GROUNDWATER MONITORING REPORT

JULY 7, 1999

Project Location:
HAPS SERVICE STATION
ROUTE 100
WAITSFIELD, VERMONT

VT DEC Site #91-1128
Griffin Job #12944625

Prepared For:

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TABLE OF CONTENTS

I. INTRODUCTION 1

II. GROUNDWATER FLOW DIRECTION AND GRADIENT 1

III. GROUNDWATER SAMPLE COLLECTION AND ANALYSIS 2

IV. SURFACE WATER INSPECTION 3

V. CONCLUSIONS 3

VI. RECOMMENDATIONS 4

APPENDICES

A. SITE MAPS
1) Site Location Map
2) Site Map
3) Groundwater Contour Map

B. LIQUID LEVEL DATA SUMMARIES
1) Current Groundwater Level Data
2) Historical Groundwater Elevations

C. GROUNDWATER QUALITY DATA SUMMARY
1) Supply Well Quality Data
2) Monitoring Well Quality Data and Charts

D. LABORATORY ANALYSIS REPORTS

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I. INTRODUCTION

The following report summarizes the most recent groundwater monitoring event conducted at Haps Service Station located on Route 100 in Waitsfield, Vermont. Groundwater monitoring is being conducted at the site by Griffin International, Inc. (Griffin) for Haps Service Station (Haps) on a semi-annual basis. This work is being conducted to monitor concentrations of dissolved petroleum in the overburden aquifer. This monitoring has been done in response to a January 20, 1998 letter of request from Mr. John Schmeltzer of the Vermont Department of Environmental Conservation (VTDEC) to Ms. Claire Ewald of Haps Service Station.

Subsurface petroleum contamination at the site, resulting from a former gasoline underground storage tank (UST), was first detected in November 1994. A groundwater remediation system was in operation at the site from December 1994 to November 1995 in order to contain and remediate petroleum contamination at the site.

Work conducted at the site for this semi-annual event included the collection and analysis of groundwater samples from seven of the on-site monitoring wells and the water supply well and the preparation of a groundwater contour map for the site. An unnamed tributary to the Mad River, which is located to the west of monitoring well MW-12, was also visually inspected for potential petroleum impacts.

II. GROUNDWATER FLOW DIRECTION AND GRADIENT

On April 14, 1999, the depth to water was measured in nine of the monitoring wells associated with the subject site. Groundwater elevations were determined relative to the casing elevations of each well. Groundwater flow direction and gradient were determined by generating a groundwater contour map using the groundwater elevation data collected at each of the accessible monitoring wells. This map can be found in Appendix A. A summary of the measured liquid level data is located in Appendix B.

Based on the April 14, 1999 data, groundwater was calculated to flow in a southwesterly direction at an average approximate gradient of 7.1% in the vicinity of the site. This groundwater flow direction and gradient is generally consistent with those measured during previous monitoring activities. The spatial variability in groundwater gradients across the site, which is consistent over time, is likely the result of varying soil permeability in the upper levels of the overburden deposits, as determined through drilling activities.

III. GROUNDWATER SAMPLE COLLECTION AND ANALYSIS

Groundwater samples were collected from monitoring wells MW-5, MW-6, and monitoring wells MW-8 through MW-12, in accordance with Griffin's groundwater sampling protocol, which complies with industry and state standards. A sample was also collected from the on-site water supply well. Free product was not observed during the sample collection.

The samples were stored on ice in the field, and delivered under proper chain-of-custody procedures to Endyne, Inc. of Williston, Vermont, a state-certified laboratory. One duplicate sample (MW-6) and one trip blank were collected for quality assurance/quality control (QA/QC) measures. The samples were analyzed for volatile organic (VOCs) by EPA Method 8021B. (EPA Method 8021B is the analytical method currently recommended by the VTDEC.) Results of the laboratory analyses are summarized in Appendix C. The laboratory analytical report can be found in Appendix D.

No petroleum constituents were reported as detected above laboratory detection limits in groundwater from monitoring well MW-5. Petroleum compounds were detected in groundwater above the applicable Vermont Groundwater Enforcement Standards (VGES) in monitoring wells MW6, MW-8, MW-9, MW-10, MW-11, and MW-12. No petroleum constituents were detected above laboratory detection limits from the supply well sample.

Analytical results of the trip blank and duplicate samples indicate that adequate quality assurance and control (QA/QC) were maintained during sample collection and analysis.

Comparison of historical data from the wells located in the vicinity of the former source areas (MW-6, MW-8, and MW-9) indicate a general decreasing trend of dissolved petroleum contaminant concentrations. Compounds detected in monitoring well MW-10 remained relatively stable since the last sampling round. Petroleum constituents in groundwater from monitoring wells MW-11 and MW-12, located downgradient of the former USTs, were found to have increased since the previous sampling round.

The increase in concentrations of total targeted VOCs in monitoring wells MW-8, MW-9, MW-10, MW-11, and MW-12 are also due to the inclusion of 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and naphthalene in the analyte list for EPA Method 8021B. These compounds are not included on the list of analytes for EPA Method 602. In addition, chlorobenzene, 1,2-dichlorobenzene, 1,3-dichlorobenzene, and 1,4-dichlorobenzene are not included on the 8021B analyte list. Therefore, the analytical data from this round is not directly comparable to previous analytical results.

No petroleum constituents have been detected in groundwater from monitoring well MW-5 since October 1997. Petroleum compounds have not been detected in samples from the supply well since February 1996.

IV. SURFACE WATER INSPECTION

During the April 14, 1999 sampling event, the unnamed tributary to the Mad River, located to the west of monitoring well MW-12, was visually inspected for signs of petroleum impacts. No indications of petroleum impact such as stressed vegetation, stained soil, or oily sheens were observed along the length of the eastern streambank in the direct vicinity of MW-12.

V. CONCLUSIONS

Based on the data collected during the most recent round of groundwater monitoring, the following conclusions are presented regarding petroleum impacts to groundwater at the Haps Service Station and vicinity in Waitsfield, Vermont.

1) Petroleum contamination is present in the subsurface at the site in the dissolved phase. Based on this most recent sampling round, analytical data indicates an increase in petroleum constituents from groundwater in monitoring wells MW-11 and MW-12. Petroleum constituents have not been detected in groundwater from monitoring well MW-5 since October 1997.

2) Petroleum constituents were not detected in the sample collected from the on-site water supply well during the most recent sampling round. Dissolved petroleum contamination has not been detected in the water supply well since February 1996. A subsurface layer of very fine sand, silt, and clay, which underlies the overburden aquifer, has been observed at the site. This layer is likely to serve as a confining layer, which protects any lower aquifer(s) from petroleum contamination impact, thus reducing the risk of future impact to the on-site supply well.

3) Over time, the natural processes of dilution, dispersion, and biodegradation are likely to continue to reduce residual adsorbed or dissolved contaminant concentrations present in the subsurface at the Haps Service Station facility and site vicinity.

VI. RECOMMENDATIONS

Based on the conclusions stated above, the following recommendations concerning petroleum contamination at Haps Service Station are made:

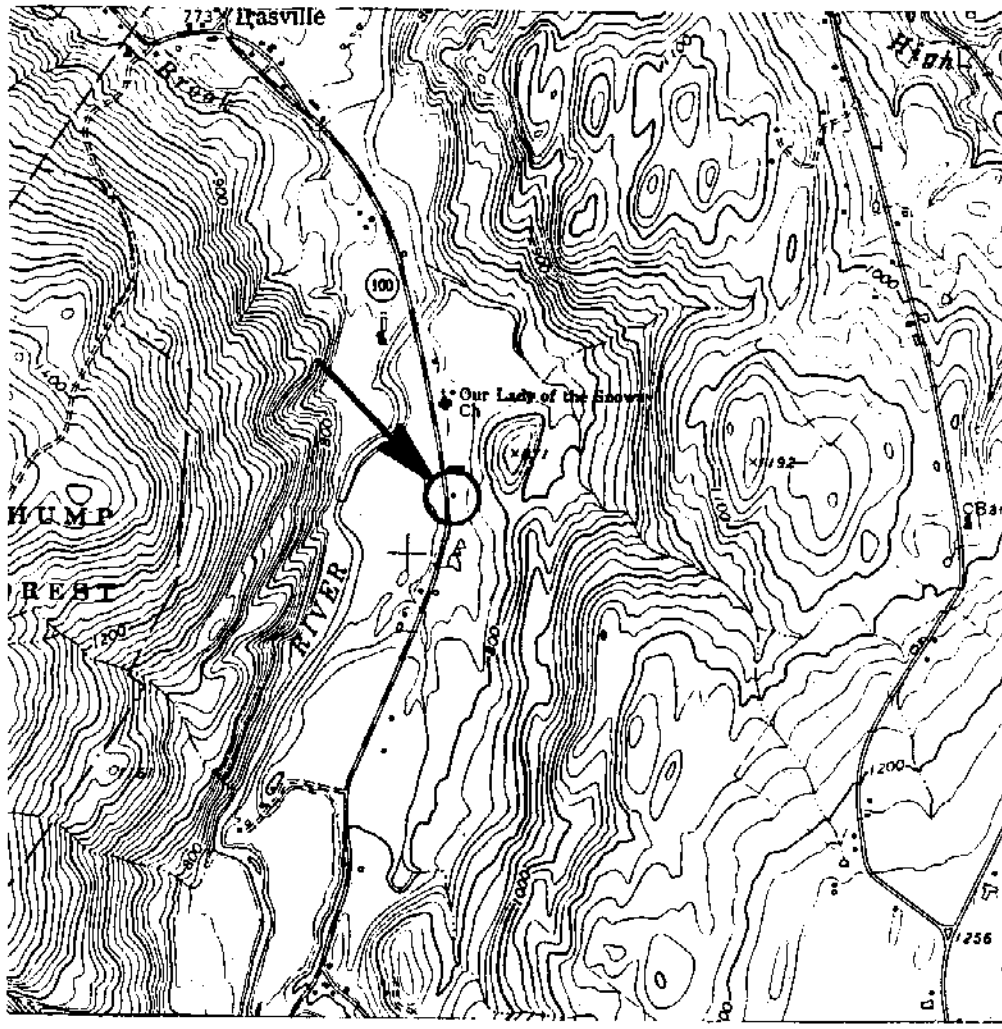
1) Groundwater monitoring should continue at this site on a semi-annual basis. Groundwater samples should be collected from monitoring wells MW-6 through MW-12. All samples should be laboratory analyzed for BTEX and MTBE per EPA Method 8021B.

