05-01	VOCT	2,4-Dimethyl-3-pentanone	ug/L	JN		27				Est. conc., tentative ID. (TIC)
2	187455	2/18/98	RH-LHGW08-01	VOCT	2,4-Dimethyl-3-pentanone	ug/L	JN		43				Est. conc., tentative ID. (TIC)
2	187456	2/18/98	RH-LHGW09-01	VOCT	2,4-Dimethyl-3-pentanone	ug/L	JN		34				Est. conc., tentative ID. (TIC)
2	187457	2/18/98	RH-LHGW11-01	VOCT	2,4-Dimethyl-3-pentanone	ug/L	JN		30				Est. conc., tentative ID. (TIC)
2	187458	2/18/98	RH-LHGW12-01	VOCT	2,4-Dimethyl-3-pentanone	ug/L	JN		23				Est. conc., tentative ID. (TIC)
2	187459	2/18/98	RH-LHGW13-01	VOCT	2,4-Dimethyl-3-pentanone	ug/L	JN		26				Est. conc., tentative ID. (TIC)
2	187462	2/18/98	RH-LHGW13-91	VOCT	2,4-Dimethyl-3-pentanone	ug/L	JN		22				Est. conc., tentative ID. (TIC)
2	187460	2/18/98	RH-LHGW04-01	VOCT	2-Butenylbenzene	ug/L	JN		4.7				Est. conc., tentative ID. (TIC)
2	187458	2/18/98	RH-LHGW12-01	VOCT	2-Methyl-5-(1-methylcyclo	ug/L	JN		3				Est. conc., tentative ID. (TIC)

Table B-2
Summary of Data Validation Qualified Results
Refuse Hideaway Landfill
Middleton, Wisconsin

SDG	Labno	Date	Sample	Test	Parameter	UNIT	DVQ	LQ	CONC	RDL	LOD	LOQ	Comment
2	187456	2/18/98	RH-LHGW09-01	VOCT	2-Pentanone	ug/L	JN		18				Est. conc., tentative ID. (TIC)
2	187457	2/18/98	RH-LHGW11-01	VOCT	2-Pentanone	ug/L	JN		82				Est. conc., tentative ID. (TIC)
2	187122	2/13/98	RH-GWP9D-01	VOCT	2-Pentyl-thiophene	ug/L	JN		3.1				Est. conc., tentative ID. (TIC)
2	187458	2/18/98	RH-LHGW12-01	VOCT	3,7,7-t-Bicyclo[4.2.0]hep	ug/L	JN		6.3				Est. conc., tentative ID. (TIC)
2	187459	2/18/98	RH-LHGW13-01	VOCT	3,7,7-t-Bicyclo[4.2.0]hep	ug/L	JN		2.8				Est. conc., tentative ID. (TIC)
2	187461	2/18/98	RH-LHGW05-01	VOCT	3-methylbutanal	ug/L	JN		5.6				Est. conc., tentative ID. (TIC)
2	187458	2/18/98	RH-LHGW12-01	VOCT	3-Methylbutanal	ug/L	JN		4.5				Est. conc., tentative ID. (TIC)
2	187457	2/18/98	RH-LHGW11-01	VOCT	Acetic Acid	ug/L	JN		98				Est. conc., tentative ID. (TIC)
2	187468	2/18/98	TRIP BLANK (05)	VOCT	Acetic Acid	ug/L	JN		1.4				Est. conc., tentative ID. (TIC)
1	186868	2/12/98	RH-GWFB01-01	VOCT	Acetonitrile	ug/L	JN		6.1				Est. conc., tentative ID. (TIC)
6	188788	3/2/98	RH-GWFB04-01	VOCT	Acetonitrile	ug/L	JN		4.7				Est. conc., tentative ID. (TIC)
6	188791	3/3/98	RH-GWFB05-01	VOCT	Acetonitrile	ug/L	JN		3.2				Est. conc., tentative ID. (TIC)
1	186889	2/11/98	RH-GWP08BR-01	VOCT	Acetonitrile	ug/L	JN		3				Est. conc., tentative ID. (TIC)
1	186888	2/11/98	RH-GWP08D-01	VOCT	Acetonitrile	ug/L	JN		5.9				Est. conc., tentative ID. (TIC)
1	186882	2/11/98	RH-GWP1D-01	VOCT	Acetonitrile	ug/L	JN		1.1				Est. conc., tentative ID. (TIC)
1	186883	2/11/98	RH-GWP1D-91	VOCT	Acetonitrile	ug/L	JN		1.8				Est. conc., tentative ID. (TIC)
1	186867	2/12/98	RH-GWP21BR-01	VOCT	Acetonitrile	ug/L	JN		2.3				Est. conc., tentative ID. (TIC)
1	186874	2/10/98	RH-GWP23S-91	VOCT	Acetonitrile	ug/L	JN	B	3.9				Est. conc., tentative ID. (TIC)
1	186877	2/10/98	RH-GWP32D-01	VOCT	Acetonitrile	ug/L	JN	B	1.3				Est. conc., tentative ID. (TIC)
1	186878	2/10/98	RH-GWP33D-01	VOCT	Acetonitrile	ug/L	JN	B	1.9				Est. conc., tentative ID. (TIC)
1	186887	2/11/98	RH-GWP36D-01	VOCT	Acetonitrile	ug/L	JN		2.9				Est. conc., tentative ID. (TIC)
6	188335	2/25/98	RH-GWTB11-01	VOCT	Acetonitrile	ug/L	JN		1.6				Est. conc., tentative ID. (TIC)
1	186884	2/11/98	RH-GWP03S-01	VOCT	Benzene ethanamine	ug/L	JN		3.1				Est. conc., tentative ID. (TIC)
2	187461	2/18/98	RH-LHGW05-01	VOCT	bicyclo[2.2.1]heptan-2-on	ug/L	JN		18				Est. conc., tentative ID. (TIC)
2	187461	2/18/98	RH-LHGW05-01	VOCT	bicyclo[2.2.1]heptan-2-on	ug/L	JN		28				Est. conc., tentative ID. (TIC)
2	187455	2/18/98	RH-LHGW08-01	VOCT	bicyclo[2.2.1]heptan-2-on	ug/L	JN		24				Est. conc., tentative ID. (TIC)
2	187455	2/18/98	RH-LHGW08-01	VOCT	bicyclo[2.2.1]heptan-2-on	ug/L	JN		37				Est. conc., tentative ID. (TIC)
2	187456	2/18/98	RH-LHGW09-01	VOCT	bicyclo[2.2.1]heptan-2-on	ug/L	JN		21				Est. conc., tentative ID. (TIC)
2	187456	2/18/98	RH-LHGW09-01	VOCT	bicyclo[2.2.1]heptan-2-on	ug/L	JN		35				Est. conc., tentative ID. (TIC)
2	187457	2/18/98	RH-LHGW11-01	VOCT	bicyclo[2.2.1]heptan-2-on	ug/L	JN		42				Est. conc., tentative ID. (TIC)
2	187457	2/18/98	RH-LHGW11-01	VOCT	bicyclo[2.2.1]heptan-2-on	ug/L	JN		52				Est. conc., tentative ID. (TIC)
2	187462	2/18/98	RH-LHGW13-91	VOCT	bicyclo[2.2.1]heptan-2-on	ug/L	JN		10.8				Est. conc., tentative ID. (TIC)
2	187462	2/18/98	RH-LHGW13-91	VOCT	bicyclo[2.2.1]heptan-2-on	ug/L	JN		8.8				Est. conc., tentative ID. (TIC)
1	186866	2/12/98	RH-GWP21D-01	VOCT	Ether	ug/L	JN		34				Est. conc., tentative ID. (TIC)
2	187122	2/13/98	RH-GWP9D-01	VOCT	Heptanal	ug/L	JN		12				Est. conc., tentative ID. (TIC)
1	186879	2/10/98	RH-GWP01S-01	VOCT	Hexane	ug/L	JN		1.6				Est. conc., tentative ID. (TIC)
1	186884	2/11/98	RH-GWP03S-01	VOCT	Hexane	ug/L	JN		1.1				Est. conc., tentative ID. (TIC)
1	186885	2/11/98	RH-GWP04S-01	VOCT	Hexane	ug/L	JN		2.2				Est. conc., tentative ID. (TIC)
1	186877	2/10/98	RH-GWP32D-01	VOCT	Hexane	ug/L	JN		1				Est. conc., tentative ID. (TIC)
1	186870	2/13/98	RH-GWP32S-01	VOCT	Hexane	ug/L	JN		1.2				Est. conc., tentative ID. (TIC)
1	186878	2/10/98	RH-GWP33D-01	VOCT	Hexane	ug/L	JN		2.4				Est. conc., tentative ID. (TIC)
1	186871	2/10/98	RH-GWTB01-01	VOCT	Hexane	ug/L	JN		2.3				Est. conc., tentative ID. (TIC)
3	188047	2/23/98	RH-GWTBO9-01	VOCT	Hexane	ug/L	JN		1.6				Est. conc., tentative ID. (TIC)
2	187243	2/17/98	TRIP BLANK (04)	VOCT	Hexane	ug/L	JN		2.3				Est. conc., tentative ID. (TIC)
2	187460	2/18/98	RH-LHGW04-01	VOCT	Indane	ug/L	JN		2.8				Est. conc., tentative ID. (TIC)
6	188786	3/2/98	RH-GWP26S-01	VOCT	Nonanal	ug/L	JN		5.9				Est. conc., tentative ID. (TIC)
1	186884	2/11/98	RH-GWP03S-01	VOCT	Octa cyclotetrasiloxane	ug/L	JN		1.1				Est. conc., tentative ID. (TIC)
1	186885	2/11/98	RH-GWP04S-01	VOCT	Octa cyclotetrasiloxane	ug/L	JN		1.1				Est. conc., tentative ID. (TIC)
1	186874	2/10/98	RH-GWP23S-91	VOCT	Octa cyclotetrasiloxane	ug/L	JN		1.2				Est. conc., tentative ID. (TIC)

Table B-2
Summary of Data Validation Qualified Results
Refuse Hideaway Landfill
Middleton, Wisconsin

SDG	Labno	Date	Sample	Test	Parameter	UNIT	DVQ	LQ	CONC	RDL	LOD	LOQ	Comment
3	187861	2/23/98	RH-GWP27S-01	VOCT	Octa cyclotetrasiloxane	ug/L	JN		2.6				Est. conc., tentative ID. (TIC)
2	187122	2/13/98	RH-GWP9D-01	VOCT	Pentanal	ug/L	JN		6				Est. conc., tentative ID. (TIC)
2	187460	2/18/98	RH-LHGW04-01	VOCT	Trimethylsilanol	ug/L	JN		23				Est. conc., tentative ID. (TIC)
2	187461	2/18/98	RH-LHGW05-01	VOCT	Trimethylsilanol	ug/L	JN		25				Est. conc., tentative ID. (TIC)
2	187458	2/18/98	RH-LHGW12-01	VOCT	Trimethylsilanol	ug/L	JN		13				Est. conc., tentative ID. (TIC)
2	187459	2/18/98	RH-LHGW13-01	VOCT	Trimethylsilanol	ug/L	JN		25				Est. conc., tentative ID. (TIC)
2	187462	2/18/98	RH-LHGW13-91	VOCT	Trimethylsilanol	ug/L	JN		18				Est. conc., tentative ID. (TIC)
2	187122	2/13/98	RH-GWP9D-01	VOCT	Undecane	ug/L	JN		2.2				Est. conc., tentative ID. (TIC)
2	187466	2/18/98	RH-LHGWP16S-01	IND	Volatile Fatty Acids	mg/L	J		17	3	NA	NA	Lab Duplicate QC exceeded
2	187467	2/18/98	RH-LHGWP16S-91	IND	Volatile Fatty Acids	mg/L	UJ	U		3	NA	NA	Lab Duplicate QC exceeded
6	188339	2/26/98	RH-GWFB03-01	MTL	Arsenic	ug/L	UJ	US		1	1	3	ICV/CCV criteria exceeded
6	188336	2/26/98	RH-GWP29S-01	MTL	Arsenic	ug/L	UJ	US		1	1	3	ICV/CCV criteria exceeded
6	188337	2/26/98	RH-GWP29S-91	MTL	Arsenic	ug/L	UJ	US		1	1	3	ICV/CCV criteria exceeded
6	188339	2/26/98	RH-GWFB03-01	MTL	Cadmium	ug/L	UJ	U		0.1	0.10	0.33	ICV/CCV criteria exceeded
6	188337	2/26/98	RH-GWP29S-91	MTL	Cadmium	ug/L	UJ	U		0.1	0.10	0.33	ICV/CCV criteria exceeded
6	188336	2/26/98	RH-GWP29S-01	MTL	Manganese	ug/L	U			0.3	0.3	1.0	Detected in associated blank
6	188336	2/26/98	RH-GWP29S-01	SVOC	bis(2-Ethylhexyl)phthalate	ug/L	J		32	1.3	1.3	4.1	Field Dup QC criteria exceeded
6	188337	2/26/98	RH-GWP29S-91	SVOC	bis(2-Ethylhexyl)phthalate	ug/L	J		19	1.3	1.2	3.8	Field Dup QC criteria exceeded

This table presents a summary of analytical results from the February 1998 sampling event at the Refuse Hideaway Landfill Site that were qualified during the data validation process.

SDG = Sample Delivery Group
DVQ = Data Validation Qualifier
- U = Undetected
- J = Estimated
- UJ = Undetected RDL estimated
- N = tentative identification (tentatively identified compound from library search)
- Q = Quantified by standard calibration procedure. This flag is used for compounds included in the initial and continuing calibration, but not presented in the QAPP target compound list. These results are qualified as usable, and are not estimated.

LQ = Laboratory Qualifier
- U = Undetected
- J = Estimated
- S = Method of Standard Additions
- B = Also detected in associated blank

RDL = Reported Detection Limit. Note the RDL may be adjusted when the sample result is less than 5x or 10x the associated blank concentrations.
LOD = Limit of detection
LOQ = Limit of Quantitation

Table B-3
Validated Groundwater Results - Semivolatiles
Refuse Hideaway Landfill
Middleton, Wisconsin

Parameter	UNIT	RH-GWP29S-01 2/26/98 CONC	LQ/DVQ	RDL	RH-GWP29S-91 2/26/98 CONC	LQ/DVQ	RDL	RH-GWFB03-01 2/26/98 CONC	LQ/DVQ	RDL
Semivolatiles										
Acenaphthene	ug/L		U/	1.4		U/	1.4		U/	1.4
Acenaphthylene	ug/L		U/	1.5		U/	1.5		U/	1.5
Anthracene	ug/L		U/	1.2		U/	1.2		U/	1.2
Benzo(a)Anthracene	ug/L		U/	0.63		U/	0.63		U/	0.63
Benzo(a)Pyrene	ug/L		U/	1.4		U/	1.4		U/	1.4
Benzo(b)Fluoranthene	ug/L		U/	2.4		U/	2.4		U/	2.4
Benzo(G,H,I)Perylene	ug/L		U/	2.1		U/	2.1		U/	2.1
Benzo(k)Fluoranthene	ug/L		U/	2.5		U/	2.5		U/	2.5
Bis(2-Chloroethoxy)Methane	ug/L		U/	1.0		U/	1.0		U/	1.0
Bis(2-Chloroethyl)Ether	ug/L		U/	1.3		U/	1.3		U/	1.3
Bis(2-Ethylhexyl)Phthalate	ug/L	32	/J	1.3	19	/J	1.3		U/	1.3
4-Bromophenyl-phenylether	ug/L		U/	1.9		U/	1.9		U/	1.9
Butylbenzylphthalate	ug/L		U/	0.59		U/	0.59		U/	0.59
2-Chloronaphthalene	ug/L		U/	1.9		U/	1.9		U/	1.9
2-Chlorophenol	ug/L		U/	0.93		U/	0.93		U/	0.93
4-Chlorophenyl-phenylether	ug/L		U/	2.2		U/	2.2		U/	2.2
Chrysene	ug/L		U/	0.48		U/	0.48		U/	0.48
Di-N-Butylphthalate	ug/L		U/	0.86		U/	0.86		U/	0.86
Di-N-Octylphthalate	ug/L		U/	2.5		U/	2.5		U/	2.5
Dibenz(A,H)Anthracene	ug/L		U/	2.4		U/	2.4		U/	2.4
1,2-Dichlorobenzene	ug/L		U/	2.3		U/	2.3		U/	2.3
1,3-Dichlorobenzene	ug/L		U/	2.7		U/	2.7		U/	2.7
1,4-Dichlorobenzene	ug/L		U/	2.5		U/	2.5		U/	2.5
3,3-Dichlorobenzidine	ug/L		U/	0.70		U/	0.70		U/	0.70
2,4-Dichlorophenol	ug/L		U/	0.99		U/	0.99		U/	0.99
Diethylphthalate	ug/L		U/	0.73		U/	0.73		U/	0.73
2,4-Dimethylphenol	ug/L		U/	1.1		U/	1.1		U/	1.1
Dimethylphthalate	ug/L		U/	0.67		U/	0.67		U/	0.67
2,4-Dinitrophenol	ug/L		U/	2.0		U/	2.0		U/	2.0
2,4-Dinitrotoluene	ug/L		U/	0.77		U/	0.77		U/	0.77
2,6-Dinitrotoluene	ug/L		U/	1.0		U/	1.0		U/	1.0
Fluoranthene	ug/L		U/	0.96		U/	0.96		U/	0.96
Fluorene	ug/L		U/	1.6		U/	1.6		U/	1.6
Hexachlorobenzene	ug/L		U/	1.8		U/	1.8		U/	1.8
Hexachlorobutadiene	ug/L		U/	3.0		U/	3.0		U/	3.0
Hexachlorocyclopentadiene	ug/L		U/	3.8		U/	3.8		U/	3.8
Hexachloroethane	ug/L		U/	2.7		U/	2.7		U/	2.7
Indeno(1,2,3-Cd)Pyrene	ug/L		U/	2.3		U/	2.3		U/	2.3
Isophorone	ug/L		U/	1.1		U/	1.1		U/	1.1
4-Methylphenol	ug/L		U/	0.97		U/	0.97		U/	0.97
Naphthalene	ug/L		U/	2.2		U/	2.2		U/	2.2
Nitrobenzene	ug/L		U/	1.0		U/	1.0		U/	1.0
2-Nitrophenol	ug/L		U/	0.89		U/	0.89		U/	0.89
4-Nitrophenol	ug/L		U/	2.7		U/	2.7		U/	2.7
N-Nitroso-Di-N-Propylamine	ug/L		U/	0.38		U/	0.38		U/	0.38
N-Nitrosodiphenylamine	ug/L		U/	1.2		U/	1.2		U/	1.2
Pentachlorophenol	ug/L		U/	2.5		U/	2.5		U/	2.5

