SECOR

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San Diego, CA 92108
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Date: July 15, 2005

ARCO QUARTERLY GROUNDWATER MONITORING REPORT

Facility No.: 1919 Address:	660 Via de la Valle, Solana Beach, CA
ARCO Environmental Engineer :	Roy Thun
Consulting Co./Contact Person:	SECOR/Marci J. Richards and Bradley Eisenberg
SECOR Project No.:	08BP.U1919.05
Primary Agency/Regulatory ID No.:	County of San Diego, Departmental of Environmental Health (DEH), Land and Water Quality Division, Site Assessment and Mitigation Program (SAM), Danny Martinez/H05166-002

WORK PERFORMED THIS QUARTER [Second - 2005]:

1. Conducted second quarter 2005 groundwater monitoring and sampling.
2. Submitted the first quarter 2005 groundwater monitoring report.

WORK PROPOSED FOR NEXT QUARTER [Second - 2005]:

1. Conduct third quarter 2005 groundwater monitoring and sampling.
2. Submit second quarter 2005 groundwater monitoring report.

REGISTERED GEOLOGIST
BRADLEY G EISENBERG
No. 6872
Exp. 11/05
STATE OF CALIFORNIA

Current Phase of Project:	Monitoring	(Assessment, Remed., etc.)
Frequency of Sampling:	Quarterly (Well reduction 2nd, 3rd, 4th Quarters)	(Quarterly, etc.)
Frequency of Monitoring:	Quarterly	(Monthly, etc.)
Are Liquid Phase Hydrocarbons Present On-Site:	No	(Yes/No)
Cumulative LPH Recovered to Date:	180	(gallons)
LPH recovered This Quarter:	None	(gallons)
Bulk Soil Removed to Date:	Unknown	(cubic yards)
Bulk Soil Removed This Quarter:	None	(cubic yards)
Water Wells or Surface Waters within a 2000' Radius & Their Respective Directions:	None	(Distance and Direction)
Current Remediation Techniques:	None	(SVES, LPH Removal, etc.)
Permits for Discharge:	APCD	(NPDES, POTW, etc.)

Date: July 15, 2005

ARCO QUARTERLY GROUNDWATER MONITORING REPORT (Cont'd)
ARCO Facility #1919

Approximate Depth to Groundwater	2.81 to 23.61	(Measured Feet)
Groundwater Gradient:	Southwest	(Direction)
	0.004	(Magnitude)
Groundwater Beneficial Use	No (Exempt as Source of Drinking Water)	(Yes/ No)

DISCUSSION: On May 16, 2005 SECOR personnel gauged 18 groundwater monitoring wells and purged and sampled seven groundwater monitoring wells associated with the site (Figure 1), in general accordance with the well sampling reduction program. Field data was documented on the attached monitoring well gauging log and well purging/sampling logs. The depth to water ranged between 2.81 feet below ground surface (bgs) in MW-25 to 23.61 feet bgs in MW-26. Groundwater elevations ranged between 4.40 and 8.54 feet above mean sea level (MSL). Estimated groundwater flow direction was to the southwest at an approximate gradient of 0.004 (Figure 2). Liquid phase hydrocarbons (LPH) were not observed in the wells during the monitoring and sampling event.

In accordance with the attached sampling procedures, SECOR purged and sampled the groundwater monitoring wells. The samples collected from all monitoring wells purged were analyzed for gasoline-range organics (C_6-C_{12}; GRO); for benzene, toluene, ethylbenzene, and total xylenes (BTEX); and for the fuel oxygenates methyl tert-butyl ether (MTBE), ethyl tert-butyl ether (ETBE), di-isopropyl ether (DIPE), tert-amyl methyl ether (TAME), tert-butyl alcohol (TBA), and ethanol. Analytical results are summarized in Tables 2 and 3, and GRO, benzene, and MTBE concentration distribution is shown on Figure 3. Figure 4 depicts a dissolved benzene and MTBE isoconcentration map. Hydrographs showing changes in groundwater elevation and benzene and MTBE concentrations with time are also attached.

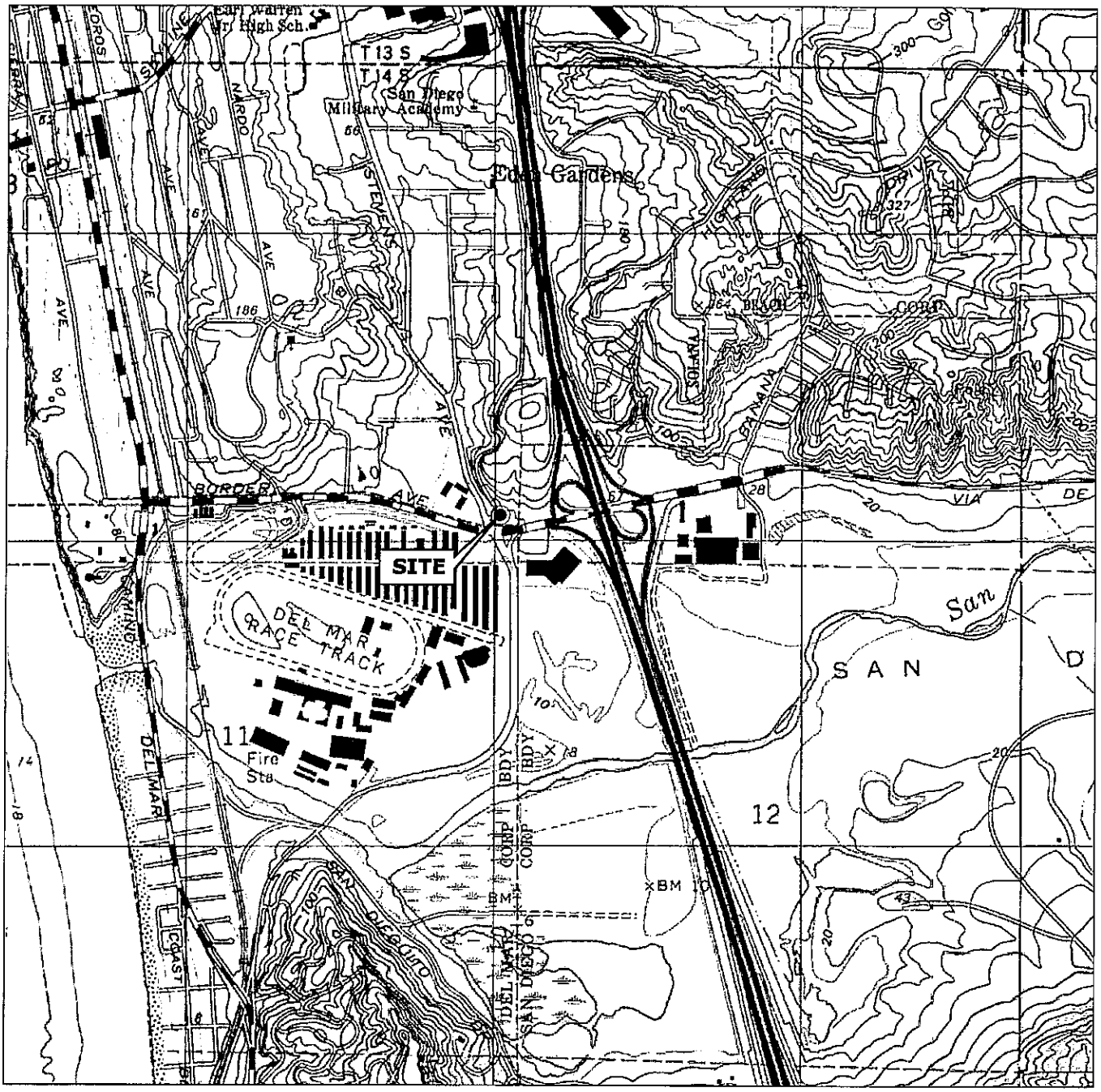
CONCLUSIONS AND RECOMMENDATIONS: Groundwater elevations were generally approximately one-half to three quarters of a foot lower than the previous quarter. Groundwater sample analytical results were generally consistent with previous quarters, continuing a trend of generally decreasing dissolved benzene and MTBE concentrations in sampled wells, where detected above reporting limits. SECOR recommends the periodic groundwater monitoring and sampling program be changed to semi-annual.

SUMMARY OF UNUSUAL ACTIVITIES: None

AGENCY DIRECTIVE REQUIREMENTS: Conduct purge groundwater sampling.

ATTACHED:

- Site Location Map (Figure 1)
- Site Plan (Figure 2)
- Groundwater Elevation Contour Map, May 16, 2005 (Figure 3)
- GRO, Benzene, and MTBE Concentrations in Groundwater May 16, 2005 (Figure 4)
- Benzene and MTBE Isoconcentration Map, May 16, 2005 (Figure 5)
- Summary of Groundwater Elevations, 2002 to Present (Table 1)
- Summary of Groundwater Sample Analytical Results, 2002 to Present (Table 2)
- Summary of Additional Oxygenates Analytical Results, 2002 to Present (Table 3)



REFERENCE: PROFFESIONAL USGS TOPOGRAPHIC SERIES

NORTH

0 2000 4000

APPROXIMATE SCALE IN FEET

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FOR:			FIGURE:
ARCO FACILITY #1919 660 VIA DE LA VALLE SOLANA BEACH, CALIFORNIA		SITE LOCATION MAP	1

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
08BP.U1919.05	PD		BGE	6/23/05

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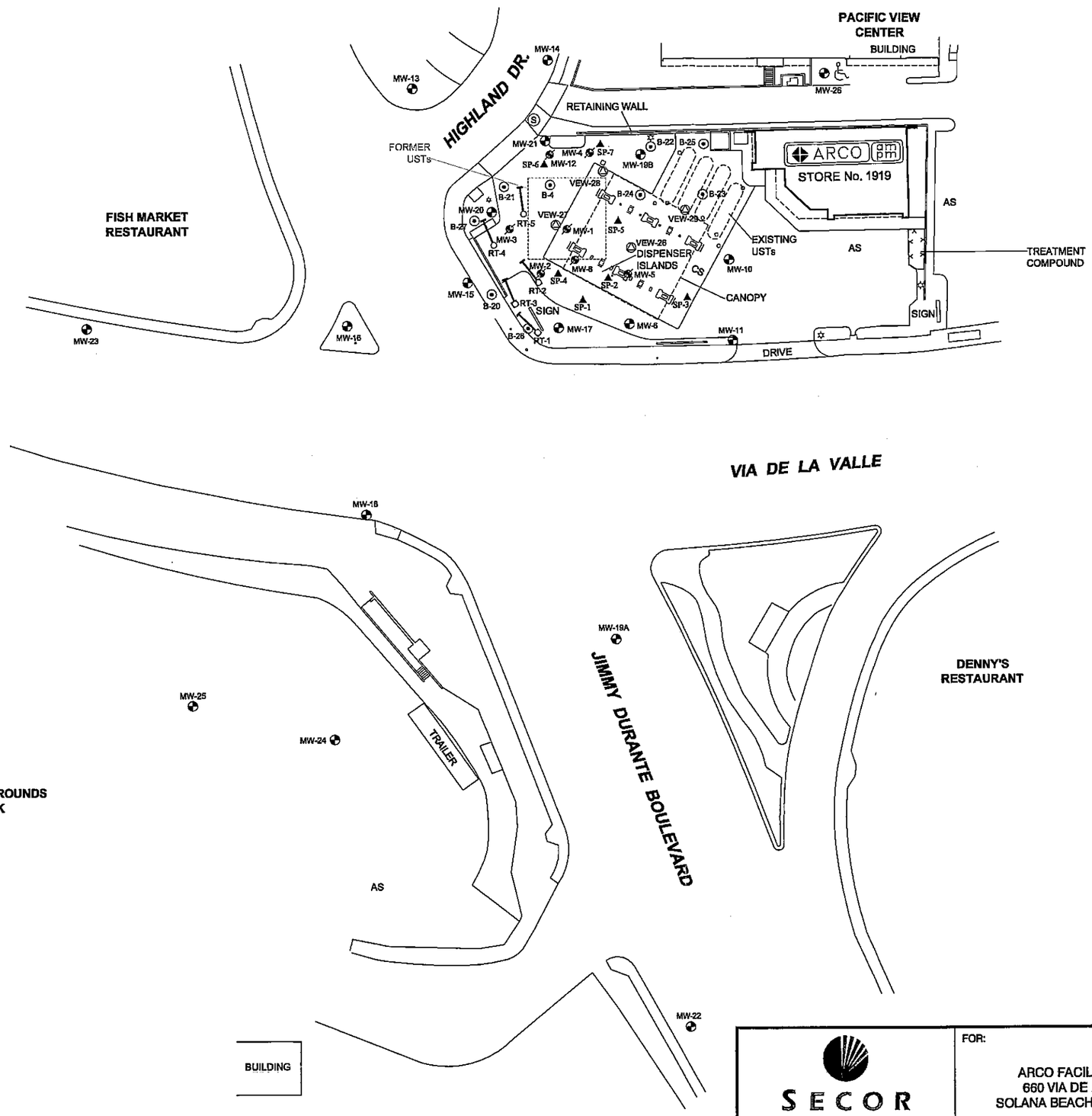
1919SLOC



LEGEND:

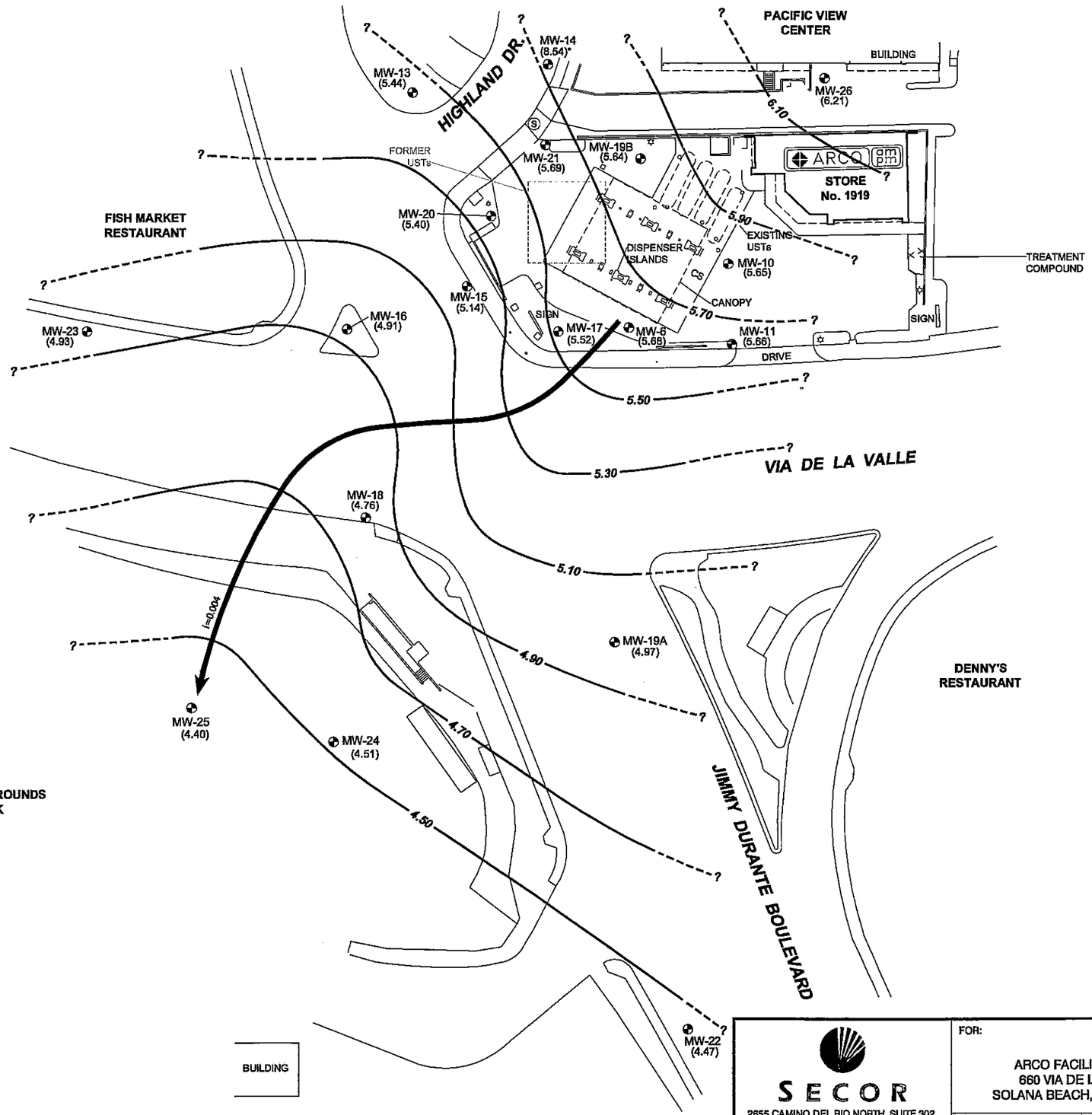
MW-26	GROUNDWATER MONITORING WELL
MW-12	DESTROYED MONITORING WELL
R-3	HORIZONTAL VAPOR EXTRACTION TRENCH
VEW-29	VAPOR EXTRACTION WELL
SP-6	SPARGE WELL
B-22	SOIL BOREHOLE
S	STORM DRAIN
	LIGHT POLE
AS	ASPHALT SURFACE
CS	CONCRETE SURFACE
USTs	UNDERGROUND STORAGE TANKS

SOURCE: SOUTHERN CALIFORNIA SURVEY, SEPTEMBER 26, 2003

SECOR 2655 CAMINO DEL RIO NORTH, SUITE 302 SAN DIEGO, CALIFORNIA PHONE: (619) 296-6195/296-6199 (FAX)	FOR: ARCO FACILITY #1919 660 VIA DE LA VALLE SOLANA BEACH, CALIFORNIA		SITE PLAN		FIGURE: 2
	JOB NUMBER: 08BP.U1919.05	DRAWN BY: PD	CHECKED BY:	APPROVED BY: BGE	DATE: 6/23/05

FILEPATH:Q:\CADD-08\PROJECTS 2005\ARCO\1919-2K5\1919SP6-05.DWG|JVELA|JUN 24, 2005 AT 14:46|LAYOUT: MODEL

1919SP6-05



LEGEND:

MW-26	GROUNDWATER MONITORING WELL
(S)	STORM DRAIN
☆	LIGHT POLE
AS	ASPHALT SURFACE
CS	CONCRETE SURFACE
USTs	UNDERGROUND STORAGE TANKS
(4.51)	GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL (MSL)
?--4.50--	INTERPRETED RELATIVE GROUNDWATER ELEVATION CONTOUR IN FEET ABOVE MSL. DASHED WHERE INFERRED. QUERIED WHERE UNKNOWN.
i=0.004	INTERPRETED GROUNDWATER FLOW DIRECTION AND HYDRAULIC GRADIENT (i)
UST	UNDERGROUND STORAGE TANK
[NM]	GROUNDWATER ELEVATION NOT MEASURED- INACCESSIBLE
*	GROUNDWATER ELEVATION WAS NOT USED TO CREATE CONTOUR MAP

0 60 120

APPROXIMATE SCALE (FEET)

REFERENCE:
SOUTHERN CALIFORNIA SURVEY, REPORT DATED SEPTEMBER 26, 2003

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FOR:
ARCO FACILITY #1919
660 VIA DE LA VALLE
SOLANA BEACH, CALIFORNIA

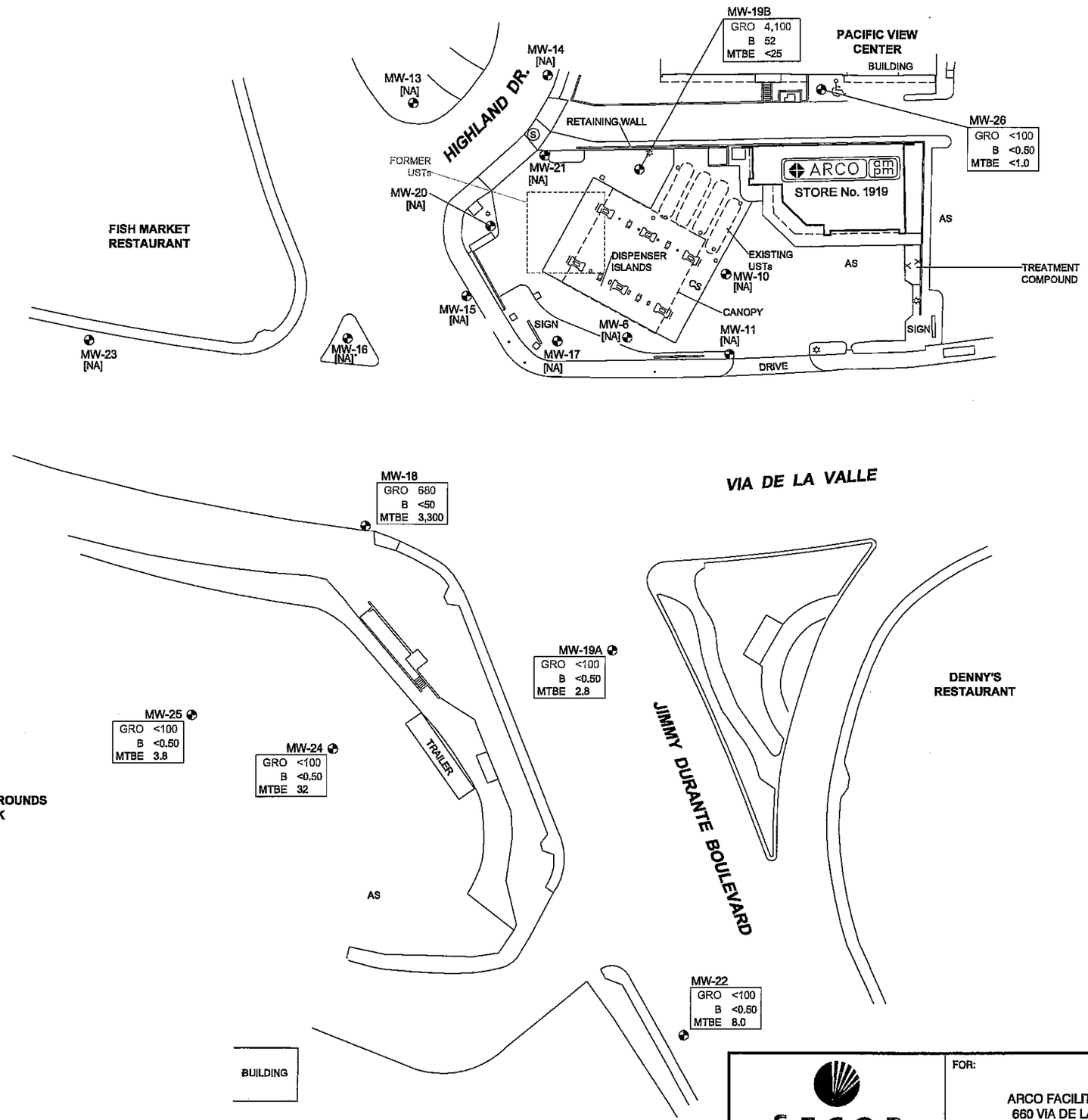
GROUNDWATER ELEVATION CONTOUR MAP, MAY 16, 2005

FIGURE: 3

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
08BP.U1919.05	ARA		BGE	4/8/05

FILEPATH:Q:\CADD-08\PROJECTS 2005\ARCO\1919-2K5\1919GW5-05.DWG|JVELA|JUN 24, 2005 AT 14:47|LAYOUT: MODEL

1919GW5-05



LEGEND:

MW-26	GROUNDWATER MONITORING WELL
Ⓢ	STORM DRAIN
☼	LIGHT POLE
AS	ASPHALT SURFACE
CS	CONCRETE SURFACE
USTs	UNDERGROUND STORAGE TANKS
GRO <100 B <0.50 MTBE <1.0	NO PURGE AND PURGE GROUNDWATER SAMPLE ANALYTICAL CONCENTRATION IN MICROGRAMS PER LITER ($\mu g/L$), RESPECTIVELY
GRO	GASOLINE-RANGE ORGANICS C6-C12
B	BENZENE
MTBE	METHYL TERT-BUTYL ETHER
<	BELOW LABORATORY REPORTING LIMIT SHOWN
[NA]	NOT ANALYZED - WILL REDUCTION PROGRAM

REFERENCE:
SOUTHERN CALIFORNIA SURVEY, REPORT DATED SEPTEMBER 26, 2003

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FOR:
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660 VIA DE LA VALLE
SOLANA BEACH, CALIFORNIA

GRO, BENZENE, AND MTBE CONCENTRATIONS IN GROUNDWATER
MAY 16, 2005

FIGURE: 4

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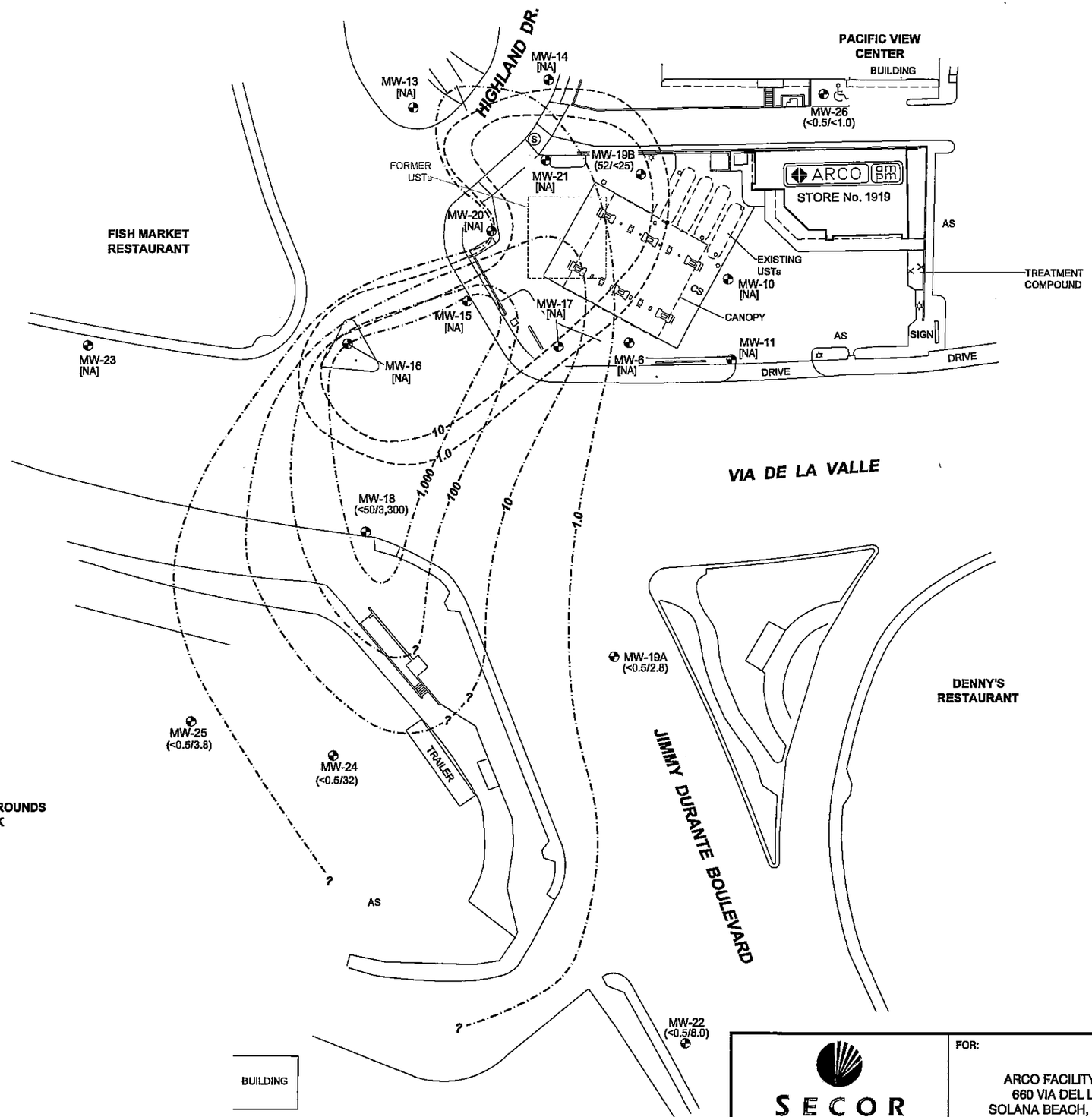
1919CON5-05