2) Petroleum constituents have not been detected in groundwater from monitoring well MW-5 since October 1997. Griffin recommends that the sampling of this monitoring well be discontinued.

APPENDIX A

SITE MAPS

1) Site Location Map
2) Site Map
3) Groundwater Contour Map



JOB #: 12944625
SOURCE: USGS- WAITSFIELD, VERMONT QUADRANGLE

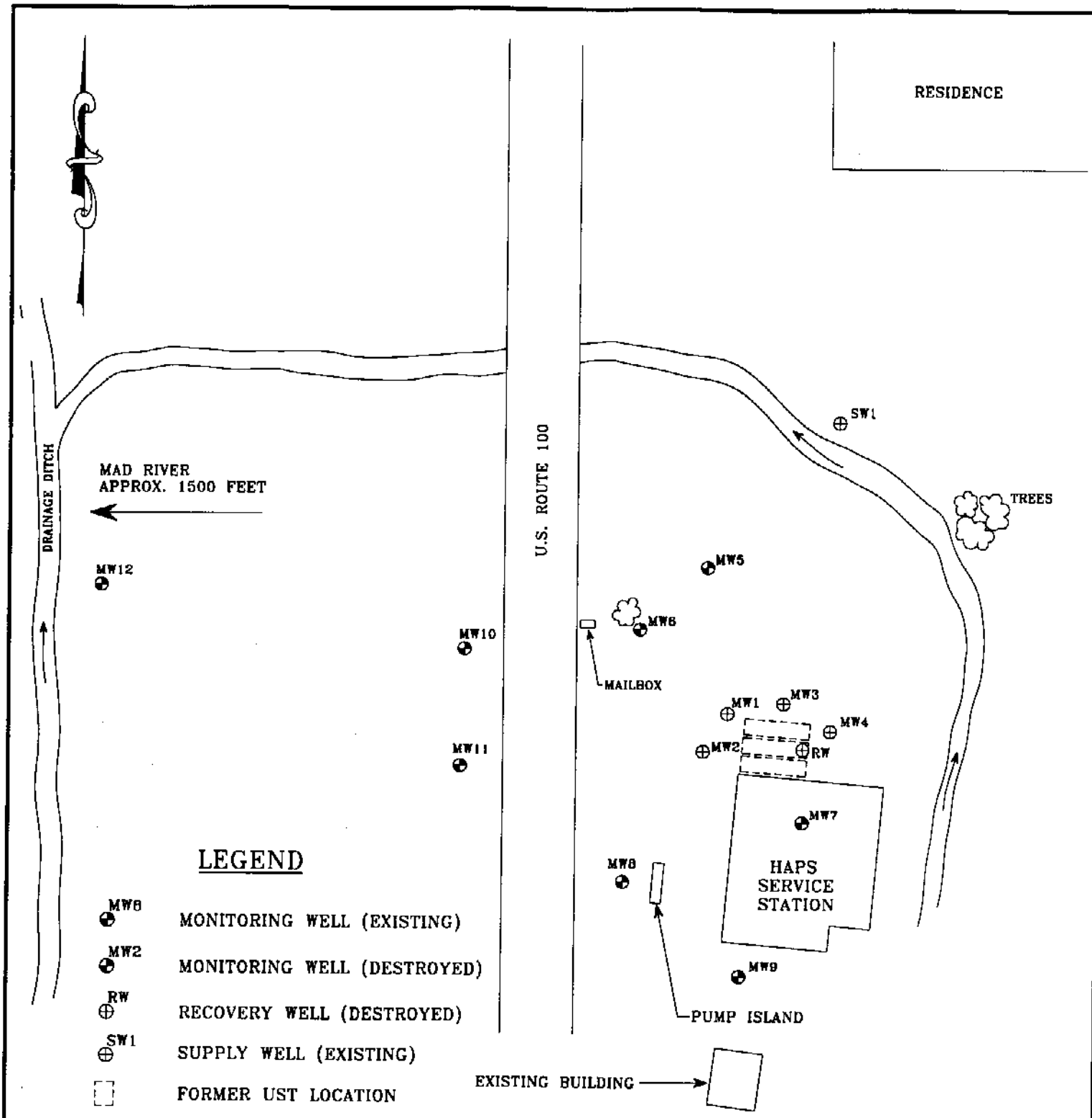
GRIFFIN INTERNATIONAL

HAPS SERVICE CENTER

ROUTE 100 WAITSFIELD, VERMONT

SITE LOCATION MAP

DATE: 12/9/94	DWG.#:1	SCALE: 1:24000	DRN.:SB	APP.:PM



JOB #: 12944625

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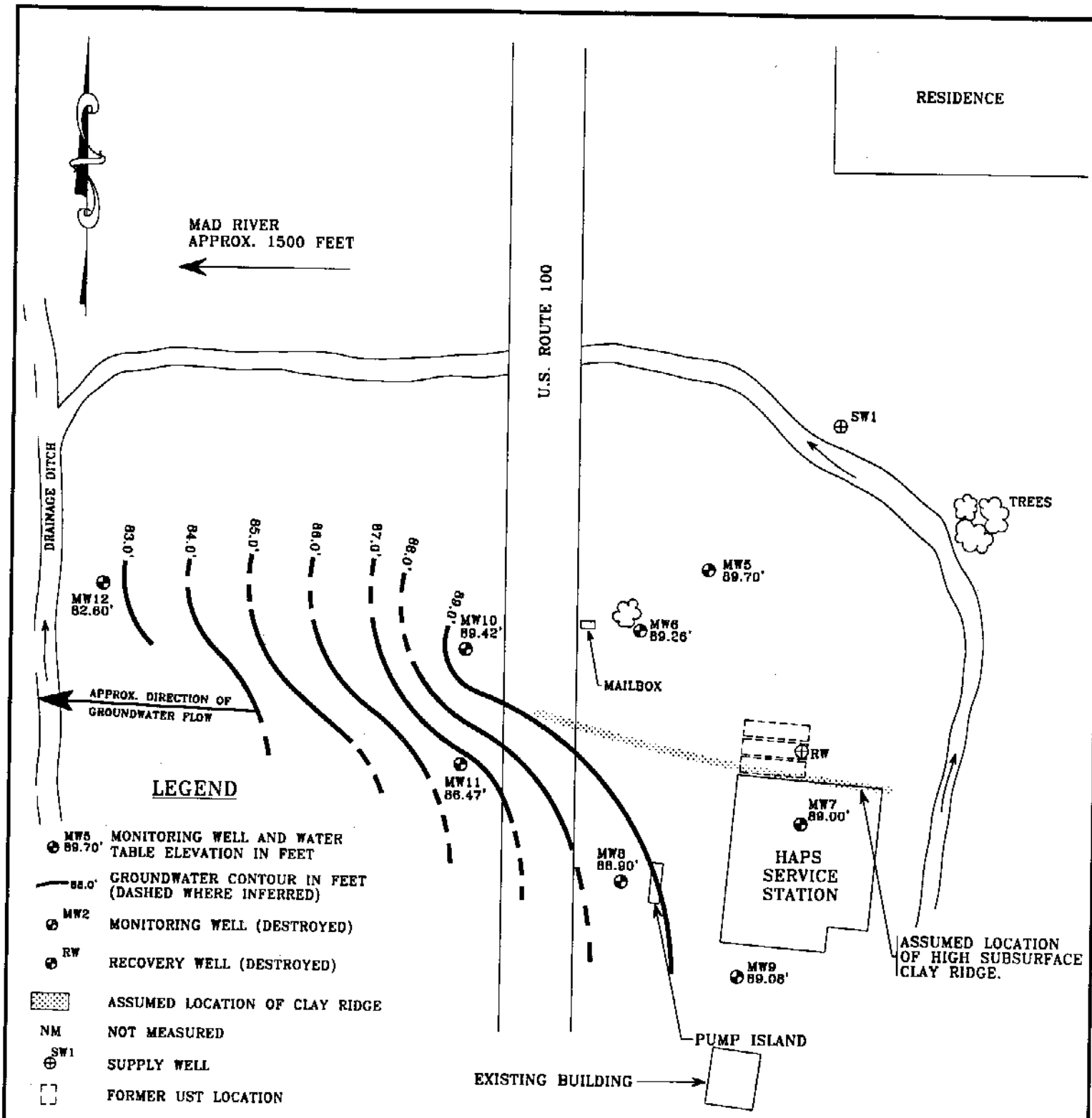
ROUTE 100 WAITSFIELD, VERMONT