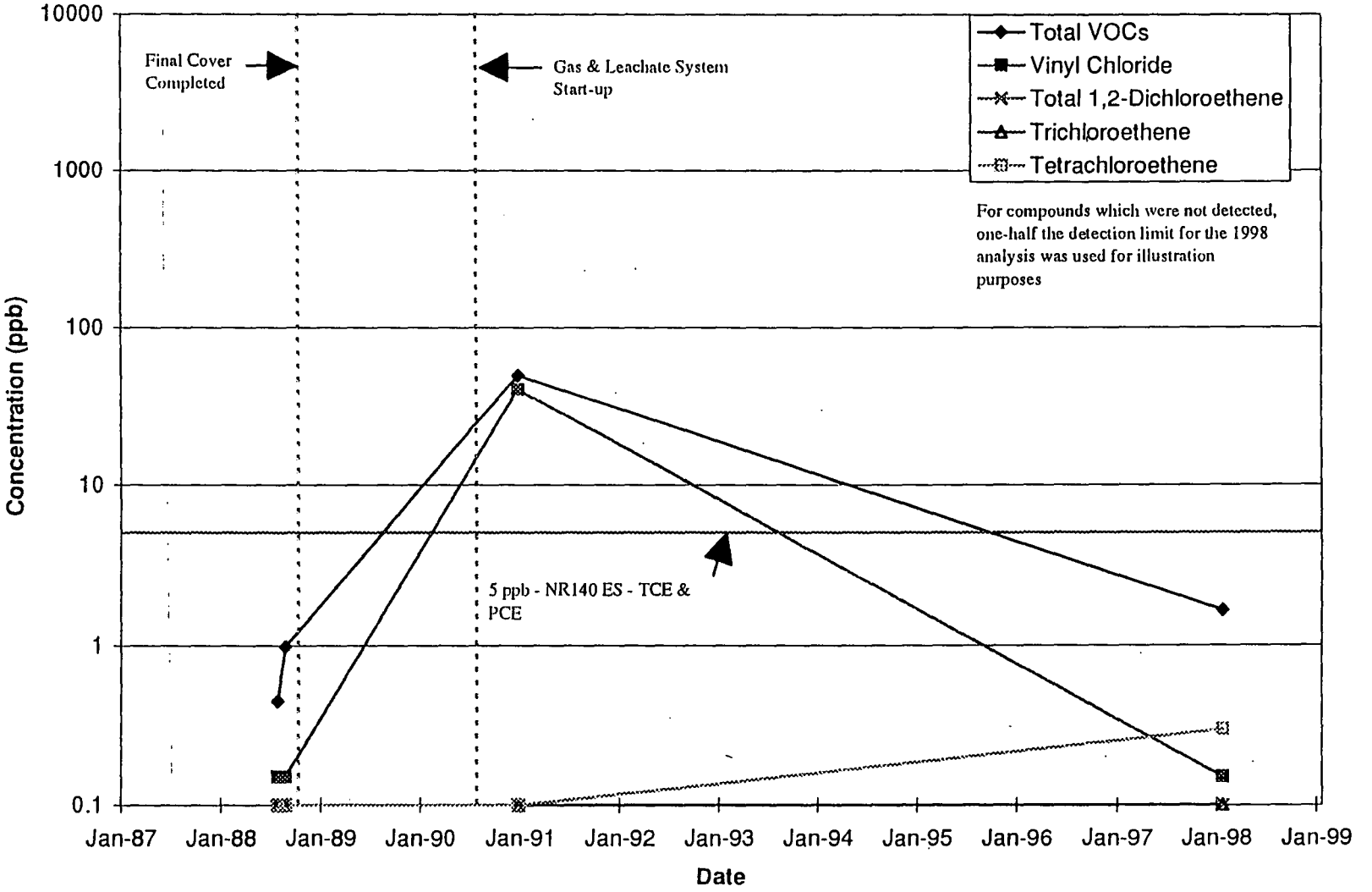
Table B-3
Validated Groundwater Results - Semivolatiles
Refuse Hideaway Landfill
Middleton, Wisconsin

Parameter	UNIT	RH-GWP29S-01 2/26/98 CONC	LQ/DVQ	RDL	RH-GWP29S-91 2/26/98 CONC	LQ/DVQ	RDL	RH-GWFB03-01 2/26/98 CONC	LQ/DVQ	RDL
Phenanthrene	ug/L		U/	0.76		U/	0.76		U/	0.76
Phenol	ug/L		U/	0.53		U/	0.53		U/	0.53
Pyrene	ug/L		U/	0.73		U/	0.73		U/	0.73
1,2,4-Trichlorobenzene	ug/L		U/	2.9		U/	2.9		U/	2.9
2,4,5-Trichlorophenol	ug/L		U/	1.2		U/	1.2		U/	1.2
2,4,6-Trichlorophenol	ug/L		U/	0.78		U/	0.78		U/	0.78
bis(2-Chloroisopropyl)ether	ug/L		U/	2.2		U/	2.2		U/	2.2
4-Nitroaniline	ug/L		U/	1.8		U/	1.8		U/	1.8
2-Methylphenol	ug/L		U/	1.0		U/	1.0		U/	1.0
2-Methylnaphthalene	ug/L		U/	2.0		U/	2.0		U/	2.0
Carbazole	ug/L		U/	1.0		U/	1.0		U/	1.0
2-Nitroaniline	ug/L		U/	0.97		U/	0.97		U/	0.97
3-Nitroaniline	ug/L		U/	1.2		U/	1.2		U/	1.2
4,6-Dinitro-2-methylphenol	ug/L		U/	0.87		U/	0.87		U/	0.87
Dibenzofuran	ug/L		U/	1.8		U/	1.8		U/	1.8
4-Chloroaniline	ug/L		U/	1.2		U/	1.2		U/	1.2
4-Chloro-3-methylphenol	ug/L		U/	1.0		U/	1.0		U/	1.0
Pesticide/PCBs										
alpha-BHC	ug/L		U/	0.011		U/	0.011		U/	0.011
beta-BHC	ug/L		U/	0.015		U/	0.015		U/	0.015
delta-BHC	ug/L		U/	0.011		U/	0.011		U/	0.011
gamma-BHC (Lindane)	ug/L		U/	0.012		U/	0.012		U/	0.012
Heptachlor	ug/L		U/	0.018		U/	0.018		U/	0.018
Aldrin	ug/L		U/	0.012		U/	0.012		U/	0.012
Heptachlor epoxide	ug/L		U/	0.011		U/	0.011		U/	0.011
Endosulfan I	ug/L		U/	0.011		U/	0.011		U/	0.011
Dieldrin	ug/L		U/	0.031		U/	0.031		U/	0.031
4,4-DDE	ug/L		U/	0.02		U/	0.02		U/	0.02
Endrin	ug/L		U/	0.032		U/	0.032		U/	0.032
Endosulfan II	ug/L		U/	0.018		U/	0.018		U/	0.018
4,4-DDD	ug/L		U/	0.025		U/	0.025		U/	0.025
Endosulfan sulfate	ug/L		U/	0.018		U/	0.018		U/	0.018
4,4-DDT	ug/L		U/	0.022		U/	0.022		U/	0.022
Endrin ketone	ug/L		U/	0.025		U/	0.025		U/	0.025
Methoxychlor	ug/L		U/	0.18		U/	0.18		U/	0.18
alpha-Chlordane	ug/L		U/	0.0093		U/	0.0093		U/	0.0093
Endrin aldehyde	ug/L		U/	0.018		U/	0.018		U/	0.018
Toxaphene	ug/L		U/	1.1		U/	1.1		U/	1.1
Aroclor-1016	ug/L		U/	0.31		U/	0.31		U/	0.31
Aroclor-1221	ug/L		U/	0.31		U/	0.31		U/	0.31
Aroclor-1232	ug/L		U/	0.31		U/	0.31		U/	0.31
Aroclor-1242	ug/L		U/	0.31		U/	0.31		U/	0.31
Aroclor-1248	ug/L		U/	0.31		U/	0.31		U/	0.31
Aroclor-1254	ug/L		U/	0.31		U/	0.31		U/	0.31
Aroclor-1260	ug/L		U/	0.31		U/	0.31		U/	0.31
Chlordane	ug/L		U/	0.0089		U/	0.0089		U/	0.0089

C

INDIVIDUAL WELL WATER QUALITY GRAPHS

P03S



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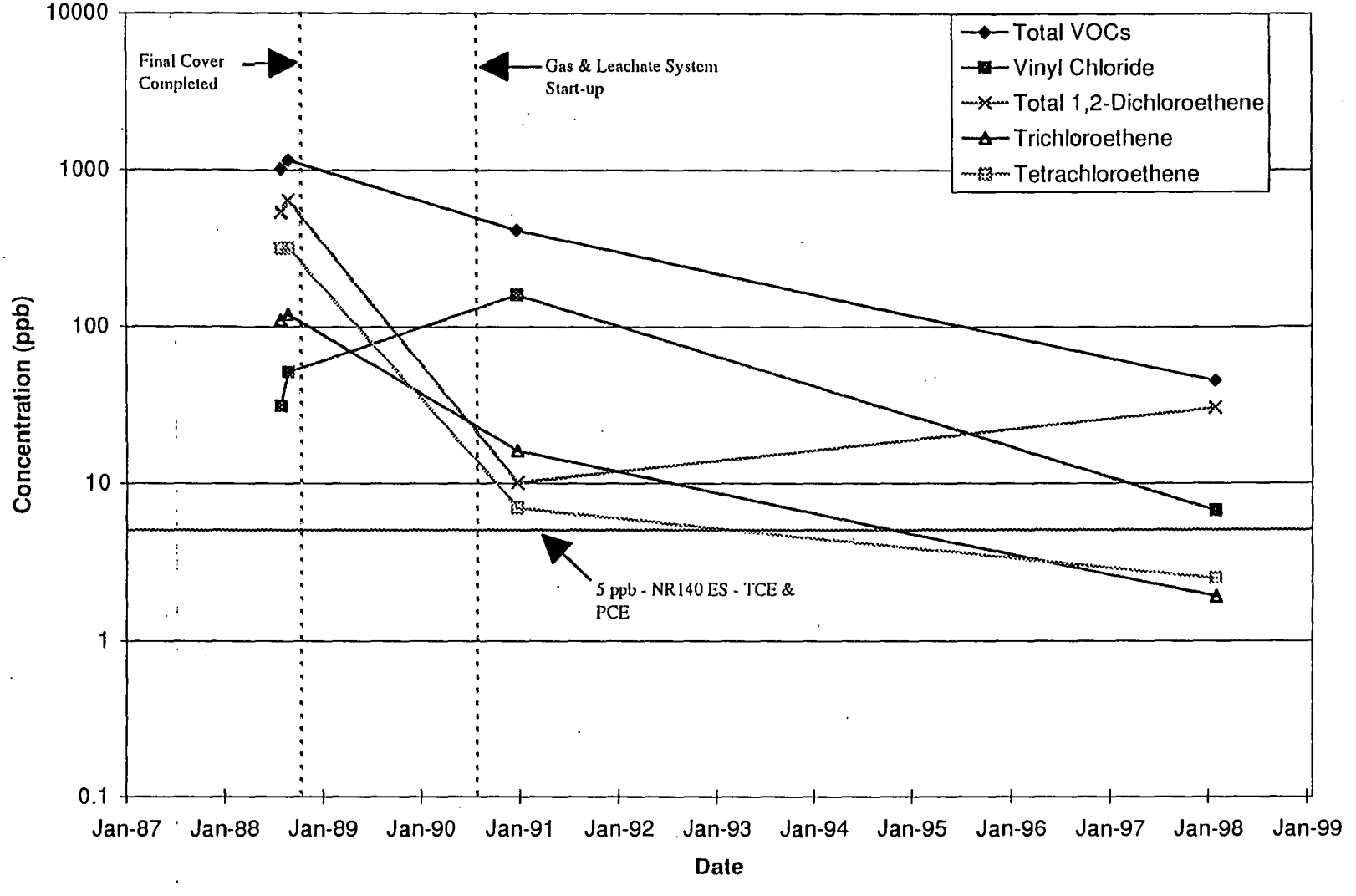
Note: Concentration scale is logarithmic.

P08S



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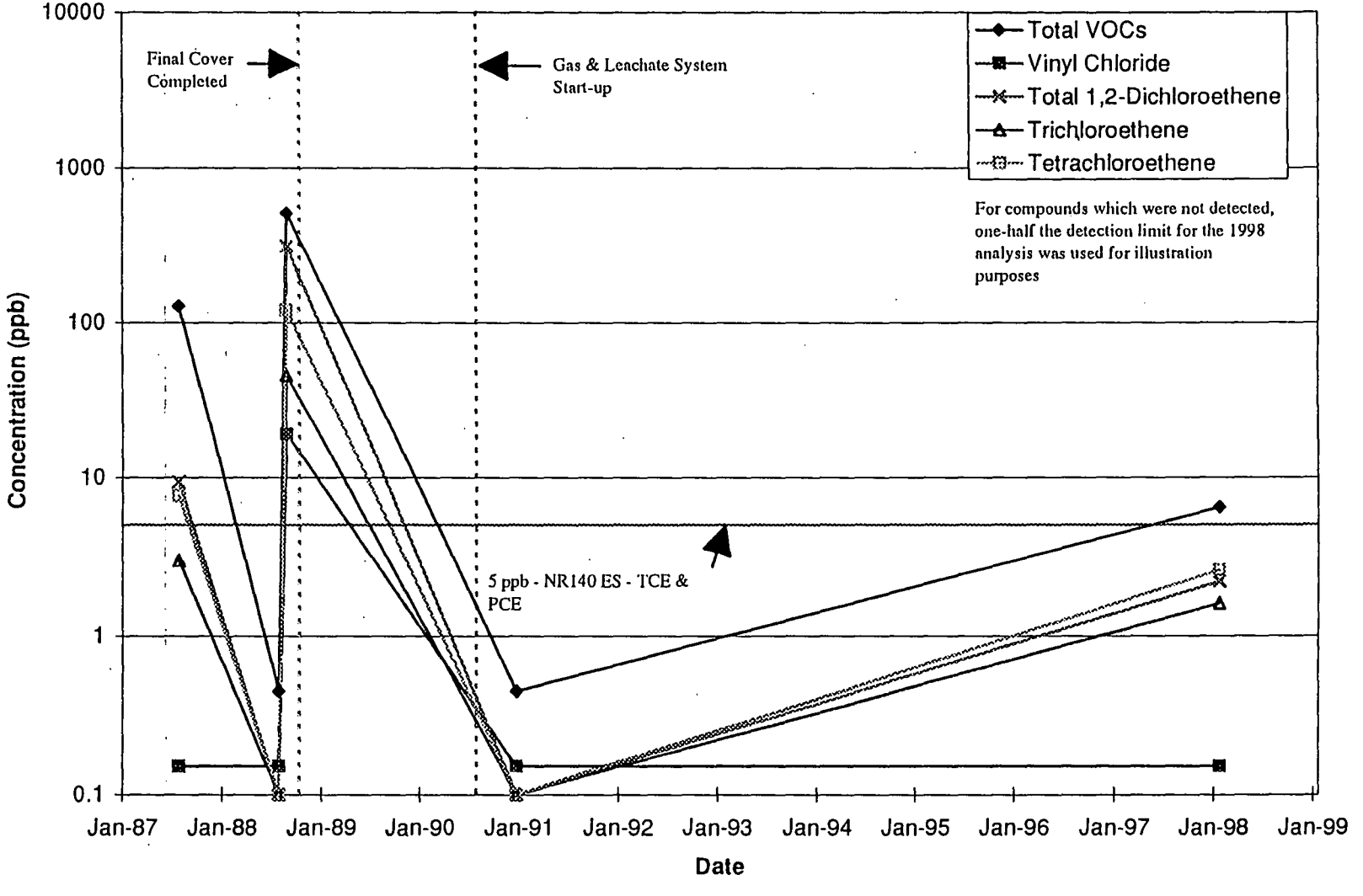
Note: Concentration scale is logarithmic.