LEGEND:

MW-26	GROUNDWATER MONITORING WELL
Ⓢ	STORM DRAIN
☼	LIGHT POLE
AS	ASPHALT SURFACE
CS	CONCRETE SURFACE
USTs	UNDERGROUND STORAGE TANKS
(<1.0/130)	BENZENE AND MTBE CONCENTRATIONS IN MICROGRAMS PER LITER (μg/L)
10 ?	ESTIMATED BENZENE ISOCONCENTRATION CONTOUR IN μg/L, QUERIED WHERE UNKNOWN
10 ?	ESTIMATED MTBE ISOCONCENTRATION CONTOUR IN μg/L, QUERIED WHERE UNKNOWN
MTBE	METHYL TERT-BUTYL ETHER
<	BELOW LABORATORY REPORTING LIMIT
[NA]	NOT ANALYZED - WELL REDUCTION PROGRAM

REFERENCE:
SOUTHERN CALIFORNIA SURVEY, REPORT DATED SEPTEMBER 26, 2003

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PHONE: (619) 296-6195/296-6199 (FAX)

FOR:
ARCO FACILITY No. 1919
660 VIA DEL LA VALLE
SOLANA BEACH, CALIFORNIA

BENZENE AND MTBE ISOCONCENTRATION MAP
MAY 16, 2005

FIGURE: 5

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
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1919ISO5-05

TABLE 1

SUMMARY OF GROUNDWATER ELEVATIONS, 2002 TO PRESENT
ARCO Facility #1919

Well Identification / Surveyed Well Elevation[1] (Feet MSL)	Date Measured	Depth to Water (Feet)	LPH Thickness (Feet)	Groundwater Elevation[2] (Feet MSL)
MW-1	01/14/93	7.69	0.01	6.33
14.02	02/20/93	7.69	Sheen	6.30
	03/16/93	7.77	Sheen	6.25
	04/14/93	7.64	Sheen	6.38
	05/10/93	7.99	0.03	6.05 [3]
	09/02/93	8.13	0.05	5.93 [3]
	10/01/93	Well Destroyed		
MW-2	01/14/93	6.98	Sheen	5.95
12.93	02/20/93	6.77	Sheen	6.16
	03/16/93	6.72	Sheen	6.21
	04/14/93	6.80	Sheen	6.13
	05/10/93	6.90	Sheen	6.03
	09/02/93	7.08	Sheen	5.85
	10/01/93	Well Destroyed		
MW-3	01/14/93	6.38	0.00	4.17
12.55	04/14/93	6.94	0.00	5.61
	09/02/93	6.99	0.00	5.56
	10/01/93	Well Destroyed		
MW-4	01/14/93	7.28	Sheen	6.06
13.34	02/20/93	7.01	Sheen	6.33
	03/16/93	7.12	Sheen	6.22
	04/14/93	7.14	Sheen	6.20
	05/10/93	7.29	0.00	6.05
	09/02/93	7.37	0.00	5.97
	10/01/93	Well Destroyed		
MW-5	01/14/93	8.56	0.01	5.99 [3]
14.54	02/20/93	8.16	Sheen	6.38
	03/16/93	8.31	0.02	6.25 [3]
	04/14/93	8.47	0.09	6.14 [3]
	05/10/93	8.64	0.16	6.02 [3]
	09/02/93	8.88	0.30	5.88 [3]
	10/01/93	Well Destroyed		
MW-6	01/28/02	10.13	0.00	5.98
16.11	04/17/02	10.10	0.00	6.01
	07/09/02	10.17	0.00	5.94
	10/21/02	10.44	0.00	5.67
	02/21/03	10.27	0.00	5.84
	05/08/03	10.47	0.00	5.64
	07/25/03	10.39	0.00	5.72
15.96	11/21/03	10.66	0.00	5.30
	02/25/04	10.52	0.00	5.44
	06/21/04	10.55	0.00	5.41
	09/13/04	10.78	0.00	5.18
	12/20/04	10.62	0.00	5.34
	03/07/05	9.84	0.00	6.12
	05/16/05	10.28	0.00	5.68

TABLE 1

SUMMARY OF GROUNDWATER ELEVATIONS, 2002 TO PRESENT
ARCO Facility #1919

Well Identification / Surveyed Well Elevation[1] (Feet MSL)	Date Measured	Depth to Water (Feet)	LPH Thickness (Feet)	Groundwater Elevation[2] (Feet MSL)
MW-7	01/14/93	7.00	Sheen	5.47
12.47	02/20/93	6.61	0.29	6.08 [3]
	03/16/93	6.83	0.02	5.66 [3]
	04/14/93	6.88	0.14	5.70 [3]
	05/10/93	6.95	0.03	5.54 [3]
	09/02/93	7.03	Sheen	5.44
	10/01/93	Well Destroyed		
MW-8	01/14/93	7.80	0.01	6.04 [3]
13.83	02/20/93	7.51	Sheen	6.32
	03/16/93	7.61	Sheen	6.22
	04/14/93	7.70	0.02	6.15 [3]
	05/10/93	7.86	0.07	6.02 [3]
	09/02/93	7.99	0.08	5.90 [3]
	10/01/93	Well Destroyed		
MW-10	01/28/02	10.70	0.00	6.04
16.74	04/17/02	10.67	0.00	6.07
	07/09/02	10.73	0.00	6.01
	10/21/02	11.03	0.00	5.71
	02/21/03	10.87	0.00	5.87
	05/08/03	11.04	0.00	5.70
	07/25/03	11.02	0.00	5.72
16.59	11/21/03	11.16	0.00	5.43
	02/25/04	11.16	0.00	5.43
	06/21/04	11.21	0.00	5.38
	09/13/04	11.38	0.00	5.21
	12/20/04	11.21	0.00	5.38
	03/07/05	10.48	0.00	6.11
	05/16/05	10.94	0.00	5.65
MW-11	01/28/02	7.62	0.00	5.95
13.57	04/17/02	7.55	0.00	6.02
	07/09/02	7.65	0.00	5.92
	10/21/02	7.96	0.00	5.61
	02/21/03	7.78	0.00	5.79
	05/08/03	7.87	0.00	5.70
	07/25/03	7.85	0.00	5.72
13.40	11/21/03	8.17	0.00	5.23
	02/25/04	7.95	0.00	5.45
	06/21/04	7.98	0.00	5.42
	09/13/04	8.22	0.00	5.18
	12/20/04	8.00	0.00	5.40
	03/07/05	7.27	0.00	6.13
	05/16/05	7.74	0.00	5.66
MW-12	01/14/93	8.20	0.00	6.07
14.27	04/14/93	8.20	0.00	6.07
	09/02/93	8.27	0.00	6.00
	10/01/93	Well Destroyed		

TABLE 1

SUMMARY OF GROUNDWATER ELEVATIONS, 2002 TO PRESENT
ARCO Facility #1919

Well Identification / Surveyed Well Elevation[1] (Feet MSL)	Date Measured	Depth to Water (Feet)	LPH Thickness (Feet)	Groundwater Elevation[2] (Feet MSL)
MW-13	01/28/02	6.97	0.00	5.96
12.93	04/17/02	6.95	0.00	5.98
	07/09/02	6.97	0.00	5.96
	10/21/02	7.37	0.00	5.56
	02/21/03	7.28	0.00	5.65
	05/08/03	7.36	0.00	5.57
	07/25/03	7.32	0.00	5.61
12.79	11/21/03	7.63	0.00	5.16
	02/25/04	7.54	0.00	5.25
	06/21/04	7.66	0.00	5.13
	09/13/04	7.67	0.00	5.12
	12/20/04	7.52	0.00	5.27
	03/07/05	6.96	0.00	5.83
	05/16/05	7.35	0.00	5.44
MW-14	01/28/02	8.14	0.00	6.45
14.59	04/17/02	8.73	0.00	5.86
	07/09/02	8.72	0.00	5.87
	10/21/02	Not Measured - Not Accessible		
	02/21/03	9.08	0.00	5.51
	05/08/03	9.31	0.00	5.28
	07/25/03	9.13	0.00	5.46
14.62	11/21/03	9.31	0.00	5.31
	02/25/04	9.31	0.00	5.31
	06/21/04	9.40	0.00	5.22
	09/13/04	9.47	0.00	5.15
	12/20/04	9.23	0.00	5.39
	03/07/05	8.70	0.00	5.92
	05/16/05	6.08	0.00	8.54
MW-15	01/28/02	5.88	0.00	5.79
11.67	04/17/02	5.61	0.00	6.06
	07/09/02	5.90	0.00	5.77
	10/21/02	Not Measured - Not Accessible		
	02/21/03	Not Measured - Not Accessible		
	05/08/03	Not Measured - Not Accessible		
	07/25/03	Not Measured - Not Accessible		
11.30	11/21/03	7.05	Sheen	4.25
	02/25/04	6.25	0.00	5.05
	06/21/04	6.40	0.00	4.90
	09/13/04	6.60	0.00	4.70
	12/20/04	6.47	0.00	4.83
	03/07/05	5.43	0.00	5.87
	05/16/05	6.16	0.00	5.14
MW-16	01/28/02	7.92	0.00	5.19
13.11	04/17/02	7.69	0.00	5.42

TABLE 1

SUMMARY OF GROUNDWATER ELEVATIONS, 2002 TO PRESENT
ARCO Facility #1919

Well Identification / Surveyed Well Elevation[1] (Feet MSL)	Date Measured	Depth to Water (Feet)	LPH Thickness (Feet)	Groundwater Elevation[2] (Feet MSL)
MW-16	07/09/02	7.96	0.00	5.15
Cont'd	10/21/02	8.41	0.00	4.70
	02/21/03	7.91	0.00	5.20
	05/08/03	8.08	0.00	5.03
	07/25/03	8.01	0.00	5.10
	11/21/03	8.50	0.00	4.58
	02/25/04	8.28	0.00	4.80
	06/21/04	8.34	0.00	4.74
	09/13/04	8.56	0.00	4.52
13.08	12/20/04	8.48	0.00	4.60
	03/07/05	7.52	0.00	5.56
	05/16/05	8.17	0.00	4.91
MW-17	01/28/02	9.30	0.00	5.88
15.18	04/17/02	9.21	0.00	5.97
	07/09/02	9.32	0.00	5.86
	10/21/02	9.60	0.00	5.58
	02/21/03	9.39	0.00	5.79
	05/08/03	9.57	0.00	5.61
	07/25/03	9.43	0.00	5.75
15.00	11/21/03	9.96	0.00	5.04
	02/25/04	9.60	0.00	5.40
	06/21/04	9.70	0.00	5.30
	09/13/04	9.91	0.00	5.09
	12/20/04	9.78	0.00	5.22
	03/07/05	8.96	0.00	6.04
	05/16/05	9.48	0.00	5.52
MW-18	01/28/02	8.73	0.00	5.02
13.75	04/17/02	8.55	0.00	5.20
	07/09/02	8.85	0.00	4.90
	10/21/02	9.24	0.00	4.51
	02/21/03	8.74	0.00	5.01
	05/08/03	8.91	0.00	4.84
	07/25/03	8.78	0.00	4.97
13.74	11/21/03	9.36	0.00	4.38
	02/25/04	9.03	0.00	4.71
	06/21/04	9.18	0.00	4.56
	09/13/04	9.37	0.00	4.37
	12/20/04	9.32	0.00	4.42
	03/07/05	8.22	0.00	5.52
	05/16/05	8.98	0.00	4.76
*MW-19A	01/28/02	8.27	0.00	5.15
13.42	04/17/02	8.08	0.00	5.34
	07/09/02	8.35	0.00	5.07
	10/21/02	8.68	0.00	4.74

TABLE 1

SUMMARY OF GROUNDWATER ELEVATIONS, 2002 TO PRESENT
ARCO Facility #1919

Well Identification / Surveyed Well Elevation[1] (Feet MSL)	Date Measured	Depth to Water (Feet)	LPH Thickness (Feet)	Groundwater Elevation[2] (Feet MSL)
*MW-19A	02/21/03	8.24	0.00	5.18
Cont'd	05/08/03	8.39	0.00	5.03
	07/25/03	8.25	0.00	5.17
	11/21/03	8.79	0.00	4.60
13.39	02/25/04	8.45	0.00	4.94
	06/21/04	8.54	0.00	4.85
	09/13/04	8.91	0.00	4.48
	12/20/04	8.76	0.00	4.63
	03/07/05	7.76	0.00	5.63
	05/16/05	8.42	0.00	4.97
MW-19B	01/28/02	10.76	0.00	6.06
16.82	04/17/02	10.74	0.00	6.08
	07/09/02	10.78	0.00	6.04
	10/21/02	11.14	0.00	5.68
	02/21/03	10.99	0.00	5.83
	05/08/03	11.15	0.00	5.67
	07/25/03	11.08	0.00	5.74
16.67	11/21/03	11.42	0.00	5.25
	02/25/04	11.28	0.00	5.39
	06/21/04	11.36	0.00	5.31
	09/13/04	11.48	0.00	5.19
	12/20/04	11.30	0.00	5.37
	03/07/05	10.62	0.00	6.05
	05/16/05	11.03	0.00	5.64
MW-20	01/28/02	7.50	0.00	5.88
13.38	04/17/02	7.48	0.00	5.90
	07/09/02	7.59	0.00	5.79
	10/21/02	7.95	0.00	5.43
	02/21/03	7.74	0.00	5.64
	05/08/03	7.87	0.00	5.51
	07/25/03	7.74	0.00	5.64
13.26	11/21/03	8.35	0.00	4.91
	02/25/04	8.12	0.00	5.14
	06/21/04	8.15	0.00	5.11
	09/13/04	8.36	0.00	4.90
	12/20/04	8.19	0.00	5.07
	03/07/05	7.39	0.00	5.87
	05/16/05	7.86	0.00	5.40
MW-21	01/28/02	7.63	0.00	6.14
13.77	04/17/02	7.62	0.00	6.15
	07/09/02	7.65	0.00	6.12
	10/21/02	8.04	0.00	5.73
	02/21/03	7.89	0.00	5.88
	05/08/03	8.03	0.00	5.74

TABLE 1

SUMMARY OF GROUNDWATER ELEVATIONS, 2002 TO PRESENT
ARCO Facility #1919

Well Identification / Surveyed Well Elevation[1] (Feet MSL)	Date Measured	Depth to Water (Feet)	LPH Thickness (Feet)	Groundwater Elevation[2](Feet MSL)
MW-21	07/25/03	8.00	0.00	5.77
13.52	11/21/03	8.32	0.00	5.20
Cont'd	02/25/04	8.16	0.00	5.36
	06/21/04	8.28	0.00	5.24
	09/13/04	8.40	0.00	5.12
	12/20/04	8.20	0.00	5.32
	03/07/05	7.52	0.00	6.00
	05/16/05	7.83	0.00	5.69
MW-22	01/28/02	5.36	0.00	4.45
9.81	04/17/02	5.07	0.00	4.74
	07/09/02	5.24	0.00	4.57
	10/21/02	5.55	0.00	4.26
	02/21/03	5.27	0.00	4.54
	05/08/03	5.25	0.00	4.56
	07/25/03	5.05	0.00	4.76
9.78	11/21/03	5.65	0.00	4.13
	02/25/04	5.49	0.00	4.29
	06/21/04	5.61	0.00	4.17
	09/13/04	5.91	0.00	3.87
	12/20/04	5.77	0.00	4.01
	03/07/05	4.63	0.00	5.15
	05/16/05	5.31	0.00	4.47
MW-23	01/28/02	7.23	0.00	5.22
12.45	04/17/02	6.99	0.00	5.46
	07/09/02	7.28	0.00	5.17
	10/21/02	7.80	0.00	4.65
	02/21/03	7.13	0.00	5.32
	05/08/03	7.44	0.00	5.01
	07/25/03	7.39	0.00	5.06
12.42	11/21/03	7.98	0.00	4.44
	02/25/04	7.73	0.00	4.69
	06/21/04	7.81	0.00	4.61
	09/13/04	7.99	0.00	4.43
	12/20/04	7.94	0.00	4.48
	03/07/05	6.67	0.00	5.75
	05/16/05	7.49	0.00	4.93
MW-24	11/21/03	4.64	0.00	4.19
8.83	02/25/04	4.28	0.00	4.55
	06/21/04	4.49	0.00	4.34
	09/13/04	4.78	0.00	4.05
	12/20/04	4.55	0.00	4.28
	03/07/05	3.50	0.00	5.33
	05/16/05	4.32	0.00	4.51

TABLE 1

SUMMARY OF GROUNDWATER ELEVATIONS, 2002 TO PRESENT
ARCO Facility #1919

Well Identification / Surveyed Well Elevation[1] (Feet MSL)	Date Measured	Depth to Water (Feet)	LPH Thickness (Feet)	Groundwater Elevation[2] (Feet MSL)
MW-25 7.21	11/21/03	3.21	0.00	4.00
	02/25/04	2.83	0.00	4.38
	06/21/04	Not Measured - Inaccessible		
	09/13/04	3.24	0.00	3.97
	12/20/04	3.09	0.00	4.12
	03/07/05	1.99	0.00	5.22
	05/16/05	2.81	0.00	4.40
MW-26 29.82	11/21/03	23.93	0.00	5.89
	02/25/04	23.79	0.00	6.03
	06/21/04	23.83	0.00	5.99
	09/13/04	24.14	0.00	5.68
	12/20/04	23.93	0.00	5.89
	03/07/05	23.19	0.00	6.63
	05/16/05	23.61	0.00	6.21

Survey elevation and depth to water measurements prior to 9/28/94 summarized from Alton Geoscience Reports.

Notes:

[1] = Elevations are in feet above mean sea level (MSL).
[2] = Groundwater elevation in feet MSL = Surveyed Well Elevation - Depth to Water
[3] = Elevations adjusted by adding (0.75 x LPH thickness) to measured water elevations.
LPH = Liquid - Phase Hydrocarbons
* MW-19 was renamed MW-19A after the installation of another MW-19 (now MW-19B).

TABLE 2

SUMMARY OF GROUNDWATER SAMPLE ANALYTICAL RESULTS, 2002 TO PRESENT
ARCO Facility #1919

All Results Reported in Micrograms per Liter (µg/L)

Well Identification	Sampling Date	GRO	B	T	E	X	MTBE
MW-1	01/14/93	Not Sampled - Measured LPH Thickness					
	02/20/93	Not Sampled - LPH Sheen					
	03/16/93	Not Sampled - LPH Sheen					
	04/14/93	Not Sampled - LPH Sheen					
	05/10/93	Not Sampled - Measured LPH Thickness					
	09/02/93	Not Sampled - Measured LPH Thickness					
	10/01/93	Well Destroyed					
MW-2	01/14/93	Not Sampled - LPH Sheen					
	02/20/93	Not Sampled - LPH Sheen					
	03/16/93	Not Sampled - LPH Sheen					
	04/14/93	Not Sampled - LPH Sheen					
	05/10/93	Not Sampled - LPH Sheen					
	09/02/93	Not Sampled - LPH Sheen					
	10/01/93	Well Destroyed					
MW-3	01/14/93	Not Sampled					
	01/14/93	Not Sampled					
	04/14/93	Not Sampled					
	09/02/93	Not Sampled					
	10/01/93	Well Destroyed					
MW-4	01/14/93	Not Sampled - LPH Sheen					
	02/20/93	Not Sampled - LPH Sheen					
	03/16/93	Not Sampled - LPH Sheen					
	04/14/93	Not Sampled - LPH Sheen					
	05/10/93	Not Sampled					
	09/02/93	Not Sampled					
	10/01/93	Well Destroyed					
MW-5	01/14/93	Not Sampled - Measured LPH Thickness					
	02/20/93	Not Sampled - LPH Sheen					
	03/16/93	Not Sampled - Measured LPH Thickness					
	04/14/93	Not Sampled - Measured LPH Thickness					
	05/10/93	Not Sampled - Measured LPH Thickness					
	09/02/93	Not Sampled - Measured LPH Thickness					
	10/01/93	Well Destroyed					
MW-6	01/28/02 NP	1,400	110	0.52	96	2.2	150
	04/17/02 NP	2,400	370	1.4	820	4.7	150
	07/09/02	Not Sampled - Well Reduction Program					
	10/21/02 NP	3,500	750	<5.0	630	<15	110
	02/21/03 NP	<500	0.56	<0.50	2.7	<1.5	62
	05/08/03	Not Sampled - Well Reduction Program					
	07/25/03 NP	740	47	0.83	79	<1.5	120
	11/21/03 NP	820	30	<0.50	32	<1.5	94
	11/21/03	670	110	<0.50	140	<1.5	200
	02/25/04	<500	<0.50	<0.50	<0.50	<1.5	59
	06/21/04	Not Sampled - Well Reduction Program					
	09/13/04	Not Sampled - Well Reduction Program					
	12/20/04	Not Sampled - Well Reduction Program					
	03/08/05	<100	<0.50	<0.50	<0.50	<1.0	3.5
	05/16/05	Not Sampled - Well Reduction Program					

TABLE 2

SUMMARY OF GROUNDWATER SAMPLE ANALYTICAL RESULTS, 2002 TO PRESENT
ARCO Facility #1919

All Results Reported in Micrograms per Liter (µg/L)

Well Identification	Sampling Date	GRO	B	T	E	X	MTBE
MW-7	01/14/93	Not Sampled - LPH Sheen					
	02/20/93	Not Sampled - Measured LPH Thickness					
	03/16/93	Not Sampled - Measured LPH Thickness					
	04/14/93	Not Sampled - Measured LPH Thickness					
	05/10/93	Not Sampled - Measured LPH Thickness					
	09/02/93	Not Sampled - LPH Sheen					
	10/01/93	Well Destroyed					
MW-8	01/14/93	Not Sampled - Measured LPH Thickness					
	02/20/93	Not Sampled - LPH Sheen					
	03/16/93	Not Sampled - LPH Sheen					
	04/14/93	Not Sampled - Measured LPH Thickness					
	05/10/93	Not Sampled - Measured LPH Thickness					
	09/02/93	Not Sampled - Measured LPH Thickness					
	10/01/93	Well Destroyed					
MW-10	01/28/02 NP	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	04/17/02 NP	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	07/09/02	Not Sampled - Well Reduction Program					
	10/21/02 NP	<500	<0.50	<0.50	<0.50	<1.50	<1.0
	02/21/03 NP	<500	<0.50	<0.50	<0.50	<1.5	1.1
	05/08/03	Not Sampled - Well Reduction Program					
	07/25/03 NP	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	11/21/03 NP	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	11/21/03	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	02/25/04	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	06/21/04	Not Sampled - Well Reduction Program					
	09/13/04	Not Sampled - Well Reduction Program					
	12/20/04	Not Sampled - Well Reduction Program					
	03/08/05	<100	<0.50	<0.50	<0.50	<1.0	<1.0
	05/16/05	Not Sampled - Well Reduction Program					
MW-11	01/28/02 NP	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	04/17/02 NP	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	07/09/02	Not Sampled - Well Reduction Program					
	10/21/02 NP	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	02/21/03 NP	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	05/08/03	Not Sampled - Well Reduction Program					
	07/25/03 NP	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	11/21/03 NP	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	11/21/03	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	02/25/04	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	06/21/04	Not Sampled - Well Reduction Program					
	09/13/04	Not Sampled - Well Reduction Program					
	12/20/04	Not Sampled - Well Reduction Program					
	03/08/05	<100	<0.50	<0.50	<0.50	<1.0	<1.0
	05/16/05	Not Sampled - Well Reduction Program					
MW-12	01/14/93	94,962	3,463	6,161	3,397	17,783	--
	04/14/93	48,000	2,500	3,500	1,600	7,500	--
	09/02/93	54,000	4,100	5,500	2,500	13,000	--

TABLE 2

SUMMARY OF GROUNDWATER SAMPLE ANALYTICAL RESULTS, 2002 TO PRESENT
ARCO Facility #1919

All Results Reported in Micrograms per Liter (µg/L)

Well Identification	Sampling Date	GRO	B	T	E	X	MTBE
MW-13	10/01/93	Well Destroyed					
	01/28/02 NP	<500	<0.50	<0.50	<0.50	<1.5	1.1
	04/17/02 NP	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	07/09/02 NP	Not Sampled - Well Reduction Program					
	10/21/02 NP	<500	<0.50	<0.50	<0.50	<1.5	1.8
	02/21/03 NP	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	05/08/03	Not Sampled - Well Reduction Program					
	07/25/03	Not Sampled - Well Reduction Program					
	11/21/03 NP	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	11/21/03	<500	<0.50	<0.50	<0.50	<1.5	18
	02/25/04	<500	<0.50	<0.50	<0.50	<1.5	17
	06/21/04	Not Sampled - Well Reduction Program					
	09/13/04	Not Sampled - Well Reduction Program					
	12/20/04	Not Sampled - Well Reduction Program					
	03/08/05	<100	<0.50	<0.50	<0.50	<1.0	9.3
	05/16/05	Not Sampled - Well Reduction Program					
MW-14	01/28/02 NP	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	04/17/02 NP	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	07/09/02	Not Sampled - Well Reduction Program					
	10/21/02	Not Sampled - Well Reduction Program					
	02/21/03 NP	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	05/08/03	Not Sampled - Well Reduction Program					
	07/25/03	Not Sampled - Well Reduction Program					
	11/21/03 NP	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	11/21/03	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	02/25/04	<500	<0.50	<0.50	<0.50	<1.5	2.0
	06/21/04	Not Sampled - Well Reduction Program					
	09/13/04	Not Sampled - Well Reduction Program					
	12/20/04	Not Sampled - Well Reduction Program					
	03/07/05	<100	<0.50	<2.0	<0.50	<1.0	<1.0
	05/16/05	Not Sampled - Well Reduction Program					
MW-15	01/28/02 NP	4,000	1,300	<62	390	<190	24,000
	04/17/02 NP	1,700	540	<100	180	<300	7,400
	07/09/02	Not Sampled - Well Reduction Program					
	10/21/02	Not Sampled - Well Not Accessible					
	02/21/03	Not Sampled - Well Not Accessible					
	05/08/03	Not Sampled - Well Not Accessible					
	07/25/03	Not Sampled - Well Not Accessible					
	11/21/03	Not Sampled - LPH Sheen					
	02/25/04	2,400	910	<200	<200	<600	51,000
	06/21/04	Not Sampled - Well Reduction Program					
	09/13/04	Not Sampled - Well Reduction Program					
	12/20/04	Not Sampled - Well Reduction Program					
	03/08/05	Not Analyzed - Suspect Sample					
	05/16/05	Not Sampled - Well Reduction Program					

TABLE 2

SUMMARY OF GROUNDWATER SAMPLE ANALYTICAL RESULTS, 2002 TO PRESENT
ARCO Facility #1919

All Results Reported in Micrograms per Liter (µg/L)