SITE MAP

DATE: 2/8/99	DWG.#: 2	SCALE: 1"=50'	DRN.:SB	APP.:TK



JOB #: 12944625

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ROUTE 100 WAITSFIELD, VERMONT

GROUNDWATER CONTOUR MAP
MEASUREMENT DATE: 10/12/98

DATE: 2/8/99	DWG.#: 3	SCALE: 1"=50'	DRN.:SB	APP.:TK

APPENDIX B

LIQUID LEVEL DATA SUMMARIES
1) Current Groundwater Level Data
2) Historical Groundwater Elevations

Current Groundwater Level Data
Haps Service Station
Route 100
Waitsfield, Vermont
VTDEC Site #91-1128
April 14, 1999

Well I.D.	Well Depth	Top of Casing Elevation	Depth to Product	Depth to Water	Water Table Elevation
MW-1	17.0	98.82	-	9.19	89.63
MW-5	15.0	97.72	-	7.76	89.96
MW-6	17.0	99.46	-	9.89	89.57
MW-7	15.0	100.00	-	10.74	89.26
MW-8	17.0	99.96	-	10.85	89.11
MW-9	17.0	99.51	-	10.19	89.32
MW-10	15.0	97.54	-	7.92	89.62
MW-11	15.0	98.42	-	10.35	88.07
MW-12	10.0	87.23	-	4.17	83.06

All values reported in feet

Ref:GWLEVEL.XLS

Historical Groundwater Elevations
Haps Service Station
Waitsfield, Vermont

Well No.	Monitoring Date: 3-22-95	3-28-95	3-31-95	4-4-95	4-11-95	4-19-95	4-26-95	5-10-95	5/30/95*	6-5-95	6-15-95	6-21-95
RW												
MW-1	89.04	88.82	88.78	88.74	88.73	88.91	88.87	88.80	88.84	88.67		
MW-2						89.80			89.72	89.67		
MW-3		88.07	87.96	87.99			88.02	87.85	89.13	90.73		
MW-4		90.92	90.89	90.84	90.82	91.05	91.05	90.93	N/A	N/A		
MW-5		89.27	89.18	89.13	89.09	89.32	89.30	89.13	89.04	88.84		
MW-6		88.49	88.42	88.36	88.31	88.62	88.60	88.45	88.47	88.22	87.68	87.36
MW-7	86.23	85.45	85.15	84.98	84.87	N/A	85.10	85.48	N/A	N/A	N/A	N/A
MW-8	87.32	88.50	88.48	88.41	85.89	88.53	88.52	88.25	83.80	83.48	83.37	83.06
MW-9	88.77	88.68	88.64	88.58	88.50	88.64	88.68	88.51	88.33	88.23		
MW-10	89.01	88.60	87.43	86.56	86.15	88.90	88.89	87.67	88.43	85.45	83.99	83.18
MW-11	86.64	86.33	86.03	85.82	85.50	85.90	85.81	85.44	85.11	84.81	84.59	84.56
MW-12		82.55	82.26	81.75	81.57	82.12	81.73	81.06	80.97	80.79		

Well No.	Monitoring Date: 7-5-95	7-25-95	8-9-95	8-31-95	9-12-95	9-26-95	10-10-95	10-16-95	10-16-95	10-26-95	11-10-95	1-26-96
RW												-
MW-1		87.83								90.55		-
MW-2												-
MW-3		89.93								91.65		91.92
MW-4												-
MW-5		88.85								89.94		-
MW-6	86.68	85.45	89.51	88.28	88.33	88.58	89.14	89.10	89.08	89.40	88.06	89.61
MW-7	84.65	84.89	89.20	86.03	84.90	84.86	88.84	88.76	88.78	89.16	88.06	89.40
MW-8	82.93	82.56	89.03	87.58	83.34	83.53	88.66	88.50	88.51	89.01	88.88	89.13
MW-9		86.26								89.18		89.28
MW-10	83.00	82.75	89.61	86.53	86.92	88.89	89.35			89.51	89.47	89.58
MW-11	84.44	84.42	87.28	85.11	84.78	85.03	86.25			87.56	87.14	88.07
MW-12		80.58								83.77		83.50

(0.48 Foot Drawdown)

All values reported in feet

Ref :GWLEVEL.XLS

Historical Groundwater Elevations
Haps Service Station
Waitsfield, Vermont

Well No.	Monitoring Date: 2-26-96	3-25-96	5-14-96	6-10-96	7-30-96	11-7-96	4-10-97	10-23-97	5-12-98	10-12-98	4-14-99
RW							-	-	-		
MW-1			90.66		89.67	89.13	89.76	-	-		
MW-2							-	-	-		
MW-3			92.76		91.75	91.20	-	-	-		
MW-4							-	-	-		
MW-5			91.10		89.94	89.36	90.16	89.09	89.86	89.70	89.96
MW-6		88.82	90.50	89.69	89.53	88.92	89.65	88.70	89.43	89.26	89.57
MW-7		86.53	90.45	89.08	89.22	88.56	89.39	87.88	89.22	89.00	89.26
MW-8	88.37	88.46	90.31	89.18	89.04	88.55	89.21	88.33	89.10	88.90	89.11
MW-9			90.69		89.17	88.62	89.40	88.23	89.34	89.08	89.32
MW-10	89.17	89.06	90.32	89.78	89.66	89.09	89.65	88.88	89.53	89.42	89.62
MW-11	86.17	85.89	90.07	88.19	87.11	85.87	88.16	85.18	86.14	86.47	88.07
MW-12			84.75		81.42	81.60	83.49	80.87	-	82.60	83.06

All values reported in feet

Ref :GWLEVEL.XLS

APPENDIX C

GROUNDWATER QUALITY DATA SUMMARY
1) Supply Well Quality Data
2) Monitoring Well Quality Data and Charts

Groundwater Quality Summary
Haps Service Station
Waitsfield, Vermont

Site Supply Well

PARAMETER	Date of Sample Collection											
	12/7/94	1/10/95	2/10/95	3/10/95	4/4/95	5/3/95	6/5/95	7/5/95	7/25/95	8/31/95	9/26/95	10/26/95
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DCB	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-DCB	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-DCB	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total BTEX	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MTBE	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND	ND
BTEX+MTBE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

PARAMETER	Date of Sample Collection											
	11/21/95	1/26/96	2/26/96	3/13/96	3/25/96	5/14/96	6/10/96	7/30/96	11/7/96	4/10/97	10/23/97	5/12/98
Benzene	ND	ND (1)	1.1	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Chlorobenzene	ND	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
1,2-DCB	ND	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
1,3-DCB	ND	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
1,4-DCB	ND	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Ethylbenzene	ND	ND (1)	2.2	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Toluene	ND	ND (1)	4.3	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Xylenes	ND	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Total BTEX	0.0	0.0	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MTBE	ND	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
BTEX+MTBE	0.0	0.0	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

See page 2 of Site Supply Well table for notes.

Groundwater Quality Summary
Haps Service Station
Waitsfield, Vermont

Site Supply Well

PARAMETER	Date of Sample Collection											
	10/12/98	4/14/99										VGES*
Benzene	ND(1)	ND(1)										5
Ethylbenzene	ND(1)	ND(1)										700
Toluene	ND(1)	ND(1)										1,000
Xylenes	ND(1)	ND(1)										10,000
Total BTEX	ND (1)	ND (1)										
1,2,4 Trimethylbenzene	NA	ND(1)										5
1,3,5 Trimethylbenzene	NA	ND(1)										4
Naphthalene	ND(1)	ND(1)										20
MTBE	ND(10)	ND(10)										40
Total VOCs	ND(10)	ND(10)										

All values reported in ug/L (ppb)

Detections are **Bold**

VGES - Vermont Groundwater Enforcement Standard, Source VT Groundwater Protection Rule and Strategy, 11/15/97

Values greater than the applicable VGES are shaded

ND(1000) - Not Detected (Detection Limit)

Chlorobenzene, 1,2-DCB, 1,3-DCB and 1,4-DCB past sampling data has been removed from chart due to consistent non-detect results

TBQ(1) - Trace Below Quantitation Limit (Quantitation Limit)

4/14/99 Analysis by EPA Method 8021B. Analyses prior to this date were run by EPA Method 602.

Groundwater Quality Data Summary
Haps Service Station
Waltsfield, Vermont

Monitoring Well 5

Sampling Date / *Analytical Method* / PARAMETER	4/19/95 602	7/25/95 602	10/26/95 602	1/26/96 602	5/14/96 602	7/30/96 602	11/7/96 602	4/10/97 602	10/23/97 602	5/12/98 602	10/12/98 602	4/14/99 8021B	VGES
Benzene	ND	**18.1**	ND		**TBQ (1)**	**8.1**	ND(1)	**3.8**	ND(1)	ND(1)	ND(1)	ND(1)	**5**
Toluene	ND	**12.2**	ND		ND(1)	**1.0**	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	**1,000**
Ethylbenzene	ND	ND	ND	No	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	**700**
Xylenes	ND	**6.1**	ND	Sample	**1.0**	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	**10,000**
Total BTEX	ND	**36.4**	ND(10)	Collected	**1.0**	**9.1**	ND(10)	**3.8**	ND(10)	ND(10)	ND(10)	ND(1)	-
MTBE	ND(10)	ND(10)	ND(10)	on this	ND(10)	**19.5**	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	**40**
1,2,4 Trimethylbenzene	NA	NA	NA	Date	NA	NA	NA	NA	NA	NA	NA	ND(1)	**5**
1,3,5 Trimethylbenzene	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	ND(1)	**4**
Naphthalene	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	ND(1)	**20**
Total Targeted VOCs	ND	**36.4**	ND		**1.0**	**28.6**	ND (10)	**3.8**	ND (10)	ND (10)	ND (10)	ND (10)	-

All values reported in ug/L (ppb)

Detections are **Bold**

Detected concentrations (sampled after 11/15/97) which are equal to or greater than the applicable VGES are shaded.