P08D



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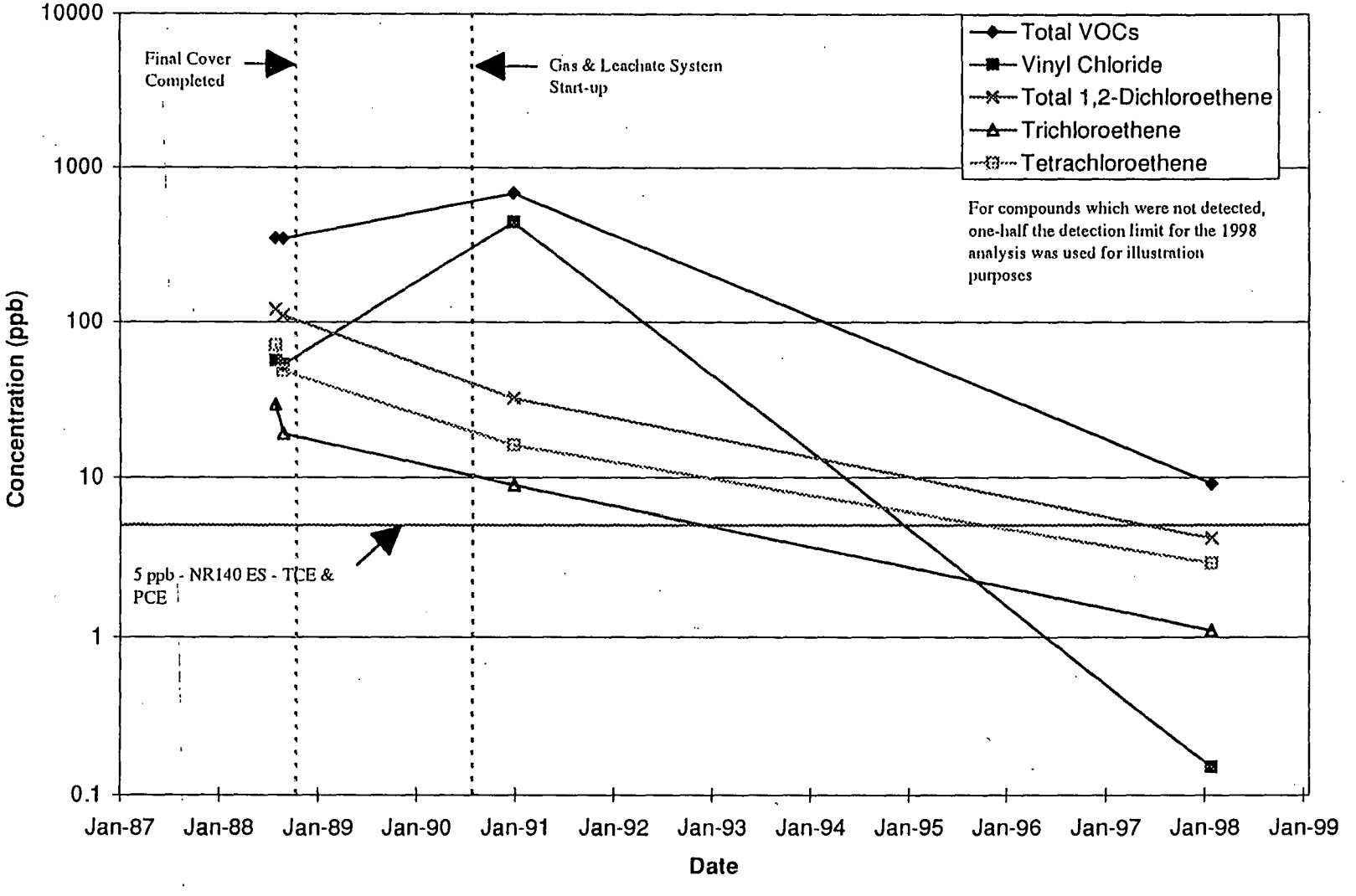
Note: Concentration scale is logarithmic.

P09S



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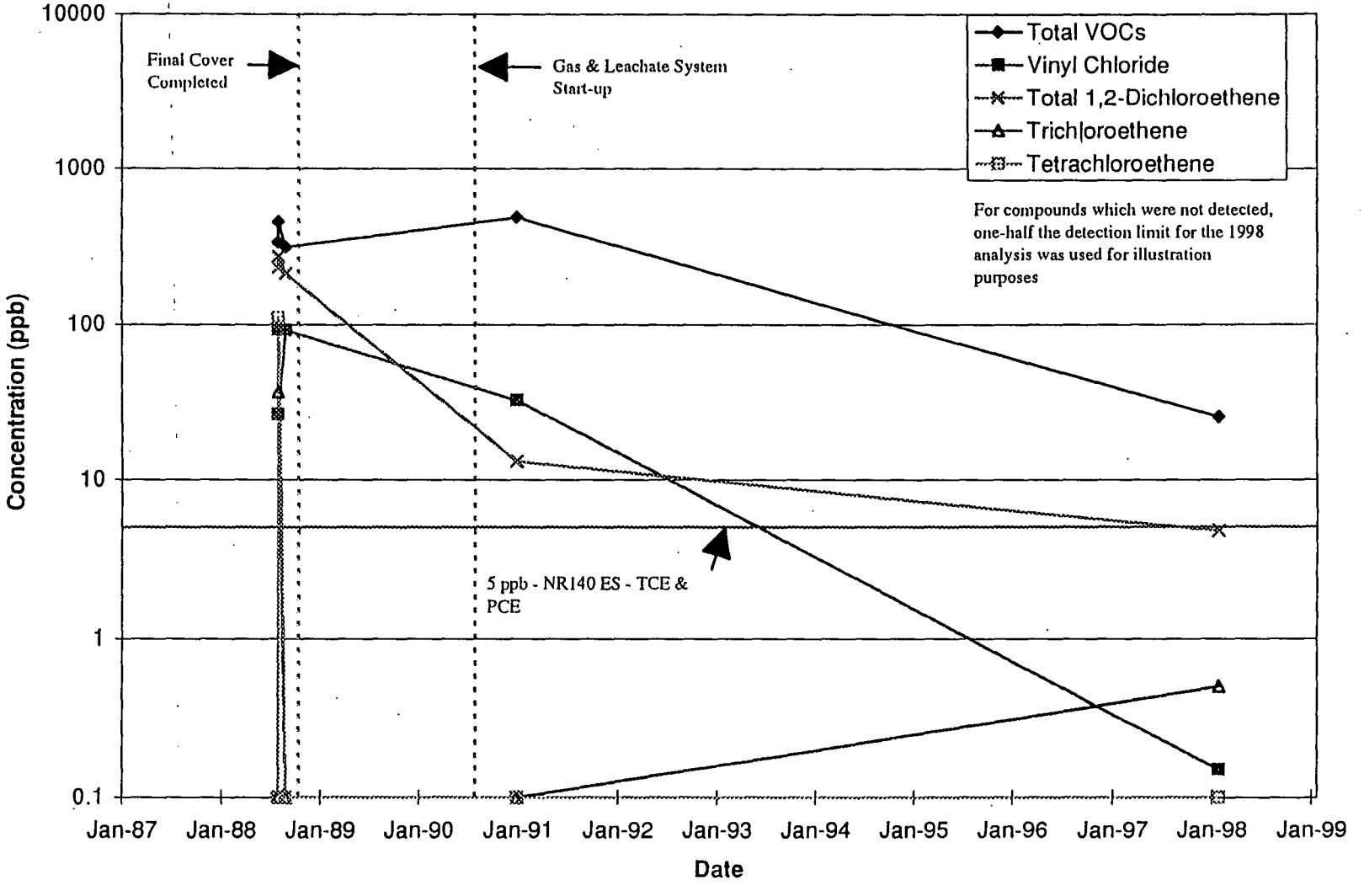
Note: Concentration scale is logarithmic.

P09D



Note: Concentration scale is logarithmic.

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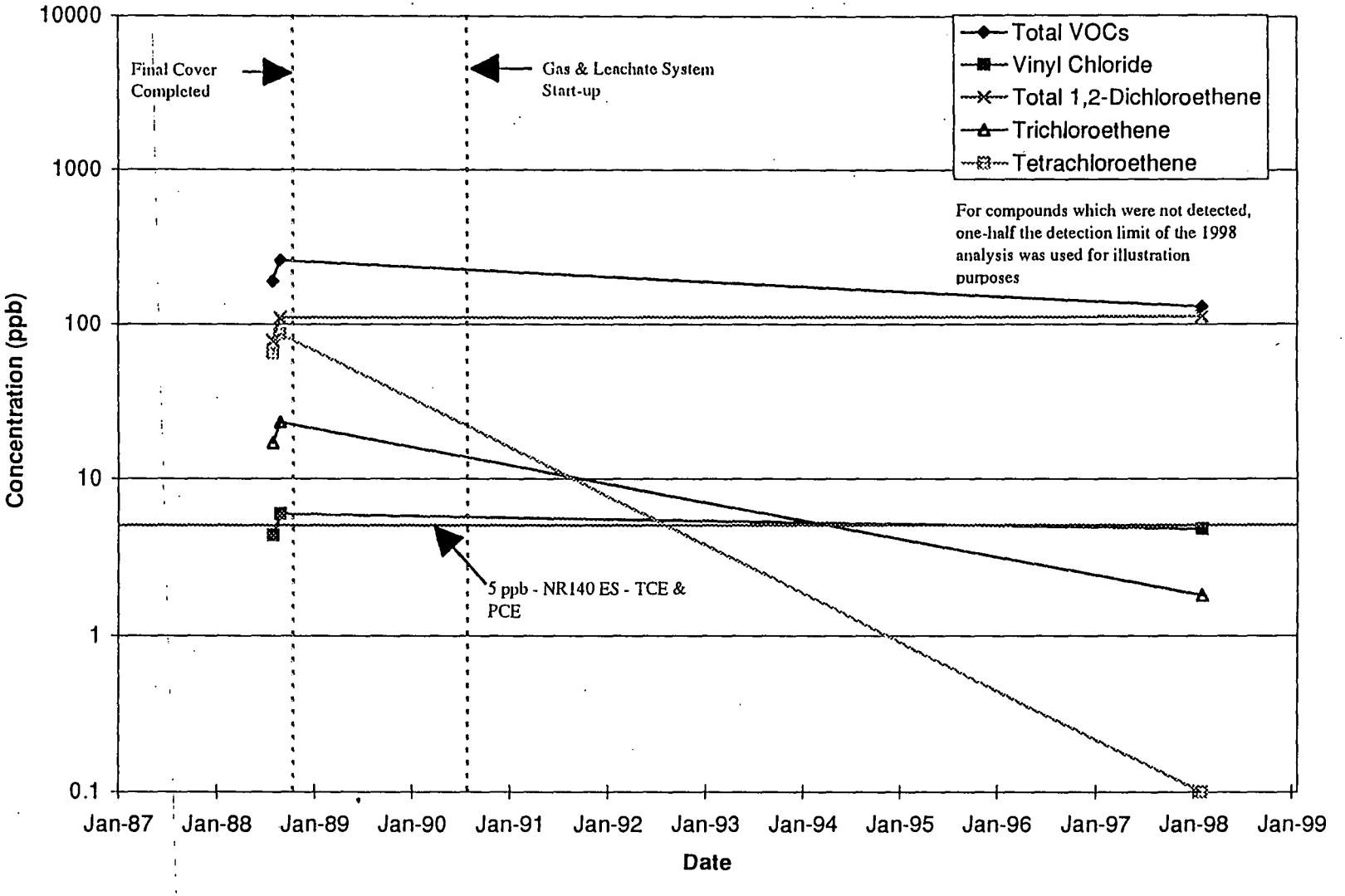
P16S



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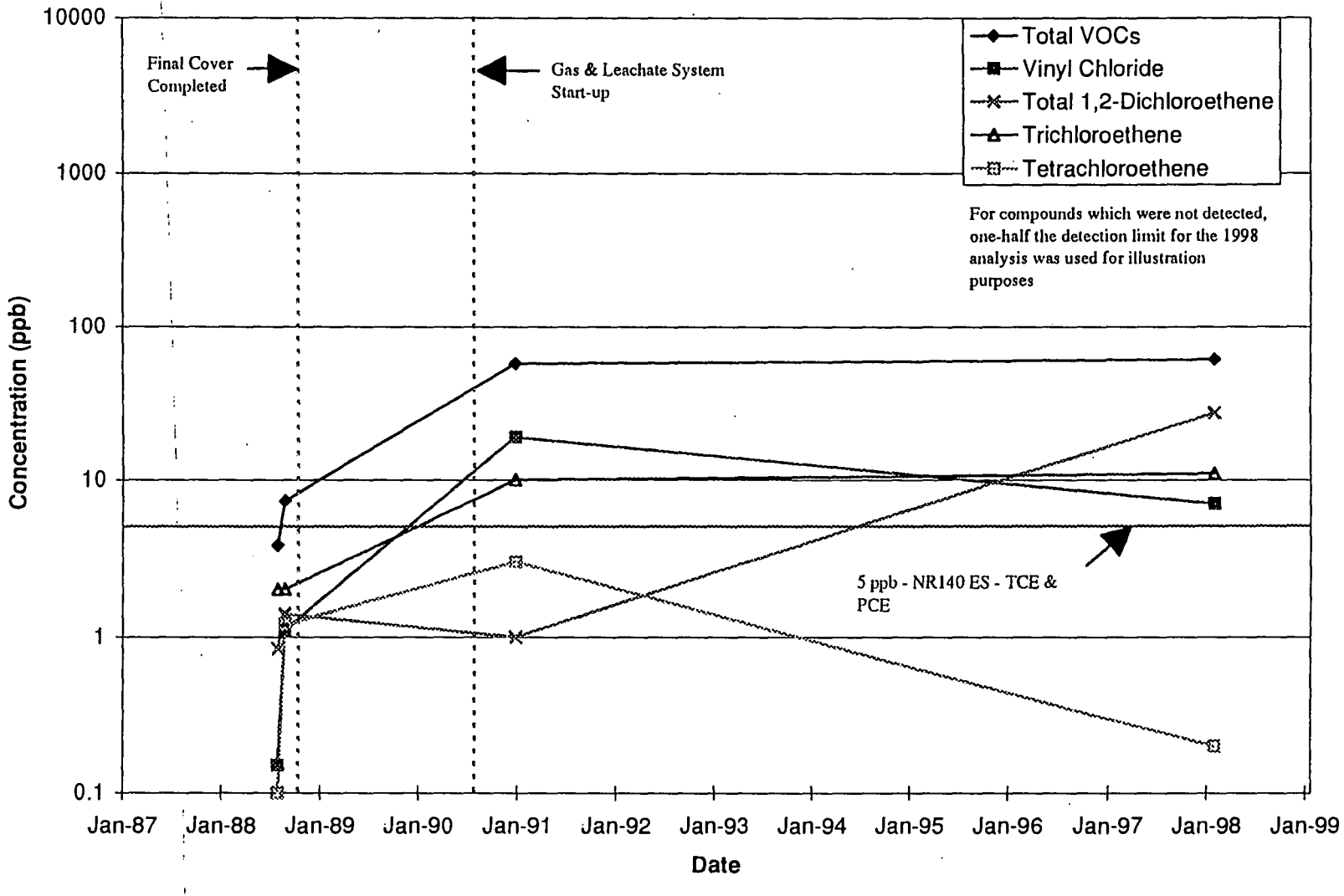
Note: Concentration scale is logarithmic.

P16D



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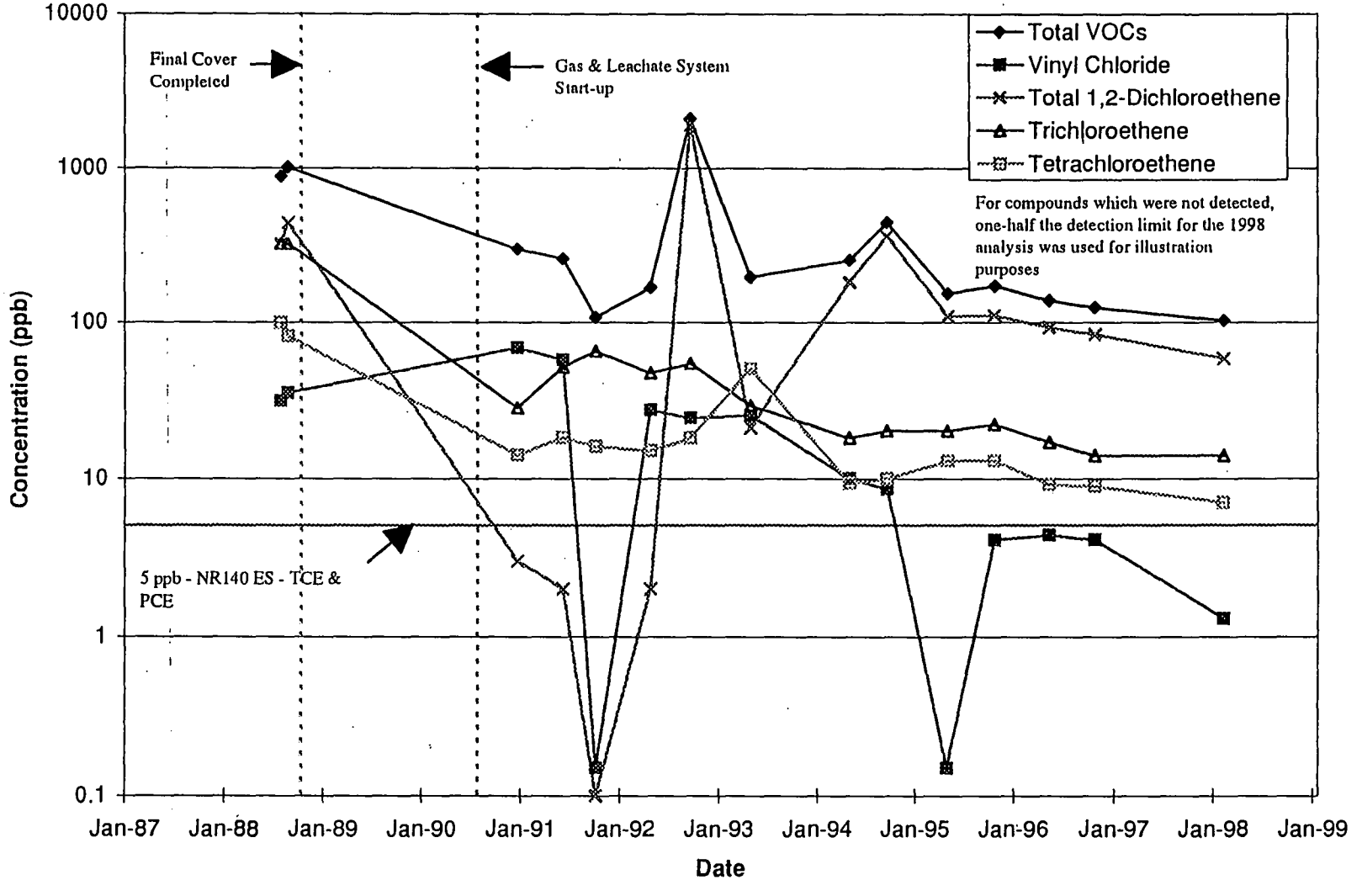
Note: Concentration scale is logarithmic.