Well Identification	Sampling Date	GRO	B	T	E	X	MTBE
MW-16	01/28/02 NP	<500	<40	<40	<40	<120	7,000
	04/17/02 NP	<500	<50	<50	<50	<150	5,000
	07/09/02	Not Sampled - Well Reduction Program					
	10/21/02 NP	<500	<50	<50	<50	<150	7,200
	02/21/03 NP	<500	<50	<50	<50	<150	5,600
	05/08/03	Not Sampled - Well Reduction Program					
	07/25/03	Not Sampled - Well Reduction Program					
	11/21/03 NP	<500	<25	<25	<25	<75	6,300
	11/21/03	<500	<50	<50	<50	<150	6,000
	02/25/04	<500	<50	<50	<50	<150	5,900
	06/21/04	Not Sampled - Well Reduction Program					
	09/13/04	Not Sampled - Well Reduction Program					
	12/20/04	Not Sampled - Well Reduction Program					
	03/08/05	Not Analyzed - Suspect Sample					
	05/16/05	Not Sampled - Well Reduction Program					
MW-17	01/28/02 NP	13,000	6,300	<40	1,500	<120	760
	04/17/02 NP	7,900	4,100	<25	1,200	<75	520
	07/09/02	Not Sampled - Well Reduction Program					
	10/21/02 NP	2,800	600	<5.0	610	<15	13
	02/21/03 NP	3,900	860	<5.0	1,200	<15	110
	05/08/03	Not Sampled - Well Reduction Program					
	07/25/03 NP	700	1,600	16	1,100	46	56
	11/21/03 NP	5,700	2,600	<20	1,200	<60	47
	11/21/03	510	150	<5.0	80	<15	1,300
	02/25/04	<500	21	<5.0	42	<15	620
	06/21/04	Not Sampled - Well Reduction Program					
	09/13/04	Not Sampled - Well Reduction Program					
	12/20/04	Not Sampled - Well Reduction Program					
	03/08/05	160	4.7	<2.5	4.3	<5.0	220
	05/16/05	Not Sampled - Well Reduction Program					
MW-18	01/28/02 NP	<500	<40	<40	<40	<120	5,600
	04/17/02 NP	<500	<25	<25	<25	<75	6,500
	07/09/02 NP	<500	<25	<25	<25	<75	7,800
	10/21/02 NP	<500	<50	<50	<50	<150	9,100
	02/21/03 NP	<500	<20	<20	<20	<60	6,000
	05/08/03 NP	<500	<0.500	<0.500	<0.500	<1.50	3,840
	07/25/03 NP	<500	<200	<200	<200	<600	73,000
	11/21/03 NP	<500	<20	<20	<20	<60	2,800
	11/21/03	<500	<25	<25	<25	<75	6,100
	02/25/04	<500	<50	<50	<50	<150	9,100
	06/21/04	<500	<50	<50	<50	<150	8,200
	09/13/04	<500	<50	<50	<50	<150	6,100
	12/20/04	1,300	<50	<50	<50	<50	2,900
	03/07/05	<100	<1.2	<1.2	<1.2	<2.5	200
	05/16/05	680	<50	<50	<50	<100	3,300

TABLE 2

SUMMARY OF GROUNDWATER SAMPLE ANALYTICAL RESULTS, 2002 TO PRESENT
ARCO Facility #1919

All Results Reported in Micrograms per Liter (µg/L)

Well Identification	Sampling Date	GRO	B	T	E	X	MTBE
MW-19A*	01/28/02 NP	<500	<0.50	<0.50	<0.50	<1.5	4.3
	04/17/02 NP	<500	<0.50	<0.50	<0.50	<1.5	1.4
	07/09/02 NP	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	10/21/02 NP	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	02/21/03 NP	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	05/08/03 NP	<500	<0.500	<0.500	<0.500	<1.50	<1.00
	07/25/03 NP	<500	<0.50	<0.50	<0.50	<1.5	1.0
	11/21/03 NP	<500	<0.50	<0.50	<0.50	<1.5	1.8
	11/21/03	<500	<0.50	<0.50	<0.50	<1.5	16
	02/25/04	<500	<0.50	<0.50	<0.50	<1.5	10
	06/21/04	<500	<0.50	<0.50	<0.50	<1.5	14
	09/13/04	<500	<0.50	<0.50	<0.50	<1.5	6.3
	12/20/04	<100	<1.0	<1.0	<1.0	<1.0	3.2
	03/07/05	<100	<0.50	<0.50	<0.50	<1.0	8.6
	05/16/05	<100	<0.50	<0.50	<0.50	<1.0	2.8
MW-19B*	01/28/02 NP	3,800	280	40	470	150	<4.0
	04/17/02 NP	4,000	250	23	530	300	<5.0
	07/09/02 NP	6,800	380	18	630	330	<5.0
	10/21/02 NP	3,900	450	<5.0	1,100	19	<10
	02/21/03 NP	1,400	77	<5.0	410	<15	<10
	05/08/03 NP	7,100	302	9.67	1,690	91.1	<1.00
	07/25/03 NP	3,200	180	<5.0	950	<15	12
	11/21/03 NP	4,600	150	<5.0	1,000	22	63
	11/21/03	6,800	190	160	1,400	550	290
	02/25/04	7,600	170	340	1,800	1,100	180
	06/21/04	7,100	75	110	1,100	440	29
	09/13/04	8,300	68	180	1,200	810	<20
	12/20/04	2,100	20	35	280	140	<5.0
	03/08/05	8,900	81	840	1,800	2,200	<25
	05/16/05	4,100	52	330	1,200	1,100	<25
MW-20	01/28/02 NP	550	20	1.1	56	7.2	<1.0
	04/17/02 NP	4,200	28	26	610	130	<1.0
	07/09/02	Not Sampled - Well Reduction Program					
	10/21/02 NP	510	4.8	<0.5	14	<1.5	<1.0
	02/21/03 NP	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	05/08/03	Not Sampled - Well Reduction Program					
	07/25/03 NP	<500	1.3	<0.50	1.1	<1.5	<1.0
	11/21/03 NP	<500	2.8	<0.50	5.2	<1.5	<1.0
	11/21/03	<500	1.2	<0.50	0.83	<1.5	<1.0
	02/25/04	<500	<0.50	<0.50	1.2	<1.5	<1.0
	06/21/04	Not Sampled - Well Reduction Program					
	09/13/04	Not Sampled - Well Reduction Program					
	12/20/04	Not Sampled - Well Reduction Program					
	03/08/05	<100	<0.50	<0.50	13.0	5.4	<1.0
	05/16/05	Not Sampled - Well Reduction Program					

TABLE 2

SUMMARY OF GROUNDWATER SAMPLE ANALYTICAL RESULTS, 2002 TO PRESENT
ARCO Facility #1919

All Results Reported in Micrograms per Liter (µg/L)

Well Identification	Sampling Date	GRO	B	T	E	X	MTBE
MW-21	01/28/02 NP	2,200	19	18	510	38	<10
	04/17/02 NP	6,300	69	100	1,300	460	<5.0
	07/09/02	Not Sampled - Well Reduction Program					
	10/21/02 NP	3,700	50	7.8	1,200	<15	<10
	02/21/03 NP	<500	20	<2.5	320	<7.5	<5.0
	05/08/03	Not Sampled - Well Reduction Program					
	07/25/03 NP	1,700	40	<2.5	540	150	<5.0
	11/21/03 NP	1,600	110	<5.0	550	30	<10
	11/21/03	4,900	170	80	720	1,000	<10
	02/25/04	6,000	240	160	1,000	1,800	<10
	06/21/04	Not Sampled - Well Reduction Program					
	09/13/04	Not Sampled - Well Reduction Program					
	12/20/04	Not Sampled - Well Reduction Program					
	03/08/05	9,700	490	490	1,700	4,500	84
	05/16/05	Not Sampled - Well Reduction Program					
MW-22	01/28/02 NP	<500	<0.50	<0.50	<0.50	<1.5	44
	04/17/02 NP	<500	<0.50	<0.50	<0.50	<1.5	21
	07/09/02 NP	<500	<0.50	<0.50	<0.50	<1.5	13
	10/21/02 NP	<500	<0.50	<0.50	<0.50	<1.50	17
	02/21/03 NP	<500	<0.50	<0.50	<0.50	<1.5	27
	05/08/03 NP	<500	<0.500	<0.500	<0.500	<1.50	7.9
	07/25/03 NP	<500	<0.50	<0.50	<0.50	<1.5	7.7
	11/21/03 NP	<500	<0.50	<0.50	<0.50	<1.5	8.9
	11/21/03	<500	<0.50	<0.50	<0.50	<1.5	33
	02/25/04	<500	<0.50	<0.50	<0.50	<1.5	29
	06/21/04	<500	<0.50	<0.50	<0.50	<1.5	47
	09/13/04	<500	<0.50	<0.50	<0.50	<1.5	72
	12/20/04	<100	<1.0	<1.0	<1.0	<1.0	38
	03/07/05	<100	<0.50	1.1	<0.50	<1.0	8.8
	05/16/05	<100	<0.50	<0.50	<0.50	<1.0	8.0
MW-23	01/28/02 NP	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	04/17/02 NP	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	07/09/02	Not Sampled - Well Reduction Program					
	10/21/02 NP	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	02/21/03 NP	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	05/08/03	Not Sampled - Well Reduction Program					
	07/25/03	Not Sampled - Well Reduction Program					
	11/21/03 NP	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	11/21/03	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	02/25/04	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	06/21/04	Not Sampled - Well Reduction Program					
	09/13/04	Not Sampled - Well Reduction Program					
	12/20/04	Not Sampled - Well Reduction Program					
	03/07/05	<100	<0.50	<25	<0.50	<1.0	<1.0
	05/16/05	Not Sampled - Well Reduction Program					

TABLE 2

SUMMARY OF GROUNDWATER SAMPLE ANALYTICAL RESULTS, 2002 TO PRESENT
ARCO Facility #1919

All Results Reported in Micrograms per Liter (µg/L)

Well Identification	Sampling Date	GRO	B	T	E	X	MTBE
MW-24	11/21/03 NP	<500	<5.0	<5.0	<5.0	<15	790
	11/21/03	<500	<2.5	<2.5	<2.5	<7.5	480
	02/25/04	<500	<2.5	<2.5	<2.5	<7.5	430
	06/21/04	<500	<2.5	<2.5	<2.5	<7.5	340
	09/13/04	<500	<2.5	<2.5	<2.5	<7.5	450
	12/20/04	<100	<2.5	<2.5	<2.5	<2.5	130
	03/08/05	<100	<0.50	<0.50	<0.50	<1.0	69
	05/16/05	<100	<0.50	<0.50	<0.50	<1.0	32
MW-25	11/21/03 NP	<500	<10	<10	<10	<30	2,400
	11/21/03	<500	<10	<10	<10	<30	2,000
	02/25/04	<500	<10	<10	<10	<30	2,200
	06/21/04	Not Sampled - Inaccessible					
	09/13/04	<500	<1.0	<1.0	<1.0	<3.0	140
	12/20/04	<100	<1.0	<1.0	<1.0	<1.0	82
	03/08/05	<100	<0.50	<0.50	<0.50	<1.0	72
	05/16/05	<100	<0.50	<0.50	<0.50	<1.0	3.8
MW-26	11/21/03 NP	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	11/21/03	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	02/25/04	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	06/21/04	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	09/13/04	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	12/20/04	<100	<1.0	<1.0	<1.0	<1.0	<1.0
	03/07/05	<100	<0.50	<0.50	<0.50	<1.0	<1.0
	05/16/05	<100	<0.50	<0.50	<0.50	<1.0	<1.0

Data in the table prior to 9/28/94 summarized from Alton Geoscience Reports.

Notes:

GRO = Gasoline-range organics (C_6-C_{12}) (DHS Modified EPA Method 8015)
B = Benzene
T = Toluene
E = Ethylbenzene
X = Total Xylenes
BTEX = Analyzed by EPA Method 8260B.
MTBE = Methyl-tert-butyl ether analyzed by EPA Method 8260.
< = Less than indicated laboratory reporting limit
-- = Sample not analyzed
NP = Sample collected by no-purge sampling procedures
* MW-19 was renamed MW-19A after the installation of another well designated MW-19 (now MW-19B).

TABLE 3

SUMMARY OF ADDITIONAL OXYGENATES ANALYTICAL RESULTS, 2002 TO PRESENT

ARCO Facility #1919

All Results Reported in Micrograms per Liter (µg/L)

Well Identification	Sampling Date	TBA	DIPE	ETBE	TAME	ETHANOL
MW-1	Well Destroyed 10/93					
MW-2	Well Destroyed 10/93					
MW-3	Well Destroyed 10/93					
MW-4	Well Destroyed 10/93					
MW-5	Well Destroyed 10/93					
MW-6	01/28/02 NP	<25	<5.0	<5.0	17	--
	04/17/02 NP	<25	<5.0	<5.0	24	--
	07/09/02	Not Sampled - Well Reduction Program				
	10/21/02 NP	<500	<50	<50	<50	--
	02/21/03 NP	<50	<5.0	<5.0	<5.0	<150
	05/08/03	Not Sampled - Well Reduction Program				
	07/25/03 NP	<50	<5.0	<5.0	16	<150
	11/21/03 NP	<50	<5.0	<5.0	11	<150
	11/21/03	66	<5.0	<5.0	8.1	<150
	02/25/04	<50	<5.0	<5.0	<5.0	<150
	06/21/04	Not Sampled - Well Reduction Program				
	09/13/04	Not Sampled - Well Reduction Program				
	12/20/04	Not Sampled - Well Reduction Program				
	03/08/05	<25	<2.0	<2.0	<2.0	<500
	05/16/05	Not Sampled - Well Reduction Program				
MW-7	Well Destroyed 10/93					
MW-8	Well Destroyed 10/93					
MW-10	01/28/02 NP	<25	<5.0	<5.0	<5.0	--
	04/17/02 NP	<25	<5.0	<5.0	<5.0	--
	07/09/02	Not Sampled - Well Reduction Program				
	10/21/02 NP	<50	<5.0	<5.0	<5.0	--
	02/21/03 NP	<50	<5.0	<5.0	<5.0	<150
	05/08/03	Not Sampled - Well Reduction Program				
	07/25/03 NP	<50	<5.0	<5.0	<5.0	<150
	11/21/03 NP	<50	<5.0	<5.0	<5.0	<150
	11/21/03	<50	<5.0	<5.0	<5.0	<150
	02/25/04	<50	<5.0	<5.0	<5.0	<150
	06/21/04	Not Sampled - Well Reduction Program				
	09/13/04	Not Sampled - Well Reduction Program				
	12/20/04	Not Sampled - Well Reduction Program				
	03/08/05	<25	<2.0	<2.0	<2.0	<500
	05/16/05	Not Sampled - Well Reduction Program				
MW-11	01/28/02 NP	<25	<5.0	<5.0	<5.0	--
	07/09/02	Not Sampled - Well Reduction Program				
	10/21/02 NP	<50	<5.0	<5.0	<5.0	--
	02/21/03 NP	<50	<5.0	<5.0	<5.0	<150
	05/08/03	Not Sampled - Well Reduction Program				
	07/25/03	<50	<0.50	<0.50	<0.50	<150
	11/21/03 NP	<50	<5.0	<5.0	<5.0	<150
	11/21/03	<50	<5.0	<5.0	<5.0	<150
	02/25/04	<50	<5.0	<5.0	<5.0	<150

TABLE 3

SUMMARY OF ADDITIONAL OXYGENATES ANALYTICAL RESULTS, 2002 TO PRESENT

ARCO Facility #1919

All Results Reported in Micrograms per Liter (µg/L)

Well Identification	Sampling Date	TBA	DIPE	ETBE	TAME	ETHANOL
MW-11 Cont'd	06/21/04	Not Sampled - Well Reduction Program				
	09/13/04	Not Sampled - Well Reduction Program				
	12/20/04	Not Sampled - Well Reduction Program				
	03/08/05	<25	<2.0	<2.0	<2.0	<500
	05/16/05	Not Sampled - Well Reduction Program				
MW-12	Well Destroyed 10/93					
MW-13	01/28/02 NP	<25	<5.0	<5.0	<5.0	--
	04/17/02 NP	<25	<5.0	<5.0	<5.0	--
	07/09/02	Not Sampled - Well Reduction Program				
	10/21/02 NP	<50	<5.0	<5.0	<5.0	--
	02/21/03 NP	<50	<5.0	<5.0	<5.0	<150
	05/08/03	Not Sampled - Well Reduction Program				
	07/25/03	Not Sampled - Well Reduction Program				
	11/21/03 NP	<50	<5.0	<5.0	<5.0	<150
	11/21/03	<50	<5.0	<5.0	<5.0	<150
	02/25/04	<50	<5.0	<5.0	<5.0	<150
	06/21/04	Not Sampled - Well Reduction Program				
	09/13/04	Not Sampled - Well Reduction Program				
	12/20/04	Not Sampled - Well Reduction Program				
	03/08/05	<25	<2.0	<2.0	<2.0	<500
	05/16/05	Not Sampled - Well Reduction Program				
MW-14	01/28/02 NP	<25	<5.0	<5.0	<5.0	--
	04/17/02 NP	<25	<5.0	<5.0	<5.0	--
	07/09/02	Not Sampled - Well Reduction Program				
	10/21/02	Not Sampled				
	02/21/03 NP	<50	<5.0	<5.0	<5.0	<150
	05/08/03	Not Sampled - Well Reduction Program				
	07/25/03	Not Sampled - Well Reduction Program				
	11/21/03 NP	<50	<5.0	<5.0	<5.0	<150
	11/21/03	<50	<5.0	<5.0	<5.0	<150
	02/25/04	<50	<5.0	<5.0	<5.0	<150
	06/21/04	Not Sampled - Well Reduction Program				
	09/13/04	Not Sampled - Well Reduction Program				
	12/20/04	Not Sampled - Well Reduction Program				
	03/07/05	<25	<2.0	<2.0	<2.0	<500
	05/16/05	Not Sampled - Well Reduction Program				
MW-15	01/28/02 NP	3,600	<620	<620	<620	--
	04/17/02 NP	<5,000	<1,000	<1,000	<1,000	--
	07/09/02	Not Sampled - Well Reduction Program				
	10/21/02	Not Sampled - Well Reduction Program				
	02/21/03	Not Sampled - Not Accessible				
	05/08/03	Not Sampled - Well Reduction Program				
	07/25/03	Not Sampled - Well Reduction Program				

TABLE 3

SUMMARY OF ADDITIONAL OXYGENATES ANALYTICAL RESULTS, 2002 TO PRESENT

ARCO Facility #1919

All Results Reported in Micrograms per Liter (µg/L)

Well Identification	Sampling Date	TBA	DIPE	ETBE	TAME	ETHANOL
MW-15 Cont'd	11/21/03	Not Sampled - LPH Sheen				
	02/25/04	51,000	<2,000	<2,000	<2,000	<60,000
	06/21/04	Not Sampled - Well Reduction Program				
	09/13/04	Not Sampled - Well Reduction Program				
	12/20/04	Not Sampled - Well Reduction Program				
	03/08/05	Not Analyzed - Suspect Sample				
	05/16/05	Not Sampled - Well Reduction Program				
MW-16	01/28/02 NP	<2,000	<400	<400	<400	--
	04/17/02 NP	<2,500	<500	<500	<500	--
	07/09/02	Not Sampled - Well Reduction Program				
	10/21/02 NP	<5,000	<500	<500	<500	--
	02/21/03 NP	<5,000	<500	<500	<500	<15,000
	05/08/03	Not Sampled - Well Reduction Program				
	07/25/03	Not Sampled - Well Reduction Program				
	11/21/03 NP	<2,500	<250	<250	<250	<7,500
	11/21/03	<5,000	<500	<500	<500	<15,000
	02/25/04	<5,000	<500	<500	<500	<15,000
	06/21/04	Not Sampled - Well Reduction Program				
	09/13/04	Not Sampled - Well Reduction Program				
	12/20/04	Not Sampled - Well Reduction Program				
	03/08/05	Not Analyzed - Suspect Sample				
	05/16/05	Not Sampled - Well Reduction Program				
MW-17	01/28/02 NP	<2,000	<400	<400	<400	--
	04/17/02 NP	<1,200	<250	<250	<250	--
	07/09/02	Not Sampled - Well Reduction Program				
	10/21/02 NP	<500	<50	<50	<50	--
	02/21/03 NP	<500	<50	<50	<50	<1,500
	05/08/03	Not Sampled - Well Reduction Program				
	07/25/03 NP	<500	<50	<50	<50	<1,500
	11/21/03 NP	<2,000	<200	<200	<200	<6,000
	11/21/03	<500	<50	<50	<50	<1,500
	02/25/04	<500	<50	<50	<50	<1,500
	06/21/04	Not Sampled - Well Reduction Program				
	09/13/04	Not Sampled - Well Reduction Program				
	12/20/04	Not Sampled - Well Reduction Program				
	03/08/05	250	<10	<10	<10	<2500
	05/16/05	Not Sampled - Well Reduction Program				
MW-18	01/28/02 NP	<2,000	<400	<400	<400	--
	04/17/02 NP	<1,200	<250	<250	<250	--
	07/09/02 NP	1,700	<250	<250	<250	--
	10/21/02 NP	<5,000	<500	<500	<500	--
	02/21/03 NP	<2,000	<200	<200	<200	<6,000
	05/08/03 NP	78.7	<1.00	<1.00	15.6	<50.0
	07/25/03 NP	<20,000	<2,000	<2,000	<2,000	<60,000

TABLE 3

SUMMARY OF ADDITIONAL OXYGENATES ANALYTICAL RESULTS, 2002 TO PRESENT

ARCO Facility #1919

All Results Reported in Micrograms per Liter (µg/L)

Well Identification	Sampling Date	TBA	DIPE	ETBE	TAME	ETHANOL
MW-18 Cont'd	11/21/03 NP	<2,000	<200	<200	<200	<6,000
	11/21/03	<2,500	<250	<250	<250	<7,500
	02/25/04	<5,000	<500	<500	<500	<15,000
	06/21/04	<5,000	<500	<500	<500	<15,000
	09/13/04	<5,000	<500	<500	<500	<15,000
	12/20/04	2,300	<100	<100	<100	<25,000
	03/07/05	1,800	<5.0	<5.0	<5.0	<1,200
	05/16/05	<2,500	<200	<200	<200	<50,000
MW-19A*	01/28/02 NP	<25	<5.0	<5.0	<5.0	--
	04/17/02 NP	<25	<5.0	<5.0	<5.0	--
	07/09/02 NP	<25	<5.0	<5.0	<5.0	--
	10/21/02 NP	<50	<5.0	<5.0	<5.0	--
	02/21/03 NP	<50	<5.0	<5.0	<5.0	<150
	05/08/03 NP	<25.0	<1.00	<1.00	<1.00	<50.0
	07/25/03 NP	<50	<5.0	<5.0	<5.0	<150
	11/21/03 NP	<50	<5.0	<5.0	<5.0	<150
	11/21/03	<50	<5.0	<5.0	<5.0	<150.
	02/25/04	<50	<5.0	<5.0	<5.0	<150
	06/21/04	<50	<5.0	<5.0	<5.0	<150
	09/13/04	<50	<5.0	<5.0	<5.0	<150
	12/20/04	<25	<2.0	<2.0	<2.0	<500
	03/07/05	<25	<2.0	<2.0	<2.0	<500
	05/16/05	<25	<2.0	<2.0	<2.0	<500
MW-19B*	01/28/02 NP	<100	<20	<20	<20	--
	04/17/02 NP	<120	<25	<25	<25	--
	07/09/02 NP	<120	<25	<25	<25	--
	10/21/02 NP	<500	<50	<50	<50	--
	02/21/03 NP	<500	<50	<50	<50	<1,500
	05/08/03 NP	<25.0	<1.00	<1.00	<1.00	<50.0
	07/25/03 NP	<500	<50	<50	<50	<1,500
	11/21/03 NP	<500	<50	<50	<50	<1,500
	11/21/03	<1,000	<100	<100	<100	<3,000
	02/25/04	<1,000	<100	<100	<100	<3,000
	06/21/04	<1,000	<100	<100	<100	<3,000
	09/13/04	<1,000	<100	<100	<100	<3,000
	12/20/04	<120	<10	<10	<10	<2,500
	03/08/05	<620	<50	<50	<50	<12,000
	05/16/05	<620	<50	<50	<50	<12,000
MW-20	01/28/02 NP	<25	<5.0	<5.0	<5.0	--
	04/17/02 NP	<25	<5.0	<5.0	<5.0	--
	07/09/02	Not Sampled - Well Reduction Program				
	10/21/02 NP	<50	<5.0	<5.0	<5.0	--
	02/21/03 NP	<50	<5.0	<5.0	<5.0	<150
	05/08/03	Not Sampled - Well Reduction Program				

TABLE 3

SUMMARY OF ADDITIONAL OXYGENATES ANALYTICAL RESULTS, 2002 TO PRESENT

ARCO Facility #1919

All Results Reported in Micrograms per Liter (µg/L)

Well Identification	Sampling Date	TBA	DIPE	ETBE	TAME	ETHANOL
MW-20 Cont'd	07/25/03 NP	<50	<5.0	<5.0	<5.0	<150
	11/21/03 NP	<50	<5.0	<5.0	<5.0	<150
	11/21/03	<50	<5.0	<5.0	<5.0	<150
	02/25/04	<50	<5.0	<5.0	<5.0	<150
	06/21/04	Not Sampled - Well Reduction Program				
	09/13/04	Not Sampled - Well Reduction Program				
	12/20/04	Not Sampled - Well Reduction Program				
	03/08/05	<25	<2.0	<2.0	<2.0	<500
	05/16/05	Not Sampled - Well Reduction Program				
MW-21	01/28/02 NP	<250	<50	<50	<50	--
	04/17/02 NP	<120	<25	<25	<25	--
	07/09/02	Not Sampled - Well Reduction Program				
	10/21/02 NP	<500	<50	<50	<50	--
	02/21/03 NP	<250	<25	<25	<25	<750
	05/08/03	Not Sampled - Well Reduction Program				
	07/25/03 NP	<250	<25	<25	<25	<750
	11/21/03 NP	<500	<50	<50	<50	<1,500
	11/21/03	<500	<50	<50	<50	<1,500
	02/25/04	<500	<50	<50	<50	<1,500
	06/21/04	Not Sampled - Well Reduction Program				
	09/13/04	Not Sampled - Well Reduction Program				
	12/20/04	Not Sampled - Well Reduction Program				
	03/08/05	<620	<50	<50	<50	<12000
	05/16/05	Not Sampled - Well Reduction Program				
MW-22	01/28/02 NP	<25	<5.0	<5.0	<5.0	--
	04/17/02 NP	<25	<5.0	<5.0	<5.0	--
	07/09/02 NP	<25	<5.0	<5.0	<5.0	--
	10/21/02 NP	<50	<5.0	<5.0	<5.0	--
	02/21/03 NP	<50	<5.0	<5.0	<5.0	<150
	05/08/03 NP	<25.0	<1.00	<1.00	<1.00	<50.0
	07/25/03 NP	<50	<5.0	<5.0	<5.0	<150
	11/21/03 NP	<50	<5.0	<5.0	<5.0	<150
	11/21/03	170	<5.0	<5.0	<5.0	<150
	02/25/04	160	<5.0	<5.0	<5.0	<150
	06/21/04	91	<5.0	<5.0	<5.0	<150
	09/13/04	110	<5.0	<5.0	<5.0	<150
	12/20/04	150	<2.0	<2.0	<2.0	<500
	03/07/05	200	<2.0	<2.0	<2.0	<500
	05/16/05	98	<2.0	<2.0	<2.0	<500
MW-23	01/28/02 NP	<25	<5.0	<5.0	<5.0	--
	04/17/02 NP	<25	<5.0	<5.0	<5.0	--
	07/09/02	Not Sampled - Well Reduction Program				
	10/21/02 NP	<50	<5.0	<5.0	<5.0	--
	02/21/03 NP	<50	<5.0	<5.0	<5.0	<150