VGES - Vermont Groundwater Enforcement Standard, Source VT Groundwater Protection Rule and Strategy, 11/15/97

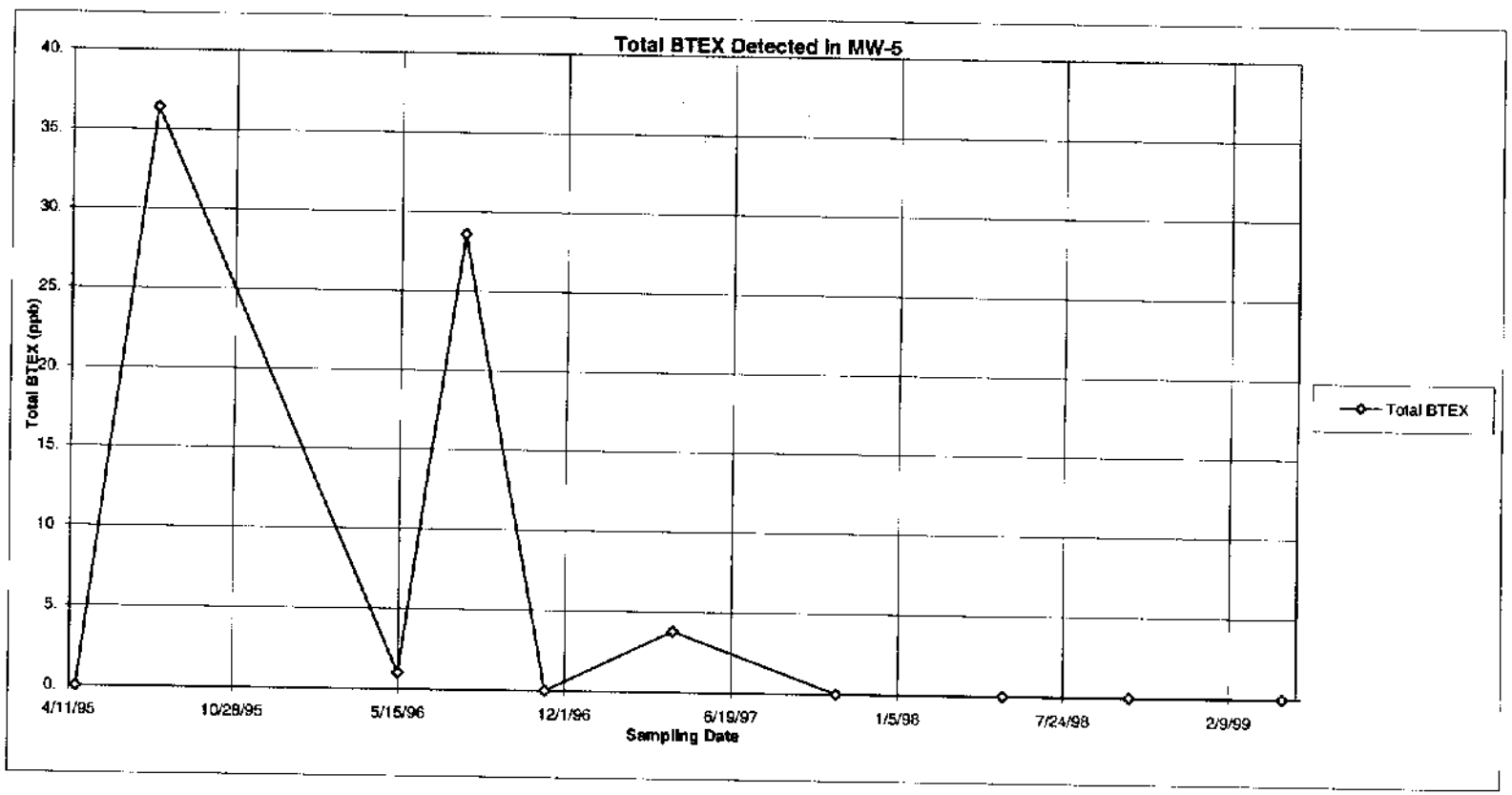
ND(1000) - Not Detected (Detection Limit)

Chlorobenzene, 1,2-DCB, 1,3-DCB and 1,4-DCB past sampling data has been removed from chart due to consistent non-detect results

TBQ(1) - Trace Below Quantitation Limit (Quantitation Limit)

NA - not available

Groundwater Quality Data Summary
Haps Service Station
Waitsfield, Vermont



REF: Hapsmw.xls

Groundwater Quality Data Summary
Haps Service Station
Waitsfield, Vermont

Monitoring Well 6

Sampling Date / *Analytical Method* / PARAMETER	1/3/95 602	4/19/95 -	7/25/95 -	10/26/95 602	1/26/96 602	5/14/96 602	7/30/96 602	11/7/96 -	4/10/97 -	10/23/97 -	5/12/98 602	10/12/98 602	4/14/99 8021B	VGES
Benzene	**3,700.**			**1,460.**	**304.**	**308.**	**348.**				**27.2**	**42.9**	**21.8**	5
Toluene	**8,190.**	No Sample	No	**11,000.**	**5,010.**	**2,400.**	**2,080.**				**338.**	**711.**	**59.0**	1,000
Ethylbenzene	**627.**	Collected	Sample	**1,920.**	**955.**	**779.**	**594.**	No	No	No	**84.5**	**173.**	**20.1**	700
Xylenes	**3,910.**	This Date	Collected	**10,200.**	**7,090.**	**5,020.**	**3,530.**	Sample	Sample	Sample	**450.**	**914.**	**112.**	10,000
Total BTEX	**16,427.**	Free	Insufficient	**24,580.**	**13,359.**	**8,507.**	**6,552.**	Collected	Collected	Collected	**900.**	**1,841.**	**213.**	-
MTBE	**5,950.**	Product	Water In	ND (2,000)	ND (2,000)	ND (2,000)	ND (2,000)	This	This	This	ND(100)	ND(100)	ND(20)	40
1,2,4 Trimethylbenzene	NA	In Well	Well	NA	NA	NA	NA	Date	Date	Date	NA	NA	**74.7**	5
1,3,5 Trimethylbenzene	NA			NA	NA	NA	NA				NA	NA	**34.8**	4
Naphthalene	NA			NA	NA	NA	NA				NA	NA	**16.8**	20
Total Targeted VOCs	**22,377.**			**24,580.**	**13,359.**	**8,507.**	**6,552.**				**900.**	**1,841.**	**339.**	-

All values reported in ug/L (ppb)

Detections are **Bold**

Detected concentrations (sampled after 11/15/97) which are equal to or greater than the applicable VGES are shaded.

VGES - Vermont Groundwater Enforcement Standard. Source VT Groundwater Protection Rule and Strategy, 11/15/97

ND(1000) - Not Detected (Detection Limit)

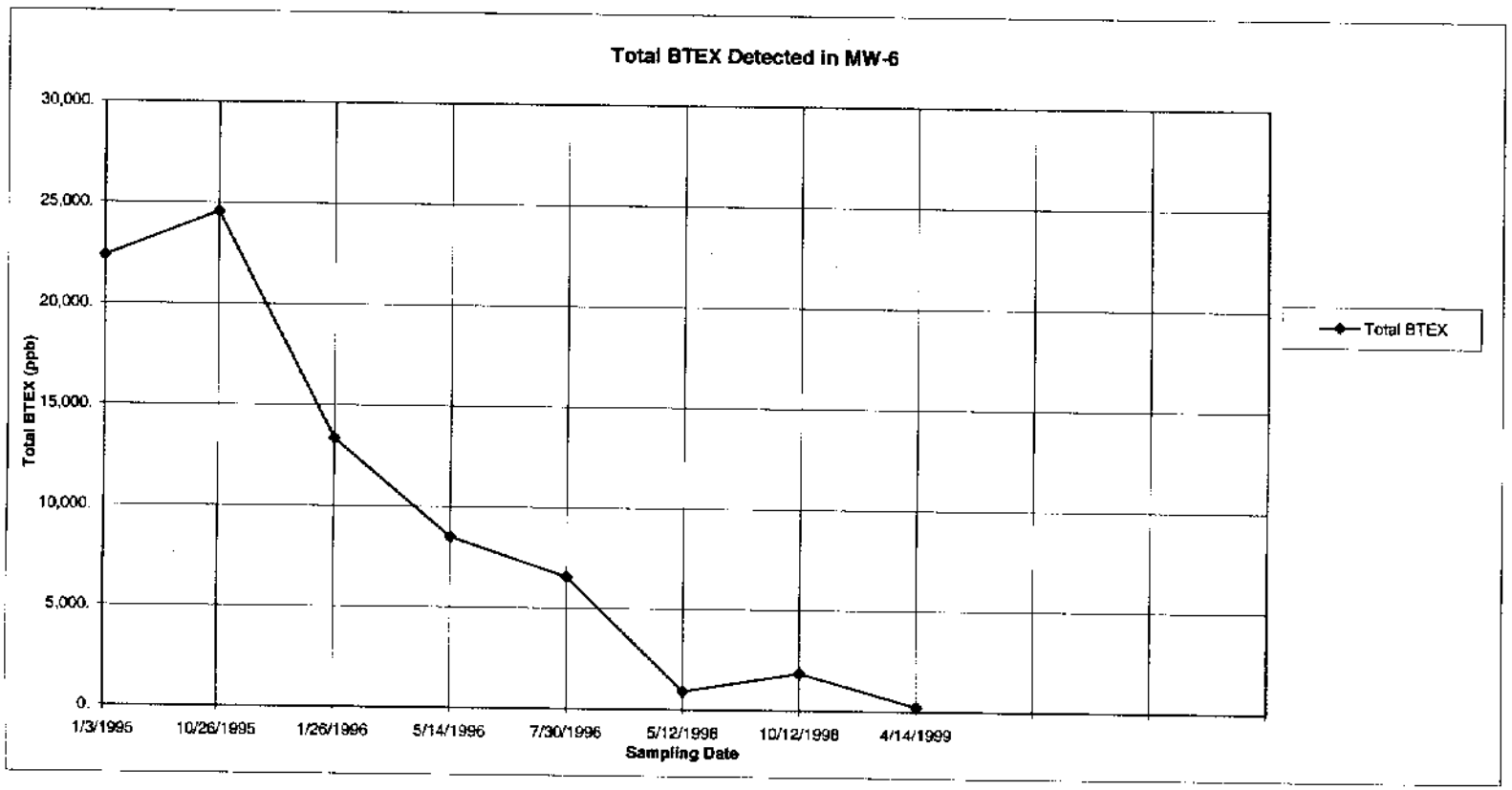
Chlorobenzene, 1,2-DCB, 1,3-DCB and 1,4-DCB past sampling data has been removed from chart due to consistent non-detect results