P17S



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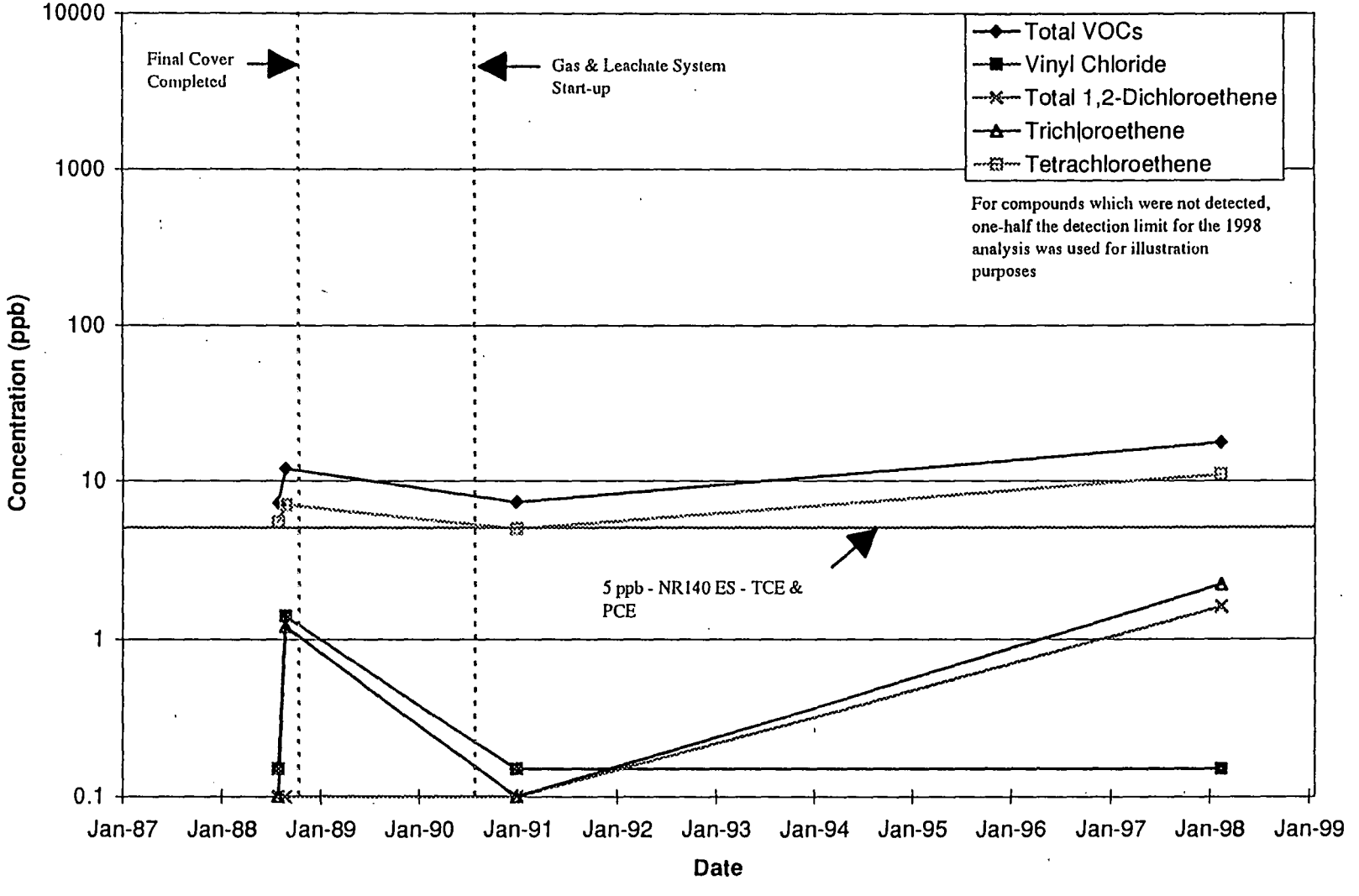
Note: Concentration scale is logarithmic.

P18S



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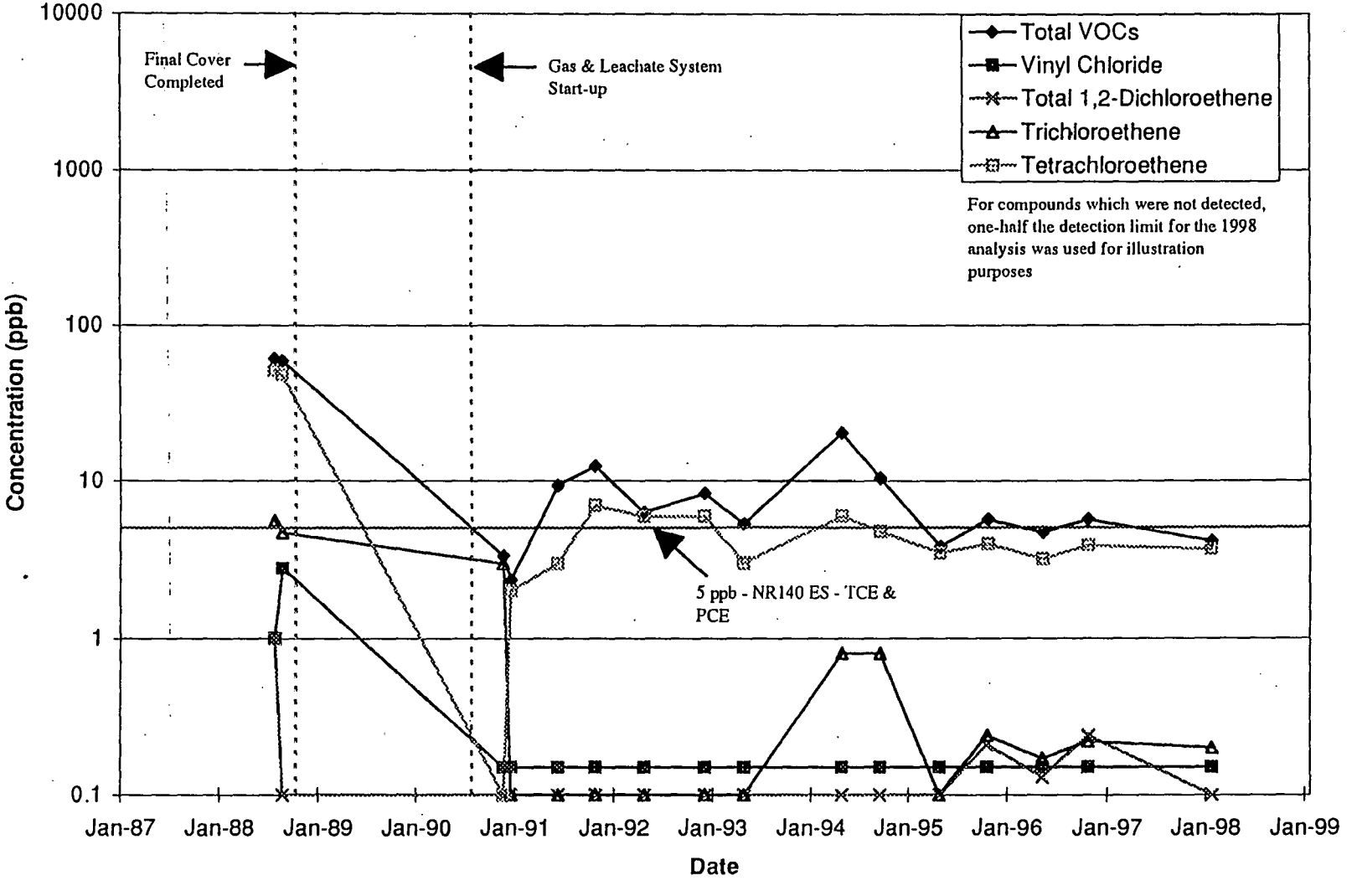
Note: Concentration scale is logarithmic.

P20S/P20SR



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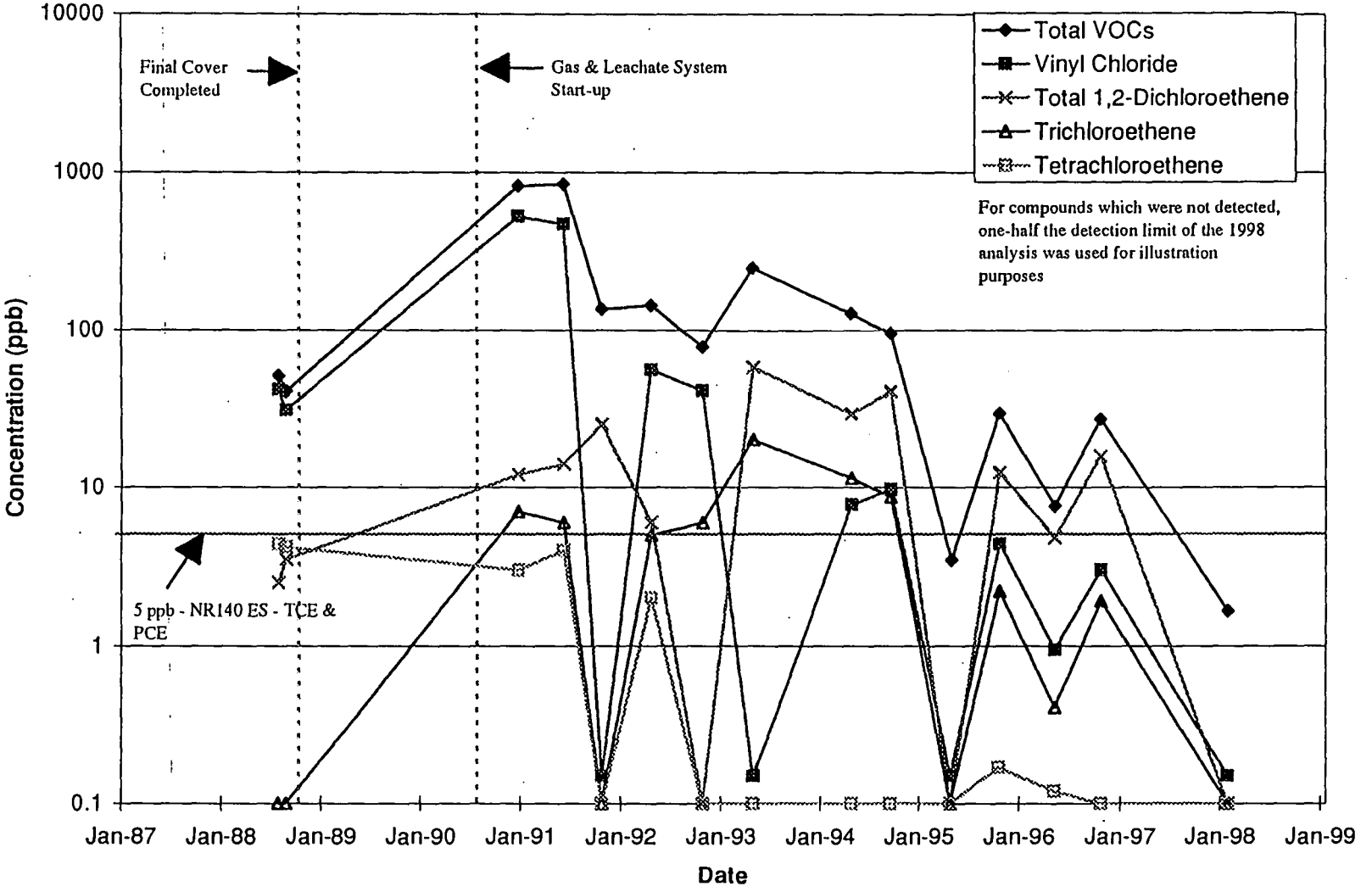
Note: Concentration scale is logarithmic.

P21S



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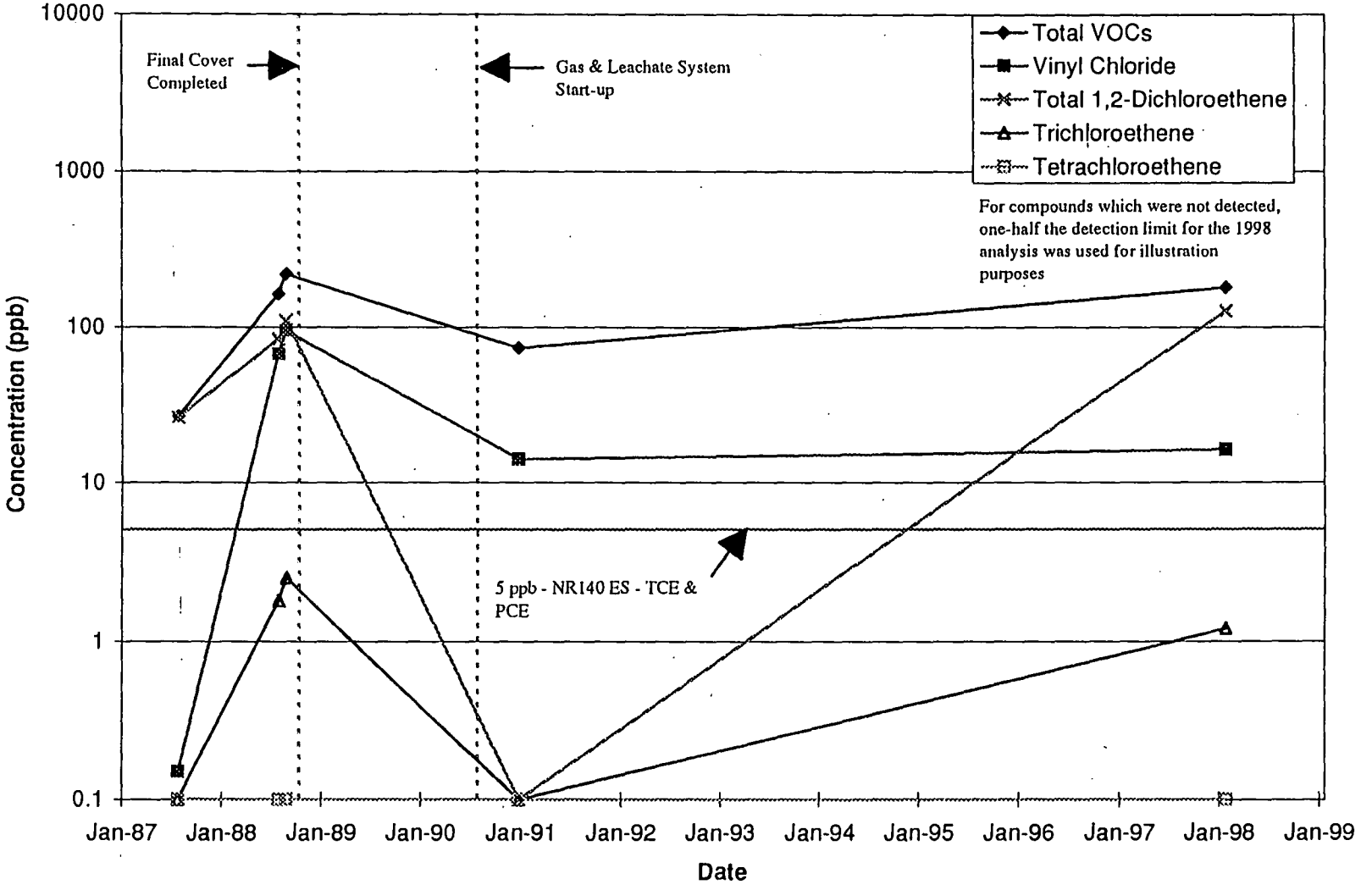
Note: Concentration scale is logarithmic.

P21D



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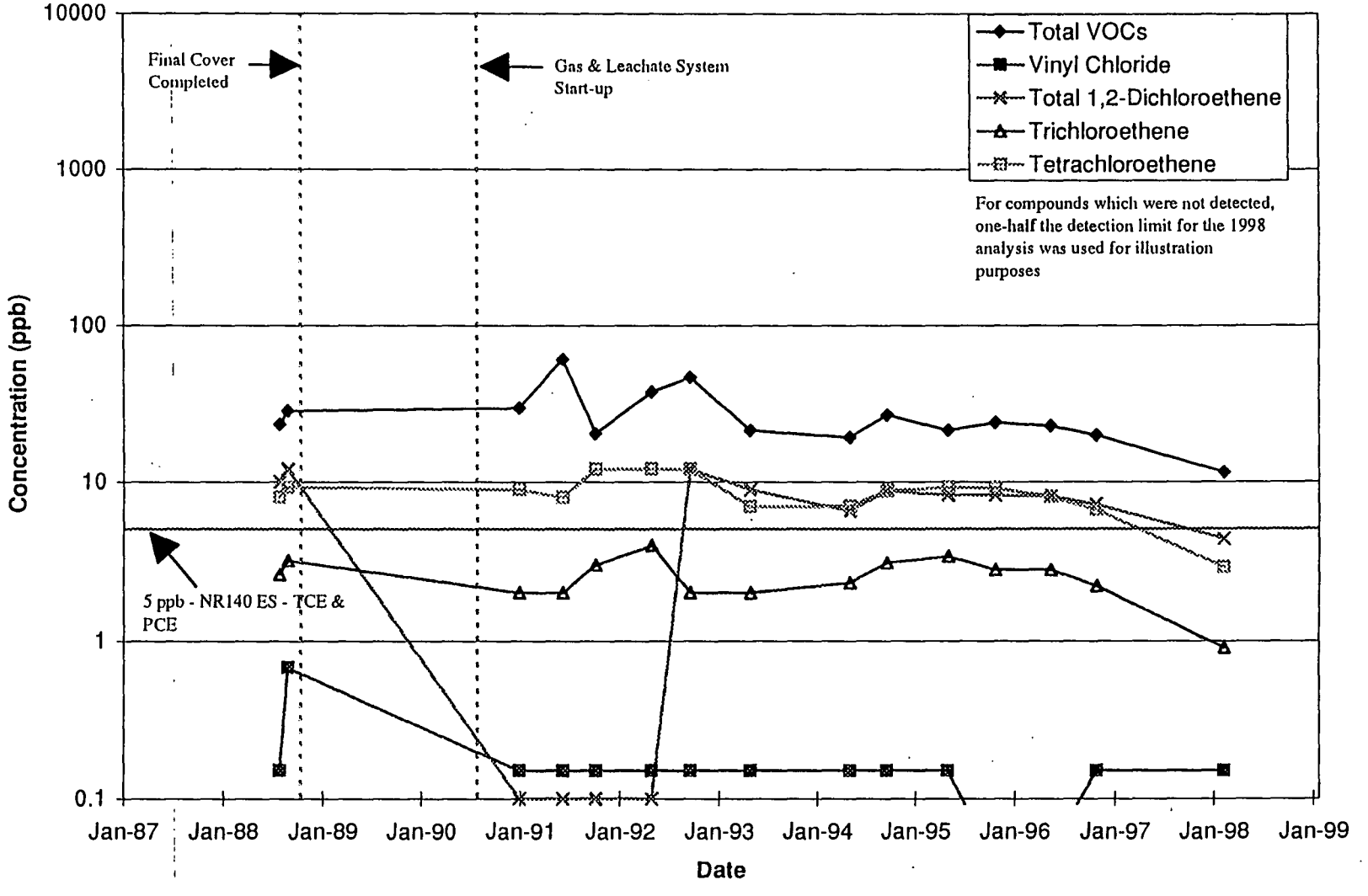
Note: Concentration scale is logarithmic.