TABLE 3

SUMMARY OF ADDITIONAL OXYGENATES ANALYTICAL RESULTS, 2002 TO PRESENT

ARCO Facility #1919

All Results Reported in Micrograms per Liter (µg/L)

Well Identification	Sampling Date	TBA	DIPE	ETBE	TAME	ETHANOL
MW-23 Cont'd	05/08/03	Not Sampled - Well Reduction Program				
	07/25/03	Not Sampled - Well Reduction Program				
	11/21/03 NP	<50	<5.0	<5.0	<5.0	<150
	11/21/03	<50	<5.0	<5.0	<5.0	<150
	02/25/04	<50	<5.0	<5.0	<5.0	<150
	06/21/04	Not Sampled - Well Reduction Program				
	09/13/04	Not Sampled - Well Reduction Program				
	12/20/04	Not Sampled - Well Reduction Program				
	03/07/05	<25	<2.0	<2.0	<2.0	<500
	05/16/05	Not Sampled - Well Reduction Program				
MW-24	11/21/03 NP	<500	<50	<50	<50	<1,500
	11/21/03	<250	<25	<25	<25	<750
	02/25/04	<250	<25	<25	<25	<750
	06/21/04	<250	<25	<25	<25	<750
	09/13/04	<250	<25	<25	<25	<750
	12/20/04	<62	<5.0	<5.0	<5.0	<1,200
	03/08/05	<25	<2.0	<2.0	<2.0	<500
	05/16/05	88	<2.0	<2.0	<2.0	<500
MW-25	11/21/03 NP	<1,000	<100	<100	<100	<3,000
	11/21/03	<1,000	<100	<100	<100	<3,000
	02/25/04	<1,000	<100	<100	<100	<3,000
	06/21/04	Not Sampled - Inaccessible				
	09/13/04	310	<10	<10	<10	<300
	12/20/04	460	<2.0	<2.0	<2.0	<500
	03/08/05	330	<2.0	<2.0	<2.0	<500
	05/16/05	480	<2.0	<2.0	<2.0	<500

TABLE 3

SUMMARY OF ADDITIONAL OXYGENATES ANALYTICAL RESULTS, 2002 TO PRESENT

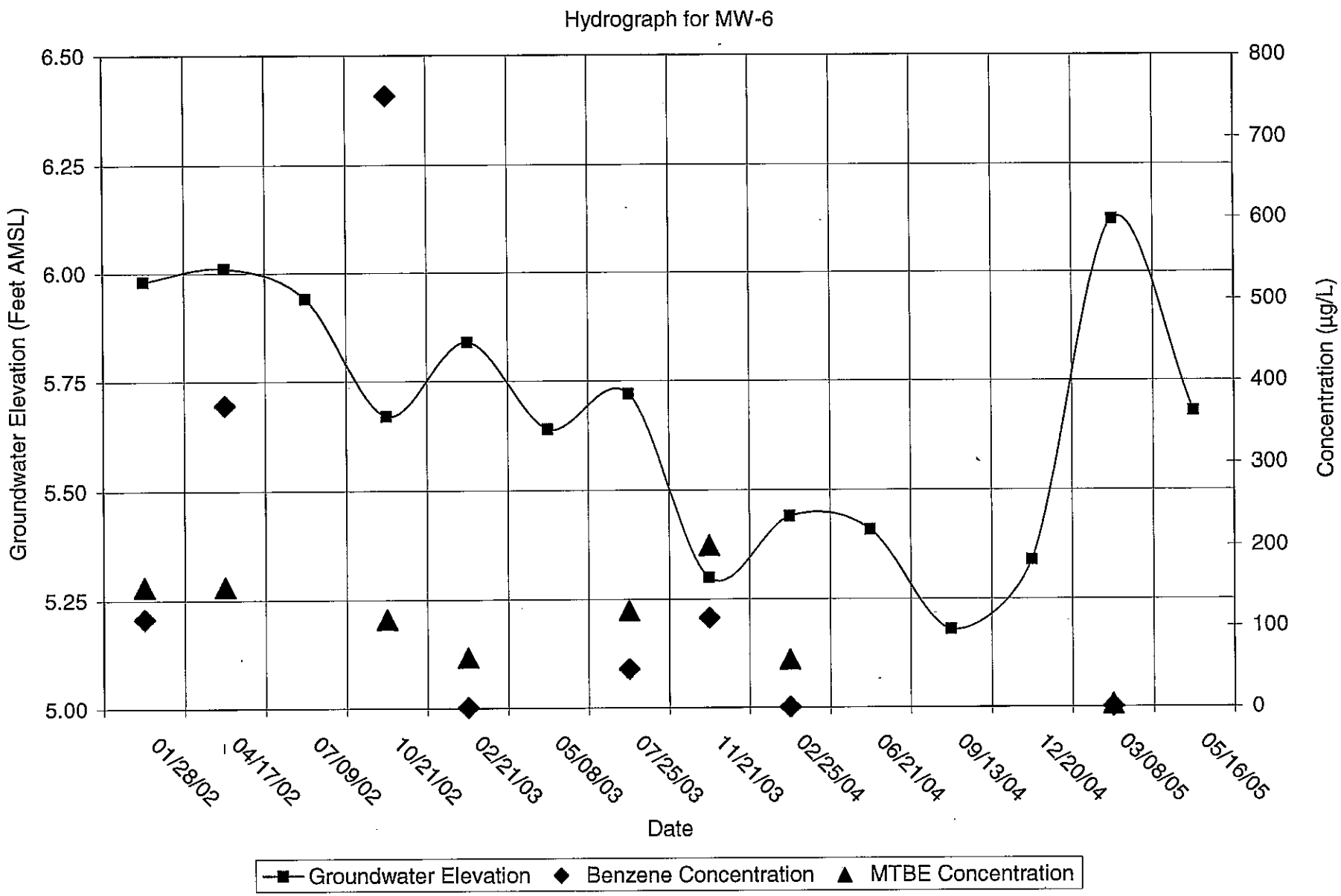
ARCO Facility #1919

All Results Reported in Micrograms per Liter (µg/L)

Well Identification	Sampling Date	TBA	DIPE	ETBE	TAME	ETHANOL
MW-26	11/21/03 NP	<50	<5.0	<5.0	<5.0	<150
	11/21/03	<50	<5.0	<5.0	<5.0	<150
	02/25/04	<50	<5.0	<5.0	<5.0	<150
	06/21/04	<50	<5.0	<5.0	<5.0	<150
	09/13/04	<50	<5.0	<5.0	<5.0	<150
	12/20/04	<25	<2.0	<2.0	<2.0	<500
	03/07/05	<25	<2.0	<2.0	<2.0	<500
	05/16/05	<25	<2.0	<2.0	<2.0	>500

Notes:

TBA = Tert-butyl alcohol
DIPE = Di-isopropyl ether
ETBE = Ethyl tert-butyl ether
TAME = tert-Amyl methyl ether
Samples analyzed by EPA Method 8260B.
< = Less than indicated laboratory reporting limit
NP = Samples collected by no-purge procedures.
-- = Sample not analyzed.
* MW-19 was renamed MW-19A after the installation of another well designated MW-19 (now MW-19B).



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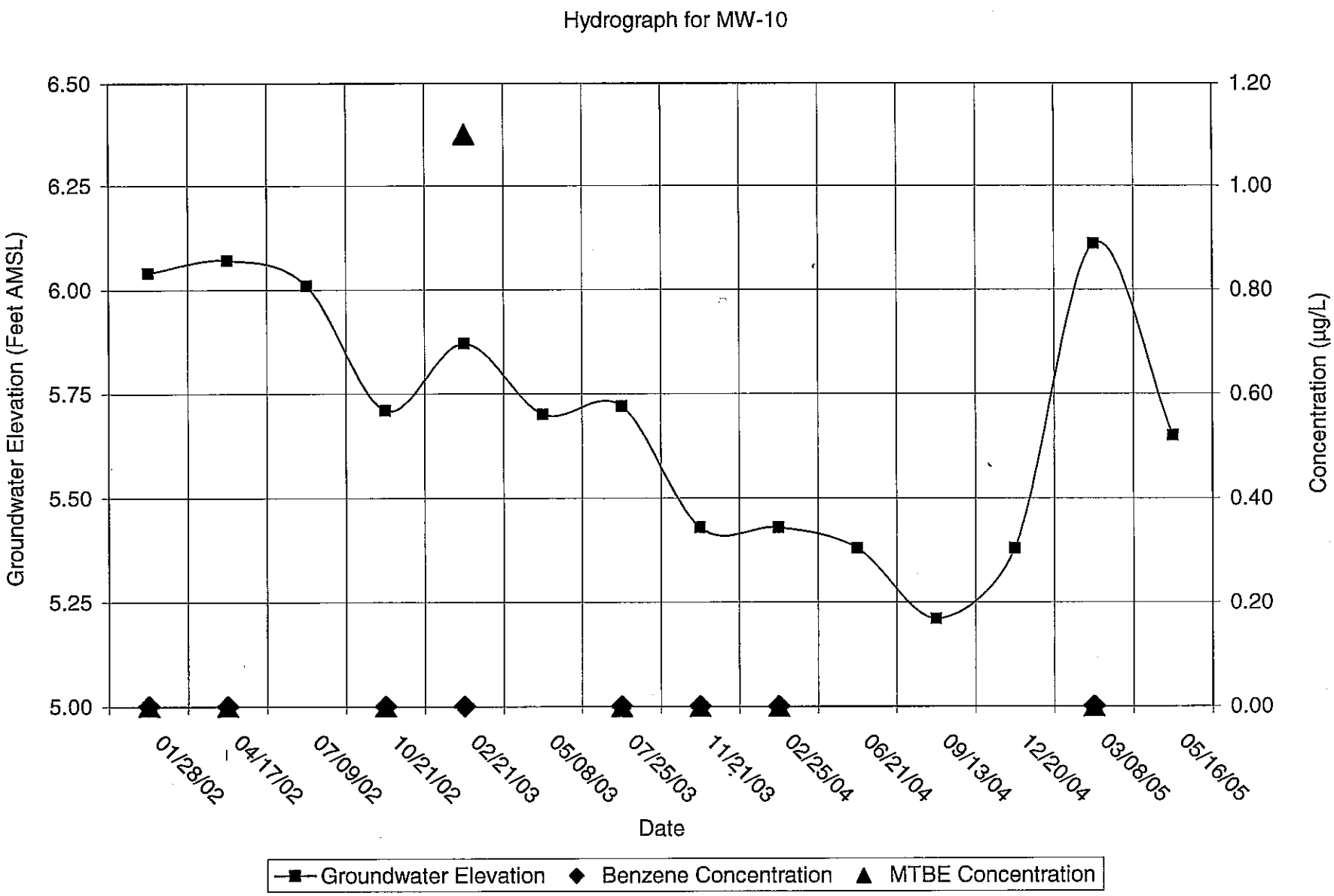

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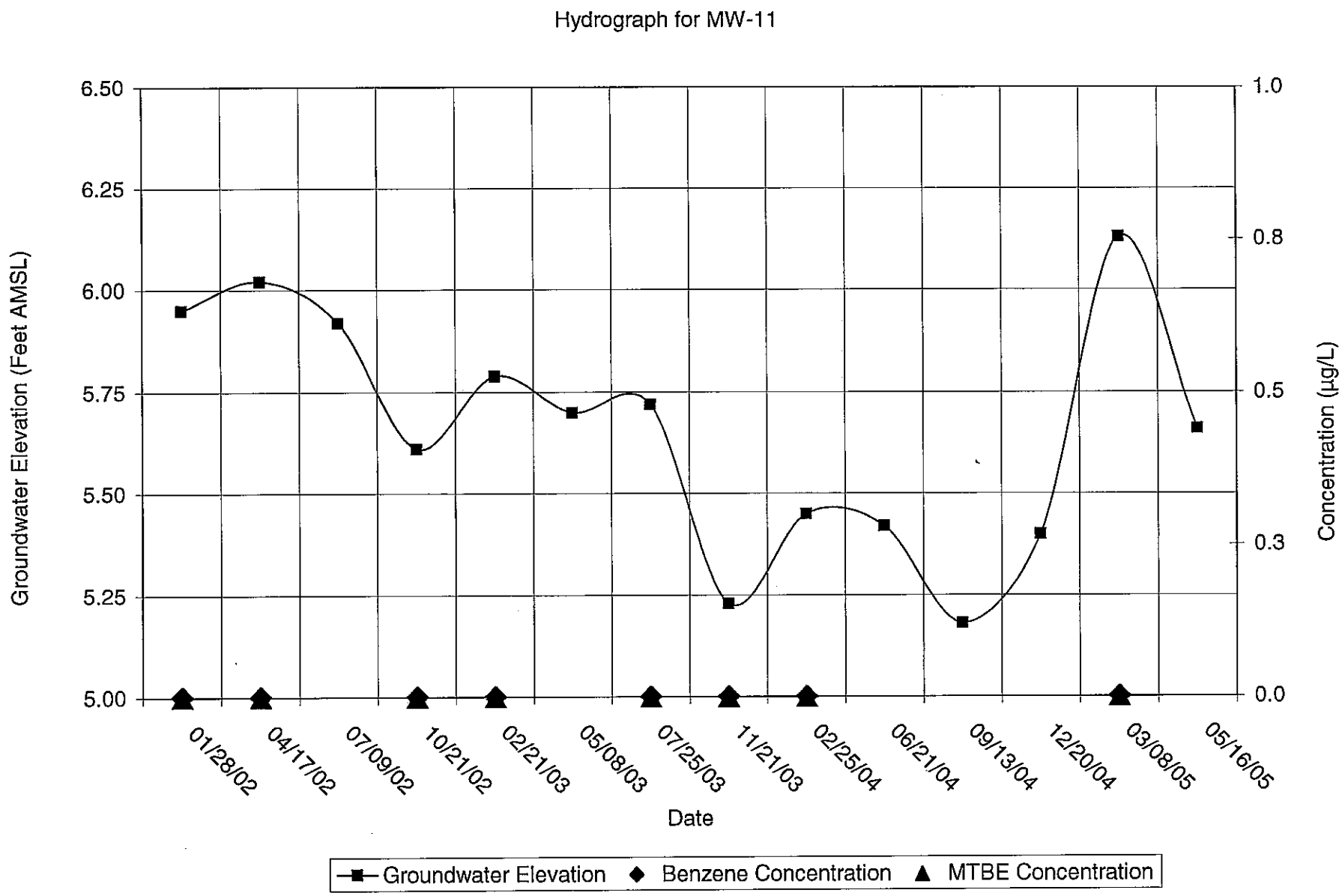

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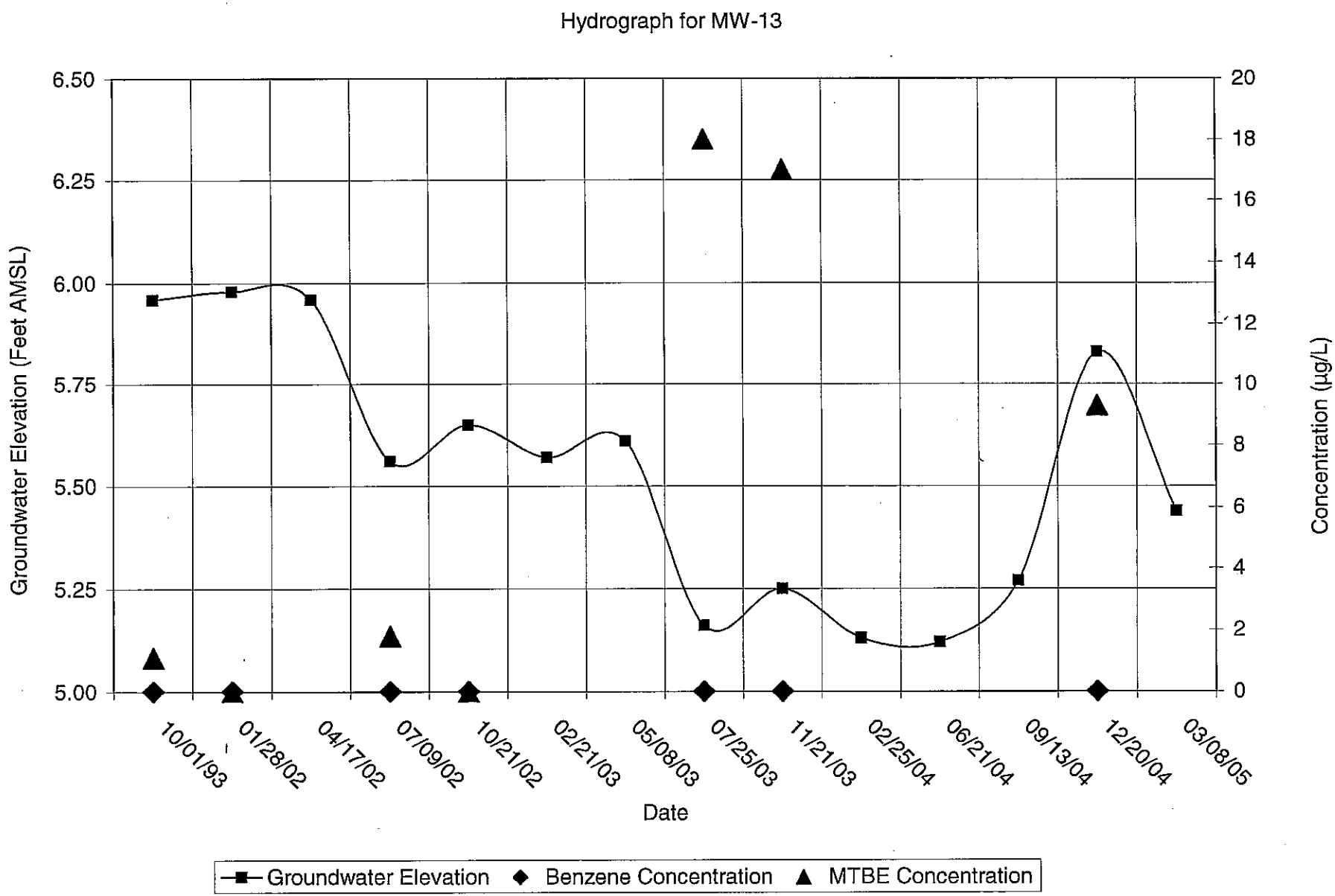

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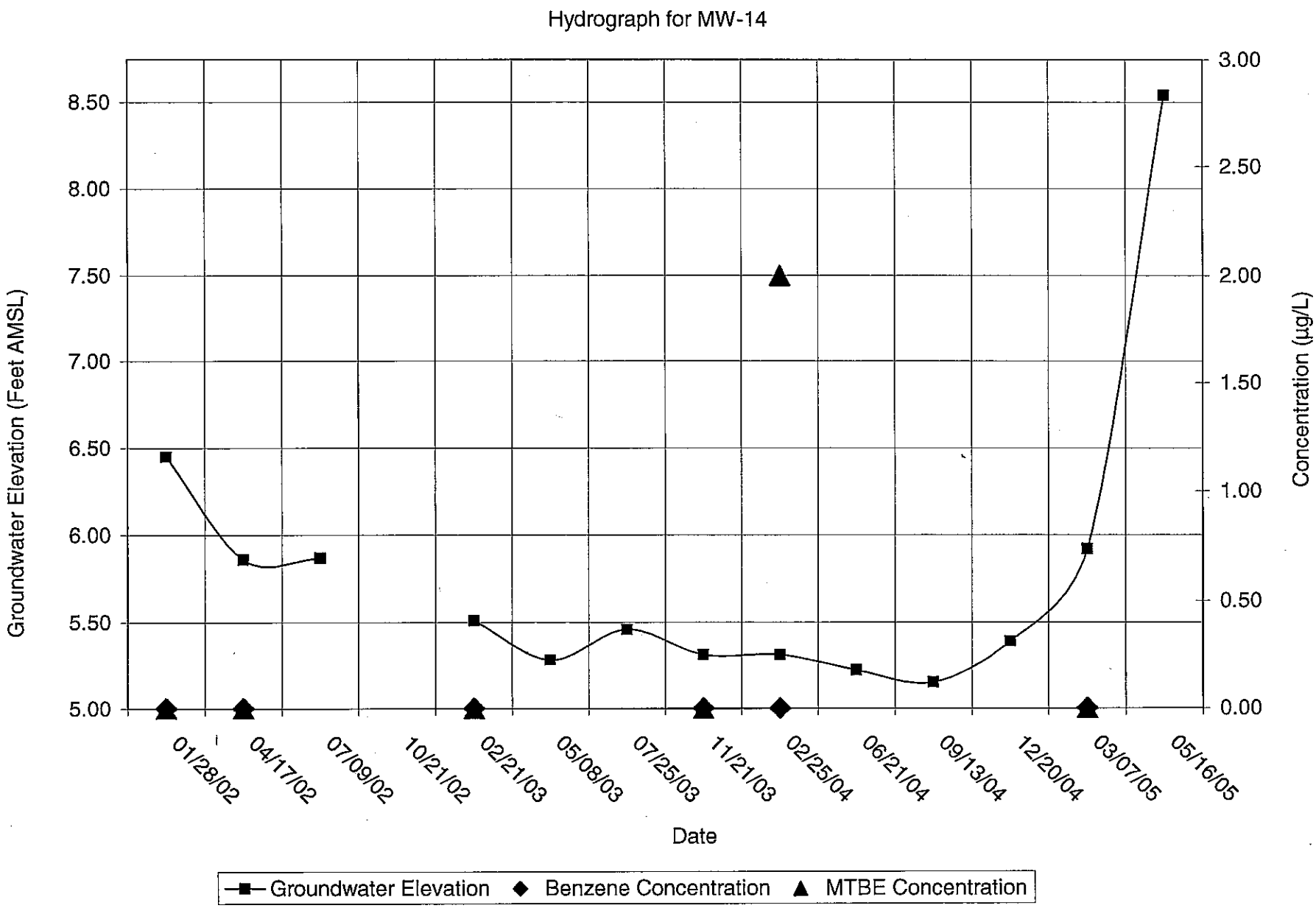

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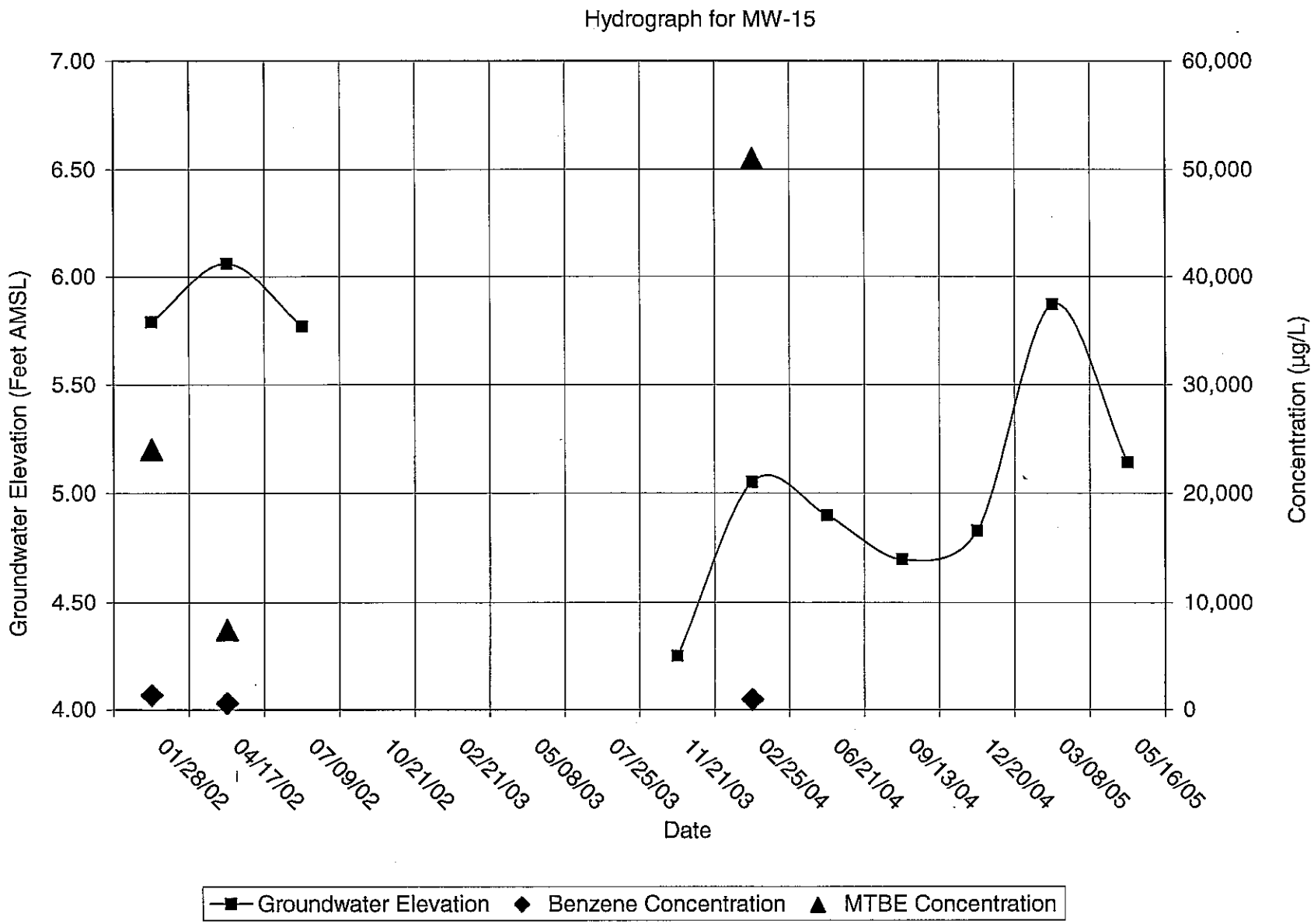