TBQ(1) - Trace Below Quantitation Limit (Quantitation Limit)

NA - not available

REF: Hapsmw.xls

Groundwater Quality Data Summary
Haps Service Station
Waltsfield, Vermont



REF: Hapsmw.xls

Groundwater Quality Data Summary
Haps Service Station
Waitsfield, Vermont

Monitoring Well 8

Sampling Date / *Analytical Method* / PARAMETER	3/10/95	4/19/95	7/25/95	10/26/95	1/26/96	5/14/96 602	7/30/96 602	11/7/96 -	4/10/97 -	10/23/97 -	5/12/98 602	10/12/98 602	4/14/99 8021B	VGES
Benzene						**3,730.**	**1,430.**				**678.**	**404.**	**378.**	5
Toluene						**28,800.**	**9,990.**	No	No	No	**6,920.**	**4,930.**	**4,970.**	1000
Ethylbenzene						**7,580.**	**2,290.**	Sample	Sample	Sample	**1,330.**	**1,270.**	**1,600.**	700
Xylenes						**59,800.**	**16,700.**	Collected	Collected	Collected	**12,100.**	**12,500.**	**13,800.**	10000
Total BTEX						**99,910.**	**30,410.**	This	This	This	**21,028.**	**19,104.**	**20,748.**	-
MTBE						ND (1000)	ND (1000)	Date	Date	Date	ND (1000)	ND (1000)	ND (1000)	40
1,2,4 Trimethylbenzene						NA	NA				NA	NA	**6,360.**	5
1,3,5 Trimethylbenzene						NA	NA				NA	NA	**2,340.**	4
Naphthalene						NA	NA				NA	NA	**2,270.**	20
Total Targeted VOCs						**99,910.**	**30,410.**				**21,028.**	**19,104.**	**31,718.**	-

All values reported in ug/L (ppb)

Detections are **Bold**

Detected concentrations (sampled after 11/15/97) which are equal to or greater than the applicable VGES are shaded.

VGES - Vermont Groundwater Enforcement Standard, Source VT Groundwater Protection Rule and Strategy, 11/15/97

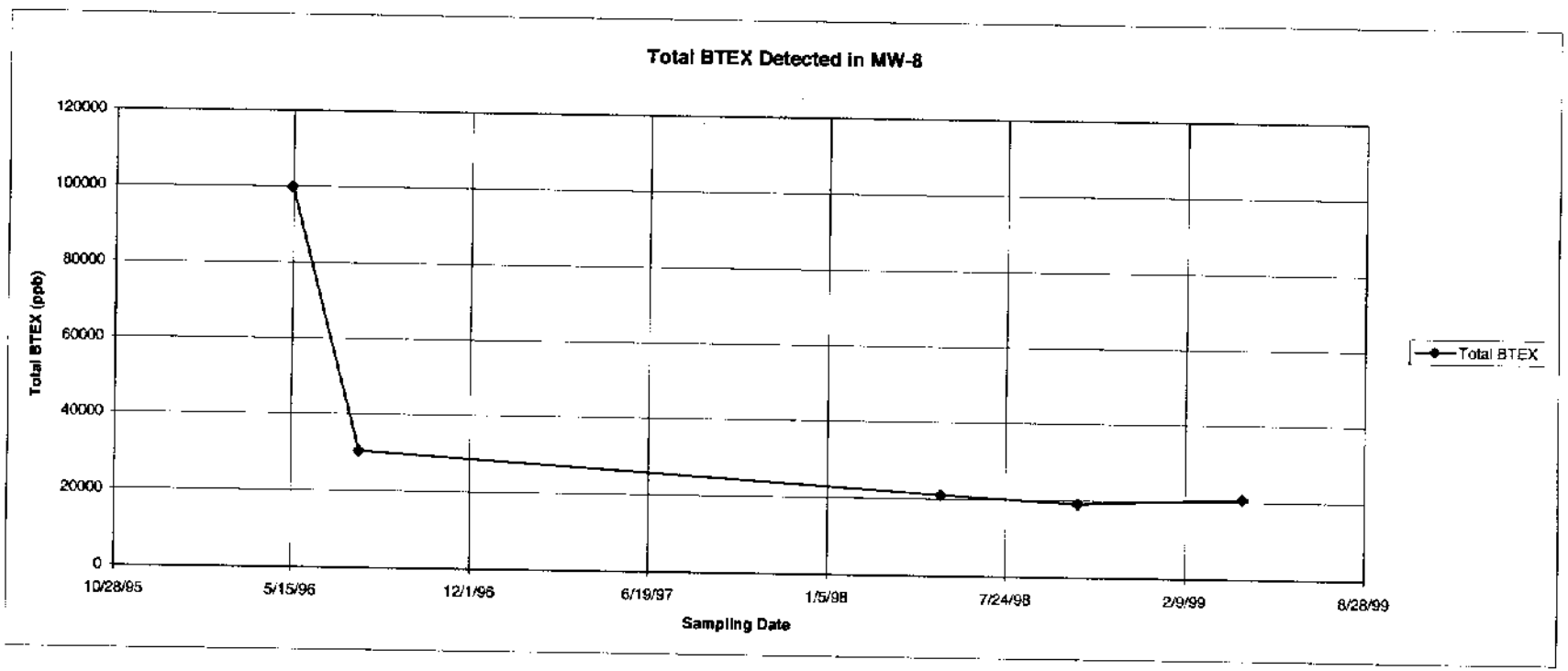
ND (1000) - Not Detected (Detection Limit)

Chlorobenzene, 1,2-DCB, 1,3-DCB and 1,4-DCB past sampling data has been removed from chart due to consistent non-detect results

TBQ(1) - Trace Below Quantitation Limit (Quantitation Limit)

NA - not available

Groundwater Quality Data Summary
Haps Service Station
Waitsfield, Vermont



REF: Hapsmw.xls

Groundwater Quality Data Summary
Haps Service Station
Waltsfield, Vermont

Monitoring Well 9

Sampling Date	1/13/95	4/19/95	7/25/95	10/26/95	1/26/96	5/14/96	7/30/96	11/7/96	4/10/97	10/23/97	5/12/98	10/12/98	4/14/99	
Analytical Method	602	602	-	602	602	602	602	602	602	602	602	602	8021B	
PARAMETER														VGES
Benzene	**TBQ**	**TBQ**		ND	ND (100)	ND (100)	ND (100)	ND (100)	**TBQ (5)**	ND (5)	ND (5)	ND (5)	ND (10)	**5**
Toluene	ND	**TBQ**		ND	ND (100)	ND (100)	ND (100)	ND (100)	**7.5**	ND (5)	ND (5)	ND (5)	**TBQ (10)**	**1000**
Ethylbenzene	**104.**	**71.1**	No	**TBQ (100)**	ND (100)	**152.**	**TBQ (100)**	**TBQ (100)**	**45.7**	**24.8**	**36.5**	**17.6**	**26.0**	**700**
Xylenes	**323.**	**245.**	Sample	**223.**	ND (100)	**535.**	**143.**	**267.**	**150.**	**65.9**	**102.**	**41.6**	**74.9**	**10000**
Total BTEX	**427.**	**316.**	Collected	**223.**	ND	**687.**	**143.**	**267.**	**203.**	**91.**	**139.**	**59.**	**101.**	-
MTBE	ND (100)	ND (100)	Free	ND (1000)	ND (1000)	ND (1000)	ND (1000)	ND (1000)	ND (50)	ND (50)	**96.9**	ND (50)	ND (100)	**40**
1,2,4 Trimethylbenzene	NA	NA	Product	NA	NA	NA	NA	NA	NA	NA	NA	NA	**271.**	**5**
1,3,5 Trimethylbenzene	NA	NA	In Well	NA	NA	NA	NA	NA	NA	NA	NA	NA	**59.1**	**4**
Naphthalene	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	**93.9**	**20**
Total Targeted VOCs	**427.**	**316.**		**223.**	ND	**687.**	**143.**	**267.**	**203.**	**91.**	**235.**	**59.**	**525.**	-

All values reported in ug/L (ppb)

Detections are **Bold**

Detected concentrations (sampled after 11/15/97) which are equal to or greater than the applicable VGES are shaded.