P22S



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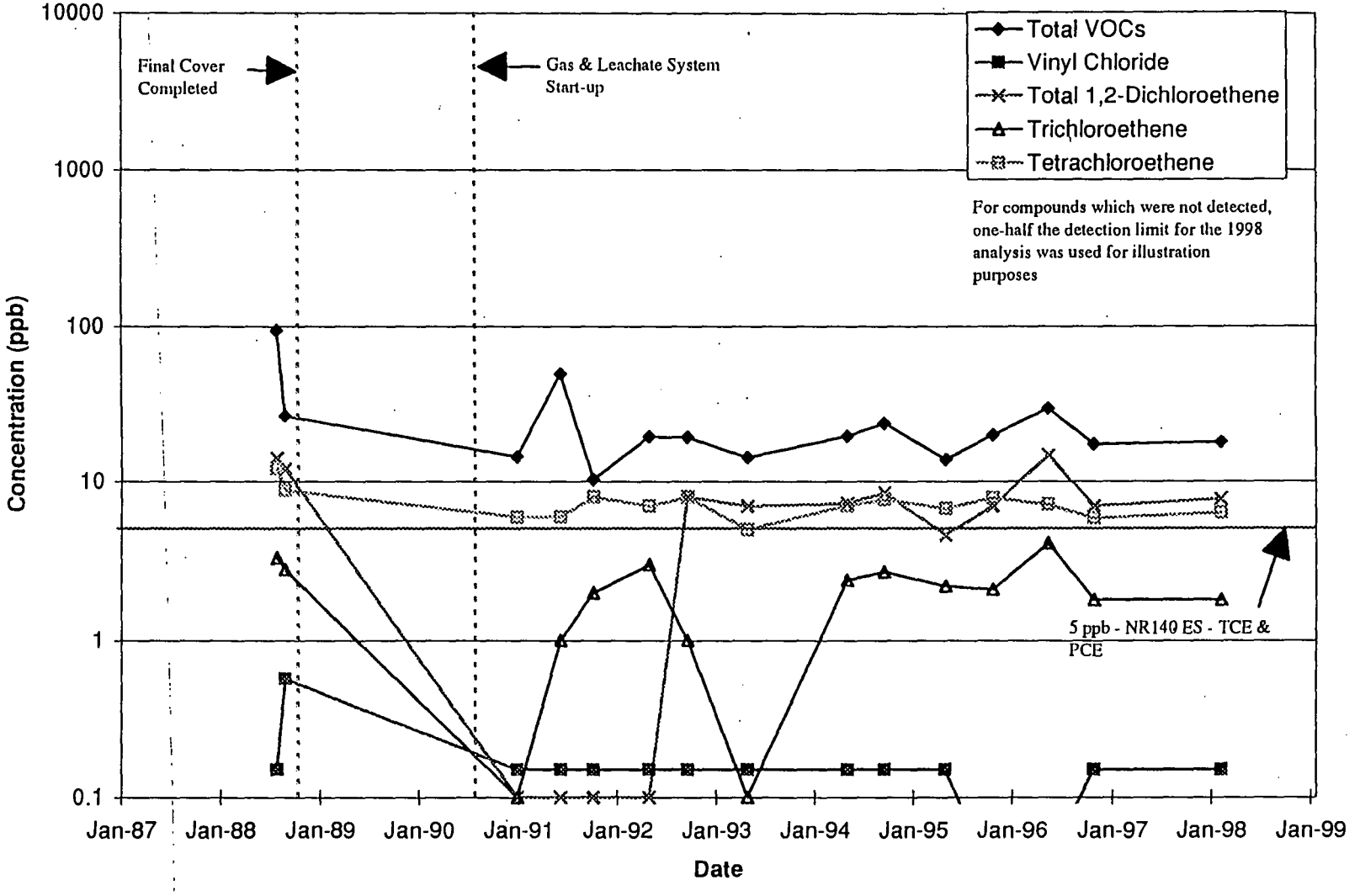
Note: Concentration scale is logarithmic.

P22D



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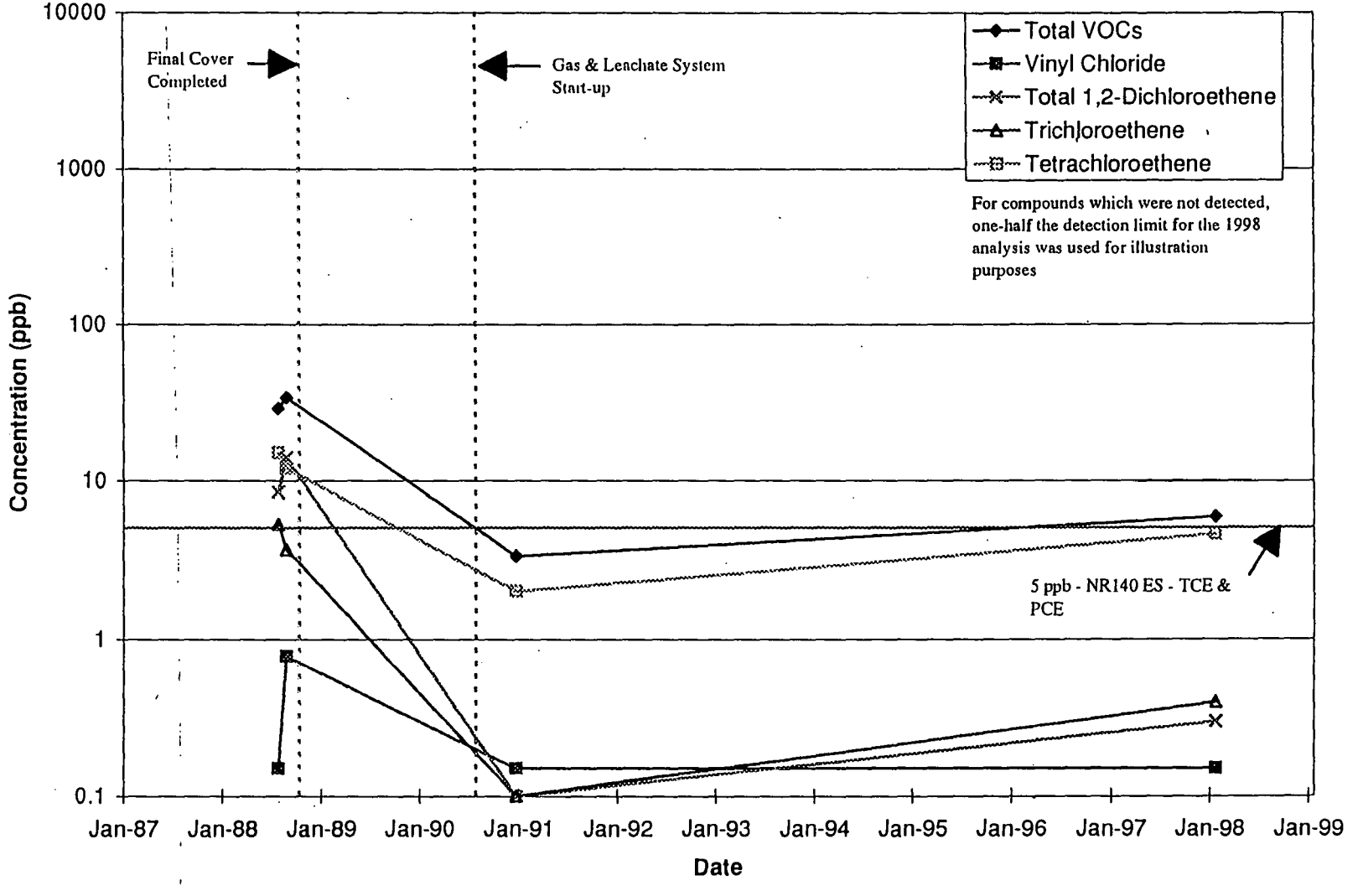
Note: Concentration scale is logarithmic.

P23S



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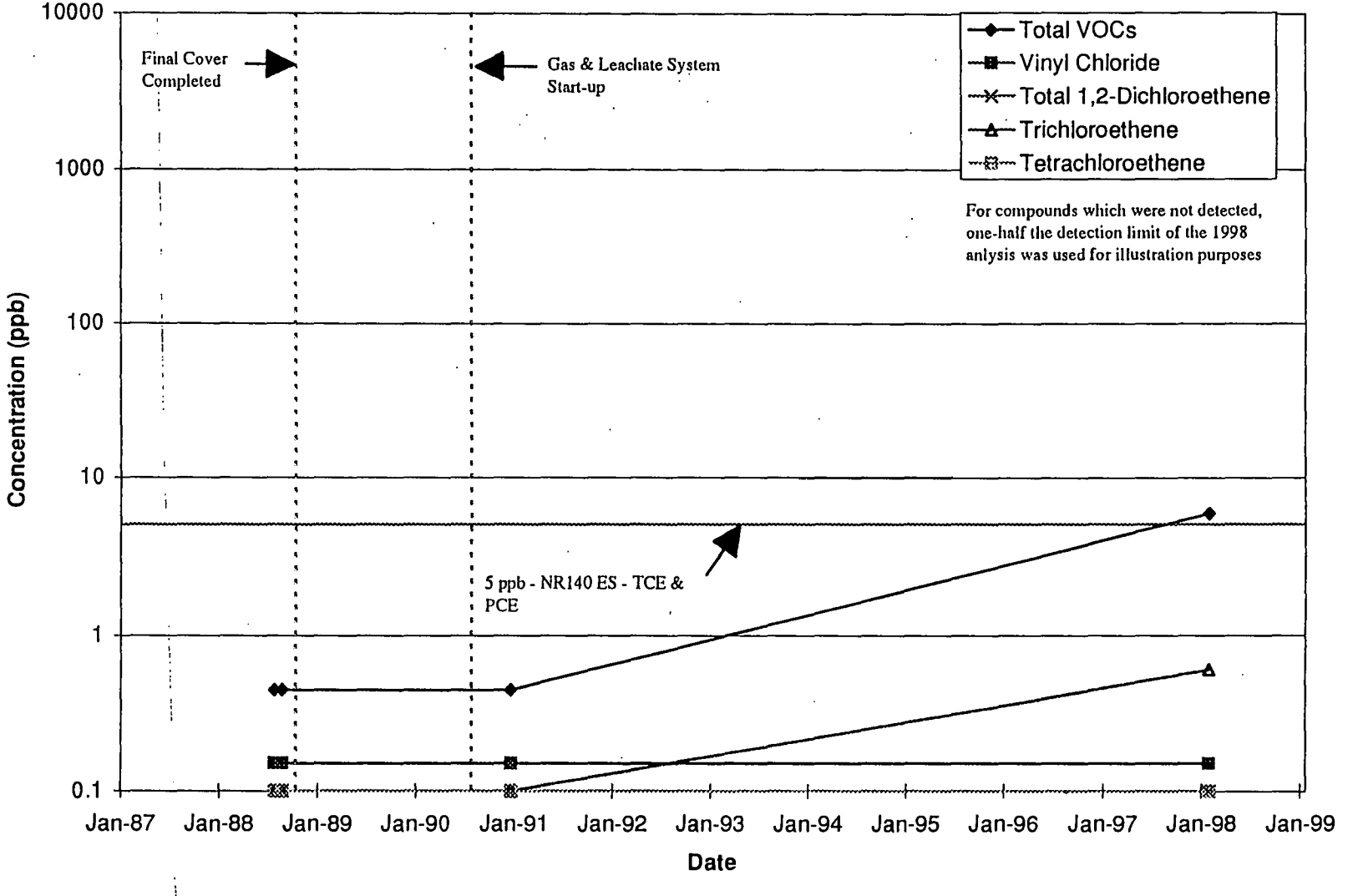
Note: Concentration scale is logarithmic.

P25S



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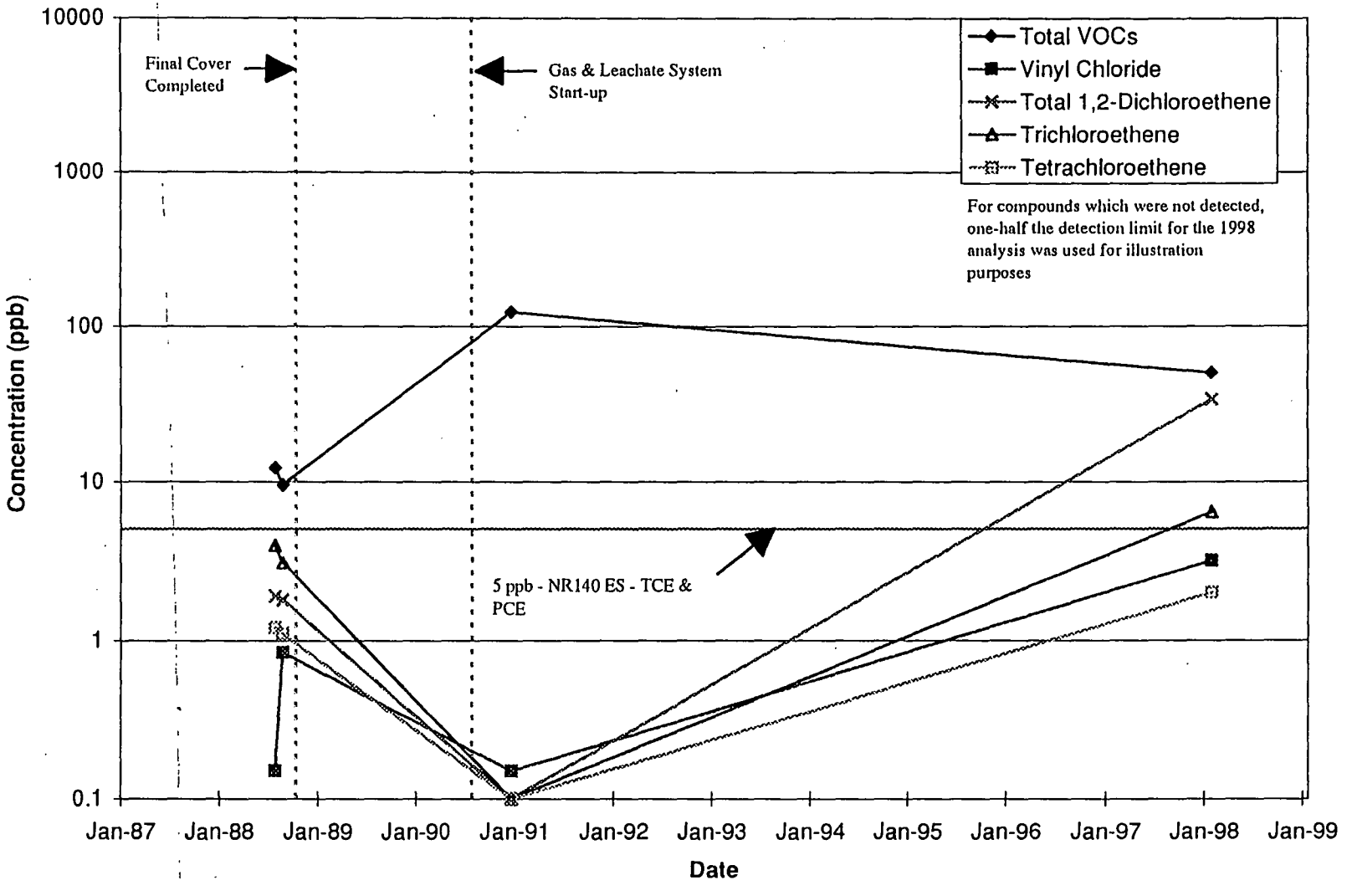
Note: Concentration scale is logarithmic.