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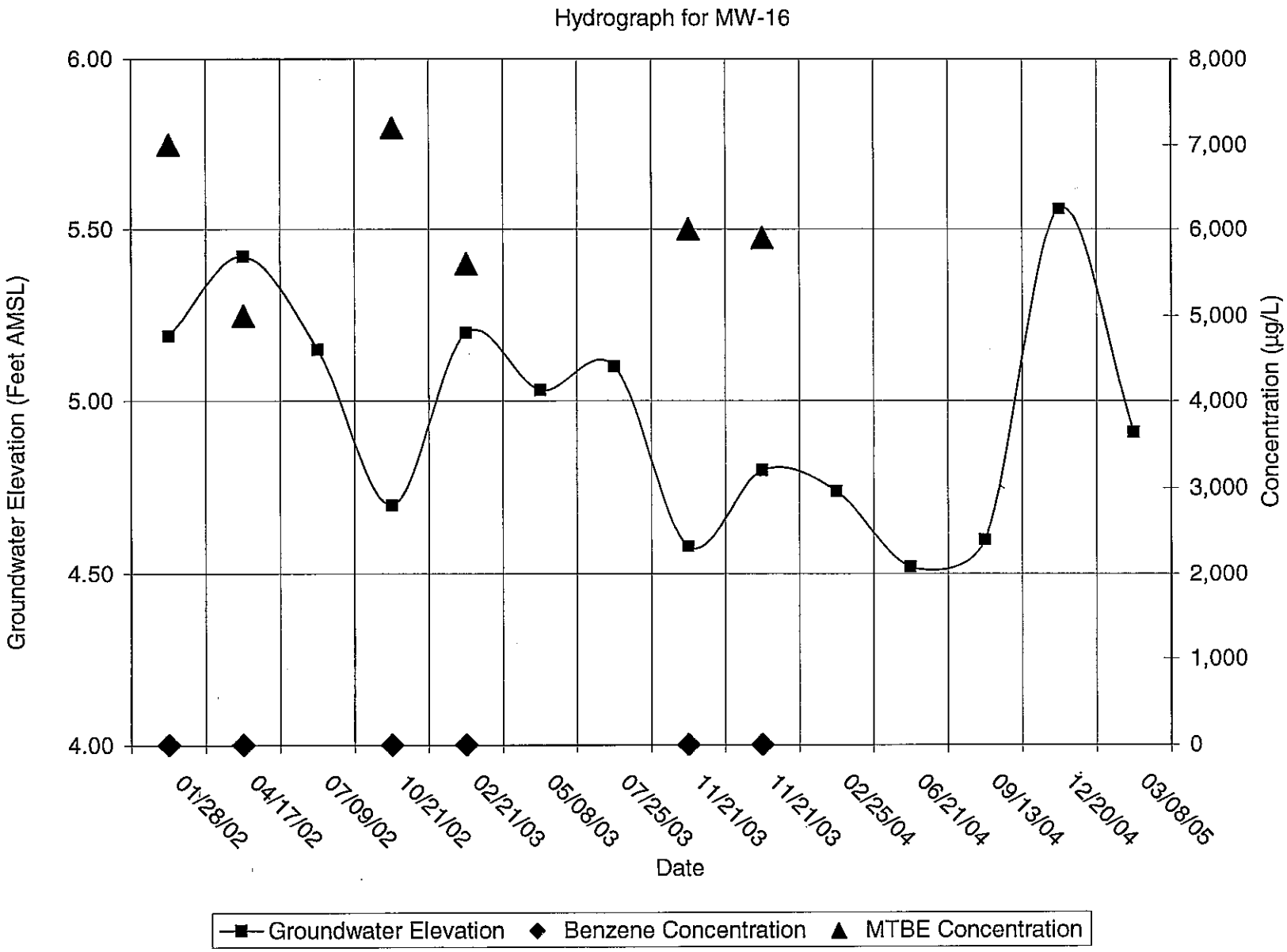

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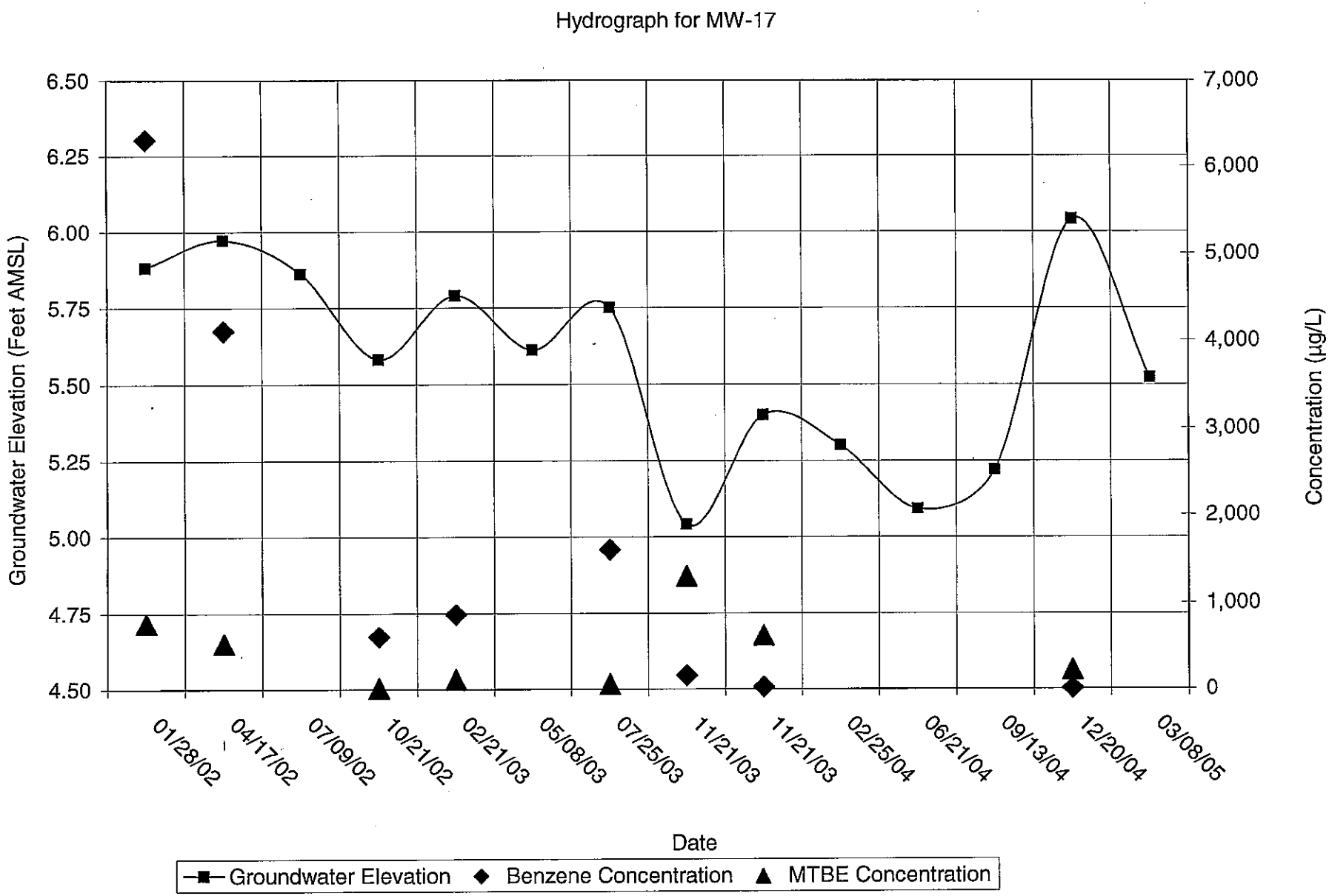

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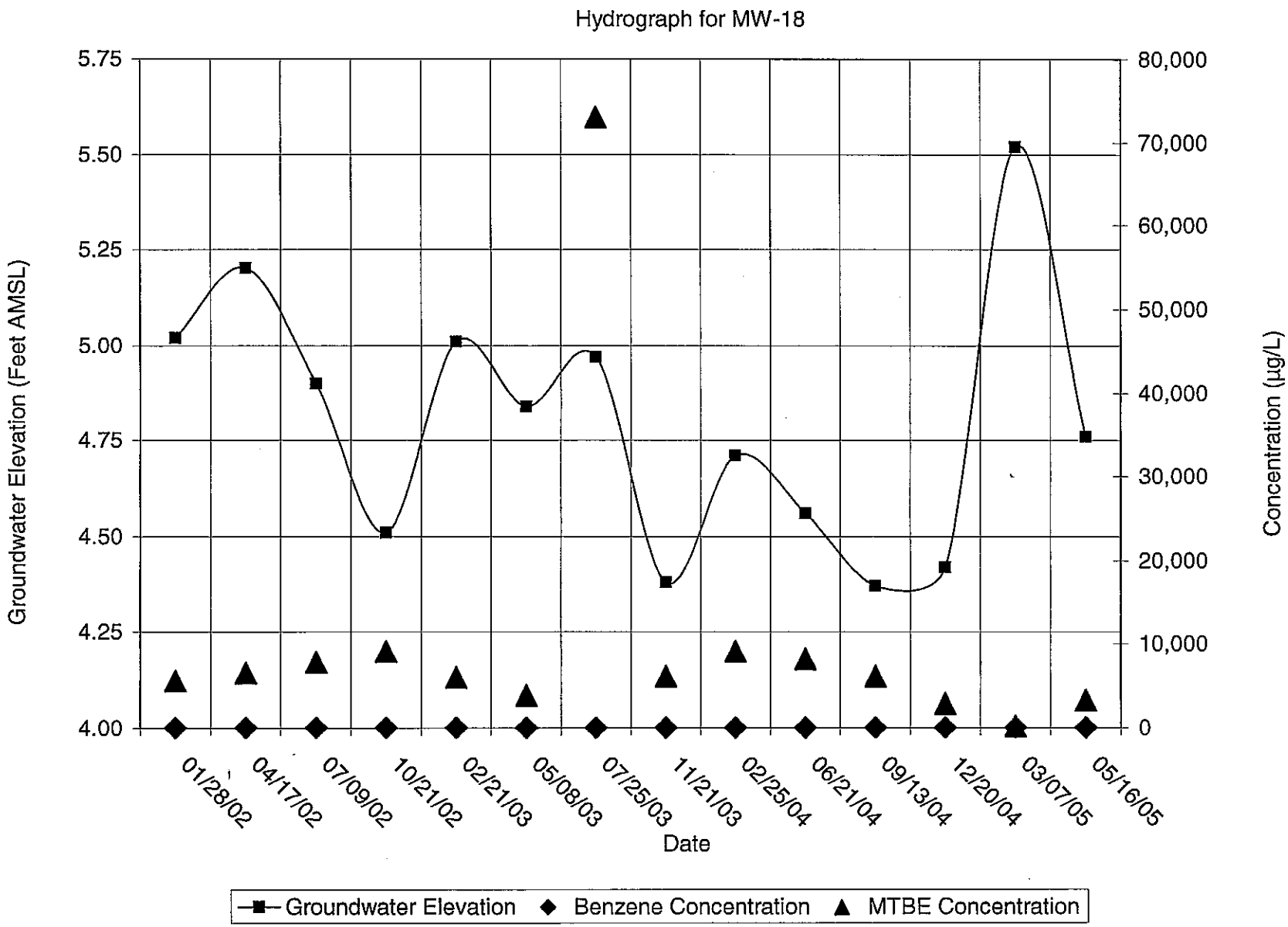

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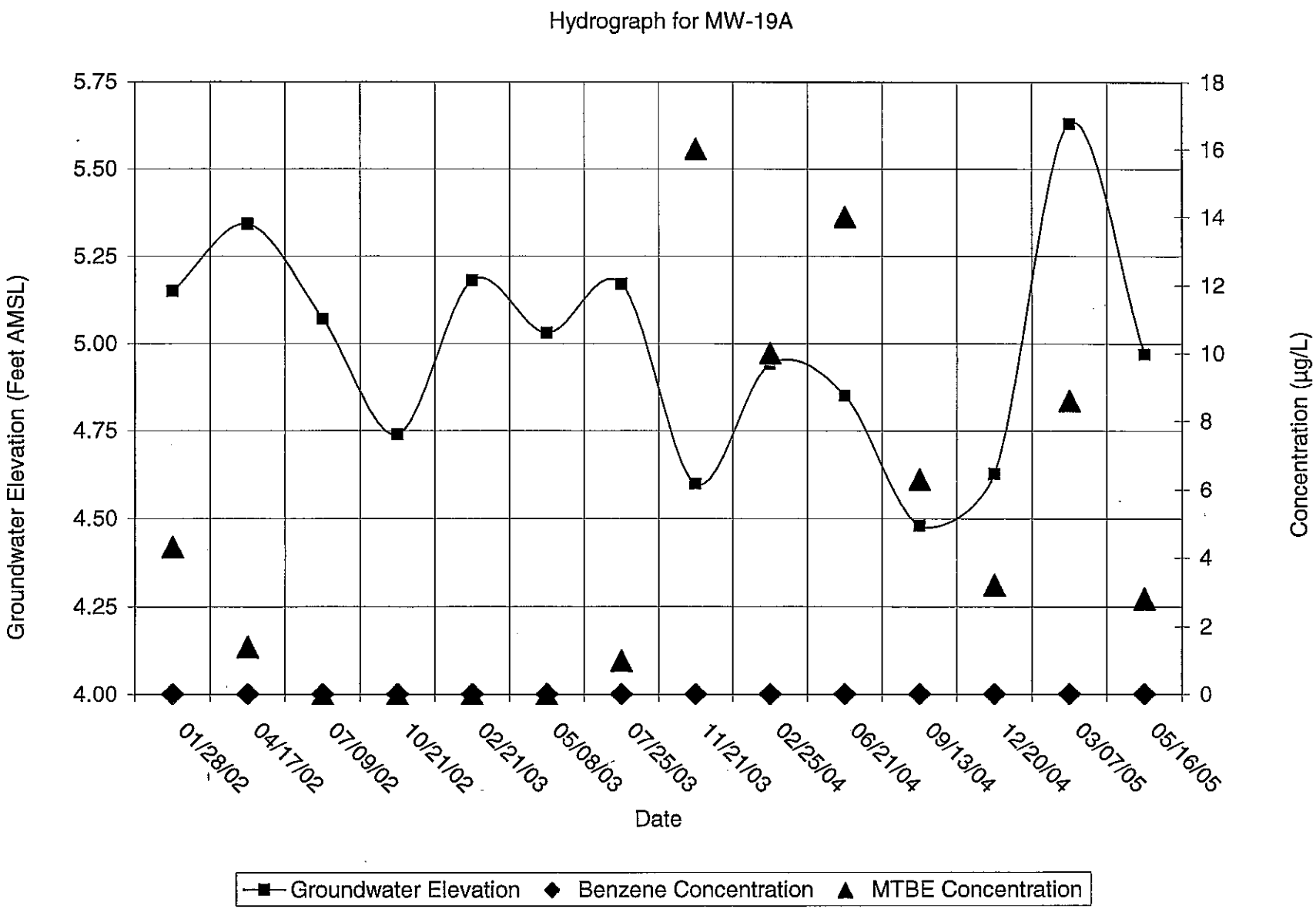

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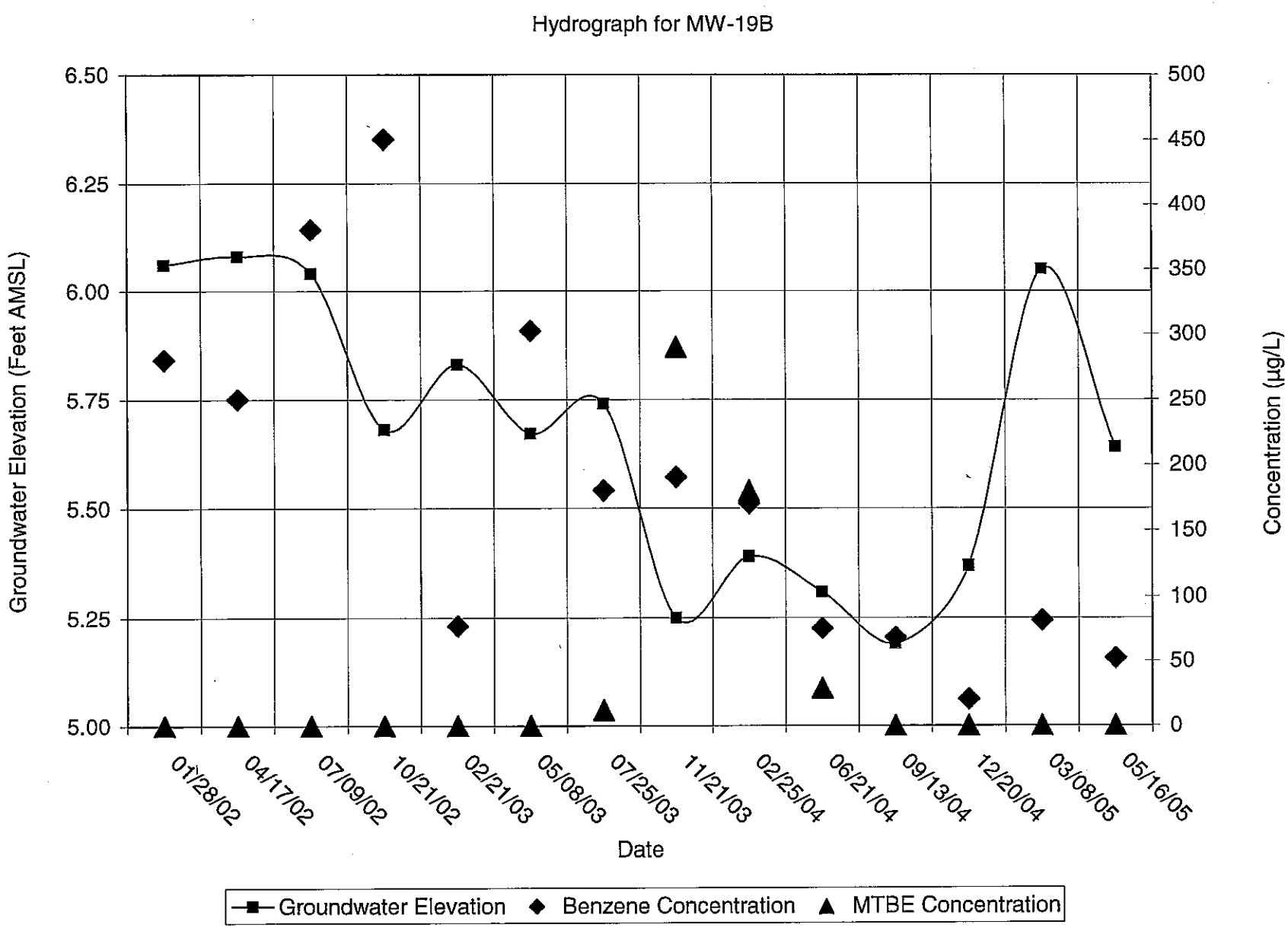

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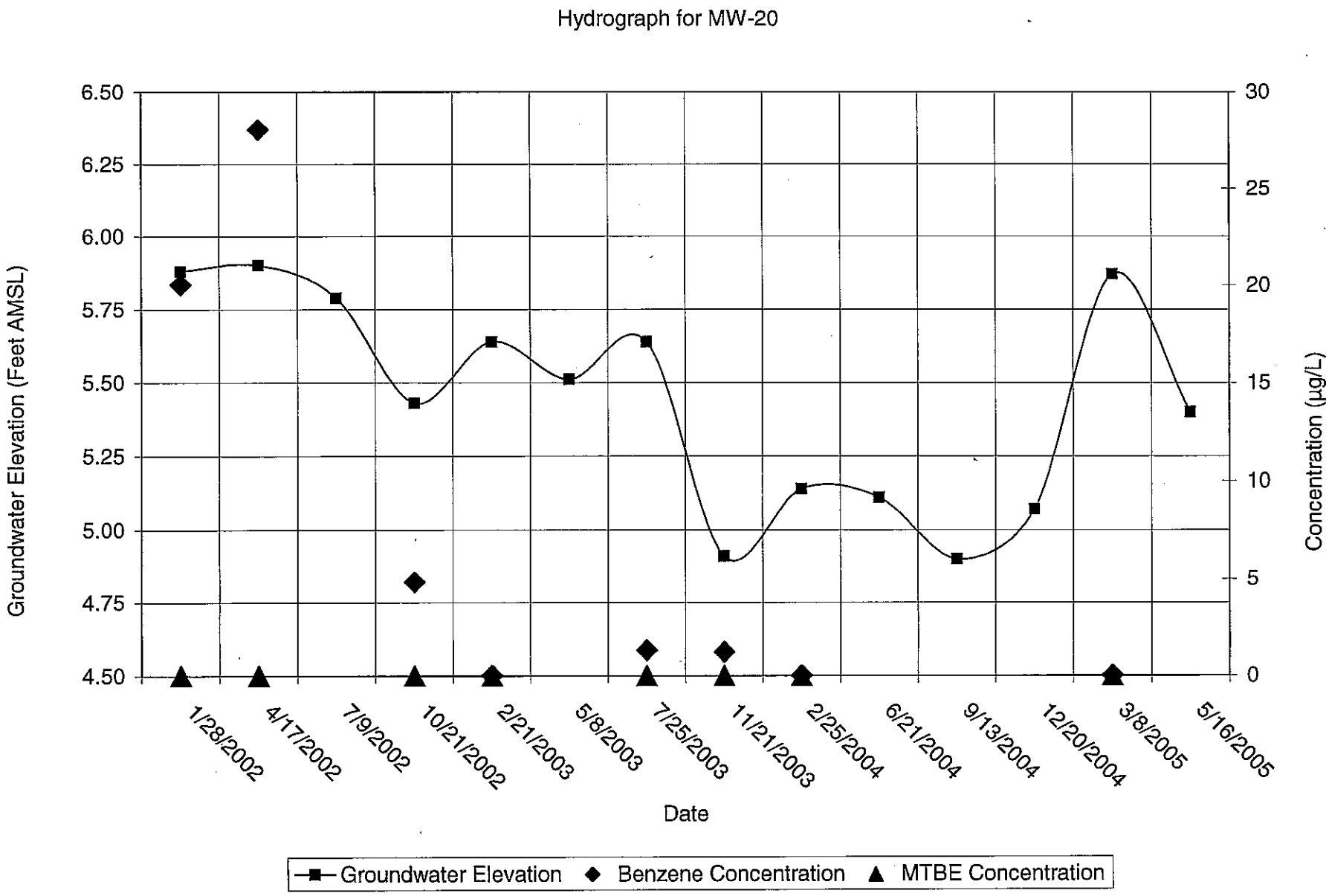

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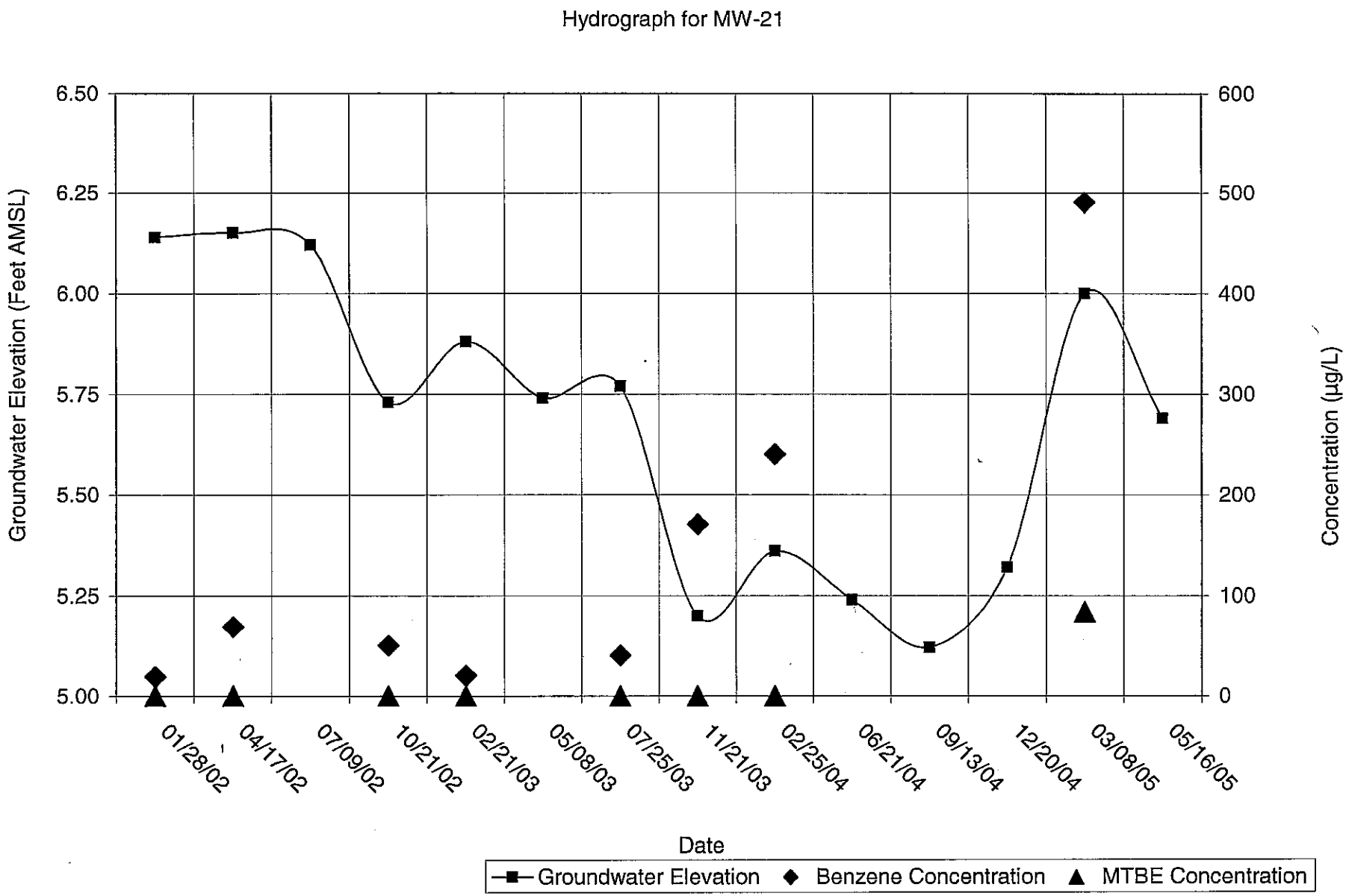

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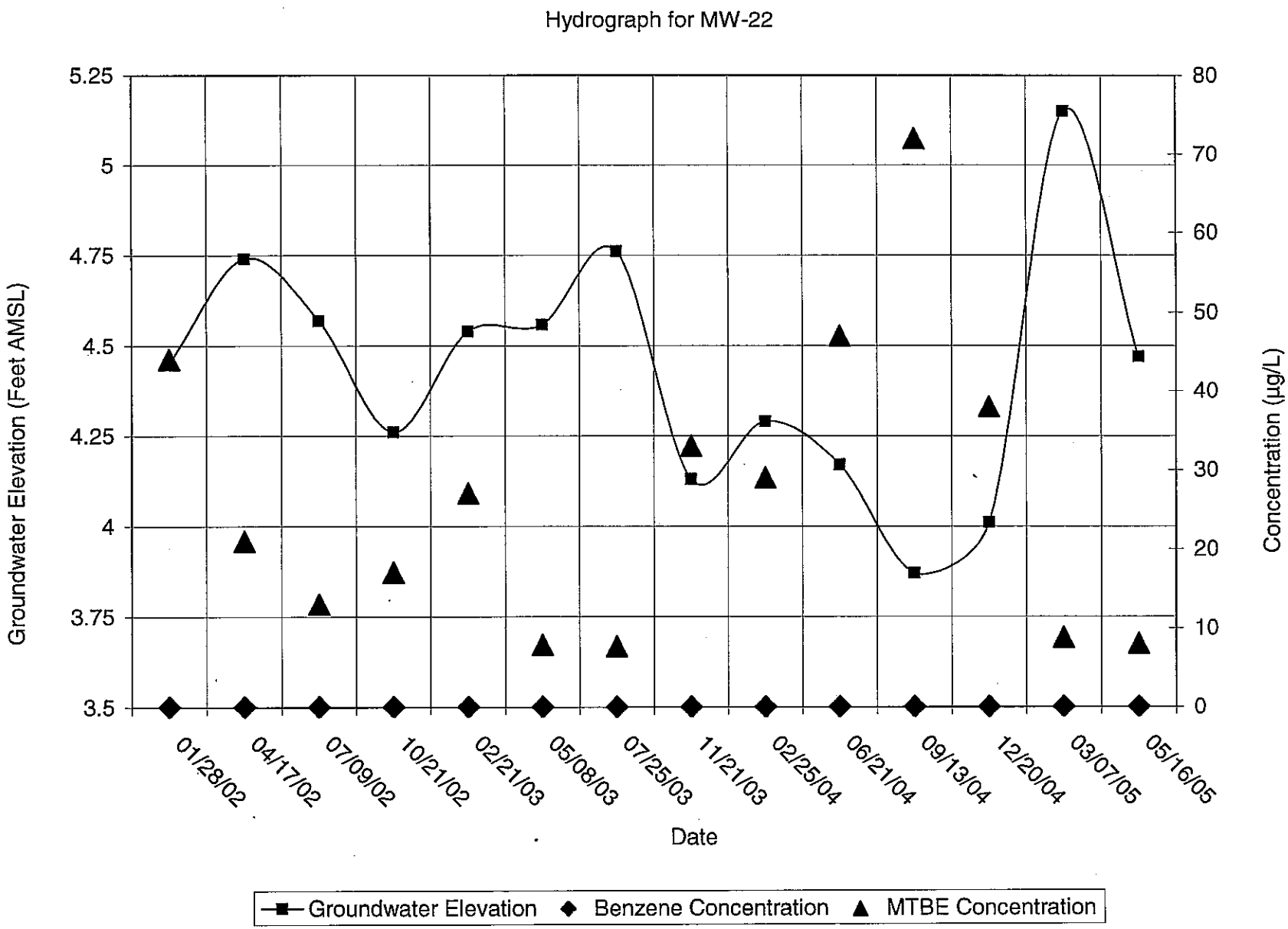