VGES - Vermont Groundwater Enforcement Standard, Source VT Groundwater Protection Rule and Strategy, 11/15/97

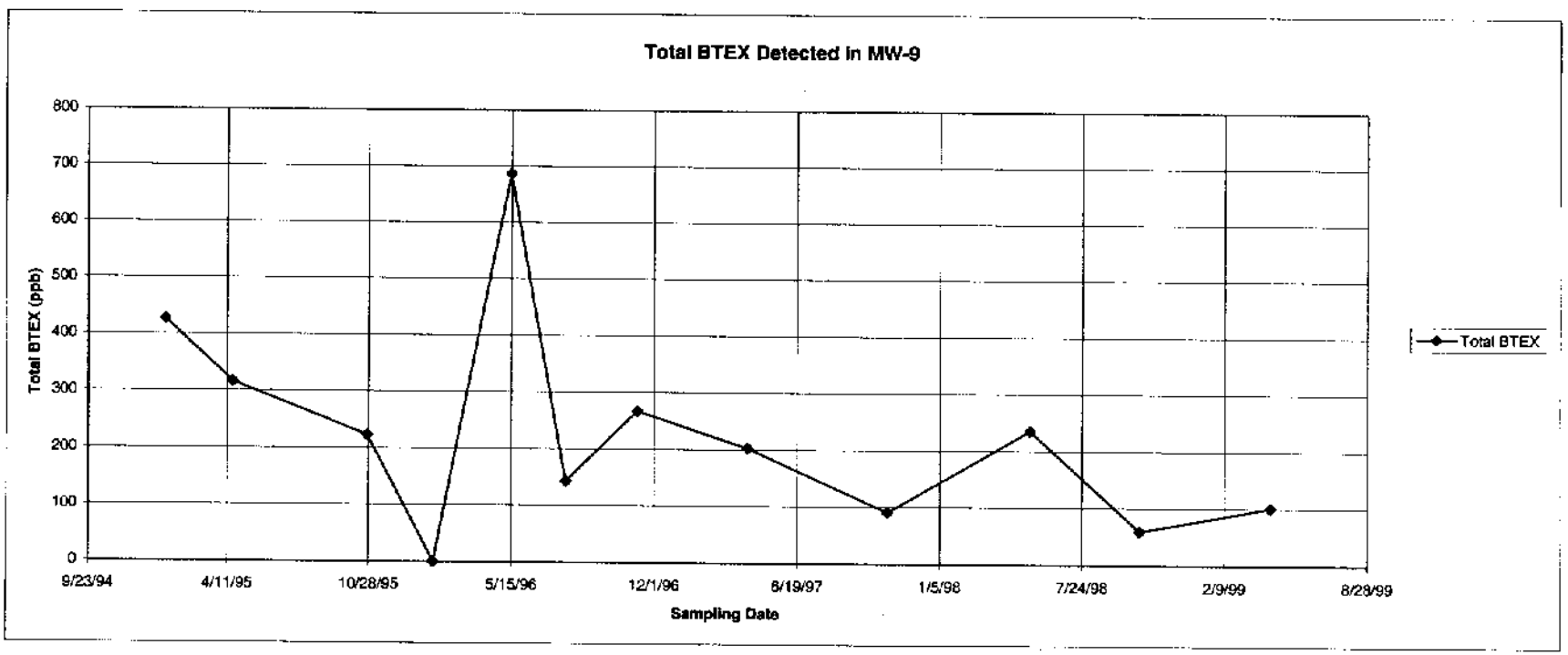
ND (1000) - Not Detected (Detection Limit)

Chlorobenzene, 1,2-DCB, 1,3-DCB and 1,4-DCB past sampling data has been removed from chart due to consistent non-detect results

TBQ(1) - Trace Below Quantitation Limit (Quantitation Limit)

NA - not available

Groundwater Quality Data Summary
Haps Service Station
Waitsfield, Vermont



REF: Hapsmw.xls

Groundwater Quality Data Summary
Haps Service Station
Waitsfield, Vermont

Monitoring Well 10

Sampling Date *Analytical Method* PARAMETER	3/10/95 602	4/19/95 602	7/25/95 -	10/26/95 602	1/26/96 602	5/14/96 602	7/30/96 602	11/7/96 602	4/10/97 602	10/23/97 602	5/12/98 602	10/12/98 602	4/14/99 8021B	VGES
Benzene	**171.**	**2,120.**		**786.**	**167.**	**185.**	**106.**	**69.3**	**53.9**	**25.9**	ND (10)	**7.3**	**17.2**	**5**
Toluene	**287.**	**8,440.**		**6,250.**	**2,770.**	**1,810.**	**586.**	**614.**	**299.**	**31.8**	**45.5**	**26.8**	ND<5	**1000**
Ethylbenzene	**TBQ**	**886.**	No	**1,390.**	**648.**	**700.**	**287.**	**282.**	**185.**	**94.1**	**72.4**	**42.5**	**45.5**	**700**
Xylenes	**3,113.**	**5,860.**	Sample	**6,980.**	**4,740.**	**4,120.**	**1,490.**	**1,330.**	**954.**	**188.**	**176.**	**116.**	**137.**	**10000**
Total BTEX	**3,571.**	**17,306.**	Collected	**15,406.**	**8,325.**	**6,815.**	**2,469.**	**2,295.**	**1,492.**	**340.**	**294.**	**193.**	**200.**	-
MTBE	ND (100)	ND (1000)	Insufficient	ND (1000)	ND (1000)	ND (1000)	ND (1000)	**279.**	ND (200)	ND (100)	ND (100)	ND (50)	ND (50)	**40**
1,2,4 Trimethylbenzene	NA	NA	Water	NA	NA	NA	NA	NA	NA	NA	NA	NA	**199.**	**5**
1,3,5 Trimethylbenzene	NA	NA	In Well	NA	NA	NA	NA	NA	NA	NA	NA	NA	**81.6**	**4**
Naphthalene	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	**61.0**	**20**
Total Targeted VOCs	**3,571.**	**17,306.**		**15,406.**	**8,325.**	**6,815.**	**2,469.**	**2,574.**	**1,492.**	**340.**	**294.**	**193.**	**541.**	-

All values reported in ug/L (ppb)

Detections are **Bold**

Detected concentrations (sampled after 11/15/97) which are equal to or greater than the applicable VGES are shaded.

VGES - Vermont Groundwater Enforcement Standard, Source VT Groundwater Protection Rule and Strategy, 11/15/97

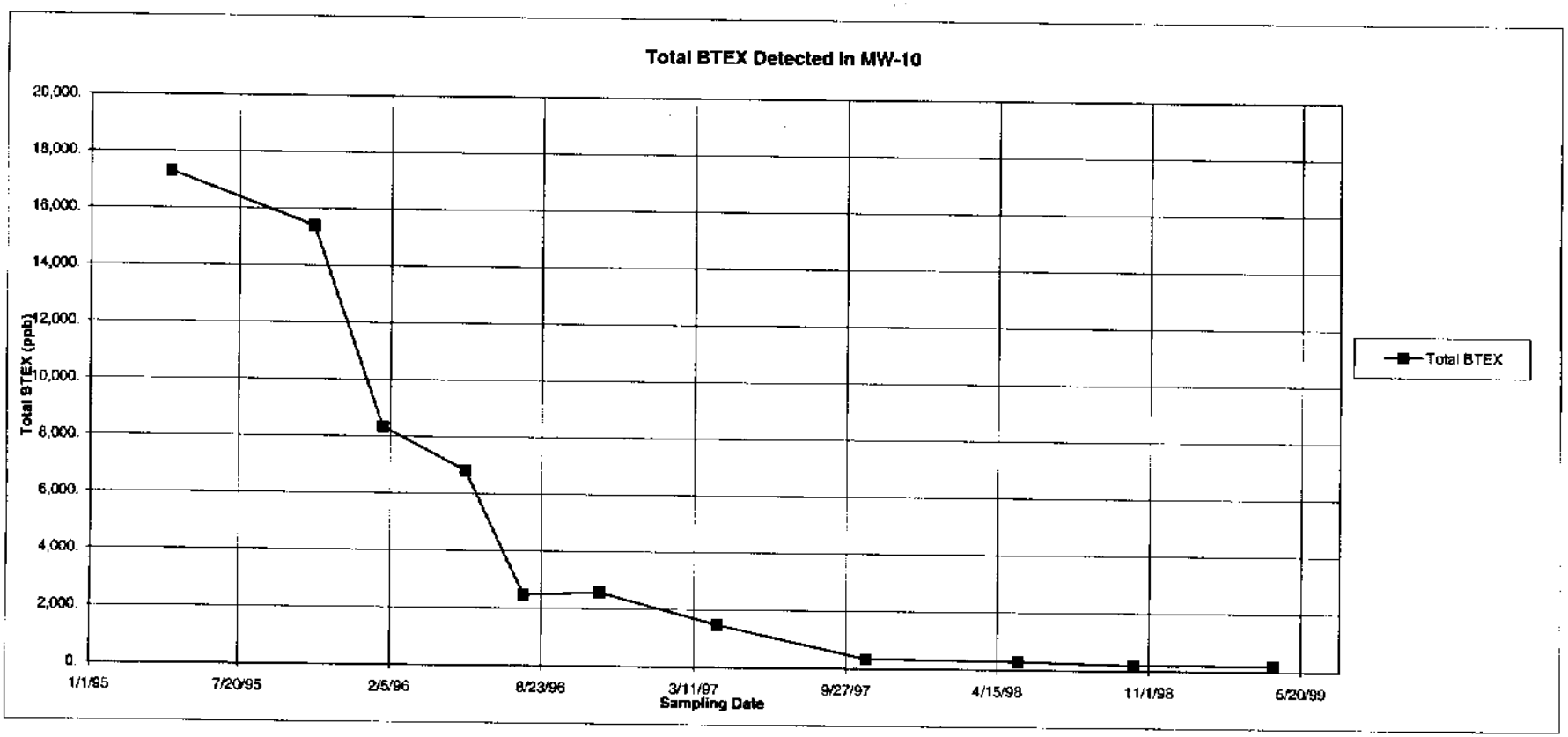
ND(1000) - Not Detected (Detection Limit)