P25D



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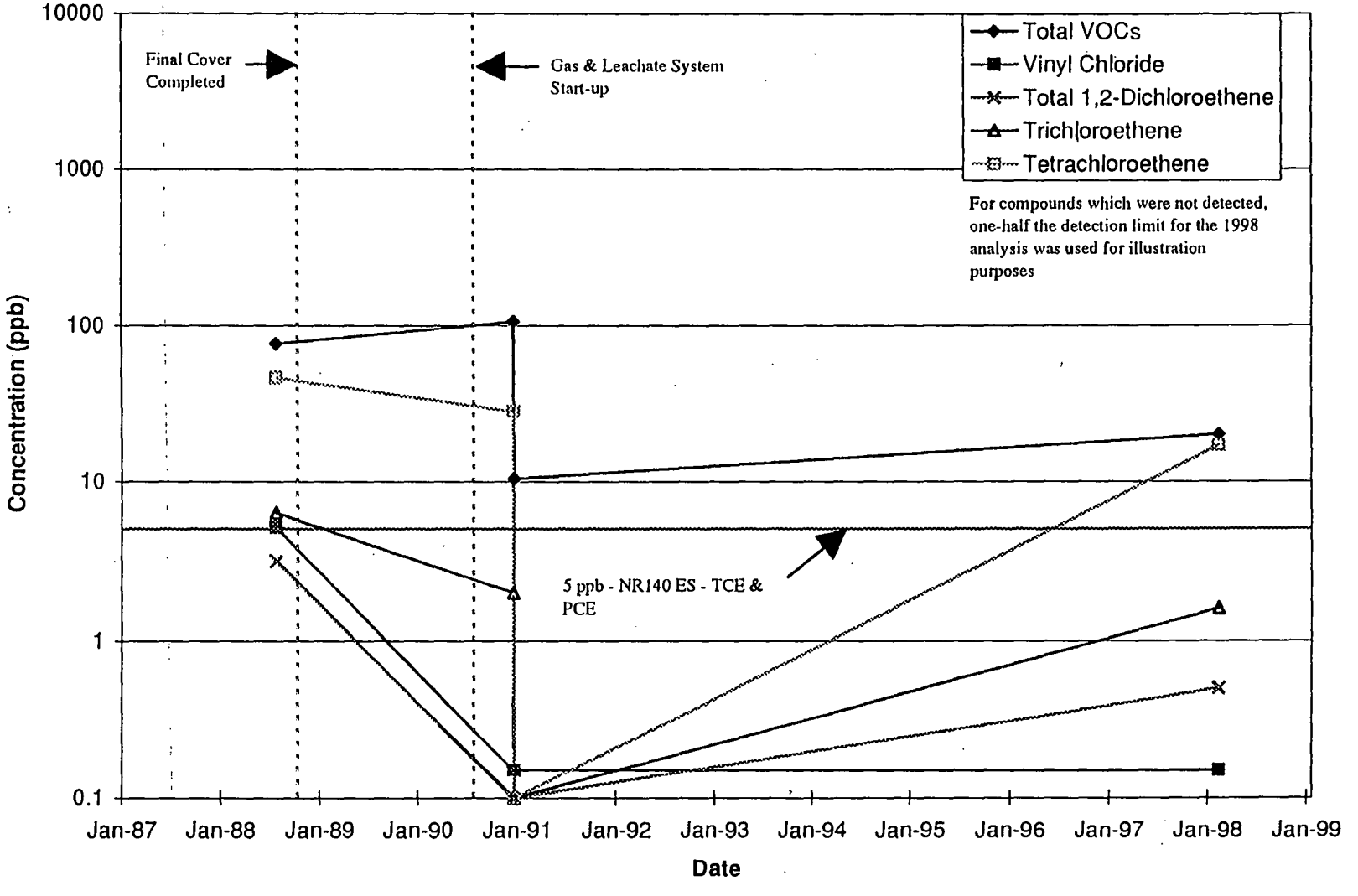
Note: Concentration scale is logarithmic.

P26D



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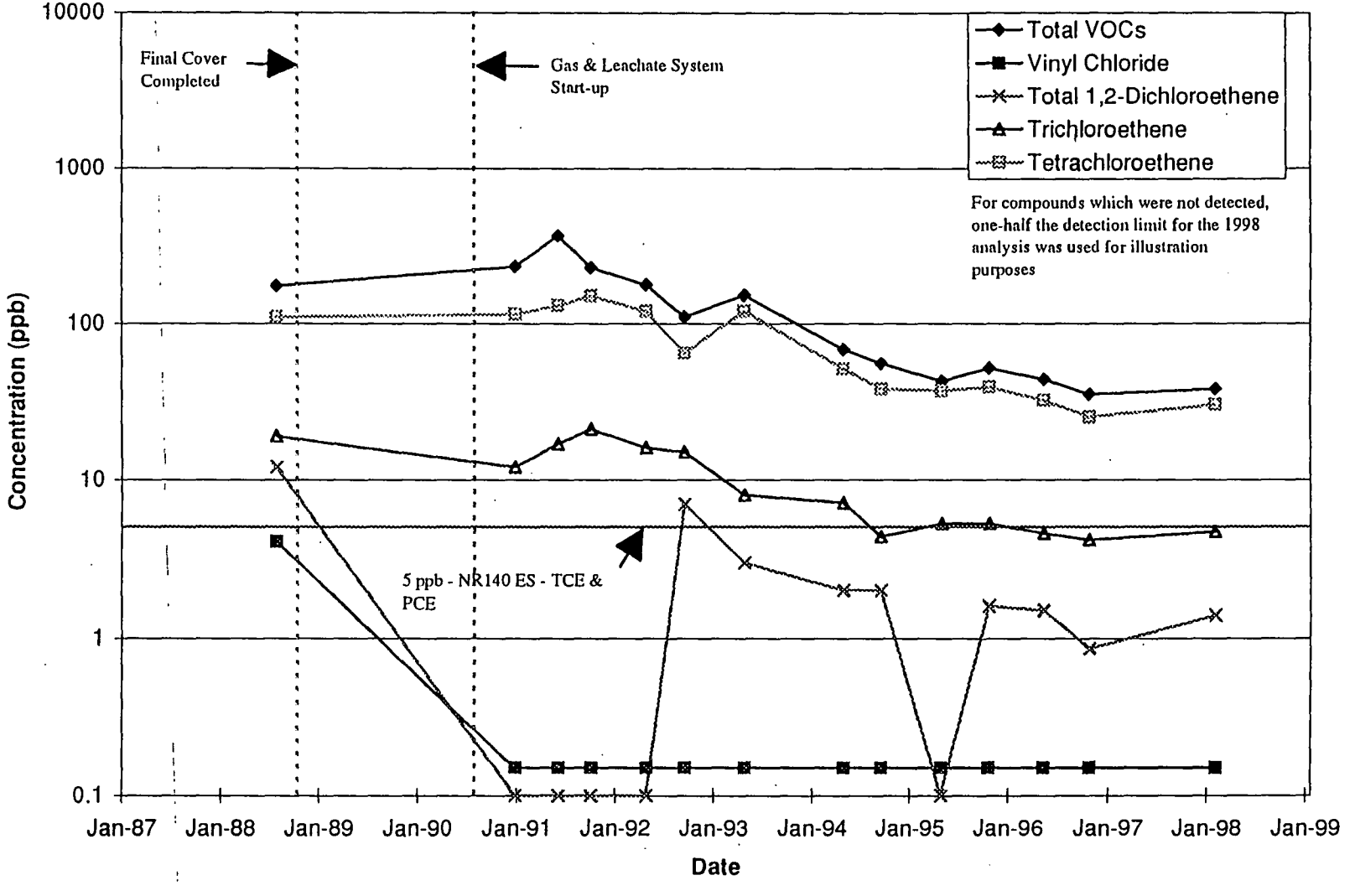
Note: Concentration scale is logarithmic.

P27S



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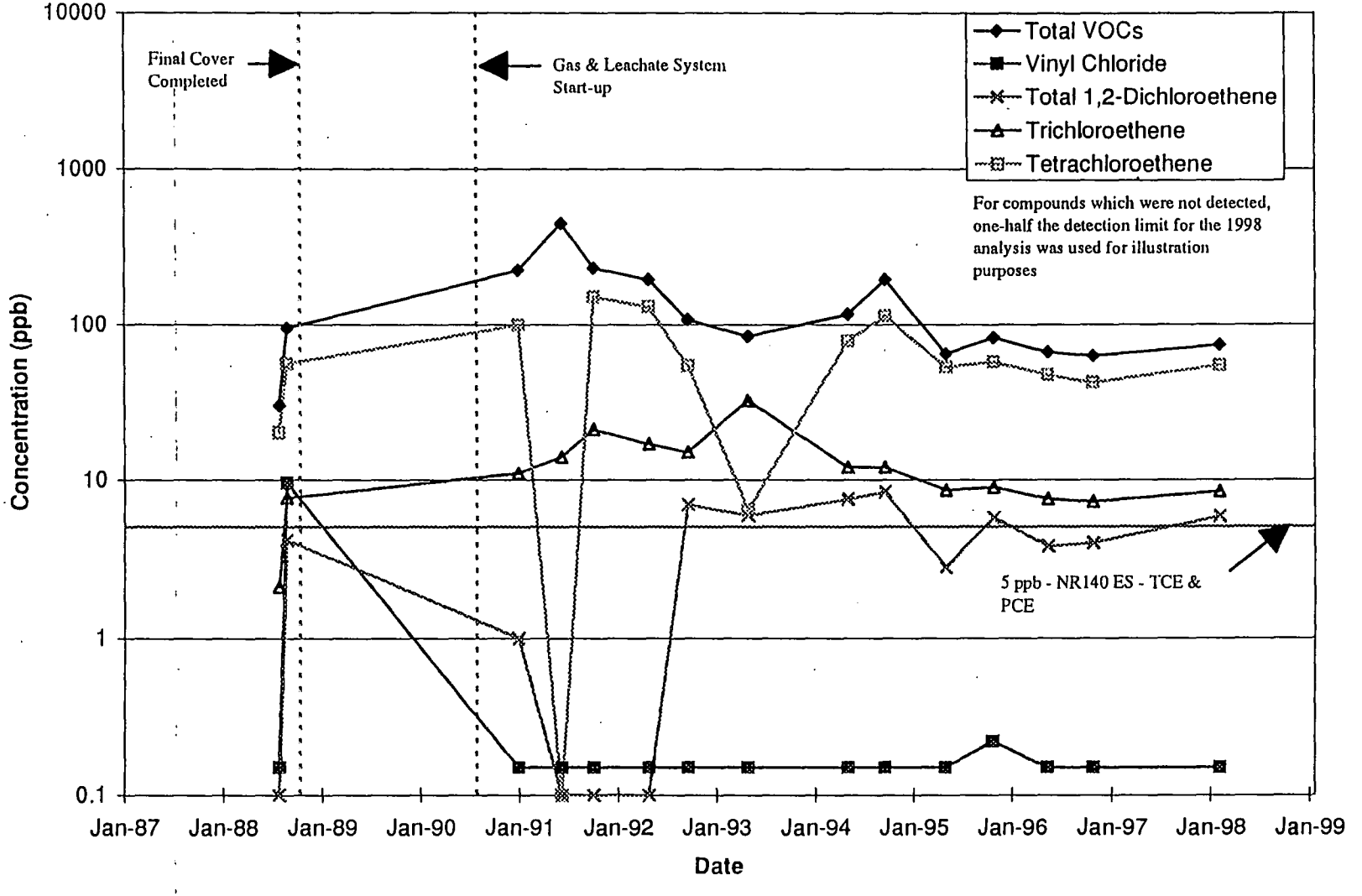
Note: Concentration scale is logarithmic.

P27D



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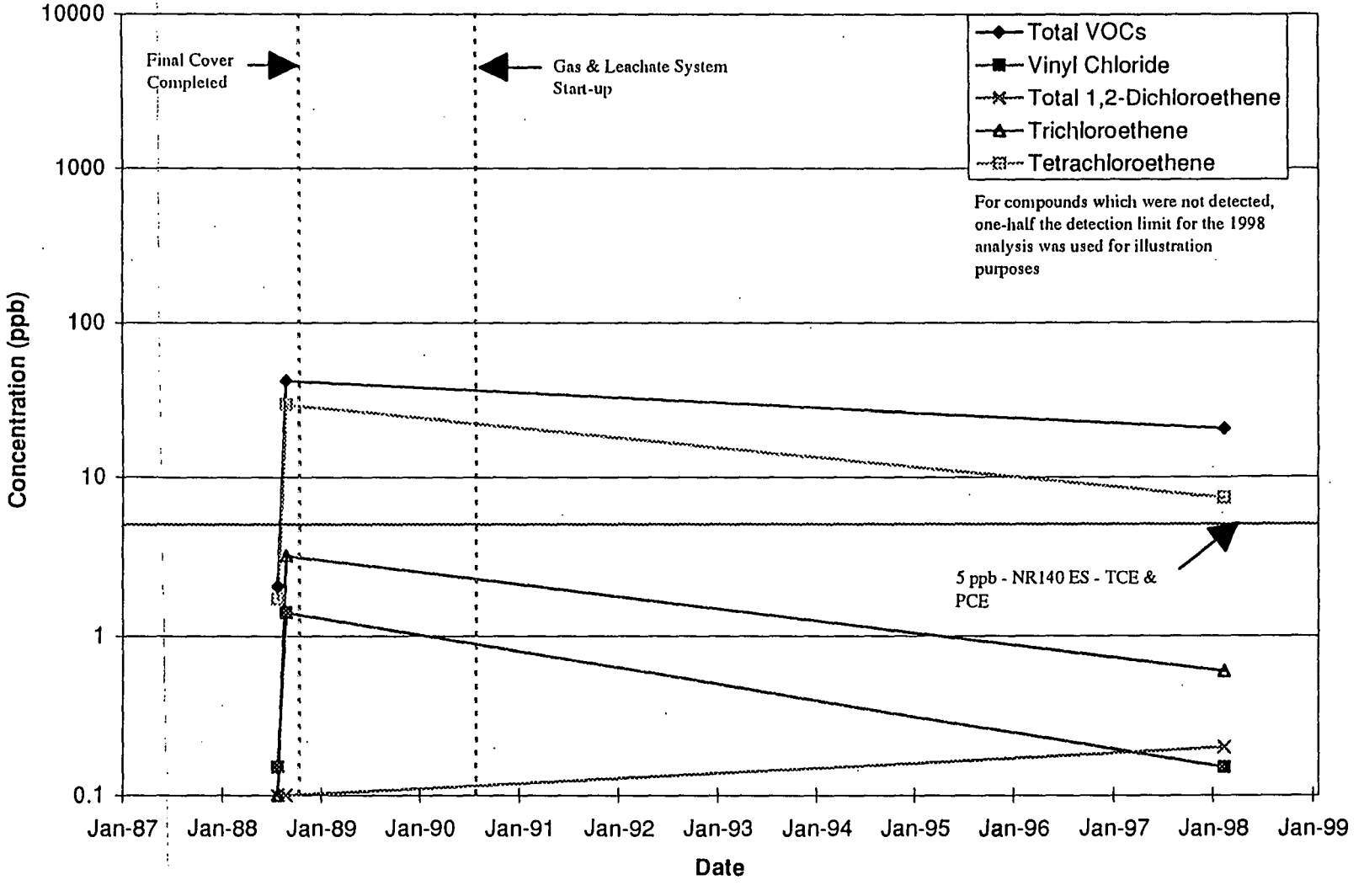
Note: Concentration scale is logarithmic.

P28S



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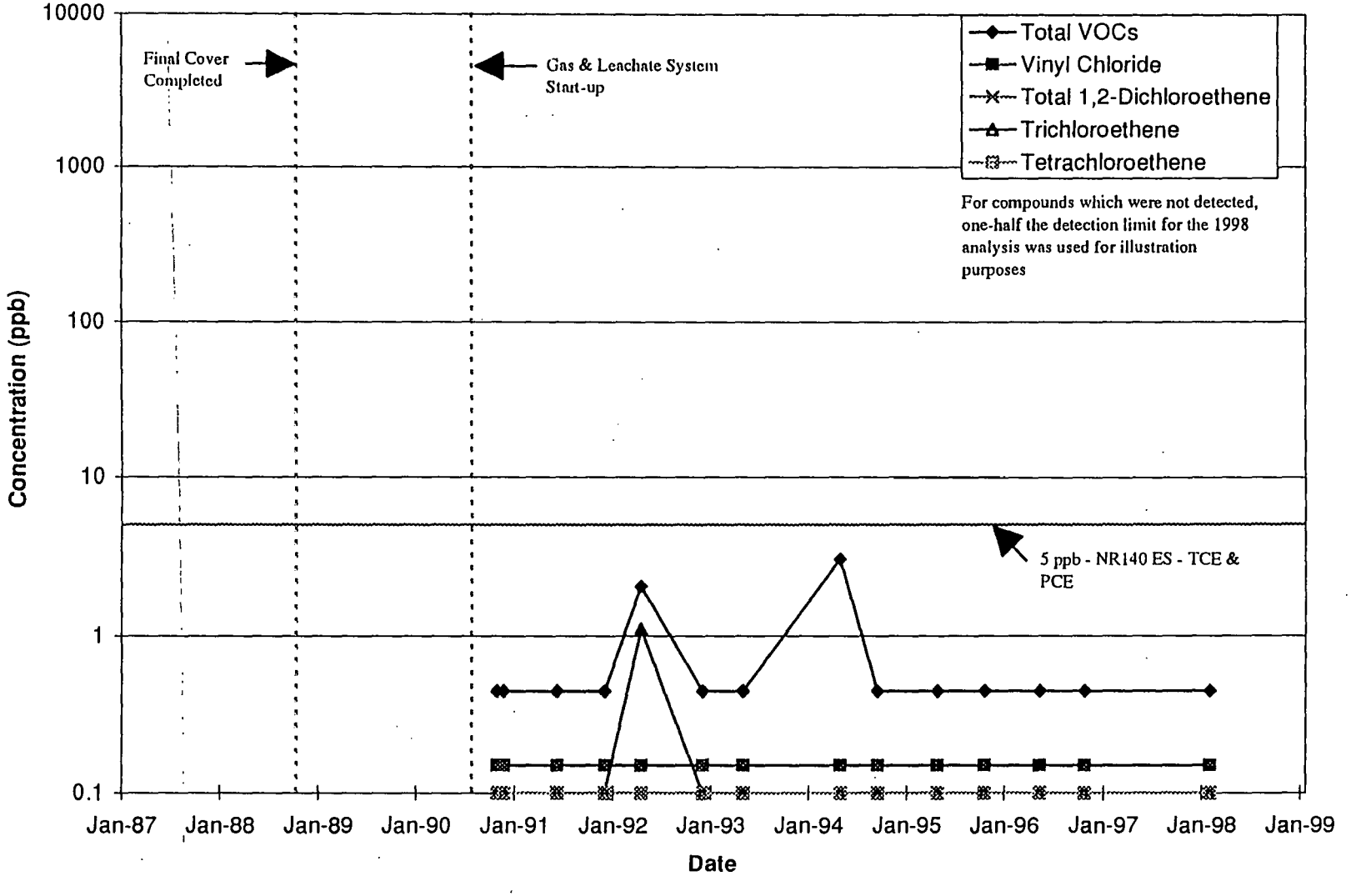
Note: Concentration scale is logarithmic.