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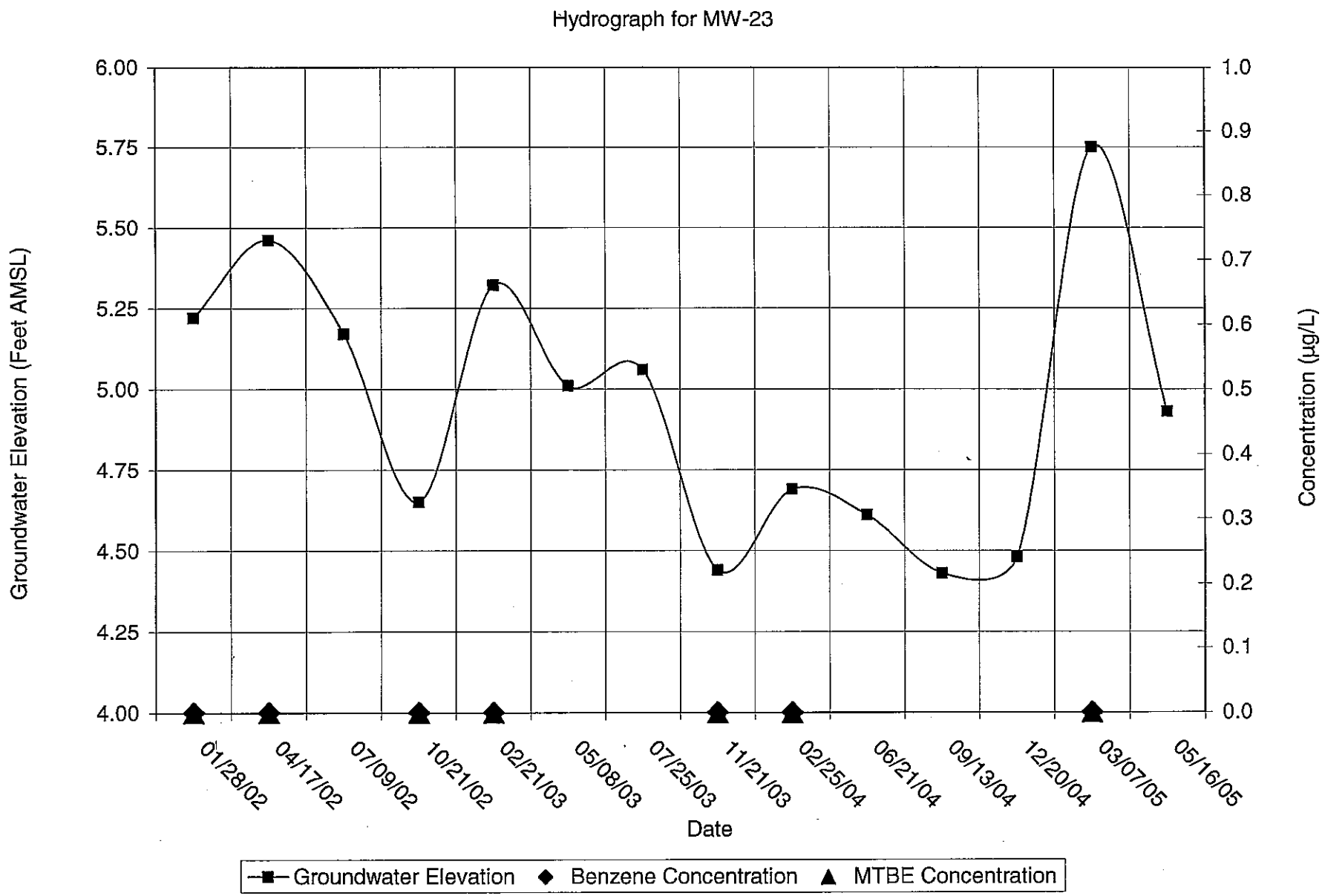

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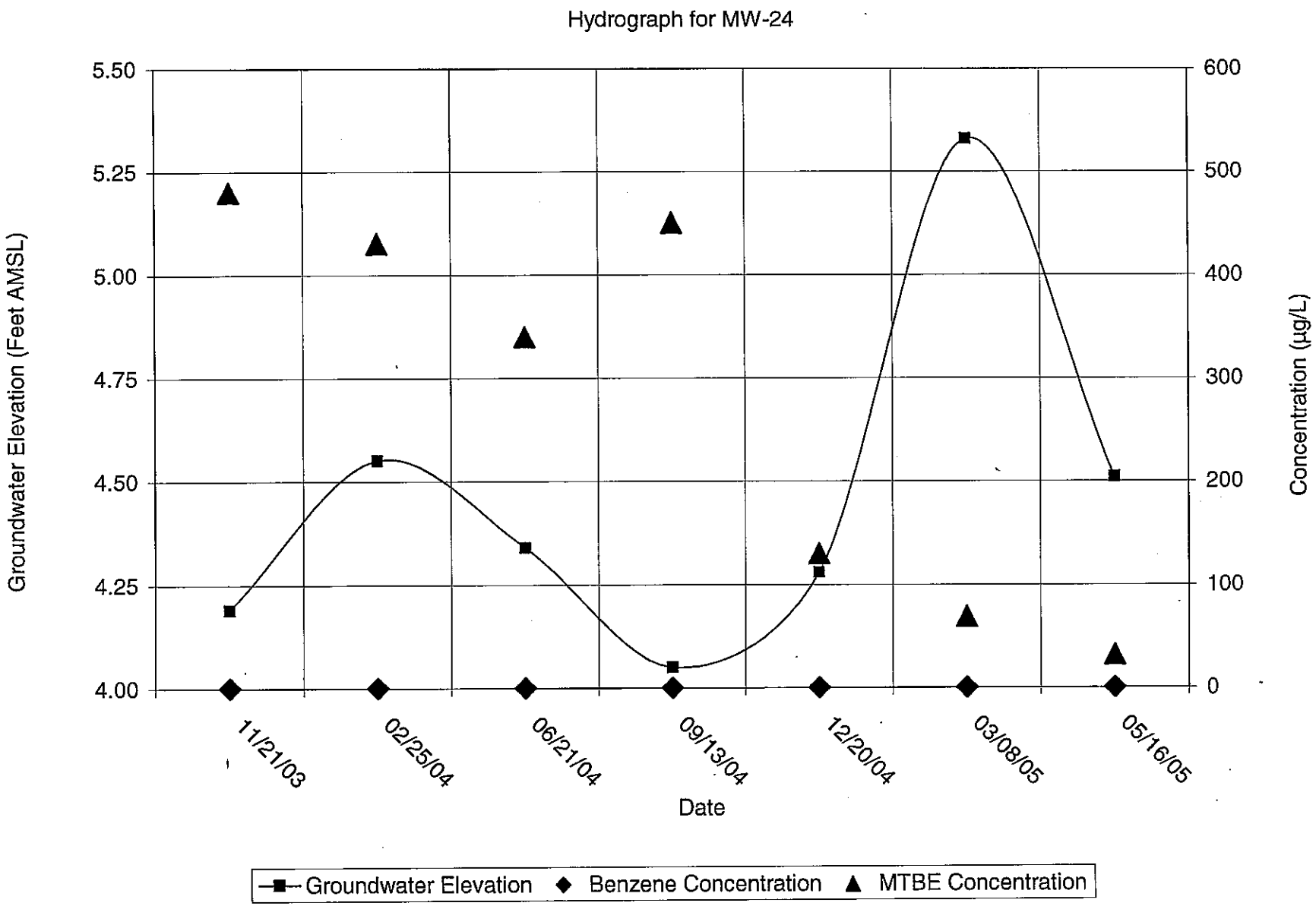

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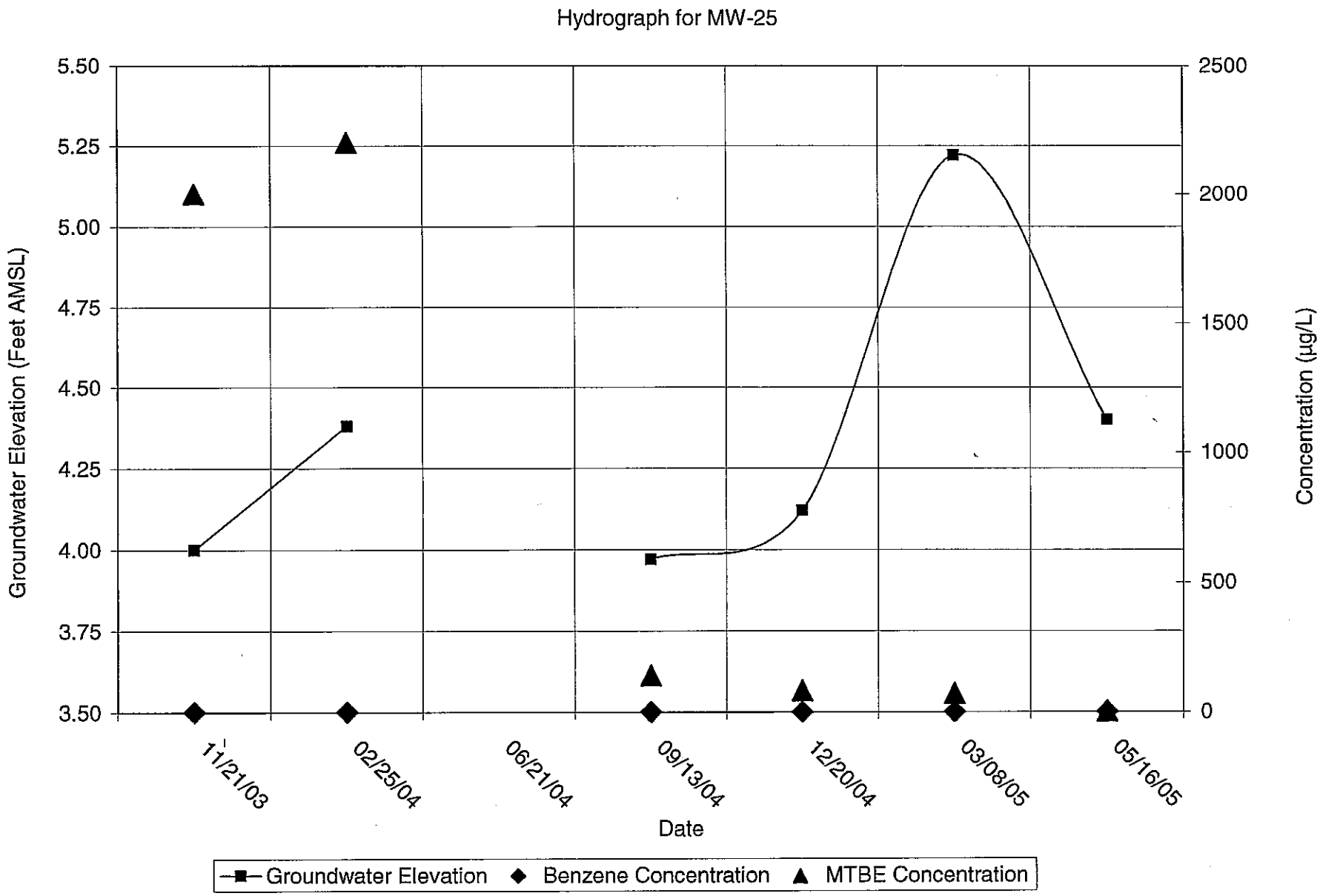

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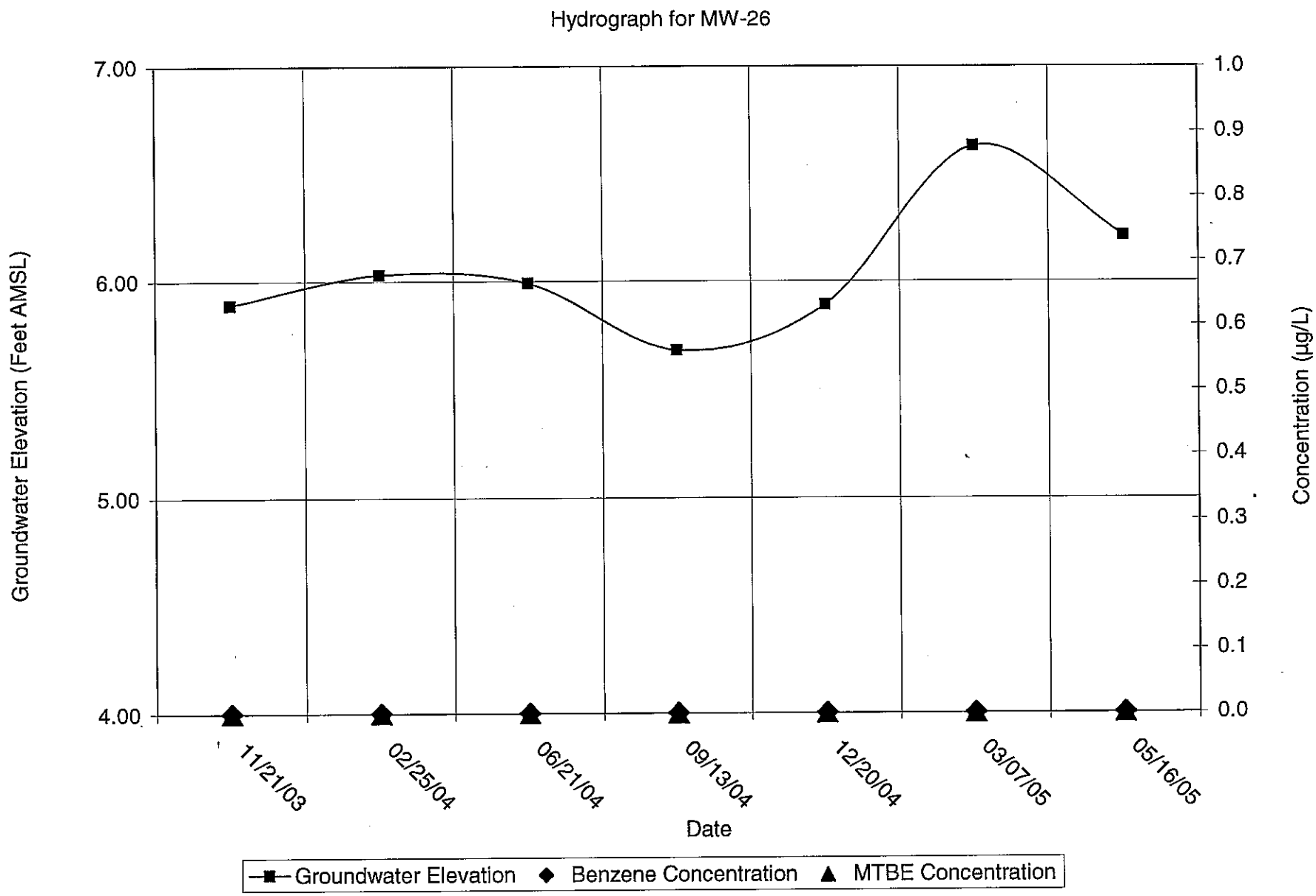

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MONITORING WELL PURGING AND SAMPLING PROCEDURES
SAN DIEGO COUNTY

Fast recovering well: A well is considered to be fast recovering if recovery to 80 percent or more of its static condition occurs within 2 hours when using the high-flow purging method.

Slow recovering well: A well is considered to be slow recovering if recovery to 80 percent of its static water level takes longer than 2 hours when using the high-flow purging and sampling method.

Purging and Sampling Methods: The following method is currently approved by SAM.

High-flow Purging and Sampling: Purging using a pumping rate greater than 1 liter per minute (lpm) or 0.26 gallon per minute (gpm) (Barcelona and Puls, 1996). Traditionally, the high-flow purging method has been widely used. This method typically involves the removal of up to 3 borehole volumes prior to sampling. Samples are most often collected with a bailer or other device after completion of purging. This methodology provides a composite of the contaminant concentration within the well and will likely not be suitable for low yield wells.

1. High-flow Purging and Sampling Method

This method is widely used and involves the removal of water from the well at a rate in excess of 1 lpm (0.26 gpm) by a variety of methods, including pumps, bailers, etc. The following steps are necessary to collect representative samples. Well purging to "dryness" should be avoided.

a. Measure for NAPL

LNAPL and DNAPL may be present in groundwater monitoring wells. If NAPL exists, the well sampling procedure described in this section will typically not apply. Special considerations may be necessary and should be discussed with the SAM project manager on a case-by-case basis.

b. Measure Water Level

The groundwater level in the monitoring well should be measured to an accuracy of 0.01 foot prior to purging and sampling activities.

c. Placement of Pump

The pump should be placed in the lower one-third of the well screen.

d. Calculation of Borehole Volume

f. Parameter Stability

It is assumed that parameter stability is achieved when the difference between successive measurements is less than 10 percent. Generally, measurements are made after one borehole volume is removed and then at one-half borehole volume intervals. Commonly, the measurement of temperature, specific conductance, and pH are used exclusively, but it has been found these parameters are less sensitive to field conditions. It is recommended that dissolved oxygen, turbidity, specific conductance, and temperature be monitored.

g. Purge Well

The well must be purged with a device that does not compromise the sample by cross-contamination, aeration, or other negative effects

(1) Fast Recovering Wells

DEH considers the following two options acceptable methods for properly purging fast recovering wells:

(a) Option I
i. Remove 3 borehole volumes of water.
ii. Allow the well to recover to 80% of its static condition prior to collecting the sample.

(b) Option II
i. Remove 1 borehole volume of water.
ii. Conduct field water-quality measurements (dissolved oxygen, turbidity, specific conductance, and temperature).
iii. Remove an additional ½ borehole volume of water. Conduct field water quality measurements again. If the first and second measurements vary by less than 10%, purging is considered adequate. Proceed to step (v.) below.
iv. Repeat step (iii) until the measurements vary by less than 10% or until 3 borehole volumes of water have been removed.
v. Allow the well to recover to 80% of its static condition before collecting the sample.

(2) Slow Recovering Wells

(a) Remove 1 borehole volume of water.

(b) The well should be allowed to recover for 2 hours after purging has stopped. Then the well should be sampled as soon after 2 hours as possible. Note that if the well recovers to greater than 80% in less than 2 hours, it is a fast recovering well. If so, follow the steps in Option I or II above.

h. Collect Samples

After the monitoring well has been properly purged, the guidelines below for groundwater sample collection should be followed.

(1) In the case of a fast recovering well, samples should be collected when the well has recovered to 80%. In the case of a slow recovering well, samples should be collected as soon as possible after 2 hours have elapsed.

(2) Collect groundwater samples from wells with sampling equipment.

Sampling equipment must be compatible with the contaminant being analyzed

(3) Sampling equipment should be decontaminated before use.

(4) Samples requiring organic analyses should not be filtered.

(5) Samples should be transferred from the sampling device to a container in a manner that minimizes aeration.

(6) Samples should be collected in approved sample containers appropriate for the type of analysis to be performed.

(7) Samples should not be transferred from one sample container to another.

(8) Headspace in sample containers should be avoided.

(9) EPA SW-846 sample preservation and holding times for specific analyses should be followed.

Appropriate sample chain-of-custody procedures must be followed.

SECOR

MONITORING WELL GAUGING LOG

Site Name & Facility No: **ARCO 1919** Date: 051603

Project Number: 08BP.U1919.05 / 4142 Field Representative(s): MN DK MM LG JM

Checked by: OR

Well No.	Previous QTR DTW	Gauging Time	Depth to Floating Product	Depth to Water (ft)	Floating Product Thickness	Total Casing Depth (ft)	Casing Elevation[1]	Groundwater Elevation[1]	Corrected Groundwater Elevation[1]*	Comments
MW-6	10.62	1002	—	10.28	—	15.63	15.96	5.68		
MW-10	11.21	1003	—	10.94	—	16.40	16.59	5.65		
MW-11	8.00	0950	—	7.74	—	16.47	13.40	5.66		
MW-13	7.52	1008 ~~1000~~	—	7.35 ~~6.08~~	—	17.25	12.79	5.44		
MW-14	9.23	1000	—	6.08	—	17.60	14.62	8.54		
MW-15	6.47	1030	—	6.16	—	17.18	11.30	5.14		
MW-16	8.48	1019	—	8.17	—	16.18	13.08	4.91		
MW-17	9.78	0951	—	9.48	—	21.90	15.00	5.52		
MW-18	9.32	1015	—	8.98	—	19.85	13.74	4.76		
MW-19A	8.76	1001	—	8.42	—	19.70	13.39	4.97		
MW-19B	11.30	0935	—	11.03	—	14.34	16.67	5.64		
MW-20	8.19	0956	—	7.86	—	18.83	13.26	5.40		

Notes:
1 = feet above mean sea level unless noted otherwise
* = elevation adjusted by adding (.75 x product thickness) to measured water elevation
— = not measured due to the presence of liquid-phase hydrocarbons

Sheen = discontinuous, non-measurable thickness of LPH
Trace = continuous, non-measurable thickness of LPH
ND = Not detected
NM = Not measured

SECOR

MONITORING WELL GAUGING LOG

Site Name & Facility No: **ARCO 1919** Date: 051605

Project Number: 08BP.U1919.05 / 4142 Field Representative(s): [illegible]

Checked by: [illegible]

Well No.	Previous QTR DTW	Gauging Time	Depth to Floating Product	Depth to Water (ft)	Floating Product Thickness	Total Casing Depth (ft)	Casing Elevation[1]	Groundwater Elevation[1]	Corrected Groundwater Elevation[1]*	Comments
MW-21	8.20	0944	—	7.83	—	11.78	13.52	5.69		
MW-22	5.77	0930	-	5.31	—	18.10	9.78	4.47		
MW-23	7.94	0915	-	7.49	-	20.30	12.42	4.93		
MW-24	4.55	0945	-	4.32	-	16.73	8.83	4.51		
MW-25	3.09	0950	-	2.81	-	17.35	7.21	4.40		
MW-26	23.93	0950	-	23.64	-	34.65	29.82	6.21		

Notes:
1 = feet above mean sea level unless noted otherwise
* = elevation adjusted by adding (.75 x product thickness) to measured water elevation
\- = not measured due to the presence of liquid-phase hydrocarbons

Sheen = discontinuous, non-measurable thickness of LPH
Trace = continuous, non-measurable thickness of LPH
ND = Not detected
NM = Not measured

SECOR

International Incorporated

Monitoring Well Inspection Report

Site No. & Name: **ARCO 1919** Date: 05/6/05

Project Number: 08BP.U1919.05 / 4142 Field Personnel: [illegible]

	Well Location Number:	MW-6	MW-10	MW-11	MW-13	MW-14	MW-15	MW-16	MW-17
EXTERIOR	Well Perimeter Seal Condition (G-Good P-Poor)	G	G	G	G	G	G	G	G
	Well Structure Drainage (G-Good P-Poor)	G	G	G	G	G	G	G	G
	Properly Secured (Y-Yes N-No)	Y	N	Y	Y	Y	Y	Y	Y
	Type of Well Vault (E=EMCO Wheaton M=Morrison V=Vault)	M	V	V	E	E	E	G	V
INTERIOR	Type of Well Seal (Dirt, Concrete, etc.)	C	C	C	C	C	C	C	C
	Well Casing Type (i.e. 2" or 4")	4	4	4	4	4	4"	4	4
	Locking Cap Condition (G-Good P-Poor)	G	G	G	G	G	G	G	G
	Rubber Seal Condition (G-Good P-Poor)	G	G	G	G	G	G	G	G
	Lock on Well (Y-Yes N-No)	Y	Y	Y	Y	Y	Y	Y	Y
	Liquid Present in Well Vault (Y-Yes N-No)	N	N	Y	N	N	N	N	Y

	Well Location Number:	MW-18	MW-19A	MW-19B	MW-20	MW-21	MW-22	MW-23	MW-24
EXTERIOR	Well Perimeter Seal Condition (G-Good P-Poor)	G	G	G	G	G	G	G	G
	Well Structure Drainage (G-Good P-Poor)	G	G	G	G	G	G	G	G
	Properly Secured (Y-Yes N-No)	Y	Y	Y	Y	N	Y	Y	Y
	Type of Well Vault (E=EMCO Wheaton M=Morrison V=Vault)	M	M	E	E	E	M	M	M
INTERIOR	Type of Well Seal (Dirt, Concrete, etc.)	C	C	C	C	C	C	C	C
	Well Casing Type (i.e. 2" or 4")	4	4	4	4	4	2	2	2
	Locking Cap Condition (G-Good P-Poor)	G	G	G	G	G	G	G	G
	Rubber Seal Condition (G-Good P-Poor)	G	G	G	G	G	G	G	G
	Lock on Well (Y-Yes N-No)	Y	Y	Y	Y	Y	Y	Y	Y
	Liquid Present in Well Vault (Y-Yes N-No)	N	N	N	Y	N	N	Y	Y

Comments: Stinger in MW-10

SECOR

International Incorporated

Monitoring Well Inspection Report

Site No. & Name: **ARCO 1919** Date: 05/16/05

Project Number: 08BP.U1919.05 / 4142 Field Personnel: [illegible]

	Well Location Number:		MW-25	MW-26						
EXTERIOR	Well Perimeter Seal Condition	G-Good P-Poor	G	G						
	Well Structure Drainage	G-Good P-Poor	G	G						
	Properly Secured	Y-Yes N-No	Y	Y						
	Type of Well Vault	(E=EMCO Wheaton M=Morrison V=Vault)	M	M						
INTERIOR	Type of Well Seal (Dirt, Concrete, etc.)		C	C						
	Well Casing Type	(i.e. 2" or 4")	2	2						
	Locking Cap Condition	G-Good P-Poor	G	G						
	Rubber Seal Condition	G-Good P-Poor	G	G						
	Lock on Well	Y-Yes N-No	N	Y						
	Liquid Present in Well Vault	Y-Yes N-No	Y	Y						

	Well Location Number:									
EXTERIOR	Well Perimeter Seal Condition	G-Good P-Poor								
	Well Structure Drainage	G-Good P-Poor								
	Properly Secured	Y-Yes N-No								
	Type of Well Vault	(E=EMCO Wheaton M=Morrison V=Vault)								
INTERIOR	Type of Well Seal (Dirt, Concrete, etc.)									
	Well Casing Type	(i.e. 2" or 4")								
	Locking Cap Condition	G-Good P-Poor								
	Rubber Seal Condition	G-Good P-Poor								
	Lock on Well	Y-Yes N-No								
	Liquid Present in Well Vault	Y-Yes N-No								

Comments:

SECOR INTERNATIONAL INCORPORATED	WELL PURGING / SAMPLING LOG	Well No: MW- 18
	Project Name: ARCO 1919	Date: 5/16/05
	Project Number: 08BP.U1919.05 / 4142	Sample Time: 1254
	SECOR Rep: ~~D. Wong~~ JM/MN/NW — Checked by: ~~JM~~	Sample No: MW- 18

PURGING & SAMPLING EQUIPMENT / METHOD	WELL SPECIFICATIONS & MEASUREMENTS	
Water Level Meter Type & ID: Solinist #3A	Borehole Diameter (in): 8 (10) 12	
Purging Equipment / Method: ___ Vac Truck ___ Submersible Pump X Bailer ___ Other	Casing Diameter (in): 2 (4)	
pH Temp/Conductivity Meter Type / ID: 6	Depth to Water (DTW_1) (ft): 8.97@1249	
Sampling Method: ___ Teflon Bailer X Disposable Bailer ___ Other:	Total Well Depth (DTB) (ft): 19.85	Water Column: 10.88
Decontamination Method: ___ Steam / High Pressure Wash X 3 Stage (Alconox, Tap & DI rinse) ___ Other:	Floating Product: —	Thickness (in): —
	Borehole Volume (gal): 16.32	1.5 Borehole Volumes (gal): 24.48

PURGING INFORMATION

Time	DTW (ft)	Water Volume Purged (gal)	pH	Temp (°C)	Elect. Cond. (μ mhos)	Water Description (odor, turbidity, color)
1245	Started Purging					
1248	12.10	16.5	7.34	21.6	4550	gray, roots, med silt, sulfur odor
1251	12.12	24.5	7.36	21.7	4660	
1254	9.60	Sample				

Maximum Drawdown (DTW_2) (ft) = 12.12

H_2O Removal Rate (GPM) = 4.08

X Fast Recharging Well

___ Slow Recharging Well

SAMPLING INFORMATION

Time Sampled: 1254

Depth to Water at time of sampling (DTW_3): 9.60

Container Types & Volumes	Filtered (Y/N)	Sample Preservatives	Analytical Parameters
(6) x 40ml VOAs	(N)	HCL & ICE or NONE	GRO, BTEX, MTBE, (8015M, 8260B)
			DIPE, TAME, ETBE, TBA, Ethanol (8260B)

BOREHOLE VOLUME CALCULATIONS

The calculation of one borehole volume is based on the formula in the SAM Manual.