Chlorobenzene, 1,2-DCB, 1,3-DCB and 1,4-DCB past sampling data has been removed from chart due to consistent non-detect results

TBQ(1) - Trace Below Quantitation Limit (Quantitation Limit)

NA - not available

Groundwater Quality Data Summary
Haps Service Station
Waitsfield, Vermont



REF: Hapsmw.xls

Groundwater Quality Data Summary
Haps Service Station
Waitsfield, Vermont

Monitoring Well 11

Sampling Date	3/10/95	4/19/95	7/25/95	10/26/95	1/26/96	5/14/96	7/30/96	11/7/96	4/10/97	10/23/97	5/12/98	10/12/98	4/14/99	
Analytical Method	602	602	-	602	602	602	602	602	602	-	602	602	8021B	
PARAMETER														VGES
Benzene	**82.9**	**698.**		**255.**	**1,460.**	**492.**	**25.9**	**105.**	**25.1**		**62.0**	**60.3**	**264.**	**5**
Toluene	**235.**	**851.**		**1,510.**	**4,590.**	**1,460.**	**109.**	**806.**	**157.**		**115.**	**112.**	**2160.**	**1000**
Ethylbenzene	**38.7**	ND	No Sample	**TBQ<50**	**184.**	**315.**	**TBQ<20**	**70.5**	ND (20)	No Sample	**52.3**	**54.2**	**202.**	**700**
Xylenes	**250.**	**666.**	Collected	**1,400.**	**3,370.**	**2,470.**	**189.**	**399.**	**186.**	Collected	**449.**	**148.**	**2890.**	**10000**
Total BTEX	**607.**	**2,215.**	Insufficient	**3,165.**	**9,604.**	**4,737.**	**324.**	**1,381.**	**368.**	Insufficient	**678.**	**375.**	**5,516.**	-
MTBE	ND (100)	**5,000.**	Water	ND (500)	ND (500)	ND (500)	ND (200)	**408.**	ND (200)	Recharge	**103.**	**66.9**	ND (200)	**40**
1,2,4-Trimethylbenzene	NA	NA	In Well	NA	NA	NA	NA	NA	NA		NA	NA	**642.**	**5**
1,3,5-Trimethylbenzene	NA	NA		NA	NA	NA	NA	NA	NA		NA	NA	**208.**	**4**
Naphthalene	NA	NA		NA	NA	NA	NA	NA	NA		NA	NA	**158.**	**20**
Total Targeted VOCs	**607.**	**7,215.**		**3,165.**	**9,604.**	**4,737.**	**324.**	**1,789.**	**368.**		**781.**	**441.**	**6,366.**	-

All values reported in ug/L (ppb)

Detections are **Bold**

Detected concentrations (sampled after 11/15/97) which are equal to or greater than the applicable VGES are shaded.

VGES - Vermont Groundwater Enforcement Standard, Source VT Groundwater Protection Rule and Strategy, 11/15/97

ND(1000) - Not Detected (Detection Limit)

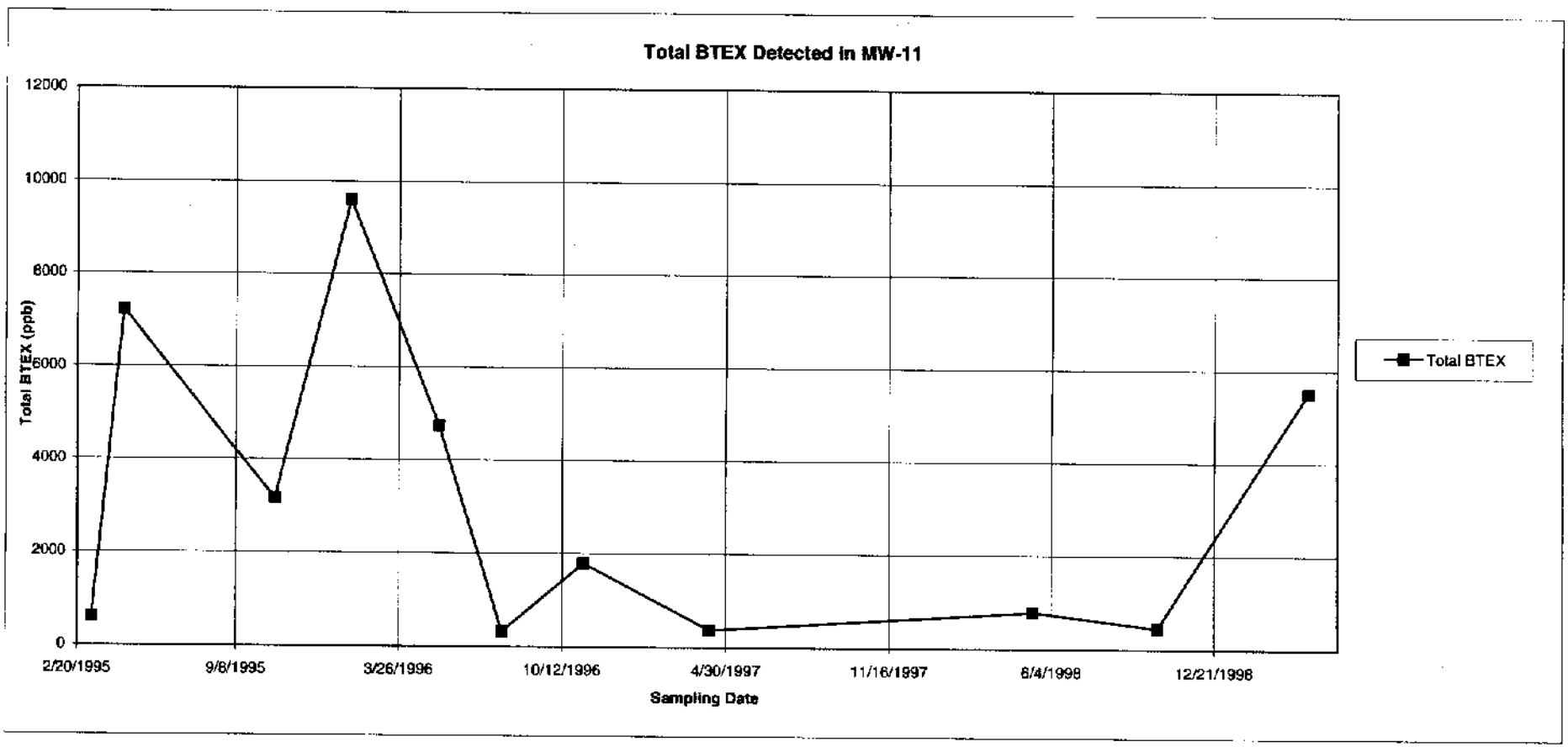
Chlorobenzene, 1,2-DCB, 1,3-DCB and 1,4-DCB past sampling data has been removed from chart due to consistent non-detect results

TBQ(1) - Trace Below Quantitation Limit (Quantitation Limit)

NA - not available

REF: Hapsmw.xls

Groundwater Quality Data Summary
Haps Service Station
Waitsfield, Vermont



REF: Hapsmw.xls

Groundwater Quality Data Summary
Haps Service Station
Waitsfield, Vermont

Monitoring Well 12

Sampling Date / *Analytical Method* / PARAMETER	3/10/95 602	4/19/95 602	7/25/95 602	10/26/95 602	1/26/96 602	5/14/96 602	7/30/96 602	11/7/96 602	4/10/97 602	10/23/97 602	5/12/98 -	10/12/98 602	4/14/99 8021B	VGES
Benzene	**31.7**	**486.**	**981.**	**288.**	**332.**	**691.**	**1,360.**	**1,030.**	**432.**	**394.**		**65.1**	**156.**	5
Toluene	**33.1**	ND	**582.**	**1,190.**	**1,660.**	**3,070.**	**356.**	**808.**	**1,440.**	**TBQ (50)**		**9.9**	**501.**	1000
Ethylbenzene	ND	**183.**	**250.**	**86.8**	**82.9**	**559.**	**525.**	**427.**	**650.**	**110.**	No	**19.3**	**127.**	700
Xylenes	**48.6**	**521.**	**805.**	**1,670.**	**3,030.**	**4,560.**	**1,440.**	**1,840.**	**4,440.**	**188.**	Sample	**67.9**	**643.**	10000
Total BTEX	**113.**	**1,190.**	**2,618.**	**3,235.**	**5,105.**	**8,880.**	**3,681.**	**4,105.**	**6,962.**	**692.**	Collected	**162.**	**1,427.**	-
MTBE	**433.**	**3,550.**	**6,710.**	**TBQ (500)**	**716.**	**TBQ (500)**	**5,030.**	**4,470.**	**732.**	**1,290.**	This	**36.1**	**130.**	40
1,3,5-Trimethylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Date	NA	**179.**	5
1,2,4-Trimethylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	**444.**	4
Naphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	**121.**	20
Total Targeted VOCs	**546.**	**4,740.**	**9,328.**	**3,235.**	**5,821.**	**8,880.**	**8,711.**	**8,575.**	**7,694.**	**1,982.**		**198.**	**2,301.**	-

All values reported in ug/L (ppb)

Detections are **Bold**

Detected concentrations (sampled after 11/15/97) which are equal to or greater than the applicable VGES are shaded.