P30I



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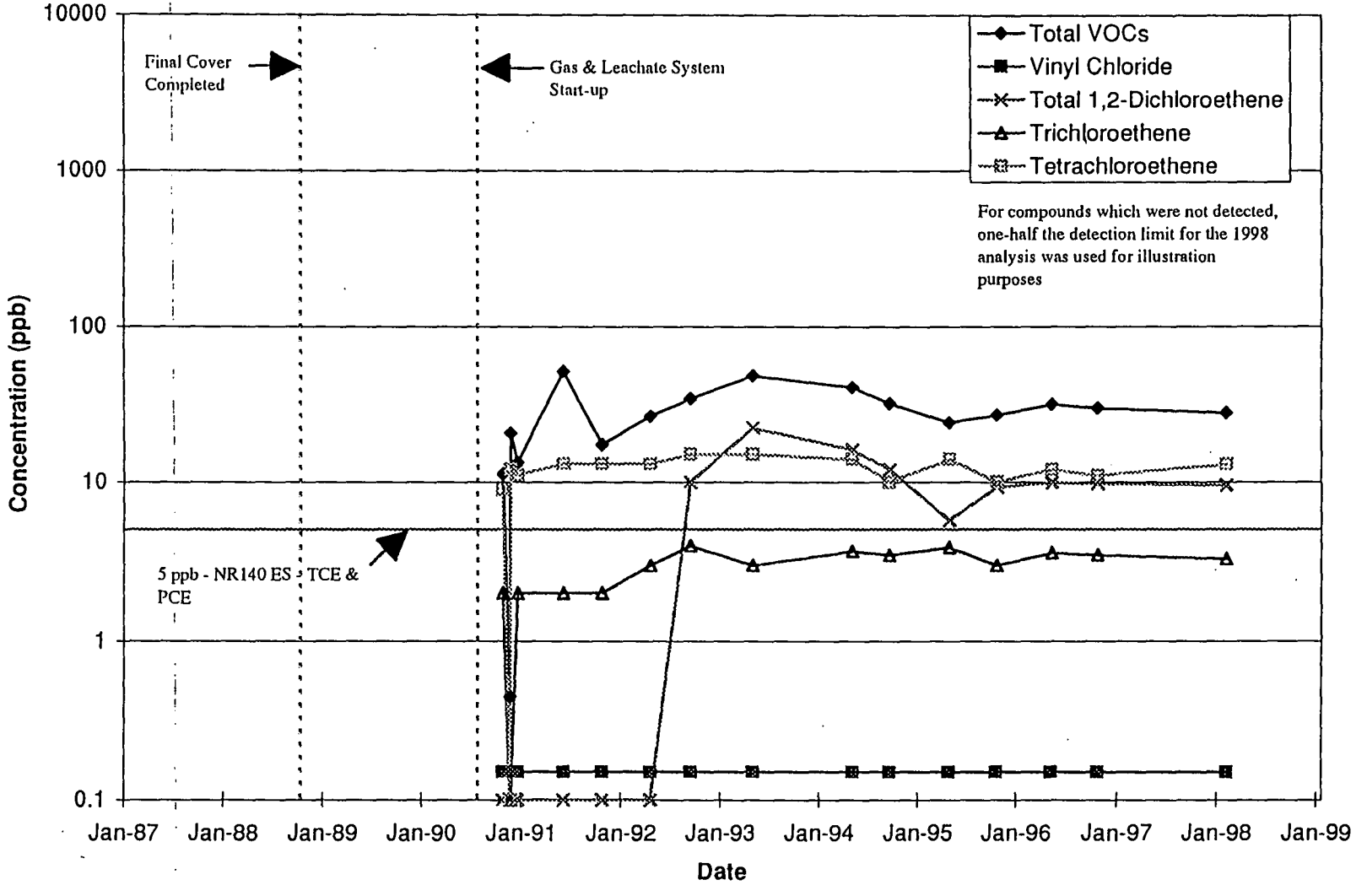
Note: Concentration scale is logarithmic.

P31IA



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Note: Concentration scale is logarithmic.

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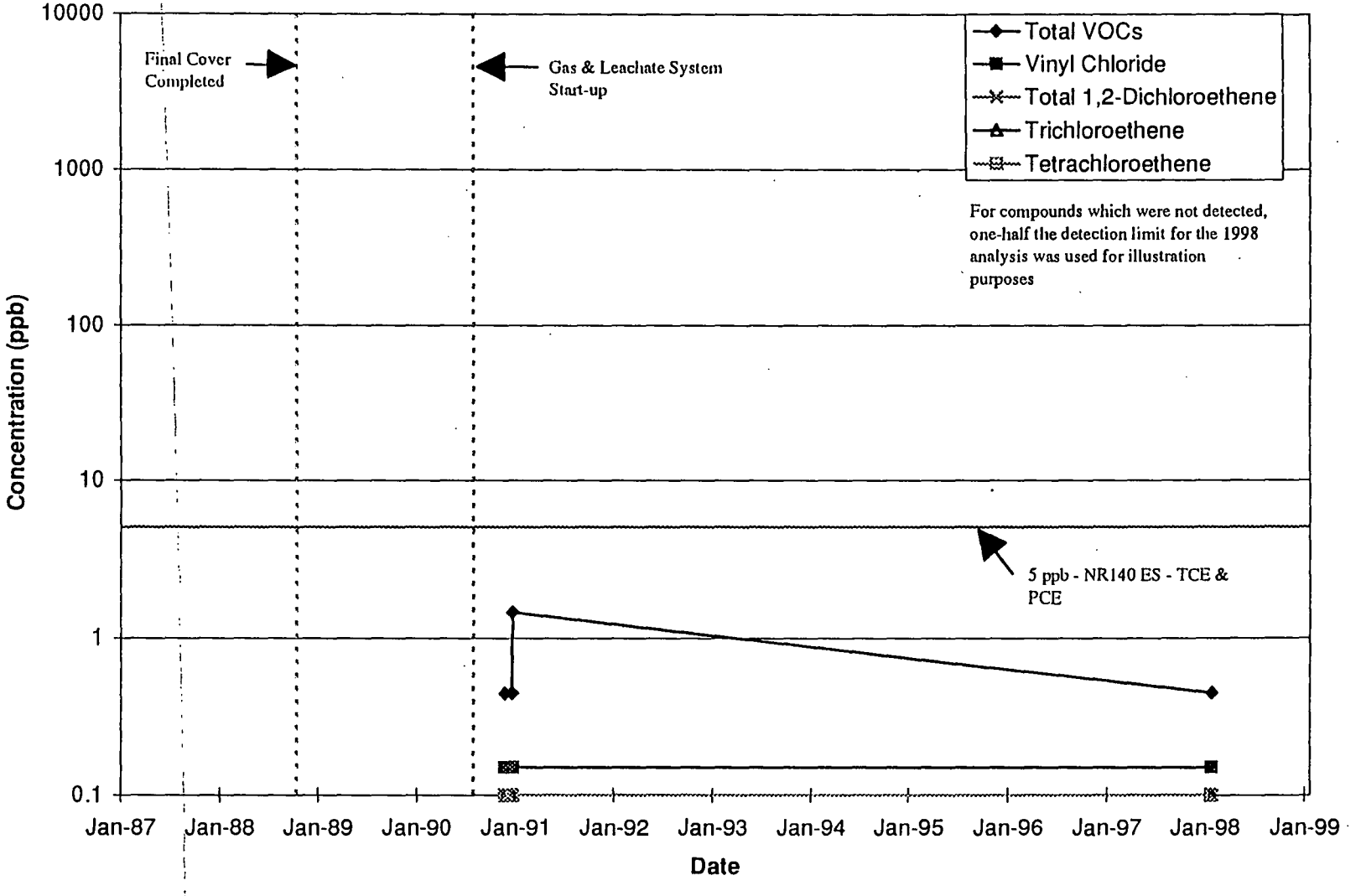

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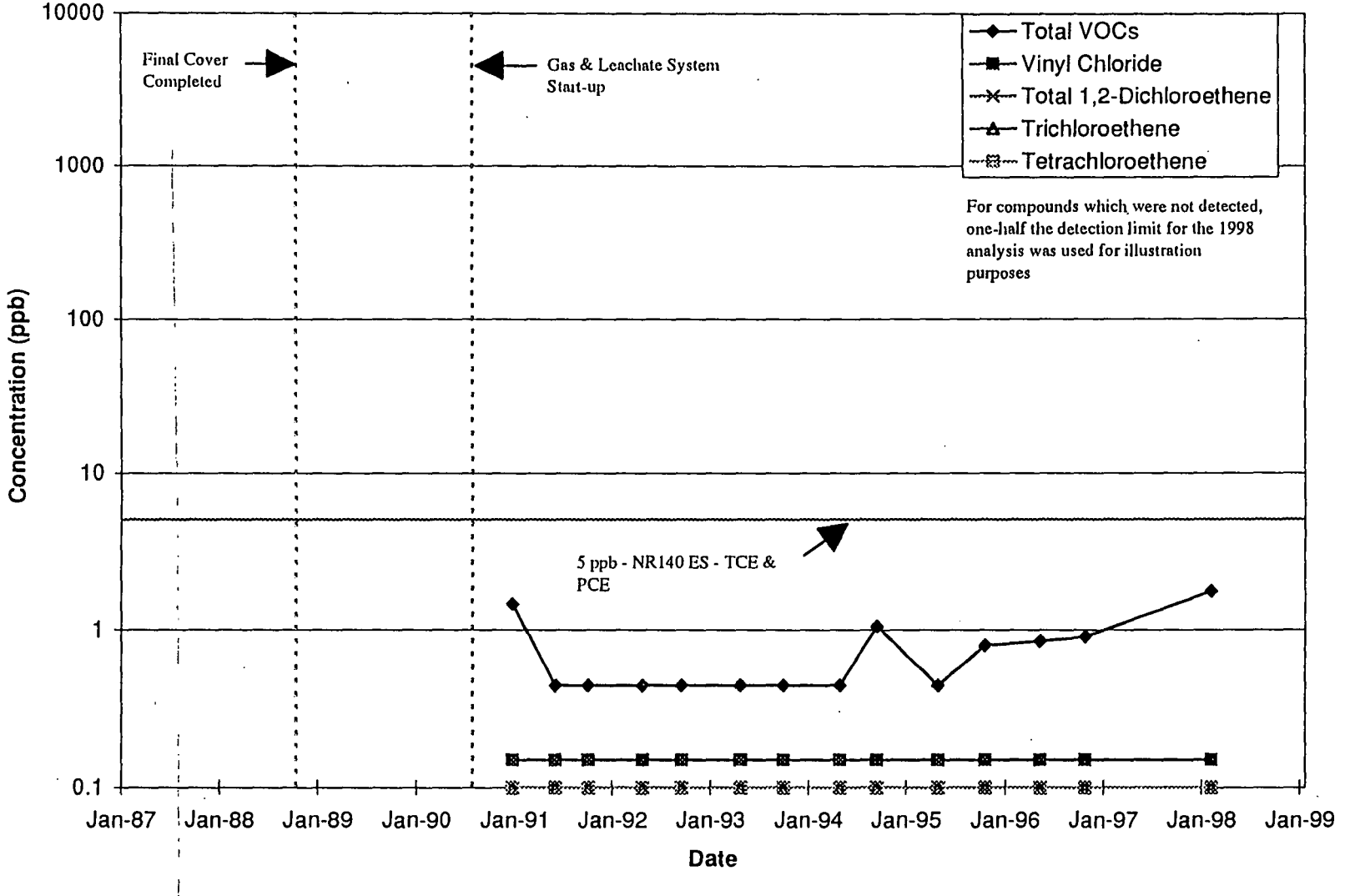
Note: Concentration scale is logarithmic.

P34S



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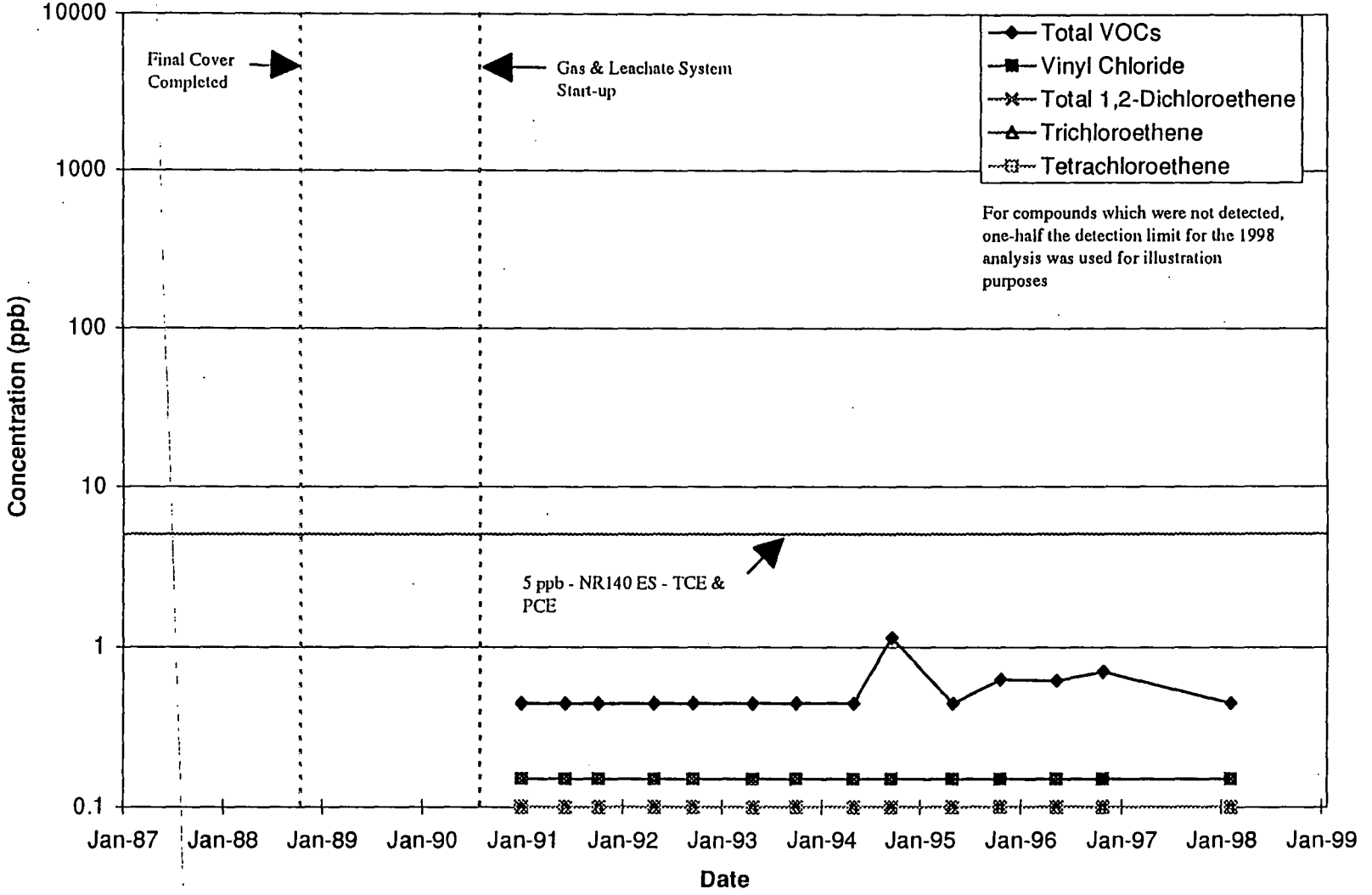
Note: Concentration scale is logarithmic.

P35S



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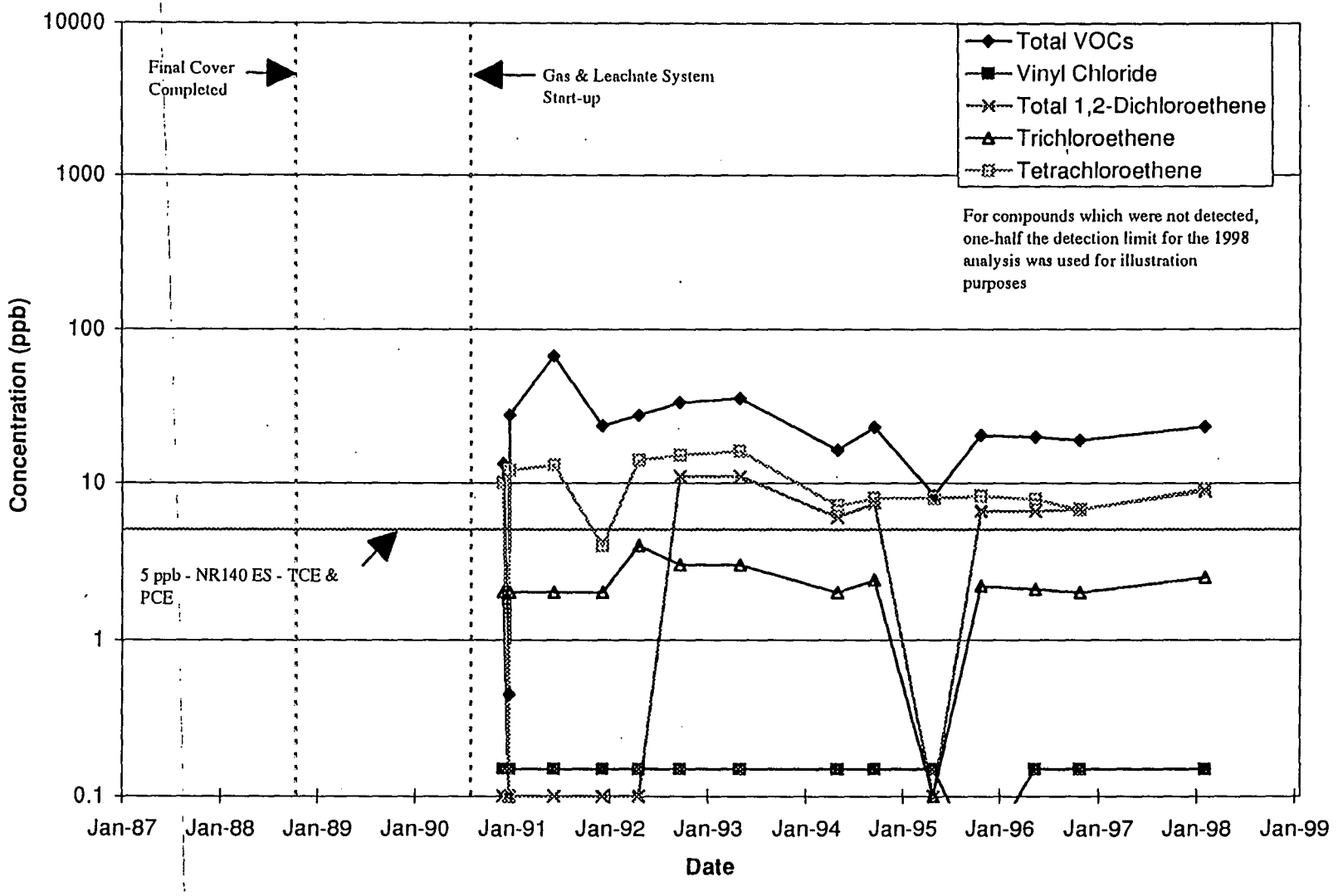
Note: Concentration scale is logarithmic.