Diameter (in)	Borehole Diameter (in)	Calculated Borehole Volume (gal)
2	8	.77 ($DTB-DTW_1$)
2	10	1.14 ($DTB-DTW_1$)
4	10	1.50 ($DTB-DTW_1$)
4	12	1.95 ($DTB-DTW_1$)
6	10	2.11 ($DTB-DTW_1$)

Notes:

RECOVERY CALCULATIONS

$$\% \text{ of Recovery} = 1 - \frac{(DTW_1) - (DTW_3)}{(DTW_1) - (DTW_2)} \times 100$$

$$\% \text{ of Recovery} = 1 - \frac{(8.97) - (9.60)}{(8.97) - (12.12)}$$

$$\frac{-0.63}{-3.15} = 80\%$$

80% Recharge = 9.60

SECOR INTERNATIONAL INCORPORATED	WELL PURGING / SAMPLING LOG		Well No: MW- 19A
	Project Name: ARCO 1919		Date: 5/16/05
	Project Number: 08BP.U1919.05 / 4142		Sample Time: 1153
	SECOR Rep: W Wong	Checked by: DE	Sample No: MW- 19A

PURGING & SAMPLING EQUIPMENT / METHOD	WELL SPECIFICATIONS & MEASUREMENTS	
Water Level Meter Type & ID: Solinist # 3A	Borehole Diameter (in): 8 (10) 12	
Purging Equipment / Method: ___Vac Truck ___Submersible Pump ☒Bailer ___Other	Casing Diameter (in): 2 (4)	
pH Temp/Conductivity Meter Type / ID: 6	Depth to Water (DTW_1) (ft): 9.42 @ 1142	
Sampling Method: ___Teflon Bailer ☒Disposable Bailer ___Other:	Total Well Depth (DTB) (ft): 19.70	Water Column: 11.28
Decontamination Method: ___Steam / High Pressure Wash ☒3 Stage (Alconox, Tap & DI rinse) ___Other:	Floating Product: —	Thickness (in): —
	Borehole Volume (gal): 16.92	1.5 Borehole Volumes (gal): 25.38

PURGING INFORMATION

Time	DTW (ft)	Water Volume Purged (gal)	pH	Temp (°C)	Elect. Cond. (μ mhos)	Water Description (odor, turbidity, color)
1145	Started Purging					
1149	9.62	17	7.00	23.3	3010	brown, (mu)med silt, odorless
1151	10.63	25.5	6.98	23.3	3020	"
1153	8.86	Sample				

Maximum Drawdown (DTW_2) (ft) = 10.63

H_2O Removal Rate (GPM) = 4.25

☒ Fast Recharging Well

___ Slow Recharging Well

SAMPLING INFORMATION

Time Sampled: 1153

Depth to Water at time of sampling (DTW_3): 8.86

Container Types & Volumes	Filtered (Y/N)	Sample Preservatives	Analytical Parameters
(6) x 40ml VOAs	(N)	HCL & ICE or NONE	GRO, BTEX, MTBE, (8015M, 8260B)
			DIPE, TAME, ETBE, TBA, Ethanol (8260B)

BOREHOLE VOLUME CALCULATIONS

The calculation of one borehole volume is based on the formula in the SAM Manual.

Diameter (in)	Borehole Diameter (in)	Calculated Borehole Volume (gal)
2	8	.77 (DTB-DTW_1)
2	10	1.14 (DTB-DTW_1)
4	10	1.50 (DTB-DTW_1)
4	12	1.95 (DTB-DTW_1)
.6	10	2.11 (DTB-DTW_1)

Notes:

RECOVERY CALCULATIONS

$$\% \text{ of Recovery} = 1 - \frac{(DTW_1) - (DTW_3)}{(DTW_1) - (DTW_2)} \times 100$$

$$\% \text{ of Recovery} = 1 - \frac{(8.42) - (8.86)}{(8.42) - (10.63)} = \frac{-0.44}{-2.21} = 80\ \%$$

80% Recharge = 8.86

SECOR

INTERNATIONAL INCORPORATED

WELL PURGING / SAMPLING LOG

Project Name:	ARCO 1919	Well No:	MW- 19B
Project Number:	08BP.U1919.05 / 4142	Date:	051605
SECOR Rep:	D. KRAUTTER	Sample Time:	1319
Checked by:	de	Sample No:	MW- 19B

PURGING & SAMPLING EQUIPMENT / METHOD

Water Level Meter Type & ID: Solinist # ~~B~~ 2

Purging Equipment / Method: ___ Vac Truck ___ Submersible Pump X Bailer ___ Other

pH Temp/Conductivity Meter Type / ID:

Sampling Method: ___ Teflon Bailer X Disposable Bailer ___ Other:

Decontamination Method: ___ Steam / High Pressure Wash X 3 Stage (Alconox, Tap & DI rinse) ___ Other:

WELL SPECIFICATIONS & MEASUREMENTS

Borehole Diameter (in): 8 (10) 12

Casing Diameter (in): 2 (4)

Depth to Water (DTW_1) (ft): ~~11.03~~ 11.10 @ 1210

Total Well Depth (DTB) (ft): 14.45 ~~14.34~~

Water Column: ~~3.31~~ 3.35

Floating Product:

Thickness (in):

Borehole Volume (gal): ~~4.08~~ 5.03

1.5 Borehole Volumes (gal): 7.45 7.54

PURGING INFORMATION

Time	DTW (ft)	Water Volume Purged (gal)	pH	Temp (°C)	Elect. Cond. (μ mhos)	Water Description (odor, turbidity, color)
1230	Started Purging					
1250	13.70	5.5	7.04	22.7	1923	BLK. CLOUDY, ST. ODOR
1303	14.45 (DRY)	8.	7.16	22.7	1944	" "
1319	11.77	SAMP				

Maximum Drawdown (DTW_2) (ft) = 14.45

H_2O Removal Rate (GPM) = 0.24

X Fast Recharging Well

___ Slow Recharging Well

SAMPLING INFORMATION

Time Sampled: 1319

Depth to Water at time of sampling (DTW_3): 11.77

Container Types & Volumes	Filtered (Y/N)	Sample Preservatives	Analytical Parameters
(6) x 40ml VOAs	(N)	HCL & ICE or NONE	GRO, BTEX, MTBE, (8015M, 8260B)
			DIPE, TAME, ETBE, TBA, Ethanol (8260B)

BOREHOLE VOLUME CALCULATIONS

The calculation of one borehole volume is based on the formula in the SAM Manual.

Diameter (in)	Borehole Diameter (in)	Calculated Borehole Volume (gal)
2	8	.77 (DTB-DTW_1)
2	10	1.14 (DTB-DTW_1)
4	10	1.50 (DTB-DTW_1)
4	12	1.95 (DTB-DTW_1)
6	10	2.11 (DTB-DTW_1)

Notes:

RECOVERY CALCULATIONS

$$\% \text{ of Recovery} = 1 - \frac{(DTW_1) - (DTW_3)}{(DTW_1) - (DTW_2)} \times 100$$

$$\% \text{ of Recovery} = 1 - \frac{(11.10) - (11.77)}{(11.10) - (14.45)} = \frac{-0.67}{-3.35} = 80\%$$

80% Recharge = 11.77

SECOR INTERNATIONAL INCORPORATED	WELL PURGING / SAMPLING LOG		Well No: MW- 22
	Project Name: ARCO 1919		Date: 05/16/05
	Project Number: 08BP.U1919.05 / 4142		Sample Time: 1145
	SECOR Rep: M.N., J.M.	Checked by: de	Sample No: MW- 22

PURGING & SAMPLING EQUIPMENT / METHOD	WELL SPECIFICATIONS & MEASUREMENTS
Water Level Meter Type & ID: Solinist # 5	Borehole Diameter (in): (8) 10 12
Purging Equipment / Method: ___ Vac Truck ___ Submersible Pump X Bailer ___ Other	Casing Diameter (in): (2) 4
pH Temp/Conductivity Meter Type / ID:	Depth to Water (DTW_1) (ft): 5.33
Sampling Method: ___ Teflon Bailer X Disposable Bailer ___ Other:	Total Well Depth (DTB) (ft): 18.10 / Water Column: 12.77
Decontamination Method: ___ Steam / High Pressure Wash X 3 Stage (Alconox, Tap & DI rinse) ___ Other:	Floating Product: — / Thickness (in): —
	Borehole Volume (gal): 9.83 / 1.5 Borehole Volumes (gal): 14.75

PURGING INFORMATION

Time	DTW (ft)	Water Volume Purged (gal)	pH	Temp (°C)	Elect. Cond. (μ mhos)	Water Description (odor, turbidity, color)
1132	Started Purging					
1138	5.55	10	6.86	23.7	5.94	Grey, odor, cloudy
1142	5.83	15	6.87	23.7	5.98	"
1145	5.41	Sample				

Maximum Drawdown (DTW_2) (ft) = 5.83

H_2O Removal Rate (GPM) = 1.50

X Fast Recharging Well

___ Slow Recharging Well

SAMPLING INFORMATION

Time Sampled: 1145

Depth to Water at time of sampling (DTW_3): 5.41

Container Types & Volumes	Filtered (Y/N)	Sample Preservatives	Analytical Parameters
(6) x 40ml VOAs	(N)	HCL & ICE or NONE	GRO, BTEX, MTBE, (8015M, 8260B)
			DIPE, TAME, ETBE, TBA, Ethanol (8260B)

BOREHOLE VOLUME CALCULATIONS

The calculation of one borehole volume is based on the formula in the SAM Manual.

Diameter (in)	Borehole Diameter (in)	Calculated Borehole Volume (gal)
2	8	.77 (DTB-DTW_1)
2	10	1.14 (DTB-DTW_1)
4	10	1.50 (DTB-DTW_1)
4	12	1.95 (DTB-DTW_1)
6	10	2.11 (DTB-DTW_1)

Notes: 12 VOAS

RECOVERY CALCULATIONS

$$\% \text{ of Recovery} = 1 - \frac{(DTW_1) - (DTW_3)}{(DTW_1) - (DTW_2)} \times 100$$

$$\% \text{ of Recovery} = 1 - \frac{(5.33) - (5.41)}{(5.33) - (5.83)} = 84\%$$

80% Recharge = 5.43

SECOR INTERNATIONAL INCORPORATED	WELL PURGING / SAMPLING LOG		Well No: MW- 24
	Project Name: ARCO 1919		Date: 05/6/05
	Project Number: 08BP.U1919.05 / 4142		Sample Time: 1155
	SECOR Rep: I. Cummins	Checked by: AE	Sample No: MW- 24

PURGING & SAMPLING EQUIPMENT / METHOD	WELL SPECIFICATIONS & MEASUREMENTS
Water Level Meter Type & ID: Solinist # 8	Borehole Diameter (in): (8) 10 12
Purging Equipment / Method: ___Vac Truck ___Bailer X Submersible Pump ___Other	Casing Diameter (in): (2) 4
pH Temp/Conductivity Meter Type / ID: 3b	Depth to Water (DTW_1) (ft): 4.34
Sampling Method: ___Teflon Bailer X Disposable Bailer ___Other:	Total Well Depth (DTB) (ft): 16.73 / Water Column: 12.39
Decontamination Method: ___Steam / High Pressure Wash X 3 Stage (Alconox, Tap & DI rinse) ___Other:	Floating Product: / Thickness (in):
	Borehole Volume (gal): 9.54 / 1.5 Borehole Volumes (gal): 14.31

PURGING INFORMATION

Time	DTW (ft)	Water Volume Purged (gal)	pH	Temp (°C)	Elect. Cond. (μ mhos)	Water Description (odor, turbidity, color)
1148	Started Purging					
1151	8.89	10	~~8.54~~ 7.29	22.8	8.04	gray, cloudy, odor
1153	10.16	14.5	7.35	22.9	8.55	
1155	5.40	Sample				

Maximum Drawdown (DTW_2) (ft) = 10.16

H_2O Removal Rate (GPM) = 2.90

X Fast Recharging Well

___ Slow Recharging Well

SAMPLING INFORMATION

Time Sampled: 1155

Depth to Water at time of sampling (DTW_3): 5.40

Container Types & Volumes	Filtered (Y/N)	Sample Preservatives	Analytical Parameters
(6) x 40ml VOAs	(N)	HCL & ICE or NONE	GRO, BTEX, MTBE, (8015M, 8260B)
			DIPE, TAME, ETBE, TBA, Ethanol (8260B)

BOREHOLE VOLUME CALCULATIONS

The calculation of one borehole volume is based on the formula in the SAM Manual.

Diameter (in)	Borehole Diameter (in)	Calculated Borehole Volume (gal)
2	8	.77 (DTB-DTW_1)
2	10	1.14 (DTB-DTW_1)
4	10	1.50 (DTB-DTW_1)
4	12	1.95 (DTB-DTW_1)
6	10	2.11 (DTB-DTW_1)

Notes:

RECOVERY CALCULATIONS

$$\% \text{ of Recovery} = 1 - \frac{(DTW_1) - (DTW_3)}{(DTW_1) - (DTW_2)} \times 100$$

$$\% \text{ of Recovery} = 1 - \frac{(4.34) - (5.40)}{(4.34) - (10.16)} \quad \frac{-1.06}{-5.82} = 82\%$$

80% Recharge = 5.50

SECOR INTERNATIONAL INCORPORATED	WELL PURGING / SAMPLING LOG		Well No: MW- 25
	Project Name: ARCO 1919		Date: [illegible]
	Project Number: 08BP.U1919.05 / 4142		Sample Time: 1141
	SECOR Rep: I. Cummings	Checked by: (le)	Sample No: MW- 25

PURGING & SAMPLING EQUIPMENT / METHOD	WELL SPECIFICATIONS & MEASUREMENTS	
Water Level Meter Type & ID: Solinist # 8	Borehole Diameter (in): (8) 10 12	
Purging Equipment / Method: ___ Vac Truck ___ Bailer X Submersible Pump ___ Other	Casing Diameter (in): (2) 4	
pH Temp/Conductivity Meter Type / ID: 36	Depth to Water (DTW_1) (ft): 2.81	
Sampling Method: ___ Teflon Bailer X Disposable Bailer ___ Other:	Total Well Depth (DTB) (ft): 17.35	Water Column: 14.54
	Floating Product: —	Thickness (in): —
Decontamination Method: ___ Steam / High Pressure Wash X 3 Stage (Alconox, Tap & DI rinse) ___ Other:	Borehole Volume (gal): 11.20	1.5 Borehole Volumes (gal): 16.79

PURGING INFORMATION

Time	DTW (ft)	Water Volume Purged (gal)	pH	Temp (°C)	Elect. Cond. (μ mhos)	Water Description (odor, turbidity, color)
1135	Started Purging					
1138	3.09	11.5	7.01	23.6	5740	yellow green, cloudy, noodle
1140	3.12	17	7.08	23.9	5790	
1141	2.83	sample				

Maximum Drawdown (DTW_2) (ft) = 3.12

H_2O Removal Rate (GPM) = 3.40

X Fast Recharging Well

___ Slow Recharging Well

SAMPLING INFORMATION

Time Sampled: 1141

Depth to Water at time of sampling (DTW_3): 2.83

Container Types & Volumes	Filtered (Y/N)	Sample Preservatives	Analytical Parameters
(6) x 40ml VOAs	(N)	HCL & ICE or NONE	GRO, BTEX, MTBE, (8015M, 8260B)
			DIPE, TAME, ETBE, TBA, Ethanol (8260B)

BOREHOLE VOLUME CALCULATIONS

The calculation of one borehole volume is based on the formula in the SAM Manual.

Diameter (in)	Borehole Diameter (in)	Calculated Borehole Volume (gal)
2	8	.77 (DTB-DTW_1)
2	10	1.14 (DTB-DTW_1)
4	10	1.50 (DTB-DTW_1)
4	12	1.95 (DTB-DTW_1)
6	10	2.11 (DTB-DTW_1)

Notes:

RECOVERY CALCULATIONS

$$\% \text{ of Recovery} = 1 - \frac{(DTW_1) - (DTW_3)}{(DTW_1) - (DTW_2)} \times 100$$

$$\% \text{ of Recovery} = 1 - \frac{(2.81) - (2.83)}{(2.81) - (3.12)} = \frac{-0.02}{-0.31} = 94\%$$

80% Recharge = 2.87

SECOR INTERNATIONAL INCORPORATED	WELL PURGING / SAMPLING LOG		Well No: MW- 26
	Project Name: ARCO 1919		Date: 5/16/05
	Project Number: 08BP.U1919.05 / 4142		Sample Time: 1151
	SECOR Rep: D. KRAUTTER	Checked by:	Sample No: MW- 26

PURGING & SAMPLING EQUIPMENT / METHOD	WELL SPECIFICATIONS & MEASUREMENTS	
Water Level Meter Type & ID: Solinist # 2	Borehole Diameter (in): (8) 10 12	
Purging Equipment / Method: ___Vac Truck X Submersible Pump ___Bailer ___Other	Casing Diameter (in): (2) 4	
pH Temp/Conductivity Meter Type / ID:	Depth to Water (DTW_1) (ft): ~~23.64~~ 23.55 @ 1056	
Sampling Method: ___Teflon Bailer X Disposable Bailer ___Other:	Total Well Depth (DTB) (ft): 34.85 ~~34.85~~	Water Column: ~~7.04~~ 11.30
Decontamination Method: ___Steam / High Pressure Wash X 3 Stage (Alconox, Tap & DI rinse) ___Other:	Floating Product:	Thickness (in):
	Borehole Volume (gal): ~~8.50~~ 8.70	1.5 Borehole Volumes (gal): ~~12.75~~ 13.05

PURGING INFORMATION

Time	DTW (ft)	Water Volume Purged (gal)	pH	Temp (°C)	Elect. Cond. (μ mhos)	Water Description (odor, turbidity, color)
1105	Started Purging					
1116	26.54	9	7.31	22.5	2130	CLOUDY, NO ODOR
1124	26.99	13.5	7.47	22.4	2120	" "
1151	23.57	SAMP.				

Maximum Drawdown (DTW_2) (ft) = 26.99

H_2O Removal Rate (GPM) = .71

X Fast Recharging Well

___ Slow Recharging Well

SAMPLING INFORMATION

Time Sampled: 1151

Depth to Water at time of sampling (DTW_3): 23.57

Container Types & Volumes	Filtered (Y/N)	Sample Preservatives	Analytical Parameters
(6) x 40ml VOAs	(N)	HCL & ICE or NONE	GRO, BTEX, MTBE, (8015M, 8260B)
			DIPE, TAME, ETBE, TBA, Ethanol (8260B)

BOREHOLE VOLUME CALCULATIONS

The calculation of one borehole volume is based on the formula in the SAM Manual.

Diameter (in)	Borehole Diameter (in)	Calculated Borehole Volume (gal)
2	8	.77 (DTB-DTW_1)
2	10	1.14 (DTB-DTW_1)
4	10	1.50 (DTB-DTW_1)
4	12	1.95 (DTB-DTW_1)
6	10	2.11 (DTB-DTW_1)

Notes:

RECOVERY CALCULATIONS

$$\% \text{ of Recovery} = 1 - \frac{(DTW_1) - (DTW_3)}{(DTW_1) - (DTW_2)} \times 100$$

$$\% \text{ of Recovery} = 1 - \frac{(23.55) - (23.57)}{(23.55) - (26.99)} = \frac{.02}{3.44} = 99\%$$

80% Recharge = 24.24

SEVERN TRENT STL

STL Los Angeles
1721 South Grand Avenue
Santa Ana, CA 92705

Tel: 714 258 8610 Fax: 714 258 0921
www.stl-inc.com

May 27, 2005

STL LOT NUMBER: **E5E180132**
PO/CONTRACT: GEM-6-21909

BRAD EISENBERG
SECOR International Inc
2655 Camino Del Rio North
Suite 302
San Diego, CA 92108-1633

Dear BRAD EISENBERG,

This report contains the analytical results for the nine samples received under chain of custody by STL Los Angeles on May 17, 2005. These samples are associated with your ARCO #1919 project.

STL Los Angeles certifies that the test results provided in this report meet all the requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in the case narrative. The case narrative is an integral part of the report. NELAP Certification Number for STL Los Angeles is 01118CA/E87652.

Any matrix related anomaly is footnoted within the report. A cooler receipt temperature between 2-6 degrees Celsius is within EPA acceptance criteria. The temperature(s) of the coolers received for this project can be found on the Project Receipt Checklist.

This report shall not be reproduced except in full, without the written approval of the laboratory.

This report contains 000025 pages.

CASE NARRATIVE

Historical control limits for the LCS are used to define the estimate of uncertainty for a method.

All applicable quality control procedures met method-specified acceptance criteria.

If you have any questions, please feel free to call me at 714.258.8610.

Sincerely,

Sabina Sudoko

Sabina Sudoko
Project Manager
CC: Project File

Chain of Custody Record

Project Name: ARCO 1919 Groundwater Monitoring
BP BU/AR Region/Enfos Segment: Retail
State or Lead Regulatory Agency: County of San Diego, DEH
Requested Due Date (mm/dd/yy): Standard TAT

On-site Time:	Temp:
Off-site Time:	Temp:
Sky Conditions:	
Meteorological Events:	
Wind Speed:	Direction:

Lab Name:	STL Los Angeles	BP AR Facility No.:	1919	Consultant Contractor:	SECOR International, Inc.
Address:	1721 Grand Ave.	BP AR Facility Address:	660 Via de la Valle, Solana Beach, CA	Address:	2655 Camino Del Rio North, Suite 302
	Santa Ana, CA 92705-4808	Site Lat/Long:			San Diego, CA 92108
Lab PM:	Sabina Sudoko	California Global ID No.:	T0607301584	Consultant Contractor Project No.:	08BP.01919.07.0427
Tele Fax:	714.258.8610	Enfos Project No.:	G0BQ4-0001	Consultant Contractor PM:	Brad Eisenberg
BP AR PM Contact:	Roy Thun	Provision or RCOP:	Provision	Tele Fax:	619.296.6195/6199
Address:	4 Centerpointe Dr.	Phase/WBS:	Monitoring (04)	Report Type & QC Level:	Normal
	La Palma, CA 90623	Sub Phase/Task:	Analytical	E-mail EDD To:	beisenberg@secor.com
Tele Fax:	661.287.3855/222-2349	Cost Element:	Subcontracted Cost	Invoice to:	Atlantic Richfield Co.

Lab Bottle Order No:

Item No.	Sample Description	Time	Date	Matrix: Soil/Solid	Matrix: Water/Liquid	Matrix: Air	Laboratory No.	No. of Containers	Preservative: Unpreserved	Preservative: H_2SO_4	Preservative: HNO_3	Preservative: HCl	Preservative: Methanol		Requested Analysis: EPA 8015M GRO C6-C12	Requested Analysis: EPA 8260B BTEX, Oxys, MTBE, EtOH								Sample Point Lat/Long and Comment
1	TB-1919-2005 0516				X			6				X												HOLD
2	EB-1919-2005 0516				X			6				X												HOLD
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								

	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Name:						
Sampler's Company:		06/16/05	14:15	STL-LA	5/16/05	14:15
Shipment Date:	STL-LA	05/16/05	5:00 PM			
Shipment Method:						
Shipment Tracking No:					5-17-5	17:00

Special Instructions: Oxy's = TBA, DIPE, TAME, ETBE

Custody Seals In Place Yes ___ No ___ Temp Blank Yes ___ No ___ Cooler Temperature on Receipt ___ °F/C Trip Blank Yes ___ No ___

Distribution: White Copy - Laboratory / Yellow Copy - BP/Atlantic Richfield Co. / Pink Copy - Consultant/Contractor

BP COC Rev. 4 10/1/04

STL LOS ANGELES - PROJECT RECEIPT CHECKLIST Date: 5/18/05

LIMS Lot #: E5E180132 Quote #: 62428

Client Name: Secor Project:

Received by: MG Date/Time Received: 5/17/05 17:00

Delivered by : ☐ Client ☒ STL ☐ DHL ☐ Fed Ex ☐ UPS ☐ Other

****

	Initial / Date
Custody Seal Status Cooler: ☐ Intact ☐ Broken ☒ None	MK 5/18
Custody Seal Status Samples: ☐ Intact ☐ Broken ☒ None	
Custody Seal #(s): ☒ No Seal #	
Sampler Signature on COC ☐ Yes ☐ No ☒ N/A	
IR Gun # B Correction Factor 0.4 °C IR passed daily verification ☒ Yes ☐ No	
Temperature - BLANK 3.9 °C +/- 0.4 CF = 4.4 °C	
Temperature – COOLER (___ °C ___ °C ___ °C ___ °C) = ___ avg °C +/- ___ CF = ___ °C	
Samples outside temperature criteria but received within 6 hours of final sampling ☐ Yes ☒ N/A	
Sample Container(s): ☒ STL-LA ☐ Client	
One COC/Multiple coolers: ☐ Yes- # coolers ___ All within temp criteria ☐ Yes ☐ No ☒ N/A	
One or more coolers with an anomaly: ☐ Yes -- (fill out PRC for each) ☒ N/A	
Samples: ☒ Intact ☐ Broken ☐ Other	
pH measured: ☐ Yes ☐ Anomaly (if checked, notify lab and file NCM) ☐ N/A	
Anomalies: ☐ No ☐ Yes – complete CUR and Create NCM NCM #	

Complete shipment received in good condition with correct temperatures, containers, labels, volumes preservatives and within method specified holding times. ☒ Yes ☐ N/A

Labeled by: Natasha Kuka Labeling checked

****

Turn Around Time: ☐ RUSH–24HR ☐ RUSH–48HR ☐ RUSH–72HR ☒ NORMAL

Short-Hold Notification: ☐ pH ☐ Wet Chem ☐ Metals (Filter/Pres) ☐ Encore ☐ >1/2 HT expired...