VGES - Vermont Groundwater Enforcement Standard, Source VT Groundwater Protection Rule and Strategy, 11/15/97

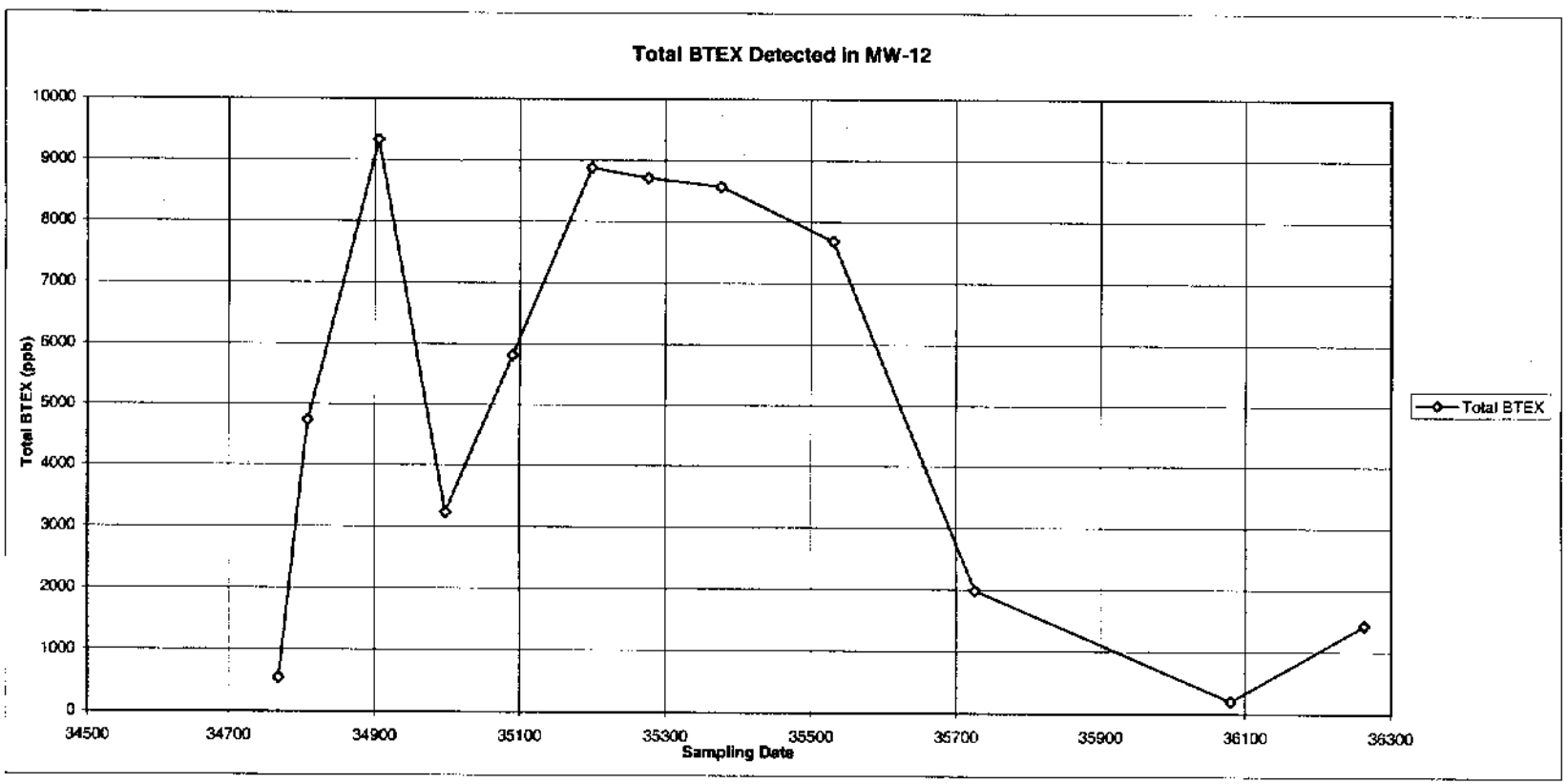
ND(1000) - Not Detected (Detection Limit)

Chlorobenzene, 1,2-DCB, 1,3-DCB and 1,4-DCB past sampling data has been removed from chart due to consistent non-detect results

TBQ(1) - Trace Below Quantitation Limit (Quantitation Limit)

NA - not available

Groundwater Quality Data Summary
Haps Service Station
Waltsfield, Vermont



REF: Hapsmw.xls

Groundwater Quality Data Summary
Haps Service Station
Waitsfield, Vermont

Quality Assurance/Quality Control Samples

Sample Date: April 14, 1999

PARAMETER	Equip. Blank	Trip Blank	Duplicate (MW-8)	VGES
Benzene		ND (1)	22.7	**5**
Toluene	No	ND (1)	66.9	**1000**
Ethylbenzene	Equip.	ND (1)	22.9	**700**
Xylenes	Blank	ND (1)	117.	**10000**
Total BTEX	Collected	ND	229.5	
MTBE	Disposable	ND (10)	TBQ (20)	**40**
1,2,4-Trimethylbenzene	Bailers	ND (1)	75.1	**5**
1,3,5-Trimethylbenzene	Used	ND (1)	33.6	**4**
Naphthalene		ND (1)	17.0	**20**
Total Targeted VOCs		ND	355.2	-

VGES = Vermont Groundwater Enforcement Standard, 11/15/97
All Values Reported in ug/L (ppb)
Laboratory analysis by EPA 8021B
ND (1) = not detected (detection limit)
VOCs = volatile organic compounds
TBQ(1) - Trace Below Quantitation Limit (Quantitation Limit)

APPENDIX D

LABORATORY ANALYSIS REPORTS

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

EPA METHOD 8021B--PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Haps Service Station/#12944625
CLIENT PROJ. #: 12944625

DATE RECEIVED: April 15, 1999
REPORT DATE: April 26, 1999
ORDER ID: 1992

Ref. #:	137,008	137,009	137,010	137,011	137,012
Site:	Trip Blank	MW #12	MW #11	MW #10	MW #5
Date Sampled:	4/14/99	4/14/99	4/14/99	4/14/99	4/14/99
Time Sampled:	7:50	9:42	10:03	10:24	10:37
Sampler:	D. Tourangeau	D. Tourangeau	D. Tourangeau	D. Tourangeau	D. Tourangeau
Date Analyzed:	4/22/99	4/21/99	4/22/99	4/21/99	4/22/99
UIP Count:	0	>10	>10	>10	0
Dil. Factor (%):	100	20	5	20	100
Surr % Rec. (%):	85	87	92	84	99
Parameter	Conc. (ug/L)	Conc. (ug/L)	Conc. (ug/L)	Conc. (ug/L)	Conc. (ug/L)
MTBE	<10	130.	<200	<50	<10
Benzene	<1	156.	264.	17.2	<1
Toluene	<1	501.	2,160.	<5	<1
Ethylbenzene	<1	127.	202.	45.5	<1
Xylenes	<1	643.	2,890.	137.	<1
1,3,5 Trimethyl Benzene	<1	179.	208.	81.6	<1
1,2,4 Trimethyl Benzene	<1	444.	642.	199.	<1
Naphthalene	<1	121.	158.	61.0	<1

Ref. #:	137,013	137,014	137,015	137,016	137,017
Site:	MW #6	Duplicate	MW #8	MW #9	Supply Well
Date Sampled:	4/14/99	4/14/99	4/14/99	4/14/99	4/14/99
Time Sampled:	11:04	11:04	12:11	12:29	12:44
Sampler:	D. Tourangeau	D. Tourangeau	D. Tourangeau	D. Tourangeau	D. Tourangeau
Date Analyzed:	4/22/99	4/23/99	4/22/99	4/23/99	4/23/99
UIP Count:	>10	>10	>10	>10	0
Dil. Factor (%):	50	50	1	10	100
Surr % Rec. (%):	82	80	113	94	90
Parameter	Conc. (ug/L)	Conc. (ug/L)	Conc. (ug/L)	Conc. (ug/L)	Conc. (ug/L)
MTBE	<20	TBQ <20	<1000	<100	<10
Benzene	21.8	22.7	378.	<10	<1
Toluene	59.0	66.9	4,970.	TBQ <10	<1
Ethylbenzene	20.1	22.9	1,600.	26.0	<1
Xylenes	112.	117.	13,800.	74.9	<1
1,3,5 Trimethyl Benzene	34.8	33.6	2,340.	59.1	<1
1,2,4 Trimethyl Benzene	74.7	75.1	6,360.	271.	<1
Naphthalene	16.8	17.0	2,270.	93.9	<1

Note: UIP = Unidentified Peaks