P401



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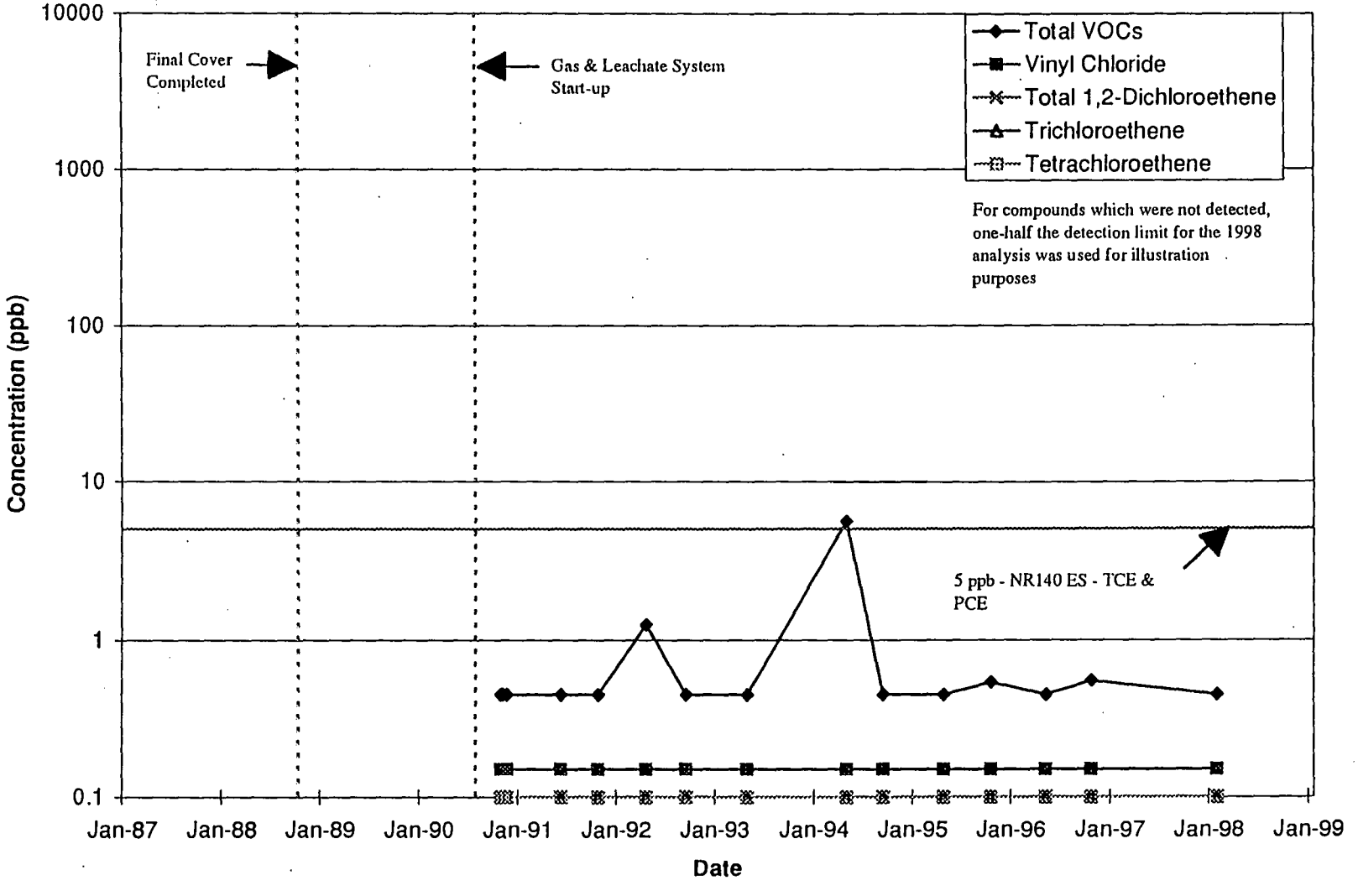
Note: Concentration scale is logarithmic.

P41D



M:\jobs\1242\161\01\graph98\P41D.xls

Note: Concentration scale is logarithmic.

D

NEW SCHULTZ WELL GEOPHYSICAL RESULTS

University of Wisconsin–Extension
Wisconsin Geological and Natural History Survey
3817 Mineral Point Road · Madison, WI 53705-5100
TELEPHONE 608/262.1705 · FAX 608/262.8086
James M. Robertson, *Director and State Geologist*

MEMORANDUM

To: Jeff Ramsby, Montgomery Watson

From: Ken Bradbury

Date: March 31, 1998

re: Logging of Schultz well near Refuse Hideaway

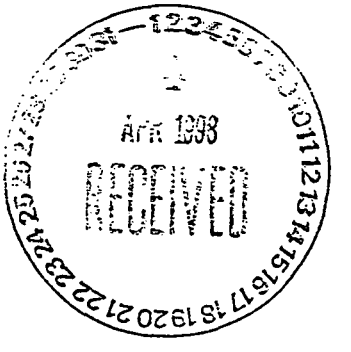
Jeff:

Enclosed is a disk with the digital logger files from the Schultz well that we logged yesterday. Also enclosed is a plot of the gamma, SP, and resistivity logs.

My conclusion from the flowmeter logging is that there was no measurable flow in the borehole or the casing. The traces of flow we seemed to observe were probably caused by lowering the probe through the well. Once we began letting the probe stabilize for five minutes between readings we did not detect any flow.

I've enclosed a copy of our field notes.

Please call me if you have questions about these data.



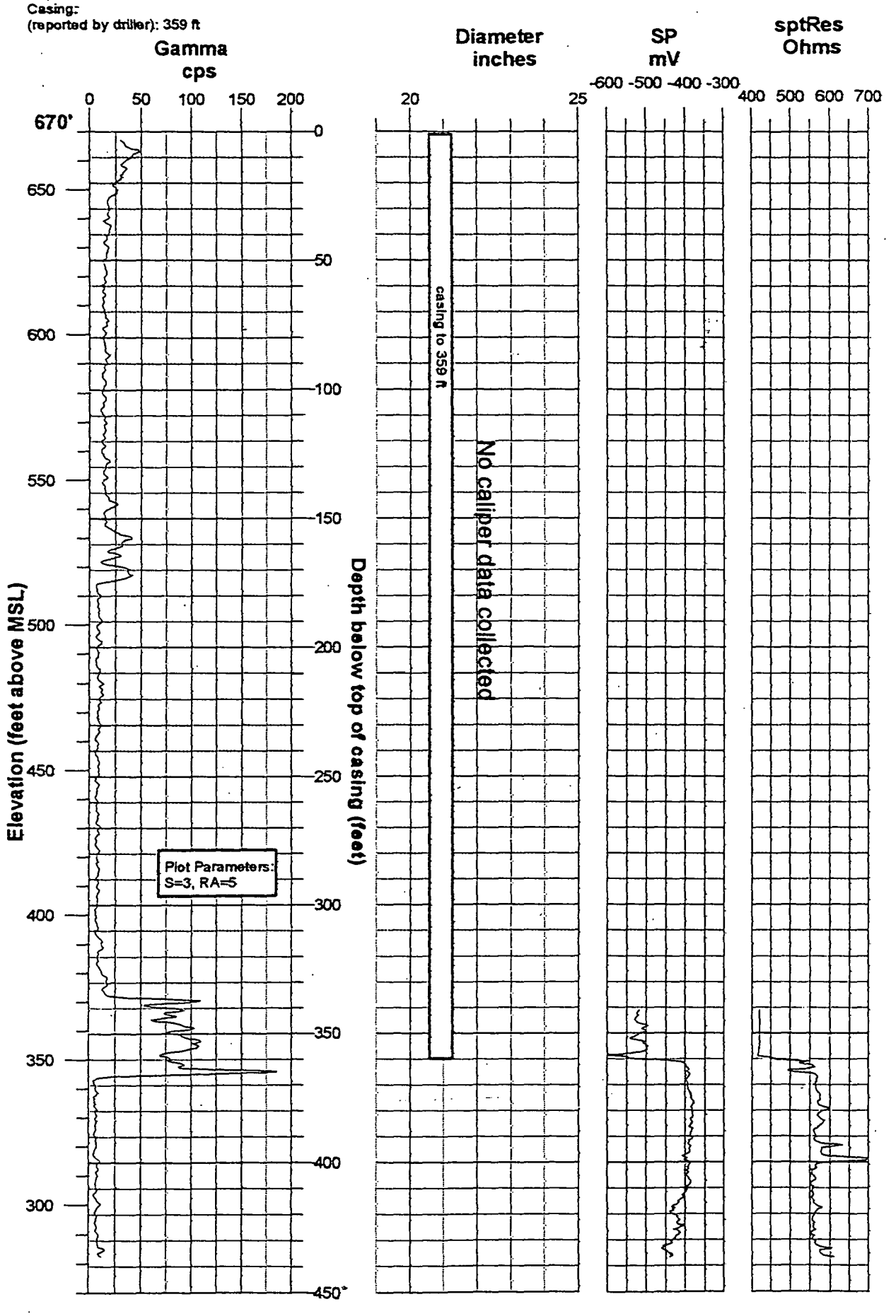
UW—Extension provides equal opportunities in employment and programming, including Title IX requirements.

Wisconsin Geological and Natural History Survey
Geophysical Log
Mt. Sopris MGX 1000C digital logger
Logged 3/30/98 by K. Bradbury & B. Batten

Elevation: est 945 ft
Depth to water: 61.1 ft
Casing:
(reported by driller): 359 ft

Well: DN-???
Schultz well near
Refuse Hideaway Landfill

T7N, R8E, section 7, NW1/4, SE1/4



E

VOC MASS REMOVAL CALCULATION METHODS

APPENDIX E
VOC MASS REMOVAL CALCULATION METHODS

LEACHATE EXTRACTION SYSTEM

The leachate extraction system has been pumping leachate containing VOCs since initiating operation in July, 1991. The mass of VOCs removed during this time can be computed using the volume pumped and the concentration of VOCs in the leachate during this time.

Historical leachate pumping data from the RI Report indicates that in 1992 and 1993 approximately 229,990 gal and 144,588 gal. of leachate were removed from the landfill, respectively. This results in an average yearly leachate removal rate of approximately 187,289 gal. Since the leachate extraction system started operation in July 1991, and was upgraded in 1996, the system would have extracted approximately an average annual volume of 187,289 gal of leachate for the first five years of operation. The five year total removal would have been approximately 936,445 gal.

Based on WDNR records for the 11 month period of July 1997 through May 1998 approximately 457,950 gal were extracted. Assuming that this removal rate was similar to that for the two years following the extraction system upgrade, the quantity of leachate removed in the two years of operation would have been approximately 997,600 gal. The total quantity of leachate extracted by the extraction system from July 1991 through July 1998 is approximately 1,934,045 gal.

A total VOC concentration of 199.98 ug/L was measured at the leachate tank on November 30, 1992. An average concentration of 346.5 ug/L was calculated for the leachate samples taken on February 18, 1998. Since the volumes contributed by each well are not known, this value is assumed representative for the cumulative volume in the tank. The average of these two total concentration values is approximately 273.24 ug/L. In order to calculate the total pounds of VOCs removed from the landfill by the leachate extraction system a total VOC concentration value of 250 ug/L is used. Assuming 2,000,000 gal. of leachate has been extracted from the landfill, the total mass of VOCs removed is approximately 4 lb.

LANDFILL GAS EXTRACTION SYSTEM

The mass of VOCs and chlorinated VOCs withdrawn from a landfill gas extraction well is estimated from the concentration of VOCs in the well and the flow rates from the wells. Table 4.1 summarizes the flow rates and VOC concentrations from data collected in 1989, during a system test and during system operation in 1991. The concentration is reported on a volume per volume basis and needs to be changed to a mass per volume basis. This is done by multiplying by the molecular weight of the compound, in grams/mole, and using the ideal gas law which states that one mole of gas occupies 22.4 liters at standard temperature and pressure. Using appropriate conversion factors, the mass of VOCs and

chlorinated VOCs can then estimated. The 1991 concentration is for the entire flow system, so the mass extracted for each compound detected is computed and added up for the total VOCs or chlorinated VOCs, as appropriate. The 1998 data has flow rates and concentrations data for each extraction well. The mass removed is computed for each extraction well and summed for the entire system.

GROUNDWATER

The methods described in this section are used to estimate the rate of degradation in concentration and mass of VOCs present within the groundwater. The graphs of water quality, in Appendix C shows that the concentration in many of the wells is decreasing on approximately a straight line on the semi-log graph. This shows that the concentration is declining at a first order rate. This analysis uses a first order rate decay equation to estimate the decay rate and the half lives at which the concentration and mass are declining.

Concentration-based rate estimate: The biodegradation of volatile organic compounds (VOCs) is commonly represented as a first-order decay equation of the form (ASTM 1996; Buscheck and Alcantar 1995; Mobil 1995):

$$C(t) = C_o e^{-kt} \qquad [1]$$

where C(t) is the VOC concentration as a function of time, C_o is the initial contaminant concentration, k is the first-order biodegradation rate constant, and t is the elapsed time.

Plotting C versus time on a log scale yields a line with a slope of -k and a y-intercept of C_o. This k represents the attenuation rate at a particular location in the contaminant plume. This decrease in VOC concentration is likely the result of a number of mechanisms, including dilution from recharge, dispersion, sorption, volatilization, and biochemical stabilization. As a result, the rate constant reflects the overall effect of these mechanisms, rather than destruction by a single mechanism.

For this analysis, concentration-based estimates were developed for nine wells at various locations in the plume which had been sampled regularly since the installation of source control systems in 1991 (see Table 3.4 and discussion in Section 4.3).

Mass-based decay rate estimate: To better estimate the biodegradation rate, it is desirable to determine the overall decrease in contaminant mass. The rate of decrease is calculated by comparing the mass of contaminants in the entire plume at various times and then substituting M_o(initial contaminant mass) for C_o and M(t)(contaminant mass at time t) for C(t) in equation [1].

In order to estimate the mass of contaminant in specific areas of the plume from monitoring well and aquifer data, isoconcentration, plume-thickness isopach, and porosity maps were

developed. The contaminated area was gridded into a horizontal 2-dimensional grid and total mass was calculated by summing the grid elements in the following manner:

$$M = \sum M_{i,j} = \sum C_{\max(i,j)} T_{ij} R_d n_{ij} \frac{A_C}{A_T} A \qquad [3]$$

where M is the total contaminant mass, $C_{max(i,j)}$ is the maximum concentration in a particular node, T_{ij} is the plume thickness in node i,j, R_d is the retardation factor to account for the adsorbed fraction of contaminant which is not represented in groundwater sampling, n is the porosity at node i,j, A_C/A_T is a constant (the area ratio of a unit normal distribution to a unit rectangle) to describe the vertical concentration distribution (assumed to be normal, from C_{max} to 0) across the plume, and A is the area in node i,j. Details of the methods are described below:

1. The plume thickness was determined by analyzing cross sections at various locations in the aquifer and establishing the vertical boundaries of the plume. A map of isopach lines was produced and imported to Surfer™ (Version 6, Golden Software, Inc.) software, which used Kriging to produce a regular (100' x 100') grid of plume thickness values. This grid was imported into Excel for further manipulation.
2. Since porosity varied across the site as well (either sandstone or sand and gravel), a grid of porosity values was produced by determining the boundary between the two types of material and importing the associated values into Surfer to produce a porosity grid. This grid was also imported into Excel. Porosity values for sandstone (0.1) and sand and gravel (0.3) were taken from HSI's contaminant transport simulation.
3. The maximum concentration data was entered into Surfer for each time period, a concentration grid produced, and imported into Excel.
4. A retardation factor for each aquifer was calculated based on its porosity, bulk density, and fraction organic carbon, as well as the average partitioning coefficient (K_{OC}) of the VOCs.
5. The resulting mass in each 100' by 100' node was calculated by multiplying the plume thickness, porosity, and concentration matrices by the retardation factor of the associated aquifer material, the area ratio (A_C/A_T), and the area of each node (10,000 ft^2).
6. The decay rate for different areas was determined by summing the masses for each time period and plugging them into the following equation:

   $k = (\ln(M_o) - \ln(M_f))/(\Delta t)$

   M_o = intial mass
   M_f = final mass
   Δt = elapsed time
   k = rate constant($days^{-1}$)

For this analysis, mass-based rate estimates were determined for the entire plume, the area closest to the source, and sub-regions (based on geology) within the area closest to the source. These analyses are summarized on Table 4.4 and discussed in Section 4.3. The near source area is used as approximately the property boundary shown on the site maps.

ROD-SPECIFIED GROUNDWATER EXTRACTION SYSTEM

The mass of VOCs that could be expected to be removed through the ROD-specified groundwater extraction system was calculated using the proposed extraction well locations and flow rates shown in the FS. The anticipated influent concentration was assumed to be an average of the concentrations in monitoring wells located nearest to the extraction well locations. The values used in this analysis are summarized in the following table:

Proposed Extraction Well Number	Estimated Flow Rate from FS (gal/min)	Nearest Monitoring Wells	Average Total VOC Concentration in Nearest Wells (ug/L)
1	10	P17S	92
2	10	P27S, P27D	56
3	10	P16S, P16D	96
4	15	P9S, P9D	18
		Flow-weighted Avg.	= 60.2 ug/L

Using the flow weighted average of 60.2 ug/L and the total flow rate of 45 gpm, the annual total VOC mass removal rate was calculated and converted to lbs/yr. The result is 11.9 lbs/yr. For comparison with mass removal rates from current site processes over the 7 yr period between the 1991 and 1998 monitoring events, the rate was multiplied by 7 to arrive at 83.3 lbs of total VOCs removed.

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