Outside Analysis(es) (Test/Lab/Date Sent Out) :

N/A

********** LEAVE NO BLANK SPACES ; USE N/A **********

Headspace Anomaly ☐ N/A MK 5/18/05

Lab ID	Container(s) #	Headspace	Lab ID	Container(s) #	Headspace
		☐ > 6mm			☐ > 6mm
		☐ > 6mm			☐ > 6mm
		☐ > 6mm			☐ > 6mm
		☐ > 6mm			☐ > 6mm
		☐ > 6mm			☐ > 6mm
		☐ > 6mm			☐ > 6mm
		☐ > 6mm			☐ > 6mm

LIMS Lot # E5E180132

PROJECT RECEIPT CHECKLIST Cont'd

Fraction	1	2	3	4	5	6	7	8	9					
VOAH/ *	6	6	6	6	6	12	6	6	6					

* VOA with headspace/bubbles < 6mm

H: HCL, S: H2SO4, N: HNO3, V: VOA, SL, Sleeve, E: Encore, PB: Poly Bottle, CGB: Clear Glass Bottle, AGJ: Amber Glass Jar, T: Terracore AGB: Amber Glass Bottle, n/f/l:HNO3-Lab filtered, n/f:HNO3-Field filtered, znna: Zinc Acetate/Sodium Hydroxide, Na2s2o3: sodium thiosulfate

Condition Upon Receipt Anomaly Form

☐ N/A MC 5/18/05

- **COOLERS**
  - ☐ Not Received (received COC only)
  - ☐ Leaking
  - ☐ Other:
- **CUSTODY SEALS (COOLER(S)**
  - ☐ None
  - ☐ Not Intact
  - ☐ Other
- **CONTAINER(S)**
  - ☐ None
  - ☐ Not Intact
  - ☐ Other
- **TEMPERATURE (SPECS 4 ± 2°C)**
  - ☐ Cooler Temp(s)
  - ☐ Temperature Blank(s)
- **CHAIN OF CUSTODY (COC)**
  - ☐ Not relinquished by Client; No date/time relinquished
  - ☐ Incomplete information provided
  - ☐ Other ☐ COC not received – notify PM
- **CONTAINERS**
  - ☐ Leaking ☐ Voa Vials with Bubbles > 6mm
  - ☐ Broken
  - ☐ Extra
  - ☐ Without Labels
  - ☐ Other:
- **LABELS**
  - ☐ Not the same ID/info as in COC
  - ☐ Incomplete Information
  - ☐ Markings/Info illegible
  - ☐ Torn
- **SAMPLES**
  - ☐ Samples NOT RECEIVED but listed on COC
  - ☐ Samples received but NOT LISTED on COC
  - ☐ Logged based on Label Information
  - ☐ Logged based on info from other samples on COC
  - ☐ Logged according to Work Plan
  - ☐ Logged on HOLD UNTIL FURTHER NOTICE
  - ☐ Will be noted on COC--Client to send samples with new COC
  - ☐ Mislabeled as to tests, preservatives, etc.
  - ☐ Holding time expired -- list sample ID and test
  - ☐ Improper container used
  - ☐ Not preserved/Improper preservative used
  - ☐ Improper pH _____ Lab to preserve sample and document
  - ☐ Insufficient quantities for analysis ☐ Other

Comments:

☐ Corrective Action Implemented:

☐ Client Informed: verbally on _____ By: _____ ☐ In writing on _____ By: _____

☐ Sample(s) on hold until: _____ ☐ Sample(s) processed "as is."

Logged by/Date: [signature] 5/18/05 **PM Review/Date:** 5/18 5c

SECOR International Inc

Client Sample ID: MW-18

GC/MS Volatiles

Lot-Sample #...:	E5E180132-003	**Work Order #...:**	HAQFH1AA	**Matrix.....:**	W
Date Sampled...:	05/16/05 12:54	**Date Received..:**	05/17/05 17:00	**MS Run #.....:**	5140139
Prep Date.....:	05/19/05	**Analysis Date..:**	05/19/05		
Prep Batch #...:	5140192	**Analysis Time..:**	11:00		
Dilution Factor:	100				
Analyst ID.....:	000038	**Instrument ID..:**	MSN		
		Method.....:	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diisopropyl Ether (DIPE)	ND	200	ug/L
Benzene	ND	50	ug/L
Ethanol	ND IO,IB	50000	ug/L
Ethylbenzene	ND	50	ug/L
tert-Butyl alcohol	ND	2500	ug/L
Toluene	ND	50	ug/L
o-Xylene	ND	100	ug/L
Xylenes (total)	ND	100	ug/L
m-Xylene & p-Xylene	ND	100	ug/L
Methyl tert-butyl ether (MTBE)	**3300**	**100**	**ug/L**
Ethyl-t-Butyl Ether (ETBE)	ND	200	ug/L
Tert-amyl methyl ether (TAME)	ND	200	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Bromofluorobenzene	91	(75 - 120)
1,2-Dichloroethane-d4	96	(65 - 130)
Toluene-d8	92	(80 - 130)

NOTE(S):

IO Contract limits originate from BP-GCLN Technical Requirements

IB CCV recovery above limit; analyte not detected.

SECOR International Inc

Client Sample ID: MW-18

GC Volatiles

Lot-Sample #...:	E5E180132-003	Work Order #...:	HAQFH1AC	Matrix.....:	W
Date Sampled...:	05/16/05 12:54	Date Received..:	05/17/05 17:00	MS Run #.....:	5144175
Prep Date.....:	05/19/05	Analysis Date..:	05/19/05		
Prep Batch #...:	5144307	Analysis Time..:	13:36		
Dilution Factor:	1				
Analyst ID.....:	001464	Instrument ID..:	G13		
		Method.....:	SW846 8015B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
GRO (C6 - C12)	**680**	**100**	**ug/L**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	90	(70 - 130)

SECOR International Inc

Client Sample ID: MW-19A

GC/MS Volatiles

Lot-Sample #...:	E5E180132-004	**Work Order #...:**	HAQF31AA	**Matrix.....:**	W
Date Sampled...:	05/16/05 11:53	**Date Received..:**	05/17/05 17:00	**MS Run #.....:**	5140139
Prep Date.....:	05/19/05	**Analysis Date..:**	05/19/05		
Prep Batch #...:	5140192	**Analysis Time..:**	11:25		
Dilution Factor:	1				
Analyst ID.....:	000038	**Instrument ID..:**	MSN		
		Method.....:	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diisopropyl Ether (DIPE)	ND	2.0	ug/L
Benzene	ND	0.50	ug/L
Ethanol	ND IO,IB	500	ug/L
Ethylbenzene	ND	0.50	ug/L
tert-Butyl alcohol	ND	25	ug/L
Toluene	ND	0.50	ug/L
o-Xylene	ND	1.0	ug/L
Xylenes (total)	ND	1.0	ug/L
m-Xylene & p-Xylene	ND	1.0	ug/L
Methyl tert-butyl ether (MTBE)	**2.8**	**1.0**	**ug/L**
Ethyl-t-Butyl Ether (ETBE)	ND	2.0	ug/L
Tert-amyl methyl ether (TAME)	ND	2.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Bromofluorobenzene	90	(75 - 120)
1,2-Dichloroethane-d4	104	(65 - 130)
Toluene-d8	94	(80 - 130)

NOTE(S):

IO Contract limits originate from BP-GCLN Technical Requirements

IB CCV recovery above limit; analyte not detected.

SECOR International Inc

Client Sample ID: MW-19A

GC Volatiles

Lot-Sample #...:	E5E180132-004	**Work Order #...:**	HAQF31AC	**Matrix.....:**	W
Date Sampled...:	05/16/05 11:53	**Date Received..:**	05/17/05 17:00	**MS Run #.....:**	5144175
Prep Date.....:	05/19/05	**Analysis Date..:**	05/19/05		
Prep Batch #...:	5144307	**Analysis Time..:**	14:03		
Dilution Factor:	1				
Analyst ID.....:	001464	**Instrument ID..:**	G13		
		Method.....:	SW846 8015B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
GRO (C6 - C12)	ND	100	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	87	(70 - 130)

SECOR International Inc

Client Sample ID: MW-19B

GC/MS Volatiles

Lot-Sample #...:	E5E180132-005	Work Order #...:	HAQF41AA	Matrix.....:	W
Date Sampled...:	05/16/05 13:19	Date Received..:	05/17/05 17:00	MS Run #.....:	5140139
Prep Date.....:	05/19/05	Analysis Date..:	05/19/05		
Prep Batch #...:	5140192	Analysis Time..:	11:46		
Dilution Factor:	25				
Analyst ID.....:	000038	Instrument ID..:	MSN		
		Method.....:	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diisopropyl Ether (DIPE)	ND	50	ug/L
Benzene	**52**	**12**	**ug/L**
Ethanol	ND IO,IB	12000	ug/L
Ethylbenzene	**1200**	**12**	**ug/L**
tert-Butyl alcohol	ND	620	ug/L
Toluene	**330**	**12**	**ug/L**
o-Xylene	**400**	**25**	**ug/L**
Xylenes (total)	**1100**	**25**	**ug/L**
m-Xylene & p-Xylene	**740**	**25**	**ug/L**
Methyl tert-butyl ether (MTBE)	ND	25	ug/L
Ethyl-t-Butyl Ether (ETBE)	ND	50	ug/L
Tert-amyl methyl ether (TAME)	ND	50	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Bromofluorobenzene	93	(75 - 120)
1,2-Dichloroethane-d4	103	(65 - 130)
Toluene-d8	92	(80 - 130)

NOTE(S):

IO Contract limits originate from BP-GCLN Technical Requirements

IB CCV recovery above limit; analyte not detected.

SECOR International Inc

Client Sample ID: MW-19B

GC Volatiles

Lot-Sample #...:	E5E180132-005	Work Order #...:	HAQF41AC	Matrix.....:	W
Date Sampled...:	05/16/05 13:19	Date Received..:	05/17/05 17:00	MS Run #.....:	5144175
Prep Date.....:	05/19/05	Analysis Date..:	05/19/05		
Prep Batch #...:	5144307	Analysis Time..:	14:31		
Dilution Factor:	25				
Analyst ID.....:	001464	Instrument ID..:	G13		
		Method.....:	SW846 8015B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
GRO (C6 - C12)	4100	2500	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	98	(70 - 130)

SECOR International Inc

Client Sample ID: MW-22

GC/MS Volatiles

Lot-Sample #...:	E5E180132-006	**Work Order #...:**	HAQGH1AA	**Matrix.....:**	W
Date Sampled...:	05/16/05 11:45	**Date Received..:**	05/17/05 17:00	**MS Run #.....:**	5140139
Prep Date.....:	05/19/05	**Analysis Date..:**	05/19/05		
Prep Batch #...:	5140192	**Analysis Time..:**	12:08		
Dilution Factor:	1				
Analyst ID.....:	000038	**Instrument ID..:**	MSN		
		Method.....:	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diisopropyl Ether (DIPE)	ND	2.0	ug/L
Benzene	ND	0.50	ug/L
Ethanol	ND IO,IB	500	ug/L
Ethylbenzene	ND	0.50	ug/L
tert-Butyl alcohol	**98**	**25**	**ug/L**
Toluene	ND	0.50	ug/L
o-Xylene	ND	1.0	ug/L
Xylenes (total)	ND	1.0	ug/L
m-Xylene & p-Xylene	ND	1.0	ug/L
Methyl tert-butyl ether (MTBE)	**8.0**	**1.0**	**ug/L**
Ethyl-t-Butyl Ether (ETBE)	ND	2.0	ug/L
Tert-amyl methyl ether (TAME)	ND	2.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Bromofluorobenzene	89	(75 - 120)
1,2-Dichloroethane-d4	98	(65 - 130)
Toluene-d8	91	(80 - 130)

NOTE(S):

IO Contract limits originate from BP-GCLN Technical Requirements

IB CCV recovery above limit; analyte not detected.

SECOR International Inc

Client Sample ID: MW-22

GC Volatiles

Lot-Sample #...:	E5E180132-006	Work Order #...:	HAQGH1AC	Matrix.....:	W
Date Sampled...:	05/16/05 11:45	Date Received..:	05/17/05 17:00	MS Run #.....:	5144175
Prep Date.....:	05/19/05	Analysis Date..:	05/19/05		
Prep Batch #...:	5144307	Analysis Time..:	14:59		
Dilution Factor:	1				
Analyst ID.....:	001464	Instrument ID..:	G13		
		Method.....:	SW846 8015B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
GRO (C6 - C12)	ND	100	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	89	(70 - 130)

SECOR International Inc

Client Sample ID: MW-24

GC/MS Volatiles

Lot-Sample #...:	E5E180132-007	**Work Order #...:**	HAQGR1AA	**Matrix.....:**	W
Date Sampled...:	05/16/05 11:55	**Date Received..:**	05/17/05 17:00	**MS Run #.....:**	5140139
Prep Date.....:	05/19/05	**Analysis Date..:**	05/19/05		
Prep Batch #...:	5140192	**Analysis Time..:**	12:30		
Dilution Factor:	1				
Analyst ID.....:	000038	**Instrument ID..:**	MSN		
		Method.....:	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diisopropyl Ether (DIPE)	ND	2.0	ug/L
Benzene	ND	0.50	ug/L
Ethanol	ND IO,IB	500	ug/L
Ethylbenzene	ND	0.50	ug/L
tert-Butyl alcohol	**88**	**25**	**ug/L**
Toluene	ND	0.50	ug/L
o-Xylene	ND	1.0	ug/L
Xylenes (total)	ND	1.0	ug/L
m-Xylene & p-Xylene	ND	1.0	ug/L
Methyl tert-butyl ether (MTBE)	**32**	**1.0**	**ug/L**
Ethyl-t-Butyl Ether (ETBE)	ND	2.0	ug/L
Tert-amyl methyl ether (TAME)	ND	2.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Bromofluorobenzene	89	(75 - 120)
1,2-Dichloroethane-d4	96	(65 - 130)
Toluene-d8	89	(80 - 130)

NOTE(S):

IO Contract limits originate from BP-GCLN Technical Requirements

IB CCV recovery above limit; analyte not detected.

SECOR International Inc

Client Sample ID: MW-24

GC Volatiles

Lot-Sample #...:	E5E180132-007	**Work Order #...:**	HAQGR1AC	**Matrix.....:**	W
Date Sampled...:	05/16/05 11:55	**Date Received..:**	05/17/05 17:00	**MS Run #.....:**	5144175
Prep Date.....:	05/19/05	**Analysis Date..:**	05/19/05		
Prep Batch #...:	5144307	**Analysis Time..:**	15:27		
Dilution Factor:	1				
Analyst ID.....:	001464	**Instrument ID..:**	G13		
		Method.....:	SW846 8015B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
GRO (C6 - C12)	ND	100	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	86	(70 - 130)

SECOR International Inc

Client Sample ID: MW-25

GC/MS Volatiles

Lot-Sample #...:	E5E180132-008	**Work Order #...:**	HAQG81AA	**Matrix.....:**	W
Date Sampled...:	05/16/05 11:41	**Date Received..:**	05/17/05 17:00	**MS Run #.....:**	5140139
Prep Date.....:	05/19/05	**Analysis Date..:**	05/19/05		
Prep Batch #...:	5140192	**Analysis Time..:**	12:51		
Dilution Factor:	1				
Analyst ID.....:	000038	**Instrument ID..:**	MSN		
		Method.....:	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diisopropyl Ether (DIPE)	ND	2.0	ug/L
Benzene	ND	0.50	ug/L
Ethanol	ND IO,IB	500	ug/L
Ethylbenzene	ND	0.50	ug/L
tert-Butyl alcohol	**480**	**25**	**ug/L**
Toluene	ND	0.50	ug/L
o-Xylene	ND	1.0	ug/L
Xylenes (total)	ND	1.0	ug/L
m-Xylene & p-Xylene	ND	1.0	ug/L
Methyl tert-butyl ether (MTBE)	**3.8**	**1.0**	**ug/L**
Ethyl-t-Butyl Ether (ETBE)	ND	2.0	ug/L
Tert-amyl methyl ether (TAME)	ND	2.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Bromofluorobenzene	89	(75 - 120)
1,2-Dichloroethane-d4	92	(65 - 130)
Toluene-d8	88	(80 - 130)

NOTE(S):

IO Contract limits originate from BP-GCLN Technical Requirements

IB CCV recovery above limit; analyte not detected.

SECOR International Inc

Client Sample ID: MW-25

GC Volatiles

Lot-Sample #...:	E5E180132-008	**Work Order #...:**	HAQG81AC	**Matrix.....:**	W
Date Sampled...:	05/16/05 11:41	**Date Received..:**	05/17/05 17:00	**MS Run #.....:**	5144175
Prep Date.....:	05/19/05	**Analysis Date..:**	05/19/05		
Prep Batch #...:	5144307	**Analysis Time..:**	15:55		
Dilution Factor:	1				
Analyst ID.....:	001464	**Instrument ID..:**	G13		
		Method.....:	SW846 8015B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
GRO (C6 - C12)	ND	100	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	86	(70 - 130)

SECOR International Inc

Client Sample ID: MW-26

GC/MS Volatiles

Lot-Sample #...:	E5E180132-009	**Work Order #...:**	HAQHJ1AC	**Matrix.....:**	W
Date Sampled...:	05/16/05 11:51	**Date Received..:**	05/17/05 17:00	**MS Run #.....:**	5140139
Prep Date.....:	05/19/05	**Analysis Date..:**	05/19/05		
Prep Batch #...:	5140192	**Analysis Time..:**	13:13		
Dilution Factor:	1				
Analyst ID.....:	000038	**Instrument ID..:**	MSN		
		Method.....:	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diisopropyl Ether (DIPE)	ND	2.0	ug/L
Benzene	ND	0.50	ug/L
Ethanol	ND IO,IB	500	ug/L
Ethylbenzene	ND	0.50	ug/L
tert-Butyl alcohol	ND	25	ug/L
Toluene	ND	0.50	ug/L
o-Xylene	ND	1.0	ug/L
Xylenes (total)	ND	1.0	ug/L
m-Xylene & p-Xylene	ND	1.0	ug/L
Methyl tert-butyl ether (MTBE)	ND	1.0	ug/L
Ethyl-t-Butyl Ether (ETBE)	ND	2.0	ug/L
Tert-amyl methyl ether (TAME)	ND	2.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Bromofluorobenzene	89	(75 - 120)
1,2-Dichloroethane-d4	102	(65 - 130)
Toluene-d8	92	(80 - 130)

NOTE(S):

IO Contract limits originate from BP-GCLN Technical Requirements

IB CCV recovery above limit; analyte not detected.

SECOR International Inc

Client Sample ID: MW-26

GC Volatiles

Lot-Sample #...:	E5E180132-009	**Work Order #...:**	HAQHJ1AD	**Matrix.....:**	W
Date Sampled...:	05/16/05 11:51	**Date Received..:**	05/17/05 17:00	**MS Run #.....:**	5144175
Prep Date.....:	05/19/05	**Analysis Date..:**	05/19/05		
Prep Batch #...:	5144307	**Analysis Time..:**	17:47		
Dilution Factor:	1				
Analyst ID.....:	001464	**Instrument ID..:**	G13		
		Method.....:	SW846 8015B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
GRO (C6 - C12)	ND	100	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	89	(70 - 130)

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: E5E180132
MB Lot-Sample #: E5E200000-192

Work Order #...: HAX4E1AA

Matrix.....: WATER

Prep Date.....: 05/19/05
Analysis Time..: 09:54

Analysis Date..: 05/19/05
Prep Batch #...: 5140192
Instrument ID..: MSN

Dilution Factor: 1

Analyst ID.....: 000038

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Benzene	ND	0.50	ug/L	SW846 8260B
Ethanol	ND IO,IB	500	ug/L	SW846 8260B
Ethylbenzene	ND	0.50	ug/L	SW846 8260B
tert-Butyl alcohol	ND	25	ug/L	SW846 8260B
Toluene	ND	0.50	ug/L	SW846 8260B
o-Xylene	ND	1.0	ug/L	SW846 8260B
Xylenes (total)	ND	1.0	ug/L	SW846 8260B
m-Xylene & p-Xylene	ND	1.0	ug/L	SW846 8260B
Methyl tert-butyl ether (MTBE)	ND	1.0	ug/L	SW846 8260B
Diisopropyl Ether (DIPE)	ND	2.0	ug/L	SW846 8260B
Ethyl-t-Butyl Ether (ETBE	ND	2.0	ug/L	SW846 8260B
Tert-amyl methyl ether (T	ND	2.0	ug/L	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Bromofluorobenzene	92	(75 - 120)
1,2-Dichloroethane-d4	100	(65 - 130)
Toluene-d8	89	(80 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

IO Contract limits originate from BP-GCLN Technical Requirements

IB CCV recovery above limit; analyte not detected.

METHOD BLANK REPORT

GC Volatiles

Client Lot #...: E5E180132
MB Lot-Sample #: E5E240000-307

Work Order #...: HA51Q1AA

Matrix.....: WATER

Prep Date.....: 05/19/05

Analysis Time..: 12:12

Analysis Date..: 05/19/05

Prep Batch #...: 5144307

Instrument ID..: G13

Dilution Factor: 1

Analyst ID.....: 001464

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
GRO (C6 - C12)	ND	100	ug/L	SW846 8015B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	93	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: E5E180132 Work Order #...: HAX4E1AC Matrix.....: WATER
LCS Lot-Sample#: E5E200000-192
Prep Date.....: 05/19/05 Analysis Date..: 05/19/05
Prep Batch #...: 5140192 Analysis Time..: 09:32
Dilution Factor: 1 Instrument ID..: MSN
Analyst ID.....: 000038

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD
Benzene	10.0	9.67	ug/L	97	SW846 8260B
tert-Butyl alcohol	50.0	41.7	ug/L	83	SW846 8260B
Ethanol	2000	1910	ug/L	95	SW846 8260B
		Qualifiers: IO,IB			
Tert-amyl methyl ether (T	10.0	8.90	ug/L	89	SW846 8260B
Ethyl-t-Butyl Ether (ETBE	10.0	9.01	ug/L	90	SW846 8260B
Ethylbenzene	10.0	10.4	ug/L	104	SW846 8260B
Diisopropyl Ether (DIPE)	10.0	9.95	ug/L	100	SW846 8260B
Methyl tert-butyl ether (MTBE)	10.0	9.25	ug/L	92	SW846 8260B
Toluene	10.0	9.89	ug/L	99	SW846 8260B
m-Xylene & p-Xylene	20.0	20.1	ug/L	100	SW846 8260B
o-Xylene	10.0	10.4	ug/L	104	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Bromofluorobenzene	92	(75 - 120)
1,2-Dichloroethane-d4	108	(65 - 130)
Toluene-d8	93	(80 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

IO Contract limits originate from BP-GCLN Technical Requirements

IB CCV recovery above limit; analyte not detected.

LABORATORY CONTROL SAMPLE DATA REPORT

GC Volatiles

Client Lot #...: E5E180132
LCS Lot-Sample#: E5E240000-307
Prep Date.....: 05/19/05
Prep Batch #...: 5144307
Dilution Factor: 1
Analyst ID.....: 001464

Work Order #...: HA51Q1AC
Analysis Date..: 05/19/05
Analysis Time..: 12:40
Instrument ID..: G13

Matrix.....: WATER

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD
GRO (C6 - C12)	**1000**	**930**	**ug/L**	**93**	**SW846 8015B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	124	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

MATRIX SPIKE SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: E5E180132 Work Order #...: HAQGH1AD-MS Matrix.....: W
MS Lot-Sample #: E5E180132-006 HAQGH1AE-MSD
Date Sampled...: 05/16/05 11:45 Date Received..: 05/17/05 17:00 MS Run #.....: 5140139
Prep Date.....: 05/19/05 Analysis Date..: 05/19/05
Prep Batch #...: 5140192 Analysis Time..: 17:53
Dilution Factor: 1 Analyst ID.....: 000038 Instrument ID..: MSN

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD
Benzene	ND	10.0	9.69	ug/L	97		SW846 8260B
	ND	10.0	9.68	ug/L	97	0.10	SW846 8260B
tert-Butyl alcohol	98	50.0	166	ug/L	136		SW846 8260B
	98	50.0	154	ug/L	111	7.9	SW846 8260B
Ethanol	ND	2000	1880	ug/L	94		SW846 8260B
		Qualifiers:	IO,IB				
	ND	2000	1700	ug/L	85	9.7	SW846 8260B
		Qualifiers:	IO,IB				
Tert-amyl methyl ether (T	ND	10.0	9.28	ug/L	93		SW846 8260B
	ND	10.0	9.10	ug/L	91	2.0	SW846 8260B
Ethyl-t-Butyl Ether (ETBE	ND	10.0	9.06	ug/L	91		SW846 8260B
	ND	10.0	9.17	ug/L	92	1.2	SW846 8260B
Ethylbenzene	ND	10.0	9.90	ug/L	99		SW846 8260B
	ND	10.0	9.86	ug/L	99	0.40	SW846 8260B
Diisopropyl Ether (DIPE)	ND	10.0	11.0	ug/L	110		SW846 8260B
	ND	10.0	10.6	ug/L	106	3.2	SW846 8260B
Methyl tert-butyl ether (MTBE)	8.0	10.0	19.6	ug/L	115		SW846 8260B
	8.0	10.0	19.0	ug/L	110	2.7	SW846 8260B
Toluene	ND	10.0	9.58	ug/L	96		SW846 8260B
	ND	10.0	9.39	ug/L	94	2.0	SW846 8260B
m-Xylene & p-Xylene	ND	20.0	19.8	ug/L	99		SW846 8260B
	ND	20.0	19.4	ug/L	97	1.9	SW846 8260B
o-Xylene	ND	10.0	9.77	ug/L	98		SW846 8260B
	ND	10.0	9.80	ug/L	98	0.30	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Bromofluorobenzene	95	(75 - 120)
	92	(75 - 120)
1,2-Dichloroethane-d4	88	(65 - 130)
	88	(65 - 130)
Toluene-d8	93	(80 - 130)
	92	(80 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

IO Contract limits originate from BP-GCLN Technical Requirements

IB CCV recovery above limit; analyte not detected.

MATRIX SPIKE SAMPLE DATA REPORT

GC Volatiles

Client Lot #...:	E5E180132	Work Order #...:	HAQ521AD-MS	Matrix.....:	WATER
MS Lot-Sample #:	E5E180228-002		HAQ521AE-MSD		
Date Sampled...:	05/17/05 08:30	Date Received..:	05/17/05 17:00	MS Run #.....:	5144175
Prep Date.....:	05/19/05	Analysis Date..:	05/19/05		
Prep Batch #...:	5144307	Analysis Time..:	16:23		
Dilution Factor:	1	Analyst ID.....:	001464	Instrument ID..:	G13

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD
GRO (C6 - C12)	ND	1000	909	ug/L	91		SW846 8015B
	ND	1000	915	ug/L	91	0.61	SW846 8015B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	122	(70 - 130)
	121	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters